FINAL APPROVED 7/92

RCRA FACILITY INVESTIGATION
VOLUME II OF II

SPARTON TECHNOLOGY, INC.
COORS ROAD FACILITY
ALBUQUERQUE, NEW MEXICO

MAY 1992

HDR

008561

ATTACHMENT 4

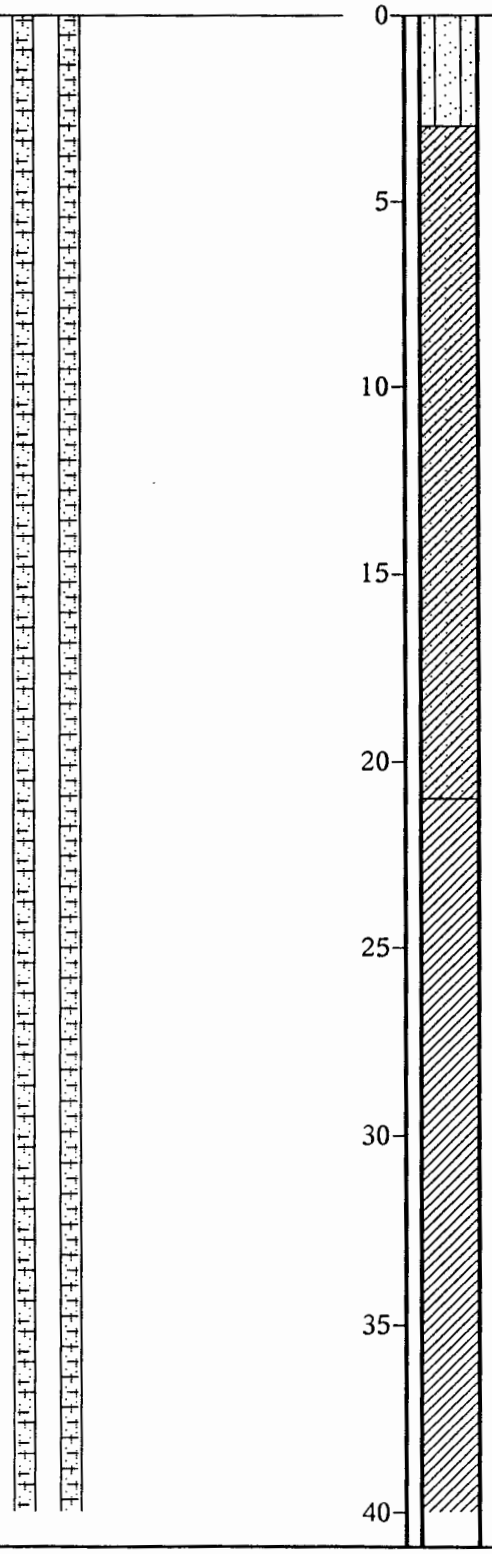
Boring Logs and Well Completion Diagrams

Top of PVC Casing Elevation 5142.22

Equipment GD-1500

Elevation ft **Date** 4/13/90

GROUND SURFACE



TAN SILTY FINE TO MEDIUM SAND (SM)

TAN & BROWN CLAYEY MEDIUM TO COARSE SAND (SC)

TAN SILTY CLAY (CL) with fine sand

Cement/Bentonite Grout

2" PVC Casing to 173 feet

6-3/4" Borehole to 206 feet

Harding Lawson Associates Engineers and Environmental Services

MONITORING WELL DETAIL PZ-1

Sparton Technology Inc.
Albuquerque, New Mexico

PLATE

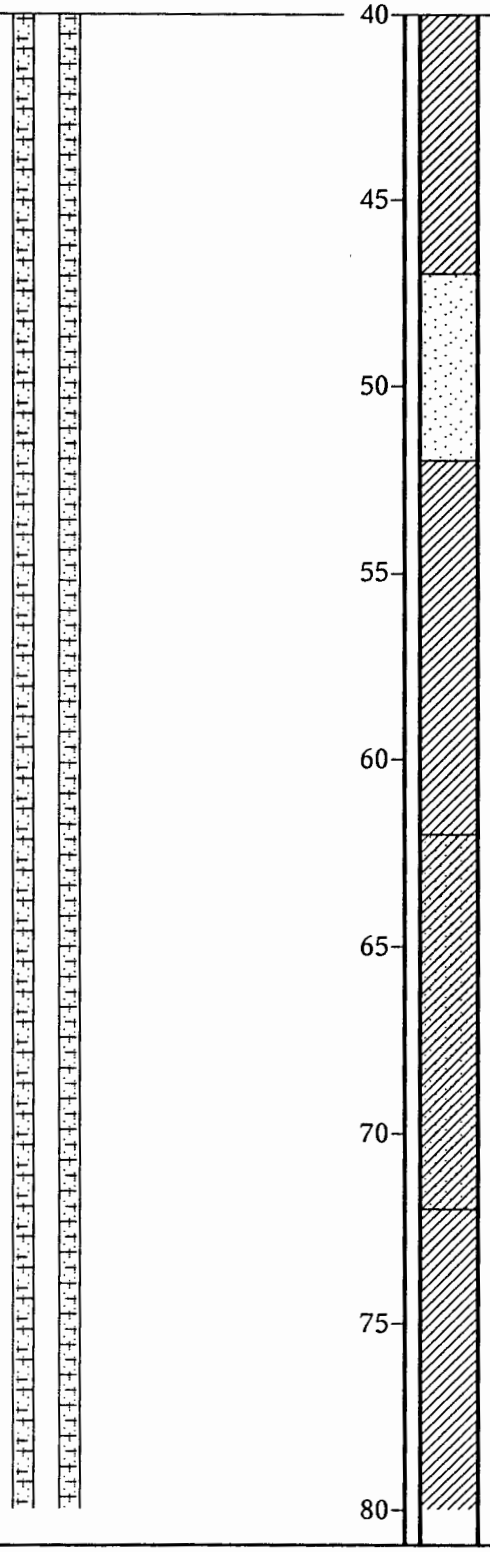
DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
	06310,039.12		12/90		

Top of PVC Casing
Elevation 5142.22

Equipment GD-1500

Elevation ft Date 4/13/90

GROUND SURFACE



TAN, BROWN & BLACK MEDIUM TO COARSE SAND (SP)

TAN SILTY CLAY (CL)
with sand

-with medium grained sand seam from 57 to 59 feet

TAN, BROWN & BLACK MEDIUM TO COARSE SAND (SC)

TAN SILTY CLAY (CL)
with sand

Harding Lawson Associates
Engineers and
Environmental Services

MONITORING WELL DETAIL PZ-1

Sparton Technology Inc.
Albuquerque, New Mexico

PLATE

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
	06310,039.12		12/90		

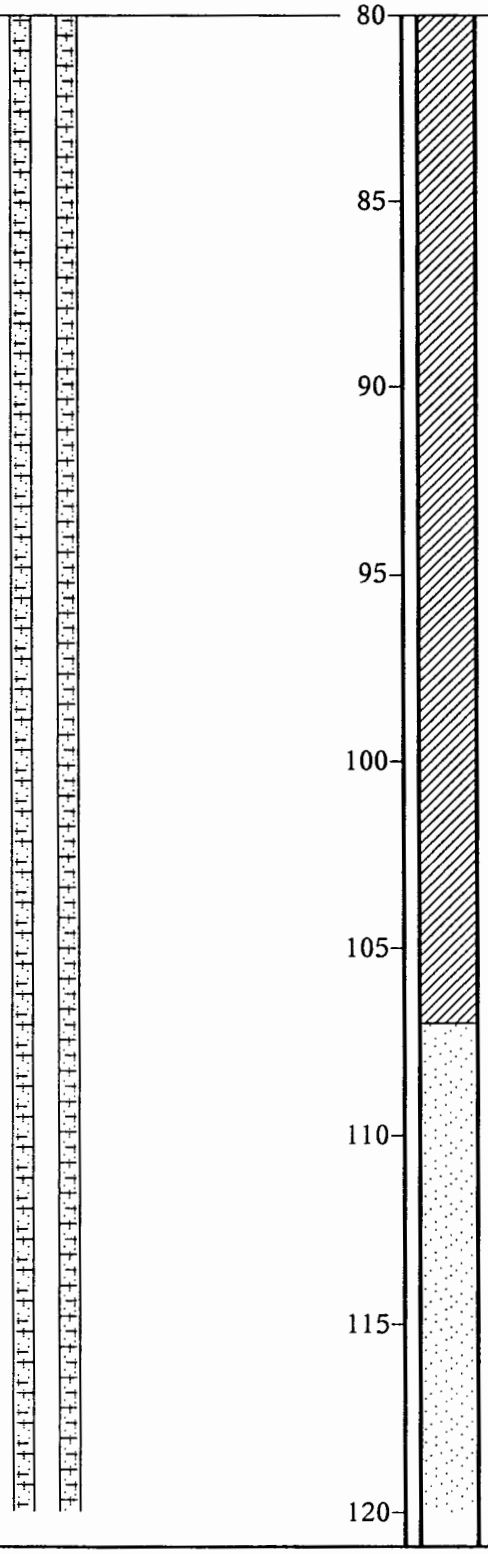
008564

Top of PVC Casing Elevation 5142.22

Equipment GD-1500

Elevation ft **Date** 4/13/90

GROUND SURFACE



BROWN, TAN & BLACK MEDIUM TO COARSE SAND (SP)
with occasional gravel and sandy clay pockets

Harding Lawson Associates
Engineers and Environmental Services

MONITORING WELL DETAIL PZ-1

Sparton Technology Inc.
Albuquerque, New Mexico

PLATE

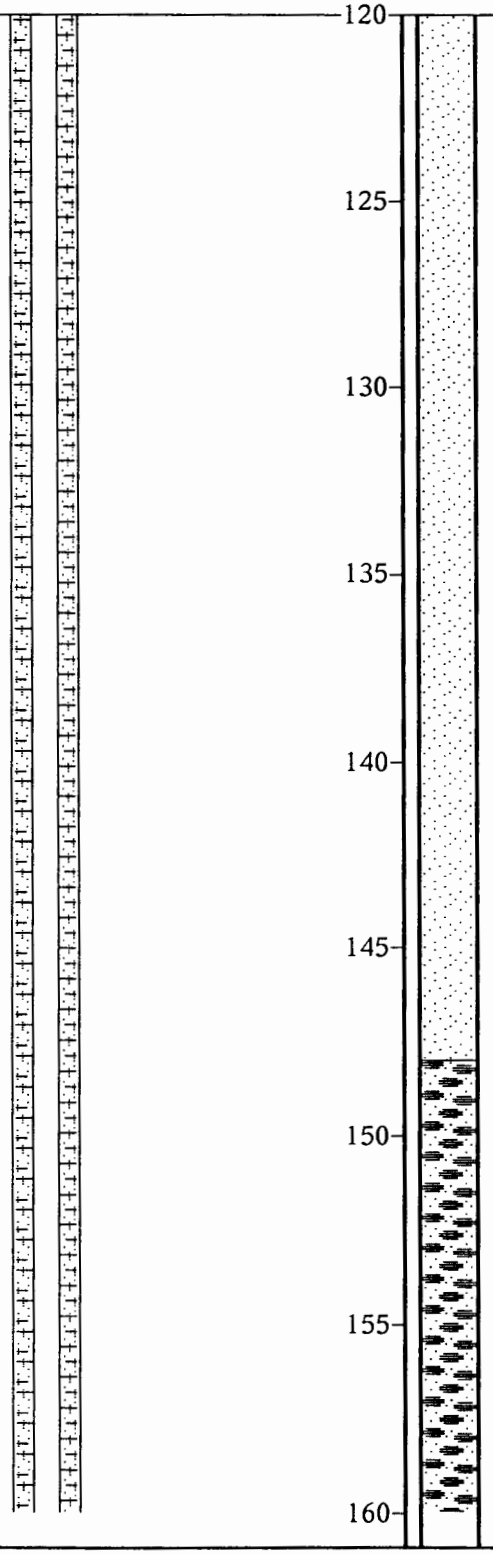
DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
	06310,039.12		12/90		

Top of PVC Casing
Elevation 5142.22

Equipment GD-1500

Elevation ft Date 4/13/90

GROUND SURFACE



TAN, BROWN & BLACK SANDY GRAVEL (GP)

Harding Lawson Associates MONITORING WELL DETAIL PZ-1

Engineers and Environmental Services

Sparton Technology Inc.
Albuquerque, New Mexico

PLATE

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
	06310,039.12		12/90		

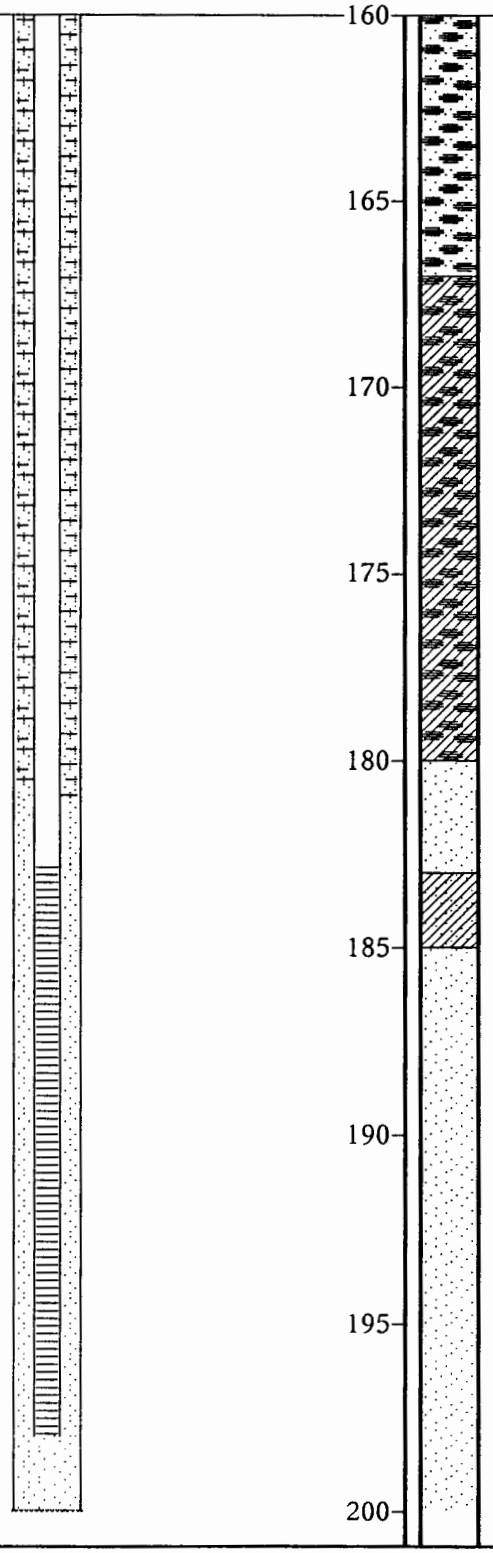
008566

Top of PVC Casing Elevation 5142.22

Equipment GD-1500

Elevation ft **Date** 4/13/90

GROUND SURFACE



Stainless Steel casing from 173 to 182.8 feet

Sandpack:
20x40 sand (180'-181')
10x20 sand (181'-206')

2" Stainless Steel Screen (Slot size 0.02") from 138.8 to 149 feet

Bottom Cap

TAN, BROWN & BLACK CLAYEY GRAVEL (GC)

TAN, BROWN & BLACK FINE TO COARSE SAND (SW)
with gravel

TAN, BROWN & BLACK CLAYEY FINE TO MEDIUM SAND (SC)

TAN, BROWN & BLACK MEDIUM TO COARSE SAND (SP)
with gravel

-with .2' clay seam at 190 feet

Harding Lawson Associates Engineers and Environmental Services

MONITORING WELL DETAIL PZ-1

Sparton Technology Inc.
Albuquerque, New Mexico

PLATE

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
	06310,039.12		12/90		

008567

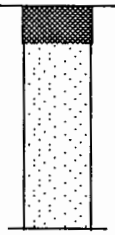
Top of PVC Casing Elevation 5142.22

Equipment GD-1500

Elevation ft **Date** 4/13/90

GROUND SURFACE

Bentonite pellet seal



200

205

End of Boring at 206 feet.

210

215

220

225

230

235

240

Harding Lawson Associates Engineers and Environmental Services

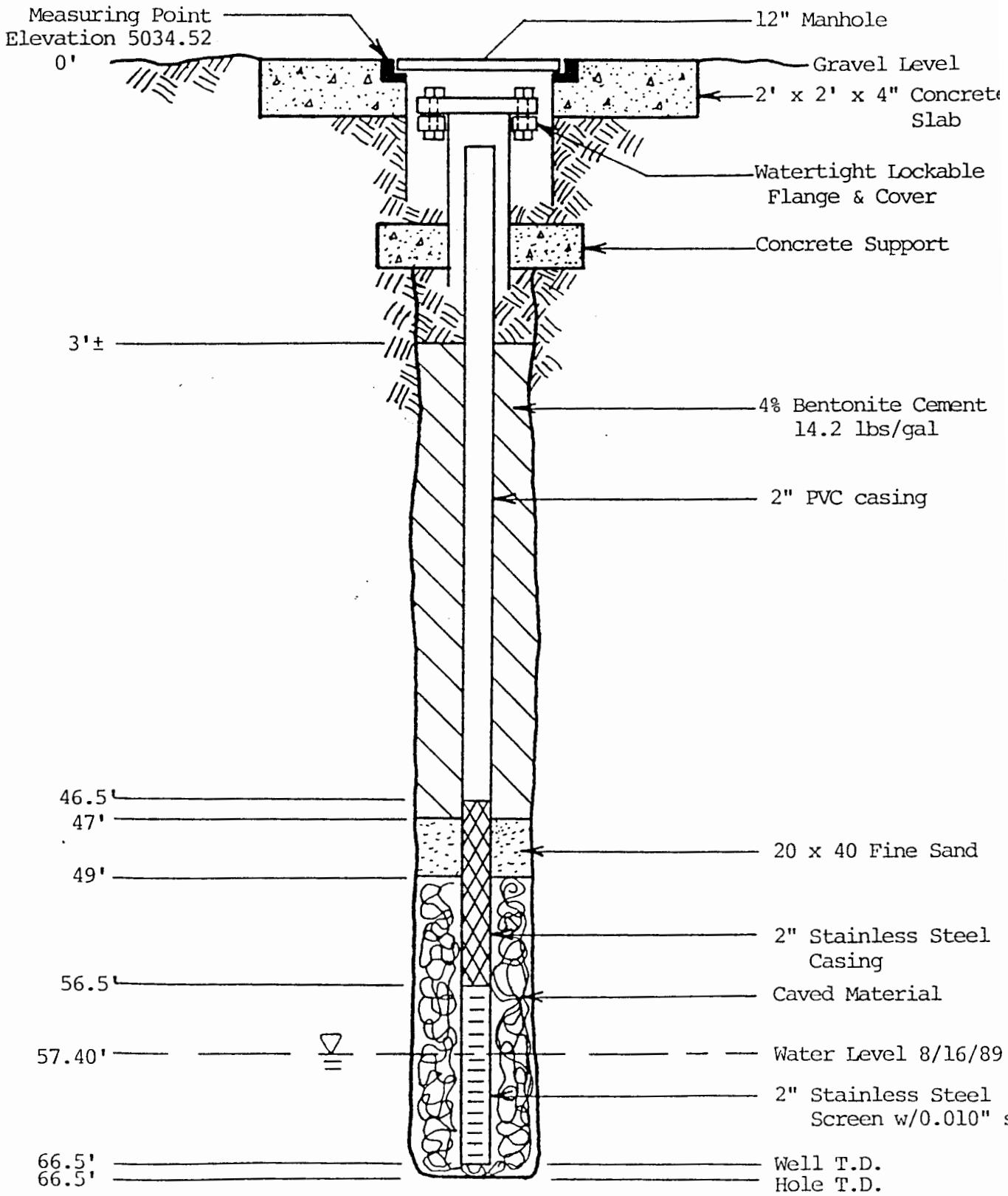
MONITORING WELL DETAIL PZ-1

Sparton Technology Inc.
Albuquerque, New Mexico

PLATE

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
	06310,039.12		12/90		

008568



CONSTRUCTION DIAGRAM
MW-34-OS

METRIC
Corporation

SAMPLE LOG

Well Number MW-34 (OS) Well Location Off site along Irving Blvd.

Well Owner Sparton Technology, Inc.

Sample Logger Peter H. Metzner, METRIC Corporation

Driller METRIC Corporation

Drilling Medium Hollow-stem augers

Date of Completion 6-2-89 Ground Elev. 5034.52

Depth (feet)	Thickness (feet)	Stratigraphic Description
0-5	5	Moderate yellowish brown (10 YR 5/4), poorly sorted fine to very coarse-grained sand with some pebbles (SP)
5-10	5	Moderate yellowish brown (10 YR 5/4), well sorted medium-grained sand with some large pebbles (SW)
10-15	5	Moderate yellowish brown (10 YR 5/4), well sorted medium-grained sand with some granular gravel (SW)
15-20	5	Moderate yellowish brown (10 YR 5/4), well sorted medium-grained sand with pebbles to 10mm (SW)
20-30	10	Moderate yellowish brown (10YR 5/4), well sorted fine-grained sand with some granular gravel (SW)
30-35	5	Moderate yellowish brown (10 YR 5/4), well sorted fine-grained sand (SW)
35-40	5	Moderate yellowish brown (10 YR 5/4), well sorted fine-grained sand with some pebbles from 10 to 20mm (SW)
40-45	5	Moderate yellowish brown (10 YR 5/4), well sorted fine-grained sand with pebbles from 10 to 40mm (SW)

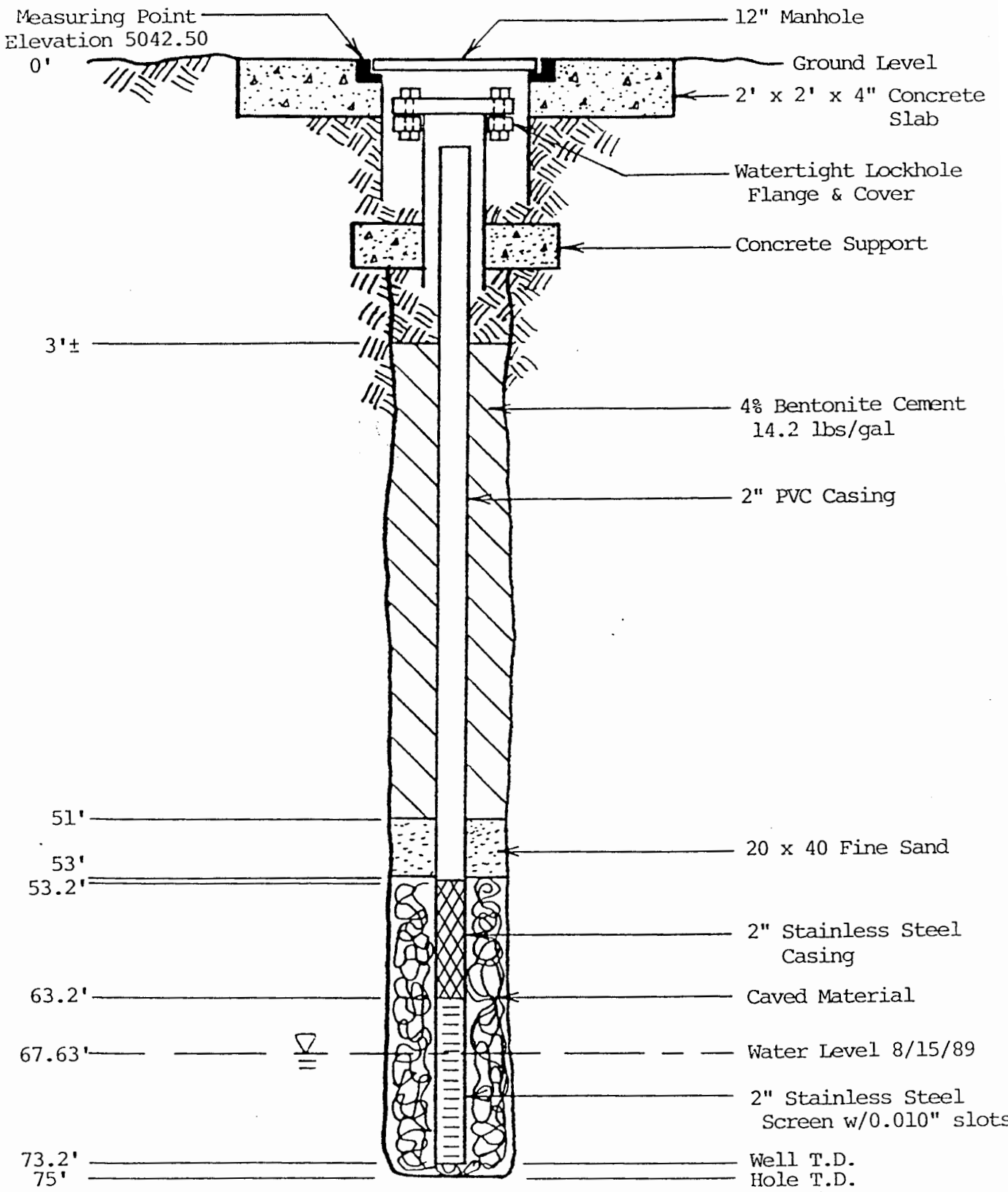
METRIC
Corporation

SAMPLE LOG
Continued

Well Number MW-34 (OS) Well Location Off site along Irving Blvd.

(Continued from Previous Page)

Depth (feet)	Thickness (feet)	Stratigraphic Description
45-55	10	Moderate yellowish brown (10 YR 5/4), fine-grained sand with pebbles from 10 to 50mm (SP)
55-59	4	Moderate yellowish brown (10 YR 5/4), fine-grained sand with pebbles from 4 to 70mm (SW)
59-66	7	Pale yellowish brown (10 YR 6/2), fine to medium-grained sand (SP)
60-66.5	.5	Moderate yellowish brown (10 YR 5/4), very fine-grained clayey sand (SC)



CONSTRUCTION DIAGRAM
MW-35-OS

008572

METRIC
Corporation

SAMPLE LOG

Well Number MW-35 (OS) Well Location Off site along Irving Blvd.

Well Owner Sparton Technology, Inc.

Sample Logger Peter H. Metzner, METRIC Corporation

Driller METRIC Corporation

Drilling Medium Hollow-stem augers

Date of Completion 6-9-89 Ground Elev. 5042.50

Depth (feet)	Thickness (feet)	Stratigraphic Description
0-5	5	Moderate yellowish brown (10 YR 5/4), well sorted fine-grained sand (SW)
5-10	5	Moderate yellowish brown (10 YR 5/4), well sorted fine-grained sand to silt (SM)
10-20	10	Moderate yellowish brown (10 YR 5/4), well sorted very fine-grained sand (SW)
20-25	5	Moderate yellowish brown (10 YR 5/4), well sorted very fine-grained sand with some pebbles (SW)
25-35	10	Dark yellowish brown (10 YR 4/2), well sorted fine-grained sand to silt (SM)
35-45	10	Dark yellowish brown (10 YR 4/2), fine sandy clay (CL)
45-51	6	Dark yellowish brown (10 YR 4/2), clayey fine sand (SC)
51-55	4	Dark yellowish brown (10 YR 4/2), fine-grained sand with pebbles from 5 to 30mm (SP)
55-68	13	Moderate yellowish brown (10 YR 5/4), fine to very fine-grained sand interbedded with pebbles from 10 to 70mm (SP)
68-75.5	7.5	Light brown (5 YR 6/4), fine to very fine sand (SP)

METRIC
Corporation

SAMPLE LOG

Well Number MW-36 (OS) Well Location Off site along Irving Blvd.

Well Owner Sparton Technology, Inc.

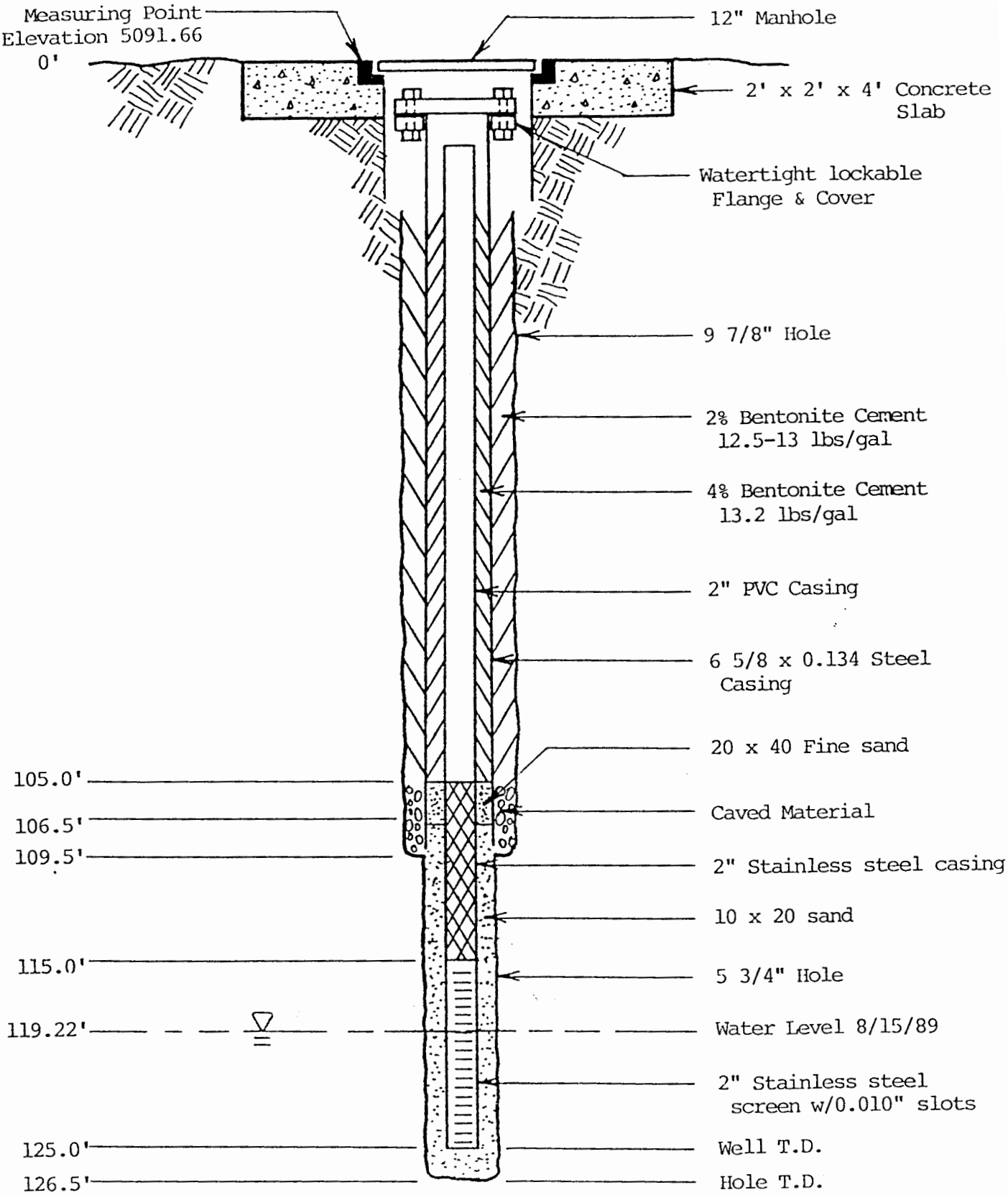
Sample Logger Peter H. Metzner, METRIC Corporation

Driller Rodgers & Company

Drilling Medium Mud rotary

Date of Completion 6-22-89 Ground Elev. 5059.30

Depth (feet)	Thickness (feet)	Stratigraphic Description
0-5	5	Moderate yellowish brown (10 YR 5/4), poorly sorted medium to very fine sand (SP)
5-11	6	Moderate yellowish brown (10 YR 5/4), slightly clayey fine sand with some granular gravel (SM)
11-55	44	Moderate yellowish brown (10 YR 5/4), sandy clay with some granular gravel (CL)
55-57	2	Moderate yellowish brown (10 YR 5/4), clay with granular gravel (CH)
57-65	8	Moderate yellowish brown (10 YR 5/4), slightly clayey very coarse sand with granular gravel (SP)
65-80	15	Medium gray (N5), medium-sorted very coarse sand to pebble gravel (SP)
80-85	5	Medium gray (N5), medium sorted coarse sand to pebble gravel (SP)
85-94	9	Pale yellowish brown (10 YR 6/2), well sorted very coarse sand to granular gravel (SW)



008575

CONSTRUCTION DIAGRAM

MW-37-OS

METRIC
Corporation

SAMPLE LOG

Well Number MW-37 (OS) Well Location Off site along Irving Blvd.

Well Owner Sparton Technology, Inc.

Sample Logger Peter H. Metzner, METRIC Corporation

Driller Rodgers & Company

Drilling Medium Mud rotary

Date of Completion 7-1-89 Ground Elev. 5091.66

Depth (feet)	Thickness (feet)	Stratigraphic Description
0-5	5	Moderate yellowish brown (10 YR 5/4), very fine sand (SW)
5-10	5	Moderate yellowish brown (10 YR 5/4), fine sand (SW)
10-14	4	Moderate yellowish brown (10 YR 5/4), clayey fine sand (SC)
14-35	21	Pale yellowish brown (10 YR 6/2), slightly clayey well sorted medium to coarse sand (SP)
35-45	10	Moderate yellowish brown (10 YR 5/4), clayey fine sand (SC)
45-55	10	Moderate yellowish brown (10 YR 5/4), fine sandy clay (CL)
55-65	10	Moderate yellowish brown (10 YR 5/4), medium to coarse sand (SP)
65-85	20	Pale yellowish brown (10 YR 6/2), medium sorted medium to very coarse sand (SD)
85-95	10	Moderate yellowish brown (10 YR 5/4), well sorted medium to coarse-grained sand (SW)
95-100	5	Moderate yellowish brown (10 YR 5/4), slightly clayey medium-grained sand (SW)

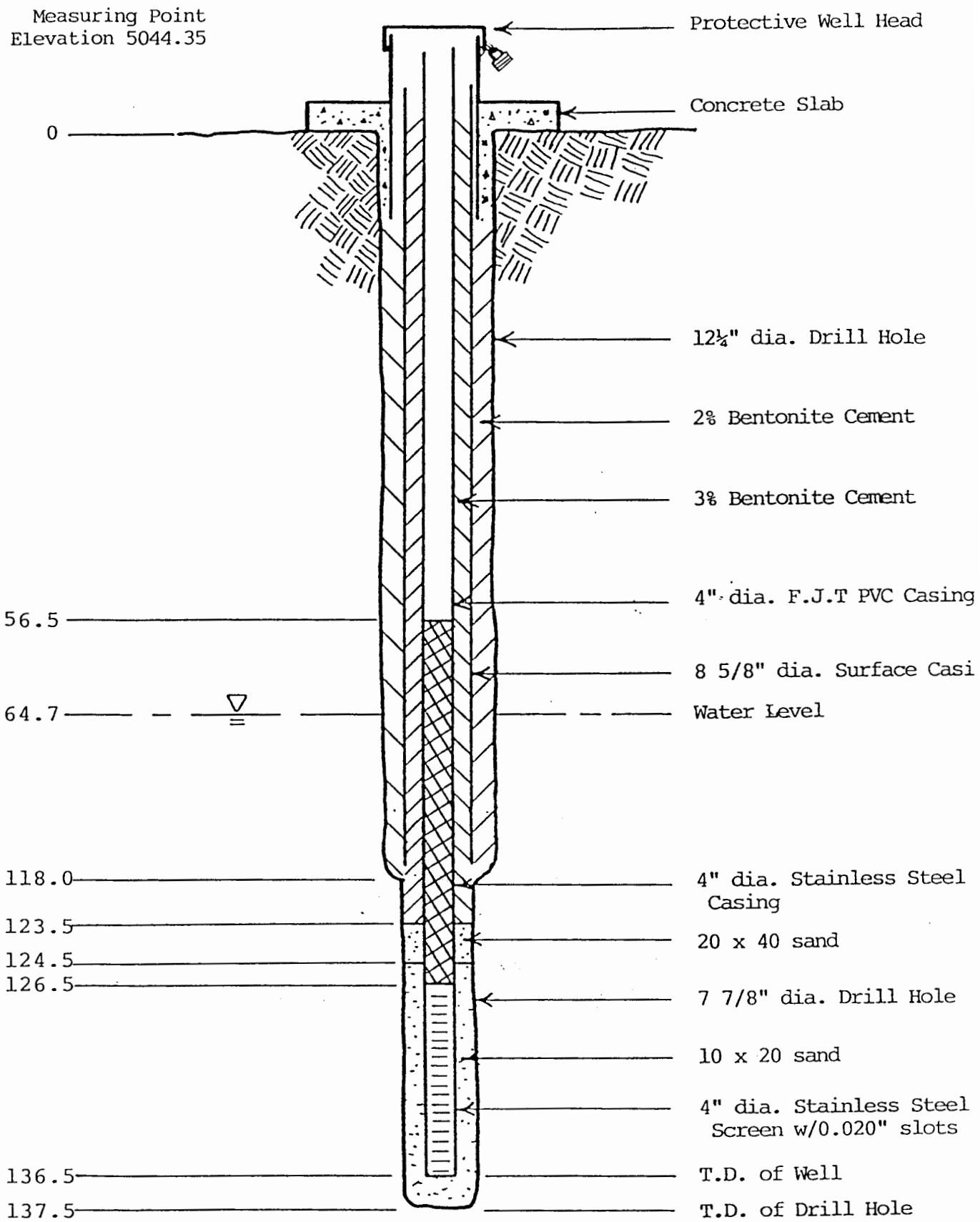
METRIC
Corporation

SAMPLE LOG
Continued

Well Number MW-37 (OS) Well Location Off site along Irving Blvd.

(Continued from Previous Page)

Depth (feet)	Thickness (feet)	Stratigraphic Description
100-111	11	Pale yellowish brown (10 YR 6/2), coarse sand to granular gravel (SP)
111-117	6	Medium gray (N5), pebble gravel (GP)
117-126.5	9.5	Medium gray (N5) very coarse sand to granular gravel (SP)



Construction Diagram
MW-38

008578

METRIC
Corporation

SAMPLE LOG

Well Number MW-38 Well Location On site, South

Well Owner Sparton Technology, Inc.

Sample Logger Peter H. Metzner, METRIC Corporation

Driller Rodgers & Company

Drilling Medium Mud rotary

Date of Completion _____ Ground Elev. 5045'

Depth (feet)	Thickness (feet)	Stratigraphic Description
0-8	8	Moderate yellowish brown (10YR 5/4) fine sandy clay (CL)
8-13	5	Light brown (5YR 6/4) very coarse sand to granule gravel (SP)
13-15	2	Moderate yellowish brown (10YR 5/4) fine sandy clay and very coarse sand to granular gravel (SC)
15-20	5	Light brown (5YR 6/4) very poorly sorted coarse sand to granule gravel (SP)
20-22	2	Light brown (5YR 6/4) very coarse sand to granule gravel (GP)
22-38	16	Light brown (5YR 6/4) fine to medium clayey sand with granule and pebble gravel (SC)
38-48	10	Light brown (5YR 6/4) very fine to medium sand with some granule fragments (SP)
48-50	2	Light brown (5YR 6/4) fine to coarse sand (SP)
50-60	10	Medium gray (N5) very coarse sand to pebble gravel (SW)
60-66	6	Medium gray (N5) coarse sand to pebble gravel (SP)
66-90	24	Medium gray (N5) pebble gravel with fine clayey sand (GM)

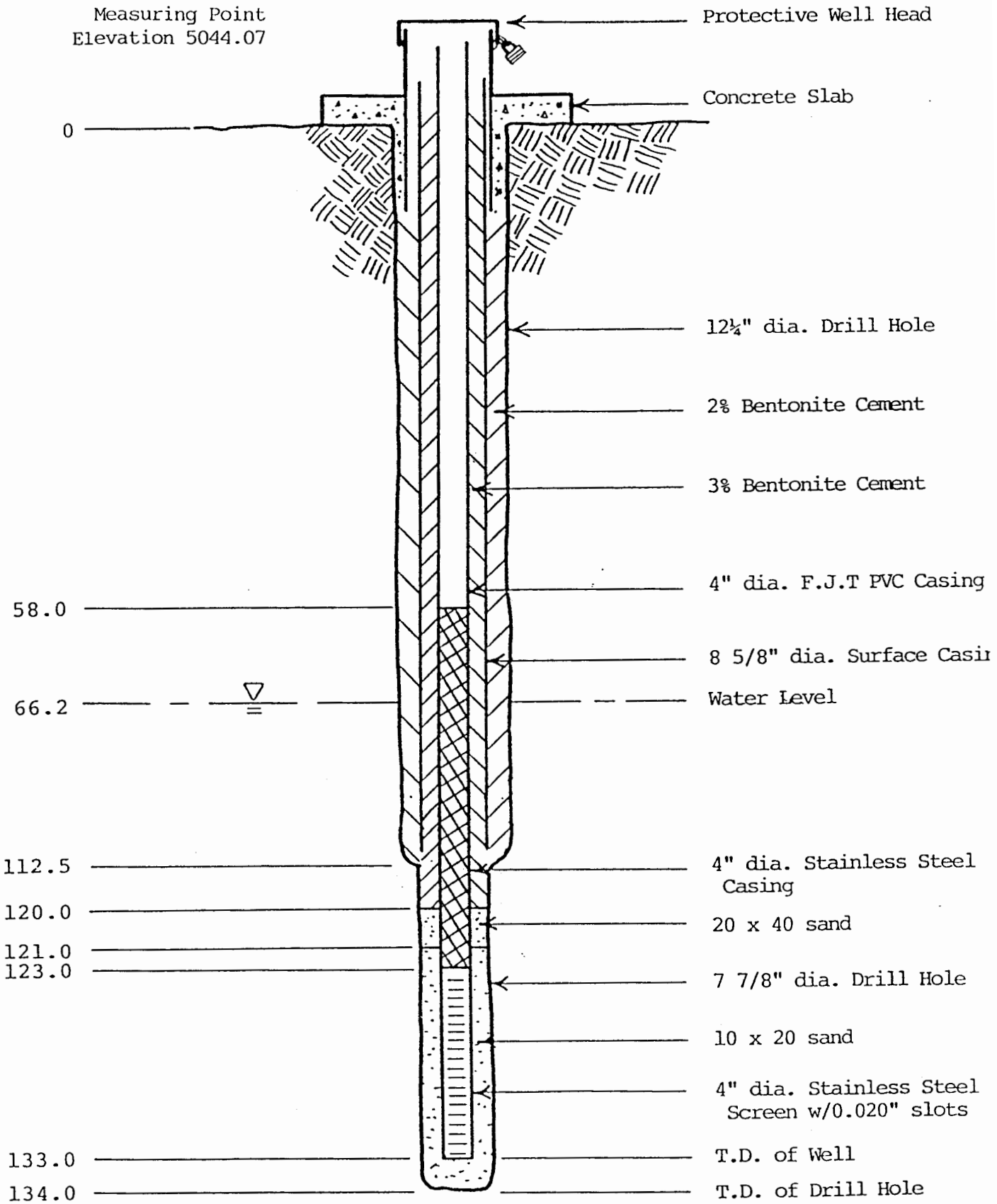
METRIC
Corporation

SAMPLE LOG
Continued

Well Number MW-38 Well Location _____

(Continued from Previous Page)

Depth (feet)	Thickness (feet)	Stratigraphic Description
90-101	11	Light brown (5YR 6/4) fine clayey sand with granule gravel (SC)
101-118	17	Light brown (5YR 6/4) and medium brown (N5) poorly sorted medium sand to pebble gravel (SP)
118-121	3	Light olive gray (5Y 6/1) fine to medium sand (SP)
121-126	5	Light olive gray (5Y 6/1) medium sand (SW)
126-136	10	Light olive gray (5Y 6/1) medium to coarse sand (SP)
136-137	11	Light brown (5YR 6/4) very coarse sand to granule gravel with some fine sandy clay (SC)



Construction Diagram
MW-39

METRIC
Corporation

SAMPLE LOG

Well Number MW-39 Well Location On site, South

Well Owner Sparton Technology, Inc.

Sample Logger Peter H. Metzner - METRIC Corporation

Driller Rodgers & Company

Drilling Medium Mud rotary

Date of Completion _____ Ground Elev. 5044'

Depth (feet)	Thickness (feet)	Stratigraphic Description
0-2	2	Light brown (5YR 6/4) clayey fine to coarse sand (SC)
2-15	13	Light brown (5YR 6/4) slightly clayey, silty very coarse sand to granule gravel (SM)
15-40	25	Moderate yellowish brown (10YR 5/4) clayey very fine sand (SC)
40-43	3	Pale yellowish brown (10YR 6/2) and medium gray (N5) pebble gravel (GW)
43-78	35	Pale yellowish brown (10YR 6/2) and medium gray (N5) slightly cemented pebble gravel (GW)
78-83	5	Pale yellowish brown (10YR 6/2) and medium gray (N5) slightly cemented pebble gravel with alternating clayey fine sand layers (GP)
83-93	10	Light brown (5YR 6/4) clayey very fine sand with pebble gravel (SC)
93-98	5	Light brown (5YR 6/4) fine sandy clay with pebble gravel (CL)
98-103	5	Light brown (5YR 6/4) fine sand to medium gray (N5) granule and pebble gravel (SP)
103-112	9	Medium gray (N5) light brown (5YR 6/4) and grayish orange pink (5YR 7/2) granule and pebble gravel (GP)

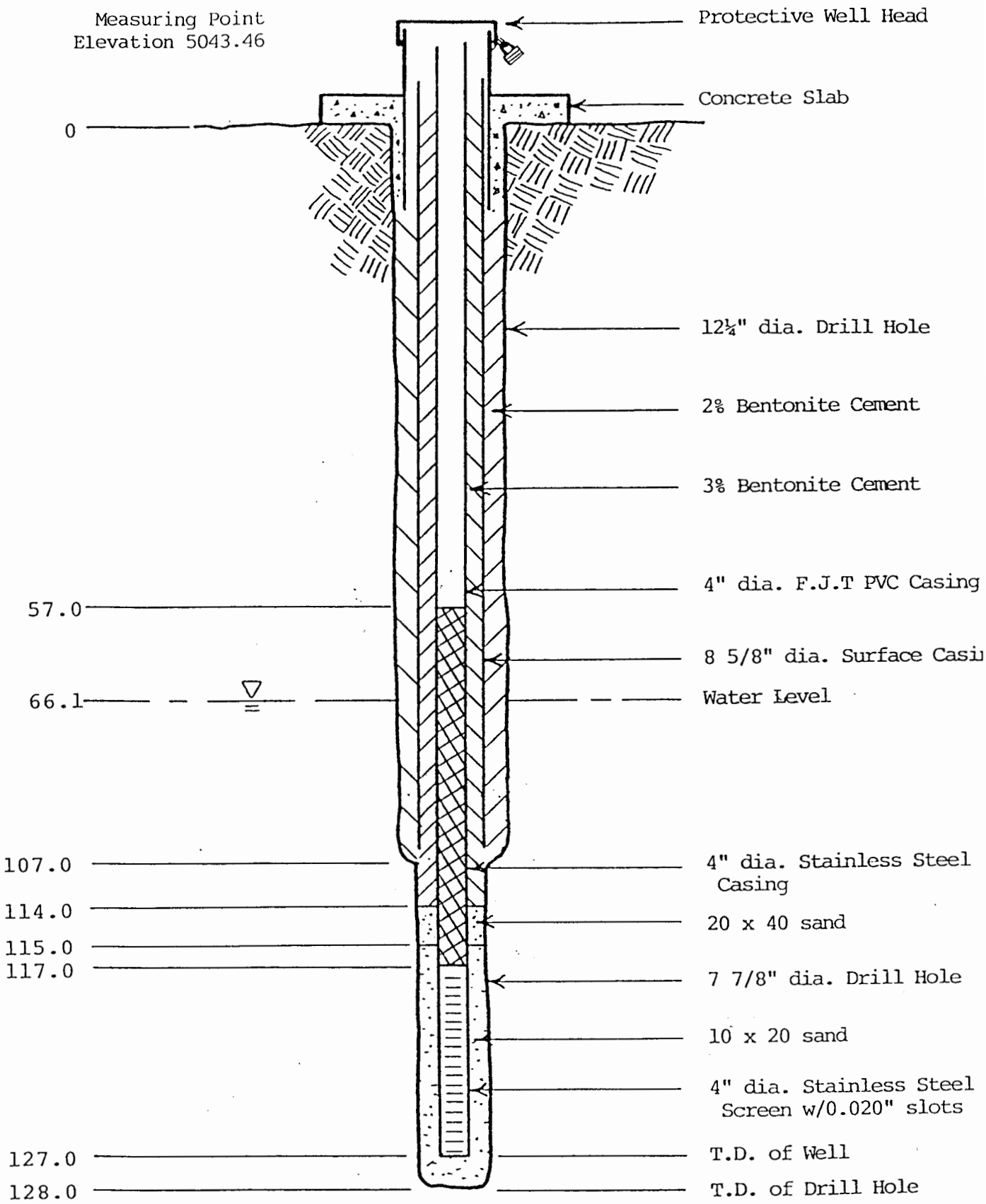
METRIC
Corporation

SAMPLE LOG
Continued

Well Number MW-39 Well Location

(Continued from Previous Page)

Depth (feet)	Thickness (feet)	Stratigraphic Description
112-127	13	Pale yellowish brown (10YR 6/2) poorly sorted fine to very coarse sand (SP)
127-133	6	Medium gray (N5), light brown (5YR 6/4), and grayish orange pink (5YR 7/2) pebble gravel (GP)
133-134	1	Light brown (5YR 6/4) silty clay (CL)



Construction Diagram
MW-40

008584

METRIC
Corporation

SAMPLE LOG

Well Number MW-40 Well Location On site, SW

Well Owner Sparton Technology, Inc.

Sample Logger Peter H. Metzner - METRIC Corporation

Driller Rodgers & Company

Drilling Medium Mud rotary

Date of Completion _____ Ground Elev. 5044'

Depth (feet)	Thickness (feet)	Stratigraphic Description
0-21	21	Light brown (5YR 6/4) silty clay (CL)
21-31	10	Light brown (5YR 6/4) slightly clayey very fine to coarse sand (SP)
31-38	7	Light brown (5YR 6/4) slightly clayey fine sand (SM)
38-50	12	Light brown (5YR 6/4) slightly clayey, very poorly sorted, fine sand to granule gravel (SW)
50-54	4	Light brown (5YR 6/4) slightly clayey very fine to coarse sand (SM)
54-61	7	Light brown (5YR 6/4) slightly clayey medium to very coarse sand (SM)
61-90	29	Light brown (5YR 6/4) clayey fine to coarse sand (SC)
90-107	17	Light brown (5YR 6/4) medium to very coarse sand (SP)
107-111	4	Light olive gray (5YR 6/1) fine to medium sand (SP)
111-116	5	Light brown (5YR 6/4) to light olive gray (5Y 6/1) medium to very coarse sand (SP)

METRIC
Corporation

SAMPLE LOG

Continued

Well Number MW-40 Well Location _____

(Continued from Previous Page)

Depth (feet)	Thickness (feet)	Stratigraphic Description
116-121	5	Light brown (5YR 6/4) to light olive gray (5Y 6/1) fine to very coarse sand (SP)
121-128	7	Light brown (5YR 6/4) poorly sorted clayey, very fine to very coarse sand (SC)

METRIC
Corporation

SAMPLE LOG

Well Number MW-41 Well Location On site, West

Well Owner Sparton Technology, Inc.

Sample Logger Peter H. Metzner - METRIC Corporation

Driller Rodgers & Company

Drilling Medium Mud rotary

Date of Completion _____ Ground Elev. 5047'

Depth (feet)	Thickness (feet)	Stratigraphic Description
0-35	35	Light brown (5YR 6/4) silty clay (CL)
35-42	7	Medium gray (N5) slightly cemented granule and pebble gravel (GP)
42-47	5	Light brown (5YR 6/4) medium to very coarse sand (SP)
47-51	4	Light brown (5YR 6/4) slightly cemented fine to coarse sand (SP)
51-77	26	Medium gray (N5) and light brown (5YR 6/4) pebble gravel (GP)
77-85	8	Medium gray (N5) slightly cemented pebble gravel (GP)
85-96	11	Pale yellowish brown (10YR 6/2) medium to coarse sand (SP)
96-106	10	Light brown (5YR 6/4) medium to coarse sand (SP)
106-116	10	Light brown (5YR 6/4) to pale wellowish brown (10YR 6/2) fine to very coarse sand (SP)
116-117	1	Light brown (5YR 6/4) to pale yellowish brown (10YR 6/2) coarse sand to granule gravel (SP)

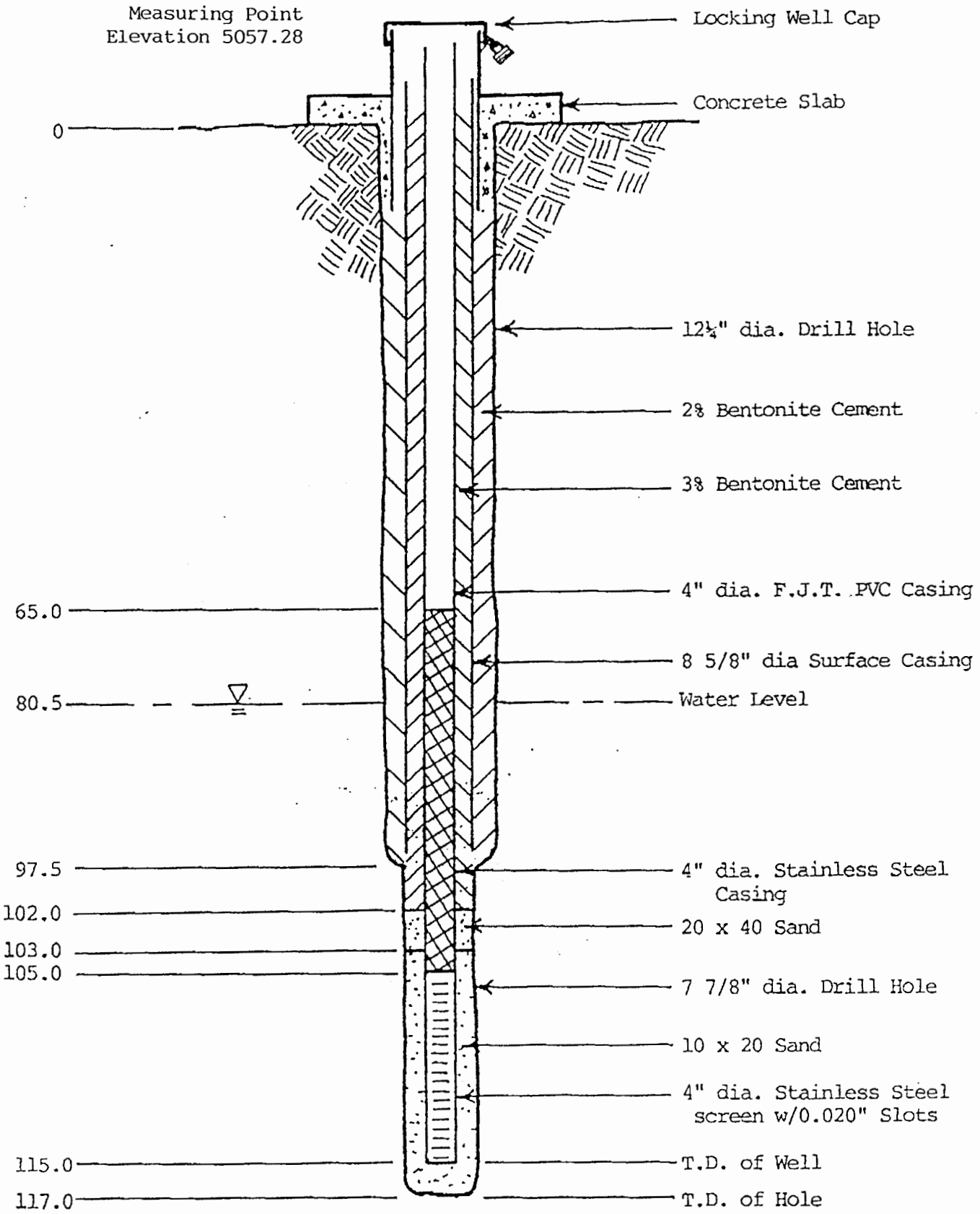
METRIC
Corporation

SAMPLE LOG
Continued

Well Number MW-41 Well Location _____

(Continued from Previous Page)

Depth (feet)	Thickness (feet)	Stratigraphic Description
117-118	1	Light brown (5YR 6/4) very coarse sand and medium gray (N5) granule gravel (SP)



MW-42
CONSTRUCTION DIAGRAM

METRIC
Corporation

SAMPLE LOG

Well Number MW-42 Well Location On site, NW

Well Owner Sparton Technology, Inc.

Sample Logger METRIC Corporation, Peter H. Metzner

Driller Rodgers & Company, Inc.

Drilling Medium Mud rotary

Date of Completion 10-31-89 Ground Elev. 5055'

Depth (feet)	Thickness (feet)	Stratigraphic Description
0-10	10	Pale yellowish brown (10 YR 6/2) silt to very fine sand with some very coarse sand
10-30	20	Pale yellowish brown (10 YR 6/2) very fine to medium sand with some granule gravel
30-35	5	Pale yellowish brown (10 YR 6/2) poorly sorted, fine sand to granule gravel
35-40	5	Pale yellowish brown (10 YR 6/2) poorly sorted, medium sand to small pebble gravel
40-45	5	Moderate yellowish brown (10 YR 5/4) silt
45-50	5	Moderate yellowish brown (10 YR 5/4) silty clay
50-55	5	Medium gray (N5) to yellowish gray (5 Y 8/1) granule gravel to small pebble gravel
55-75	20	Medium gray (N5) to yellowish gray (5 Y 8/1) large pebble gravel
75-80	5	Medium gray (N5) to yellowish gray (5 Y 8/1) pebble gravel with pale yellowish brown (10 YR 6/2) clayey silt
80-95	15	Pale yellowish brown (10 YR 6/2) poorly sorted clayey very fine sand to very coarse sand, with some granule gravel

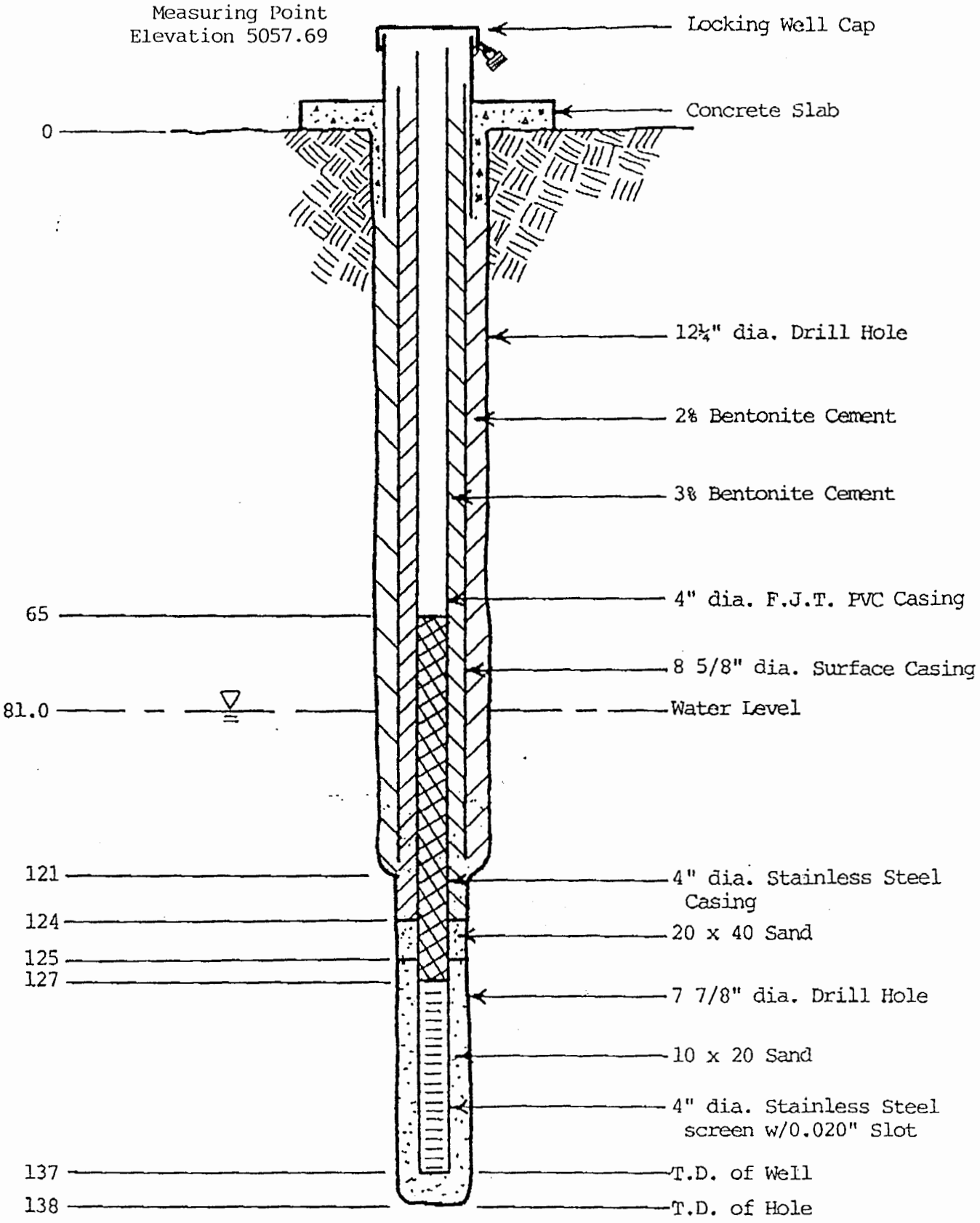
METRIC
Corporation

SAMPLE LOG
Continued

Well Number MW-42 Well Location On site, NW

(Continued from Previous Page)

Depth (feet)	Thickness (feet)	Stratigraphic Description
95-97	2	Pale yellowish brown (10 YR 6/2) coarse sand to pebble gravel
97-105	8	Pale yellowish brown (10 YR 6/2) coarse to very coarse sand
105-115	10	Pale yellowish brown (10 YR 6/2) coarse sand
115-117	2	Pale yellowish brown (10 YR 6/2) medium to very coarse sand



MW-43
CONSTRUCTION DIAGRAM

METRIC
Corporation

SAMPLE LOG

Well Number MW-43 Well Location On site, NW

Well Owner Sparton Technology, Inc.

Sample Logger METRIC Corporation, Peter H. Metzner

Driller Rodgers & Company, Inc.

Drilling Medium Mud rotary

Date of Completion 11-9-89 Ground Elev. 5056'

Depth (feet)	Thickness (feet)	Stratigraphic Description
0-15	15	Pale yellowish brown (10 YR 6/2) poorly sorted very fine to very coarse sand
15-35	20	Pale yellowish brown (10 YR 6/2) fine to medium sand
35-45	10	Pale yellowish brown (10 YR 6/2) very fine to fine sand
45-50	5	Moderate yellowish brown (10 YR 5/4) silty clay
50-75	25	Medium gray (N5) to yellowish gray (5 Y 8/1) pebble gravel
75-80	5	Medium gray (N5) to yellowish gray (5 Y 8/1) very coarse sand to pebble gravel
80-85	5	Pale yellowish brown (10 YR 6/2) clay with some small pebble gravel
85-90	5	Pale yellowish brown (10 YR 6/2) fine sandy clay
90-95	5	Pale yellowish brown (10 YR 6/2) fine sandy clay and medium gray (N5) to yellowish gray (5 Y 8/1) small pebble gravel
95-100	5	Medium gray (N5) to yellowish gray (5 Y 8/1) small pebble gravel

METRIC
Corporation

SAMPLE LOG
Continued

Well Number MW-43 Well Location On site, NW

(Continued from Previous Page)

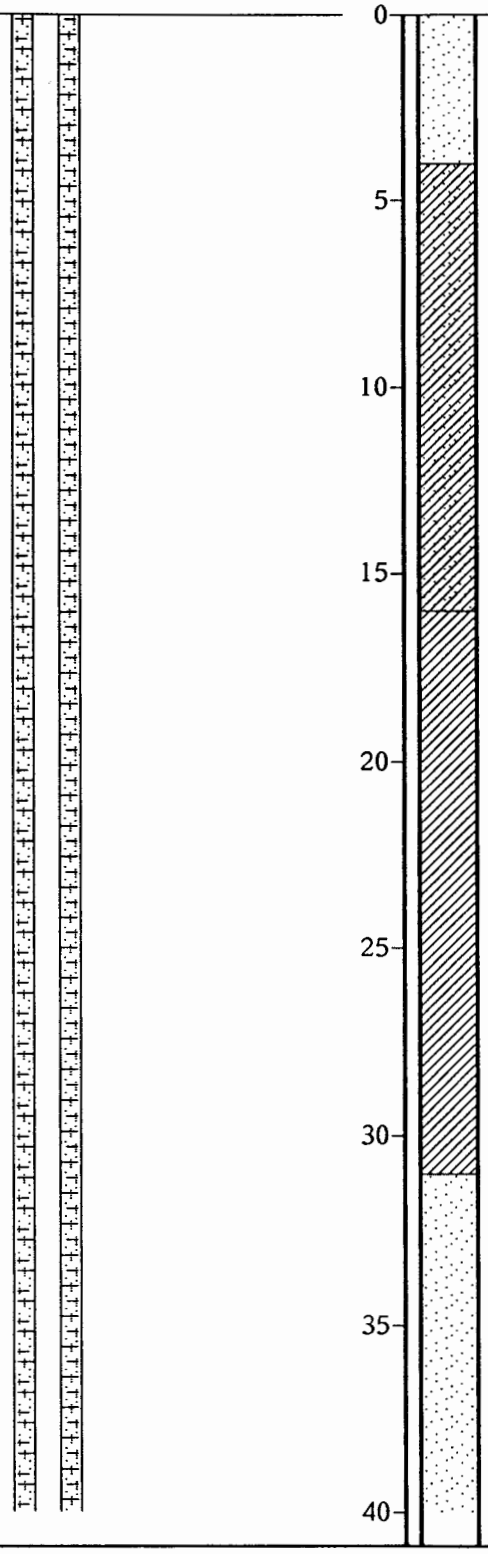
Depth (feet)	Thickness (feet)	Stratigraphic Description
100-120	20	Pale yellowish brown (10 YR 6/2) fine sandy clay with granule to pebble gravel
120-124	4	Very light gray (N8) granule gravel
124-130	6	Very light gray (N8) small pebble gravel
130-136	6	Pale yellowish brown (10 YR 6/2) well sorted, coarse sand to granule gravel
136-138	2	Pale yellowish brown (10 YR 6/2) well sorted, clayey coarse sand to granule gravel

Top of PVC Casing Elevation 5060.68

Equipment GD-1500

Elevation ft **Date** 11/18/89

GROUND SURFACE



YELLOWISH-BROWN FINE TO MEDIUM SAND (SP)

YELLOWISH-BROWN CLAYEY FINE TO MEDIUM SAND (SC)

YELLOWISH-BROWN SANDY CLAY (CL)
with coarse sand

YELLOWISH-BROWN FINE TO COARSE SAND (SW)
with gravel

Cement/Bentonite Grout

4" PVC Casing to 70 feet

12-1/4" Borehole to 103 feet

8-5/8" steel casing to 102 feet

Harding Lawson Associates
Engineers and Environmental Services

MONITORING WELL DETAIL MW-44

Sparton Technology Inc.
Albuquerque, New Mexico

PLATE

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
	06310,039.12		12/90		

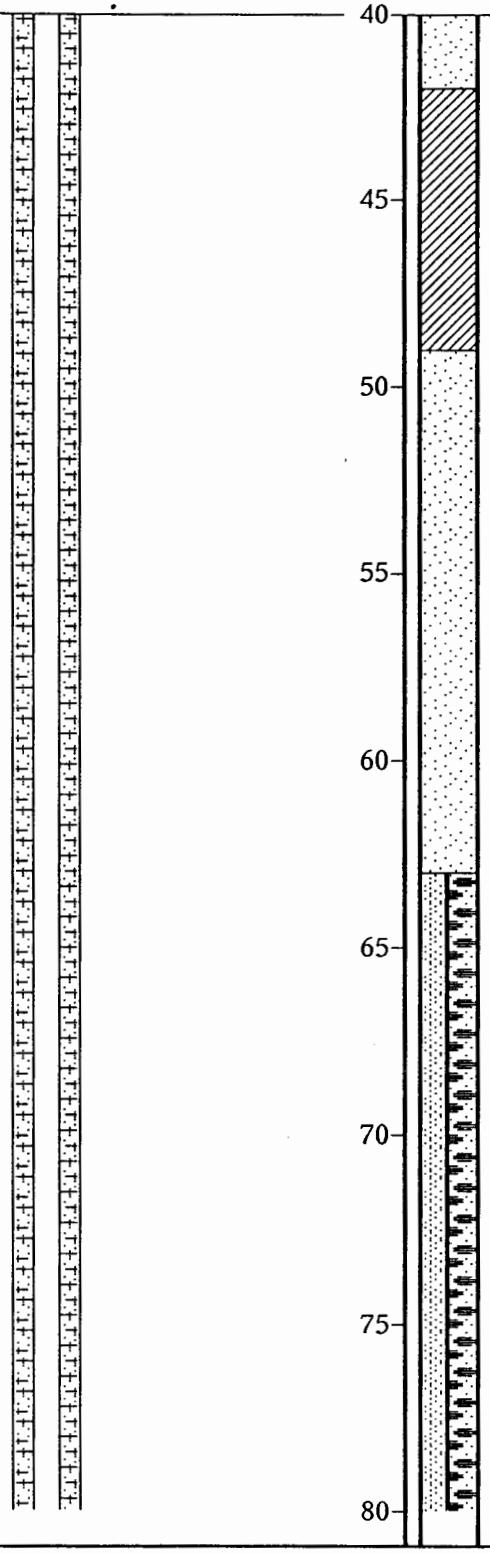
008595

Top of PVC Casing
Elevation 5060.68

Equipment GD-1500

Elevation ft Date 11/18/89

GROUND SURFACE



Harding Lawson Associates
Engineers and
Environmental Services

MONITORING WELL DETAIL MW-44

Sparton Technology Inc.
Albuquerque, New Mexico

PLATE

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
	06310,039.12		12/90		

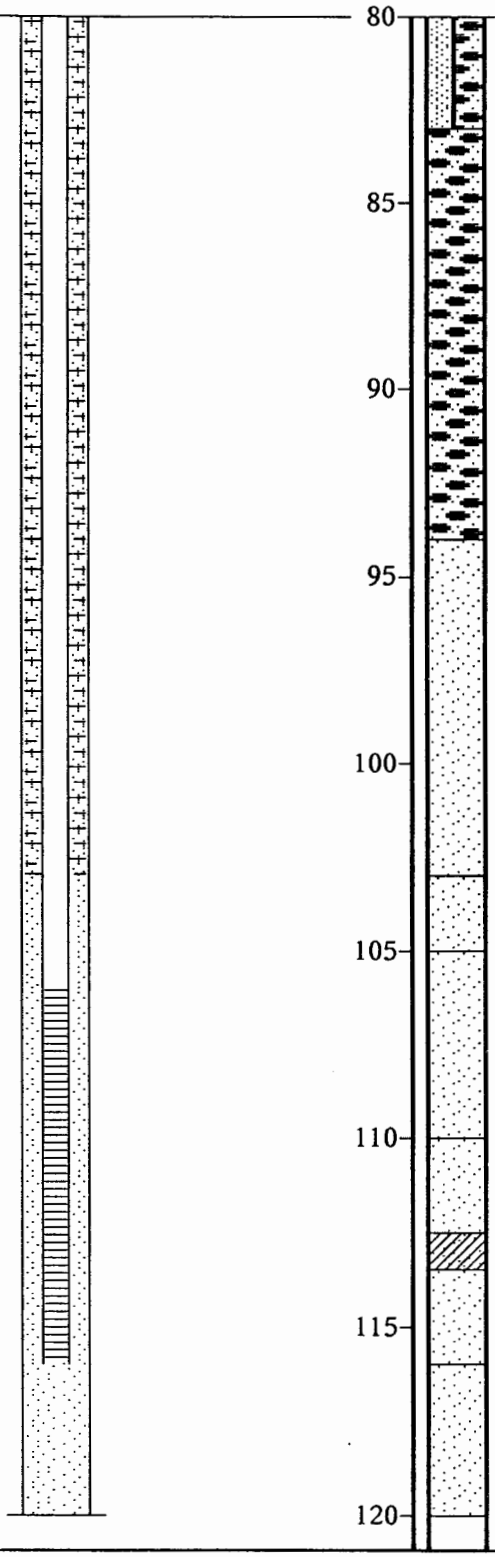
008596

Top of PVC Casing
Elevation 5060.68

Equipment GD-1500

Elevation ft Date 11/18/89

GROUND SURFACE



Stainless Steel casing
from 70-106 feet

Sandpack:
20x40 sand (103-104)
10x20 sand (104-120)

7-7/8" Borehole
102-120 feet

4" Stainless Steel
Screen (Slot size 0.02")
from 106 to 116 feet

Bottom Cap

80
85
90
95
100
105
110
115
120

BROWN & GRAY GRAVEL (GP)
with coarse sand

BROWN & GRAY COARSE
SAND (SP)
with fine gravel

BROWN FINE SAND (SP)
with silt

BROWN & GRAY FINE TO
COARSE SAND (SW)

BROWN & GRAY COARSE
SAND (SP)
with fines

BROWN MEDIUM SAND (SP)
with clay

BROWN & GRAY MEDIUM TO
COARSE SAND (SP)

BROWN FINE SAND (SP)
with silt

End of Boring at 120 feet.

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MONITORING WELL DETAIL MW-44

Sparton Technology Inc.
Albuquerque, New Mexico

PLATE

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
	06310,039.12		12/90		

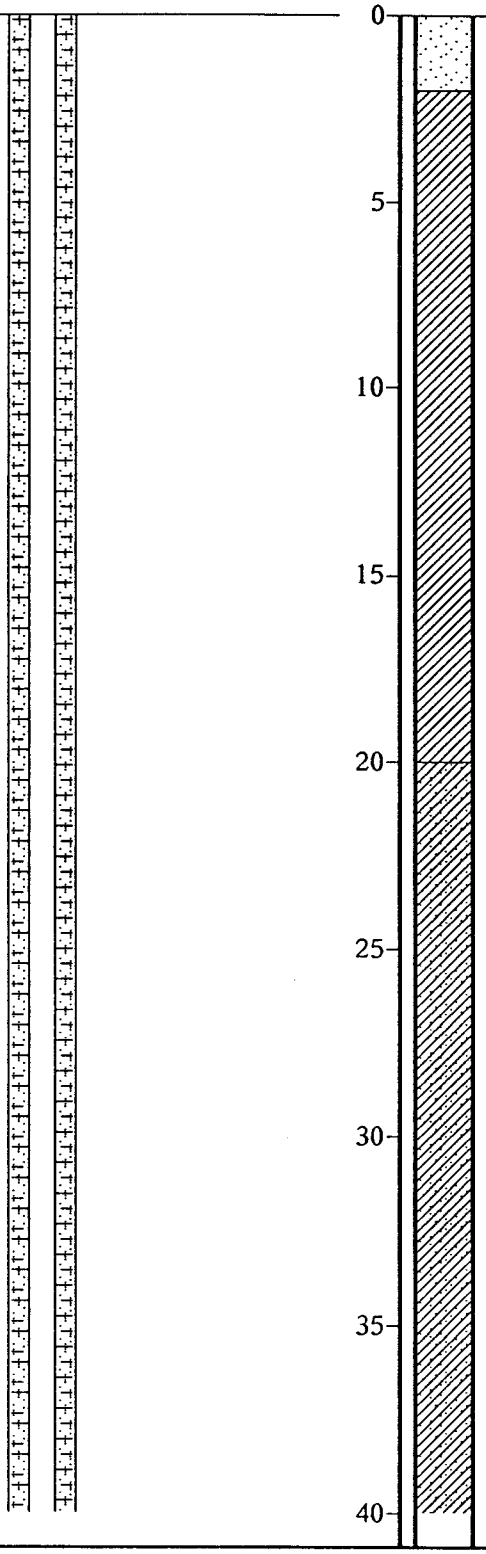
008597

Top of PVC Casing Elevation 5092.35

Equipment GD-1500

Elevation ft **Date** 11/24/89

GROUND SURFACE



YELLOWISH-BROWN FINE SAND (SP)

YELLOWISH-BROWN SANDY CLAY (CL)

-with medium coarse sand below 15 feet

YELLOWISH-BROWN CLAYEY MEDIUM TO COARSE SAND (SC)

Cement/Bentonite Grout

4" PVC Casing to 71 feet

12-1/4" Borehole to 136 feet

8-5/8" steel casing to 135.25 feet

Harding Lawson Associates
Engineers and Environmental Services

MONITORING WELL DETAIL MW-45

Sparton Technology Inc.
Albuquerque, New Mexico

PLATE

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
	06310,039.12		12/90		

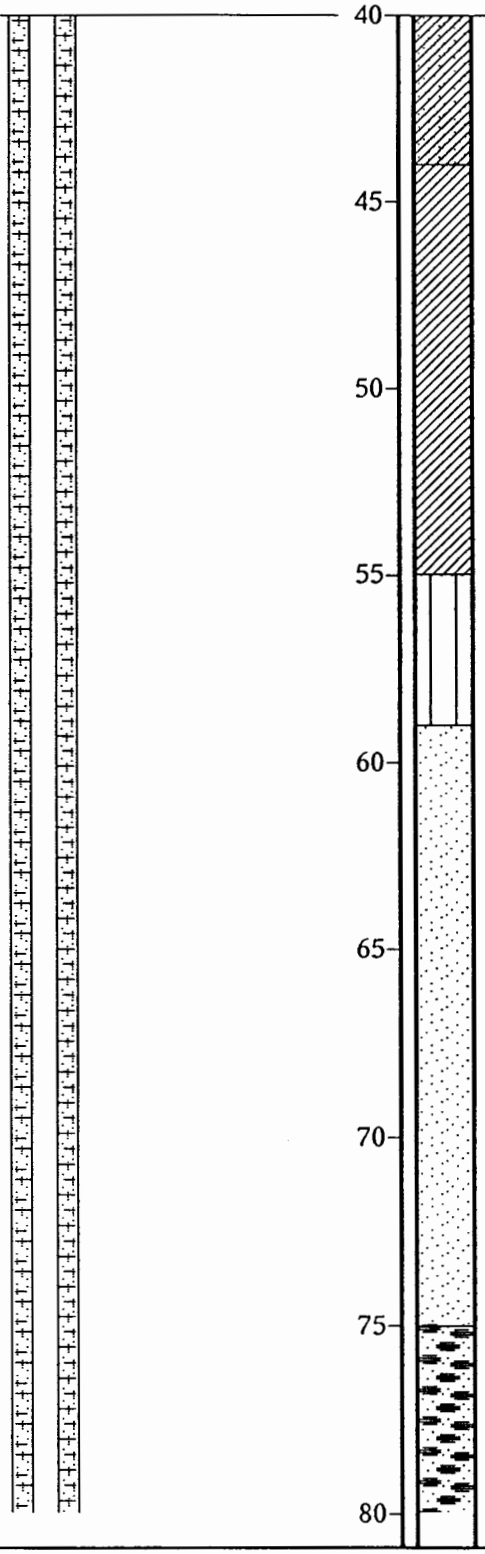
008598

Top of PVC Casing
Elevation 5092.35

Equipment GD-1500

Elevation ft Date 11/24/89

GROUND SURFACE



YELLOWISH-BROWN SANDY CLAY (CL)

BROWN CLAYEY SILT (ML)

BROWN & GRAY MEDIUM TO COARSE SAND (SP)

BROWN & GRAY SANDY GRAVEL (GP)

-with clay from 78 to 83 feet

Harding Lawson Associates
Engineers and Environmental Services

MONITORING WELL DETAIL MW-45

Sparton Technology Inc.
Albuquerque, New Mexico

PLATE

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
	06310,039.12		12/90		

008599

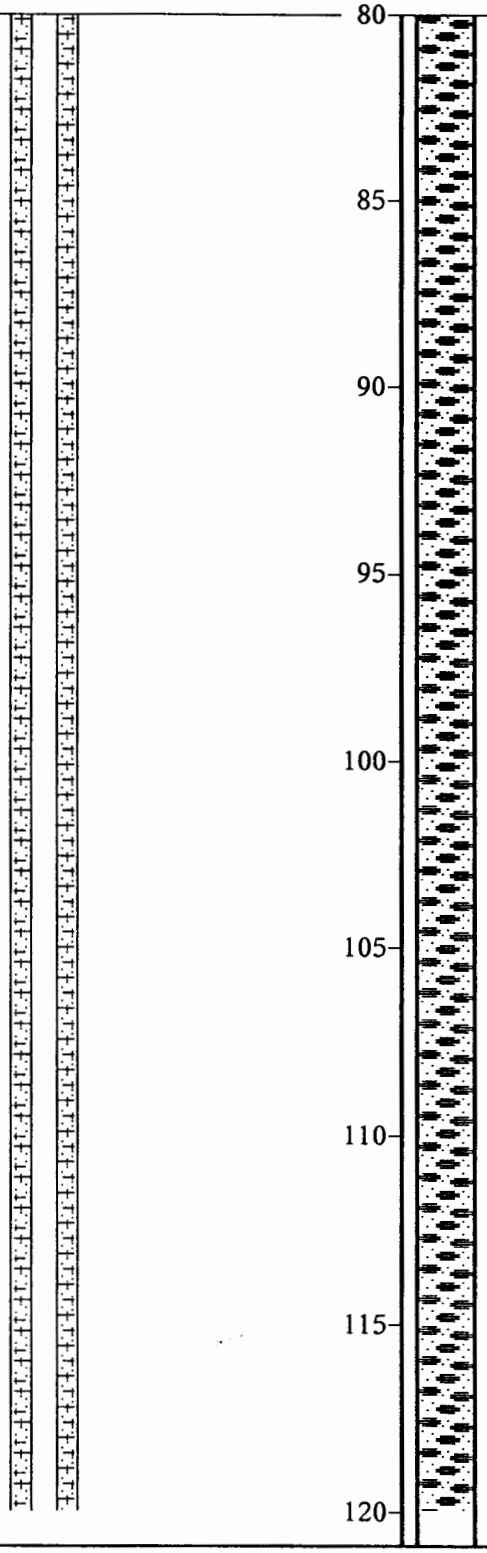
Top of PVC Casing Elevation 5092.35

Equipment GD-1500

Elevation ft **Date** 11/24/89

GROUND SURFACE

Stainless Steel casing from 71-143 feet



-gray below 95 feet

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Environmental Services

MONITORING WELL DETAIL MW-45

Sparton Technology Inc.
Albuquerque, New Mexico

PLATE

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
	06310,039.12		12/90		

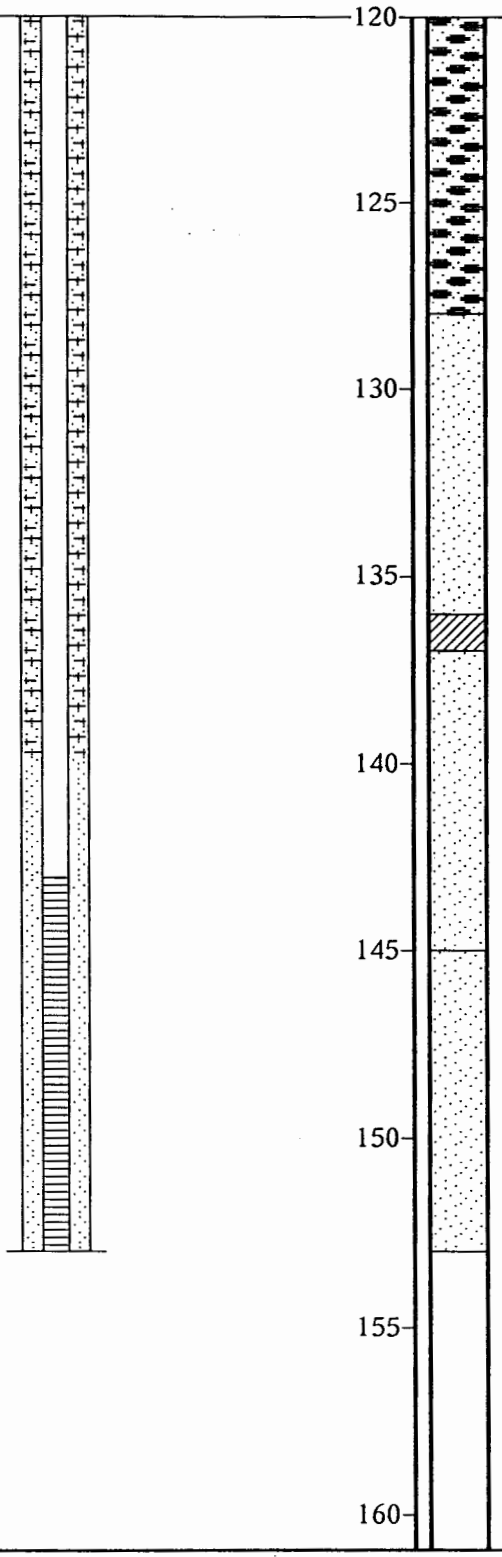
008600

Top of PVC Casing
Elevation 5092.35

Equipment GD-1500

Elevation ft Date 11/24/89

GROUND SURFACE



BROWN & GRAY MEDIUM TO COARSE SAND (SP)
with gravel
-no gravel below 130 feet

7-7/8" Borehole
136-153 feet

LIGHT BROWN SILTY CLAY (CL)
BROWN & GRAY MEDIUM TO COARSE SAND (SP)

Sandpack:
20x40 sand (140-141)
10x20 sand (141-153)

-with 3-inch clay layer from 141.5 to 141.8 feet

BROWN & GRAY FINE TO COARSE SAND (SW)

4" Stainless Steel Screen (Slot size 0.02") from 143 to 153 feet

Bottom Cap

End of Boring at 153 feet.

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MONITORING WELL DETAIL MW-45

Sparton Technology Inc.
Albuquerque, New Mexico

PLATE

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
	06310,039.12		12/90		

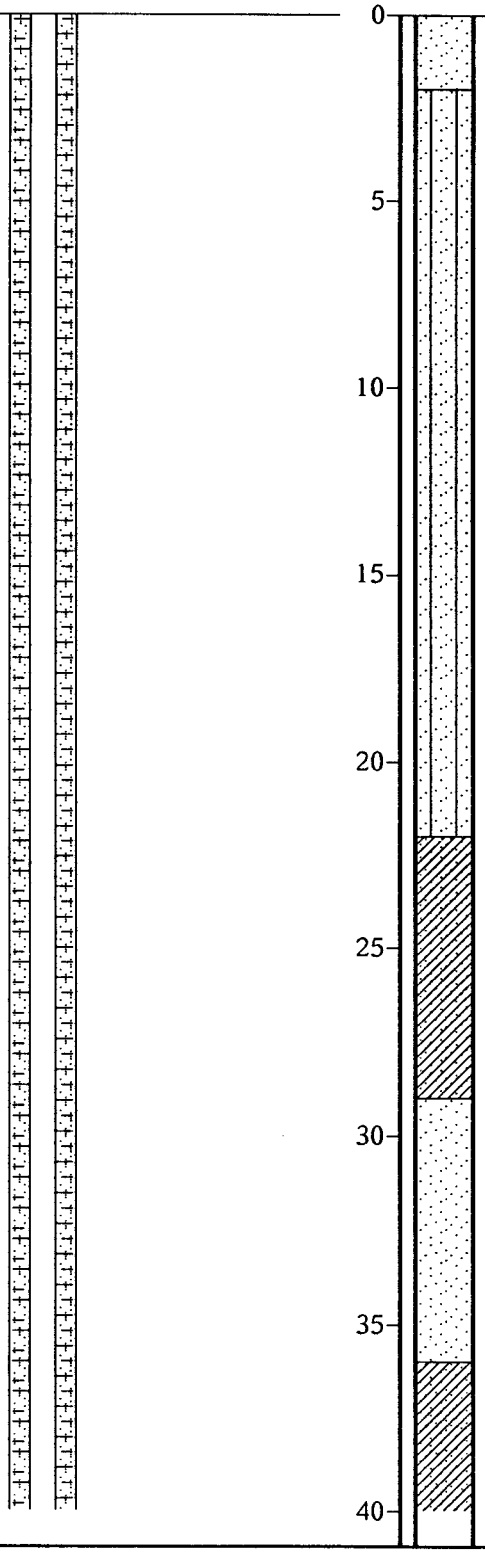
008601

Top of PVC Casing
Elevation 5118.95

Equipment GD-1500

Elevation ft Date 11/30/89

GROUND SURFACE



YELLOWISH-BROWN FINE SAND (SP)

YELLOWISH-BROWN SILTY FINE SAND (SM)

Cement/Bentonite Grout

4" PVC Casing to 125 feet

YELLOWISH-BROWN CLAYEY FINE SAND (SC)

-with medium sand below 27 feet

12-1/4" Borehole to 165 feet

BROWN FINE TO COARSE SAND (SW)
with clay

8-5/8" steel casing to 164.25 feet

BROWN CLAYEY FINE TO MEDIUM SAND (SC)
with occasional sandy clay

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Engineers and Environmental Services

MONITORING WELL DETAIL MW-46

Sparton Technology Inc.
Albuquerque, New Mexico

PLATE

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
	06310,039.12		12/90		

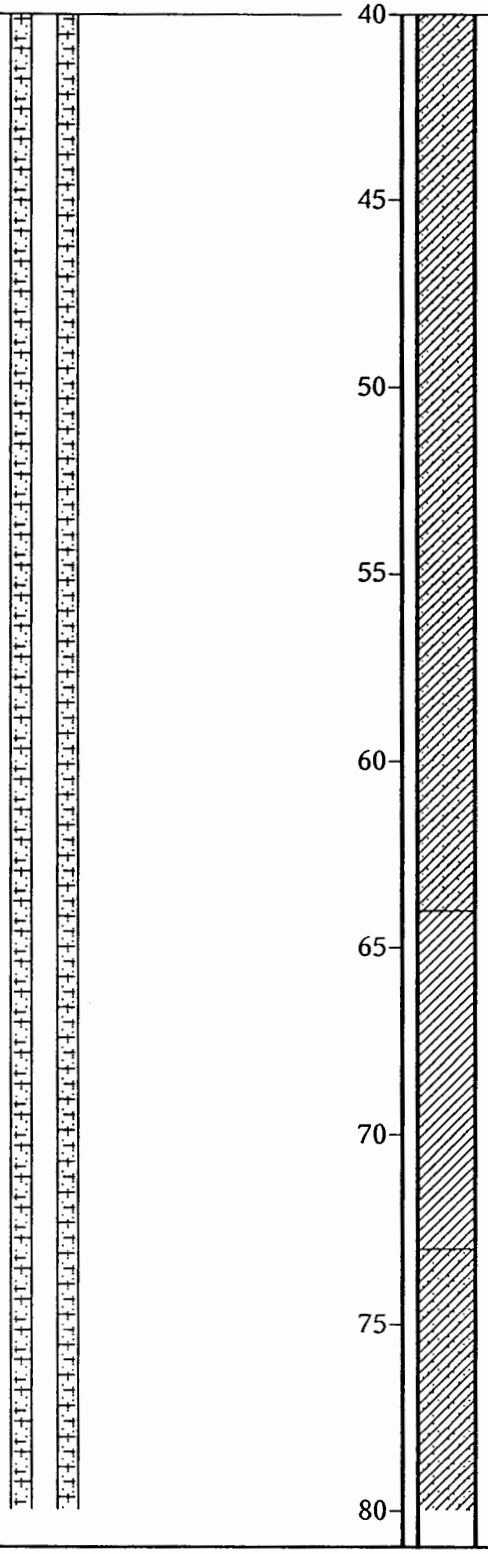
008602

Top of PVC Casing
Elevation 5118.95

Equipment GD-1500

Elevation ft Date 11/30/89

GROUND SURFACE



BROWN SANDY CLAY (CL)

BROWN CLAYEY FINE TO MEDIUM SAND (SC)
with occasional sandy clay

Harding Lawson Associates
Engineers and Environmental Services

MONITORING WELL DETAIL MW-46

Sparton Technology Inc.
Albuquerque, New Mexico

PLATE

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
	06310,039.12		12/90		

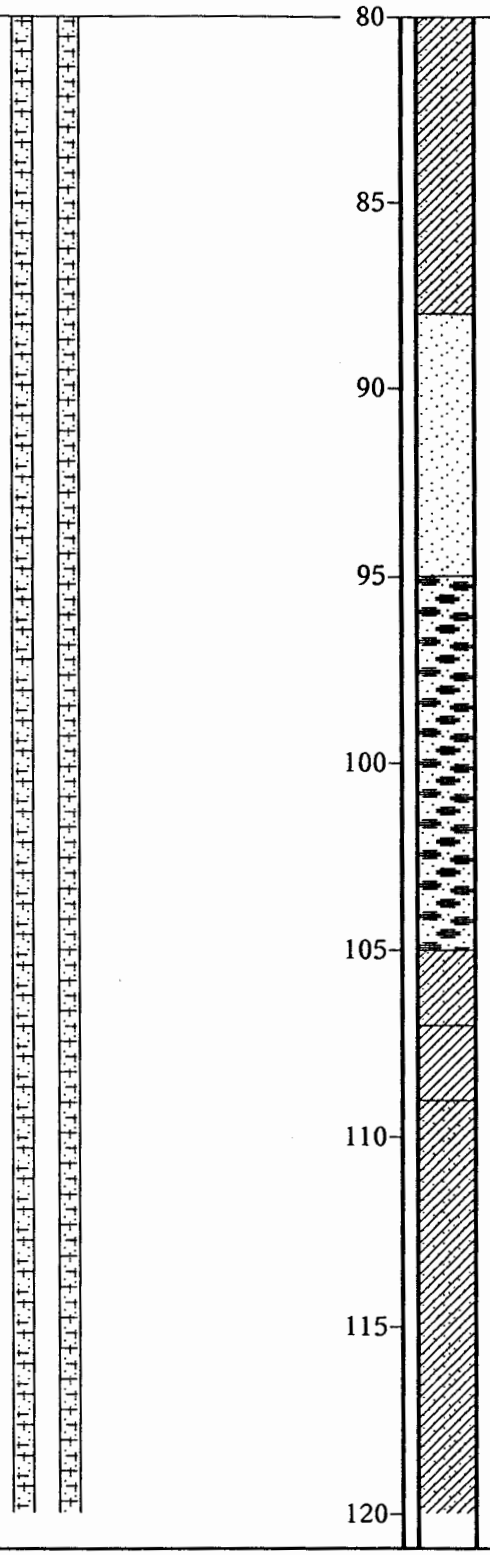
008603

Top of PVC Casing
Elevation 5118.95

Equipment GD-1500

Elevation ft Date 11/30/89

GROUND SURFACE



Harding Lawson Associates
Engineers and Environmental Services

MONITORING WELL DETAIL MW-46

Sparton Technology Inc.
Albuquerque, New Mexico

PLATE

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
	06310,039.12		12/90		

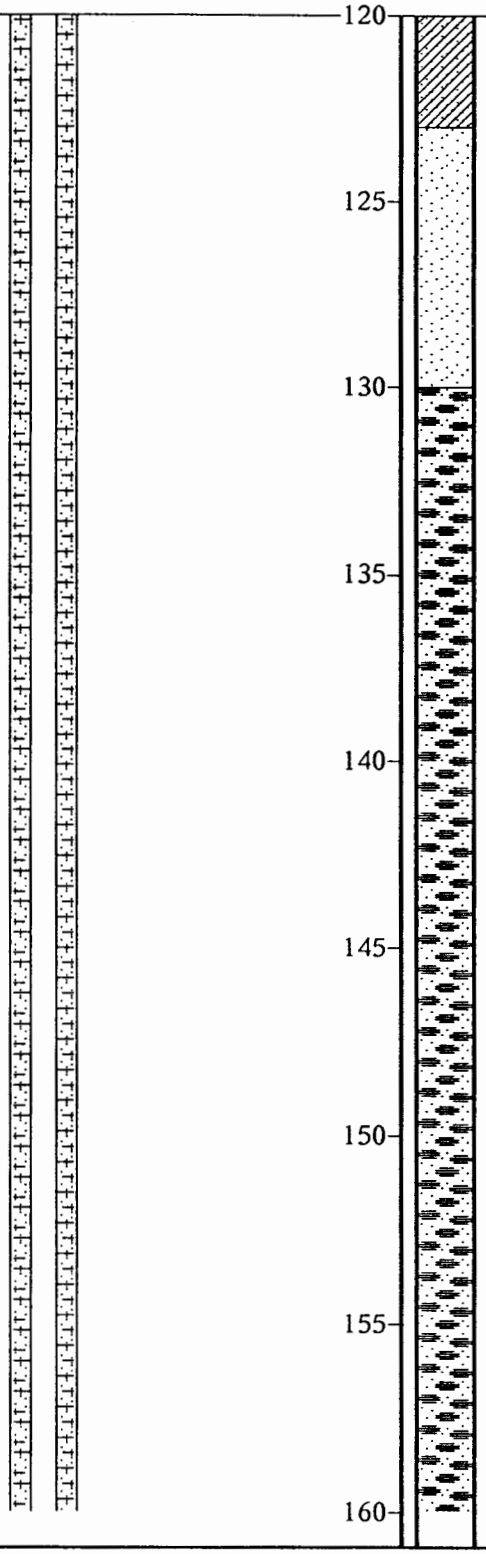
008604

Top of PVC Casing
Elevation 5118.95

Equipment GD-1500

Elevation ft Date 11/30/89

GROUND SURFACE



BROWN MEDIUM TO COARSE SAND (SP)

with gravel and cobbles below 128.5 feet

BROWN & GRAY SANDY GRAVEL (GP)

Stainless Steel casing from 125-170 feet

-slightly clayey below 150 feet

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MONITORING WELL DETAIL MW-46

Sparton Technology Inc.
Albuquerque, New Mexico

PLATE

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
	06310,039.12		12/90		

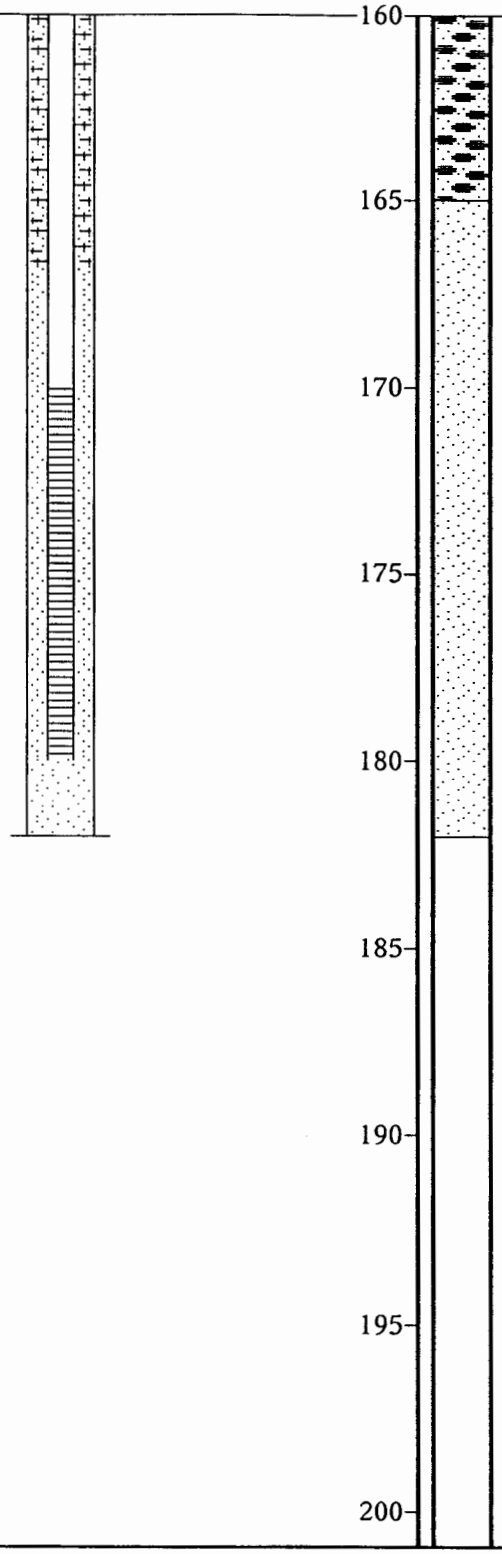
008605

Top of PVC Casing
Elevation 5118.95

Equipment GD-1500

Elevation ft Date 11/30/89

GROUND SURFACE



Sandpack:
20x40 sand (167-168)
10x20 sand (168-180)

7-7/8" Borehole
165-182 feet

4" Stainless Steel
Screen (Slot size 0.02")
from 170 to 180 feet

Bottom Cap

BROWN FINE TO COARSE
SAND (SW)

-with gravel from 179 to 182 feet

End of Boring at 182 feet.

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Environmental Services

MONITORING WELL DETAIL MW-46

Sparton Technology Inc.
Albuquerque, New Mexico

PLATE

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
	06310,039.12		12/90		

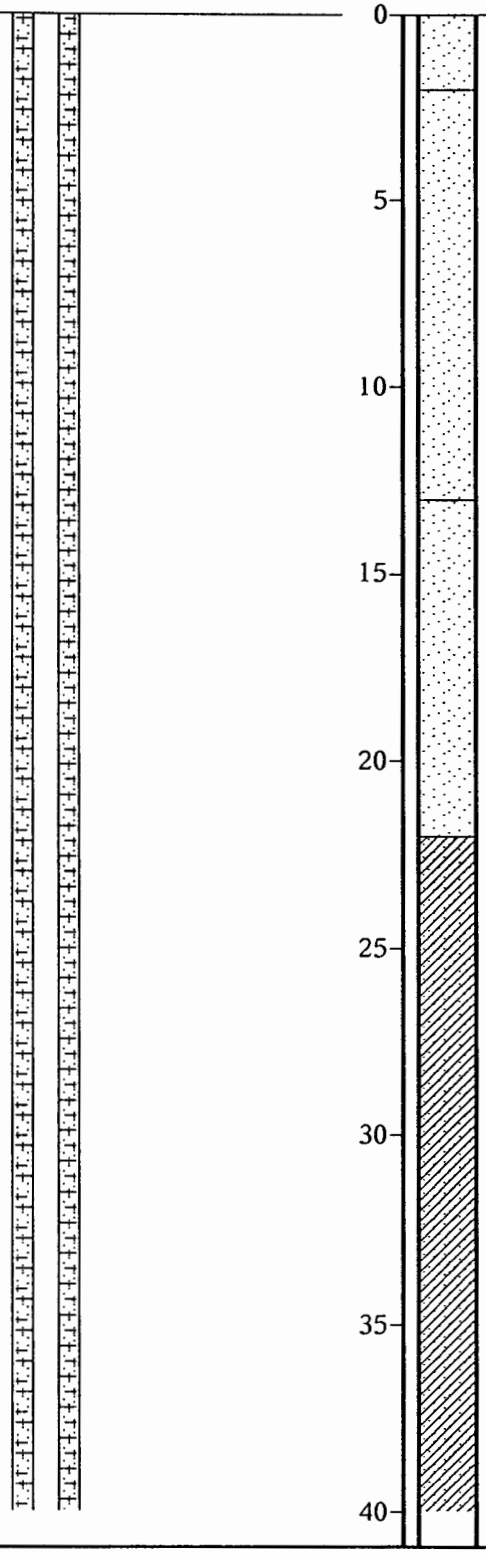
008606

Top of PVC Casing
Elevation 5155.84

Equipment GD-1500

Elevation ft Date 12/7/89

GROUND SURFACE



LIGHT BROWN FINE SAND (SP)

BROWN & GRAY FINE TO COARSE SAND (SW)

-with sandy clay pockets below 7 feet

BROWN FINE TO MEDIUM SAND (SP)

YELLOWISH-BROWN CLAYEY FINE SAND (SC)

Cement/Bentonite Grout

4" PVC Casing to 164.6 feet

12-1/4" Borehole to 175 feet

8-5/8" steel casing to 174 feet

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Engineers and Environmental Services

MONITORING WELL DETAIL MW-47

Sparton Technology Inc.
Albuquerque, New Mexico

PLATE

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
	06310,039.12		12/90		

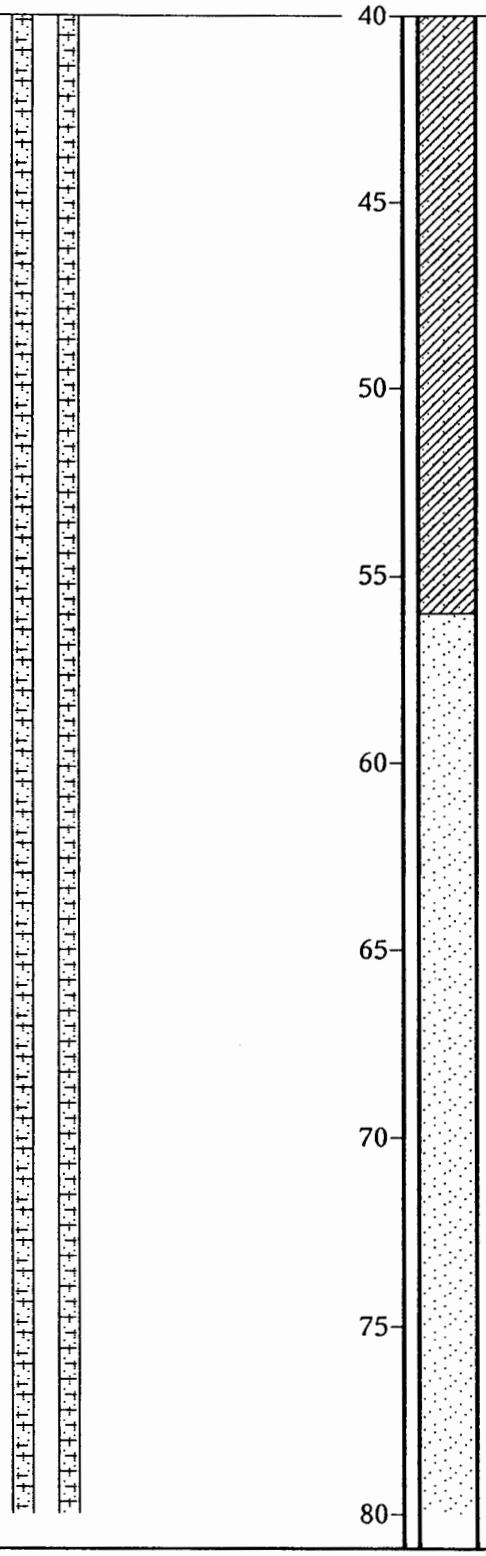
008607

Top of PVC Casing
Elevation 5155.84

Equipment GD-1500

Elevation ft Date 12/7/89

GROUND SURFACE



-with medium sand below 42 feet

BROWN & GRAY MEDIUM TO COARSE SAND (SP)
with gravel

-with occasional sandy clay pockets from 66 to 68 feet

-with occasional sandy clay pockets from 72 to 82 feet

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MONITORING WELL DETAIL MW-47

Sparton Technology Inc.
Albuquerque, New Mexico

PLATE

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
	06310,039.12		12/90		

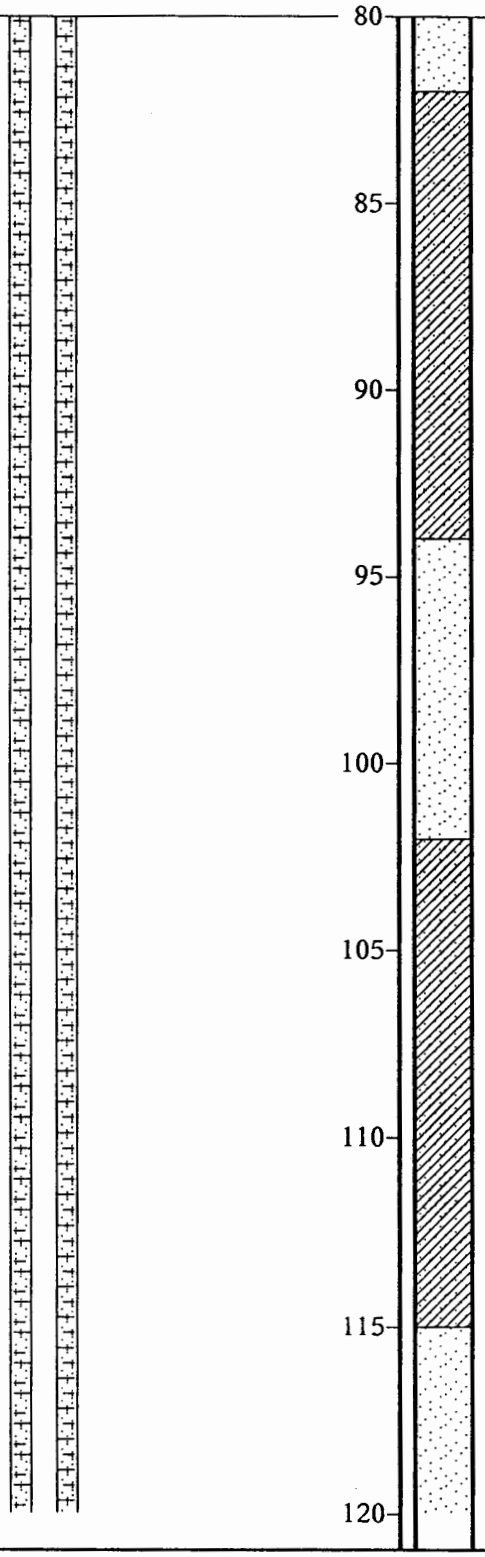
008608

Top of PVC Casing
Elevation 5155.84

Equipment GD-1500

Elevation ft Date 12/7/89

GROUND SURFACE



BROWN CLAYEY MEDIUM TO COARSE SAND (SC)

BROWN MEDIUM TO COARSE SAND (SP)
with gravel, occasional clay pockets

BROWN CLAYEY MEDIUM TO COARSE SAND (SC)

BROWN & GRAY FINE TO COARSE SAND (SW)
with occasional clay

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Engineers and Environmental Services

MONITORING WELL DETAIL MW-47

Sparton Technology Inc.
Albuquerque, New Mexico

PLATE

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
	06310,039.12		12/90		

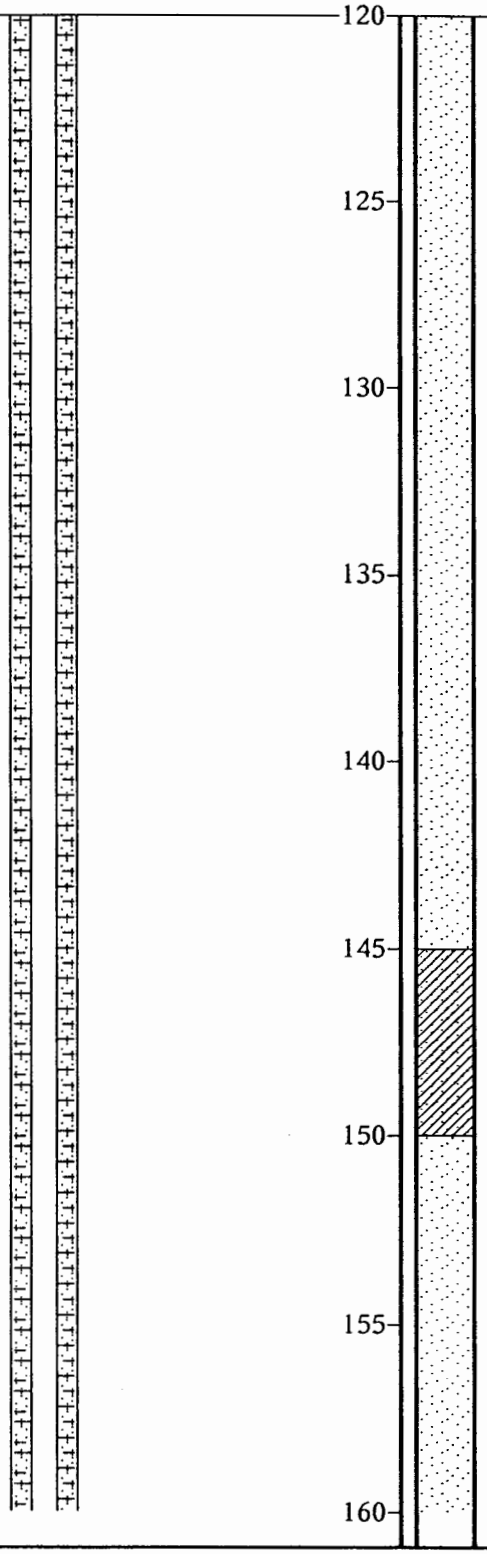
008609

Top of PVC Casing
Elevation 5155.84

Equipment GD-1500

Elevation ft Date 12/7/89

GROUND SURFACE



BROWN CLAYEY FINE SAND (SC)

BROWN & GRAY MEDIUM TO COARSE SAND (SP)
with occasional gravel

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MONITORING WELL DETAIL MW-47

Sparton Technology Inc.
Albuquerque, New Mexico

PLATE

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
	06310,039.12		12/90		

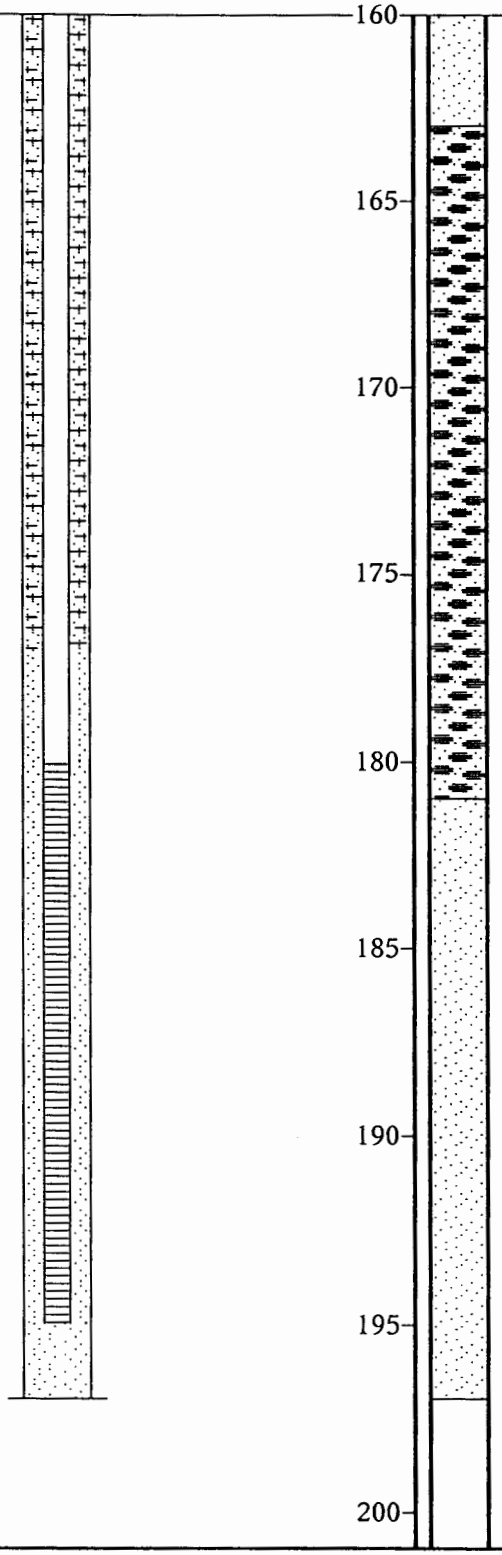
008610

Top of PVC Casing
Elevation 5155.84

Equipment GD-1500

Elevation ft Date 12/7/89

GROUND SURFACE



Stainless Steel casing
from 164.6-180 feet

Sandpack:
20x40 sand (177-178)
10x20 sand (178-197)

7-7/8" Borehole
174-197 feet

4" Stainless Steel
Screen (Slot size 0.02")
from 180 to 195 feet

Bottom Cap

BROWN, GRAY, & BLACK
GRAVEL (GP)

BROWN, GRAY, & BLACK
GRAVELLY SAND (SP)

End of Boring at 197 feet.

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MONITORING WELL DETAIL MW-47

Sparton Technology Inc.
Albuquerque, New Mexico

PLATE

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
	06310,039.12		12/90		

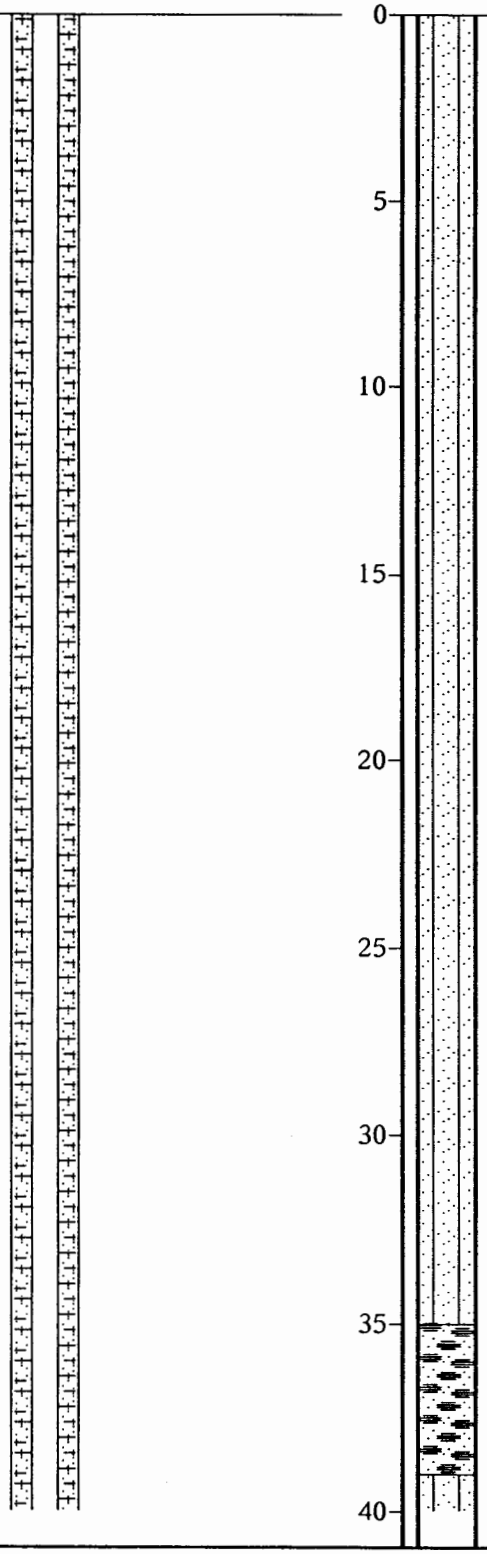
008611

Top of PVC Casing
Elevation 5043.68

Equipment GD-1500

Elevation ft Date 1/11/90

GROUND SURFACE



LIGHT BROWN SILTY FINE TO MEDIUM SAND (SM)

Cement/Bentonite Grout

4" PVC Casing to 56.4 feet

12-1/4" Borehole to 128 feet

8-5/8" steel casing to 127.7 feet

BROWN & GRAY SANDY GRAVEL (GP)

LIGHT BROWN SILTY FINE TO

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MONITORING WELL DETAIL MW-49

Sparton Technology Inc.
Albuquerque, New Mexico

PLATE

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
	06310,039.12		12/90		

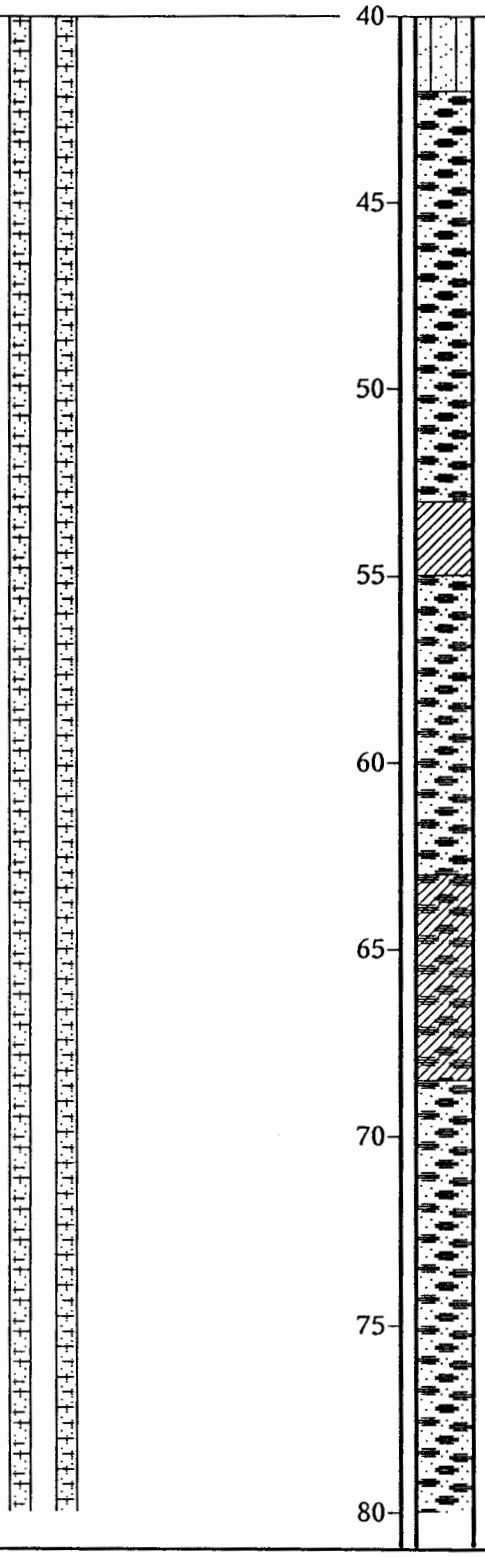
008612

Top of PVC Casing
Elevation 5043.68

Equipment GD-1500

Elevation ft Date 1/11/90

GROUND SURFACE



MEDIUM SAND (SM)

BROWN & GRAY SANDY GRAVEL (GP)

LIGHT BROWN SANDY CLAY (CL)

BROWN, GRAY, & BLACK GRAVEL (GP)

LIGHT BROWN CLAYEY GRAVEL (GC)

BROWN, GRAY, & BLACK SANDY GRAVEL (GP)

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MONITORING WELL DETAIL MW-49

PLATE

Sparton Technology Inc.
Albuquerque, New Mexico

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
	06310,039.12		12/90		

008613

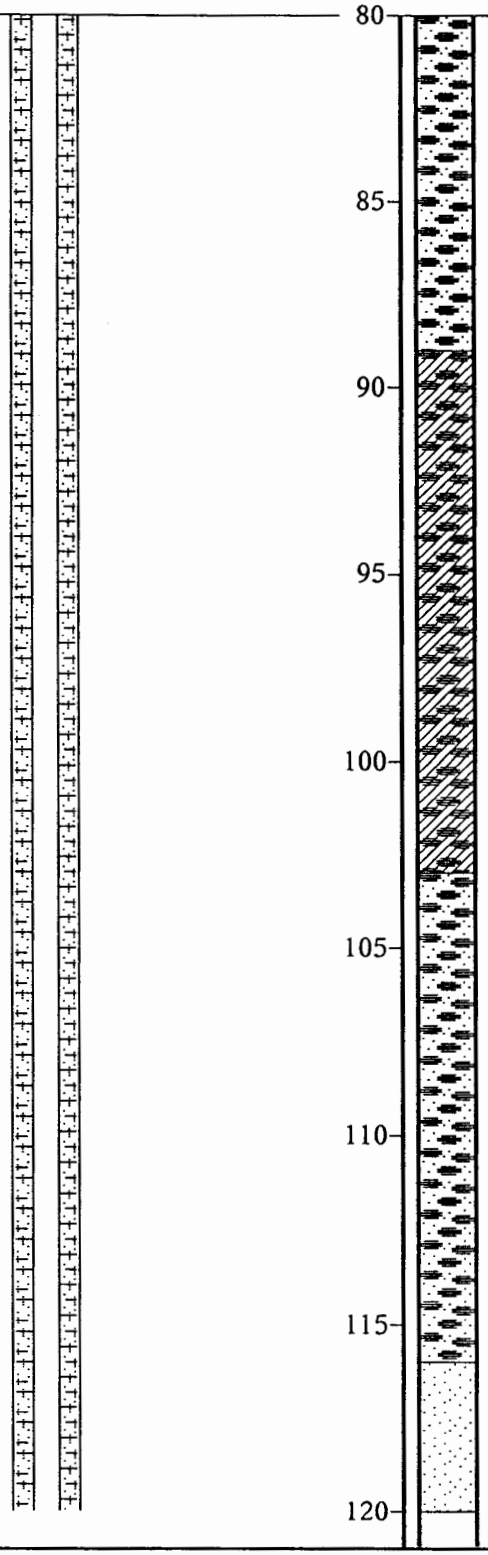
Top of PVC Casing
Elevation 5043.68

Equipment GD-1500

Elevation ft Date 1/11/90

GROUND SURFACE

Stainless Steel casing
from 56.4-137.8 feet



BROWN CLAYEY GRAVEL (GC)

BROWN, GRAY, & BLACK SANDY GRAVEL (GP)

BROWN & GRAY MEDIUM TO COARSE SAND (SP)
with gravel

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MONITORING WELL DETAIL MW-49

Sparton Technology Inc.
Albuquerque, New Mexico

PLATE

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
	06310,039.12		12/90		

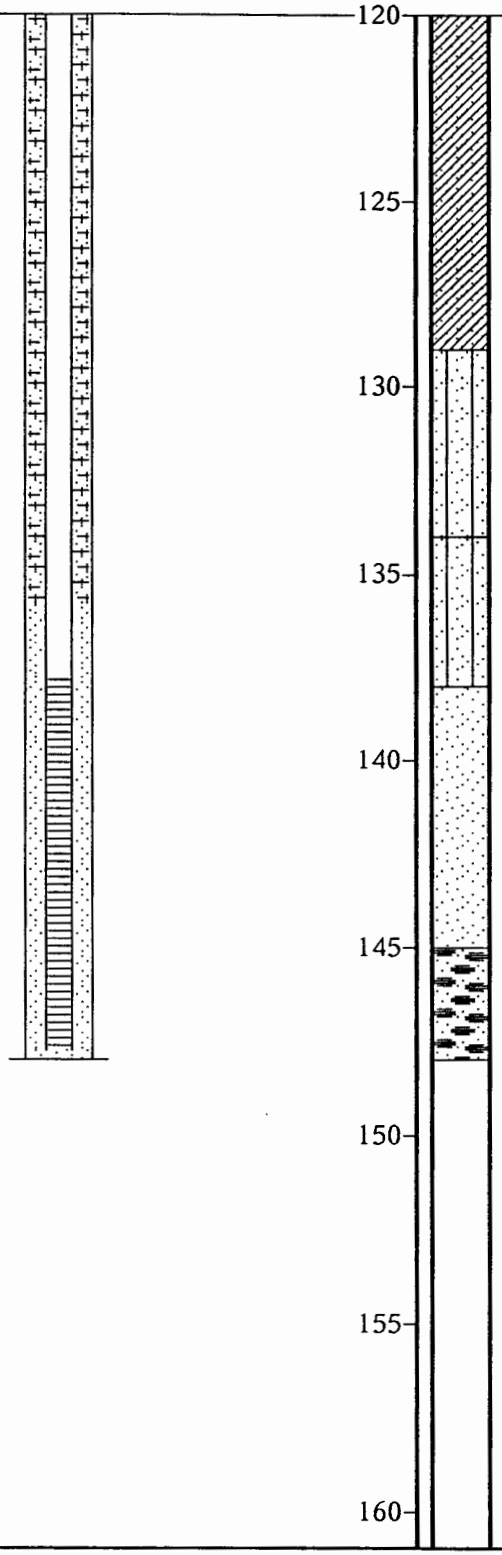
008614

Top of PVC Casing
Elevation 5043.68

Equipment GD-1500

Elevation ft Date 1/11/90

GROUND SURFACE



Sandpack:
20x40 sand
(134.7-135.8)
10x20 sand
(135.8-147.9)

7-7/8" Borehole
from 128-148 feet

4" Stainless Steel
Screen (Slot size 0.02")
from 137.7 to 147.7
feet

Bottom Cap

120 — LIGHT BROWN CLAYEY FINE TO COARSE SAND (SC)

125 — -loss of coarse sand from 126 to 128 feet

130 — BROWN SILTY FINE SAND (SM)

135 — BROWN SILTY FINE SAND (SM)
with clay laminations and
embedded gravel

140 — BROWN & GRAY MEDIUM TO COARSE SAND (SP)
with gravel

145 — BROWN, GRAY, & BLACK COARSE SANDY GRAVEL (GP)
with occasional sandy clay

End of Boring at 148.00 feet.

150

155

160

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MONITORING WELL DETAIL MW-49

Sparton Technology Inc.
Albuquerque, New Mexico

PLATE

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
	06310,039.12		12/90		

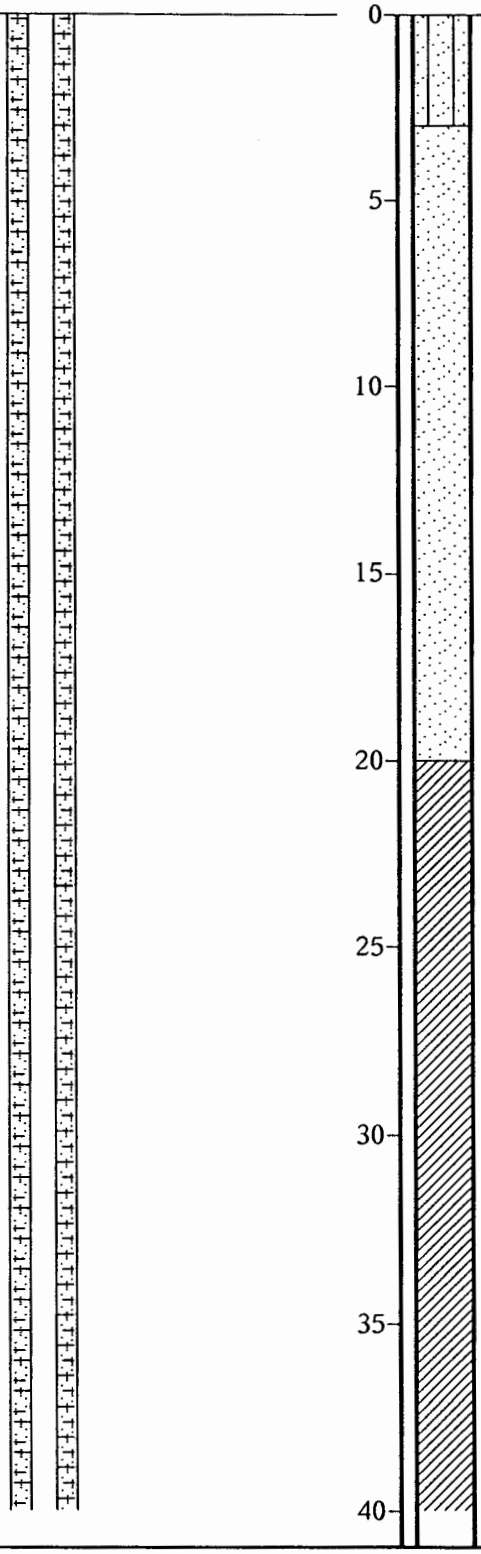
008615

Top of PVC Casing Elevation 5211.51

Equipment GD-1500

Elevation ft **Date** 4/2/90

GROUND SURFACE



YELLOWISH-BROWN SILTY FINE TO MEDIUM SAND (SM)

YELLOWISH-BROWN SILTY FINE TO COARSE SAND (SW)

TAN SILTY CLAY (CL) with sand

-with pumice (low density), vesicular from 31 to 40 feet

Cement/Bentonite Grout

4" PVC Casing to 225 feet

12-1/4" Borehole to 235 feet

8-5/8" steel casing to 234 feet

Harding Lawson Associates
Engineers and Environmental Services

MONITORING WELL DETAIL MW-50

Sparton Technology Inc.
Albuquerque, New Mexico

PLATE

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
	06310,039.12		12/90		

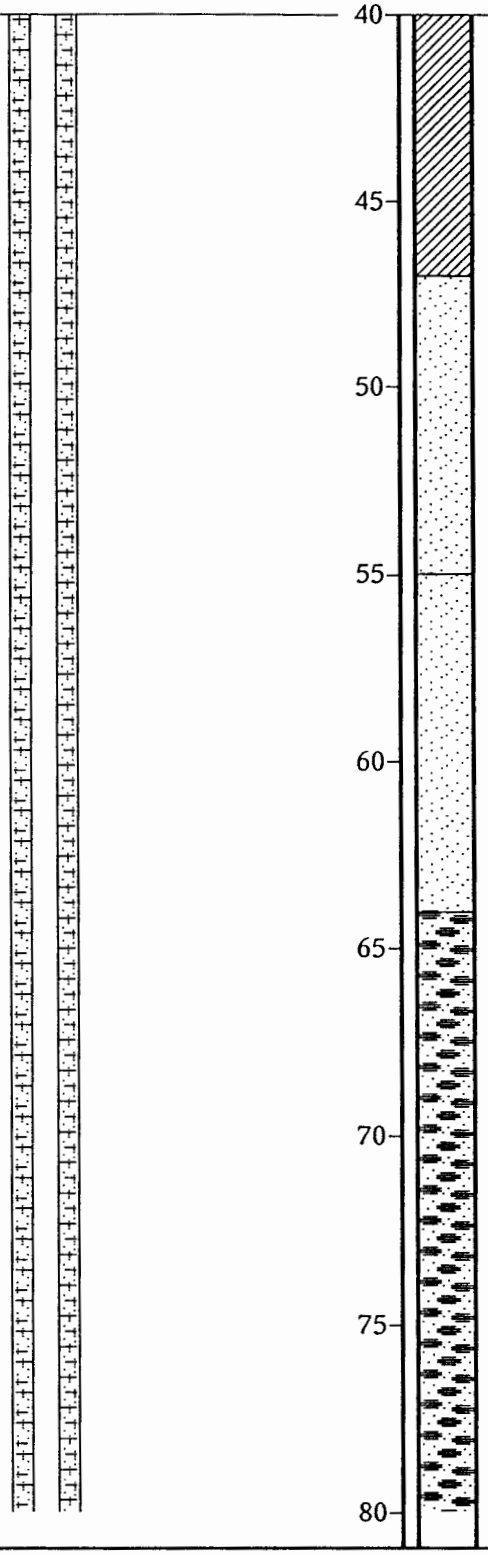
008616

Top of PVC Casing
Elevation 5211.51

Equipment GD-1500

Elevation ft Date 4/2/90

GROUND SURFACE



-with gray gravel from 42 to 45 feet

TAN, BROWN & GRAY FINE TO COARSE SAND (SW)
with sandy clay pockets

TAN, BROWN & GRAY MEDIUM TO COARSE SAND (SP)
with gravel

TAN, GRAY, BROWN & BLACK GRAVEL (GP)
basaltic, with sand (slow penetration)

Harding Lawson Associates
Engineers and Environmental Services

MONITORING WELL DETAIL MW-50

Sparton Technology Inc.
Albuquerque, New Mexico

PLATE

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
	06310,039.12		12/90		

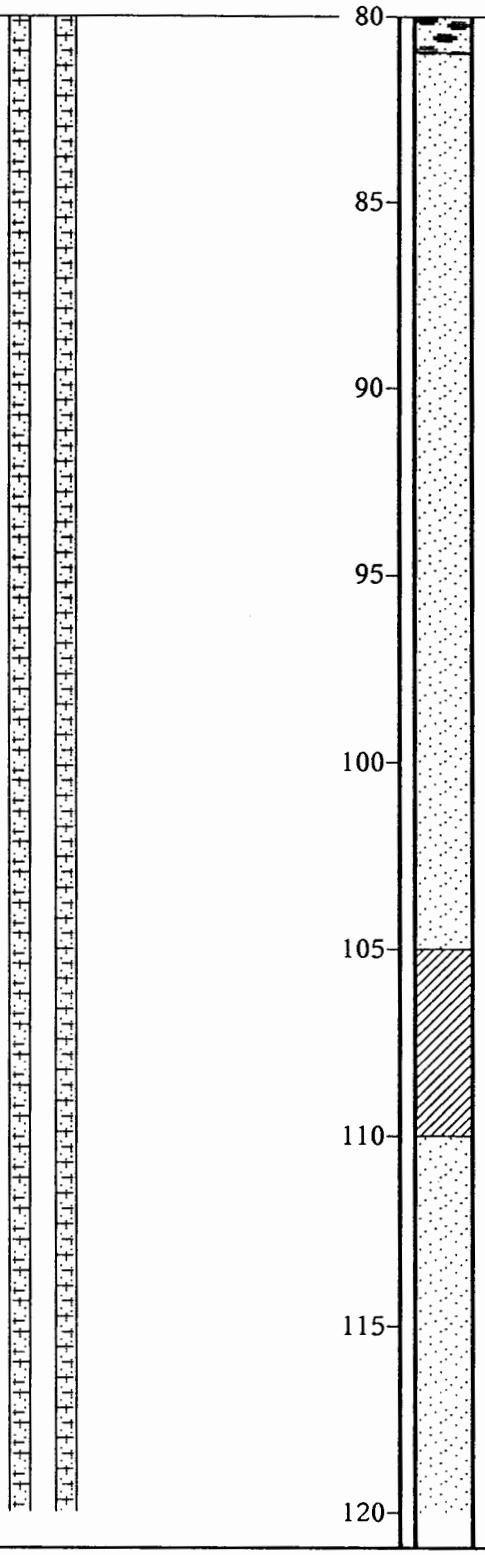
008617

Top of PVC Casing
Elevation 5211.51

Equipment GD-1500

Elevation ft Date 4/2/90

GROUND SURFACE



TAN, GRAY, BROWN & BLACK GRAVELLY SAND (SP)

TAN SANDY CLAY (CL)

TAN, GRAY, BROWN & BLACK MEDIUM TO COARSE SAND (SP)

Harding Lawson Associates
Engineers and Environmental Services

MONITORING WELL DETAIL MW-50

Sparton Technology Inc.
Albuquerque, New Mexico

PLATE

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
	06310,039.12		12/90		

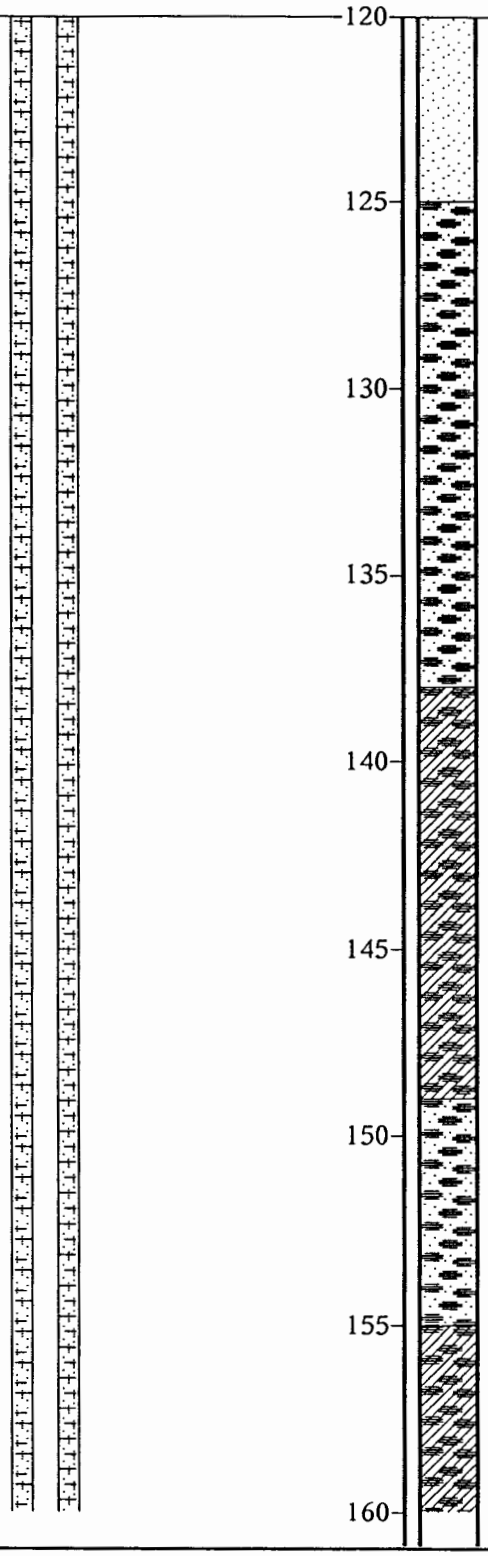
008618

Top of PVC Casing
Elevation 5211.51

Equipment GD-1500

Elevation ft Date 4/2/90

GROUND SURFACE



TAN, BROWN, BLACK & GRAY
SANDY GRAVEL (GP)

-with occasional silty clay seams
from 136 to 137 feet
TAN CLAYEY GRAVEL (GC)

TAN, GRAY, BROWN & BLACK
SANDY GRAVEL (GP)
with occasional clay
-with boulders from 151 to 153 feet

TAN, BROWN, GRAY & BLACK
CLAYEY GRAVEL (GC)

Harding Lawson Associates
Engineers and
Environmental Services

MONITORING WELL DETAIL MW-50

Sparton Technology Inc.
Albuquerque, New Mexico

PLATE

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
	06310,039.12		12/90		

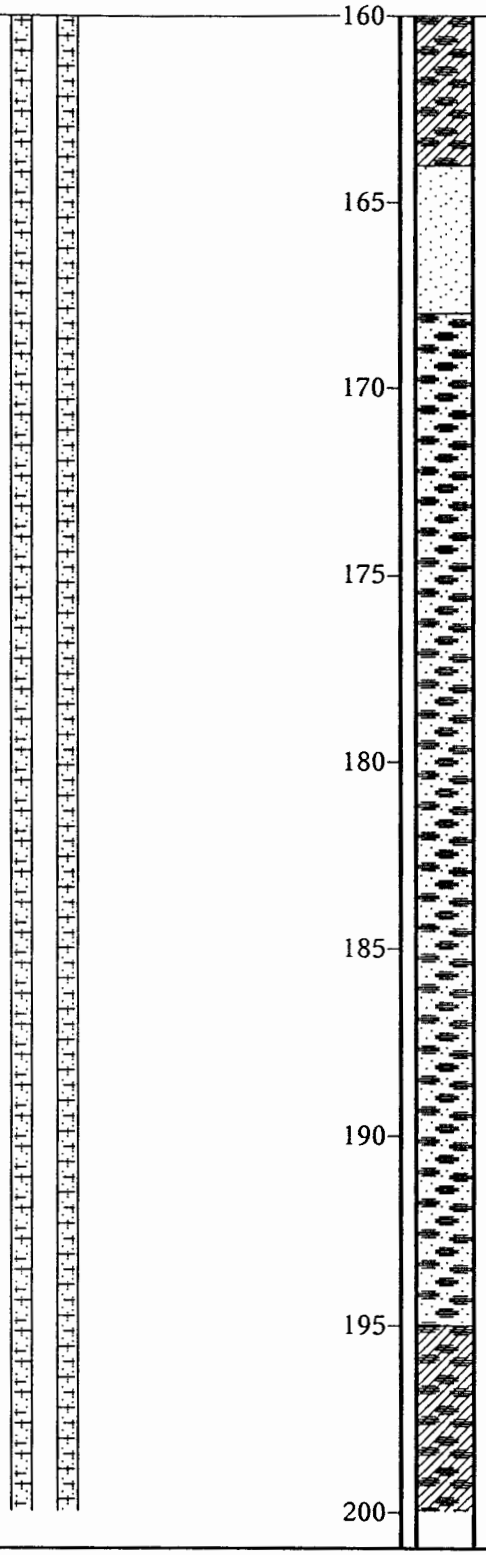
008619

Top of PVC Casing
Elevation 5211.51

Equipment GD-1500

Elevation ft Date 4/2/90

GROUND SURFACE



TAN, GRAY, BROWN & BLACK FINE TO COARSE SAND (SW)

TAN, GRAY, BROWN & BLACK SANDY GRAVEL (GP)

-with boulders from 184 to 195 feet

TAN, BROWN & BLACK CLAYEY GRAVEL (GC)

Harding Lawson Associates
Engineers and Environmental Services

MONITORING WELL DETAIL MW-50

Sparton Technology Inc.
Albuquerque, New Mexico

PLATE

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
	06310,039.12		12/90		

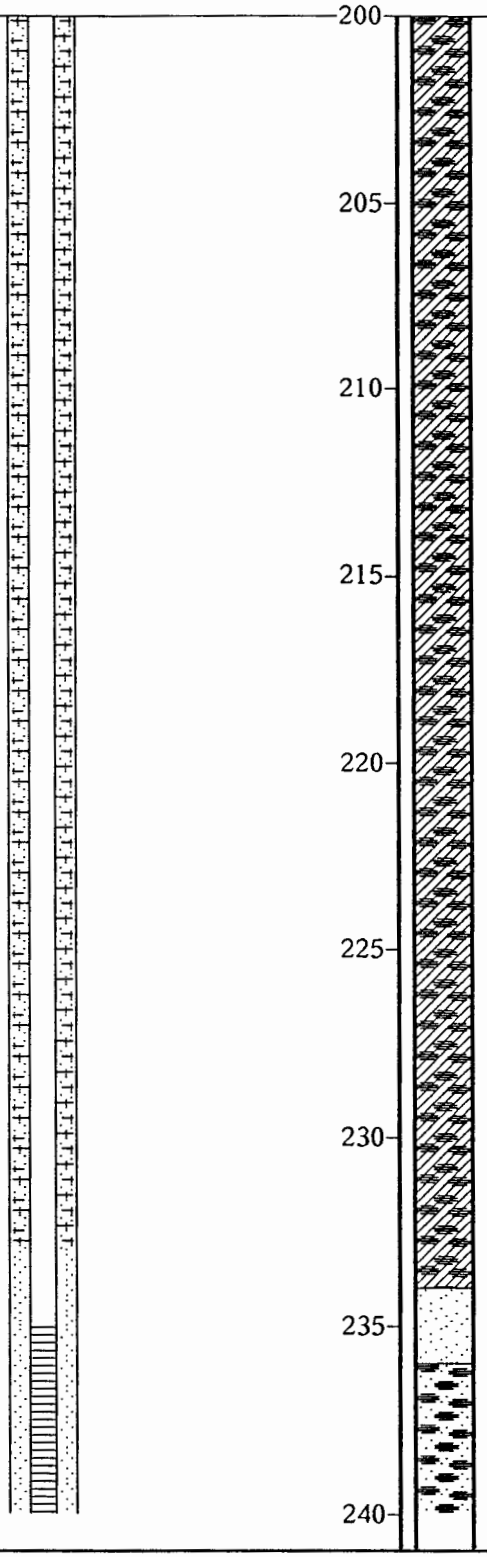
008620

Top of PVC Casing
Elevation 5211.51

Equipment GD-1500

Elevation ft Date 4/2/90

GROUND SURFACE



4" Stainless Steel
casing
from 225 to 235 feet

7-7/8" Borehole
from 234-260 feet

BROWN, GRAY & BLACK MEDIUM TO COARSE SAND (SP)
with gravel
BROWN, GRAY & BLACK SANDY GRAVEL (GP)
with fine sand seams

Harding Lawson Associates
Engineers and
Environmental Services

MONITORING WELL DETAIL MW-50

Sparton Technology Inc.
Albuquerque, New Mexico

PLATE

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
	06310,039.12		12/90		

008621

Top of PVC Casing Elevation 5211.51

Equipment GD-1500

Elevation ft **Date** 4/2/90

GROUND SURFACE

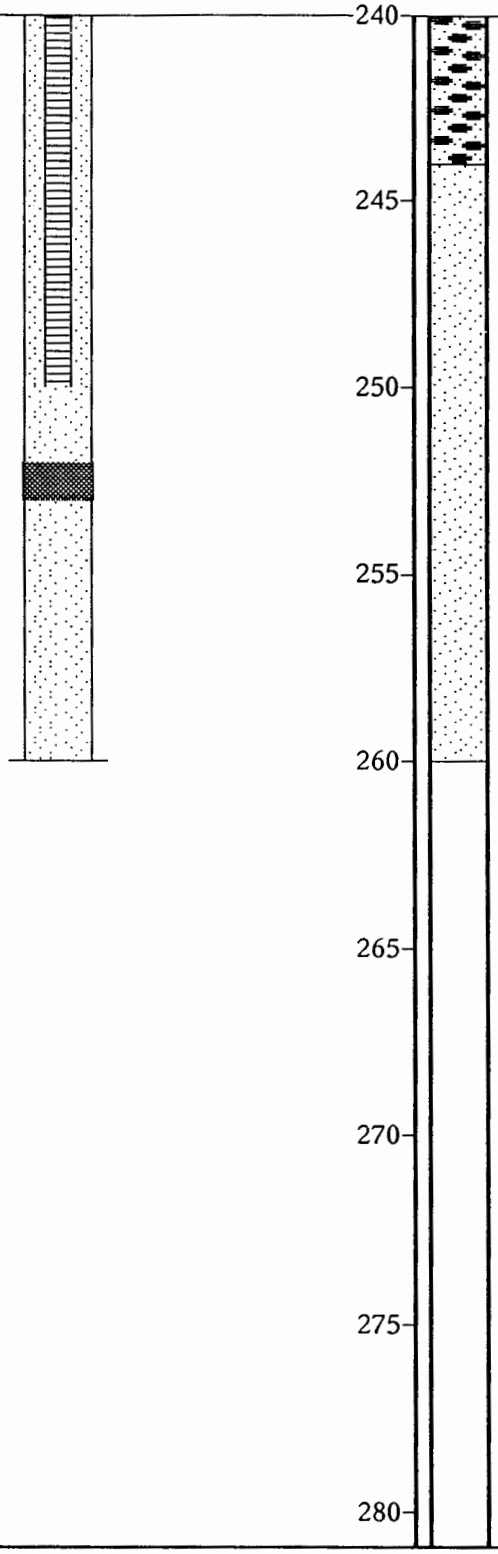
4" Stainless Steel Screen (Slot size 0.02") from 235 to 250 feet

Sandpack:
20x40 sand (232-233)
10x20 sand (233-252)

Bottom Cap

Bentonite seal (252-253)

Sandpack:
10x20 sand (253-260)



-tan sandy clay pockets from 243 to 244 feet

BROWN, GRAY & BLACK GRAVELLY SAND (SP)

End of Boring at 260 feet.

Harding Lawson Associates
Engineers and Environmental Services

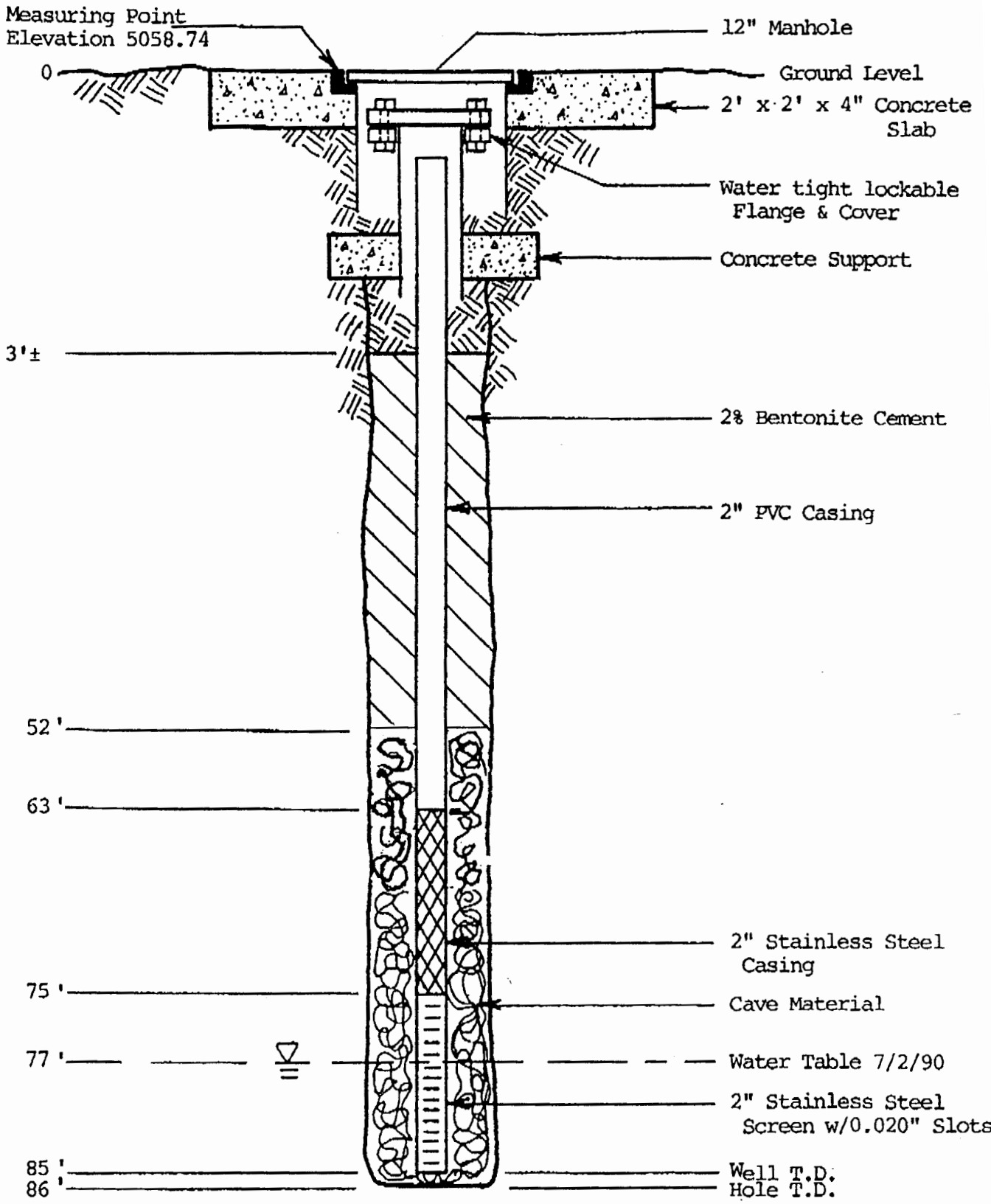
MONITORING WELL DETAIL MW-50

Sparton Technology Inc.
Albuquerque, New Mexico

PLATE

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
	06310,039.12		12/90		

008622



COMPLETION DIAGRAM
MW-51

008623

METRIC
Corporation

SAMPLE LOG

Well Number MW-51 Well Location

Well Owner Sparton Technology, Inc.

Sample Logger Peter H. Metzner, METRIC Corporation

Driller Rodgers & Company, Inc.

Drilling Medium Hollow Stem Auger

Date of Completion 5-11-90 Ground Elev. 5058.5

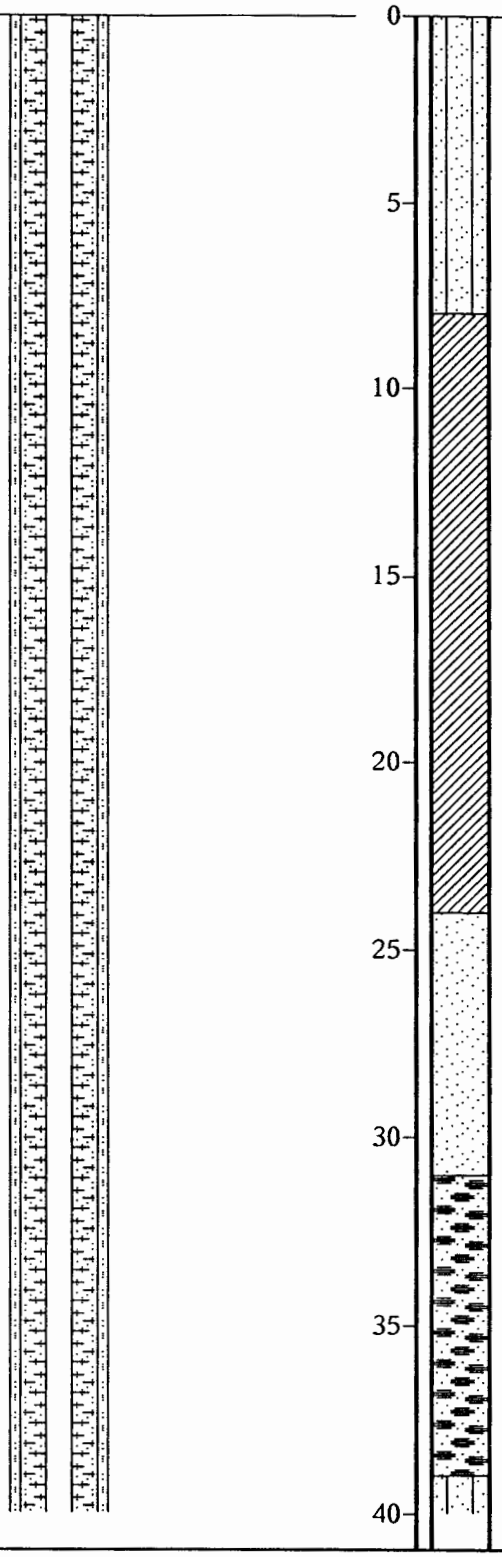
Depth (feet)	Thickness (feet)	Stratigraphic Description
0 - 20	20	Pale yellowish brown (10YR6/2) medium-sorted very fine to medium fine sand with some coarse and granule gravel
20 - 70	50	Moderate yellowish brown (10YR5/4) well-sorted very fine to fine sand
70 - 86	16	Pale yellowish brown (10YR6/2) fine to coarse sand with subangular to rounded granule to cobble gravel

Top of PVC Casing
Elevation 5165.41

Equipment GD-1500

Elevation ft Date 6/4/90

GROUND SURFACE



LIGHT TAN SILTY FINE TO MEDIUM SAND (SM)
slightly clayey

TAN SANDY CLAY (CL)

Cement/Bentonite Grout

4" PVC Casing to 177 feet

BROWN, BLACK, WHITE, GRAY, & TAN FINE TO COARSE SAND (SW)
with occasional gravel

12-1/4" Borehole to 188 feet

BROWN, BLACK, GRAY, TAN, & WHITE SANDY GRAVEL (GP)

BROWN, BLACK, GRAY, & TAN

Harding Lawson Associates
Engineers and Environmental Services

MONITORING WELL DETAIL MW-52

Sparton Technology Inc.
Albuquerque, New Mexico

PLATE

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
	06310,039.12		12/90		

008625

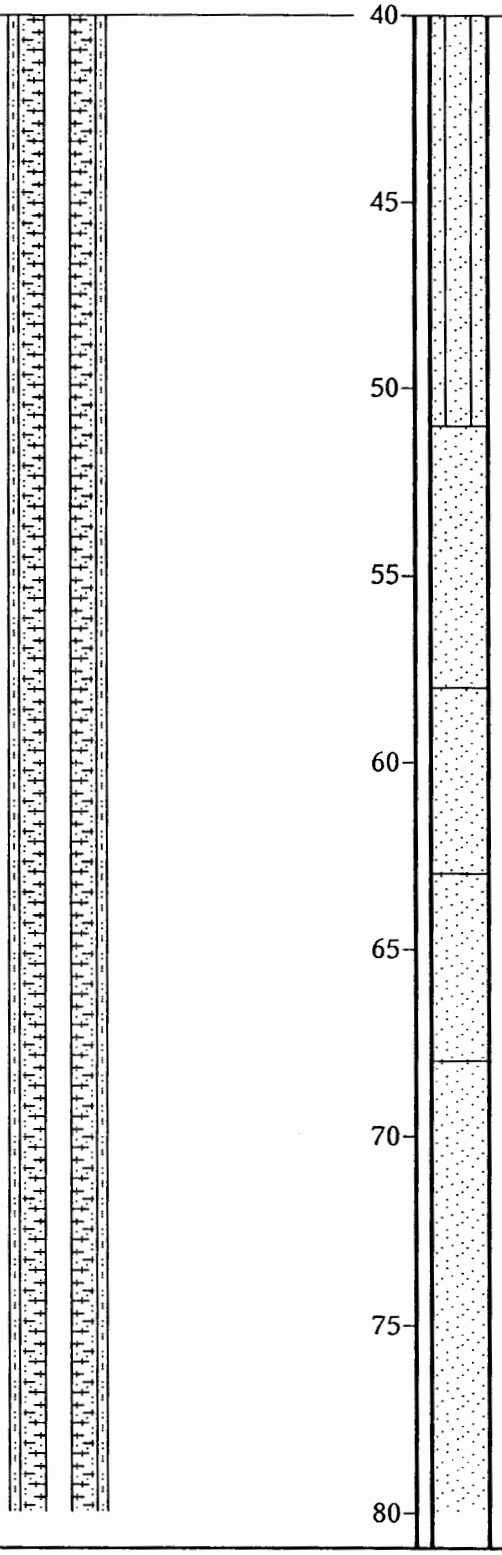
Top of PVC Casing Elevation 5165.41

Equipment GD-1500

Elevation ft **Date** 6/4/90

GROUND SURFACE

8-5/8"
Steel casing
from 0 to 186.8 feet



SILTY FINE TO MEDIUM SAND (SM)
-slightly clayey

-with occasional coarse sand

BROWN, BLACK, TAN, GRAY, & WHITE MEDIUM TO COARSE SAND (SP)

TAN SILTY FINE TO COARSE SAND (SW)
with clay

TAN, BROWN, & BLACK MEDIUM TO COARSE SAND (SP)

TAN, BROWN, & BLACK SILTY FINE TO COARSE SAND (SW)

-with clay below 79 feet

Harding Lawson Associates
Engineers and
Environmental Services

MONITORING WELL DETAIL MW-52

Sparton Technology Inc.
Albuquerque, New Mexico

PLATE

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
	06310,039.12		12/90		

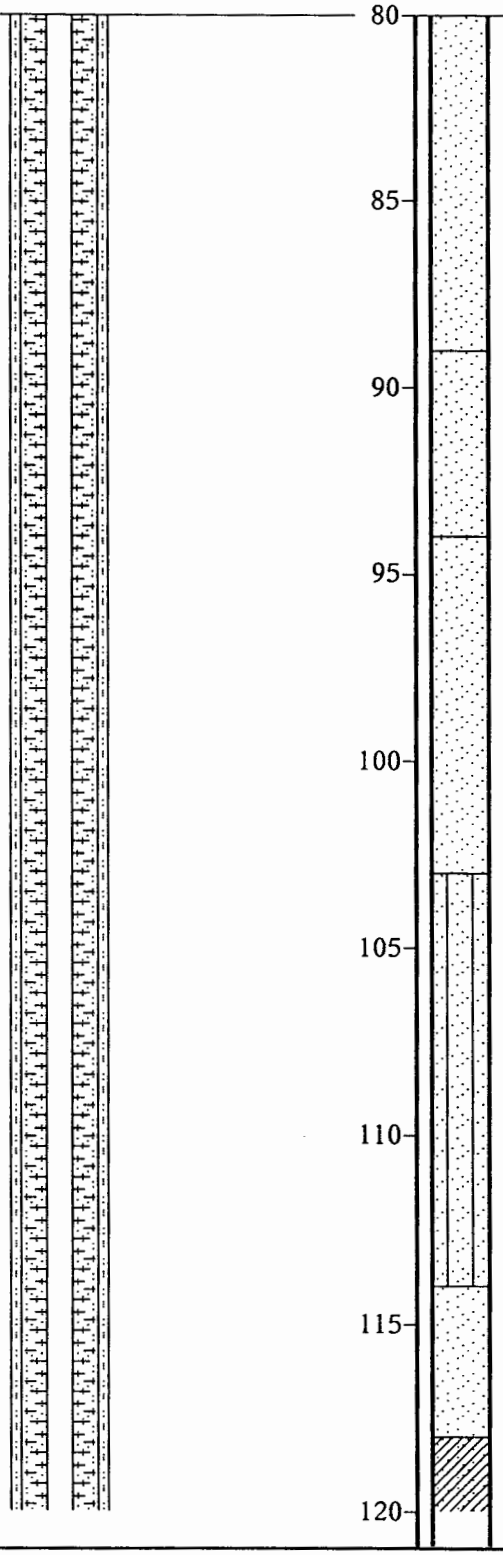
008626

Top of PVC Casing
Elevation 5165.41

Equipment GD-1500

Elevation ft Date 6/4/90

GROUND SURFACE



BROWN, BLACK, TAN, & GRAY MEDIUM TO COARSE SAND (SP)

TAN, BROWN, & BLACK FINE TO COARSE SAND (SW)

TAN, BROWN, & BLACK SILTY FINE TO MEDIUM SAND (SM)

BROWN, BLACK, TAN, WHITE, & GRAY FINE TO MEDIUM SAND (SP) with coarse sand

BROWN & TAN CLAYEY MEDIUM TO COARSE SAND (SC)

Harding Lawson Associates
Engineers and Environmental Services

MONITORING WELL DETAIL MW-52

Sparton Technology Inc.
Albuquerque, New Mexico

PLATE

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
	06310,039.12		12/90		

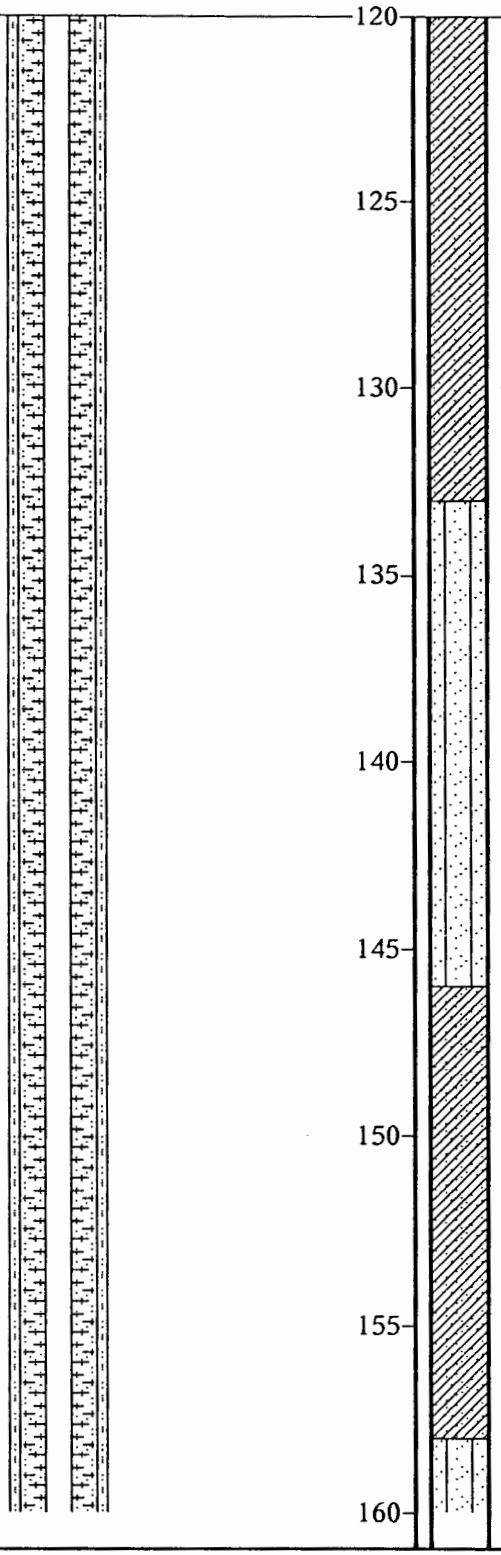
008627

Top of PVC Casing
Elevation 5165.41

Equipment GD-1500

Elevation ft Date 6/4/90

GROUND SURFACE



BROWN, TAN, & BLACK SILTY FINE TO MEDIUM SAND (SM)

-with coarse sand below 137 feet

TAN & BROWN CLAYEY FINE TO MEDIUM SAND (SC)

BROWN, TAN, & BLACK SILTY FINE TO MEDIUM SAND (SM)

Harding Lawson Associates
Engineers and
Environmental Services

MONITORING WELL DETAIL MW-52

Sparton Technology Inc.
Albuquerque, New Mexico

PLATE

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
	06310,039.12		12/90		

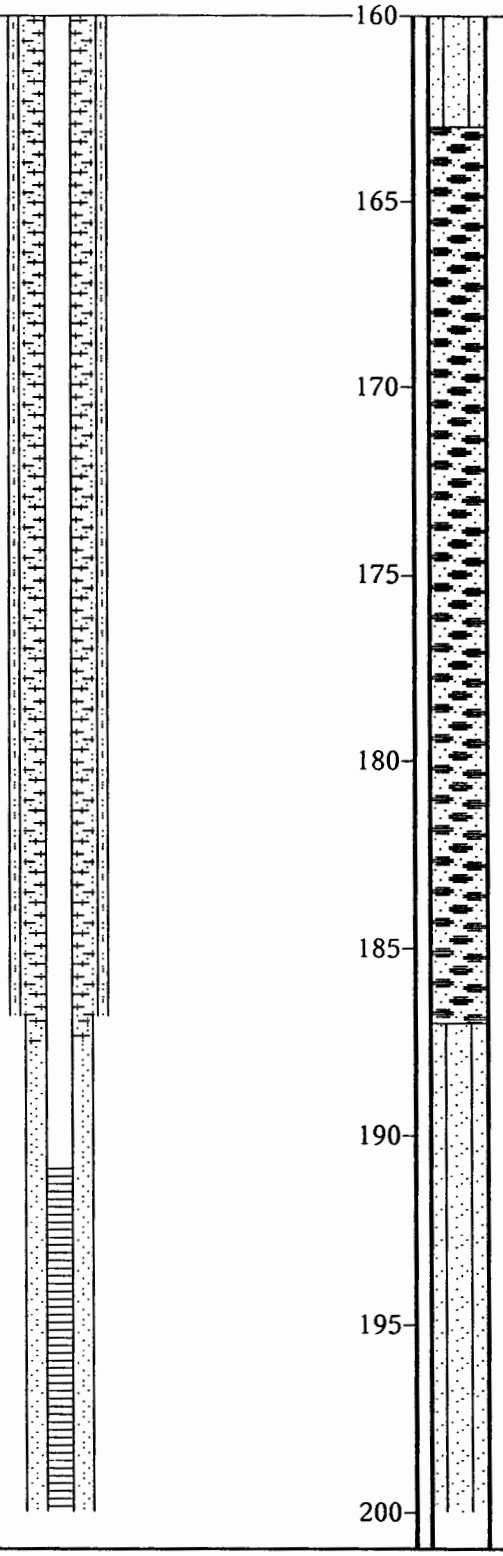
008628

Top of PVC Casing
Elevation 5165.41

Equipment GD-1500

Elevation ft Date 6/4/90

GROUND SURFACE



BROWN, BLACK, GRAY, WHITE, & SANDY GRAVEL (GP)

-with decreasing sand content

TAN SILTY FINE TO MEDIUM SAND (SM)

Stainless Steel casing from 177 to 190.8 feet

Sandpack:
20x40 sand (187.6'-188.9')
10x20 sand (188.9'-206.5')

7-7/8" Borehole from 187 to 208 feet

4" Stainless Steel Screen (Slot size 0.02") from 190.8 to 206 feet

Harding Lawson Associates
Engineers and Environmental Services

MONITORING WELL DETAIL MW-52

Sparton Technology Inc.
Albuquerque, New Mexico

PLATE

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
	06310,039.12		12/90		

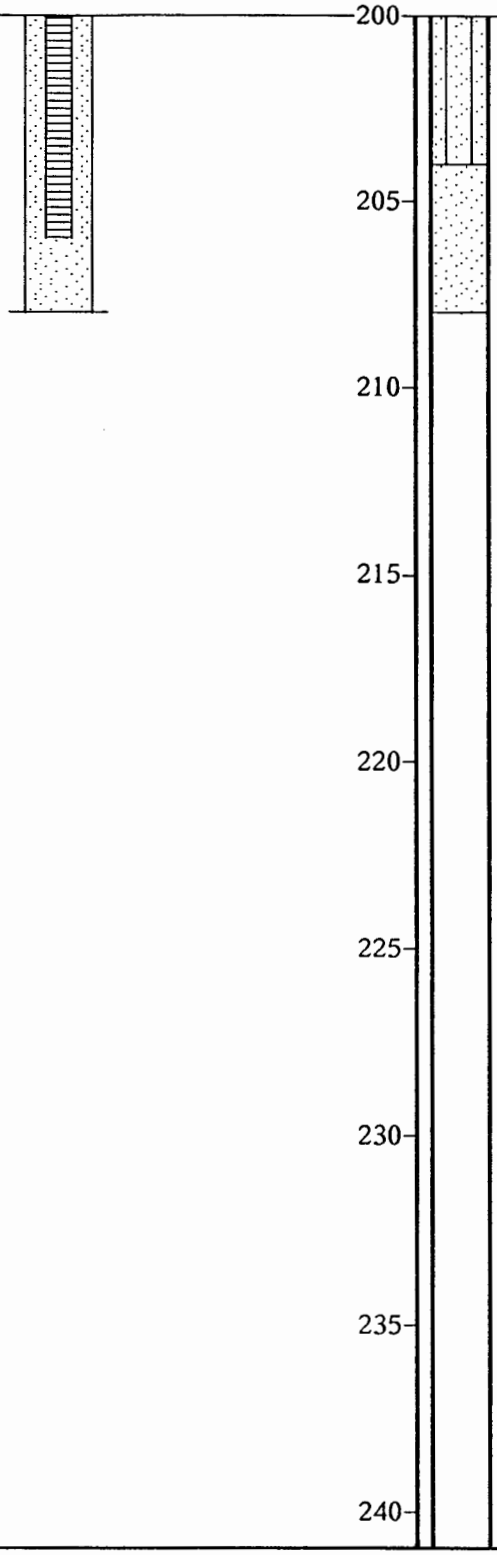
008629

Top of PVC Casing Elevation 5165.41

Equipment GD-1500

Elevation ft **Date** 6/4/90

GROUND SURFACE



Bottom Cap

TAN, BROWN, & BLACK FINE TO COARSE SAND (SW)

End of boring at 208 feet.

Harding Lawson Associates Engineers and Environmental Services

MONITORING WELL DETAIL MW-52

Sparton Technology Inc.
Albuquerque, New Mexico

PLATE

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
	06310,039.12		12/90		

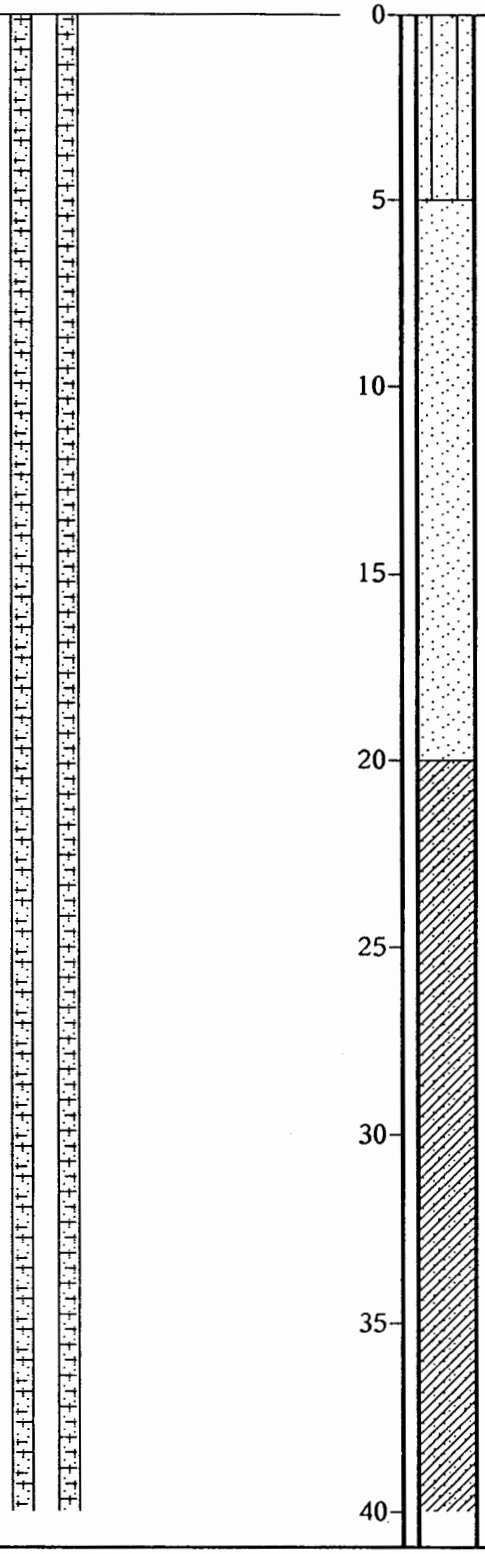
008630

Top of PVC Casing
Elevation 5097.64

Equipment GD-1500

Elevation 5097.64 ft Date 7/26/90

GROUND SURFACE



TAN SILTY SAND (SM)
with occasional clay

TAN, BROWN & BLACK MEDIUM TO COARSE SAND (SP)
with occasional clay

TAN, BROWN & BLACK CLAYEY MEDIUM TO COARSE SAND (SC)
with silty seams below 57 feet

4" PVC Casing
to 107 feet

8-5/8" Steel casing
from 0 to 112 feet

12-1/4" Borehole
to 112 feet

Cement/Bentonite
Grout

Harding Lawson Associates
Engineers and
Environmental Services

MONITORING WELL DETAIL MW-54

Sparton Technology Inc.
Albuquerque, New Mexico

PLATE

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
	06310,039.12		12/90		

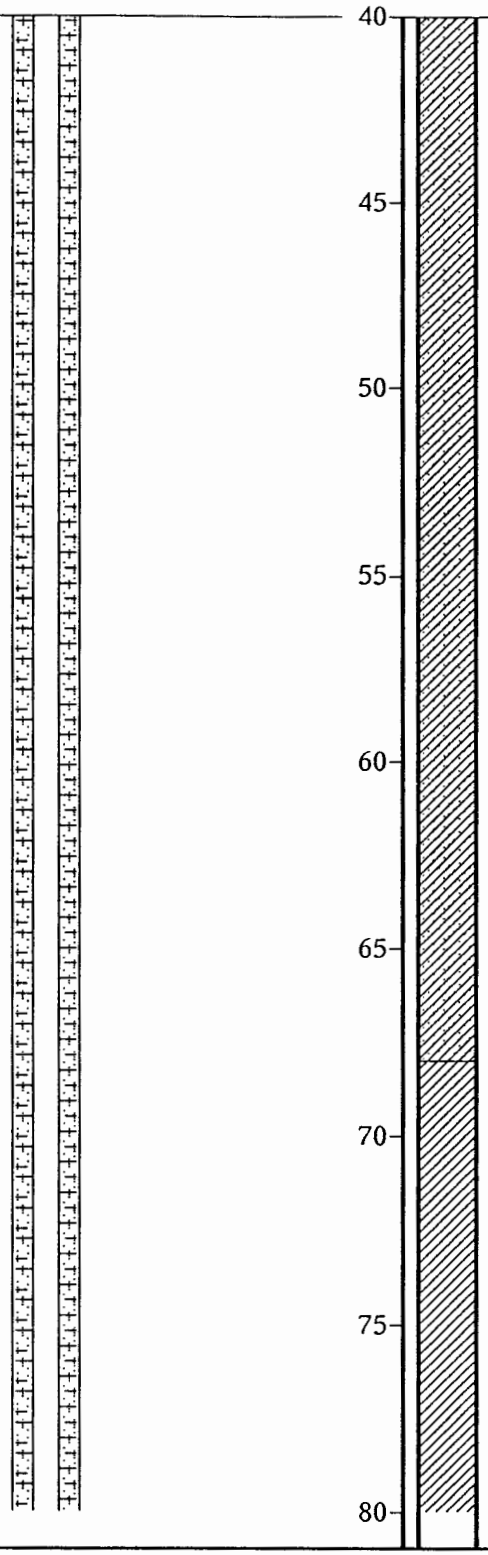
008631

Top of PVC Casing
Elevation 5097.64

Equipment GD-1500

Elevation 5097.64 ft Date 7/26/90

GROUND SURFACE



TAN & BROWN SILTY CLAY (CL)
with some sand

Harding Lawson Associates
Engineers and
Environmental Services

MONITORING WELL DETAIL MW-54

Sparton Technology Inc.
Albuquerque, New Mexico

PLATE

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
	06310,039.12		12/90		

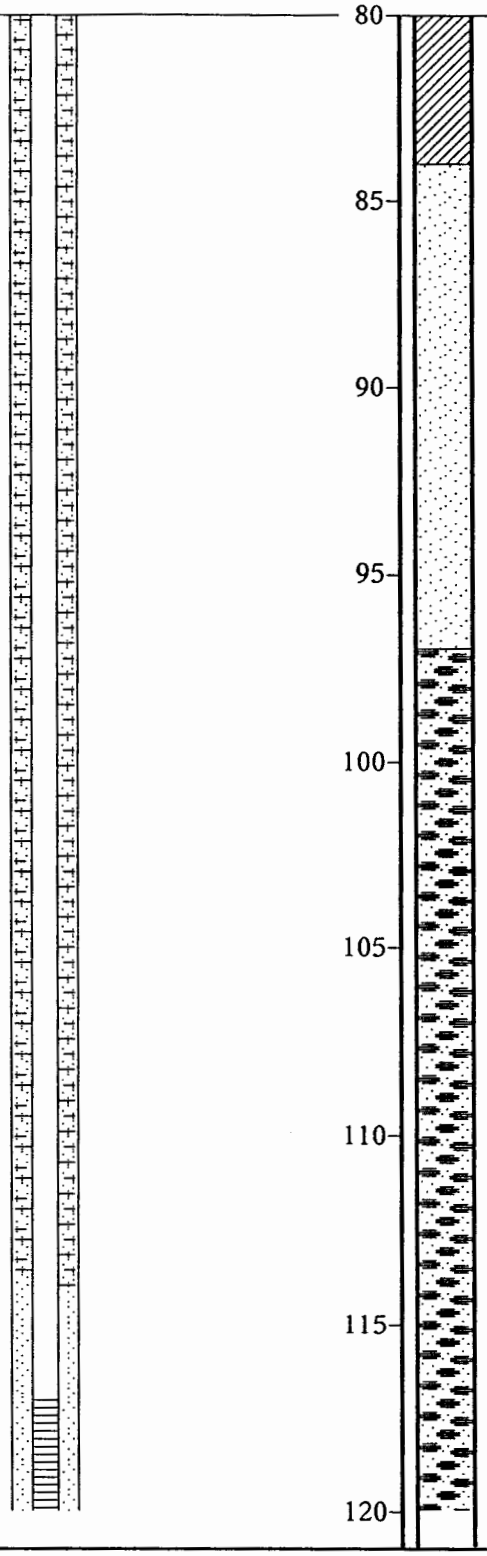
008632

Top of PVC Casing
Elevation 5097.64

Equipment GD-1500

Elevation 5097.64 ft Date 7/26/90

GROUND SURFACE



TAN, BROWN & BLACK MEDIUM TO COARSE SAND (SP)
with occasional gravel

-increasing gravel below 95.0 feet

TAN, BROWN & BLACK SANDY GRAVEL (GP)
with cobbles

4" Stainless Steel casing from 107 to 117 feet

Sandpack:
20x40 sand
(114 to 115 feet)
10x20 sand
(115 to 132 feet)

Harding Lawson Associates
Engineers and Environmental Services

MONITORING WELL DETAIL MW-54

Sparton Technology Inc.
Albuquerque, New Mexico

PLATE

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
	06310,039.12		12/90		

008633

Top of PVC Casing Elevation 5097.64

Equipment GD-1500

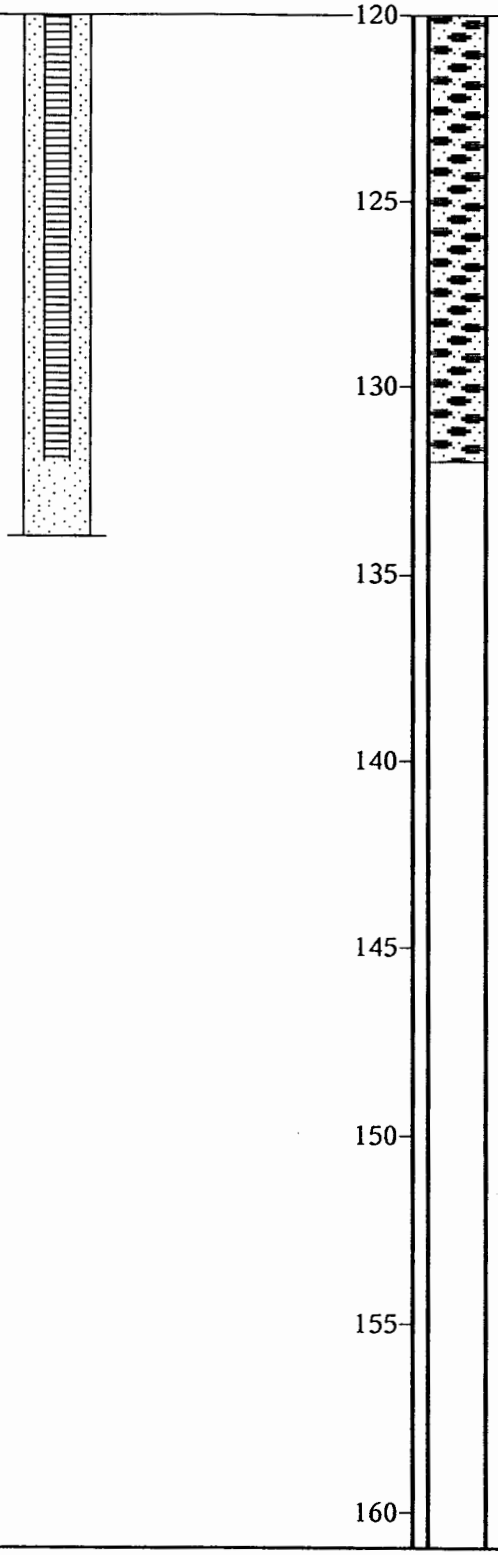
Elevation 5097.64 ft **Date** 7/26/90

GROUND SURFACE

7-7/8" borehole from 112 to 134 feet

4" Stainless Steel Screen (slot size 0.02") from 117 to 132 feet

Bottom Cap



End of Boring at 132.00 feet.

Harding Lawson Associates
Engineers and Environmental Services

MONITORING WELL DETAIL MW-54

Sparton Technology Inc.
Albuquerque, New Mexico

PLATE

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
	06310,039.12		12/90		

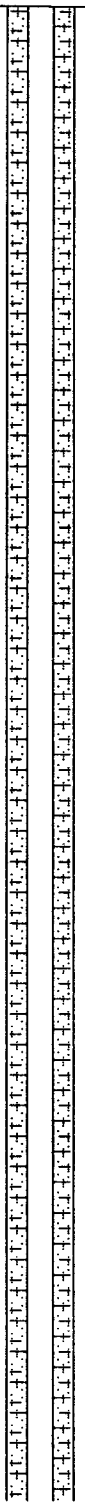
008634

Top of PVC Casing
Elevation 5168.61

Equipment GD-1500

Elevation 5168.61 ft Date 8/13/90

GROUND SURFACE

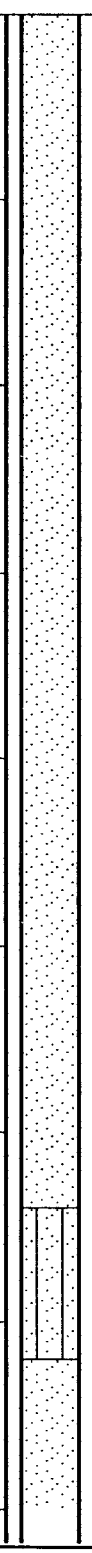


4" PVC Casing
to 190 feet

8-5/8" Steel casing
from 0 to 210 feet

12-1/4" Borehole
to 212 feet

Cement/Bentonite
Grout



0

BROWN MEDIUM TO COARSE SAND (SW)
with occasional silt

5

10

-fine to medium sand below 10.0 feet

15

20

25

30

BROWN FINE SILTY SAND (SM)

35

BROWN FINE TO MEDIUM SAND (SP)

-with silt from 38 to 48 feet

40

Harding Lawson Associates
Engineers and
Environmental Services

MONITORING WELL DETAIL MW-56

Sparton Technology Inc.
Albuquerque, New Mexico

PLATE

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
	06310,039.12		12/90		

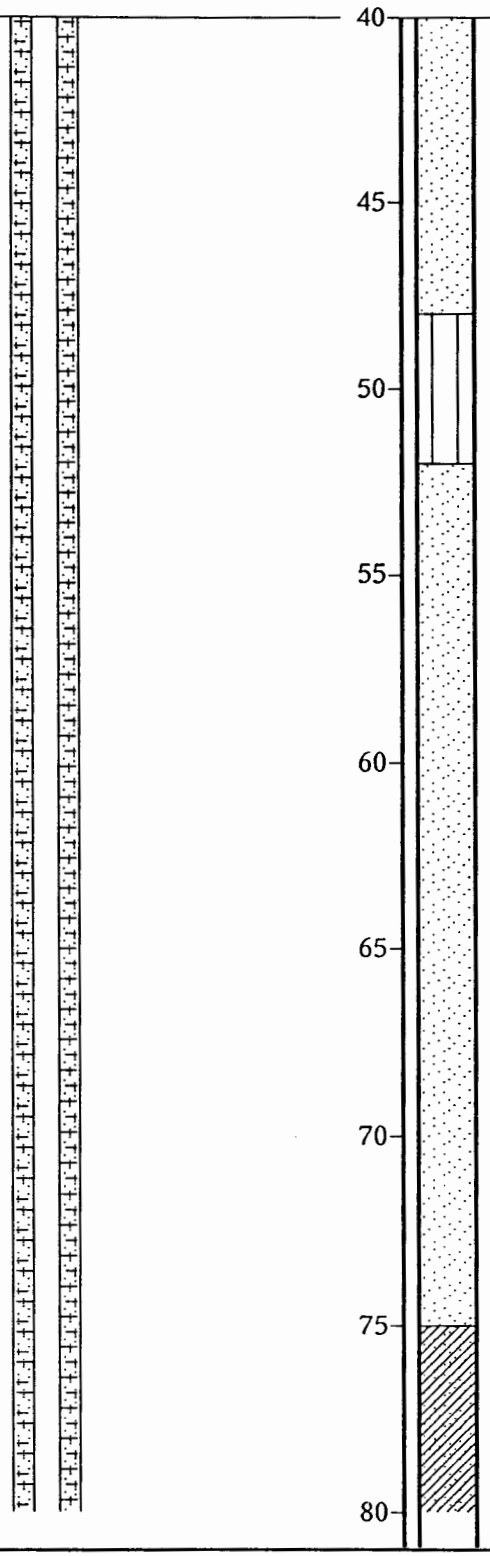
008635

Top of PVC Casing
Elevation 5168.61

Equipment GD-1500

Elevation 5168.61 ft Date 8/13/90

GROUND SURFACE



BROWN SILT (ML)
with occasional fine sand

BROWN FINE TO MEDIUM SAND (SP)
with occasional clay and minor gravel

BROWN & GRAY CLAYEY SAND (SC)

Harding Lawson Associates
Engineers and
Environmental Services

MONITORING WELL DETAIL MW-56

Sparton Technology Inc.
Albuquerque, New Mexico

PLATE

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
	06310,039.12		12/90		

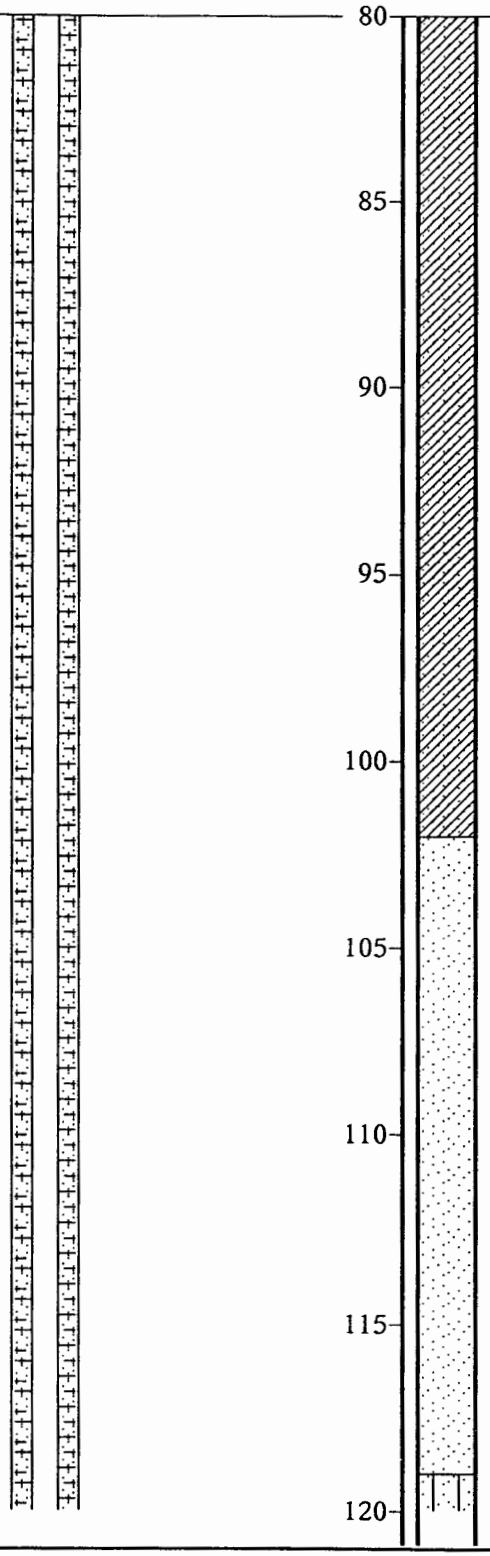
008636

Top of PVC Casing
Elevation 5168.61

Equipment GD-1500

Elevation 5168.61 ft Date 8/13/90

GROUND SURFACE



BROWN & GRAY FINE SAND (SP)
with some silt

BROWN FINE SILTY SAND (SM)

Harding Lawson Associates
Engineers and
Environmental Services

MONITORING WELL DETAIL MW-56

Sparton Technology Inc.
Albuquerque, New Mexico

PLATE

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
	06310,039.12		12/90		

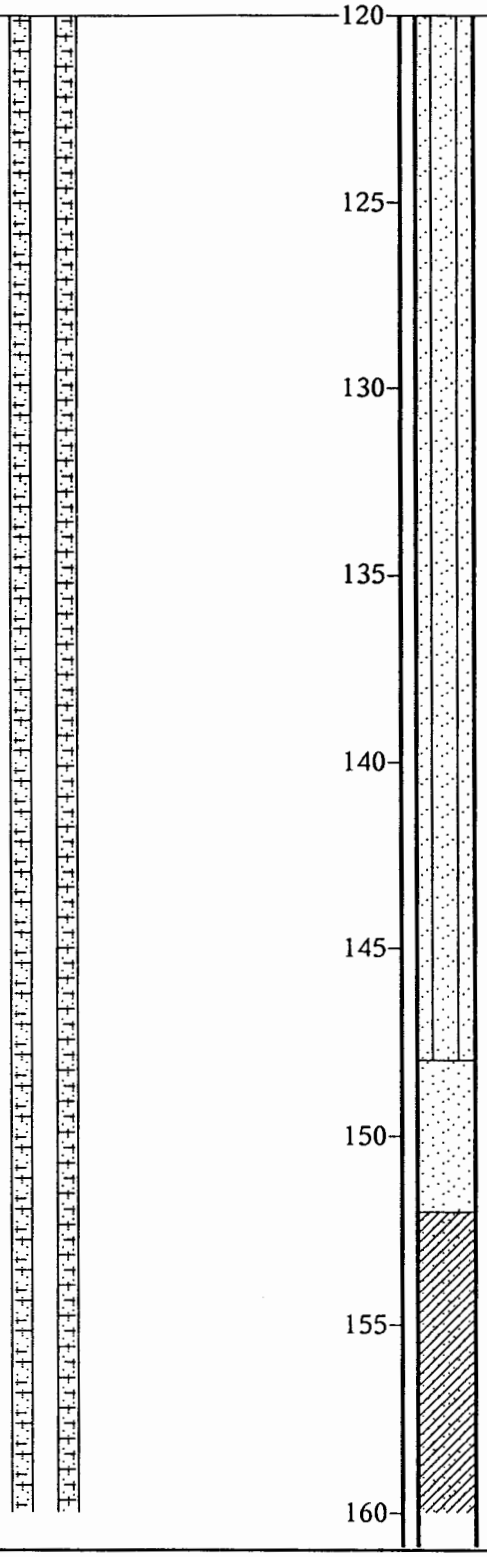
008637

Top of PVC Casing
Elevation 5168.61

Equipment GD-1500

Elevation 5168.61 ft Date 8/13/90

GROUND SURFACE



-occasional small gravel at 145 feet

BROWN & GRAY MEDIUM TO COARSE SAND (SW)

BROWN & GRAY CLAYEY SAND (SC) with some silt

Harding Lawson Associates
Engineers and Environmental Services

MONITORING WELL DETAIL MW-56

Sparton Technology Inc.
Albuquerque, New Mexico

PLATE

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
	06310,039.12		12/90		

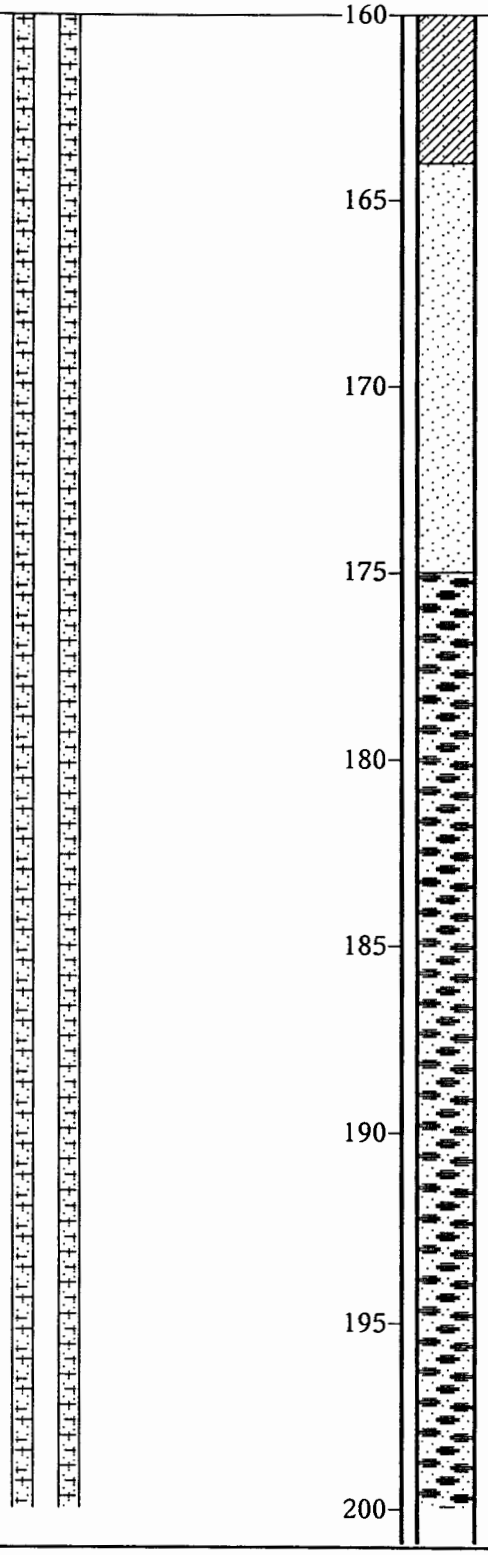
008638

Top of PVC Casing
Elevation 5168.61

Equipment GD-1500

Elevation 5168.61 ft Date 8/13/90

GROUND SURFACE



BROWN FINE TO COARSE SAND (SW) with occasional gravel, increased fine sand, decreased gravel below 165 feet

-occasional clay below 168 feet

BLACK & GRAY SANDY GRAVEL (GW)

4" Stainless Steel casing from 190 to 220 feet

Harding Lawson Associates
Engineers and Environmental Services

MONITORING WELL DETAIL MW-56

Sparton Technology Inc.
Albuquerque, New Mexico

PLATE

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
	06310,039.12		12/90		

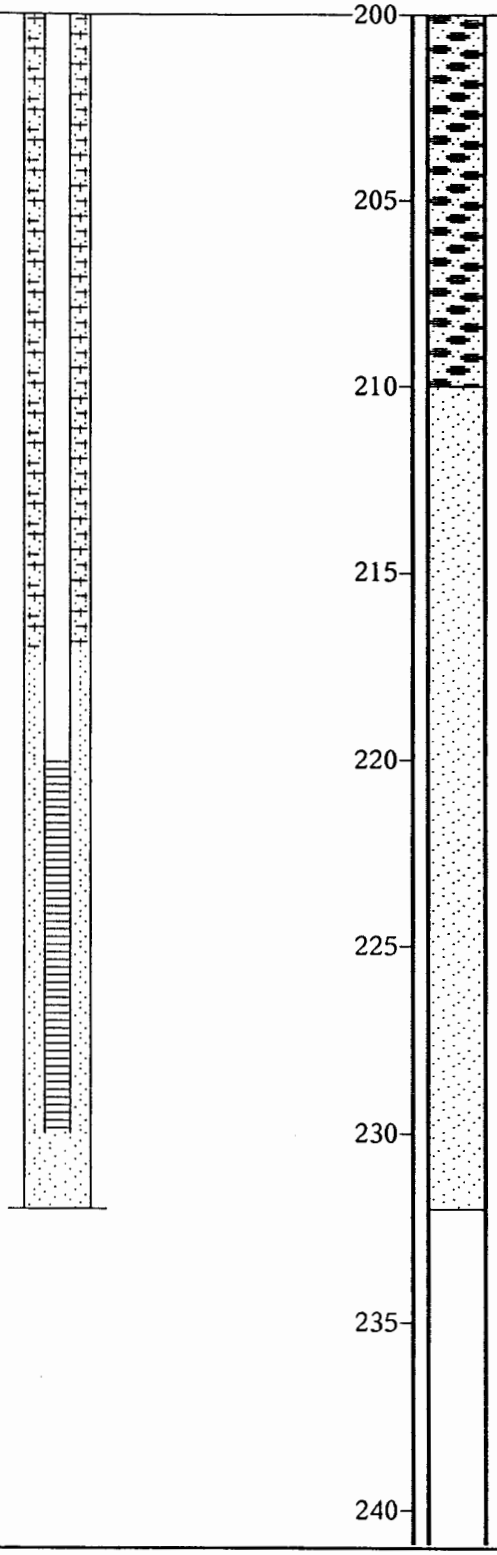
008639

Top of PVC Casing
Elevation 5168.61

Equipment GD-1500

Elevation 5168.61 ft Date 8/13/90

GROUND SURFACE



7-7/8" borehole from 210 to 232 feet

Sandpack:
20x40 sand
(217 to 218 feet)
10x20 sand
(218 to 232 feet)

4" Stainless Steel Screen (slot size 0.02") from 220 to 230 feet

Bottom Cap

BROWN & BLACK FINE TO COARSE SAND (SW)

End of boring at 232.0 feet.

Harding Lawson Associates
Engineers and Environmental Services

MONITORING WELL DETAIL MW-56

Sparton Technology Inc.
Albuquerque, New Mexico

PLATE

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
	06310,039.12		12/90		

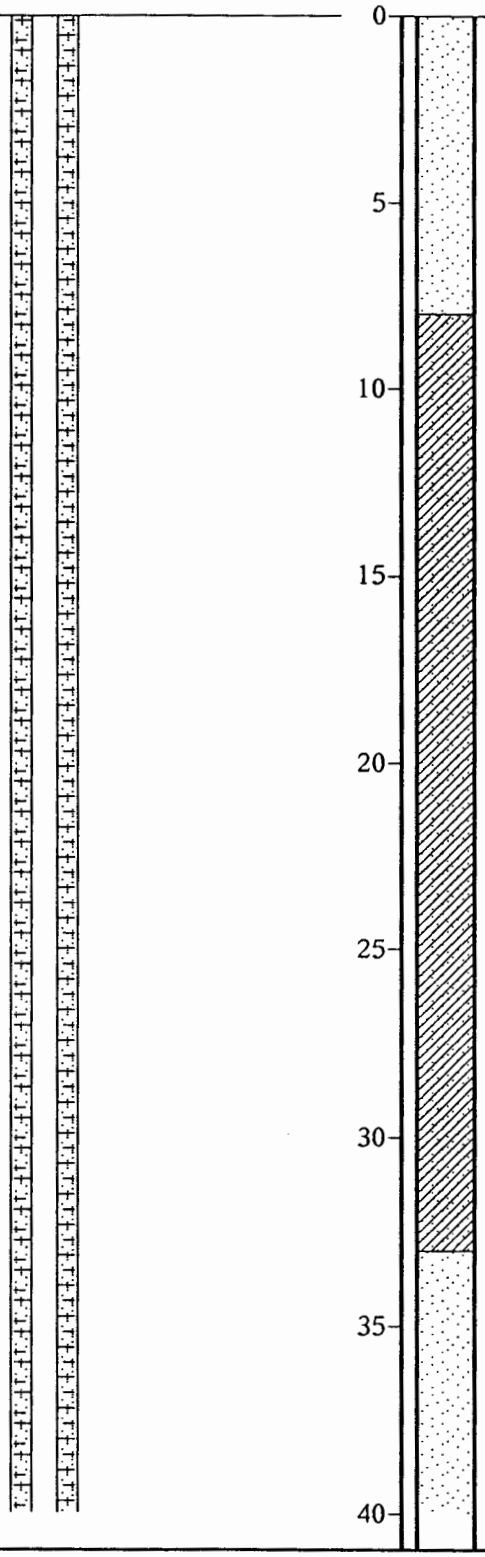
008640

Top of PVC Casing
Elevation 5168.61

Equipment GD-1500

Elevation 5168.61 ft Date 8/5/90

GROUND SURFACE



BROWN FINE TO COARSE SAND (SW)
with occasional clay and small gravel

YELLOW-BROWN CLAYEY FINE TO MEDIUM SAND (SC)

BROWN & GRAY FINE TO COARSE SAND (SW)
with occasional clay

4" PVC Casing
to 171.6 feet

8-5/8" Steel casing
from 0 to 243 feet

12-1/4" Borehole
to 244.5 feet

Cement/Bentonite
Grout

Harding Lawson Associates
Engineers and
Environmental Services

MONITORING WELL DETAIL MW-55

Sparton Technology Inc.
Albuquerque, New Mexico

PLATE

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
	06310,039.12		12/90		

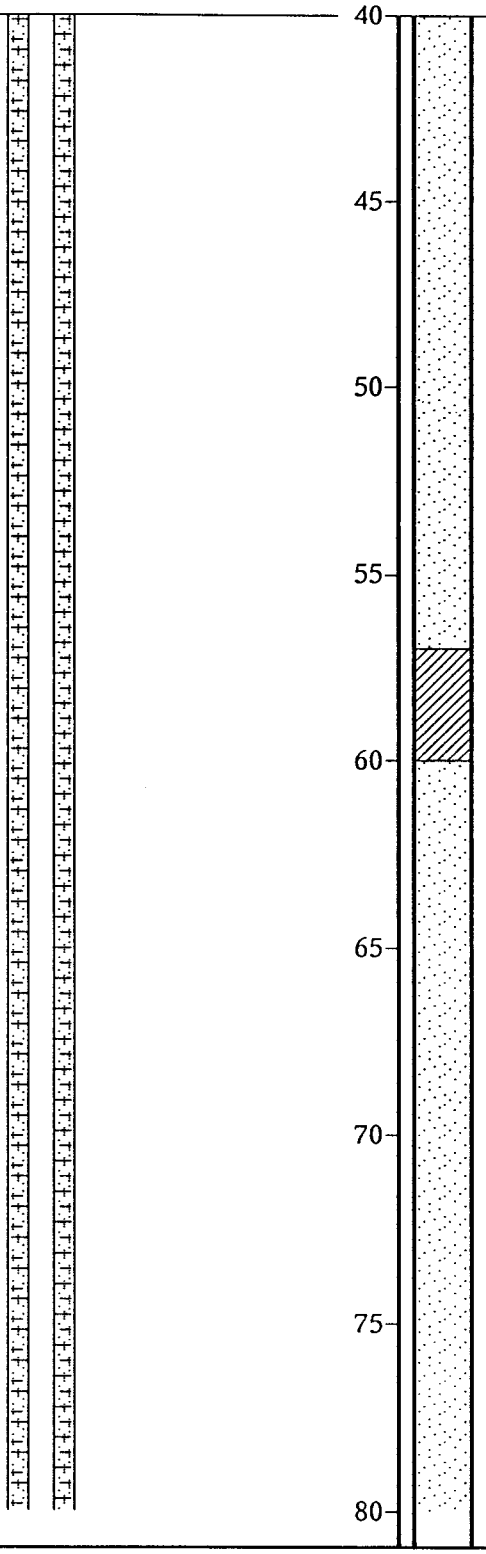
008641

Top of PVC Casing
Elevation 5168.61

Equipment GD-1500

Elevation 5168.61 ft Date 8/5/90

GROUND SURFACE



TAN & BROWN SANDY CLAY (CL)

BROWN FINE TO COARSE SAND (SW)
with occasional clay

Harding Lawson Associates
Engineers and
Environmental Services

MONITORING WELL DETAIL MW-55

Sparton Technology Inc.
Albuquerque, New Mexico

PLATE

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
	06310,039.12		12/90		

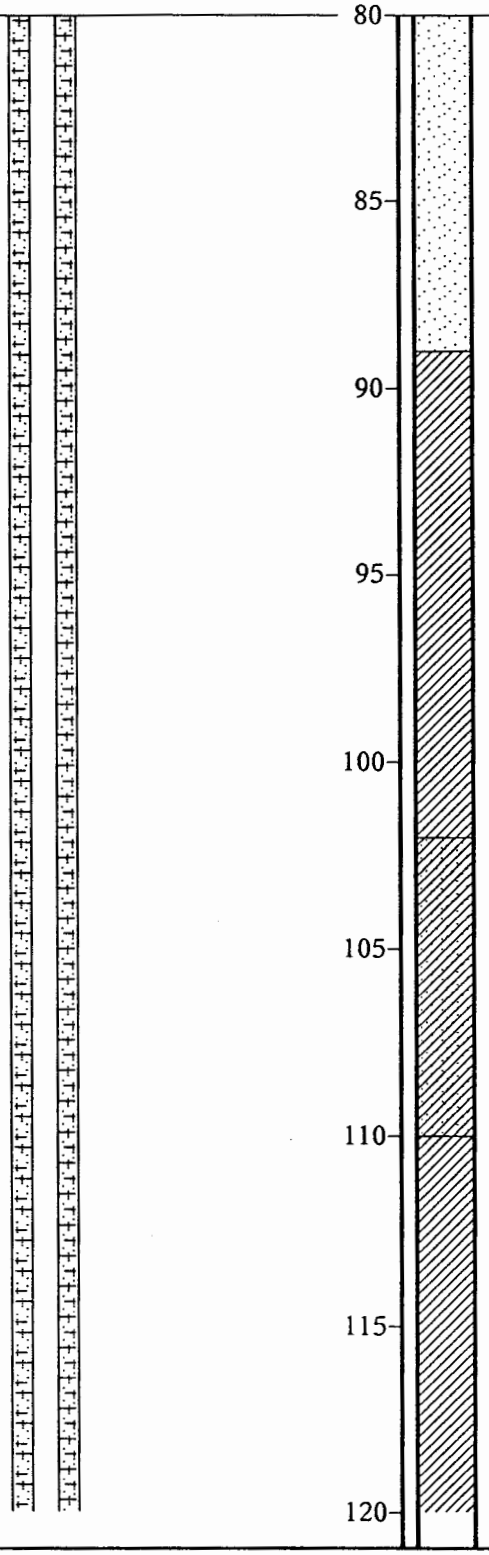
008642

Top of PVC Casing
Elevation 5168.61

Equipment GD-1500

Elevation 5168.61 ft Date 8/5/90

GROUND SURFACE



BROWN SANDY CLAY (CL)

BROWN & GRAY CLAYEY FINE TO MEDIUM SAND (SC)

BROWN SANDY CLAY (CL)

Harding Lawson Associates
Engineers and
Environmental Services

MONITORING WELL DETAIL MW-55

Sparton Technology Inc.
Albuquerque, New Mexico

PLATE

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
	06310,039.12		12/90		

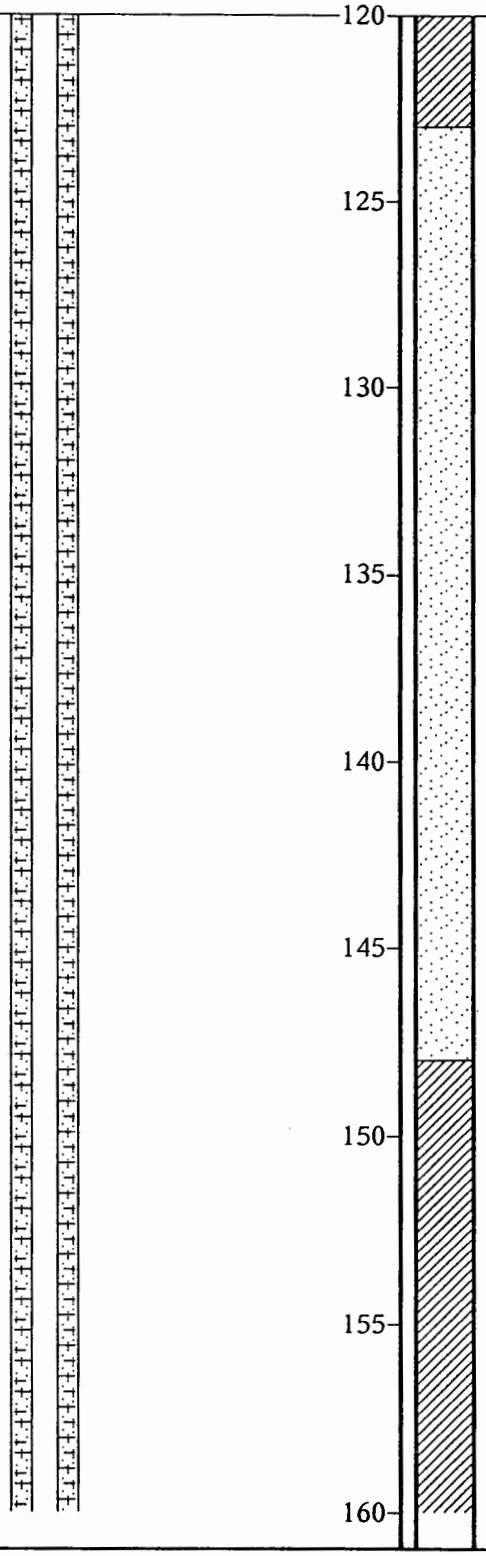
008643

Top of PVC Casing
Elevation 5168.61

Equipment GD-1500

Elevation 5168.61 ft Date 8/5/90

GROUND SURFACE



BROWN & GRAY MEDIUM TO COARSE SAND (SW) with occasional gravel

BROWN SANDY CLAY (CL)

Harding Lawson Associates
Engineers and Environmental Services

MONITORING WELL DETAIL MW-55

Sparton Technology Inc.
Albuquerque, New Mexico

PLATE

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
	06310,039.12		12/90		

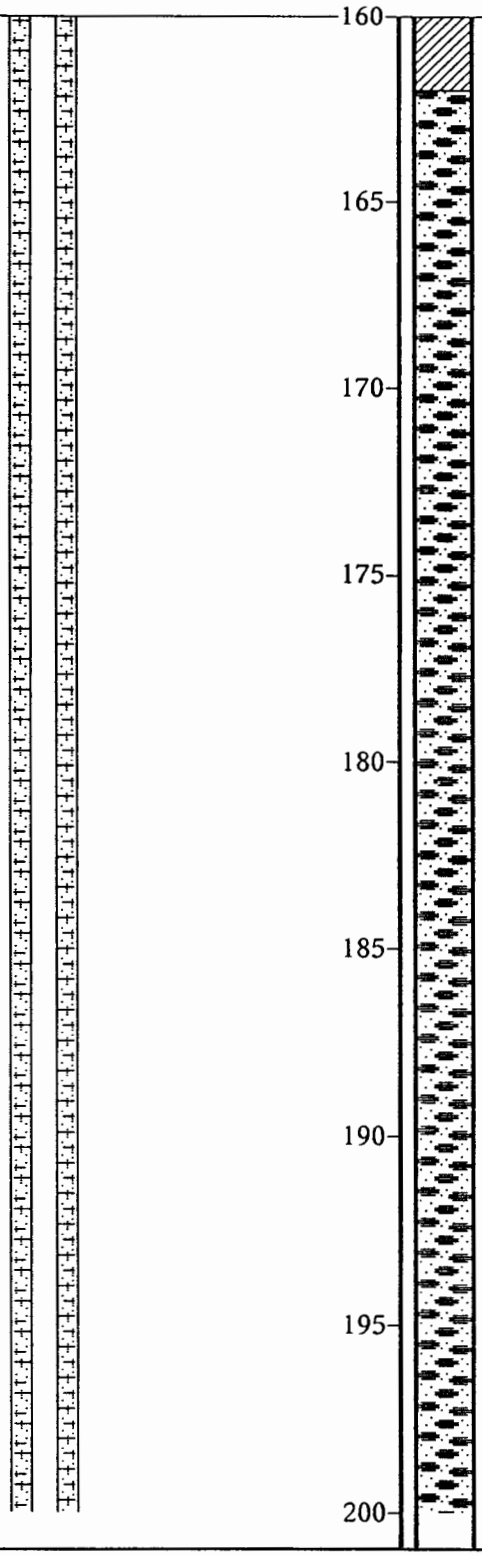
008644

Top of PVC Casing
Elevation 5168.61

Equipment GD-1500

Elevation 5168.61 ft Date 8/5/90

GROUND SURFACE



BROWN & GRAY SANDY GRAVEL (GP)

4" Stainless Steel casing from 171.6 to 255 feet

Harding Lawson Associates
Engineers and Environmental Services

MONITORING WELL DETAIL MW-55

Sparton Technology Inc.
Albuquerque, New Mexico

PLATE

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
	06310,039.12		12/90		

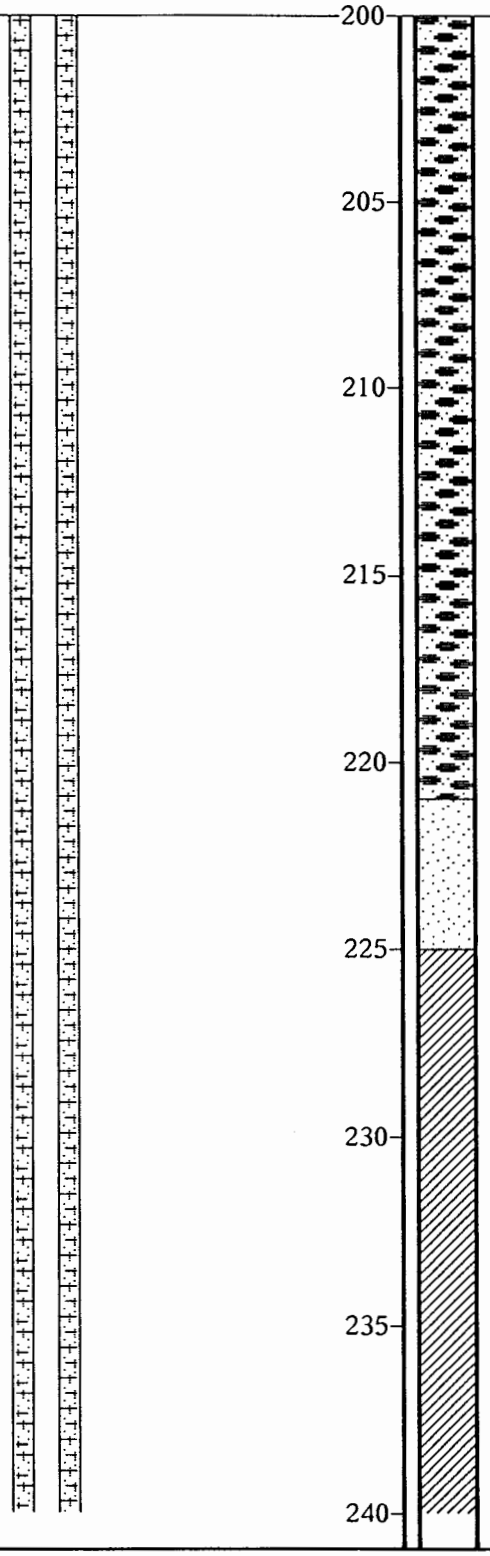
008645

Top of PVC Casing
Elevation 5168.61

Equipment GD-1500

Elevation 5168.61 ft Date 8/5/90

GROUND SURFACE



BROWN MEDIUM TO COARSE SAND (SW)
with occasional clay and gravel

BROWN SANDY CLAY (CL)
with some silt

Harding Lawson Associates
Engineers and Environmental Services

MONITORING WELL DETAIL MW-55

Sparton Technology Inc.
Albuquerque, New Mexico

PLATE

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
	06310,039.12		12/90		

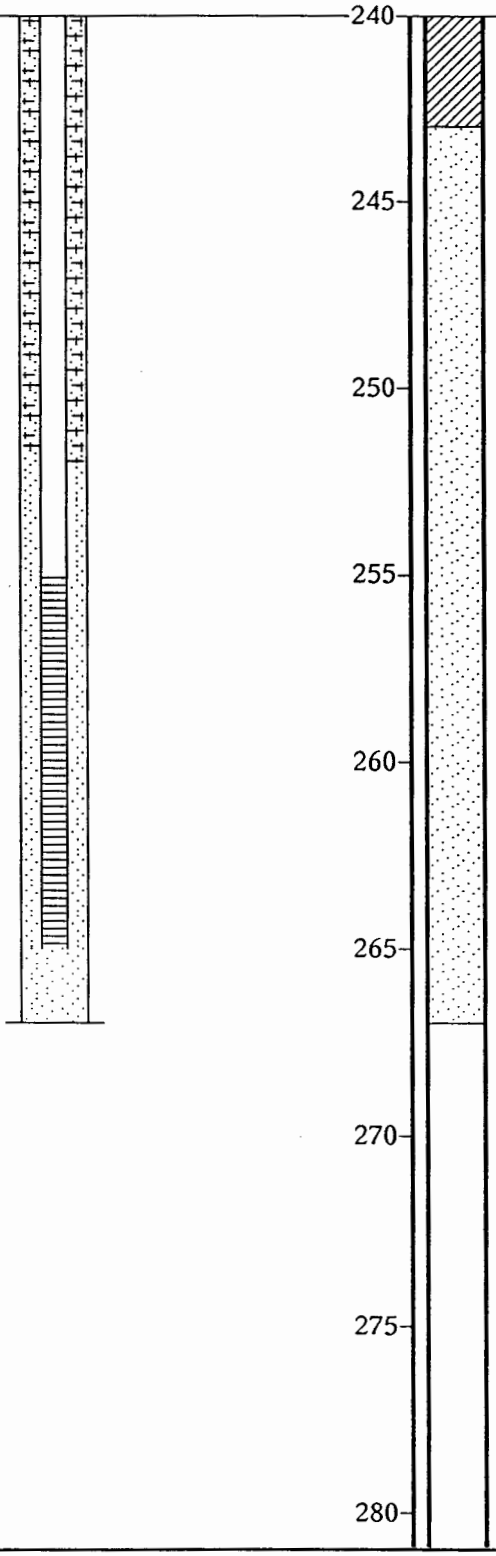
008646

Top of PVC Casing
Elevation 5168.61

Equipment GD-1500

Elevation 5168.61 ft Date 8/5/90

GROUND SURFACE



7-7/8" borehole from 243 to 267 feet

Sandpack:
20x40 sand
(252 to 253 feet)
10x20 sand
(253 to 267 feet)

4" Stainless Steel Screen (slot size 0.02") from 255 to 265 feet

Bottom Cap

BROWN & GRAY FINE TO COARSE SAND (SW)

End of boring at 267.0 feet.

Harding Lawson Associates
Engineers and Environmental Services

MONITORING WELL DETAIL MW-55

Sparton Technology Inc.
Albuquerque, New Mexico

PLATE

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
	06310,039.12		12/90		

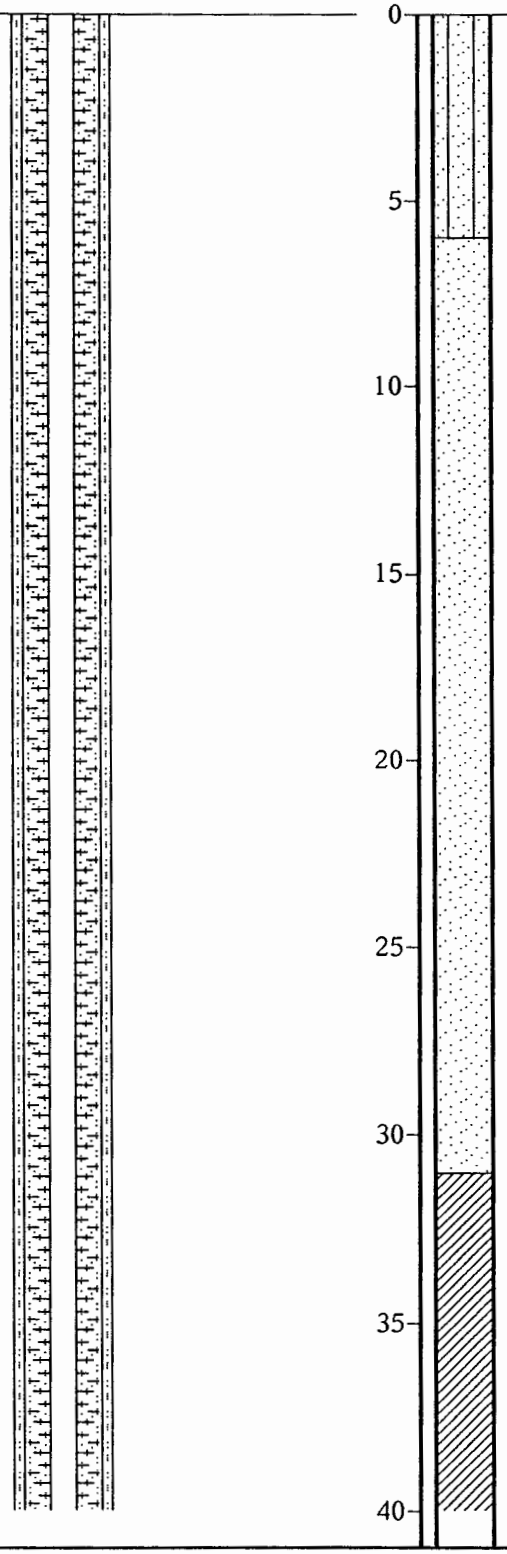
008647

Top of PVC Casing
Elevation 5163.96

Equipment GD-1500

Elevation ft Date 6/14/90

GROUND SURFACE



TAN SILTY FINE TO MEDIUM SAND (SM)

TAN, BROWN, & BLACK MEDIUM TO COARSE SAND (SP)

TAN SANDY CLAY (CL)

Cement/Bentonite Grout

4" PVC Casing to 175 feet

12-1/4" Borehole to 186 feet

Harding Lawson Associates
Engineers and Environmental Services

MONITORING WELL DETAIL MW-53

Sparton Technology Inc.
Albuquerque, New Mexico

PLATE

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
	06310,039.12		12/90		

008648

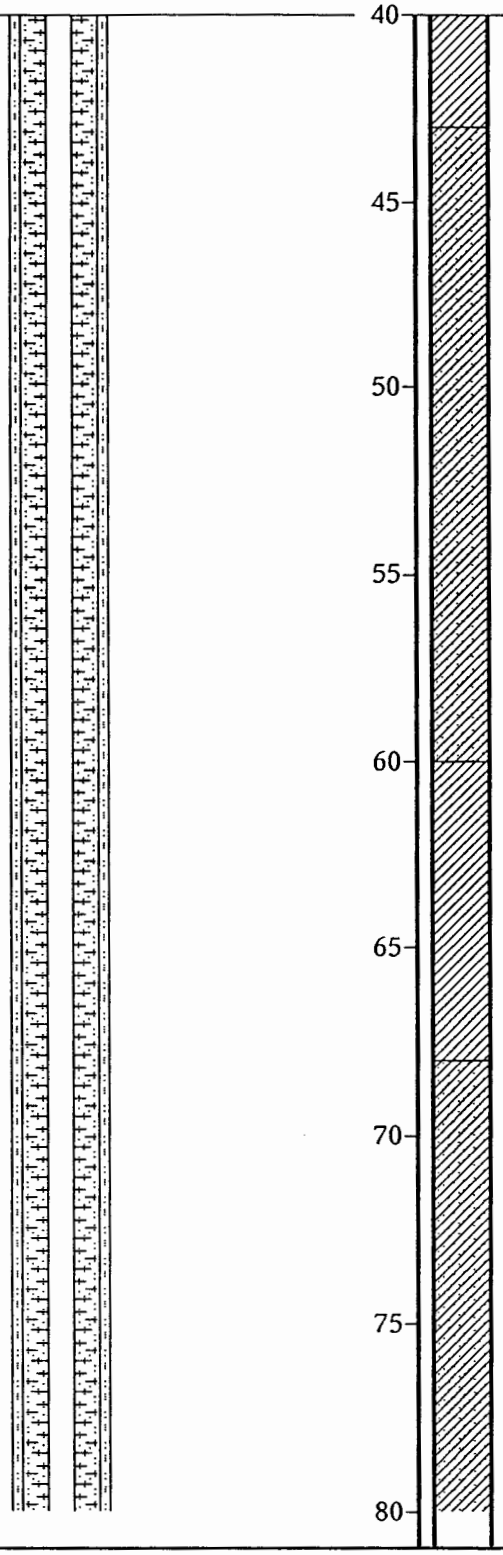
Top of PVC Casing
Elevation 5163.96

Equipment GD-1500

Elevation ft Date 6/14/90

GROUND SURFACE

8-5/8" Steel casing
from 0 to 183.8 feet



TAN CLAYEY MEDIUM TO COARSE SAND (SC)

TAN SANDY CLAY (CL)

TAN CLAYEY MEDIUM SAND (SC)

Harding Lawson Associates
Engineers and
Environmental Services

MONITORING WELL DETAIL MW-53

Sparton Technology Inc.
Albuquerque, New Mexico

PLATE

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
	06310,039.12		12/90		

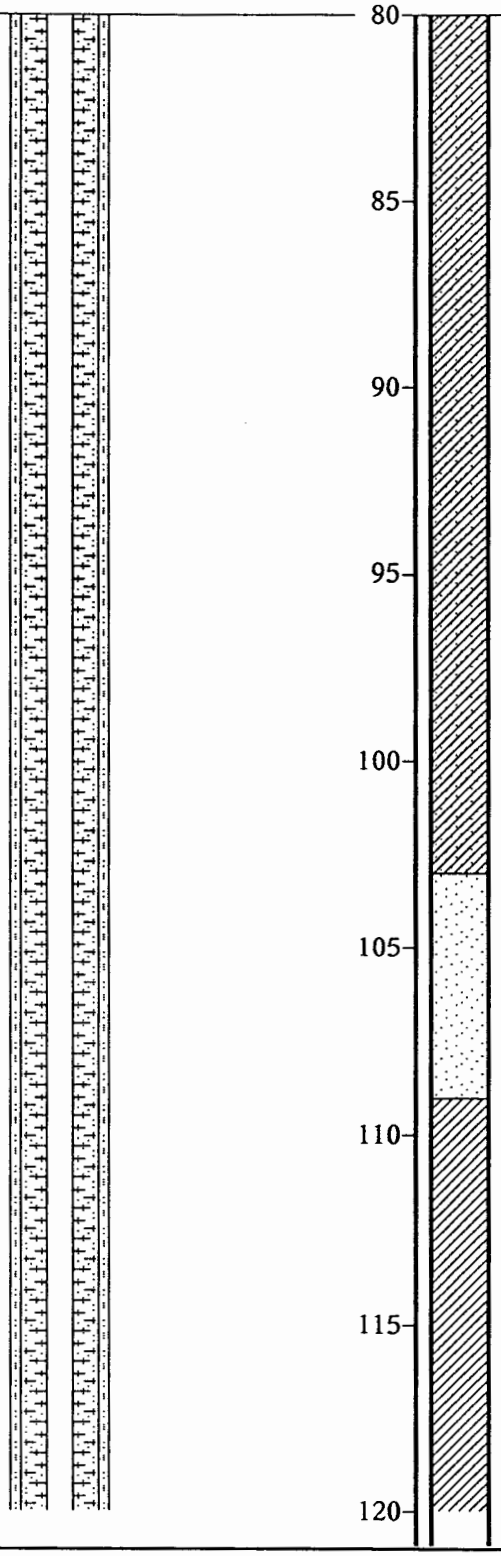
008649

Top of PVC Casing
Elevation 5163.96

Equipment GD-1500

Elevation ft Date 6/14/90

GROUND SURFACE



-with clayey gravel from 80 to 84 feet

TAN, BROWN, BLACK, & GRAY
MEDIUM TO COARSE SAND (SP)
with gravel

TAN & BROWN SANDY CLAY (CL)

Harding Lawson Associates
Engineers and
Environmental Services

MONITORING WELL DETAIL MW-53

Sparton Technology Inc.
Albuquerque, New Mexico

PLATE

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
	06310,039.12		12/90		

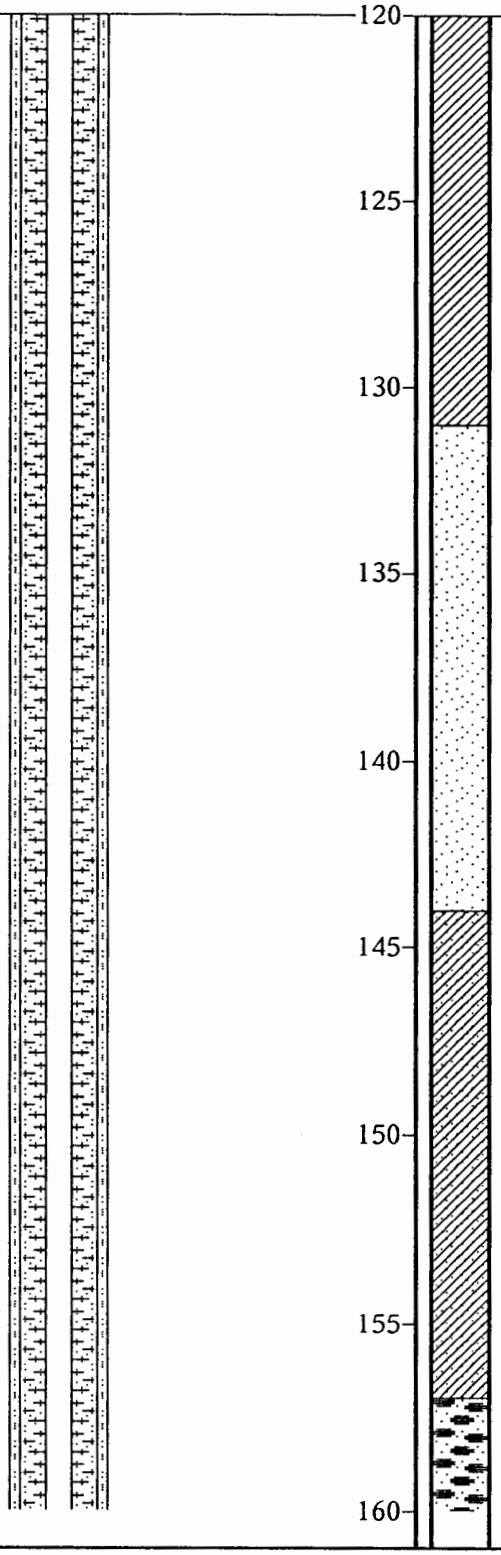
008650

Top of PVC Casing
Elevation 5163.96

Equipment GD-1500

Elevation ft Date 6/14/90

GROUND SURFACE



TAN, BROWN, BLACK, & GRAY FINE TO COARSE SAND (SW)
with occasional gravel

TAN & BROWN CLAYEY FINE SAND (SC)

BROWN, TAN, BLACK, & GRAY SANDY GRAVEL (GP)

- with cobbles at 159 feet

Harding Lawson Associates
Engineers and Environmental Services

MONITORING WELL DETAIL MW-53

Sparton Technology Inc.
Albuquerque, New Mexico

PLATE

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
	06310,039.12		12/90		

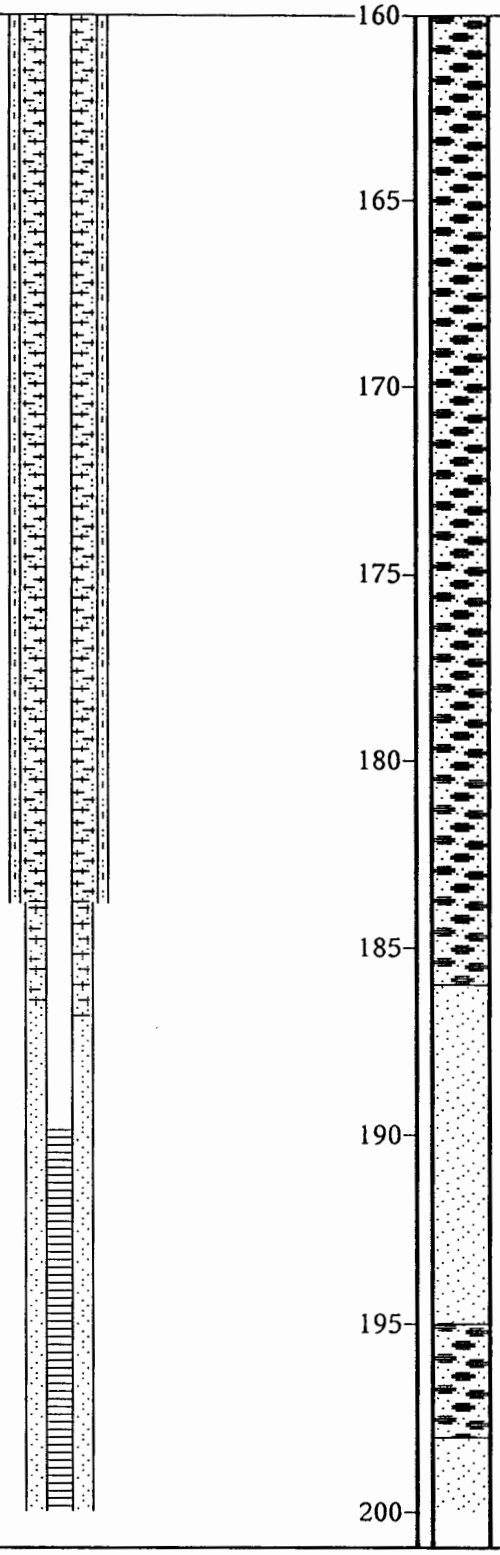
008651

Top of PVC Casing
Elevation 5163.96

Equipment GD-1500

Elevation ft Date 6/14/90

GROUND SURFACE



Stainless Steel casing from 175 to 189.8 feet

7-7/8" Borehole from 184 to 206 feet

Sandpack:
20x40 sand
(186.8'-187.8')
10x20 sand
(187.8'-205')

4" Stainless Steel Screen (Slot size 0.02") from 189.8 to 204 feet

BROWN, BLACK, GRAY, TAN, & WHITE MEDIUM TO COARSE SAND (SP)
with gravel

-with increasing gravel to 195 feet

BROWN, GRAY, BLACK, & TAN SANDY GRAVEL (GP)

BROWN FINE TO MEDIUM SAND (SP)

Harding Lawson Associates
Engineers and Environmental Services

MONITORING WELL DETAIL MW-53

Sparton Technology Inc.
Albuquerque, New Mexico

PLATE

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
	06310,039.12		12/90		

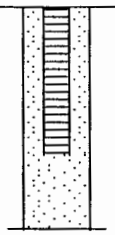
008652

Top of PVC Casing
Elevation 5163.96

Equipment GD-1500

Elevation ft Date 6/14/90

GROUND SURFACE



Bottom Cap

200

205

TAN SANDY CLAY (CL)

End of boring at 206 feet.

210

215

220

225

230

235

240

Harding Lawson Associates
Engineers and
Environmental Services

MONITORING WELL DETAIL MW-53

Sparton Technology Inc.
Albuquerque, New Mexico

PLATE

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
	06310,039.12		12/90		

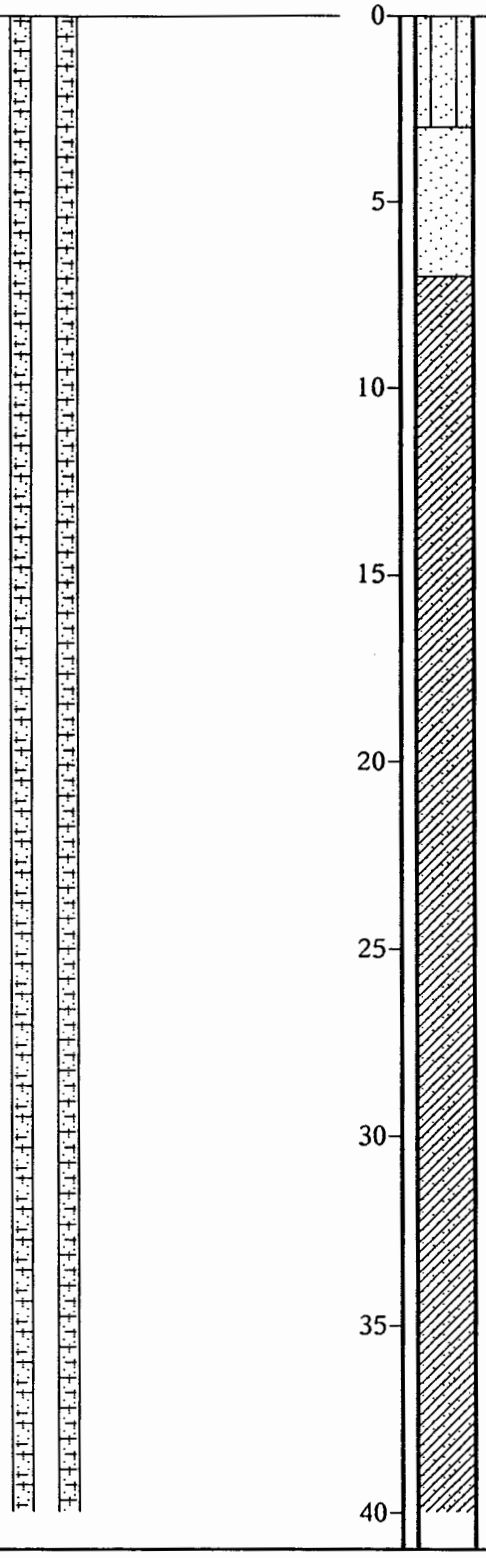
008653

Top of PVC Casing Elevation 5168.33

Equipment GD-1500

Elevation ft Date 12/15/89

GROUND SURFACE



YELLOW-BROWN FINE TO MEDIUM SAND (SM)

BROWN FINE TO COARSE SAND (SW)
with occasional clay, gravel

YELLOW-BROWN CLAYEY FINE TO MEDIUM SAND (SC)

Cement/Bentonite Grout

4" PVC Casing to 180.0 feet

12-1/4" Borehole to 188 feet

8-5/8" steel casing to 187 feet

Harding Lawson Associates
Engineers and Environmental Services

MONITORING WELL DETAIL MW-48

Sparton Technology Inc.
Albuquerque, New Mexico

PLATE

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
	06310,039.12		12/90		

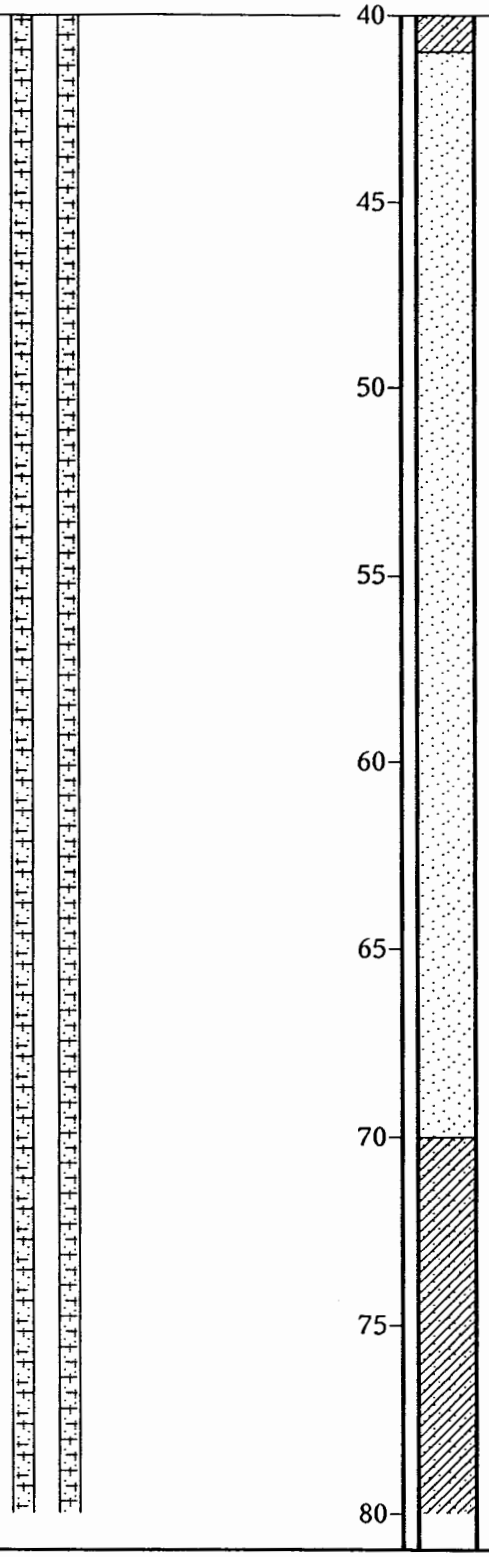
008654

Top of PVC Casing
Elevation 5168.33

Equipment GD-1500

Elevation ft Date 12/15/89

GROUND SURFACE



BROWN & GRAY FINE TO COARSE SAND (SW)
with occasional clay

-with gravel from 67 to 69 feet

BROWN CLAYEY SAND (SC)

Harding Lawson Associates
Engineers and Environmental Services

MONITORING WELL DETAIL MW-48

Sparton Technology Inc.
Albuquerque, New Mexico

PLATE

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
	06310,039.12		12/90		

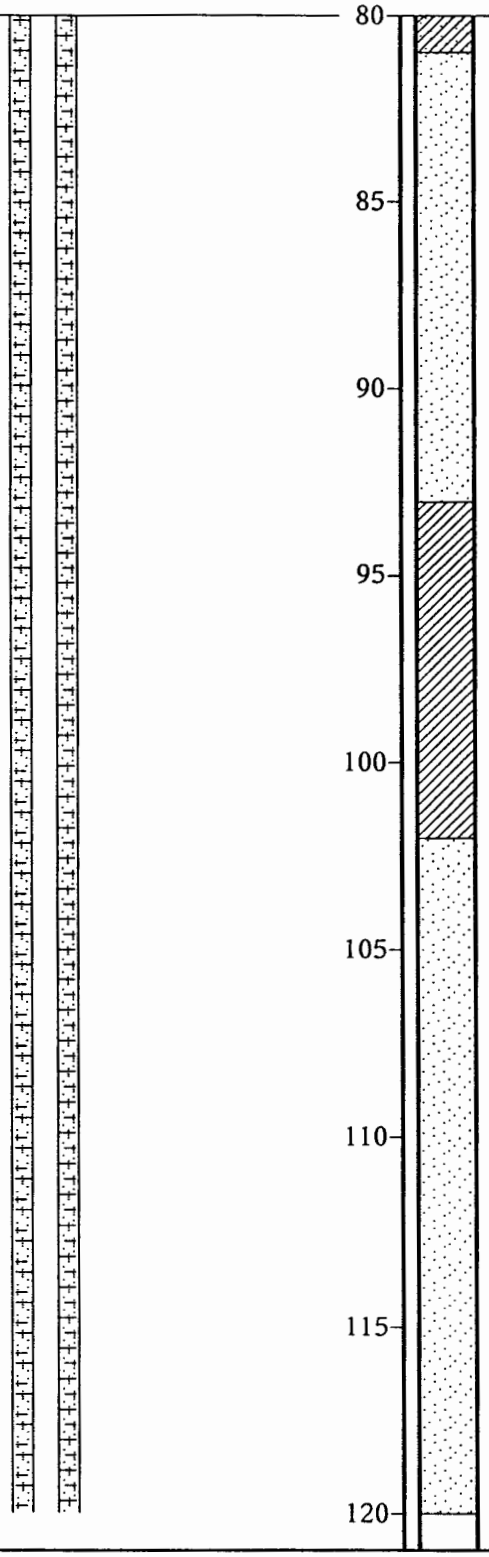
008655

Top of PVC Casing
Elevation 5168.33

Equipment GD-1500

Elevation ft Date 12/15/89

GROUND SURFACE



BROWN & GRAY FINE TO COARSE SAND (SW)
with occasional clay and gravel

BROWN SANDY CLAY (CL)

BROWN & GRAY FINE TO COARSE SAND (SW)
with occasional clay and gravel

-loss of gravel and clay below 115 feet

Harding Lawson Associates
Engineers and Environmental Services

MONITORING WELL DETAIL MW-48

Sparton Technology Inc.
Albuquerque, New Mexico

PLATE

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
	06310,039.12		12/90		

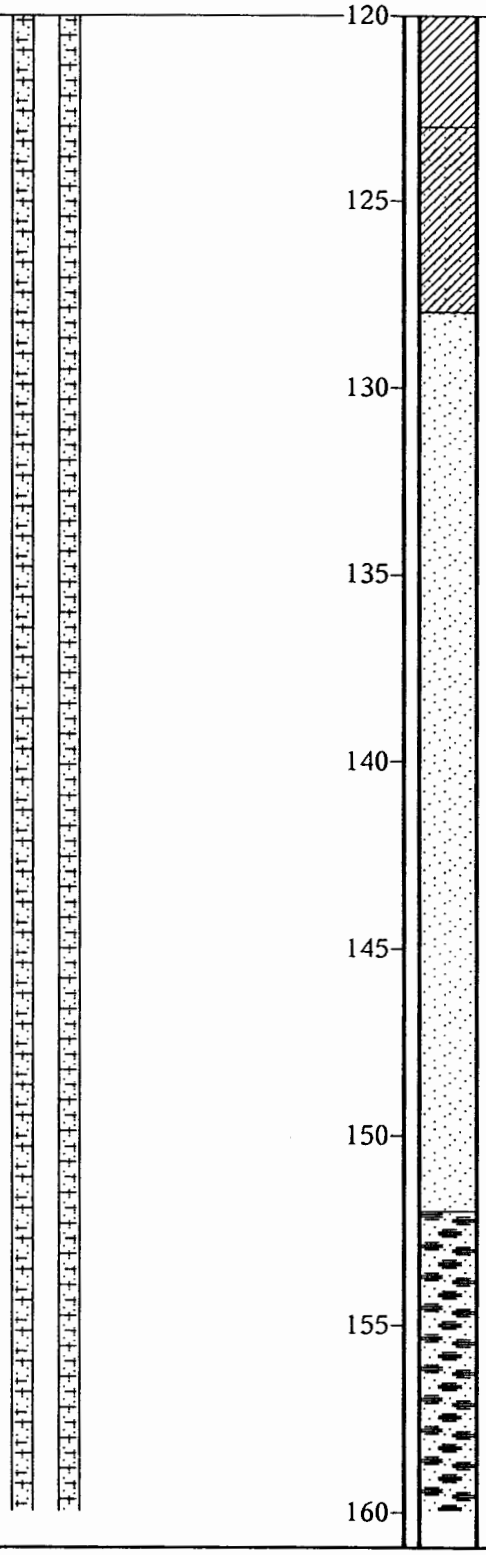
008656

Top of PVC Casing
Elevation 5168.33

Equipment GD-1500

Elevation ft Date 12/15/89

GROUND SURFACE



BROWN SANDY CLAY (CL)

BROWN & GRAY CLAYEY MEDIUM TO COARSE SAND (SC)

BROWN & GRAY MEDIUM TO COARSE SAND (SP)
with gravel

BROWN & GRAY SANDY GRAVEL (GP)
with cobbles

Harding Lawson Associates
Engineers and Environmental Services

MONITORING WELL DETAIL MW-48

PLATE

Sparton Technology Inc.
Albuquerque, New Mexico

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
	06310,039.12		12/90		

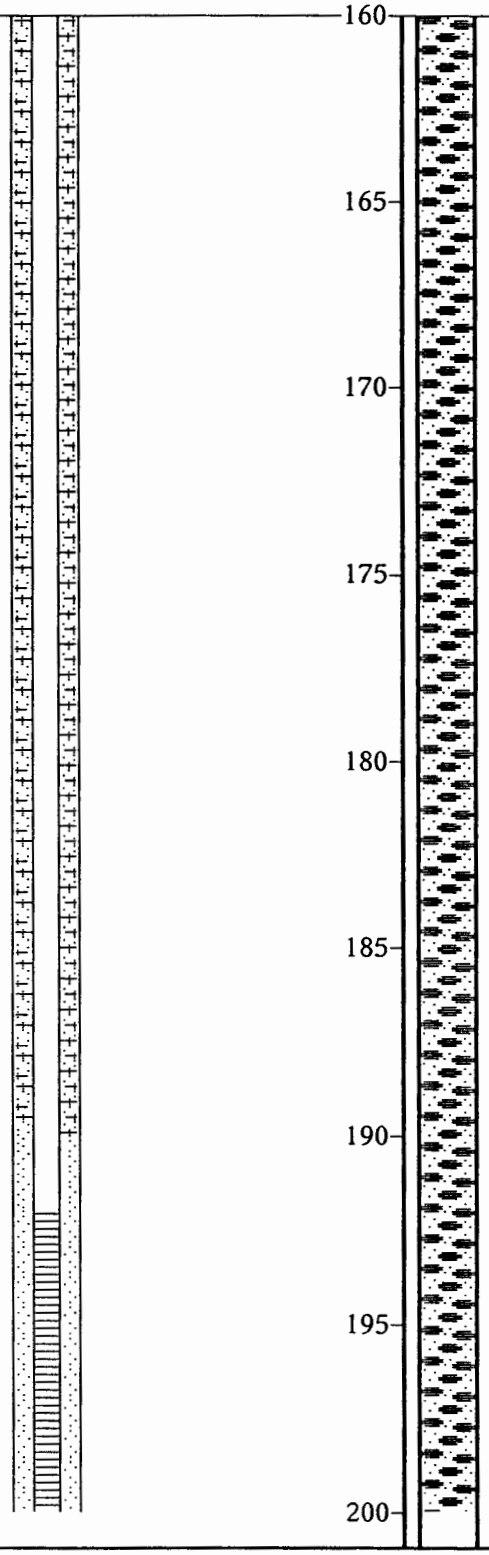
008657

Top of PVC Casing
Elevation 5168.33

Equipment GD-1500

Elevation ft Date 12/15/89

GROUND SURFACE



Stainless Steel casing
from 180-192 feet

7-7/8" Borehole
188-209 feet

Sandpack:
20x40 sand (189-190)
10x20 sand (190-207)

4" Stainless Steel
Screen (Slot size 0.02")
from 192 to 207 feet

Harding Lawson Associates
Engineers and
Environmental Services

MONITORING WELL DETAIL MW-48

Sparton Technology Inc.
Albuquerque, New Mexico

PLATE

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
	06310,039.12		12/90		

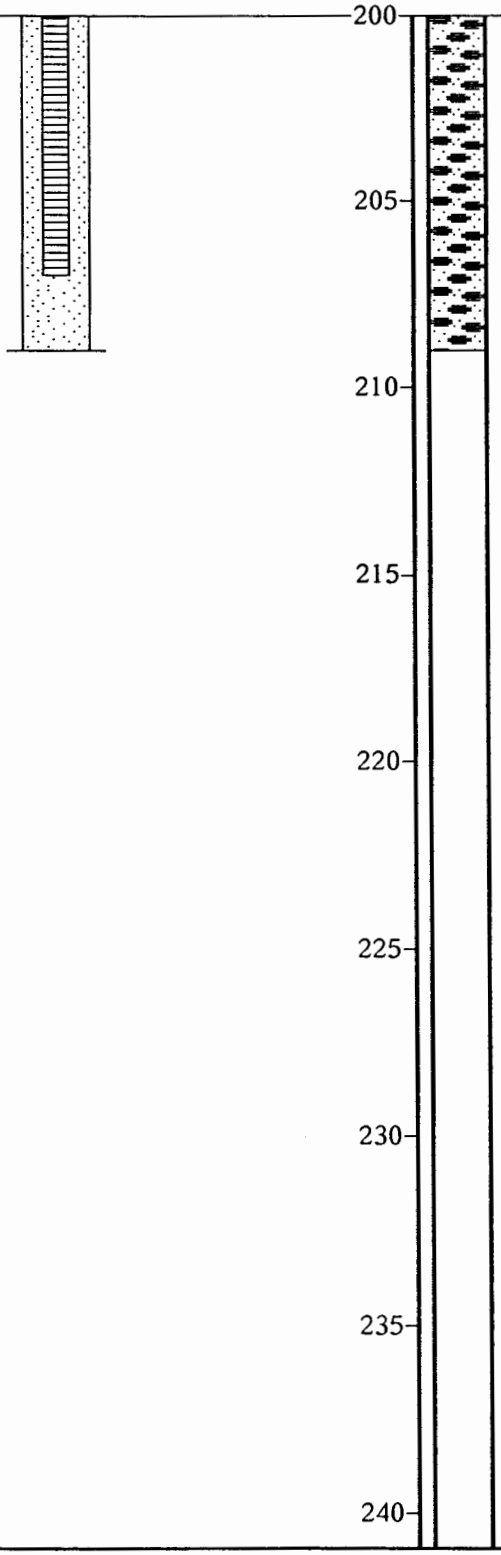
008658

Top of PVC Casing
Elevation 5168.33

Equipment GD-1500

Elevation ft Date 12/15/89

GROUND SURFACE



Bottom Cap

End of Boring at 209.0 feet.

Harding Lawson Associates
Engineers and
Environmental Services

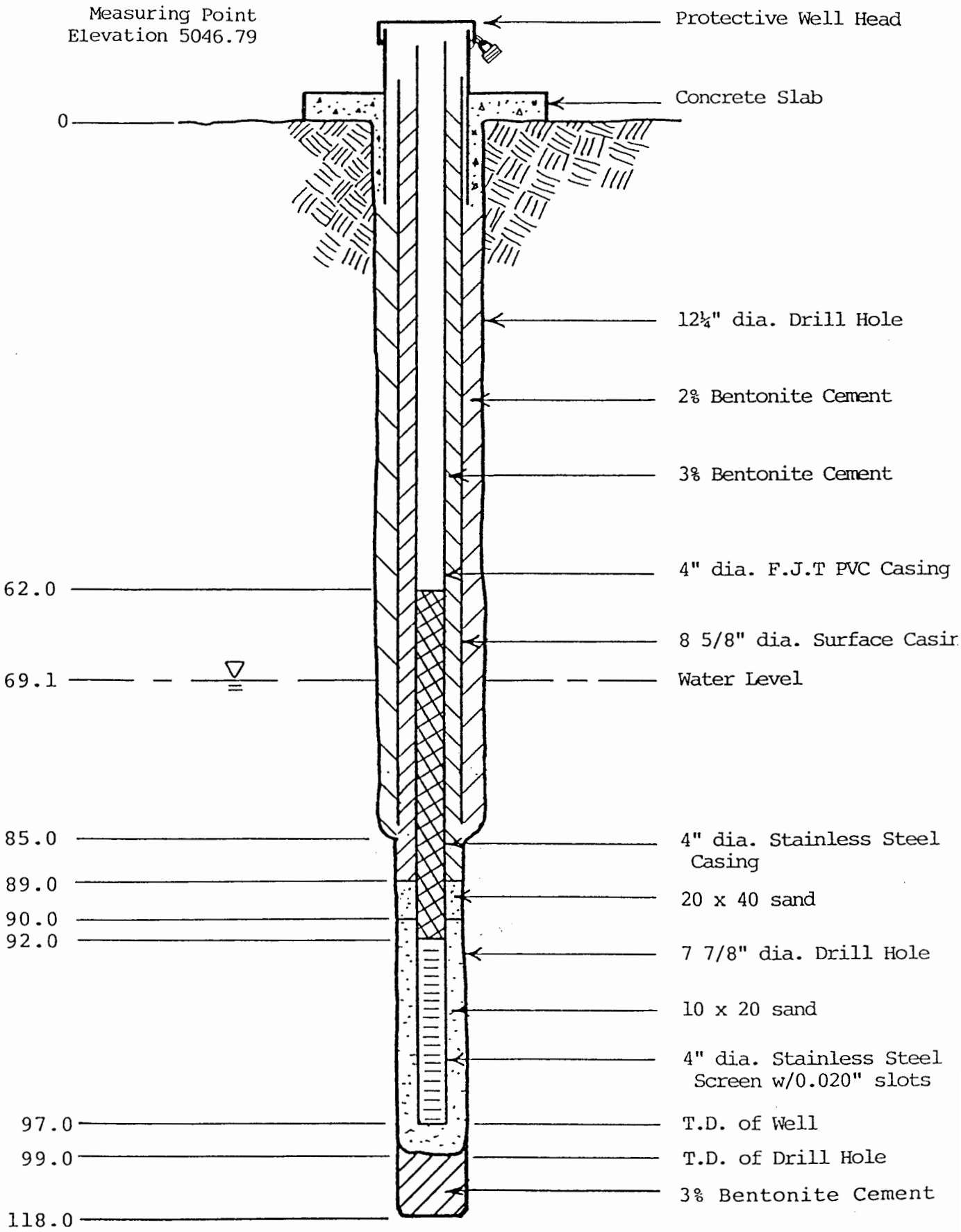
MONITORING WELL DETAIL MW-48

Sparton Technology Inc.
Albuquerque, New Mexico

PLATE

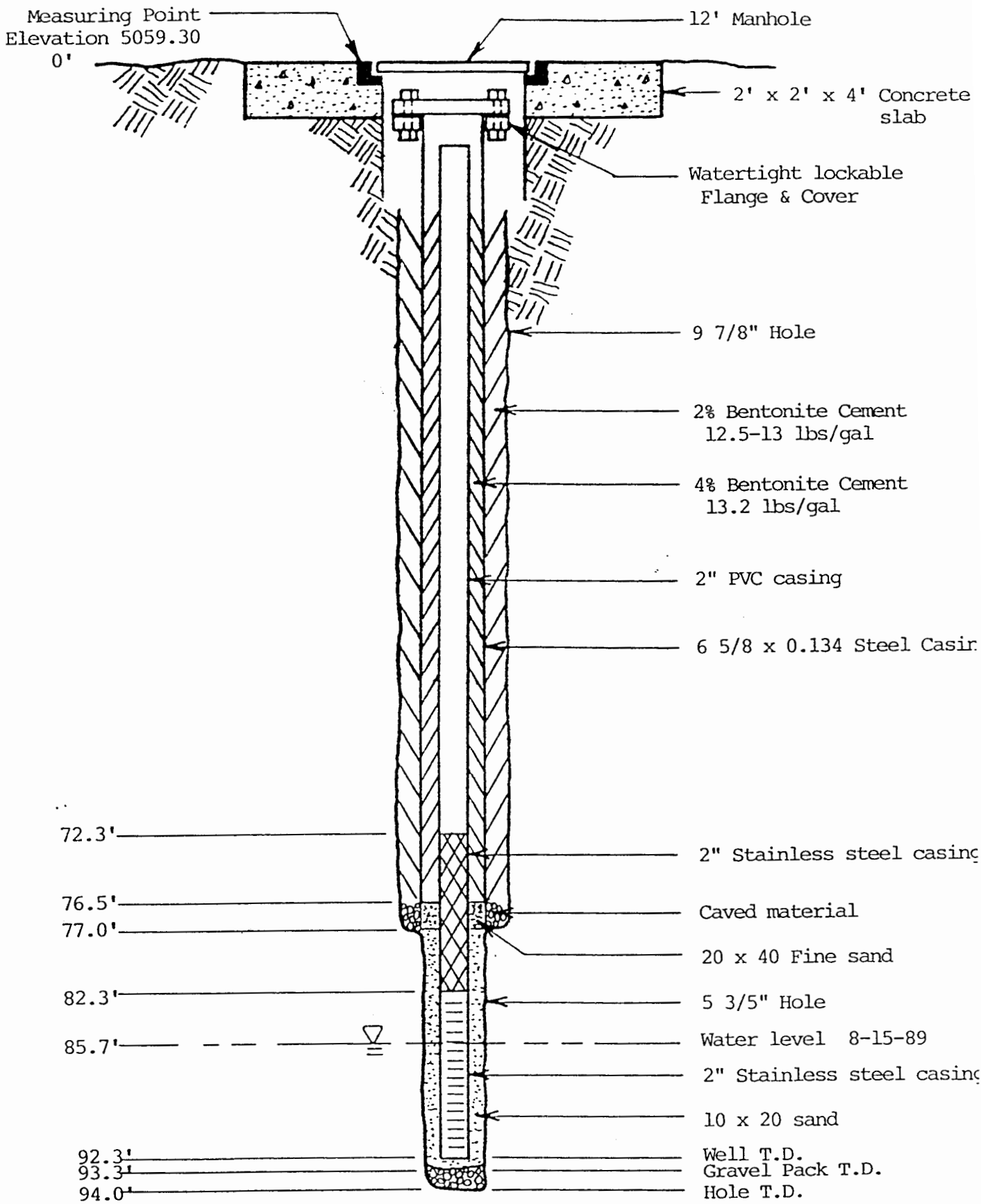
DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
	06310,039.12		12/90		

008659



Construction Diagram
MW-41

008660



CONSTRUCTION DIAGRAM
MW-36-OS

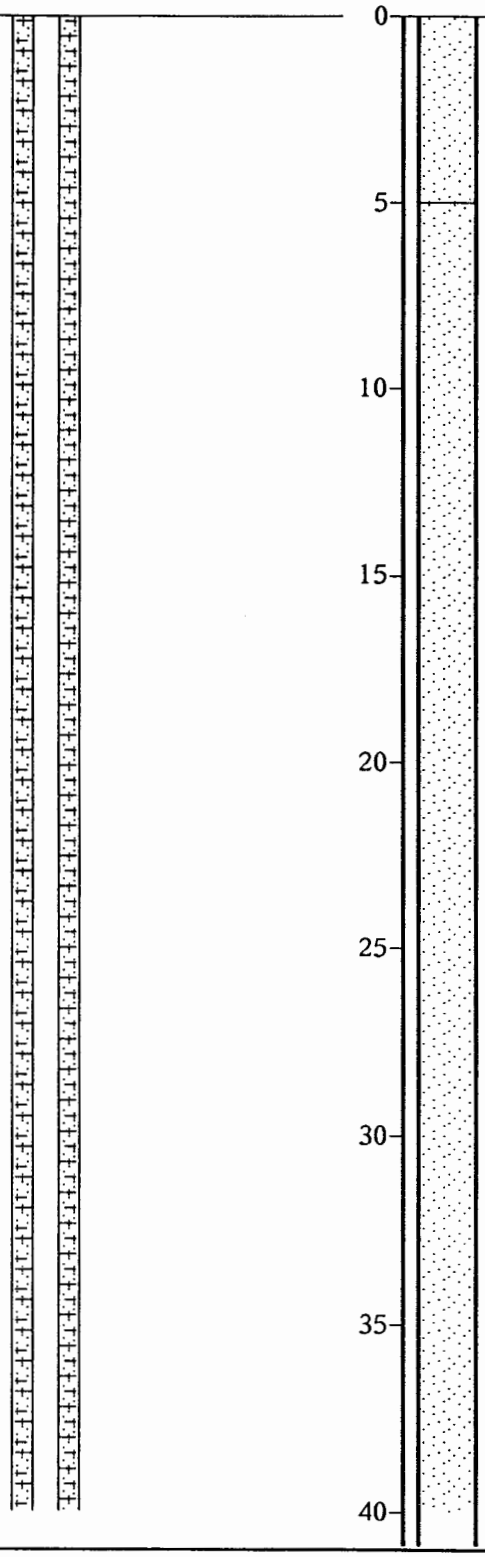
008661

Top of PVC Casing Elevation 5103.54

Equipment GD-1500

Elevation 5103.54 ft **Date** 8/29/90

GROUND SURFACE



TAN FINE SAND (SP)
with silt

BROWN FINE TO COARSE SAND (SW)
with occasional clay

4" PVC Casing
to 116 feet

8-5/8" Steel casing
from 0 to 121 feet

12-1/4" Borehole
to 122 feet

Cement/Bentonite
Grout

Harding Lawson Associates
Engineers and
Environmental Services

MONITORING WELL DETAIL MW-57

Sparton Technology Inc.
Albuquerque, New Mexico

PLATE

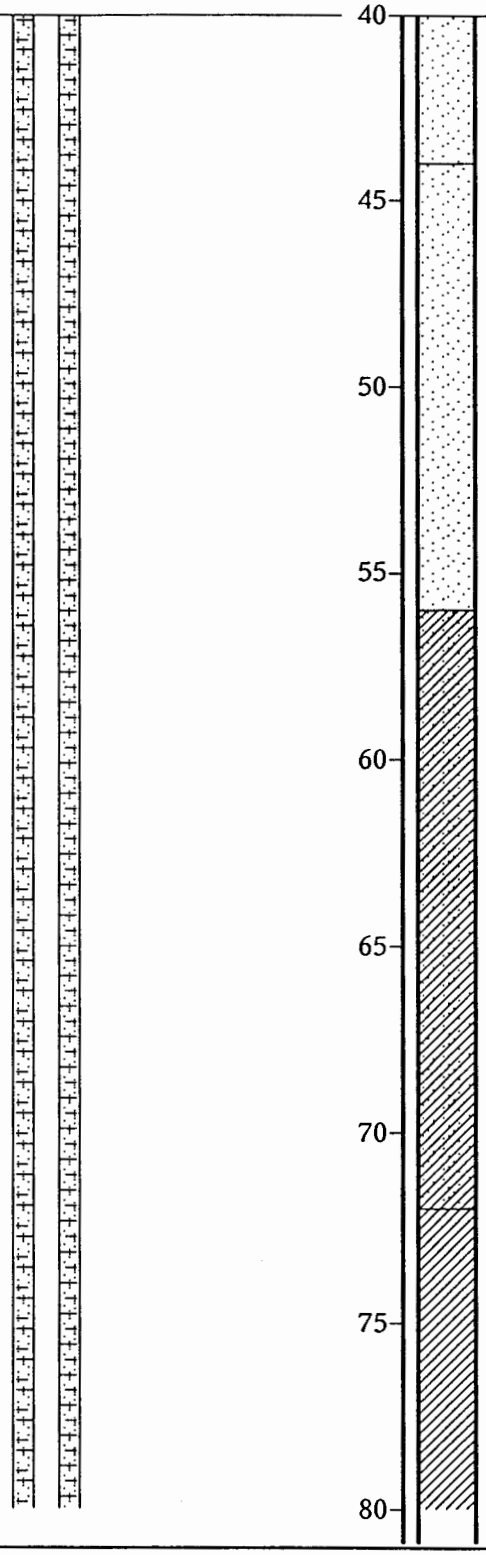
DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
	06310,039.12		12/90		

Top of PVC Casing
Elevation 5103.54

Equipment GD-1500

Elevation 5103.54 ft Date 8/29/90

GROUND SURFACE



DARK BROWN & BLACK FINE SAND (SP)

BROWN CLAYEY MEDIUM SAND (SC)

LIGHT BROWN TO BROWN SILTY CLAY (CL)

Harding Lawson Associates
Engineers and Environmental Services

MONITORING WELL DETAIL MW-57

Sparton Technology Inc.
Albuquerque, New Mexico

PLATE

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
	06310,039.12		12/90		

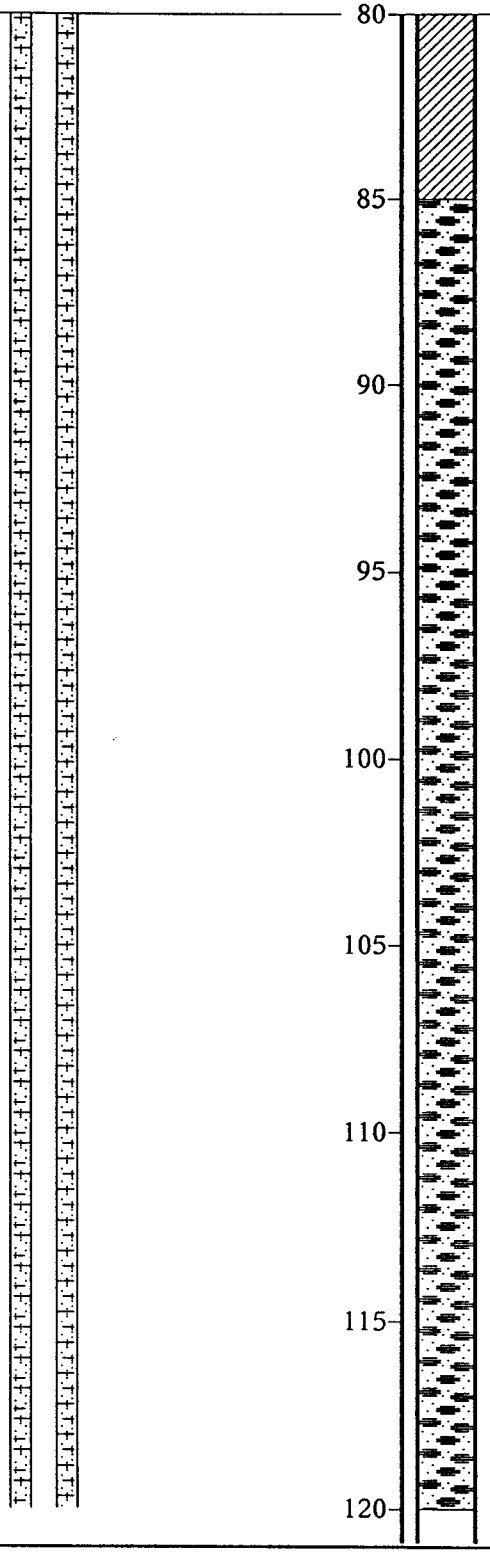
008663

Top of PVC Casing
Elevation 5103.54

Equipment GD-1500

Elevation 5103.54 ft Date 8/29/90

GROUND SURFACE



-occasional sand below 80 feet

BROWN & BLACK COARSE SANDY GRAVEL (GW)

4" Stainless Steel casing from 116 to 126 feet

Harding Lawson Associates
Engineers and Environmental Services

MONITORING WELL DETAIL MW-57

Sparton Technology Inc.
Albuquerque, New Mexico

PLATE

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
	06310,039.12		12/90		

008664

Top of PVC Casing
Elevation 5103.54

Equipment GD-1500

Elevation 5103.54 ft Date 8/29/90

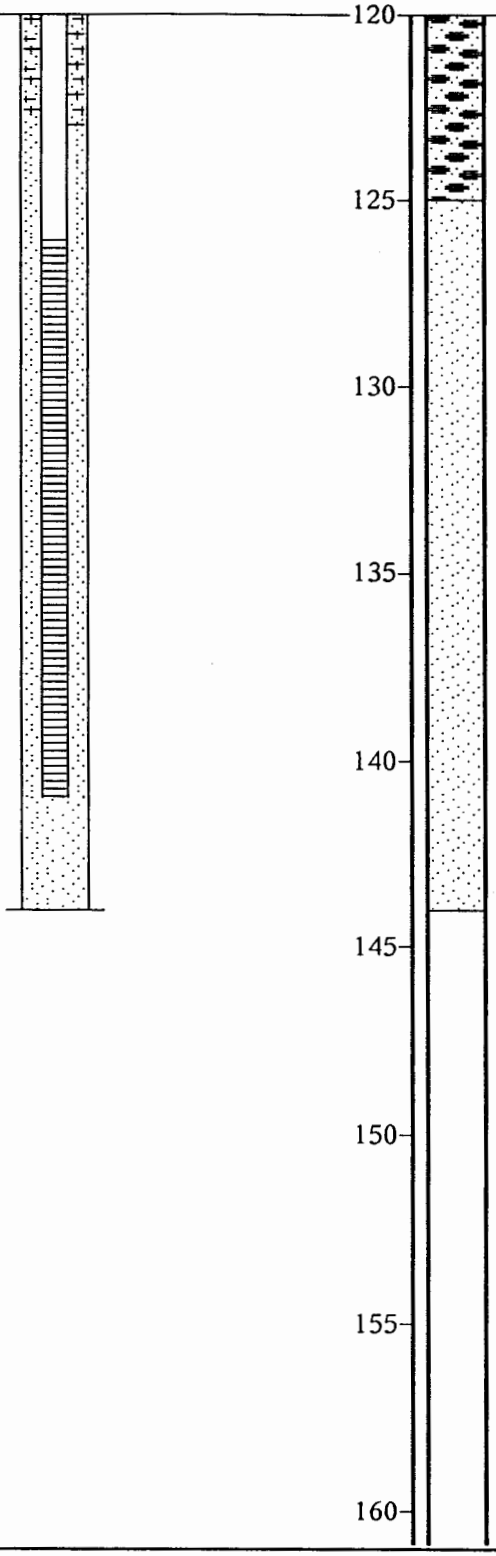
GROUND SURFACE

Sandpack:
20x40 sand
(123 to 124 feet)
10x20 sand
(124 to 144 feet)

7-7/8" borehole from
121 to 144 feet

4" Stainless Steel
Screen (slot size 0.02")
from 126 to 141 feet

Bottom Cap



BROWN & BLACK GRAVEL (GP)
cobble size

BLACK & GRAY FINE TO MEDIUM
SAND (SP)

End of boring at 144.0 feet.

Harding Lawson Associates
Engineers and
Environmental Services

MONITORING WELL DETAIL MW-57

Sparton Technology Inc.
Albuquerque, New Mexico

PLATE

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
	06310,039.12		12/90		

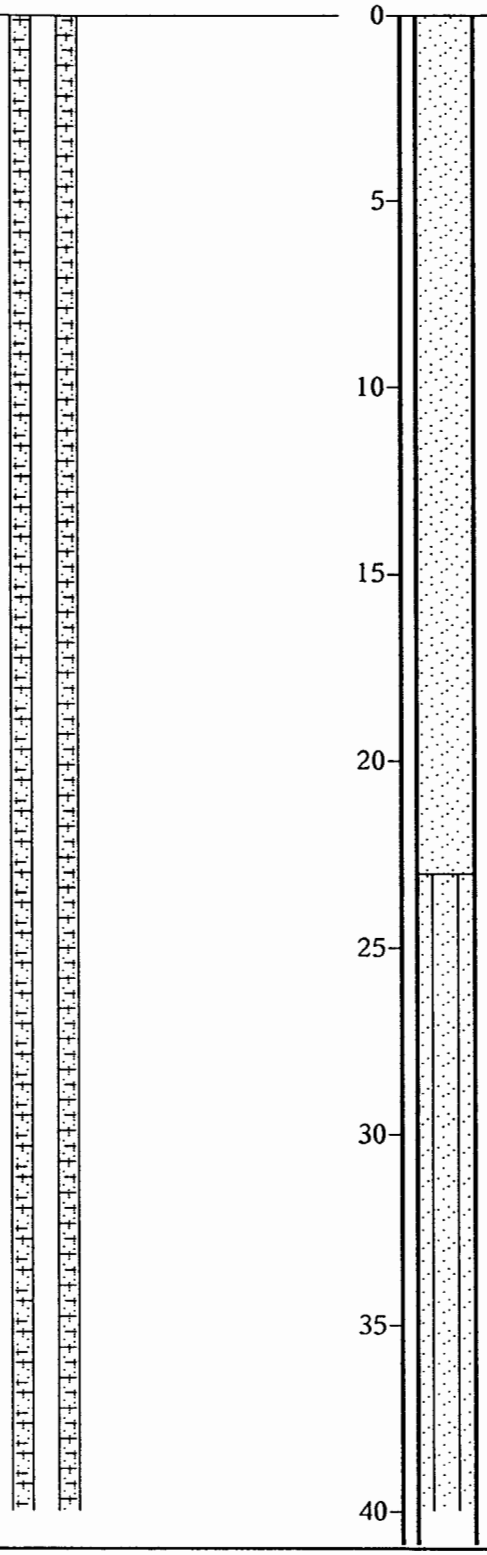
008665

Top of PVC Casing Elevation 5168.89

Equipment GD-1500

Elevation 5168.89 ft Date 9/10/90

GROUND SURFACE



TAN & BROWN FINE TO COARSE SAND (SW)
with occasional clay

BROWN & GRAY SILTY SAND (SM)

4" PVC Casing to 182.5 feet

8-5/8" Steel casing from 0 to 189 feet

12-1/4" Borehole to 190 feet

Cement/Bentonite Grout

Harding Lawson Associates
Engineers and Environmental Services

MONITORING WELL DETAIL MW-58

Sparton Technology Inc.
Albuquerque, New Mexico

PLATE

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
	06310,039.12		12/90		

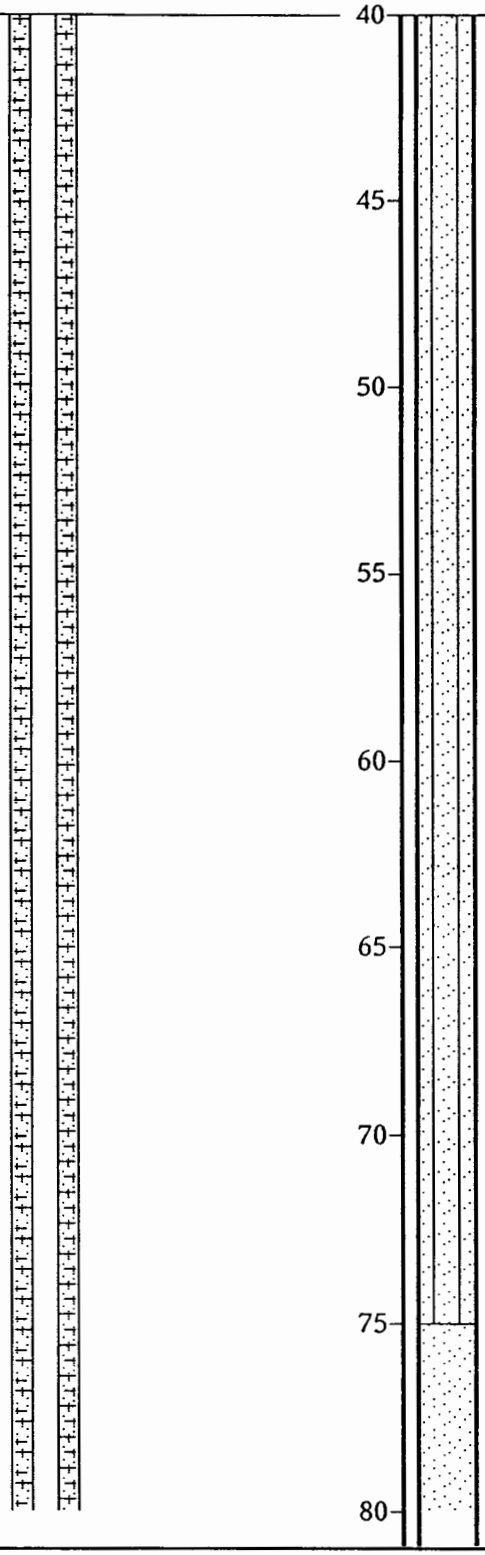
008666

Top of PVC Casing
Elevation 5168.89

Equipment GD-1500

Elevation 5168.89 ft Date 9/10/90

GROUND SURFACE



-increasing silt at 44 feet

-occasional clay at 55 feet

DARK BROWN FINE TO MEDIUM SAND (SP)
with some clay

Harding Lawson Associates
Engineers and
Environmental Services

MONITORING WELL DETAIL MW-58

Sparton Technology Inc.
Albuquerque, New Mexico

PLATE

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
	06310,039.12		12/90		

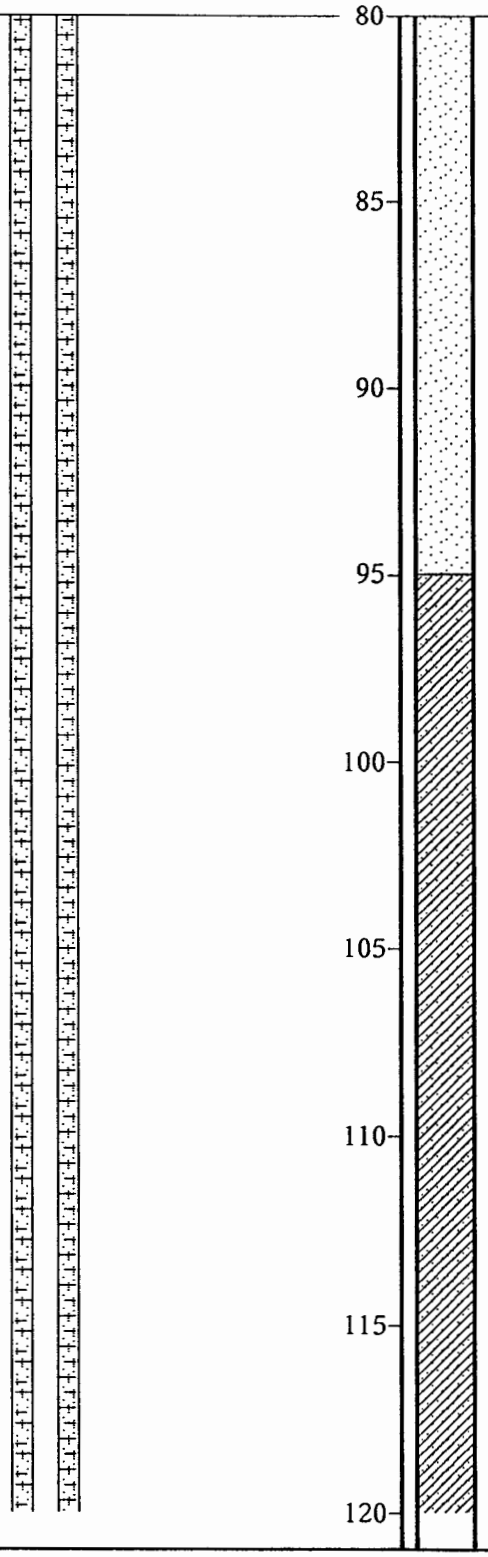
008667

Top of PVC Casing
Elevation 5168.89

Equipment GD-1500

Elevation 5168.89 ft Date 9/10/90

GROUND SURFACE



TAN & BROWN FINE CLAYEY SAND (SC)

Harding Lawson Associates
Engineers and Environmental Services

MONITORING WELL DETAIL MW-58

Sparton Technology Inc.
Albuquerque, New Mexico

PLATE

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
	06310,039.12		12/90		

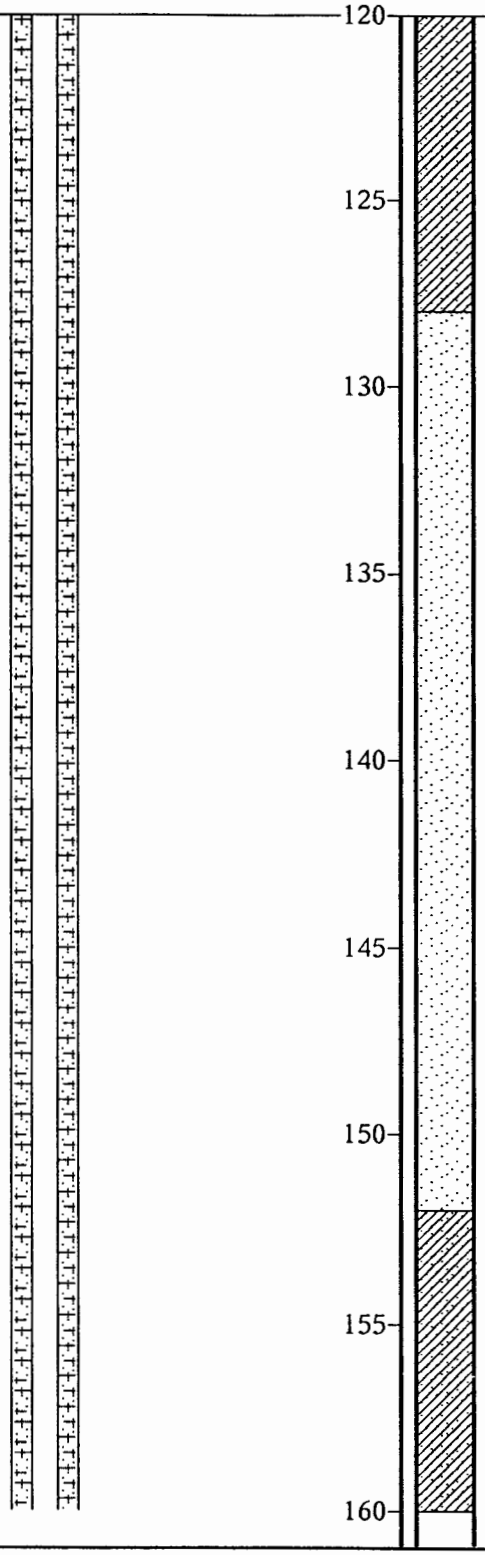
008668

Top of PVC Casing
Elevation 5168.89

Equipment GD-1500

Elevation 5168.89 ft Date 9/10/90

GROUND SURFACE



TAN & BROWN FINE TO MEDIUM SAND (SP)
with occasional clay

-little to no clay below 135 feet

TAN, BROWN & GRAY CLAYEY SAND (SC)

Harding Lawson Associates
Engineers and Environmental Services

MONITORING WELL DETAIL MW-58

Sparton Technology Inc.
Albuquerque, New Mexico

PLATE

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
	06310,039.12		12/90		

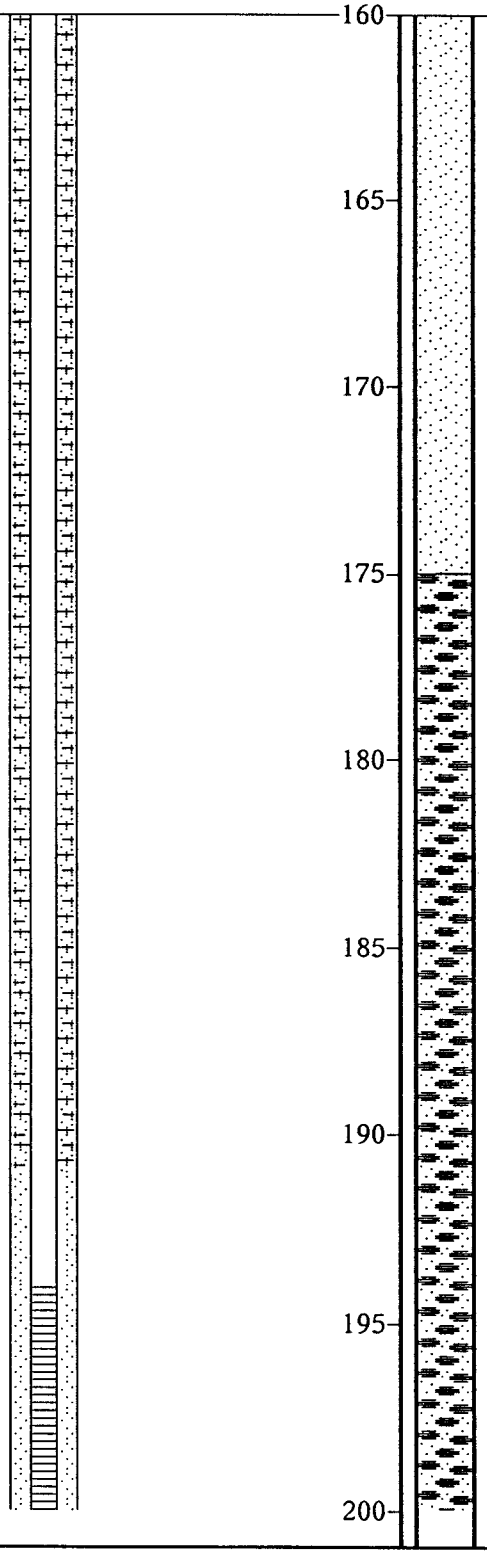
008669

Top of PVC Casing
Elevation 5168.89

Equipment GD-1500

Elevation 5168.89 ft Date 9/10/90

GROUND SURFACE



BROWN TO DARK BROWN FINE TO MEDIUM SAND (SC)

-tan clay below 168 feet

BROWN, GRAY & BLACK SANDY GRAVEL (GP)

4" Stainless Steel casing from 182.5 to 194 feet

Sandpack:
20x40 sand
(191 to 192 feet)
10x20 sand
(192 to 211 feet)

7-7/8" borehole from 189 to 211 feet

Harding Lawson Associates
Engineers and Environmental Services

MONITORING WELL DETAIL MW-58

Sparton Technology Inc.
Albuquerque, New Mexico

PLATE

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
	06310,039.12		12/90		

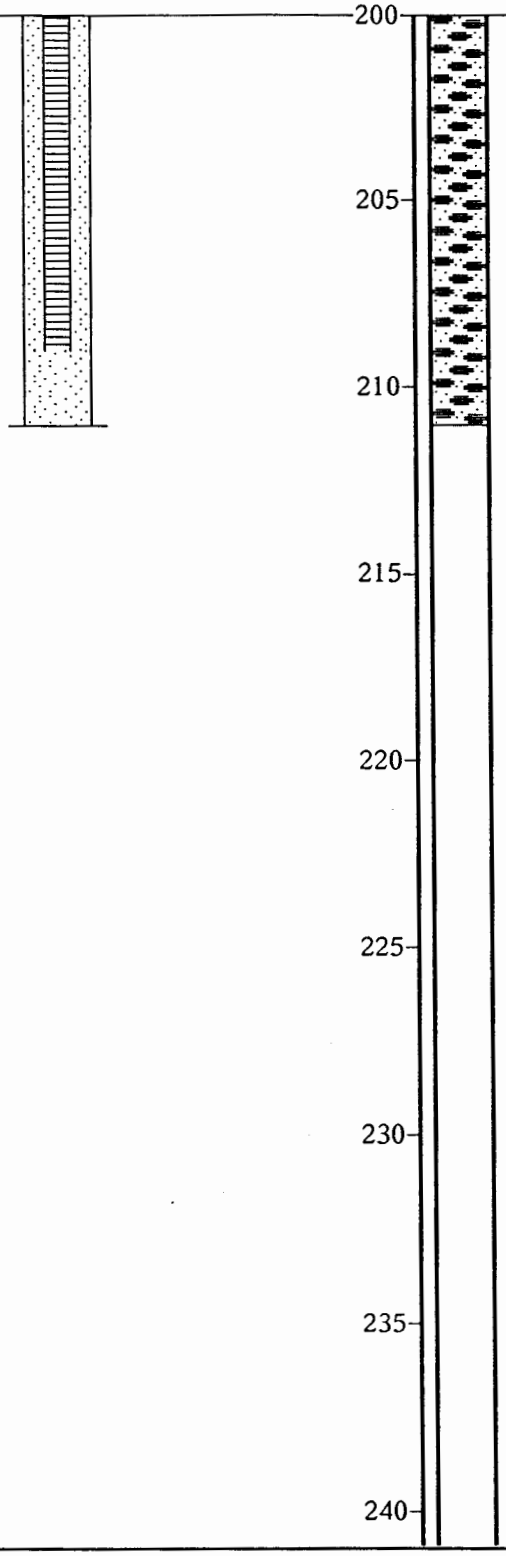
008670

Top of PVC Casing
Elevation 5168.89

Equipment GD-1500

Elevation 5168.89 ft Date 9/10/90

GROUND SURFACE



4" Stainless Steel
Screen (slot size 0.02")
from 194 to 209 feet

Bottom Cap

End of boring at 211.0 feet.

Harding Lawson Associates
Engineers and
Environmental Services

MONITORING WELL DETAIL MW-58

Sparton Technology Inc.
Albuquerque, New Mexico

PLATE

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
	06310,039.12		12/90		

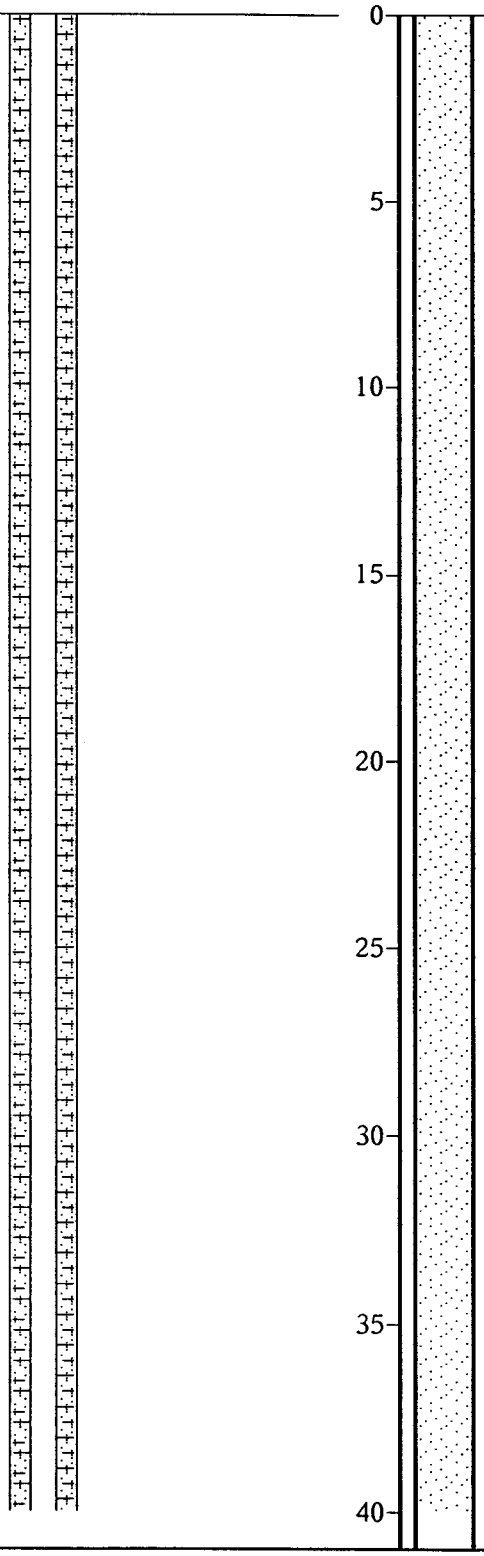
008671

Top of PVC Casing Elevation 5059.18

Equipment GD-1500

Elevation 5059.18 ft **Date** 9/17/90

GROUND SURFACE



TAN & BROWN FINE TO COARSE SAND (SW)

4" PVC Casing to 88.9 feet

8-5/8" Steel casing from 0 to 95 feet

12-1/4" Borehole to 97 feet

Cement/Bentonite Grout

Harding Lawson Associates
Engineers and Environmental Services

MONITORING WELL DETAIL MW-59

Sparton Technology Inc.
Albuquerque, New Mexico

PLATE

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
	06310,039.12		12/90		

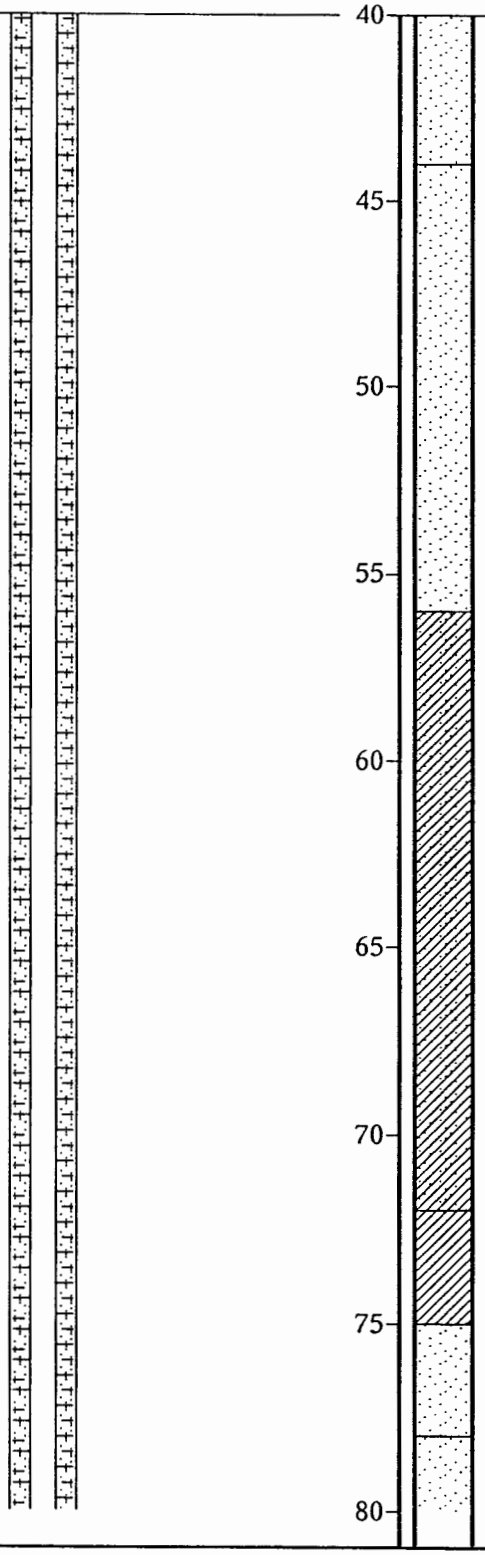
008672

Top of PVC Casing
Elevation 5059.18

Equipment GD-1500

Elevation 5059.18 ft Date 9/17/90

GROUND SURFACE



BROWN FINE TO MEDIUM SAND (SP)

TAN & BROWN FINE CLAYEY SAND (SC)

TAN SANDY CLAY (CL)

BROWN MEDIUM TO COARSE SAND (SW)

BROWN FINE SAND (SP) with occasional tan clay

Harding Lawson Associates
Engineers and Environmental Services

MONITORING WELL DETAIL MW-59

Sparton Technology Inc.
Albuquerque, New Mexico

PLATE

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
	06310,039.12		12/90		

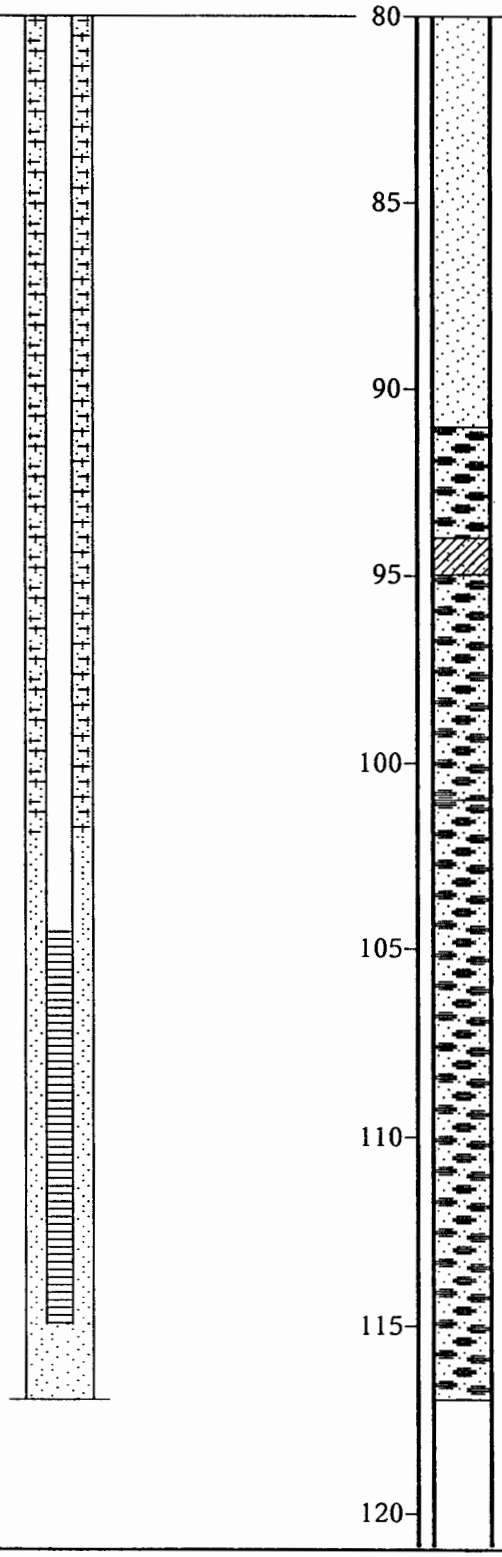
008673

Top of PVC Casing
Elevation 5059.18

Equipment GD-1500

Elevation 5059.18 ft Date 9/17/90

GROUND SURFACE



4" Stainless Steel casing from 88.9 to 104.6 feet

7-7/8" borehole from 95 to 117 feet

Sandpack:
20x40 sand
(102 to 103 feet)
10x20 sand
(103 to 117 feet)

4" Stainless Steel Screen (slot size 0.02") from 104.5 to 115 feet

Bottom Cap

BROWN, GRAY & BLACK SANDY GRAVEL (GP)

TAN CLAYEY SAND (SC)

BROWN, GRAY & BLACK SANDY GRAVEL (GP)
occasional clayey sand from 96 to 98 feet and from 99 to 100 feet

BROWN & BLACK GRAVEL (GW)
cobble size

End of boring at 117.0 feet.

Harding Lawson Associates
Engineers and Environmental Services

MONITORING WELL DETAIL MW-59

Sparton Technology Inc.
Albuquerque, New Mexico

PLATE

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
	06310,039.12		12/90		

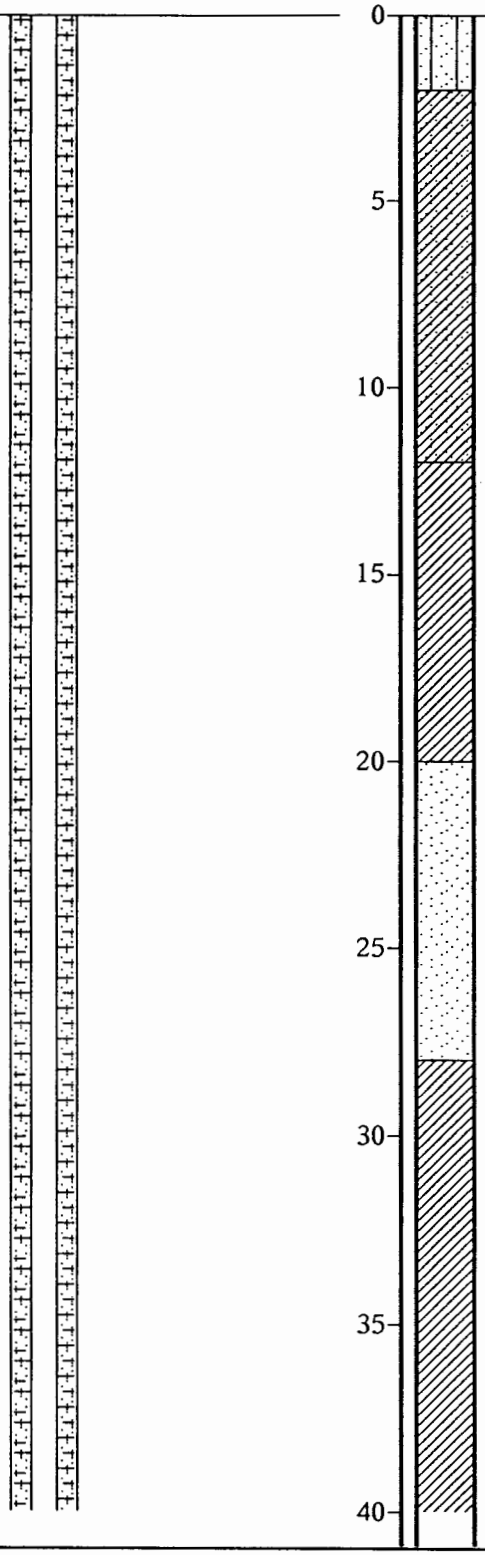
008674

Top of PVC Casing Elevation 5133.62

Equipment GD-1500

Elevation 5133.62 ft Date 9/26/90

GROUND SURFACE



BROWN & TAN SILTY FINE TO MEDIUM SAND (SM)
BROWN & TAN CLAYEY MEDIUM SAND (SC)

BROWN & GRAY SANDY CLAY (CL)

BROWN & GRAY MEDIUM TO COARSE SAND (SP)
with occasional fine gravel

TAN & BROWN SILTY CLAY (CL)
with occasional sand and some embedded gravel

4" PVC Casing to 155 feet

8-5/8" Steel casing from 0 to 175 feet

12-1/4" Borehole to 176 feet

Cement/Bentonite Grout

Harding Lawson Associates
Engineers and Environmental Services

MONITORING WELL DETAIL MW-60

Sparton Technology Inc.
Albuquerque, New Mexico

PLATE

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
	06310,039.12		12/90		

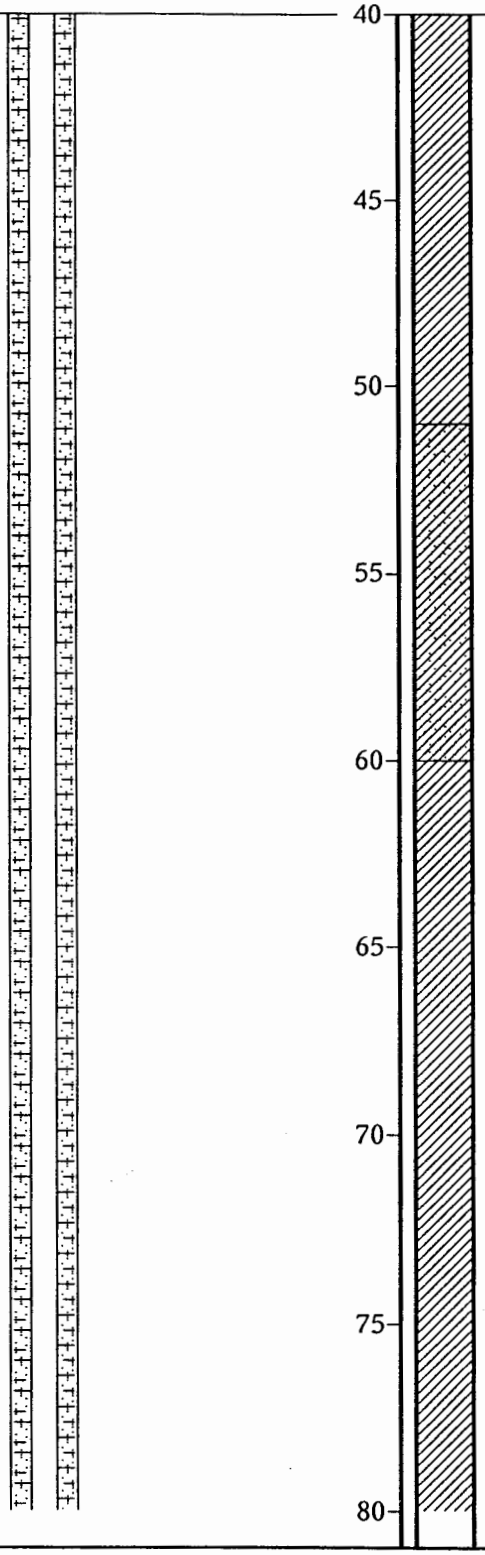
008675

Top of PVC Casing
Elevation 5133.62

Equipment GD-1500

Elevation 5133.62 ft Date 9/26/90

GROUND SURFACE



BROWN & GRAY CLAYEY MEDIUM SAND (SC)

TAN & BROWN SANDY CLAY (CL)

Harding Lawson Associates
Engineers and Environmental Services

MONITORING WELL DETAIL MW-60

Sparton Technology Inc.
Albuquerque, New Mexico

PLATE

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
	06310,039.12		12/90		

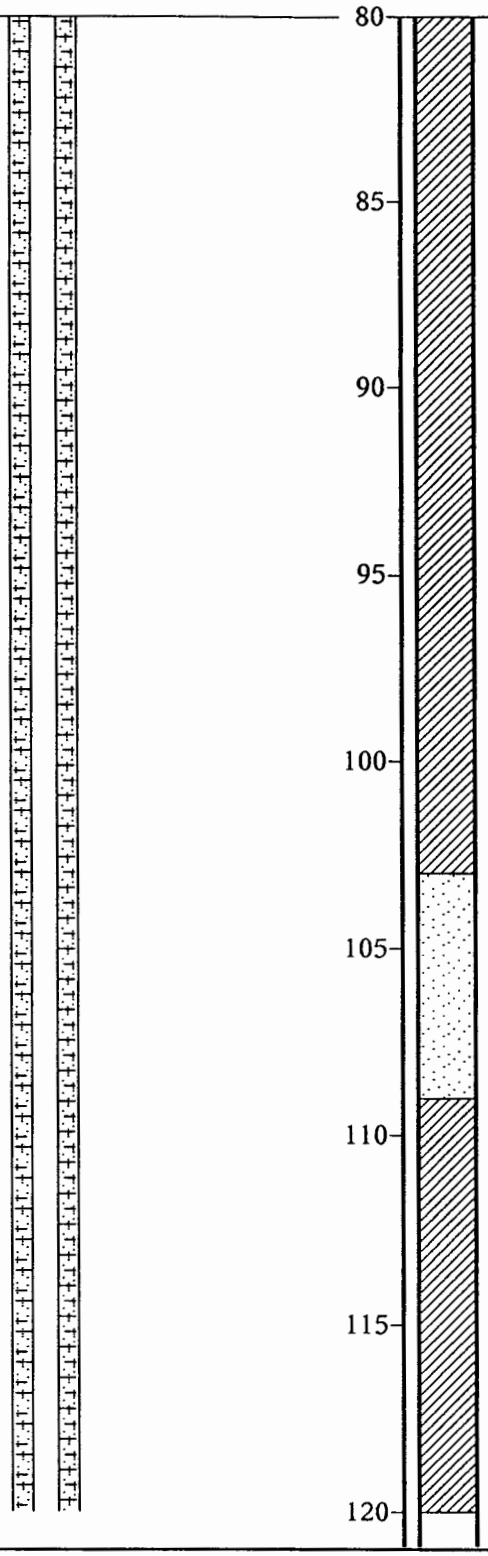
008676

Top of PVC Casing
Elevation 5133.62

Equipment GD-1500

Elevation 5133.62 ft Date 9/26/90

GROUND SURFACE



BROWN & GRAY FINE TO COARSE SAND (SW)

BROWN & GRAY SILTY CLAY (CL) with sand

-occasional coarse sand and gravel below 116 feet

Harding Lawson Associates
Engineers and Environmental Services

MONITORING WELL DETAIL MW-60

Sparton Technology Inc.
Albuquerque, New Mexico

PLATE

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
	06310,039.12		12/90		

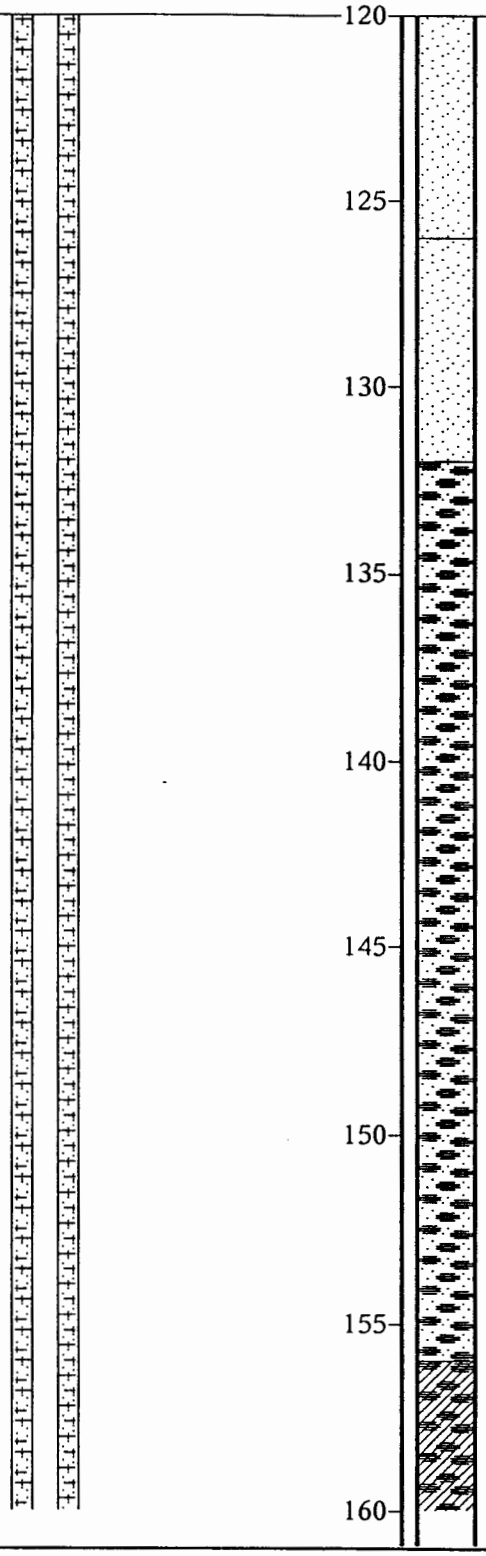
008677

Top of PVC Casing
Elevation 5133.62

Equipment GD-1500

Elevation 5133.62 ft Date 9/26/90

GROUND SURFACE



BROWN & GRAY FINE TO COARSE SAND (SW)
with some gravel

BROWN & GRAY GRAVELLY SAND (SP)

BROWN & GRAY SANDY GRAVEL (GP)

BROWN & GRAY CLAYEY GRAVEL (GC)

4" Stainless Steel casing from 155 to 175 feet

Harding Lawson Associates
Engineers and Environmental Services

MONITORING WELL DETAIL MW-60

Sparton Technology Inc.
Albuquerque, New Mexico

PLATE

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
	06310,039.12		12/90		

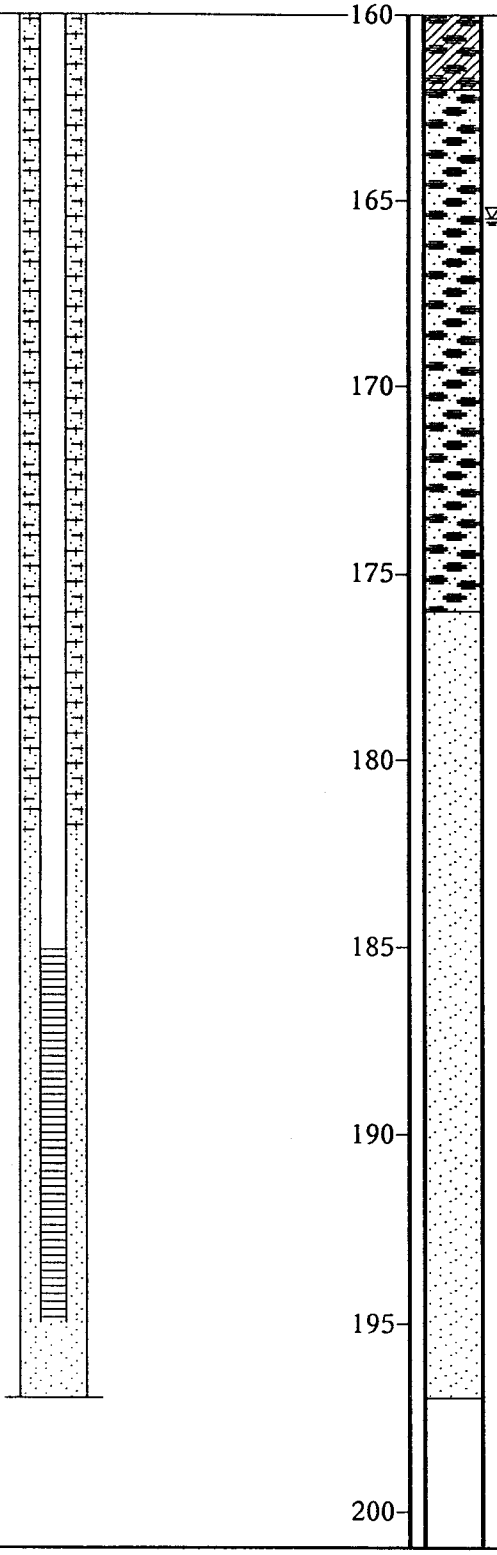
008678

Top of PVC Casing
Elevation 5133.62

Equipment GD-1500

Elevation 5133.62 ft Date 9/26/90

GROUND SURFACE



BROWN & GRAY GRAVEL (GP)
with occasional clay

DARK BROWN & BLACK FINE SAND (SP)

7-7/8" borehole from 175 to 197 feet

Sandpack:
20x40 sand
(182 to 183 feet)

10x20 sand
(183 to 197 feet)

4" Stainless Steel Screen (slot size 0.02") from 185 to 195 feet

Bottom Cap

End of boring at 197.00 feet.
Groundwater encountered at 165.48 feet during drilling.

Harding Lawson Associates
Engineers and Environmental Services

MONITORING WELL DETAIL MW-60

Sparton Technology Inc.
Albuquerque, New Mexico

PLATE

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
	06310,039.12		12/90		

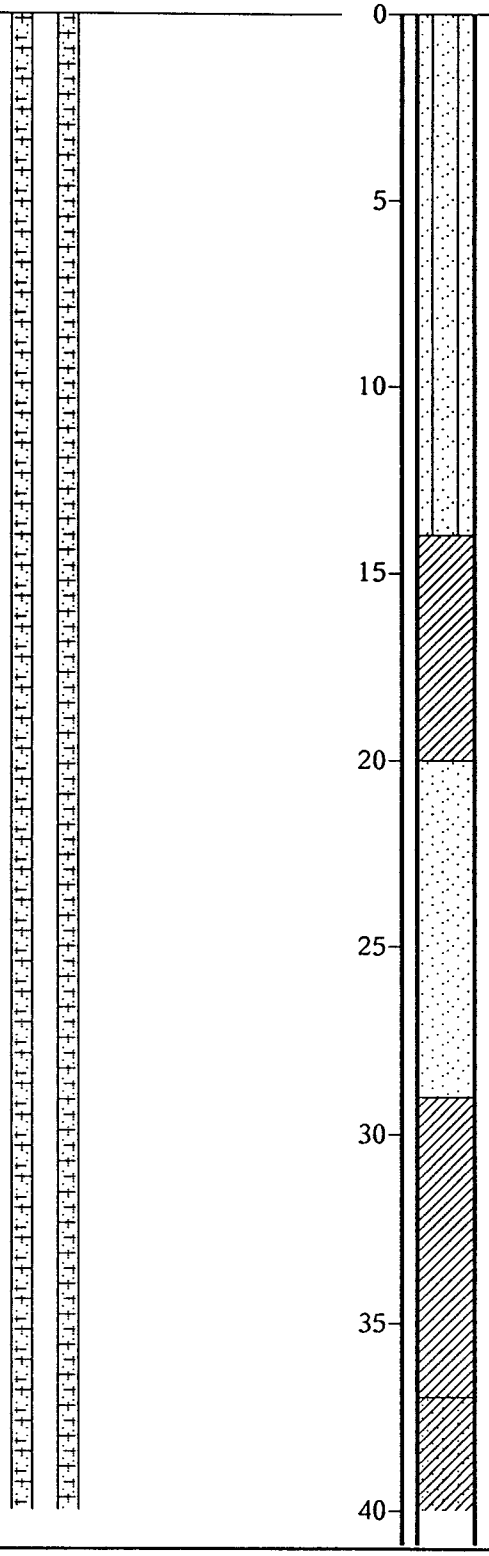
008679

Top of PVC Casing
Elevation 5133.98

Equipment GD-1500

Elevation 5133.98 ft Date 9/28/90

GROUND SURFACE



TAN SILTY FINE SAND (SM)

BROWN & TAN SANDY CLAY (CL)
with some seams of clayey sand

BROWN & GRAY GRAVELLY SAND (SP)

TAN & BROWN SILTY CLAY (CL)
with some sand

TAN & BROWN CLAYEY SAND (SC)

4" PVC Casing
to 148 feet

8-5/8" Steel casing
from 0 to 153 feet

12-1/4" Borehole
to 154 feet

Cement/Bentonite
Grout

Harding Lawson Associates
Engineers and
Environmental Services

MONITORING WELL DETAIL MW-61

Sparton Technology Inc.
Albuquerque, New Mexico

PLATE

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
	06310,039.12		12/90		

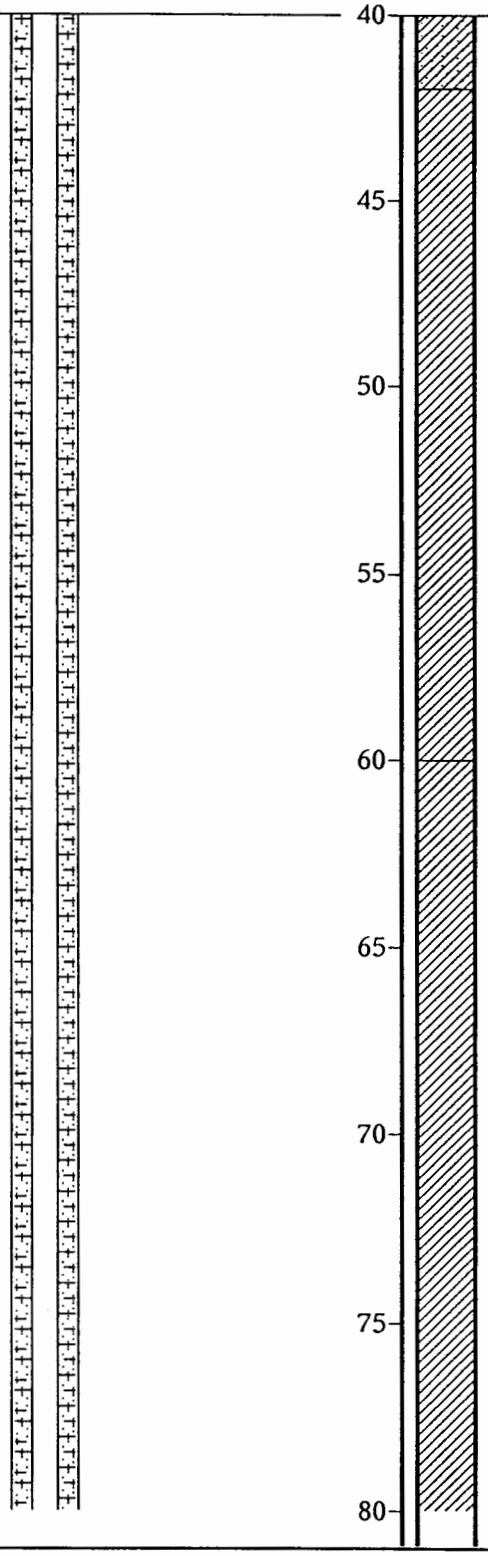
008680

Top of PVC Casing
Elevation 5133.98

Equipment GD-1500

Elevation 5133.98 ft Date 9/28/90

GROUND SURFACE



TAN & BROWN SILTY CLAY (CL)
with occasional sand

TAN & BROWN SANDY CLAY (CL)

Harding Lawson Associates
Engineers and
Environmental Services

MONITORING WELL DETAIL MW-61

Sparton Technology Inc.
Albuquerque, New Mexico

PLATE

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
	06310,039.12		12/90		

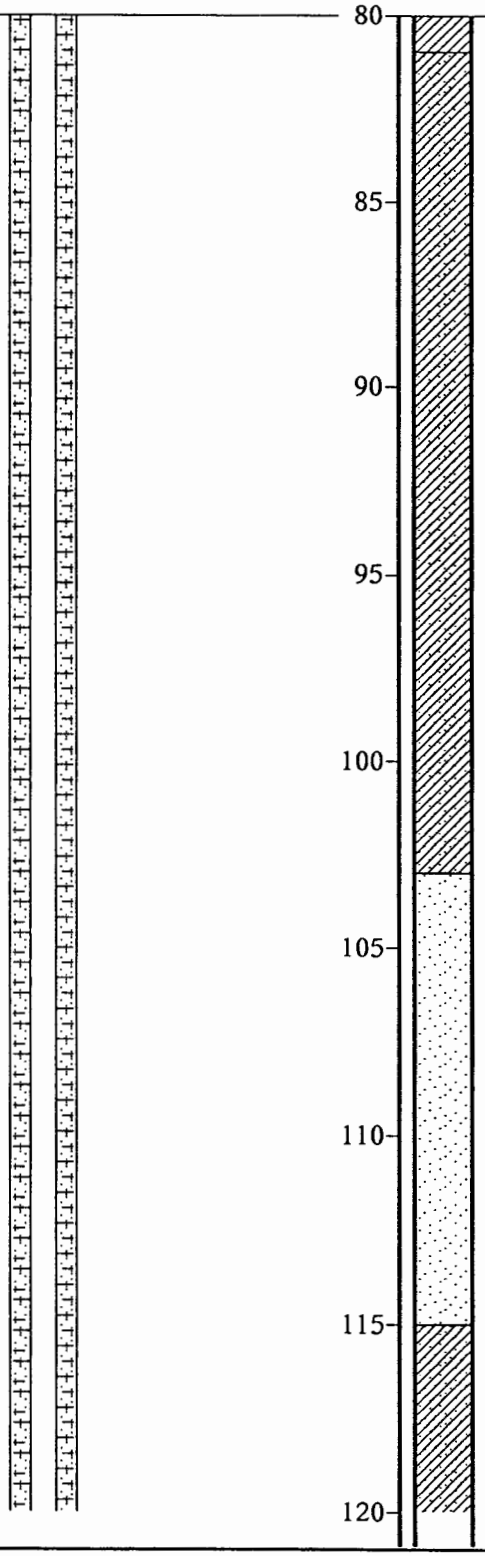
008681

Top of PVC Casing
Elevation 5133.98

Equipment GD-1500

Elevation 5133.98 ft Date 9/28/90

GROUND SURFACE



TAN & BROWN CLAYEY SAND (SC)

BROWN & GRAY MEDIUM TO COARSE SAND (SP)

TAN & DARK BROWN CLAYEY SAND (SC)

Harding Lawson Associates
Engineers and Environmental Services

MONITORING WELL DETAIL MW-61

Sparton Technology Inc.
Albuquerque, New Mexico

PLATE

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
	06310,039.12		12/90		

008682

Top of PVC Casing Elevation 5133.98

Equipment GD-1500

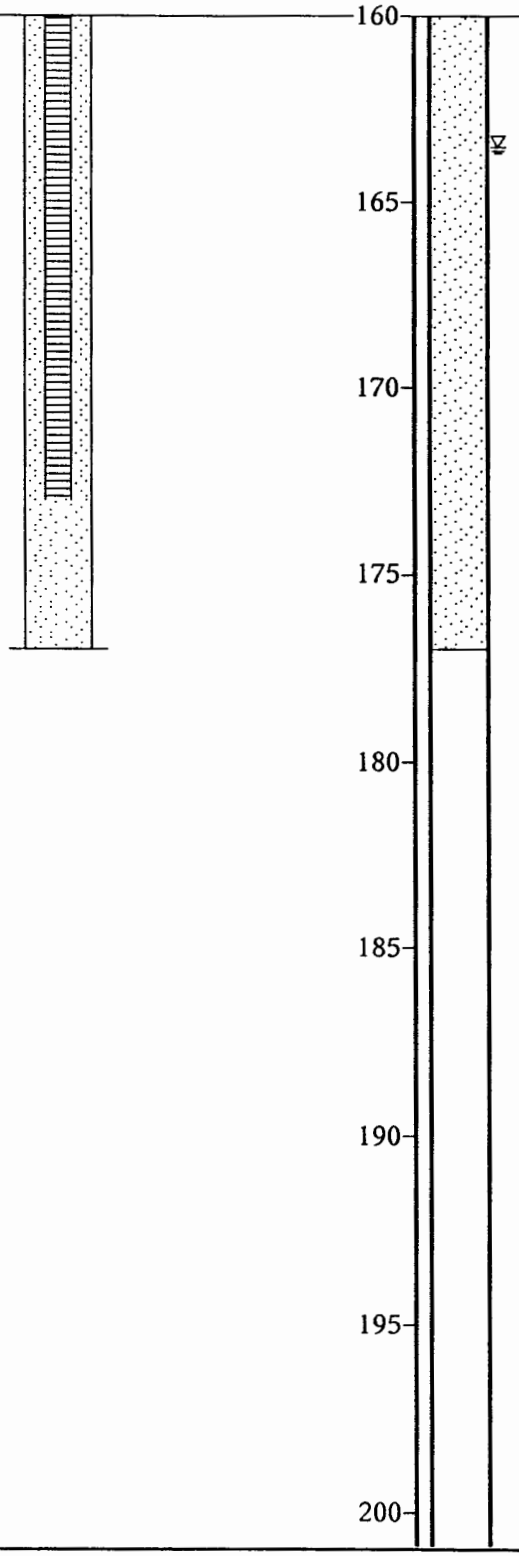
Elevation 5133.98 ft Date 9/28/90

GROUND SURFACE

7-7/8" borehole from 154 to 177 feet

4" Stainless Steel Screen (slot size 0.02") from 158 to 173 feet

Bottom Cap



End of boring at 177.00 feet.
Groundwater encountered at 163.55 feet during drilling.

Harding Lawson Associates
Engineers and Environmental Services

MONITORING WELL DETAIL MW-61

Sparton Technology Inc.
Albuquerque, New Mexico

PLATE

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
	06310,039.12		12/90		

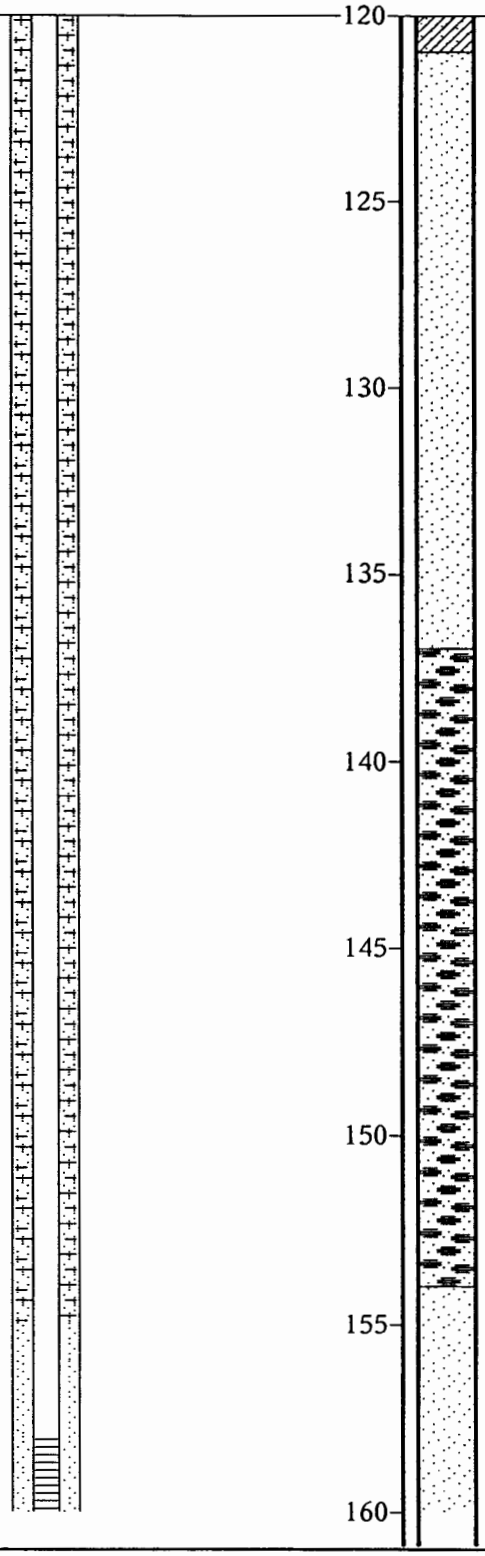
008683

Top of PVC Casing
Elevation 5133.98

Equipment GD-1500

Elevation 5133.98 ft Date 9/28/90

GROUND SURFACE



BROWN & BLACK MEDIUM TO COARSE SAND (SP)

BROWN & GRAY SANDY GRAVEL (GP)

DARK BROWN FINE TO MEDIUM SAND (SP)

4" Stainless Steel casing from 148 to 158 feet

Sandpack:
20x40 sand
(155 to 156 feet)
10x20 sand
(156 to 177 feet)

Harding Lawson Associates
Engineers and Environmental Services

MONITORING WELL DETAIL MW-61

Sparton Technology Inc.
Albuquerque, New Mexico

PLATE

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
	06310,039.12		12/90		

Top of PVC Casing
Elevation 5075.00

Equipment GD-1500

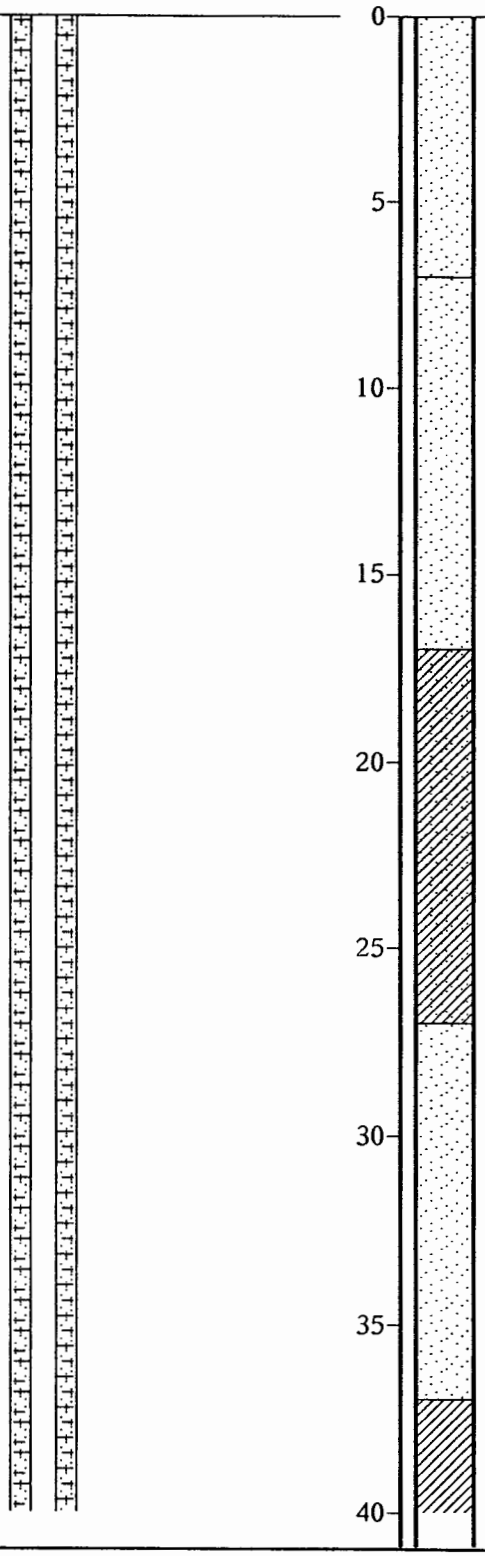
Elevation 5075.00 ft Date 9/28/90

GROUND SURFACE

2" PVC Casing
to 85 feet

Cement/Bentonite
Grout to 44 feet

6-1/4" Borehole
to 115 feet



TAN FINE SAND (SP)

LIGHT BROWN FINE TO MEDIUM SAND (SP)

LIGHT BROWN CLAYEY FINE SAND (SC)

LIGHT BROWN FINE SAND (SP)

LIGHT BROWN FINE SANDY CLAY (CL)

Harding Lawson Associates
Engineers and
Environmental Services

MONITORING WELL DETAIL MW-62

Sparton Technology Inc.
Albuquerque, New Mexico

PLATE

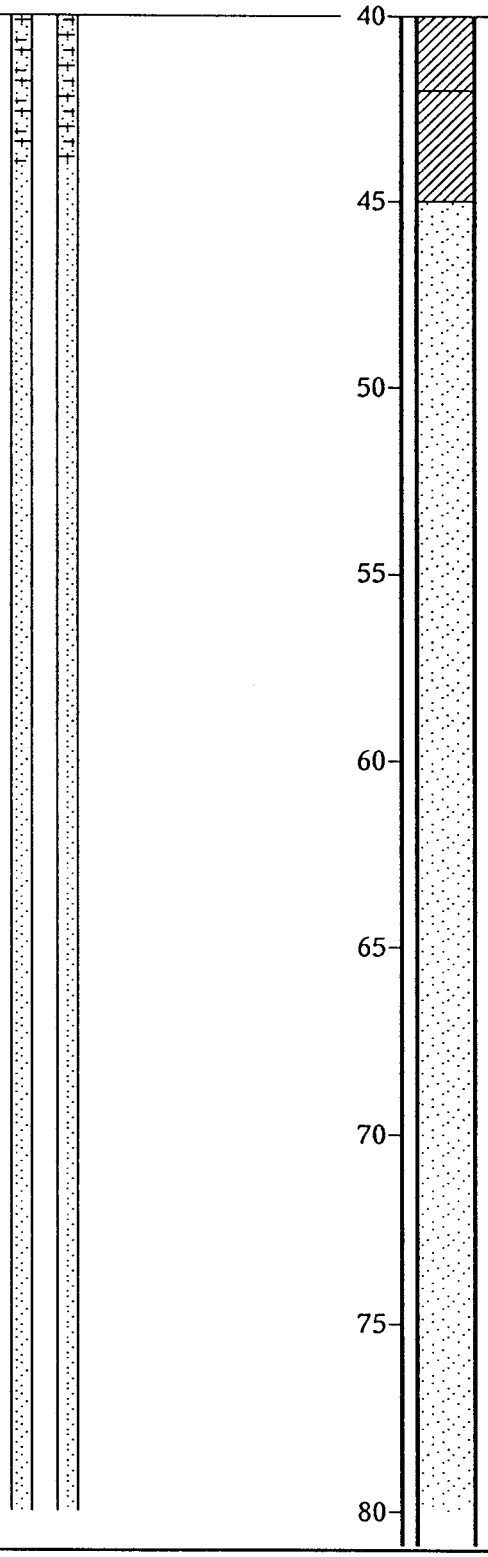
DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
	06310,039.12		12/90		

Top of PVC Casing
Elevation 5075.00

Equipment GD-1500

Elevation 5075.00 ft Date 9/28/90

GROUND SURFACE



LIGHT BROWN CLAY (CL)

TAN MEDIUM TO COARSE SAND (SW)

-granular gravel at 52 feet

Borehole allowed to cave-in from 44 to 115 feet

-1/4" to 1-1/2" pebbly gravel at 67 feet

Harding Lawson Associates
Engineers and Environmental Services

MONITORING WELL DETAIL MW-62

Sparton Technology Inc.
Albuquerque, New Mexico

PLATE

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
	06310,039.12		12/90		

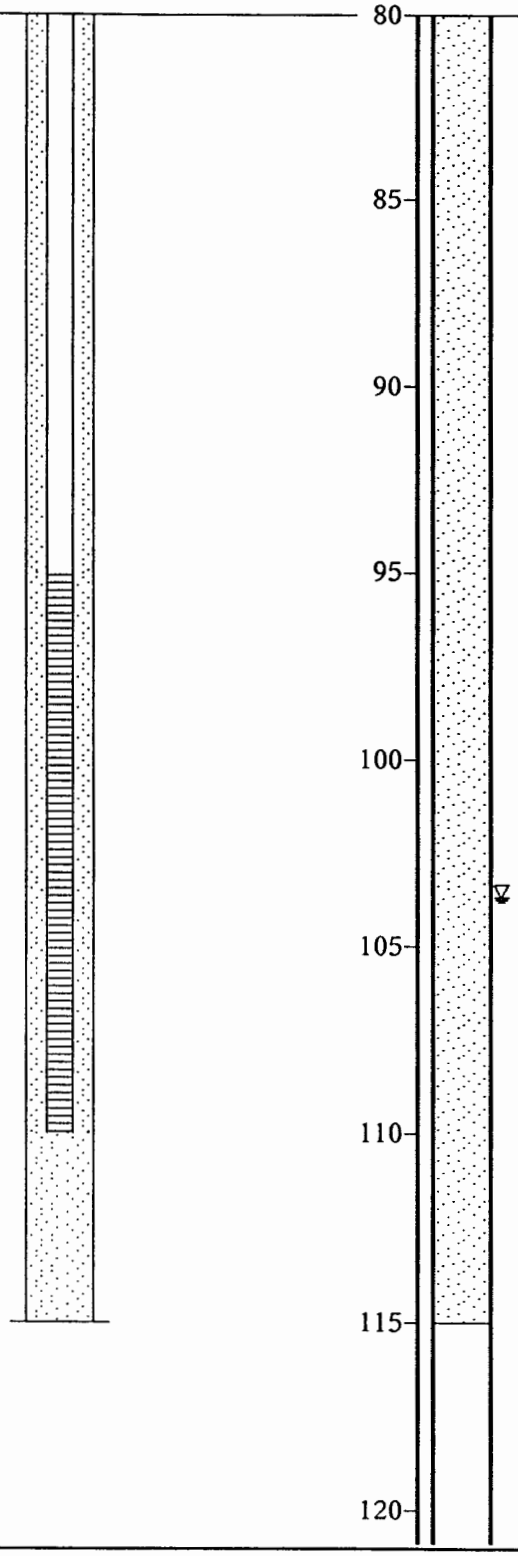
008686

Top of PVC Casing
Elevation 5075.00

Equipment GD-1500

Elevation 5075.00 ft Date 9/28/90

GROUND SURFACE



2" Stainless Steel Casing from 85 to 95 feet

2" Stainless Steel Screen (slot size 0.01") from 95 to 110 feet

-occasional gravel at 85 feet

-1/2" gravel at 98 feet

-2" gravel at 100 feet

End of boring at 115.00 feet.
Groundwater encountered at 103.66 feet during drilling.

Harding Lawson Associates
Engineers and Environmental Services

MONITORING WELL DETAIL MW-62

Sparton Technology Inc.
Albuquerque, New Mexico

PLATE

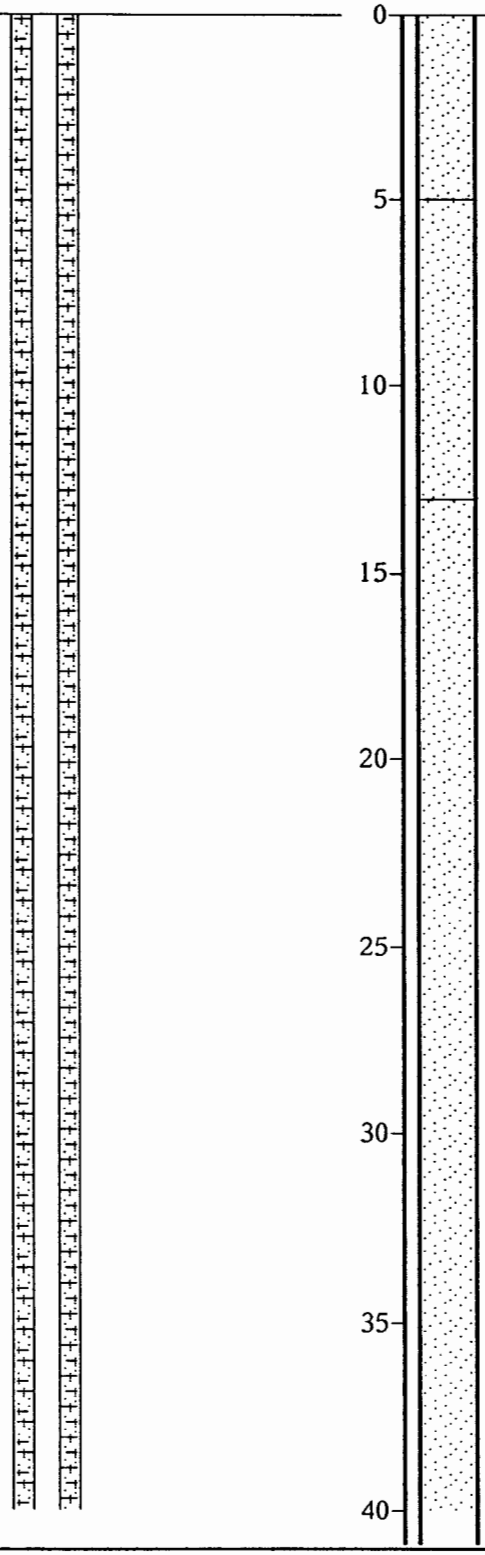
DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
	06310,039.12		12/90		

Top of PVC Casing
Elevation 5065.74

Equipment GD-1500

Elevation 5065.74 ft Date 10/1/90

GROUND SURFACE



2" PVC Casing
to 73 feet

6-1/4" Borehole
to 98 feet

Cement/Bentonite
Grout

0 TAN FINE SAND (SP)

5 TAN TO BROWN FINE TO MEDIUM SAND (SW)

10

YELLOW, BROWN & TAN FINE SAND (SP)

15

20

25

30

35

40

-increased medium sand with occasional gravel from 38 to 42 feet

Harding Lawson Associates
Engineers and
Environmental Services

MONITORING WELL DETAIL MW-63

Sparton Technology Inc.
Albuquerque, New Mexico

PLATE

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
	06310,039.12		12/90		

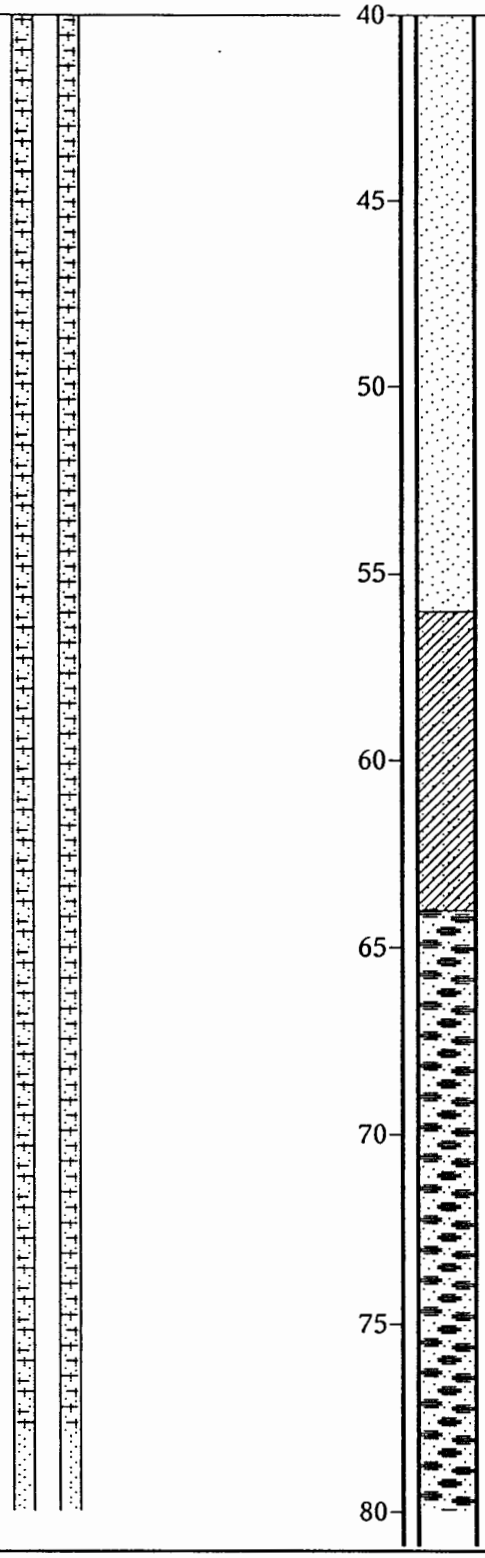
008688

Top of PVC Casing
Elevation 5065.74

Equipment GD-1500

Elevation 5065.74 ft Date 10/1/90

GROUND SURFACE



-occasional gravel from 44 to 50 feet

BROWN CLAYEY SAND (SC)
occasional coarse sand and small gravel

BROWN SANDY GRAVEL (GP)
gravel size increases with depth

2" Stainless Steel
casing from
73 to 83 feet

Harding Lawson Associates
Engineers and
Environmental Services

MONITORING WELL DETAIL MW-63

Sparton Technology Inc.
Albuquerque, New Mexico

PLATE

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
	06310,039.12		12/90		

008689

Top of PVC Casing
Elevation 5065.74

Equipment GD-1500

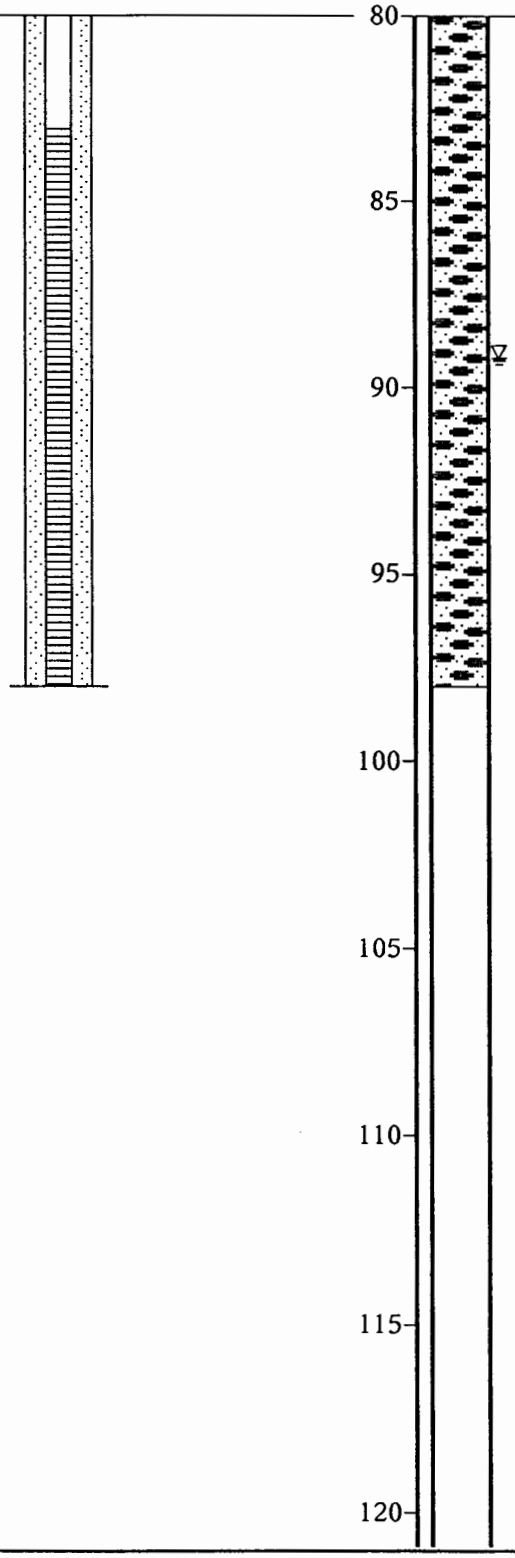
Elevation 5065.74 ft Date 10/1/90

GROUND SURFACE

2" Stainless Steel Screen (slot size 0.01") from 83 to 98 feet

Natural sand formation allowed to collapse around screen

Bottom Cap



End of boring at 98.00 feet.
Groundwater encountered at 89.20 feet during drilling.

Harding Lawson Associates
Engineers and Environmental Services

MONITORING WELL DETAIL MW-63

Sparton Technology Inc.
Albuquerque, New Mexico

PLATE

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
	06310,039.12		12/90		

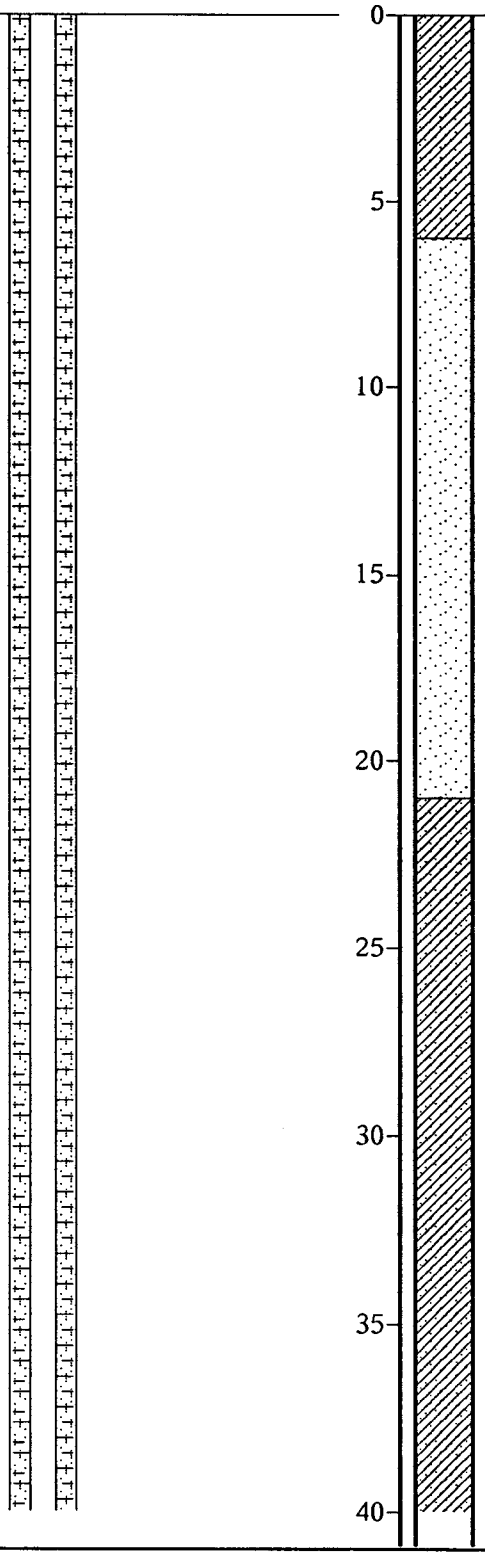
008690

Top of PVC Casing Elevation 5097.84

Equipment GD-1500

Elevation 5097.84 ft **Date** 10/3/90

GROUND SURFACE



TAN & BROWN CLAYEY FINE SAND (SC)

-medium to coarse sand below 4 feet

BROWN & GRAY MEDIUM TO COARSE SAND (SP)
with occasional gravel

TAN & BROWN CLAYEY FINE SAND (SC)

-with medium sand below 32 feet

4" PVC Casing to 113 feet

8-5/8" Steel casing from 0 to 134 feet

12-1/4" Borehole to 136 feet

Cement/Bentonite Grout

Harding Lawson Associates
Engineers and Environmental Services

MONITORING WELL DETAIL MW-64

Sparton Technology Inc.
Albuquerque, New Mexico

PLATE

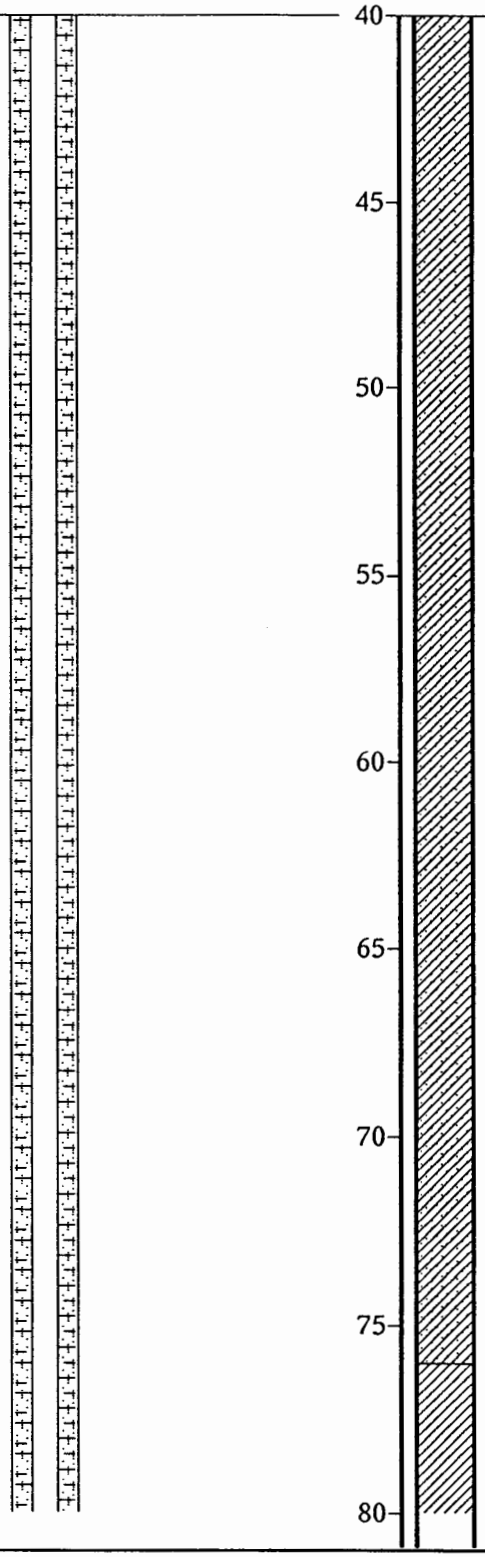
DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
	06310,039.12		12/90		

Top of PVC Casing
Elevation 5097.84

Equipment GD-1500

Elevation 5097.84 ft Date 10/3/90

GROUND SURFACE



-interbedded with occasional sandy clay seams below 74 feet

TAN SANDY CLAY (CL)

Harding Lawson Associates
Engineers and Environmental Services

MONITORING WELL DETAIL MW-64

Sparton Technology Inc.
Albuquerque, New Mexico

PLATE

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
	06310,039.12		12/90		

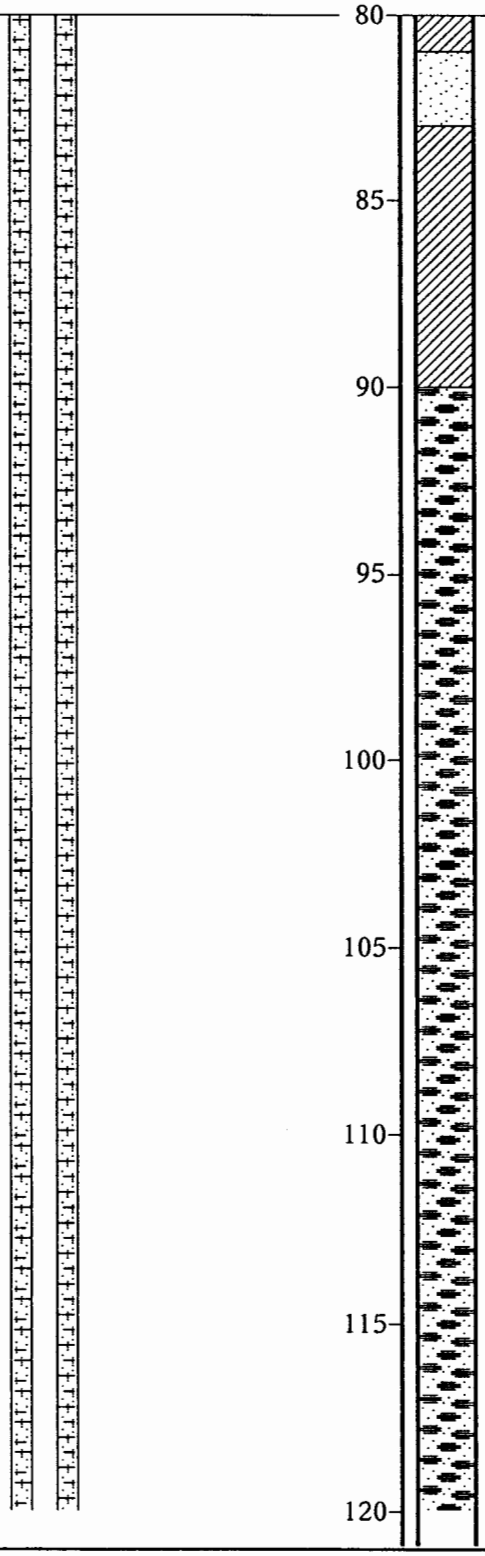
008692

Top of PVC Casing
Elevation 5097.84

Equipment GD-1500

Elevation 5097.84 ft Date 10/3/90

GROUND SURFACE



BROWN & GRAY MEDIUM TO COARSE SAND (SP)
TAN SANDY CLAY (CL)

BROWN & GRAY SANDY GRAVEL (GP)

4" Stainless Steel casing from 113 to 138'10" feet

Harding Lawson Associates
Engineers and Environmental Services

MONITORING WELL DETAIL MW-64

Sparton Technology Inc.
Albuquerque, New Mexico

PLATE

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
	06310,039.12		12/90		

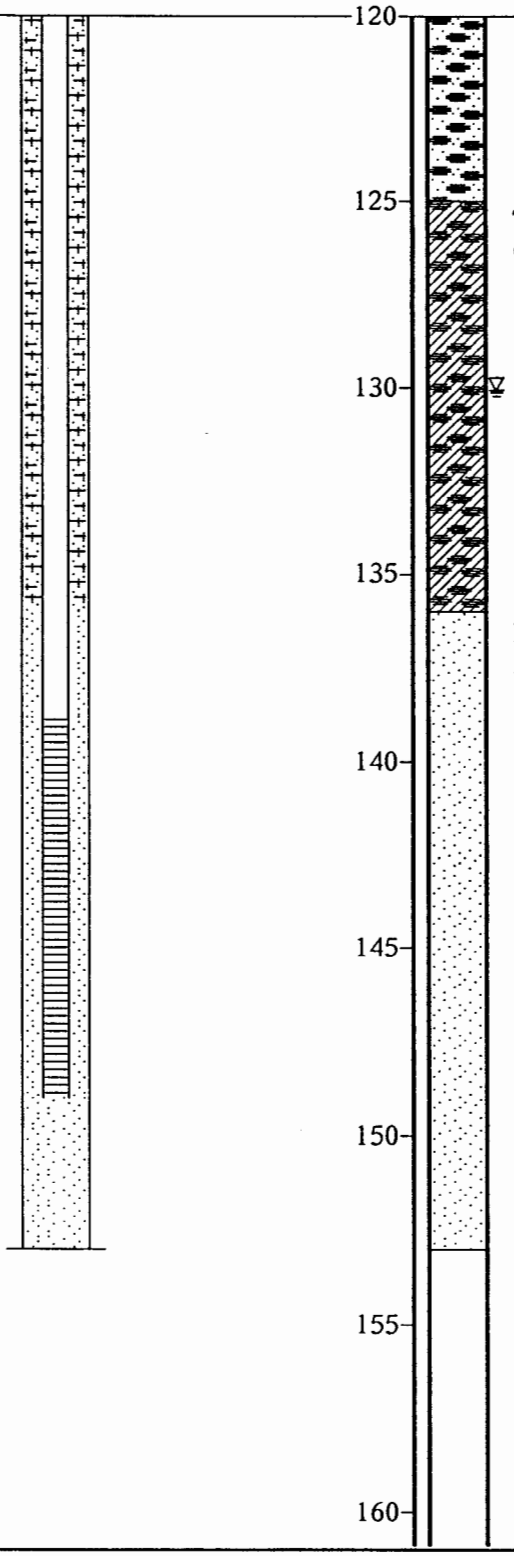
008693

Top of PVC Casing
Elevation 5097.84

Equipment GD-1500

Elevation 5097.84 ft Date 10/3/90

GROUND SURFACE



TAN, BROWN & GRAY CLAYEY GRAVEL (GC)

DARK BROWN & BLACK FINE TO MEDIUM SAND (SP)

Sandpack:
20x40 sand
(136 to 137 feet)

10x20 sand
(137 to 152 feet)

7-7/8" borehole from
136 to 152 feet

4" Stainless Steel
Screen (slot size 0.02")
from 138.8 to 149 feet

Bottom Cap

End of boring at 153.00 feet.
Groundwater encountered at 130.05 feet during drilling.

Harding Lawson Associates
Engineers and
Environmental Services

MONITORING WELL DETAIL MW-64

Sparton Technology Inc.
Albuquerque, New Mexico

PLATE

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
	06310,039.12		12/90		

008694

ATTACHMENT 5

Groundwater Flow

DATE 1/24/90

SPARTON TECHNOLOGIES
MONITOR WELL
BI-WEEKLY WATER LEVEL DATA

RECEIVED
DEC 17 1990
HAZARDOUS WASTE CONTROL OFFICE
TECHNICAL

MONITOR WELL	MEASURING POINT ELEVATION	TOTAL DEPTH ELEVATION	AIR LINE CALIBRATION ELEVATION	AIR LINE OR SOUNDER READING	WATER LEVEL ELEVATION
MW-7	5044.80	-	4970.48	102.0	4978.98
MW-9	5044.13	4965.84	4974.60	15.0	4975.85
MW-12	5041.81	-	4968.40	85.0	4975.48
MW-13	5043.35	4971.69	4972.18	51.0	4976.43
MW-14	5041.94	4970.04	4970.32	43.0	4973.90
MW-15	5047.51	4974.40	4974.60	25.0	4976.68
MW-16	5047.53	4975.53	4977.50	33.0	4980.25
MW-17	5049.30	-	4978.41	21.0	4980.16
MW-19	5046.27	4934.85	4968.90	74.0	4975.07
MW-20	5045.81	4906.61	4968.50	75.0	4974.75
MW-21	5048.41	4977.61	4978.00	25.0	4980.08
MW-22	5048.08	4972.28	4975.80	45.0	4979.55
MW-29	5044.57	4926.72	4970.36	67.0	4975.94
MW-30	5044.70	4932.44	4969.10	71.0	4975.02
MW-31	5043.57	4932.74	4967.95	76.0	4974.28
MW-32	5048.08	4925.21	4968.71	69.0	4974.46
MW-33	5044.36	4969.11	4972.56	31.0	4975.14
MW-34	5034.52	4968.07	-	58.68	4975.84
MW-35	5042.50	4969.39	-	68.46	4974.04
MW-36	5059.30	4967.00	-	86.29	4973.01
MW-37	5091.66	4966.65	-	119.56	4972.10
MW-38	5044.35	4905.06	4969.24	80.0	4975.91
MW-39	5044.07	4908.74	4969.05	70.0	4974.88
MW-40	5043.46	4914.18	4968.47	69.0	4974.22
MW-41	5046.79	4942.11	4968.49	70.0	4974.32
MW-42	5057.28	4939.29	4970.50	47.0	4974.42
MW-43	5057.69	4917.85	4970.67	42.0	4974.17
MW-44	5060.68	4944.97	-	85.63	4975.05
MW-45	5092.35	4941.30	-	118.04	4974.31
MW-46	5118.95	-	-	147.6	4971.35
MW-47	5155.84	-	-	184.6	4971.20
MW-48	5168.33	-	-	197.7	4970.67
MW-49	5043.68	-	-	70.1	4973.58

REVISED MW-42 AND 43 AIRLINE CALIBRATION ELEVATION 7/3/90

ATE 2/21/90

SPARTON TECHNOLOGIES
MONITOR WELL
BI-WEEKLY WATER LEVEL DATA

MONITOR WELL	MEASURING POINT ELEVATION	TOTAL DEPTH ELEVATION	AIR LINE CALIBRATION ELEVATION	AIR LINE OR SOUNDER READING	WATER LEVEL ELEVATION
MW-7	5044.80	4969.68	4970.48	100.0	4978.81
MW-9	5044.13	4965.84	4974.60	11.0	4975.52
MW-12	5041.81	4966.63	4968.40	83.0	4975.32
MW-13	5043.35	4971.69	4972.18	50.0	4976.35
MW-14	5041.94	4970.04	4970.32	40.0	4973.65
MW-15	5047.51	4974.40	4974.60	21.0	4976.35
MW-16	5047.53	4975.53	4977.50	29.0	4979.92
MW-17	5049.30	4977.25	4978.41	20.0	4980.08
MW-19	5046.27	4934.85	4968.90	70.0	4974.73
MW-20	5045.81	4906.61	4968.50	74.0	4974.67
MW-21	5048.41	4977.61	4978.00	24.0	4980.00
MW-22	5048.08	4972.28	4975.80	40.0	4979.13
MW-29	5044.57	4926.72	4970.36	64.5	4975.74
MW-30	5044.70	4932.44	4969.10	70.0	4974.93
MW-31	5043.57	4932.74	4967.95	75.0	4974.20
MW-32	5048.08	4925.21	4968.71	66.0	4974.21
MW-33	5044.36	4969.11	4972.56	30.0	4975.06
MW-34	5034.52	4968.07	-	59.00	4975.52
MW-35	5042.50	4969.39	-	68.62	4973.88
MW-36	5059.30	4967.00	-	86.36	4972.94
MW-37	5091.66	4966.65	-	119.67	4971.99
MW-38	5044.35	4905.06	4969.24	77.0	4975.66
MW-39	5044.07	4908.74	4969.05	69.0	4974.80
MW-40	5043.46	4914.18	4968.47	69.0	4974.22
MW-41	5046.79	4942.11	4968.49	67.0	4974.07
MW-42	5057.28	4939.29	4970.50	45.0	4974.25
MW-43	5057.69	4917.85	4970.67	40.0	4974.01
MW-44	5060.68	4944.97	-	85.71	4974.97
MW-45	5092.35	4941.30	-	118.05	4974.30
MW-46	5118.95	4939.36	-	145.20	4973.75*
MW-47	5155.84	4961.43	-	184.10	4971.74
MW-48	5168.33	4961.99	-	197.54	4970.79
MW-49	5043.68	4893.26	-	70.14	4973.54

REVISED MW-42 AND 43 AIRLINE CALIBRATION ELEVATION 7/3/90

* data misentry; should read 4971.35

.TE 3/21/90

SPARTON TECHNOLOGIES
MONITOR WELL
BI-WEEKLY WATER LEVEL DATA

MONITOR WELL	MEASURING POINT ELEVATION	TOTAL DEPTH ELEVATION	AIR LINE CALIBRATION ELEVATION	AIR LINE OR SOUNDER READING	WATER LEVEL ELEVATION
MW-7	5044.80	4969.68	4970.48	100.0	4978.81
MW-9	5044.13	4965.84	4974.60	10.0	4975.43
MW-12	5041.81	4966.63	4968.40	80.0	4975.07
MW-13	5043.35	4971.69	4972.18	49.0	4976.26
MW-14	5041.94	4970.04	4970.32	40.0	4973.65
MW-15	5047.51	4974.40	4974.60	16.0	4975.93
MW-16	5047.53	4975.53	4977.50	29.0	4979.92
MW-17	5049.30	4977.25	4978.41	20.0	4980.08
MW-19	5046.27	4934.85	4968.90	70.0	4974.73
MW-20	5045.81	4906.61	4968.50	74.0	4974.67
MW-21	5048.41	4977.61	4978.00	21.0	4979.75
MW-22	5048.08	4972.28	4975.80	40.0	4979.13
MW-29	5044.57	4926.72	4970.36	65.0	4975.78
MW-30	5044.70	4932.44	4969.10	70.0	4974.93
MW-31	5043.57	4932.74	4967.95	75.0	4974.20
MW-32	5048.08	4925.21	4968.71	65.0	4974.13
MW-33	5044.36	4969.11	4972.56	30.0	4975.06
MW-34	5034.52	4968.07	-	58.85	4975.67
MW-35	5042.50	4969.39	-	68.53	4973.97
MW-36	5059.30	4967.00	-	86.23	4973.07
MW-37	5091.66	4966.65	-	119.53	4972.13
MW-38	5044.35	4905.06	4969.24	77.0	4975.66
MW-39	5044.07	4908.74	4969.05	70.0	4974.88
MW-40	5043.46	4914.18	4968.47	66.0	4973.97
MW-41	5046.79	4942.11	4968.49	66.0	4973.99
MW-42	5057.28	4939.29	4970.50	45.0	4974.25
MW-43	5057.69	4917.85	4970.67	40.0	4974.01
MW-44	5060.68	4944.97	-	85.60	4975.08
MW-45	5092.35	4941.30	-	117.85	4974.50
MW-46	5118.95	4939.36	-	147.30	4971.65
MW-47	5155.84	4961.43	-	184.52	4971.32
MW-48	5168.33	4961.99	-	197.38	4970.95
MW-49	5043.68	4893.26	-	70.00	4973.68

REVISED MW-42 AND 43 AIRLINE CALIBRATION ELEVATION 7/3/90

E 4/18/90

SPARTON TECHNOLOGIES
MONITOR WELL
BI-WEEKLY WATER LEVEL DATA

MONITOR WELL	MEASURING POINT ELEVATION	TOTAL DEPTH ELEVATION	AIR LINE CALIBRATION ELEVATION	AIR LINE OR SOUNDER READING	WATER LEVEL ELEVATION
MW-7	5044.80	4969.68	4970.48	108.0	4979.48
MW-9	5044.13	4965.84	4974.60	20.0	4976.27
MW-12	5041.81	4966.63	4968.40	89.0	4975.82
MW-13	5043.35	4971.69	4972.18	59.0	4977.10
MW-14	5041.94	4970.04	4970.32	45.0	4974.07
MW-15	5047.51	4974.40	4974.60	20.0	4976.27
MW-16	5047.53	4975.53	4977.50	30.0	4980.00
MW-17	5049.30	4977.25	4978.41	21.0	4980.16
MW-19	5046.27	4934.85	4968.90	75.0	4975.15
MW-20	5045.81	4906.61	4968.50	80.0	4975.17
MW-21	5048.41	4977.61	4978.00	22.0	4979.83
MW-22	5048.08	4972.28	4975.80	45.0	4979.55
MW-29	5044.57	4926.72	4970.36	73.0	4976.44
MW-30	5044.70	4932.44	4969.10	75.0	4975.35
MW-31	5043.57	4932.74	4967.95	80.0	4974.62
MW-32	5048.08	4925.21	4968.71	70.0	4974.54
MW-33	5044.36	4969.11	4972.56	35.0	4975.48
MW-34	5034.52	4968.07	-	58.25	4976.27
MW-35	5042.50	4969.39	-	68.75	4973.75
MW-36	5059.30	4967.00	-	86.75	4972.55
MW-37	5091.66	4966.65	-	119.38	4972.28
MW-38	5044.35	4905.06	4969.24	85.0	4976.32
MW-39	5044.07	4908.74	4969.05	75.0	4975.30
MW-40	5043.46	4914.18	4968.47	71.0	4974.39
MW-41	5046.79	4942.11	4968.49	71.0	4974.41
MW-42	5057.28	4939.29	4970.50	50.0	4974.67
MW-43	5057.69	4917.85	4970.67	45.0	4974.42
MW-44	5060.68	4944.97	-	85.40	4975.28
MW-45	5092.35	4941.30	-	117.85	4974.50
MW-46	5118.95	4939.36	-	147.40	4971.55
MW-47	5155.84	4961.43	-	184.60	4971.24
MW-48	5168.33	4961.99	-	197.60	4970.73
MW-49	5043.68	4893.26	-	69.60	4974.08
MW-50	5211.51		-		
MW-51	5058.74		-		
PZ-1	5142.22		-		

REVISED MW-42 AND 43 AIRLINE CALIBRATION ELEVATION 7/3/90

ΓE 5/16/90

SPARTON TECHNOLOGIES
MONITOR WELL
BI-WEEKLY WATER LEVEL DATA

MONITOR WELL	MEASURING POINT ELEVATION	TOTAL DEPTH ELEVATION	AIR LINE CALIBRATION ELEVATION	AIR LINE OR SOUNDER READING	WATER LEVEL ELEVATION
MW-7	5044.80	4969.68	4970.48	110.0	4979.65
MW-9	5044.13	4965.84	4974.60	20.0	4976.27
MW-12	5041.81	4966.63	4968.40	90.0	4975.90
MW-13	5043.35	4971.69	4972.18	60.0	4977.18
MW-14	5041.94	4970.04	4970.32	46.0	4974.15
MW-15	5047.51	4974.40	4974.60	21.0	4976.35
MW-16	5047.53	4975.53	4977.50	30.0	4980.00
MW-17	5049.30	4977.25	4978.41	22.0	4980.24
MW-19	5046.27	4934.85	4968.90	75.0	4975.15
MW-20	5045.81	4906.61	4968.50	79.0	4975.08
MW-21	5048.41	4977.61	4978.00	25.0	4980.08
MW-22	5048.08	4972.28	4975.80	46.0	4979.63
MW-29	5044.57	4926.72	4970.36	70.0	4976.19
MW-30	5044.70	4932.44	4969.10	75.0	4975.35
MW-31	5043.57	4932.74	4967.95	80.0	4974.62
MW-32	5048.08	4925.21	4968.71	72.0	4974.71
MW-33	5044.36	4969.11	4972.56	35.0	4975.48
MW-34	5034.52	4968.07	-	58.50	4976.02
MW-35	5042.50	4969.39	-	67.98	4974.52
MW-36	5059.30	4967.00	-	85.98	4973.32
MW-37	5091.66	4966.65	-	119.31	4972.35
MW-38	5044.35	4905.06	4969.24	85.0	4976.32
MW-39	5044.07	4908.74	4969.05	75.0	4975.30
MW-40	5043.46	4914.18	4968.47	71.0	4974.39
MW-41	5046.79	4942.11	4968.49	70.0	4974.32
MW-42	5057.28	4939.29	4970.50	49.0	4974.58
MW-43	5057.69	4917.85	4970.67	42.0	4974.17
MW-44	5060.68	4944.97	-	85.28	4975.40
MW-45	5092.35	4941.30	-	117.80	4974.55
MW-46	5118.95	4939.36	-	147.40	4971.55
MW-47	5155.84	4961.43	-	184.60	4971.24
MW-48	5168.33	4961.99	-	197.60	4970.73
MW-49	5043.68	4893.26	-	69.65	4974.03
MW-50	5211.51		-	244.82	4966.69
MW-51	5058.74		-	77.76	4980.98
PZ-1	5142.22		-	178.45	4963.77

REVISED MW-42 AND 43 AIRLINE CALIBRATION ELEVATION 7/3/90

ATE 6/13/90

SPARTON TECHNOLOGIES
MONITOR WELL
BI-WEEKLY WATER LEVEL DATA

MONITOR WELL	MEASURING POINT ELEVATION	TOTAL DEPTH ELEVATION	AIR LINE CALIBRATION ELEVATION	AIR LINE OR SOUNDER READING	WATER LEVEL ELEVATION
MW-7	5044.80	4969.68	4970.48	113.0	4979.90
MW-9	5044.13	4965.84	4974.60	25.0	4976.68
MW-12	5041.81	4966.63	4968.40	94.0	4976.23
MW-13	5043.35	4971.69	4972.18	64.0	4977.51
MW-14	5041.94	4970.04	4970.32	49.0	4974.40
MW-15	5047.51	4974.40	4974.60	24.0	4976.60
MW-16	5047.53	4975.53	4977.50	35.0	4980.42
MW-17	5049.30	4977.25	4978.41	25.0	4980.49
MW-19	5046.27	4934.85	4968.90	80.0	4975.57
MW-20	5045.81	4906.61	4968.50	83.0	4975.42
MW-21	5048.41	4977.61	4978.00	25.0	4980.08
MW-22	5048.08	4972.28	4975.80	50.0	4979.97
MW-29	5044.57	4926.72	4970.36	80.0	4977.03
MW-30	5044.70	4932.44	4969.10	80.0	4975.77
MW-31	5043.57	4932.74	4967.95	84.0	4974.95
MW-32	5048.08	4925.21	4968.71	75.0	4974.96
MW-33	5044.36	4969.11	4972.56	40.0	4975.89
MW-34	5034.52	4968.07	-	57.54	4976.98
MW-35	5042.50	4969.39	-	67.81	4974.69
MW-36	5059.30	4967.00	-	85.91	4973.39
MW-37	5091.66	4966.65	-	119.37	4972.29
MW-38	5044.35	4905.06	4969.24	90.0	4976.74
MW-39	5044.07	4908.74	4969.05	80.0	4975.72
MW-40	5043.46	4914.18	4968.47	75.0	4974.72
MW-41	5046.79	4942.11	4968.49	75.0	4974.74
MW-42	5057.28	4939.29	4970.50	50.0	4974.67
MW-43	5057.69	4917.85	4970.67	45.0	4974.42
MW-44	5060.68	4944.97	-	85.25	4975.43
MW-45	5092.35	4941.30	-	117.77	4974.58
MW-46	5118.95	4939.36	-	147.41	4971.54
MW-47	5155.84	4961.43	-	184.60	4971.24
MW-48	5168.33	4961.99	-	197.64	4970.69
MW-49	5043.68	4893.26	-	69.37	4974.31
MW-50	5211.51		-	244.70	4966.81
MW-51	5058.74		-	77.76	4980.98
MW-52	5165.84			196.90	4968.94
PZ-1	5142.22		-	178.67	4963.55

REVISED MW-42 AND 43 AIRLINE CALIBRATION ELEVATION 7/3/90

ATE 6/27/90

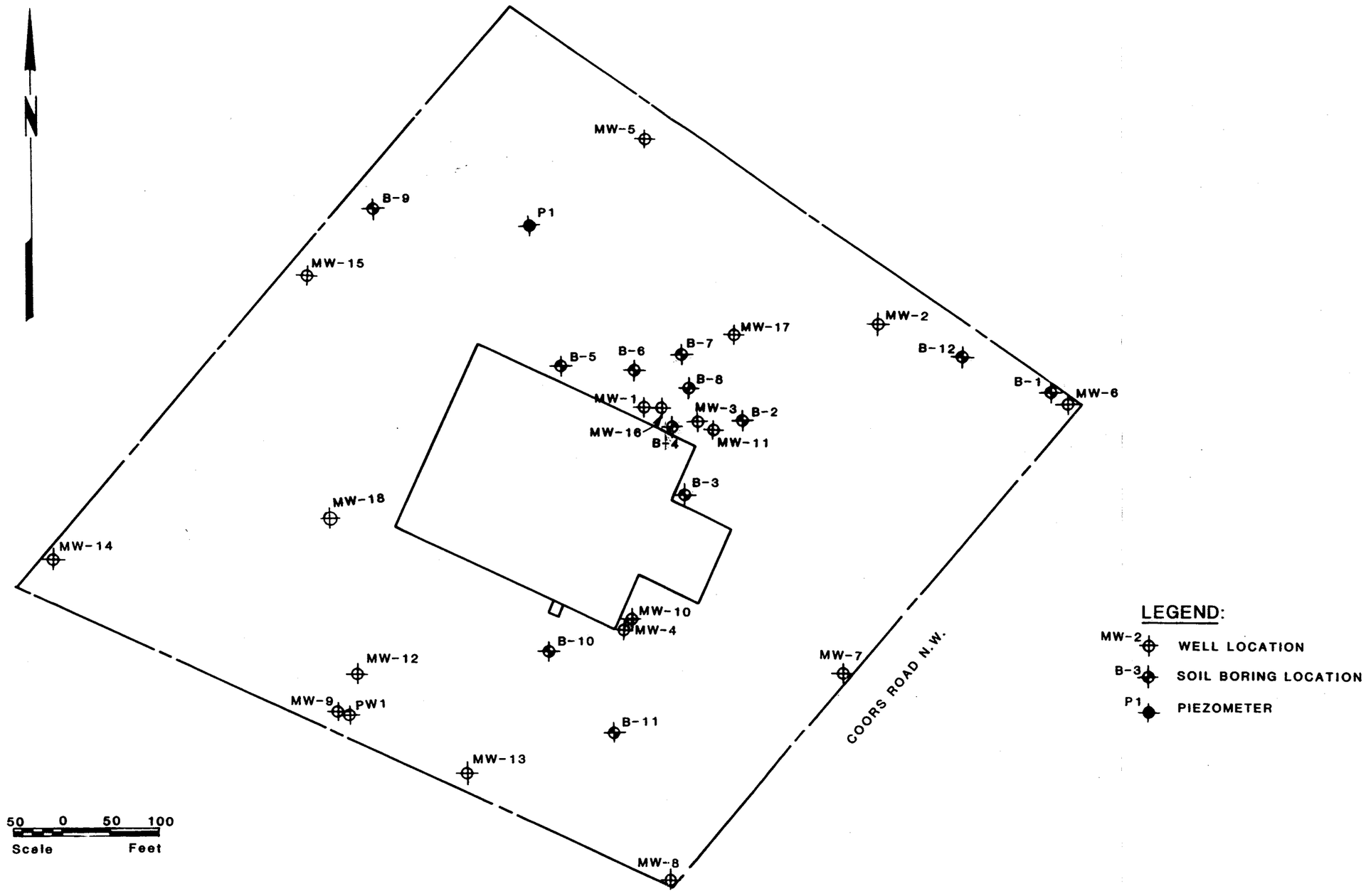
SPARTON TECHNOLOGIES
MONITOR WELL
BI-WEEKLY WATER LEVEL DATA

MONITOR WELL	MEASURING POINT ELEVATION	TOTAL DEPTH ELEVATION	AIR LINE CALIBRATION ELEVATION	AIR LINE OR SOUNDER READING	WATER LEVEL ELEVATION
MW-7	5044.80	4969.68	4970.48	115.0	4980.06
MW-9	5044.13	4965.84	4974.60	25.0	4976.68
MW-12	5041.81	4966.63	4968.40	95.0	4976.32
MW-13	5043.35	4971.69	4972.18	65.0	4977.60
MW-14	5041.94	4970.04	4970.32	50.0	4974.49
MW-15	5047.51	4974.40	4974.60	25.0	4976.68
MW-16	5047.53	4975.53	4977.50	35.0	4980.42
MW-17	5049.30	4977.25	4978.41	25.0	4980.49
MW-19	5046.27	4934.85	4968.90	80.0	4975.57
MW-20	5045.81	4906.61	4968.50	85.0	4975.58
MW-21	5048.41	4977.61	4978.00	25.0	4980.08
MW-22	5048.08	4972.28	4975.80	52.0	4980.13
MW-29	5044.57	4926.72	4970.36	79.0	4976.94
MW-30	5044.70	4932.44	4969.10	80.0	4975.77
MW-31	5043.57	4932.74	4967.95	85.0	4975.03
MW-32	5048.08	4925.21	4968.71	75.0	4974.96
MW-33	5044.36	4969.11	4972.56	40.0	4975.89
MW-34	5034.52	4968.07	-	57.32	4977.20
MW-35	5042.50	4969.39	-	67.64	4974.86
MW-36	5059.30	4967.00	-	85.80	4973.50
MW-37	5091.66	4966.65	-	119.31	4972.35
MW-38	5044.35	4905.06	4969.24	90.0	4976.74
MW-39	5044.07	4908.74	4969.05	80.0	4975.72
MW-40	5043.46	4914.18	4968.47	76.0	4974.80
MW-41	5046.79	4942.11	4968.49	75.0	4974.74
MW-42	5057.28	4939.29	4970.50	50.0	4974.67
MW-43	5057.69	4917.85	4970.67	45.0	4974.42
MW-44	5060.68	4944.97	-	85.13	4975.55
MW-45	5092.35	4941.30	-	117.74	4974.61
MW-46	5118.95	4939.36	-	147.42	4971.53
MW-47	5155.84	4961.43	-	184.57	4971.27
MW-48	5168.33	4961.99	-	197.60	4970.73
MW-49	5043.68	4893.26	-	69.36	4974.32
MW-50	5211.51		-	244.76	4966.75
MW-51	5058.74		-	77.73	4981.01
MW-52	5165.84		-	196.95	4968.89
MW-53	5164.27		-	194.08	4970.19
PZ-1	5142.22		-	178.89	4963.33

REVISED MW-42 AND 43 AIRLINE CALIBRATION ELEVATION 7/3/90

ATTACHMENT 6

Unsaturated Zone Boring Logs and Analytical Data



REFERENCE: SPARTON TECH. INC. SURVEY BY DENNEY-GROSS & ASSOC., INC., DATED 10/5/84

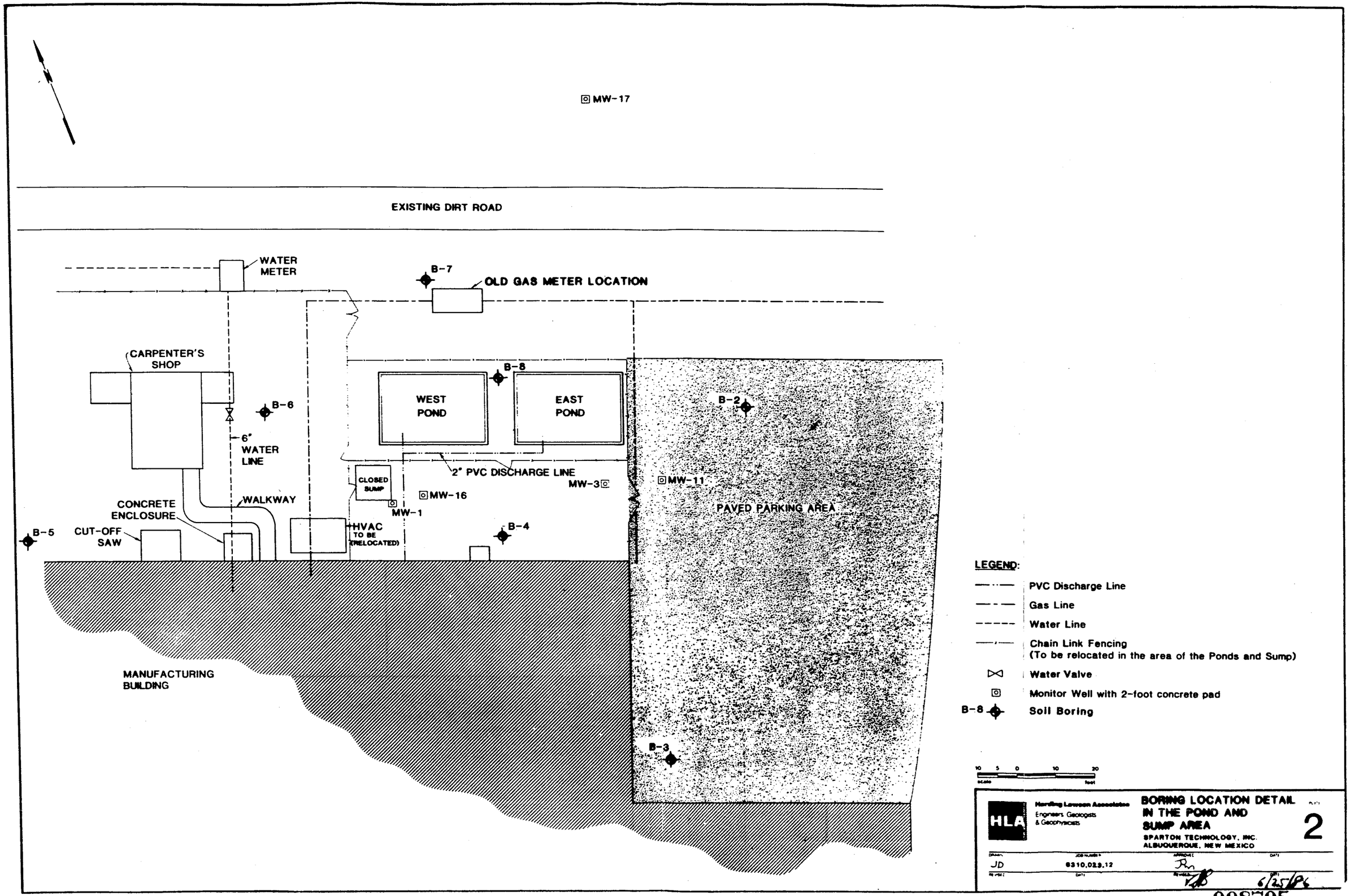
HLA Harding Lawson Associates
Engineers, Geologists & Geophysicists

BORING LOCATION PLAN
Sparton Technology, Inc.
Albuquerque, New Mexico

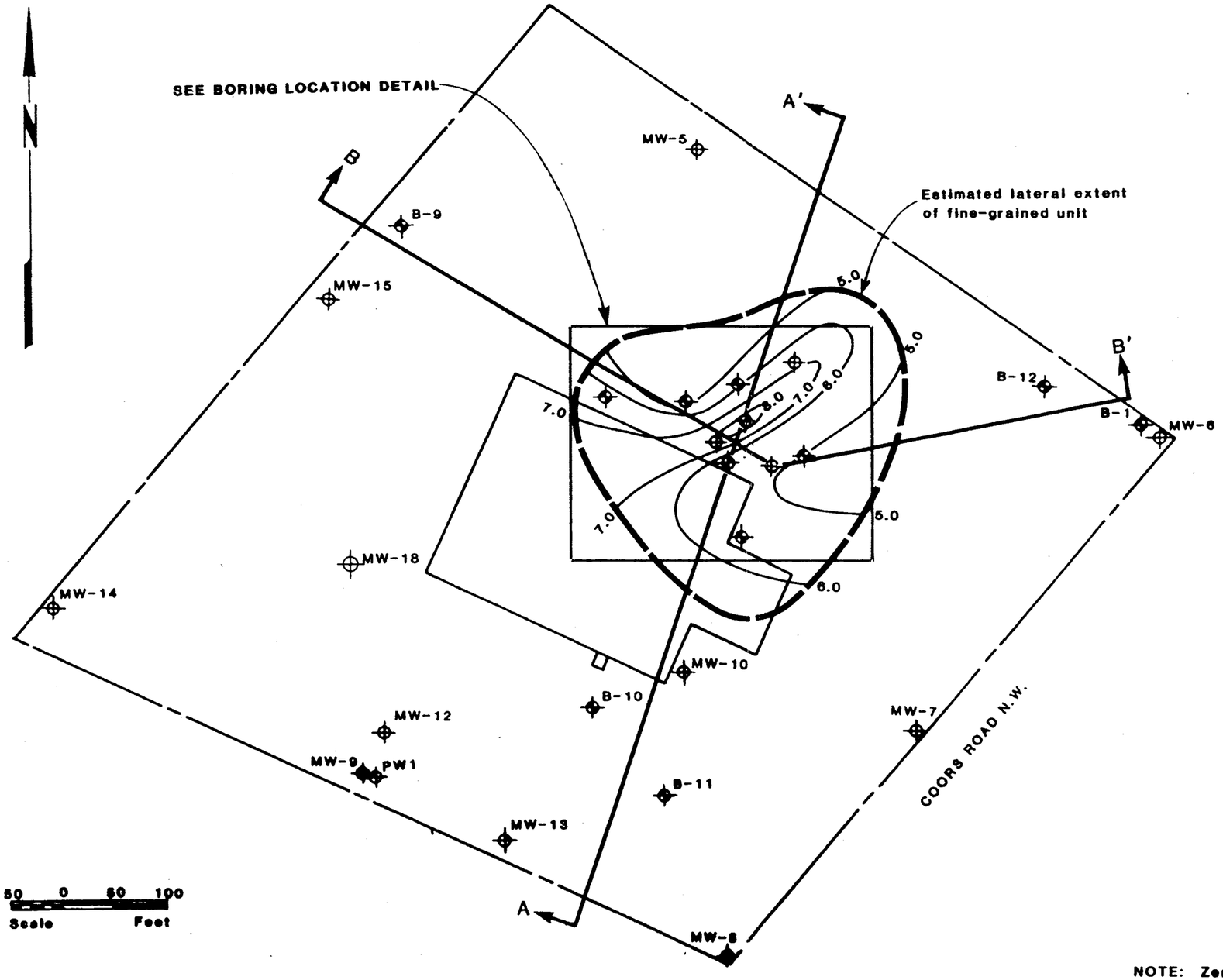
PLATE 1

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
CS.	6310,023.12	TJC			

008704

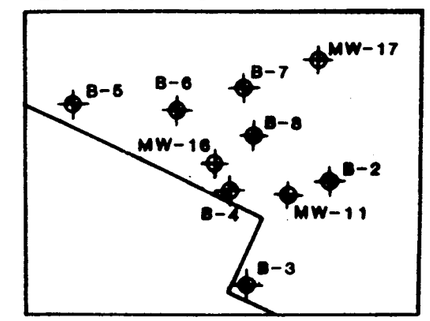

MW-17
EXISTING DIRT ROAD
WATER METER
B-7
OLD GAS METER LOCATION
CARPENTER'S SHOP
B-8
WEST POND
EAST POND
B-2
B-6
6" WATER LINE
2" PVC DISCHARGE LINE
CLOSED SUMP
MW-3
MW-11
MW-16
MW-1
WALKWAY
CONCRETE ENCLOSURE
PAVED PARKING AREA
B-5
CUT-OFF SAW
HVAC TO BE (RELOCATED)
B-4
MANUFACTURING BUILDING
B-3
LEGEND:
PVC Discharge Line
Gas Line
Water Line
Chain Link Fencing
(To be relocated in the area of the Ponds and Sump)
Water Valve
Monitor Well with 2-foot concrete pad
B-8 Soil Boring
10 5 0 10 20
scale feet
HLA
Harding Lawson Associates
Engineers, Geologists & Geophysicists
BORING LOCATION DETAIL IN THE POND AND SUMP AREA
SPARTON TECHNOLOGY, INC.
ALBUQUERQUE, NEW MEXICO
2
JD
6310.023.12
6/25/86

008705



Upper Surface Elevation of Fine-grained Unit in Soil Samples	
Boring No.	Elevation (MSL)
B-2	5004.0
B-3	5005.5
B-4	5005.3
B-5	5006.3
B-6	5004.9
B-7	5005.8
B-8	5008.2
MW-11	5005.5
MW-16	5008.0
MW-17	5006.5

BORING LOCATION DETAIL



LEGEND:

MW-2 WELL LOCATION

B-3 SOIL BORING LOCATION

GEOLOGIC SECTION LINE

5.0 CONTOUR LINE OF EQUAL ELEVATION. INTERVAL IS 1.0 foot.

NOTE: Zero elevation datum is 5000' MSL.

REFERENCE: SPARTON TECH. INC. SURVEY BY DENNEY-GROSS & ASSOC., INC., DATED 10/5/84

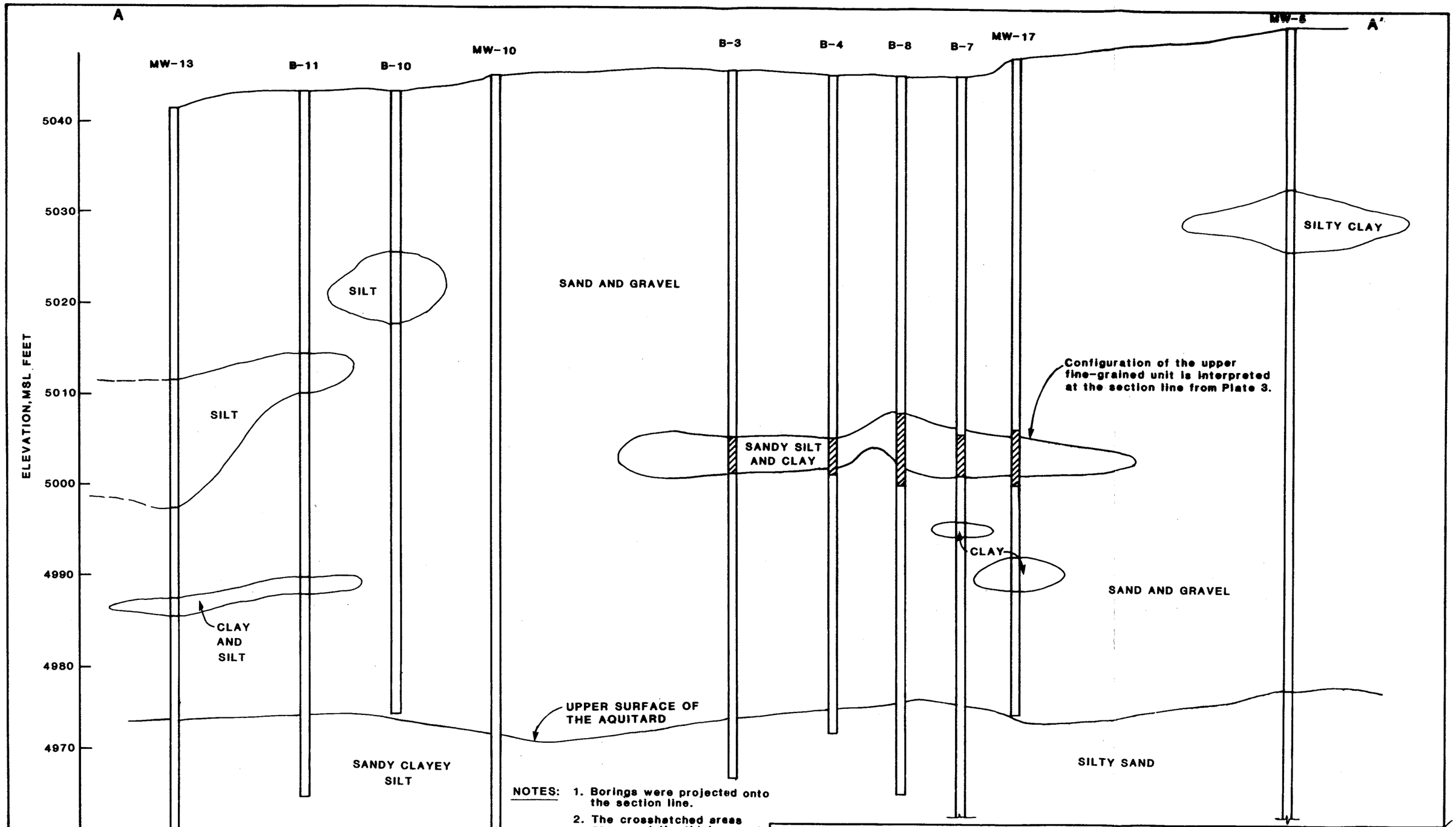
HLA Harding Lawson Associates
Engineers, Geologists & Geophysicists

CONFIGURATION OF UPPER SURFACE OF THE FINE-GRAINED UNIT AT APPROXIMATELY 5005 FEET MSL
Sparton Technology, Inc.
Albuquerque, New Mexico

PLATE 3

DRAWN EB. | JOB NUMBER 6310,023.12 | APPROVED TSB | DATE 1/23/86 | REVISED | DATE

008706



NOTES:
1. Borings were projected onto the section line.
2. The crosshatched areas represent the thickness of the Sandy Silt and Clay unit at the boring location.
3. The aquitard contact is interpreted at the section line from Plate 6.

Harding Lawson Associates
Engineers, Geologists & Geophysicists

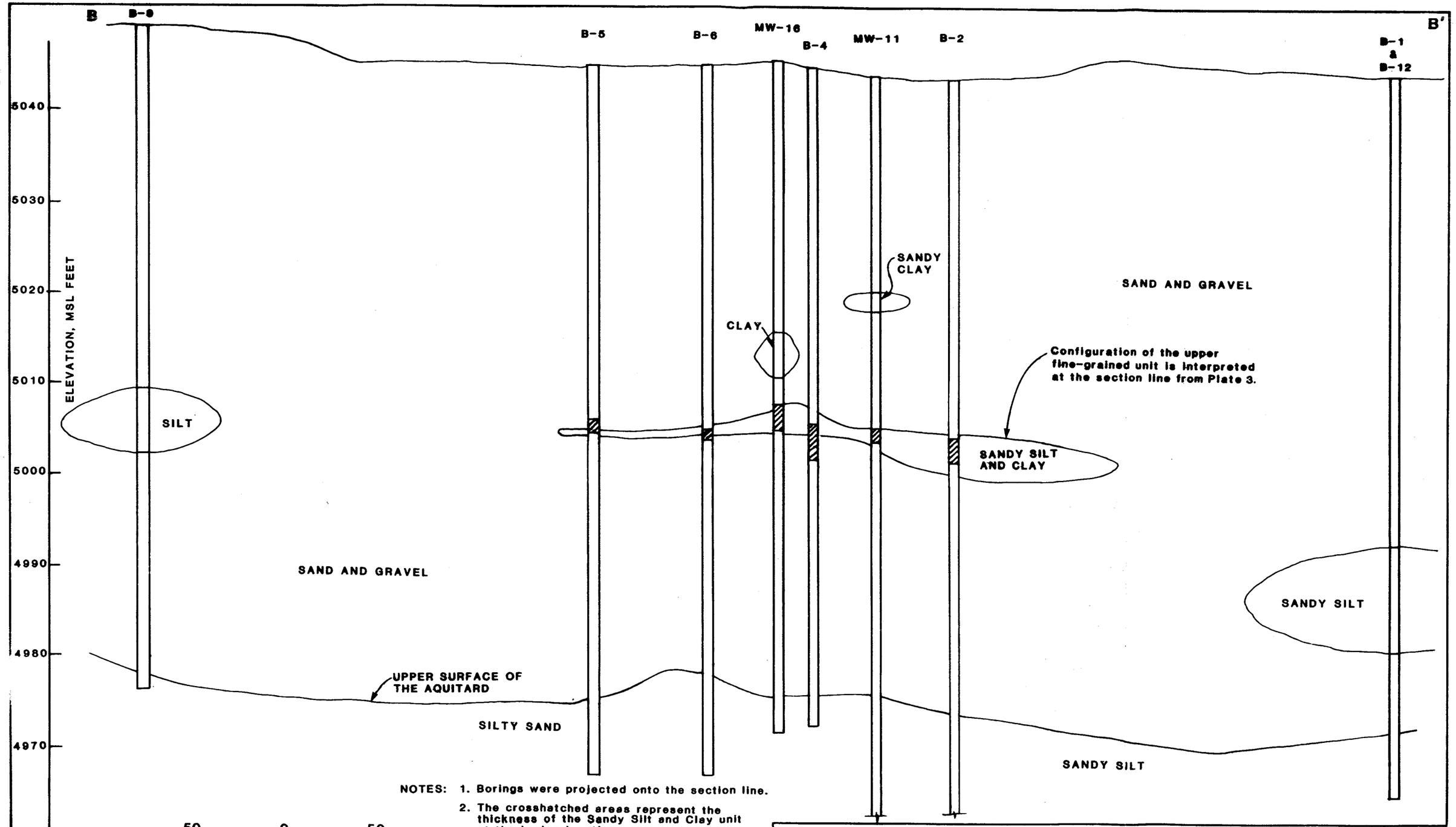
GEOLOGIC SECTION A A'

Sparton Technology, Inc.
Albuquerque, New Mexico

PLATE 4

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
ES	6310,023.12	TSK	6/25/86		

008707



NOTES:
1. Borings were projected onto the section line.
2. The crosshatched areas represent the thickness of the Sandy Silt and Clay unit at the boring location.
3. The aquitard contact is interpreted at the section line from Plate 6.

Harding Lawson Associates
Engineers, Geologists & Geophysicists

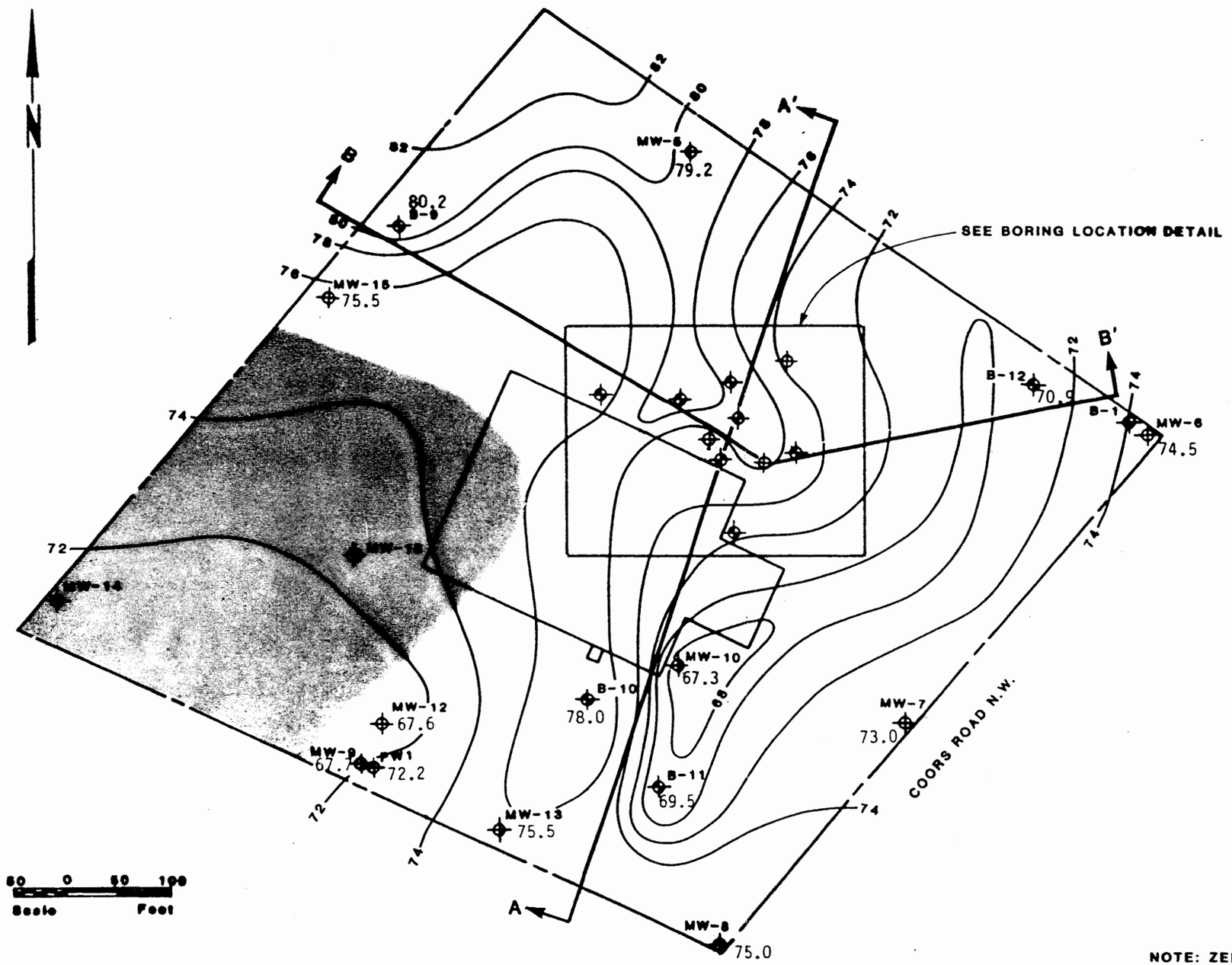
GEOLOGIC SECTION B-B'
Sparton Technology, Inc.
Albuquerque, New Mexico

PLATE 5

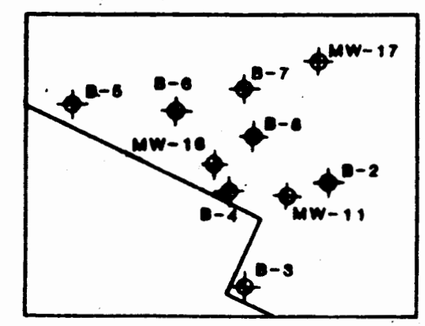
DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
ES.	6310,023.12	TLB	6/13/86		

008708

Aquitard Upper Surface Elevation in Detail	
Boring No.	Elevation (MSL)
B-2	4974.5
B-3	4972.0
B-4	<4973.9
B-5	4975.5
B-6	4979.6
B-7	4977.8
B-8	4977.4
MW-11	4976.4
MW-16	<4973.0
MW-17	4973.0



BORING LOCATION DETAIL



LEGEND:

MW-2 WELL LOCATION

B-3 SOIL BORING LOCATION

GEOLOGIC SECTION LINE

70 CONTOUR LINE OF EQUAL ELEVATION INTERVAL IS 2 FEET.

SHADED AREA REPRESENTS ZONE WHERE AQUITARD MAY BE THIN OR ABSENT.

NOTE: ZERO ELEVATION DATUM IS 4900 FEET MSL.

REFERENCE: SPARTON TECH. INC. SURVEY BY DENNEY-GROSS & ASSOC., INC., DATED 10/5/84

HLA Harding Lawson Associates Engineers, Geologists & Geophysicists

CONFIGURATION OF THE UPPER SURFACE OF THE AQUITARD
Sparton Technology, Inc.
Albuquerque, New Mexico

PLATE 6

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
EG.	6310,023.12	TSB	6/25/86		

008709

MAJOR DIVISIONS				TYPICAL NAMES
COARSE-GRAINED SOILS MORE THAN HALF IS LARGER THAN NO. 200 SIEVE	GRAVELS MORE THAN HALF COARSE FRACTION IS LARGER THAN No. 4 SIEVE SIZE	CLEAN GRAVELS WITH LITTLE OR NO FINES	GW	WELL-GRADED GRAVELS, GRAVEL-SAND MIXTURES
			GP	POORLY GRADED GRAVELS, GRAVEL-SAND MIXTURES
		GRAVELS WITH OVER 12% FINES	GM	SILTY GRAVELS, POORLY GRADED GRAVEL-SAND-SILT MIXTURES
			GC	CLAYEY GRAVELS, POORLY GRADED GRAVEL-SAND-CLAY MIXTURES
	SANDS MORE THAN HALF COARSE FRACTION IS SMALLER THAN NO. 4 SIEVE SIZE	CLEAN SANDS WITH LITTLE OR NO FINES	SW	WELL-GRADED SANDS, GRAVELLY SANDS
			SP	POORLY GRADED SANDS, GRAVELLY SANDS
		SANDS WITH OVER 12% FINES	SM	SILTY SANDS, POORLY GRADED SAND-SILT MIXTURES
			SC	CLAYEY SANDS, POORLY GRADED SAND-CLAY MIXTURES
FINE-GRAINED SOILS MORE THAN HALF IS SMALLER THAN NO. 200 SIEVE	SILTS AND CLAYS LIQUID LIMIT 50% OR LESS		ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS, OR CLAYEY SILTS WITH SLIGHT PLASTICITY
			CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
			OL	ORGANIC CLAYS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS LIQUID LIMIT GREATER THAN 50%		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SANDY OR SILTY SOILS, ELASTIC SILTS
			CH	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS
			OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOILS			Pt	PEAT AND OTHER HIGHLY ORGANIC SOILS

UNIFIED SOIL CLASSIFICATION SYSTEM

Perm — Permeability
Consol — Consolidation
LL — Liquid Limit (%)
PI — Plastic Index (%)
G_s — Specific Gravity
MA — Particle Size Analysis
■ — "Undisturbed" Sample
⊠ — Bulk or Classification Sample

	Shear Strength (psf)	Confining Pressure	
TxUU (FM) or (S)	3200	(2600)	— Unconsolidated Undrained Triaxial Shear (field moisture or saturated)
TxCU (P)	3200	(2600)	— Consolidated Undrained Triaxial Shear (with or without pore pressure measurement)
TxCD	3200	(2600)	— Consolidated Drained Triaxial Shear
SSCU (P)	3200	(2600)	— Simple Shear Consolidated Undrained (with or without pore pressure measurement)
SSCD	3200	(2600)	— Simple Shear Consolidated Drained
DSCD	2700	(2000)	— Consolidated Drained Direct Shear
UC	470		— Unconfined Compression
LVS	700		— Laboratory Vane Shear

KEY TO TEST DATA

Harding Lawson Associates
Engineers, Geologists & Geophysicists

SOIL CLASSIFICATION CHART AND KEY TO TEST DATA

Sparton Technology, Inc.
Albuquerque, New Mexico

PLATE

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
ES.	6310,023.12				

008710

Appendix A-1

Geologic Logs

Appendix A. Field Investigation

1. Geologic Logs
2. Construction of MW-18
3. Particle Size Analysis

Equipment Hollow-Stem Auger

Elevation 5044.6 Date 9/4/85 to 9/6/85

Depth (ft)	Description	PID Background (ppm)	PID Sample (ppm)
0	LIGHT BROWN FINE TO MEDIUM SAND (SP) dry, grains subangular to rounded, 95% quartz, 3% feldspar, 2% other concrete dust 3 to 3.5 feet tire fragments 4 to 6 feet Fill		
5	gravelly 7 to 26 feet, mainly igneous and metamorphic		
10	silty 9 to 10 feet		
15		0.0	2.0
	lost sampler at 18 feet, retrieve and start new boring	0.0	2.0
20	sandy gravel 22.3 to 23.7 feet		
25		0.0	1.5
	trace silt 28 to 40 feet		
30			
35			
40	LIGHT BROWN SANDY GRAVEL (GW) moist, gravel angular to rounded, mainly quartzite with some igneous gravel		

(Continuation of Log)

Depth (ft)	Description
40	
45	
50	lost sampler shoe at 52 feet, start new boring LIGHT BROWN FINE SANDY SILT (ML) moist, subangular grains, trace clay
55	very sandy 57.5 to 59 feet
60	
65	GRAY GRAVELLY COARSE SAND (SW) saturated, grains subangular to rounded, 80% quartz, 12% feldspar, 8% other End of Boring - 67.5 feet Note: No PID readings were taken above 52.5 feet.
70	
75	
80	

Harding Lawson Associates
Engineers Geologists & Geophysicists

LOG OF BORING B001
Sparton Technology, Inc.
Albuquerque, New Mexico

PLATE A1

DRAWN EB. JOB NUMBER 6310,023.12 APPROVED TSB DATE 6/25/86 REVISED DATE

008713

Equipment Hollow-Stem Auger

Elevation 5044.04 **Date** 9/16/85 to 9/17/85

PID Background (ppm)	PID Sample (ppm)	Depth (ft)	Description
		0	ASPHALT 2-INCHES THICK
0.0	0.4		LIGHT BROWN SILTY FINE TO COARSE SAND (SM) grains angular to rounded, 93% quartz, 6% feldspar, 1% other
		5	very silty 5.5 to 5.7 feet
			LIGHT BROWN GRAVELLY FINE TO COARSE SAND (SW) dry, gravel and grains subangular to rounded, 90% quartz, 8% feldspar, 2% other, partially caliche-cemented
0.0	0.2		
		10	
0.0	0.4		no gravel 14 to 15 feet
		15	
0.0	0.2		
		20	cobbles below 21 feet, angular to rounded, mainly vein quartz and quartzite
		25	
			LIGHT BROWN FINE TO MEDIUM SAND (SP) dry, grains subangular to rounded, 96% quartz, 2% feldspar, 2% other, frosted grains
0.0	2.2		
		30	
0.0	3.3		
		35	BROWN SILTY CLAYEY SAND (SC) moist, grains well rounded
0.0	3.0		BROWN CLAYEY SILT (ML) moist, trace sand
		40	

(Continuation of Log)

PID Background (ppm)	PID Sample (ppm)	Depth (ft)	Description
		40	
0.0	5.0		LIGHT GRAY FINE TO MEDIUM SAND (SP) dry, grains subangular to well rounded, 96% quartz, 2% feldspar, 2% other, faint horizontal bedding
		45	
0.0	4.5		BROWN & GRAY GRAVELLY CLAYEY SILTY SAND (SW) moist, grains angular to subrounded, 90% quartz, 3% feldspar, 7% other, rounded quartzite cobbles, quartzite and igneous gravel
		50	
		55	
0.0	3.0		LIGHT BROWN FINE TO MEDIUM SAND (SP) moist, trace silt and gravel, grains rounded to well rounded, 95% quartz, 2% feldspar, 3% other, rounded quartzite and some igneous gravel, cross-bedded
		60	fish scale at 59.5 feet
0.0	5.2		sand and gravel 62 to 63 feet seepage encountered at 63 feet
		65	silty fine sand 64 to 65 feet
0.0	19.0		LIGHT BROWN SILTY FINE SAND (SM) saturated, grains angular to rounded, cross-bedded
		70	
0.0	14.0		
		75	gravel 75 to 75.2 feet, angular to rounded, igneous and quartzite
0.0	1.8		
0.0	2.4		faint horizontal bedding
		80	light green silty clay with minor carbonaceous pockets 80.3 to 80.5 feet

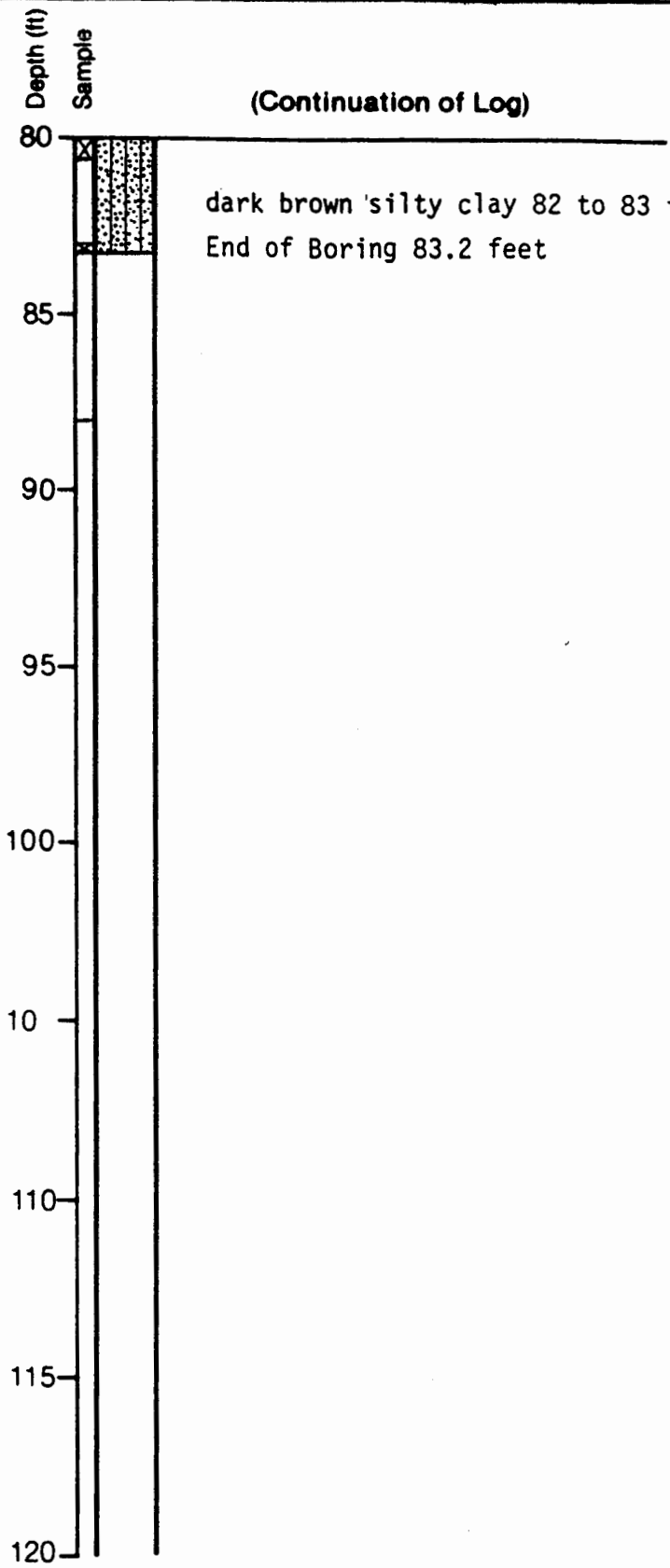
Harding Lawson Associates
Engineers, Geologists & Geophysicists

LOG OF BORING B002
Sparton Technology, Inc.
Albuquerque, New Mexico

PLATE **A2**

Drawn Sg. Kg. | JOB NUMBER 6310,023.12 | APPROVED TSB | DATE 10/25/86 | REVISED | DATE

008714



(Continuation of Log)

dark brown silty clay 82 to 83 feet

End of Boring 83.2 feet

Harding Lawson Associates
Engineers, Geologists
& Geophysicists

LOG OF BORING B002 (cont.)

Sparton Technology, Inc.
Albuquerque, New Mexico

PLATE
A3

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
	6310,023.12	TSB	6/25/86		

008715

Equipment Hollow Stem Auger

Elevation 5045.98 **Date** 9/13/85 to 9/14/85

PID Background (ppm)	PID Sample (ppm)	Depth (ft)	Description
		0	ASPHALT 2-INCHES THICK LIGHT BROWN SILTY FINE TO MEDIUM SAND (SM) moist
0.0	6.8	5	LIGHT BROWN FINE TO COARSE SAND (SW) moist, subangular to rounded, 92% quartz, 5% feldspar, 3% other, trace silt 0.5-inch clay stringer at 5.5 feet LIGHT BROWN SANDY GRAVEL (GW) moist, gravel rounded, mainly quartzite with some igneous, grains subangular to rounded, 92% quartz, 5% feldspar, 3% other, trace silt
		10	
		15	LIGHT BROWN SILTY FINE TO MEDIUM SAND (SM) moist, grains angular to well rounded, 92% quartz, 5% feldspar, 3% other
0.0	10.6	20	
0.0	14.8	25	LIGHT BROWN FINE TO MEDIUM SAND (SP) moist, grains subangular to rounded, 88% quartz, 7% feldspar, 5% other, trace silt
0.0	18.4	30	
0.0	6.2	35	silty 35.5 to 36 feet
0.0	3.2	40	

(Continuation of Log)

PID Background (ppm)	PID Sample (ppm)	Depth (ft)	Description
	1.4	40	BROWN CLAYEY SILT (ML) moist, trace sand with rounded grains, root marks, iron-stained in pockets sandy 44 to 44.5 feet purple 44.4 to 44.5 feet
0.0	5.2	45	LIGHT GRAY FINE TO MEDIUM SAND (SP) dry, grains angular to rounded, 93% quartz, 4% feldspar, 3% other, trace rounded quartzite gravel and silt, iron-stained 44.5 to 45 feet, some frosted grains, faint cross-bedding
0.0	49	50	LIGHT BROWN & GRAY SILTY GRAVELLY SAND (SW) moist, grains angular to rounded, 70% quartz, 20% feldspar, 10% other, quartzite and igneous gravel
0.0	20 *		
		55	no gravel 55 to 55.5 feet
0.0	120 *		
0.0	130 *	60	
		65	
		70	seepage encountered at 67 feet
0.0	50	75	LIGHT GRAY FINE SANDY SILT (ML) saturated LIGHT GRAY SILTY FINE SAND (SM) saturated, grains angular to rounded, 95% quartz, 2% feldspar, 3% other End of Boring - 78 feet
		80	* readings taken inside hollow stem

Harding Lawson Associates
Engineers, Geologists & Geophysicists

LOG OF BORING B003
Sparton Technology, Inc.
Albuquerque, New Mexico

PLATE **A4**

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
ES	6310,023.12	TSB	6/25/86		

008716

Equipment Hollow-Stem Auger

Elevation 5045.3 Date 9/24/85 to 9/25/85

PID Background (ppm)	PID Sample (ppm)	Depth (ft)	Sample
		0	LIGHT BROWN SILTY FINE TO MEDIUM SAND (SM) moist, grains angular to rounded, 96% quartz, 2% feldspar, 2% other, horizontal bedding
		5	LIGHT GRAY AND BROWN FINE TO COARSE SAND (SW) moist, grains angular to well rounded, 92% quartz, 5% feldspar, 3% other, horizontal bedding
0.0	15.0		silty fine sand 7.5 to 7.8 feet
		10	
0.0	82		silty fine sand with trace clay 13.5 to 14.2 feet
		15	
0.0	138		LIGHT BROWN SILTY FINE SAND (SM) moist, grains angular to rounded, 97% quartz, 2% feldspar, 1% other, horizontal bedding
		20	
0.0	75		clayey 24.5 to 24.7 feet
		25	
0.0	84		clayey 28.7 to 29.1 feet
		30	
0.0	150		LIGHT GRAY FINE TO COARSE SAND (SW) moist, 92% quartz, 6% feldspar, 2% other
		35	LIGHT GREEN SILTY FINE SAND (SM) moist, grains subrounded to well rounded, 96% quartz, 2.5% feldspar, 1.5% other, faint horizontal bedding red stained 35 to 35.2 feet
0.0	64		clayey and very silty 38 to 38.3 feet
		40	

(Continuation of Log)

PID Background (ppm)	PID Sample (ppm)	Depth (ft)	Sample
		40	BROWN SANDY SILT (ML) moist, horizontal bedding, trace clay, clay layer 42.5 to 43 feet
0.0	80	45	LIGHT GRAY FINE TO COARSE SAND (SW) moist, grains angular to rounded, 94% quartz, 4% feldspar, 2% other, faint horizontal bedding, trace silt and gravel gravelly below 47.5 feet, quartzite and igneous, subangular to rounded
0.0	34		brown silty clay layer with roots 48.7 to 49.2 feet
		50	
0.0	88		no gravel 52.5 to 53.5 feet
		55	
0.0	1.4		
		60	ground-water seepage encountered at 62.2 feet sandy gravel 62.5 to 65.5 feet
		65	
0.0	30		GRAY SILTY FINE SAND (SM) saturated, grains angular to rounded, 97% quartz, 1% feldspar, 2% other, horizontal bedding thin silty clay stringers 66.8 to 67.2 feet
0.0	67	70	GRAY FINE TO COARSE SAND (SW) saturated, grains subangular to well rounded, 94% quartz, 4% feldspar, 2% other, faint horizontal bedding sandy gravel 68.5 to 69.3 feet
			End of Boring - 71.4 feet
		75	
		80	

Harding Lawson Associates
Engineers, Geologists & Geophysicists

LOG OF BORING B004
Sparton Technology, Inc.
Albuquerque, New Mexico

PLATE A5

DRAWN E.C. | JOB NUMBER 6310,023.12 | APPROVED TSB | DATE 6/25/86 | REVISED | DATE

008717

Equipment Hollow Stem Auger

Elevation 5045.3 Date 9/23/85

PID Background (ppm)	PID Sample (ppm)	Depth (ft)	Description
		0	LIGHT BROWN SILTY FINE SAND (SM) moist, grains subangular to rounded, 96% quartz, 2% feldspar, 2% other
0.0	0.0	5	LIGHT GRAY & BROWN FINE TO COARSE SAND (SW) moist, grains subangular to well rounded, 93% quartz, 4% feldspar, 3% other, horizontal bedding, trace silt clayey 4.9 to 5.0 feet
0.0	2.9	10	
0.0	2.7	15	LIGHT GRAY SILTY FINE SAND (SM) moist, grains subrounded to well rounded, 95% quartz, 3% feldspar, 2% other
0.0	13.6	20	
0.0	2.9	25	sandy silty clay 23.6 to 24.2 feet brown below 24.2 feet
	11.6		
	26		
0.0	7.0	30	
0.0	8.9	35	very silty 33 to 33.5 feet
0.0	24	40	DARK BROWN SILTY CLAY (CL) saturated, trace sand

(Continuation of Log)

PID Background (ppm)	PID Sample (ppm)	Depth (ft)	Description
	9.0	40	LIGHT GRAY GRAVELLY FINE TO COARSE SAND (SW) moist, grains angular to rounded, 90% quartz, 6% feldspar, 4% other, gravel rounded, mainly quartzite with some igneous, trace silt
0.0	11.2	45	
		50	
0.0	60	55	no gravel 54.2 to 55.2 feet
	40		
0.0	6.8	60	
0.0	20	65	seepage encountered at 65 feet
0.0	10.4	70	trace clay 69.9 to 70.1 feet LIGHT GRAY SILTY FINE SAND (SM) saturated, grains angular to well rounded, 98% quartz, 2% other, trace clay 69.9 to 70.1 feet sandy silt 73 to 73.5 feet
		75	
		80	End of Boring - 78 feet

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LOG OF BORING B005
Sparton Technology, Inc.
Albuquerque, New Mexico

PLATE A6

DRAWN Ed. | JOB NUMBER 6310,023.12 | APPROVED TSB | DATE 6/25/86 | REVISED | DATE

008718

Equipment Hollow Stem Auger

Elevation 5045.38 **Date** 9/20/85 to 9/21/85

PID Background (ppm)	PID Sample (ppm)	Depth (ft)	Description
		0	LIGHT BROWN FINE TO MEDIUM SAND (SP) moist, grains subangular to well rounded, 97% quartz, 2% feldspar, 1% other, trace silt
0.0	3.7		
		5	LIGHT GRAY-BROWN FINE TO COARSE SAND (SW) moist, grains angular to well rounded, 92% quartz, 5% feldspar 3% other, horizontal bedding
		10	silty 9.5 to 10.5 feet
		15	clayey and silty 15.5 to 15.6 feet gravelly 15.6 to 15.8 feet, mainly granite and quartzite, minor caliche cement below 15.6 feet LIGHT BROWN SILTY FINE SAND (SM) moist, grains angular to subrounded, 97% quartz, 2% feldspar, 1% other
		20	coarse sand 21.6 to 22.5 feet
0.0	47		
		25	clayey 24.4 to 24.6 feet
0.0	120		
		30	trace silt 29.5 to 30.8 feet
0.0	92		
		35	trace silt 34.2 to 35 feet silty clay stringers 36 to 36.2 feet
0.0	50		
		40	clayey 39.5 to 40.5 feet

(Continuation of Log)

PID Background (ppm)	PID Sample (ppm)	Depth (ft)	Description
		40	BROWN SANDY SILTY CLAY (CL) moist BROWN CLAYEY SILTY FINE SAND (SM) moist, with gray coarse sand pockets with rounded to well rounded gains
0.0	24	45	LIGHT GRAY GRAVELLY FINE TO COARSE SAND (SW) moist, grains well rounded, 96% quartz, 2% feldspar, 2% other, cobbles and gravels rounded, mainly igneous with some quartzite, faint cross bedding
0.0	66		dark gray mottling below 44 feet
		50	
0.0	34		grains 90% quartz, 5% feldspar, 5% other below 53 feet
		55	
0.0	20		
		60	
0.0	6.0	65	seepage encountered at 65.5 feet MEDIUM GRAY SILTY FINE TO MEDIUM SAND (SM) saturated, grains subangular to well rounded, 96% quartz, 2% feldspar, 2% other, horizontal bedding
0.0	2.2	70	grains 90% quartz, 3% feldspar, 7% dark minerals 68 to 71 feet light gray below 71.3 feet
0.0	112		very silty with clay stringers below 73 feet
		75	
		80	End of Boring - 78 feet * HNU meter was not working properly 8 to 23 feet

Harding Lawson Associates
Engineers, Geologists & Geophysicists

LOG OF BORING B006

Sparton Technology, Inc.
Albuquerque, New Mexico

PLATE **A7**

DRAWN Eg. Kg. | JOB NUMBER 6310.023.12 | APPROVED TSB | DATE 6/25/86 | REVISED | DATE

Equipment Hollow-Stem Auger

Elevation 5045.26 **Date** 9/18/85 to 9/19/85

PID Background (ppm)	PID Sample (ppm)	Depth (ft)	Description
		0	LIGHT BROWN SILTY FINE SAND (SM) moist, grains angular to subrounded, 95% quartz, 3% feldspar, 2% other
0.0	1.3		brown sandy clay 3 to 4 feet
		5	BROWN FINE TO COARSE GRAVELLY SAND (SW) grains angular to subrounded, 70% quartz, 20% feldspar, 10% other, gravel mostly igneous, traces of caliche-cement
0.0	0.6	10	no gravel 8 to 15 feet
0.0	13.8	15	thin sandy silt layer at 15 feet horizontal bedding below 15 feet
0.0	9.0	20	
0.0	63	25	LIGHT BROWN FINE TO MEDIUM SAND (SP) moist, grains angular to rounded, 93% quartz, 2% feldspar, 5% other, trace silt clayey 24.6 to 24.9 feet
0.0	32	30	thin clayey layer at 30.5 feet thin caliche-cemented layer at 31 feet
0.0	38	35	thin clayey layers at 36.3 and 36.8 feet very silty with trace clay below 38 feet
0.0	11.8	40	INTERBEDDED BROWN SILTY CLAY (CL) & CLAYEY SILT (ML) moist, some orange iron staining

(Continuation of Log)

PID Background (ppm)	PID Sample (ppm)	Depth (ft)	Description
		40	
0.0	13.4 1.9	45	LIGHT GRAY & BROWN SILTY GRAVELLY SAND (SW) moist, grains angular to subrounded, 85% quartz, 5% feldspar, 10% other, gravels subangular to rounded, mainly quartzite with some igneous gravel, trace clay
0.0	4.2	50	RED CLAY (CH) moist, trace silt, minor calcite filled voids, worm burrows SANDY GRAVEL (GW) moist, mainly quartzite with some igneous
0.0	16.8 3.4	55	LIGHT GRAY FINE TO MEDIUM SAND (SP) moist, 96% quartz, 2% feldspar, 2% other silty clay 54.3 to 54.5 feet SILTY SANDY GRAVEL (GW) moist, angular to rounded, quartzite and igneous
0.0	8.8 15.0	60	ORANGE-YELLOW & LIGHT GRAY FINE TO COARSE SAND (SW) moist, grains subrounded to well rounded, 95% quartz, 2% feldspar, 3% other, faint cross-bedding ORANGE-YELLOW SANDY GRAVEL (GW) moist, grains subrounded to well rounded, 85% quartz, 5% feldspar, 10% other
		65	seepage encountered at 66 feet
0.0	8.6	70	GRAY SILTY FINE TO MEDIUM SAND (SM) saturated, grains angular to rounded, 98% quartz, 2% other, faint horizontal bedding gravelly 68.5 to 69.3 feet calcite-cemented 69.9 to 70.1 feet
0.0	5.4 26	75	calcite-cemented 74.4 to 74.6 feet
0.0	3.0	80	very silty 80.1 to 80.4 feet

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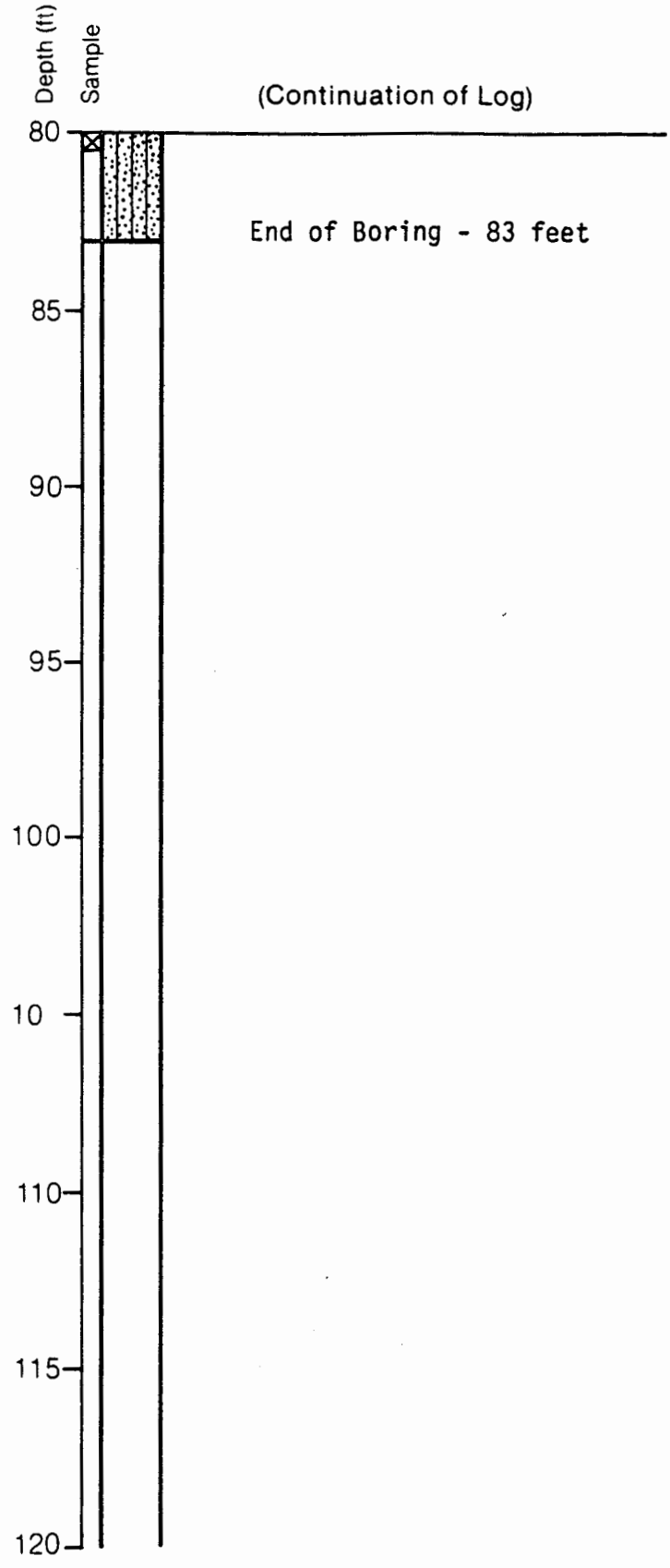
LOG OF BORING B007

Sparton Technology, Inc.
Albuquerque, New Mexico

PLATE **A8**

DRAWN ES. | JOB NUMBER 6310,023.12 | APPROVED TSB | DATE 6/25/86 | REVISED | DATE

008720



Harding Lawson Associates
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& Geophysicists

LOG OF BORING B007 (cont.)
Sparton Technology, Inc.
Albuquerque, New Mexico

PLATE
A9

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
ES.	6310,023.12	TSB	6/25/86		

008721

Equipment Hollow Stem Auger

Elevation 5045.42 **Date** 9/25/85 to 9/26/85

PID Background (ppm)	PID Sample (ppm)	Depth (ft)	Description
		0	SANDY GRAVEL (GW)
			LIGHT BROWN SILTY FINE TO MEDIUM SAND (SM) moist, grains subangular to rounded, 96% quartz, 2% feldspar, 2% other
0.0	7.8	5	
			LIGHT BROWN FINE TO COARSE SAND (SW) moist, grains angular to rounded, 93% quartz, 4% feldspar, 3% other, horizontal bedding
0.0	20	10	trace gravel 9.5 to 10.0 feet, subangular to subrounded
0.0	18.0	15	gravelly 15.2 to 15.3 feet trace gravel 16.8 to 17.5 feet
0.0	16.2 60	20	LIGHT BROWN FINE SAND (SP) moist, grains subrounded to rounded, 97% quartz, 2% feldspar, 1% other, horizontal bedding
		25	silty and clayey 25.3 to 25.8 feet
0.0	63		
			GREEN SILTY FINE SAND (SM) moist, grains angular to rounded, partially cemented by calcite very silty 30.5 to 30.8 feet
0.0	22	30	
0.0	95	35	
			BROWN SANDY SILTY CLAY (CL) moist with red and green staining LIGHT BROWN FINE SAND (SP) moist, grains angular to rounded, 98% quartz, 1.5% feldspar, 0.5% other
0.0	52	40	

(Continuation of Log)

PID Background (ppm)	PID Sample (ppm)	Depth (ft)	Description
		40	LIGHT GREEN-BROWN SILTY FINE SAND (SM) moist, 95% quartz, 3% feldspar, 2% other RED-BROWN SANDY CLAYEY SILT (ML) moist, faint horizontal bedding
0.0	5.4	45	LIGHT GRAY FINE TO COARSE GRAVELLY SAND (SW) moist, grains subangular to well rounded, 92% quartz, 5% feldspar, 3% other, gravel angular to rounded, mainly quartzite and igneous
0.0	12.0	50	clayey 49 to 50 feet
		55	sandy gravel 54 to 58 feet
0.0	19.0	60	no gravel 58.3 to 59 feet
		65	seepage encountered at 66 feet
0.0	38 72	70	LIGHT GRAY SILTY FINE SAND (SM) saturated, grains subangular to rounded, 97% quartz, 2% feldspar 1% other, horizontal bedding gravel 69 to 69.5 feet sandy clay 69.5 to 69.8 feet partially calcite-cemented 69.8 to 70.5 feet
		75	gravelly 75.2 to 76.2 feet BROWN CLAYEY SILT (ML) saturated BROWN SILTY CLAY (CL) saturated End of Boring - 79 feet
		80	

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Engineers Geologists & Geophysicists

LOG OF BORING B008

Sparton Technology, Inc.
Albuquerque, New Mexico

PLATE A10

DRAWN Eg. Kg. | JOB NUMBER 6310,023.12 | APPROVED TSB | DATE 6/25/86 | REVISED | DATE

008722

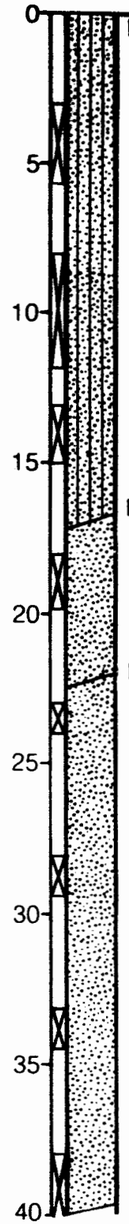
Equipment Hollow Stem Auger

Elevation 5049.6 Date 9/9/85

PID Background (ppm)	PID Sample (ppm)
0.0	0.2
0.0	0.2
0.0	0.2
0.0	0.4
0.0	0.2
0.0	0.5
0.0	0.8
0.0	0.7

Depth (ft): 0, 5, 10, 15, 20, 25, 30, 35, 40

Sample



LIGHT BROWN SILTY FINE SAND (SM)
dry, grains subangular to subrounded, with roots

silty clay layer 10.7 to 11.0 feet

LIGHT BROWN FINE TO COARSE SAND (SW)
dry, grains subrounded to subangular

LIGHT BROWN FINE TO MEDIUM SAND (SP)
dry, grains subangular to subrounded
90% quartz, 5% feldspar, 5% other

(Continuation of Log)

PID Background (ppm)	PID Sample (ppm)
0.0	0.6
0.0	1.4
0.0	0.8
0.0	1.0
0.0	0.8

Depth (ft): 40, 45, 50, 55, 60, 65, 70, 75, 80

Sample

LIGHT GRAY SANDY SILT (ML)
dry

moist below 44 feet

silty clay layer 45 to 45.5 feet
clayey below 45.5 feet with red and black iron staining

LIGHT GRAY MEDIUM TO COARSE SAND (SP)
moist, grains subrounded to well rounded, 80% quartz, 15% feldspar and plagioclase, 5 % other
gravelly with trace silt 48 to 49 feet

LIGHT GRAY SANDY GRAVEL (GP)
moist, gravels subangular to rounded, mainly igneous with some quartzite, grains rounded to well rounded, 85% quartz, 8% plagioclase and feldspar, 7% other
trace silt and clay 50.1 to 51.5 feet
clay balls 58 to 59 feet

LIGHT GRAY SANDY GRAVEL (GW)
moist, gravels and cobbles rounded, mainly quartzite with some igneous, rounded medium sand grains, 95% quartz, 4% feldspar, 1% other

seepage encountered at 67.7 feet

LIGHT GRAY CLAYEY SILT (ML)
saturated

End of Boring - 73 feet

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Engineers Geologists & Geophysicists

LOG OF BORING B009
Sparton Technology, Inc.
Albuquerque, New Mexico

PLATE A11

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
EB	6310,023.12	TSB	6/25/86		

008723

Equipment Hollow Stem Auger

Elevation 5043.5 Date 9/10/85 to 9/11/85

PID Background (ppm)	PID Sample (ppm)	Depth (ft)	Description
0.0	0.7	0	LIGHT BROWN SILTY FINE TO MEDIUM SAND (SM) dry, grains subrounded to angular, 75% quartz, 20% feldspar, 5% other, trace gravel no gravel 2.5 to 4.0 feet
0.0	1.0	5	
0.0	1.0	10	coarse below 11 feet subrounded cobbles below 12 feet driller's note: cobbles in 3-4" layers, penetrated several layers 13 to 18 feet
0.0	10.0	15	SANDY CLAYEY SILT (ML) dry, grains rounded
0.0	2.8	20	
0.0	4.0	25	LIGHT BROWN FINE TO MEDIUM SAND (SP) dry, grains subangular to rounded, 90% quartz, 8% feldspar, 2% other
0.0	5.0	30	LIGHT BROWN SILTY SAND (SM) dry, grains subangular to rounded, 90% quartz, 8% feldspar, 2% other
0.0	0.1 *	35	LIGHT GRAY FINE TO COARSE SAND (SW) dry, grains subangular to subrounded 80% quartz, 15% feldspar, 5% other
		40	

(Continuation of Log)

PID Background (ppm)	PID Sample (ppm)	Depth (ft)	Description
0.0	0.4 *	40	
0.0	1.8	45	gravelly 47 to 48.5 feet
0.0	0.0	50	LIGHT BROWN SILTY FINE SAND (SM) moist, grains angular to subangular, 80% quartz, 15% feldspar, 5% other, trace gravel LIGHT BROWN GRAVELLY FINE TO COARSE SAND (SW) moist, grains subangular to rounded, 65% quartz, 25% feldspar and plagioclase, 10% other, gravel angular to rounded, mainly quartzite with some igneous trace silty clay and iron staining 54 to 54.4 feet seepage encountered at 60.5 feet
		55	
		60	
0.0	52	65	LIGHT BROWN CLAYEY SILT (ML) saturated, trace sand GREEN GRAY SILTY CLAY (CL) saturated, blocky End of Boring - 68.3 feet * HNU meter probably was not working properly. The intake fan was clogging.
		70	
		75	
		80	

Harding Lawson Associates
Engineers, Geologists & Geophysicists

LOG OF BORING B010
Sparton Technology, Inc.
Albuquerque, New Mexico

PLATE A12

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
EB	6310,023.12	TSB	6/25/86		

008724

Equipment Hollow Stem Auger

Elevation 5043.49 Date 9/12/85

PID Background (ppm)	PID Sample (ppm)	Depth (ft)	Description
		0	ASPHALT 2-INCHES THICK LIGHT BROWN SILTY FINE TO MEDIUM SAND (SM) dry, grains angular to subangular, 75% quartz, 20% feldspar, 5% other
0.0	0.0	5	
			LIGHT BROWN FINE TO COARSE SAND (SW) dry, grains subangular to subrounded, 85% quartz, 10% feldspar, 5% other, trace silt
0.0	0.0	10	thin caliche-cemented layer at 9 feet
0.0	0.0	15	gravelly 14 to 19 feet
0.0	0.0	20	LIGHT BROWN FINE TO MEDIUM SILTY SAND (SM) dry, grains subangular to subrounded, 85% quartz, 12% feldspar, 3% other clayey 22 to 22.9 feet
0.0	0.0	25	
0.0	0.0	30	LIGHT BROWN & GRAY SANDY SILT (ML) dry, grains angular to subrounded clayey 30.9 to 31.3 feet
0.0	0.2	35	LIGHT BROWN SILTY FINE TO MEDIUM SAND (SM) dry, grains angular to subrounded, 80% quartz, 18% feldspar, 2% other very silty 35.7 to 36.0 feet
0.0	0.1	40	

(Continuation of Log)

PID Background (ppm)	PID Sample (ppm)	Depth (ft)	Description
		40	
0.0	0.8	45	trace silt 43.5 to 45.5 feet
0.0	2.0	50	trace coarse sand grains 48 to 49.5 feet moist below 50.5 feet silty clay layer 51.5 to 51.7 feet
0.0	1.2	55	LIGHT BROWN SANDY SILT (ML) moist, grains angular to subrounded LIGHT GRAY MEDIUM TO COARSE SAND (SP) moist, grains subrounded to rounded, 92% quartz, 4% feldspar, 4% other
0.0	0.1	60	seepage encountered at 62.5 feet brown and trace silt below 62.5 feet
0.0	0.0	65	
0.0	0.0	70	
0.0	0.0	75	BROWN SANDY SILT (ML) saturated, grains angular to rounded, 90% quartz, 7% feldspar, 3% other, trace well rounded gravel clayey below 76.5 feet End of Boring - 77.7 feet
		80	

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Engineers, Geologists & Geophysicists

LOG OF BORING B011
Sparton Technology, Inc.
Albuquerque, New Mexico

PLATE A13

DRAWN EB. JOB NUMBER 6310,023.12 APPROVED TSB DATE 6/25/86 REVISED DATE

008725

Equipment Hollow Stem Auger

Elevation 5045.8 Date 9/27/85

Depth (ft) | Sample

0

No samples taken above 67.5 feet
BROWN & GRAY SAND

5

10

15

20

25

30

35

sand and gravel below 35 feet

40

(Continuation of Log)

Depth (ft) | Sample

40

45

50

55

60

65

BROWN GRAVELLY FINE TO COARSE SAND (SW)
saturated, grains subangular to rounded,
88% quartz, 6% feldspar, 6% other, gravel
angular to rounded, mainly igneous with some
quartzite, trace silt

silty and clayey 73.3 to 73.5 feet

silty and clayey 74.9 to 75.3 feet

70

INTERBEDDED BROWN CLAYEY SILT (ML) & SILTY CLAY (CL)
saturated, horizontal bedding

75

LIGHT BROWN SILTY FINE SAND (SM)
saturated
thin caliche-cemented layers 79 to 79.5 feet
silty clay stringers 79.9 to 80.4 feet

80

driller's note: trace odor of solvents during grouting

End of Boring - 80.4 feet

HLA Harding Lawson Associates
Engineers, Geologists & Geophysicists

LOG OF BORING B012
Sparton Technology, Inc.
Albuquerque, New Mexico

PLATE A14

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
EB.	6310,023.12	TSB	6/25/86		

008726

Appendix A-2

Construction of MW-18

Equipment Hollow Stem Auger

Elevation — Date 5/22/86

PID Background (ppm)	PID Sample (ppm)
0.4	0.4
0.4	0.4
0.4	0.4
0.4	0.4
0.4	0.4
0.4	0.4
0.4	0.4
0.4	0.6

Depth (ft): 0, 5, 10, 15, 20, 25, 30, 35, 40

Sample

LIGHT BROWN FINE TO MEDIUM SAND (SW)
dry, trace silt, grains rounded to well rounded, 85% quartz, 15% feldspar

LIGHT GRAY FINE TO COARSE SAND (SW)
moist, grains angular to subrounded
94% quartz, 5% feldspar, 1% other

gravel 15.5 to 16 feet

trace silt 18 to 21 feet

below 28 feet grains, rounded to well rounded, 95% quartz, 3% feldspar, 2% other

clayey and silty 38 to 38.7
BROWN SILTY CLAY (CL)
saturated, sandy 39.5 to 40 feet

(Continuation of Log)

PID Background (ppm)	PID Sample (ppm)
0.6	0.4
06.	0.5
0.6	0.4
0.6	0.5
0.6	0.6
0.6	1.8
0.6	4.2
0.5	1.6
0.5	1.6

Depth (ft): 40, 45, 50, 55, 60, 65, 70, 75, 80

Sample

GRAY SANDY GRAVEL (GW)
gravel subrounded to rounded, mainly quartzite and vein quartz

GRAY FINE TO COARSE SAND (SW)
moist, grains rounded to well rounded, 92% quartz, 6% feldspar, 2% other, horizontal bedding

Gray Sandy Gravel (GW)
moist, medium to coarse, grains subangular to rounded, 80% quartz, 16% feldspar, 4% other, cobbles and gravel subrounded to rounded, mainly quartzite and vein quartz with some basalt and granite

trace iron staining at 53 feet

GRAY FINE TO MEDIUM SAND (SW)
saturated, grains subangular to rounded, 95% quartz, 4% feldspar, 1% other, faint cross-bedding

clayey silt 69.2 to 69.5 feet

GRAY FINE SAND (SP)
saturated, trace silt, grains angular to rounded, 96% quartz, 2% feldspar, 2% other, faint horizontal bedding

1 inch caliche-cemented layer at 74 feet

GRAY SILTY SAND (SM)
saturated, grains subangular to subrounded, 96% quartz, 3% feldspar, 1% other

HLA Harding Lawson Associates
Engineers, Geologists & Geophysicists

LOG OF BORING MW-18
Sparton Technology, Inc.
Albuquerque, New Mexico

PLATE A15

DRAWN Ed. | JOB NUMBER 6310,031.12 | APPROVED TSB | DATE 6/25/86 | REVISED | DATE

008728

PID Background (ppm)	PID Sample (ppm)	Depth (ft)	Sample	(Continuation of Log)
0.5	1.6	80		GRAY FINE TO MEDIUM SAND (SW) saturated, trace silt, grains subangular to rounded, 94% quartz, 4% feldspar, 2% other
				End of Boring 81 feet
		85		Note: Above 43 feet the 11.7 ev PID probe was used. Below 43 feet the 10.2 ev PID probe was used.
		90		
		95		
		100		
		10		
		110		
		115		
		120		

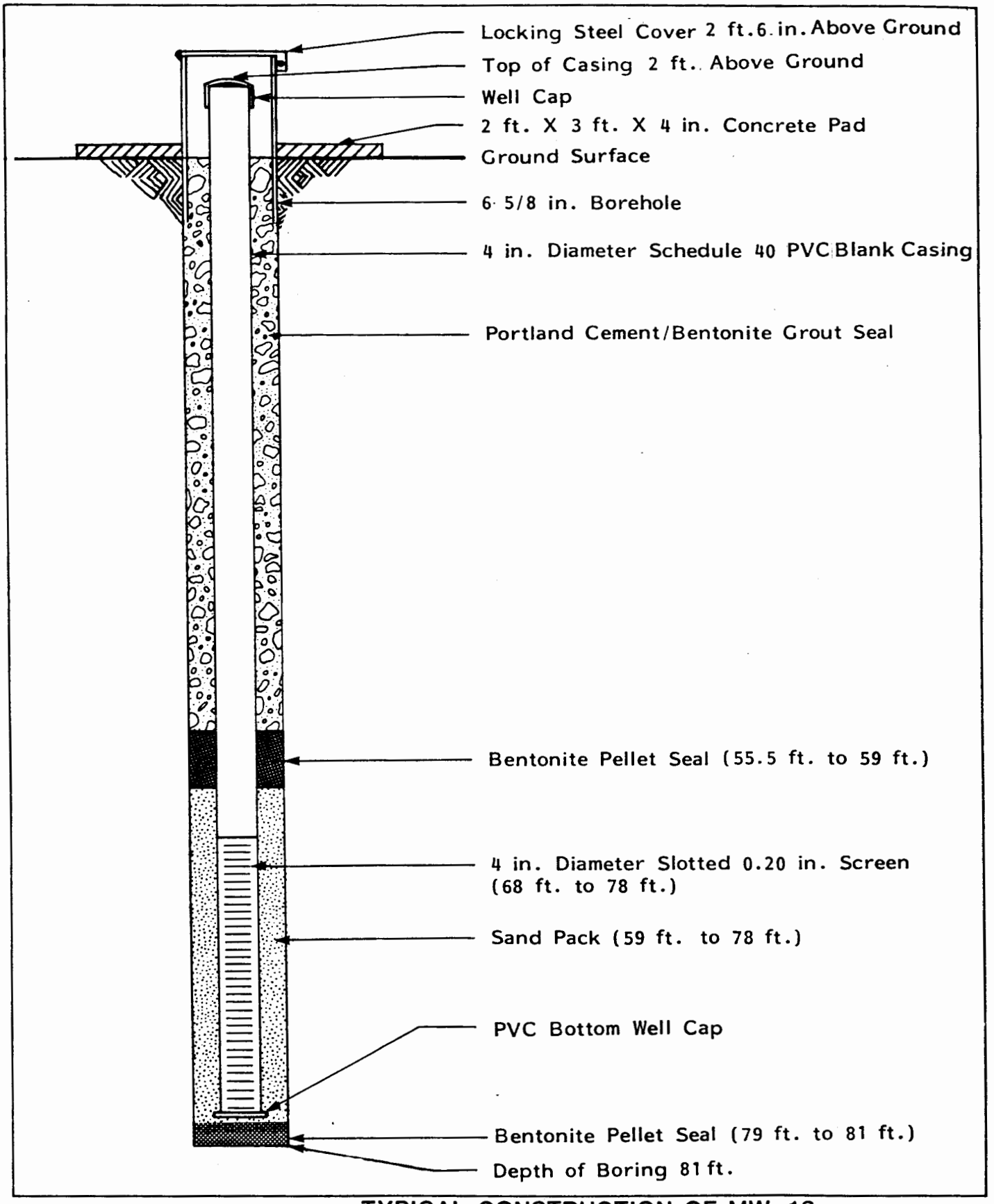
Harding Lawson Associates
Engineers, Geologists & Geophysicists

LOG OF BORING MW-18 (cont.)

Sparton Technology, Inc.
Albuquerque, New Mexico

PLATE **A16**

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
EB	6310,031.12	TSB	6/25/86		



Harding Lawson Associates
Engineers Geologists & Geophysicists

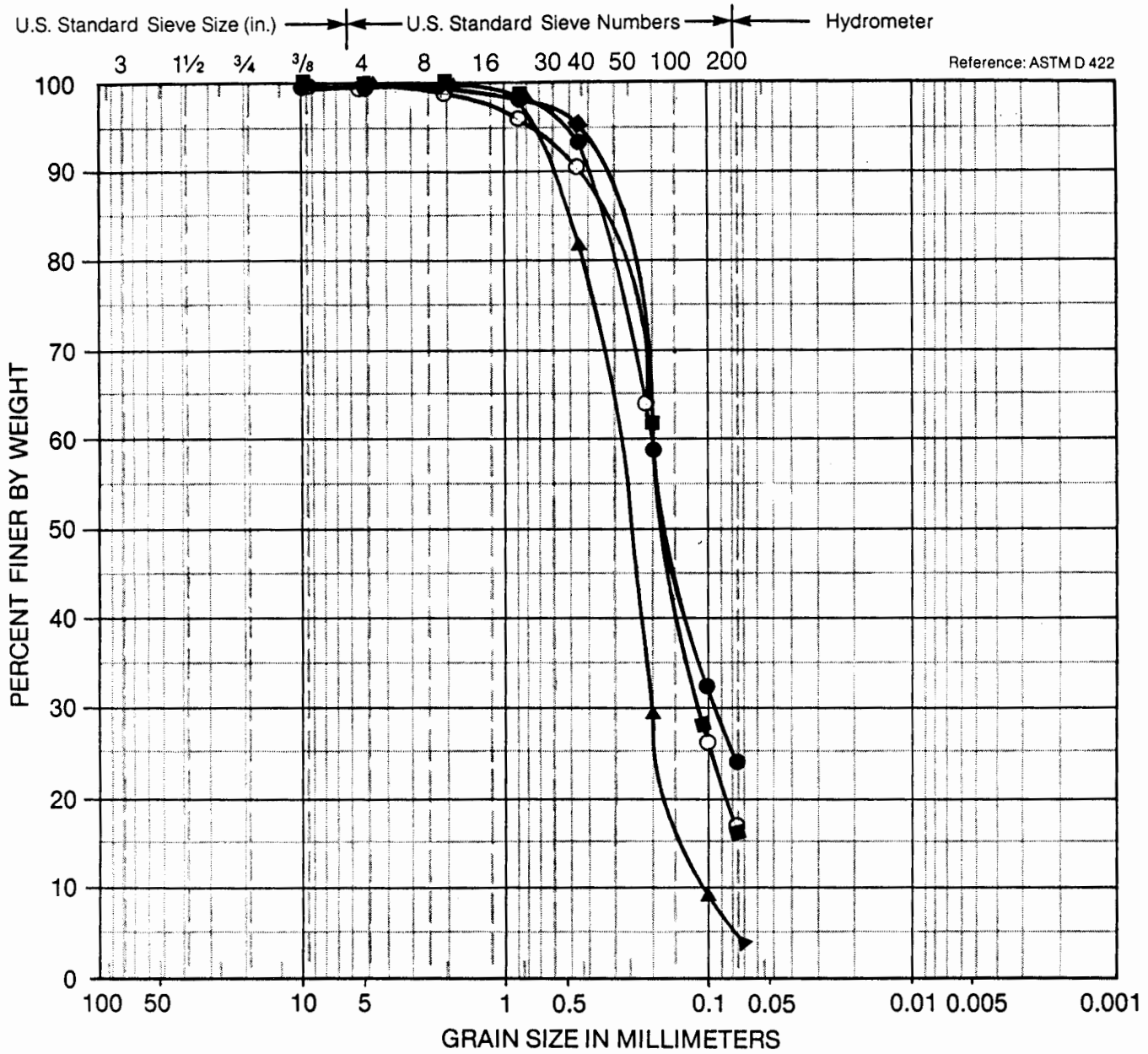
TYPICAL CONSTRUCTION OF MW-18

Sparton Technology, Inc.
Albuquerque, New Mexico

PLATE **A17**

DRAWN	JOB NUMBER	APPR.	DATE	REVISED	DATE
MR	6310,023.12	TSB	6/25/86	JB	6/30/86

008730



COBBLES	COARSE	FINE	COARSE	MEDIUM	FINE	SILT OR CLAY
	GRAVEL		SAND			

Symbol	Sample Source	Classification
■	B-18 @ 16 - 16.8 feet	BROWN SILTY SAND (SM)
▲	B-18 @ 34 - 35.5 feet	TAN POORLY GRADED SAND (SP)
●	B-18 @ 65 - 65.8 feet	BROWN SILTY SAND (SM)
○	B-18 @ 74 - 75 feet	BROWN SILTY SAND (SM)

Harding Lawson Associates
Engineers, Geologists
& Geophysicists

Particle Size Analysis

Sparton Technology, Inc.
Albuquerque, New Mexico

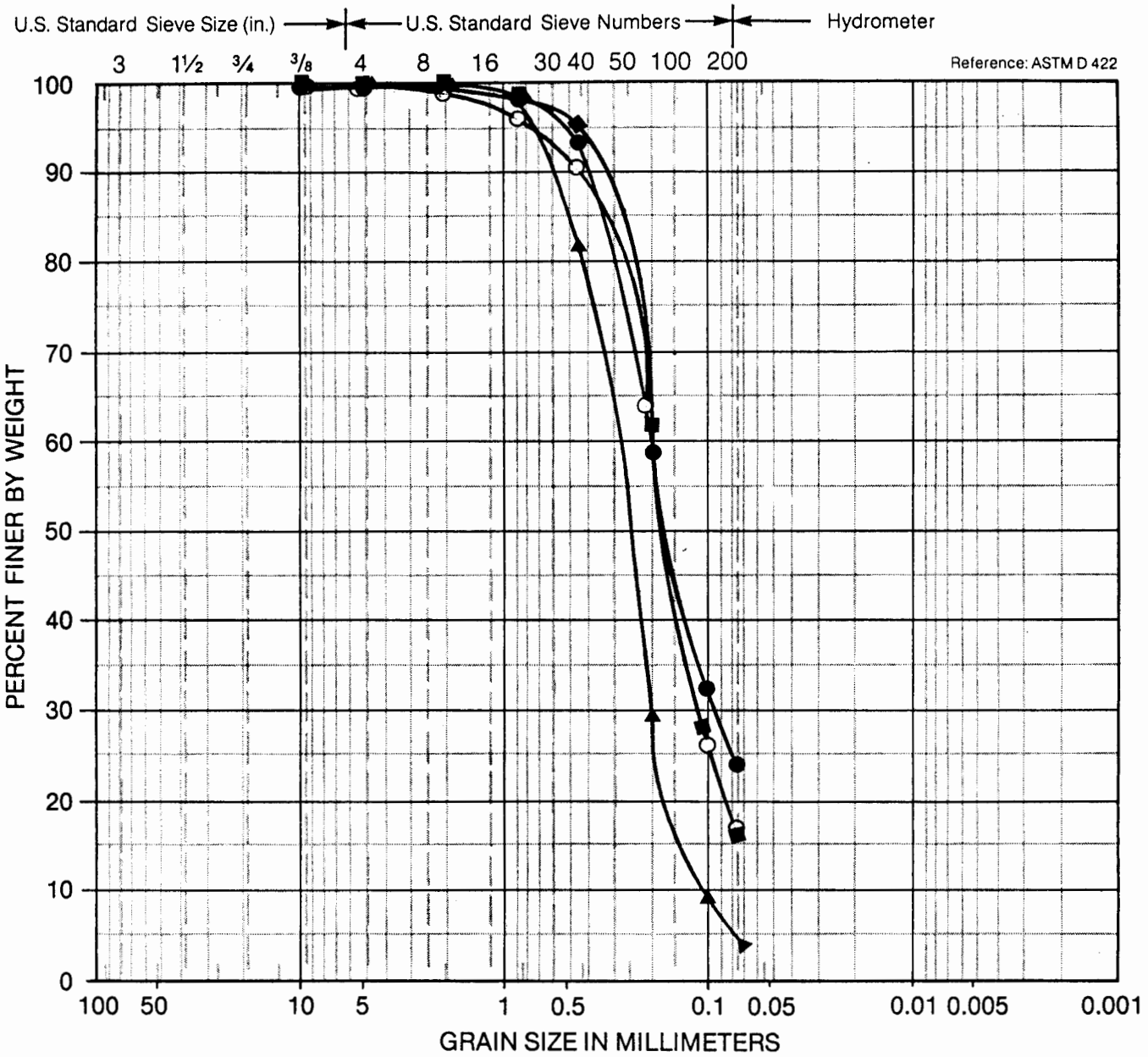
PLATE
A18

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
Es.	6310,023.12	TSB	6/25/86		

008731

Appendix A-3

Particle Size Analysis



COBBLES	COARSE	FINE	COARSE	MEDIUM	FINE	SILT OR CLAY
	GRAVEL		SAND			

Symbol	Sample Source	Classification
■	B-18 @ 16 - 16.8 feet	BROWN SILTY SAND (SM)
▲	B-18 @ 34 - 35.5 feet	TAN POORLY GRADED SAND (SP)
●	B-18 @ 65 - 65.8 feet	BROWN SILTY SAND (SM)
○	B-18 @ 74 - 75 feet	BROWN SILTY SAND (SM)

Harding Lawson Associates
Engineers, Geologists & Geophysicists

Particle Size Analysis
Sparton Technology, Inc.
Albuquerque, New Mexico

PLATE A18

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
Ed.	6310,023.12	SB	6/25/86		

008733

Appendix B. Chemical Laboratory Investigation

1. Sample Identification
2. Analytical Results

Appendix B-1

Sample Identification

SAMPLE DESCRIPTION INFORMATION

for

Sparton Technology

RMA Sample No.	Sample Description	Sample Type	Date Sampled	Date Receiv
51324-01	6310,023.12 4-5' A & B	Soil	9/4/85	9/5/85
51324-02	6310,023.12 9-10' A & B	Soil	9/4/85	9/5/85
51324-03	6310,023.12 14-15' A & B	Soil	9/4/85	9/5/85
51324-04	6310,023.12 18-18.5' A & B	Soil	9/4/85	9/5/85
51324-05	6310,023.12 24-25' A & B	Soil	9/4/85	9/5/85
51324-06	6310,023.12 30.5-31.5' A & B	Soil	9/4/85	9/5/85
51324-07	6310,023.12 35-36' A & B	Soil	9/4/85	9/5/85
51324-08	6310,023.12 39-40' A & B	Soil	9/5/85	9/6/85
51324-09	6310,023.12 44-45' A & B	Soil	9/5/85	9/6/85
51324-10	6310,023.12 47.5-52' A & B	Soil	9/5/85	9/6/85
51324-11	6310,023.12 54.5-55.5' A & B	Soil	9/5/85	9/6/85
51324-12	6310,023.12 58.5-59' A & B	Soil	9/5/85	9/6/85
51324-13	6310,023.12 63-64' A & B	Soil	9/5/85	9/6/85
51324-14	6310,023.12 37.3-52.3; 55.5-56.5'	Soil	9/5/85	9/6/85
51324-15	6310,023.12 5.0-5.5' A & B	Soil	9/9/85	9/10/85
51324-16	6310,023.12 11-11.5' A & B	Soil	9/9/85	9/10/85
51324-17	6310,023.12 13.5-14.5' A & B	Soil	9/9/85	9/10/85
51324-18	6310,023.12 18.5-19.5' A & B	Soil	9/9/85	9/10/85
51324-19	6310,023.12 23-24' A & B	Soil	9/9/85	9/10/85
51324-20	6310,023.12 28-33' A & B	Soil	9/9/85	9/10/85
51324-21	6310,023.12 33.5-34.5' A & B	Soil	9/9/85	9/10/85
51324-22	6310,023.12 39-39.5' A & B	Soil	9/9/85	9/10/85

SAMPLE DESCRIPTION INFORMATION

for

Sparton Technology

RMA Sample No.	Sample Description	Sample Type	Date Sampled	Date Received
51324-23	6310,023.12 44-45' A & B	Soil	9/9/85	9/10/85
51324-24	6310,023.12 49-50' A & B	Soil	9/9/85	9/10/85
51324-25	6310,023.12 53-54.5' A & B	Soil	9/9/85	9/10/85
51324-26	6310,023.12 58-59' A & B	Soil	9/9/85	9/10/85
51324-27	6310,023.12 65-66' A & B	Soil	9/9/85	9/10/85
51324-28	6310,023.12 4.5-5.5' A & B	Soil	9/10/85	9/11/85
51324-29	6310,023.12 10-11' A & B	Soil	9/10/85	9/11/85
51324-30	6310,023.12 13.5-14.5' A & B	Soil	9/10/85	9/11/85
51324-31	6310,023.12 18.3-19' A & B	Soil	9/10/85	9/11/85
51324-32	6310,023.12 30.5-31.5' A & B	Soil	9/10/85	9/11/85
51324-33	6310,023.12 35.5-36.5' A & B	Soil	9/10/85	9/11/85
51324-34	6310,023.12 38.3-39' A & B	Soil	9/11/85	9/12/85
51324-35	6310,023.12 44.5-45.5' A & B	Soil	9/11/85	9/12/85
51324-36	6310,023.12 49-50' A & B	Soil	9/11/85	9/12/85
51324-37	6310,023.12 53.5-54.5' A & B	Soil	9/11/85	9/12/85
51324-38	6310,023.12 58.5-59.5' A & B	Soil	9/11/85	9/12/85
51324-39	6310,023.12 66.3-67' A & B	Soil	9/11/85	9/12/85
51324-40	6310,023.12 4.5-5.5' A & B	Soil	9/12/85	9/13/85
51324-41	6310,023.12 9-10' A & B	Soil	9/12/85	9/13/85
51324-42	6310,023.12 14-15' A & B	Soil	9/12/85	9/13/85
51324-43	6310,023.12 19.5-20.5' A & B	Soil	9/12/85	9/13/85
51324-44	6310,023.12 24.5-25.5' A & B	Soil	9/12/85	9/13/85

SAMPLE DESCRIPTION INFORMATION

for

Sparton Technology

RMA Sample No.	Sample Description	Sample Type	Date Sampled	Date Receiv
51324-67	6310,023.12 44-44.5' A & B	Soil	9/17/85	9/18/85
51324-68	6310,023.12 49-50' A & B	Soil	9/17/85	9/18/85
51324-69	6310,023.12 59-59.5' A & B	Soil	9/17/85	9/18/85
51324-70	6310,023.12 4.5-5.5' A & B	Soil	9/18/85	9/19/85
51324-71	6310,023.12 10.5-11' A & B	Soil	9/18/85	9/19/85
51324-72	6310,023.12 15-16' A & B	Soil	9/18/85	9/19/85
51324-73	6310,023.12 18.2-18.8' A & B	Soil	9/18/85	9/19/85
51324-74	6310,023.12 25-26' A & B	Soil	9/18/85	9/19/85
51324-75	6310,023.12 30-31' A & B	Soil	9/18/85	9/19/85
51324-76	6310,023.12 35.5-36.5' A & B	Soil	9/18/85	9/19/85
51324-77	6310,023.12 39-40' A & B	Soil	9/19/85	9/20/85
51324-78	6310,023.12 43-44' A & B	Soil	9/19/85	9/20/85
51324-79	6310,023.12 49.5-50.5' A & B	Soil	9/19/85	9/20/85
51324-80	6310,023.12 57-57.5' A & B	Soil	9/19/85	9/20/85
51324-81	6310,023.12 58.5-59.5' A & B	Soil	9/19/85	9/20/85
51324-82	6310,023.12 5-6' A & B	Soil	9/20/85	9/21/85
51324-83	6310,023.12 9-10' A & B	Soil	9/20/85	9/21/85
51324-84	6310,023.12 14.5-15.5' A & B	Soil	9/20/85	9/21/85
51324-85	6310,023.12 20.5-21.5' A & B	Soil	9/20/85	9/21/85
51324-86	6310,023.12 24.5-25.5' A & B	Soil	9/21/85	9/23/85
51324-87	6310,023.12 30-31' A & B	Soil	9/21/85	9/23/85
51324-88	6310,023.12 35-36' A & B	Soil	9/21/85	9/23/85

SAMPLE DESCRIPTION INFORMATION

for

Sparton Technology

RMA Sample No.	Sample Description	Sample Type	Date Sampled	Date Receiv
51324-89	6310,023.12 40.5-41.5' A & B	Soil	9/21/85	9/23/85
51324-90	6310,023.12 44-44.5' A & B	Soil	9/21/85	9/23/85
51324-91	6310,023.12 48.3-49.3' A & B	Soil	9/21/85	9/23/85
51324-92	6310,023.12 53.5-55' A & B	Soil	9/21/85	9/23/85
51324-93	6310,023.12 58-59.2' A & B	Soil	9/21/85	9/23/85
51324-94	6310,023.12 4.5-5.5' A & B	Soil	9/23/85	9/24/85
51324-95	6310,023.12 10-11' A & B	Soil	9/23/85	9/24/85
51324-96	6310,023.12 15-15.5' A & B	Soil	9/23/85	9/24/85
51324-97	6310,023.12 20.5-21' A & B	Soil	9/23/85	9/24/85
51324-98	6310,023.12 25.5-26' A & B	Soil	9/23/85	9/24/85
51324-99	6310,023.12 30.5-31.5' A & B	Soil	9/23/85	9/24/85
51324-100	6310,023.12 35-36' A & B	Soil	9/23/85	9/24/85
51324-101	6310,023.12 39.5-40.5' A & B	Soil	9/23/85	9/24/85
51324-102	6310,023.12 43.1-44.2' A & B	Soil	9/23/85	9/24/85
51324-103	6310,023.12 54.2-54.7' A & B	Soil	9/23/85	9/24/85
51324-104	6310,023.12 58.2-59.4' A & B	Soil	9/23/85	9/24/85
51324-105*	6310,023.12 4-5' A & B	Soil	9/24/85	9/25/85
51324-106	6310,023.12 9-10' A & B	Soil	9/24/85	9/25/85
51324-107	6310,023.12 13.5-14' A & B	Soil	9/24/85	9/25/85
51324-108	6310,023.12 20-21' A & B	Soil	9/24/85	9/25/85
51324-109	6310,023.12 25.5-26' A & B	Soil	9/24/85	9/25/85
51324-110	6310,023.12 29-30' A & B	Soil	9/24/85	9/25/85

SAMPLE DESCRIPTION INFORMATION

for

Sparton Technology

RMA Sample No.	Sample Description	Sample Type	Date Sampled	Date Receive
51324-111	6310,023.12 35-36' A & B	Soil	9/24/85	9/25/85
51324-112	6310,023.12 40-41' A & B	Soil	9/24/85	9/25/85
51324-113	6310,023.12 44-45' A & B	Soil	9/24/85	9/25/85
51324-114	6310,023.12 48.5-49' A & B	Soil	9/25/85	9/26/85
51324-115	6310,023.12 53-53.5' A & B	Soil	9/25/85	9/26/85
51324-116	6310,023.12 5.5-6.5' A & B	Soil	9/26/85	9/27/85
51324-117	6310,023.12 10.5-11.5' A & B	Soil	9/26/85	9/27/85
51324-118	6310,023.12 15.5-16.5' A & B	Soil	9/26/85	9/27/85
51324-119	6310,023.12 20.5-21' A & B	Soil	9/26/85	9/27/85
51324-120	6310,023.12 27-27.5' A & B	Soil	9/26/85	9/27/85
51324-121	6310,023.12 29.5-30.5' A & B	Soil	9/26/85	9/27/85
51324-122	6310,023.12 36.5-37.5' A & B	Soil	9/26/85	9/27/85
51324-123	6310,023.12 41.5-42.5' A & B	Soil	9/26/85	9/27/85
51324-124	6310,023.12 49-49.7' A & B	Soil	9/26/85	9/27/85
51324-125	6310,023.12 58.3-59' A & B	Soil	9/26/85	9/27/85
51324-126	6310,023.12 59.3-60.3' A & B	Soil	9/26/85	9/27/85
51324-127	6310,023.12 26-28', 29-30.5', 34-37.5' A & B	Soil	9/26/85	9/27/85

January 29, 1986

Appendix B-2

Analytical Results

REPORT OF ANALYTICAL DATA

FOR

HARDING LAWSON ASSOCIATES

Prepared by:

Rocky Mountain Analytical Laboratory
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January 29, 1986

SPARTON TECHNOLOGY

BORE 001

TABLE 1. TOTAL ORGANIC HALOGEN (TOX) RESULTS - BORE 001

Bore Depth (ft.)	Detection Limit (mg/kg)	TOX Conc. (mg/kg)
4.0-5.0	2	ND
9.0-10.0	2	ND
14.0-15.0	2	ND
18.0-18.5	2	ND
24.0-25.0	2	ND
30.5-31.5	2	ND
35.0-36.0	2	ND
39.0-40.0	2	ND
44.0-45.0	2	ND
47.5-52.0	2	ND
52.5-53.0	2	NR
54.5-56.5	2	ND
58.0-59.0	2	ND
63.0-64.0	2	ND

ND = Not Detected. NR = Not Received.

TABLE 2. TOTAL METALS RESULTS - BORE 001

	Concentration (mg/kg)			
Bore Depth (ft.)	Cadmium	Chromium	Lead	Nickel
4.0-5.0	ND	1.8	4.0	2.1
9.0-10.0	ND	1.9	3.0	2.2
14.0-15.0	ND	1.8	3.0	1.6
18.0-18.5	ND	2.5	3.0	2.2
24.0-25.0	ND	1.6	4.0	2.0
30.5-31.5	ND	1.7	3.0	2.0
35.0-36.0	ND	2.2	4.0	2.3
39.0-40.0	ND	2.2	3.0	2.3
44.0-45.0	ND	1.6	3.0	2.7
47.5-52.0	ND	2.4	4.0	2.6
52.5-53.0	ND	NR	NR	NR
54.5-56.5	ND	2.4	4.0	2.8
58.0-59.0	ND	1.6	3.0	2.0
63.0-64.0	ND	1.3	3.0	2.0
Detection Limit	1.0	0.5	2.5	1.0
RCRA MCL	1.0	5.0	5.0	NA

ND = Not Detected. NR = Not Received. NA = Not Applicable.
MCL = Maximum Contaminant Level.

TABLE 3. EP TOXICITY RCRA METALS - BORE 001

Bore Depth (ft)	Concentration (mg/L)					
	Cadmium	Chromium	Lead	Nickel	Hexavalent Chromium	Trivalent Chromium
4.0-5.0	ND	ND	ND	ND	ND	ND
18.0-18.5	0.005	ND	ND	ND	ND	ND
47.5-52.0	0.005	0.009	ND	0.063	ND	ND
54.5-56.5	ND	ND	ND	ND	ND	ND
Detection Limit	0.004	0.005	0.025	0.01	0.01	0.01
RCRA MCL	1.0	5.0	5.0	NA	NA	NA

ND = Not Detected. NA = Not Applicable.
MCL = Maximum Contaminant Level.

TABLE 4. VOLATILE ORGANICS- BORE 001

Parameter	Concentration (ug/kg) Detection Limit	Bore Depth 58.9-59.0'
Acetone	10	BDL
Benzene	5	BDL
Bromoform	5	BDL
Methyl bromide	10	BDL
2-Butanone	10	BDL
Carbon disulfide	5	BDL
Carbon tetrachloride	5	BDL
Chlorobenzene	5	BDL
Chlorodibromomethane	5	BDL
Chloroethane	10	BDL
2-Chloroethylvinyl ether	10	BDL
Chloroform	5	BDL
Methyl chloride	10	BDL
Dichlorobromomethane	5	BDL
1,1-Dichloroethane	5	BDL
1,2-Dichloroethane	5	BDL
1,1-Dichloroethylene	5	BDL
1,2-Dichloropropane	5	BDL
cis-1,3-Dichloropropylene	5	BDL
trans-1,3-Dichloropropylene	5	BDL
Ethylbenzene	5	BDL
2-Hexanone	10	BDL
Methylene chloride	10	BDL
4-Methyl-2-pentanone	10	BDL
Styrene	5	BDL
1,1,2,2-Tetrachloroethane	5	BDL
Tetrachloroethylene	5	BDL
Toluene	5	BDL
1,2-trans-Dichloroethylene	5	BDL
1,1,1-Trichloroethane	5	BDL
1,1,2-Trichloroethane	5	BDL
Trichloroethylene	5	BDL
Vinyl acetate	10	BDL
Vinyl chloride	10	BDL
Total xylenes	5	BDL
Percent Moisture	0.1	6.2

BDL = Below Detection Limit

SPARTON TECHNOLOGY

BORE 002

TABLE 1. TOTAL ORGANIC HALOGEN (TOX) RESULTS - BORE 002

Bore Depth (ft.)	Detection Limit (mg/kg)	TOX Conc. (mg/kg)
4.5-5.5	2	ND
10.5-11.5	2	ND
14.5-15.5	2	ND
19.5-20.5	2	ND
30.0-31.0	2	ND
35.0-35.5	2	ND
40.0-41.0	2	ND
44.0-44.5	2	ND
49.0-50.0	2	ND
59.0-59.5	2	3

ND = Not Detected.

TABLE 2. PURGEABLE ORGANICS RESULTS - BORE 002

	Concentration (ug/kg)	
Parameter	Detection Limit	TOX 59.0-59.5'
1,1-Dichloroethylene	0.5	ND
1,2-trans-Dichloroethylene	0.5	ND
1,1,1-Trichloroethane	0.5	ND
Trichloroethylene	0.5	ND

ND = Not Detected.

008748

TABLE 3. TOTAL METALS RESULTS - BORE 002

Bore Depth (ft)	Concentration (mg/kg) Cadmium	Chromium	Lead	Nickel
4.5-5.5	ND	2.8	3.0	2.0
10.0-11.5	ND	3.0	5.5	2.6
14.5-15.5	ND	2.9	4.0	2.0
19.5-20.5	ND	2.4	4.0	2.0
30.0-31.0	ND	2.6	ND	2.3
35.0-35.5	ND	6.6	5.7	5.3
40.0-41.0	ND	7.1	7.2	8.2
44.0-44.5	ND	2.2	ND	2.0
49.0-50.0	ND	4.9	4.0	5.3
59.0-59.5	ND	3.1	3.0	3.3
Detection Limits	1.0	0.5	2.5	1.0
RCRA MCL	1.0	5.0	5.0	NA

ND = Not Detected. NR = Not Received. NA = Not Applicable.
MCL = Maximum Contaminant Level.

TABLE 4. EP TOXICITY RCRA METALS - BORE 002

Bore Depth (ft)	Concentration (mg/L) Cadmium	Chromium	Lead	Nickel	Hexavalent Chromium	Trivalent Chromium
10.5-11.5	ND	0.026	ND	ND	ND	0.026
35.0-35.5	ND	0.088	ND	ND	0.02	0.068
40.0-41.0	ND	0.011	ND	0.028	ND	0.01
49.0-50.0	ND	0.012	ND	0.029	ND	0.01
59.0-59.5	ND	ND	ND	ND	ND	ND
Detection Limit	0.004	0.005	0.025	0.01	0.01	0.01
RCRA MCL	1.0	5.0	5.0	NA	NA	NA

ND = Not Detected. NA = Not Applicable.
MCL = Maximum Contaminant Level.

008749

TABLE 5. VOLATILE ORGANICS- BORE 002

Parameter	Detection limit	Concentration (ug/kg) Bore Depth 35.0-35.5'	Bore Depth 40.0-41.0'	Bore Depth 44.0-44.5'
Acetone	10	BDL	BDL	BDL
Benzene	5	BDL	BDL	BDL
Bromoform	5	BDL	BDL	BDL
Methyl bromide	10	BDL	BDL	BDL
2-Butanone	10	BDL	BDL	BDL
Carbon disulfide	5	BDL	BDL	BDL
Carbon tetrachloride	5	BDL	BDL	BDL
Chlorobenzene	5	BDL	BDL	BDL
Chlorodibromomethane	5	BDL	BDL	BDL
Chloroethane	10	BDL	BDL	BDL
2-Chloroethylvinyl ether	10	BDL	BDL	BDL
Chloroform	5	BDL	BDL	BDL
Methyl chloride	10	BDL	BDL	BDL
Dichlorobromomethane	5	BDL	BDL	BDL
1,1-Dichloroethane	5	BDL	BDL	BDL
1,2-Dichloroethane	5	BDL	BDL	BDL
1,1-Dichloroethylene	5	BDL	BDL	BDL
1,2-Dichloropropane	5	BDL	BDL	BDL
cis-1,3-Dichloropropylene	5	BDL	BDL	BDL
trans-1,3-Dichloropropylene	5	BDL	BDL	BDL
Ethylbenzene	5	BDL	BDL	BDL
2-Hexanone	10	BDL	BDL	BDL
Methylene chloride	10	BDL	BDL	BDL
4-Methyl-2-pentanone	10	BDL	BDL	BDL
Styrene	5	BDL	BDL	BDL
1,1,2,2-Tetrachloroethane	5	BDL	BDL	BDL
Tetrachloroethylene	5	BDL	BDL	BDL
Toluene	5	BDL	BDL	BDL
1,2-trans-Dichloroethylene	5	BDL	BDL	BDL
1,1,1-Trichloroethane	5	BDL	BDL	BDL
1,1,2-Trichloroethane	5	BDL	BDL	BDL
Trichloroethylene	5	BDL	BDL	BDL
Vinyl acetate	10	BDL	BDL	BDL
Vinyl chloride	10	BDL	BDL	BDL
Total xylenes	5	BDL	BDL	BDL
Percent Moisture	0.1	12.0	15.5	2.7

BDL = Below Detection Limit

008750

SPARTON TECHNOLOGY

BORE 003

TABLE 1. TOTAL ORGANIC HALOGEN (TOX) RESULTS - BORE 003

Bore Depth (ft.)	Detection Limit (mg/kg)	TOX Conc. (mg/kg)
4.5-5.5	2	2
20.5-21.5	2	ND
25.0-25.5	2	ND
30.0-31.0	2	3
35.5-36.0	2	3
39.4-40.5	2	3
44.0-45.0	2	4
48.5-49.5	2	ND

ND = Not Detected.

TABLE 2. PURGEABLE ORGANICS RESULTS - BORE 003

		Concentration (ug/kg)					
Parameter	Detection Limit	Bore Depth 4.5-5.5'	Bore Depth 30.0-31.0'	Bore Depth 35.5-36.0'	Bore Depth 39.0-39.4'	Bore Depth 44.0-45.0'	Bore Depth 48.5-49.5'
1,1-Dichloroethylene	1.0	ND	ND	ND	ND	ND	ND
1,2-trans-Dichloroethylene	0.5	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	2.0	ND	ND	ND	ND	ND	ND
Trichloroethylene	1.0	ND	ND	ND	ND	ND	ND

ND = Not Detected.

008752

TABLE 3. TOTAL METALS RESULTS - BORE 003

Bore Depth (ft)	Concentration (mg/kg) Cadmium	Chromium	Lead	Nickel
4.5-5.5	ND	4.3	4.0	4.0
20.5-21.5	ND	2.6	3.0	2.8
25.0-25.5	ND	2.3	3.0	2.5
30.0-31.0	ND	2.6	ND	3.2
35.5-36.0	ND	2.8	3.0	2.7
39.4-40.5	ND	4.3	4.0	4.7
44.0-45.0	ND	4.2	4.0	4.7
48.5-49.5	ND	2.6	ND	2.3
Detection Limits	1.0	0.5	2.5	1.0
RCRA MCL	1.0	5.0	5.0	NA

ND = Not Detected. NA = Not Applicable.
MCL = Maximum Contaminant Level.

TABLE 4. EP TOXICITY RCRA METALS - BORE 003

Bore Depth (ft)	Concentration (mg/L) Cadmium	Chromium	Lead	Nickel	Hexavalent Chromium	Trivalent Chromium
4.5-5.5	ND	0.005	ND	ND	ND	ND
35.5-36.0	ND	0.007	ND	ND	ND	ND
39.4-40.5	ND	ND	ND	ND	ND	ND
44.0-45.0	ND	ND	ND	0.02	ND	ND
Detection Limit	0.004	0.005	0.025	0.01	0.01	0.01
RCRA MCL	1.0	5.0	5.0	NA	NA	NA

ND = Not Detected. NA = Not Applicable.
MCL = Maximum Contaminant Level.

TABLE 5. VOLATILE ORGANICS- BORE 003

Parameter	Detection Limit	Concentration (ug/kg) Bore Depth 39.5-40.5'	Bore Depth 44.0-45.0'	Bore Dep 48.5-49.5
Acetone	10	BDL	BDL	BDL
Benzene	5	BDL	BDL	BDL
Bromoform	5	BDL	BDL	BDL
Methyl bromide	10	BDL	BDL	BDL
2-Butanone	10	BDL	BDL	BDL
Carbon disulfide	5	BDL	BDL	BDL
Carbon tetrachloride	5	BDL	BDL	BDL
Chlorobenzene	5	BDL	BDL	BDL
Chlorodibromomethane	5	BDL	BDL	BDL
Chloroethane	10	BDL	BDL	BDL
2-Chloroethylvinyl ether	10	BDL	BDL	BDL
Chloroform	5	BDL	BDL	BDL
Methyl chloride	10	BDL	BDL	BDL
Dichlorobromomethane	5	BDL	BDL	BDL
1,1-Dichloroethane	5	BDL	BDL	BDL
1,2-Dichloroethane	5	BDL	BDL	BDL
1,1-Dichloroethylene	5	BDL	BDL	BDL
1,2-Dichloropropane	5	BDL	BDL	BDL
cis-1,3-Dichloropropylene	5	BDL	BDL	BDL
trans-1,3-Dichloropropylene	5	BDL	BDL	BDL
Ethylbenzene	5	BDL	BDL	BDL
2-Hexanone	10	BDL	BDL	BDL
Methylene chloride	10	BDL	BDL	BDL
4-Methyl-2-pentanone	10	BDL	BDL	BDL
Styrene	5	BDL	BDL	BDL
1,1,2,2-Tetrachloroethane	5	BDL	BDL	BDL
Tetrachloroethylene	5	BDL	BDL	BDL
Toluene	5	BDL	BDL	BDL
1,2-trans-Dichloroethylene	5	BDL	BDL	BDL
1,1,1-Trichloroethane	5	BDL	BDL	BDL
1,1,2-Trichloroethane	5	BDL	BDL	BDL
Trichloroethylene	5	BDL	BDL	BDL
Vinyl acetate	10	BDL	BDL	BDL
Vinyl chloride	10	BDL	BDL	BDL
Total xylenes	5	BDL	BDL	BDL
Percent Moisture	0.1	2.8	8.8	1.8

BDL = Below Detection Limit

008754

SPARTON TECHNOLOGY

BORE 004

TABLE 1. TOTAL ORGANIC HALOGEN (TOX) RESULTS - BORE 004

Bore Depth (ft.)	Detection Limit (mg/kg)	TOX Conc. (mg/kg)
5.0-6.0	2	ND
9.0-10.0	2	ND
13.5-14.0	2	ND
20.0-21.0	2	ND
25.5-26.0	2	ND
29.0-30.0	2	ND
35.0-36.0	2	ND
40.0-41.0	2	ND
44.0-45.0	2	ND
48.5-49.0	2	ND
53.0-53.5	2	ND

ND = Not Detected.

TABLE 2. TOTAL METALS RESULTS - BORE 004

	Concentration (mg/kg)			
Bore Depth (ft)	Cadmium	Chromium	Lead	Nickel
5.0-6.0	ND	4.5	5.0	3.6
9.0-10.0	ND	2.6	5.1	2.5
13.5-14.0	ND	4.0	4.0	3.9
20.0-21.0	ND	3.7	4.0	2.9
25.5-26.0	ND	7.8	7.3	6.0
29.0-30.0	ND	2.8	4.0	2.5
35.0-36.0	ND	3000	5.0	25
40.0-41.0	ND	58	10	9.4
44.0-45.0	ND	12	3.0	2.5
48.5-49.0	ND	40	14	14
53.0-53.5	ND	9.7	5.4	3.2
Detection Limit	1.0	0.5	2.5	1.0
RCRA MCL	1.0	5.0	5.0	NA

ND = Not Detected. NR = Not Received. NA = Not Applicable.
MCL = Maximum Contaminant Level.

008756

TABLE 3. EP TOXICITY RCRA METALS - BORE 004

Bore Depth (ft)	Concentration (mg/L)					
	Cadmium	Chromium	Lead	Nickel	Hexavalent Chromium	Trivalent Chromium
5.0-6.0	0.010	0.010	ND	ND	ND	0.01
9.0-10.0	0.004	ND	ND	ND	ND	ND
13.5-14.0	ND	ND	ND	ND	ND	ND
20.0-21.0	ND	ND	ND	ND	ND	ND
25.5-26.0	ND	ND	ND	ND	ND	ND
29.0-30.0	ND	ND	ND	ND	ND	ND
35.0-36.0	ND	8.4	ND	0.12	8.0	0.35
40.0-41.0	0.007	0.25	ND	0.025	ND	0.25
44.0-45.0	ND	0.008	ND	ND	ND	ND
48.5-49.0	0.005	0.059	ND	0.046	0.02	0.039
53.0-53.5	ND	ND	ND	ND	ND	ND
Detection Limit	0.004	0.005	0.025	0.01	0.01	0.01
RCRA MCL	1.0	5.0	5.0	NA	NA	NA

ND = Not Detected. NA = Not Applicable.
MCL = Maximum Contaminant Level.

008757

TABLE 4. VOLATILE ORGANICS- BORE 004

Parameter	Detection Limit	Concentration (ug/kg) Bore Depth 20.0-21.0'	Bore Depth 35.0-36.0'	Bore Depth 40.0-41.0'	Bore Depth 44.0-45.0'	Bore Depth 53.0-53.5'
Acetone	10	BDL	BDL	BDL	BDL	BDL
Benzene	5	BDL	BDL	BDL	BDL	BDL
Bromoform	5	BDL	BDL	BDL	BDL	BDL
Methyl bromide	10	BDL	BDL	BDL	BDL	BDL
2-Butanone	10	BDL	BDL	BDL	BDL	BDL
Carbon disulfide	5	BDL	BDL	BDL	BDL	BDL
Carbon tetrachloride	5	BDL	BDL	BDL	BDL	BDL
Chlorobenzene	5	BDL	BDL	BDL	BDL	BDL
Chlorodibromomethane	5	BDL	BDL	BDL	BDL	BDL
Chloroethane	10	BDL	BDL	BDL	BDL	BDL
2-Chloroethylvinyl ether	10	BDL	BDL	BDL	BDL	BDL
Chloroform	5	BDL	BDL	BDL	BDL	BDL
Methyl chloride	10	BDL	BDL	BDL	BDL	BDL
Dichlorobromomethane	5	BDL	BDL	BDL	BDL	BDL
1,1-Dichloroethane	5	BDL	BDL	BDL	BDL	BDL
1,2-Dichloroethane	5	BDL	BDL	BDL	BDL	BDL
1,1-Dichloroethylene	5	BDL	BDL	BDL	BDL	BDL
1,2-Dichloropropane	5	BDL	BDL	BDL	BDL	BDL
cis-1,3-Dichloropropylene	5	BDL	BDL	BDL	BDL	BDL
trans-1,3-Dichloropropylene	5	BDL	BDL	BDL	BDL	BDL
Ethylbenzene	5	BDL	BDL	BDL	BDL	BDL
2-Hexanone	10	BDL	BDL	BDL	BDL	BDL
Methylene chloride	10	BDL	BDL	BDL	BDL	BDL
4-Methyl-2-pentanone	10	BDL	BDL	BDL	BDL	BDL
Styrene	5	BDL	BDL	BDL	BDL	BDL
1,1,2,2-Tetrachloroethane	5	BDL	BDL	BDL	BDL	BDL
Tetrachloroethylene	5	BDL	BDL	BDL	BDL	BDL
Toluene	5	BDL	BDL	BDL	BDL	BDL
1,2-trans-Dichloroethylene	5	BDL	BDL	BDL	BDL	BDL
1,1,1-Trichloroethane	5	BDL	BDL	BDL	BDL	BDL
1,1,2-Trichloroethane	5	BDL	BDL	BDL	BDL	BDL
Trichloroethylene	5	BDL	BDL	BDL	BDL	BDL
Vinyl acetate	10	BDL	BDL	BDL	BDL	BDL
Vinyl chloride	10	BDL	BDL	BDL	BDL	BDL
Total xylenes	5	BDL	BDL	BDL	BDL	BDL
Percent Moisture	0.1	6.4	8.5	15.7	2.9	3.7

BDL = Below Detection Limit

008758

SPARTON TECHNOLOGY

BORE 005

TABLE 1. TOTAL ORGANIC HALOGEN (TOX) RESULTS - BORE 005

Bore Depth (ft.)	Detection Limit (mg/kg)	TOX Conc. (mg/kg)
4.5-5.5	2	ND
10.0-11.0	2	ND
15.0-15.5	2	ND
20.5-21.0	2	ND
25.5-26.0	2	ND
30.5-31.5	2	ND
35.0-36.0	2	8
39.5-40.0	2	ND
43.1-44.2	2	ND
54.2-54.7	2	ND
58.2-59.4	2	ND

ND = Not Detected.

TABLE 2. PURGEABLE ORGANICS RESULTS - BORE 005

	Concentration (ug/kg)	
Parameter	Detection Limit	Bore Depth 35.0-36.0'
1,1-Dichloroethylene	0.5	ND
1,2-trans-Dichloroethylene	0.5	ND
1,1,1-Trichloroethane	0.5	0.8
Trichloroethylene	0.5	1.5

ND = Not Detected.

008760

TABLE 3. TOTAL METALS RESULTS - BORE 005

Bore Depth (ft)	Concentration (mg/kg) Cadmium	Chromium	Lead	Nickel
4.5-5.5	ND	2.8	5.1	2.8
10.0-11.0	ND	2.8	4.0	2.8
15.0-15.5	ND	2.4	4.0	2.4
20.5-21.0	ND	2.8	4.0	2.7
25.5-26.0	ND	3.1	4.0	3.1
30.5-31.5	ND	2.8	4.0	3.2
35.0-36.0	ND	3.0	8.9	3.3
39.5-40.0	ND	9.2	11	11
43.1-44.2	ND	15	4.0	4.9
54.2-54.7	ND	2.7	4.0	2.9
58.2-59.4	ND	7.7	3.0	3.0
Detection Limit	1.0	0.5	2.5	1.0
RCRA MCL	1.0	5.0	5.0	NA

ND = Not Detected. NA = Not Applicable.
MCL = Maximum Contaminant Level.

TABLE 4. EP TOXICITY RCRA METALS - BORE 005

Bore Depth (ft)	Concentration (mg/L) Cadmium	Chromium	Lead	Nickel	Hexavalent Chromium	Trivalent Chromium
4.5-5.5	ND	ND	ND	ND	ND	ND
25.5-26.0	ND	ND	ND	ND	ND	ND
35.0-36.0	ND	ND	ND	ND	ND	ND
39.5-40.0	ND	ND	ND	0.022	ND	ND
43.1-44.2	ND	ND	ND	ND	ND	ND
58.2-59.4	ND	ND	ND	ND	ND	ND
Detection Limit	0.004	0.005	0.025	0.01	0.01	0.01
RCRA MCL	1.0	5.0	5.0	NA	NA	NA

ND = Not Detected. NA = Not Applicable.
MCL = Maximum Contaminant Level.

008761

TABLE 5. VOLATILE ORGANICS- BORE 005

Parameter	Detection Limit	Concentration (ug/kg) Bore Depth 35.0-36.0'	Bore Depth 39.5-40.0'	Bore Depth 43.1-44.2'	Bore Depth 54.2 54.7'
Acetone	10	BDL	22	BDL	BDL
Benzene	5	BDL	BDL	BDL	BDL
Bromoform	5	BDL	BDL	BDL	BDL
Methyl bromide	10	BDL	BDL	BDL	BDL
2-Butanone	10	BDL	BDL	BDL	BDL
Carbon disulfide	5	BDL	BDL	BDL	BDL
Carbon tetrachloride	5	BDL	BDL	BDL	BDL
Chlorobenzene	5	BDL	BDL	BDL	BDL
Chlorodibromomethane	5	BDL	BDL	BDL	BDL
Chloroethane	10	BDL	BDL	BDL	BDL
2-Chloroethylvinyl ether	10	BDL	BDL	BDL	BDL
Chloroform	5	BDL	BDL	BDL	BDL
Methyl chloride	10	BDL	BDL	BDL	BDL
Dichlorobromomethane	5	BDL	BDL	BDL	BDL
1,1-Dichloroethane	5	BDL	BDL	BDL	BDL
1,2-Dichloroethane	5	BDL	BDL	BDL	BDL
1,1-Dichloroethylene	5	BDL	9	BDL	BDL
1,2-Dichloropropane	5	BDL	BDL	BDL	BDL
cis-1,3-Dichloropropylene	5	BDL	BDL	BDL	BDL
trans-1,3-Dichloropropylene	5	BDL	BDL	BDL	BDL
Ethylbenzene	5	BDL	BDL	BDL	BDL
2-Hexanone	10	BDL	BDL	BDL	BDL
Methylene chloride	10	BDL	BDL	BDL	BDL
4-Methyl-2-pentanone	10	BDL	BDL	BDL	BDL
Styrene	5	BDL	BDL	BDL	BDL
1,1,2,2-Tetrachloroethane	5	BDL	BDL	BDL	BDL
Tetrachloroethylene	5	BDL	BDL	BDL	BDL
Toluene	5	BDL	BDL	BDL	BDL
1,2-trans-Dichloroethylene	5	BDL	BDL	BDL	BDL
1,1,1-Trichloroethane	5	BDL	BDL	BDL	BDL
1,1,2-Trichloroethane	5	BDL	50	BDL	BDL
Trichloroethylene	5	BDL	80	BDL	BDL
Vinyl acetate	10	BDL	BDL	BDL	BDL
Vinyl chloride	10	BDL	BDL	BDL	BDL
Total xylenes	5	BDL	BDL	BDL	BDL
Percent Moisture	0.1	7.8	21.5	4.2	4.1

BDL = Below Detection Limit

SPARTON TECHNOLOGY

BORE 006

TABLE 1. TOTAL ORGANIC HALOGEN (TOX) RESULTS - BORE 006

Bore Depth (ft.)	Detection Limit (mg/kg)	TOX Conc. (mg/kg)
5.0-6.0	2	ND
9.0-10.0	2	ND
14.5-15.5	2	ND
20.5-21.5	2	ND
24.5-25.5	2	ND
30.0-31.0	2	ND
35.0-36.0	2	ND
40.5-41.5	2	ND
44.0-44.5	2	ND
48.3-49.3	2	ND
53.5-55.0	2	ND
58.0-59.2	2	ND

ND = Not Detected.

TABLE 2. TOTAL METALS RESULTS - BORE 006

	Concentration (mg/kg)			
Bore Depth (ft)	Cadmium	Chromium	Lead	Nickel
5.0-6.0	ND	4.8	5.0	3.7
9.0-10.0	ND	2.5	4.0	2.6
14.5-15.5	ND	1.9	4.0	2.2
20.5-21.5	ND	4.2	5.4	4.5
24.5-25.5	ND	5.1	7.3	5.4
30.0-31.0	ND	2.8	5.0	3.4
35.0-36.0	ND	2.7	5.0	2.7
40.5-41.5	ND	8.5	9.7	9.3
44.0-44.5	ND	2.4	4.0	2.7
48.3-49.3	ND	2.1	4.0	2.4
53.5-55.0	ND	3.4	4.0	3.0
58.0-59.2	ND	5.9	4.0	2.9
Detection Limit	1.0	0.5	2.5	1.0
RCRA MCL	1.0	5.0	5.0	NA

ND = Not Detected. NA = Not Applicable.
MCL = Maximum Contaminant Level.

TABLE 3. EP TOXICITY RCRA METALS - BORE 006

Bore Depth (ft)	Concentration (mg/L)					
	Cadmium	Chromium	Lead	Nickel	Hexavalent Chromium	Trivalent Chromium
5.0-6.0	ND	0.011	ND	ND	ND	0.01
20.5-21.5	ND	ND	ND	ND	ND	ND
24.5-25.5	ND	ND	ND	ND	ND	ND
40.5-41.5	0.007	ND	ND	0.028	ND	ND
53.5-55.0	0.004	ND	ND	ND	ND	ND
58.0-59.2	0.004	ND	ND	0.042	ND	ND
Detection Limit	0.004	0.005	0.025	0.01	0.01	0.01
RCRA MCL	1.0	5.0	5.0	NA	NA	NA

ND = Not Detected. NA = Not Applicable.
MCL = Maximum Contaminant Level.

TABLE 4. VOLATILE ORGANICS- BORE 006

Parameter	Detection Limit	Concentration (ug/kg) Bore Depth 30.0-31.0'	Bore Depth 35.0-36.0'	Bore Depth 40.5-41.5'	Bore Depth 44.0-44.5'
Acetone	10	BDL	BDL	BDL	BDL
Benzene	5	BDL	BDL	BDL	BDL
Bromoform	5	BDL	BDL	BDL	BDL
Methyl bromide	10	BDL	BDL	BDL	BDL
2-Butanone	10	BDL	BDL	BDL	BDL
Carbon disulfide	5	BDL	BDL	BDL	BDL
Carbon tetrachloride	5	BDL	BDL	BDL	BDL
Chlorobenzene	5	BDL	BDL	BDL	BDL
Chlorodibromomethane	5	BDL	BDL	BDL	BDL
Chloroethane	10	BDL	BDL	BDL	BDL
2-Chloroethylvinyl ether	10	BDL	BDL	BDL	BDL
Chloroform	5	BDL	BDL	BDL	BDL
Methyl chloride	10	BDL	BDL	BDL	BDL
Dichlorobromomethane	5	BDL	BDL	BDL	BDL
1,1-Dichloroethane	5	BDL	BDL	BDL	BDL
1,2-Dichloroethane	5	BDL	BDL	BDL	BDL
1,1-Dichloroethylene	5	BDL	BDL	BDL	BDL
1,2-Dichloropropane	5	BDL	BDL	BDL	BDL
cis-1,3-Dichloropropylene	5	BDL	BDL	BDL	BDL
trans-1,3-Dichloropropylene	5	BDL	BDL	BDL	BDL
Ethylbenzene	5	BDL	BDL	BDL	BDL
2-Hexanone	10	BDL	BDL	BDL	BDL
Methylene chloride	10	BDL	BDL	BDL	BDL
4-Methyl-2-pentanone	10	BDL	BDL	BDL	BDL
Styrene	5	BDL	BDL	BDL	BDL
1,1,2,2-Tetrachloroethane	5	BDL	BDL	BDL	BDL
Tetrachloroethylene	5	BDL	BDL	BDL	BDL
Toluene	5	BDL	BDL	BDL	BDL
1,2-trans-Dichloroethylene	5	BDL	BDL	BDL	BDL
1,1,1-Trichloroethane	5	BDL	BDL	BDL	BDL
1,1,2-Trichloroethane	5	BDL	BDL	BDL	BDL
Trichloroethylene	5	BDL	BDL	BDL	BDL
Vinyl acetate	10	BDL	BDL	BDL	BDL
Vinyl chloride	10	BDL	BDL	BDL	BDL
Total xylenes	5	BDL	BDL	BDL	BDL
Percent Moisture	0.1	4.1	3.2	14.6	2.5

BDL = Below Detection Limit

SPARTON TECHNOLOGY

BORE 007

TABLE 1. TOTAL ORGANIC HALOGEN (TOX) RESULTS - BORE 007

Bore Depth (ft.)	Detection Limit (mg/kg)	TOX Conc. (mg/kg)
4.5-5.5	2	ND
10.5-11.0	2	ND
15.0-16.0	2	ND
18.2-18.8	2	ND
25.0-26.0	2	ND
30.0-31.0	2	ND
35.5-36.5	2	ND
39.0-40.0	2	ND
43.0-44.0	2	3
49.5-50.5	2	2
57.0-57.5	2	ND
58.5-59.5	2	ND

ND = Not Detected.

TABLE 2. PURGEABLE ORGANICS RESULTS - BORE 007

		Concentration (ug/kg)	
Parameter	Detection Limit	Bore Depth 43.0-44.0'	Bore Depth 49.5-50.5'
1,1-Dichloroethylene	6	ND	ND
1,2-trans-Dichloroethylene	6	ND	ND
1,1,1-Trichloroethane	6	140	530
Trichloroethylene	6	380	990

ND = Not Detected.

008768

TABLE 3. TOTAL METALS RESULTS - BORE 007

Bore Depth (ft)	Concentration (mg/kg) Cadmium	Chromium	Lead	Nickel
4.5-5.5	ND	3.1	3.0	2.2
10.5-11.0	ND	2.2	ND	2.0
15.0-16.0	ND	2.7	ND	2.0
18.2-18.8	ND	1.8	ND	2.0
25.0-26.0	ND	3.2	5.0	3.7
30.0-31.0	ND	2.5	5.0	3.3
35.5-36.5	ND	3.6	5.0	4.6
39.0-40.0	ND	4.7	5.6	4.9
43.0-44.0	ND	21	12	13
49.5-50.5	ND	19	12	14
57.0-57.5	ND	4.2	4.0	3.5
58.5-59.5	ND	4.7	4.0	2.7
Detection Limit	1.0	0.5	2.5	1.0
RCRA MCL	1.0	5.0	5.0	NA

ND = Not Detected. NA = Not Applicable.
MCL = Maximum Contaminant Level.

TABLE 4. EP TOXICITY RCRA METALS - BORE 007

Bore Depth (ft)	Concentration (mg/L) Cadmium	Chromium	Lead	Nickel	Hexavalent Chromium	Trivalent Chromium
4.5-5.5	ND	ND	ND	ND	ND	ND
35.5-36.5	ND	ND	ND	ND	ND	ND
39.0-40.0	ND	ND	ND	0.012	ND	ND
43.0-44.0	ND	ND	ND	0.060	ND	ND
49.5-50.5	ND	0.062	ND	0.063	0.03	0.032
57.0-57.5	ND	0.011	ND	ND	ND	0.01
58.5-59.5	ND	0.013	ND	ND	ND	0.01
Detection Limit	0.004	0.005	0.025	0.01	0.01	0.01
RCRA MCL	1.0	5.0	5.0	NA	NA	NA

ND = Not Detected. NA = Not Applicable.
MCL = Maximum Contaminant Level.

TABLE 5. VOLATILE ORGANICS- BORE 007

Parameter	Detection Limit	Concentration (ug/kg) Bore Depth 25.0-26.0'	Bore Depth 35.5-36.5'	Bore Depth 39.0-40.0'	Bore Depth 43.0-44.0'	Bore 49.5-
Acetone	10	22	BDL	14	17	BI
Benzene	5	BDL	BDL	BDL	BDL	BI
Bromoform	5	BDL	BDL	BDL	BDL	BI
Methyl bromide	10	BDL	BDL	BDL	BDL	BI
2-Butanone	10	BDL	BDL	BDL	BDL	BI
Carbon disulfide	5	BDL	BDL	BDL	BDL	BI
Carbon tetrachloride	5	BDL	BDL	BDL	BDL	BI
Chlorobenzene	5	BDL	BDL	BDL	BDL	BI
Chlorodibromomethane	5	BDL	BDL	BDL	BDL	BI
Chloroethane	10	BDL	BDL	BDL	BDL	BI
2-Chloroethylvinyl ether	10	BDL	BDL	BDL	BDL	BI
Chloroform	5	BDL	BDL	BDL	BDL	BI
Methyl chloride	10	BDL	BDL	BDL	BDL	BI
Dichlorobromomethane	5	BDL	BDL	BDL	BDL	BI
1,1-Dichloroethane	5	BDL	BDL	BDL	BDL	BI
1,2-Dichloroethane	5	BDL	BDL	BDL	BDL	BI
1,1-Dichloroethylene	5	BDL	BDL	BDL	BDL	BI
1,2-Dichloropropane	5	BDL	BDL	BDL	BDL	BI
cis-1,3-Dichloropropylene	5	BDL	BDL	BDL	BDL	BI
trans-1,3-Dichloropropylene	5	BDL	BDL	BDL	BDL	BI
Ethylbenzene	5	BDL	BDL	BDL	BDL	BI
2-Hexanone	10	BDL	BDL	BDL	BDL	BI
Methylene chloride	10	BDL	BDL	BDL	BDL	BI
4-Methyl-2-pentanone	10	BDL	BDL	BDL	BDL	BI
Styrene	5	BDL	BDL	BDL	BDL	BI
1,1,2,2-Tetrachloroethane	5	BDL	BDL	BDL	9	2
Tetrachloroethylene	5	BDL	BDL	BDL	BDL	BI
Toluene	5	BDL	BDL	BDL	BDL	5
1,2-trans-Dichloroethylene	5	BDL	BDL	BDL	BDL	BI
1,1,1-Trichloroethane	5	BDL	BDL	BDL	BDL	BI
1,1,2-Trichloroethane	5	BDL	BDL	BDL	BDL	BI
Trichloroethylene	5	BDL	BDL	BDL	BDL	BI
Vinyl acetate	10	BDL	BDL	BDL	BDL	BI
Vinyl chloride	10	BDL	BDL	BDL	BDL	BI
Total xylenes	5	BDL	BDL	BDL	BDL	BI
Percent Moisture	0.1	5.4	3.3	4.4	6.6	21.

BDL = Below Detection Limit

SPARTON TECHNOLOGY

BORE 008

TABLE 1. TOTAL ORGANIC HALOGEN (TOX) RESULTS - BORE 008

Bore Depth (ft.)	Detection Limit (mg/kg)	TOX Conc. (mg/kg)
5.5-6.5	2	ND
10.5-11.5	2	ND
15.5-16.5	2	ND
20.5-21.0	2	ND
27.0-27.5	2	ND
29.5-30.3	2	3
36.5-37.5	2	3
41.5-42.5	2	2
49.0-49.7	2	2
58.3-59.0	2	ND
59.3-60.3	2	ND

ND = Not Detected.

TABLE 2. PURGEABLE ORGANICS RESULTS - BORE 008

		Concentration (ug/kg)			
Parameter	Detection Limit	Bore Depth 29.5-30.3'	Bore Depth 36.5-37.5'	Bore Depth 41.5-42.5	Bore Dept 49.0-49.7'
1,1-Dichloroethylene	0.5	ND	ND	ND(2.5)	ND(2.0)
1,2-trans-Dichloroethylene	0.5	ND	ND	ND(2.5)	ND(2.0)
1,1,1-Trichloroethane	0.5	ND	1.1	22(2.5)	ND(10)
Trichloroethylene	0.5	ND	0.7	140(2.5)	21(2.0)

ND = Not Detected.
Values in parentheses represent adjusted detection limits.

008772

TABLE 3. TOTAL METALS RESULTS - BORE 008

Bore Depth (ft)	Concentration (mg/kg) Cadmium	Chromium	Lead	Nickel
5.5-6.5	ND	3.7	4.0	2.1
10.5-11.5	ND	7.3	4.0	2.4
15.5-16.5	ND	15	5.7	5.0
20.5-21.5	ND	41	5.0	14
27.0-27.5	ND	44	6.6	6.4
29.5-30.3	ND	850	9.5	45
36.5-37.5	ND	3300	ND	9.6
41.5-42.5	4.0	100	12	62
49.0-49.7	ND	51	11	23
58.3-59.0	ND	29	4.0	5.0
59.3-60.3	ND	15	5.0	4.1
Detection Limit	1.0	0.5	2.5	1.0
RCRA MCL	1.0	5.0	5.0	NA

ND = Not Detected. NA = Not Applicable. MCL = Maximum Contaminant Level.

008773

TABLE 4. EP TOXICITY RCRA METALS - BORE 008

Bore Depth (ft)	Concentration (mg/L) Cadmium	Chromium	Lead	Nickel	Hexavalent Chromium	Trivalent Chromium
5.5-6.5	ND	0.008	ND	ND	ND	ND
10.5-11.5	ND	0.007	ND	ND	ND	ND
15.5-16.5	ND	0.055	ND	0.027	ND	0.055
20.5-21.0	0.006	0.32	ND	0.095	ND	0.32
27.0-27.5	ND	0.18	ND	0.069	0.02	0.16
29.5-30.3	0.018	8.1	ND	0.33	7.1	1.0
36.5-37.5	ND	4.2	ND	0.12	3.1	1.1
41.5-42.5	0.094	0.093	ND	0.33	0.06	0.033
49.0-49.7	ND	0.087	ND	0.17	ND	0.087
58.3-59.0	ND	0.018	ND	0.086	0.02	ND
59.3-60.3	ND	0.054	ND	0.025	0.03	0.024
Detection Limit	0.004	0.005	0.025	0.01	0.01	0.01
RCRA MCL	1.0	5.0	5.0	NA	NA	NA

ND = Not Detected. NA = Not Applicable. MCL = Maximum Contaminant Level.

008774

TABLE 5. VOLATILE ORGANICS- BORE 008

Parameter	Detection Limit	Concentration (ug/kg) Bore Depth 27.0-27.5'	Bore Depth 36.5-37.5'	Bore Depth 41.5-42.5'	Bore Depth 49.0-49.7'	Bore Depth 59.3-60.3'
Acetone	10	BDL	44	1200	25	BDL
Benzene	5	BDL	BDL	BDL	BDL	BDL
Bromoform	5	BDL	BDL	BDL	BDL	BDL
Methyl bromide	10	BDL	BDL	BDL	BDL	BDL
2-Butanone	10	BDL	BDL	BDL	BDL	BDL
Carbon disulfide	5	BDL	BDL	BDL	BDL	BDL
Carbon tetrachloride	5	BDL	BDL	BDL	BDL	BDL
Chlorobenzene	5	BDL	BDL	BDL	BDL	BDL
Chlorodibromomethane	5	BDL	BDL	BDL	BDL	BDL
Chloroethane	10	BDL	BDL	BDL	BDL	BDL
2-Chloroethylvinyl ether	10	BDL	BDL	BDL	BDL	BDL
Chloroform	5	BDL	BDL	BDL	BDL	BDL
Methyl chloride	10	BDL	BDL	BDL	BDL	BDL
Dichlorobromomethane	5	BDL	BDL	BDL	BDL	BDL
1,1-Dichloroethane	5	BDL	BDL	BDL	BDL	BDL
1,2-Dichloroethane	5	BDL	BDL	BDL	BDL	BDL
1,1-Dichloroethylene	5	BDL	BDL	BDL	BDL	BDL
1,2-Dichloropropane	5	BDL	BDL	BDL	BDL	BDL
cis-1,3-Dichloropropylene	5	BDL	BDL	BDL	BDL	BDL
trans-1,3-Dichloropropylene	5	BDL	BDL	BDL	BDL	BDL
Ethylbenzene	5	BDL	BDL	BDL	BDL	BDL
2-Hexanone	10	BDL	BDL	BDL	BDL	BDL
Methylene chloride	10	BDL	BDL	BDL	BDL	BDL
4-Methyl-2-pentanone	10	BDL	BDL	BDL	BDL	BDL
Styrene	5	BDL	BDL	BDL	BDL	BDL
1,1,2,2-Tetrachloroethane	5	BDL	BDL	BDL	7	BDL
Tetrachloroethylene	5	BDL	BDL	BDL	BDL	BDL
Toluene	5	BDL	BDL	BDL	BDL	BDL
1,2-trans-Dichloroethylene	5	BDL	BDL	BDL	BDL	BDL
1,1,1-Trichloroethane	5	BDL	BDL	BDL	BDL	BDL
1,1,2-Trichloroethane	5	BDL	BDL	BDL	BDL	BDL
Trichloroethylene	5	BDL	BDL	BDL	BDL	BDL
Vinyl acetate	10	BDL	BDL	BDL	BDL	BDL
Vinyl chloride	10	BDL	BDL	BDL	BDL	BDL
Total xylenes	5	BDL	BDL	BDL	BDL	BDL
Percent Moisture	0.1	7.1	9.5	15.4	22.2	3.0

BDL = Below Detection Limit

008775

SPARTON TECHNOLOGY

BORE 009

TABLE 1. TOTAL ORGANIC HALOGEN (TOX) RESULTS - BORE 009

Bore Depth (ft.)	Detection Limit (mg/kg)	TOX Conc. (mg/kg)
5.0-5.5	2	ND
11.0-11.5	2	ND
13.5-14.5	2	ND
18.5-19.5	2	ND
23.0-24.0	2	ND
28.0-33.0	2	ND
33.5-34.5	2	ND
39.0-39.5	2	ND
44.0-45.0	2	ND
49.0-50.0	2	ND
53.0-54.5	2	ND
58.0-59.0	2	ND
65.0-66.0	2	ND

ND = Not Detected.

TABLE 2. TOTAL METALS RESULTS - BORE 009

	Concentration (mg/kg)			
Bore Depth (ft)	Cadmium	Chromium	Lead	Nickel
5.0-5.5	ND	4.1	5.6	4.9
11.0-11.5	ND	2.9	4.0	3.9
13.5-14.5	ND	1.9	4.0	2.6
18.5-19.5	ND	1.8	4.0	2.6
23.0-24.0	ND	2.6	5.0	3.3
28.0-33.0	ND	1.7	4.0	2.2
33.5-34.5	ND	1.6	3.0	2.1
39.0-39.5	ND	1.3	3.0	2.3
44.0-45.0	ND	6.0	7.4	7.0
49.0-50.0	ND	2.1	3.0	2.1
53.0-54.5	ND	1.8	4.0	2.0
58.0-59.0	ND	2.6	ND	2.6
65.0-66.0	ND	1.8	ND	2.4
Detection Limit	1.0	0.5	2.5	1.0
RCRA MCL	1.0	5.0	5.0	NA

ND = Not Detected. NR = Not Received. NA = Not Applicable.
MCL = Maximum Contaminant Level.

TABLE 3. EP TOXICITY RCRA METALS - BORE 009

Bore Depth (ft)	Concentration (mg/L)					
	Cadmium	Chromium	Lead	Nickel	Hexavalent Chromium	Trivalent Chromium
5.0-5.5	ND	ND	ND	ND	ND	ND
11.0-11.5	ND	ND	ND	ND	ND	ND
23.0-24.0	ND	ND	ND	ND	ND	ND
44.0-45.0	ND	ND	ND	ND	ND	ND
58.0-59.0	ND	ND	ND	0.044	ND	ND
Detection Limit	0.004	0.005	0.025	0.01	0.01	0.01
RCRA MCL	1.0	5.0	5.0	NA	NA	NA

ND = Not Detected. NA = Not Applicable.
MCL = Maximum Contaminant Level.

TABLE 4. VOLATILE ORGANICS- BORE 009

Parameter	Detection Limit	Concentration(ug/kg) Bore Depth 49.0-50.0'	Bore Depth 65.0-66.0'
Acetone	10	BDL	BDL
Benzene	5	BDL	BDL
Bromoform	5	BDL	BDL
Methyl bromide	10	BDL	BDL
2-Butanone	10	BDL	BDL
Carbon disulfide	5	BDL	BDL
Carbon tetrachloride	5	BDL	BDL
Chlorobenzene	5	BDL	BDL
Chlorodibromomethane	5	BDL	BDL
Chloroethane	10	BDL	BDL
2-Chloroethylvinyl ether	10	BDL	BDL
Chloroform	5	BDL	BDL
Methyl chloride	10	BDL	BDL
Dichlorobromomethane	5	BDL	BDL
1,1-Dichloroethane	5	BDL	BDL
1,2-Dichloroethane	5	BDL	BDL
1,1-Dichloroethylene	5	BDL	BDL
1,2-Dichloropropane	5	BDL	BDL
cis-1,3-Dichloropropylene	5	BDL	BDL
trans-1,3-Dichloropropylene	5	BDL	BDL
Ethylbenzene	5	BDL	BDL
2-Hexanone	10	BDL	BDL
Methylene chloride	10	BDL	BDL
4-Methyl-2-pentanone	10	BDL	BDL
Styrene	5	BDL	BDL
1,1,2,2-Tetrachloroethane	5	BDL	BDL
Tetrachloroethylene	5	BDL	BDL
Toluene	5	BDL	BDL
1,2-trans-Dichloroethylene	5	BDL	BDL
1,1,1-Trichloroethane	5	BDL	BDL
1,1,2-Trichloroethane	5	BDL	BDL
Trichloroethylene	5	BDL	BDL
Vinyl acetate	10	BDL	BDL
Vinyl chloride	10	BDL	BDL
Total xylenes	5	BDL	BDL
Percent Moisture	0.1	4.0	1.8

BDL = Below Detection Limit

SPARTON TECHNOLOGY

BORE 010

TABLE 1. TOTAL ORGANIC HALOGEN (TOX) RESULTS - BORE 010

Bore Depth (ft.)	Detection Limit (mg/kg)	TOX Conc. (mg/kg)
4.5-5.5	2	ND
10.0-11.0	2	ND
13.5-14.5	2	6
18.3-19.0	2	5
30.5-31.5	2	10
35.5-36.5	2	4
38.3-39.0	2	ND
44.5-45.5	2	ND
49.0-50.0	2	ND
53.5-54.5	2	ND
58.5-59.5	2	4
66.3-67.0	2	ND

ND = Not Detected.

Table 2. PURGEABLE ORGANICS RESULTS - BORE 010

		Concentration (ug/kg)				
Parameter	Detection Limit	Bore Depth 13.5-14.5'	Bore Depth 18.3-19.0'	Bore Depth 30.5-31.5'	Bore Depth 35.5-36.5'	Bore Depth 58.5-59.5'
1,1-Dichloroethylene	1.0	ND	ND	ND	ND	ND
1,2-trans-Dichloroethylene	0.5	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	2.0	ND	ND	ND	ND	ND
Trichloroethylene	1.0	ND	ND	ND	ND	ND

ND = Not Detected.

008781

TABLE 3. TOTAL METALS RESULTS - BORE 010

Bore Depth (ft)	Concentration (mg/kg) Cadmium	Chromium	Lead	Nickel
4.5-5.5	ND	1.9	ND	2.0
10.0-11.0	ND	2.5	4.0	2.4
13.5-14.5	ND	1.6	4.0	2.0
18.3-19.0	ND	2.8	4.0	3.0
30.5-31.5	ND	1.8	3.0	2.0
35.5-36.5	ND	4.1	3.0	4.1
38.3-39.0	ND	2.8	3.0	2.8
44.5-45.5	ND	3.0	3.0	3.5
49.0-50.0	ND	2.0	3.0	2.9
53.5-54.5	ND	2.3	3.0	2.6
58.5-59.5	ND	2.8	ND	2.5
66.3-67.0	ND	7.0	5.9	5.3
Detection Limit	1.0	0.5	2.5	1.0
RCRA MCL	1.0	5.0	5.0	NA

ND = Not Detected. NA = Not Applicable.
MCL = Maximum Contaminant Level.

TABLE 4. EP TOXICITY RCRA METALS - BORE 010

Bore Depth (ft)	Concentration (mg/L) Cadmium	Chromium	Lead	Nickel	Hexavalent Chromium	Trivalent Chromium
13.5-14.5	ND	ND	ND	ND	ND	ND
18.3-19.0	ND	ND	ND	ND	ND	ND
30.5-31.5	ND	ND	ND	ND	ND	ND
35.5-36.5	ND	ND	ND	ND	ND	ND
58.5-59.5	ND	ND	ND	ND	ND	ND
66.3-67.0	ND	ND	ND	ND	ND	ND
Detection Limit	0.004	0.005	0.025	0.01	0.01	0.01
RCRA MCL	1.0	5.0	5.0	NA	NA	NA

ND = Not Detected. NA = Not Applicable.
MCL = Maximum Contaminant Level.

TABLE 5. VOLATILE ORGANICS- BORE 010

Parameter	Detection Limit	Concentration (ug/kg) Bore Depth 13.5-14.5'	Bore Depth 18.3-19.0'	Bore Depth 30.5-31.5'	Bore Depth 35.5-36.5'	Bore Depth 58.5-59.5'	Bore Depth 66.3-67.0'
Acetone	10	BDL	BDL	BDL	3	BDL	500
Benzene	5	BDL	BDL	BDL	BDL	BDL	BDL
Bromoform	5	BDL	BDL	BDL	BDL	BDL	BDL
Methyl bromide	10	BDL	BDL	BDL	BDL	BDL	BDL
2-Butanone	10	BDL	BDL	BDL	BDL	BDL	BDL
Carbon disulfide	5	BDL	BDL	BDL	BDL	BDL	BDL
Carbon tetrachloride	5	BDL	BDL	BDL	BDL	BDL	BDL
Chlorobenzene	5	BDL	BDL	BDL	BDL	BDL	BDL
Chlorodibromomethane	5	BDL	BDL	BDL	BDL	BDL	BDL
Chloroethane	10	BDL	BDL	BDL	BDL	BDL	BDL
2-Chloroethylvinyl ether	10	BDL	BDL	BDL	BDL	BDL	BDL
Chloroform	5	BDL	BDL	BDL	BDL	BDL	BDL
Methyl chloride	10	BDL	BDL	BDL	BDL	BDL	BDL
Dichlorobromomethane	5	BDL	BDL	BDL	BDL	BDL	BDL
1,1-Dichloroethane	5	BDL	BDL	BDL	BDL	BDL	BDL
1,2-Dichloroethane	5	BDL	BDL	BDL	BDL	BDL	BDL
1,1-Dichloroethylene	5	BDL	BDL	BDL	BDL	BDL	BDL
1,2-Dichloropropane	5	BDL	BDL	BDL	BDL	BDL	BDL
cis-1,3-Dichloropropylene	5	BDL	BDL	BDL	BDL	BDL	BDL
trans-1,3-Dichloropropylene	5	BDL	BDL	BDL	BDL	BDL	BDL
Ethylbenzene	5	BDL	BDL	BDL	BDL	BDL	BDL
2-Hexanone	10	BDL	BDL	BDL	BDL	BDL	BDL
Methylene chloride	10	BDL	BDL	BDL	BDL	BDL	BDL
4-Methyl-2-pentanone	10	BDL	BDL	BDL	BDL	BDL	BDL
Styrene	5	BDL	BDL	BDL	BDL	BDL	BDL
1,1,2,2-Tetrachloroethane	5	BDL	BDL	BDL	BDL	BDL	BDL
Tetrachloroethylene	5	BDL	BDL	BDL	BDL	BDL	BDL
Toluene	5	BDL	BDL	BDL	BDL	BDL	BDL
1,2-trans-Dichloroethylene	5	BDL	BDL	BDL	BDL	BDL	BDL
1,1,1-Trichloroethane	5	BDL	BDL	BDL	BDL	BDL	BDL
1,1,2-Trichloroethane	5	BDL	BDL	BDL	BDL	BDL	BDL
Trichloroethylene	5	BDL	BDL	BDL	BDL	BDL	BDL
Vinyl acetate	10	BDL	BDL	BDL	BDL	BDL	BDL
Vinyl chloride	10	BDL	BDL	BDL	BDL	BDL	BDL
Total xylenes	5	BDL	BDL	BDL	BDL	BDL	BDL
Percent Moisture	0.1	2.1	3.6	2.8	3.0	3.2	16.3

BDL = Below Detection Limit

008783

SPARTON TECHNOLOGY

BORE 011

TABLE 1. TOTAL ORGANIC HALOGEN (TOX) RESULTS - BORE 011

Bore Depth (ft.)	Detection Limit (mg/kg)	TOX Conc. (mg/kg)
4.5-5.5	2	ND
9.0-10.0	2	ND
14.0-15.0	2	ND
19.5-20.5	2	2
24.5-25.5	2	ND
30.0-31.0	2	ND
35.0-36.0	2	ND
38.0-39.0	2	ND
45.0-46.0	2	ND
50.0-51.0	2	4
54.5-55.5	2	4
60.0-61.0	2	ND

ND = Not Detected.

TABLE 2. PURGEABLE ORGANICS RESULTS - BORE 011

	Concentration (ug/kg)			
Parameter	Detection Limit	Bore Depth 19.5-20.5'	Bore Depth 50.0-51.0'	Bore Depth 54.5-55.5'
1,1-Dichloroethylene	1.0	ND	ND	ND
1,2-trans-Dichloroethylene	0.5	ND	ND	ND
1,1,1-Trichloroethane	2.0	ND	ND	ND
Trichloroethylene	1.0	ND	ND	ND

ND = Not Detected.

008785

TABLE 3. TOTAL METALS RESULTS - BORE 011

Bore Depth (ft)	Concentration (mg/kg) Cadmium	Chromium	Lead	Nickel
4.5-5.5	ND	3.8	5.0	3.8
9.0-10.0	ND	2.5	3.0	2.4
14.0-15.0	ND	2.3	5.4	4.0
19.5-20.5	ND	3.3	4.0	3.7
24.5-25.5	ND	2.5	4.0	2.8
30.0-31.0	ND	5.4	5.5	6.5
35.0-36.0	ND	3.7	5.0	4.2
38.0-39.0	ND	3.5	4.0	3.5
45.0-46.0	ND	3.0	5.0	3.0
50.0-51.0	ND	7.2	5.7	8.4
54.5-55.5	ND	3.7	3.0	3.7
60.0-61.0	ND	3.4	3.0	3.6
Detection Limit	1.0	0.5	2.5	1.0
RCRA MCL	1.0	5.0	5.0	NA

ND = Not Detected. NA = Not Applicable.
MCL = Maximum Contaminant Level.

TABLE 4. EP TOXICITY RCRA METALS - BORE 011

Bore Depth (ft)	Concentration (mg/L) Cadmium	Chromium	Lead	Nickel	Hexavalent Chromium	Trivalent Chromium
19.5-20.5	ND	ND	ND	ND	ND	ND
30.0-31.0	ND	ND	ND	ND	ND	ND
35.0-36.0	ND	ND	ND	ND	ND	ND
50.0-51.0	ND	ND	ND	ND	ND	ND
54.5-55.5	ND	ND	ND	ND	ND	ND
Detection Limit	0.004	0.005	0.025	0.01	0.01	0.01
RCRA MCL	1.0	5.0	5.0	NA	NA	NA

ND = Not Detected. NA = Not Applicable.
MCL = Maximum Contaminant Level.

TABLE 5. VOLATILE ORGANICS- BORE 011

Parameter	Detection Limit	Concentration (ug/kg) Bore Depth 19.5-20.5'	Bore Depth 24.5-25.5'	Bore Depth 54.5-55.5'	Bore Depth 60.0-61.0'
Acetone	10	BDL	BDL	BDL	BDL
Benzene	5	BDL	BDL	BDL	BDL
Bromoform	5	BDL	BDL	BDL	BDL
Methyl bromide	10	BDL	BDL	BDL	BDL
2-Butanone	10	BDL	BDL	BDL	BDL
Carbon disulfide	5	BDL	BDL	BDL	BDL
Carbon tetrachloride	5	BDL	BDL	BDL	BDL
Chlorobenzene	5	BDL	BDL	BDL	BDL
Chlorodibromomethane	5	BDL	BDL	BDL	BDL
Chloroethane	10	BDL	BDL	BDL	BDL
2-Chloroethylvinyl ether	10	BDL	BDL	BDL	BDL
Chloroform	5	BDL	BDL	BDL	BDL
Methyl chloride	10	BDL	BDL	BDL	BDL
Dichlorobromomethane	5	BDL	BDL	BDL	BDL
1,1-Dichloroethane	5	BDL	BDL	BDL	BDL
1,2-Dichloroethane	5	BDL	BDL	BDL	BDL
1,1-Dichloroethylene	5	BDL	BDL	BDL	BDL
1,2-Dichloropropane	5	BDL	BDL	BDL	BDL
cis-1,3-Dichloropropylene	5	BDL	BDL	BDL	BDL
trans-1,3-Dichloropropylene	5	BDL	BDL	BDL	BDL
Ethylbenzene	5	BDL	BDL	BDL	BDL
2-Hexanone	10	BDL	BDL	BDL	BDL
Methylene chloride	10	BDL	BDL	BDL	BDL
4-Methyl-2-pentanone	10	BDL	BDL	BDL	BDL
Styrene	5	BDL	BDL	BDL	BDL
1,1,2,2-Tetrachloroethane	5	BDL	BDL	BDL	BDL
Tetrachloroethylene	5	BDL	BDL	BDL	BDL
Toluene	5	BDL	BDL	BDL	BDL
1,2-trans-Dichloroethylene	5	BDL	BDL	BDL	BDL
1,1,1-Trichloroethane	5	BDL	BDL	BDL	BDL
1,1,2-Trichloroethane	5	BDL	BDL	BDL	BDL
Trichloroethylene	5	BDL	BDL	BDL	BDL
Vinyl acetate	10	BDL	BDL	BDL	BDL
Vinyl chloride	10	BDL	BDL	BDL	BDL
Total xylenes	5	BDL	BDL	BDL	BDL
Percent Moisture	0.1	2.3	2.3	9.7	5.6

BDL = Below Detection Limit

REPORT OF ANALYTICAL DATA

FOR

HARDING LAWSON ASSOCIATES

Prepared by:

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May 5, 1986

SPARTON TECHNOLOGY

BORE 001

008789

TABLE 1. PERCENT MOISTURE RESULTS — BORE 001

Bore Depth (ft.)	Detection Limit (%)	Moisture Content (%)
4.0 - 5.0	0.1	0.7
9.0 - 10.0	0.1	0.9
14.0 - 15.0	0.1	0.9
18.0 - 18.5	0.1	1.1
24.0 - 25.0	0.1	0.9
30.5 - 31.5	0.1	2.1
35.0 - 36.0	0.1	0.8
39.0 - 40.0	0.1	1.8
44.0 - 45.0	0.1	1.0
47.5 - 52.0	0.1	1.7
54.5 - 55.5	0.1	4.0
63.0 - 64.0	0.1	10.6

008790

SPARTON TECHNOLOGY

BORE 002

008791

TABLE 2. PERCENT MOISTURE RESULTS — BORE 002

Bore Depth (ft.)	Detection Limit (%)	Moisture Content (%)
4.5 - 5.5	0.1	2.0
10.5 - 11.5	0.1	1.7
14.5 - 15.5	0.1	2.9
19.5 - 20.5	0.1	2.9
30.0 - 31.0	0.1	5.8
49.0 - 50.0	0.1	3.1
59.0 - 59.5	0.1	6.0

008792

SPARTON TECHNOLOGY

BORE 003

008793

TABLE 3. PERCENT MOISTURE RESULTS — BORE 003

Bore Depth (ft.)	Detection Limit (%)	Moisture Content (%)
4.5 - 5.5	0.1	3.4
20.5 - 21.5	0.1	3.7
25.0 - 25.5	0.1	3.4
30.0 - 31.0	0.1	3.9
35.5 - 36.0	0.1	3.7

008794

SPARTON TECHNOLOGY

BORE 004

008795

TABLE 4. PERCENT MOISTURE RESULTS — BORE 004

Bore Depth (ft.)	Detection Limit (%)	Moisture Content (%)
4.0 - 5.0	0.1	7.6
9.0 - 10.0	0.1	4.5
13.5 - 14.0	0.1	12.0
25.5 - 26.0	0.1	4.9
29.0 - 30.0	0.1	4.4
48.5 - 49.0	0.1	21.3

SPARTON TECHNOLOGY

BORE 005

008797

TABLE 5. PERCENT MOISTURE RESULTS — BORE 005

Bore Depth (ft.)	Detection Limit (%)	Moisture Content (%)
4.5 - 5.5	0.1	5.4
10.0 - 11.0	0.1	3.5
15.0 - 15.5	0.1	3.7
20.5 - 21.0	0.1	4.8
25.5 - 26.0	0.1	5.3
30.5 - 31.5	0.1	6.3
58.2 - 59.4	0.1	3.0

008798

SPARTON TECHNOLOGY

BORE 006

008799

TABLE 6. PERCENT MOISTURE RESULTS — BORE 006

Bore Depth (ft.)	Detection Limit (%)	Moisture Content (%)
5.0 - 6.0	0.1	5.2
9.0 - 10.0	0.1	9.8
14.5 - 15.5	0.1	4.1
20.5 - 21.5	0.1	9.5
24.5 - 25.5	0.1	8.4
48.3 - 49.3	0.1	2.7
53.5 - 55.0	0.1	2.7
58.0 - 59.2	0.1	3.7

008800

SPARTON TECHNOLOGY

BORE 007

008801

TABLE 7. PERCENT MOISTURE RESULTS — BORE 007

Bore Depth (ft.)	Detection Limit (%)	Moisture Content (%)
4.5 - 5.5	0.1	3.7
10.5 - 11.0	0.1	2.6
15.0 - 16.0	0.1	4.4
18.2 - 18.8	0.1	5.0
30.0 - 31.0	0.1	5.0
57.0 - 57.5	0.1	4.5
58.5 - 59.5	0.1	3.4

SPARTON TECHNOLOGY

BORE 008

008803

TABLE 8. PERCENT MOISTURE RESULTS — BORE 008

Bore Depth (ft.)	Detection Limit (%)	Moisture Content (%)
5.5 - 6.5	0.1	14.1
10.5 - 11.5	0.1	3.0
15.5 - 16.5	0.1	3.1
20.5 - 21.0	0.1	5.1
29.5 - 30.5	0.1	15.3
58.3 - 59.0	0.1	4.1

008804

SPARTON TECHNOLOGY

BORE 009

008805

TABLE 9. PERCENT MOISTURE RESULTS — BORE 009

Bore Depth (ft.)	Detection Limit (%)	Moisture Content (%)
5.0 - 5.5	0.1	3.2
11.0 - 11.5	0.1	3.0
13.5 - 14.5	0.1	1.1
18.5 - 19.5	0.1	0.9
23.0 - 24.0	0.1	0.8
28.0 - 33.0	0.1	0.7
33.5 - 34.5	0.1	0.9
39.0 - 39.5	0.1	0.3
44.0 - 45.0	0.1	12.9
53.0 - 54.5	0.1	2.2
58.0 - 59.0	0.1	16.0

SPARTON TECHNOLOGY

BORE 010

008807

SPARTON TECHNOLOGY

BORE 011

008808

TABLE 11. PERCENT MOISTURE RESULTS — BORE 011

Bore Depth (ft.)	Detection Limit (%)	Moisture Content (%)
4.5 - 5.5	0.1	3.0
9.0 - 10.0	0.1	1.3
14.0 - 15.0	0.1	1.7
30.0 - 31.0	0.1	5.5
35.0 - 36.0	0.1	2.6
38.0 - 39.0	0.1	3.3
45.0 - 46.0	0.1	1.3
50.0 - 51.0	0.1	12.8

ATTACHMENT 7

Off-Site Investigation

Report Prepared for

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OFF-SITE INVESTIGATION
SPARTON TECHNOLOGY, INC.
COORS ROAD PLANT
ALBUQUERQUE, NEW MEXICO

HLA Job No. 6310,036.12

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October 19, 1987

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EXECUTIVE SUMMARY

This report presents an evaluation of contaminant magnitude and migration associated with Sparton Technology, Inc., at their Albuquerque, New Mexico facility and at designated surrounding off-site locations. This task was accomplished by conducting a soil gas study (July 20 to August 7, 1987) to determine the extent and magnitude of the contaminant plume using trichloroethane (TCA) and trichloroethylene (TCE) as indicator parameters. The collection of soil gas data was performed by Tracer Research Corporation (TRC) under subcontract to Harding Lawson Associates (HLA). Values obtained during the field effort were plotted and concentration isopleths were generated for the two constituents. The data from the 1987 study was compared to a soil gas study conducted at the facility by TRC in 1984.

Additional evaluations indicate that (1) there has been substantial decrease in contaminant levels from 1983 to 1987; (2) the groundwater velocity ranges between approximately 6 feet per year and 83 feet per year; (3) the dissemination of the plume appears to be primarily by dispersion with low velocity influence; and (4) that concentrations of TCA and TCE that are in excess of the state standards are in relatively close proximity to the site.

Based on the 1987 soil gas isopleths, and using the "worst case" TCA concentrations plotted to 0.01 micrograms per liter, the areal extent of the soil gas plume is approximately 100 feet east of Coors Road, 500 feet west of the facility's northwest corner, 900 feet west of the intersection of Eagle Ranch Road and Irving Boulevard, 2,000 feet south of the facility (downgradient), and 1,100 feet north of the site (upgradient).

I INTRODUCTION

A. Background

Sparton Technology, Inc. (Sparton) operates an electronics manufacturing facility at 9621 Coors Road, NW, in Albuquerque, New Mexico. Past waste management practices may have resulted in contamination of groundwater beneath the site. Subsequent contaminant migration to off-site areas via natural flow mechanisms was suspected. Sparton reached an agreement with the New Mexico Environmental Improvement Division (EID) for Sparton to authorize a soil gas investigation both on and off site to estimate the areal extent of the suspected plume (see Appendix A, Tracer Research Corporation Report, 1987). Harding Lawson Associates (HLA) was contracted and directed by Sparton to accomplish this task. HLA contracted Tracer Research Corporation (TRC) to conduct the nondestructive in situ testing program. Metric Corporation (Metric), a subconsultant to HLA, provided access clearance and utility location for off-site locations. Metric also assisted in the review and analysis of the resulting data and preparation of this report.

A limited soil gas study was conducted at the Sparton facility in 1984. The 1984 soil gas study was also performed by TRC under the supervision of HLA, and used soil gas values of trichloroethane (TCA)

and trichloroethylene (TCE) as indicator parameters of the suspected plume. A report describing the 1984 soil gas investigation is included as Appendix B.

B. Objectives

The objective of this study was to evaluate TCA and TCE contaminant magnitude and migration associated with the subsurface hydrologic regime at the Sparton facility. This goal was accomplished by completing the following tasks:

(1) Conducting a soil gas study, and from those results estimating:

- the lateral extent of the plume, and
- the upgradient and downgradient limit of the plume;

(2) Comparing the 1984 soil gas study to the 1987 study to identify any changes or trends with time;

(3) Reviewing various transport mechanisms with respect to site-specific hydrogeologic conditions and current mapping of soil gas contours (isopleths); and

(4) Reviewing existing quarterly chemical analyses for TCA and TCE from on-site monitoring wells to identify any changes or trends with time in the upper flow zone.

II 1987 SOIL GAS FIELD INVESTIGATION

A. Preinvestigation Plan

Prior to the field sampling activity, HLA presented a proposed location sampling plan (see Plate 1). This plan was composed of several longitudinal and latitudinal transects. Sample locations at the facility were spaced at 100-foot intervals; off-site locations were to be spaced at 200-foot intervals. With respect to off-site locations, interval spacing would increase or decrease as the data points were evaluated in the field. This flexibility was necessary to allow for maximum coverage of the area of investigation. Actual transects and spacing of data points for this investigation are presented on Plate 2.

B. Soil Gas Methodology (Refer to Appendix A)

The procedure used by TRC for the Sparton investigation involved gas chromatographic analysis of soil gas extracted from the ground. Prior to removal of the soil gas sample, the equipment was standardized with known pure laboratory samples, specifically, TCA, TCE, and perchloroethylene (PCE). Once the gas chromatograph was calibrated, a small diameter, hollow probe was either driven or hydraulically advanced into the soil at the designated sample location. This depth was usually between five and six feet below ground surface. A pump was used to draw soil gas into the probe. A syringe was placed into

the pump tubing and a small volume of soil gas was extracted. The gas sample was injected into the gas chromatograph and analyzed. Each value of TCA and TCE was plotted in the field on a 1-inch to 200-foot scale aerial photograph of the area provided by Metric.

PCE values were not plotted because PCE was not considered to be an indicator parameter for the contouring of the contaminant plume. PCE is an impurity related to the manufacturing of TCE. PCE was recorded by TRC because their computer analyzes certain chemicals in suites, and this portion of the computer program could not be deleted without deleting values of TCA and TCE. Recorded values of PCE were typically one to two orders of magnitude below measured values for TCA and TCE.

As a control check, ambient air samples were taken during the day. Generally, an early morning, a mid-day, and an end-of-shift sample were collected to serve as background quality samples. From July 20 to July 24, 1987, maximum values of ambient air samples for TCA and TCE ranged from 0.00007 to 0.00124 micrograms per liter (ug/l) and from less than 0.0001 to 0.00031 ug/l, respectively. Table 1 presents all ambient air sample values obtained during the referenced time period.

TRC advised HLA that based on their empirical experience with similar projects, the 0.01 ug/l contour would be the relevant limit of potential contamination attributable to a source. Although TRC has a

post-manufacturing modification (patent pending) which allows detection of volatile constituents to 0.0001 ug/l, according to TRC values below 0.01 ug/l could not unequivocally be interpreted as related to the source in question. HLA has presented TCA and TCE contours to 0.01 ug/l based on TRC's input. All data points have been reported, but the 0.01 contour limit was established as the lower limit of concern for the investigation. It should be noted that within the area of investigation, the maximum ground surface elevational difference is approximately 157 feet. Therefore, there is some potential for various data values to be masked or altered by excessive overburden or discontinuities within the overburden.

C. Field Procedure

The proposed transects for the project are presented on Plate 1. Plate 2 presents the actual transects and data collection points. The areal extent of this investigation was slightly under one square mile, and extends downgradient of the site approximately 3,200 feet. Data points were sampled from July 20 through July 24, 1987. Additional vertical profile data points were collected in the vicinity of SGB_2-07* on August 7, 1987. All data point values are included in Appendix A.

---

* SGB_2-07 = Soil Gas Transect B_2, sample location point No. 7.

Plates 1 through 4, and Figures 1 and 2 of Appendix A present a "true north" and a "facility north," which is actually to the northeast. For the purposes of this report, all directions stated are referenced to "facility north."

Data points for Transect A were collected on 100-foot intervals along the site boundaries from the southeast to northwest corners of the facility. From the northwest corner of the Sparton site, Transect A proceeded northward on 200-foot intervals and terminated at the edge of Calabacillas Arroyo. Data point SGA-17 was located on the east side of Coors Road in the right-of-way. Data point SGA-16 was located at the base of the hill at the bend in the canal east of Coors Road.

The western limit of the investigation for transects B, B_2, C, and C_2 was determined by either physical limits of accessible property or by soil gas limits at or below 10^{-3} ug/l, based on the advice of TRC. These transects generally arced eastward to Coors Road (Exception: Transect C_2 ended approximately 1,000 feet west of Coors Road due to 10^{-4} ug/l or below detection limit values). East of Coors Road, data collection points for each transect did not follow a spacing pattern due to the lack of right-of-way access or the inability of equipment to traverse rugged terrain. The major portion of Transect D was sampled at 400-foot intervals beginning approximately

800 feet west of Coors Road and continuing in a west-northwest arc to the western limit of accessible property. East of Coors Road, data points were collected where access was granted and where sample locations were accessible to the truck-mounted equipment.

Transect E extended at 200-foot intervals from the northwest (off site) to the northwest corner of the facility. Data points were collected at 100-foot intervals along the northern property line of the facility and east to Coors Road. At that point, the E Transect consisted of SGE-08 on the east side of Coors Road in the right-of-way and SGE-09, approximately midway between the northeast and southeast corners of the property.

Transect F consisted of three data points on the east side of Coors Road. They were collected at 200-foot intervals starting at approximately 200 feet north of SGE-08 and proceeding northward to the Calabacillas Arroyo.

Transect G consisted of four data points along the centerline of the Calabacillas Arroyo. These points began north of SGA-21 and proceeded in an easterly direction, terminating at the west edge of the culverts underlying Coors Road. Heavy rains and lightning curtailed any further study of the arroyo on July 24, 1987.

All data points collected during this investigation are contoured no lower than 0.01 ug/l for TCA and TCE on Plates 3 and 4, respectively. Specific values for TCA and TCE along the nine transects of this investigation are presented in the TRC report (see Appendix A).

All data collection points were staked, numbered, and flagged. Vertical and horizontal control was established by Metric. A copy of the sample location map with horizontal control was provided to TRC to plot the TCA and TCE contours (see Appendix A). Table 2 presents the ground levels elevations, referenced to mean sea level (MSL), for the data sampling points.

III DISCUSSION

In order to assess contaminant magnitude and migration at the Sparton facility, it is necessary to review existing data and evaluate the interrelationships of these data. Applicable information from various select and phased studies at and around the facility include:

- Evaluation of soil gas graphs and isopleths as an indication of the extent of groundwater contaminant migration (see Plates 5 through 8, and Appendix A, Figures 1 and 2);
- comparison of groundwater concentrations versus time from selected wells screened in the upper flow zone (see Plates 9 through 17);
- evaluation of plume velocity (see Plate 18, case 1 and 2); and
- Evaluation of plume transport mechanism(s) (see Plate 19, Figures A through E).

A. Soil Gas Concentration

Soil gas investigations were conducted at the facility in May 1984 and July 1987. Figures 1 and 2 of Appendix A (1987 study) present soil gas contour maps for TCA and TCE, respectively. Figures 1 and 2 of Appendix B (1984 study) present soil gas contour maps for TCE and TCA, respectively. Plates 5, 6, 7, and 8 present graphs of soil gas values along the south boundary of the facility and along Irving Boulevard for TCA and TCE, respectively. Each graph presents soil gas values collected during the 1984 and 1987 studies. Comparison of the

figures indicates that there has been a decrease in soil gas concentrations by approximately one order of magnitude from 1984 to 1987 for the constituents investigated, and there is a decrease in soil gas concentration levels with distance from the source.

B. Groundwater Concentration

Monitoring wells MW-6, MW-8, MW-9, MW-14, and MW-15 were chosen to assess groundwater concentration levels of TCA and TCE in the upper flow zone. Quarterly sampling data for these constituents are plotted for the years 1983 through 1987. The only exceptions to this are wells MW-14 and MW-15. These two wells only have data plotted after 1985 as it was not until that time that packers were installed to separate the upper and lower flow zones in the screened area.

Although all referenced wells currently exceed state standards as of the third sampling quarter of 1987, a review of the data indicates that most have displayed a decrease in constituent level with time.

C. Groundwater Velocity

To determine the rate of groundwater flow in the upper flow zone throughout the site, the particle velocity is calculated using the equation (Driscoll 1986, page 83):

$$V = \frac{cKi}{n}$$

Where: V = velocity, in feet/year
K = hydraulic conductivity, in feet/day
i = hydraulic gradient, in feet/foot
n = porosity, nondimensional
c = conversation factor, 365 days/year

Based on permeability data (Metric Corporation 1987, Table 1) obtained from monitoring wells MW-16, MW-18, and MW-24, a range of hydraulic conductivities (K) from 0.92 feet per day (feet/day) to 13.0 feet/day was used. The hydraulic gradient (i) was calculated as 0.007 based upon site-specific groundwater elevation data (HLA 1986), and represents a "worst case" condition as opposed to a regional hydraulic gradient of 0.0016. The porosity (n) of the formation was estimated as 0.40 (Todd 1959, Table 2-6).

Plate 18 presents the calculations for groundwater velocity for the given range of hydraulic conductivities. Based on these calculations, it appears that the groundwater velocity in the upper flow zone ranges between 5.88 feet/year and 83.04 feet/year.

It is important to note that previous calculations of groundwater velocity were based on an aquifer pump test of PW-1 at the facility. However, the well is constructed with 68 feet of screen in the lower

flow zone and 10 feet of screen in the upper flow zone. Therefore, a high velocity calculated from this pump test data is not indicative of the groundwater velocity in the upper flow zone where the bulk of the contamination is located.

D. Transport Mechanisms

The two major mechanisms of solute (dissolved substance) transport are advection and dispersion. Advection is the transportation of solutes by the flowing groundwater (Freeze and Cherry 1979, pages 75 and 76). Solutes typically move in a longitudinal direction and downgradient with the natural flow of groundwater. As solutes move longitudinally, there is also lateral spreading of contaminant concentration. This process is referred to as dispersion, and is a consequence of both mechanical fluid mixing and molecular diffusion (ibid). Longitudinal dispersion in the direction of bulk flow is more common than lateral, or transverse, dispersion except when the groundwater flow is very low. Some sources note that depending on the exact nature of the aquifer, the dispersion may be a greater influence than advection (Driscoll 1986, page 710).

The upgradient distance from the facility for the 0.01 contour for TCA and TCE is approximately 1,110 feet. The downgradient distance is approximately 2,000 feet. Review of the TCA and TCE soil gas contour

maps (see Appendix A, Figures 1 and 2) reflect a similar pattern as that of the dispersion pattern with low groundwater velocity influence as presented on Plate 19, Figure E.

Soil gas data taken in close proximity to on-site monitoring wells along the property line were compared to groundwater monitoring results from samples taken from those wells in the same time period as the soil gas survey was being conducted. For each well, the ratio of groundwater concentration/soil gas concentration was calculated, and these ratios were examined using standard statistical techniques.

The results of this analysis indicate that the worst case horizontal limits of the groundwater plume containing TCE concentrations at or above the state standard coincides approximately with the 0.1 ug/l soil gas contour. Similarly, using the worst case for TCA, the 0.01 ug/l soil gas contour is appropriate. This supports the premise that the plume is still in relatively close proximity to the Sparton site (see Appendix C for calculations).

The transport mechanism associated with soil gas movement is dispersion. Given that the groundwater velocity is low (see Section IV.C) and contaminant migration is dispersive, it would be reasonable to conclude that the soil gas isopleths reflect a general pattern for the lateral extent of TCA and TCE contamination in the groundwater.

E. Possible Outside Influences on 1987 Soil Gas Investigation

The area of the 1987 investigation has been subject to extensive earth-moving and road building activities. It is possible that some of the off-site soil gas values for TCA and TCE have been affected by (1) in-field repair of heavy equipment, (2) solvents used in transport vehicles hauling asphalt material, and (3) placement of asphalt pavement or asphalt stockpile areas.

Approximately 400 feet south of Irving Boulevard, on the east side of Eagle Ranch Road, is a localized increase of TCA values. In an attempt to further understand this apparent anomaly, a soil gas vertical profile was performed. Results indicate that the concentrations of TCA and TCE increase with depth; however, data collection did not extend to groundwater. It is not clear at this time if the pattern is attributable to upward movement of soil gases from the phreatic zone, or downward migration of an alternate surface source. An alternate surface source is highly suspect based on a review of an aerial photograph of the early construction phases of Eagle Ranch Road. In this photograph, there appears to be a tank structure in the exact location where the increased soil gas values were obtained.

IV CONCLUSIONS

In order to accurately access the current extent and magnitude of TCA and TCE concentration levels associated with the Sparton facility, an evaluation of several relevant factors has been completed. These data include the 1984 and 1987 soil gas investigation, the presentation of solute transport mechanisms and plume patterns, the review of concentration level trends for TCA and TCE at wells that monitor the upper flow zone at the facility, and the calculation of a probable range of groundwater velocities that exist in the vicinity of the facility.

Based on the evaluation of these data and HLA's understanding of the site, the following conclusions are warranted:

- Using the field criteria of 0.01 ug/l, the upgradient limit of the TCA soil gas plume appears to be at the edge of the Calabacillas Arroyo. The downgradient limit occurs about 2,000 feet south of the facility property. The upgradient limit of the TCE soil gas plume appears to be approximately 50 feet south of the Calabacillas Arroyo. The downgradient limit occurs about 2,000 feet south of the facility property;

- Using the same criteria as above, the basic lateral extent of the TCA soil gas plume is approximately 200 feet east of Coors Road, approximately 500 feet west of the northwest corner of the facility, and 900 feet west of the Irving Boulevard and Eagle Ranch Road intersection. The lateral extent of the TCE soil gas plume is approximately 30 feet east of Coors Road and 1,000 feet west of the facility's southwest corner;

- Correlation of soil gas and groundwater data tend to support the relative close proximity of the plume to the facility site;

- There has been a substantial decrease in concentration levels of TCA and TCE in the groundwater at monitoring wells MW-9, MW-14, and MW-15, from 1983 to 1987. There is a decrease in soil concentration levels with distance from the facility that reflects a dispersive pattern;

- The major solute transport mechanism appears to be that of dispersion with a minor component of advection from regional flow. This is evidenced by the presence of TCA and TCE soil gas values approximately 1,100 feet upgradient of the facility; and

- The probable range of groundwater velocities in the area of the facility is between 6 feet per year and 83 feet per year. This range is based upon site-specific pump test data, from the upper flow zone, and a higher hydraulic gradient than is found in the regional environment. Using the upper limit of this range and assuming a 20 year time frame, a "worst case" distance of contamination from the source would be approximately 1,660 feet. Other sources have previously suggested that the rate of migration may be two orders of magnitude or greater than this referenced upper limit based on data collected at well PW-1. This well, however, is screened primarily in the lower flow zone. This higher velocity is therefore not considered to be representative of upper flow zone conditions.

REFERENCES

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Freeze, R., and J. Cherry. Groundwater. 1979, pp. 75 and 76.

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Metric Corporation. "Aquifer Testing at the Sparton Technology, Inc. Coors Road Plant, Albuquerque, New Mexico." April 1987.

Todd. Groundwater Hydrology. 1956, Table 2.6.

DISTRIBUTION

1 copy to:	Mr. Blair Thompson Sparton Corporation 2400 East Ganson Street Jackson, Michigan 49202
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JSH/SDP:kmr/sve

QUALITY CONTROL REVIEWER:

Jay E. Mabrey, P.E.
Associate Engineer

TABLES

TABLE 1

Background Ambient Air Samples
for TCA and TCE

Date	Air Sample TCA (ug/l)	Air Sample TCE (ug/l)	Time
7/20/87	0.00078	0.00015	1043
	0.00124	0.00015	1305
	0.00067	0.00031	1613
	0.00082	0.00015	1719
7/21/87	0.00039	0.00015	0756
	0.00062	0.00015	1132
	0.00032	0.00015	1456
	0.00046	0.00015	1639
7/22/87	0.00031	0.00015	0838
	0.00065	0.00015	1141
	0.00034	0.00015	1259
	0.00007	0.00015	1619
	0.00007	0.00015	1708
7/23/87	0.00035	0.00016	0840
	0.00029	0.00016	1119
	0.00031	0.00016	1301
7/24/87	0.00026	0.00011	0815
	0.00021	0.00011	0920
	0.00050	0.00011	1112
	0.00025	0.00011	1532
	0.00031	0.00011	1647

TABLE 2

Ground Level (G.L.) Elevations for
Soil Gas Sampling Sites (Feet, MSL)

Site Label	G.L. Elevation
A- 1	5039
A- 2	5041
A- 3	5041
A- 4	5041
A- 5	5043
A- 6	5042
A- 7	5042
A- 8	5041
A- 9	5040
A-10	5042
A-11	5043
A-12	5045
A-13	5048
A-14	5045
A-15	5055
A-16	4996
A-17	5037
A-18	5059
A-19	5060
A-20	5060
A-21	5058
B- 1	5028
B- 2	5030
B- 3	5034
B- 4	5036
B- 5	5040
B- 6	5046
B- 7	5057
B- 8	5064
B- 9	5074
B-10	5085
B-11	5099
B-12	5110
B-13	5119

TABLE 2 (Continued)

Ground Level (G.L.) Elevations for
Soil Gas Sampling Sites (Feet, MSL)

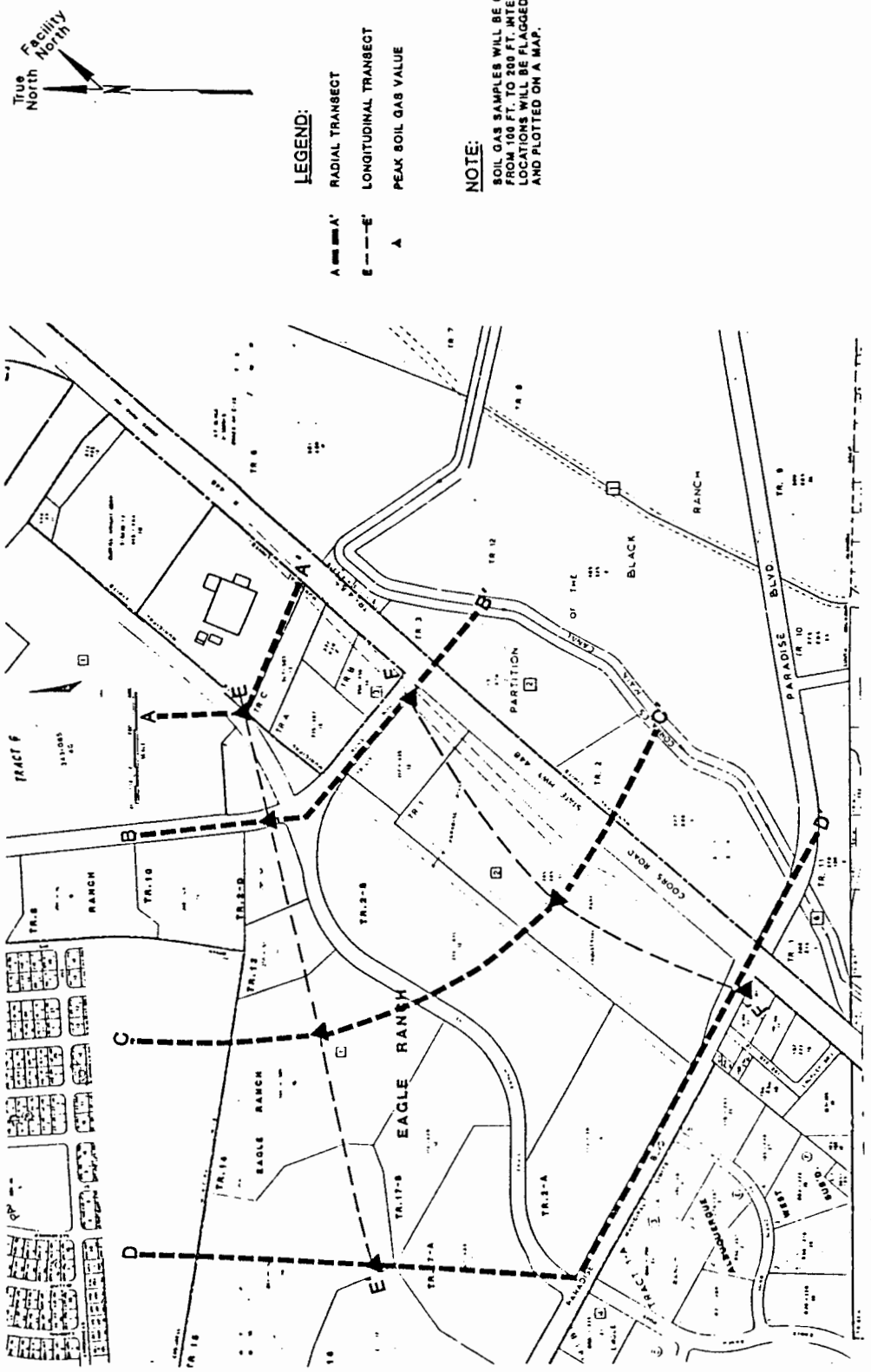
Site Label	G.L. Elevation
B2- 1	5150
B2- 2	5153
B2- 3	5088
B2- 4	5069
B2- 5	5065
B2- 6	5053
B2- 7	5047
B2- 8	5053
B2- 9	5064
B2-10	5042
B2-11	5028
B2-12	5023
B2-13	5025
B2-14	5024
C- 1	4999
C- 2	5069
C- 3	5064
C- 4	5042
C- 5	5032
C- 6	5017
C- 7	5011
C- 8	5011
C- 9	5075
C-10	5081
C-11	5085
C-12	5109
C-13	5094
C-14	5079
C-15	5088
C-16	5100
C2- 1	5060
C2- 2	5066
C2- 3	5082
C2- 4	5100
C2- 5	5123
C2- 6	5119
C2- 7	5108
C2- 8	5120

TABLE 2 (Continued)

Ground Level (G.L.) Elevations for
Soil Gas Sampling Sites (Feet, MSL)

Site Label	G.L. Elevation
C2- 9	5111
C2-10	5089
C2-11	5087
D- 1	4996
D- 2	4998
D- 3	5032
D- 4	5037
D- 5	5047
D- 6	5061
D- 7	5088
D- 8	5099
D- 9	5153
D-10	5155
D-11	5121
D-12	5108
E -1	5055
E- 2	5052
E- 3	5052
E- 4	5051
E- 5	5048
E- 6	5046
E- 7	5043
E- 8	5042
E- 9	5040
E-10	5059
E-11	5068
E-12	5061
E-13	5071
F- 1	5039
F- 2	5042
F- 3	5042
G- 1	5028
G- 2	5026
G- 3	5024
G- 4	5020

PLATES



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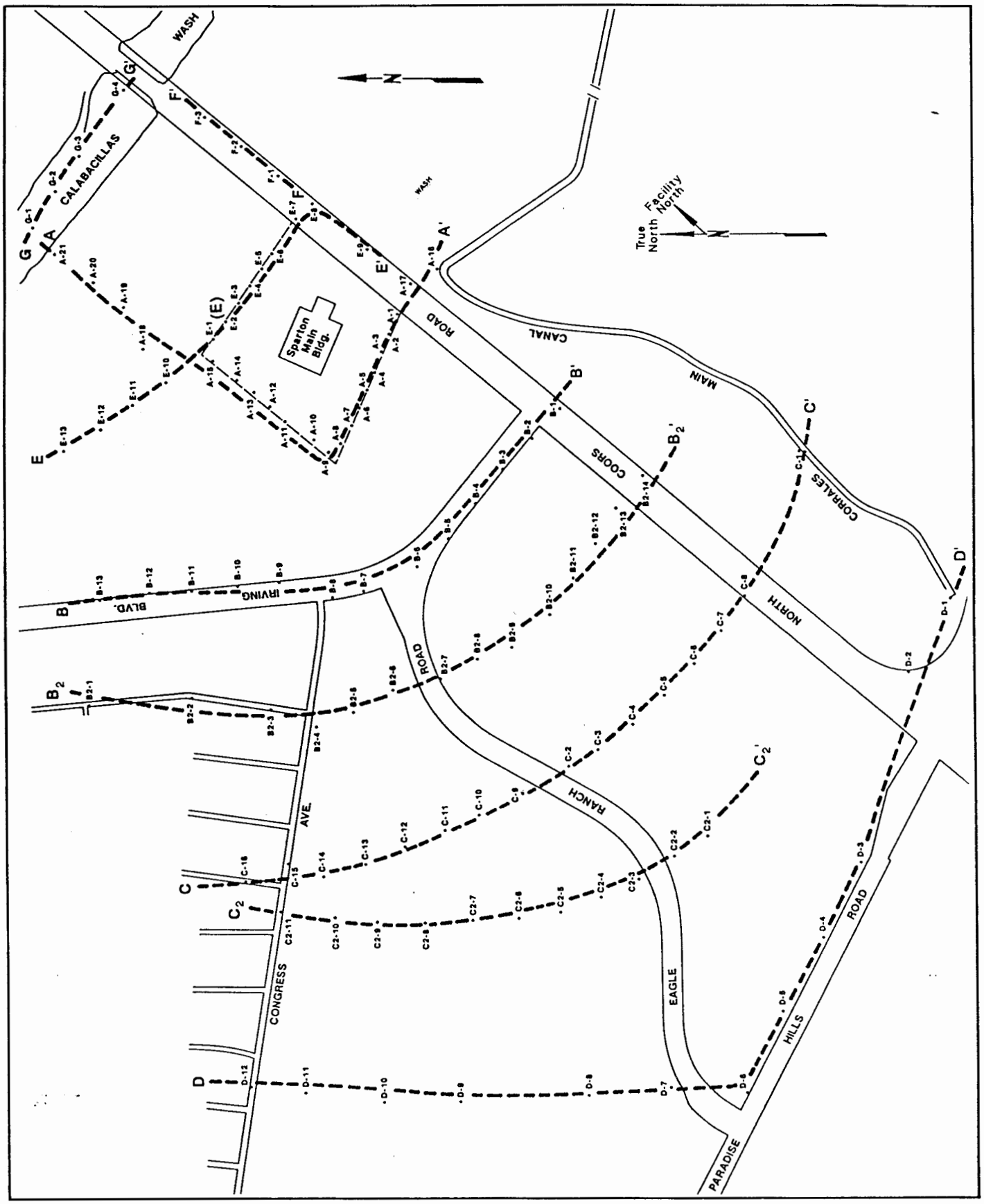
PROPOSED SAMPLING PLAN TRANSECTS

SPARTON TECHNOLOGY, INC.
ALBUQUERQUE, NEW MEXICO

PLATE **1**

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
S.K.	6310,036.12	J.S.H.	9/8/87		

008840



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ACTUAL SAMPLING PLAN TRANSECTS

SPARTON TECHNOLOGY, INC.
ALBUQUERQUE, NEW MEXICO

PLATE **2**

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
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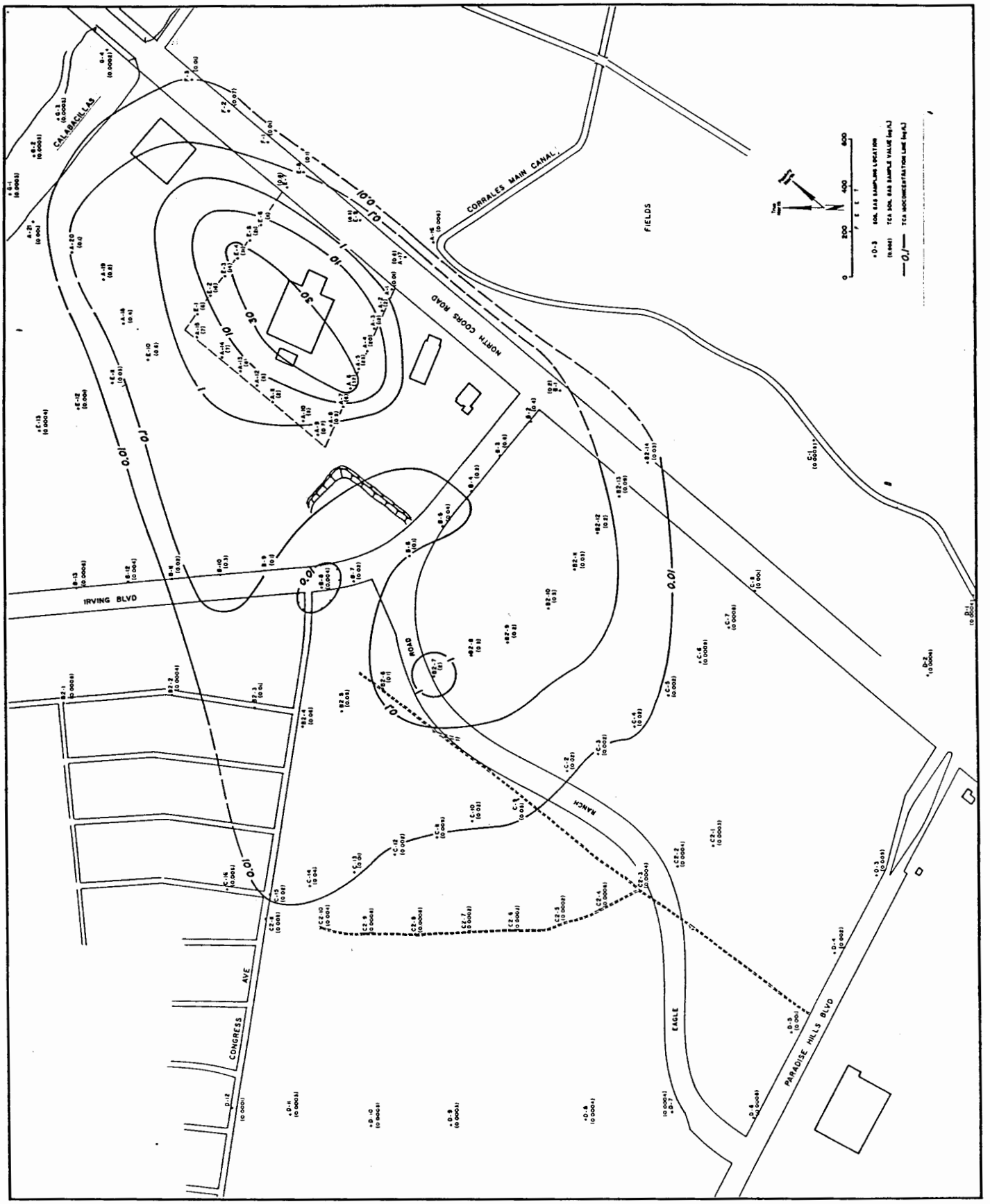

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TCA CONCENTRATION CONTOURS

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ALBUQUERQUE, NEW MEXICO

PLATE
3

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
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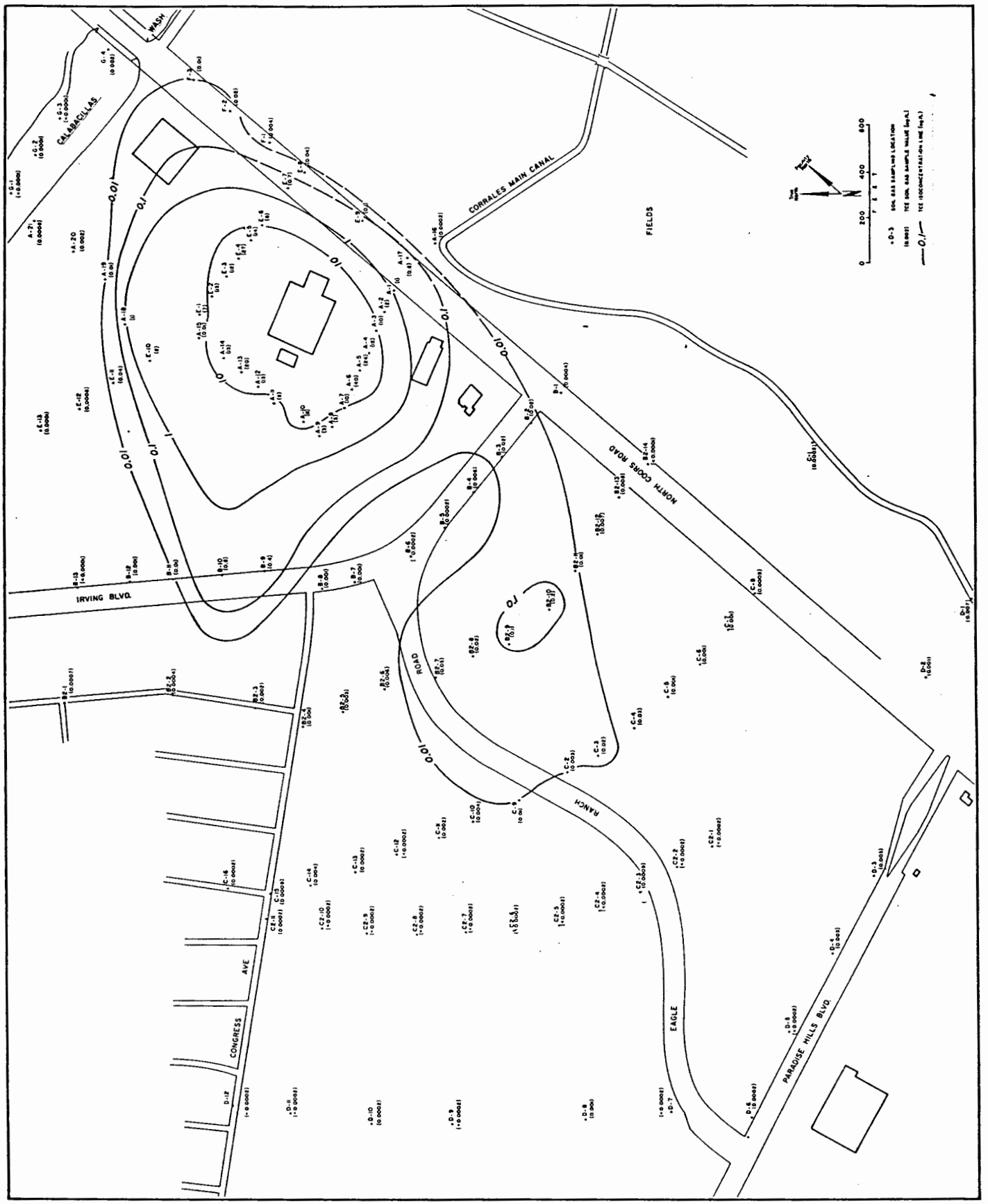
008842



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TCE CONCENTRATION CONTOURS

SPARTON TECHNOLOGY, INC.

ALBUQUERQUE, NEW MEXICO

PLATE **4**

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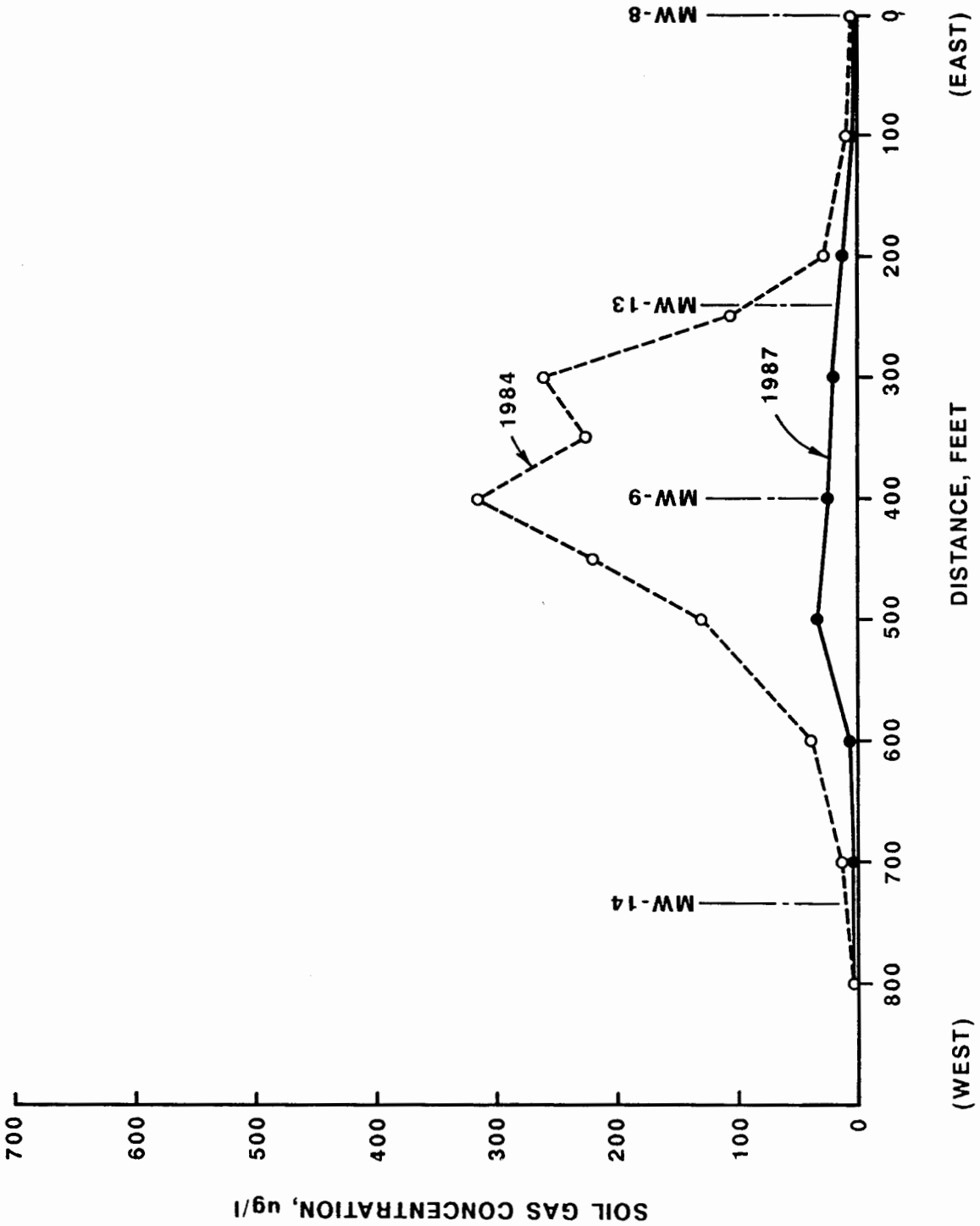

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TCA SOIL GAS CONCENTRATIONS FACILITY SOUTH BOUNDARY

PLATE
5

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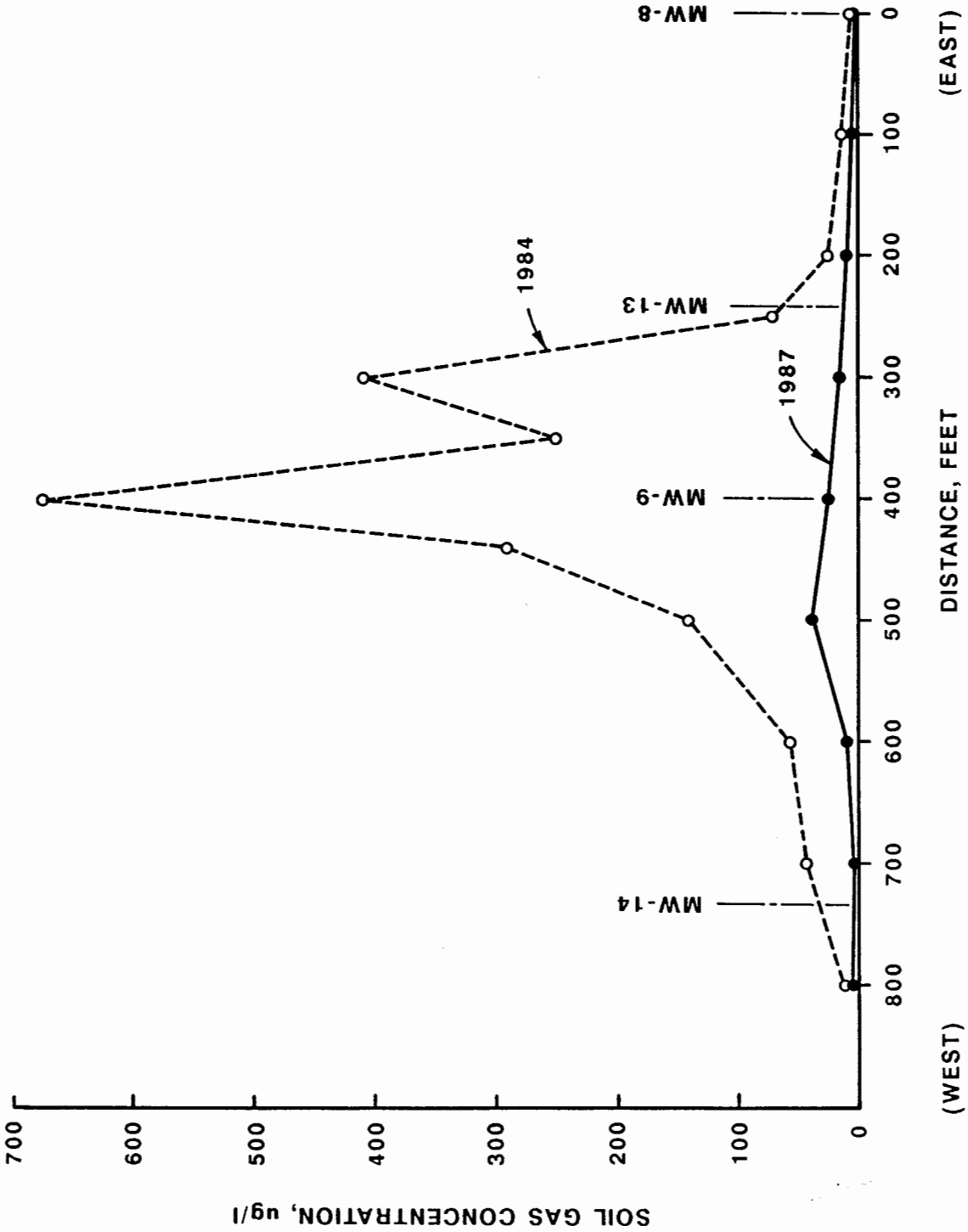

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TCE SOIL GAS CONCENTRATIONS FACILITY SOUTH BOUNDARY

PLATE
6

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
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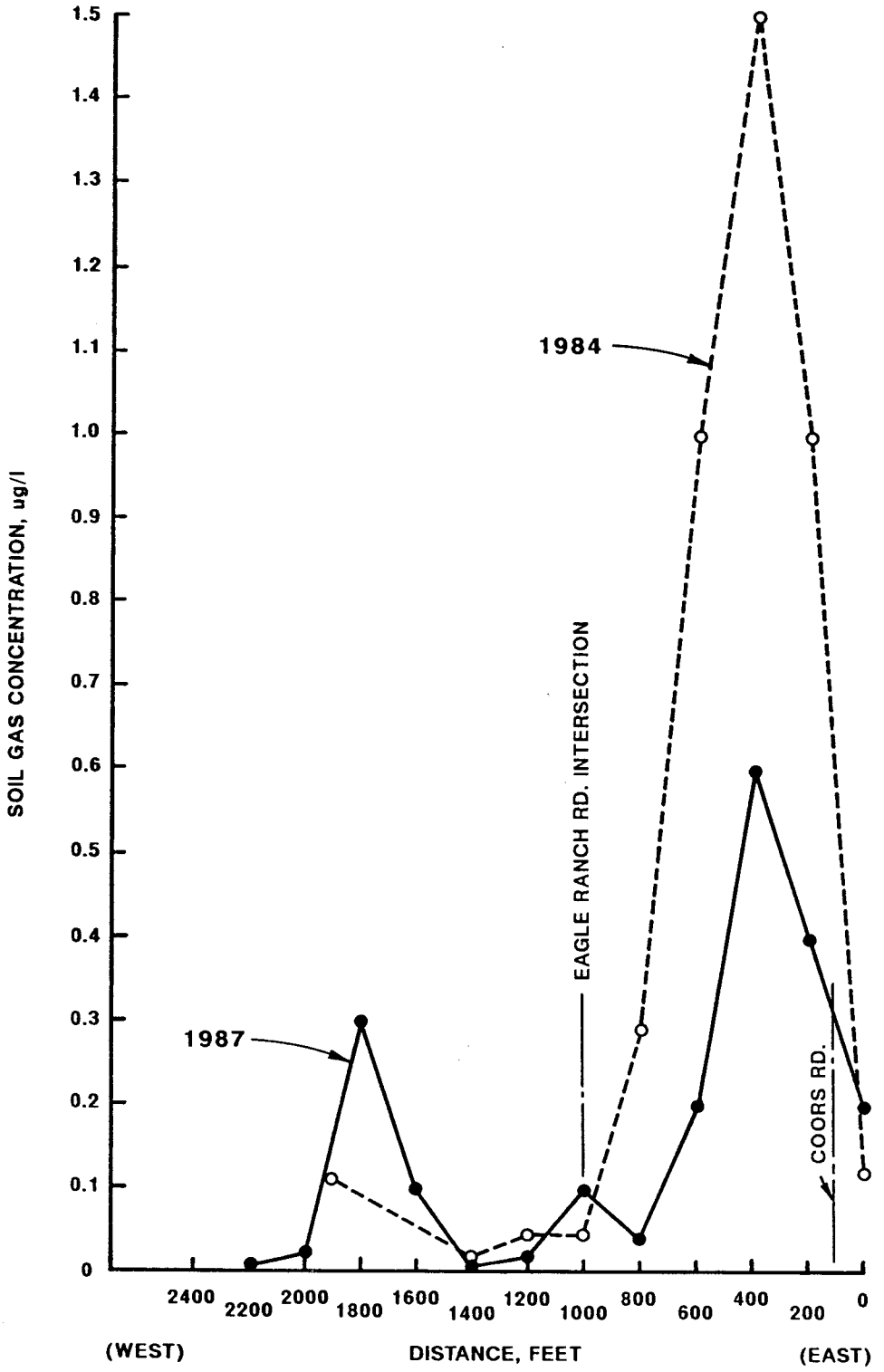

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TCA SOIL GAS CONCENTRATIONS IRVING BLVD.

PLATE
7

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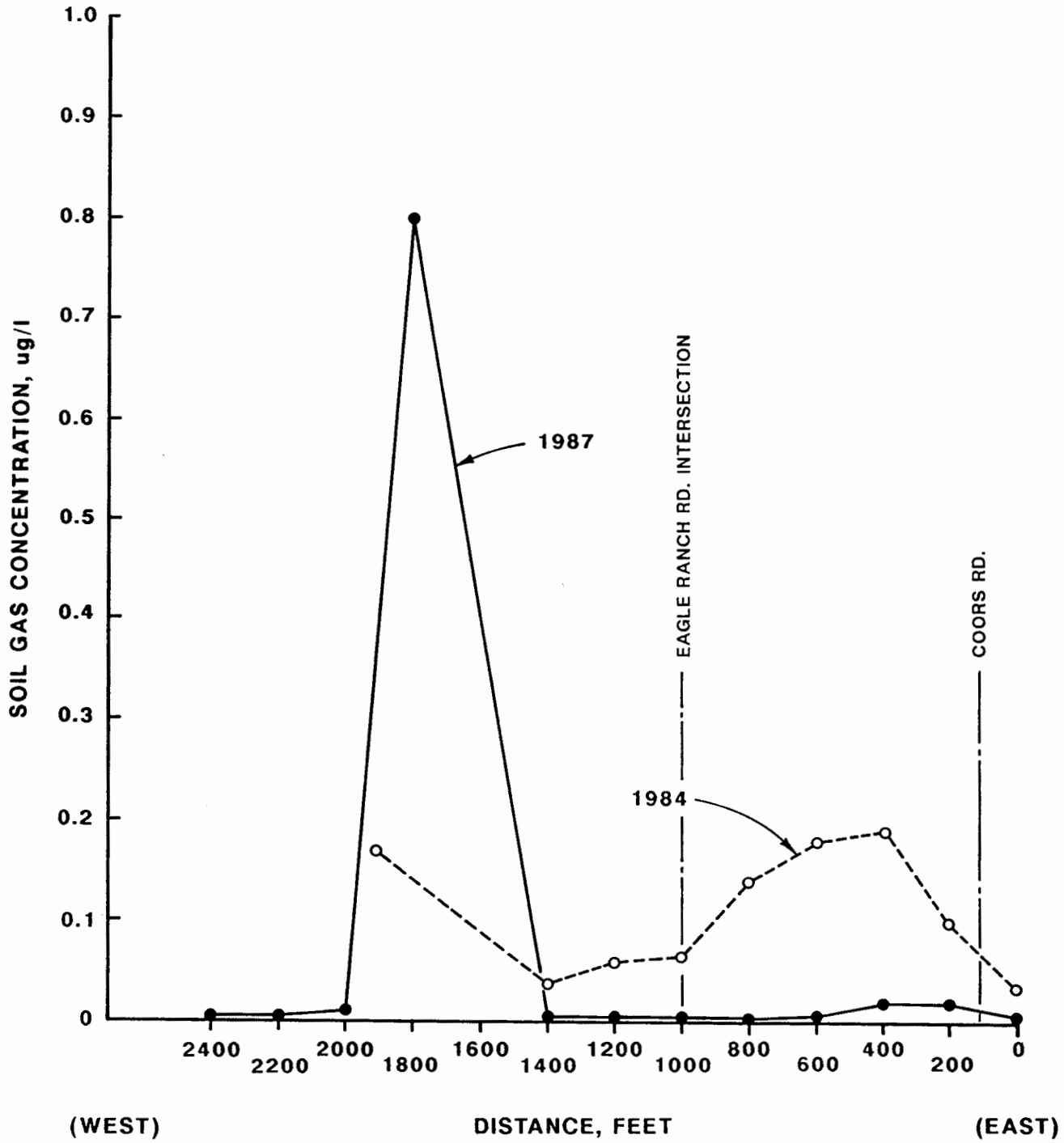

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TCE SOIL GAS CONCENTRATIONS
IRVING BLVD.

PLATE
8

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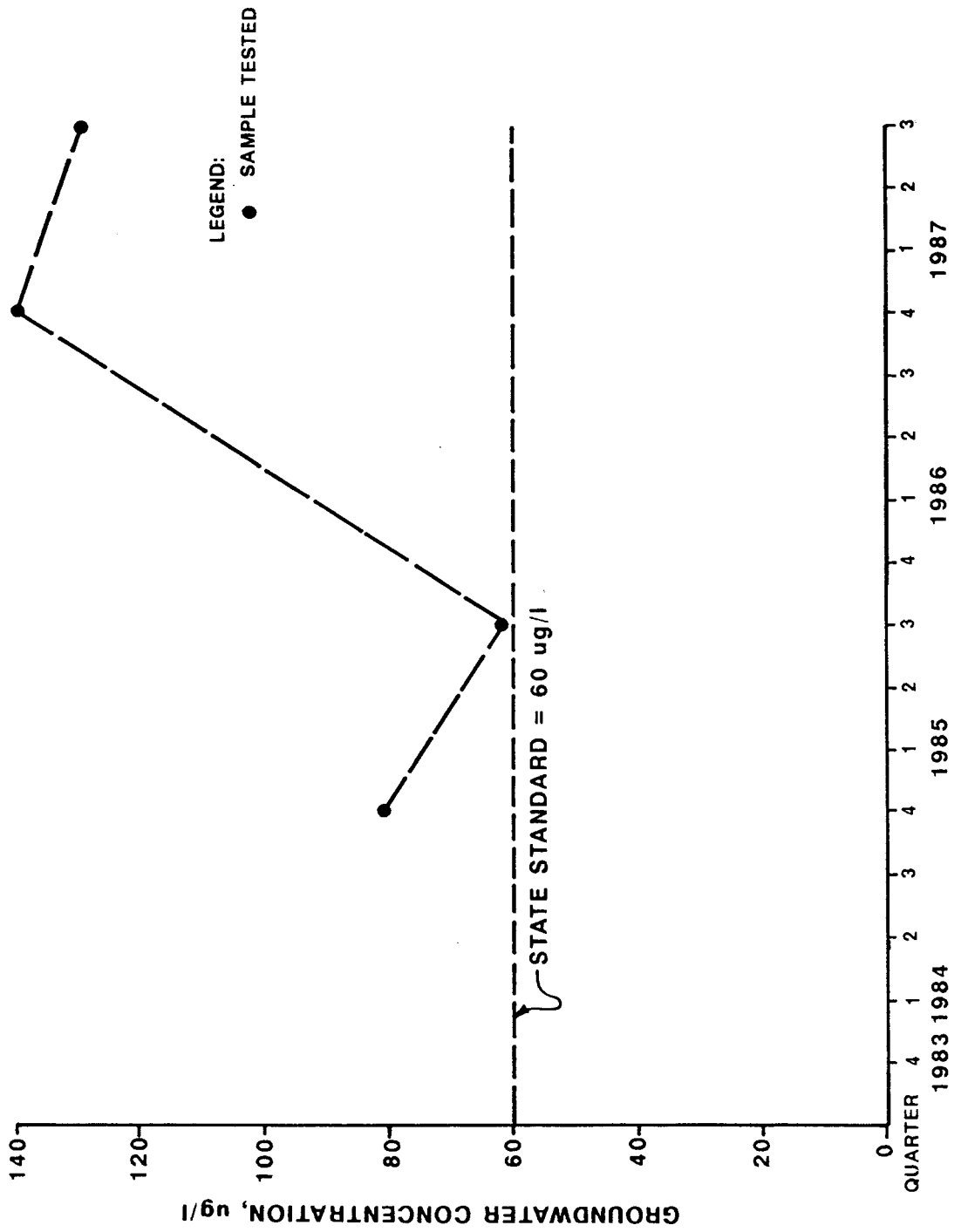

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TCA QUARTERLY SAMPLING
1983 TO 1987 : MW-6

PLATE
9

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
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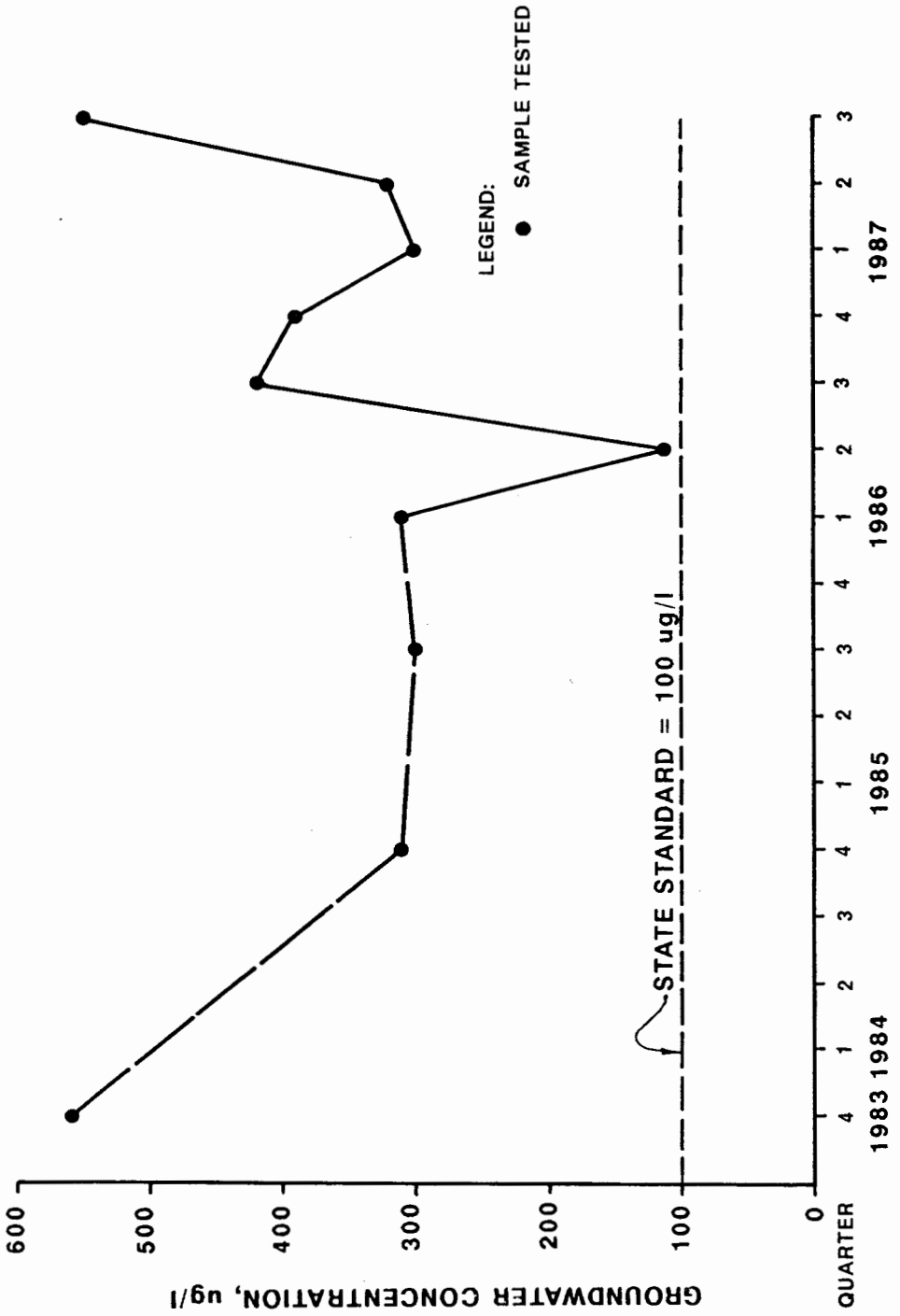
008848



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TCE QUARTERLY SAMPLING
1983 TO 1987 : MW-6

PLATE
10

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
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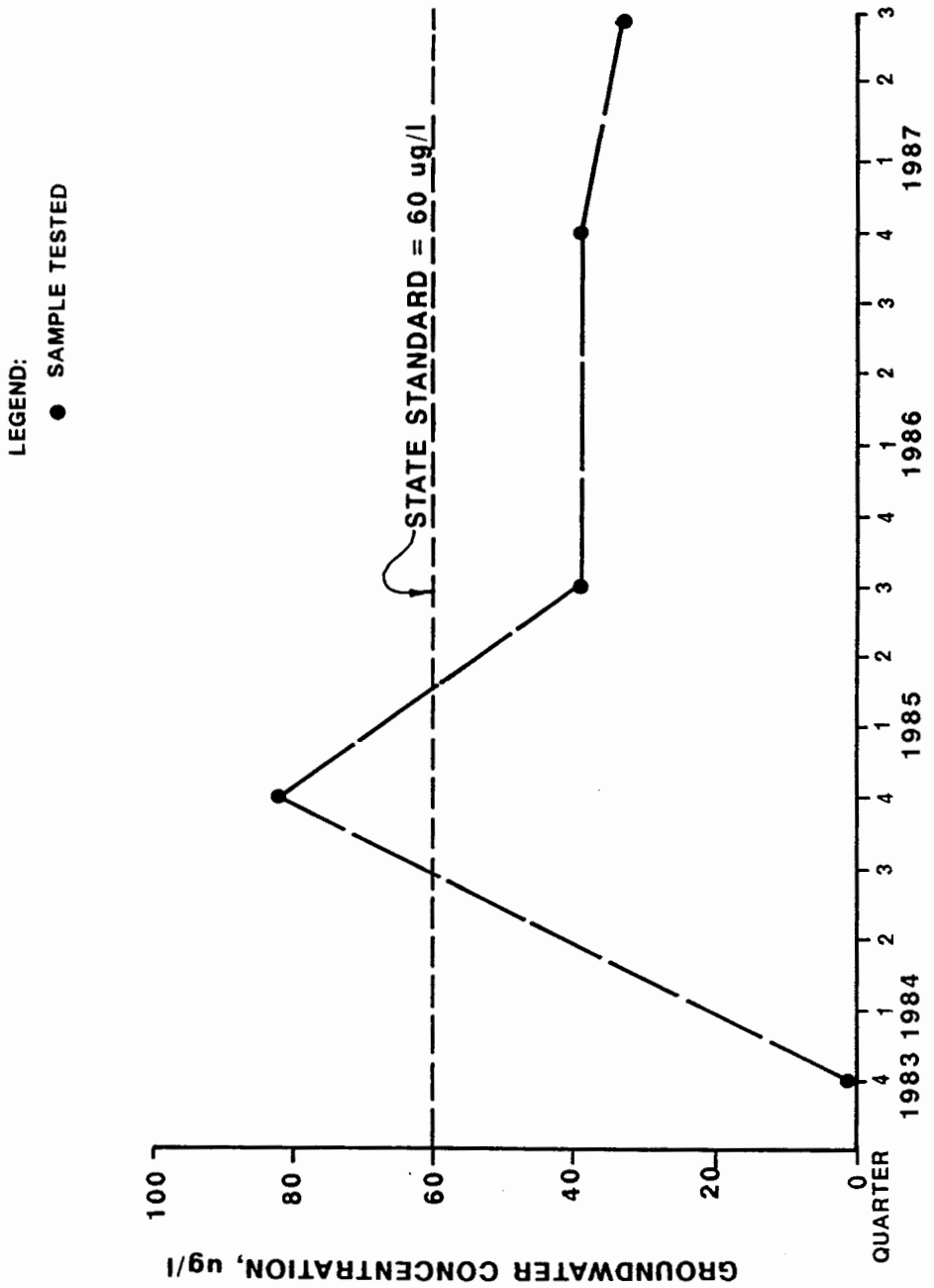

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TCA QUARTERLY SAMPLING
1983 TO 1987 : MW-8

PLATE
11

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
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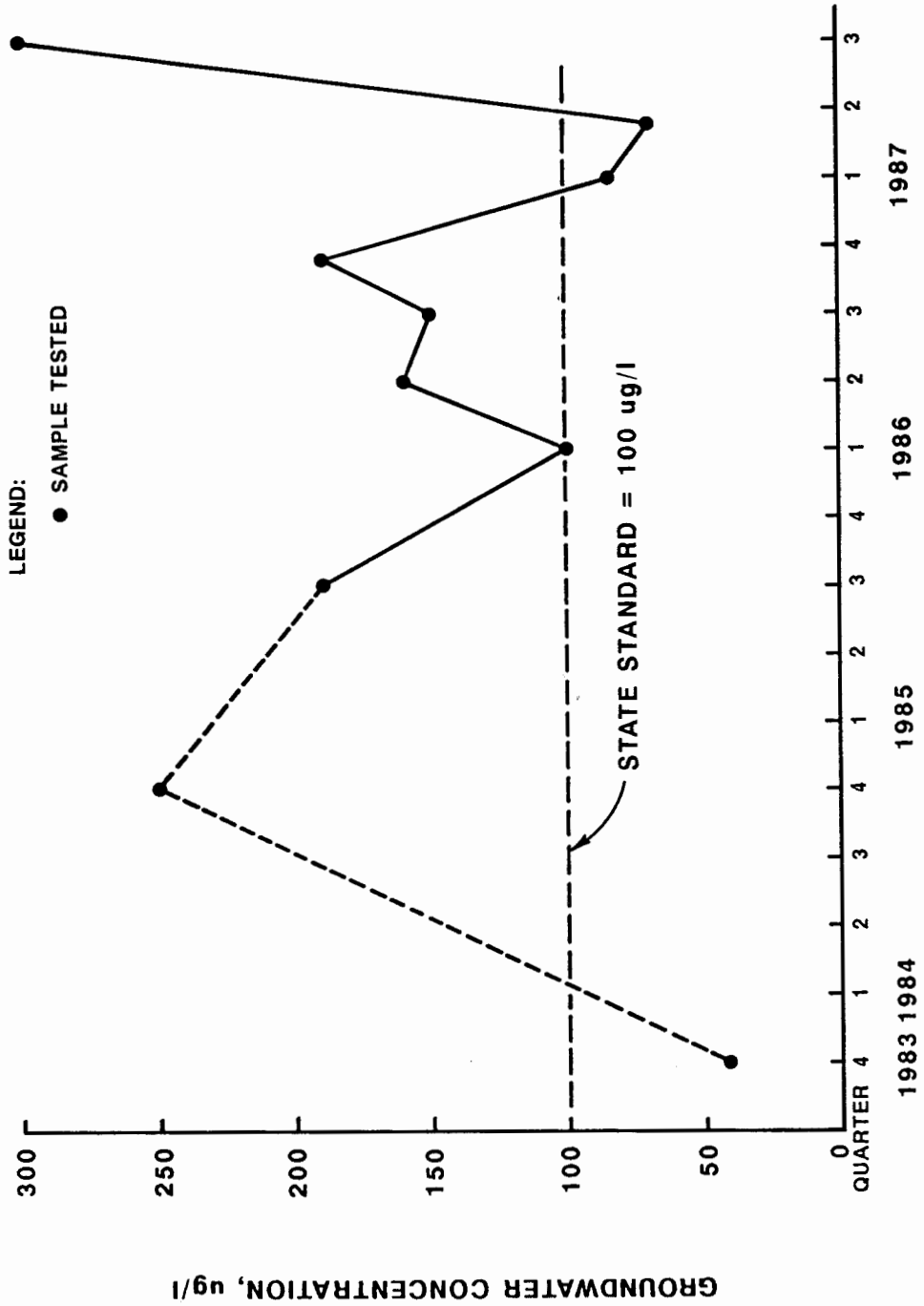
008850



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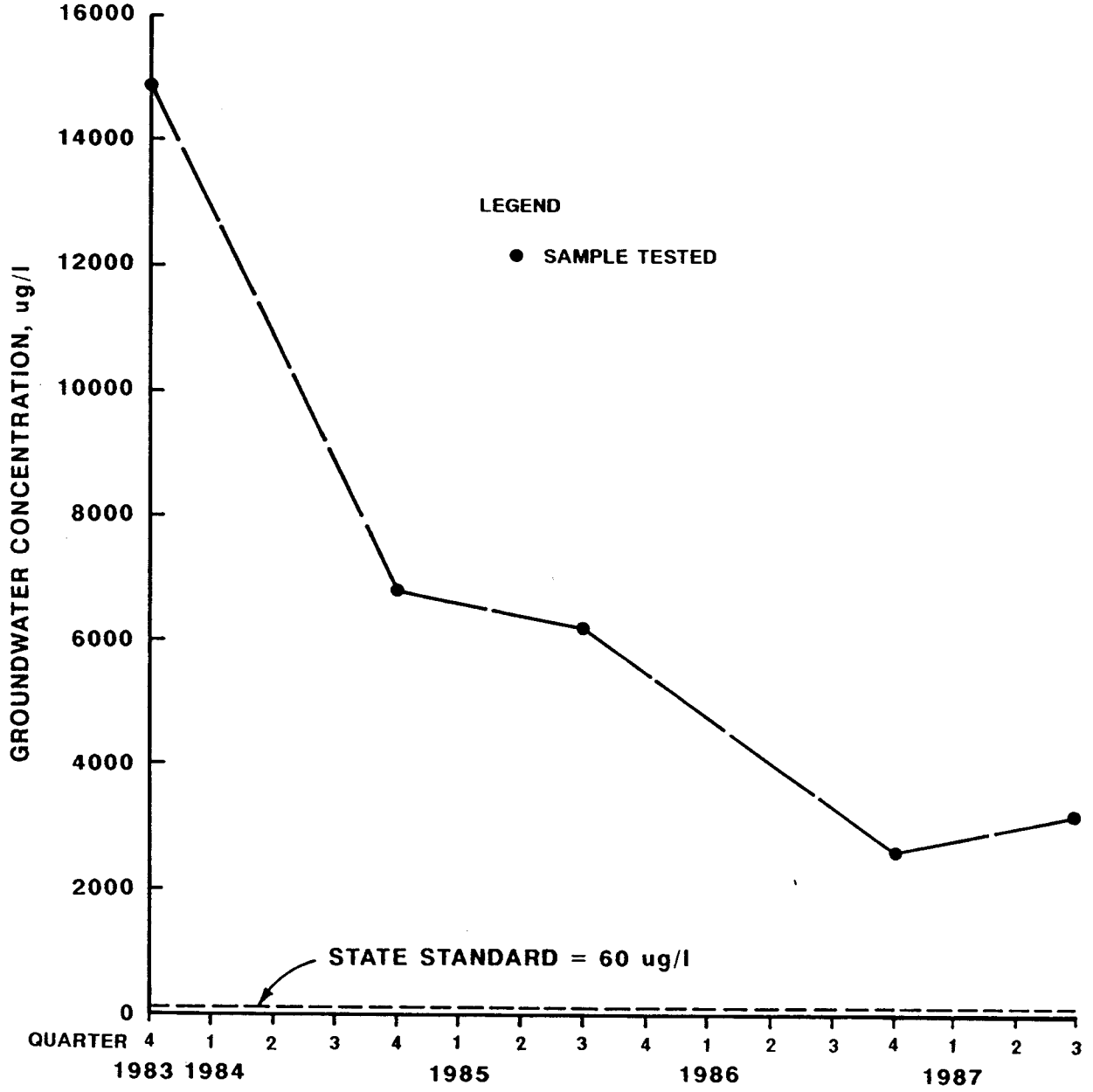
TCE QUARTERLY SAMPLING
1983 TO 1987 : MW-8

PLATE
12

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE

008851



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TCA QUARTERLY SAMPLING
1983 TO 1987 : MW-9

PLATE
13

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
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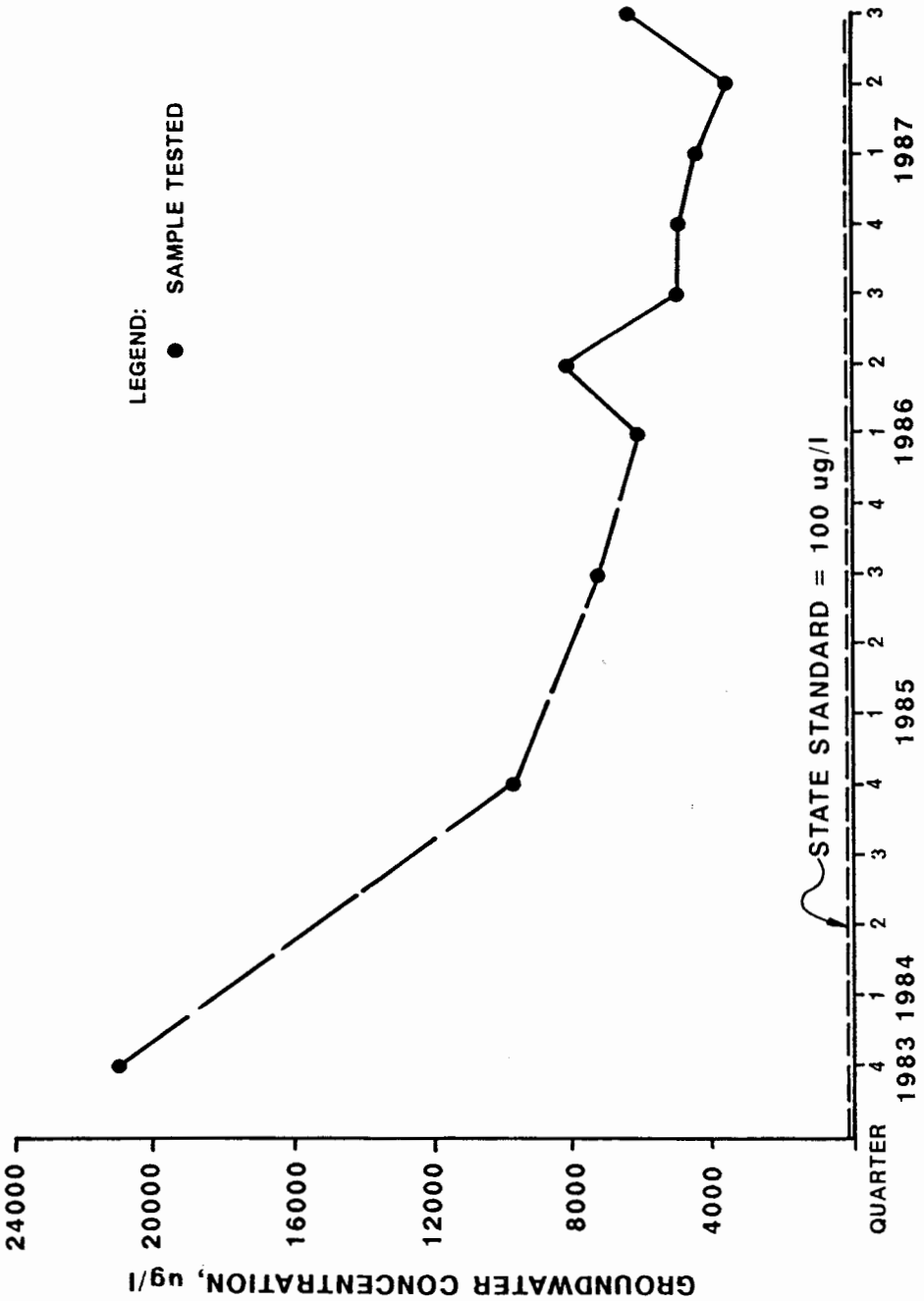
008852



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TCE QUARTERLY SAMPLING 1983 TO 1987 : MW-9

PLATE **14**

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
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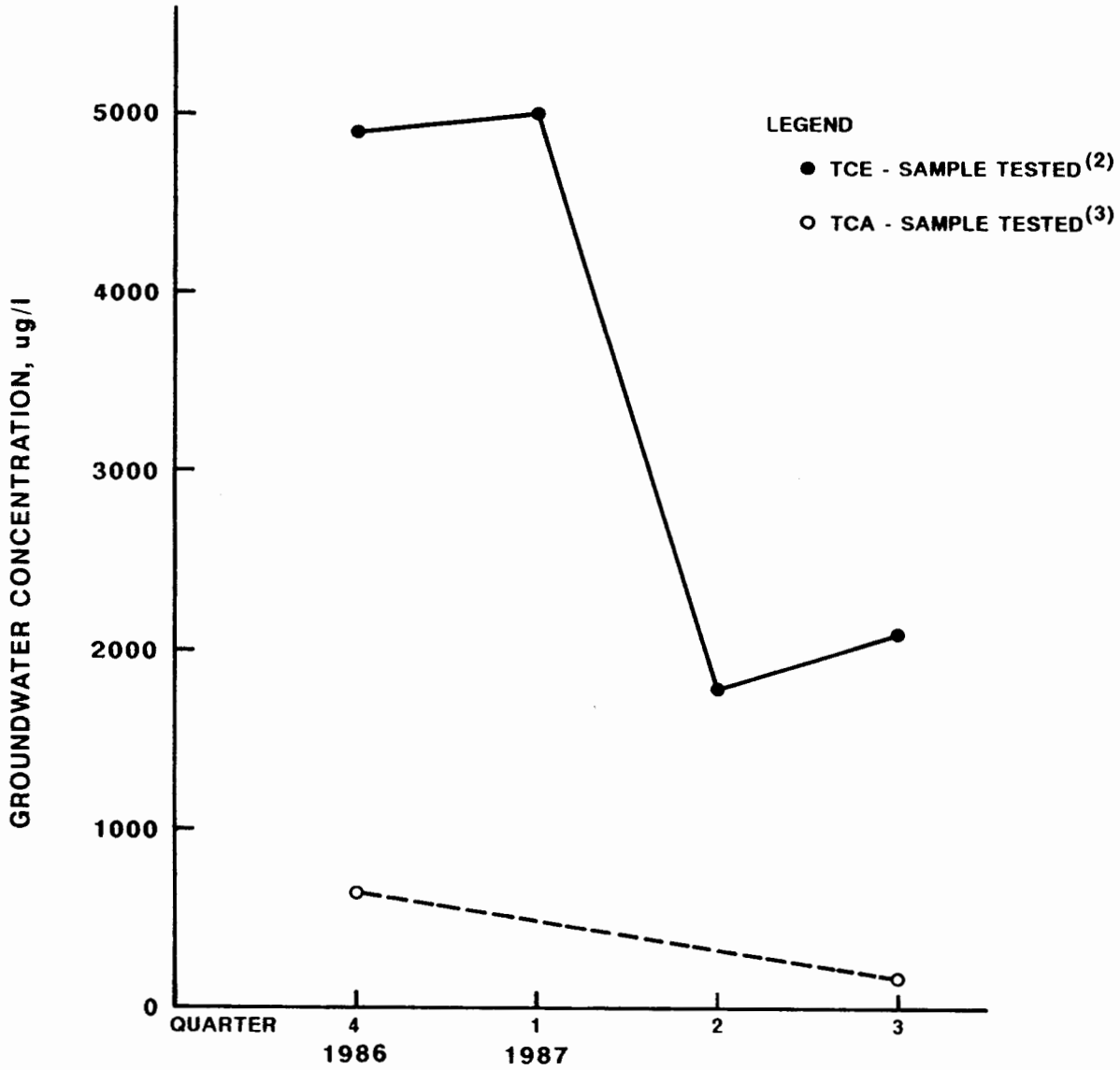
008853



NOTES: 1.PACKER PLACED TO ISOLATE UPPER FLOW ZONE IN 1985.

2. STATE STANDARD (TCE) = 100 ug/l.

3. STATE STANDARD (TCA) = 60 ug/l.

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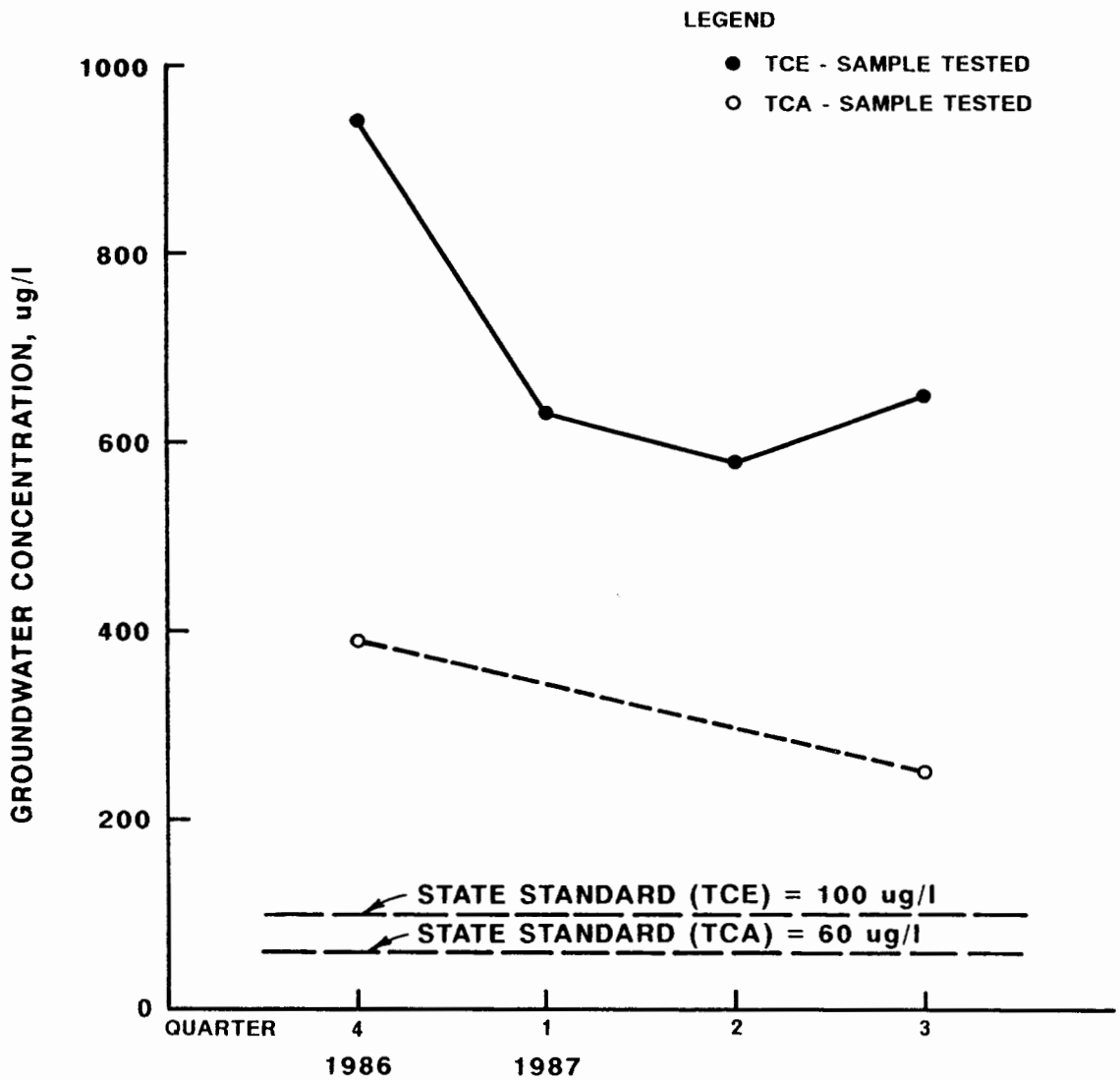
TCA AND TCE QUARTERLY SAMPLING(1)
1986 TO 1987 : MW-14

PLATE
15

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
S.K.	06310,036.12				

008854



NOTE: 1. PACKER PLACED TO ISOLATE UPPER FLOW ZONE IN 1985.

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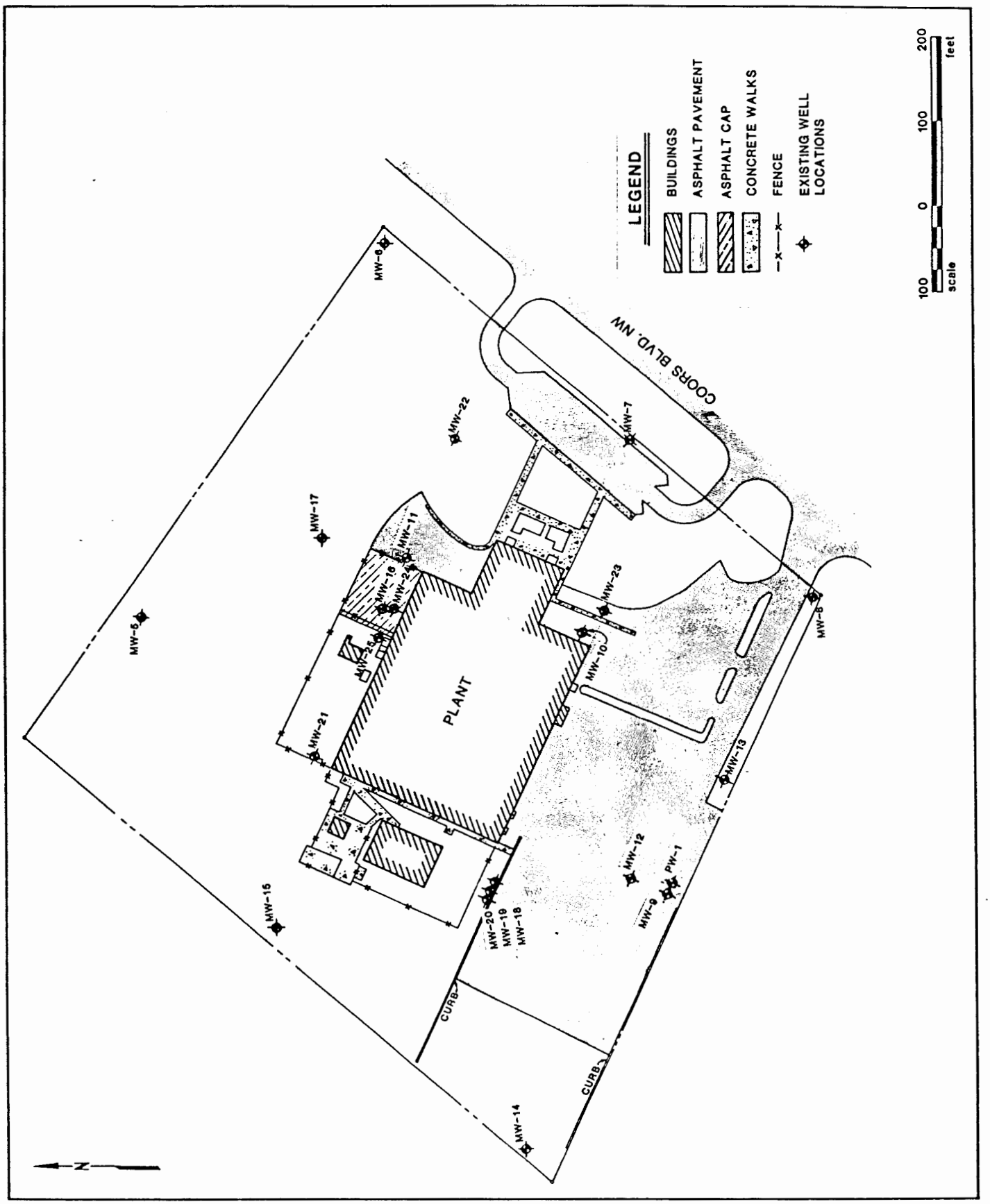
TCA AND TCE QUARTERLY SAMPLING[1]
1986 TO 1987 : MW-15

PLATE
16

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
	06310.036.12				

008855



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EXISTING WELLS

Sparton Technology, Inc.
Albuquerque, New Mexico

PLATE
17

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
	06310,036.12				

008856

(1) $V = \frac{cKi}{n}$

where:
V = velocity, in feet/year
K = 0.92 feet/day
i = 0.007
n = 0.40
c = 365 days/year

$$V = \frac{(365 \text{ days/year})\ (0.92 \text{ feet/day})\ (0.007)}{0.40}$$

$$= 5.88 \text{ feet/year}$$

(2) $$V = \frac{(365 \text{ days/year})\ (13.0 \text{ feet/day})\ (0.007)}{0.40}$$

$$= 83.04 \text{ feet/year}$$

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RANGE OF GROUNDWATER VELOCITIES AT SPARTON FACILITY

PLATE
18

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
	06310,036.12				

Figure (A) ADVECTION (with continous source)

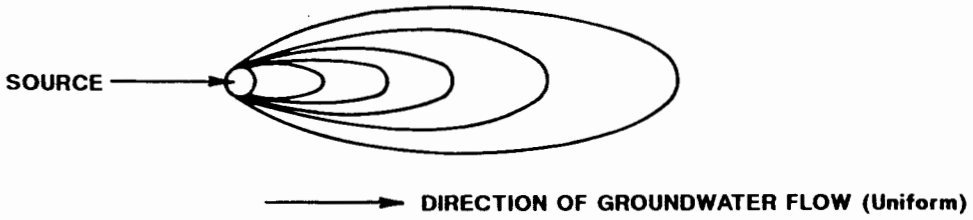


Figure (B) ADVECTION (with terminated source)

Figure (C) DISPERSION (with no advective influence)

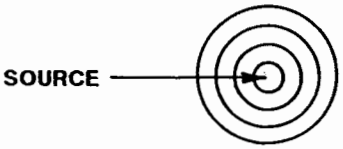
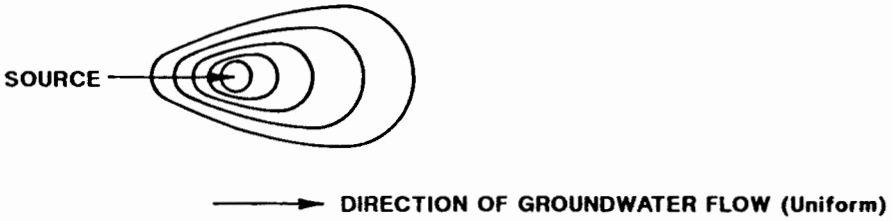


Figure (D) ADVECTION (with minor dispersion influence)

Figure (E) DISPERSION (with minor advection influence; i.e.: low groundwater velocity)



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IDEALIZED FLOW PATTERNS

PLATE
19

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
S.K.	06310,036.12				

008858

APPENDIX A

TRC Report, 1987

Tracer Research Corporation

3855 North Business Center Drive Tucson, Arizona 85705 (602) 888-9400

SHALLOW SOIL GAS INVESTIGATION
AT THE
SPARTON FACILITY
ALBUQUERQUE, NEW MEXICO

AUGUST, 1987

PREPARED FOR:

HARDING LAWSON ASSOCIATES
6220 Westpark, Suite 100
Houston, Texas 77057

SUBMITTED BY:

Tracer Research Corporation

008860

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SAMPLING AND ANALYTIC PROCEDURES..... 3

QUALITY ASSURANCE/QUALITY CONTROL PROCEDURES 5

APPENDIX A

CONDENSED DATA..... 7

FIGURES (MAPS)..... ATTACHED

INTRODUCTION

A shallow soil gas investigation was conducted by Tracer Research Corporation in the vicinity of the Sparton facility in Albuquerque, New Mexico. The investigation was conducted July 20-24, 1987. Additionally a depth profile consisting of 6 samples was taken on August 7, 1987. The main purpose was to delineate the sububsurface distribution of the following compounds:

1,1,1-Trichloroethane (TCA)
Trichloroethene (TCE)
Tetrachloroethene (PCE)

Analytical results are condensed in Appendix A. Maps of sampling locations and isoconcentration contours for TCA and TCE are attached.

008862

BACKGROUND ON THE METHODOLOGY

The presence of volatile organic chemicals (VOCs) in shallow soil gas indicates the observed compounds may either be in the vadose zone near the probe or in groundwater below the probe. The soil gas technology is most effective in mapping low molecular weight halogenated solvent chemicals and petroleum hydrocarbons possessing high vapor pressures and low aqueous solubilities. These compounds readily partition out of the groundwater and into the soil gas as a result of their high gas/liquid partitioning coefficients. Once in the soil gas, VOCs diffuse vertically and horizontally through the soil to the ground surface where they dissipate into the atmosphere. The contamination acts as a source and the above ground atmosphere acts as a sink, and typically a concentration gradient develops between the two. The concentration gradient in soil gas between the source and ground surface may be locally distorted by hydrologic and geologic anomalies (e.g. clays, perched water); however, soil gas mapping generally remains effective because distribution of the contamination is usually broader in areal extent than the local geologic barriers and is defined using a large data base. The presence of geologic obstructions on a small scale tends to create anomalies in the soil gas-groundwater correlation, but generally does not obscure the broader areal picture of the contaminant distribution.

008863

SAMPLING AND ANALYTIC PROCEDURES

Tracer Research Corporation utilized an analytical field van which was equipped with two gas chromatographs and two Spectra Physics SP4270 computing integrators. In addition, the van has two built-in gasoline powered generators which provide the electrical power (110 volts AC) to operate all of the gas chromatographic instruments and field equipment. A specialized hydraulic mechanism consisting of two cylinders and a set of jaws was used to drive and withdraw the sampling probes. Probes consist of 7-foot lengths of 3/4 inch diameter steel pipe which are fitted with detachable drive points. A hydraulic hammer was used to assist in driving probes past cobbles and through unusually hard soil.

Soil gas samples were collected by driving a hollow steel probe to a depth less than 14 feet into the ground. The above-ground end of the sampling probes was fitted with a steel reducer and a length of polyethylene tubing leading to a vacuum pump. Five to 10 liters of gas was evacuated with a vacuum pump. During the soil gas evacuation, samples were collected by inserting a syringe needle through a silicone rubber segment in the evacuation line and down into the steel probe. Ten milliliters of gas were collected for immediate analysis in the TRC analytical field van. Soil gas was subsampled (duplicate injections) in volumes ranging from 1 ul to 2 ml, depending on the VOC concentration at any particular location.

A gas chromatograph equipped with an electron capture detector was used for analyses of TCA, TCE and PCE. Nitrogen was used as the carrier gas.

008864

Detection limits are a function of the injection volume as well as the detector sensitivity for individual compounds. Thus, the detection limit varies with the sample size. Generally, the larger the injection size the greater the sensitivity. However, peaks for compounds of interest must be kept within the linear range of the detector. If any compound has a high concentration, it is necessary to use small injections, and in some cases to dilute the sample to keep it within linear range. This may cause decreased detection limits for other compounds in the analyses. The detection limits range down to 0.00005 ug/l for compounds such as TCA and PCE depending on the conditions of the measurement, in particular, the sample size. If any component being analyzed is not detected, the detection limit for that compound in that analysis is given as a "less than" value (e.g. <0.0001 ug/l). This number is calculated from the current response factor, the sample size, and the estimated minimum peak size (area) that would have been visible under the conditions of the measurement.

QUALITY ASSURANCE/QUALITY CONTROL PROCEDURES

Tracer Research Corporation's normal quality assurance procedures were followed in order to prevent any cross-contamination of soil gas samples.

- Steel probes are used only once during the day and then washed with high pressure soap and hot water spray or steam-cleaned to eliminate the possibility of cross-contamination. Enough probes are carried on each van to avoid the need to reuse any during the day.

- Probe adaptors (steel reducer and tubing) are used once during the course of the day and cleaned at the end of each working day by baking in the GC oven. The tubing is replaced periodically as needed during the job to insure cleanliness and good fit.

- Silicone tubing (connecting the adaptor to the vacuum pump) is replaced as needed to insure proper sealing around the syringe needle. This tubing does not directly contact soil gas samples.

- Glass syringes are usually used for only one sample per day and are washed and baked out at night. If they must be used twice, they are purged with carrier gas (nitrogen) and baked out between probe samplings.

- Septa through which soil gas samples are injected into the chromatograph are replaced on a daily basis to prevent possible gas leaks from the chromatographic column.

- Analytical instruments are calibrated each day by the use of chemical standards prepared in water by serial dilution from commercially available pure chemicals. Calibration checks are also run after approximately every five soil gas sampling locations.

- 2 cc subsampling syringes are checked for contamination prior to sampling each day by injecting nitrogen carrier gas into the gas chromatograph.

- Prior to sampling each day, system blanks are run to check the sampling apparatus (probe, adaptor, 10 cc syringe) for contamination by drawing ambient air from above ground through the system and comparing the analysis to a concurrently sampled air analysis.

- All sampling and 2 cc subsampling syringes are decontaminated each day and no such equipment is reused before being decontaminated. Microliter size subsampling syringes are reused only after a nitrogen carrier gas blank is run to insure it is not contaminated by the previous sample.

- Soil gas pumping is monitored by a vacuum gauge to insure that an adequate gas flow from the vadose zone is maintained. A negative pressure (vacuum) of 2 in. Hg less than the maximum capacity of the pump (evacuation rate >0.02 cfm) usually indicates that a reliable gas sample cannot be obtained because the soil has a very low air permeability.

APPENDIX A: CONDENSED DATA

008870

Tracer Research Corporation
3855 North Business Center Drive
Tucson, Arizona 85705

HARDING LAWSON/SPARTON/ALBUQUERQUE, NEW MEXICO

Sample	Depth	Date	TCA (ug/l)	TCE (ug/l)	PCE (ug/l)
SGA-01	5.5'	07/20	0.01	1	0.007
SGA-02	5'	07/20	2	2	0.01
SGA-03	6'	07/20	12	10	0.1
SGA-04	6'	07/20	20	15	0.2
SGA-05	6'	07/20	23	24	0.4
SGA-06	6'	07/20	32	40	0.4
SGA-07	6'	07/20	6	10	0.2
SGA-08	5.5'	07/20	0.9	3	0.07
SGA-09	5.5'	07/20	0.7	3	0.09
SGA-10	5.5'	07/20	3	11	0.4
SGA-11	5.5'	07/20	2	5	0.2
SGA-12	5.5'	07/20	5	13	0.5
SGA-13	6'	07/20	8	20	0.7
SGA-14	6'	07/20	7	13	0.6
SGA-15	5.5'	07/20	7	0.01	0.4
SGA-16	6'	07/20	0.0006	0.0002	0.0006
SGA-17	5'	07/21	0.6	0.6	0.006
SGA-18	6'	07/24	0.4	1	0.05
SGA-19	5'	07/24	0.2	0.01	0.002
SGA-20	4.5'	07/24	0.1	0.002	0.0007
SGA-21	5'	07/24	0.001	0.0008	0.0006
SGB-01	6'	07/21	0.2	0.0004	0.01
SGB-02	5'	07/21	0.4	0.02	0.006
SGB-03	6'	07/21	0.6	0.02	0.001
SGB-04	6'	07/21	0.2	0.006	0.0004
SGB-05	5'	07/21	0.04	0.0002	0.0006
SGB-06	6'	07/21	0.1	<0.0002	0.0002
SGB-07	5'	07/21	0.02	0.001	0.0001
SGB-08	6'	07/21	0.004	0.001	0.0002
SGB-09	6'	07/21	0.1	0.4	0.007
SGB-10	6'	07/21	0.3	0.8	0.01
SGB-11	6'	07/21	0.02	0.01	0.0003
SGB-12	6'	07/21	0.004	0.001	0.0001

Notations:
I interference with adjacent peaks
NA not analyzed

Analyzed by S. Cherba
Checked by M. Favero
Proofed by L. Laplander

008871

Tracer Research Corporation
3855 North Business Center Drive
Tucson, Arizona 85705

HARDING LAWSON ASSOCIATES/SPARTON/ALBUQUERQUE, NEW MEXICO

Sample	Depth	Date	TCA (ug/l)	TCE (ug/l)	PCE (ug/l)
SGD-13	6'	07/24	0.0006	<0.0001	0.0001
SGC-01	6'	07/20	0.0005	0.0002	0.0001
SGC-02	6'	07/21	0.009	0.003	0.0001
SGC-03	5'	07/21	0.02	0.02	0.0002
SGC-04	6'	07/21	0.02	0.09	0.0002
SGC-05	6'	07/21	0.002	0.001	0.00009
SGC-06	5'	07/21	0.0009	0.001	0.00009
SGC-07	6'	07/21	0.0008	0.001	0.00009
SGC-08	6'	07/21	0.001	0.0009	0.0006
SGC-09	6'	07/21	0.03	0.01	0.00009
SGC-10	6'	07/21	0.02	0.004	0.00009
SGC-11	6'	07/22	0.009	0.002	0.0002
SGC-12	6'	07/22	0.002	<0.0002	0.00008
SGC-13	6'	07/22	0.01	0.0002	0.00008
SGC-14	6'	07/22	0.04	0.004	0.00008
SGC-15	6'	07/22	0.02	0.0009	0.00009
SGC-16	5'	07/22	0.006	0.0002	0.00005
SGD-01	6'	07/20	0.0004	0.007	0.0003
SGD-02	6'	07/21	0.0006	0.001	0.0001
SGD-03	6'	07/22	0.009	0.003	0.0002
SGD-04	6'	07/22	0.002	0.003	0.0002
SGD-05	6'	07/22	0.001	<0.0002	0.0002
SGD-06	6'	07/22	0.0008	0.0002	0.0002
SGD-07	5'	07/22	0.0004	<0.0002	0.00006
SGD-08	5.5	07/22	0.0004	0.001	0.00008
SGD-09	6'	07/22	0.0003	<0.0002	0.00006
SGD-10	6'	07/22	0.0003	<0.0002	0.00008
SGD-10A	6'	07/22	0.0003	0.0002	0.00008
SGD-11	6'	07/22	0.0002	<0.0002	0.00006
SGD-12	6'	07/22	0.0001	<0.0002	0.00006
SGE-01	6'	07/23	6	7	0.2
SGE-02	6'	07/23	16	13	0.4
SGE-03	6'	07/23	14	12	0.2

Notations:
I interference with adjacent peaks
NA not analyzed

Analyzed by S. Cherba
Checked by M. Favero
Proofed by L. Laplander

008872

Tracer Research Cor[illegible]ation
3855 North Business C[illegible]ter Drive
Tucson, Arizona 85705

HARDING LAWSON ASSOCIATES/SPARTON/ALBUQUERQUE, NEW MEXICO

Sample	Depth	Date	TCA (ug/l)	TCE (ug/l)	PCE (ug/l)
SGE-04	6'	07/23	31	27	0.5
SGE-05	6'	07/23	21	14	0.3
SGE-06	6'	07/23	11	8	0.1
SGE-07	6'	07/23	0.8	0.7	0.009
SGE-08	6'	07/23	0.1	0.04	0.0009
SGE-09	6'	07/23	0.3	0.1	0.001
SGE-10	6'	07/24	0.6	2	0.09
SGE-11	6'	07/24	0.03	0.04	0.003
SGE-12	6'	07/24	0.001	0.0008	0.00007
SGE-13	6'	07/24	0.0004	0.0001	0.00007
SGF-01	5'	07/24	0.01	0.004	0.0002
SGF-02	6'	07/24	0.07	0.02	0.00008
SGF-03	6'	07/24	0.01	0.01	0.0004
SGG-01	5'	07/24	0.0003	<0.0001	0.00009
SGG-02	6'	07/24	0.0005	0.0001	0.0002
SGG-03	6'	07/24	0.0003	<0.0001	0.0002
SGG-04	6'	07/24	0.0002	0.002	0.0008
SGD-01	6'	07/23	0.0008	0.0007	0.0002
SGB2-02	5'	07/23	0.0004	0.0004	0.0001
SGB2-03	5'	07/23	0.01	0.002	0.00005
SGB2-04	4.5'	07/23	0.06	0.001	0.0002
SGB2-05	6'	07/23	0.09	0.003	0.0001
SGB2-06	6'	07/23	0.1	0.006	0.0003
SGB2-07	6'	07/23	2	0.05	0.006
SGB2-08	6'	07/23	0.3	0.02	0.0002
SGB2-09	5'	07/23	0.2	0.1	0.0004
SGB2-10	6'	07/23	0.5	0.2	0.0007
SGB2-11	6'	07/23	0.03	0.01	0.0002

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Notations:
I interference with adjacent peaks
NA not analyzed

Analyzed by S. Cherba
Checked by M. Favero
Proofed by L. Laplander

Tracer Research Corp ntion
3855 North Business Ce..er Drive
Tucson, Arizona 85705

HARDING LAWSON/SPARTON/ALBUQUERQUE, NEW MEXICO

Sample	Depth	Date	TCA (ug/l)	TCE (ug/l)	PCE (ug/l)
SGB-12	6'	07/23	0.2	0.007	0.0006
SGB-13	6'	07/23	0.09	0.008	0.0002
SGB-14	6'	07/24	0.03	<0.0001	0.0001
SGC2-01	6'	07/22	0.0003	<0.0002	0.00007
SGC2-02	5'	07/22	0.0004	<0.0002	0.00008
SGC2-03	3.5'	07/22	0.0004	0.0009	0.0002
SGC2-04	5'	07/22	0.0006	<0.0002	0.00008
SGC2-05	6'	07/22	0.0002	<0.0002	0.00007
SGC2-06	6'	07/22	0.0003	<0.0002	0.00007
SGC2-07	6'	07/22	0.0002	<0.0002	0.00005
SGC2-08	6'	07/22	0.0006	<0.0002	0.00005
SGC2-09	6'	07/22	0.0008	<0.0002	0.00005
SGC2-10	6'	07/22	0.004	<0.0002	0.00005
SGC2-11	6'	07/22	0.005	0.0002	0.00003

Notations:
I interference with adjacent peaks
NA not analyzed

Analyzed by S. Cherba
Checked by M. Favero
Proofed by L. Laplander

Tracer Research Corp ation
3855 North Business C er Drive
Tucson, Arizona 85705

HARDING LAWSON/SPARTON/ALBUQUERQUE, NEW MEXICO

Sample	Date	TCA (ug/l)	TCE (ug/l)	PCE (ug/l)
DP-5.0 '	08/07	2	0.09	0.007
DP-10.3 '	08/07	3	0.2	<0.001
DP-15.7 '	08/07	8	0.8	4
DP-21.0 '	08/07	11	1	<0.02
DP-26.3 '	08/07	14	1	<0.02
DP-31.7 '	08/07	11	1	<0.02

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Notations:
I interference with adjacent peaks
NA not analyzed

Analyzed by T. Bode
Checked by T. Bode
Proofed by D. Evans

APPENDIX B
TRC Report, 1984

CONFIDENTIAL

CONSULTING REPORT

Harding Lawson Associates
6300 Westpark, Suite 100
Houston, Texas 77057

Soil gas investigation of volatile organic compounds at the Sparton Technology, Inc. site, 9621 Coors Road NW, Albuquerque, New Mexico 87114

By

Glenn M. Thompson Ph.D.
Tracer Research Corporation
1687 West Grant Road
Tucson, Arizona 85745

602-623-0200

May 25, 1984

-CONFIDENTIAL-

008877

OBJECTIVES:

A soil gas survey was performed to determine to the extent of volatile contaminant migration off-site in the down-gradient direction from the Spartan property and to determine if there was a source of contamination up-gradient from the property that was contributing to ground water contamination in the area.

METHOD:

The soil gas survey is performed by collecting and analysing samples of shallow soil gas in transects across the property and in accessable down-gradient areas for the principal volatile constituents of the contamination. The soil gas is collected by driving a 3/4" steel pipe into the ground to a depth of five (5) feet. The pipe is closed at the tip with perforations for air entry several inches up from the tip. Soil gas is pumped from the ground through the probe at the rate of two (2) or three (3) liters per minute for a period of about three (3) minutes, the time required to obtain a representative sample. The sample is collected in a glass syringe and immediately injected into a gas chromatograph for analysis. The analysis is performed in the field in the TRC mobil laboratory. The analysis typically requires three (3) to four (4) minutes and is completed in about the same amount of time that is required to pull the sampling probe from the ground.

The results of the measurement are immediately available to be used in deciding where to place the next probe.

Blanks are periodically run to determine if the sampling system is contaminated. The blank is obtained by drawing air above ground through the probe, pump and syringe sampling system. Thus, an uncontaminated system should produce a gas sample that looks exactly like air above ground injected with a clean syringe.

SELECTION OF CONTAMINANTS FOR PLUME MAPPING:

Previous work at the site by HLA indicated that TCE, 1,1,1 TCA, 1,1 DCE, methylenechloride and PCE were present in the ground water. Of these contaminants, TCE and TCA were present in concentrations of at least a factor of ten (10) higher than all the rest. Accordingly, TCE and TCA were the two components of the contamination selected for use in the plume mapping effort. In addition to the fact that TCE and TCA were the major volatile contaminants, other factors reinforced the decision to monitor only the TCE and TCA. The detectability of TCE and TCA is at least fifty (50) times greater than the DCE and the methylenechloride at the same concentration. Thus it is impractical in measurements where speed is essential, to measure the minor components of the contaminant mixture in the presence of major components that may yield 500 times more signal.

The TCE and TCA are also believed to be as mobil or more mobil in ground water systems than the other volatile components. Thus the TCE and TCA are likely to represent the "worst case" situation for movement of contaminants off-site. PCE which is as detectable as TCE and TCA was present in much smaller concentrations and was of little significance in this investigation.

RESULTS:

The work consisted largely of soil gas measurements made in transects along the property boundaries, across the interior of the property on the north and west sides of the building and along a road approximately 800 feet southwest of the property. Soil gas measurements were also made at all of the existing shallow monitoring wells to determine how well soil gas concentrations would correlate with ground water concentrations. Several soil gas points were resampled on subsequent days to determine the reproducibility of the sampling technique.

The soil gas data are provided in Table 1 which consists of three (3) parts, each identified by date of collection. The results are tabulated in the order of collection. Sites that were sampled on a subsequent day by driving a probe within five (5) feet of the original spot, are indicated by a "B" after the number given to the site on the previous day. The replicate sample measurements are listed in Table 2. The samples collected adjacent to the existing monitoring wells are listed in Table 3 along with the measurements of the ground water collected from the wells. The results of the soil gas sampling are also plotted and contoured on plat maps of the site (Figs. 1 & 2).

The transects of the plume at the southwestern boundary and at the off-site location about 800 feet further down-gradient are shown in Figures 3 and 4. The location of the transects relative to the property and to the known contamination source is shown in Figure 5.

TABLE 1 - 5/8/84

SAMPLE	TCA Concentration ug/l	TCE Concentration ug/l
SG10 (MW-8)*	1.8	4.0
SG20	8.7	13
SG30	28	26
SG40	260	410
SG50 (MW-9)	310	670
SG60	130	141
SG70	39	56
SG80	13	43
SG90	2.0	11
SG55	220	290
SG45	220	240
SG35	105	71
SG100 (MW-7)	2.9	.85
SG110 (MW-6)	2.9	3.6
SG120 (MW-4)	330	560
SG130	1.0	0.10
SG140	1.5	.19
SG150	1.0	0.18
SG160	.29	0.14
SG170	.046	.064
SG180	.046	.059
SG190	.017	.038
SG200	.11	0.17
SG125	.12	.033
Blank	.003	.014

*Soil gas sample collected adjacent to MW-8.

TABLE 1 - 5/9/84

SAMPLE	TCA Concentration ug/l	TCE Concentration ug/l
SG10B	1.9	4.1
SG210	3.8	4.8
SG220	3.7	2.4
SG100B	3.2	0.99
SG230	1.3	0.72
SG240	2.8	3.0
SG250	3.5	4.1
MW7	150	600
SG110B	2.7	3.3
SG260	77	140
SG50B	198	360
MW7	148	600
SG45B	172	200
SG270	6	34
SG280	12	47
SG290	2.5	9.7
SG300	3.3	16
MW8	107	447
SG310	19	81
SG320	.36	1.8
SG330	17	53
SG340	13	37
SG350	21	33
SG360	32	52
SG370 (MW5)	40	80
MW9	17,000	22,000
SG380	27	39
SG390	42	93
SG400	42	79
MW6	200	17,000
SG410	13	11

TABLE 1 - 5/10/84

SAMPLE	TCA Concentration ug/l	TCE Concentration ug/l
SG420	11	7.6
SG430	59	28
SG440	140	59
SG450	440	720
SG460	150	61
SG470	78	61
SG480	19	32
SG490	53	140
SG500	28	48
MW5	170	400
SG510	32	43
SG520	56	102
MW4	5,600	11,000
SG530	45	32
SG540	41	27
SG550	26	25

Table 2 - Repeat sampling within five (5) foot radius of selected points to test reproducibility of sampling procedure.

5/8/84	TCA	TCE	5/9/84	TCA	TCE
SG10	1.8	4.0	SG10B	1.9	4.1
SG100	2.9	.85	SG100B	3.2	.99
SG110	2.9	3.6	SG110B	2.7	3.3
SG50	315	675	SG50B	200	360
SG45	220	240	SG45B	172	200

Table 3 - TCA and TCE soil gas concentration compared to ground water concentrations in the shallow aquifer.

Monitoring Well /	Soil Gas Sampling Point	TCA ug/l water/ug/l SG	TCE ug/lwater/ug/l SG
MW8	SG10B	107/1.9 = 56	447/4.1 = 109
MW7	SG100B	85/3.2 = 27	380/.99 = 380
MW9	SG50B	17,000/198 = 85	22,000/364 = 60
MW6	SG110B	151/2.7 = 55	585/3.3 = 177
MW5	SG370	165/40 = 4.1	395/80 = 5
MW4	SG120	5,600/334 = 17	11,000/560 = 19

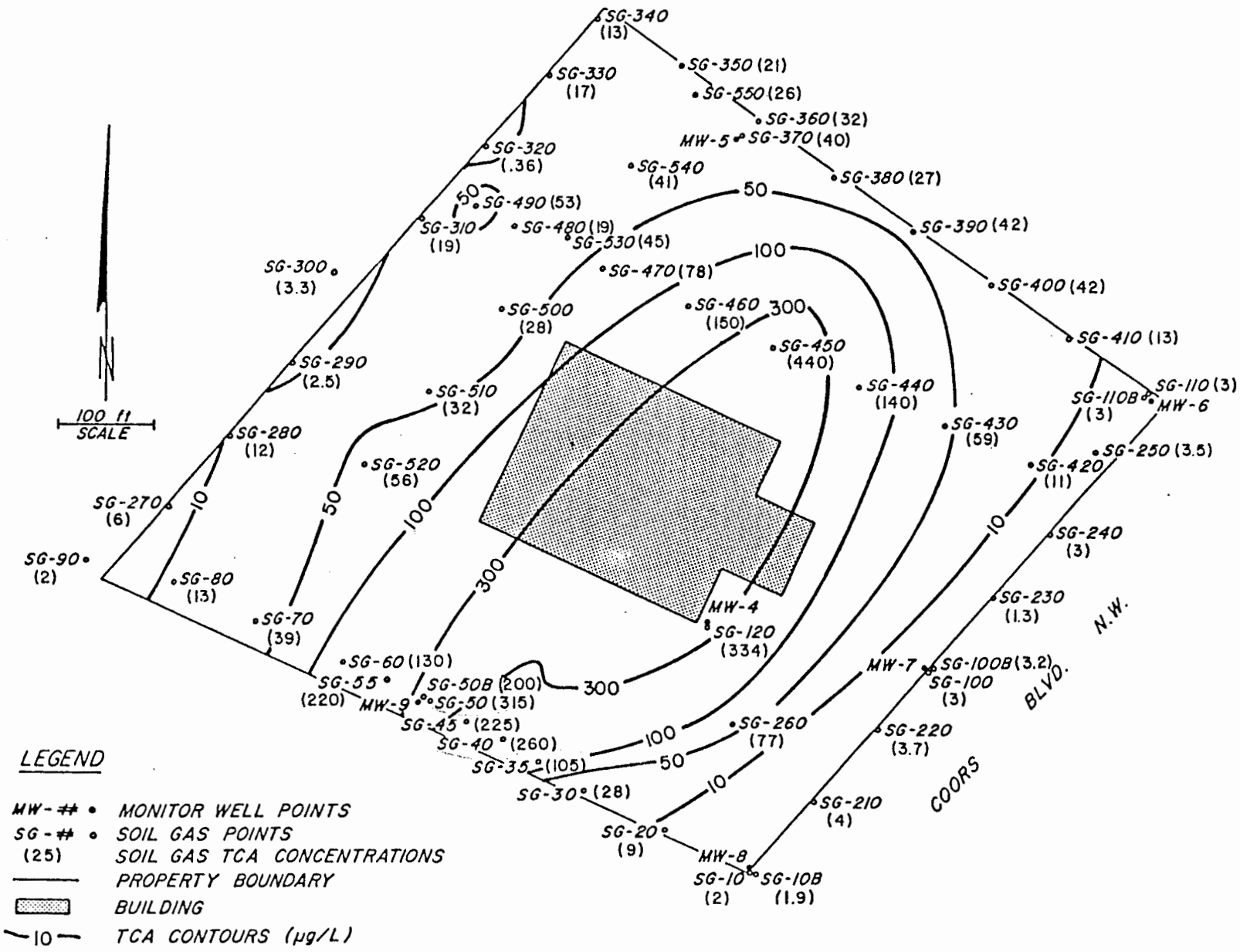

Figure 2. TCA in Soil-Gas Contour Map.

008886

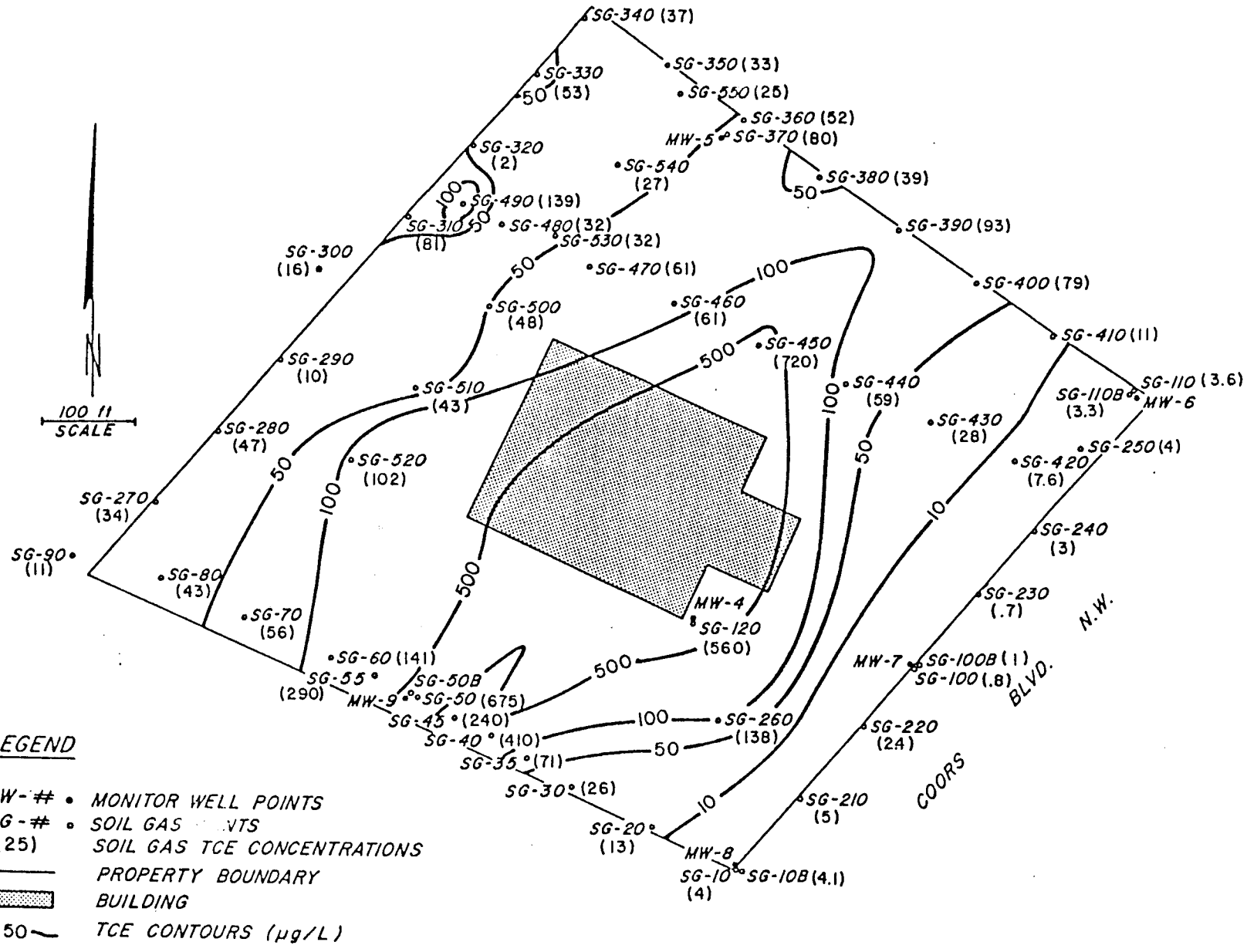

Figure 1. TCE in Soil-Gas Contour Map.

008887

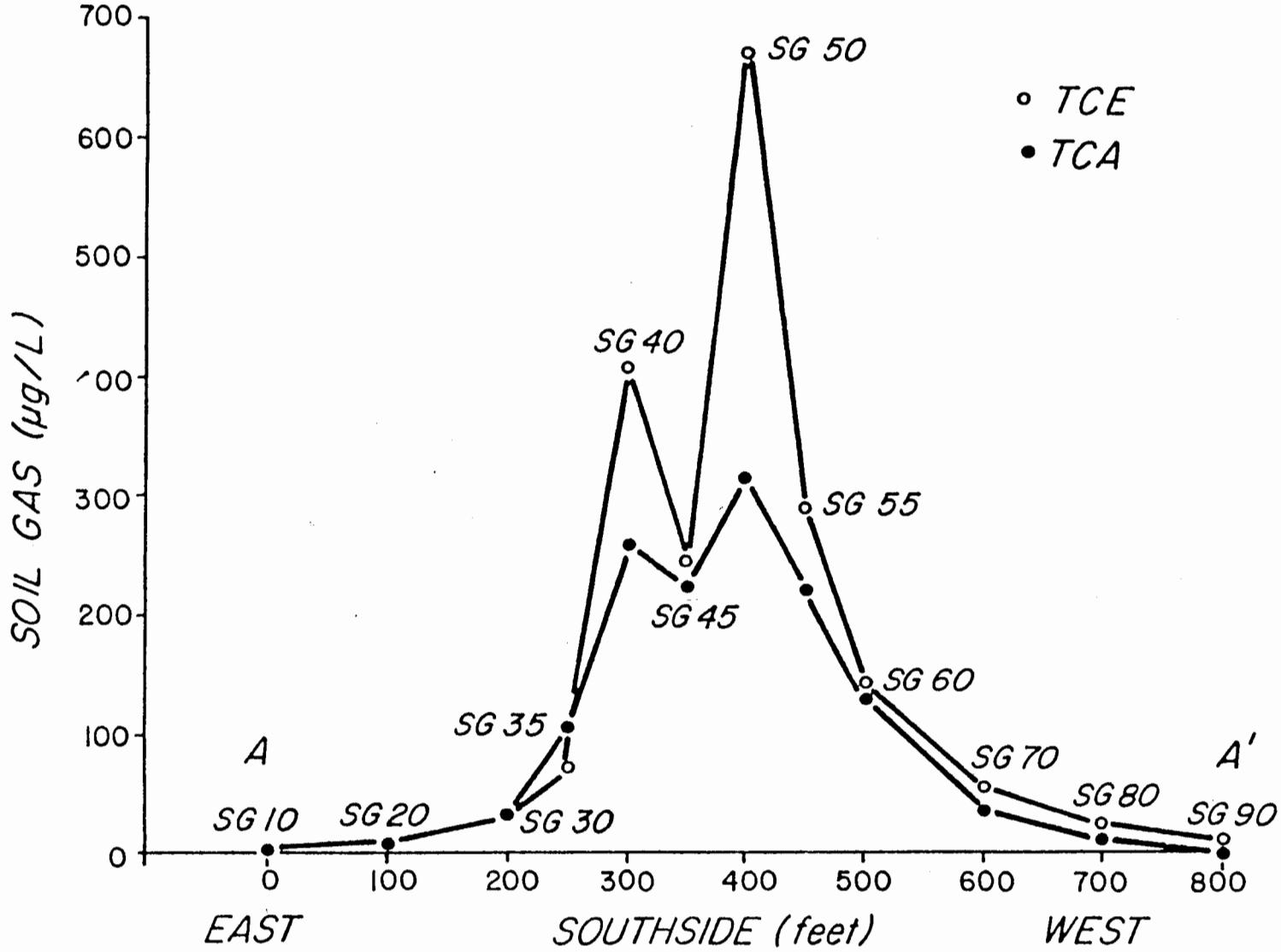

Figure 3 - Soil gas transect A-A' along southwestern property boundary.

008888

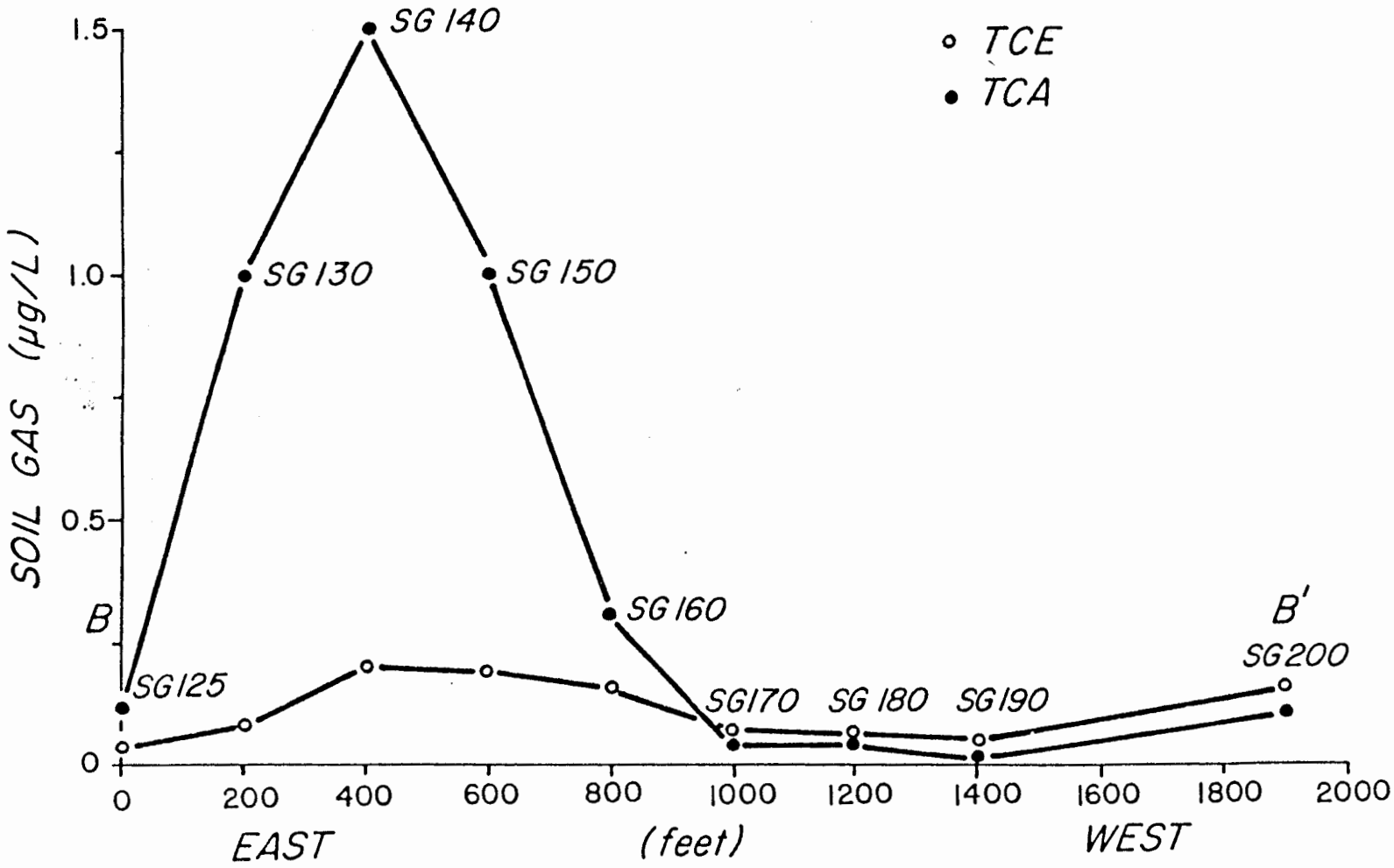

Figure 4 - Soil gas transect B-B' 800 feet southwest of the property down-gradient from transect A-A'.

008889

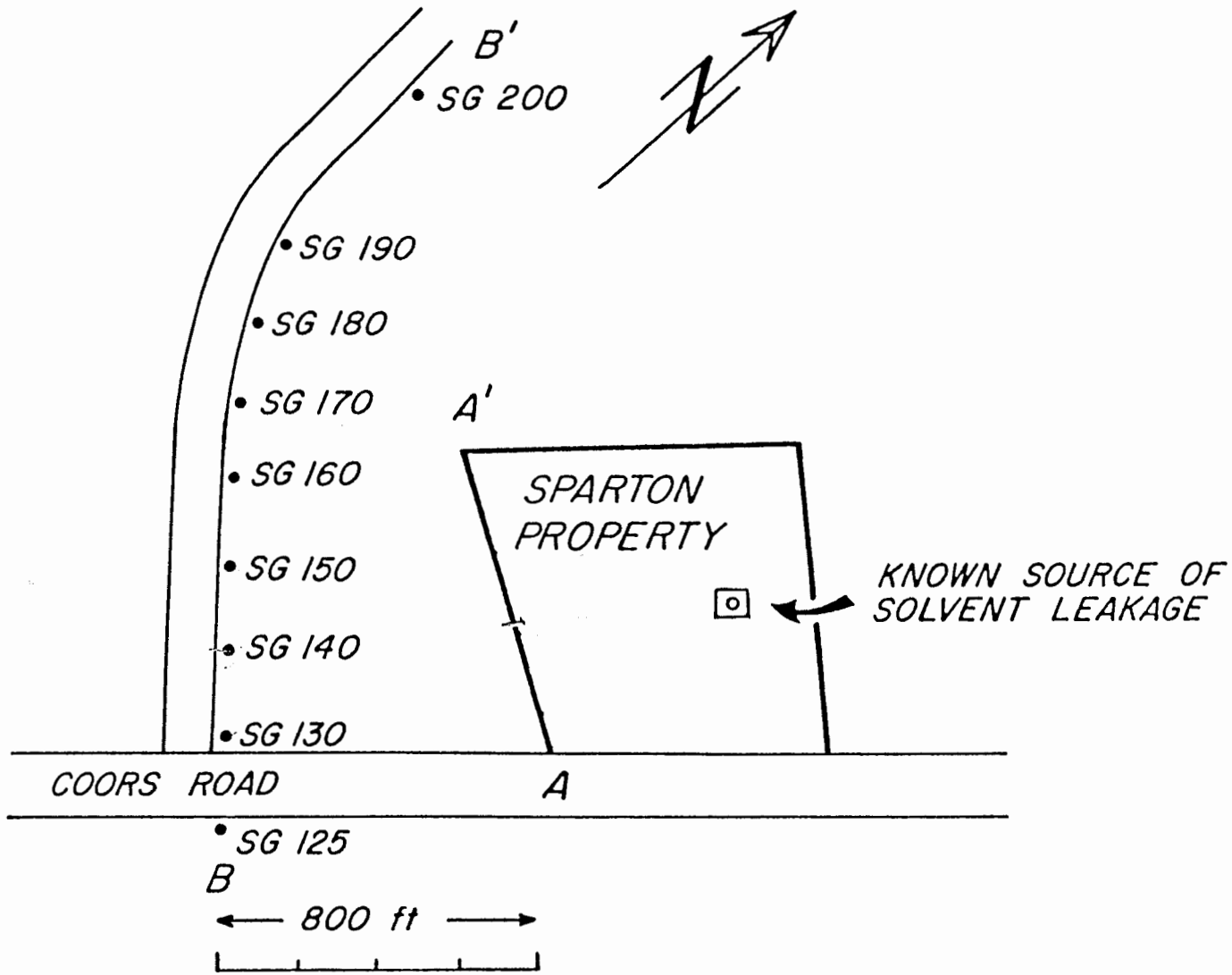

Figure 5 - Map showing location of transects A-A' and B-B' relative to to the property.

DISCUSSION OF RESULTS:

The soil gas sampling shows TCA and TCE decreasing in concentration radially in all directions from the known contamination source area on the northeast side of the building (Figs. 1 & 2). The contours are skewed to the southwest in the direction of ground water movement and indicate that contamination is moving off-site in the ground water. The contamination was observed again 800 feet further down-gradient in the second transect.

The off-site plume cross section showed TCA and TCE concentrations in the shallow soil gas of 1.5 ug/l and 0.19 ug/l respectively. The system blank analysed during this part of the work showed that the background for TCA in the system was 0.003 ug/l and 0.014 ug/l for TCE. Thus the TCA anamoly observed off-site was approximately 300 times greater than background and the TCE was 13 times greater than background. The TCE background represents a small amount of equipment contamination from the on-site work earlier that day. However, the TCA background represents primarily the ambient atmospheric levels of TCA.

The ability to predict the concentration of TCA in the ground water off-site is limited by the fact that the coupled ground water/soil gas measurements needed for prediction are made on-site in rather close proximity to the source. The on-site correlation measurements are less valuable for prediction of off-site ground water contamination because they are influenced by lateral diffusion of contaminants from the source in addition to upward diffusion of contaminants from the water table.

The highest ground water/soil gas ratios are probably the best to use for prediction of ground water contamination off-site because they are the least effected by lateral diffusion from the source (Table 3). The highest ratios observed were 85 and 380 for TCA and TCE respectively. Using these ground water to soil gas ratios to determine the level of off-site contamination in the ground water one calculates concentrations of 130 ug/l and 80 ug/l for TCA and TCE respectively at the high point indicated by the transect. No meaningful confidence interval can be attached to these estimates due to the lack of sufficient data for correlation off-site.

The estimates could be off by a considerable factor in either direction, but they appear plausible considerting the high concentrations measured 800 feet up-gradient in the ground water at MW9 (17,000 ug/l TCA and 22,000 ug/l TCE).

The ratio of contaminant concentration in the ground water to soil gas can be effected by a variety of variables and an attempt to evaluate and adjust for each of the variables would be a hopeless task. An empirical average obtained from several paired ground water - soil gas measurements is usually the best approach for predicting the amount of contaminant in the ground water and will probably give "order of magnitude" prediction accuracy. However, in this case, the problems related to the proximity of the source are thought to be significant enough to justify the slightly different approach used here.

Two soil gas transects were made across the north and west sides of the property in an attempt to determine if an up-gradient source of contamination existed. The only source evident in the soil gas survey however is on-site. With a minor exception on the northwest part of the property, soil gas TCE and TCA concentrations decrease away from the center of the Sparton property (Figs. 1 & 2). However, the magnitude of the on-site source would easily obscure a minor contribution to the soil gas made by an off-site source. A transect made 800 or 1,000 feet up-gradient would have been needed to clearly identify an up-gradient source.

APPENDIX C
Data Analysis

WELL NO.	TCE GROUNDWATER CONC.,ug/l	TCE SOIL GAS CONC.,ug/l	TCE GW/SG RATIO	TCA GROUNDWATER CONC.,ug/l	TCA SOIL GAS CONC.,ug/l	TCA GW/SG RATIO
5	39	13	3.0	15	16	0.9
6	540	0.7	771.4	130	0.8	162.5
8	300	1	300.0	33	0.01	3300.0
9	6400	24	266.7	3300	23	143.5
13	1300	12.5	104.0	520	16	32.5
14	2100	3	700.0	170	0.7	242.9
15	650	20	32.5	250	8	31.3
AVERAGE			311			559
STANDARD DEVIATION			311			1212

008894

Harding Lawson Associates
Engineers
and
Geoscientists

SHEET 1 OF 3
JOB NO. 06310,036.12
DATE 10-9-87
PROJECT
COMPUTED BY KM
SUBJECT
CHECKED BY

1) TCE

Using a t-statistic at the 95% confidence level, with 6 degrees of freedom;

$t_{.95,6} = 2.45$

The upper limit (worst case) of the 95% confidence interval is given by

$\bar{X} + 2.45(s)$

where $\bar{X}$ = average

s = standard deviation

so $\bar{X} + 2.45(s) = 311 + 2.45(311)$

$= 1073$

or, $\frac{GW}{SG} = 1073$

where GW = groundwater conc.

SG = soil gas conc.

AND, SOLVING FOR SG

$$SG = \frac{GW}{1073}$$

IF WE ARE LOOKING FOR GROUNDWATER CONCENTRATIONS EQUAL TO THE STATE STANDARD (100 ug/l), THE ESTIMATED SOIL GAS CONCENTRATION WOULD THEN BE

$$SG = \frac{100}{1073}$$

$$= \underline{0.09 \text{ ug/l}}$$

Harding Lawson Associates
Engineers
and
Geoscientists

SHEET 3 OF 3
JOB NO. 06310.086.12
DATE 10-9-87
PROJECT
COMPUTED BY JEM
SUBJECT
CHECKED BY

2) TCA

USING A SIMILAR ANALYSIS FOR THE TCA RATIOS,

THE UPPER LIMIT OF THE 95% CONFIDENCE INTERVAL = 3528

AND THE SOIL GAS CONCENTRATION CORRESPONDING TO THE STATE LIMIT OF 60 ug/l IS = 0.02 ug/l

Tracer Research Corporation

PREPARED FOR:

Metric Corporation
8429 Washington Place NE
Suite A
Albuquerque, New Mexico 87113
(505)828-2801

SHALLOW SOIL GAS INVESTIGATION

SPARTAN TECHNOLOGY BUILDING
9621 NORTH COORS ROAD
ALBUQUERQUE, NEW MEXICO

JUNE 1991

REVISED 12/91

SUBMITTED BY:

Tracer Research Corporation

191263S.REP
1-91-263-S

008888

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INTRODUCTION

A shallow soil gas investigation was performed by Tracer Research Corporation (*TRACER*) at the Spartan Technology Building site located in Albuquerque, New Mexico. The investigation was conducted on June 17-19, 1991 under contract to Metric Corporation. The purpose of the investigation was to delineate the extent of possible contamination in the subsurface.

During this survey, a total of 63 soil gas samples were collected and analyzed. Samples were analyzed for volatile organic compounds from the following suite:

COMPOUND	DETECTOR
1,1,1-trichloroethane (TCA)	ECD
trichloroethene (TCE)	ECD
tetrachloroethene (PCE)	ECD

The compounds in this suite were chosen as target compounds because of their suspected presence in the subsurface and amenability to soil gas technology. Soil gas samples were screened on a gas chromatograph equipped with an electron capture detector (ECD).

SHALLOW SOIL GAS INVESTIGATION - METHODOLOGY

Shallow soil gas investigation refers to a method developed by *TRACER* for investigating underground contamination from volatile organic chemicals (VOCs) such as industrial solvents, cleaning fluids and petroleum products by looking for their vapors in the shallow soil gas. The method involves pumping a small amount of soil gas out of the ground through a hollow probe driven into the ground and analyzing the gas for the presence of volatile contaminants. The presence of VOCs in shallow soil gas indicates the observed compounds may either be in the vadose zone near the probe or in groundwater below the probe. The soil gas technology is most effective in mapping low molecular weight halogenated solvent chemicals and petroleum hydrocarbons possessing high vapor pressures and low aqueous solubilities. These compounds readily partition out of the groundwater and into the soil gas as a result of their high gas/liquid partitioning coefficients. Once in the soil gas, VOCs diffuse vertically and horizontally through the soil to the ground surface where they dissipate into the atmosphere. The contamination acts as a source and the above ground atmosphere acts as a sink, and typically a concentration gradient develops between the two. The concentration gradient in soil gas between the source and ground surface may be locally distorted by hydrologic and geologic anomalies (e.g. clays, perched water); however, soil gas mapping generally remains effective because distribution of the contamination is usually broader in areal extent than the local geologic barriers and is defined using a large database. The presence of geologic obstructions on a small scale tends to create anomalies in the soil gas-groundwater correlation, but generally does not obscure the broader areal picture of the contaminant distribution.

Soil gas contaminant mapping helps to reduce the time and cost required to delineate underground contamination by volatile contaminants. The soil gas investigation does this by outlining the general areal extent of contamination. Conventional bore holes or observation wells are used to verify both the presence and extent of the subsurface

contamination as indicated in the soil gas survey. In this manner, soil gas contaminant mapping can assist in determining the placement of monitoring wells. Thus the likelihood of drilling unnecessary monitoring wells is reduced. The soil gas survey is not intended to be substitute for conventional methodology, but rather to enable conventional methods to be used efficiently.

EQUIPMENT

Tracer Research Corporation utilized a one ton Ford analytical van that was equipped with one gas chromatograph and two Spectra Physics computing integrators. In addition, the van had two built-in gasoline powered generators that provide the electrical power (110 volts AC) to operate all of the gas chromatographic instruments and field equipment. A specialized hydraulic mechanism consisting of two cylinders and a set of jaws was used to drive and withdraw the sampling probes. A hydraulic hammer was used to assist in driving probes past cobbles and through unusually hard soil.

SOIL GAS SAMPLING PROCEDURES

Sampling probes consisted of 7 foot lengths of 3/4 inch diameter hollow steel pipe that were fitted with detachable drive tips. Soil gas probes were advanced 4-6 feet below grade. Once inserted into the ground, the above-ground end of the sampling probes were fitted with a steel reducer and a length of polyethylene tubing leading to a vacuum pump. Gas flow was monitored by a vacuum gauge to insure that an adequate flow was obtained.

To adequately purge the volume of air within the probe, 2 to 5 liters of gas was evacuated with a vacuum pump. During the soil gas evacuation, samples were collected in a glass syringe by inserting a syringe needle through a silicone rubber segment in the evacuation line and down into the steel probe. Ten milliliters of gas were collected for immediate analysis in the *TRACER* analytical field van. Soil gas was subsampled (duplicate

injections) in volumes ranging from 1 uL to 2 mL, depending on the VOC concentration at any particular location.

Sample probe vacuums ranged from 1-5 inches Hg. The maximum pump vacuum was measured at 17 inches Hg (If the probe had become plugged or totally obstructed the vacuum would have read the maximum of 17 inches Hg).

ANALYTICAL PROCEDURES

A Varian 3300 gas chromatograph was used for the soil gas analyses. It was equipped with an electron capture detector (ECD). Compounds were separated on a 6' by 1/8" OD packed column with OV-101 as the stationary phase in a temperature controlled oven. Nitrogen was used as the carrier gas.

Halocarbon compounds detected in the samples were identified by chromatographic retention time. Quantification of compounds was achieved by comparison of the detector response of the sample with the response measured for calibration standards (external standardization). Instrument calibration checks were run periodically throughout the day and system blanks were run at the beginning of the day to check for contamination in the soil gas sampling equipment. Air samples were also routinely analyzed to check for background levels in the atmosphere.

Detection limits for the compounds of interest were a function of the injection volume as well as the detector sensitivity for individual compounds. Thus the detection limit varied with the sample size. Generally, the larger the injection size the greater the sensitivity. However, peaks for compounds of interest were kept within the linear range of the analytical equipment. If any compound had a high concentration, it was necessary to use small injections, and in some cases to dilute the sample to keep it within linear range. This may have caused decreased detection limits for other compounds in the analyses.

The detection limits for the halocarbon compounds were approximately 0.0002 ug/L.

Detection limits were dependant upon the conditions of the measurement, in particular, the sample size. If any component being analyzed was not detected, the detection limit for that compound in that analysis is given as a "less than" value (e. g. < 0.1 ug/L). Detection limits obtained from GC analyses were calculated from the current response factor, the sample size, and the estimated minimum peak size (area) that would have been visible under the conditions of the measurement.

QUALITY ASSURANCE/QUALITY CONTROL PROCEDURES

Tracer Research Corporation's normal quality assurance procedures were followed in order to prevent any cross-contamination of soil gas samples. These procedures are described below:

- Steel probes are used only once during the day and then washed with high pressure soap and hot water spray or steam-cleaned to eliminate the possibility of cross-contamination. Enough probes are carried on each van to avoid the need to reuse any during the day.
- Probe adaptors (*TRACER*'s patented design) are used to connect the sample probe to the vacuum pump. The adaptor is designed to eliminate the possibility of exposing the sample stream to any part of the adaptor. Associated tubing connecting the adaptor to the vacuum pump is replaced periodically as needed during the job to insure cleanliness and good fit. At the end of each day the adaptor is cleaned with soap and water and baked in the GC oven.
- Silicone tubing (which acts as a septum for the syringe needle) is replaced as needed to insure proper sealing around the syringe needle. This tubing does not directly contact soil gas samples.

- Glass syringes are usually used for only one sample per day and are washed and baked out at night. If they must be used twice, they are purged with carrier gas (nitrogen) and baked out between probe samplings.
- Injector port septa through which soil gas samples are injected into the chromatograph are replaced on a daily basis to prevent possible gas leaks from the chromatographic column.
- Analytical instruments are calibrated each day by analytical standards from Chem Service, Inc. Calibration checks are also run after approximately every five soil gas sampling locations.
- Subsampling syringes are checked for contamination prior to sampling each day by injecting nitrogen carrier gas into the gas chromatograph.
- Prior to sampling each day, system blanks are run to check the sampling apparatus (probe, adaptor, 10 cc syringe) for contamination by drawing ambient air from above ground through the system and comparing the analysis to concurrently sampled ambient air analysis.
- All sampling and subsampling syringes are decontaminated each day and no such equipment is reused before being decontaminated. Microliter size subsampling syringes are reused only after a nitrogen carrier gas blank is run to insure it is not contaminated by the previous sample.
- Soil gas pumping is monitored by a vacuum gauge to insure that an adequate gas flow from the vadose zone is maintained. A reliable gas sample can be obtained if the sample vacuum gauge reading is at least 2 inches Hg less than the maximum pump vacuum.

TEST RESULTS

A total of 63 soil gas and 8 ambient air samples were collected and analyzed on site. Analytical data are condensed in Appendix A and reported in micrograms per liter. Appendix B contains maps showing the distribution of the target VOCs.

Ambient air samples were collected during the course of the investigation to help evaluate the Level of Significance for the selected compounds. The Level of Significance is simply the level above which is considered to be significant in terms of groundwater or soil contamination. TCA, TCE and PCE were not detected in any of the ambient air samples analyzed in the field. The Level of Significance for each target compound is based on several factors; concentrations in ambient air, background levels, and *TRACER's* past experience. Based on the evaluation of these factors, the Level of Significance for the selected target compounds was determined to be 0.001 ug/L. In other words, soil gas concentrations of TCA, TCE and PCE greater than the determined Level of Significance may indicate possible VOC contamination in the vicinity.

Prior to the start of the soil gas survey, sample locations were placed by the client. The investigation started at sampling point SG-91-1 and continued from that point as data became available. Sample locations SG-91-1 through SG-91-10 were collected along North Coors Road, investigation proceeded to the north-northwest of the Spartan Building and proceeded to cover the area surrounding the building.

TCA concentrations over the entire site ranged from non-detect (<0.0004 ug/L) to 12 ug/L. The highest concentration was detected at sampling location SG-61. The elevated levels of TCA are concentrated around the Spartan Building and decrease as you move further away from the building decreasing to non-detect (<0.0004 ug/L) levels to the northwest.

The TCE detected followed much the same path as the TCA mentioned earlier although not a broad spread. TCE ranged in concentration from non-detect (<0.001 ug/L)

to 24 ug/L detected at sampling location SG-91-61. Concentrations of TCE above 1 ug/L were detected at those sampling locations immediately surrounding the Spartan Building with concentrations decreasing away from the building. The TCE seemed to be concentrated in a more southwesterly direction than the TCA as shown if figure 3.

PCE was also detected during the investigation. The PCE was detected in a much smaller area that either the TCA or the TCE and at lower concentrations. The PCE ranged in concentration from non-detect (<0.0006 ug/L) to 0.2 ug/L being detected at sampling locations SG-91-42, SG-91-49, SG-91-50, and SG-91-61, these samples being located immediately to the north-northwest of the Spartan Building. One isolated area around sampling location SG-91-38 also showed contourable levels of PCE.

CONCLUSIONS

The highest concentrations of TCA, TCE and PCE were detected at those sampling locations in the immediate vicinity of the Spartan Building. Concentrations decreased to levels of non-detect to the northwest. No conclusions can be drawn regarding the area to the southeast of this site because no samples were collected to the southeast of the Spartan Building, further investigation would need to be conducted to assess the area in this direction and soil gas technology would be ideal for this function.

APPENDIX A: ANALYTICAL DATA

008908

METRIC CORPORATION/SPARTAN FACILITY/ALBUQUERQUE, NEW MEXICO JOB #1-91-263-S
6/17/91
CONDENSED DATA

SAMPLE	TCA ug/l	TCE ug/l	PCE ug/l
AIR	<0.0002	<0.0007	<0.0003
SG-91-1-6'	0.01	0.003	0.009
SG-91-2-6'	0.1	0.02	<0.0006
SG-91-3-6'	0.08	0.03	0.001
SG-91-4-6'	0.4	0.3	0.004
SG-91-5-6'	0.2	0.2	0.003
SG-91-6-6'	0.2	0.4	0.004
SG-91-7-6'	<0.0004	0.004	<0.0006
SG-91-8-6'	0.07	<0.001	<0.0006
SG-91-9-6'	<0.0004	<0.001	<0.0006
SG-91-10-6'	<0.0004	<0.001	<0.0006
SG-91-11-6'	<0.0004	<0.001	<0.0006
SG-91-12-6'	<0.0004	<0.001	<0.0006
SG-91-13-6'	<0.0004	<0.001	<0.0006
SG-91-14-6'	0.005	<0.001	<0.0006
SG-91-15-6'	0.1	0.02	<0.0006
SG-91-16-6'	<0.0004	<0.001	<0.0006
AIR	<0.0002	<0.0007	<0.0003
SG-91-17-6'	<0.0004	<0.001	<0.0006
SG-91-18-6'	<0.0004	<0.001	<0.0006
SG-91-19-6'	<0.0004	<0.001	<0.0006
SG-91-20-6'	<0.0004	<0.001	<0.0006
SG-91-21-6'	<0.0004	<0.001	<0.0006
SG-91-22-4'	<0.0004	<0.001	<0.0006

006800

Analyzed by: D. Ho
Proofed by: KW

METRIC CORPORATION/SPARTAN FACILITY/ALBUQUERQUE, NEW MEXICO JOB #1-91-263-S
6/17/91
CONDENSED DATA

SAMPLE	TCA ug/l	TCE ug/l	PCE ug/l
SG-91-23-5'	<0.0004	<0.001	<0.0006
SG-91-24-6'	<0.0004	<0.001	<0.0006
SG-91-25-6'	<0.0004	<0.001	<0.0006
SG-91-26-4'	<0.0004	<0.001	<0.0006
SG-91-27-6'	0.003	<0.001	<0.0006
SG-91-28-6'	0.02	<0.001	<0.0006
SG-91-29-6'	0.09	0.02	<0.0006
SG-91-30-5'	0.04	<0.001	<0.0006
SG-91-31-6'	<0.0004	<0.001	<0.0006
SG-91-32-6'	<0.0004	<0.001	<0.0006
AIR	<0.0002	<0.0007	<0.0003

008910

Analyzed by: D. Ho
Proofed by: KW

METRIC CORPORATION/SPARTAN FACILITY/ALBUQUERQUE, NEW MEXICO JOB #1-91-263-S
6/18/91
CONDENSED DATA

SAMPLE	TCA ug/l	TCE ug/l	PCE ug/l
AIR	<0.0002	<0.0007	<0.0003
SG-91-33-6'	0.02	0.01	<0.0006
SG-91-34-6'	0.1	0.8	0.01
SG-91-35-6'	0.06	0.1	0.003
SG-91-36-6'	0.3	0.4	0.03
SG-91-37-6'	0.07	0.06	<0.0006
SG-91-38-6'	0.5	0.2	0.001
SG-91-39-6'	0.04	<0.001	<0.0006
SG-91-40-5'	0.06	<0.003	0.007
SG-91-41-6'	0.03	0.03	0.001
SG-91-42-6'	0.6	8	0.2
SG-91-43-6'	0.07	0.3	0.02
SG-91-44-4'	<0.0004	<0.001	<0.0006
SG-91-45-5'	<0.0004	<0.001	<0.0006
SG-91-46-6'	<0.0004	<0.001	<0.0006
AIR	<0.0002	<0.0007	<0.0003
SG-91-47-6'	0.3	0.1	<0.006
SG-91-48-6'	2	1	0.03
SG-91-49-5'	7	8	0.2
SG-91-50-6'	8	8	0.2
SG-91-51-5'	0.001	<0.001	<0.0006
SG-91-52-5'	0.002	<0.001	<0.0006
SG-91-53-5'	0.006	<0.001	<0.0006
SG-91-54-5'	0.003	<0.001	0.002

008911

Analyzed by: D. Ho
Proofed by: kr

METRIC CORPORATION/SPARTAN FACILITY/ALBUQUERQUE, NEW MEXICO JOB #1-91-263-S
6/18/91
CONDENSED DATA

SAMPLE	TCA ug/l	TCE ug/l	PCE ug/l
SG-91-55-6'	1	2	0.09
SG-91-56-6'	2	3	0.1
SG-91-57-6'	1	3	0.1
SG-91-58-6'	0.8	4	0.1
SG-91-59-5'	0.8	0.8	0.02
SG-91-60-6'	2	5	0.06
AIR	<0.0002	<0.0007	<0.0003

003912

Analyzed by: D. Ho
Proofed by: KW

Tracer Research Corporation

METRIC CORPORATION/SPARTAN FACILITY/ALBUQUERQUE, NEW MEXICO JOB #1-91-263-S
6/19/91
CONDENSED DATA

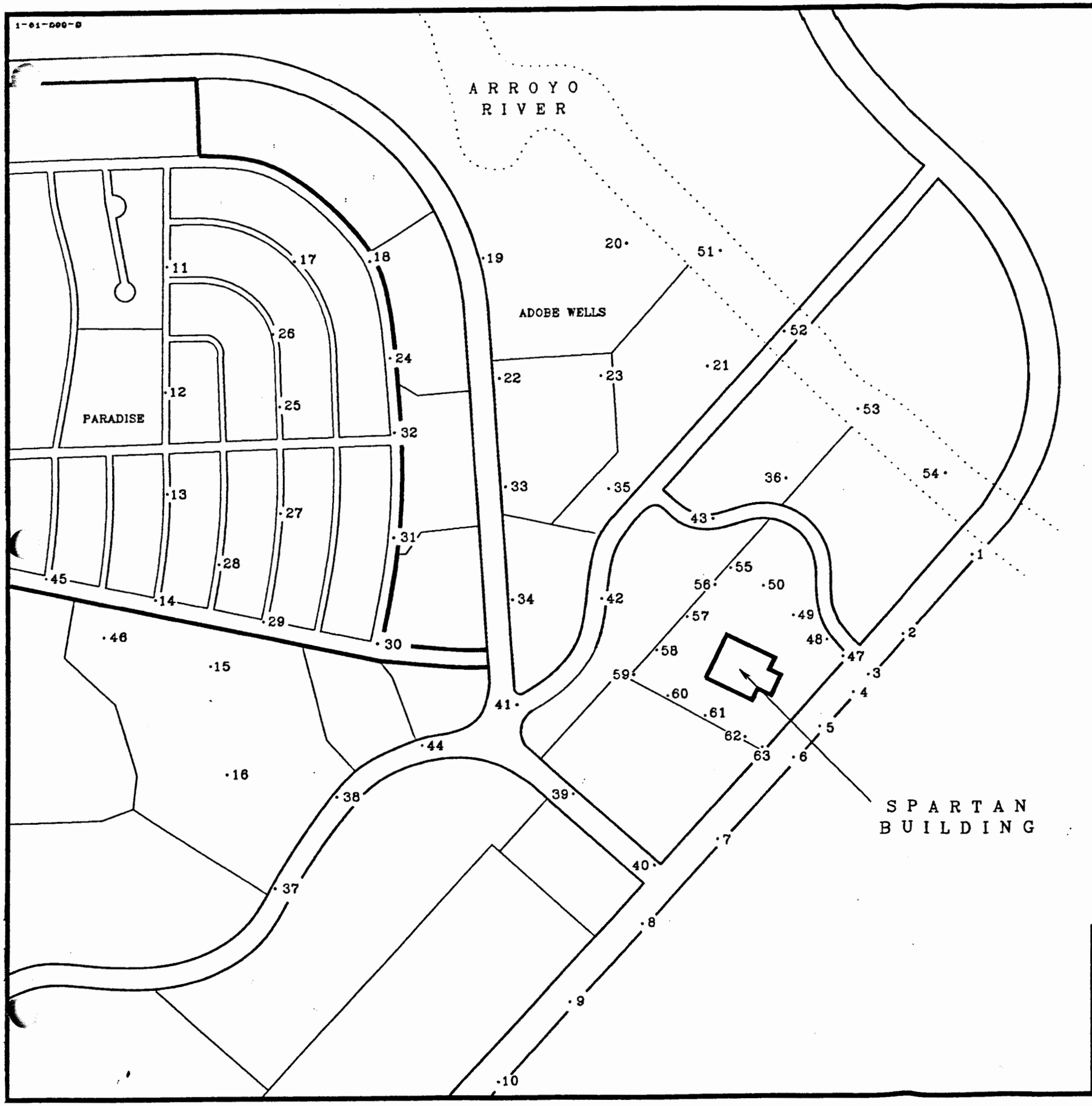
SAMPLE	TCA ug/l	TCE ug/l	PCE ug/l
AIR	<0.0003	<0.001	0.0009
SG-91-61-6'	12	24	0.2
SG-91-62-6'	6	7	<0.1
SG-91-63-6'	1	2	<0.05
AIR	<0.0003	<0.001	<0.0005

008913

Analyzed by: D. Ho
Proofed by: KW

Tracer Research Corporation

APPENDIX B: FIGURES



EXPLANATION

·61 Sampling Probe Location

SPARTAN TECHNOLOGY

9621 NORTH COORS
ALBUQUERQUE, NEW MEXICO

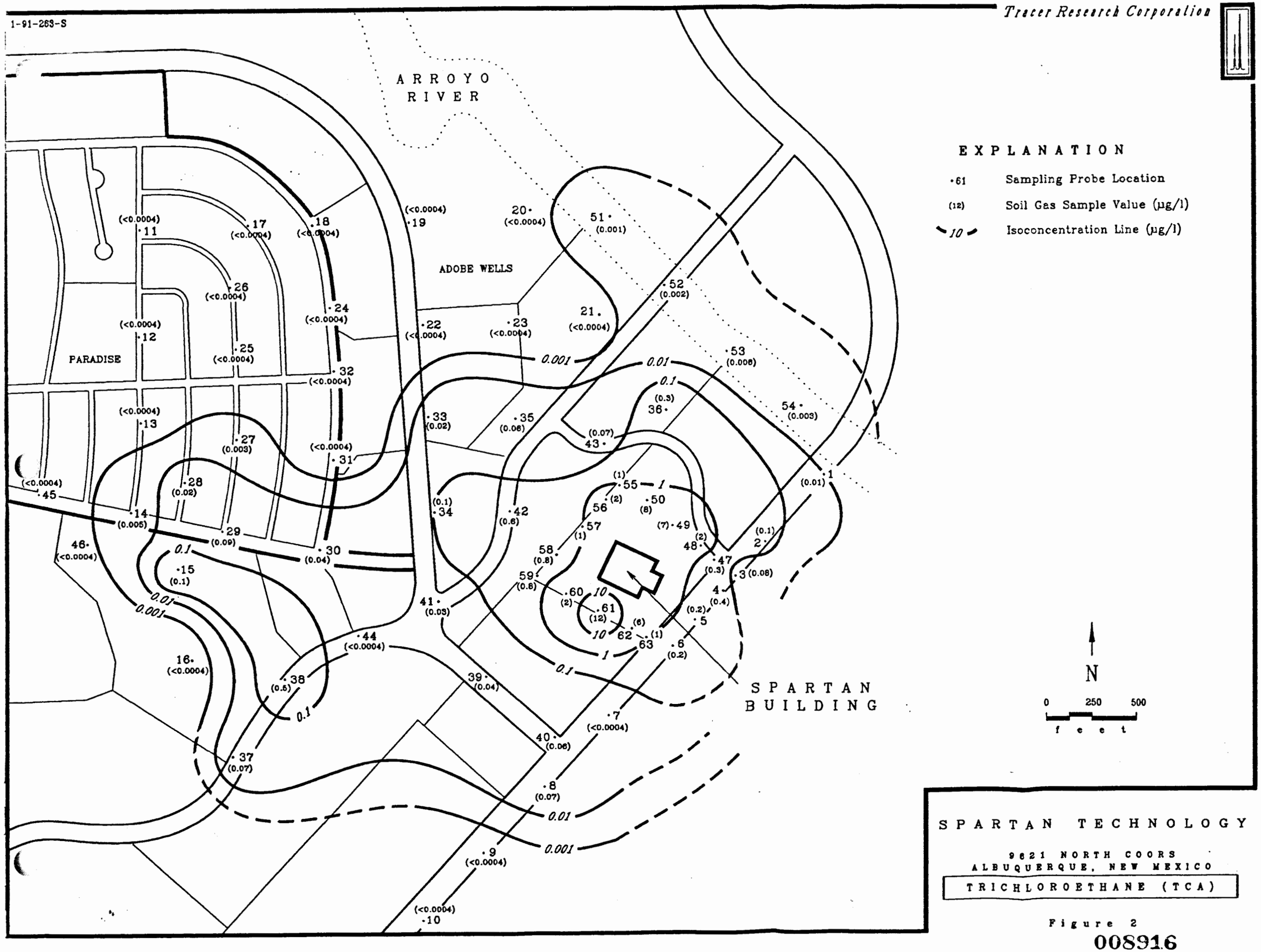
SAMPLING LOCATIONS

Figure 1

008915

1-91-263-S

Tracer Research Corporation



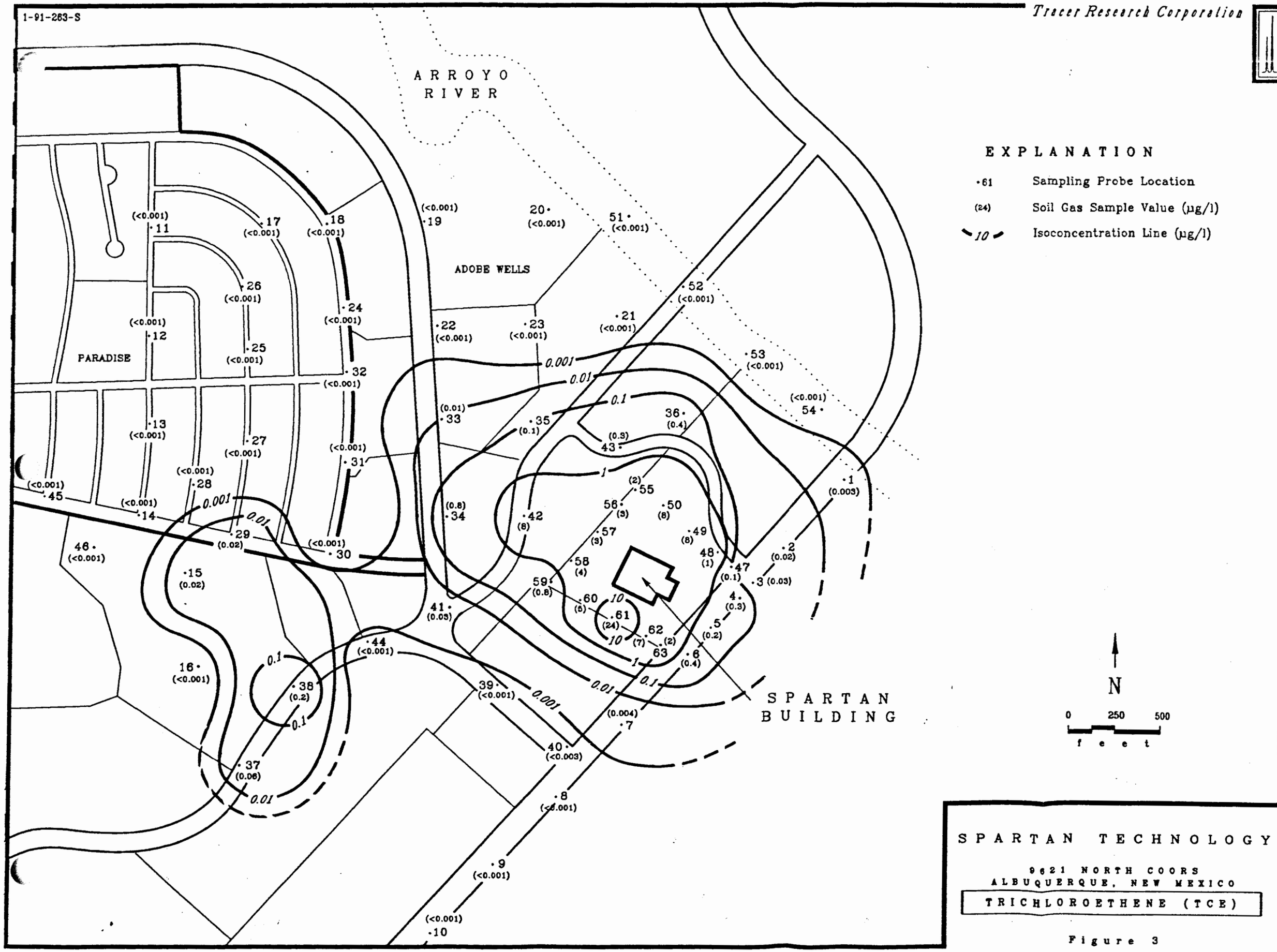
SPARTAN TECHNOLOGY

9621 NORTH COORS
ALBUQUERQUE, NEW MEXICO

TRICHLOROETHANE (TCA)

Figure 2

008916



SPARTAN TECHNOLOGY

9621 NORTH COORS
ALBUQUERQUE, NEW MEXICO

TRICHLOROETHENE (TCE)

Figure 3

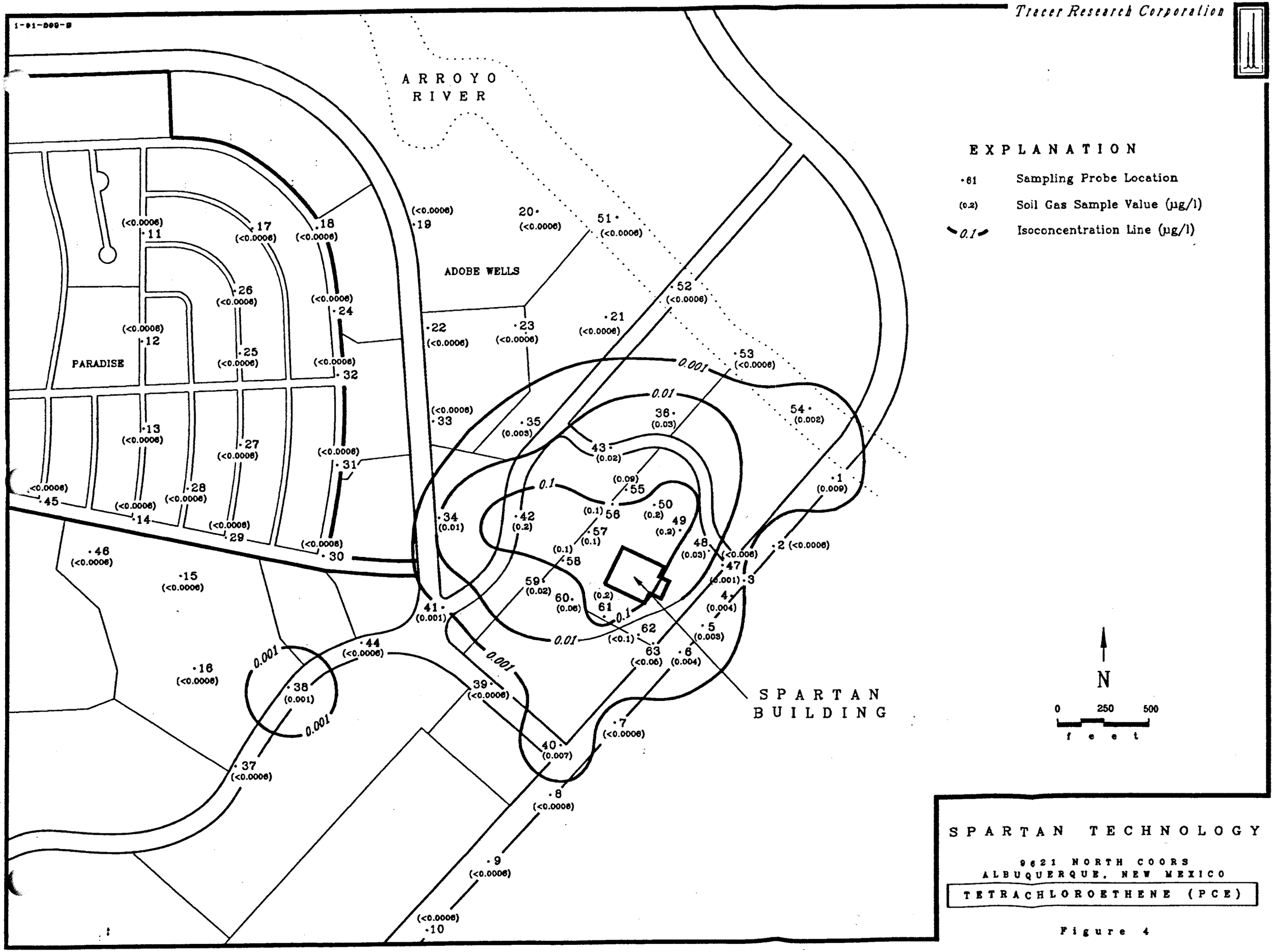

ARROYO RIVER
ADOBE WELLS
PARADISE
SPARTAN BUILDING
EXPLANATION
·61 Sampling Probe Location
(0.2) Soil Gas Sample Value (µg/l)
0.1 Isoconcentration Line (µg/l)
N
0 250 500
feet
SPARTAN TECHNOLOGY
9621 NORTH COORS
ALBUQUERQUE, NEW MEXICO
TETRACHLOROETHENE (PCE)

Figure 4

ATTACHMENT 8

Description of Vicinity Wells

WATER WELL LOCATIONS

MAP INDEX NUMBER	LEGAL ADDRESS	OWNER NAME AND ADDRESS	PERMIT NO.	MAP LOCATION	WELL DEPTH (FT.)	USE	PERMIT
1	11N.2E.2.343	Paradise Service Corp. 5633 Paradise Blvd., NW Albuquerque, NM	RG-4462-S		1000	Municipal	12/30/63
2	11N.2E.13.430	Alpha Southwest 205 Rossmoor Rd. SW Albuquerque, NM	RG-46641		340	Irrigation	06/21/87
3	11N.2E.24	J.M. Warren 227 Mezcal Dr. NE Albuquerque, NM	RG-137		169	Domestic	05/28/57
4	11N.2E.24	Jon W. Davis 12520 Monroe, NE Albuquerque, NM	RG-38127	Lot 11, BLK. 7	260	Domestic	06/21/82
5	11N.2E.24.300	J.M. Warren 227 Mezcal Dr. NE Albuquerque, NM	RG-685		184	Domestic	05/06/57
6	11N.2E.25.221	John R. Vento 5898 Coors Blvd., NW Albuquerque, NM	RG-26439		102	Domestic	10/16/75
7	11N.3E.	R.S. Hawes 8809 4th St., NW Albuquerque, NM	RG-21753	School District 3 Alameda Grant	125	Domestic	10/05/72
8	11N.3E.2&3	Lee Gibson Box 284 Albuquerque, NM	RG-6714	North Junction 2nd & 4th Sts.	44	Domestic	11/16/61

008920

WATER WELL LOCATIONS
(CONTINUED)

MAP INDEX NUMBER	LEGAL ADDRESS	OWNER NAME AND ADDRESS	PERMIT NO.	MAP LOCATION	WELL DEPTH (FT.)	USE	PERMIT
9	11N.3E.3.334	Elizabeth Sanatorium Edith Blvd., NE Albuquerque, NM	RG-4483-A		245	Commercial	12/19/60
10	11N.3E.3.424	G.T. Tummard 4212 Copper, NE Albuquerque, NM	RG-3228		100	Domestic/San.	05/31/60
11	11N.3E.3.442	Adolph Chavez 10017 Edith, NE Albuquerque, NM	RG-23222		127	Domestic	06/26/74
12	11N.3E.3.442	Jack Coowder 10600-C 2nd St., NW Albuquerque, NM	RG-9331		46	Domestic	08/27/63
13	11N.3E.4	Ernie D. Braunschweig Box 2071 Corrales, NM	RG-28227	Tract 1-B, Mary Christ Trust	296	Domestic	06/13/85
14	11N.3E.4	Dean Lowrey 1131 Westerfield, NE Albuquerque, NM	RG-17902	9B1A1A3	59	Domestic	01/11/71
15	11N.3E.4.122	Rubio Lujan 817 Alameda, NW Albuquerque, NM	RG-23193		105	Domestic	05/31/73
16	11N.3E.4.213	Duke City Developers 314 Rio Grande, NW Albuquerque, NM	RG-53519		300	Domestic	06/17/91
17	11N.3E.4.221	Ken Yarbrough Box 235A Corrales, NM	RG-19558		137	Domestic	10/20/71

008921

WATER WELL LOCATIONS
(CONTINUED)

MAP INDEX NUMBER	LEGAL ADDRESS	OWNER NAME AND ADDRESS	PERMIT NO.	MAP LOCATION	WELL DEPTH (FT.)	USE	PERMIT
18	11N.3E.4.231	Journal Pub. Company P. O. Drawer J Albuquerque, NM	RG-43787		114	Irrigation	11/04/85
19	11N.3E.4.241	Mike Sims Box 1068 Corrales, NM	RG-53850		230	Domestic	06/10/91
20	11N.3E.5	Ruth Battuello P. O. Box 10339 Alameda, NM	RG-50610	Tract, 1 Lands of Betty Pulekos	128	Domestic	05/11/89
21	11N.3E.5	Robert W. McCormick 2717 W. Carol, NE Albuquerque, NM	RG-18345	Lot 4	121	Domestic	02/17/71
22	11N.3E.5	C. Patrick McGreevy Star Rt. Box 1236 Corrales, NM	RG-30249	Lot 7, Valle del Norte Estates	132	Domestic	05/15/86
23	11N.3E.5.120	Harry Pasxon P. O. Box 447 Corrales, NM	RG-49172		300	Domestic	05/23/88
24	11N.3E.5.222	Jerry Camilli 7424 2nd St., NW Albuquerque, NM	RG-53064		327	Domestic	12/07/90
25	11N.3E.5.222	Jerry Camilli 7424 2nd St. NW Albuquerque, NM	RG-53064-x		150	Domestic	03/18/91
26	11N.3E.5.410	Billy A. Romero Applewood Rd., NW Albuquerque, NM	RG-27605		130	Domestic	09/27/76

008922

WATER WELL LOCATIONS
(CONTINUED)

MAP INDEX NUMBER	LEGAL ADDRESS	OWNER NAME AND ADDRESS	PERMIT NO.	MAP LOCATION	WELL DEPTH (FT.)	USE	PERMIT
27	11N.3E.8.134	Albert J. Black P. O. Box 154 Alameda, NM	RG-3664		200	Domestic	11/16/81
28	11N.3E.8.134	Albert J. Black P. O. Box 154 Alameda, NM	RG-6095		200	Domestic	03/02/62
29	11N.3E.8.330	Robert B. Briscoe 9846 Coors Rd., NW Albuquerque, NM	RG-12467		152	Domestic	05/13/65
30	11N.3E.8.330	Rick Schalk 9848 Coors Rd., NW Albuquerque, NM	RG-27958		149	Domestic	12/01/76
31	11N.3E.8.333	Robert B. Briscoe 1900 Bryn Mawr, NE Albuquerque, NM	RG-5774		140	Domestic	05/08/61
32	11N.3E.9	Johnny Atencio 4516 Carlisle, NW Albuquerque, NM	RG-25421		212	Domestic	03/20/75
33	11N.3E.9	Charles Bonner Box 10143 Alameda, NM	RG-37025	Lot A of Bonner Subdivision	200	Domestic	09/30/81
34	11N.3E.9	Albert Klassen 844 Guadalupe Circle, NW Albuquerque, NM	RG-10278		141	Domestic	02/12/82
35	11N.3E.9	Dan Wilson 809 Alameda Blvd., NW Albuquerque, NM	RG-35701	Tract B, Lands of Dan & Angie Wilson	126	Domestic	05/22/90

WATER WELL LOCATIONS
(CONTINUED)

MAP INDEX NUMBER	LEGAL ADDRESS	OWNER NAME AND ADDRESS	PERMIT NO.	MAP LOCATION	WELL DEPTH (FT.)	USE	PERMIT
36	11N.3E.9.323	Southern Union Gas. Co. 4625 Edith, NE Albuquerque, NM	RG-19136		200	Industrial Water	06/25/71
37	11N.3E.10	Matt Caudill 6400 Edith, NE Albuquerque, NM	RG-50888	100 Diers Rd., NW	176	Domestic	07/03/89
38	11N.3E.10	Mary C. Montano 10031 Foute St., NW Albuquerque, NM	RG-36896	Tract 58c, Map 23	80	Domestic	09/28/81
39	11N.3E.10.122	Glen Garcia 6201 Roger, NE Albuquerque, NM	RG-35088		105	Domestic	11/12/80
40	11N.3E.15	Cambro Construction, Inc. 7424 2nd St., NW Albuquerque, NM	RG-48726	Tract B-3, Lands of Montoya	220	Domestic	02/12/88
41	11N.3E.15	Harry Schofield 10113 Toltec, NE Albuquerque, NM	RG-45812	Tract B-2 Lands of Maximiano Maldonado	130	Domestic	07/09/90
42	11N.3E.15	Carlton D. Smoot 8901 6th St., NW Albuquerque, NM	RG-26591	Tract B-1, Map 24	175	Domestic	N.L.
43	11N.3E.15.121	Jerry Camilli 7424 2nd St. NW Albuquerque, NM	RG-48726		223	Domestic (CLW)	03/18/91
44	11N.3E.15.440	C.R. Davis 1000 Stadium Dr., SE Albuquerque, NM	RG-9518		255	Domestic/San.	10/12/63

WATER WELL LOCATIONS
(CONTINUED)

MAP INDEX NUMBER	LEGAL ADDRESS	OWNER NAME AND ADDRESS	PERMIT NO.	MAP LOCATION	WELL DEPTH (FT.)	USE	PERMIT
45	11N.3E.16	Jose Tarango 218 Garduno Rd., NW Albuquerque, NM	RG-17887	Tract E, 100F	146	Domestic	10/16/70
46	11N.E3.16.230	Quintin Kruichak Rt. 4, Box 708-C Albuquerque, NM	RG-504		112	Domestic	04/05/57
47	11N.3E.16.421	David Garduno 8806 4th St., N.W. Albuquerque, NM	RG-22575		152	Domestic	05/02/73
48	11N.3E.17.100	A.F. Black 200 16th St., NW Albuquerque, NM	RG-5711		68	Domestic	05/01/61
49	11N.3E.17.221	Jesse Morris 8821 Rio Grande, NW Albuquerque, NM	RG-25308		38	Domestic	10/10/74
50	11N.3E.17.223	Maud R. Anderson Rt. 2, Box 421 Albuquerque, NM	RG-64		53	Irrigation	12/12/55
51	11N.3E.17.400	Steven U. Rizek 8904 Rio Grande, NW Albuquerque, NM	RG-43518	Tract 21, Lands of Leo Luna	231	Domestic	06/10/85
52	11N.3E.18	Jerry Forrester 7100 Coors Blvd., NW Albuquerque, NM	RG-26578	Tract A-1	131	Domestic	10/24/75
53	11N.3E.18.300	C.C. Roberson 600 Morningside, SE Albuquerque, NM	RG-4455		115	Domestic	05/31/60

008925

WATER WELL LOCATIONS
(CONTINUED)

MAP INDEX NUMBER	LEGAL ADDRESS	OWNER NAME AND ADDRESS	PERMIT NO.	MAP LOCATION	WELL DEPTH (FT.)	USE	PERMIT
54	11N.3E.18.324	John Dutrigg North Coors Rd., NW Albuquerque, NM	RG-21704		95	Commercial	08/13/74
55	11N.3E.18.331	Bob Green 8311 Calle Petrirrojo, NW Albuquerque, NM	RG-49967-x-3		255	Domestic	06/17/91
56	11N.3E.19	William Ellison 1617 University, NE Albuquerque, NM	RG-18259	(137E-1-9)	80	Domestic	06/14/71
57	11N.3E.19	Mary Mann 5036 Fairfax, NW Albuquerque, NM	RG-18129	(E. of Coors)	40	Domestic	07/29/77
58	11N.3E.19	W.F. Mann Rt. 3, Box 3021 Albuquerque, NM	RG-29059	(.75 Mi. S. of Sipi, .4 Mi. east)	140	Domestic	07/19/77
59	11N.3E.20	Fred W. Carpenter 723 Ranchitos Rd., NW Albuquerque, NM	RG-19104	Tract 20, Maj. 27 Dis. Mrges.	48	Domestic	07/06/71
60	11N.3E.20	Elizabeth S. Sanchez 7622 Rio Grande, NW Albuquerque, NM	RG-45715	Tract 83, Map 27 MRGCD	60	Domestic	06/27/86
61	11N.3E.20	Mary M. Seis 2524 Elkgo Rd., NW Albuquerque, NM	RG-45544	Lot C, Tract C-2 Village Los Rancho de Albuquerque	160	Domestic	06/27/86
62	11N.3E.20.122	Jerold Joseph 1009 Acequia Trail, NW Albuquerque, NM	RG-24951		42	Domestic	06/01/74

008926

WATER WELL LOCATIONS
(CONTINUED)

MAP INDEX NUMBER	LEGAL ADDRESS	OWNER NAME AND ADDRESS	PERMIT NO.	MAP LOCATION	WELL DEPTH (FT.)	USE	PERMIT
63	11N.3E.20.400	Fred W. Carpenter 723 Ranchitos Rd., NW Albuquerque, NM	RG-19104		140	Domestic	07/08/71
64	11N.3E.21	Gilbert Escarcida 7610 Daniel Circle, NW Albuquerque, NM	RG-51149	Lot 3, Lands of Jacobson	100	Domestic	07/09/90
65	11N.3E.21.140	Joe Atkinson 1013 Sandia Rd., NW Albuquerque, NM	RG-21926		95	Domestic	10/10/72
66	11N.3E.21.142	Horace Garcia 248 Los Ranchos, NW Albuquerque, NM	RG-6908		37	Domestic	04/19/62
67	11N.3E.21.200	Mike Sedillo 7820 2nd St., NW Albuquerque, NM	RG-18788		86	Domestic	08/31/72
68	11N.3E.21.442	City of Albuquerque	RG-2193		813	Exploratory	12/10/75
69	11N.3E.22	Michael Worth 8014 Edith Blvd., NE Albuquerque, NM	RG-38844	Tract 4B	120	Domestic	11/04/82
70	11N.3E.22.122	Archie Montoya 200 Ortega, NE Albuquerque, NM	RG-21008		96	Domestic	05/21/72
71	11N.3E.22.220	Wylie Bros. Const. P. O. Box 8526 Albuquerque, NM	RG-18337		158	Domestic/San.	04/15/74
72	11N.3E.22.300	George M. Thatcher 7424 Albuquerque, NM	RG-6969x		60	Dairy	07/29/63

008927

WATER WELL LOCATIONS
(CONTINUED)

MAP INDEX NUMBER	LEGAL ADDRESS	OWNER NAME AND ADDRESS	PERMIT NO.	MAP LOCATION	WELL DEPTH (FT.)	USE	PERMIT
73	11N.3E.22.420	Albuquerque International Balloon Fiesta Albuquerque, NM	RG-40603		135	Domestic/San.	09/26/83
74	11N.3E.27	Gray L. Hemminger 6627 Letta, NE Albuquerque, NM	RG-21359	Lot 3, Caldwells Replat.	151	Domestic	08/10/72
75	11N.3E.27	Mr. Woods Bear Canyon Rd. Albuquerque, NM	RG-848		100	Domestic	06/14/57
76	11N.3E.27.141	H.P. Murphy 2881 Campbell, NW Albuquerque, NM	RG-1268		102	Domestic	09/26/57
77	11N.3E.27.300	Academy Boys, Inc. 318 Silver, SW Albuquerque, NM	RG-972		100	Domestic	08/21/58
78	11N.3E.27.310	Academy for Boys 6540 Edith Blvd., NE Albuquerque, NM	RG-53-E		103	Irrigation	04/20/62
79	11N.3E.27.314	Sandia Prep School 532 Osuna Rd., NE Albuquerque, NM	RG-53-E		208	Commercial	08/23/82
80	11N.3E.27.333	William Keller 6308 Elm St., NE Albuquerque, NM	RG-18870		151	Domestic	05/27/71
81	11N.3E.27.333	David E. Mowery 6305 Elm St., NE Albuquerque, NM	RG-23167		150	Domestic	05/10/73

008928

WATER WELL LOCATIONS
(CONTINUED)

MAP INDEX NUMBER	LEGAL ADDRESS	OWNER NAME AND ADDRESS	PERMIT NO.	MAP LOCATION	WELL DEPTH (FT.)	USE	PERMIT
82	11N.3E.27.440	Universal Constructors Station B, Box 6608 Albuquerque, NM	RG-12871-A		256	Commercial	07/22/69
83	11N.3E.27.424	Contractors Equipment Supply 707 Broadway, NE Albuquerque, NM	RG-33540		353	Domestic/San.	02/06/81
84	11N.3E.28	Charlie Hinman 6748 Edgewood, NW Albuquerque, NM	RG-39413	Lot 146	75	Domestic	12/08/83
85	11N.3E.28	Patricia Luna 330 Tyler Rd., NW Albuquerque, NM	RG-45112	Lot 19, Kingsbury Addition	65	Domestic	02/18/86
86	11N.3E.28	Richard Meyers 113 Green Valley, NW Albuquerque, NM	RG-19143	Lot 11, BLK. 11 Zia Gardens	38	Domestic	04/14/71
87	11N.3E.28	Joseph E. Maschewski 311 Reese St. Albuquerque, NM	RG-79		75	Domestic	12/20/56
88	11N.3E.28	A.P. Moraga 355 Tyler Rd. NW Albuquerque, NM	RG-15674	Lot 8, Kingsbury Subdivision	146	Domestic	05/09/69
89	11N.3E.28	Charles T. Simms 308 Enchanted Valley, NW Albuquerque, NM	RG-18185	Lot 15, BLK 12 Enchanted Valley Acadmey	140	Domestic	N.L.
90	11N.3E.28.111	Harold Dobbin 6629 Elwood, NE Albuquerque, NM	RG-44515		71	Domestic	01/03/86

008929

WATER WELL LOCATIONS
(CONTINUED)

MAP INDEX NUMBER	LEGAL ADDRESS	OWNER NAME AND ADDRESS	PERMIT NO.	MAP LOCATION	WELL DEPTH (FT.)	USE	PERMIT
91	11N.3E.28.114	Bob Donegan 340 Enchanted Valley, NW Albuquerque, NM	RG-17697		99	Domestic	07/20/70
92	11N.3E.28.114	David W. Perry 336 Enchanted Valley, NW Albuquerque, NM	RG-17708		100	Domestic	07/20/70
93	11N.3E.28.144	Tom Trueblood 6008 2nd St. NW Albuquerque, NM	RG-52732		80	Domestic	08/14/90
94	11N.3E.28.314	Louie M. Gonzales 305 Willow Rd., NW Albuquerque, NM	RG-22303		90	Domestic	12/11/72
95	11N.3E.29	Calvin D. Ary 601 Tascosa Ln., NW Albuquerque, NM	RG-17377	Lot 3, Bernauer Addition #1	112	Domestic	04/13/70
96	11N.3E.29	John Eaves 2426 Dietzfern Rd., NW Albuquerque, NM	RG-44713	Tract 31-B, Map 29 MRGCD	95	Domestic	05/03/86
97	11N.3E.29	Samuel T. Picraux 712 Fairway, NW Albuquerque, NM	RG-33549	Lot 16, BLK B Lee Acres	60	Domestic	06/27/86
98	11N.3E.29.222	Amy Lagant 54 Charles, NW Albuquerque, NM	RG-53524		63	Irrigation	05/06/91
99	11N.3E.29.241	Albuquerque Board of Educ. Taft Junior School 620 Schulte Rd., NW Albuquerque, NM	RG-323		191	School	02/04/65

008930

WATER WELL LOCATIONS
(CONTINUED)

MAP INDEX NUMBER	LEGAL ADDRESS	OWNER NAME AND ADDRESS	PERMIT NO.	MAP LOCATION	WELL DEPTH (FT.)	USE	PERMIT
100	11N.3E.29.341	Vickie Haskins 6409 La Chachia, NW Albuquerque, NM	RG-38015		97	Domestic	12/26/89
101	11N.3E.30.423	Maxie Anderson 1776 Montano, NW Albuquerque, NM	RG-16366		129	Domestic	03/27/69
102	11N.3E.30.423	Kevin Caldwell 5000 Los Poblomas, NW Albuquerque, NM	RG-23841		80	Irrigation	06/07/91
103	11N.3E.30.424	Albert T. Vasery P. O. Box 487 Albuquerque, NM	RG-13964-S		50	Domestic	07/26/71
104	12N.3E.31.130	Rio Rancho Estates 1429 Central Ave., SW Albuquerque, NM	RG-6743-S		815	Municipal	01/21/64
105	12N.3E.31.134	Rio Rancho Estates 1429 Central Ave., NW Albuquerque, NM	RG-6745		350	Domestic	02/02/62
106	12N.3E.32	Browood Development P. O. Box 10244 Albuquerque, NM	RG-34800	SE, SW, SE	310	Exploratory	08/02/80

008931

WATER WELL LOCATIONS
(CONTINUED)

MAP INDEX NUMBER	LEGAL ADDRESS	OWNER NAME AND ADDRESS	PERMIT NO.	MAP LOCATION	WELL DEPTH (FT.)	USE	PERMIT
107	12N.3E.32	John Smith 911 Florida, SE Albuquerque, NM	RG-39864	Tract B-3-A, Lands of Pallmer	190	Domestic	05/31/83
108	12N.3E.32	John Smith 911 Florida, SE Albuquerque, NM	RG-38152	Tract B-1-A, Lands of Pallmer	307	Domestic	07/01/82
109	12N.3E.32	Lance Tepper P. O. Box 2235 Corrales, NM	RG-49752	Tract B-3-A of Plat B3 Lands of Pallmer	130	Domestic	08/09/88
110	12N.3E.32.244	Albert C. Anderson Star Rt. 1730 Corrales, NM	RG-21819		133	Domestic	09/25/72
111	12N.3E.32.440	Quinton Pettis	RG-48982		240	Domestic	04/13/88
112	12N.3E.32.444	Robert Bulman 590 Appelwood Corrales, NM	RG-26940		300	Domestic	05/14/91
113	12N.3E.32&33	Tom Spross P. O. Box 890 Cedar Crest, NM	RG-50857	Tract B2, Lands of Christ Estates	301	Domestic	07/04/89
114	12N.3E.33	John Barnham Coronado Rd. Corrales, NM	RG-49163		160	Domestic	05/18/88
115	12N.3E.33	Ruth Pertinen	RG-47160		150	Domestic	03/24/87
116	12N.3E.33.322	Jack Satriana 807 Coronado Rd. Corrales, NM	RG-25977		80	Domestic	05/06/91

008932

WATER WELL LOCATIONS
(CONTINUED)

MAP INDEX NUMBER	LEGAL ADDRESS	OWNER NAME AND ADDRESS	PERMIT NO.	MAP LOCATION	WELL DEPTH (FT.)	USE	PERMIT
117	12N.3E.33.322	Prudential Mark V 4425 Juan Tabo, NE Albuquerque, NM	RG-10100		185	Domestic	06/17/91
118	12N.3E.33.232	David Schafer P. O. Box 538 Corrales, NM	RG-37372		123	Domestic	03/17/82
119	12N.3E.33.244	Eugene Atencio, Jr. 159 E. Ranchitos Rd. Corrales, NM	RG-18690		42	Domestic	08/22/72
120	12N.3E.33.400	William Leddicoet Star Rt. Box 978 Corrales, NM	RG-41428		127	Domestic	04/18/84
121	12N.3E.33.400	William Liddicoet Star Rt. Box 978 Corrales, NM	RG-41428		169	Domestic	01/03/59
122	12N.3E.33.414	Jim W. McCaulley P. O. Box 543 Corrales, NM	RG-10740		290	Domestic	04/29/91

008933

ATTACHMENT 9

June 1991 Sampling and Analysis

Rocky Mountain
Analytical Laboratory

Enseco

ANALYTICAL RESULTS
FOR
SPARTON TECHNOLOGY
ENSECO-RMAL NO. 015363

JUNE 21, 1991

Reviewed by: Joel E. Holtz

Sue Dalla

Enseco Incorporated
4955 Yarrow Street
Arvada, Colorado 80002
303/421-6611 Fax: 303/431-7171

Introduction

This report presents the analytical results as well as supporting information to aid in the evaluation and interpretation of the data and is arranged in the following order:

- Sample Description Information
- Analytical Test Requests
- Analytical Results
- Quality Control Report

Consistent with directives in the CLP protocol in SW-846 and other EPA methods, all GC/MS analyses were performed so that the maximum concentration of sample was analyzed. Some samples required dilutions to avoid saturation of the detector, to achieve linearity for a specific target compound or to reduce matrix interferences. As stated in Section 7.5.4 of Method 8270, 7.4.1.16 of Method 8240 and Exhibit E of the CLP protocol these dilutions must be performed. The reporting limits for these samples are therefore proportionate to the dilution required. Surrogate compounds may not be measurable in samples which have been diluted.

Samples 015363-0001 and -0002 were diluted for Method 8240 due to the concentration of target compounds and the reporting limits were raised accordingly.

Sample Description Information

The Sample Description Information lists all of the samples received in this project together with the internal laboratory identification number assigned for each sample. Each project received at Enseco - RMAL is assigned a unique six digit number. Samples within the project are numbered sequentially. The laboratory identification number is a combination of the six digit project code and the sample sequence number.

Also given in the Sample Description Information is the Sample Type (matrix), Date of Sampling (if known) and Date of Receipt at the laboratory.

Analytical Test Requests

The Analytical Test Requests lists the analyses that were performed on each sample. The Custom Test column indicates where tests have been modified to conform to the specific requirements of this project.

Enseco
A Corning Company

SAMPLE DESCRIPTION INFORMATION
for
Sparton Technology Inc.

Lab ID	Client ID	Matrix	Sampled Date	Sampled Time	Received Date
015363-0001-SA	MW-48 Groundwater	AQUEOUS	11 JUN 91	09:56	12 JUN 91
015363-0002-SA	MW-47 Groundwater	AQUEOUS	11 JUN 91	11:35	12 JUN 91
015363-0003-SA	MW-58 Groundwater	AQUEOUS	11 JUN 91	11:55	12 JUN 91
015363-0004-SA	MW-53 Groundwater	AQUEOUS	11 JUN 91	13:58	12 JUN 91

Enseco
A Corning Company

ANALYTICAL TEST REQUESTS
for
Sparton Technology Inc.

Lab ID: 015363	Group Code	Analysis Description	Custom Test?
0001 - 0004	A	Volatile Organics	N
		Appendix IX List	N
		Screen - Volatile Organics	N
		Appendix IX Metals (Total) done by ICP	N
		Prep - Total Metals, ICP	N
		Mercury, Cold Vapor AA (Total)	N
		Prep - Mercury, Cold Vapor AA (Total)	N
		Arsenic, Furnace AA (Total)	N
		Prep - Total Metals, Furnace AA	N
		Prep - Total Metals, Furnace AA	N
		Thallium, Furnace AA (Total)	N
		Selenium, Furnace AA (Total)	N
		Lead, Furnace AA (Total)	N

Analytical Results

The analytical results for this project are presented in the following data tables. Each data table includes sample identification information, and when available and appropriate, dates sampled, received, authorized, prepared and analyzed. The authorization data is the date when the project was defined by the client such that laboratory work could begin.

Data sheets contain a listing of the parameters measured in each test, the analytical results and the Enseco reporting limit. Reporting limits are adjusted to reflect dilution of the sample, when appropriate. Solid and waste samples are reported on an "as received" basis, i.e. no correction is made for moisture content.

Enseco-RMAL is no longer routinely blank-correcting analytical data. Uncorrected analytical results are reported, along with associated blank results, for all organic and metals analyses. Analytical results and blank results are reported for conventional inorganic parameters as specified in the method. This policy is described in detail in the Enseco Incorporated Quality Assurance Program Plan for Environmental Chemical Monitoring, Revision 3.3, May, 1989.

The results from the Standard Enseco QA/QC Program, which generates data which are independent of matrix effects, is provided subsequently.

Enseco
A Corning Company

Volatile Organics
Appendix IX List
Method 8240

Client Name: Sparton Technology Inc.
Client ID: MW-48 Groundwater
Lab ID: 015363-0001-SA
Matrix: AQUEOUS Sampled: 11 JUN 91 Received: 12 JUN 91
Authorized: 12 JUN 91 Prepared: 13 JUN 91 Analyzed: 17 JUN 91

Parameter	Result	Units	Reporting Limit
Acetone	ND	ug/L	50
Acetonitrile	ND	ug/L	1000
Acrolein	ND	ug/L	500
Acrylonitrile	ND	ug/L	500
Allyl chloride	ND	ug/L	50
Benzene	ND	ug/L	25
Bromodichloromethane	ND	ug/L	25
Bromoform	ND	ug/L	25
Bromomethane	ND	ug/L	50
2-Butanone (MEK)	ND	ug/L	50
Carbon disulfide	ND	ug/L	25
Carbon tetrachloride	ND	ug/L	25
Chlorobenzene	ND	ug/L	25
Chloroethane	ND	ug/L	50
Chloroform	ND	ug/L	25
Chloromethane	ND	ug/L	50
Chloroprene	ND	ug/L	25
Dibromochloromethane	ND	ug/L	25
,2-Dibromo-3-chloro-propane (DBCP)	ND	ug/L	50
1,2-Dibromoethane (EDB)	ND	ug/L	50
Dibromomethane	ND	ug/L	25
trans-1,4-Dichloro-2-butene	ND	ug/L	25
Dichlorodifluoromethane	ND	ug/L	100
1,1-Dichloroethane	ND	ug/L	25
1,2-Dichloroethane	ND	ug/L	25
1,1-Dichloroethene	ND	ug/L	25
1,2-Dichloroethene (total)	ND	ug/L	25
1,2-Dichloropropane	ND	ug/L	25
cis-1,3-Dichloropropene	ND	ug/L	25
trans-1,3-Dichloropropene	ND	ug/L	25
1,4-Dioxane	ND	ug/L	2500
Ethylbenzene	ND	ug/L	25
Ethyl methacrylate	ND	ug/L	100
Iodomethane	ND	ug/L	25
Isobutanol	ND	ug/L	1000
2-Hexanone	ND	ug/L	50
Methacrylonitrile	ND	ug/L	25
Methylene chloride	ND	ug/L	25

(continued on following page)

ND = Not detected
NA = Not applicable

.eported By: Robert Broderick Approved By: Mark Dymerski

Enseco
A Corning Company

Volatile Organics
Appendix IX List
Method 8240

Client Name: Sparton Technology Inc.
Client ID: MW-48 Groundwater
Lab ID: 015363-0001-SA
Matrix: AQUEOUS Sampled: 11 JUN 91 Received: 12 JUN 91
Authorized: 12 JUN 91 Prepared: 13 JUN 91 Analyzed: 17 JUN 91

Parameter	Result	Units	Reporting Limit
Methyl methacrylate	ND	ug/L	100
4-Methyl-2-pentanone (MIBK)	ND	ug/L	50
Propionitrile	ND	ug/L	25
Styrene	ND	ug/L	25
1,1,1,2-Tetrachloroethane	ND	ug/L	25
1,1,2,2-Tetrachloroethane	ND	ug/L	25
Tetrachloroethene	ND	ug/L	25
Toluene	ND	ug/L	25
1,1,1-Trichloroethane	ND	ug/L	25
1,1,2-Trichloroethane	ND	ug/L	25
Trichloroethene	410	ug/L	25
Trichlorofluoromethane	ND	ug/L	25
1,2,3-Trichloropropane	ND	ug/L	25
Vinyl acetate	ND	ug/L	50
Vinyl chloride	ND	ug/L	50
Xylenes (total)	ND	ug/L	25

urrogate	Recovery	
Toluene-d8	109	%
4-Bromofluorobenzene	101	%
1,2-Dichloroethane-d4	88	%

ND = Not detected
NA = Not applicable

eported By: Robert Broderick Approved By: Mark Dymerski

Enseco
A Corning Company

Volatile Organics
Appendix IX List
Method 8240

ient Name: Sparton Technology Inc.
Client ID: MW-47 Groundwater
Lab ID: 015363-0002-SA
Matrix: AQUEOUS Sampled: 11 JUN 91 Received: 12 JUN 91
Authorized: 12 JUN 91 Prepared: 13 JUN 91 Analyzed: 17 JUN 91

Parameter	Result	Units	Reporting Limit
Acetone	ND	ug/L	12
Acetonitrile	ND	ug/L	240
Acrolein	ND	ug/L	120
Acrylonitrile	ND	ug/L	120
Allyl chloride	ND	ug/L	12
Benzene	ND	ug/L	6.0
Bromodichloromethane	ND	ug/L	6.0
Bromoform	ND	ug/L	6.0
Bromomethane	ND	ug/L	12
2-Butanone (MEK)	ND	ug/L	12
Carbon disulfide	ND	ug/L	6.0
Carbon tetrachloride	ND	ug/L	6.0
Chlorobenzene	ND	ug/L	6.0
Chloroethane	ND	ug/L	12
Chloroform	ND	ug/L	6.0
Chloromethane	ND	ug/L	12
Chloroprene	ND	ug/L	6.0
Dibromochloromethane	ND	ug/L	6.0
1,2-Dibromo-3-chloro-propane (DBCP)	ND	ug/L	12
1,2-Dibromoethane (EDB)	ND	ug/L	12
Dibromomethane	ND	ug/L	6.0
trans-1,4-Dichloro-2-butene	ND	ug/L	6.0
Dichlorodifluoromethane	ND	ug/L	24
1,1-Dichloroethane	ND	ug/L	6.0
1,2-Dichloroethane	ND	ug/L	6.0
1,1-Dichloroethene	ND	ug/L	6.0
1,2-Dichloroethene (total)	ND	ug/L	6.0
1,2-Dichloropropane	ND	ug/L	6.0
cis-1,3-Dichloropropene	ND	ug/L	6.0
trans-1,3-Dichloropropene	ND	ug/L	6.0
1,4-Dioxane	ND	ug/L	600
Ethylbenzene	ND	ug/L	6.0
Ethyl methacrylate	ND	ug/L	24
Iodomethane	ND	ug/L	6.0
Isobutanol	ND	ug/L	240
2-Hexanone	ND	ug/L	12
Methacrylonitrile	ND	ug/L	6.0
Methylene chloride	ND	ug/L	6.0

(continued on following page)

ND = Not detected
NA = Not applicable

orted By: Robert Broderick Approved By: Mark Dymerski

Enseco
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Volatile Organics
Appendix IX List
Method 8240

Client Name: Sparton Technology Inc.
Client ID: MW-47 Groundwater
Lab ID: 015363-0002-SA
Matrix: AQUEOUS Sampled: 11 JUN 91 Received: 12 JUN 91
Authorized: 12 JUN 91 Prepared: 13 JUN 91 Analyzed: 17 JUN 91

Parameter	Result	Units	Reporting Limit
Methyl methacrylate	ND	ug/L	24
4-Methyl-2-pentanone (MIBK)	ND	ug/L	12
Propionitrile	ND	ug/L	6.0
Styrene	ND	ug/L	6.0
1,1,1,2-Tetrachloroethane	ND	ug/L	6.0
1,1,2,2-Tetrachloroethane	ND	ug/L	6.0
Tetrachloroethene	ND	ug/L	6.0
Toluene	ND	ug/L	6.0
1,1,1-Trichloroethane	ND	ug/L	6.0
1,1,2-Trichloroethane	ND	ug/L	6.0
Trichloroethene	120	ug/L	6.0
Trichlorofluoromethane	ND	ug/L	6.0
1,2,3-Trichloropropane	ND	ug/L	6.0
Vinyl acetate	ND	ug/L	12
Vinyl chloride	ND	ug/L	12
Xylenes (total)	ND	ug/L	6.0

urrogate	Recovery	
Toluene-d8	106	%
4-Bromofluorobenzene	100	%
1,2-Dichloroethane-d4	86	%

ND = Not detected
NA = Not applicable

eported By: Robert Broderick Approved By: Mark Dymerski

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Volatile Organics
Appendix IX List
Method 8240

Client Name: Sparton Technology Inc.
Client ID: MW-58 Groundwater
Lab ID: 015363-0003-SA
Matrix: AQUEOUS Sampled: 11 JUN 91 Received: 12 JUN 91
Authorized: 12 JUN 91 Prepared: 13 JUN 91 Analyzed: 17 JUN 91

Parameter	Result	Units	Reporting Limit
Acetone	ND	ug/L	10
Acetonitrile	ND	ug/L	200
Acrolein	ND	ug/L	100
Acrylonitrile	ND	ug/L	100
Allyl chloride	ND	ug/L	10
Benzene	ND	ug/L	5.0
Bromodichloromethane	ND	ug/L	5.0
Bromoform	ND	ug/L	5.0
Bromomethane	ND	ug/L	10
2-Butanone (MEK)	ND	ug/L	10
Carbon disulfide	ND	ug/L	5.0
Carbon tetrachloride	ND	ug/L	5.0
Chlorobenzene	ND	ug/L	5.0
Chloroethane	ND	ug/L	10
Chloroform	ND	ug/L	5.0
Chloromethane	ND	ug/L	10
Chloroprene	ND	ug/L	5.0
Dibromochloromethane	ND	ug/L	5.0
1,2-Dibromo-3-chloro-propane (DBCP)	ND	ug/L	10
1,2-Dibromoethane (EDB)	ND	ug/L	10
Dibromomethane	ND	ug/L	5.0
trans-1,4-Dichloro-2-butene	ND	ug/L	5.0
Dichlorodifluoromethane	ND	ug/L	20
1,1-Dichloroethane	ND	ug/L	5.0
1,2-Dichloroethane	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	5.0
1,2-Dichloroethene (total)	ND	ug/L	5.0
1,2-Dichloropropane	ND	ug/L	5.0
cis-1,3-Dichloropropene	ND	ug/L	5.0
trans-1,3-Dichloropropene	ND	ug/L	5.0
1,4-Dioxane	ND	ug/L	500
Ethylbenzene	ND	ug/L	5.0
Ethyl methacrylate	ND	ug/L	20
Iodomethane	ND	ug/L	5.0
Isobutanol	ND	ug/L	200
2-Hexanone	ND	ug/L	10
Methacrylonitrile	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0

(continued on following page)

ND = Not detected
NA = Not applicable

Reported By: Robert Broderick Approved By: Mark Dymerski

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Volatile Organics
Appendix IX List
Method 8240

ent Name: Sparton Technology Inc.
Client ID: MW-58 Groundwater
Lab ID: 015363-0003-SA
Matrix: AQUEOUS Sampled: 11 JUN 91 Received: 12 JUN 91
Authorized: 12 JUN 91 Prepared: 13 JUN 91 Analyzed: 17 JUN 91

Parameter	Result	Units	Reporting Limit
Methyl methacrylate	ND	ug/L	20
4-Methyl-2-pentanone (MIBK)	ND	ug/L	10
Propionitrile	ND	ug/L	5.0
Styrene	ND	ug/L	5.0
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0
Tetrachloroethene	ND	ug/L	5.0
Toluene	ND	ug/L	5.0
1,1,1-Trichloroethane	ND	ug/L	5.0
1,1,2-Trichloroethane	ND	ug/L	5.0
Trichloroethene	29	ug/L	5.0
Trichlorofluoromethane	ND	ug/L	5.0
1,2,3-Trichloropropane	ND	ug/L	5.0
Vinyl acetate	ND	ug/L	10
Vinyl chloride	ND	ug/L	10
Xylenes (total)	ND	ug/L	5.0

rogate	Recovery	
Toluene-d8	106	%
4-Bromofluorobenzene	104	%
1,2-Dichloroethane-d4	92	%

ND = Not detected
NA = Not applicable

Reported By: Robert Broderick Approved By: Mark Dymerski

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Volatile Organics
Appendix IX List
Method 8240

lient Name: Sparton Technology Inc.
Client ID: MW-53 Groundwater
Lab ID: 015363-0004-SA
Matrix: AQUEOUS Sampled: 11 JUN 91 Received: 12 JUN 91
Authorized: 12 JUN 91 Prepared: 13 JUN 91 Analyzed: 17 JUN 91

Parameter	Result	Units	Reporting Limit
Acetone	ND	ug/L	10
Acetonitrile	ND	ug/L	200
Acrolein	ND	ug/L	100
Acrylonitrile	ND	ug/L	100
Allyl chloride	ND	ug/L	10
Benzene	ND	ug/L	5.0
Bromodichloromethane	ND	ug/L	5.0
Bromoform	ND	ug/L	5.0
Bromomethane	ND	ug/L	10
2-Butanone (MEK)	ND	ug/L	10
Carbon disulfide	ND	ug/L	5.0
Carbon tetrachloride	ND	ug/L	5.0
Chlorobenzene	ND	ug/L	5.0
Chloroethane	ND	ug/L	10
Chloroform	ND	ug/L	5.0
Chloromethane	ND	ug/L	10
Chloroprene	ND	ug/L	5.0
Dibromochloromethane	ND	ug/L	5.0
,2-Dibromo-3-chloro-propane (DBCP)	ND	ug/L	10
1,2-Dibromoethane (EDB)	ND	ug/L	10
Dibromomethane	ND	ug/L	5.0
trans-1,4-Dichloro-2-butene	ND	ug/L	5.0
Dichlorodifluoromethane	ND	ug/L	20
1,1-Dichloroethane	ND	ug/L	5.0
1,2-Dichloroethane	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	5.0
1,2-Dichloroethene (total)	ND	ug/L	5.0
1,2-Dichloropropane	ND	ug/L	5.0
cis-1,3-Dichloropropene	ND	ug/L	5.0
trans-1,3-Dichloropropene	ND	ug/L	5.0
1,4-Dioxane	ND	ug/L	500
Ethylbenzene	ND	ug/L	5.0
Ethyl methacrylate	ND	ug/L	20
Iodomethane	ND	ug/L	5.0
Isobutanol	ND	ug/L	200
2-Hexanone	ND	ug/L	10
Methacrylonitrile	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0

(continued on following page)

ND = Not detected
NA = Not applicable

:ported By: Robert Broderick Approved By: Mark Dymerski

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Volatile Organics
Appendix IX List
Method 8240

Client Name: Sparton Technology Inc.
Client ID: MW-53 Groundwater
Lab ID: 015363-0004-SA
Matrix: AQUEOUS Sampled: 11 JUN 91 Received: 12 JUN 91
Authorized: 12 JUN 91 Prepared: 13 JUN 91 Analyzed: 17 JUN 91

Parameter	Result	Units	Reporting Limit
Methyl methacrylate	ND	ug/L	20
4-Methyl-2-pentanone (MIBK)	ND	ug/L	10
Propionitrile	ND	ug/L	5.0
Styrene	ND	ug/L	5.0
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0
Tetrachloroethene	ND	ug/L	5.0
Toluene	ND	ug/L	5.0
1,1,1-Trichloroethane	ND	ug/L	5.0
1,1,2-Trichloroethane	ND	ug/L	5.0
Trichloroethene	ND	ug/L	5.0
Trichlorofluoromethane	ND	ug/L	5.0
1,2,3-Trichloropropane	ND	ug/L	5.0
Vinyl acetate	ND	ug/L	10
Vinyl chloride	ND	ug/L	10
Xylenes (total)	ND	ug/L	5.0

urrogate	Recovery	
Toluene-d8	107	%
4-Bromofluorobenzene	101	%
1,2-Dichloroethane-d4	93	%

ND = Not detected
NA = Not applicable

Reported By: Robert Broderick Approved By: Mark Dymerski

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Metals

Total Metals

Client Name: Sparton Technology Inc.
Client ID: MW-48 Groundwater
Lab ID: 015363-0001-SA
Matrix: AQUEOUS Sampled: 11 JUN 91 Received: 12 JUN 91
Authorized: 12 JUN 91 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Antimony	ND	mg/L	0.060	6010	15 JUN 91	18 JUN 91
Arsenic	0.0053	mg/L	0.0050	7060	15 JUN 91	17 JUN 91
Barium	0.046	mg/L	0.010	6010	15 JUN 91	18 JUN 91
Beryllium	ND	mg/L	0.0020	6010	15 JUN 91	18 JUN 91
Cadmium	ND	mg/L	0.0050	6010	15 JUN 91	18 JUN 91
Chromium	0.27	mg/L	0.010	6010	15 JUN 91	18 JUN 91
Cobalt	ND	mg/L	0.010	6010	15 JUN 91	18 JUN 91
Copper	ND	mg/L	0.020	6010	15 JUN 91	18 JUN 91
Lead	ND	mg/L	0.0050	7421	15 JUN 91	17 JUN 91
Mercury	ND	mg/L	0.00020	7470	16 JUN 91	16 JUN 91
Nickel	ND	mg/L	0.040	6010	15 JUN 91	18 JUN 91
Selenium	ND	mg/L	0.0050	7740	15 JUN 91	18 JUN 91
Silver	ND	mg/L	0.010	6010	15 JUN 91	18 JUN 91
Thallium	ND	mg/L	0.010	7841	15 JUN 91	18 JUN 91
Tin	ND	mg/L	0.10	6010	15 JUN 91	18 JUN 91
Vanadium	ND	mg/L	0.010	6010	15 JUN 91	18 JUN 91
Zinc	ND	mg/L	0.020	6010	15 JUN 91	18 JUN 91

ND = Not detected
NA = Not applicable

Reported By: Sandra Jones Approved By: Sandra Jones

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Metals

Total Metals

Client Name: Sparton Technology Inc.
Client ID: MW-47 Groundwater
Lab ID: 015363-0002-SA
Matrix: AQUEOUS Sampled: 11 JUN 91 Received: 12 JUN 91
Authorized: 12 JUN 91 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Antimony	ND	mg/L	0.060	6010	15 JUN 91	18 JUN 91
Arsenic	0.0054	mg/L	0.0050	7060	15 JUN 91	17 JUN 91
Barium	0.050	mg/L	0.010	6010	15 JUN 91	18 JUN 91
Beryllium	ND	mg/L	0.0020	6010	15 JUN 91	18 JUN 91
Cadmium	ND	mg/L	0.0050	6010	15 JUN 91	18 JUN 91
Chromium	0.14	mg/L	0.010	6010	15 JUN 91	18 JUN 91
Cobalt	ND	mg/L	0.010	6010	15 JUN 91	18 JUN 91
Copper	ND	mg/L	0.020	6010	15 JUN 91	18 JUN 91
Lead	ND	mg/L	0.0050	7421	15 JUN 91	17 JUN 91
Mercury	ND	mg/L	0.00020	7470	16 JUN 91	16 JUN 91
Nickel	ND	mg/L	0.040	6010	15 JUN 91	18 JUN 91
Selenium	ND	mg/L	0.0050	7740	15 JUN 91	18 JUN 91
Silver	ND	mg/L	0.010	6010	15 JUN 91	18 JUN 91
Thallium	ND	mg/L	0.010	7841	15 JUN 91	18 JUN 91
Tin	ND	mg/L	0.10	6010	15 JUN 91	18 JUN 91
Vanadium	ND	mg/L	0.010	6010	15 JUN 91	18 JUN 91
Zinc	ND	mg/L	0.020	6010	15 JUN 91	18 JUN 91

ND = Not detected
NA = Not applicable

Reported By: Sandra Jones Approved By: Sandra Jones

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Metals

Total Metals

Client Name: Sparton Technology Inc.
Client ID: MW-58 Groundwater
Lab ID: 015363-0003-SA
Matrix: AQUEOUS Sampled: 11 JUN 91 Received: 12 JUN 91
Authorized: 12 JUN 91 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Antimony	ND	mg/L	0.060	6010	15 JUN 91	18 JUN 91
Arsenic	0.0050	mg/L	0.0050	7060	15 JUN 91	17 JUN 91
Barium	0.046	mg/L	0.010	6010	15 JUN 91	18 JUN 91
Beryllium	ND	mg/L	0.0020	6010	15 JUN 91	18 JUN 91
Cadmium	ND	mg/L	0.0050	6010	15 JUN 91	18 JUN 91
Chromium	0.017	mg/L	0.010	6010	15 JUN 91	18 JUN 91
Cobalt	ND	mg/L	0.010	6010	15 JUN 91	18 JUN 91
Copper	ND	mg/L	0.020	6010	15 JUN 91	18 JUN 91
Lead	ND	mg/L	0.0050	7421	15 JUN 91	17 JUN 91
Mercury	ND	mg/L	0.00020	7470	16 JUN 91	16 JUN 91
Nickel	ND	mg/L	0.040	6010	15 JUN 91	18 JUN 91
Selenium	ND	mg/L	0.0050	7740	15 JUN 91	18 JUN 91
Silver	ND	mg/L	0.010	6010	15 JUN 91	18 JUN 91
Thallium	ND	mg/L	0.010	7841	15 JUN 91	18 JUN 91
Tin	ND	mg/L	0.10	6010	15 JUN 91	18 JUN 91
Vanadium	ND	mg/L	0.010	6010	15 JUN 91	18 JUN 91
Zinc	ND	mg/L	0.020	6010	15 JUN 91	18 JUN 91

ND = Not detected
NA = Not applicable

Reported By: Sandra Jones Approved By: Sandra Jones

Enseco
A Corning Company

Metals

Total Metals

Client Name: Sparton Technology Inc.
Client ID: MW-53 Groundwater
Lab ID: 015363-0004-SA
Matrix: AQUEOUS Sampled: 11 JUN 91 Received: 12 JUN 91
Authorized: 12 JUN 91 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Antimony	ND	mg/L	0.060	6010	15 JUN 91	18 JUN 91
Arsenic	0.0064	mg/L	0.0050	7060	15 JUN 91	17 JUN 91
Barium	0.063	mg/L	0.010	6010	15 JUN 91	18 JUN 91
Beryllium	ND	mg/L	0.0020	6010	15 JUN 91	18 JUN 91
Cadmium	ND	mg/L	0.0050	6010	15 JUN 91	18 JUN 91
Chromium	0.019	mg/L	0.010	6010	15 JUN 91	18 JUN 91
Cobalt	ND	mg/L	0.010	6010	15 JUN 91	18 JUN 91
Copper	ND	mg/L	0.020	6010	15 JUN 91	18 JUN 91
Lead	ND	mg/L	0.0050	7421	15 JUN 91	17 JUN 91
Mercury	ND	mg/L	0.00020	7470	16 JUN 91	16 JUN 91
Nickel	ND	mg/L	0.040	6010	15 JUN 91	18 JUN 91
Selenium	ND	mg/L	0.0050	7740	15 JUN 91	18 JUN 91
Silver	ND	mg/L	0.010	6010	15 JUN 91	18 JUN 91
Thallium	ND	mg/L	0.010	7841	15 JUN 91	18 JUN 91
Tin	ND	mg/L	0.10	6010	15 JUN 91	18 JUN 91
Vanadium	ND	mg/L	0.010	6010	15 JUN 91	18 JUN 91
Zinc	ND	mg/L	0.020	6010	15 JUN 91	18 JUN 91

ND = Not detected
NA = Not applicable

Reported By: Sandra Jones Approved By: Sandra Jones

Quality Control Results

The Enseco laboratories operate under a vigorous QA/QC program designed to ensure the generation of scientifically valid, legally defensible data by monitoring every aspect of laboratory operations. Routine QA/QC procedures include the use of approved methodologies, independent verification of analytical standards, use of duplicate Laboratory Control Samples to assess the precision and accuracy of the methodology on a routine basis, and a rigorous system of data review.

In addition, the Enseco laboratories maintain a comprehensive set of certifications from both state and federal governmental agencies which require frequent analyses of blind audit samples. Enseco - Rocky Mountain Analytical Laboratory is certified by the EPA under the EPA/CLP program for both Organic and Inorganic analyses, under the USATHAMA (U.S. Army) program, by the Army Corps of Engineers, and the states of Colorado, New Jersey, New York, Utah, and Florida, among others.

The standard laboratory QC package is designed to:

1) establish a strong, cost-effective QC program that ensures the generation of scientifically valid, legally defensible data

2) assess the laboratory's performance of the analytical method using control limits generated with a well-defined matrix

3) establish clear-cut guidelines for acceptability of analytical data so that QC decisions can be made immediately at the bench, and

4) provide a standard set of reportables which assures the client of the quality of his data.

The Enseco QC program is based upon monitoring the precision and accuracy of an analytical method by analyzing a set of Duplicate Control Samples (DCS) at frequent, well-defined intervals. Each DCS is a well-characterized matrix which is spiked with target compounds at 5-100 times the reporting limit, depending upon the methodology being monitored. The purpose of the DCS is not to duplicate the sample matrix, but rather to provide an interference-free, homogeneous matrix from which to gather data to establish control limits. These limits are used to determine whether data generated by the laboratory on any given day is in control.

Control limits for accuracy (percent recovery) are based on the average, historical percent recovery +/- 3 standard deviation units. Control limits for precision (relative percent difference) range from 0 (identical duplicate DCS results) to the average, historical relative percent difference + 3 standard deviation units. These control limits are fairly narrow based on the consistency of the matrix being monitored and are updated on a quarterly basis.

For each batch of samples analyzed, an additional control measure is taken in the form of a Single Control Sample (SCS). The SCS consists of a control matrix that is spiked with either representative target compounds or surrogate compounds appropriate to the method being used. An SCS is prepared for each sample lot for which the DCS pair are not analyzed.

Accuracy for DCS and SCS is measured by Percent Recovery.

$$\% \text{ Recovery} = \frac{\text{Measured Concentration}}{\text{Actual Concentration}} \times 100$$

Precision for DCS is measured by Relative Percent Difference (RPD).

$$\text{RPD} = \frac{|\text{Measured Concentration DCS1} - \text{Measured Concentration DCS2}|}{(\text{Measured Concentration DCS1} + \text{Measured Concentration DCS2})/2} \times 100$$

All samples analyzed concurrently by the same test are assigned the same QC lot number. Projects which contain numerous samples, analyzed over several days, may have multiple QC lot numbers associated with each test. The QC information which follows includes a listing of the QC lot numbers associated with each of the samples reported, DCS and SCS (where applicable) recoveries from the QC lots associated with the samples, and control limits for these lots. The QC data is reported by test code, in the order that the tests are reported in the analytical results section of this report.

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OC LOT ASSIGNMENT REPORT
latile Organics by GC/MS

Laboratory Sample Number	QC Matrix	QC Category	QC Lot Number (DCS)	QC Run Number (SCS/BLANK)
015363-0001-SA	AQUEOUS	624-A	11 JUN 91-F	16 JUN 91-F
015363-0002-SA	AQUEOUS	624-A	11 JUN 91-F	16 JUN 91-F
015363-0003-SA	AQUEOUS	624-A	11 JUN 91-F	16 JUN 91-F
015363-0004-SA	AQUEOUS	624-A	11 JUN 91-F	16 JUN 91-F

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DUPLICATE CONTROL SAMPLE REPORT
Volatile Organics by GC/MS

Analyte	Concentration Spiked	Measured DCS1	Measured DCS2	Measured AVG	Accuracy Average(%) DCS	Accuracy Limits	Precision (RPD) DCS	Limit
Category: 624-A								
Matrix: AQUEOUS								
QC Lot: 11 JUN 91-F								
Concentration Units: ug/L								
1,1-Dichloroethene	50	58.2	57.4	57.8	116	61-145	1.4	14
Trichloroethene	50	50.0	49.5	49.8	100	71-120	1.0	14
Benzene	50	50.4	48.6	49.5	99	76-127	3.6	11
Toluene	50	54.1	53.1	53.6	107	76-125	1.9	13
Chlorobenzene	50	55.0	56.0	55.5	111	75-130	1.8	13

Calculations are performed before rounding to avoid round-off errors in calculated results.

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SINGLE CONTROL SAMPLE REPORT
Volatile Organics by GC/MS

Analyte	Concentration Spiked	Concentration Measured	Accuracy(%) SCS	Accuracy(%) Limits
Category: 624-A				
Matrix: AQUEOUS				
QC Lot: 11 JUN 91-F QC Run: 16 JUN 91-F				
Concentration Units: ug/L				
1,2-Dichloroethane-d4	50.0	43.5	87	76-114
4-Bromofluorobenzene	50.0	51.4	103	86-115
Toluene-d8	50.0	54.0	108	88-110

Calculations are performed before rounding to avoid round-off errors in calculated results.

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METHOD BLANK REPORT
Volatile Organics by GC/MS

Test: 8240CP-AP9-AP
Matrix: AQUEOUS
QC Lot: 11 JUN 91-F QC Run: 16 JUN 91-F

Analyte	Result	Units	Reporting Limit
Acetone	ND	ug/L	10
Acetonitrile	ND	ug/L	200
Acrolein	ND	ug/L	100
Acrylonitrile	ND	ug/L	100
Allyl chloride	ND	ug/L	10
Benzene	ND	ug/L	5.0
Bromodichloromethane	ND	ug/L	5.0
Bromoform	ND	ug/L	5.0
Bromomethane	ND	ug/L	10
2-Butanone (MEK)	ND	ug/L	10
Carbon disulfide	ND	ug/L	5.0
Carbon tetrachloride	ND	ug/L	5.0
Chlorobenzene	ND	ug/L	5.0
Chloroethane	ND	ug/L	10
Chloroform	ND	ug/L	5.0
Chloromethane	ND	ug/L	10
Chloroprene	ND	ug/L	5.0
Dibromochloromethane	ND	ug/L	5.0
-Dibromo-3-chloro-ropane (DBCP)	ND	ug/L	10
1,2-Dibromoethane (EDB)	ND	ug/L	10
Dibromomethane	ND	ug/L	5.0
trans-1,4-Dichloro-2-butene	ND	ug/L	5.0
Dichlorodifluoromethane	ND	ug/L	20
1,1-Dichloroethane	ND	ug/L	5.0
1,2-Dichloroethane	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	5.0
1,2-Dichloroethene (total)	ND	ug/L	5.0
1,2-Dichloropropane	ND	ug/L	5.0
cis-1,3-Dichloropropene	ND	ug/L	5.0
trans-1,3-Dichloropropene	ND	ug/L	5.0
1,4-Dioxane	ND	ug/L	500
Ethylbenzene	ND	ug/L	5.0
Ethyl methacrylate	ND	ug/L	20
Iodomethane	ND	ug/L	5.0
Isobutanol	ND	ug/L	200
2-Hexanone	ND	ug/L	10
Methacrylonitrile	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0

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METHOD BLANK REPORT
Volatile Organics by GC/MS (cont.)

Analyte	Result	Units	Reporting Limit
Test: 8240CP-AP9-AP			
Matrix: AQUEOUS			
QC Lot: 11 JUN 91-F QC Run: 16 JUN 91-F			
Methyl methacrylate	ND	ug/L	20
4-Methyl-2-pentanone (MIBK)	ND	ug/L	10
Propionitrile	ND	ug/L	5.0
Styrene	ND	ug/L	5.0
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0
Tetrachloroethene	ND	ug/L	5.0
Toluene	ND	ug/L	5.0
1,1,1-Trichloroethane	ND	ug/L	5.0
1,1,2-Trichloroethane	ND	ug/L	5.0
Trichloroethene	ND	ug/L	5.0
Trichlorofluoromethane	ND	ug/L	5.0
1,2,3-Trichloropropane	ND	ug/L	5.0
Vinyl acetate	ND	ug/L	10
Vinyl chloride	ND	ug/L	10
Xylenes (total)	ND	ug/L	5.0

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QC LOT ASSIGNMENT REPORT
etals Analysis and Preparation

Laboratory Sample Number	QC Matrix	QC Category	QC Lot Number (DCS)	QC Run Number (SCS/BLANK)
015363-0001-SA	AQUEOUS	ICP-AT	15 JUN 91-A	15 JUN 91-A
015363-0001-SA	AQUEOUS	HG-CVAA-AT	16 JUN 91-D	16 JUN 91-D
015363-0001-SA	AQUEOUS	AS-FAA-AT	15 JUN 91-A	15 JUN 91-A
015363-0001-SA	AQUEOUS	TL-FAA-AT	15 JUN 91-A	15 JUN 91-A
015363-0001-SA	AQUEOUS	SE-FAA-AT	15 JUN 91-A	15 JUN 91-A
015363-0001-SA	AQUEOUS	PB-FAA-AT	15 JUN 91-A	15 JUN 91-A
015363-0002-SA	AQUEOUS	ICP-AT	15 JUN 91-A	15 JUN 91-A
015363-0002-SA	AQUEOUS	HG-CVAA-AT	16 JUN 91-D	16 JUN 91-D
015363-0002-SA	AQUEOUS	AS-FAA-AT	15 JUN 91-A	15 JUN 91-A
015363-0002-SA	AQUEOUS	TL-FAA-AT	15 JUN 91-A	15 JUN 91-A
015363-0002-SA	AQUEOUS	SE-FAA-AT	15 JUN 91-A	15 JUN 91-A
015363-0002-SA	AQUEOUS	PB-FAA-AT	15 JUN 91-A	15 JUN 91-A
015363-0003-SA	AQUEOUS	ICP-AT	15 JUN 91-A	15 JUN 91-A
015363-0003-SA	AQUEOUS	HG-CVAA-AT	16 JUN 91-D	16 JUN 91-D
015363-0003-SA	AQUEOUS	AS-FAA-AT	15 JUN 91-A	15 JUN 91-A
015363-0003-SA	AQUEOUS	TL-FAA-AT	15 JUN 91-A	15 JUN 91-A
015363-0003-SA	AQUEOUS	SE-FAA-AT	15 JUN 91-A	15 JUN 91-A
015363-0003-SA	AQUEOUS	PB-FAA-AT	15 JUN 91-A	15 JUN 91-A
015363-0004-SA	AQUEOUS	ICP-AT	15 JUN 91-A	15 JUN 91-A
015363-0004-SA	AQUEOUS	HG-CVAA-AT	16 JUN 91-D	16 JUN 91-D
015363-0004-SA	AQUEOUS	AS-FAA-AT	15 JUN 91-A	15 JUN 91-A
015363-0004-SA	AQUEOUS	TL-FAA-AT	15 JUN 91-A	15 JUN 91-A
015363-0004-SA	AQUEOUS	SE-FAA-AT	15 JUN 91-A	15 JUN 91-A
015363-0004-SA	AQUEOUS	PB-FAA-AT	15 JUN 91-A	15 JUN 91-A

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DUPLICATE CONTROL SAMPLE REPORT
Metals Analysis and Preparation

Analyte	Concentration Spiked	Measured DCS1	Measured DCS2	Measured AVG	Accuracy Average(%) DCS	Accuracy Average(%) Limits	Precisio (RPD) DCS	Precisio (RPD) Limi
Category: ICP-AT								
Matrix: AQUEOUS								
QC Lot: 15 JUN 91-A								
Concentration Units: mg/L								
Aluminum	2.0	2.02	2.00	2.01	101	75-125	1.2	2
Antimony	0.5	0.459	0.460	0.460	92	75-125	0.3	2
Arsenic	0.5	0.482	0.482	0.482	96	75-125	0.0	2
Barium	2.0	1.91	1.91	1.91	95	75-125	0.0	2
Beryllium	0.05	0.0492	0.0495	0.0494	99	75-125	0.6	2
Cadmium	0.05	0.0493	0.0508	0.0500	100	75-125	2.9	2
Calcium	100	106	106	106	106	75-125	0.0	2
Chromium	0.2	0.191	0.195	0.193	97	75-125	2.1	2
Cobalt	0.5	0.464	0.469	0.466	93	75-125	1.1	2
Copper	0.25	0.247	0.247	0.247	99	75-125	0.0	2
Iron	1.0	0.977	0.978	0.978	98	75-125	0.0	2
Lead	0.5	0.471	0.475	0.473	95	75-125	0.8	2
Magnesium	50	50.1	49.7	49.9	100	75-125	0.9	2
Manganese	0.5	0.470	0.475	0.473	95	75-125	1.1	2
Nickel	0.5	0.462	0.468	0.465	93	75-125	1.2	2
Potassium	50	54.8	51.1	52.9	106	75-125	7.0	2
Silver	0.05	0.0441	0.0412	0.0426	85	75-125	6.8	2
Sodium	100	106	103	105	105	75-125	2.6	2
Vanadium	0.5	0.503	0.501	0.502	100	75-125	0.5	2
Zinc	0.5	0.486	0.484	0.485	97	75-125	0.3	2
Category: HG-CVAA-AT								
Matrix: AQUEOUS								
QC Lot: 16 JUN 91-D								
Concentration Units: mg/L								
Mercury	0.0010	0.00101	0.000996	0.00100	100	75-125	1.0	2
Category: AS-FAA-AT								
Matrix: AQUEOUS								
QC Lot: 15 JUN 91-A								
Concentration Units: mg/L								
Arsenic	0.03	0.0289	0.0298	0.0294	98	75-125	3.1	2

Calculations are performed before rounding to avoid round-off errors in calculated results.

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DUPLICATE CONTROL SAMPLE REPORT
Metals Analysis and Preparation (cont.)

Analyte	Concentration Spiked	Measured DCS1	Measured DCS2	Measured AVG	Accuracy Average(%) DCS	Accuracy Limits	Precisic (RPD) DCS	Limi
Category: TL-FAA-AT Matrix: AQUEOUS QC Lot: 15 JUN 91-A Concentration Units: mg/L								
Thallium	0.03	0.0320	0.0289	0.0304	102	75-125	10	2
Category: SE-FAA-AT Matrix: AQUEOUS QC Lot: 15 JUN 91-A Concentration Units: mg/L								
Selenium	0.03	0.0235	0.0260	0.0248	83	75-125	10	2
Category: PB-FAA-AT Matrix: AQUEOUS QC Lot: 15 JUN 91-A Concentration Units: mg/L								
ıd	0.03	0.0323	0.0342	0.0332	111	75-125	5.7	2(

Calculations are performed before rounding to avoid round-off errors in calculated results.

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METHOD BLANK REPORT
Metals Analysis and Preparation

Analyte	Result	Units	Reporting Limit
Test: ICP-AP9-AT			
Matrix: AQUEOUS			
QC Lot: 15 JUN 91-A QC Run: 15 JUN 91-A			
Antimony	ND	mg/L	0.060
Barium	ND	mg/L	0.010
Beryllium	ND	mg/L	0.0020
Cadmium	ND	mg/L	0.0050
Chromium	ND	mg/L	0.010
Cobalt	ND	mg/L	0.010
Copper	ND	mg/L	0.020
Nickel	ND	mg/L	0.040
Silver	ND	mg/L	0.010
Tin	ND	mg/L	0.10
Vanadium	ND	mg/L	0.010
Zinc	ND	mg/L	0.020
Test: HG-CVAA-AT			
Matrix: AQUEOUS			
QC Lot: 16 JUN 91-D QC Run: 16 JUN 91-D			
rcury	ND	mg/L	0.00020
Test: AS-FAA-AT			
Matrix: AQUEOUS			
QC Lot: 15 JUN 91-A QC Run: 15 JUN 91-A			
Arsenic	ND	mg/L	0.0050
Test: TL-FAA-AT			
Matrix: AQUEOUS			
QC Lot: 15 JUN 91-A QC Run: 15 JUN 91-A			
Thallium	ND	mg/L	0.0050

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METHOD BLANK REPORT
Metals Analysis and Preparation (cont.)

Analyte	Result	Units	Reporting Limit
Test: SE-FAA-AT Matrix: AQUEOUS QC Lot: 15 JUN 91-A QC Run: 15 JUN 91-A			
Selenium	ND	mg/L	0.0050
Test: PB-FAA-AT Matrix: AQUEOUS QC Lot: 15 JUN 91-A QC Run: 15 JUN 91-A			
Lead	ND	mg/L	0.0050

Rocky Mountain
Analytical Laboratory

Enseco

ANALYTICAL RESULTS
FOR
SPARTON TECHNOLOGY
ENSECO-RMAL NO. 015356

JUNE 21, 1991

Reviewed by: Joel E. Holtz

Debbie Fazio (for)
Sue Dalla

008966

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Introduction

This report presents the analytical results as well as supporting information to aid in the evaluation and interpretation of the data and is arranged in the following order:

- Sample Description Information
- Analytical Test Requests
- Analytical Results
- Quality Control Report

Consistent with directives in the CLP protocol in SW-846 and other EPA methods, all GC/MS analyses were performed so that the maximum concentration of sample was analyzed. Some samples required dilutions to avoid saturation of the detector, to achieve linearity for a specific target compound or to reduce matrix interferences. As stated in Section 7.5.4 of Method 8270, 7.4.1.16 of Method 8240 and Exhibit E of the CLP protocol these dilutions must be performed. The reporting limits for these samples are therefore proportionate to the dilution required. Surrogate compounds may not be measurable in samples which have been diluted.

Sample 015356-0002 was diluted for Method 8240 due to the concentration of target compounds and the reporting limits were raised accordingly.

Sample Description Information

The Sample Description Information lists all of the samples received in this project together with the internal laboratory identification number assigned for each sample. Each project received at Enseco - RMAL is assigned a unique six digit number. Samples within the project are numbered sequentially. The laboratory identification number is a combination of the six digit project code and the sample sequence number.

Also given in the Sample Description Information is the Sample Type (matrix), Date of Sampling (if known) and Date of Receipt at the laboratory.

Analytical Test Requests

The Analytical Test Requests lists the analyses that were performed on each sample. The Custom Test column indicates where tests have been modified to conform to the specific requirements of this project.

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SAMPLE DESCRIPTION INFORMATION
for
Sparton Technology Inc.

Lab ID	Client ID	Matrix	Sampled Date	Sampled Time	Received Date
015356-0001-SA	MW-55 Groundwater	AQUEOUS	10 JUN 91	11:45	11 JUN 91
015356-0002-SA	MW-56 Groundwater	AQUEOUS	10 JUN 91	13:03	11 JUN 91
015356-0003-SA	MW-62 Groundwater	AQUEOUS	10 JUN 91	12:53	11 JUN 91
015356-0004-SA	MW-60 Groundwater	AQUEOUS	10 JUN 91	14:42	11 JUN 91
015356-0005-SA	MW-61 Groundwater	AQUEOUS	10 JUN 91	15:22	11 JUN 91

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ANALYTICAL TEST REQUESTS
for
Sparton Technology Inc.

Lab ID: 015356	Group Code	Analysis Description	Custom Test?
0001 - 0005	A	Volatile Organics	N
		Appendix IX List	N
		Screen - Volatile Organics	N
		Appendix IX Metals (Total) done by ICP	N
		Prep - Total Metals, ICP	N
		Mercury, Cold Vapor AA (Total)	N
		Prep - Mercury, Cold Vapor AA (Total)	N
		Arsenic, Furnace AA (Total)	N
		Prep - Total Metals, Furnace AA	N
		Prep - Total Metals, Furnace AA	N
		Thallium, Furnace AA (Total)	N
		Selenium, Furnace AA (Total)	N
		Lead, Furnace AA (Total)	N

Analytical Results

The analytical results for this project are presented in the following data tables. Each data table includes sample identification information, and when available and appropriate, dates sampled, received, authorized, prepared and analyzed. The authorization data is the date when the project was defined by the client such that laboratory work could begin.

Data sheets contain a listing of the parameters measured in each test, the analytical results and the Enseco reporting limit. Reporting limits are adjusted to reflect dilution of the sample, when appropriate. Solid and waste samples are reported on an "as received" basis, i.e. no correction is made for moisture content.

Enseco-RMAL is no longer routinely blank-correcting analytical data. Uncorrected analytical results are reported, along with associated blank results, for all organic and metals analyses. Analytical results and blank results are reported for conventional inorganic parameters as specified in the method. This policy is described in detail in the Enseco Incorporated Quality Assurance Program Plan for Environmental Chemical Monitoring, Revision 3.3, May, 1989.

The results from the Standard Enseco QA/QC Program, which generates data which are independent of matrix effects, is provided subsequently.

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Volatile Organics
Appendix IX List
Method 8240

Client Name: Sparton Technology Inc.
Client ID: MW-55 Groundwater
Lab ID: 015356-0001-SA
Matrix: AQUEOUS Sampled: 10 JUN 91 Received: 11 JUN 91
Authorized: 11 JUN 91 Prepared: 12 JUN 91 Analyzed: 17 JUN 91

Parameter	Result	Units	Reporting Limit
Acetone	ND	ug/L	10
Acetonitrile	ND	ug/L	200
Acrolein	ND	ug/L	100
Acrylonitrile	ND	ug/L	100
Allyl chloride	ND	ug/L	10
Benzene	ND	ug/L	5.0
Bromodichloromethane	ND	ug/L	5.0
Bromoform	ND	ug/L	5.0
Bromomethane	ND	ug/L	10
2-Butanone (MEK)	ND	ug/L	10
Carbon disulfide	ND	ug/L	5.0
Carbon tetrachloride	ND	ug/L	5.0
Chlorobenzene	ND	ug/L	5.0
Chloroethane	ND	ug/L	10
Chloroform	ND	ug/L	5.0
Chloromethane	ND	ug/L	10
Chloroprene	ND	ug/L	5.0
Dibromochloromethane	ND	ug/L	5.0
1,2-Dibromo-3-chloro-propane (DBCP)	ND	ug/L	10
1,2-Dibromoethane (EDB)	ND	ug/L	10
Dibromomethane	ND	ug/L	5.0
trans-1,4-Dichloro-2-butene	ND	ug/L	5.0
Dichlorodifluoromethane	ND	ug/L	20
1,1-Dichloroethane	ND	ug/L	5.0
1,2-Dichloroethane	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	5.0
1,2-Dichloroethene (total)	ND	ug/L	5.0
1,2-Dichloropropane	ND	ug/L	5.0
cis-1,3-Dichloropropene	ND	ug/L	5.0
trans-1,3-Dichloropropene	ND	ug/L	5.0
1,4-Dioxane	ND	ug/L	500
Ethylbenzene	ND	ug/L	5.0
Ethyl methacrylate	ND	ug/L	20
Iodomethane	ND	ug/L	5.0
Isobutanol	ND	ug/L	200
2-Hexanone	ND	ug/L	10
Methacrylonitrile	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0

(continued on following page)

ND = Not detected
NA = Not applicable

Reported By: Steven Francis Approved By: Mark Dymerski

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Volatile Organics
Appendix IX List
Method 8240

Client Name: Sparton Technology Inc.
Client ID: MW-55 Groundwater
Lab ID: 015356-0001-SA
Matrix: AQUEOUS Sampled: 10 JUN 91 Received: 11 JUN 91
Authorized: 11 JUN 91 Prepared: 12 JUN 91 Analyzed: 17 JUN 91

Parameter	Result	Units	Reporting Limit
Methyl methacrylate	ND	ug/L	20
4-Methyl-2-pentanone (MIBK)	ND	ug/L	10
Propionitrile	ND	ug/L	5.0
Styrene	ND	ug/L	5.0
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0
Tetrachloroethene	ND	ug/L	5.0
Toluene	ND	ug/L	5.0
1,1,1-Trichloroethane	ND	ug/L	5.0
1,1,2-Trichloroethane	ND	ug/L	5.0
Trichloroethene	45	ug/L	5.0
Trichlorofluoromethane	ND	ug/L	5.0
1,2,3-Trichloropropane	ND	ug/L	5.0
Vinyl acetate	ND	ug/L	10
Vinyl chloride	ND	ug/L	10
Xylenes (total)	ND	ug/L	5.0

rogate	Recovery	
Toluene-d8	100	%
4-Bromofluorobenzene	96	%
1,2-Dichloroethane-d4	107	%

ND = Not detected
NA = Not applicable

rted By: Steven Francis Approved By: Mark Dymerski

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Volatile Organics
Appendix IX List
Method 8240

Client Name: Sparton Technology Inc.
Client ID: MW-56 Groundwater
Lab ID: 015356-0002-SA
Matrix: AQUEOUS Sampled: 10 JUN 91 Received: 11 JUN 91
Authorized: 11 JUN 91 Prepared: 12 JUN 91 Analyzed: 17 JUN 91

Parameter	Result	Units	Reporting Limit
Acetone	30	ug/L	20
Acetonitrile	ND	ug/L	400
Acrolein	ND	ug/L	200
Acrylonitrile	ND	ug/L	200
Allyl chloride	ND	ug/L	20
Benzene	ND	ug/L	10
Bromodichloromethane	ND	ug/L	10
Bromoform	ND	ug/L	10
Bromomethane	ND	ug/L	20
2-Butanone (MEK)	ND	ug/L	20
Carbon disulfide	ND	ug/L	10
Carbon tetrachloride	ND	ug/L	10
Chlorobenzene	ND	ug/L	10
Chloroethane	ND	ug/L	20
Chloroform	ND	ug/L	10
Chloromethane	ND	ug/L	20
Chloroprene	ND	ug/L	10
Dibromochloromethane	ND	ug/L	10
,2-Dibromo-3-chloro-propane (DBCP)	ND	ug/L	20
1,2-Dibromoethane (EDB)	ND	ug/L	20
Dibromomethane	ND	ug/L	10
trans-1,4-Dichloro-2-butene	ND	ug/L	10
Dichlorodifluoromethane	ND	ug/L	40
1,1-Dichloroethane	ND	ug/L	10
1,2-Dichloroethane	ND	ug/L	10
1,1-Dichloroethene	ND	ug/L	10
1,2-Dichloroethene (total)	ND	ug/L	10
1,2-Dichloropropane	ND	ug/L	10
cis-1,3-Dichloropropene	ND	ug/L	10
trans-1,3-Dichloropropene	ND	ug/L	10
1,4-Dioxane	ND	ug/L	1000
Ethylbenzene	ND	ug/L	10
Ethyl methacrylate	ND	ug/L	40
Iodomethane	ND	ug/L	10
Isobutanol	ND	ug/L	400
2-Hexanone	ND	ug/L	20
Methacrylonitrile	ND	ug/L	10
Methylene chloride	ND	ug/L	10

(continued on following page)

ND = Not detected
NA = Not applicable

.eported By: Steven Francis Approved By: Mark Dymerski

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Volatile Organics
Appendix IX List
Method 8240

Client Name: Sparton Technology Inc.
Client ID: MW-56 Groundwater
Lab ID: 015356-0002-SA
Matrix: AQUEOUS Sampled: 10 JUN 91 Received: 11 JUN 91
Authorized: 11 JUN 91 Prepared: 12 JUN 91 Analyzed: 17 JUN 91

Parameter	Result	Units	Reporting Limit
Methyl methacrylate	ND	ug/L	40
4-Methyl-2-pentanone (MIBK)	ND	ug/L	20
Propionitrile	ND	ug/L	10
Styrene	ND	ug/L	10
1,1,1,2-Tetrachloroethane	ND	ug/L	10
1,1,2,2-Tetrachloroethane	ND	ug/L	10
Tetrachloroethene	ND	ug/L	10
Toluene	ND	ug/L	10
1,1,1-Trichloroethane	ND	ug/L	10
1,1,2-Trichloroethane	ND	ug/L	10
Trichloroethene	200	ug/L	10
Trichlorofluoromethane	ND	ug/L	10
1,2,3-Trichloropropane	ND	ug/L	10
Vinyl acetate	ND	ug/L	20
Vinyl chloride	ND	ug/L	20
Xylenes (total)	ND	ug/L	10

Surrogate	Recovery	
Toluene-d8	100	%
4-Bromofluorobenzene	99	%
1,2-Dichloroethane-d4	104	%

ND = Not detected
NA = Not applicable

Reported By: Steven Francis Approved By: Mark Dymerski

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Volatile Organics
Appendix IX List
Method 8240

Client Name: Sparton Technology Inc.
Client ID: MW-62 Groundwater
Lab ID: 015356-0003-SA
Matrix: AQUEOUS Sampled: 10 JUN 91 Received: 11 JUN 91
Authorized: 11 JUN 91 Prepared: 12 JUN 91 Analyzed: 18 JUN 91

Parameter	Result	Units	Reporting Limit
Acetone	ND	ug/L	10
Acetonitrile	ND	ug/L	200
Acrolein	ND	ug/L	100
Acrylonitrile	ND	ug/L	100
Allyl chloride	ND	ug/L	10
Benzene	ND	ug/L	5.0
Bromodichloromethane	ND	ug/L	5.0
Bromoform	ND	ug/L	5.0
Bromomethane	ND	ug/L	10
2-Butanone (MEK)	ND	ug/L	10
Carbon disulfide	ND	ug/L	5.0
Carbon tetrachloride	ND	ug/L	5.0
Chlorobenzene	ND	ug/L	5.0
Chloroethane	ND	ug/L	10
Chloroform	ND	ug/L	5.0
Chloromethane	ND	ug/L	10
Chloroprene	ND	ug/L	5.0
Dibromochloromethane	ND	ug/L	5.0
1,2-Dibromo-3-chloro-propane (DBCP)	ND	ug/L	10
1,2-Dibromoethane (EDB)	ND	ug/L	10
Dibromomethane	ND	ug/L	5.0
trans-1,4-Dichloro-2-butene	ND	ug/L	5.0
Dichlorodifluoromethane	ND	ug/L	20
1,1-Dichloroethane	ND	ug/L	5.0
1,2-Dichloroethane	ND	ug/L	5.0
1,1-Dichloroethene	9.6	ug/L	5.0
1,2-Dichloroethene (total)	ND	ug/L	5.0
1,2-Dichloropropane	ND	ug/L	5.0
cis-1,3-Dichloropropene	ND	ug/L	5.0
trans-1,3-Dichloropropene	ND	ug/L	5.0
1,4-Dioxane	ND	ug/L	500
Ethylbenzene	ND	ug/L	5.0
Ethyl methacrylate	ND	ug/L	20
Iodomethane	ND	ug/L	5.0
Isobutanol	ND	ug/L	200
2-Hexanone	ND	ug/L	10
Methacrylonitrile	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0

(continued on following page)

ND = Not detected
NA = Not applicable

Reported By: Robert Broderick Approved By: Mark Dymerski

Enseco
A Corning Company

Volatile Organics
Appendix IX List
Method 8240

Client Name: Sparton Technology Inc.
Client ID: MW-62 Groundwater
Lab ID: 015356-0003-SA
Matrix: AQUEOUS Sampled: 10 JUN 91 Received: 11 JUN 91
Authorized: 11 JUN 91 Prepared: 12 JUN 91 Analyzed: 18 JUN 91

Parameter	Result	Units	Reporting Limit
Methyl methacrylate	ND	ug/L	20
4-Methyl-2-pentanone (MIBK)	ND	ug/L	10
Propionitrile	ND	ug/L	5.0
Styrene	ND	ug/L	5.0
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0
Tetrachloroethene	ND	ug/L	5.0
Toluene	ND	ug/L	5.0
1,1,1-Trichloroethane	12	ug/L	5.0
1,1,2-Trichloroethane	ND	ug/L	5.0
Trichloroethene	ND	ug/L	5.0
Trichlorofluoromethane	ND	ug/L	5.0
1,2,3-Trichloropropane	ND	ug/L	5.0
Vinyl acetate	ND	ug/L	10
Vinyl chloride	ND	ug/L	10
Xylenes (total)	ND	ug/L	5.0

Surrogate	Recovery	
Toluene-d8	108	%
4-Bromofluorobenzene	98	%
1,2-Dichloroethane-d4	96	%

ND = Not detected
NA = Not applicable

Reported By: Robert Broderick Approved By: Mark Dymerski

Enseco
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Volatile Organics
Appendix IX List
Method 8240

Client Name: Sparton Technology Inc.
Client ID: MW-60 Groundwater
Lab ID: 015356-0004-SA
Matrix: AQUEOUS Sampled: 10 JUN 91 Received: 11 JUN 91
Authorized: 11 JUN 91 Prepared: 12 JUN 91 Analyzed: 18 JUN 91

Parameter	Result	Units	Reporting Limit
Acetone	ND	ug/L	10
Acetonitrile	ND	ug/L	200
Acrolein	ND	ug/L	100
Acrylonitrile	ND	ug/L	100
Allyl chloride	ND	ug/L	10
Benzene	ND	ug/L	5.0
Bromodichloromethane	ND	ug/L	5.0
Bromoform	ND	ug/L	5.0
Bromomethane	ND	ug/L	10
2-Butanone (MEK)	ND	ug/L	10
Carbon disulfide	ND	ug/L	5.0
Carbon tetrachloride	ND	ug/L	5.0
Chlorobenzene	ND	ug/L	5.0
Chloroethane	ND	ug/L	10
Chloroform	ND	ug/L	5.0
Chloromethane	ND	ug/L	10
Chloroprene	ND	ug/L	5.0
Dibromochloromethane	ND	ug/L	5.0
1,2-Dibromo-3-chloro-propane (DBCP)	ND	ug/L	10
1,2-Dibromoethane (EDB)	ND	ug/L	10
Dibromomethane	ND	ug/L	5.0
trans-1,4-Dichloro-2-butene	ND	ug/L	5.0
Dichlorodifluoromethane	ND	ug/L	20
1,1-Dichloroethane	ND	ug/L	5.0
1,2-Dichloroethane	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	5.0
1,2-Dichloroethene (total)	ND	ug/L	5.0
1,2-Dichloropropane	ND	ug/L	5.0
cis-1,3-Dichloropropene	ND	ug/L	5.0
trans-1,3-Dichloropropene	ND	ug/L	5.0
1,4-Dioxane	ND	ug/L	500
Ethylbenzene	ND	ug/L	5.0
Ethyl methacrylate	ND	ug/L	20
Iodomethane	ND	ug/L	5.0
Isobutanol	ND	ug/L	200
2-Hexanone	ND	ug/L	10
Methacrylonitrile	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0

(continued on following page)

ND = Not detected
NA = Not applicable

Reported By: Robert Broderick Approved By: Mark Dymerski

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Volatile Organics
Appendix IX List
Method 8240

Client Name: Sparton Technology Inc.
Client ID: MW-60 Groundwater
Lab ID: 015356-0004-SA
Matrix: AQUEOUS Sampled: 10 JUN 91 Received: 11 JUN 91
Authorized: 11 JUN 91 Prepared: 12 JUN 91 Analyzed: 18 JUN 91

Parameter	Result	Units	Reporting Limit
Methyl methacrylate	ND	ug/L	20
4-Methyl-2-pentanone (MIBK)	ND	ug/L	10
Propionitrile	ND	ug/L	5.0
Styrene	ND	ug/L	5.0
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0
Tetrachloroethene	ND	ug/L	5.0
Toluene	ND	ug/L	5.0
1,1,1-Trichloroethane	ND	ug/L	5.0
1,1,2-Trichloroethane	ND	ug/L	5.0
Trichloroethene	ND	ug/L	5.0
Trichlorofluoromethane	ND	ug/L	5.0
1,2,3-Trichloropropane	ND	ug/L	5.0
Vinyl acetate	ND	ug/L	10
Vinyl chloride	ND	ug/L	10
Xylenes (total)	ND	ug/L	5.0

Surrogate	Recovery	
Toluene-d8	108	%
4-Bromofluorobenzene	98	%
1,2-Dichloroethane-d4	91	%

ND = Not detected
NA = Not applicable

Reported By: Robert Broderick Approved By: Mark Dymerski

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Volatile Organics
Appendix IX List
Method 8240

Client Name: Sparton Technology Inc.
Client ID: MW-61 Groundwater
Lab ID: 015356-0005-SA
Matrix: AQUEOUS Sampled: 10 JUN 91 Received: 11 JUN 91
Authorized: 11 JUN 91 Prepared: 12 JUN 91 Analyzed: 18 JUN 91

Parameter	Result	Units	Reporting Limit
Acetone	ND	ug/L	10
Acetonitrile	ND	ug/L	200
Acrolein	ND	ug/L	100
Acrylonitrile	ND	ug/L	100
Allyl chloride	ND	ug/L	10
Benzene	ND	ug/L	5.0
Bromodichloromethane	ND	ug/L	5.0
Bromoform	ND	ug/L	5.0
Bromomethane	ND	ug/L	10
2-Butanone (MEK)	ND	ug/L	10
Carbon disulfide	ND	ug/L	5.0
Carbon tetrachloride	ND	ug/L	5.0
Chlorobenzene	ND	ug/L	5.0
Chloroethane	ND	ug/L	10
Chloroform	ND	ug/L	5.0
Chloromethane	ND	ug/L	10
Chloroprene	ND	ug/L	5.0
Dibromochloromethane	ND	ug/L	5.0
1,2-Dibromo-3-chloro-propane (DBCP)	ND	ug/L	10
1,2-Dibromoethane (EDB)	ND	ug/L	10
Dibromomethane	ND	ug/L	5.0
trans-1,4-Dichloro-2-butene	ND	ug/L	5.0
Dichlorodifluoromethane	ND	ug/L	20
1,1-Dichloroethane	ND	ug/L	5.0
1,2-Dichloroethane	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	5.0
1,2-Dichloroethene (total)	ND	ug/L	5.0
1,2-Dichloropropane	ND	ug/L	5.0
cis-1,3-Dichloropropene	ND	ug/L	5.0
trans-1,3-Dichloropropene	ND	ug/L	5.0
1,4-Dioxane	ND	ug/L	500
Ethylbenzene	ND	ug/L	5.0
Ethyl methacrylate	ND	ug/L	20
Iodomethane	ND	ug/L	5.0
Isobutanol	ND	ug/L	200
2-Hexanone	ND	ug/L	10
Methacrylonitrile	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0

(continued on following page)

ND = Not detected
NA = Not applicable

Reported By: Robert Broderick Approved By: Mark Dymerski

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Volatile Organics
Appendix IX List
Method 8240

..ient Name: Sparton Technology Inc.
Client ID: MW-61 Groundwater
Lab ID: 015356-0005-SA
Matrix: AQUEOUS Sampled: 10 JUN 91 Received: 11 JUN 91
Authorized: 11 JUN 91 Prepared: 12 JUN 91 Analyzed: 18 JUN 91

Parameter	Result	Units	Reporting Limit
Methyl methacrylate	ND	ug/L	20
4-Methyl-2-pentanone (MIBK)	ND	ug/L	10
Propionitrile	ND	ug/L	5.0
Styrene	ND	ug/L	5.0
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0
Tetrachloroethene	ND	ug/L	5.0
Toluene	ND	ug/L	5.0
1,1,1-Trichloroethane	ND	ug/L	5.0
1,1,2-Trichloroethane	ND	ug/L	5.0
Trichloroethene	ND	ug/L	5.0
Trichlorofluoromethane	ND	ug/L	5.0
1,2,3-Trichloropropane	ND	ug/L	5.0
Vinyl acetate	ND	ug/L	10
Vinyl chloride	ND	ug/L	10
Xylenes (total)	ND	ug/L	5.0

rrogate	Recovery	
Toluene-d8	109	%
4-Bromofluorobenzene	101	%
1,2-Dichloroethane-d4	95	%

ND = Not detected
NA = Not applicable

ıorted By: Robert Broderick Approved By: Mark Dymerski

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Metals

Total Metals

Client Name: Sparton Technology Inc.
Client ID: MW-55 Groundwater
Lab ID: 015356-0001-SA
Matrix: AQUEOUS Sampled: 10 JUN 91 Received: 11 JUN 91
Authorized: 11 JUN 91 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Antimony	ND	mg/L	0.060	6010	13 JUN 91	18 JUN 91
Arsenic	ND	mg/L	0.0050	7060	13 JUN 91	17 JUN 91
Barium	0.037	mg/L	0.010	6010	13 JUN 91	18 JUN 91
Beryllium	ND	mg/L	0.0020	6010	13 JUN 91	18 JUN 91
Cadmium	ND	mg/L	0.0050	6010	13 JUN 91	18 JUN 91
Chromium	ND	mg/L	0.010	6010	13 JUN 91	18 JUN 91
Cobalt	ND	mg/L	0.010	6010	13 JUN 91	18 JUN 91
Copper	ND	mg/L	0.020	6010	13 JUN 91	18 JUN 91
Lead	ND	mg/L	0.0050	7421	13 JUN 91	17 JUN 91
Mercury	ND	mg/L	0.00020	7470	13 JUN 91	14 JUN 91
Nickel	ND	mg/L	0.040	6010	13 JUN 91	18 JUN 91
Selenium	ND	mg/L	0.0050	7740	13 JUN 91	18 JUN 91
Silver	ND	mg/L	0.010	6010	13 JUN 91	18 JUN 91
Thallium	ND	mg/L	0.010	7841	13 JUN 91	18 JUN 91
Tin	ND	mg/L	0.10	6010	13 JUN 91	18 JUN 91
Vanadium	ND	mg/L	0.010	6010	13 JUN 91	18 JUN 91
Zinc	ND	mg/L	0.020	6010	13 JUN 91	18 JUN 91

ND = Not detected
NA = Not applicable

Reported By: Sandra Jones Approved By: Dave Roberts

Enseco
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Metals

Total Metals

Client Name: Sparton Technology Inc.
Client ID: MW-56 Groundwater
Lab ID: 015356-0002-SA
Matrix: AQUEOUS Sampled: 10 JUN 91 Received: 11 JUN 91
Authorized: 11 JUN 91 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Antimony	ND	mg/L	0.060	6010	13 JUN 91	18 JUN 91
Arsenic	ND	mg/L	0.0050	7060	13 JUN 91	17 JUN 91
Barium	0.049	mg/L	0.010	6010	13 JUN 91	18 JUN 91
Beryllium	ND	mg/L	0.0020	6010	13 JUN 91	18 JUN 91
Cadmium	ND	mg/L	0.0050	6010	13 JUN 91	18 JUN 91
Chromium	0.18	mg/L	0.010	6010	13 JUN 91	18 JUN 91
Cobalt	ND	mg/L	0.010	6010	13 JUN 91	18 JUN 91
Copper	ND	mg/L	0.020	6010	13 JUN 91	18 JUN 91
Lead	ND	mg/L	0.0050	7421	13 JUN 91	17 JUN 91
Mercury	ND	mg/L	0.00020	7470	13 JUN 91	14 JUN 91
Nickel	ND	mg/L	0.040	6010	13 JUN 91	18 JUN 91
Selenium	ND	mg/L	0.0050	7740	13 JUN 91	18 JUN 91
Silver	ND	mg/L	0.010	6010	13 JUN 91	18 JUN 91
Thallium	ND	mg/L	0.010	7841	13 JUN 91	18 JUN 91
Tin	ND	mg/L	0.10	6010	13 JUN 91	18 JUN 91
Vanadium	ND	mg/L	0.010	6010	13 JUN 91	18 JUN 91
Zinc	ND	mg/L	0.020	6010	13 JUN 91	18 JUN 91

ND = Not detected
NA = Not applicable

Reported By: Sandra Jones Approved By: Dave Roberts

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Metals

Total Metals

Client Name: Sparton Technology Inc.
Client ID: MW-62 Groundwater
Lab ID: 015356-0003-SA
Matrix: AQUEOUS Sampled: 10 JUN 91 Received: 11 JUN 91
Authorized: 11 JUN 91 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Antimony	ND	mg/L	0.060	6010	13 JUN 91	18 JUN 91
Arsenic	ND	mg/L	0.010	7060	13 JUN 91	17 JUN 91
Barium	0.068	mg/L	0.010	6010	13 JUN 91	18 JUN 91
Beryllium	ND	mg/L	0.0020	6010	13 JUN 91	18 JUN 91
Cadmium	ND	mg/L	0.0050	6010	13 JUN 91	18 JUN 91
Chromium	ND	mg/L	0.010	6010	13 JUN 91	18 JUN 91
Cobalt	ND	mg/L	0.010	6010	13 JUN 91	18 JUN 91
Copper	ND	mg/L	0.020	6010	13 JUN 91	18 JUN 91
Lead	ND	mg/L	0.0050	7421	13 JUN 91	17 JUN 91
Mercury	ND	mg/L	0.00020	7470	13 JUN 91	14 JUN 91
Nickel	ND	mg/L	0.040	6010	13 JUN 91	18 JUN 91
Selenium	ND	mg/L	0.010	7740	13 JUN 91	18 JUN 91
Silver	ND	mg/L	0.010	6010	13 JUN 91	18 JUN 91
Thallium	ND	mg/L	0.010	7841	13 JUN 91	18 JUN 91
Tin	ND	mg/L	0.10	6010	13 JUN 91	18 JUN 91
Vanadium	ND	mg/L	0.010	6010	13 JUN 91	18 JUN 91
Zinc	0.051	mg/L	0.020	6010	13 JUN 91	18 JUN 91

ND = Not detected
NA = Not applicable

Reported By: Sandra Jones Approved By: Dave Roberts

Enseco
A Corning Company

Metals

Total Metals

Client Name: Sparton Technology Inc.
Client ID: MW-60 Groundwater
Lab ID: 015356-0004-SA
Matrix: AQUEOUS Sampled: 10 JUN 91 Received: 11 JUN 91
Authorized: 11 JUN 91 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Antimony	ND	mg/L	0.060	6010	13 JUN 91	18 JUN 91
Arsenic	ND	mg/L	0.0050	7060	13 JUN 91	17 JUN 91
Barium	0.060	mg/L	0.010	6010	13 JUN 91	18 JUN 91
Beryllium	ND	mg/L	0.0020	6010	13 JUN 91	18 JUN 91
Cadmium	ND	mg/L	0.0050	6010	13 JUN 91	18 JUN 91
Chromium	ND	mg/L	0.010	6010	13 JUN 91	18 JUN 91
Cobalt	ND	mg/L	0.010	6010	13 JUN 91	18 JUN 91
Copper	ND	mg/L	0.020	6010	13 JUN 91	18 JUN 91
Lead	ND	mg/L	0.0050	7421	13 JUN 91	17 JUN 91
Mercury	ND	mg/L	0.00020	7470	13 JUN 91	14 JUN 91
Nickel	ND	mg/L	0.040	6010	13 JUN 91	18 JUN 91
Selenium	ND	mg/L	0.010	7740	13 JUN 91	18 JUN 91
Silver	ND	mg/L	0.010	6010	13 JUN 91	18 JUN 91
Thallium	ND	mg/L	0.010	7841	13 JUN 91	18 JUN 91
Tin	ND	mg/L	0.10	6010	13 JUN 91	18 JUN 91
Vanadium	ND	mg/L	0.010	6010	13 JUN 91	18 JUN 91
Zinc	ND	mg/L	0.020	6010	13 JUN 91	18 JUN 91

ND = Not detected
NA = Not applicable

Reported By: Sandra Jones Approved By: Dave Roberts

Enseco
A Corning Company

Metals

Total Metals

Client Name: Sparton Technology Inc.
Client ID: MW-61 Groundwater
Lab ID: 015356-0005-SA
Matrix: AQUEOUS Sampled: 10 JUN 91 Received: 11 JUN 91
Authorized: 11 JUN 91 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Antimony	ND	mg/L	0.060	6010	13 JUN 91	18 JUN 91
Arsenic	ND	mg/L	0.010	7060	13 JUN 91	17 JUN 91
Barium	0.051	mg/L	0.010	6010	13 JUN 91	18 JUN 91
Beryllium	ND	mg/L	0.0020	6010	13 JUN 91	18 JUN 91
Cadmium	ND	mg/L	0.0050	6010	13 JUN 91	18 JUN 91
Chromium	ND	mg/L	0.010	6010	13 JUN 91	18 JUN 91
Cobalt	ND	mg/L	0.010	6010	13 JUN 91	18 JUN 91
Copper	ND	mg/L	0.020	6010	13 JUN 91	18 JUN 91
Lead	ND	mg/L	0.0050	7421	13 JUN 91	17 JUN 91
Mercury	ND	mg/L	0.00020	7470	13 JUN 91	14 JUN 91
Nickel	ND	mg/L	0.040	6010	13 JUN 91	18 JUN 91
Selenium	ND	mg/L	0.010	7740	13 JUN 91	18 JUN 91
Silver	ND	mg/L	0.010	6010	13 JUN 91	18 JUN 91
Thallium	ND	mg/L	0.010	7841	13 JUN 91	18 JUN 91
Tin	ND	mg/L	0.10	6010	13 JUN 91	18 JUN 91
Vanadium	ND	mg/L	0.010	6010	13 JUN 91	18 JUN 91
Zinc	ND	mg/L	0.020	6010	13 JUN 91	18 JUN 91

ND = Not detected
NA = Not applicable

Reported By: Sandra Jones Approved By: Dave Roberts

Quality Control Results

The Enseco laboratories operate under a vigorous QA/QC program designed to ensure the generation of scientifically valid, legally defensible data by monitoring every aspect of laboratory operations. Routine QA/QC procedures include the use of approved methodologies, independent verification of analytical standards, use of duplicate Laboratory Control Samples to assess the precision and accuracy of the methodology on a routine basis, and a rigorous system of data review.

In addition, the Enseco laboratories maintain a comprehensive set of certifications from both state and federal governmental agencies which require frequent analyses of blind audit samples. Enseco - Rocky Mountain Analytical Laboratory is certified by the EPA under the EPA/CLP program for both Organic and Inorganic analyses, under the USATHAMA (U.S. Army) program, by the Army Corps of Engineers, and the states of Colorado, New Jersey, New York, Utah, and Florida, among others.

The standard laboratory QC package is designed to:

1) establish a strong, cost-effective QC program that ensures the generation of scientifically valid, legally defensible data

2) assess the laboratory's performance of the analytical method using control limits generated with a well-defined matrix

3) establish clear-cut guidelines for acceptability of analytical data so that QC decisions can be made immediately at the bench, and

4) provide a standard set of reportables which assures the client of the quality of his data.

The Enseco QC program is based upon monitoring the precision and accuracy of an analytical method by analyzing a set of Duplicate Control Samples (DCS) at frequent, well-defined intervals. Each DCS is a well-characterized matrix which is spiked with target compounds at 5-100 times the reporting limit, depending upon the methodology being monitored. The purpose of the DCS is not to duplicate the sample matrix, but rather to provide an interference-free, homogeneous matrix from which to gather data to establish control limits. These limits are used to determine whether data generated by the laboratory on any given day is in control.

Control limits for accuracy (percent recovery) are based on the average, historical percent recovery +/- 3 standard deviation units. Control limits for precision (relative percent difference) range from 0 (identical duplicate DCS results) to the average, historical relative percent difference + 3 standard deviation units. These control limits are fairly narrow based on the consistency of the matrix being monitored and are updated on a quarterly basis.

For each batch of samples analyzed, an additional control measure is taken in the form of a Single Control Sample (SCS). The SCS consists of a control matrix that is spiked with either representative target compounds or surrogate compounds appropriate to the method being used. An SCS is prepared for each sample lot for which the DCS pair are not analyzed.

Accuracy for DCS and SCS is measured by Percent Recovery.

$$\% \text{ Recovery} = \frac{\text{Measured Concentration}}{\text{Actual Concentration}} \times 100$$

Precision for DCS is measured by Relative Percent Difference (RPD).

$$\text{RPD} = \frac{|\text{Measured Concentration DCS1} - \text{Measured Concentration DCS2}|}{(\text{Measured Concentration DCS1} + \text{Measured Concentration DCS2})/2} \times 100$$

All samples analyzed concurrently by the same test are assigned the same QC lot number. Projects which contain numerous samples, analyzed over several days, may have multiple QC lot numbers associated with each test. The QC information which follows includes a listing of the QC lot numbers associated with each of the samples reported, DCS and SCS (where applicable) recoveries from the QC lots associated with the samples, and control limits for these lots. The QC data is reported by test code, in the order that the tests are reported in the analytical results section of this report.

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QC LOT ASSIGNMENT REPORT
V tile Organics by GC/MS

Laboratory Sample Number	QC Matrix	QC Category	QC Lot Number (DCS)	QC Run Number (SCS/BLANK)
015356-0001-SA	AQUEOUS	624-A	13 JUN 91-L	17 JUN 91-L
015356-0002-SA	AQUEOUS	624-A	13 JUN 91-L	17 JUN 91-L
015356-0003-SA	AQUEOUS	624-A	11 JUN 91-F	17 JUN 91-F
015356-0004-SA	AQUEOUS	624-A	17 JUN 91-F	17 JUN 91-F
015356-0005-SA	AQUEOUS	624-A	17 JUN 91-F	17 JUN 91-F

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DUPLICATE CONTROL SAMPLE REPORT
Volatile Organics by GC/MS

Analyte	Concentration Spiked	Measured DCS1	Measured DCS2	Measured AVG	Accuracy Average(%) DCS	Accuracy Average(%) Limits	Precision (RPD) DCS	Precision (RPD) Limit
Category: 624-A Matrix: AQUEOUS QC Lot: 13 JUN 91-L Concentration Units: ug/L								
1,1-Dichloroethene	50	52.1	50.8	51.4	103	61-145	2.5	14
Trichloroethene	50	48.0	45.6	46.8	94	71-120	5.1	14
Benzene	50	49.1	48.3	48.7	97	76-127	1.6	11
Toluene	50	51.5	54.2	52.8	106	76-125	5.1	13
Chlorobenzene	50	53.6	50.9	52.2	105	75-130	5.2	13
Category: 624-A Matrix: AQUEOUS QC Lot: 11 JUN 91-F Concentration Units: ug/L								
1,1-Dichloroethene	50	58.2	57.4	57.8	116	61-145	1.4	14
Trichloroethene	50	50.0	49.5	49.8	100	71-120	1.0	14
Benzene	50	50.4	48.6	49.5	99	76-127	3.6	11
Toluene	50	54.1	53.1	53.6	107	76-125	1.9	13
Chlorobenzene	50	55.0	56.0	55.5	111	75-130	1.8	13
Category: 624-A Matrix: AQUEOUS QC Lot: 17 JUN 91-F Concentration Units: ug/L								
1,1-Dichloroethene	50	56.5	59.2	57.8	116	61-145	4.7	14
Trichloroethene	50	49.9	50.5	50.2	100	71-120	1.2	14
Benzene	50	48.7	48.4	48.6	97	76-127	0.6	11
Toluene	50	50.0	52.4	51.2	102	76-125	4.7	13
Chlorobenzene	50	51.6	54.8	53.2	106	75-130	6.0	13

Calculations are performed before rounding to avoid round-off errors in calculated results.

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SINGLE CONTROL SAMPLE REPORT
Volatile Organics by GC/MS

Analyte	Concentration Spiked	Concentration Measured	Accuracy(%) SCS	Accuracy(%) Limits
Category: 624-A				
Matrix: AQUEOUS				
QC Lot: 13 JUN 91-L QC Run: 17 JUN 91-L				
Concentration Units: ug/L				
1,2-Dichloroethane-d4	50.0	50.0	100	76-114
4-Bromofluorobenzene	50.0	48.1	96	86-115
Toluene-d8	50.0	50.6	101	88-110
Category: 624-A				
Matrix: AQUEOUS				
QC Lot: 11 JUN 91-F QC Run: 17 JUN 91-F				
Concentration Units: ug/L				
1,2-Dichloroethane-d4	50.0	47.0	94	76-114
4-Bromofluorobenzene	50.0	48.7	97	86-115
Toluene-d8	50.0	53.1	106	88-110
Category: 624-A				
Matrix: AQUEOUS				
Lot: 17 JUN 91-F QC Run: 17 JUN 91-F				
Concentration Units: ug/L				
1,2-Dichloroethane-d4	50.0	47.0	94	76-114
4-Bromofluorobenzene	50.0	48.7	97	86-115
Toluene-d8	50.0	53.1	106	88-110

Calculations are performed before rounding to avoid round-off errors in calculated results.

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METHOD BLANK REPORT
Volatile Organics by GC/MS

Test: 8240CP-AP9-AP
Matrix: AQUEOUS
QC Lot: 13 JUN 91-L QC Run: 17 JUN 91-L

Analyte	Result	Units	Reporting Limit
Acetone	ND	ug/L	10
Acetonitrile	ND	ug/L	200
Acrolein	ND	ug/L	100
Acrylonitrile	ND	ug/L	100
Allyl chloride	ND	ug/L	10
Benzene	ND	ug/L	5.0
Bromodichloromethane	ND	ug/L	5.0
Bromoform	ND	ug/L	5.0
Bromomethane	ND	ug/L	10
2-Butanone (MEK)	ND	ug/L	10
Carbon disulfide	ND	ug/L	5.0
Carbon tetrachloride	ND	ug/L	5.0
Chlorobenzene	ND	ug/L	5.0
Chloroethane	ND	ug/L	10
Chloroform	ND	ug/L	5.0
Chloromethane	ND	ug/L	10
Chloroprene	ND	ug/L	5.0
Dibromochloromethane	ND	ug/L	5.0
,2-Dibromo-3-chloro-propane (DBCP)	ND	ug/L	10
1,2-Dibromoethane (EDB)	ND	ug/L	10
Dibromomethane	ND	ug/L	5.0
trans-1,4-Dichloro-2-butene	ND	ug/L	5.0
Dichlorodifluoromethane	ND	ug/L	20
1,1-Dichloroethane	ND	ug/L	5.0
1,2-Dichloroethane	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	5.0
1,2-Dichloroethene (total)	ND	ug/L	5.0
1,2-Dichloropropane	ND	ug/L	5.0
cis-1,3-Dichloropropene	ND	ug/L	5.0
trans-1,3-Dichloropropene	ND	ug/L	5.0
1,4-Dioxane	ND	ug/L	500
Ethylbenzene	ND	ug/L	5.0
Ethyl methacrylate	ND	ug/L	20
Iodomethane	ND	ug/L	5.0
Isobutanol	ND	ug/L	200
2-Hexanone	ND	ug/L	10
Methacrylonitrile	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0

METHOD BLANK REPORT
Volatile Organics by GC/MS (cont.)

Analyte	Result	Units	Reporting Limit
Test: 8240CP-AP9-AP			
Matrix: AQUEOUS			
QC Lot: 13 JUN 91-L QC Run: 17 JUN 91-L			
Methyl methacrylate	ND	ug/L	20
4-Methyl-2-pentanone (MIBK)	ND	ug/L	10
Propionitrile	ND	ug/L	5.0
Styrene	ND	ug/L	5.0
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0
Tetrachloroethene	ND	ug/L	5.0
Toluene	ND	ug/L	5.0
1,1,1-Trichloroethane	ND	ug/L	5.0
1,1,2-Trichloroethane	ND	ug/L	5.0
Trichloroethene	ND	ug/L	5.0
Trichlorofluoromethane	ND	ug/L	5.0
1,2,3-Trichloropropane	ND	ug/L	5.0
Vinyl acetate	ND	ug/L	10
Vinyl chloride	ND	ug/L	10
Xylenes (total)	ND	ug/L	5.0
Test: 8240CP-AP9-AP			
Matrix: AQUEOUS			
QC Lot: 11 JUN 91-F QC Run: 17 JUN 91-F			
Acetone	ND	ug/L	10
Acetonitrile	ND	ug/L	200
Acrolein	ND	ug/L	100
Acrylonitrile	ND	ug/L	100
Allyl chloride	ND	ug/L	10
Benzene	ND	ug/L	5.0
Bromodichloromethane	ND	ug/L	5.0
Bromoform	ND	ug/L	5.0
Bromomethane	ND	ug/L	10
2-Butanone (MEK)	ND	ug/L	10
Carbon disulfide	ND	ug/L	5.0
Carbon tetrachloride	ND	ug/L	5.0
Chlorobenzene	ND	ug/L	5.0
Chloroethane	ND	ug/L	10
Chloroform	ND	ug/L	5.0
Chloromethane	ND	ug/L	10
Chloroprene	ND	ug/L	5.0
Dibromochloromethane	ND	ug/L	5.0

METHOD BLANK REPORT
Volatile Organics by GC/MS (cont.)

Test: 8240CP-AP9-AP
Matrix: AQUEOUS
QC Lot: 11 JUN 91-F QC Run: 17 JUN 91-F

Analyte	Result	Units	Reporting Limit
1,2-Dibromo-3-chloro-propane (DBCP)	ND	ug/L	10
1,2-Dibromoethane (EDB)	ND	ug/L	10
Dibromomethane	ND	ug/L	5.0
trans-1,4-Dichloro-2-butene	ND	ug/L	5.0
Dichlorodifluoromethane	ND	ug/L	20
1,1-Dichloroethane	ND	ug/L	5.0
1,2-Dichloroethane	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	5.0
1,2-Dichloroethene (total)	ND	ug/L	5.0
1,2-Dichloropropane	ND	ug/L	5.0
cis-1,3-Dichloropropene	ND	ug/L	5.0
trans-1,3-Dichloropropene	ND	ug/L	5.0
1,4-Dioxane	ND	ug/L	500
Ethylbenzene	ND	ug/L	5.0
Ethyl methacrylate	ND	ug/L	20
Iodomethane	ND	ug/L	5.0
Isobutanol	ND	ug/L	200
2-Hexanone	ND	ug/L	10
Methacrylonitrile	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
Methyl methacrylate	ND	ug/L	20
4-Methyl-2-pentanone (MIBK)	ND	ug/L	10
Propionitrile	ND	ug/L	5.0
Styrene	ND	ug/L	5.0
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0
Tetrachloroethene	ND	ug/L	5.0
Toluene	ND	ug/L	5.0
1,1,1-Trichloroethane	ND	ug/L	5.0
1,1,2-Trichloroethane	ND	ug/L	5.0
Trichloroethene	ND	ug/L	5.0
Trichlorofluoromethane	ND	ug/L	5.0
1,2,3-Trichloropropane	ND	ug/L	5.0
Vinyl acetate	ND	ug/L	10
Vinyl chloride	ND	ug/L	10
Xylenes (total)	ND	ug/L	5.0

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METHOD BLANK REPORT
Volatile Organics by GC/MS (cont.)

Test: 8240CP-AP9-AP
Matrix: AQUEOUS
QC Lot: 17 JUN 91-F QC Run: 17 JUN 91-F

Analyte	Result	Units	Reporting Limit
Acetone	ND	ug/L	10
Acetonitrile	ND	ug/L	200
Acrolein	ND	ug/L	100
Acrylonitrile	ND	ug/L	100
Allyl chloride	ND	ug/L	10
Benzene	ND	ug/L	5.0
Bromodichloromethane	ND	ug/L	5.0
Bromoform	ND	ug/L	5.0
Bromomethane	ND	ug/L	10
2-Butanone (MEK)	ND	ug/L	10
Carbon disulfide	ND	ug/L	5.0
Carbon tetrachloride	ND	ug/L	5.0
Chlorobenzene	ND	ug/L	5.0
Chloroethane	ND	ug/L	10
Chloroform	ND	ug/L	5.0
Chloromethane	ND	ug/L	10
Chloroprene	ND	ug/L	5.0
Dibromochloromethane	ND	ug/L	5.0
2-Dibromo-3-chloro-propane (DBCP)	ND	ug/L	10
1,2-Dibromoethane (EDB)	ND	ug/L	10
Dibromomethane	ND	ug/L	5.0
trans-1,4-Dichloro-2-butene	ND	ug/L	5.0
Dichlorodifluoromethane	ND	ug/L	20
1,1-Dichloroethane	ND	ug/L	5.0
1,2-Dichloroethane	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	5.0
1,2-Dichloroethene (total)	ND	ug/L	5.0
1,2-Dichloropropane	ND	ug/L	5.0
cis-1,3-Dichloropropene	ND	ug/L	5.0
trans-1,3-Dichloropropene	ND	ug/L	5.0
1,4-Dioxane	ND	ug/L	500
Ethylbenzene	ND	ug/L	5.0
Ethyl methacrylate	ND	ug/L	20
Iodomethane	ND	ug/L	5.0
Isobutanol	ND	ug/L	200
2-Hexanone	ND	ug/L	10
Methacrylonitrile	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0

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METHOD BLANK REPORT
Volatile Organics by GC/MS (cont.)

Test: 8240CP-AP9-AP
Matrix: AQUEOUS
QC Lot: 17 JUN 91-F QC Run: 17 JUN 91-F

Analyte	Result	Units	Reporting Limit
Methyl methacrylate	ND	ug/L	20
4-Methyl-2-pentanone (MIBK)	ND	ug/L	10
Propionitrile	ND	ug/L	5.0
Styrene	ND	ug/L	5.0
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0
Tetrachloroethene	ND	ug/L	5.0
Toluene	ND	ug/L	5.0
1,1,1-Trichloroethane	ND	ug/L	5.0
1,1,2-Trichloroethane	ND	ug/L	5.0
Trichloroethene	ND	ug/L	5.0
Trichlorofluoromethane	ND	ug/L	5.0
1,2,3-Trichloropropane	ND	ug/L	5.0
Vinyl acetate	ND	ug/L	10
Vinyl chloride	ND	ug/L	10
Xylenes (total)	ND	ug/L	5.0

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QC LOT ASSIGNMENT REPORT
Metals Analysis and Preparation

Laboratory Sample Number	QC Matrix	QC Category	QC Lot Number (DCS)	QC Run Number (SCS/BLANK)
015356-0001-SA	AQUEOUS	ICP-AT	13 JUN 91-L	13 JUN 91-L
015356-0001-SA	AQUEOUS	HG-CVAA-AT	13 JUN 91-A	13 JUN 91-A
015356-0001-SA	AQUEOUS	AS-FAA-AT	13 JUN 91-L	13 JUN 91-L
015356-0001-SA	AQUEOUS	TL-FAA-AT	13 JUN 91-L	13 JUN 91-L
015356-0001-SA	AQUEOUS	SE-FAA-AT	13 JUN 91-L	13 JUN 91-L
015356-0001-SA	AQUEOUS	PB-FAA-AT	13 JUN 91-L	13 JUN 91-L
015356-0002-SA	AQUEOUS	ICP-AT	13 JUN 91-L	13 JUN 91-L
015356-0002-SA	AQUEOUS	HG-CVAA-AT	13 JUN 91-A	13 JUN 91-A
015356-0002-SA	AQUEOUS	AS-FAA-AT	13 JUN 91-L	13 JUN 91-L
015356-0002-SA	AQUEOUS	TL-FAA-AT	13 JUN 91-L	13 JUN 91-L
015356-0002-SA	AQUEOUS	SE-FAA-AT	13 JUN 91-L	13 JUN 91-L
015356-0002-SA	AQUEOUS	PB-FAA-AT	13 JUN 91-L	13 JUN 91-L
015356-0003-SA	AQUEOUS	ICP-AT	13 JUN 91-L	13 JUN 91-L
015356-0003-SA	AQUEOUS	HG-CVAA-AT	13 JUN 91-A	13 JUN 91-A
015356-0003-SA	AQUEOUS	AS-FAA-AT	13 JUN 91-L	13 JUN 91-L
015356-0003-SA	AQUEOUS	TL-FAA-AT	13 JUN 91-L	13 JUN 91-L
015356-0003-SA	AQUEOUS	SE-FAA-AT	13 JUN 91-L	13 JUN 91-L
015356-0003-SA	AQUEOUS	PB-FAA-AT	13 JUN 91-L	13 JUN 91-L
015356-0004-SA	AQUEOUS	ICP-AT	13 JUN 91-L	13 JUN 91-L
015356-0004-SA	AQUEOUS	HG-CVAA-AT	13 JUN 91-A	13 JUN 91-A
015356-0004-SA	AQUEOUS	AS-FAA-AT	13 JUN 91-L	13 JUN 91-L
015356-0004-SA	AQUEOUS	TL-FAA-AT	13 JUN 91-L	13 JUN 91-L
015356-0004-SA	AQUEOUS	SE-FAA-AT	13 JUN 91-L	13 JUN 91-L
015356-0004-SA	AQUEOUS	PB-FAA-AT	13 JUN 91-L	13 JUN 91-L
015356-0005-SA	AQUEOUS	ICP-AT	13 JUN 91-L	13 JUN 91-L
015356-0005-SA	AQUEOUS	HG-CVAA-AT	13 JUN 91-A	13 JUN 91-A
015356-0005-SA	AQUEOUS	AS-FAA-AT	13 JUN 91-L	13 JUN 91-L
015356-0005-SA	AQUEOUS	TL-FAA-AT	13 JUN 91-L	13 JUN 91-L
015356-0005-SA	AQUEOUS	SE-FAA-AT	13 JUN 91-L	13 JUN 91-L
015356-0005-SA	AQUEOUS	PB-FAA-AT	13 JUN 91-L	13 JUN 91-L

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DUPLICATE CONTROL SAMPLE REPORT
Metals Analysis and Preparation

Analyte	Concentration Spiked	Measured DCS1	Measured DCS2	Measured AVG	Accuracy Average(%) DCS	Accuracy Limits	Precis (RPD) DCS Lim
Category: ICP-AT							
Matrix: AQUEOUS							
QC Lot: 13 JUN 91-L							
Concentration Units: mg/L							
Aluminum	2.0	2.11	2.04	2.08	104	75-125	3.4
Antimony	0.5	0.475	0.477	0.476	95	75-125	0.5
Arsenic	0.5	0.488	0.486	0.487	97	75-125	0.4
Barium	2.0	1.91	1.95	1.93	96	75-125	2.1
Beryllium	0.05	0.0504	0.0501	0.0502	100	75-125	0.6
Cadmium	0.05	0.0533	0.0551	0.0542	108	75-125	3.4
Calcium	100	107	109	108	108	75-125	1.1
Chromium	0.2	0.195	0.201	0.198	99	75-125	2.8
Cobalt	0.5	0.475	0.477	0.476	95	75-125	0.5
Copper	0.25	0.256	0.249	0.252	101	75-125	2.7
Iron	1.0	0.956	0.986	0.971	97	75-125	3.1
Lead	0.5	0.480	0.483	0.482	96	75-125	0.8
Magnesium	50	51.0	50.6	50.8	102	75-125	0.8
Manganese	0.5	0.479	0.489	0.484	97	75-125	2.1
Nickel	0.5	0.476	0.483	0.480	96	75-125	1.6
Potassium	50	55.0	47.8	51.4	103	75-125	14
Silver	0.05	0.0463	0.0500	0.0482	96	75-125	7.8
Sodium	100	108	102	105	105	75-125	5.4
Vanadium	0.5	0.505	0.510	0.507	101	75-125	1.1
Zinc	0.5	0.484	0.494	0.489	98	75-125	2.1
Category: HG-CVAA-AT							
Matrix: AQUEOUS							
QC Lot: 13 JUN 91-A							
Concentration Units: mg/L							
Mercury	0.0010	0.00101	0.00104	0.00102	102	75-125	3.3
Category: AS-FAA-AT							
Matrix: AQUEOUS							
QC Lot: 13 JUN 91-L							
Concentration Units: mg/L							
Arsenic	0.03	0.0284	0.0283	0.0284	95	75-125	0.3

Calculations are performed before rounding to avoid round-off errors in calculated results

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DUPLICATE CONTROL SAMPLE REPORT
Metals Analysis and Preparation (cont.)

Analyte	Concentration Spiked	Measured DCS1	Measured DCS2	Measured AVG	Accuracy Average(%) DCS	Accuracy Limits	Precision (RPD) DCS	Limit
Category: TL-FAA-AT Matrix: AQUEOUS QC Lot: 13 JUN 91-L Concentration Units: mg/L								
Thallium	0.03	0.0314	0.0281	0.0298	99	75-125	11	20
Category: SE-FAA-AT Matrix: AQUEOUS QC Lot: 13 JUN 91-L Concentration Units: mg/L								
Selenium	0.03	0.0252	0.0250	0.0251	84	75-125	0.8	20
Category: PB-FAA-AT Matrix: AQUEOUS QC Lot: 13 JUN 91-L Concentration Units: mg/L								
i	0.03	0.0285	0.0303	0.0294	98	75-125	6.1	20

Calculations are performed before rounding to avoid round-off errors in calculated results.

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METHOD BLANK REPORT
Metals Analysis and Preparation

Analyte	Result	Units	Reporting Limit
Test: ICP-AP9-AT			
Matrix: AQUEOUS			
QC Lot: 13 JUN 91-L QC Run: 13 JUN 91-L			
Antimony	ND	mg/L	0.060
Barium	ND	mg/L	0.010
Beryllium	ND	mg/L	0.0020
Cadmium	ND	mg/L	0.0050
Chromium	ND	mg/L	0.010
Cobalt	ND	mg/L	0.010
Copper	ND	mg/L	0.020
Nickel	ND	mg/L	0.040
Silver	ND	mg/L	0.010
Tin	ND	mg/L	0.10
Vanadium	ND	mg/L	0.010
Zinc	ND	mg/L	0.020
Test: HG-CVAA-AT			
Matrix: AQUEOUS			
QC Lot: 13 JUN 91-A QC Run: 13 JUN 91-A			
'ercury	ND	mg/L	0.00020
Test: AS-FAA-AT			
Matrix: AQUEOUS			
QC Lot: 13 JUN 91-L QC Run: 13 JUN 91-L			
Arsenic	ND	mg/L	0.0050
Test: TL-FAA-AT			
Matrix: AQUEOUS			
QC Lot: 13 JUN 91-L QC Run: 13 JUN 91-L			
Thallium	ND	mg/L	0.0050

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METHOD BLANK REPORT
Metals Analysis and Preparation (cont.)

Analyte	Result	Units	Reporting Limit
Test: SE-FAA-AT Matrix: AQUEOUS QC Lot: 13 JUN 91-L QC Run: 13 JUN 91-L			
Selenium	ND	mg/L	0.0050
Test: PB-FAA-AT Matrix: AQUEOUS QC Lot: 13 JUN 91-L QC Run: 13 JUN 91-L			
Lead	ND	mg/L	0.0050

Rocky Mountain
Analytical Laboratory

Enseco

ANALYTICAL RESULTS

FOR

SPARTON TECHNOLOGY, INC.

ENSECO-RMAL NO. 015435

JUNE 28, 1991

Reviewed by: Joel E. Holtz

Joel E. Holtz

Sue Dalla

Sue Dalla

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Introduction

This report presents the analytical results as well as supporting information to aid in the evaluation and interpretation of the data and is arranged in the following order:

- Sample Description Information
- Analytical Test Requests
- Analytical Results
- Quality Control Report

Consistent with directives in the CLP protocol in SW-846 and other EPA methods, all GC/MS analyses were performed so that the maximum concentration of sample was analyzed. Some samples required dilutions to avoid saturation of the detector, to achieve linearity for a specific target compound or to reduce matrix interferences. As stated in Section 7.5.4 of Method 8270, 7.4.1.16 of Method 8240 and Exhibit E of the CLP protocol these dilutions must be performed. The reporting limits for these samples are therefore proportionate to the dilution required. Surrogate compounds may not be measurable in samples which have been diluted.

Samples 015435-0004, -0005, -0013, and -0014 were diluted for Method 8240 due to the concentration of target compounds and the reporting limits were raised accordingly.

The reporting limits were raised for samples 015435-0001 through -0014 for copper and zinc for Method 6010 due to the concentration of copper and zinc in the preparation blank.

Sample Description Information

The Sample Description Information lists all of the samples received in this project together with the internal laboratory identification number assigned for each sample. Each project received at Enseco - RMAL is assigned a unique six digit number. Samples within the project are numbered sequentially. The laboratory identification number is a combination of the six digit project code and the sample sequence number.

Also given in the Sample Description Information is the Sample Type (matrix), Date of Sampling (if known) and Date of Receipt at the laboratory.

Analytical Test Requests

The Analytical Test Requests lists the analyses that were performed on each sample. The Custom Test column indicates where tests have been modified to conform to the specific requirements of this project.

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SAMPLE DESCRIPTION INFORMATION
for
Sparton Technology Inc.

Lab ID	Client ID	Matrix	Sampled Date	Sampled Time	Received Date
015435-0001-SA	MW-52 Groundwater	AQUEOUS	13 JUN 91	10:21	15 JUN 91
015435-0002-SA	MW-57 Groundwater	AQUEOUS	13 JUN 91	10:45	15 JUN 91
015435-0003-SA	MW-64 Groundwater	AQUEOUS	13 JUN 91	12:26	15 JUN 91
015435-0004-SA	MW-46 Groundwater	AQUEOUS	13 JUN 91	13:20	15 JUN 91
015435-0005-SA	MW-45 Groundwater	AQUEOUS	13 JUN 91	14:45	15 JUN 91
015435-0006-SA	MW-36 Groundwater	AQUEOUS	13 JUN 91	14:50	15 JUN 91
015435-0007-SA	MW-44 Groundwater	AQUEOUS	14 JUN 91	09:31	15 JUN 91
015435-0008-SA	MW-35 Groundwater	AQUEOUS	14 JUN 91	09:32	15 JUN 91
015435-0009-SA	MW-63 Groundwater	AQUEOUS	14 JUN 91	10:55	15 JUN 91
015435-0010-SA	MW-34 Groundwater	AQUEOUS	14 JUN 91	10:28	15 JUN 91
015435-0011-SA	MW-51 Groundwater	AQUEOUS	14 JUN 91	11:50	15 JUN 91
015435-0012-SA	MW-59 Groundwater	AQUEOUS	14 JUN 91	12:32	15 JUN 91
015435-0013-SA	MW-42 Groundwater	AQUEOUS	14 JUN 91	13:41	15 JUN 91
015435-0014-SA	MW-37 Groundwater	AQUEOUS	14 JUN 91	14:45	15 JUN 91

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ANALYTICAL TEST REQUESTS
for
Sparton Technology Inc.

Lab ID: 015435	Group Code	Analysis Description	Custom Test?
0001 - 0014	A	Volatile Organics	N
		Appendix IX List	N
		Screen - Volatile Organics	N
		Appendix IX Metals (Total) done by ICP	N
		Prep - Total Metals, ICP	N
		Mercury, Cold Vapor AA (Total)	N
		Prep - Mercury, Cold Vapor AA (Total)	N
		Arsenic, Furnace AA (Total)	N
		Prep - Total Metals, Furnace AA	N
		Prep - Total Metals, Furnace AA	N
		Thallium, Furnace AA (Total)	N
		Selenium, Furnace AA (Total)	N
		Lead, Furnace AA (Total)	N

Analytical Results

The analytical results for this project are presented in the following data tables. Each data table includes sample identification information, and when available and appropriate, dates sampled, received, authorized, prepared and analyzed. The authorization data is the date when the project was defined by the client such that laboratory work could begin.

Data sheets contain a listing of the parameters measured in each test, the analytical results and the Enseco reporting limit. Reporting limits are adjusted to reflect dilution of the sample, when appropriate. Solid and waste samples are reported on an "as received" basis, i.e. no correction is made for moisture content.

Enseco-RMAL is no longer routinely blank-correcting analytical data. Uncorrected analytical results are reported, along with associated blank results, for all organic and metals analyses. Analytical results and blank results are reported for conventional inorganic parameters as specified in the method. This policy is described in detail in the Enseco Incorporated Quality Assurance Program Plan for Environmental Chemical Monitoring, Revision 3.3, May, 1989.

The results from the Standard Enseco QA/QC Program, which generates data which are independent of matrix effects, is provided subsequently.

Enseco
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Volatile Organics
Appendix IX List
Method 8240

Client Name: Sparton Technology Inc.
Client ID: MW-52 Groundwater
Lab ID: 015435-0001-SA
Matrix: AQUEOUS Sampled: 13 JUN 91 Received: 15 JUN 91
Authorized: 15 JUN 91 Prepared: 16 JUN 91 Analyzed: 19 JUN 91

Parameter	Result	Units	Reporting Limit
Acetone	ND	ug/L	10
Acetonitrile	ND	ug/L	200
Acrolein	ND	ug/L	100
Acrylonitrile	ND	ug/L	100
Allyl chloride	ND	ug/L	10
Benzene	ND	ug/L	5.0
Bromodichloromethane	ND	ug/L	5.0
Bromoform	ND	ug/L	5.0
Bromomethane	ND	ug/L	10
2-Butanone (MEK)	ND	ug/L	10
Carbon disulfide	ND	ug/L	5.0
Carbon tetrachloride	ND	ug/L	5.0
Chlorobenzene	ND	ug/L	5.0
Chloroethane	ND	ug/L	10
Chloroform	ND	ug/L	5.0
Chloromethane	ND	ug/L	10
Chloroprene	ND	ug/L	5.0
Dibromochloromethane	ND	ug/L	5.0
1,2-Dibromo-3-chloro-propane (DBCP)	ND	ug/L	10
1,2-Dibromoethane (EDB)	ND	ug/L	10
Dibromomethane	ND	ug/L	5.0
trans-1,4-Dichloro-2-butene	ND	ug/L	5.0
Dichlorodifluoromethane	ND	ug/L	20
1,1-Dichloroethane	ND	ug/L	5.0
1,2-Dichloroethane	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	5.0
1,2-Dichloroethene (total)	ND	ug/L	5.0
1,2-Dichloropropane	ND	ug/L	5.0
cis-1,3-Dichloropropene	ND	ug/L	5.0
trans-1,3-Dichloropropene	ND	ug/L	5.0
1,4-Dioxane	ND	ug/L	500
Ethylbenzene	ND	ug/L	5.0
Ethyl methacrylate	ND	ug/L	20
Iodomethane	ND	ug/L	5.0
Isobutanol	ND	ug/L	200
2-Hexanone	ND	ug/L	10
Methacrylonitrile	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0

(continued on following page)

ND = Not detected
NA = Not applicable

Reported By: Robert Broderick Approved By: Mark Dymerski

Enseco
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Volatile Organics
Appendix IX List
Method 8240

Client Name: Sparton Technology Inc.
Client ID: MW-52 Groundwater
Lab ID: 015435-0001-SA
Matrix: AQUEOUS Sampled: 13 JUN 91 Received: 15 JUN 91
Authorized: 15 JUN 91 Prepared: 16 JUN 91 Analyzed: 19 JUN 91

Parameter	Result	Units	Reporting Limit
Methyl methacrylate	ND	ug/L	20
4-Methyl-2-pentanone (MIBK)	ND	ug/L	10
Propionitrile	ND	ug/L	5.0
Styrene	ND	ug/L	5.0
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0
Tetrachloroethene	ND	ug/L	5.0
Toluene	ND	ug/L	5.0
1,1,1-Trichloroethane	ND	ug/L	5.0
1,1,2-Trichloroethane	ND	ug/L	5.0
Trichloroethene	ND	ug/L	5.0
Trichlorofluoromethane	ND	ug/L	5.0
1,2,3-Trichloropropane	ND	ug/L	5.0
Vinyl acetate	ND	ug/L	10
Vinyl chloride	ND	ug/L	10
Xylenes (total)	ND	ug/L	5.0

Surrogate	Recovery	
Toluene-d8	100	%
4-Bromofluorobenzene	98	%
1,2-Dichloroethane-d4	90	%

ND = Not detected
NA = Not applicable

Reported By: Robert Broderick Approved By: Mark Dymerski

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Volatile Organics
Appendix IX List
Method 8240

Client Name: Sparton Technology Inc.
Client ID: MW-57 Groundwater
Lab ID: 015435-0002-SA
Matrix: AQUEOUS Sampled: 13 JUN 91 Received: 15 JUN 91
Authorized: 15 JUN 91 Prepared: 16 JUN 91 Analyzed: 19 JUN 91

Parameter	Result	Units	Reporting Limit
Acetone	ND	ug/L	10
Acetonitrile	ND	ug/L	200
Acrolein	ND	ug/L	100
Acrylonitrile	ND	ug/L	100
Allyl chloride	ND	ug/L	10
Benzene	ND	ug/L	5.0
Bromodichloromethane	ND	ug/L	5.0
Bromoform	ND	ug/L	5.0
Bromomethane	ND	ug/L	10
2-Butanone (MEK)	ND	ug/L	10
Carbon disulfide	ND	ug/L	5.0
Carbon tetrachloride	ND	ug/L	5.0
Chlorobenzene	ND	ug/L	5.0
Chloroethane	ND	ug/L	10
Chloroform	ND	ug/L	5.0
Chloromethane	ND	ug/L	10
Chloroprene	ND	ug/L	5.0
Dibromochloromethane	ND	ug/L	5.0
1,2-Dibromo-3-chloro-propane (DBCP)	ND	ug/L	10
1,2-Dibromoethane (EDB)	ND	ug/L	10
Dibromomethane	ND	ug/L	5.0
trans-1,4-Dichloro-2-butene	ND	ug/L	5.0
Dichlorodifluoromethane	ND	ug/L	20
1,1-Dichloroethane	ND	ug/L	5.0
1,2-Dichloroethane	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	5.0
1,2-Dichloroethene (total)	ND	ug/L	5.0
1,2-Dichloropropane	ND	ug/L	5.0
cis-1,3-Dichloropropene	ND	ug/L	5.0
trans-1,3-Dichloropropene	ND	ug/L	5.0
1,4-Dioxane	ND	ug/L	500
Ethylbenzene	ND	ug/L	5.0
Ethyl methacrylate	ND	ug/L	20
Iodomethane	ND	ug/L	5.0
Isobutanol	ND	ug/L	200
2-Hexanone	ND	ug/L	10
Methacrylonitrile	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0

(continued on following page)

ND = Not detected
NA = Not applicable

Reported By: Robert Broderick Approved By: Mark Dymerski

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Volatile Organics
Appendix IX List
Method 8240

Client Name: Sparton Technology Inc.
Client ID: MW-57 Groundwater
Lab ID: 015435-0002-SA
Matrix: AQUEOUS Sampled: 13 JUN 91 Received: 15 JUN 91
Authorized: 15 JUN 91 Prepared: 16 JUN 91 Analyzed: 19 JUN 91

Parameter	Result	Units	Reporting Limit
Methyl methacrylate	ND	ug/L	20
4-Methyl-2-pentanone (MIBK)	ND	ug/L	10
Propionitrile	ND	ug/L	5.0
Styrene	ND	ug/L	5.0
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0
Tetrachloroethene	ND	ug/L	5.0
Toluene	ND	ug/L	5.0
1,1,1-Trichloroethane	ND	ug/L	5.0
1,1,2-Trichloroethane	ND	ug/L	5.0
Trichloroethene	ND	ug/L	5.0
Trichlorofluoromethane	ND	ug/L	5.0
1,2,3-Trichloropropane	ND	ug/L	5.0
Vinyl acetate	ND	ug/L	10
Vinyl chloride	ND	ug/L	10
Xylenes (total)	ND	ug/L	5.0

Surrogate	Recovery	
Toluene-d8	99	%
4-Bromofluorobenzene	101	%
1,2-Dichloroethane-d4	92	%

ND = Not detected
NA = Not applicable

Reported By: Robert Broderick Approved By: Mark Dymerski

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Volatile Organics
Appendix IX List
Method 8240

Client Name: Sparton Technology Inc.
Client ID: MW-64 Groundwater
Lab ID: 015435-0003-SA
Matrix: AQUEOUS Sampled: 13 JUN 91 Received: 15 JUN 91
Authorized: 15 JUN 91 Prepared: 16 JUN 91 Analyzed: 19 JUN 91

Parameter	Result	Units	Reporting Limit
Acetone	ND	ug/L	10
Acetonitrile	ND	ug/L	200
Acrolein	ND	ug/L	100
Acrylonitrile	ND	ug/L	100
Allyl chloride	ND	ug/L	10
Benzene	ND	ug/L	5.0
Bromodichloromethane	ND	ug/L	5.0
Bromoform	ND	ug/L	5.0
Bromomethane	ND	ug/L	10
2-Butanone (MEK)	ND	ug/L	10
Carbon disulfide	ND	ug/L	5.0
Carbon tetrachloride	ND	ug/L	5.0
Chlorobenzene	ND	ug/L	5.0
Chloroethane	ND	ug/L	10
Chloroform	ND	ug/L	5.0
Chloromethane	ND	ug/L	10
Chloroprene	ND	ug/L	5.0
Dibromochloromethane	ND	ug/L	5.0
1,2-Dibromo-3-chloro-propane (DBCP)	ND	ug/L	10
1,2-Dibromoethane (EDB)	ND	ug/L	10
Dibromomethane	ND	ug/L	5.0
trans-1,4-Dichloro-2-butene	ND	ug/L	5.0
Dichlorodifluoromethane	ND	ug/L	20
1,1-Dichloroethane	ND	ug/L	5.0
1,2-Dichloroethane	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	5.0
1,2-Dichloroethene (total)	ND	ug/L	5.0
1,2-Dichloropropane	ND	ug/L	5.0
cis-1,3-Dichloropropene	ND	ug/L	5.0
trans-1,3-Dichloropropene	ND	ug/L	5.0
1,4-Dioxane	ND	ug/L	500
Ethylbenzene	ND	ug/L	5.0
Ethyl methacrylate	ND	ug/L	20
Iodomethane	ND	ug/L	5.0
Isobutanol	ND	ug/L	200
2-Hexanone	ND	ug/L	10
Methacrylonitrile	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0

(continued on following page)

ND = Not detected
NA = Not applicable

Reported By: Robert Broderick Approved By: Mark Dymerski

Enseco
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Volatile Organics
Appendix IX List
Method 8240

Client Name: Sparton Technology Inc.
Client ID: MW-64 Groundwater
Lab ID: 015435-0003-SA
Matrix: AQUEOUS Sampled: 13 JUN 91 Received: 15 JUN 91
Authorized: 15 JUN 91 Prepared: 16 JUN 91 Analyzed: 19 JUN 91

Parameter	Result	Units	Reporting Limit
Methyl methacrylate	ND	ug/L	20
4-Methyl-2-pentanone (MIBK)	ND	ug/L	10
Propionitrile	ND	ug/L	5.0
Styrene	ND	ug/L	5.0
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0
Tetrachloroethene	ND	ug/L	5.0
Toluene	ND	ug/L	5.0
1,1,1-Trichloroethane	ND	ug/L	5.0
1,1,2-Trichloroethane	ND	ug/L	5.0
Trichloroethene	ND	ug/L	5.0
Trichlorofluoromethane	ND	ug/L	5.0
1,2,3-Trichloropropane	ND	ug/L	5.0
Vinyl acetate	ND	ug/L	10
Vinyl chloride	ND	ug/L	10
Xylenes (total)	ND	ug/L	5.0

Surrogate	Recovery	
Toluene-d8	100	%
4-Bromofluorobenzene	101	%
1,2-Dichloroethane-d4	95	%

ND = Not detected
NA = Not applicable

Reported By: Robert Broderick Approved By: Mark Dymerski

Enseco
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Volatile Organics
Appendix IX List
Method 8240

Client Name: Sparton Technology Inc.
Client ID: MW-46 Groundwater
Lab ID: 015435-0004-SA
Matrix: AQUEOUS Sampled: 13 JUN 91 Received: 15 JUN 91
Authorized: 15 JUN 91 Prepared: 16 JUN 91 Analyzed: 19 JUN 91

Parameter	Result	Units	Reporting Limit
Acetone	ND	ug/L	100
Acetonitrile	ND	ug/L	2000
Acrolein	ND	ug/L	1000
Acrylonitrile	ND	ug/L	1000
Allyl chloride	ND	ug/L	100
Benzene	ND	ug/L	50
Bromodichloromethane	ND	ug/L	50
Bromoform	ND	ug/L	50
Bromomethane	ND	ug/L	100
2-Butanone (MEK)	ND	ug/L	100
Carbon disulfide	ND	ug/L	50
Carbon tetrachloride	ND	ug/L	50
Chlorobenzene	ND	ug/L	50
Chloroethane	ND	ug/L	100
Chloroform	ND	ug/L	50
Chloromethane	ND	ug/L	100
Chloroprene	ND	ug/L	50
Dibromochloromethane	ND	ug/L	50
1,2-Dibromo-3-chloro-propane (DBCP)	ND	ug/L	100
1,2-Dibromoethane (EDB)	ND	ug/L	100
Dibromomethane	ND	ug/L	50
trans-1,4-Dichloro-2-butene	ND	ug/L	50
Dichlorodifluoromethane	ND	ug/L	200
1,1-Dichloroethane	ND	ug/L	50
1,2-Dichloroethane	ND	ug/L	50
1,1-Dichloroethene	ND	ug/L	50
1,2-Dichloroethene (total)	ND	ug/L	50
1,2-Dichloropropane	ND	ug/L	50
cis-1,3-Dichloropropene	ND	ug/L	50
trans-1,3-Dichloropropene	ND	ug/L	50
1,4-Dioxane	ND	ug/L	5000
Ethylbenzene	ND	ug/L	50
Ethyl methacrylate	ND	ug/L	200
Iodomethane	ND	ug/L	50
Isobutanol	ND	ug/L	2000
2-Hexanone	ND	ug/L	100
Methacrylonitrile	ND	ug/L	50
Methylene chloride	ND	ug/L	50

(continued on following page)

ND = Not detected
NA = Not applicable

Reported By: Robert Broderick Approved By: Mark Dymerski

Enseco
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Volatile Organics
Appendix IX List
Method 8240

Client Name: Sparton Technology Inc.
Client ID: MW-46 Groundwater
Lab ID: 015435-0004-SA
Matrix: AQUEOUS Sampled: 13 JUN 91 Received: 15 JUN 91
Authorized: 15 JUN 91 Prepared: 16 JUN 91 Analyzed: 19 JUN 91

Parameter	Result	Units	Reporting Limit
Methyl methacrylate	ND	ug/L	200
4-Methyl-2-pentanone (MIBK)	ND	ug/L	100
Propionitrile	ND	ug/L	50
Styrene	ND	ug/L	50
1,1,1,2-Tetrachloroethane	ND	ug/L	50
1,1,2,2-Tetrachloroethane	ND	ug/L	50
Tetrachloroethene	ND	ug/L	50
Toluene	ND	ug/L	50
1,1,1-Trichloroethane	86	ug/L	50
1,1,2-Trichloroethane	ND	ug/L	50
Trichloroethene	1300	ug/L	50
Trichlorofluoromethane	ND	ug/L	50
1,2,3-Trichloropropane	ND	ug/L	50
Vinyl acetate	ND	ug/L	100
Vinyl chloride	ND	ug/L	100
Xylenes (total)	ND	ug/L	50

Surrogate	Recovery	
Toluene-d8	102	%
4-Bromofluorobenzene	99	%
1,2-Dichloroethane-d4	88	%

ND = Not detected
NA = Not applicable

Reported By: Robert Broderick Approved By: Mark Dymerski

Enseco
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Volatile Organics
Appendix IX List
Method 8240

Client Name: Sparton Technology Inc.
Client ID: MW-45 Groundwater
Lab ID: 015435-0005-SA
Matrix: AQUEOUS Sampled: 13 JUN 91 Received: 15 JUN 91
Authorized: 15 JUN 91 Prepared: 16 JUN 91 Analyzed: 19 JUN 91

Parameter	Result	Units	Reporting Limit
Acetone	ND	ug/L	100
Acetonitrile	ND	ug/L	2000
Acrolein	ND	ug/L	1000
Acrylonitrile	ND	ug/L	1000
Allyl chloride	ND	ug/L	100
Benzene	ND	ug/L	50
Bromodichloromethane	ND	ug/L	50
Bromoform	ND	ug/L	50
Bromomethane	ND	ug/L	100
2-Butanone (MEK)	ND	ug/L	100
Carbon disulfide	ND	ug/L	50
Carbon tetrachloride	ND	ug/L	50
Chlorobenzene	ND	ug/L	50
Chloroethane	ND	ug/L	100
Chloroform	ND	ug/L	50
Chloromethane	ND	ug/L	100
Chloroprene	ND	ug/L	50
Dibromochloromethane	ND	ug/L	50
1,2-Dibromo-3-chloro-propane (DBCP)	ND	ug/L	100
1,2-Dibromoethane (EDB)	ND	ug/L	100
Dibromomethane	ND	ug/L	50
trans-1,4-Dichloro-2-butene	ND	ug/L	50
Dichlorodifluoromethane	ND	ug/L	200
1,1-Dichloroethane	ND	ug/L	50
1,2-Dichloroethane	ND	ug/L	50
1,1-Dichloroethene	ND	ug/L	50
1,2-Dichloroethene (total)	ND	ug/L	50
1,2-Dichloropropane	ND	ug/L	50
cis-1,3-Dichloropropene	ND	ug/L	50
trans-1,3-Dichloropropene	ND	ug/L	50
1,4-Dioxane	ND	ug/L	5000
Ethylbenzene	ND	ug/L	50
Ethyl methacrylate	ND	ug/L	200
Iodomethane	ND	ug/L	50
Isobutanol	ND	ug/L	2000
2-Hexanone	ND	ug/L	100
Methacrylonitrile	ND	ug/L	50
Methylene chloride	ND	ug/L	50

(continued on following page)

ND = Not detected
NA = Not applicable

Reported By: Robert Broderick Approved By: Mark Dymerski

Enseco
A Corning Company

Volatile Organics
Appendix IX List
Method 8240

Client Name: Sparton Technology Inc.
Client ID: MW-45 Groundwater
Lab ID: 015435-0005-SA
Matrix: AQUEOUS Sampled: 13 JUN 91 Received: 15 JUN 91
Authorized: 15 JUN 91 Prepared: 16 JUN 91 Analyzed: 19 JUN 91

Parameter	Result	Units	Reporting Limit
Methyl methacrylate	ND	ug/L	200
4-Methyl-2-pentanone (MIBK)	ND	ug/L	100
Propionitrile	ND	ug/L	50
Styrene	ND	ug/L	50
1,1,1,2-Tetrachloroethane	ND	ug/L	50
1,1,2,2-Tetrachloroethane	ND	ug/L	50
Tetrachloroethene	ND	ug/L	50
Toluene	ND	ug/L	50
1,1,1-Trichloroethane	ND	ug/L	50
1,1,2-Trichloroethane	ND	ug/L	50
Trichloroethene	770	ug/L	50
Trichlorofluoromethane	ND	ug/L	50
1,2,3-Trichloropropane	ND	ug/L	50
Vinyl acetate	ND	ug/L	100
Vinyl chloride	ND	ug/L	100
Xylenes (total)	ND	ug/L	50

Surrogate	Recovery	
Toluene-d8	100	%
4-Bromofluorobenzene	100	%
1,2-Dichloroethane-d4	88	%

ND = Not detected
NA = Not applicable

Reported By: Robert Broderick Approved By: Mark Dymerski

Enseco
A Corning Company

Volatile Organics
Appendix IX List
Method 8240

Client Name: Sparton Technology Inc.
Client ID: MW-36 Groundwater
Lab ID: 015435-0006-SA
Matrix: AQUEOUS Sampled: 13 JUN 91 Received: 15 JUN 91
Authorized: 15 JUN 91 Prepared: 16 JUN 91 Analyzed: 19 JUN 91

Parameter	Result	Units	Reporting Limit
Acetone	ND	ug/L	10
Acetonitrile	ND	ug/L	200
Acrolein	ND	ug/L	100
Acrylonitrile	ND	ug/L	100
Allyl chloride	ND	ug/L	10
Benzene	ND	ug/L	5.0
Bromodichloromethane	ND	ug/L	5.0
Bromoform	ND	ug/L	5.0
Bromomethane	ND	ug/L	10
2-Butanone (MEK)	ND	ug/L	10
Carbon disulfide	ND	ug/L	5.0
Carbon tetrachloride	ND	ug/L	5.0
Chlorobenzene	ND	ug/L	5.0
Chloroethane	ND	ug/L	10
Chloroform	ND	ug/L	5.0
Chloromethane	ND	ug/L	10
Chloroprene	ND	ug/L	5.0
Dibromochloromethane	ND	ug/L	5.0
1,2-Dibromo-3-chloro-propane (DBCP)	ND	ug/L	10
1,2-Dibromoethane (EDB)	ND	ug/L	10
Dibromomethane	ND	ug/L	5.0
trans-1,4-Dichloro-2-butene	ND	ug/L	5.0
Dichlorodifluoromethane	ND	ug/L	20
1,1-Dichloroethane	ND	ug/L	5.0
1,2-Dichloroethane	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	5.0
1,2-Dichloroethene (total)	ND	ug/L	5.0
1,2-Dichloropropane	ND	ug/L	5.0
cis-1,3-Dichloropropene	ND	ug/L	5.0
trans-1,3-Dichloropropene	ND	ug/L	5.0
1,4-Dioxane	ND	ug/L	500
Ethylbenzene	ND	ug/L	5.0
Ethyl methacrylate	ND	ug/L	20
Iodomethane	ND	ug/L	5.0
Isobutanol	ND	ug/L	200
2-Hexanone	ND	ug/L	10
Methacrylonitrile	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0

(continued on following page)

ND = Not detected
NA = Not applicable

Reported By: Robert Broderick Approved By: Mark Dymerski

Enseco
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Volatile Organics
Appendix IX List
Method 8240

Client Name: Sparton Technology Inc.
Client ID: MW-36 Groundwater
Lab ID: 015435-0006-SA
Matrix: AQUEOUS Sampled: 13 JUN 91 Received: 15 JUN 91
Authorized: 15 JUN 91 Prepared: 16 JUN 91 Analyzed: 19 JUN 91

Parameter	Result	Units	Reporting Limit
Methyl methacrylate	ND	ug/L	20
4-Methyl-2-pentanone (MIBK)	ND	ug/L	10
Propionitrile	ND	ug/L	5.0
Styrene	ND	ug/L	5.0
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0
Tetrachloroethene	ND	ug/L	5.0
Toluene	ND	ug/L	5.0
1,1,1-Trichloroethane	ND	ug/L	5.0
1,1,2-Trichloroethane	ND	ug/L	5.0
Trichloroethene	22	ug/L	5.0
Trichlorofluoromethane	ND	ug/L	5.0
1,2,3-Trichloropropane	ND	ug/L	5.0
Vinyl acetate	ND	ug/L	10
Vinyl chloride	ND	ug/L	10
Xylenes (total)	ND	ug/L	5.0

Surrogate	Recovery	
Toluene-d8	101	%
4-Bromofluorobenzene	98	%
1,2-Dichloroethane-d4	90	%

ND = Not detected
NA = Not applicable

Reported By: Robert Broderick Approved By: Mark Dymerski

Enseco
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Volatile Organics
Appendix IX List
Method 8240

Client Name: Sparton Technology Inc.
Client ID: MW-44 Groundwater
Lab ID: 015435-0007-SA
Matrix: AQUEOUS Sampled: 14 JUN 91 Received: 15 JUN 91
Authorized: 15 JUN 91 Prepared: 16 JUN 91 Analyzed: 19 JUN 91

Parameter	Result	Units	Reporting Limit
Acetone	ND	ug/L	10
Acetonitrile	ND	ug/L	200
Acrolein	ND	ug/L	100
Acrylonitrile	ND	ug/L	100
Allyl chloride	ND	ug/L	10
Benzene	ND	ug/L	5.0
Bromodichloromethane	ND	ug/L	5.0
Bromoform	ND	ug/L	5.0
Bromomethane	ND	ug/L	10
2-Butanone (MEK)	ND	ug/L	10
Carbon disulfide	ND	ug/L	5.0
Carbon tetrachloride	ND	ug/L	5.0
Chlorobenzene	ND	ug/L	5.0
Chloroethane	ND	ug/L	10
Chloroform	ND	ug/L	5.0
Chloromethane	ND	ug/L	10
Chloroprene	ND	ug/L	5.0
Dibromochloromethane	ND	ug/L	5.0
1,2-Dibromo-3-chloro-propane (DBCP)	ND	ug/L	10
1,2-Dibromoethane (EDB)	ND	ug/L	10
Dibromomethane	ND	ug/L	5.0
trans-1,4-Dichloro-2-butene	ND	ug/L	5.0
Dichlorodifluoromethane	ND	ug/L	20
1,1-Dichloroethane	ND	ug/L	5.0
1,2-Dichloroethane	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	5.0
1,2-Dichloroethene (total)	ND	ug/L	5.0
1,2-Dichloropropane	ND	ug/L	5.0
cis-1,3-Dichloropropene	ND	ug/L	5.0
trans-1,3-Dichloropropene	ND	ug/L	5.0
1,4-Dioxane	ND	ug/L	500
Ethylbenzene	ND	ug/L	5.0
Ethyl methacrylate	ND	ug/L	20
Iodomethane	ND	ug/L	5.0
Isobutanol	ND	ug/L	200
2-Hexanone	ND	ug/L	10
Methacrylonitrile	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0

(continued on following page)

ND = Not detected
NA = Not applicable

Reported By: Robert Broderick Approved By: Mark Dymerski

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Volatile Organics
Appendix IX List
Method 8240

Client Name: Sparton Technology Inc.
Client ID: MW-44 Groundwater
Lab ID: 015435-0007-SA
Matrix: AQUEOUS Sampled: 14 JUN 91 Received: 15 JUN 91
Authorized: 15 JUN 91 Prepared: 16 JUN 91 Analyzed: 19 JUN 91

Parameter	Result	Units	Reporting Limit
Methyl methacrylate	ND	ug/L	20
4-Methyl-2-pentanone (MIBK)	ND	ug/L	10
Propionitrile	ND	ug/L	5.0
Styrene	ND	ug/L	5.0
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0
Tetrachloroethene	ND	ug/L	5.0
Toluene	ND	ug/L	5.0
1,1,1-Trichloroethane	ND	ug/L	5.0
1,1,2-Trichloroethane	ND	ug/L	5.0
Trichloroethene	ND	ug/L	5.0
Trichlorofluoromethane	ND	ug/L	5.0
1,2,3-Trichloropropane	ND	ug/L	5.0
Vinyl acetate	ND	ug/L	10
Vinyl chloride	ND	ug/L	10
Xylenes (total)	ND	ug/L	5.0

Surrogate	Recovery	
Toluene-d8	99	%
4-Bromofluorobenzene	100	%
1,2-Dichloroethane-d4	88	%

ND = Not detected
NA = Not applicable

Reported By: Robert Broderick Approved By: Mark Dymerski

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Volatile Organics
Appendix IX List
Method 8240

Client Name: Sparton Technology Inc.
Client ID: MW-35 Groundwater
Lab ID: 015435-0008-SA
Matrix: AQUEOUS Sampled: 14 JUN 91 Received: 15 JUN 91
Authorized: 15 JUN 91 Prepared: 16 JUN 91 Analyzed: 21 JUN 91

Parameter	Result	Units	Reporting Limit
Acetone	ND	ug/L	10
Acetonitrile	ND	ug/L	200
Acrolein	ND	ug/L	100
Acrylonitrile	ND	ug/L	100
Allyl chloride	ND	ug/L	10
Benzene	ND	ug/L	5.0
Bromodichloromethane	ND	ug/L	5.0
Bromoform	ND	ug/L	5.0
Bromomethane	ND	ug/L	10
2-Butanone (MEK)	ND	ug/L	10
Carbon disulfide	ND	ug/L	5.0
Carbon tetrachloride	ND	ug/L	5.0
Chlorobenzene	ND	ug/L	5.0
Chloroethane	ND	ug/L	10
Chloroform	ND	ug/L	5.0
Chloromethane	ND	ug/L	10
Chloroprene	ND	ug/L	5.0
Dibromochloromethane	ND	ug/L	5.0
1,2-Dibromo-3-chloro-propane (DBCP)	ND	ug/L	10
1,2-Dibromoethane (EDB)	ND	ug/L	10
Dibromomethane	ND	ug/L	5.0
trans-1,4-Dichloro-2-butene	ND	ug/L	5.0
Dichlorodifluoromethane	ND	ug/L	20
1,1-Dichloroethane	ND	ug/L	5.0
1,2-Dichloroethane	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	5.0
1,2-Dichloroethene (total)	ND	ug/L	5.0
1,2-Dichloropropane	ND	ug/L	5.0
cis-1,3-Dichloropropene	ND	ug/L	5.0
trans-1,3-Dichloropropene	ND	ug/L	5.0
1,4-Dioxane	ND	ug/L	500
Ethylbenzene	ND	ug/L	5.0
Ethyl methacrylate	ND	ug/L	20
Iodomethane	ND	ug/L	5.0
Isobutanol	ND	ug/L	200
2-Hexanone	ND	ug/L	10
Methacrylonitrile	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0

(continued on following page)

ND = Not detected
NA = Not applicable

Reported By: Robert Broderick Approved By: Mark Dymerski

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Volatile Organics
Appendix IX List
Method 8240

Client Name: Sparton Technology Inc.
Client ID: MW-35 Groundwater
Lab ID: 015435-0008-SA
Matrix: AQUEOUS Sampled: 14 JUN 91 Received: 15 JUN 91
Authorized: 15 JUN 91 Prepared: 16 JUN 91 Analyzed: 21 JUN 91

Parameter	Result	Units	Reporting Limit
Methyl methacrylate	ND	ug/L	20
4-Methyl-2-pentanone (MIBK)	ND	ug/L	10
Propionitrile	ND	ug/L	5.0
Styrene	ND	ug/L	5.0
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0
Tetrachloroethene	ND	ug/L	5.0
Toluene	ND	ug/L	5.0
1,1,1-Trichloroethane	ND	ug/L	5.0
1,1,2-Trichloroethane	ND	ug/L	5.0
Trichloroethene	ND	ug/L	5.0
Trichlorofluoromethane	ND	ug/L	5.0
1,2,3-Trichloropropane	ND	ug/L	5.0
Vinyl acetate	ND	ug/L	10
Vinyl chloride	ND	ug/L	10
Xylenes (total)	ND	ug/L	5.0

Surrogate	Recovery	
Toluene-d8	102	%
4-Bromofluorobenzene	99	%
1,2-Dichloroethane-d4	99	%

ND = Not detected
NA = Not applicable

Reported By: Robert Broderick Approved By: Mark Dymerski

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Volatile Organics
Appendix IX List
Method 8240

Client Name: Sparton Technology Inc.
Client ID: MW-63 Groundwater
Lab ID: 015435-0009-SA
Matrix: AQUEOUS Sampled: 14 JUN 91 Received: 15 JUN 91
Authorized: 15 JUN 91 Prepared: 16 JUN 91 Analyzed: 21 JUN 91

Parameter	Result	Units	Reporting Limit
Acetone	ND	ug/L	10
Acetonitrile	ND	ug/L	200
Acrolein	ND	ug/L	100
Acrylonitrile	ND	ug/L	100
Allyl chloride	ND	ug/L	10
Benzene	ND	ug/L	5.0
Bromodichloromethane	ND	ug/L	5.0
Bromoform	ND	ug/L	5.0
Bromomethane	ND	ug/L	10
2-Butanone (MEK)	ND	ug/L	10
Carbon disulfide	ND	ug/L	5.0
Carbon tetrachloride	ND	ug/L	5.0
Chlorobenzene	ND	ug/L	5.0
Chloroethane	ND	ug/L	10
Chloroform	ND	ug/L	5.0
Chloromethane	ND	ug/L	10
Chloroprene	ND	ug/L	5.0
Dibromochloromethane	ND	ug/L	5.0
1,2-Dibromo-3-chloro-propane (DBCP)	ND	ug/L	10
1,2-Dibromoethane (EDB)	ND	ug/L	10
Dibromomethane	ND	ug/L	5.0
trans-1,4-Dichloro-2-butene	ND	ug/L	5.0
Dichlorodifluoromethane	ND	ug/L	20
1,1-Dichloroethane	ND	ug/L	5.0
1,2-Dichloroethane	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	5.0
1,2-Dichloroethene (total)	ND	ug/L	5.0
1,2-Dichloropropane	ND	ug/L	5.0
cis-1,3-Dichloropropene	ND	ug/L	5.0
trans-1,3-Dichloropropene	ND	ug/L	5.0
1,4-Dioxane	ND	ug/L	500
Ethylbenzene	ND	ug/L	5.0
Ethyl methacrylate	ND	ug/L	20
Iodomethane	ND	ug/L	5.0
Isobutanol	ND	ug/L	200
2-Hexanone	ND	ug/L	10
Methacrylonitrile	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0

(continued on following page)

ND = Not detected
NA = Not applicable

Reported By: Robert Broderick Approved By: Mark Dymerski

Enseco
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Volatile Organics
Appendix IX List
Method 8240

Client Name: Sparton Technology Inc.
Client ID: MW-63 Groundwater
Lab ID: 015435-0009-SA
Matrix: AQUEOUS Sampled: 14 JUN 91 Received: 15 JUN 91
Authorized: 15 JUN 91 Prepared: 16 JUN 91 Analyzed: 21 JUN 91

Parameter	Result	Units	Reporting Limit
Methyl methacrylate	ND	ug/L	20
4-Methyl-2-pentanone (MIBK)	ND	ug/L	10
Propionitrile	ND	ug/L	5.0
Styrene	ND	ug/L	5.0
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0
Tetrachloroethene	ND	ug/L	5.0
Toluene	ND	ug/L	5.0
1,1,1-Trichloroethane	ND	ug/L	5.0
1,1,2-Trichloroethane	ND	ug/L	5.0
Trichloroethene	ND	ug/L	5.0
Trichlorofluoromethane	ND	ug/L	5.0
1,2,3-Trichloropropane	ND	ug/L	5.0
Vinyl acetate	ND	ug/L	10
Vinyl chloride	ND	ug/L	10
Xylenes (total)	ND	ug/L	5.0

Surrogate	Recovery	
Toluene-d8	103	%
4-Bromofluorobenzene	101	%
1,2-Dichloroethane-d4	101	%

ND = Not detected
NA = Not applicable

Reported By: Robert Broderick Approved By: Mark Dymerski

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Volatile Organics
Appendix IX List
Method 8240

Client Name: Sparton Technology Inc.
Client ID: MW-34 Groundwater
Lab ID: 015435-0010-SA
Matrix: AQUEOUS Sampled: 14 JUN 91 Received: 15 JUN 91
Authorized: 15 JUN 91 Prepared: 16 JUN 91 Analyzed: 21 JUN 91

Parameter	Result	Units	Reporting Limit
Acetone	ND	ug/L	10
Acetonitrile	ND	ug/L	200
Acrolein	ND	ug/L	100
Acrylonitrile	ND	ug/L	100
Allyl chloride	ND	ug/L	10
Benzene	ND	ug/L	5.0
Bromodichloromethane	ND	ug/L	5.0
Bromoform	ND	ug/L	5.0
Bromomethane	ND	ug/L	10
2-Butanone (MEK)	ND	ug/L	10
Carbon disulfide	ND	ug/L	5.0
Carbon tetrachloride	ND	ug/L	5.0
Chlorobenzene	ND	ug/L	5.0
Chloroethane	ND	ug/L	10
Chloroform	ND	ug/L	5.0
Chloromethane	ND	ug/L	10
Chloroprene	ND	ug/L	5.0
Dibromochloromethane	ND	ug/L	5.0
1,2-Dibromo-3-chloro-propane (DBCP)	ND	ug/L	10
1,2-Dibromoethane (EDB)	ND	ug/L	10
Dibromomethane	ND	ug/L	5.0
trans-1,4-Dichloro-2-butene	ND	ug/L	5.0
Dichlorodifluoromethane	ND	ug/L	20
1,1-Dichloroethane	ND	ug/L	5.0
1,2-Dichloroethane	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	5.0
1,2-Dichloroethene (total)	ND	ug/L	5.0
1,2-Dichloropropane	ND	ug/L	5.0
cis-1,3-Dichloropropene	ND	ug/L	5.0
trans-1,3-Dichloropropene	ND	ug/L	5.0
1,4-Dioxane	ND	ug/L	500
Ethylbenzene	ND	ug/L	5.0
Ethyl methacrylate	ND	ug/L	20
Iodomethane	ND	ug/L	5.0
Isobutanol	ND	ug/L	200
2-Hexanone	ND	ug/L	10
Methacrylonitrile	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0

(continued on following page)

ND = Not detected
NA = Not applicable

Reported By: Robert Broderick Approved By: Mark Dymerski

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Volatile Organics
Appendix IX List
Method 8240

Client Name: Sparton Technology Inc.
Client ID: MW-34 Groundwater
Lab ID: 015435-0010-SA
Matrix: AQUEOUS Sampled: 14 JUN 91 Received: 15 JUN 91
Authorized: 15 JUN 91 Prepared: 16 JUN 91 Analyzed: 21 JUN 91

Parameter	Result	Units	Reporting Limit
Methyl methacrylate	ND	ug/L	20
4-Methyl-2-pentanone (MIBK)	ND	ug/L	10
Propionitrile	ND	ug/L	5.0
Styrene	ND	ug/L	5.0
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0
Tetrachloroethene	ND	ug/L	5.0
Toluene	ND	ug/L	5.0
1,1,1-Trichloroethane	ND	ug/L	5.0
1,1,2-Trichloroethane	ND	ug/L	5.0
Trichloroethene	ND	ug/L	5.0
Trichlorofluoromethane	ND	ug/L	5.0
1,2,3-Trichloropropane	ND	ug/L	5.0
Vinyl acetate	ND	ug/L	10
Vinyl chloride	ND	ug/L	10
Xylenes (total)	ND	ug/L	5.0

Surrogate	Recovery	
Toluene-d8	103	%
4-Bromofluorobenzene	98	%
1,2-Dichloroethane-d4	94	%

ND = Not detected
NA = Not applicable

Reported By: Robert Broderick Approved By: Mark Dymerski

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Volatile Organics
Appendix IX List
Method 8240

Client Name: Sparton Technology Inc.
Client ID: MW-51 Groundwater
Lab ID: 015435-0011-SA
Matrix: AQUEOUS Sampled: 14 JUN 91 Received: 15 JUN 91
Authorized: 15 JUN 91 Prepared: 16 JUN 91 Analyzed: 21 JUN 91

Parameter	Result	Units	Reporting Limit
Acetone	ND	ug/L	10
Acetonitrile	ND	ug/L	200
Acrolein	ND	ug/L	100
Acrylonitrile	ND	ug/L	100
Allyl chloride	ND	ug/L	10
Benzene	ND	ug/L	5.0
Bromodichloromethane	ND	ug/L	5.0
Bromoform	ND	ug/L	5.0
Bromomethane	ND	ug/L	10
2-Butanone (MEK)	ND	ug/L	10
Carbon disulfide	ND	ug/L	5.0
Carbon tetrachloride	ND	ug/L	5.0
Chlorobenzene	ND	ug/L	5.0
Chloroethane	ND	ug/L	10
Chloroform	ND	ug/L	5.0
Chloromethane	ND	ug/L	10
Chloroprene	ND	ug/L	5.0
Dibromochloromethane	ND	ug/L	5.0
1,2-Dibromo-3-chloro-propane (DBCP)	ND	ug/L	10
1,2-Dibromoethane (EDB)	ND	ug/L	10
Dibromomethane	ND	ug/L	5.0
trans-1,4-Dichloro-2-butene	ND	ug/L	5.0
Dichlorodifluoromethane	ND	ug/L	20
1,1-Dichloroethane	ND	ug/L	5.0
1,2-Dichloroethane	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	5.0
1,2-Dichloroethene (total)	ND	ug/L	5.0
1,2-Dichloropropane	ND	ug/L	5.0
cis-1,3-Dichloropropene	ND	ug/L	5.0
trans-1,3-Dichloropropene	ND	ug/L	5.0
1,4-Dioxane	ND	ug/L	500
Ethylbenzene	ND	ug/L	5.0
Ethyl methacrylate	ND	ug/L	20
Iodomethane	ND	ug/L	5.0
Isobutanol	ND	ug/L	200
2-Hexanone	ND	ug/L	10
Methacrylonitrile	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0

(continued on following page)

ND = Not detected
NA = Not applicable

Reported By: Robert Broderick Approved By: Mark Dymerski

Enseco
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Volatile Organics
Appendix IX List
Method 8240

Client Name: Sparton Technology Inc.
Client ID: MW-51 Groundwater
Lab ID: 015435-0011-SA
Matrix: AQUEOUS Sampled: 14 JUN 91 Received: 15 JUN 91
Authorized: 15 JUN 91 Prepared: 16 JUN 91 Analyzed: 21 JUN 91

Parameter	Result	Units	Reporting Limit
Methyl methacrylate	ND	ug/L	20
4-Methyl-2-pentanone (MIBK)	ND	ug/L	10
Propionitrile	ND	ug/L	5.0
Styrene	ND	ug/L	5.0
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0
Tetrachloroethene	ND	ug/L	5.0
Toluene	ND	ug/L	5.0
1,1,1-Trichloroethane	ND	ug/L	5.0
1,1,2-Trichloroethane	ND	ug/L	5.0
Trichloroethene	ND	ug/L	5.0
Trichlorofluoromethane	ND	ug/L	5.0
1,2,3-Trichloropropane	ND	ug/L	5.0
Vinyl acetate	ND	ug/L	10
Vinyl chloride	ND	ug/L	10
Xylenes (total)	ND	ug/L	5.0

Surrogate	Recovery	
Toluene-d8	104	%
4-Bromofluorobenzene	98	%
1,2-Dichloroethane-d4	94	%

ND = Not detected
NA = Not applicable

Reported By: Robert Broderick Approved By: Mark Dymerski

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Volatile Organics
Appendix IX List
Method 8240

Client Name: Sparton Technology Inc.
Client ID: MW-59 Groundwater
Lab ID: 015435-0012-SA
Matrix: AQUEOUS Sampled: 14 JUN 91 Received: 15 JUN 91
Authorized: 15 JUN 91 Prepared: 16 JUN 91 Analyzed: 25 JUN 91

Parameter	Result	Units	Reporting Limit
Acetone	ND	ug/L	10
Acetonitrile	ND	ug/L	200
Acrolein	ND	ug/L	100
Acrylonitrile	ND	ug/L	100
Allyl chloride	ND	ug/L	10
Benzene	ND	ug/L	5.0
Bromodichloromethane	ND	ug/L	5.0
Bromoform	ND	ug/L	5.0
Bromomethane	ND	ug/L	10
2-Butanone (MEK)	ND	ug/L	10
Carbon disulfide	ND	ug/L	5.0
Carbon tetrachloride	ND	ug/L	5.0
Chlorobenzene	ND	ug/L	5.0
Chloroethane	ND	ug/L	10
Chloroform	ND	ug/L	5.0
Chloromethane	ND	ug/L	10
Chloroprene	ND	ug/L	5.0
Dibromochloromethane	ND	ug/L	5.0
1,2-Dibromo-3-chloro-propane (DBCP)	ND	ug/L	10
1,2-Dibromoethane (EDB)	ND	ug/L	10
Dibromomethane	ND	ug/L	5.0
trans-1,4-Dichloro-2-butene	ND	ug/L	5.0
Dichlorodifluoromethane	ND	ug/L	20
1,1-Dichloroethane	ND	ug/L	5.0
1,2-Dichloroethane	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	5.0
1,2-Dichloroethene (total)	ND	ug/L	5.0
1,2-Dichloropropane	ND	ug/L	5.0
cis-1,3-Dichloropropene	ND	ug/L	5.0
trans-1,3-Dichloropropene	ND	ug/L	5.0
1,4-Dioxane	ND	ug/L	500
Ethylbenzene	ND	ug/L	5.0
Ethyl methacrylate	ND	ug/L	20
Iodomethane	ND	ug/L	5.0
Isobutanol	ND	ug/L	200
2-Hexanone	ND	ug/L	10
Methacrylonitrile	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0

(continued on following page)

ND = Not detected
NA = Not applicable

Reported By: Cherie Windholz Approved By: Mark Dymerski

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Volatile Organics
Appendix IX List
Method 8240

Client Name: Sparton Technology Inc.
Client ID: MW-59 Groundwater
Lab ID: 015435-0012-SA
Matrix: AQUEOUS Sampled: 14 JUN 91 Received: 15 JUN 91
Authorized: 15 JUN 91 Prepared: 16 JUN 91 Analyzed: 25 JUN 91

Parameter	Result	Units	Reporting Limit
Methyl methacrylate	ND	ug/L	20
4-Methyl-2-pentanone (MIBK)	ND	ug/L	10
Propionitrile	ND	ug/L	5.0
Styrene	ND	ug/L	5.0
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0
Tetrachloroethene	ND	ug/L	5.0
Toluene	ND	ug/L	5.0
1,1,1-Trichloroethane	ND	ug/L	5.0
1,1,2-Trichloroethane	ND	ug/L	5.0
Trichloroethene	ND	ug/L	5.0
Trichlorofluoromethane	ND	ug/L	5.0
1,2,3-Trichloropropane	ND	ug/L	5.0
Vinyl acetate	ND	ug/L	10
Vinyl chloride	ND	ug/L	10
Xylenes (total)	ND	ug/L	5.0

Surrogate	Recovery	
Toluene-d8	100	%
4-Bromofluorobenzene	99	%
1,2-Dichloroethane-d4	93	%

ND = Not detected
NA = Not applicable

Reported By: Cherie Windholz Approved By: Mark Dymerski

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Volatile Organics
Appendix IX List
Method 8240

Client Name: Sparton Technology Inc.
Client ID: MW-42 Groundwater
Lab ID: 015435-0013-SA
Matrix: AQUEOUS Sampled: 14 JUN 91 Received: 15 JUN 91
Authorized: 15 JUN 91 Prepared: 16 JUN 91 Analyzed: 25 JUN 91

Parameter	Result	Units	Reporting Limit
Acetone	ND	ug/L	100
Acetonitrile	ND	ug/L	2000
Acrolein	ND	ug/L	1000
Acrylonitrile	ND	ug/L	1000
Allyl chloride	ND	ug/L	100
Benzene	ND	ug/L	50
Bromodichloromethane	ND	ug/L	50
Bromoform	ND	ug/L	50
Bromomethane	ND	ug/L	100
2-Butanone (MEK)	ND	ug/L	100
Carbon disulfide	ND	ug/L	50
Carbon tetrachloride	ND	ug/L	50
Chlorobenzene	ND	ug/L	50
Chloroethane	ND	ug/L	100
Chloroform	ND	ug/L	50
Chloromethane	ND	ug/L	100
Chloroprene	ND	ug/L	50
Dibromochloromethane	ND	ug/L	50
1,2-Dibromo-3-chloro-propane (DBCP)	ND	ug/L	100
1,2-Dibromoethane (EDB)	ND	ug/L	100
Dibromomethane	ND	ug/L	50
trans-1,4-Dichloro-2-butene	ND	ug/L	50
Dichlorodifluoromethane	ND	ug/L	200
1,1-Dichloroethane	ND	ug/L	50
1,2-Dichloroethane	ND	ug/L	50
1,1-Dichloroethene	160	ug/L	50
1,2-Dichloroethene (total)	ND	ug/L	50
1,2-Dichloropropane	ND	ug/L	50
cis-1,3-Dichloropropene	ND	ug/L	50
trans-1,3-Dichloropropene	ND	ug/L	50
1,4-Dioxane	ND	ug/L	5000
Ethylbenzene	ND	ug/L	50
Ethyl methacrylate	ND	ug/L	200
Iodomethane	ND	ug/L	50
Isobutanol	ND	ug/L	2000
2-Hexanone	ND	ug/L	100
Methacrylonitrile	ND	ug/L	50
Methylene chloride	ND	ug/L	50

(continued on following page)

ND = Not detected
NA = Not applicable

Reported By: Cherie Windholz Approved By: Mark Dymerski

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Volatile Organics
Appendix IX List
Method 8240

Client Name: Sparton Technology Inc.
Client ID: MW-42 Groundwater
Lab ID: 015435-0013-SA
Matrix: AQUEOUS Sampled: 14 JUN 91 Received: 15 JUN 91
Authorized: 15 JUN 91 Prepared: 16 JUN 91 Analyzed: 25 JUN 91

Parameter	Result	Units	Reporting Limit
Methyl methacrylate	ND	ug/L	200
4-Methyl-2-pentanone (MIBK)	ND	ug/L	100
Propionitrile	ND	ug/L	50
Styrene	ND	ug/L	50
1,1,1,2-Tetrachloroethane	ND	ug/L	50
1,1,2,2-Tetrachloroethane	ND	ug/L	50
Tetrachloroethene	ND	ug/L	50
Toluene	ND	ug/L	50
1,1,1-Trichloroethane	220	ug/L	50
1,1,2-Trichloroethane	ND	ug/L	50
Trichloroethene	1000	ug/L	50
Trichlorofluoromethane	ND	ug/L	50
1,2,3-Trichloropropane	ND	ug/L	50
Vinyl acetate	ND	ug/L	100
Vinyl chloride	ND	ug/L	100
Xylenes (total)	ND	ug/L	50

Surrogate	Recovery	
Toluene-d8	97	%
4-Bromofluorobenzene	96	%
1,2-Dichloroethane-d4	97	%

ND = Not detected
NA = Not applicable

Reported By: Cherie Windholz Approved By: Mark Dymerski

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Volatile Organics
Appendix IX List
Method 8240

Client Name: Sparton Technology Inc.
Client ID: MW-37 Groundwater
Lab ID: 015435-0014-SA
Matrix: AQUEOUS Sampled: 14 JUN 91 Received: 15 JUN 91
Authorized: 15 JUN 91 Prepared: 16 JUN 91 Analyzed: 25 JUN 91

Parameter	Result	Units	Reporting Limit
Acetone	ND	ug/L	250
Acetonitrile	ND	ug/L	5000
Acrolein	ND	ug/L	2500
Acrylonitrile	ND	ug/L	2500
Allyl chloride	ND	ug/L	250
Benzene	ND	ug/L	120
Bromodichloromethane	ND	ug/L	120
Bromoform	ND	ug/L	120
Bromomethane	ND	ug/L	250
2-Butanone (MEK)	ND	ug/L	250
Carbon disulfide	ND	ug/L	120
Carbon tetrachloride	ND	ug/L	120
Chlorobenzene	ND	ug/L	120
Chloroethane	ND	ug/L	250
Chloroform	ND	ug/L	120
Chloromethane	ND	ug/L	250
Chloroprene	ND	ug/L	120
Dibromochloromethane	ND	ug/L	120
1,2-Dibromo-3-chloro-propane (DBCP)	ND	ug/L	250
1,2-Dibromoethane (EDB)	ND	ug/L	250
Dibromomethane	ND	ug/L	120
trans-1,4-Dichloro-2-butene	ND	ug/L	120
Dichlorodifluoromethane	ND	ug/L	500
1,1-Dichloroethane	ND	ug/L	120
1,2-Dichloroethane	ND	ug/L	120
1,1-Dichloroethene	ND	ug/L	120
1,2-Dichloroethene (total)	ND	ug/L	120
1,2-Dichloropropane	ND	ug/L	120
cis-1,3-Dichloropropene	ND	ug/L	120
trans-1,3-Dichloropropene	ND	ug/L	120
1,4-Dioxane	ND	ug/L	12000
Ethylbenzene	ND	ug/L	120
Ethyl methacrylate	ND	ug/L	500
Iodomethane	ND	ug/L	120
Isobutanol	ND	ug/L	5000
2-Hexanone	ND	ug/L	250
Methacrylonitrile	ND	ug/L	120
Methylene chloride	ND	ug/L	120

(continued on following page)

ND = Not detected
NA = Not applicable

Reported By: Cherie Windholz Approved By: Mark Dymerski

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Volatile Organics
Appendix IX List
Method 8240

Client Name: Sparton Technology Inc.
Client ID: MW-37 Groundwater
Lab ID: 015435-0014-SA
Matrix: AQUEOUS Sampled: 14 JUN 91 Received: 15 JUN 91
Authorized: 15 JUN 91 Prepared: 16 JUN 91 Analyzed: 25 JUN 91

Parameter	Result	Units	Reporting Limit
Methyl methacrylate	ND	ug/L	500
4-Methyl-2-pentanone (MIBK)	ND	ug/L	250
Propionitrile	ND	ug/L	120
Styrene	ND	ug/L	120
1,1,1,2-Tetrachloroethane	ND	ug/L	120
1,1,2,2-Tetrachloroethane	ND	ug/L	120
Tetrachloroethene	ND	ug/L	120
Toluene	ND	ug/L	120
1,1,1-Trichloroethane	ND	ug/L	120
1,1,2-Trichloroethane	ND	ug/L	120
Trichloroethene	2000	ug/L	120
Trichlorofluoromethane	ND	ug/L	120
1,2,3-Trichloropropane	ND	ug/L	120
Vinyl acetate	ND	ug/L	250
Vinyl chloride	ND	ug/L	250
Xylenes (total)	ND	ug/L	120

Surrogate	Recovery	
Toluene-d8	98	%
4-Bromofluorobenzene	99	%
1,2-Dichloroethane-d4	99	%

ND = Not detected
NA = Not applicable

Reported By: Cherie Windholz Approved By: Mark Dymerski

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Metals

Total Metals

Client Name: Sparton Technology Inc.
Client ID: MW-52 Groundwater
Lab ID: 015435-0001-SA
Matrix: AQUEOUS Sampled: 13 JUN 91 Received: 15 JUN 91
Authorized: 15 JUN 91 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Antimony	ND	mg/L	0.060	6010	17 JUN 91	19 JUN 91
Arsenic	0.0067	mg/L	0.0050	7060	17 JUN 91	18 JUN 91
Barium	0.038	mg/L	0.010	6010	17 JUN 91	19 JUN 91
Beryllium	ND	mg/L	0.0020	6010	17 JUN 91	19 JUN 91
Cadmium	ND	mg/L	0.0050	6010	17 JUN 91	19 JUN 91
Chromium	ND	mg/L	0.010	6010	17 JUN 91	19 JUN 91
Cobalt	ND	mg/L	0.010	6010	17 JUN 91	19 JUN 91
Copper	ND	mg/L	0.029	6010	17 JUN 91	19 JUN 91
Lead	ND	mg/L	0.0050	7421	17 JUN 91	18 JUN 91
Mercury	ND	mg/L	0.00020	7470	17 JUN 91	17 JUN 91
Nickel	ND	mg/L	0.040	6010	17 JUN 91	19 JUN 91
Selenium	ND	mg/L	0.0050	7740	17 JUN 91	19 JUN 91
Silver	ND	mg/L	0.010	6010	17 JUN 91	19 JUN 91
Thallium	ND	mg/L	0.010	7841	17 JUN 91	18 JUN 91
Tin	ND	mg/L	0.10	6010	17 JUN 91	19 JUN 91
Vanadium	0.012	mg/L	0.010	6010	17 JUN 91	19 JUN 91
Zinc	ND	mg/L	0.033	6010	17 JUN 91	19 JUN 91

ND = Not detected
NA = Not applicable

Reported By: Erik Natkin Approved By: Fred Velasquez

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Metals

Total Metals

Client Name: Sparton Technology Inc.
Client ID: MW-57 Groundwater
Lab ID: 015435-0002-SA
Matrix: AQUEOUS Sampled: 13 JUN 91 Received: 15 JUN 91
Authorized: 15 JUN 91 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Antimony	ND	mg/L	0.060	6010	17 JUN 91	19 JUN 91
Arsenic	0.0061	mg/L	0.0050	7060	17 JUN 91	18 JUN 91
Barium	0.15	mg/L	0.010	6010	17 JUN 91	19 JUN 91
Beryllium	ND	mg/L	0.0020	6010	17 JUN 91	19 JUN 91
Cadmium	ND	mg/L	0.0050	6010	17 JUN 91	19 JUN 91
Chromium	0.044	mg/L	0.010	6010	17 JUN 91	19 JUN 91
Cobalt	ND	mg/L	0.010	6010	17 JUN 91	19 JUN 91
Copper	ND	mg/L	0.029	6010	17 JUN 91	19 JUN 91
Lead	0.029	mg/L	0.010	7421	17 JUN 91	18 JUN 91
Mercury	ND	mg/L	0.00020	7470	17 JUN 91	17 JUN 91
Nickel	ND	mg/L	0.040	6010	17 JUN 91	19 JUN 91
Selenium	ND	mg/L	0.0050	7740	17 JUN 91	19 JUN 91
Silver	ND	mg/L	0.010	6010	17 JUN 91	19 JUN 91
Thallium	ND	mg/L	0.010	7841	17 JUN 91	18 JUN 91
Tin	ND	mg/L	0.10	6010	17 JUN 91	19 JUN 91
Vanadium	0.013	mg/L	0.010	6010	17 JUN 91	19 JUN 91
Zinc	0.60	mg/L	0.033	6010	17 JUN 91	19 JUN 91

ND = Not detected
NA = Not applicable

Reported By: Erik Natkin Approved By: Fred Velasquez

Enseco
A Corning Company

Metals

Total Metals

Client Name: Sparton Technology Inc.
Client ID: MW-64 Groundwater
Lab ID: 015435-0003-SA
Matrix: AQUEOUS Sampled: 13 JUN 91 Received: 15 JUN 91
Authorized: 15 JUN 91 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Antimony	ND	mg/L	0.060	6010	17 JUN 91	19 JUN 91
Arsenic	ND	mg/L	0.010	7060	17 JUN 91	18 JUN 91
Barium	0.046	mg/L	0.010	6010	17 JUN 91	19 JUN 91
Beryllium	ND	mg/L	0.0020	6010	17 JUN 91	19 JUN 91
Cadmium	ND	mg/L	0.0050	6010	17 JUN 91	19 JUN 91
Chromium	ND	mg/L	0.010	6010	17 JUN 91	19 JUN 91
Cobalt	ND	mg/L	0.010	6010	17 JUN 91	19 JUN 91
Copper	ND	mg/L	0.029	6010	17 JUN 91	19 JUN 91
Lead	ND	mg/L	0.0050	7421	17 JUN 91	18 JUN 91
Mercury	ND	mg/L	0.00020	7470	17 JUN 91	17 JUN 91
Nickel	ND	mg/L	0.040	6010	17 JUN 91	19 JUN 91
Selenium	ND	mg/L	0.0050	7740	17 JUN 91	19 JUN 91
Silver	ND	mg/L	0.010	6010	17 JUN 91	19 JUN 91
Thallium	ND	mg/L	0.010	7841	17 JUN 91	18 JUN 91
Tin	ND	mg/L	0.10	6010	17 JUN 91	19 JUN 91
Vanadium	ND	mg/L	0.010	6010	17 JUN 91	19 JUN 91
Zinc	ND	mg/L	0.033	6010	17 JUN 91	19 JUN 91

ND = Not detected
NA = Not applicable

Reported By: Erik Natkin Approved By: Fred Velasquez

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Metals

Total Metals

Client Name: Sparton Technology Inc.
Client ID: MW-46 Groundwater
Lab ID: 015435-0004-SA
Matrix: AQUEOUS Sampled: 13 JUN 91 Received: 15 JUN 91
Authorized: 15 JUN 91 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Antimony	ND	mg/L	0.060	6010	17 JUN 91	19 JUN 91
Arsenic	ND	mg/L	0.010	7060	17 JUN 91	18 JUN 91
Barium	0.075	mg/L	0.010	6010	17 JUN 91	19 JUN 91
Beryllium	ND	mg/L	0.0020	6010	17 JUN 91	19 JUN 91
Cadmium	ND	mg/L	0.0050	6010	17 JUN 91	19 JUN 91
Chromium	0.34	mg/L	0.010	6010	17 JUN 91	19 JUN 91
Cobalt	ND	mg/L	0.010	6010	17 JUN 91	19 JUN 91
Copper	ND	mg/L	0.029	6010	17 JUN 91	19 JUN 91
Lead	ND	mg/L	0.0050	7421	17 JUN 91	18 JUN 91
Mercury	ND	mg/L	0.00020	7470	17 JUN 91	17 JUN 91
Nickel	ND	mg/L	0.040	6010	17 JUN 91	19 JUN 91
Selenium	ND	mg/L	0.0050	7740	17 JUN 91	19 JUN 91
Silver	ND	mg/L	0.010	6010	17 JUN 91	19 JUN 91
Thallium	ND	mg/L	0.010	7841	17 JUN 91	18 JUN 91
Tin	ND	mg/L	0.10	6010	17 JUN 91	19 JUN 91
Vanadium	ND	mg/L	0.010	6010	17 JUN 91	19 JUN 91
Zinc	0.048	mg/L	0.033	6010	17 JUN 91	19 JUN 91

ND = Not detected
NA = Not applicable

Reported By: Erik Natkin Approved By: Fred Velasquez

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Metals

Total Metals

Client Name: Sparton Technology Inc.
Client ID: MW-45 Groundwater
Lab ID: 015435-0005-SA
Matrix: AQUEOUS Sampled: 13 JUN 91 Received: 15 JUN 91
Authorized: 15 JUN 91 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Antimony	ND	mg/L	0.060	6010	17 JUN 91	19 JUN 91
Arsenic	ND	mg/L	0.010	7060	17 JUN 91	18 JUN 91
Barium	0.047	mg/L	0.010	6010	17 JUN 91	19 JUN 91
Beryllium	ND	mg/L	0.0020	6010	17 JUN 91	19 JUN 91
Cadmium	ND	mg/L	0.0050	6010	17 JUN 91	19 JUN 91
Chromium	0.16	mg/L	0.010	6010	17 JUN 91	19 JUN 91
Cobalt	ND	mg/L	0.010	6010	17 JUN 91	19 JUN 91
Copper	ND	mg/L	0.029	6010	17 JUN 91	19 JUN 91
Lead	ND	mg/L	0.0050	7421	17 JUN 91	18 JUN 91
Mercury	ND	mg/L	0.00020	7470	17 JUN 91	17 JUN 91
Nickel	ND	mg/L	0.040	6010	17 JUN 91	19 JUN 91
Selenium	ND	mg/L	0.0050	7740	17 JUN 91	19 JUN 91
Silver	ND	mg/L	0.010	6010	17 JUN 91	19 JUN 91
Thallium	ND	mg/L	0.010	7841	17 JUN 91	18 JUN 91
Tin	ND	mg/L	0.10	6010	17 JUN 91	19 JUN 91
Vanadium	ND	mg/L	0.010	6010	17 JUN 91	19 JUN 91
Zinc	ND	mg/L	0.033	6010	17 JUN 91	19 JUN 91

ND = Not detected
NA = Not applicable

Reported By: Erik Natkin Approved By: Fred Velasquez

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Metals

Total Metals

Client Name: Sparton Technology Inc.
Client ID: MW-36 Groundwater
Lab ID: 015435-0006-SA
Matrix: AQUEOUS Sampled: 13 JUN 91 Received: 15 JUN 91
Authorized: 15 JUN 91 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Antimony	ND	mg/L	0.060	6010	17 JUN 91	19 JUN 91
Arsenic	ND	mg/L	0.020	7060	17 JUN 91	18 JUN 91
Barium	0.066	mg/L	0.010	6010	17 JUN 91	19 JUN 91
Beryllium	ND	mg/L	0.0020	6010	17 JUN 91	19 JUN 91
Cadmium	ND	mg/L	0.0050	6010	17 JUN 91	19 JUN 91
Chromium	0.077	mg/L	0.010	6010	17 JUN 91	19 JUN 91
Cobalt	ND	mg/L	0.010	6010	17 JUN 91	19 JUN 91
Copper	ND	mg/L	0.029	6010	17 JUN 91	19 JUN 91
Lead	ND	mg/L	0.0050	7421	17 JUN 91	18 JUN 91
Mercury	ND	mg/L	0.00020	7470	17 JUN 91	17 JUN 91
Nickel	ND	mg/L	0.040	6010	17 JUN 91	19 JUN 91
Selenium	ND	mg/L	0.0050	7740	17 JUN 91	19 JUN 91
Silver	ND	mg/L	0.010	6010	17 JUN 91	19 JUN 91
Thallium	ND	mg/L	0.020	7841	17 JUN 91	18 JUN 91
Tin	ND	mg/L	0.10	6010	17 JUN 91	19 JUN 91
Vanadium	ND	mg/L	0.010	6010	17 JUN 91	19 JUN 91
Zinc	ND	mg/L	0.033	6010	17 JUN 91	19 JUN 91

ND = Not detected
NA = Not applicable

Reported By: Erik Natkin Approved By: Fred Velasquez

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Metals

Total Metals

Client Name: Sparton Technology Inc.
Client ID: MW-44 Groundwater
Lab ID: 015435-0007-SA
Matrix: AQUEOUS Sampled: 14 JUN 91 Received: 15 JUN 91
Authorized: 15 JUN 91 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Antimony	ND	mg/L	0.060	6010	17 JUN 91	19 JUN 91
Arsenic	ND	mg/L	0.010	7060	17 JUN 91	18 JUN 91
Barium	0.10	mg/L	0.010	6010	17 JUN 91	19 JUN 91
Beryllium	ND	mg/L	0.0020	6010	17 JUN 91	19 JUN 91
Cadmium	ND	mg/L	0.0050	6010	17 JUN 91	19 JUN 91
Chromium	ND	mg/L	0.010	6010	17 JUN 91	19 JUN 91
Cobalt	ND	mg/L	0.010	6010	17 JUN 91	19 JUN 91
Copper	ND	mg/L	0.029	6010	17 JUN 91	19 JUN 91
Lead	ND	mg/L	0.0050	7421	17 JUN 91	18 JUN 91
Mercury	ND	mg/L	0.00020	7470	17 JUN 91	17 JUN 91
Nickel	ND	mg/L	0.040	6010	17 JUN 91	19 JUN 91
Selenium	ND	mg/L	0.0050	7740	17 JUN 91	19 JUN 91
Silver	ND	mg/L	0.010	6010	17 JUN 91	19 JUN 91
Thallium	ND	mg/L	0.020	7841	17 JUN 91	18 JUN 91
Tin	ND	mg/L	0.10	6010	17 JUN 91	19 JUN 91
Vanadium	ND	mg/L	0.010	6010	17 JUN 91	19 JUN 91
Zinc	ND	mg/L	0.033	6010	17 JUN 91	19 JUN 91

ND = Not detected
NA = Not applicable

Reported By: Erik Natkin Approved By: Fred Velasquez

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Metals

Total Metals

Client Name: Sparton Technology Inc.
Client ID: MW-35 Groundwater
Lab ID: 015435-0008-SA
Matrix: AQUEOUS Sampled: 14 JUN 91 Received: 15 JUN 91
Authorized: 15 JUN 91 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Antimony	ND	mg/L	0.060	6010	17 JUN 91	19 JUN 91
Arsenic	ND	mg/L	0.010	7060	17 JUN 91	18 JUN 91
Barium	0.063	mg/L	0.010	6010	17 JUN 91	19 JUN 91
Beryllium	ND	mg/L	0.0020	6010	17 JUN 91	19 JUN 91
Cadmium	0.0052	mg/L	0.0050	6010	17 JUN 91	19 JUN 91
Chromium	ND	mg/L	0.010	6010	17 JUN 91	19 JUN 91
Cobalt	ND	mg/L	0.010	6010	17 JUN 91	19 JUN 91
Copper	ND	mg/L	0.029	6010	17 JUN 91	19 JUN 91
Lead	ND	mg/L	0.0050	7421	17 JUN 91	18 JUN 91
Mercury	ND	mg/L	0.00020	7470	17 JUN 91	17 JUN 91
Nickel	ND	mg/L	0.040	6010	17 JUN 91	19 JUN 91
Selenium	ND	mg/L	0.010	7740	17 JUN 91	19 JUN 91
Silver	ND	mg/L	0.010	6010	17 JUN 91	19 JUN 91
Thallium	ND	mg/L	0.025	7841	17 JUN 91	18 JUN 91
Tin	ND	mg/L	0.10	6010	17 JUN 91	19 JUN 91
Vanadium	ND	mg/L	0.010	6010	17 JUN 91	19 JUN 91
Zinc	ND	mg/L	0.033	6010	17 JUN 91	19 JUN 91

ND = Not detected
NA = Not applicable

Reported By: Erik Natkin Approved By: Fred Velasquez

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Metals

Total Metals

Client Name: Sparton Technology Inc.
Client ID: MW-63 Groundwater
Lab ID: 015435-0009-SA
Matrix: AQUEOUS Sampled: 14 JUN 91 Received: 15 JUN 91
Authorized: 15 JUN 91 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Antimony	ND	mg/L	0.060	6010	17 JUN 91	19 JUN 91
Arsenic	ND	mg/L	0.010	7060	17 JUN 91	18 JUN 91
Barium	0.053	mg/L	0.010	6010	17 JUN 91	19 JUN 91
Beryllium	ND	mg/L	0.0020	6010	17 JUN 91	19 JUN 91
Cadmium	ND	mg/L	0.0050	6010	17 JUN 91	19 JUN 91
Chromium	ND	mg/L	0.010	6010	17 JUN 91	19 JUN 91
Cobalt	ND	mg/L	0.010	6010	17 JUN 91	19 JUN 91
Copper	ND	mg/L	0.029	6010	17 JUN 91	19 JUN 91
Lead	ND	mg/L	0.0050	7421	17 JUN 91	18 JUN 91
Mercury	ND	mg/L	0.00020	7470	17 JUN 91	17 JUN 91
Nickel	ND	mg/L	0.040	6010	17 JUN 91	19 JUN 91
Selenium	ND	mg/L	0.0050	7740	17 JUN 91	19 JUN 91
Silver	ND	mg/L	0.010	6010	17 JUN 91	19 JUN 91
Thallium	ND	mg/L	0.010	7841	17 JUN 91	18 JUN 91
Tin	ND	mg/L	0.10	6010	17 JUN 91	19 JUN 91
Vanadium	ND	mg/L	0.010	6010	17 JUN 91	19 JUN 91
Zinc	ND	mg/L	0.033	6010	17 JUN 91	19 JUN 91

ND = Not detected
NA = Not applicable

Reported By: Erik Natkin Approved By: Fred Velasquez

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A Corning Company

Metals

Total Metals

Client Name: Sparton Technology Inc.
Client ID: MW-34 Groundwater
Lab ID: 015435-0010-SA
Matrix: AQUEOUS Sampled: 14 JUN 91 Received: 15 JUN 91
Authorized: 15 JUN 91 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Antimony	ND	mg/L	0.060	6010	17 JUN 91	19 JUN 91
Arsenic	ND	mg/L	0.010	7060	17 JUN 91	18 JUN 91
Barium	0.10	mg/L	0.010	6010	17 JUN 91	19 JUN 91
Beryllium	ND	mg/L	0.0020	6010	17 JUN 91	19 JUN 91
Cadmium	ND	mg/L	0.0050	6010	17 JUN 91	19 JUN 91
Chromium	ND	mg/L	0.010	6010	17 JUN 91	19 JUN 91
Cobalt	ND	mg/L	0.010	6010	17 JUN 91	19 JUN 91
Copper	ND	mg/L	0.029	6010	17 JUN 91	19 JUN 91
Lead	ND	mg/L	0.0050	7421	17 JUN 91	18 JUN 91
Mercury	ND	mg/L	0.00020	7470	17 JUN 91	17 JUN 91
Nickel	ND	mg/L	0.040	6010	17 JUN 91	19 JUN 91
Selenium	ND	mg/L	0.0050	7740	17 JUN 91	19 JUN 91
Silver	ND	mg/L	0.010	6010	17 JUN 91	19 JUN 91
Thallium	ND	mg/L	0.010	7841	17 JUN 91	18 JUN 91
Tin	ND	mg/L	0.10	6010	17 JUN 91	19 JUN 91
Vanadium	ND	mg/L	0.010	6010	17 JUN 91	19 JUN 91
Zinc	ND	mg/L	0.033	6010	17 JUN 91	19 JUN 91

ND = Not detected
NA = Not applicable

Reported By: Erik Natkin Approved By: Fred Velasquez

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Metals

Total Metals

Client Name: Sparton Technology Inc.
Client ID: MW-51 Groundwater
Lab ID: 015435-0011-SA
Matrix: AQUEOUS Sampled: 14 JUN 91 Received: 15 JUN 91
Authorized: 15 JUN 91 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Antimony	ND	mg/L	0.060	6010	17 JUN 91	19 JUN 91
Arsenic	ND	mg/L	0.010	7060	17 JUN 91	18 JUN 91
Barium	0.12	mg/L	0.010	6010	17 JUN 91	19 JUN 91
Beryllium	ND	mg/L	0.0020	6010	17 JUN 91	19 JUN 91
Cadmium	ND	mg/L	0.0050	6010	17 JUN 91	19 JUN 91
Chromium	ND	mg/L	0.010	6010	17 JUN 91	19 JUN 91
Cobalt	ND	mg/L	0.010	6010	17 JUN 91	19 JUN 91
Copper	ND	mg/L	0.029	6010	17 JUN 91	19 JUN 91
Lead	0.0062	mg/L	0.0050	7421	17 JUN 91	18 JUN 91
Mercury	ND	mg/L	0.00020	7470	17 JUN 91	17 JUN 91
Nickel	ND	mg/L	0.040	6010	17 JUN 91	19 JUN 91
Selenium	ND	mg/L	0.0050	7740	17 JUN 91	19 JUN 91
Silver	ND	mg/L	0.010	6010	17 JUN 91	19 JUN 91
Thallium	ND	mg/L	0.010	7841	17 JUN 91	18 JUN 91
Tin	ND	mg/L	0.10	6010	17 JUN 91	19 JUN 91
Vanadium	ND	mg/L	0.010	6010	17 JUN 91	19 JUN 91
Zinc	ND	mg/L	0.033	6010	17 JUN 91	19 JUN 91

ND = Not detected
NA = Not applicable

Reported By: Erik Natkin Approved By: Fred Velasquez

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Metals

Total Metals

Client Name: Sparton Technology Inc.
Client ID: MW-59 Groundwater
Lab ID: 015435-0012-SA
Matrix: AQUEOUS Sampled: 14 JUN 91 Received: 15 JUN 91
Authorized: 15 JUN 91 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Antimony	ND	mg/L	0.060	6010	17 JUN 91	19 JUN 91
Arsenic	ND	mg/L	0.010	7060	17 JUN 91	18 JUN 91
Barium	0.070	mg/L	0.010	6010	17 JUN 91	19 JUN 91
Beryllium	ND	mg/L	0.0020	6010	17 JUN 91	19 JUN 91
Cadmium	ND	mg/L	0.0050	6010	17 JUN 91	19 JUN 91
Chromium	ND	mg/L	0.010	6010	17 JUN 91	19 JUN 91
Cobalt	ND	mg/L	0.010	6010	17 JUN 91	19 JUN 91
Copper	ND	mg/L	0.029	6010	17 JUN 91	19 JUN 91
Lead	ND	mg/L	0.0050	7421	17 JUN 91	18 JUN 91
Mercury	ND	mg/L	0.00020	7470	17 JUN 91	17 JUN 91
Nickel	ND	mg/L	0.040	6010	17 JUN 91	19 JUN 91
Selenium	ND	mg/L	0.0050	7740	17 JUN 91	19 JUN 91
Silver	ND	mg/L	0.010	6010	17 JUN 91	19 JUN 91
Thallium	ND	mg/L	0.020	7841	17 JUN 91	18 JUN 91
Tin	ND	mg/L	0.10	6010	17 JUN 91	19 JUN 91
Vanadium	ND	mg/L	0.010	6010	17 JUN 91	19 JUN 91
Zinc	ND	mg/L	0.033	6010	17 JUN 91	19 JUN 91

ND = Not detected
NA = Not applicable

Reported By: Erik Natkin Approved By: Fred Velasquez

Enseco
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Metals

Total Metals

Client Name: Sparton Technology Inc.
Client ID: MW-42 Groundwater
Lab ID: 015435-0013-SA
Matrix: AQUEOUS Sampled: 14 JUN 91 Received: 15 JUN 91
Authorized: 15 JUN 91 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Antimony	ND	mg/L	0.060	6010	17 JUN 91	19 JUN 91
Arsenic	ND	mg/L	0.010	7060	17 JUN 91	18 JUN 91
Barium	0.056	mg/L	0.010	6010	17 JUN 91	19 JUN 91
Beryllium	ND	mg/L	0.0020	6010	17 JUN 91	19 JUN 91
Cadmium	ND	mg/L	0.0050	6010	17 JUN 91	19 JUN 91
Chromium	ND	mg/L	0.010	6010	17 JUN 91	19 JUN 91
Cobalt	ND	mg/L	0.010	6010	17 JUN 91	19 JUN 91
Copper	ND	mg/L	0.029	6010	17 JUN 91	19 JUN 91
Lead	ND	mg/L	0.0050	7421	17 JUN 91	18 JUN 91
Mercury	ND	mg/L	0.00020	7470	17 JUN 91	17 JUN 91
Nickel	ND	mg/L	0.040	6010	17 JUN 91	19 JUN 91
Selenium	ND	mg/L	0.0050	7740	17 JUN 91	19 JUN 91
Silver	ND	mg/L	0.010	6010	17 JUN 91	19 JUN 91
Thallium	ND	mg/L	0.010	7841	17 JUN 91	18 JUN 91
Tin	ND	mg/L	0.10	6010	17 JUN 91	19 JUN 91
Vanadium	ND	mg/L	0.010	6010	17 JUN 91	19 JUN 91
Zinc	ND	mg/L	0.033	6010	17 JUN 91	19 JUN 91

ND = Not detected
NA = Not applicable

Reported By: Erik Natkin Approved By: Fred Velasquez

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Metals

Total Metals

Client Name: Sparton Technology Inc.
Client ID: MW-37 Groundwater
Lab ID: 015435-0014-SA
Matrix: AQUEOUS Sampled: 14 JUN 91 Received: 15 JUN 91
Authorized: 15 JUN 91 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Antimony	ND	mg/L	0.060	6010	17 JUN 91	19 JUN 91
Arsenic	0.011	mg/L	0.0050	7060	17 JUN 91	18 JUN 91
Barium	0.046	mg/L	0.010	6010	17 JUN 91	19 JUN 91
Beryllium	ND	mg/L	0.0020	6010	17 JUN 91	19 JUN 91
Cadmium	ND	mg/L	0.0050	6010	17 JUN 91	19 JUN 91
Chromium	ND	mg/L	0.010	6010	17 JUN 91	19 JUN 91
Cobalt	ND	mg/L	0.010	6010	17 JUN 91	19 JUN 91
Copper	ND	mg/L	0.029	6010	17 JUN 91	19 JUN 91
Lead	ND	mg/L	0.010	7421	17 JUN 91	18 JUN 91
Mercury	ND	mg/L	0.00020	7470	17 JUN 91	17 JUN 91
Nickel	ND	mg/L	0.040	6010	17 JUN 91	19 JUN 91
Selenium	ND	mg/L	0.0050	7740	17 JUN 91	19 JUN 91
Silver	ND	mg/L	0.010	6010	17 JUN 91	19 JUN 91
Thallium	ND	mg/L	0.0050	7841	17 JUN 91	18 JUN 91
Tin	ND	mg/L	0.10	6010	17 JUN 91	19 JUN 91
Vanadium	0.011	mg/L	0.010	6010	17 JUN 91	19 JUN 91
Zinc	ND	mg/L	0.033	6010	17 JUN 91	19 JUN 91

ND = Not detected
NA = Not applicable

Reported By: Erik Natkin Approved By: Fred Velasquez

Quality Control Results

The Enseco laboratories operate under a vigorous QA/QC program designed to ensure the generation of scientifically valid, legally defensible data by monitoring every aspect of laboratory operations. Routine QA/QC procedures include the use of approved methodologies, independent verification of analytical standards, use of duplicate Laboratory Control Samples to assess the precision and accuracy of the methodology on a routine basis, and a rigorous system of data review.

In addition, the Enseco laboratories maintain a comprehensive set of certifications from both state and federal governmental agencies which require frequent analyses of blind audit samples. Enseco - Rocky Mountain Analytical Laboratory is certified by the EPA under the EPA/CLP program for both Organic and Inorganic analyses, under the USATHAMA (U.S. Army) program, by the Army Corps of Engineers, and the states of Colorado, New Jersey, New York, Utah, and Florida, among others.

The standard laboratory QC package is designed to:

1) establish a strong, cost-effective QC program that ensures the generation of scientifically valid, legally defensible data

2) assess the laboratory's performance of the analytical method using control limits generated with a well-defined matrix

3) establish clear-cut guidelines for acceptability of analytical data so that QC decisions can be made immediately at the bench, and

4) provide a standard set of reportables which assures the client of the quality of his data.

The Enseco QC program is based upon monitoring the precision and accuracy of an analytical method by analyzing a set of Duplicate Control Samples (DCS) at frequent, well-defined intervals. Each DCS is a well-characterized matrix which is spiked with target compounds at 5-100 times the reporting limit, depending upon the methodology being monitored. The purpose of the DCS is not to duplicate the sample matrix, but rather to provide an interference-free, homogeneous matrix from which to gather data to establish control limits. These limits are used to determine whether data generated by the laboratory on any given day is in control.

Control limits for accuracy (percent recovery) are based on the average, historical percent recovery +/- 3 standard deviation units. Control limits for precision (relative percent difference) range from 0 (identical duplicate DCS results) to the average, historical relative percent difference + 3 standard deviation units. These control limits are fairly narrow based on the consistency of the matrix being monitored and are updated on a quarterly basis.

For each batch of samples analyzed, an additional control measure is taken in the form of a Single Control Sample (SCS). The SCS consists of a control matrix that is spiked with either representative target compounds or surrogate compounds appropriate to the method being used. An SCS is prepared for each sample lot for which the DCS pair are not analyzed.

Accuracy for DCS and SCS is measured by Percent Recovery.

$$\% \text{ Recovery} = \frac{\text{Measured Concentration}}{\text{Actual Concentration}} \times 100$$

Precision for DCS is measured by Relative Percent Difference (RPD).

$$\text{RPD} = \frac{|\text{Measured Concentration DCS1} - \text{Measured Concentration DCS2}|}{(\text{Measured Concentration DCS1} + \text{Measured Concentration DCS2})/2} \times 100$$

All samples analyzed concurrently by the same test are assigned the same QC lot number. Projects which contain numerous samples, analyzed over several days, may have multiple QC lot numbers associated with each test. The QC information which follows includes a listing of the QC lot numbers associated with each of the samples reported, DCS and SCS (where applicable) recoveries from the QC lots associated with the samples, and control limits for these lots. The QC data is reported by test code, in the order that the tests are reported in the analytical results section of this report.

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ΩC LOT ASSIGNMENT REPORT
latile Organics by GC/MS

Laboratory Sample Number	QC Matrix	QC Category	QC Lot Number (DCS)	QC Run Number (SCS/BLANK)
015435-0001-SA	AQUEOUS	624-A	17 JUN 91-F	18 JUN 91-F
015435-0002-SA	AQUEOUS	624-A	17 JUN 91-F	18 JUN 91-F
015435-0003-SA	AQUEOUS	624-A	17 JUN 91-F	18 JUN 91-F
015435-0004-SA	AQUEOUS	624-A	17 JUN 91-F	18 JUN 91-F
015435-0005-SA	AQUEOUS	624-A	17 JUN 91-F	18 JUN 91-F
015435-0006-SA	AQUEOUS	624-A	17 JUN 91-F	18 JUN 91-F
015435-0007-SA	AQUEOUS	624-A	17 JUN 91-F	18 JUN 91-F
015435-0008-SA	AQUEOUS	624-A	17 JUN 91-F	20 JUN 91-F
015435-0009-SA	AQUEOUS	624-A	17 JUN 91-F	20 JUN 91-F
015435-0010-SA	AQUEOUS	624-A	17 JUN 91-F	20 JUN 91-F
015435-0011-SA	AQUEOUS	624-A	17 JUN 91-F	20 JUN 91-F
015435-0012-SA	AQUEOUS	624-A	19 JUN 91-B	25 JUN 91-B
015435-0013-SA	AQUEOUS	624-A	19 JUN 91-B	25 JUN 91-B
015435-0014-SA	AQUEOUS	624-A	19 JUN 91-B	25 JUN 91-B

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DUPLICATE CONTROL SAMPLE REPORT
Volatile Organics by GC/MS

Analyte	Concentration Spiked	Measured DCS1	Measured DCS2	Measured AVG	Accuracy Average(%) DCS	Accuracy Limits	Precisio (RPD) DCS	Lim
Category: 624-A Matrix: AQUEOUS QC Lot: 17 JUN 91-F Concentration Units: ug/L								
1,1-Dichloroethene	50	56.5	59.2	57.8	116	61-145	4.7	
Trichloroethene	50	49.9	50.5	50.2	100	71-120	1.2	
Benzene	50	48.7	48.4	48.6	97	76-127	0.6	
Toluene	50	50.0	52.4	51.2	102	76-125	4.7	
Chlorobenzene	50	51.6	54.8	53.2	106	75-130	6.0	
Category: 624-A Matrix: AQUEOUS QC Lot: 19 JUN 91-B Concentration Units: ug/L								
1,1-Dichloroethene	50	58.2	56.7	57.4	115	61-145	2.6	
Trichloroethene	50	47.5	44.1	45.8	92	71-120	7.4	
Benzene	50	52.2	57.6	54.9	110	76-127	9.8	
Toluene	50	54.9	52.9	53.9	108	76-125	3.7	
ılorobenzene	50	51.7	51.2	51.4	103	75-130	1.0	

Calculations are performed before rounding to avoid round-off errors in calculated results.

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SINGLE CONTROL SAMPLE REPORT
Volatile Organics by GC/MS

Analyte	Concentration Spiked	Concentration Measured	Accuracy(%) SCS	Accuracy(%) Limits
Category: 624-A				
Matrix: AQUEOUS				
QC Lot: 17 JUN 91-F QC Run: 18 JUN 91-F				
Concentration Units: ug/L				
1,2-Dichloroethane-d4	50.0	43.3	87	76-114
4-Bromofluorobenzene	50.0	50.5	101	86-115
Toluene-d8	50.0	52.9	106	88-110
Category: 624-A				
Matrix: AQUEOUS				
QC Lot: 17 JUN 91-F QC Run: 20 JUN 91-F				
Concentration Units: ug/L				
1,2-Dichloroethane-d4	50.0	47.4	95	76-114
4-Bromofluorobenzene	50.0	50.0	100	86-115
Toluene-d8	50.0	51.9	104	88-110
Category: 624-A				
Matrix: AQUEOUS				
QC Lot: 19 JUN 91-B QC Run: 25 JUN 91-B				
Concentration Units: ug/L				
1,2-Dichloroethane-d4	50.0	48.2	96	76-114
4-Bromofluorobenzene	50.0	49.3	99	86-115
Toluene-d8	50.0	46.4	93	88-110

Calculations are performed before rounding to avoid round-off errors in calculated results.

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METHOD BLANK REPORT
Volatile Organics by GC/MS

Test: 8240CP-AP9-AP
Matrix: AQUEOUS
QC Lot: 17 JUN 91-F QC Run: 18 JUN 91-F

Analyte	Result	Units	Reporting Limit
Acetone	ND	ug/L	10
Acetonitrile	ND	ug/L	200
Acrolein	ND	ug/L	100
Acrylonitrile	ND	ug/L	100
Allyl chloride	ND	ug/L	10
Benzene	ND	ug/L	5.0
Bromodichloromethane	ND	ug/L	5.0
Bromoform	ND	ug/L	5.0
Bromomethane	ND	ug/L	10
2-Butanone (MEK)	ND	ug/L	10
Carbon disulfide	ND	ug/L	5.0
Carbon tetrachloride	ND	ug/L	5.0
Chlorobenzene	ND	ug/L	5.0
Chloroethane	ND	ug/L	10
Chloroform	ND	ug/L	5.0
Chloromethane	ND	ug/L	10
Chloroprene	ND	ug/L	5.0
Dibromochloromethane	ND	ug/L	5.0
1,2-Dibromo-3-chloro-propane (DBCP)	ND	ug/L	10
1,2-Dibromoethane (EDB)	ND	ug/L	10
Dibromomethane	ND	ug/L	5.0
trans-1,4-Dichloro-2-butene	ND	ug/L	5.0
Dichlorodifluoromethane	ND	ug/L	20
1,1-Dichloroethane	ND	ug/L	5.0
1,2-Dichloroethane	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	5.0
1,2-Dichloroethene (total)	ND	ug/L	5.0
1,2-Dichloropropane	ND	ug/L	5.0
cis-1,3-Dichloropropene	ND	ug/L	5.0
trans-1,3-Dichloropropene	ND	ug/L	5.0
1,4-Dioxane	ND	ug/L	500
Ethylbenzene	ND	ug/L	5.0
Ethyl methacrylate	ND	ug/L	20
Iodomethane	ND	ug/L	5.0
Isobutanol	ND	ug/L	200
2-Hexanone	ND	ug/L	10
Methacrylonitrile	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0

METHOD BLANK REPORT
Volatile Organics by GC/MS (cont.)

Test: 8240CP-AP9-AP
Matrix: AQUEOUS
QC Lot: 17 JUN 91-F QC Run: 20 JUN 91-F

Analyte	Result	Units	Reporting Limit
1,2-Dibromo-3-chloro-propane (DBCP)	ND	ug/L	10
1,2-Dibromoethane (EDB)	ND	ug/L	10
Dibromomethane	ND	ug/L	5.0
trans-1,4-Dichloro-2-butene	ND	ug/L	5.0
Dichlorodifluoromethane	ND	ug/L	20
1,1-Dichloroethane	ND	ug/L	5.0
1,2-Dichloroethane	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	5.0
1,2-Dichloroethene (total)	ND	ug/L	5.0
1,2-Dichloropropane	ND	ug/L	5.0
cis-1,3-Dichloropropene	ND	ug/L	5.0
trans-1,3-Dichloropropene	ND	ug/L	5.0
1,4-Dioxane	ND	ug/L	500
Ethylbenzene	ND	ug/L	5.0
Ethyl methacrylate	ND	ug/L	20
Iodomethane	ND	ug/L	5.0
Isobutanol	ND	ug/L	200
2-Hexanone	ND	ug/L	10
Methacrylonitrile	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
Methyl methacrylate	ND	ug/L	20
4-Methyl-2-pentanone (MIBK)	ND	ug/L	10
Propionitrile	ND	ug/L	5.0
Styrene	ND	ug/L	5.0
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0
Tetrachloroethene	ND	ug/L	5.0
Toluene	ND	ug/L	5.0
1,1,1-Trichloroethane	ND	ug/L	5.0
1,1,2-Trichloroethane	ND	ug/L	5.0
Trichloroethene	ND	ug/L	5.0
Trichlorofluoromethane	ND	ug/L	5.0
1,2,3-Trichloropropane	ND	ug/L	5.0
Vinyl acetate	ND	ug/L	10
Vinyl chloride	ND	ug/L	10
Xylenes (total)	ND	ug/L	5.0

METHOD BLANK REPORT
Volatile Organics by GC/MS (cont.)

Analyte	Result	Units	Reporting Limit
Test: 8240CP-AP9-AP			
Matrix: AQUEOUS			
QC Lot: 17 JUN 91-F QC Run: 18 JUN 91-F			
Methyl methacrylate	ND	ug/L	20
4-Methyl-2-pentanone (MIBK)	ND	ug/L	10
Propionitrile	ND	ug/L	5.0
Styrene	ND	ug/L	5.0
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0
Tetrachloroethene	ND	ug/L	5.0
Toluene	ND	ug/L	5.0
1,1,1-Trichloroethane	ND	ug/L	5.0
1,1,2-Trichloroethane	ND	ug/L	5.0
Trichloroethene	ND	ug/L	5.0
Trichlorofluoromethane	ND	ug/L	5.0
1,2,3-Trichloropropane	ND	ug/L	5.0
Vinyl acetate	ND	ug/L	10
Vinyl chloride	ND	ug/L	10
Xylenes (total)	ND	ug/L	5.0
st: 8240CP-AP9-AP			
..atrix: AQUEOUS			
QC Lot: 17 JUN 91-F QC Run: 20 JUN 91-F			
Acetone	ND	ug/L	10
Acetonitrile	ND	ug/L	200
Acrolein	ND	ug/L	100
Acrylonitrile	ND	ug/L	100
Allyl chloride	ND	ug/L	10
Benzene	ND	ug/L	5.0
Bromodichloromethane	ND	ug/L	5.0
Bromoform	ND	ug/L	5.0
Bromomethane	ND	ug/L	10
2-Butanone (MEK)	ND	ug/L	10
Carbon disulfide	ND	ug/L	5.0
Carbon tetrachloride	ND	ug/L	5.0
Chlorobenzene	ND	ug/L	5.0
Chloroethane	ND	ug/L	10
Chloroform	ND	ug/L	5.0
Chloromethane	ND	ug/L	10
Chloroprene	ND	ug/L	5.0
Dibromochloromethane	ND	ug/L	5.0

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METHOD BLANK REPORT
Volatile Organics by GC/MS (cont.)

Test: 8240CP-AP9-AP
Matrix: AQUEOUS
QC Lot: 19 JUN 91-B QC Run: 25 JUN 91-B

Analyte	Result	Units	Reporting Limit
Acetone	28	ug/L	10
Acetonitrile	ND	ug/L	200
Acrolein	ND	ug/L	100
Acrylonitrile	ND	ug/L	100
Allyl chloride	ND	ug/L	10
Benzene	ND	ug/L	5.0
Bromodichloromethane	ND	ug/L	5.0
Bromoform	ND	ug/L	5.0
Bromomethane	ND	ug/L	10
2-Butanone (MEK)	ND	ug/L	10
Carbon disulfide	ND	ug/L	5.0
Carbon tetrachloride	ND	ug/L	5.0
Chlorobenzene	ND	ug/L	5.0
Chloroethane	ND	ug/L	10
Chloroform	ND	ug/L	5.0
Chloromethane	ND	ug/L	10
Chloroprene	ND	ug/L	5.0
Dibromochloromethane	ND	ug/L	5.0
2-Dibromo-3-chloro-propane (DBCP)	ND	ug/L	10
1,2-Dibromoethane (EDB)	ND	ug/L	10
Dibromomethane	ND	ug/L	5.0
trans-1,4-Dichloro-2-butene	ND	ug/L	5.0
Dichlorodifluoromethane	ND	ug/L	20
1,1-Dichloroethane	ND	ug/L	5.0
1,2-Dichloroethane	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	5.0
1,2-Dichloroethene (total)	ND	ug/L	5.0
1,2-Dichloropropane	ND	ug/L	5.0
cis-1,3-Dichloropropene	ND	ug/L	5.0
trans-1,3-Dichloropropene	ND	ug/L	5.0
1,4-Dioxane	ND	ug/L	500
Ethylbenzene	ND	ug/L	5.0
Ethyl methacrylate	ND	ug/L	20
Iodomethane	ND	ug/L	5.0
Isobutanol	ND	ug/L	200
2-Hexanone	ND	ug/L	10
Methacrylonitrile	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0

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METHOD BLANK REPORT
Volatile Organics by GC/MS (cont.)

Test: 8240CP-AP9-AP
Matrix: AQUEOUS
QC Lot: 19 JUN 91-B QC Run: 25 JUN 91-B

Analyte	Result	Units	Reporting Limit
Methyl methacrylate	ND	ug/L	20
4-Methyl-2-pentanone (MIBK)	ND	ug/L	10
Propionitrile	ND	ug/L	5.0
Styrene	ND	ug/L	5.0
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0
Tetrachloroethene	ND	ug/L	5.0
Toluene	ND	ug/L	5.0
1,1,1-Trichloroethane	ND	ug/L	5.0
1,1,2-Trichloroethane	ND	ug/L	5.0
Trichloroethene	ND	ug/L	5.0
Trichlorofluoromethane	ND	ug/L	5.0
1,2,3-Trichloropropane	ND	ug/L	5.0
Vinyl acetate	ND	ug/L	10
Vinyl chloride	ND	ug/L	10
Xylenes (total)	ND	ug/L	5.0

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QC LOT ASSIGNMENT REPORT
Metals Analysis and Preparation

Laboratory Sample Number	QC Matrix	QC Category	QC Lot Number (DCS)	QC Run Number (SCS/BLANK)
015435-0001-SA	AQUEOUS	ICP-AT	17 JUN 91-A	17 JUN 91-A
015435-0001-SA	AQUEOUS	HG-CVAA-AT	17 JUN 91-E	17 JUN 91-E
015435-0001-SA	AQUEOUS	AS-FAA-AT	17 JUN 91-A	17 JUN 91-A
015435-0001-SA	AQUEOUS	TL-FAA-AT	17 JUN 91-A	17 JUN 91-A
015435-0001-SA	AQUEOUS	SE-FAA-AT	17 JUN 91-A	17 JUN 91-A
015435-0001-SA	AQUEOUS	PB-FAA-AT	17 JUN 91-A	17 JUN 91-A
015435-0002-SA	AQUEOUS	ICP-AT	17 JUN 91-A	17 JUN 91-A
015435-0002-SA	AQUEOUS	HG-CVAA-AT	17 JUN 91-E	17 JUN 91-E
015435-0002-SA	AQUEOUS	AS-FAA-AT	17 JUN 91-A	17 JUN 91-A
015435-0002-SA	AQUEOUS	TL-FAA-AT	17 JUN 91-A	17 JUN 91-A
015435-0002-SA	AQUEOUS	SE-FAA-AT	17 JUN 91-A	17 JUN 91-A
015435-0002-SA	AQUEOUS	PB-FAA-AT	17 JUN 91-A	17 JUN 91-A
015435-0003-SA	AQUEOUS	ICP-AT	17 JUN 91-A	17 JUN 91-A
015435-0003-SA	AQUEOUS	HG-CVAA-AT	17 JUN 91-E	17 JUN 91-E
015435-0003-SA	AQUEOUS	AS-FAA-AT	17 JUN 91-A	17 JUN 91-A
015435-0003-SA	AQUEOUS	TL-FAA-AT	17 JUN 91-A	17 JUN 91-A
015435-0003-SA	AQUEOUS	SE-FAA-AT	17 JUN 91-A	17 JUN 91-A
015435-0003-SA	AQUEOUS	PB-FAA-AT	17 JUN 91-A	17 JUN 91-A
015435-0004-SA	AQUEOUS	ICP-AT	17 JUN 91-A	17 JUN 91-A
015435-0004-SA	AQUEOUS	HG-CVAA-AT	17 JUN 91-E	17 JUN 91-E
015435-0004-SA	AQUEOUS	AS-FAA-AT	17 JUN 91-A	17 JUN 91-A
015435-0004-SA	AQUEOUS	TL-FAA-AT	17 JUN 91-A	17 JUN 91-A
015435-0004-SA	AQUEOUS	SE-FAA-AT	17 JUN 91-A	17 JUN 91-A
015435-0004-SA	AQUEOUS	PB-FAA-AT	17 JUN 91-A	17 JUN 91-A
015435-0005-SA	AQUEOUS	ICP-AT	17 JUN 91-A	17 JUN 91-A
015435-0005-SA	AQUEOUS	HG-CVAA-AT	17 JUN 91-E	17 JUN 91-E
015435-0005-SA	AQUEOUS	AS-FAA-AT	17 JUN 91-A	17 JUN 91-A
015435-0005-SA	AQUEOUS	TL-FAA-AT	17 JUN 91-A	17 JUN 91-A
015435-0005-SA	AQUEOUS	SE-FAA-AT	17 JUN 91-A	17 JUN 91-A
015435-0005-SA	AQUEOUS	PB-FAA-AT	17 JUN 91-A	17 JUN 91-A
015435-0006-SA	AQUEOUS	ICP-AT	17 JUN 91-A	17 JUN 91-A
015435-0006-SA	AQUEOUS	HG-CVAA-AT	17 JUN 91-E	17 JUN 91-E
015435-0006-SA	AQUEOUS	AS-FAA-AT	17 JUN 91-A	17 JUN 91-A
015435-0006-SA	AQUEOUS	TL-FAA-AT	17 JUN 91-A	17 JUN 91-A
015435-0006-SA	AQUEOUS	SE-FAA-AT	17 JUN 91-A	17 JUN 91-A
015435-0006-SA	AQUEOUS	PB-FAA-AT	17 JUN 91-A	17 JUN 91-A
015435-0007-SA	AQUEOUS	ICP-AT	17 JUN 91-A	17 JUN 91-A
015435-0007-SA	AQUEOUS	HG-CVAA-AT	17 JUN 91-E	17 JUN 91-E
015435-0007-SA	AQUEOUS	AS-FAA-AT	17 JUN 91-A	17 JUN 91-A
015435-0007-SA	AQUEOUS	TL-FAA-AT	17 JUN 91-A	17 JUN 91-A
015435-0007-SA	AQUEOUS	SE-FAA-AT	17 JUN 91-A	17 JUN 91-A
015435-0007-SA	AQUEOUS	PB-FAA-AT	17 JUN 91-A	17 JUN 91-A
015435-0008-SA	AQUEOUS	ICP-AT	17 JUN 91-A	17 JUN 91-A
015435-0008-SA	AQUEOUS	HG-CVAA-AT	17 JUN 91-E	17 JUN 91-E
015435-0008-SA	AQUEOUS	AS-FAA-AT	17 JUN 91-A	17 JUN 91-A
015435-0008-SA	AQUEOUS	TL-FAA-AT	17 JUN 91-A	17 JUN 91-A
015435-0008-SA	AQUEOUS	SE-FAA-AT	17 JUN 91-A	17 JUN 91-A

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QC LOT ASSIGNMENT REPORT
Metals Analysis and Preparation (cont.)

Laboratory Sample Number	QC Matrix	QC Category	QC Lot Number (DCS)	QC Run Number (SCS/BLANK)
015435-0008-SA	AQUEOUS	PB-FAA-AT	17 JUN 91-A	17 JUN 91-A
015435-0009-SA	AQUEOUS	ICP-AT	17 JUN 91-A	17 JUN 91-A
015435-0009-SA	AQUEOUS	HG-CVAA-AT	17 JUN 91-E	17 JUN 91-E
015435-0009-SA	AQUEOUS	AS-FAA-AT	17 JUN 91-A	17 JUN 91-A
015435-0009-SA	AQUEOUS	TL-FAA-AT	17 JUN 91-A	17 JUN 91-A
015435-0009-SA	AQUEOUS	SE-FAA-AT	17 JUN 91-A	17 JUN 91-A
015435-0009-SA	AQUEOUS	PB-FAA-AT	17 JUN 91-A	17 JUN 91-A
015435-0010-SA	AQUEOUS	ICP-AT	17 JUN 91-A	17 JUN 91-A
015435-0010-SA	AQUEOUS	HG-CVAA-AT	17 JUN 91-E	17 JUN 91-E
015435-0010-SA	AQUEOUS	AS-FAA-AT	17 JUN 91-A	17 JUN 91-A
015435-0010-SA	AQUEOUS	TL-FAA-AT	17 JUN 91-A	17 JUN 91-A
015435-0010-SA	AQUEOUS	SE-FAA-AT	17 JUN 91-A	17 JUN 91-A
015435-0010-SA	AQUEOUS	PB-FAA-AT	17 JUN 91-A	17 JUN 91-A
015435-0011-SA	AQUEOUS	ICP-AT	17 JUN 91-A	17 JUN 91-A
015435-0011-SA	AQUEOUS	HG-CVAA-AT	17 JUN 91-F	17 JUN 91-F
015435-0011-SA	AQUEOUS	AS-FAA-AT	17 JUN 91-A	17 JUN 91-A
015435-0011-SA	AQUEOUS	TL-FAA-AT	17 JUN 91-A	17 JUN 91-A
015435-0011-SA	AQUEOUS	SE-FAA-AT	17 JUN 91-A	17 JUN 91-A
015435-0011-SA	AQUEOUS	PB-FAA-AT	17 JUN 91-A	17 JUN 91-A
015435-0012-SA	AQUEOUS	ICP-AT	17 JUN 91-A	17 JUN 91-A
015435-0012-SA	AQUEOUS	HG-CVAA-AT	17 JUN 91-F	17 JUN 91-F
015435-0012-SA	AQUEOUS	AS-FAA-AT	17 JUN 91-A	17 JUN 91-A
015435-0012-SA	AQUEOUS	TL-FAA-AT	17 JUN 91-A	17 JUN 91-A
015435-0012-SA	AQUEOUS	SE-FAA-AT	17 JUN 91-A	17 JUN 91-A
015435-0012-SA	AQUEOUS	PB-FAA-AT	17 JUN 91-A	17 JUN 91-A
015435-0013-SA	AQUEOUS	ICP-AT	17 JUN 91-A	17 JUN 91-A
015435-0013-SA	AQUEOUS	HG-CVAA-AT	17 JUN 91-F	17 JUN 91-F
015435-0013-SA	AQUEOUS	AS-FAA-AT	17 JUN 91-A	17 JUN 91-A
015435-0013-SA	AQUEOUS	TL-FAA-AT	17 JUN 91-A	17 JUN 91-A
015435-0013-SA	AQUEOUS	SE-FAA-AT	17 JUN 91-A	17 JUN 91-A
015435-0013-SA	AQUEOUS	PB-FAA-AT	17 JUN 91-A	17 JUN 91-A
015435-0014-SA	AQUEOUS	ICP-AT	17 JUN 91-A	17 JUN 91-A
015435-0014-SA	AQUEOUS	HG-CVAA-AT	17 JUN 91-F	17 JUN 91-F
015435-0014-SA	AQUEOUS	AS-FAA-AT	17 JUN 91-A	17 JUN 91-A
015435-0014-SA	AQUEOUS	TL-FAA-AT	17 JUN 91-A	17 JUN 91-A
015435-0014-SA	AQUEOUS	SE-FAA-AT	17 JUN 91-A	17 JUN 91-A
015435-0014-SA	AQUEOUS	PB-FAA-AT	17 JUN 91-A	17 JUN 91-A

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QC LOT ASSIGNMENT REPORT
Metals Analysis and Preparation (cont.)

Laboratory Sample Number	QC Matrix	QC Category	QC Lot Number (DCS)	QC Run Number (SCS/BLANK)
015435-0008-SA	AQUEOUS	PB-FAA-AT	17 JUN 91-A	17 JUN 91-A
015435-0009-SA	AQUEOUS	ICP-AT	17 JUN 91-A	17 JUN 91-A
015435-0009-SA	AQUEOUS	HG-CVAA-AT	17 JUN 91-E	17 JUN 91-E
015435-0009-SA	AQUEOUS	AS-FAA-AT	17 JUN 91-A	17 JUN 91-A
015435-0009-SA	AQUEOUS	TL-FAA-AT	17 JUN 91-A	17 JUN 91-A
015435-0009-SA	AQUEOUS	SE-FAA-AT	17 JUN 91-A	17 JUN 91-A
015435-0009-SA	AQUEOUS	PB-FAA-AT	17 JUN 91-A	17 JUN 91-A
015435-0010-SA	AQUEOUS	ICP-AT	17 JUN 91-A	17 JUN 91-A
015435-0010-SA	AQUEOUS	HG-CVAA-AT	17 JUN 91-E	17 JUN 91-E
015435-0010-SA	AQUEOUS	AS-FAA-AT	17 JUN 91-A	17 JUN 91-A
015435-0010-SA	AQUEOUS	TL-FAA-AT	17 JUN 91-A	17 JUN 91-A
015435-0010-SA	AQUEOUS	SE-FAA-AT	17 JUN 91-A	17 JUN 91-A
015435-0010-SA	AQUEOUS	PB-FAA-AT	17 JUN 91-A	17 JUN 91-A
015435-0011-SA	AQUEOUS	ICP-AT	17 JUN 91-A	17 JUN 91-A
015435-0011-SA	AQUEOUS	HG-CVAA-AT	17 JUN 91-F	17 JUN 91-F
015435-0011-SA	AQUEOUS	AS-FAA-AT	17 JUN 91-A	17 JUN 91-A
015435-0011-SA	AQUEOUS	TL-FAA-AT	17 JUN 91-A	17 JUN 91-A
015435-0011-SA	AQUEOUS	SE-FAA-AT	17 JUN 91-A	17 JUN 91-A
015435-0011-SA	AQUEOUS	PB-FAA-AT	17 JUN 91-A	17 JUN 91-A
015435-0012-SA	AQUEOUS	ICP-AT	17 JUN 91-A	17 JUN 91-A
015435-0012-SA	AQUEOUS	HG-CVAA-AT	17 JUN 91-F	17 JUN 91-F
015435-0012-SA	AQUEOUS	AS-FAA-AT	17 JUN 91-A	17 JUN 91-A
015435-0012-SA	AQUEOUS	TL-FAA-AT	17 JUN 91-A	17 JUN 91-A
5435-0012-SA	AQUEOUS	SE-FAA-AT	17 JUN 91-A	17 JUN 91-A
5435-0012-SA	AQUEOUS	PB-FAA-AT	17 JUN 91-A	17 JUN 91-A
015435-0013-SA	AQUEOUS	ICP-AT	17 JUN 91-A	17 JUN 91-A
015435-0013-SA	AQUEOUS	HG-CVAA-AT	17 JUN 91-F	17 JUN 91-F
015435-0013-SA	AQUEOUS	AS-FAA-AT	17 JUN 91-A	17 JUN 91-A
015435-0013-SA	AQUEOUS	TL-FAA-AT	17 JUN 91-A	17 JUN 91-A
015435-0013-SA	AQUEOUS	SE-FAA-AT	17 JUN 91-A	17 JUN 91-A
015435-0013-SA	AQUEOUS	PB-FAA-AT	17 JUN 91-A	17 JUN 91-A
015435-0014-SA	AQUEOUS	ICP-AT	17 JUN 91-A	17 JUN 91-A
015435-0014-SA	AQUEOUS	HG-CVAA-AT	17 JUN 91-F	17 JUN 91-F
015435-0014-SA	AQUEOUS	AS-FAA-AT	17 JUN 91-A	17 JUN 91-A
015435-0014-SA	AQUEOUS	TL-FAA-AT	17 JUN 91-A	17 JUN 91-A
015435-0014-SA	AQUEOUS	SE-FAA-AT	17 JUN 91-A	17 JUN 91-A
015435-0014-SA	AQUEOUS	PB-FAA-AT	17 JUN 91-A	17 JUN 91-A

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DUPLICATE CONTROL SAMPLE REPORT
Metals Analysis and Preparation

Analyte	Concentration Spiked	Measured DCS1	Measured DCS2	Measured AVG	Accuracy Average(%) DCS	Accuracy Average(%) Limits	Precisi (RPD) DCS Lim
Category: ICP-AT Matrix: AQUEOUS QC Lot: 17 JUN 91-A Concentration Units: mg/L							
Aluminum	2.0	1.98	1.96	1.97	99	75-125	0.9
Antimony	0.5	0.497	0.476	0.486	97	75-125	4.3
Arsenic	0.5	0.482	0.475	0.478	96	75-125	1.4
Barium	2.0	1.89	1.88	1.89	94	75-125	0.3
Beryllium	0.05	0.0483	0.0486	0.0484	97	75-125	0.6
Cadmium	0.05	0.0512	0.0528	0.0520	104	75-125	3.0
Calcium	100	107	107	107	107	75-125	0.1
Chromium	0.2	0.193	0.190	0.191	96	75-125	1.4
Cobalt	0.5	0.467	0.466	0.466	93	75-125	0.2
Copper	0.25	0.241	0.242	0.242	97	75-125	0.3
Iron	1.0	0.943	0.935	0.939	94	75-125	0.9
Lead	0.5	0.492	0.483	0.487	97	75-125	1.8
Magnesium	50	50.5	50.7	50.6	101	75-125	0.3
Manganese	0.5	0.467	0.465	0.466	93	75-125	0.5
Nickel	0.5	0.464	0.465	0.465	93	75-125	0.1
Potassium	50	50.9	50.8	50.8	102	75-125	0.2
Silver	0.05	0.0474	0.0468	0.0471	94	75-125	1.4
Sodium	100	105	105	105	105	75-125	0.3
Vanadium	0.5	0.490	0.489	0.489	98	75-125	0.3
Zinc	0.5	0.474	0.473	0.473	95	75-125	0.3
Category: HG-CVAA-AT Matrix: AQUEOUS QC Lot: 17 JUN 91-E Concentration Units: mg/L							
Mercury	0.0010	0.00108	0.00107	0.00108	108	75-125	1.1
Category: AS-FAA-AT Matrix: AQUEOUS QC Lot: 17 JUN 91-A Concentration Units: mg/L							
Arsenic	0.03	0.0279	0.0278	0.0278	93	75-125	0.4

Calculations are performed before rounding to avoid round-off errors in calculated results

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DUPLICATE CONTROL SAMPLE REPORT
Metals Analysis and Preparation (cont.)

Analyte	Concentration Spiked	Measured DCS1	Measured DCS2	Measured AVG	Accuracy Average(%) DCS	Accuracy Limits	Precis (RPD) DCS Lir
Category: TL-FAA-AT Matrix: AQUEOUS QC Lot: 17 JUN 91-A Concentration Units: mg/L							
Thallium	0.03	0.0253	0.0250	0.0252	84	75-125	1.2
Category: SE-FAA-AT Matrix: AQUEOUS QC Lot: 17 JUN 91-A Concentration Units: mg/L							
Selenium	0.03	0.0262	0.0255	0.0258	86	75-125	2.7
Category: PB-FAA-AT Matrix: AQUEOUS QC Lot: 17 JUN 91-A Concentration Units: mg/L							
Lead	0.03	0.0271	0.0295	0.0283	94	75-125	8.5
Category: HG-CVAA-AT Matrix: AQUEOUS QC Lot: 17 JUN 91-F Concentration Units: mg/L							
Mercury	0.0010	0.00104	0.00106	0.00105	105	75-125	2.2

Calculations are performed before rounding to avoid round-off errors in calculated results

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METHOD BLANK REPORT
Metals Analysis and Preparation

Analyte	Result	Units	Reporting Limit
Test: ICP-AP9-AT			
Matrix: AQUEOUS			
QC Lot: 17 JUN 91-A QC Run: 17 JUN 91-A			
Antimony	ND	mg/L	0.060
Barium	ND	mg/L	0.010
Beryllium	ND	mg/L	0.0020
Cadmium	ND	mg/L	0.0050
Chromium	ND	mg/L	0.010
Cobalt	ND	mg/L	0.010
Copper	0.029	mg/L	0.020
Nickel	ND	mg/L	0.040
Silver	ND	mg/L	0.010
Tin	ND	mg/L	0.10
Vanadium	ND	mg/L	0.010
Zinc	0.032	mg/L	0.020
Test: HG-CVAA-AT			
Matrix: AQUEOUS			
QC Lot: 17 JUN 91-E QC Run: 17 JUN 91-E			
Mercury	ND	mg/L	0.00020
Test: AS-FAA-AT			
Matrix: AQUEOUS			
QC Lot: 17 JUN 91-A QC Run: 17 JUN 91-A			
Arsenic	ND	mg/L	0.0050
Test: TL-FAA-AT			
Matrix: AQUEOUS			
QC Lot: 17 JUN 91-A QC Run: 17 JUN 91-A			
Thallium	ND	mg/L	0.0050

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METHOD BLANK REPORT
Metals Analysis and Preparation (cont.)

Analyte	Result	Units	Reporting Limit
Test: SE-FAA-AT			
Matrix: AQUEOUS			
QC Lot: 17 JUN 91-A QC Run: 17 JUN 91-A			
Selenium	ND	mg/L	0.0050
Test: PB-FAA-AT			
Matrix: AQUEOUS			
QC Lot: 17 JUN 91-A QC Run: 17 JUN 91-A			
Lead	ND	mg/L	0.0050
Test: HG-CVAA-AT			
Matrix: AQUEOUS			
QC Lot: 17 JUN 91-F QC Run: 17 JUN 91-F			
Mercury	ND	mg/L	0.00020

Rocky Mountain
Analytical Laboratory

Enseco

ANALYTICAL RESULTS
FOR
SPARTON TECHNOLOGY INC.
ENSECO-RMAL NO. 015473

JUNE 29, 1991

Reviewed by: Joel E. Holtz

Sue Dalla

Enseco Incorporated
4955 Yarrow Street
Arvada, Colorado 80002
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Introduction

This report presents the analytical results as well as supporting information to aid in the evaluation and interpretation of the data and is arranged in the following order:

- Sample Description Information
- Analytical Test Requests
- Analytical Results
- Quality Control Report

Consistent with directives in the CLP protocol in SW-846 and other EPA methods, all GC/MS analyses were performed so that the maximum concentration of sample was analyzed. Some samples required dilutions to avoid saturation of the detector, to achieve linearity for a specific target compound or to reduce matrix interferences. As stated in Section 7.5.4 of Method 8270, 7.4.1.16 of Method 8240 and Exhibit E of the CLP protocol these dilutions must be performed. The reporting limits for these samples are therefore proportionate to the dilution required. Surrogate compounds may not be measurable in samples which have been diluted.

Samples 015473-0001, -0003, -0004, -0005, -0006, -0010, and -0011 were diluted for Method 8240 due to the concentration of target compounds and the reporting limits were raised accordingly.

Acetone was detected in samples 015473-0001, -0003, -0004, -0005, -0006, and -0011 and was detected in their associated method blanks. Since acetone is a common laboratory contaminant the results are highly suspect.

Sample Description Information

The Sample Description Information lists all of the samples received in this project together with the internal laboratory identification number assigned for each sample. Each project received at Enseco - RMAL is assigned a unique six digit number. Samples within the project are numbered sequentially. The laboratory identification number is a combination of the six digit project code and the sample sequence number.

Also given in the Sample Description Information is the Sample Type (matrix), Date of Sampling (if known) and Date of Receipt at the laboratory.

Analytical Test Requests

The Analytical Test Requests lists the analyses that were performed on each sample. The Custom Test column indicates where tests have been modified to conform to the specific requirements of this project.

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SAMPLE DESCRIPTION INFORMATION
for
Sparton Technology Inc.

Lab ID	Client ID	Matrix	Sampled Date	Sampled Time	Received Date
015473-0001-SA	MW-19 Groundwater	AQUEOUS	17 JUN 91	11:40	19 JUN 91
015473-0002-SA	MW-20 Groundwater	AQUEOUS	17 JUN 91	14:25	19 JUN 91
015473-0003-SA	MW-09 Groundwater	AQUEOUS	17 JUN 91	13:12	19 JUN 91
015473-0004-SA	MW-33 Groundwater	AQUEOUS	17 JUN 91	13:58	19 JUN 91
015473-0005-SA	MW-13 Groundwater	AQUEOUS	17 JUN 91	14:33	19 JUN 91
015473-0006-SA	MW-14 Groundwater	AQUEOUS	17 JUN 91	15:20	19 JUN 91
015473-0007-SA	MW-39 Groundwater	AQUEOUS	18 JUN 91	10:11	19 JUN 91
015473-0008-SA	MW-30 Groundwater	AQUEOUS	18 JUN 91	13:17	19 JUN 91
015473-0009-SA	MW-38 Groundwater	AQUEOUS	18 JUN 91	12:16	19 JUN 91
015473-0010-SA	MW-16 Groundwater	AQUEOUS	18 JUN 91	14:04	19 JUN 91
015473-0011-SA	MW-21 Groundwater	AQUEOUS	18 JUN 91	14:47	19 JUN 91

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ANALYTICAL TEST REQUESTS
for
Sparton Technology Inc.

Lab ID: 015473	Group Code	Analysis Description	Custom Test?
0001 - 0011	A	Volatile Organics	N
		Appendix IX List	N
		Screen - Volatile Organics	N
		Appendix IX Metals (Total) done by ICP	N
		Prep - Total Metals, ICP	N
		Mercury, Cold Vapor AA (Total)	N
		Prep - Mercury, Cold Vapor AA (Total)	N
		Arsenic, Furnace AA (Total)	N
		Prep - Total Metals, Furnace AA	N
		Prep - Total Metals, Furnace AA	N
		Thallium, Furnace AA (Total)	N
		Selenium, Furnace AA (Total)	N
		Lead, Furnace AA (Total)	N

Analytical Results

The analytical results for this project are presented in the following data tables. Each data table includes sample identification information, and when available and appropriate, dates sampled, received, authorized, prepared and analyzed. The authorization data is the date when the project was defined by the client such that laboratory work could begin.

Data sheets contain a listing of the parameters measured in each test, the analytical results and the Enseco reporting limit. Reporting limits are adjusted to reflect dilution of the sample, when appropriate. Solid and waste samples are reported on an "as received" basis, i.e. no correction is made for moisture content.

Enseco-RMAL is no longer routinely blank-correcting analytical data. Uncorrected analytical results are reported, along with associated blank results, for all organic and metals analyses. Analytical results and blank results are reported for conventional inorganic parameters as specified in the method. This policy is described in detail in the Enseco Incorporated Quality Assurance Program Plan for Environmental Chemical Monitoring, Revision 3.3, May, 1989.

The results from the Standard Enseco QA/QC Program, which generates data which are independent of matrix effects, is provided subsequently.

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Volatile Organics
Appendix IX List
Method 8240

Client Name: Sparton Technology Inc.
Client ID: MW-19 Groundwater
Lab ID: 015473-0001-SA
Matrix: AQUEOUS Sampled: 17 JUN 91 Received: 19 JUN 91
Authorized: 19 JUN 91 Prepared: 21 JUN 91 Analyzed: 26 JUN 91

Parameter	Result	Units	Reporting Limit
Acetone	82	ug/L	50
Acetonitrile	ND	ug/L	1000
Acrolein	ND	ug/L	500
Acrylonitrile	ND	ug/L	500
Allyl chloride	ND	ug/L	50
Benzene	ND	ug/L	25
Bromodichloromethane	ND	ug/L	25
Bromoform	ND	ug/L	25
Bromomethane	ND	ug/L	50
2-Butanone (MEK)	ND	ug/L	50
Carbon disulfide	ND	ug/L	25
Carbon tetrachloride	ND	ug/L	25
Chlorobenzene	ND	ug/L	25
Chloroethane	ND	ug/L	50
Chloroform	ND	ug/L	25
Chloromethane	ND	ug/L	50
Chloroprene	ND	ug/L	25
Dibromochloromethane	ND	ug/L	25
1,2-Dibromo-3-chloro-propane (DBCP)	ND	ug/L	50
1,2-Dibromoethane (EDB)	ND	ug/L	50
Dibromomethane	ND	ug/L	25
trans-1,4-Dichloro-2-butene	ND	ug/L	25
Dichlorodifluoromethane	ND	ug/L	100
1,1-Dichloroethane	ND	ug/L	25
1,2-Dichloroethane	ND	ug/L	25
1,1-Dichloroethene	48	ug/L	25
1,2-Dichloroethene (total)	ND	ug/L	25
1,2-Dichloropropane	ND	ug/L	25
cis-1,3-Dichloropropene	ND	ug/L	25
trans-1,3-Dichloropropene	ND	ug/L	25
1,4-Dioxane	ND	ug/L	2500
Ethylbenzene	ND	ug/L	25
Ethyl methacrylate	ND	ug/L	100
Iodomethane	ND	ug/L	25
Isobutanol	ND	ug/L	1000
2-Hexanone	ND	ug/L	50
Methacrylonitrile	ND	ug/L	25
Methylene chloride	100	ug/L	25

(continued on following page)

ND = Not detected
NA = Not applicable

Reported By: Tim Miller Approved By: Mark Dymerski

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Volatile Organics
Appendix IX List
Method 8240

Client Name: Sparton Technology Inc.
Client ID: MW-19 Groundwater
Lab ID: 015473-0001-SA
Matrix: AQUEOUS Sampled: 17 JUN 91 Received: 19 JUN 91
Authorized: 19 JUN 91 Prepared: 21 JUN 91 Analyzed: 26 JUN 91

Parameter	Result	Units	Reporting Limit
Methyl methacrylate	ND	ug/L	100
4-Methyl-2-pentanone (MIBK)	ND	ug/L	50
Propionitrile	ND	ug/L	25
Styrene	ND	ug/L	25
1,1,1,2-Tetrachloroethane	ND	ug/L	25
1,1,2,2-Tetrachloroethane	ND	ug/L	25
Tetrachloroethene	ND	ug/L	25
Toluene	ND	ug/L	25
1,1,1-Trichloroethane	ND	ug/L	25
1,1,2-Trichloroethane	ND	ug/L	25
Trichloroethene	570	ug/L	25
Trichlorofluoromethane	ND	ug/L	25
1,2,3-Trichloropropane	ND	ug/L	25
Vinyl acetate	ND	ug/L	50
Vinyl chloride	ND	ug/L	50
Xylenes (total)	ND	ug/L	25

Surrogate	Recovery	
Toluene-d8	105	%
4-Bromofluorobenzene	103	%
1,2-Dichloroethane-d4	105	%

ND = Not detected
NA = Not applicable

Reported By: Tim Miller Approved By: Mark Dymerski

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Volatile Organics
Appendix IX List
Method 8240

Client Name: Sparton Technology Inc.
Client ID: MW-20 Groundwater
Lab ID: 015473-0002-SA
Matrix: AQUEOUS Sampled: 17 JUN 91 Received: 19 JUN 91
Authorized: 19 JUN 91 Prepared: 21 JUN 91 Analyzed: 26 JUN 91

Parameter	Result	Units	Reporting Limit
Acetone	ND	ug/L	10
Acetonitrile	ND	ug/L	200
Acrolein	ND	ug/L	100
Acrylonitrile	ND	ug/L	100
Allyl chloride	ND	ug/L	10
Benzene	ND	ug/L	5.0
Bromodichloromethane	ND	ug/L	5.0
Bromoform	ND	ug/L	5.0
Bromomethane	ND	ug/L	10
2-Butanone (MEK)	ND	ug/L	10
Carbon disulfide	ND	ug/L	5.0
Carbon tetrachloride	ND	ug/L	5.0
Chlorobenzene	ND	ug/L	5.0
Chloroethane	ND	ug/L	10
Chloroform	ND	ug/L	5.0
Chloromethane	ND	ug/L	10
Chloroprene	ND	ug/L	5.0
Dibromochloromethane	ND	ug/L	5.0
1,2-Dibromo-3-chloro-propane (DBCP)	ND	ug/L	10
1,2-Dibromoethane (EDB)	ND	ug/L	10
Dibromomethane	ND	ug/L	5.0
trans-1,4-Dichloro-2-butene	ND	ug/L	5.0
Dichlorodifluoromethane	ND	ug/L	20
1,1-Dichloroethane	ND	ug/L	5.0
1,2-Dichloroethane	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	5.0
1,2-Dichloroethene (total)	ND	ug/L	5.0
1,2-Dichloropropane	ND	ug/L	5.0
cis-1,3-Dichloropropene	ND	ug/L	5.0
trans-1,3-Dichloropropene	ND	ug/L	5.0
1,4-Dioxane	ND	ug/L	500
Ethylbenzene	ND	ug/L	5.0
Ethyl methacrylate	ND	ug/L	20
Iodomethane	ND	ug/L	5.0
Isobutanol	ND	ug/L	200
2-Hexanone	ND	ug/L	10
Methacrylonitrile	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0

(continued on following page)

ND = Not detected
NA = Not applicable

Reported By: Tim Miller Approved By: Mark Dymerski

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Volatile Organics
Appendix IX List
Method 8240

Client Name: Sparton Technology Inc.
Client ID: MW-20 Groundwater
Lab ID: 015473-0002-SA
Matrix: AQUEOUS Sampled: 17 JUN 91 Received: 19 JUN 91
Authorized: 19 JUN 91 Prepared: 21 JUN 91 Analyzed: 26 JUN 91

Parameter	Result	Units	Reporting Limit
Methyl methacrylate	ND	ug/L	20
4-Methyl-2-pentanone (MIBK)	ND	ug/L	10
Propionitrile	ND	ug/L	5.0
Styrene	ND	ug/L	5.0
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0
Tetrachloroethene	ND	ug/L	5.0
Toluene	ND	ug/L	5.0
1,1,1-Trichloroethane	ND	ug/L	5.0
1,1,2-Trichloroethane	ND	ug/L	5.0
Trichloroethene	12	ug/L	5.0
Trichlorofluoromethane	ND	ug/L	5.0
1,2,3-Trichloropropane	ND	ug/L	5.0
Vinyl acetate	ND	ug/L	10
Vinyl chloride	ND	ug/L	10
Xylenes (total)	ND	ug/L	5.0

Surrogate	Recovery	
Toluene-d8	104	%
4-Bromofluorobenzene	107	%
1,2-Dichloroethane-d4	100	%

ND = Not detected
NA = Not applicable

Reported By: Tim Miller Approved By: Mark Dymerski

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Volatile Organics
Appendix IX List
Method 8240

Client Name: Sparton Technology Inc.
Client ID: MW-09 Groundwater
Lab ID: 015473-0003-SA
Matrix: AQUEOUS Sampled: 17 JUN 91 Received: 19 JUN 91
Authorized: 19 JUN 91 Prepared: 21 JUN 91 Analyzed: 26 JUN 91

Parameter	Result	Units	Reporting Limit
Acetone	140	ug/L	100
Acetonitrile	ND	ug/L	2000
Acrolein	ND	ug/L	1000
Acrylonitrile	ND	ug/L	1000
Allyl chloride	ND	ug/L	100
Benzene	ND	ug/L	50
Bromodichloromethane	ND	ug/L	50
Bromoform	ND	ug/L	50
Bromomethane	ND	ug/L	100
2-Butanone (MEK)	ND	ug/L	100
Carbon disulfide	ND	ug/L	50
Carbon tetrachloride	ND	ug/L	50
Chlorobenzene	ND	ug/L	50
Chloroethane	ND	ug/L	100
Chloroform	ND	ug/L	50
Chloromethane	ND	ug/L	100
Chloroprene	ND	ug/L	50
Dibromochloromethane	ND	ug/L	50
1,2-Dibromo-3-chloro-propane (DBCP)	ND	ug/L	100
1,2-Dibromoethane (EDB)	ND	ug/L	100
Dibromomethane	ND	ug/L	50
trans-1,4-Dichloro-2-butene	ND	ug/L	50
Dichlorodifluoromethane	ND	ug/L	200
1,1-Dichloroethane	ND	ug/L	50
1,2-Dichloroethane	ND	ug/L	50
1,1-Dichloroethene	120	ug/L	50
1,2-Dichloroethene (total)	ND	ug/L	50
1,2-Dichloropropane	ND	ug/L	50
cis-1,3-Dichloropropene	ND	ug/L	50
trans-1,3-Dichloropropene	ND	ug/L	50
1,4-Dioxane	ND	ug/L	5000
Ethylbenzene	ND	ug/L	50
Ethyl methacrylate	ND	ug/L	200
Iodomethane	ND	ug/L	50
Isobutanol	ND	ug/L	2000
2-Hexanone	ND	ug/L	100
Methacrylonitrile	ND	ug/L	50
Methylene chloride	ND	ug/L	50

(continued on following page)

ND = Not detected
NA = Not applicable

Reported By: Tim Miller Approved By: Mark Dymerski

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Volatile Organics
Appendix IX List
Method 8240

Client Name: Sparton Technology Inc.
Client ID: MW-09 Groundwater
Lab ID: 015473-0003-SA
Matrix: AQUEOUS Sampled: 17 JUN 91 Received: 19 JUN 91
Authorized: 19 JUN 91 Prepared: 21 JUN 91 Analyzed: 26 JUN 91

Parameter	Result	Units	Reporting Limit
Methyl methacrylate	ND	ug/L	200
4-Methyl-2-pentanone (MIBK)	ND	ug/L	100
Propionitrile	ND	ug/L	50
Styrene	ND	ug/L	50
1,1,1,2-Tetrachloroethane	ND	ug/L	50
1,1,2,2-Tetrachloroethane	ND	ug/L	50
Tetrachloroethene	ND	ug/L	50
Toluene	ND	ug/L	50
1,1,1-Trichloroethane	430	ug/L	50
1,1,2-Trichloroethane	ND	ug/L	50
Trichloroethene	1400	ug/L	50
Trichlorofluoromethane	ND	ug/L	50
1,2,3-Trichloropropane	ND	ug/L	50
Vinyl acetate	ND	ug/L	100
Vinyl chloride	ND	ug/L	100
Xylenes (total)	ND	ug/L	50

Surrogate	Recovery	
Toluene-d8	101	%
4-Bromofluorobenzene	106	%
1,2-Dichloroethane-d4	102	%

ND = Not detected
NA = Not applicable

Reported By: Tim Miller Approved By: Mark Dymerski

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Volatile Organics
Appendix IX List
Method 8240

Client Name: Sparton Technology Inc.
Client ID: MW-33 Groundwater
Lab ID: 015473-0004-SA
Matrix: AQUEOUS Sampled: 17 JUN 91 Received: 19 JUN 91
Authorized: 19 JUN 91 Prepared: 21 JUN 91 Analyzed: 26 JUN 91

Parameter	Result	Units	Reporting Limit
Acetone	930	ug/L	500
Acetonitrile	ND	ug/L	10000
Acrolein	ND	ug/L	5000
Acrylonitrile	ND	ug/L	5000
Allyl chloride	ND	ug/L	500
Benzene	ND	ug/L	250
Bromodichloromethane	ND	ug/L	250
Bromoform	ND	ug/L	250
Bromomethane	ND	ug/L	500
2-Butanone (MEK)	ND	ug/L	500
Carbon disulfide	ND	ug/L	250
Carbon tetrachloride	ND	ug/L	250
Chlorobenzene	ND	ug/L	250
Chloroethane	ND	ug/L	500
Chloroform	ND	ug/L	250
Chloromethane	ND	ug/L	500
Chloroprene	ND	ug/L	250
Dibromochloromethane	ND	ug/L	250
1,2-Dibromo-3-chloro-propane (DBCP)	ND	ug/L	500
1,2-Dibromoethane (EDB)	ND	ug/L	500
Dibromomethane	ND	ug/L	250
trans-1,4-Dichloro-2-butene	ND	ug/L	250
Dichlorodifluoromethane	ND	ug/L	1000
1,1-Dichloroethane	ND	ug/L	250
1,2-Dichloroethane	ND	ug/L	250
1,1-Dichloroethene	1000	ug/L	250
1,2-Dichloroethene (total)	ND	ug/L	250
1,2-Dichloropropane	ND	ug/L	250
cis-1,3-Dichloropropene	ND	ug/L	250
trans-1,3-Dichloropropene	ND	ug/L	250
1,4-Dioxane	ND	ug/L	25000
Ethylbenzene	ND	ug/L	250
Ethyl methacrylate	ND	ug/L	1000
Iodomethane	ND	ug/L	250
Isobutanol	ND	ug/L	10000
2-Hexanone	ND	ug/L	500
Methacrylonitrile	ND	ug/L	250
Methylene chloride	ND	ug/L	250

(continued on following page)

ND = Not detected
NA = Not applicable

Reported By: Tim Miller Approved By: Mark Dymerski

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Volatile Organics
Appendix IX List
Method 8240

Client Name: Sparton Technology Inc.
Client ID: MW-33 Groundwater
Lab ID: 015473-0004-SA
Matrix: AQUEOUS Sampled: 17 JUN 91 Received: 19 JUN 91
Authorized: 19 JUN 91 Prepared: 21 JUN 91 Analyzed: 26 JUN 91

Parameter	Result	Units	Reporting Limit
Methyl methacrylate	ND	ug/L	1000
4-Methyl-2-pentanone (MIBK)	ND	ug/L	500
Propionitrile	ND	ug/L	250
Styrene	ND	ug/L	250
1,1,1,2-Tetrachloroethane	ND	ug/L	250
1,1,2,2-Tetrachloroethane	ND	ug/L	250
Tetrachloroethene	ND	ug/L	250
Toluene	ND	ug/L	250
1,1,1-Trichloroethane	1800	ug/L	250
1,1,2-Trichloroethane	ND	ug/L	250
Trichloroethene	7300	ug/L	250
Trichlorofluoromethane	ND	ug/L	250
1,2,3-Trichloropropane	ND	ug/L	250
Vinyl acetate	ND	ug/L	500
Vinyl chloride	ND	ug/L	500
Xylenes (total)	ND	ug/L	250

Surrogate	Recovery	
Toluene-d8	106	%
4-Bromofluorobenzene	105	%
1,2-Dichloroethane-d4	108	%

ND = Not detected
NA = Not applicable

Reported By: Tim Miller Approved By: Mark Dymerski

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Volatile Organics
Appendix IX List
Method 8240

Client Name: Sparton Technology Inc.
Client ID: MW-13 Groundwater
Lab ID: 015473-0005-SA
Matrix: AQUEOUS Sampled: 17 JUN 91 Received: 19 JUN 91
Authorized: 19 JUN 91 Prepared: 21 JUN 91 Analyzed: 26 JUN 91

Parameter	Result	Units	Reporting Limit
Acetone	29	ug/L	25
Acetonitrile	ND	ug/L	500
Acrolein	ND	ug/L	250
Acrylonitrile	ND	ug/L	250
Allyl chloride	ND	ug/L	25
Benzene	ND	ug/L	12
Bromodichloromethane	ND	ug/L	12
Bromoform	ND	ug/L	12
Bromomethane	ND	ug/L	25
2-Butanone (MEK)	ND	ug/L	25
Carbon disulfide	ND	ug/L	12
Carbon tetrachloride	ND	ug/L	12
Chlorobenzene	ND	ug/L	12
Chloroethane	ND	ug/L	25
Chloroform	ND	ug/L	12
Chloromethane	ND	ug/L	25
Chloroprene	ND	ug/L	12
Dibromochloromethane	ND	ug/L	12
1,2-Dibromo-3-chloro-propane (DBCP)	ND	ug/L	25
1,2-Dibromoethane (EDB)	ND	ug/L	25
Dibromomethane	ND	ug/L	12
trans-1,4-Dichloro-2-butene	ND	ug/L	12
Dichlorodifluoromethane	ND	ug/L	50
1,1-Dichloroethane	ND	ug/L	12
1,2-Dichloroethane	ND	ug/L	12
1,1-Dichloroethene	26	ug/L	12
1,2-Dichloroethene (total)	ND	ug/L	12
1,2-Dichloropropane	ND	ug/L	12
cis-1,3-Dichloropropene	ND	ug/L	12
trans-1,3-Dichloropropene	ND	ug/L	12
1,4-Dioxane	ND	ug/L	1200
Ethylbenzene	ND	ug/L	12
Ethyl methacrylate	ND	ug/L	50
Iodomethane	ND	ug/L	12
Isobutanol	ND	ug/L	500
2-Hexanone	ND	ug/L	25
Methacrylonitrile	ND	ug/L	12
Methylene chloride	ND	ug/L	12

(continued on following page)

ND = Not detected
NA = Not applicable

Reported By: Tim Miller Approved By: Mark Dymerski

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Volatile Organics
Appendix IX List
Method 8240

Client Name: Sparton Technology Inc.
Client ID: MW-13 Groundwater
Lab ID: 015473-0005-SA
Matrix: AQUEOUS Sampled: 17 JUN 91 Received: 19 JUN 91
Authorized: 19 JUN 91 Prepared: 21 JUN 91 Analyzed: 26 JUN 91

Parameter	Result	Units	Reporting Limit
Methyl methacrylate	ND	ug/L	50
4-Methyl-2-pentanone (MIBK)	ND	ug/L	25
Propionitrile	ND	ug/L	12
Styrene	ND	ug/L	12
1,1,1,2-Tetrachloroethane	ND	ug/L	12
1,1,2,2-Tetrachloroethane	ND	ug/L	12
Tetrachloroethene	ND	ug/L	12
Toluene	ND	ug/L	12
1,1,1-Trichloroethane	80	ug/L	12
1,1,2-Trichloroethane	ND	ug/L	12
Trichloroethene	330	ug/L	12
Trichlorofluoromethane	ND	ug/L	12
1,2,3-Trichloropropane	ND	ug/L	12
Vinyl acetate	ND	ug/L	25
Vinyl chloride	ND	ug/L	25
Xylenes (total)	ND	ug/L	12

Surrogate	Recovery	
Toluene-d8	106	%
4-Bromofluorobenzene	107	%
1,2-Dichloroethane-d4	109	%

ND = Not detected
NA = Not applicable

Reported By: Tim Miller Approved By: Mark Dymerski

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Volatile Organics
Appendix IX List
Method 8240

Client Name: Sparton Technology Inc.
Client ID: MW-14 Groundwater
Lab ID: 015473-0006-SA
Matrix: AQUEOUS Sampled: 17 JUN 91 Received: 19 JUN 91
Authorized: 19 JUN 91 Prepared: 21 JUN 91 Analyzed: 27 JUN 91

Parameter	Result	Units	Reporting Limit
Acetone	160	ug/L	100
Acetonitrile	ND	ug/L	2000
Acrolein	ND	ug/L	1000
Acrylonitrile	ND	ug/L	1000
Allyl chloride	ND	ug/L	100
Benzene	ND	ug/L	50
Bromodichloromethane	ND	ug/L	50
Bromoform	ND	ug/L	50
Bromomethane	ND	ug/L	100
2-Butanone (MEK)	ND	ug/L	100
Carbon disulfide	ND	ug/L	50
Carbon tetrachloride	ND	ug/L	50
Chlorobenzene	ND	ug/L	50
Chloroethane	ND	ug/L	100
Chloroform	ND	ug/L	50
Chloromethane	ND	ug/L	100
Chloroprene	ND	ug/L	50
Dibromochloromethane	ND	ug/L	50
1,2-Dibromo-3-chloro-propane (DBCP)	ND	ug/L	100
1,2-Dibromoethane (EDB)	ND	ug/L	100
Dibromomethane	ND	ug/L	50
trans-1,4-Dichloro-2-butene	ND	ug/L	50
Dichlorodifluoromethane	ND	ug/L	200
1,1-Dichloroethane	ND	ug/L	50
1,2-Dichloroethane	ND	ug/L	50
1,1-Dichloroethene	51	ug/L	50
1,2-Dichloroethene (total)	ND	ug/L	50
1,2-Dichloropropane	ND	ug/L	50
cis-1,3-Dichloropropene	ND	ug/L	50
trans-1,3-Dichloropropene	ND	ug/L	50
1,4-Dioxane	ND	ug/L	5000
Ethylbenzene	ND	ug/L	50
Ethyl methacrylate	ND	ug/L	200
Iodomethane	ND	ug/L	50
Isobutanol	ND	ug/L	2000
2-Hexanone	ND	ug/L	100
Methacrylonitrile	ND	ug/L	50
Methylene chloride	ND	ug/L	50

(continued on following page)

ND = Not detected
NA = Not applicable

Reported By: Tim Miller Approved By: Mark Dymerski

Enseco
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Volatile Organics
Appendix IX List
Method 8240

Client Name: Sparton Technology Inc.
Client ID: MW-14 Groundwater
Lab ID: 015473-0006-SA
Matrix: AQUEOUS Sampled: 17 JUN 91 Received: 19 JUN 91
Authorized: 19 JUN 91 Prepared: 21 JUN 91 Analyzed: 27 JUN 91

Parameter	Result	Units	Reporting Limit
Methyl methacrylate	ND	ug/L	200
4-Methyl-2-pentanone (MIBK)	ND	ug/L	100
Propionitrile	ND	ug/L	50
Styrene	ND	ug/L	50
1,1,1,2-Tetrachloroethane	ND	ug/L	50
1,1,2,2-Tetrachloroethane	ND	ug/L	50
Tetrachloroethene	ND	ug/L	50
Toluene	ND	ug/L	50
1,1,1-Trichloroethane	ND	ug/L	50
1,1,2-Trichloroethane	ND	ug/L	50
Trichloroethene	1100	ug/L	50
Trichlorofluoromethane	ND	ug/L	50
1,2,3-Trichloropropane	ND	ug/L	50
Vinyl acetate	ND	ug/L	100
Vinyl chloride	ND	ug/L	100
Xylenes (total)	ND	ug/L	50

Surrogate	Recovery	
Toluene-d8	105	%
4-Bromofluorobenzene	106	%
1,2-Dichloroethane-d4	103	%

ND = Not detected
NA = Not applicable

Reported By: Tim Miller Approved By: Mark Dymerski

Enseco
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Volatile Organics
Appendix IX List
Method 8240

Client Name: Sparton Technology Inc.
Client ID: MW-39 Groundwater
Lab ID: 015473-0007-SA
Matrix: AQUEOUS Sampled: 18 JUN 91 Received: 19 JUN 91
Authorized: 19 JUN 91 Prepared: 21 JUN 91 Analyzed: 27 JUN 91

Parameter	Result	Units	Reporting Limit
Acetone	ND	ug/L	10
Acetonitrile	ND	ug/L	200
Acrolein	ND	ug/L	100
Acrylonitrile	ND	ug/L	100
Allyl chloride	ND	ug/L	10
Benzene	ND	ug/L	5.0
Bromodichloromethane	ND	ug/L	5.0
Bromoform	ND	ug/L	5.0
Bromomethane	ND	ug/L	10
2-Butanone (MEK)	ND	ug/L	10
Carbon disulfide	ND	ug/L	5.0
Carbon tetrachloride	ND	ug/L	5.0
Chlorobenzene	ND	ug/L	5.0
Chloroethane	ND	ug/L	10
Chloroform	ND	ug/L	5.0
Chloromethane	ND	ug/L	10
Chloroprene	ND	ug/L	5.0
Dibromochloromethane	ND	ug/L	5.0
1,2-Dibromo-3-chloro-propane (DBCP)	ND	ug/L	10
1,2-Dibromoethane (EDB)	ND	ug/L	10
Dibromomethane	ND	ug/L	5.0
trans-1,4-Dichloro-2-butene	ND	ug/L	5.0
Dichlorodifluoromethane	ND	ug/L	20
1,1-Dichloroethane	ND	ug/L	5.0
1,2-Dichloroethane	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	5.0
1,2-Dichloroethene (total)	ND	ug/L	5.0
1,2-Dichloropropane	ND	ug/L	5.0
cis-1,3-Dichloropropene	ND	ug/L	5.0
trans-1,3-Dichloropropene	ND	ug/L	5.0
1,4-Dioxane	ND	ug/L	500
Ethylbenzene	ND	ug/L	5.0
Ethyl methacrylate	ND	ug/L	20
Iodomethane	ND	ug/L	5.0
Isobutanol	ND	ug/L	200
2-Hexanone	ND	ug/L	10
Methacrylonitrile	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0

(continued on following page)

ND = Not detected
NA = Not applicable

Reported By: Tim Miller Approved By: Mark Dymerski

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Volatile Organics
Appendix IX List
Method 8240

Client Name: Sparton Technology Inc.
Client ID: MW-39 Groundwater
Lab ID: 015473-0007-SA
Matrix: AQUEOUS Sampled: 18 JUN 91 Received: 19 JUN 91
Authorized: 19 JUN 91 Prepared: 21 JUN 91 Analyzed: 27 JUN 91

Parameter	Result	Units	Reporting Limit
Methyl methacrylate	ND	ug/L	20
4-Methyl-2-pentanone (MIBK)	ND	ug/L	10
Propionitrile	ND	ug/L	5.0
Styrene	ND	ug/L	5.0
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0
Tetrachloroethene	ND	ug/L	5.0
Toluene	ND	ug/L	5.0
1,1,1-Trichloroethane	ND	ug/L	5.0
1,1,2-Trichloroethane	ND	ug/L	5.0
Trichloroethene	ND	ug/L	5.0
Trichlorofluoromethane	ND	ug/L	5.0
1,2,3-Trichloropropane	ND	ug/L	5.0
Vinyl acetate	ND	ug/L	10
Vinyl chloride	ND	ug/L	10
Xylenes (total)	ND	ug/L	5.0

Surrogate	Recovery	
Toluene-d8	101	%
4-Bromofluorobenzene	104	%
1,2-Dichloroethane-d4	108	%

ND = Not detected
NA = Not applicable

Reported By: Tim Miller Approved By: Mark Dymerski

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Volatile Organics
Appendix IX List
Method 8240

Client Name: Sparton Technology Inc.
Client ID: MW-30 Groundwater
Lab ID: 015473-0008-SA
Matrix: AQUEOUS Sampled: 18 JUN 91 Received: 19 JUN 91
Authorized: 19 JUN 91 Prepared: 21 JUN 91 Analyzed: 27 JUN 91

Parameter	Result	Units	Reporting Limit
Acetone	ND	ug/L	10
Acetonitrile	ND	ug/L	200
Acrolein	ND	ug/L	100
Acrylonitrile	ND	ug/L	100
Allyl chloride	ND	ug/L	10
Benzene	ND	ug/L	5.0
Bromodichloromethane	ND	ug/L	5.0
Bromoform	ND	ug/L	5.0
Bromomethane	ND	ug/L	10
2-Butanone (MEK)	ND	ug/L	10
Carbon disulfide	ND	ug/L	5.0
Carbon tetrachloride	ND	ug/L	5.0
Chlorobenzene	ND	ug/L	5.0
Chloroethane	ND	ug/L	10
Chloroform	ND	ug/L	5.0
Chloromethane	ND	ug/L	10
Chloroprene	ND	ug/L	5.0
Dibromochloromethane	ND	ug/L	5.0
1,2-Dibromo-3-chloro-propane (DBCP)	ND	ug/L	10
1,2-Dibromoethane (EDB)	ND	ug/L	10
Dibromomethane	ND	ug/L	5.0
trans-1,4-Dichloro-2-butene	ND	ug/L	5.0
Dichlorodifluoromethane	ND	ug/L	20
1,1-Dichloroethane	ND	ug/L	5.0
1,2-Dichloroethane	ND	ug/L	5.0
1,1-Dichloroethene	13	ug/L	5.0
1,2-Dichloroethene (total)	ND	ug/L	5.0
1,2-Dichloropropane	ND	ug/L	5.0
cis-1,3-Dichloropropene	ND	ug/L	5.0
trans-1,3-Dichloropropene	ND	ug/L	5.0
1,4-Dioxane	ND	ug/L	500
Ethylbenzene	ND	ug/L	5.0
Ethyl methacrylate	ND	ug/L	20
Iodomethane	ND	ug/L	5.0
Isobutanol	ND	ug/L	200
2-Hexanone	ND	ug/L	10
Methacrylonitrile	ND	ug/L	5.0
Methylene chloride	37	ug/L	5.0

(continued on following page)

ND = Not detected
NA = Not applicable

Reported By: Tim Miller Approved By: Mark Dymerski

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Volatile Organics
Appendix IX List
Method 8240

Client Name: Sparton Technology Inc.
Client ID: MW-30 Groundwater
Lab ID: 015473-0008-SA
Matrix: AQUEOUS Sampled: 18 JUN 91 Received: 19 JUN 91
Authorized: 19 JUN 91 Prepared: 21 JUN 91 Analyzed: 27 JUN 91

Parameter	Result	Units	Reporting Limit
Methyl methacrylate	ND	ug/L	20
4-Methyl-2-pentanone (MIBK)	ND	ug/L	10
Propionitrile	ND	ug/L	5.0
Styrene	ND	ug/L	5.0
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0
Tetrachloroethene	ND	ug/L	5.0
Toluene	ND	ug/L	5.0
1,1,1-Trichloroethane	5.8	ug/L	5.0
1,1,2-Trichloroethane	ND	ug/L	5.0
Trichloroethene	180	ug/L	5.0
Trichlorofluoromethane	ND	ug/L	5.0
1,2,3-Trichloropropane	ND	ug/L	5.0
Vinyl acetate	ND	ug/L	10
Vinyl chloride	ND	ug/L	10
Xylenes (total)	ND	ug/L	5.0

Surrogate	Recovery	
Toluene-d8	106	%
4-Bromofluorobenzene	106	%
1,2-Dichloroethane-d4	106	%

ND = Not detected
NA = Not applicable

Reported By: Tim Miller Approved By: Mark Dymerski

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Volatile Organics
Appendix IX List
Method 8240

Client Name: Sparton Technology Inc.
Client ID: MW-38 Groundwater
Lab ID: 015473-0009-SA
Matrix: AQUEOUS Sampled: 18 JUN 91 Received: 19 JUN 91
Authorized: 19 JUN 91 Prepared: 21 JUN 91 Analyzed: 27 JUN 91

Parameter	Result	Units	Reporting Limit
Acetone	ND	ug/L	10
Acetonitrile	ND	ug/L	200
Acrolein	ND	ug/L	100
Acrylonitrile	ND	ug/L	100
Allyl chloride	ND	ug/L	10
Benzene	ND	ug/L	5.0
Bromodichloromethane	ND	ug/L	5.0
Bromoform	ND	ug/L	5.0
Bromomethane	ND	ug/L	10
2-Butanone (MEK)	ND	ug/L	10
Carbon disulfide	ND	ug/L	5.0
Carbon tetrachloride	ND	ug/L	5.0
Chlorobenzene	ND	ug/L	5.0
Chloroethane	ND	ug/L	10
Chloroform	ND	ug/L	5.0
Chloromethane	ND	ug/L	10
Chloroprene	ND	ug/L	5.0
Dibromochloromethane	ND	ug/L	5.0
1,2-Dibromo-3-chloro-propane (DBCP)	ND	ug/L	10
1,2-Dibromoethane (EDB)	ND	ug/L	10
Dibromomethane	ND	ug/L	5.0
trans-1,4-Dichloro-2-butene	ND	ug/L	5.0
Dichlorodifluoromethane	ND	ug/L	20
1,1-Dichloroethane	ND	ug/L	5.0
1,2-Dichloroethane	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	5.0
1,2-Dichloroethene (total)	ND	ug/L	5.0
1,2-Dichloropropane	ND	ug/L	5.0
cis-1,3-Dichloropropene	ND	ug/L	5.0
trans-1,3-Dichloropropene	ND	ug/L	5.0
1,4-Dioxane	ND	ug/L	500
Ethylbenzene	ND	ug/L	5.0
Ethyl methacrylate	ND	ug/L	20
Iodomethane	ND	ug/L	5.0
Isobutanol	ND	ug/L	200
2-Hexanone	ND	ug/L	10
Methacrylonitrile	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0

(continued on following page)

ND = Not detected
NA = Not applicable

Reported By: Robert Broderick Approved By: Mark Dymerski

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Volatile Organics
Appendix IX List
Method 8240

Client Name: Sparton Technology Inc.
Client ID: MW-38 Groundwater
Lab ID: 015473-0009-SA
Matrix: AQUEOUS Sampled: 18 JUN 91 Received: 19 JUN 91
Authorized: 19 JUN 91 Prepared: 21 JUN 91 Analyzed: 27 JUN 91

Parameter	Result	Units	Reporting Limit
Methyl methacrylate	ND	ug/L	20
4-Methyl-2-pentanone (MIBK)	ND	ug/L	10
Propionitrile	ND	ug/L	5.0
Styrene	ND	ug/L	5.0
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0
Tetrachloroethene	ND	ug/L	5.0
Toluene	ND	ug/L	5.0
1,1,1-Trichloroethane	ND	ug/L	5.0
1,1,2-Trichloroethane	ND	ug/L	5.0
Trichloroethene	ND	ug/L	5.0
Trichlorofluoromethane	ND	ug/L	5.0
1,2,3-Trichloropropane	ND	ug/L	5.0
Vinyl acetate	ND	ug/L	10
Vinyl chloride	ND	ug/L	10
Xylenes (total)	ND	ug/L	5.0

Surrogate	Recovery	
Toluene-d8	110	%
4-Bromofluorobenzene	101	%
1,2-Dichloroethane-d4	91	%

ND = Not detected
NA = Not applicable

Reported By: Robert Broderick Approved By: Mark Dymerski

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Volatile Organics
Appendix IX List
Method 8240

Client Name: Sparton Technology Inc.
Client ID: MW-16 Groundwater
Lab ID: 015473-0010-SA
Matrix: AQUEOUS Sampled: 18 JUN 91 Received: 19 JUN 91
Authorized: 19 JUN 91 Prepared: 21 JUN 91 Analyzed: 27 JUN 91

Parameter	Result	Units	Reporting Limit
Acetone	ND	ug/L	1000
Acetonitrile	ND	ug/L	20000
Acrolein	ND	ug/L	10000
Acrylonitrile	ND	ug/L	10000
Allyl chloride	ND	ug/L	1000
Benzene	ND	ug/L	500
Bromodichloromethane	ND	ug/L	500
Bromoform	ND	ug/L	500
Bromomethane	ND	ug/L	1000
2-Butanone (MEK)	ND	ug/L	1000
Carbon disulfide	ND	ug/L	500
Carbon tetrachloride	ND	ug/L	500
Chlorobenzene	ND	ug/L	500
Chloroethane	ND	ug/L	1000
Chloroform	ND	ug/L	500
Chloromethane	ND	ug/L	1000
Chloroprene	ND	ug/L	500
Dibromochloromethane	ND	ug/L	500
1,2-Dibromo-3-chloro-propane (DBCP)	ND	ug/L	1000
1,2-Dibromoethane (EDB)	ND	ug/L	1000
Dibromomethane	ND	ug/L	500
trans-1,4-Dichloro-2-butene	ND	ug/L	500
Dichlorodifluoromethane	ND	ug/L	2000
1,1-Dichloroethane	ND	ug/L	500
1,2-Dichloroethane	ND	ug/L	500
1,1-Dichloroethene	1400	ug/L	500
1,2-Dichloroethene (total)	ND	ug/L	500
1,2-Dichloropropane	ND	ug/L	500
cis-1,3-Dichloropropene	ND	ug/L	500
trans-1,3-Dichloropropene	ND	ug/L	500
1,4-Dioxane	ND	ug/L	50000
Ethylbenzene	ND	ug/L	500
Ethyl methacrylate	ND	ug/L	2000
Iodomethane	ND	ug/L	500
Isobutanol	ND	ug/L	20000
2-Hexanone	ND	ug/L	1000
Methacrylonitrile	ND	ug/L	500
Methylene chloride	ND	ug/L	500

(continued on following page)

ND = Not detected
NA = Not applicable

Reported By: Michael Blades Approved By: Mark Dymerski

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Volatile Organics
Appendix IX List
Method 8240

Client Name: Sparton Technology Inc.
Client ID: MW-16 Groundwater
Lab ID: 015473-0010-SA
Matrix: AQUEOUS Sampled: 18 JUN 91 Received: 19 JUN 91
Authorized: 19 JUN 91 Prepared: 21 JUN 91 Analyzed: 27 JUN 91

Parameter	Result	Units	Reporting Limit
Methyl methacrylate	ND	ug/L	2000
4-Methyl-2-pentanone (MIBK)	ND	ug/L	1000
Propionitrile	ND	ug/L	500
Styrene	ND	ug/L	500
1,1,1,2-Tetrachloroethane	ND	ug/L	500
1,1,2,2-Tetrachloroethane	ND	ug/L	500
Tetrachloroethene	ND	ug/L	500
Toluene	ND	ug/L	500
1,1,1-Trichloroethane	11000	ug/L	500
1,1,2-Trichloroethane	ND	ug/L	500
Trichloroethene	17000	ug/L	500
Trichlorofluoromethane	ND	ug/L	500
1,2,3-Trichloropropane	ND	ug/L	500
Vinyl acetate	ND	ug/L	1000
Vinyl chloride	ND	ug/L	1000
Xylenes (total)	ND	ug/L	500

Surrogate	Recovery	
Toluene-d8	108	%
4-Bromofluorobenzene	100	%
1,2-Dichloroethane-d4	94	%

ND = Not detected
NA = Not applicable

Reported By: Michael Blades Approved By: Mark Dymerski

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Volatile Organics
Appendix IX List
Method 8240

Client Name: Sparton Technology Inc.
Client ID: MW-21 Groundwater
Lab ID: 015473-0011-SA
Matrix: AQUEOUS Sampled: 18 JUN 91 Received: 19 JUN 91
Authorized: 19 JUN 91 Prepared: 21 JUN 91 Analyzed: 27 JUN 91

Parameter	Result	Units	Reporting Limit
Acetone	60	ug/L	50
Acetonitrile	ND	ug/L	1000
Acrolein	ND	ug/L	500
Acrylonitrile	ND	ug/L	500
Allyl chloride	ND	ug/L	50
Benzene	ND	ug/L	25
Bromodichloromethane	ND	ug/L	25
Bromoform	ND	ug/L	25
Bromomethane	ND	ug/L	50
2-Butanone (MEK)	ND	ug/L	50
Carbon disulfide	ND	ug/L	25
Carbon tetrachloride	ND	ug/L	25
Chlorobenzene	ND	ug/L	25
Chloroethane	ND	ug/L	50
Chloroform	ND	ug/L	25
Chloromethane	ND	ug/L	50
Chloroprene	ND	ug/L	25
Dibromochloromethane	ND	ug/L	25
1,2-Dibromo-3-chloro-propane (DBCP)	ND	ug/L	50
1,2-Dibromoethane (EDB)	ND	ug/L	50
Dibromomethane	ND	ug/L	25
trans-1,4-Dichloro-2-butene	ND	ug/L	25
Dichlorodifluoromethane	ND	ug/L	100
1,1-Dichloroethane	ND	ug/L	25
1,2-Dichloroethane	ND	ug/L	25
1,1-Dichloroethene	77	ug/L	25
1,2-Dichloroethene (total)	ND	ug/L	25
1,2-Dichloropropane	ND	ug/L	25
cis-1,3-Dichloropropene	ND	ug/L	25
trans-1,3-Dichloropropene	ND	ug/L	25
1,4-Dioxane	ND	ug/L	2500
Ethylbenzene	ND	ug/L	25
Ethyl methacrylate	ND	ug/L	100
Iodomethane	ND	ug/L	25
Isobutanol	ND	ug/L	1000
2-Hexanone	ND	ug/L	50
Methacrylonitrile	ND	ug/L	25
Methylene chloride	ND	ug/L	25

(continued on following page)

ND = Not detected
NA = Not applicable

Reported By: Michael Blades Approved By: Mark Dymerski

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Volatile Organics
Appendix IX List
Method 8240

Client Name: Sparton Technology Inc.
Client ID: MW-21 Groundwater
Lab ID: 015473-0011-SA
Matrix: AQUEOUS Sampled: 18 JUN 91 Received: 19 JUN 91
Authorized: 19 JUN 91 Prepared: 21 JUN 91 Analyzed: 27 JUN 91

Parameter	Result	Units	Reporting Limit
Methyl methacrylate	ND	ug/L	100
4-Methyl-2-pentanone (MIBK)	ND	ug/L	50
Propionitrile	ND	ug/L	25
Styrene	ND	ug/L	25
1,1,1,2-Tetrachloroethane	ND	ug/L	25
1,1,2,2-Tetrachloroethane	ND	ug/L	25
Tetrachloroethene	ND	ug/L	25
Toluene	ND	ug/L	25
1,1,1-Trichloroethane	470	ug/L	25
1,1,2-Trichloroethane	ND	ug/L	25
Trichloroethene	500	ug/L	25
Trichlorofluoromethane	ND	ug/L	25
1,2,3-Trichloropropane	ND	ug/L	25
Vinyl acetate	ND	ug/L	50
Vinyl chloride	ND	ug/L	50
Xylenes (total)	ND	ug/L	25

Surrogate	Recovery	
Toluene-d8	107	%
4-Bromofluorobenzene	100	%
1,2-Dichloroethane-d4	95	%

ND = Not detected
NA = Not applicable

Reported By: Michael Blades Approved By: Mark Dymerski

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Metals

Total Metals

Client Name: Sparton Technology Inc.
Client ID: MW-19 Groundwater
Lab ID: 015473-0001-SA
Matrix: AQUEOUS Sampled: 17 JUN 91 Received: 19 JUN 91
Authorized: 19 JUN 91 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Antimony	ND	mg/L	0.060	6010	24 JUN 91	28 JUN 91
Arsenic	ND	mg/L	0.0050	7060	21 JUN 91	24 JUN 91
Barium	0.040	mg/L	0.010	6010	24 JUN 91	28 JUN 91
Beryllium	ND	mg/L	0.0020	6010	24 JUN 91	28 JUN 91
Cadmium	ND	mg/L	0.0050	6010	24 JUN 91	28 JUN 91
Chromium	ND	mg/L	0.010	6010	24 JUN 91	28 JUN 91
Cobalt	ND	mg/L	0.010	6010	24 JUN 91	28 JUN 91
Copper	0.024	mg/L	0.020	6010	24 JUN 91	28 JUN 91
Lead	ND	mg/L	0.010	7421	21 JUN 91	24 JUN 91
Mercury	ND	mg/L	0.00020	7470	22 JUN 91	22 JUN 91
Nickel	ND	mg/L	0.040	6010	24 JUN 91	28 JUN 91
Selenium	ND	mg/L	0.010	7740	21 JUN 91	24 JUN 91
Silver	ND	mg/L	0.010	6010	24 JUN 91	28 JUN 91
Thallium	ND	mg/L	0.025	7841	21 JUN 91	25 JUN 91
Tin	ND	mg/L	0.10	6010	24 JUN 91	28 JUN 91
Vanadium	ND	mg/L	0.010	6010	24 JUN 91	28 JUN 91
Zinc	0.029	mg/L	0.020	6010	24 JUN 91	28 JUN 91

ND = Not detected
NA = Not applicable

Reported By: Scott Moroschan Approved By: Sandra Jones

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Metals

Total Metals

Client Name: Sparton Technology Inc.
Client ID: MW-20 Groundwater
Lab ID: 015473-0002-SA
Matrix: AQUEOUS Sampled: 17 JUN 91 Received: 19 JUN 91
Authorized: 19 JUN 91 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Antimony	ND	mg/L	0.060	6010	24 JUN 91	28 JUN 91
Arsenic	0.0068	mg/L	0.0050	7060	21 JUN 91	24 JUN 91
Barium	0.12	mg/L	0.010	6010	24 JUN 91	28 JUN 91
Beryllium	ND	mg/L	0.0020	6010	24 JUN 91	28 JUN 91
Cadmium	ND	mg/L	0.0050	6010	24 JUN 91	28 JUN 91
Chromium	ND	mg/L	0.010	6010	24 JUN 91	28 JUN 91
Cobalt	ND	mg/L	0.010	6010	24 JUN 91	28 JUN 91
Copper	0.027	mg/L	0.020	6010	24 JUN 91	28 JUN 91
Lead	ND	mg/L	0.010	7421	21 JUN 91	24 JUN 91
Mercury	ND	mg/L	0.00020	7470	22 JUN 91	22 JUN 91
Nickel	ND	mg/L	0.040	6010	24 JUN 91	28 JUN 91
Selenium	ND	mg/L	0.010	7740	21 JUN 91	24 JUN 91
Silver	ND	mg/L	0.010	6010	24 JUN 91	28 JUN 91
Thallium	ND	mg/L	0.010	7841	21 JUN 91	25 JUN 91
Tin	ND	mg/L	0.10	6010	24 JUN 91	28 JUN 91
Vanadium	ND	mg/L	0.010	6010	24 JUN 91	28 JUN 91
Zinc	0.027	mg/L	0.020	6010	24 JUN 91	28 JUN 91

ND = Not detected
NA = Not applicable

Reported By: Scott Moroschan Approved By: Sandra Jones

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A Corning Company

Metals

Total Metals

Client Name: Sparton Technology Inc.
Client ID: MW-09 Groundwater
Lab ID: 015473-0003-SA
Matrix: AQUEOUS Sampled: 17 JUN 91 Received: 19 JUN 91
Authorized: 19 JUN 91 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Antimony	ND	mg/L	0.060	6010	24 JUN 91	25 JUN 91
Arsenic	ND	mg/L	0.0050	7060	21 JUN 91	24 JUN 91
Barium	0.034	mg/L	0.010	6010	24 JUN 91	25 JUN 91
Beryllium	ND	mg/L	0.0020	6010	24 JUN 91	25 JUN 91
Cadmium	ND	mg/L	0.0050	6010	24 JUN 91	25 JUN 91
Chromium	ND	mg/L	0.010	6010	24 JUN 91	25 JUN 91
Cobalt	ND	mg/L	0.010	6010	24 JUN 91	25 JUN 91
Copper	ND	mg/L	0.020	6010	24 JUN 91	25 JUN 91
Lead	ND	mg/L	0.010	7421	21 JUN 91	24 JUN 91
Mercury	ND	mg/L	0.00020	7470	22 JUN 91	22 JUN 91
Nickel	ND	mg/L	0.040	6010	24 JUN 91	25 JUN 91
Selenium	ND	mg/L	0.0050	7740	21 JUN 91	24 JUN 91
Silver	ND	mg/L	0.010	6010	24 JUN 91	25 JUN 91
Thallium	ND	mg/L	0.025	7841	21 JUN 91	25 JUN 91
Tin	ND	mg/L	0.10	6010	24 JUN 91	25 JUN 91
Vanadium	ND	mg/L	0.010	6010	24 JUN 91	25 JUN 91
Zinc	0.040	mg/L	0.020	6010	24 JUN 91	25 JUN 91

ND = Not detected
NA = Not applicable

Reported By: Richard Persichitte Approved By: Sandra Jones

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Metals

Total Metals

Client Name: Sparton Technology Inc.
Client ID: MW-33 Groundwater
Lab ID: 015473-0004-SA
Matrix: AQUEOUS Sampled: 17 JUN 91 Received: 19 JUN 91
Authorized: 19 JUN 91 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Antimony	ND	mg/L	0.060	6010	24 JUN 91	25 JUN 91
Arsenic	0.0075	mg/L	0.0050	7060	22 JUN 91	24 JUN 91
Barium	0.083	mg/L	0.010	6010	24 JUN 91	25 JUN 91
Beryllium	ND	mg/L	0.0020	6010	24 JUN 91	25 JUN 91
Cadmium	ND	mg/L	0.0050	6010	24 JUN 91	25 JUN 91
Chromium	0.48	mg/L	0.010	6010	24 JUN 91	25 JUN 91
Cobalt	ND	mg/L	0.010	6010	24 JUN 91	25 JUN 91
Copper	ND	mg/L	0.020	6010	24 JUN 91	25 JUN 91
Lead	ND	mg/L	0.010	7421	22 JUN 91	24 JUN 91
Mercury	ND	mg/L	0.00020	7470	22 JUN 91	22 JUN 91
Nickel	0.28	mg/L	0.040	6010	24 JUN 91	25 JUN 91
Selenium	ND	mg/L	0.0050	7740	22 JUN 91	24 JUN 91
Silver	ND	mg/L	0.010	6010	24 JUN 91	25 JUN 91
Thallium	ND	mg/L	0.050	7841	22 JUN 91	25 JUN 91
Tin	ND	mg/L	0.10	6010	24 JUN 91	25 JUN 91
Vanadium	ND	mg/L	0.010	6010	24 JUN 91	25 JUN 91
Zinc	0.029	mg/L	0.020	6010	24 JUN 91	25 JUN 91

ND = Not detected
NA = Not applicable

Reported By: Richard Persichitte Approved By: Sandra Jones

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A Corning Company

Metals

Total Metals

Client Name: Sparton Technology Inc.
Client ID: MW-13 Groundwater
Lab ID: 015473-0005-SA
Matrix: AQUEOUS Sampled: 17 JUN 91 Received: 19 JUN 91
Authorized: 19 JUN 91 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Antimony	ND	mg/L	0.060	6010	24 JUN 91	25 JUN 91
Arsenic	ND	mg/L	0.0050	7060	21 JUN 91	24 JUN 91
Barium	0.047	mg/L	0.010	6010	24 JUN 91	25 JUN 91
Beryllium	ND	mg/L	0.0020	6010	24 JUN 91	25 JUN 91
Cadmium	ND	mg/L	0.0050	6010	24 JUN 91	25 JUN 91
Chromium	ND	mg/L	0.010	6010	24 JUN 91	25 JUN 91
Cobalt	ND	mg/L	0.010	6010	24 JUN 91	25 JUN 91
Copper	ND	mg/L	0.020	6010	24 JUN 91	25 JUN 91
Lead	ND	mg/L	0.010	7421	21 JUN 91	24 JUN 91
Mercury	ND	mg/L	0.00020	7470	22 JUN 91	22 JUN 91
Nickel	ND	mg/L	0.040	6010	24 JUN 91	25 JUN 91
Selenium	ND	mg/L	0.010	7740	21 JUN 91	24 JUN 91
Silver	ND	mg/L	0.010	6010	24 JUN 91	25 JUN 91
Thallium	ND	mg/L	0.025	7841	21 JUN 91	25 JUN 91
Tin	ND	mg/L	0.10	6010	24 JUN 91	25 JUN 91
Vanadium	ND	mg/L	0.010	6010	24 JUN 91	25 JUN 91
Zinc	ND	mg/L	0.020	6010	24 JUN 91	25 JUN 91

ND = Not detected
NA = Not applicable

Reported By: Richard Persichitte Approved By: Sandra Jones

Enseco
A Corning Company

Metals

Total Metals

Client Name: Sparton Technology Inc.
Client ID: MW-14 Groundwater
Lab ID: 015473-0006-SA
Matrix: AQUEOUS Sampled: 17 JUN 91 Received: 19 JUN 91
Authorized: 19 JUN 91 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Antimony	ND	mg/L	0.060	6010	24 JUN 91	25 JUN 91
Arsenic	ND	mg/L	0.0050	7060	21 JUN 91	24 JUN 91
Barium	0.085	mg/L	0.010	6010	24 JUN 91	25 JUN 91
Beryllium	ND	mg/L	0.0020	6010	24 JUN 91	25 JUN 91
Cadmium	ND	mg/L	0.0050	6010	24 JUN 91	25 JUN 91
Chromium	0.66	mg/L	0.010	6010	24 JUN 91	25 JUN 91
Cobalt	ND	mg/L	0.010	6010	24 JUN 91	25 JUN 91
Copper	ND	mg/L	0.020	6010	24 JUN 91	25 JUN 91
Lead	ND	mg/L	0.010	7421	21 JUN 91	24 JUN 91
Mercury	ND	mg/L	0.00020	7470	22 JUN 91	22 JUN 91
Nickel	ND	mg/L	0.040	6010	24 JUN 91	25 JUN 91
Selenium	ND	mg/L	0.010	7740	21 JUN 91	24 JUN 91
Silver	ND	mg/L	0.010	6010	24 JUN 91	25 JUN 91
Thallium	ND	mg/L	0.020	7841	21 JUN 91	25 JUN 91
Tin	ND	mg/L	0.10	6010	24 JUN 91	25 JUN 91
Vanadium	ND	mg/L	0.010	6010	24 JUN 91	25 JUN 91
Zinc	ND	mg/L	0.020	6010	24 JUN 91	25 JUN 91

ND = Not detected
NA = Not applicable

Reported By: Richard Persichitte Approved By: Sandra Jones

Enseco
A Corning Company

Metals

Total Metals

Client Name: Sparton Technology Inc.
Client ID: MW-39 Groundwater
Lab ID: 015473-0007-SA
Matrix: AQUEOUS Sampled: 18 JUN 91 Received: 19 JUN 91
Authorized: 19 JUN 91 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Antimony	ND	mg/L	0.060	6010	24 JUN 91	25 JUN 91
Arsenic	0.0056	mg/L	0.0050	7060	21 JUN 91	24 JUN 91
Barium	0.026	mg/L	0.010	6010	24 JUN 91	25 JUN 91
Beryllium	ND	mg/L	0.0020	6010	24 JUN 91	25 JUN 91
Cadmium	ND	mg/L	0.0050	6010	24 JUN 91	25 JUN 91
Chromium	0.020	mg/L	0.010	6010	24 JUN 91	25 JUN 91
Cobalt	ND	mg/L	0.010	6010	24 JUN 91	25 JUN 91
Copper	ND	mg/L	0.020	6010	24 JUN 91	25 JUN 91
Lead	ND	mg/L	0.010	7421	21 JUN 91	24 JUN 91
Mercury	ND	mg/L	0.00020	7470	22 JUN 91	22 JUN 91
Nickel	ND	mg/L	0.040	6010	24 JUN 91	25 JUN 91
Selenium	ND	mg/L	0.010	7740	21 JUN 91	24 JUN 91
Silver	ND	mg/L	0.010	6010	24 JUN 91	25 JUN 91
Thallium	ND	mg/L	0.020	7841	21 JUN 91	25 JUN 91
Tin	ND	mg/L	0.10	6010	24 JUN 91	25 JUN 91
Vanadium	ND	mg/L	0.010	6010	24 JUN 91	25 JUN 91
Zinc	0.030	mg/L	0.020	6010	24 JUN 91	25 JUN 91

ND = Not detected
NA = Not applicable

Reported By: Richard Persichitte Approved By: Sandra Jones

Enseco
A Corning Company

Metals

Total Metals

Client Name: Sparton Technology Inc.
Client ID: MW-30 Groundwater
Lab ID: 015473-0008-SA
Matrix: AQUEOUS Sampled: 18 JUN 91 Received: 19 JUN 91
Authorized: 19 JUN 91 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Antimony	ND	mg/L	0.060	6010	24 JUN 91	25 JUN 91
Arsenic	0.0057	mg/L	0.0050	7060	21 JUN 91	24 JUN 91
Barium	0.081	mg/L	0.010	6010	24 JUN 91	25 JUN 91
Beryllium	ND	mg/L	0.0020	6010	24 JUN 91	25 JUN 91
Cadmium	ND	mg/L	0.0050	6010	24 JUN 91	25 JUN 91
Chromium	0.070	mg/L	0.010	6010	24 JUN 91	25 JUN 91
Cobalt	ND	mg/L	0.010	6010	24 JUN 91	25 JUN 91
Copper	ND	mg/L	0.020	6010	24 JUN 91	25 JUN 91
Lead	ND	mg/L	0.010	7421	21 JUN 91	24 JUN 91
Mercury	ND	mg/L	0.00020	7470	22 JUN 91	22 JUN 91
Nickel	ND	mg/L	0.040	6010	24 JUN 91	25 JUN 91
Selenium	ND	mg/L	0.010	7740	21 JUN 91	24 JUN 91
Silver	ND	mg/L	0.010	6010	24 JUN 91	25 JUN 91
Thallium	ND	mg/L	0.025	7841	21 JUN 91	25 JUN 91
Tin	ND	mg/L	0.10	6010	24 JUN 91	25 JUN 91
Vanadium	0.011	mg/L	0.010	6010	24 JUN 91	25 JUN 91
Zinc	ND	mg/L	0.020	6010	24 JUN 91	25 JUN 91

ND = Not detected
NA = Not applicable

Reported By: Richard Persichitte Approved By: Sandra Jones

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Metals

Total Metals

Client Name: Sparton Technology Inc.
Client ID: MW-38 Groundwater
Lab ID: 015473-0009-SA
Matrix: AQUEOUS Sampled: 18 JUN 91 Received: 19 JUN 91
Authorized: 19 JUN 91 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Antimony	ND	mg/L	0.060	6010	24 JUN 91	25 JUN 91
Arsenic	0.0059	mg/L	0.0050	7060	21 JUN 91	24 JUN 91
Barium	0.12	mg/L	0.010	6010	24 JUN 91	25 JUN 91
Beryllium	ND	mg/L	0.0020	6010	24 JUN 91	25 JUN 91
Cadmium	ND	mg/L	0.0050	6010	24 JUN 91	25 JUN 91
Chromium	ND	mg/L	0.010	6010	24 JUN 91	25 JUN 91
Cobalt	ND	mg/L	0.010	6010	24 JUN 91	25 JUN 91
Copper	ND	mg/L	0.020	6010	24 JUN 91	25 JUN 91
Lead	ND	mg/L	0.010	7421	21 JUN 91	24 JUN 91
Mercury	ND	mg/L	0.00020	7470	22 JUN 91	22 JUN 91
Nickel	ND	mg/L	0.040	6010	24 JUN 91	25 JUN 91
Selenium	ND	mg/L	0.010	7740	21 JUN 91	24 JUN 91
Silver	ND	mg/L	0.010	6010	24 JUN 91	25 JUN 91
Thallium	ND	mg/L	0.010	7841	21 JUN 91	25 JUN 91
Tin	ND	mg/L	0.10	6010	24 JUN 91	25 JUN 91
Vanadium	ND	mg/L	0.010	6010	24 JUN 91	25 JUN 91
Zinc	0.022	mg/L	0.020	6010	24 JUN 91	25 JUN 91

ND = Not detected
NA = Not applicable

Reported By: Richard Persichitte Approved By: Sandra Jones

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A Corning Company

Metals

Total Metals

Client Name: Sparton Technology Inc.
Client ID: MW-16 Groundwater
Lab ID: 015473-0010-SA
Matrix: AQUEOUS Sampled: 18 JUN 91 Received: 19 JUN 91
Authorized: 19 JUN 91 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Antimony	ND	mg/L	0.060	6010	24 JUN 91	25 JUN 91
Arsenic	ND	mg/L	0.0050	7060	21 JUN 91	24 JUN 91
Barium	0.039	mg/L	0.010	6010	24 JUN 91	25 JUN 91
Beryllium	ND	mg/L	0.0020	6010	24 JUN 91	25 JUN 91
Cadmium	ND	mg/L	0.0050	6010	24 JUN 91	25 JUN 91
Chromium	0.28	mg/L	0.010	6010	24 JUN 91	25 JUN 91
Cobalt	ND	mg/L	0.010	6010	24 JUN 91	25 JUN 91
Copper	0.041	mg/L	0.020	6010	24 JUN 91	25 JUN 91
Lead	ND	mg/L	0.010	7421	21 JUN 91	24 JUN 91
Mercury	ND	mg/L	0.00020	7470	22 JUN 91	22 JUN 91
Nickel	0.046	mg/L	0.040	6010	24 JUN 91	25 JUN 91
Selenium	ND	mg/L	0.0050	7740	21 JUN 91	24 JUN 91
Silver	ND	mg/L	0.010	6010	24 JUN 91	25 JUN 91
Thallium	ND	mg/L	0.025	7841	21 JUN 91	25 JUN 91
Tin	ND	mg/L	0.10	6010	24 JUN 91	25 JUN 91
Vanadium	ND	mg/L	0.010	6010	24 JUN 91	25 JUN 91
Zinc	0.021	mg/L	0.020	6010	24 JUN 91	25 JUN 91

ND = Not detected
NA = Not applicable

Reported By: Richard Persichitte Approved By: Sandra Jones

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Metals

Total Metals

Client Name: Sparton Technology Inc.
Client ID: MW-21 Groundwater
Lab ID: 015473-0011-SA
Matrix: AQUEOUS Sampled: 18 JUN 91 Received: 19 JUN 91
Authorized: 19 JUN 91 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Antimony	ND	Rg/L	0.060	6010	24 JUN 91	25 JUN 91
Arsenic	0.0067	mg/L	0.0050	7060	21 JUN 91	24 JUN 91
Barium	0.064	Rg/L	0.010	6010	24 JUN 91	25 JUN 91
Beryllium	ND	Rg/L	0.0020	6010	24 JUN 91	25 JUN 91
Cadmium	ND	Rg/L	0.0050	6010	24 JUN 91	25 JUN 91
Chromium	ND	Rg/L	0.010	6010	24 JUN 91	25 JUN 91
Cobalt	ND	Rg/L	0.010	6010	24 JUN 91	25 JUN 91
Copper	ND	Rg/L	0.020	6010	24 JUN 91	25 JUN 91
Lead	ND	mg/L	0.010	7421	21 JUN 91	24 JUN 91
Mercury	ND	mg/L	0.00020	7470	22 JUN 91	22 JUN 91
Nickel	ND	Rg/L	0.040	6010	24 JUN 91	25 JUN 91
Selenium	ND	mg/L	0.010	7740	21 JUN 91	24 JUN 91
Silver	ND	Rg/L	0.010	6010	24 JUN 91	25 JUN 91
Thallium	ND	mg/L	0.020	7841	21 JUN 91	25 JUN 91
Tin	ND	Rg/L	0.10	6010	24 JUN 91	25 JUN 91
Vanadium	ND	Rg/L	0.010	6010	24 JUN 91	25 JUN 91
Zinc	ND	Rg/L	0.020	6010	24 JUN 91	25 JUN 91

ND = Not detected
NA = Not applicable

Reported By: Richard Persichitte Approved By: Sandra Jones

Quality Control Results

The Enseco laboratories operate under a vigorous QA/QC program designed to ensure the generation of scientifically valid, legally defensible data by monitoring every aspect of laboratory operations. Routine QA/QC procedures include the use of approved methodologies, independent verification of analytical standards, use of duplicate Laboratory Control Samples to assess the precision and accuracy of the methodology on a routine basis, and a rigorous system of data review.

In addition, the Enseco laboratories maintain a comprehensive set of certifications from both state and federal governmental agencies which require frequent analyses of blind audit samples. Enseco - Rocky Mountain Analytical Laboratory is certified by the EPA under the EPA/CLP program for both Organic and Inorganic analyses, under the USATHAMA (U.S. Army) program, by the Army Corps of Engineers, and the states of Colorado, New Jersey, New York, Utah, and Florida, among others.

The standard laboratory QC package is designed to:

1) establish a strong, cost-effective QC program that ensures the generation of scientifically valid, legally defensible data

2) assess the laboratory's performance of the analytical method using control limits generated with a well-defined matrix

3) establish clear-cut guidelines for acceptability of analytical data so that QC decisions can be made immediately at the bench, and

4) provide a standard set of reportables which assures the client of the quality of his data.

The Enseco QC program is based upon monitoring the precision and accuracy of an analytical method by analyzing a set of Duplicate Control Samples (DCS) at frequent, well-defined intervals. Each DCS is a well-characterized matrix which is spiked with target compounds at 5-100 times the reporting limit, depending upon the methodology being monitored. The purpose of the DCS is not to duplicate the sample matrix, but rather to provide an interference-free, homogeneous matrix from which to gather data to establish control limits. These limits are used to determine whether data generated by the laboratory on any given day is in control.

Control limits for accuracy (percent recovery) are based on the average, historical percent recovery +/- 3 standard deviation units. Control limits for precision (relative percent difference) range from 0 (identical duplicate DCS results) to the average, historical relative percent difference + 3 standard deviation units. These control limits are fairly narrow based on the consistency of the matrix being monitored and are updated on a quarterly basis.

For each batch of samples analyzed, an additional control measure is taken in the form of a Single Control Sample (SCS). The SCS consists of a control matrix that is spiked with either representative target compounds or surrogate compounds appropriate to the method being used. An SCS is prepared for each sample lot for which the DCS pair are not analyzed.

Accuracy for DCS and SCS is measured by Percent Recovery.

$$\% \text{ Recovery} = \frac{\text{Measured Concentration}}{\text{Actual Concentration}} \times 100$$

Precision for DCS is measured by Relative Percent Difference (RPD).

$$\text{RPD} = \frac{|\text{Measured Concentration DCS1} - \text{Measured Concentration DCS2}|}{(\text{Measured Concentration DCS1} + \text{Measured Concentration DCS2})/2} \times 100$$

All samples analyzed concurrently by the same test are assigned the same QC lot number. Projects which contain numerous samples, analyzed over several days, may have multiple QC lot numbers associated with each test. The QC information which follows includes a listing of the QC lot numbers associated with each of the samples reported, DCS and SCS (where applicable) recoveries from the QC lots associated with the samples, and control limits for these lots. The QC data is reported by test code, in the order that the tests are reported in the analytical results section of this report.

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QC LOT ASSIGNMENT REPORT
latile Organics by GC/MS

Laboratory Sample Number	QC Matrix	QC Category	QC Lot Number (DCS)	QC Run Number (SCS/BLANK)
015473-0001-SA	AQUEOUS	624-A	23 JUN 91-L	26 JUN 91-L
015473-0002-SA	AQUEOUS	624-A	23 JUN 91-L	26 JUN 91-L
015473-0003-SA	AQUEOUS	624-A	23 JUN 91-L	26 JUN 91-L
015473-0004-SA	AQUEOUS	624-A	23 JUN 91-L	26 JUN 91-L
015473-0005-SA	AQUEOUS	624-A	23 JUN 91-L	26 JUN 91-L
015473-0006-SA	AQUEOUS	624-A	23 JUN 91-L	26 JUN 91-L
015473-0007-SA	AQUEOUS	624-A	23 JUN 91-L	26 JUN 91-L
015473-0008-SA	AQUEOUS	624-A	23 JUN 91-L	26 JUN 91-L
015473-0009-SA	AQUEOUS	624-A	25 JUN 91-F	27 JUN 91-F2
015473-0010-SA	AQUEOUS	624-A	25 JUN 91-F	27 JUN 91-F2
015473-0011-SA	AQUEOUS	624-A	25 JUN 91-F	27 JUN 91-F2

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DUPLICATE CONTROL SAMPLE REPORT
Volatile Organics by GC/MS

Analyte	Concentration Spiked	Measured DCS1	Measured DCS2	Measured AVG	Accuracy Average(%) DCS	Accuracy Limits	Precisio (RPD) DCS	Limi
Category: 624-A Matrix: AQUEOUS QC Lot: 23 JUN 91-L Concentration Units: ug/L								
1,1-Dichloroethene	50	43.5	41.6	42.6	85	61-145	4.5	1
Trichloroethene	50	45.9	45.7	45.8	92	71-120	0.4	1
Benzene	50	49.5	47.0	48.2	97	76-127	5.2	1
Toluene	50	52.1	47.1	49.6	99	76-125	10	1
Chlorobenzene	50	52.4	48.2	50.3	101	75-130	8.3	1
Category: 624-A Matrix: AQUEOUS QC Lot: 25 JUN 91-F Concentration Units: ug/L								
1,1-Dichloroethene	50	45.8	45.5	45.6	91	61-145	0.7	1
Trichloroethene	50	47.7	47.8	47.8	96	71-120	0.2	1
Benzene	50	48.3	46.7	47.5	95	76-127	3.4	1
Toluene	50	50.8	50.7	50.8	102	76-125	0.2	1
lorobenzene	50	51.8	52.5	52.2	104	75-130	1.3	1

Calculations are performed before rounding to avoid round-off errors in calculated results.

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SINGLE CONTROL SAMPLE REPORT
Volatile Organics by GC/MS

Analyte	Concentration Spiked	Concentration Measured	Accuracy(%) SCS	Accuracy(%) Limits
Category: 624-A				
Matrix: AQUEOUS				
QC Lot: 23 JUN 91-L QC Run: 26 JUN 91-L				
Concentration Units: ug/L				
1,2-Dichloroethane-d4	50.0	47.8	96	76-114
4-Bromofluorobenzene	50.0	52.9	106	86-115
Toluene-d8	50.0	51.9	104	88-110
Category: 624-A				
Matrix: AQUEOUS				
QC Lot: 25 JUN 91-F QC Run: 27 JUN 91-F2				
Concentration Units: ug/L				
1,2-Dichloroethane-d4	50.0	45.3	91	76-114
4-Bromofluorobenzene	50.0	49.6	99	86-115
Toluene-d8	50.0	53.3	107	88-110

Calculations are performed before rounding to avoid round-off errors in calculated results.

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METHOD BLANK REPORT
Volatile Organics by GC/MS

Test: 8240CP-AP9-AP
Matrix: AQUEOUS
QC Lot: 23 JUN 91-L QC Run: 26 JUN 91-L

Analyte	Result	Units	Reporting Limit
Acetone	20	ug/L	10
Acetonitrile	ND	ug/L	200
Acrolein	ND	ug/L	100
Acrylonitrile	ND	ug/L	100
Allyl chloride	ND	ug/L	10
Benzene	ND	ug/L	5.0
Bromodichloromethane	ND	ug/L	5.0
Bromoform	ND	ug/L	5.0
Bromomethane	ND	ug/L	10
2-Butanone (MEK)	ND	ug/L	10
Carbon disulfide	ND	ug/L	5.0
Carbon tetrachloride	ND	ug/L	5.0
Chlorobenzene	ND	ug/L	5.0
Chloroethane	ND	ug/L	10
Chloroform	ND	ug/L	5.0
Chloromethane	ND	ug/L	10
Chloroprene	ND	ug/L	5.0
Dibromochloromethane	ND	ug/L	5.0
2-Dibromo-3-chloro-propane (DBCP)	ND	ug/L	10
1,2-Dibromoethane (EDB)	ND	ug/L	10
Dibromomethane	ND	ug/L	5.0
trans-1,4-Dichloro-2-butene	ND	ug/L	5.0
Dichlorodifluoromethane	ND	ug/L	20
1,1-Dichloroethane	ND	ug/L	5.0
1,2-Dichloroethane	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	5.0
1,2-Dichloroethene (total)	ND	ug/L	5.0
1,2-Dichloropropane	ND	ug/L	5.0
cis-1,3-Dichloropropene	ND	ug/L	5.0
trans-1,3-Dichloropropene	ND	ug/L	5.0
1,4-Dioxane	ND	ug/L	500
Ethylbenzene	ND	ug/L	5.0
Ethyl methacrylate	ND	ug/L	20
Iodomethane	ND	ug/L	5.0
Isobutanol	ND	ug/L	200
2-Hexanone	ND	ug/L	10
Methacrylonitrile	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0

METHOD BLANK REPORT
Volatile Organics by GC/MS (cont.)

Analyte	Result	Units	Reporting Limit
Test: 8240CP-AP9-AP			
Matrix: AQUEOUS			
QC Lot: 23 JUN 91-L QC Run: 26 JUN 91-L			
Methyl methacrylate	ND	ug/L	20
4-Methyl-2-pentanone (MIBK)	ND	ug/L	10
Propionitrile	ND	ug/L	5.0
Styrene	ND	ug/L	5.0
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0
Tetrachloroethene	ND	ug/L	5.0
Toluene	ND	ug/L	5.0
1,1,1-Trichloroethane	ND	ug/L	5.0
1,1,2-Trichloroethane	ND	ug/L	5.0
Trichloroethene	ND	ug/L	5.0
Trichlorofluoromethane	ND	ug/L	5.0
1,2,3-Trichloropropane	ND	ug/L	5.0
Vinyl acetate	ND	ug/L	10
Vinyl chloride	ND	ug/L	10
Xylenes (total)	ND	ug/L	5.0
Test: 8240CP-AP9-AP			
Matrix: AQUEOUS			
QC Lot: 25 JUN 91-F QC Run: 27 JUN 91-F2			
Acetone	19	ug/L	10
Acetonitrile	ND	ug/L	200
Acrolein	ND	ug/L	100
Acrylonitrile	ND	ug/L	100
Allyl chloride	ND	ug/L	10
Benzene	ND	ug/L	5.0
Bromodichloromethane	ND	ug/L	5.0
Bromoform	ND	ug/L	5.0
Bromomethane	ND	ug/L	10
2-Butanone (MEK)	ND	ug/L	10
Carbon disulfide	ND	ug/L	5.0
Carbon tetrachloride	ND	ug/L	5.0
Chlorobenzene	ND	ug/L	5.0
Chloroethane	ND	ug/L	10
Chloroform	ND	ug/L	5.0
Chloromethane	ND	ug/L	10
Chloroprene	ND	ug/L	5.0
Dibromochloromethane	ND	ug/L	5.0

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METHOD BLANK REPORT
Volatile Organics by GC/MS (cont.)

Analyte	Result	Units	Reporting Limit
Test: 8240CP-AP9-AP			
Matrix: AQUEOUS			
QC Lot: 25 JUN 91-F QC Run: 27 JUN 91-F2			
1,2-Dibromo-3-chloro-propane (DBCP)	ND	ug/L	10
1,2-Dibromoethane (EDB)	ND	ug/L	10
Dibromomethane	ND	ug/L	5.0
trans-1,4-Dichloro-2-butene	ND	ug/L	5.0
Dichlorodifluoromethane	ND	ug/L	20
1,1-Dichloroethane	ND	ug/L	5.0
1,2-Dichloroethane	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	5.0
1,2-Dichloroethene (total)	ND	ug/L	5.0
1,2-Dichloropropane	ND	ug/L	5.0
cis-1,3-Dichloropropene	ND	ug/L	5.0
trans-1,3-Dichloropropene	ND	ug/L	5.0
1,4-Dioxane	ND	ug/L	500
Ethylbenzene	ND	ug/L	5.0
Ethyl methacrylate	ND	ug/L	20
Iodomethane	ND	ug/L	5.0
Isobutanol	ND	ug/L	200
2-Hexanone	ND	ug/L	10
Methacrylonitrile	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
Methyl methacrylate	ND	ug/L	20
4-Methyl-2-pentanone (MIBK)	ND	ug/L	10
Propionitrile	ND	ug/L	5.0
Styrene	ND	ug/L	5.0
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0
Tetrachloroethene	ND	ug/L	5.0
Toluene	ND	ug/L	5.0
1,1,1-Trichloroethane	ND	ug/L	5.0
1,1,2-Trichloroethane	ND	ug/L	5.0
Trichloroethene	ND	ug/L	5.0
Trichlorofluoromethane	ND	ug/L	5.0
1,2,3-Trichloropropane	ND	ug/L	5.0
Vinyl acetate	ND	ug/L	10
Vinyl chloride	ND	ug/L	10
Xylenes (total)	ND	ug/L	5.0

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QC LOT ASSIGNMENT REPORT
Metals Analysis and Preparation

Laboratory Sample Number	QC Matrix	QC Category	QC Lot Number (DCS)	QC Run Number (SCS/BLANK)
015473-0001-SA	AQUEOUS	ICP-AT	24 JUN 91-R	24 JUN 91-R
015473-0001-SA	AQUEOUS	HG-CVAA-AT	22 JUN 91-C	22 JUN 91-C
015473-0001-SA	AQUEOUS	AS-FAA-AT	21 JUN 91-A	21 JUN 91-A
015473-0001-SA	AQUEOUS	TL-FAA-AT	21 JUN 91-A	21 JUN 91-A
015473-0001-SA	AQUEOUS	SE-FAA-AT	21 JUN 91-A	21 JUN 91-A
015473-0001-SA	AQUEOUS	PB-FAA-AT	21 JUN 91-A	21 JUN 91-A
015473-0002-SA	AQUEOUS	ICP-AT	24 JUN 91-R	24 JUN 91-R
015473-0002-SA	AQUEOUS	HG-CVAA-AT	22 JUN 91-C	22 JUN 91-C
015473-0002-SA	AQUEOUS	AS-FAA-AT	21 JUN 91-A	21 JUN 91-A
015473-0002-SA	AQUEOUS	TL-FAA-AT	21 JUN 91-A	21 JUN 91-A
015473-0002-SA	AQUEOUS	SE-FAA-AT	21 JUN 91-A	21 JUN 91-A
015473-0002-SA	AQUEOUS	PB-FAA-AT	21 JUN 91-A	21 JUN 91-A
015473-0003-SA	AQUEOUS	ICP-AT	24 JUN 91-R	24 JUN 91-R
015473-0003-SA	AQUEOUS	HG-CVAA-AT	22 JUN 91-C	22 JUN 91-C
015473-0003-SA	AQUEOUS	AS-FAA-AT	21 JUN 91-A	21 JUN 91-A
015473-0003-SA	AQUEOUS	TL-FAA-AT	21 JUN 91-A	21 JUN 91-A
015473-0003-SA	AQUEOUS	SE-FAA-AT	21 JUN 91-A	21 JUN 91-A
015473-0003-SA	AQUEOUS	PB-FAA-AT	21 JUN 91-A	21 JUN 91-A
015473-0004-SA	AQUEOUS	ICP-AT	24 JUN 91-R	24 JUN 91-R
015473-0004-SA	AQUEOUS	HG-CVAA-AT	22 JUN 91-C	22 JUN 91-C
015473-0004-SA	AQUEOUS	AS-FAA-AT	22 JUN 91-A	22 JUN 91-A
015473-0004-SA	AQUEOUS	TL-FAA-AT	22 JUN 91-A	22 JUN 91-A
015473-0004-SA	AQUEOUS	SE-FAA-AT	22 JUN 91-A	22 JUN 91-A
015473-0004-SA	AQUEOUS	PB-FAA-AT	22 JUN 91-A	22 JUN 91-A
015473-0005-SA	AQUEOUS	ICP-AT	24 JUN 91-R	24 JUN 91-R
015473-0005-SA	AQUEOUS	HG-CVAA-AT	22 JUN 91-C	22 JUN 91-C
015473-0005-SA	AQUEOUS	AS-FAA-AT	21 JUN 91-A	21 JUN 91-A
015473-0005-SA	AQUEOUS	TL-FAA-AT	21 JUN 91-A	21 JUN 91-A
015473-0005-SA	AQUEOUS	SE-FAA-AT	21 JUN 91-A	21 JUN 91-A
015473-0005-SA	AQUEOUS	PB-FAA-AT	21 JUN 91-A	21 JUN 91-A
015473-0006-SA	AQUEOUS	ICP-AT	24 JUN 91-R	24 JUN 91-R
015473-0006-SA	AQUEOUS	HG-CVAA-AT	22 JUN 91-C	22 JUN 91-C
015473-0006-SA	AQUEOUS	AS-FAA-AT	21 JUN 91-A	21 JUN 91-A
015473-0006-SA	AQUEOUS	TL-FAA-AT	21 JUN 91-A	21 JUN 91-A
015473-0006-SA	AQUEOUS	SE-FAA-AT	21 JUN 91-A	21 JUN 91-A
015473-0006-SA	AQUEOUS	PB-FAA-AT	21 JUN 91-A	21 JUN 91-A
015473-0007-SA	AQUEOUS	ICP-AT	24 JUN 91-R	24 JUN 91-R
015473-0007-SA	AQUEOUS	HG-CVAA-AT	22 JUN 91-C	22 JUN 91-C
015473-0007-SA	AQUEOUS	AS-FAA-AT	21 JUN 91-A	21 JUN 91-A
015473-0007-SA	AQUEOUS	TL-FAA-AT	21 JUN 91-A	21 JUN 91-A
015473-0007-SA	AQUEOUS	SE-FAA-AT	21 JUN 91-A	21 JUN 91-A
015473-0007-SA	AQUEOUS	PB-FAA-AT	21 JUN 91-A	21 JUN 91-A
015473-0008-SA	AQUEOUS	ICP-AT	24 JUN 91-R	24 JUN 91-R
015473-0008-SA	AQUEOUS	HG-CVAA-AT	22 JUN 91-C	22 JUN 91-C
015473-0008-SA	AQUEOUS	AS-FAA-AT	21 JUN 91-A	21 JUN 91-A
015473-0008-SA	AQUEOUS	TL-FAA-AT	21 JUN 91-A	21 JUN 91-A
015473-0008-SA	AQUEOUS	SE-FAA-AT	21 JUN 91-A	21 JUN 91-A

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QC LOT ASSIGNMENT REPORT
Metals Analysis and Preparation (cont.)

Laboratory Sample Number	QC Matrix	QC Category	QC Lot Number (DCS)	QC Run Number (SCS/BLANK)
015473-0008-SA	AQUEOUS	PB-FAA-AT	21 JUN 91-A	21 JUN 91-A
015473-0009-SA	AQUEOUS	ICP-AT	24 JUN 91-R	24 JUN 91-R
015473-0009-SA	AQUEOUS	HG-CVAA-AT	22 JUN 91-C	22 JUN 91-C
015473-0009-SA	AQUEOUS	AS-FAA-AT	21 JUN 91-A	21 JUN 91-A
015473-0009-SA	AQUEOUS	TL-FAA-AT	21 JUN 91-A	21 JUN 91-A
015473-0009-SA	AQUEOUS	SE-FAA-AT	21 JUN 91-A	21 JUN 91-A
015473-0009-SA	AQUEOUS	PB-FAA-AT	21 JUN 91-A	21 JUN 91-A
015473-0010-SA	AQUEOUS	ICP-AT	24 JUN 91-R	24 JUN 91-R
015473-0010-SA	AQUEOUS	HG-CVAA-AT	22 JUN 91-C	22 JUN 91-C
015473-0010-SA	AQUEOUS	AS-FAA-AT	21 JUN 91-A	21 JUN 91-A
015473-0010-SA	AQUEOUS	TL-FAA-AT	21 JUN 91-A	21 JUN 91-A
015473-0010-SA	AQUEOUS	SE-FAA-AT	21 JUN 91-A	21 JUN 91-A
015473-0010-SA	AQUEOUS	PB-FAA-AT	21 JUN 91-A	21 JUN 91-A
015473-0011-SA	AQUEOUS	ICP-AT	24 JUN 91-R	24 JUN 91-R
015473-0011-SA	AQUEOUS	HG-CVAA-AT	22 JUN 91-C	22 JUN 91-C
015473-0011-SA	AQUEOUS	AS-FAA-AT	21 JUN 91-A	21 JUN 91-A
015473-0011-SA	AQUEOUS	TL-FAA-AT	21 JUN 91-A	21 JUN 91-A
015473-0011-SA	AQUEOUS	SE-FAA-AT	21 JUN 91-A	21 JUN 91-A
015473-0011-SA	AQUEOUS	PB-FAA-AT	21 JUN 91-A	21 JUN 91-A

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DUPLICATE CONTROL SAMPLE REPORT
Metals Analysis and Preparation

Analyte	Concentration Spiked	Measured DCS1	Measured DCS2	Measured AVG	Accuracy Average(%) DCS	Accuracy Average(%) Limits	Precis (RPD) DCS Li
Category: ICP-AT							
Matrix: AQUEOUS							
QC Lot: 24 JUN 91-R							
Concentration Units: mg/L							
Aluminum	2.0	2.16	2.10	2.13	107	75-125	2.6
Antimony	0.5	0.507	0.487	0.497	99	75-125	3.9
Arsenic	0.5	0.521	0.513	0.517	103	75-125	1.5
Barium	2.0	2.07	1.98	2.02	101	75-125	4.4
Beryllium	0.05	0.0506	0.0500	0.0503	101	75-125	1.3
Cadmium	0.05	0.0445	0.0436	0.0441	88	75-125	1.9
Calcium	100	105	101	103	103	75-125	3.7
Chromium	0.2	0.187	0.189	0.188	94	75-125	1.0
Cobalt	0.5	0.486	0.473	0.480	96	75-125	2.9
Copper	0.25	0.261	0.254	0.257	103	75-125	2.8
Iron	1.0	1.06	1.04	1.05	105	75-125	2.1
Lead	0.5	0.493	0.495	0.494	99	75-125	0.4
Magnesium	50	50.4	48.9	49.6	99	75-125	3.1
Manganese	0.5	0.488	0.474	0.481	96	75-125	2.9
Nickel	0.5	0.496	0.487	0.492	98	75-125	1.9
Potassium	50	50.4	48.5	49.4	99	75-125	3.9
Silver	0.037	0.0293	0.0280	0.0287	77	75-125	4.4
Sodium	100	102	99.4	101	101	75-125	2.9
Vanadium	0.5	0.512	0.501	0.507	101	75-125	2.1
Zinc	0.5	0.502	0.485	0.494	99	75-125	3.3
Category: HG-CVAA-AT							
Matrix: AQUEOUS							
QC Lot: 22 JUN 91-C							
Concentration Units: mg/L							
Mercury	0.0010	0.00105	0.00106	0.00105	105	75-125	1.0
Category: AS-FAA-AT							
Matrix: AQUEOUS							
QC Lot: 21 JUN 91-A							
Concentration Units: mg/L							
Arsenic	0.03	0.0266	0.0281	0.0274	91	75-125	5.5

Calculations are performed before rounding to avoid round-off errors in calculated results

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DUPLICATE CONTROL SAMPLE REPORT
Metals Analysis and Preparation (cont.)

Analyte	Concentration Spiked	Measured DCS1	Measured DCS2	Measured AVG	Accuracy Average(%) DCS	Accuracy Average(%) Limits	Precisi (RPD) DCS Lim
Category: TL-FAA-AT Matrix: AQUEOUS QC Lot: 21 JUN 91-A Concentration Units: mg/L							
Thallium	0.03	0.0307	0.0296	0.0302	101	75-125	3.6
Category: SE-FAA-AT Matrix: AQUEOUS QC Lot: 21 JUN 91-A Concentration Units: mg/L							
Selenium	0.03	0.0231	0.0244	0.0238	79	75-125	5.5
Category: PB-FAA-AT Matrix: AQUEOUS QC Lot: 21 JUN 91-A Concentration Units: mg/L							
.ead	0.03	0.0290	0.0272	0.0281	94	75-125	6.4
Category: AS-FAA-AT Matrix: AQUEOUS QC Lot: 22 JUN 91-A Concentration Units: mg/L							
Arsenic	0.030	0.0279	0.0267	0.0273	91	75-125	4.4
Category: TL-FAA-AT Matrix: AQUEOUS QC Lot: 22 JUN 91-A Concentration Units: mg/L							
Thallium	0.03	0.0301	0.0322	0.0312	104	75-125	6.7

Calculations are performed before rounding to avoid round-off errors in calculated results

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DUPLICATE CONTROL SAMPLE REPORT
Metals Analysis and Preparation (cont.)

Analyte	Concentration Spiked	Measured DCS1	Measured DCS2	Measured AVG	Accuracy Average(%) DCS	Accuracy Average(%) Limits	Precis (RPD) DCS Li
Category: SE-FAA-AT Matrix: AQUEOUS QC Lot: 22 JUN 91-A Concentration Units: mg/L							
Selenium	0.03	0.0274	0.0285	0.0280	93	75-125	3.9
Category: PB-FAA-AT Matrix: AQUEOUS QC Lot: 22 JUN 91-A Concentration Units: mg/L							
Lead	0.03	0.0273	0.0268	0.0270	90	75-125	1.8

Calculations are performed before rounding to avoid round-off errors in calculated results

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METHOD BLANK REPORT
Metals Analysis and Preparation

Analyte	Result	Units	Reporting Limit
Test: ICP-AP9-AT			
Matrix: AQUEOUS			
QC Lot: 24 JUN 91-R QC Run: 24 JUN 91-R			
Antimony	ND	mg/L	0.060
Barium	ND	mg/L	0.010
Beryllium	ND	mg/L	0.0020
Cadmium	ND	mg/L	0.0050
Chromium	ND	mg/L	0.010
Cobalt	ND	mg/L	0.010
Copper	ND	mg/L	0.020
Nickel	ND	mg/L	0.040
Silver	ND	mg/L	0.010
Tin	ND	mg/L	0.10
Vanadium	ND	mg/L	0.010
Zinc	ND	mg/L	0.020
Test: HG-CVAA-AT			
Matrix: AQUEOUS			
QC Lot: 22 JUN 91-C QC Run: 22 JUN 91-C			
Mercury	ND	mg/L	0.00020
Test: AS-FAA-AT			
Matrix: AQUEOUS			
QC Lot: 21 JUN 91-A QC Run: 21 JUN 91-A			
Arsenic	ND	mg/L	0.0050
Test: TL-FAA-AT			
Matrix: AQUEOUS			
QC Lot: 21 JUN 91-A QC Run: 21 JUN 91-A			
Thallium	ND	mg/L	0.0050

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METHOD BLANK REPORT
Metals Analysis and Preparation (cont.)

Analyte	Result	Units	Reporting Limit
Test: SE-FAA-AT Matrix: AQUEOUS QC Lot: 21 JUN 91-A QC Run: 21 JUN 91-A			
Selenium	ND	mg/L	0.0050
Test: PB-FAA-AT Matrix: AQUEOUS QC Lot: 21 JUN 91-A QC Run: 21 JUN 91-A			
Lead	ND	mg/L	0.0050
Test: AS-FAA-AT Matrix: AQUEOUS QC Lot: 22 JUN 91-A QC Run: 22 JUN 91-A			
Arsenic	ND	mg/L	0.0050
Test: TL-FAA-AT Matrix: AQUEOUS QC Lot: 22 JUN 91-A QC Run: 22 JUN 91-A			
Thallium	ND	mg/L	0.0050
Test: SE-FAA-AT Matrix: AQUEOUS QC Lot: 22 JUN 91-A QC Run: 22 JUN 91-A			
Selenium	ND	mg/L	0.0050
Test: PB-FAA-AT Matrix: AQUEOUS QC Lot: 22 JUN 91-A QC Run: 22 JUN 91-A			
Lead	ND	mg/L	0.0050

Rocky Mountain
Analytical Laboratory

Enseco

ANALYTICAL RESULTS
FOR
SPARTON TECHNOLOGY INC.
ENSECO-RMAL NO. 015524

JULY 3, 1991

Reviewed by: Joe Mace (for)
Joel E. Holtz

Sue Dalla
Sue Dalla

Enseco Incorporated
4955 Yarrow Street
Arvada, Colorado 80002
303/421-6611 Fax: 303/431-7171

Introduction

This report presents the analytical results as well as supporting information to aid in the evaluation and interpretation of the data and is arranged in the following order:

- Sample Description Information
- Analytical Test Requests
- Analytical Results
- Quality Control Report

Analyses at Enseco are performed so that the maximum concentration of sample consistent with the method is analyzed. Dilutions are at times required to avoid saturation of the detector, to achieve linearity for a specific target compound or to reduce matrix interferences. In this event, reporting limits are adjusted proportionately. Surrogate compounds may not be measurable in samples which have been diluted.

Sample 015524-0004 and -0007 required dilutions for the volatile organics by Method 8240 due to the concentrations of target compounds present beyond linear range; the reporting limits were increased accordingly.

Acetone was detected in samples 015524-0005 and -0007. Acetone was also detected in the method blank at levels above the reporting limit. Concentrations of common laboratory contaminants such as acetone and bis(2-ethylhexyl)phthalate present at levels just above the reporting limit are highly suspect.

Samples 015524-0001 through -0011 required dilutions for the ICP analyses by Method 6010 due to concentrations of copper and zinc present in the method blank. Concentration of these analytes found in samples near the reporting limit may be suspect.

Sample Description Information

The Sample Description Information lists all of the samples received in this project together with the internal laboratory identification number assigned for each sample. Each project received at Enseco - RMAL is assigned

a unique six digit number. Samples within the project are numbered sequentially. The laboratory identification number is a combination of the six digit project code and the sample sequence number.

Also given in the Sample Description Information is the Sample Type (matrix), Date of Sampling (if known) and Date of Receipt at the laboratory.

Analytical Test Requests

The Analytical Test Requests lists the analyses that were performed on each sample. The Custom Test column indicates where tests have been modified to conform to the specific requirements of this project.

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SAMPLE DESCRIPTION INFORMATION
for
Sparton Technology Inc.

Lab ID	Client ID	Matrix	Sampled Date	Sampled Time	Received Date
015524-0001-SA	MW-29 Groundwwater	AQUEOUS	19 JUN 91	13:11	21 JUN 91
015524-0002-SA	MW-31 Groundwwater	AQUEOUS	19 JUN 91	13:20	21 JUN 91
015524-0003-SA	MW-40 Groundwwater	AQUEOUS	19 JUN 91	15:13	21 JUN 91
015524-0004-SA	MW-41 Groundwwater	AQUEOUS	19 JUN 91	14:37	21 JUN 91
015524-0005-SA	MW-32 Groundwwater	AQUEOUS	20 JUN 91	12:58	21 JUN 91
015524-0006-SA	MW-49 Groundwwater	AQUEOUS	20 JUN 91	09:35	21 JUN 91
015524-0007-SA	MW-43 Groundwwater	AQUEOUS	20 JUN 91	10:35	21 JUN 91
015524-0008-SA	MW-15 Groundwwater	AQUEOUS	20 JUN 91	12:50	21 JUN 91
015524-0009-SA	MW-22 Groundwwater	AQUEOUS	20 JUN 91	13:50	21 JUN 91
015524-0010-TB	Trip Blank	AQUEOUS	20 JUN 91		21 JUN 91
015524-0011-FB	Field Blank	AQUEOUS	20 JUN 91	10:48	21 JUN 91

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ANALYTICAL TEST REQUESTS
for
Sparton Technology Inc.

Lab ID: 015524	Group Code	Analysis Description	Custom Test?
0001 - 0011	A	Volatile Organics	N
		Appendix IX List	N
		Screen - Volatile Organics	N
		Appendix IX Metals (Total) done by ICP	N
		Prep - Total Metals, ICP	N
		Mercury, Cold Vapor AA (Total)	N
		Prep - Mercury, Cold Vapor AA (Total)	N
		Arsenic, Furnace AA (Total)	N
		Prep - Total Metals, Furnace AA	N
		Prep - Total Metals, Furnace AA	N
		Thallium, Furnace AA (Total)	N
		Selenium, Furnace AA (Total)	N
		Lead, Furnace AA (Total)	N

Analytical Results

The analytical results for this project are presented in the following data tables. Each data table includes sample identification information, and when available and appropriate, dates sampled, received, authorized, prepared and analyzed. The authorization data is the date when the project was defined by the client such that laboratory work could begin.

Data sheets contain a listing of the parameters measured in each test, the analytical results and the Enseco reporting limit. Reporting limits are adjusted to reflect dilution of the sample, when appropriate. Solid and waste samples are reported on an "as received" basis, i.e. no correction is made for moisture content.

Enseco-RMAL is no longer routinely blank-correcting analytical data. Uncorrected analytical results are reported, along with associated blank results, for all organic and metals analyses. Analytical results and blank results are reported for conventional inorganic parameters as specified in the method. This policy is described in detail in the Enseco Incorporated Quality Assurance Program Plan for Environmental Chemical Monitoring, Revision 3.3, May, 1989.

The results from the Standard Enseco QA/QC Program, which generates data which are independent of matrix effects, is provided subsequently.

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Volatile Organics
Appendix IX List
Method 8240

Client Name: Sparton Technology Inc.
Client ID: MW-29 Groundwwater
Lab ID: 015524-0001-SA
Matrix: AQUEOUS Sampled: 19 JUN 91 Received: 21 JUN 91
Authorized: 21 JUN 91 Prepared: 22 JUN 91 Analyzed: 30 JUN 91

Parameter	Result	Units	Reporting Limit
Acetone	ND	ug/L	10
Acetonitrile	ND	ug/L	200
Acrolein	ND	ug/L	100
Acrylonitrile	ND	ug/L	100
Allyl chloride	ND	ug/L	10
Benzene	ND	ug/L	5.0
Bromodichloromethane	ND	ug/L	5.0
Bromoform	ND	ug/L	5.0
Bromomethane	ND	ug/L	10
2-Butanone (MEK)	ND	ug/L	10
Carbon disulfide	ND	ug/L	5.0
Carbon tetrachloride	ND	ug/L	5.0
Chlorobenzene	ND	ug/L	5.0
Chloroethane	ND	ug/L	10
Chloroform	ND	ug/L	5.0
Chloromethane	ND	ug/L	10
Chloroprene	ND	ug/L	5.0
Dibromochloromethane	ND	ug/L	5.0
1,2-Dibromo-3-chloro-propane (DBCP)	ND	ug/L	10
1,2-Dibromoethane (EDB)	ND	ug/L	10
Dibromomethane	ND	ug/L	5.0
trans-1,4-Dichloro-2-butene	ND	ug/L	5.0
Dichlorodifluoromethane	ND	ug/L	20
1,1-Dichloroethane	ND	ug/L	5.0
1,2-Dichloroethane	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	5.0
1,2-Dichloroethene (total)	ND	ug/L	5.0
1,2-Dichloropropane	ND	ug/L	5.0
cis-1,3-Dichloropropene	ND	ug/L	5.0
trans-1,3-Dichloropropene	ND	ug/L	5.0
1,4-Dioxane	ND	ug/L	500
Ethylbenzene	ND	ug/L	5.0
Ethyl methacrylate	ND	ug/L	20
Iodomethane	ND	ug/L	5.0
Isobutanol	ND	ug/L	200
2-Hexanone	ND	ug/L	10
Methacrylonitrile	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0

(continued on following page)

ND = Not detected
NA = Not applicable

Reported By: Cherie Windholz Approved By: Mark Dymerski

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Volatile Organics
Appendix IX List
Method 8240

Client Name: Sparton Technology Inc.
Client ID: MW-29 Groundwwater
Lab ID: 015524-0001-SA
Matrix: AQUEOUS Sampled: 19 JUN 91 Received: 21 JUN 91
Authorized: 21 JUN 91 Prepared: 22 JUN 91 Analyzed: 30 JUN 91

Parameter	Result	Units	Reporting Limit
Methyl methacrylate	ND	ug/L	20
4-Methyl-2-pentanone (MIBK)	ND	ug/L	10
Propionitrile	ND	ug/L	5.0
Styrene	ND	ug/L	5.0
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0
Tetrachloroethene	ND	ug/L	5.0
Toluene	ND	ug/L	5.0
1,1,1-Trichloroethane	ND	ug/L	5.0
1,1,2-Trichloroethane	ND	ug/L	5.0
Trichloroethene	ND	ug/L	5.0
Trichlorofluoromethane	ND	ug/L	5.0
1,2,3-Trichloropropane	ND	ug/L	5.0
Vinyl acetate	ND	ug/L	10
Vinyl chloride	ND	ug/L	10
Xylenes (total)	ND	ug/L	5.0

Surrogate	Recovery	
Toluene-d8	97	%
4-Bromofluorobenzene	94	%
1,2-Dichloroethane-d4	100	%

ND = Not detected
NA = Not applicable

Reported By: Cherie Windholz Approved By: Mark Dymerski

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Volatile Organics
Appendix IX List
Method 8240

Client Name: Sparton Technology Inc.
Client ID: MW-31 Groundwwater
Lab ID: 015524-0002-SA
Matrix: AQUEOUS Sampled: 19 JUN 91 Received: 21 JUN 91
Authorized: 21 JUN 91 Prepared: 22 JUN 91 Analyzed: 30 JUN 91

Parameter	Result	Units	Reporting Limit
Acetone	ND	ug/L	10
Acetonitrile	ND	ug/L	200
Acrolein	ND	ug/L	100
Acrylonitrile	ND	ug/L	100
Allyl chloride	ND	ug/L	10
Benzene	ND	ug/L	5.0
Bromodichloromethane	ND	ug/L	5.0
Bromoform	ND	ug/L	5.0
Bromomethane	ND	ug/L	10
2-Butanone (MEK)	ND	ug/L	10
Carbon disulfide	ND	ug/L	5.0
Carbon tetrachloride	ND	ug/L	5.0
Chlorobenzene	ND	ug/L	5.0
Chloroethane	ND	ug/L	10
Chloroform	ND	ug/L	5.0
Chloromethane	ND	ug/L	10
Chloroprene	ND	ug/L	5.0
Dibromochloromethane	ND	ug/L	5.0
1,2-Dibromo-3-chloro-propane (DBCP)	ND	ug/L	10
1,2-Dibromoethane (EDB)	ND	ug/L	10
Dibromomethane	ND	ug/L	5.0
trans-1,4-Dichloro-2-butene	ND	ug/L	5.0
Dichlorodifluoromethane	ND	ug/L	20
1,1-Dichloroethane	ND	ug/L	5.0
1,2-Dichloroethane	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	5.0
1,2-Dichloroethene (total)	ND	ug/L	5.0
1,2-Dichloropropane	ND	ug/L	5.0
cis-1,3-Dichloropropene	ND	ug/L	5.0
trans-1,3-Dichloropropene	ND	ug/L	5.0
1,4-Dioxane	ND	ug/L	500
Ethylbenzene	ND	ug/L	5.0
Ethyl methacrylate	ND	ug/L	20
Iodomethane	ND	ug/L	5.0
Isobutanol	ND	ug/L	200
2-Hexanone	ND	ug/L	10
Methacrylonitrile	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0

(continued on following page)

ND = Not detected
NA = Not applicable

Reported By: Cherie Windholz Approved By: Mark Dymerski

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Volatile Organics
Appendix IX List
Method 8240

Client Name: Sparton Technology Inc.
Client ID: MW-31 Groundwwater
Lab ID: 015524-0002-SA
Matrix: AQUEOUS Sampled: 19 JUN 91 Received: 21 JUN 91
Authorized: 21 JUN 91 Prepared: 22 JUN 91 Analyzed: 30 JUN 91

Parameter	Result	Units	Reporting Limit
Methyl methacrylate	ND	ug/L	20
4-Methyl-2-pentanone (MIBK)	ND	ug/L	10
Propionitrile	ND	ug/L	5.0
Styrene	ND	ug/L	5.0
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0
Tetrachloroethene	ND	ug/L	5.0
Toluene	ND	ug/L	5.0
1,1,1-Trichloroethane	ND	ug/L	5.0
1,1,2-Trichloroethane	ND	ug/L	5.0
Trichloroethene	60	ug/L	5.0
Trichlorofluoromethane	ND	ug/L	5.0
1,2,3-Trichloropropane	ND	ug/L	5.0
Vinyl acetate	ND	ug/L	10
Vinyl chloride	ND	ug/L	10
Xylenes (total)	ND	ug/L	5.0

Surrogate	Recovery	
Toluene-d8	96	%
4-Bromofluorobenzene	99	%
1,2-Dichloroethane-d4	106	%

ND = Not detected
NA = Not applicable

Reported By: Cherie Windholz Approved By: Mark Dymerski

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Volatile Organics
Appendix IX List
Method 8240

Client Name: Sparton Technology Inc.
Client ID: MW-40 Groundwwater
Lab ID: 015524-0003-SA
Matrix: AQUEOUS Sampled: 19 JUN 91 Received: 21 JUN 91
Authorized: 21 JUN 91 Prepared: 22 JUN 91 Analyzed: 30 JUN 91

Parameter	Result	Units	Reporting Limit
Acetone	ND	ug/L	10
Acetonitrile	ND	ug/L	200
Acrolein	ND	ug/L	100
Acrylonitrile	ND	ug/L	100
Allyl chloride	ND	ug/L	10
Benzene	ND	ug/L	5.0
Bromodichloromethane	ND	ug/L	5.0
Bromoform	ND	ug/L	5.0
Bromomethane	ND	ug/L	10
2-Butanone (MEK)	ND	ug/L	10
Carbon disulfide	ND	ug/L	5.0
Carbon tetrachloride	ND	ug/L	5.0
Chlorobenzene	ND	ug/L	5.0
Chloroethane	ND	ug/L	10
Chloroform	ND	ug/L	5.0
Chloromethane	ND	ug/L	10
Chloroprene	ND	ug/L	5.0
Dibromochloromethane	ND	ug/L	5.0
1,2-Dibromo-3-chloro-propane (DBCP)	ND	ug/L	10
1,2-Dibromoethane (EDB)	ND	ug/L	10
Dibromomethane	ND	ug/L	5.0
trans-1,4-Dichloro-2-butene	ND	ug/L	5.0
Dichlorodifluoromethane	ND	ug/L	20
1,1-Dichloroethane	ND	ug/L	5.0
1,2-Dichloroethane	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	5.0
1,2-Dichloroethene (total)	ND	ug/L	5.0
1,2-Dichloropropane	ND	ug/L	5.0
cis-1,3-Dichloropropene	ND	ug/L	5.0
trans-1,3-Dichloropropene	ND	ug/L	5.0
1,4-Dioxane	ND	ug/L	500
Ethylbenzene	ND	ug/L	5.0
Ethyl methacrylate	ND	ug/L	20
Iodomethane	ND	ug/L	5.0
Isobutanol	ND	ug/L	200
2-Hexanone	ND	ug/L	10
Methacrylonitrile	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0

(continued on following page)

ND = Not detected
NA = Not applicable

Reported By: Cherie Windholz Approved By: Mark Dymerski

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Volatile Organics
Appendix IX List
Method 8240

Client Name: Sparton Technology Inc.
Client ID: MW-40 Groundwwater
Lab ID: 015524-0003-SA
Matrix: AQUEOUS Sampled: 19 JUN 91 Received: 21 JUN 91
Authorized: 21 JUN 91 Prepared: 22 JUN 91 Analyzed: 30 JUN 91

Parameter	Result	Units	Reporting Limit
Methyl methacrylate	ND	ug/L	20
4-Methyl-2-pentanone (MIBK)	ND	ug/L	10
Propionitrile	ND	ug/L	5.0
Styrene	ND	ug/L	5.0
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0
Tetrachloroethene	ND	ug/L	5.0
Toluene	ND	ug/L	5.0
1,1,1-Trichloroethane	ND	ug/L	5.0
1,1,2-Trichloroethane	ND	ug/L	5.0
Trichloroethene	ND	ug/L	5.0
Trichlorofluoromethane	ND	ug/L	5.0
1,2,3-Trichloropropane	ND	ug/L	5.0
Vinyl acetate	ND	ug/L	10
Vinyl chloride	ND	ug/L	10
Xylenes (total)	ND	ug/L	5.0

Surrogate	Recovery	
Toluene-d8	101	%
4-Bromofluorobenzene	96	%
1,2-Dichloroethane-d4	105	%

ND = Not detected
NA = Not applicable

Reported By: Cherie Windholz Approved By: Mark Dymerski

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Volatile Organics
Appendix IX List
Method 8240

Client Name: Sparton Technology Inc.
Client ID: MW-41 Groundwwater
Lab ID: 015524-0004-SA
Matrix: AQUEOUS Sampled: 19 JUN 91 Received: 21 JUN 91
Authorized: 21 JUN 91 Prepared: 22 JUN 91 Analyzed: 30 JUN 91

Parameter	Result	Units	Reporting Limit
Acetone	ND	ug/L	50
Acetonitrile	ND	ug/L	1000
Acrolein	ND	ug/L	500
Acrylonitrile	ND	ug/L	500
Allyl chloride	ND	ug/L	50
Benzene	ND	ug/L	25
Bromodichloromethane	ND	ug/L	25
Bromoform	ND	ug/L	25
Bromomethane	ND	ug/L	50
2-Butanone (MEK)	ND	ug/L	50
Carbon disulfide	ND	ug/L	25
Carbon tetrachloride	ND	ug/L	25
Chlorobenzene	ND	ug/L	25
Chloroethane	ND	ug/L	50
Chloroform	ND	ug/L	25
Chloromethane	ND	ug/L	50
Chloroprene	ND	ug/L	25
Dibromochloromethane	ND	ug/L	25
1,2-Dibromo-3-chloro-propane (DBCP)	ND	ug/L	50
1,2-Dibromoethane (EDB)	ND	ug/L	50
Dibromomethane	ND	ug/L	25
trans-1,4-Dichloro-2-butene	ND	ug/L	25
Dichlorodifluoromethane	ND	ug/L	100
1,1-Dichloroethane	ND	ug/L	25
1,2-Dichloroethane	ND	ug/L	25
1,1-Dichloroethene	70	ug/L	25
1,2-Dichloroethene (total)	ND	ug/L	25
1,2-Dichloropropane	ND	ug/L	25
cis-1,3-Dichloropropene	ND	ug/L	25
trans-1,3-Dichloropropene	ND	ug/L	25
1,4-Dioxane	ND	ug/L	2500
Ethylbenzene	ND	ug/L	25
Ethyl methacrylate	ND	ug/L	100
Iodomethane	ND	ug/L	25
Isobutanol	ND	ug/L	1000
2-Hexanone	ND	ug/L	50
Methacrylonitrile	ND	ug/L	25
Methylene chloride	ND	ug/L	25

(continued on following page)

ND = Not detected
NA = Not applicable

Reported By: Cherie Windholz Approved By: Mark Dymerski

Enseco
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Volatile Organics
Appendix IX List
Method 8240

Client Name: Sparton Technology Inc.
Client ID: MW-41 Groundwwater
Lab ID: 015524-0004-SA
Matrix: AQUEOUS Sampled: 19 JUN 91 Received: 21 JUN 91
Authorized: 21 JUN 91 Prepared: 22 JUN 91 Analyzed: 30 JUN 91

Parameter	Result	Units	Reporting Limit
Methyl methacrylate	ND	ug/L	100
4-Methyl-2-pentanone (MIBK)	ND	ug/L	50
Propionitrile	ND	ug/L	25
Styrene	ND	ug/L	25
1,1,1,2-Tetrachloroethane	ND	ug/L	25
1,1,2,2-Tetrachloroethane	ND	ug/L	25
Tetrachloroethene	ND	ug/L	25
Toluene	ND	ug/L	25
1,1,1-Trichloroethane	190	ug/L	25
1,1,2-Trichloroethane	ND	ug/L	25
Trichloroethene	620	ug/L	25
Trichlorofluoromethane	ND	ug/L	25
1,2,3-Trichloropropane	ND	ug/L	25
Vinyl acetate	ND	ug/L	50
Vinyl chloride	ND	ug/L	50
Xylenes (total)	ND	ug/L	25

Surrogate	Recovery	
Toluene-d8	93	%
4-Bromofluorobenzene	96	%
1,2-Dichloroethane-d4	108	%

ND = Not detected
NA = Not applicable

Reported By: Cherie Windholz Approved By: Mark Dymerski

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Volatile Organics
Appendix IX List
Method 8240

Client Name: Sparton Technology Inc.
Client ID: MW-32 Groundwwater
Lab ID: 015524-0005-SA
Matrix: AQUEOUS Sampled: 20 JUN 91 Received: 21 JUN 91
Authorized: 21 JUN 91 Prepared: 22 JUN 91 Analyzed: 01 JUL 91

Parameter	Result	Units	Reporting Limit
Acetone	30	ug/L	10
Acetonitrile	ND	ug/L	200
Acrolein	ND	ug/L	100
Acrylonitrile	ND	ug/L	100
Allyl chloride	ND	ug/L	10
Benzene	ND	ug/L	5.0
Bromodichloromethane	ND	ug/L	5.0
Bromoform	ND	ug/L	5.0
Bromomethane	ND	ug/L	10
2-Butanone (MEK)	ND	ug/L	10
Carbon disulfide	ND	ug/L	5.0
Carbon tetrachloride	ND	ug/L	5.0
Chlorobenzene	ND	ug/L	5.0
Chloroethane	ND	ug/L	10
Chloroform	ND	ug/L	5.0
Chloromethane	ND	ug/L	10
Chloroprene	ND	ug/L	5.0
Dibromochloromethane	ND	ug/L	5.0
1,2-Dibromo-3-chloro-propane (DBCP)	ND	ug/L	10
1,2-Dibromoethane (EDB)	ND	ug/L	10
Dibromomethane	ND	ug/L	5.0
trans-1,4-Dichloro-2-butene	ND	ug/L	5.0
Dichlorodifluoromethane	ND	ug/L	20
1,1-Dichloroethane	ND	ug/L	5.0
1,2-Dichloroethane	ND	ug/L	5.0
1,1-Dichloroethene	7.2	ug/L	5.0
1,2-Dichloroethene (total)	ND	ug/L	5.0
1,2-Dichloropropane	ND	ug/L	5.0
cis-1,3-Dichloropropene	ND	ug/L	5.0
trans-1,3-Dichloropropene	ND	ug/L	5.0
1,4-Dioxane	ND	ug/L	500
Ethylbenzene	ND	ug/L	5.0
Ethyl methacrylate	ND	ug/L	20
Iodomethane	ND	ug/L	5.0
Isobutanol	ND	ug/L	200
2-Hexanone	ND	ug/L	10
Methacrylonitrile	ND	ug/L	5.0
Methylene chloride	140	ug/L	5.0

(continued on following page)

ND = Not detected
NA = Not applicable

Reported By: Michael Blades Approved By: Mark Dymerski

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Volatile Organics
Appendix IX List
Method 8240

Client Name: Sparton Technology Inc.
Client ID: MW-32 Groundwwater
Lab ID: 015524-0005-SA
Matrix: AQUEOUS Sampled: 20 JUN 91 Received: 21 JUN 91
Authorized: 21 JUN 91 Prepared: 22 JUN 91 Analyzed: 01 JUL 91

Parameter	Result	Units	Reporting Limit
Methyl methacrylate	ND	ug/L	20
4-Methyl-2-pentanone (MIBK)	ND	ug/L	10
Propionitrile	ND	ug/L	5.0
Styrene	ND	ug/L	5.0
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0
Tetrachloroethene	ND	ug/L	5.0
Toluene	ND	ug/L	5.0
1,1,1-Trichloroethane	ND	ug/L	5.0
1,1,2-Trichloroethane	ND	ug/L	5.0
Trichloroethene	57	ug/L	5.0
Trichlorofluoromethane	ND	ug/L	5.0
1,2,3-Trichloropropane	ND	ug/L	5.0
Vinyl acetate	ND	ug/L	10
Vinyl chloride	ND	ug/L	10
Xylenes (total)	ND	ug/L	5.0

Surrogate	Recovery	
Toluene-d8	105	%
4-Bromofluorobenzene	98	%
1,2-Dichloroethane-d4	95	%

ND = Not detected
NA = Not applicable

Reported By: Michael Blades Approved By: Mark Dymerski

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Volatile Organics
Appendix IX List
Method 8240

Client Name: Sparton Technology Inc.
Client ID: MW-49 Groundwwater
Lab ID: 015524-0006-SA
Matrix: AQUEOUS Sampled: 20 JUN 91 Received: 21 JUN 91
Authorized: 21 JUN 91 Prepared: 22 JUN 91 Analyzed: 30 JUN 91

Parameter	Result	Units	Reporting Limit
Acetone	ND	ug/L	10
Acetonitrile	ND	ug/L	200
Acrolein	ND	ug/L	100
Acrylonitrile	ND	ug/L	100
Allyl chloride	ND	ug/L	10
Benzene	ND	ug/L	5.0
Bromodichloromethane	ND	ug/L	5.0
Bromoform	ND	ug/L	5.0
Bromomethane	ND	ug/L	10
2-Butanone (MEK)	ND	ug/L	10
Carbon disulfide	ND	ug/L	5.0
Carbon tetrachloride	ND	ug/L	5.0
Chlorobenzene	ND	ug/L	5.0
Chloroethane	ND	ug/L	10
Chloroform	ND	ug/L	5.0
Chloromethane	ND	ug/L	10
Chloroprene	ND	ug/L	5.0
Dibromochloromethane	ND	ug/L	5.0
1,2-Dibromo-3-chloro-propane (DBCP)	ND	ug/L	10
1,2-Dibromoethane (EDB)	ND	ug/L	10
Dibromomethane	ND	ug/L	5.0
trans-1,4-Dichloro-2-butene	ND	ug/L	5.0
Dichlorodifluoromethane	ND	ug/L	20
1,1-Dichloroethane	ND	ug/L	5.0
1,2-Dichloroethane	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	5.0
1,2-Dichloroethene (total)	ND	ug/L	5.0
1,2-Dichloropropane	ND	ug/L	5.0
cis-1,3-Dichloropropene	ND	ug/L	5.0
trans-1,3-Dichloropropene	ND	ug/L	5.0
1,4-Dioxane	ND	ug/L	500
Ethylbenzene	ND	ug/L	5.0
Ethyl methacrylate	ND	ug/L	20
Iodomethane	ND	ug/L	5.0
Isobutanol	ND	ug/L	200
2-Hexanone	ND	ug/L	10
Methacrylonitrile	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0

(continued on following page)

ND = Not detected
NA = Not applicable

Reported By: Cherie Windholz Approved By: Mark Dymerski

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Volatile Organics
Appendix IX List
Method 8240

Client Name: Sparton Technology Inc.
Client ID: MW-49 Groundwwater
Lab ID: 015524-0006-SA
Matrix: AQUEOUS Sampled: 20 JUN 91 Received: 21 JUN 91
Authorized: 21 JUN 91 Prepared: 22 JUN 91 Analyzed: 30 JUN 91

Parameter	Result	Units	Reporting Limit
Methyl methacrylate	ND	ug/L	20
4-Methyl-2-pentanone (MIBK)	ND	ug/L	10
Propionitrile	ND	ug/L	5.0
Styrene	ND	ug/L	5.0
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0
Tetrachloroethene	ND	ug/L	5.0
Toluene	ND	ug/L	5.0
1,1,1-Trichloroethane	ND	ug/L	5.0
1,1,2-Trichloroethane	ND	ug/L	5.0
Trichloroethene	ND	ug/L	5.0
Trichlorofluoromethane	ND	ug/L	5.0
1,2,3-Trichloropropane	ND	ug/L	5.0
Vinyl acetate	ND	ug/L	10
Vinyl chloride	ND	ug/L	10
Xylenes (total)	ND	ug/L	5.0

Surrogate	Recovery	
Toluene-d8	96	%
4-Bromofluorobenzene	97	%
1,2-Dichloroethane-d4	109	%

ND = Not detected
NA = Not applicable

Reported By: Cherie Windholz Approved By: Mark Dymerski

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Volatile Organics
Appendix IX List
Method 8240

Client Name: Sparton Technology Inc.
Client ID: MW-43 Groundwwater
Lab ID: 015524-0007-SA
Matrix: AQUEOUS Sampled: 20 JUN 91 Received: 21 JUN 91
Authorized: 21 JUN 91 Prepared: 22 JUN 91 Analyzed: 01 JUL 91

Parameter	Result	Units	Reporting Limit
Acetone	46	ug/L	33
Acetonitrile	ND	ug/L	660
Acrolein	ND	ug/L	330
Acrylonitrile	ND	ug/L	330
Allyl chloride	ND	ug/L	33
Benzene	ND	ug/L	16
Bromodichloromethane	ND	ug/L	16
Bromoform	ND	ug/L	16
Bromomethane	ND	ug/L	33
2-Butanone (MEK)	ND	ug/L	33
Carbon disulfide	ND	ug/L	16
Carbon tetrachloride	ND	ug/L	16
Chlorobenzene	ND	ug/L	16
Chloroethane	ND	ug/L	33
Chloroform	ND	ug/L	16
Chloromethane	ND	ug/L	33
Chloroprene	ND	ug/L	16
Dibromochloromethane	ND	ug/L	16
1,2-Dibromo-3-chloro-propane (DBCP)	ND	ug/L	33
1,2-Dibromoethane (EDB)	ND	ug/L	33
Dibromomethane	ND	ug/L	16
trans-1,4-Dichloro-2-butene	ND	ug/L	16
Dichlorodifluoromethane	ND	ug/L	66
1,1-Dichloroethane	ND	ug/L	16
1,2-Dichloroethane	ND	ug/L	16
1,1-Dichloroethene	59	ug/L	16
1,2-Dichloroethene (total)	ND	ug/L	16
1,2-Dichloropropane	ND	ug/L	16
cis-1,3-Dichloropropene	ND	ug/L	16
trans-1,3-Dichloropropene	ND	ug/L	16
1,4-Dioxane	ND	ug/L	1600
Ethylbenzene	ND	ug/L	16
Ethyl methacrylate	ND	ug/L	66
Iodomethane	ND	ug/L	16
Isobutanol	ND	ug/L	660
2-Hexanone	ND	ug/L	33
Methacrylonitrile	ND	ug/L	16
Methylene chloride	ND	ug/L	16

(continued on following page)

ND = Not detected
NA = Not applicable

Reported By: Michael Blades Approved By: Mark Dymerski

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Volatile Organics
Appendix IX List
Method 8240

Client Name: Sparton Technology Inc.
Client ID: MW-43 Groundwwater
Lab ID: 015524-0007-SA
Matrix: AQUEOUS Sampled: 20 JUN 91 Received: 21 JUN 91
Authorized: 21 JUN 91 Prepared: 22 JUN 91 Analyzed: 01 JUL 91

Parameter	Result	Units	Reporting Limit
Methyl methacrylate	ND	ug/L	66
4-Methyl-2-pentanone (MIBK)	ND	ug/L	33
Propionitrile	ND	ug/L	16
Styrene	ND	ug/L	16
1,1,1,2-Tetrachloroethane	ND	ug/L	16
1,1,2,2-Tetrachloroethane	ND	ug/L	16
Tetrachloroethene	ND	ug/L	16
Toluene	ND	ug/L	16
1,1,1-Trichloroethane	79	ug/L	16
1,1,2-Trichloroethane	ND	ug/L	16
Trichloroethene	280	ug/L	16
Trichlorofluoromethane	ND	ug/L	16
1,2,3-Trichloropropane	ND	ug/L	16
Vinyl acetate	ND	ug/L	33
Vinyl chloride	ND	ug/L	33
Xylenes (total)	ND	ug/L	16

Surrogate	Recovery	
Toluene-d8	103	%
4-Bromofluorobenzene	99	%
1,2-Dichloroethane-d4	96	%

ND = Not detected
NA = Not applicable

Reported By: Michael Blades Approved By: Mark Dymerski

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Volatile Organics
Appendix IX List
Method 8240

Client Name: Sparton Technology Inc.
Client ID: MW-15 Groundwwater
Lab ID: 015524-0008-SA
Matrix: AQUEOUS Sampled: 20 JUN 91 Received: 21 JUN 91
Authorized: 21 JUN 91 Prepared: 22 JUN 91 Analyzed: 01 JUL 91

Parameter	Result	Units	Reporting Limit
Acetone	ND	ug/L	10
Acetonitrile	ND	ug/L	200
Acrolein	ND	ug/L	100
Acrylonitrile	ND	ug/L	100
Allyl chloride	ND	ug/L	10
Benzene	ND	ug/L	5.0
Bromodichloromethane	ND	ug/L	5.0
Bromoform	ND	ug/L	5.0
Bromomethane	ND	ug/L	10
2-Butanone (MEK)	ND	ug/L	10
Carbon disulfide	ND	ug/L	5.0
Carbon tetrachloride	ND	ug/L	5.0
Chlorobenzene	ND	ug/L	5.0
Chloroethane	ND	ug/L	10
Chloroform	ND	ug/L	5.0
Chloromethane	ND	ug/L	10
Chloroprene	ND	ug/L	5.0
Dibromochloromethane	ND	ug/L	5.0
1,2-Dibromo-3-chloro-propane (DBCP)	ND	ug/L	10
1,2-Dibromoethane (EDB)	ND	ug/L	10
Dibromomethane	ND	ug/L	5.0
trans-1,4-Dichloro-2-butene	ND	ug/L	5.0
Dichlorodifluoromethane	ND	ug/L	20
1,1-Dichloroethane	ND	ug/L	5.0
1,2-Dichloroethane	ND	ug/L	5.0
1,1-Dichloroethene	6.3	ug/L	5.0
1,2-Dichloroethene (total)	ND	ug/L	5.0
1,2-Dichloropropane	ND	ug/L	5.0
cis-1,3-Dichloropropene	ND	ug/L	5.0
trans-1,3-Dichloropropene	ND	ug/L	5.0
1,4-Dioxane	ND	ug/L	500
Ethylbenzene	ND	ug/L	5.0
Ethyl methacrylate	ND	ug/L	20
Iodomethane	ND	ug/L	5.0
Isobutanol	ND	ug/L	200
2-Hexanone	ND	ug/L	10
Methacrylonitrile	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0

(continued on following page)

ND = Not detected
NA = Not applicable

Reported By: Michael Blades Approved By: Mark Dymerski

Enseco
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Volatile Organics
Appendix IX List
Method 8240

Client Name: Sparton Technology Inc.
Client ID: MW-15 Groundwwater
Lab ID: 015524-0008-SA
Matrix: AQUEOUS Sampled: 20 JUN 91 Received: 21 JUN 91
Authorized: 21 JUN 91 Prepared: 22 JUN 91 Analyzed: 01 JUL 91

Parameter	Result	Units	Reporting Limit
Methyl methacrylate	ND	ug/L	20
4-Methyl-2-pentanone (MIBK)	ND	ug/L	10
Propionitrile	ND	ug/L	5.0
Styrene	ND	ug/L	5.0
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0
Tetrachloroethene	ND	ug/L	5.0
Toluene	ND	ug/L	5.0
1,1,1-Trichloroethane	36	ug/L	5.0
1,1,2-Trichloroethane	ND	ug/L	5.0
Trichloroethene	91	ug/L	5.0
Trichlorofluoromethane	ND	ug/L	5.0
1,2,3-Trichloropropane	ND	ug/L	5.0
Vinyl acetate	ND	ug/L	10
Vinyl chloride	ND	ug/L	10
Xylenes (total)	ND	ug/L	5.0

Surrogate	Recovery	
Toluene-d8	103	%
4-Bromofluorobenzene	98	%
1,2-Dichloroethane-d4	96	%

ND = Not detected
NA = Not applicable

Reported By: Michael Blades Approved By: Mark Dymerski

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Volatile Organics
Appendix IX List
Method 8240

Client Name: Sparton Technology Inc.
Client ID: MW-22 Groundwwater
Lab ID: 015524-0009-SA
Matrix: AQUEOUS Sampled: 20 JUN 91 Received: 21 JUN 91
Authorized: 21 JUN 91 Prepared: 22 JUN 91 Analyzed: 01 JUL 91

Parameter	Result	Units	Reporting Limit
Acetone	ND	ug/L	10
Acetonitrile	ND	ug/L	200
Acrolein	ND	ug/L	100
Acrylonitrile	ND	ug/L	100
Allyl chloride	ND	ug/L	10
Benzene	ND	ug/L	5.0
Bromodichloromethane	ND	ug/L	5.0
Bromoform	ND	ug/L	5.0
Bromomethane	ND	ug/L	10
2-Butanone (MEK)	ND	ug/L	10
Carbon disulfide	ND	ug/L	5.0
Carbon tetrachloride	ND	ug/L	5.0
Chlorobenzene	ND	ug/L	5.0
Chloroethane	ND	ug/L	10
Chloroform	ND	ug/L	5.0
Chloromethane	ND	ug/L	10
Chloroprene	ND	ug/L	5.0
Dibromochloromethane	ND	ug/L	5.0
1,2-Dibromo-3-chloro-propane (DBCP)	ND	ug/L	10
1,2-Dibromoethane (EDB)	ND	ug/L	10
Dibromomethane	ND	ug/L	5.0
trans-1,4-Dichloro-2-butene	ND	ug/L	5.0
Dichlorodifluoromethane	ND	ug/L	20
1,1-Dichloroethane	ND	ug/L	5.0
1,2-Dichloroethane	ND	ug/L	5.0
1,1-Dichloroethene	30	ug/L	5.0
1,2-Dichloroethene (total)	ND	ug/L	5.0
1,2-Dichloropropane	ND	ug/L	5.0
cis-1,3-Dichloropropene	ND	ug/L	5.0
trans-1,3-Dichloropropene	ND	ug/L	5.0
1,4-Dioxane	ND	ug/L	500
Ethylbenzene	ND	ug/L	5.0
Ethyl methacrylate	ND	ug/L	20
Iodomethane	ND	ug/L	5.0
Isobutanol	ND	ug/L	200
2-Hexanone	ND	ug/L	10
Methacrylonitrile	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0

(continued on following page)

ND = Not detected
NA = Not applicable

Reported By: Michael Blades Approved By: Mark Dymerski

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Volatile Organics
Appendix IX List
Method 8240

Client Name: Sparton Technology Inc.
Client ID: MW-22 Groundwwater
Lab ID: 015524-0009-SA
Matrix: AQUEOUS Sampled: 20 JUN 91 Received: 21 JUN 91
Authorized: 21 JUN 91 Prepared: 22 JUN 91 Analyzed: 01 JUL 91

Parameter	Result	Units	Reporting Limit
Methyl methacrylate	ND	ug/L	20
4-Methyl-2-pentanone (MIBK)	ND	ug/L	10
Propionitrile	ND	ug/L	5.0
Styrene	ND	ug/L	5.0
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0
Tetrachloroethene	ND	ug/L	5.0
Toluene	ND	ug/L	5.0
1,1,1-Trichloroethane	130	ug/L	5.0
1,1,2-Trichloroethane	ND	ug/L	5.0
Trichloroethene	110	ug/L	5.0
Trichlorofluoromethane	ND	ug/L	5.0
1,2,3-Trichloropropane	ND	ug/L	5.0
Vinyl acetate	ND	ug/L	10
Vinyl chloride	ND	ug/L	10
Xylenes (total)	ND	ug/L	5.0

Surrogate	Recovery	
Toluene-d8	104	%
4-Bromofluorobenzene	99	%
1,2-Dichloroethane-d4	98	%

ND = Not detected
NA = Not applicable

Reported By: Michael Blades Approved By: Mark Dymerski

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Volatile Organics
Appendix IX List
Method 8240

Client Name: Sparton Technology Inc.
Client ID: Trip Blank
Lab ID: 015524-0010-TB
Matrix: AQUEOUS Sampled: 20 JUN 91 Received: 21 JUN 91
Authorized: 21 JUN 91 Prepared: 22 JUN 91 Analyzed: 01 JUL 91

Parameter	Result	Units	Reporting Limit
Acetone	ND	ug/L	10
Acetonitrile	ND	ug/L	200
Acrolein	ND	ug/L	100
Acrylonitrile	ND	ug/L	100
Allyl chloride	ND	ug/L	10
Benzene	ND	ug/L	5.0
Bromodichloromethane	ND	ug/L	5.0
Bromoform	ND	ug/L	5.0
Bromomethane	ND	ug/L	10
2-Butanone (MEK)	ND	ug/L	10
Carbon disulfide	ND	ug/L	5.0
Carbon tetrachloride	ND	ug/L	5.0
Chlorobenzene	ND	ug/L	5.0
Chloroethane	ND	ug/L	10
Chloroform	ND	ug/L	5.0
Chloromethane	ND	ug/L	10
Chloroprene	ND	ug/L	5.0
Dibromochloromethane	ND	ug/L	5.0
1,2-Dibromo-3-chloro-propane (DBCP)	ND	ug/L	10
1,2-Dibromoethane (EDB)	ND	ug/L	10
Dibromomethane	ND	ug/L	5.0
trans-1,4-Dichloro-2-butene	ND	ug/L	5.0
Dichlorodifluoromethane	ND	ug/L	20
1,1-Dichloroethane	ND	ug/L	5.0
1,2-Dichloroethane	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	5.0
1,2-Dichloroethene (total)	ND	ug/L	5.0
1,2-Dichloropropane	ND	ug/L	5.0
cis-1,3-Dichloropropene	ND	ug/L	5.0
trans-1,3-Dichloropropene	ND	ug/L	5.0
1,4-Dioxane	ND	ug/L	500
Ethylbenzene	ND	ug/L	5.0
Ethyl methacrylate	ND	ug/L	20
Iodomethane	ND	ug/L	5.0
Isobutanol	ND	ug/L	200
2-Hexanone	ND	ug/L	10
Methacrylonitrile	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0

(continued on following page)

ND = Not detected
NA = Not applicable

Reported By: Michael Blades Approved By: Mark Dymerski

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Volatile Organics
Appendix IX List
Method 8240

Client Name: Sparton Technology Inc.
Client ID: Trip Blank
Lab ID: 015524-0010-TB
Matrix: AQUEOUS Sampled: 20 JUN 91 Received: 21 JUN 91
Authorized: 21 JUN 91 Prepared: 22 JUN 91 Analyzed: 01 JUL 91

Parameter	Result	Units	Reporting Limit
Methyl methacrylate	ND	ug/L	20
4-Methyl-2-pentanone (MIBK)	ND	ug/L	10
Propionitrile	ND	ug/L	5.0
Styrene	ND	ug/L	5.0
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0
Tetrachloroethene	ND	ug/L	5.0
Toluene	ND	ug/L	5.0
1,1,1-Trichloroethane	ND	ug/L	5.0
1,1,2-Trichloroethane	ND	ug/L	5.0
Trichloroethene	ND	ug/L	5.0
Trichlorofluoromethane	ND	ug/L	5.0
1,2,3-Trichloropropane	ND	ug/L	5.0
Vinyl acetate	ND	ug/L	10
Vinyl chloride	ND	ug/L	10
Xylenes (total)	ND	ug/L	5.0

Surrogate	Recovery	
Toluene-d8	106	%
4-Bromofluorobenzene	99	%
1,2-Dichloroethane-d4	97	%

ND = Not detected
NA = Not applicable

Reported By: Michael Blades Approved By: Mark Dymerski

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Volatile Organics
Appendix IX List
Method 8240

Client Name: Sparton Technology Inc.
Client ID: Field Blank
Lab ID: 015524-0011-FB
Matrix: AQUEOUS Sampled: 20 JUN 91 Received: 21 JUN 91
Authorized: 21 JUN 91 Prepared: 22 JUN 91 Analyzed: 01 JUL 91

Parameter	Result	Units	Reporting Limit
Acetone	ND	ug/L	10
Acetonitrile	ND	ug/L	200
Acrolein	ND	ug/L	100
Acrylonitrile	ND	ug/L	100
Allyl chloride	ND	ug/L	10
Benzene	ND	ug/L	5.0
Bromodichloromethane	ND	ug/L	5.0
Bromoform	ND	ug/L	5.0
Bromomethane	ND	ug/L	10
2-Butanone (MEK)	ND	ug/L	10
Carbon disulfide	ND	ug/L	5.0
Carbon tetrachloride	ND	ug/L	5.0
Chlorobenzene	ND	ug/L	5.0
Chloroethane	ND	ug/L	10
Chloroform	ND	ug/L	5.0
Chloromethane	ND	ug/L	10
Chloroprene	ND	ug/L	5.0
Dibromochloromethane	ND	ug/L	5.0
1,2-Dibromo-3-chloro-propane (DBCP)	ND	ug/L	10
1,2-Dibromoethane (EDB)	ND	ug/L	10
Dibromomethane	ND	ug/L	5.0
trans-1,4-Dichloro-2-butene	ND	ug/L	5.0
Dichlorodifluoromethane	ND	ug/L	20
1,1-Dichloroethane	ND	ug/L	5.0
1,2-Dichloroethane	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	5.0
1,2-Dichloroethene (total)	ND	ug/L	5.0
1,2-Dichloropropane	ND	ug/L	5.0
cis-1,3-Dichloropropene	ND	ug/L	5.0
trans-1,3-Dichloropropene	ND	ug/L	5.0
1,4-Dioxane	ND	ug/L	500
Ethylbenzene	ND	ug/L	5.0
Ethyl methacrylate	ND	ug/L	20
Iodomethane	ND	ug/L	5.0
Isobutanol	ND	ug/L	200
2-Hexanone	ND	ug/L	10
Methacrylonitrile	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0

(continued on following page)

ND = Not detected
NA = Not applicable

Reported By: Michael Blades Approved By: Mark Dymerski

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Volatile Organics
Appendix IX List
Method 8240

Client Name: Sparton Technology Inc.
Client ID: Field Blank
Lab ID: 015524-0011-FB
Matrix: AQUEOUS Sampled: 20 JUN 91 Received: 21 JUN 91
Authorized: 21 JUN 91 Prepared: 22 JUN 91 Analyzed: 01 JUL 91

Parameter	Result	Units	Reporting Limit
Methyl methacrylate	ND	ug/L	20
4-Methyl-2-pentanone (MIBK)	ND	ug/L	10
Propionitrile	ND	ug/L	5.0
Styrene	ND	ug/L	5.0
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0
Tetrachloroethene	ND	ug/L	5.0
Toluene	ND	ug/L	5.0
1,1,1-Trichloroethane	ND	ug/L	5.0
1,1,2-Trichloroethane	ND	ug/L	5.0
Trichloroethene	ND	ug/L	5.0
Trichlorofluoromethane	ND	ug/L	5.0
1,2,3-Trichloropropane	ND	ug/L	5.0
Vinyl acetate	ND	ug/L	10
Vinyl chloride	ND	ug/L	10
Xylenes (total)	ND	ug/L	5.0

Surrogate	Recovery	
Toluene-d8	105	%
4-Bromofluorobenzene	99	%
1,2-Dichloroethane-d4	98	%

ND = Not detected
NA = Not applicable

Reported By: Michael Blades Approved By: Mark Dymerski

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Metals

Total Metals

Client Name: Sparton Technology Inc.
Client ID: MW-29 Groundwwater
Lab ID: 015524-0001-SA
Matrix: AQUEOUS Sampled: 19 JUN 91 Received: 21 JUN 91
Authorized: 21 JUN 91 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Antimony	ND	mg/L	0.060	6010	23 JUN 91	26 JUN 91
Arsenic	0.0079	mg/L	0.0050	7060	23 JUN 91	25 JUN 91
Barium	0.14	mg/L	0.010	6010	23 JUN 91	26 JUN 91
Beryllium	ND	mg/L	0.0020	6010	23 JUN 91	26 JUN 91
Cadmium	ND	mg/L	0.0050	6010	23 JUN 91	26 JUN 91
Chromium	ND	mg/L	0.010	6010	23 JUN 91	26 JUN 91
Cobalt	ND	mg/L	0.010	6010	23 JUN 91	26 JUN 91
Copper	ND	mg/L	0.026	6010	23 JUN 91	26 JUN 91
Lead	ND	mg/L	0.0050	7421	23 JUN 91	25 JUN 91
Mercury	ND	mg/L	0.00020	7470	24 JUN 91	25 JUN 91
Nickel	ND	mg/L	0.040	6010	23 JUN 91	26 JUN 91
Selenium	ND	mg/L	0.0050	7740	23 JUN 91	27 JUN 91
Silver	ND	mg/L	0.010	6010	23 JUN 91	26 JUN 91
Thallium	ND	mg/L	0.0050	7841	23 JUN 91	25 JUN 91
Tin	ND	mg/L	0.10	6010	23 JUN 91	26 JUN 91
Vanadium	ND	mg/L	0.010	6010	23 JUN 91	26 JUN 91
Zinc	ND	mg/L	0.031	6010	23 JUN 91	26 JUN 91

ND = Not detected
NA = Not applicable

Reported By: Leslie Gergurich Approved By: Sandra Jones

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Metals

Total Metals

Client Name: Sparton Technology Inc.
Client ID: MW-31 Groundwwater
Lab ID: 015524-0002-SA
Matrix: AQUEOUS Sampled: 19 JUN 91 Received: 21 JUN 91
Authorized: 21 JUN 91 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Antimony	ND	mg/L	0.060	6010	23 JUN 91	26 JUN 91
Arsenic	ND	mg/L	0.010	7060	23 JUN 91	25 JUN 91
Barium	0.061	mg/L	0.010	6010	23 JUN 91	26 JUN 91
Beryllium	ND	mg/L	0.0020	6010	23 JUN 91	26 JUN 91
Cadmium	ND	mg/L	0.0050	6010	23 JUN 91	26 JUN 91
Chromium	ND	mg/L	0.010	6010	23 JUN 91	26 JUN 91
Cobalt	ND	mg/L	0.010	6010	23 JUN 91	26 JUN 91
Copper	ND	mg/L	0.026	6010	23 JUN 91	26 JUN 91
Lead	ND	mg/L	0.0050	7421	23 JUN 91	25 JUN 91
Mercury	ND	mg/L	0.00020	7470	24 JUN 91	25 JUN 91
Nickel	ND	mg/L	0.040	6010	23 JUN 91	26 JUN 91
Selenium	ND	mg/L	0.0050	7740	23 JUN 91	27 JUN 91
Silver	ND	mg/L	0.010	6010	23 JUN 91	26 JUN 91
Thallium	ND	mg/L	0.010	7841	23 JUN 91	25 JUN 91
Tin	ND	mg/L	0.10	6010	23 JUN 91	26 JUN 91
Vanadium	ND	mg/L	0.010	6010	23 JUN 91	26 JUN 91
Zinc	ND	mg/L	0.031	6010	23 JUN 91	26 JUN 91

ND = Not detected
NA = Not applicable

Reported By: Leslie Gergurich Approved By: Sandra Jones

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Metals

Total Metals

Client Name: Sparton Technology Inc.
Client ID: MW-40 Groundwwater
Lab ID: 015524-0003-SA
Matrix: AQUEOUS Sampled: 19 JUN 91 Received: 21 JUN 91
Authorized: 21 JUN 91 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Antimony	ND	mg/L	0.060	6010	23 JUN 91	26 JUN 91
Arsenic	ND	mg/L	0.010	7060	23 JUN 91	25 JUN 91
Barium	0.014	mg/L	0.010	6010	23 JUN 91	26 JUN 91
Beryllium	ND	mg/L	0.0020	6010	23 JUN 91	26 JUN 91
Cadmium	ND	mg/L	0.0050	6010	23 JUN 91	26 JUN 91
Chromium	ND	mg/L	0.010	6010	23 JUN 91	26 JUN 91
Cobalt	ND	mg/L	0.010	6010	23 JUN 91	26 JUN 91
Copper	ND	mg/L	0.026	6010	23 JUN 91	26 JUN 91
Lead	ND	mg/L	0.0050	7421	23 JUN 91	25 JUN 91
Mercury	ND	mg/L	0.00020	7470	24 JUN 91	25 JUN 91
Nickel	ND	mg/L	0.040	6010	23 JUN 91	26 JUN 91
Selenium	ND	mg/L	0.0050	7740	23 JUN 91	27 JUN 91
Silver	ND	mg/L	0.010	6010	23 JUN 91	26 JUN 91
Thallium	ND	mg/L	0.010	7841	23 JUN 91	25 JUN 91
Tin	ND	mg/L	0.10	6010	23 JUN 91	26 JUN 91
Vanadium	ND	mg/L	0.010	6010	23 JUN 91	26 JUN 91
Zinc	ND	mg/L	0.031	6010	23 JUN 91	26 JUN 91

ND = Not detected
NA = Not applicable

Reported By: Leslie Gergurich Approved By: Sandra Jones

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Metals

Total Metals

Client Name: Sparton Technology Inc.
Client ID: MW-41 Groundwwater
Lab ID: 015524-0004-SA
Matrix: AQUEOUS Sampled: 19 JUN 91 Received: 21 JUN 91
Authorized: 21 JUN 91 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Antimony	ND	mg/L	0.060	6010	23 JUN 91	26 JUN 91
Arsenic	ND	mg/L	0.010	7060	23 JUN 91	25 JUN 91
Barium	0.043	mg/L	0.010	6010	23 JUN 91	26 JUN 91
Beryllium	ND	mg/L	0.0020	6010	23 JUN 91	26 JUN 91
Cadmium	ND	mg/L	0.0050	6010	23 JUN 91	26 JUN 91
Chromium	0.016	mg/L	0.010	6010	23 JUN 91	26 JUN 91
Cobalt	ND	mg/L	0.010	6010	23 JUN 91	26 JUN 91
Copper	ND	mg/L	0.026	6010	23 JUN 91	26 JUN 91
Lead	ND	mg/L	0.0050	7421	23 JUN 91	25 JUN 91
Mercury	ND	mg/L	0.00020	7470	24 JUN 91	25 JUN 91
Nickel	ND	mg/L	0.040	6010	23 JUN 91	26 JUN 91
Selenium	ND	mg/L	0.0050	7740	23 JUN 91	27 JUN 91
Silver	ND	mg/L	0.010	6010	23 JUN 91	26 JUN 91
Thallium	ND	mg/L	0.0050	7841	23 JUN 91	25 JUN 91
Tin	ND	mg/L	0.10	6010	23 JUN 91	26 JUN 91
Vanadium	ND	mg/L	0.010	6010	23 JUN 91	26 JUN 91
Zinc	ND	mg/L	0.031	6010	23 JUN 91	26 JUN 91

ND = Not detected
NA = Not applicable

Reported By: Leslie Gergurich Approved By: Sandra Jones

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Metals

Total Metals

Client Name: Sparton Technology Inc.
Client ID: MW-32 Groundwwater
Lab ID: 015524-0005-SA
Matrix: AQUEOUS Sampled: 20 JUN 91 Received: 21 JUN 91
Authorized: 21 JUN 91 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Antimony	ND	mg/L	0.060	6010	23 JUN 91	26 JUN 91
Arsenic	ND	mg/L	0.010	7060	23 JUN 91	25 JUN 91
Barium	0.14	mg/L	0.010	6010	23 JUN 91	26 JUN 91
Beryllium	ND	mg/L	0.0020	6010	23 JUN 91	26 JUN 91
Cadmium	ND	mg/L	0.0050	6010	23 JUN 91	26 JUN 91
Chromium	ND	mg/L	0.010	6010	23 JUN 91	26 JUN 91
Cobalt	ND	mg/L	0.010	6010	23 JUN 91	26 JUN 91
Copper	ND	mg/L	0.026	6010	23 JUN 91	26 JUN 91
Lead	ND	mg/L	0.0050	7421	23 JUN 91	25 JUN 91
Mercury	ND	mg/L	0.00020	7470	24 JUN 91	25 JUN 91
Nickel	ND	mg/L	0.040	6010	23 JUN 91	26 JUN 91
Selenium	ND	mg/L	0.0050	7740	23 JUN 91	27 JUN 91
Silver	ND	mg/L	0.010	6010	23 JUN 91	26 JUN 91
Thallium	ND	mg/L	0.0050	7841	23 JUN 91	25 JUN 91
Tin	ND	mg/L	0.10	6010	23 JUN 91	26 JUN 91
Vanadium	ND	mg/L	0.010	6010	23 JUN 91	26 JUN 91
Zinc	ND	mg/L	0.031	6010	23 JUN 91	26 JUN 91

ND = Not detected
NA = Not applicable

Reported By: Leslie Gergurich Approved By: Sandra Jones

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Metals

Total Metals

Client Name: Sparton Technology Inc.
Client ID: MW-49 Groundwwater
Lab ID: 015524-0006-SA
Matrix: AQUEOUS Sampled: 20 JUN 91 Received: 21 JUN 91
Authorized: 21 JUN 91 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Antimony	ND	mg/L	0.060	6010	23 JUN 91	26 JUN 91
Arsenic	0.0060	mg/L	0.0050	7060	23 JUN 91	25 JUN 91
Barium	0.12	mg/L	0.010	6010	23 JUN 91	26 JUN 91
Beryllium	ND	mg/L	0.0020	6010	23 JUN 91	26 JUN 91
Cadmium	ND	mg/L	0.0050	6010	23 JUN 91	26 JUN 91
Chromium	ND	mg/L	0.010	6010	23 JUN 91	26 JUN 91
Cobalt	ND	mg/L	0.010	6010	23 JUN 91	26 JUN 91
Copper	ND	mg/L	0.026	6010	23 JUN 91	26 JUN 91
Lead	ND	mg/L	0.0050	7421	23 JUN 91	25 JUN 91
Mercury	ND	mg/L	0.00020	7470	24 JUN 91	25 JUN 91
Nickel	ND	mg/L	0.040	6010	23 JUN 91	26 JUN 91
Selenium	ND	mg/L	0.0050	7740	23 JUN 91	27 JUN 91
Silver	ND	mg/L	0.010	6010	23 JUN 91	26 JUN 91
Thallium	ND	mg/L	0.0050	7841	23 JUN 91	25 JUN 91
Tin	ND	mg/L	0.10	6010	23 JUN 91	26 JUN 91
Vanadium	ND	mg/L	0.010	6010	23 JUN 91	26 JUN 91
Zinc	ND	mg/L	0.031	6010	23 JUN 91	26 JUN 91

ND = Not detected
NA = Not applicable

Reported By: Leslie Gergurich Approved By: Sandra Jones

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Metals

Total Metals

Client Name: Sparton Technology Inc.
Client ID: MW-43 Groundwwater
Lab ID: 015524-0007-SA
Matrix: AQUEOUS Sampled: 20 JUN 91 Received: 21 JUN 91
Authorized: 21 JUN 91 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Antimony	ND	mg/L	0.060	6010	23 JUN 91	26 JUN 91
Arsenic	0.0051	mg/L	0.0050	7060	23 JUN 91	25 JUN 91
Barium	0.17	mg/L	0.010	6010	23 JUN 91	26 JUN 91
Beryllium	ND	mg/L	0.0020	6010	23 JUN 91	26 JUN 91
Cadmium	ND	mg/L	0.0050	6010	23 JUN 91	26 JUN 91
Chromium	ND	mg/L	0.010	6010	23 JUN 91	26 JUN 91
Cobalt	ND	mg/L	0.010	6010	23 JUN 91	26 JUN 91
Copper	ND	mg/L	0.026	6010	23 JUN 91	26 JUN 91
Lead	ND	mg/L	0.010	7421	23 JUN 91	25 JUN 91
Mercury	ND	mg/L	0.00020	7470	24 JUN 91	25 JUN 91
Nickel	ND	mg/L	0.040	6010	23 JUN 91	26 JUN 91
Selenium	ND	mg/L	0.0050	7740	23 JUN 91	27 JUN 91
Silver	ND	mg/L	0.010	6010	23 JUN 91	26 JUN 91
Thallium	ND	mg/L	0.0050	7841	23 JUN 91	25 JUN 91
Tin	ND	mg/L	0.10	6010	23 JUN 91	26 JUN 91
Vanadium	ND	mg/L	0.010	6010	23 JUN 91	26 JUN 91
Zinc	ND	mg/L	0.031	6010	23 JUN 91	26 JUN 91

ND = Not detected
NA = Not applicable

Reported By: Leslie Gergurich Approved By: Sandra Jones

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A Corning Company

Metals

Total Metals

Client Name: Sparton Technology Inc.
Client ID: MW-15 Groundwwater
Lab ID: 015524-0008-SA
Matrix: AQUEOUS Sampled: 20 JUN 91 Received: 21 JUN 91
Authorized: 21 JUN 91 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Antimony	ND	mg/L	0.060	6010	23 JUN 91	26 JUN 91
Arsenic	0.0071	mg/L	0.0050	7060	23 JUN 91	25 JUN 91
Barium	0.085	mg/L	0.010	6010	23 JUN 91	26 JUN 91
Beryllium	ND	mg/L	0.0020	6010	23 JUN 91	26 JUN 91
Cadmium	ND	mg/L	0.0050	6010	23 JUN 91	26 JUN 91
Chromium	ND	mg/L	0.010	6010	23 JUN 91	26 JUN 91
Cobalt	ND	mg/L	0.010	6010	23 JUN 91	26 JUN 91
Copper	ND	mg/L	0.026	6010	23 JUN 91	26 JUN 91
Lead	ND	mg/L	0.010	7421	23 JUN 91	25 JUN 91
Mercury	ND	mg/L	0.00020	7470	24 JUN 91	25 JUN 91
Nickel	ND	mg/L	0.040	6010	23 JUN 91	26 JUN 91
Selenium	ND	mg/L	0.0050	7740	23 JUN 91	27 JUN 91
Silver	ND	mg/L	0.010	6010	23 JUN 91	26 JUN 91
Thallium	ND	mg/L	0.0050	7841	23 JUN 91	25 JUN 91
Tin	ND	mg/L	0.10	6010	23 JUN 91	26 JUN 91
Vanadium	ND	mg/L	0.010	6010	23 JUN 91	26 JUN 91
Zinc	ND	mg/L	0.031	6010	23 JUN 91	26 JUN 91

ND = Not detected
NA = Not applicable

Reported By: Leslie Gergurich Approved By: Sandra Jones

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Metals

Total Metals

Client Name: Sparton Technology Inc.
Client ID: MW-22 Groundwwater
Lab ID: 015524-0009-SA
Matrix: AQUEOUS Sampled: 20 JUN 91 Received: 21 JUN 91
Authorized: 21 JUN 91 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Antimony	ND	mg/L	0.060	6010	23 JUN 91	26 JUN 91
Arsenic	0.0064	mg/L	0.0050	7060	23 JUN 91	25 JUN 91
Barium	0.15	mg/L	0.010	6010	23 JUN 91	26 JUN 91
Beryllium	ND	mg/L	0.0020	6010	23 JUN 91	26 JUN 91
Cadmium	ND	mg/L	0.0050	6010	23 JUN 91	26 JUN 91
Chromium	ND	mg/L	0.010	6010	23 JUN 91	26 JUN 91
Cobalt	ND	mg/L	0.010	6010	23 JUN 91	26 JUN 91
Copper	0.032	mg/L	0.026	6010	23 JUN 91	26 JUN 91
Lead	ND	mg/L	0.0050	7421	23 JUN 91	25 JUN 91
Mercury	ND	mg/L	0.00020	7470	24 JUN 91	25 JUN 91
Nickel	ND	mg/L	0.040	6010	23 JUN 91	26 JUN 91
Selenium	ND	mg/L	0.0050	7740	23 JUN 91	27 JUN 91
Silver	ND	mg/L	0.010	6010	23 JUN 91	26 JUN 91
Thallium	ND	mg/L	0.0050	7841	23 JUN 91	25 JUN 91
Tin	ND	mg/L	0.10	6010	23 JUN 91	26 JUN 91
Vanadium	0.012	mg/L	0.010	6010	23 JUN 91	26 JUN 91
Zinc	0.038	mg/L	0.031	6010	23 JUN 91	26 JUN 91

ND = Not detected
NA = Not applicable

Reported By: Leslie Gergurich Approved By: Sandra Jones

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Metals

Total Metals

Client Name: Sparton Technology Inc.
Client ID: Trip Blank
Lab ID: 015524-0010-TB
Matrix: AQUEOUS Sampled: 20 JUN 91 Received: 21 JUN 91
Authorized: 21 JUN 91 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Antimony	ND	mg/L	0.060	6010	23 JUN 91	26 JUN 91
Arsenic	ND	mg/L	0.0050	7060	23 JUN 91	25 JUN 91
Barium	ND	mg/L	0.010	6010	23 JUN 91	26 JUN 91
Beryllium	ND	mg/L	0.0020	6010	23 JUN 91	26 JUN 91
Cadmium	ND	mg/L	0.0050	6010	23 JUN 91	26 JUN 91
Chromium	ND	mg/L	0.010	6010	23 JUN 91	26 JUN 91
Cobalt	ND	mg/L	0.010	6010	23 JUN 91	26 JUN 91
Copper	ND	mg/L	0.026	6010	23 JUN 91	26 JUN 91
Lead	ND	mg/L	0.0050	7421	23 JUN 91	25 JUN 91
Mercury	ND	mg/L	0.00020	7470	24 JUN 91	25 JUN 91
Nickel	ND	mg/L	0.040	6010	23 JUN 91	26 JUN 91
Selenium	ND	mg/L	0.010	7740	23 JUN 91	27 JUN 91
Silver	ND	mg/L	0.010	6010	23 JUN 91	26 JUN 91
Thallium	ND	mg/L	0.010	7841	23 JUN 91	25 JUN 91
Tin	ND	mg/L	0.10	6010	23 JUN 91	26 JUN 91
Vanadium	ND	mg/L	0.010	6010	23 JUN 91	26 JUN 91
Zinc	ND	mg/L	0.031	6010	23 JUN 91	26 JUN 91

ND = Not detected
NA = Not applicable

Reported By: Leslie Gergurich Approved By: Sandra Jones

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Metals

Total Metals

Client Name: Sparton Technology Inc.
Client ID: Field Blank
Lab ID: 015524-0011-FB
Matrix: AQUEOUS Sampled: 20 JUN 91 Received: 21 JUN 91
Authorized: 21 JUN 91 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Antimony	ND	mg/L	0.060	6010	23 JUN 91	26 JUN 91
Arsenic	ND	mg/L	0.0050	7060	23 JUN 91	25 JUN 91
Barium	ND	mg/L	0.010	6010	23 JUN 91	26 JUN 91
Beryllium	ND	mg/L	0.0020	6010	23 JUN 91	26 JUN 91
Cadmium	ND	mg/L	0.0050	6010	23 JUN 91	26 JUN 91
Chromium	ND	mg/L	0.010	6010	23 JUN 91	26 JUN 91
Cobalt	ND	mg/L	0.010	6010	23 JUN 91	26 JUN 91
Copper	ND	mg/L	0.026	6010	23 JUN 91	26 JUN 91
Lead	ND	mg/L	0.0050	7421	23 JUN 91	25 JUN 91
Mercury	ND	mg/L	0.00020	7470	24 JUN 91	25 JUN 91
Nickel	ND	mg/L	0.040	6010	23 JUN 91	26 JUN 91
Selenium	ND	mg/L	0.010	7740	23 JUN 91	27 JUN 91
Silver	ND	mg/L	0.010	6010	23 JUN 91	26 JUN 91
Thallium	ND	mg/L	0.010	7841	23 JUN 91	25 JUN 91
Tin	ND	mg/L	0.10	6010	23 JUN 91	26 JUN 91
Vanadium	ND	mg/L	0.010	6010	23 JUN 91	26 JUN 91
Zinc	ND	mg/L	0.031	6010	23 JUN 91	26 JUN 91

ND = Not detected
NA = Not applicable

Reported By: Leslie Gergurich Approved By: Sandra Jones

Quality Control Results

The Enseco laboratories operate under a vigorous QA/QC program designed to ensure the generation of scientifically valid, legally defensible data by monitoring every aspect of laboratory operations. Routine QA/QC procedures include the use of approved methodologies, independent verification of analytical standards, use of duplicate Laboratory Control Samples to assess the precision and accuracy of the methodology on a routine basis, and a rigorous system of data review.

In addition, the Enseco laboratories maintain a comprehensive set of certifications from both state and federal governmental agencies which require frequent analyses of blind audit samples. Enseco - Rocky Mountain Analytical Laboratory is certified by the EPA under the EPA/CLP program for both Organic and Inorganic analyses, under the USATHAMA (U.S. Army) program, by the Army Corps of Engineers, and the states of Colorado, New Jersey, New York, Utah, and Florida, among others.

The standard laboratory QC package is designed to:

1) establish a strong, cost-effective QC program that ensures the generation of scientifically valid, legally defensible data

2) assess the laboratory's performance of the analytical method using control limits generated with a well-defined matrix

3) establish clear-cut guidelines for acceptability of analytical data so that QC decisions can be made immediately at the bench, and

4) provide a standard set of reportables which assures the client of the quality of his data.

The Enseco QC program is based upon monitoring the precision and accuracy of an analytical method by analyzing a set of Duplicate Control Samples (DCS) at frequent, well-defined intervals. Each DCS is a well-characterized matrix which is spiked with target compounds at 5-100 times the reporting limit, depending upon the methodology being monitored. The purpose of the DCS is not to duplicate the sample matrix, but rather to provide an interference-free, homogeneous matrix from which to gather data to establish control limits. These limits are used to determine whether data generated by the laboratory on any given day is in control.

Control limits for accuracy (percent recovery) are based on the average, historical percent recovery +/- 3 standard deviation units. Control limits for precision (relative percent difference) range from 0 (identical duplicate DCS results) to the average, historical relative percent difference + 3 standard deviation units. These control limits are fairly narrow based on the consistency of the matrix being monitored and are updated on a quarterly basis.

For each batch of samples analyzed, an additional control measure is taken in the form of a Single Control Sample (SCS). The SCS consists of a control matrix that is spiked with either representative target compounds or surrogate compounds appropriate to the method being used. An SCS is prepared for each sample lot for which the DCS pair are not analyzed.

Accuracy for DCS and SCS is measured by Percent Recovery.

$$\% \text{ Recovery} = \frac{\text{Measured Concentration}}{\text{Actual Concentration}} \times 100$$

Precision for DCS is measured by Relative Percent Difference (RPD).

$$\text{RPD} = \frac{|\text{Measured Concentration DCS1} - \text{Measured Concentration DCS2}|}{(\text{Measured Concentration DCS1} + \text{Measured Concentration DCS2})/2} \times 100$$

All samples analyzed concurrently by the same test are assigned the same QC lot number. Projects which contain numerous samples, analyzed over several days, may have multiple QC lot numbers associated with each test. The QC information which follows includes a listing of the QC lot numbers associated with each of the samples reported, DCS and SCS (where applicable) recoveries from the QC lots associated with the samples, and control limits for these lots. The QC data is reported by test code, in the order that the tests are reported in the analytical results section of this report.

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QC LOT ASSIGNMENT REPORT
Volatile Organics by GC/MS

Laboratory Sample Number	QC Matrix	QC Category	QC Lot Number (DCS)	QC Run Number (SCS/BLANK)
015524-0001-SA	AQUEOUS	624-A	19 JUN 91-B	30 JUN 91-B
015524-0002-SA	AQUEOUS	624-A	19 JUN 91-B	30 JUN 91-B
015524-0003-SA	AQUEOUS	624-A	19 JUN 91-B	30 JUN 91-B
015524-0004-SA	AQUEOUS	624-A	19 JUN 91-B	30 JUN 91-B
015524-0005-SA	AQUEOUS	624-A	27 JUN 91-F	01 JUL 91-F
015524-0006-SA	AQUEOUS	624-A	19 JUN 91-B	30 JUN 91-B
015524-0007-SA	AQUEOUS	624-A	27 JUN 91-F	01 JUL 91-F
015524-0008-SA	AQUEOUS	624-A	27 JUN 91-F	01 JUL 91-F
015524-0009-SA	AQUEOUS	624-A	27 JUN 91-F	01 JUL 91-F
015524-0010-TB	AQUEOUS	624-A	27 JUN 91-F	01 JUL 91-F
015524-0011-FB	AQUEOUS	624-A	27 JUN 91-F	01 JUL 91-F

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DUPLICATE CONTROL SAMPLE REPORT
Volatile Organics by GC/MS

Analyte	Concentration Spiked	Measured DCS1	Measured DCS2	Measured AVG	Accuracy Average(%) DCS	Accuracy Average(%) Limits	Precision (RPD) DCS	Precision (RPD) Limit
Category: 624-A Matrix: AQUEOUS QC Lot: 19 JUN 91-B Concentration Units: ug/L								
1,1-Dichloroethene	50	58.2	56.7	57.4	115	61-145	2.6	14
Trichloroethene	50	47.5	44.1	45.8	92	71-120	7.4	14
Benzene	50	52.2	57.6	54.9	110	76-127	9.8	11
Toluene	50	54.9	52.9	53.9	108	76-125	3.7	13
Chlorobenzene	50	51.7	51.2	51.4	103	75-130	1.0	13
Category: 624-A Matrix: AQUEOUS QC Lot: 27 JUN 91-F Concentration Units: ug/L								
1,1-Dichloroethene	50	63.4	70.7	67.0	134	61-145	11	14
Trichloroethene	50	48.9	49.7	49.3	99	71-120	1.6	14
Benzene	50	44.7	47.7	46.2	92	76-127	6.5	11
Toluene	50	50.5	50.5	50.5	101	76-125	0.0	13
Chlorobenzene	50	53.5	54.3	53.9	108	75-130	1.5	13

Calculations are performed before rounding to avoid round-off errors in calculated results.

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SINGLE CONTROL SAMPLE REPORT
Volatile Organics by GC/MS

Analyte	Concentration Spiked	Concentration Measured	Accuracy(%) SCS	Accuracy(%) Limits
Category: 624-A				
Matrix: AQUEOUS				
QC Lot: 19 JUN 91-B QC Run: 30 JUN 91-B				
Concentration Units: ug/L				
1,2-Dichloroethane-d4	50.0	49.9	100	76-114
4-Bromofluorobenzene	50.0	48.5	97	86-115
Toluene-d8	50.0	48.7	97	88-110
Category: 624-A				
Matrix: AQUEOUS				
QC Lot: 27 JUN 91-F QC Run: 01 JUL 91-F				
Concentration Units: ug/L				
1,2-Dichloroethane-d4	50.0	48.2	96	76-114
4-Bromofluorobenzene	50.0	49.3	99	86-115
Toluene-d8	50.0	53.6	107	88-110

Calculations are performed before rounding to avoid round-off errors in calculated results.

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METHOD BLANK REPORT
Volatile Organics by GC/MS

Test: 8240CP-AP9-AP
Matrix: AQUEOUS
QC Lot: 19 JUN 91-B QC Run: 30 JUN 91-B

Analyte	Result	Units	Reporting Limit
Acetone	11	ug/L	10
Acetonitrile	ND	ug/L	200
Acrolein	ND	ug/L	100
Acrylonitrile	ND	ug/L	100
Allyl chloride	ND	ug/L	10
Benzene	ND	ug/L	5.0
Bromodichloromethane	ND	ug/L	5.0
Bromoform	ND	ug/L	5.0
Bromomethane	ND	ug/L	10
2-Butanone (MEK)	ND	ug/L	10
Carbon disulfide	ND	ug/L	5.0
Carbon tetrachloride	ND	ug/L	5.0
Chlorobenzene	ND	ug/L	5.0
Chloroethane	ND	ug/L	10
Chloroform	ND	ug/L	5.0
Chloromethane	ND	ug/L	10
Chloroprene	ND	ug/L	5.0
Dibromochloromethane	ND	ug/L	5.0
1,2-Dibromo-3-chloro-propane (DBCP)	ND	ug/L	10
1,2-Dibromoethane (EDB)	ND	ug/L	10
Dibromomethane	ND	ug/L	5.0
trans-1,4-Dichloro-2-butene	ND	ug/L	5.0
Dichlorodifluoromethane	ND	ug/L	20
1,1-Dichloroethane	ND	ug/L	5.0
1,2-Dichloroethane	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	5.0
1,2-Dichloroethene (total)	ND	ug/L	5.0
1,2-Dichloropropane	ND	ug/L	5.0
cis-1,3-Dichloropropene	ND	ug/L	5.0
trans-1,3-Dichloropropene	ND	ug/L	5.0
1,4-Dioxane	ND	ug/L	500
Ethylbenzene	ND	ug/L	5.0
Ethyl methacrylate	ND	ug/L	20
Iodomethane	ND	ug/L	5.0
Isobutanol	ND	ug/L	200
2-Hexanone	ND	ug/L	10
Methacrylonitrile	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0

METHOD BLANK REPORT
Volatile Organics by GC/MS (cont.)

Analyte	Result	Units	Reporting Limit
Test: 8240CP-AP9-AP			
Matrix: AQUEOUS			
QC Lot: 19 JUN 91-B QC Run: 30 JUN 91-B			
Methyl methacrylate	ND	ug/L	20
4-Methyl-2-pentanone (MIBK)	ND	ug/L	10
Propionitrile	ND	ug/L	5.0
Styrene	ND	ug/L	5.0
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0
Tetrachloroethene	ND	ug/L	5.0
Toluene	ND	ug/L	5.0
1,1,1-Trichloroethane	ND	ug/L	5.0
1,1,2-Trichloroethane	ND	ug/L	5.0
Trichloroethene	ND	ug/L	5.0
Trichlorofluoromethane	ND	ug/L	5.0
1,2,3-Trichloropropane	ND	ug/L	5.0
Vinyl acetate	ND	ug/L	10
Vinyl chloride	ND	ug/L	10
Xylenes (total)	ND	ug/L	5.0
Test: 8240CP-AP9-AP			
Matrix: AQUEOUS			
QC Lot: 27 JUN 91-F QC Run: 01 JUL 91-F			
Acetone	15	ug/L	10
Acetonitrile	ND	ug/L	200
Acrolein	ND	ug/L	100
Acrylonitrile	ND	ug/L	100
Allyl chloride	ND	ug/L	10
Benzene	ND	ug/L	5.0
Bromodichloromethane	ND	ug/L	5.0
Bromoform	ND	ug/L	5.0
Bromomethane	ND	ug/L	10
2-Butanone (MEK)	ND	ug/L	10
Carbon disulfide	ND	ug/L	5.0
Carbon tetrachloride	ND	ug/L	5.0
Chlorobenzene	ND	ug/L	5.0
Chloroethane	ND	ug/L	10
Chloroform	ND	ug/L	5.0
Chloromethane	ND	ug/L	10
Chloroprene	ND	ug/L	5.0
Dibromochloromethane	ND	ug/L	5.0

METHOD BLANK REPORT
Volatile Organics by GC/MS (cont.)

Test: 8240CP-AP9-AP
Matrix: AQUEOUS
QC Lot: 27 JUN 91-F QC Run: 01 JUL 91-F

Analyte	Result	Units	Reporting Limit
1,2-Dibromo-3-chloro-propane (DBCP)	ND	ug/L	10
1,2-Dibromoethane (EDB)	ND	ug/L	10
Dibromomethane	ND	ug/L	5.0
trans-1,4-Dichloro-2-butene	ND	ug/L	5.0
Dichlorodifluoromethane	ND	ug/L	20
1,1-Dichloroethane	ND	ug/L	5.0
1,2-Dichloroethane	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	5.0
1,2-Dichloroethene (total)	ND	ug/L	5.0
1,2-Dichloropropane	ND	ug/L	5.0
cis-1,3-Dichloropropene	ND	ug/L	5.0
trans-1,3-Dichloropropene	ND	ug/L	5.0
1,4-Dioxane	ND	ug/L	500
Ethylbenzene	ND	ug/L	5.0
Ethyl methacrylate	ND	ug/L	20
Iodomethane	ND	ug/L	5.0
Isobutanol	ND	ug/L	200
2-Hexanone	ND	ug/L	10
Methacrylonitrile	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
Methyl methacrylate	ND	ug/L	20
4-Methyl-2-pentanone (MIBK)	ND	ug/L	10
Propionitrile	ND	ug/L	5.0
Styrene	ND	ug/L	5.0
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0
Tetrachloroethene	ND	ug/L	5.0
Toluene	ND	ug/L	5.0
1,1,1-Trichloroethane	ND	ug/L	5.0
1,1,2-Trichloroethane	ND	ug/L	5.0
Trichloroethene	ND	ug/L	5.0
Trichlorofluoromethane	ND	ug/L	5.0
1,2,3-Trichloropropane	ND	ug/L	5.0
Vinyl acetate	ND	ug/L	10
Vinyl chloride	ND	ug/L	10
Xylenes (total)	ND	ug/L	5.0

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QC LOT ASSIGNMENT REPORT
Metals Analysis and Preparation

Laboratory Sample Number	QC Matrix	QC Category	QC Lot Number (DCS)	QC Run Number (SCS/BLANK)
015524-0001-SA	AQUEOUS	ICP-AT	23 JUN 91-A	23 JUN 91-A
015524-0001-SA	AQUEOUS	HG-CVAA-AT	24 JUN 91-C	24 JUN 91-C
015524-0001-SA	AQUEOUS	AS-FAA-AT	23 JUN 91-A	23 JUN 91-A
015524-0001-SA	AQUEOUS	TL-FAA-AT	23 JUN 91-A	23 JUN 91-A
015524-0001-SA	AQUEOUS	SE-FAA-AT	23 JUN 91-A	23 JUN 91-A
015524-0001-SA	AQUEOUS	PB-FAA-AT	23 JUN 91-A	23 JUN 91-A
015524-0002-SA	AQUEOUS	ICP-AT	23 JUN 91-A	23 JUN 91-A
015524-0002-SA	AQUEOUS	HG-CVAA-AT	24 JUN 91-C	24 JUN 91-C
015524-0002-SA	AQUEOUS	AS-FAA-AT	23 JUN 91-A	23 JUN 91-A
015524-0002-SA	AQUEOUS	TL-FAA-AT	23 JUN 91-A	23 JUN 91-A
015524-0002-SA	AQUEOUS	SE-FAA-AT	23 JUN 91-A	23 JUN 91-A
015524-0002-SA	AQUEOUS	PB-FAA-AT	23 JUN 91-A	23 JUN 91-A
015524-0003-SA	AQUEOUS	ICP-AT	23 JUN 91-A	23 JUN 91-A
015524-0003-SA	AQUEOUS	HG-CVAA-AT	24 JUN 91-C	24 JUN 91-C
015524-0003-SA	AQUEOUS	AS-FAA-AT	23 JUN 91-A	23 JUN 91-A
015524-0003-SA	AQUEOUS	TL-FAA-AT	23 JUN 91-A	23 JUN 91-A
015524-0003-SA	AQUEOUS	SE-FAA-AT	23 JUN 91-A	23 JUN 91-A
015524-0003-SA	AQUEOUS	PB-FAA-AT	23 JUN 91-A	23 JUN 91-A
015524-0004-SA	AQUEOUS	ICP-AT	23 JUN 91-A	23 JUN 91-A
015524-0004-SA	AQUEOUS	HG-CVAA-AT	24 JUN 91-C	24 JUN 91-C
015524-0004-SA	AQUEOUS	AS-FAA-AT	23 JUN 91-A	23 JUN 91-A
015524-0004-SA	AQUEOUS	TL-FAA-AT	23 JUN 91-A	23 JUN 91-A
015524-0004-SA	AQUEOUS	SE-FAA-AT	23 JUN 91-A	23 JUN 91-A
015524-0004-SA	AQUEOUS	PB-FAA-AT	23 JUN 91-A	23 JUN 91-A
015524-0005-SA	AQUEOUS	ICP-AT	23 JUN 91-A	23 JUN 91-A
015524-0005-SA	AQUEOUS	HG-CVAA-AT	24 JUN 91-C	24 JUN 91-C
015524-0005-SA	AQUEOUS	AS-FAA-AT	23 JUN 91-A	23 JUN 91-A
015524-0005-SA	AQUEOUS	TL-FAA-AT	23 JUN 91-A	23 JUN 91-A
015524-0005-SA	AQUEOUS	SE-FAA-AT	23 JUN 91-A	23 JUN 91-A
015524-0005-SA	AQUEOUS	PB-FAA-AT	23 JUN 91-A	23 JUN 91-A
015524-0006-SA	AQUEOUS	ICP-AT	23 JUN 91-A	23 JUN 91-A
015524-0006-SA	AQUEOUS	HG-CVAA-AT	24 JUN 91-C	24 JUN 91-C
015524-0006-SA	AQUEOUS	AS-FAA-AT	23 JUN 91-A	23 JUN 91-A
015524-0006-SA	AQUEOUS	TL-FAA-AT	23 JUN 91-A	23 JUN 91-A
015524-0006-SA	AQUEOUS	SE-FAA-AT	23 JUN 91-A	23 JUN 91-A
015524-0006-SA	AQUEOUS	PB-FAA-AT	23 JUN 91-A	23 JUN 91-A
015524-0007-SA	AQUEOUS	ICP-AT	23 JUN 91-A	23 JUN 91-A
015524-0007-SA	AQUEOUS	HG-CVAA-AT	24 JUN 91-C	24 JUN 91-C
015524-0007-SA	AQUEOUS	AS-FAA-AT	23 JUN 91-A	23 JUN 91-A
015524-0007-SA	AQUEOUS	TL-FAA-AT	23 JUN 91-A	23 JUN 91-A
015524-0007-SA	AQUEOUS	SE-FAA-AT	23 JUN 91-A	23 JUN 91-A
015524-0007-SA	AQUEOUS	PB-FAA-AT	23 JUN 91-A	23 JUN 91-A
015524-0008-SA	AQUEOUS	ICP-AT	23 JUN 91-A	23 JUN 91-A
015524-0008-SA	AQUEOUS	HG-CVAA-AT	24 JUN 91-C	24 JUN 91-C
015524-0008-SA	AQUEOUS	AS-FAA-AT	23 JUN 91-A	23 JUN 91-A
015524-0008-SA	AQUEOUS	TL-FAA-AT	23 JUN 91-A	23 JUN 91-A
015524-0008-SA	AQUEOUS	SE-FAA-AT	23 JUN 91-A	23 JUN 91-A

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QC LOT ASSIGNMENT REPORT
Metals Analysis and Preparation (cont.)

Laboratory Sample Number	QC Matrix	QC Category	QC Lot Number (DCS)	QC Run Number (SCS/BLANK)
015524-0008-SA	AQUEOUS	PB-FAA-AT	23 JUN 91-A	23 JUN 91-A
015524-0009-SA	AQUEOUS	ICP-AT	23 JUN 91-A	23 JUN 91-A
015524-0009-SA	AQUEOUS	HG-CVAA-AT	24 JUN 91-C	24 JUN 91-C
015524-0009-SA	AQUEOUS	AS-FAA-AT	23 JUN 91-A	23 JUN 91-A
015524-0009-SA	AQUEOUS	TL-FAA-AT	23 JUN 91-A	23 JUN 91-A
015524-0009-SA	AQUEOUS	SE-FAA-AT	23 JUN 91-A	23 JUN 91-A
015524-0009-SA	AQUEOUS	PB-FAA-AT	23 JUN 91-A	23 JUN 91-A
015524-0010-TB	AQUEOUS	ICP-AT	23 JUN 91-A	23 JUN 91-A
015524-0010-TB	AQUEOUS	HG-CVAA-AT	24 JUN 91-C	24 JUN 91-C
015524-0010-TB	AQUEOUS	AS-FAA-AT	23 JUN 91-A	23 JUN 91-A
015524-0010-TB	AQUEOUS	TL-FAA-AT	23 JUN 91-A	23 JUN 91-A
015524-0010-TB	AQUEOUS	SE-FAA-AT	23 JUN 91-A	23 JUN 91-A
015524-0010-TB	AQUEOUS	PB-FAA-AT	23 JUN 91-A	23 JUN 91-A
015524-0011-FB	AQUEOUS	ICP-AT	23 JUN 91-A	23 JUN 91-A
015524-0011-FB	AQUEOUS	HG-CVAA-AT	24 JUN 91-C	24 JUN 91-C
015524-0011-FB	AQUEOUS	AS-FAA-AT	23 JUN 91-A	23 JUN 91-A
015524-0011-FB	AQUEOUS	TL-FAA-AT	23 JUN 91-A	23 JUN 91-A
015524-0011-FB	AQUEOUS	SE-FAA-AT	23 JUN 91-A	23 JUN 91-A
015524-0011-FB	AQUEOUS	PB-FAA-AT	23 JUN 91-A	23 JUN 91-A

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DUPLICATE CONTROL SAMPLE REPORT
Metals Analysis and Preparation

Analyte	Concentration Spiked	Measured DCS1	Measured DCS2	Measured AVG	Accuracy Average(%) DCS	Accuracy Average(%) Limits	Precisi (RPD) DCS Lim
Category: ICP-AT							
Matrix: AQUEOUS							
QC Lot: 23 JUN 91-A							
Concentration Units: mg/L							
Aluminum	2.0	2.30	2.32	2.31	115	75-125	0.8
Antimony	0.5	0.541	0.547	0.544	109	75-125	1.2
Arsenic	0.5	0.531	0.558	0.544	109	75-125	4.9
Barium	2.0	2.17	2.19	2.18	109	75-125	0.8
Beryllium	0.05	0.0557	0.0559	0.0558	112	75-125	0.4
Cadmium	0.05	0.0548	0.0512	0.0530	106	75-125	6.8
Calcium	100	110	111	111	111	75-125	1.2
Chromium	0.2	0.211	0.210	0.210	105	75-125	0.5
Cobalt	0.5	0.516	0.519	0.518	104	75-125	0.4
Copper	0.25	0.289	0.286	0.287	115	75-125	1.0
Iron	1.0	1.13	1.12	1.12	112	75-125	1.0
Lead	0.5	0.540	0.545	0.543	109	75-125	1.0
Magnesium	50	55.2	55.6	55.4	111	75-125	0.7
Manganese	0.5	0.516	0.523	0.519	104	75-125	1.3
Nickel	0.5	0.523	0.525	0.524	105	75-125	0.5
Potassium	50	54.0	54.3	54.2	108	75-125	0.5
Silver	0.05	0.0437	0.0407	0.0422	84	75-125	7.0
Sodium	100	110	110	110	110	75-125	0.3
Vanadium	0.5	0.540	0.542	0.541	108	75-125	0.3
Zinc	0.5	0.539	0.545	0.542	108	75-125	1.1
Category: HG-CVAA-AT							
Matrix: AQUEOUS							
QC Lot: 24 JUN 91-C							
Concentration Units: mg/L							
Mercury	0.0010	0.000988	0.00102	0.00100	100	75-125	2.8
Category: AS-FAA-AT							
Matrix: AQUEOUS							
QC Lot: 23 JUN 91-A							
Concentration Units: mg/L							
Arsenic	0.03	0.0310	0.0286	0.0298	99	75-125	8.1

Calculations are performed before rounding to avoid round-off errors in calculated results

DUPLICATE CONTROL SAMPLE REPORT
Metals Analysis and Preparation (cont.)

Analyte	Concentration Spiked	Measured DCS1	Measured DCS2	Measured AVG	Accuracy Average(%) DCS	Accuracy Limits	Precisi (RPD) DCS Lim
Category: TL-FAA-AT Matrix: AQUEOUS QC Lot: 23 JUN 91-A Concentration Units: mg/L							
Thallium	0.03	0.0345	0.0362	0.0354	118	75-125	4.8
Category: SE-FAA-AT Matrix: AQUEOUS QC Lot: 23 JUN 91-A Concentration Units: mg/L							
Selenium	0.03	0.0314	0.0310	0.0312	104	75-125	1.3
Category: PB-FAA-AT Matrix: AQUEOUS QC Lot: 23 JUN 91-A Concentration Units: mg/L							
ead	0.03	0.0303	0.0301	0.0302	101	75-125	0.7

Calculations are performed before rounding to avoid round-off errors in calculated results

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METHOD BLANK REPORT
Metals Analysis and Preparation

Analyte	Result	Units	Reporting Limit
Test: ICP-AP9-AT			
Matrix: AQUEOUS			
QC Lot: 23 JUN 91-A QC Run: 23 JUN 91-A			
Antimony	ND	mg/L	0.060
Barium	ND	mg/L	0.010
Beryllium	ND	mg/L	0.0020
Cadmium	ND	mg/L	0.0050
Chromium	ND	mg/L	0.010
Cobalt	ND	mg/L	0.010
Copper	0.026	mg/L	0.020
Nickel	ND	mg/L	0.040
Silver	ND	mg/L	0.010
Tin	ND	mg/L	0.10
Vanadium	ND	mg/L	0.010
Zinc	0.031	mg/L	0.020
Test: HG-CVAA-AT			
Matrix: AQUEOUS			
QC Lot: 24 JUN 91-C QC Run: 24 JUN 91-C			
'ercury	ND	mg/L	0.00020
Test: AS-FAA-AT			
Matrix: AQUEOUS			
QC Lot: 23 JUN 91-A QC Run: 23 JUN 91-A			
Arsenic	ND	mg/L	0.0050
Test: TL-FAA-AT			
Matrix: AQUEOUS			
QC Lot: 23 JUN 91-A QC Run: 23 JUN 91-A			
Thallium	ND	mg/L	0.0050

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METHOD BLANK REPORT
Metals Analysis and Preparation (cont.)

Analyte	Result	Units	Reporting Limit
Test: SE-FAA-AT Matrix: AQUEOUS QC Lot: 23 JUN 91-A QC Run: 23 JUN 91-A			
Selenium	ND	mg/L	0.0050
Test: PB-FAA-AT Matrix: AQUEOUS QC Lot: 23 JUN 91-A QC Run: 23 JUN 91-A			
Lead	ND	mg/L	0.0050

ATTACHMENT 10

Pumping Test Analysis

ATTACHMENT 10

PUMPING TEST ANALYSIS

BACKGROUND

Aquifer characteristics of the lower flow zones were determined from analysis of data obtained from two constant rate pumping tests conducted in October 1984. The two pumping tests were conducted along the southwest boundary of the Sparton property. The pump test data and details of the well installations and other information are contained in the Harding Lawson Associates (HLA) Report, Hydrogeologic Characterization and Remedial Investigation, Sparton Technology, Inc., 9621 Coors Road N.W., Albuquerque, New Mexico, dated March 13, 1985. A copy of this report is included in the Appendix to this Attachment.

The pumping tests were conducted in well PW-1, and wells MW-12, MW-13, and MW-14 were used as observation wells. A diagram or plan view of the pumping test installation is given on the attached Figure 1. The geologic cross-section corresponding to the pumping test installation is included as Figure 2 (reproduced from Figure 11 of the HLA Report). Specifically, PW-1 included a 10-inch screen and well casing installed in a 16-inch borehole. The screened interval extended from 60 feet below ground to a total depth of 138 feet. MW-12 was a 4-inch well screened from a depth of 64 feet to 133 feet. MW-13 was a 2-inch well installed in an 8-inch borehole with screen from 60 feet to 139.5 feet. MW-14 was a 2-inch well screened from 61 feet to 127 feet. The screen lengths were sufficient to completely penetrate the upper lower (ULFZ) and lower lower flow

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zones (LLFZ) as well as the upper flow zone (UFZ). Installation logs for each well are given in the HLA Report. Water levels were measured in each well using a computer-controlled pressure transducer system. In addition to the wells with transducer installations, hand-measured observations were also obtained during the pumping tests from monitor wells MW-4 (UFZ well), MW-10 (LLFZ well), MW-11 (LLFZ well), and MW-15 (all flow zones). Horizontal distances to the observation wells with respect to the pumping well PW-1 are as follows: MW-4 -- 300 feet northeast; MW-10 -- 310 feet northeast; MW-11 -- 480 feet northeast; MW-12 -- 45 feet north; MW-13 -- 153 feet east; MW-14 -- 345 feet northwest; and MW-15 -- 450 feet north. (See Figure 1 for location.) After the pumping tests, the wells were modified/plugged as follows:

Well No.	Status*
PW-1	Plugged back to UFZ
MW-4	Plugged
MW-10	Plugged
MW-11	Plugged
MW-12	Plugged back to UFZ
MW-13	Plugged back to UFZ
MW-14	Plugged back to UFZ
MW-15	Plugged back to UFZ
* See Figure 53, Final RFI Report.	

The pumping tests were conducted using a 25-horsepower submersible pump installed 126 feet below the top of casing in well PW-1. The discharge from the pump was directed through a 4-inch discharge pipe into the municipal sewer located just off the

southeast corner of the Sparton property. Sparton had previously obtained permission from New Mexico Utilities for the discharge during the pumping tests.

The first pumping test was scheduled as a 48-hour constant-rate test. The pumping rate was designed to be 200 gallons per minute; however, there were flow regulation problems during the first hour or so of the test. For the remainder of the test, a constant rate of 180 gallons per minute was maintained. Equilibrium or steady-state conditions developed in the pumped well and monitor wells after approximately 200 minutes of pumping and corresponded to a drawdown of approximately 25 feet in well PW-1. Pumping was continued for approximately 1300 minutes thereafter for a total pumping time of 1500 minutes (25 hours). Upon completion of the pumping interval, recovery data was obtained for three and one-half hours. However, recovery to pre-pumping water levels occurred in approximately 100 to 200 minutes.

Due to the problems with flow control management in the first hour or so of the first pumping test, a second pumping test was run at a constant rate of 189 gallons per minute to obtain information on the early portion of the pumping test. The second pumping test was run for 120 minutes. The data set looks almost identical to the first test results. Upon completion of the two-hour pumping, recovery data was obtained for approximately 30 minutes upon which the drawdown had essentially reached pre-pumping levels. It should be noted that the drawdowns observed in the second test were comparable to the first test when ratioed according to the respective pumping rates.

Transducer strip chart plots and digitized data for wells PW-1, MW-12, MW-13, and MW-14 are included in the HLA Report with the exception of the digitized time-drawdown

data for MW-13 for the first pumping test. However, this information was synthesized from the strip chart plot of the transducer's output. (A tabulation of all pump test data is included as Tables 1 through 4.)

The original HLA Report did not contain any data plots other than the strip chart plots of the actual transducer data. For current analyses the drawdown and recovery data has been plotted in a variety of ways to allow understanding and analysis of this information. These various plots are attached as figures to this attachment. The data plots include:

1. Cartesian coordinate plots of drawdown/recovery data for the original pumping test for wells PW-1, MW-12, MW-13, and MW-14 (Figures 3-6).
2. Semi-logarithmic plots of time-drawdown information for both the original pumping test and the two-hour pumping test for wells PW-1, MW-12, MW-13, and MW-14 (Figures 7-14).
3. Semi-logarithmic plots of residual drawdown versus time (t/t') for the original pumping test for wells PW-1, MW-12, MW-13, and MW-14 (Figures 15-18).
4. Full logarithmic data plots in non-dimensional form of drawdown versus time (t/r^2) for both the original pumping tests and the two-hour pumping tests for all four wells (Figures 19-22). Note that the chosen scale is compatible with common graphical matching type curves such as those found in Lohman, etc.
5. A distance drawdown plot of the equilibrium drawdowns measured in each

of the wells to demonstrate the radius of influence existing for the pumping test of PW-1 (Figure 23).

ANALYSIS

Original Analysis

The original HLA Report contains a summary (page 43) of aquifer characteristics based on analysis of the data from each individual observation well. According to the report, these parameters were calculated using Theis and Hantush methods and also Jacob straight-line approximations to semi-logarithmic time-drawdown data. With respect to the aquifer parameters reported by HLA, significant variation was observed well to well. No attempt was made to analyze the data on a multi-well basis or consider the effects of aquifer stratification, semi-confined conditions, and/or the development of an equilibrium or steady-state drawdown condition during pumping.

Current Analysis

Continued investigation and analysis of subsurface conditions indicated a significant degree of aquifer stratification or anisotropy. Further, the intermittent presence of finer grained layers indicated that semi-confined conditions could exist. Finally, the presence of a potential recharge source (irrigation canal and irrigated fields) to the immediate east of the Sparton property suggested that equilibrium or steady-state conditions could develop during a pumping test. Recognizing the potential for these various conditions, the aquifer data was reanalyzed using a variety of methods with primary emphasis on multi-well distance drawdown analyses using the equilibrium or

steady-state portion of the time-drawdown data for each well. Analysis was based on procedures for steady radial flow without vertical movement given in Ground Water Hydraulics by Lohman (USGS Professional Paper 708). Note that Equation 34 used in this analysis is identical to Jacob's approximation to the non-steady Theis equation (Equation 57). Using data plotted in Figure 23, a transmissivity, T, of 18,277 gallons per day per foot can be calculated. Using the extrapolated value for radius of influence(or radial distance to zero drawdown), R_o, and the previously calculated transmissivity, Lohman's Equation 59 can be utilized to obtain a storage coefficient, S, value of 0.0021. Note that this storage coefficient corresponds to an equilibrium time of 200 minutes. If an equilibrium time of 300 minutes had been used in the calculations, the storage coefficient would increase to approximately 0.003. It should be noted that the extrapolated radius of influence obtained from MW-12, MW-13, and MW-14 data agrees well with reported observations of drawdown in more remote wells up to 450 to 480 feet away (MW-11 and MW-15) as noted in the HLA Report on page 41. As a further check of equilibrium methods, data from MW-12 and MW-13 was analyzed for both confined and unconfined conditions using Lohman's Equations 31(unconfined) and 32 (confined).

For calculation purposes, an aquifer saturated thickness of 75 feet was assumed. In addition, the base of the aquifer was assumed to be at elevation 4900 which agrees reasonably well with geologic profiles of the area. Utilizing the referenced equations, a transmissivity of 17,748 gallons per day per foot was calculated for confined conditions, and a transmissivity of 18,863 gallons per day per foot was calculated for unconfined conditions. This good agreement is reasonable since the equilibrium equations recognize

that thick unconfined aquifers with small drawdowns are similar to confined aquifers. It should be noted that these calculations agreed very well with the previous multi-well steady-state analysis.

Other types of analysis were considered as well. Using the full logarithmic plots of the time drawdown data given on Figures 19-22, a variety of possible non-steady and steady conditions were investigated. The analytical conditions considered were:

1. Non-steady radial flow without vertical movement (Theis method).
2. Leaky confined aquifers with vertical movement (Cooper method and the Hantush modified method to evaluate semi-pervious confining beds).
3. Unconfined aquifers with vertical movement (Boulton's general method and also Boulton's delayed yield procedure).
4. Aquifer boundaries and theory of images (Stallman's method).

One of the problems in applying these analytical methods to the pumping test data in Figures 19-22 is that the four wells do not provide a consistent "family" or grouping. Each of the wells appears to have its own separate family identity, although there are similarities in shape common to all four non-dimensional plots.

The data do not match Theis type curves at all. In addition, Jacob's approximation cannot be validly used on the semi-logarithmic data plots since sloping of the drawdown curve occurs only during the very early portion of the data. The individual plots have similarity to the Cooper type curves for leaky confined aquifers with vertical movement. However, it should be noted that an equilibrium condition in the time-drawdown data would also match up reasonably well to a Cooper type curve. The Hantush type curves

for leaky confined aquifers with vertical movement through semi-pervious confining beds do not match the data at all. The test data also does not match the Boulton type curves, either for unconfined conditions with vertical movement and/or vertical movement due to delayed yield. However, individual well plots match up well with Stallman's image procedure, which it should be noted is an equilibrium type solution. However, as with the other analyses, the multi-well data plot indicates some other phenomenon is present. Obviously, there are some other flaws with using the Stallman approach, since the observation wells are located in three general compass directions away from the pumped well, and the assumed source of recharge would be only on the east side. The large curve displacement observed in the recovery data indicates that some form of recharge is obviously taking place.

The general appearance of the pump test data indicates that equilibrium and/or steady-state conditions developed at an early stage during the pumping test. Continued pumping did not result in an increase in either drawdown or area of influence. The recognition that the radius of influence is relatively constant and fairly extensive is very important with respect to the evaluation of various remedial alternatives included as part of the Corrective Measure Study (CMS). The values for transmissivity and storage obtained from the current analysis of the pump test data also seem reasonable and compare favorably to rule-of-thumb specific capacity numbers used by water well contractors in the immediate area.

POSSIBLE PUMPING TEST ANALYSIS DEFICIENCIES

1. Significant time has elapsed since data was obtained, and field notes are unavailable from HLA. Current analysis is based on published information and data.

2. The test installation included only on-site wells. However, subsequent geologic correlation of off-site conditions to those investigated in the pumping tests indicate general applicability to the entire site.

3. Digital data for the pumping portion of the first test is unavailable for MW-13; however, this deficiency is offset by a copy of the strip chart recording of the missing data and the availability of data from the second pumping test.

4. There were pumping rate control problems in the first test and some transducer noise/interference problems noted in both tests. However, the confirmation provided by the second test satisfactorily covers the former deficiency and the overall data base is relatively unaffected by the "noise".

5. Drawdown in the pumped well PW-1 seems 20 to 30% high with respect to both cumulative log-log plotting and distance-drawdown data. Conversely the specific capacity of PW-1, reported at 7.5 gpm/ft, seems low compared to the typical 9 gpm/ft for this area (personal communication with Rogers & Co). However, it should be noted that drawdown observations in pumped wells are often suspect and the remaining observation well data is very consistent.

6. For a stratified and potentially unconfined aquifer, the pumping test typically

should have been designed to run for 72 hours to evaluate delayed yield, etc. In fact, the pumping test was designed for 48 hours of constant rate pumping. However, since the equilibrium or steady-state conditions prevailed for approximately 22 hours of the 25-hour first test and since the second pumping test confirmed the equilibrium or steady-state condition, the lack of 72 hours of pumping data is not a serious deficiency.

7. Analysis of time-drawdown data from individual wells yields a wide range of transmissivity and some variation in storage coefficient values as previously reported by HLA report and as calculated in the current analysis. This possible deficiency is offset by the excellent agreement in the distance-drawdown data using the equilibrium portion of each data set. Further, the individual non-steady well analyses are generally based on the early portion of the time-drawdown data where either the curve shape can be matched or the curve slope can be quantified.

8. When all the pump test data is plotted together on a cumulative non-dimensional plot it is obvious that a "textbook" aquifer condition does not exist and a simple Theis solution is not available. The lack of any "family" grouping is probably more of a "real world" situation due to the aquifer complexity than a deficiency.

9. Probably the biggest deficiency was the failure to anticipate that an equilibrium or steady-state condition would develop at all, much less at a very early pumping stage. Indeed, previous analysis tried to force a non-

steady solution. However equilibrium or steady-state conditions provide a higher level of confidence in analytical results.

10. As noted in the analysis section, there is considerable ambiguity as to whether the aquifer is unconfined, partially confined or confined. However, considering the saturated thickness of the aquifer (approximately 75 feet), relatively small drawdowns at the observation wells (1.5 feet to 6 feet), and the apparent equilibrium or steady-state conditions that developed during the pumping tests, there is no significant analytical difference between confined or unconfined conditions. Indeed analysis showed differences in the order of 5% in the calculation of transmissivity. However, the calculated storage coefficient values in the range of 0.002 to 0.003 indicate essentially confined conditions. In any case, the more critical parameter, radius of influence, is well documented and not dependent on aquifer confinement evaluation.

CONCLUSIONS AND RECOMMENDATIONS

Aquifer parameters for the lower flow zones obtained from current analysis of the 1984 pumping test data are adequate for the evaluation of various remedial alternatives to be included in the Corrective Measure Study (CMS). Although these aquifer parameters were developed from on-site pumping tests, geologic correlation off-site indicates general application to the entire plume area.

A radius of influence, R_o, of approximately 600 feet has been demonstrated by both

analytical methods (see Figure 23) and remote observation points during actual pumping. This value should be used in future calculations of capture area, etc. The 600-ft radius of influence reflects steady-state or equilibrium conditions; i.e., it is not a time-dependent value. It should also be noted that this radius of influence will not be affected by pumping rate.

A transmissivity, T, of 18,000 gpd/ft has generally been calculated for the data base as a whole, with lesser values in the order of 12,000 to 14,000 gpd/ft considering only PW-1 data. For conservative design, a transmissivity of 18,000 gpd/ft is recommended.

Both the HLA Report and current analysis indicate a storage coefficient, S, value in the range of 0.002 to 0.003. Some individual analyses indicate a storage coefficient an order of magnitude less. However, considering that radius of influence is well defined, a storage coefficient of 0.0025 is recommended as a conservative measure.

Finally, it should be recognized in any pumping system design that the aquifer is significantly stratified with significant anisotropy. As a result, fully penetrating pumped wells with significant drawdowns could cause downward vertical movement of contaminants from near-water-surface (UFZ) high-constituent-concentration areas.

Analysis by Pierce L. Chandler, Jr., P.E.

HDR Engineering, Inc.

May 1, 1992

SAMPLE CALCULATIONS

I. LOWER FLOW ZONES

A. Steady radial flow without vertical movement

1. Using distance-drawdown data given on Figure 23, the Transmissivity, T, may be calculated from:

$$T = \frac{2.30\ Q}{2\pi\ \Delta s/\Delta \log_{10} r}$$

(Lohman, Eq 34, units of $L^2\ T^{-1}$)

with appropriate conversions for T expressed in gallons per day per foot, the equation becomes

$$T = \frac{528\ Q}{\Delta s/\Delta \log_{10} r}.$$

where Q = 180 gallons per minute and

$\Delta s/\Delta \log_{10} r$ = 5.2 feet/cycle

T = 18277 gallons per day per foot

The Storage Coefficient, S, may be determined from the calculated T; the radial distance to zero drawdown, r_o = 600 feet extrapolated from the data in Figure 23; and, the nominal time to equilibrium, t_e, of 200 minutes (0.139 days) using:

$$S = 2.25\ T \left(\frac{t}{r^2}\right)_0 \qquad \text{(Lohman, Eq 59, Dimensionless)}$$

with appropriate conversion factors for T in gallons per day per foot

$$S = \frac{0.3\ T\ t_e}{r_0^{\ 2}} = \frac{0.3\ (18277\ \text{gal/day/ft})\ (0.139\ \text{days})}{(600\ \text{ft})^2}$$

S = 0.0021

note that if $t_e \approx 300$ minutes

$$\mathbf{S \cong 0.003}$$

2. Using data from MW-12 and MW-13, and assuming <u>confined</u> conditions, Transmissivity was checked using:

$$T = \frac{2.30\ Q \log_{10}(r_2/r_1)}{2\pi\ (s_1 - s_2)} \quad \text{(Lohman, Eq 32, } L^2T^{-1} \text{ units)}$$

in typical units,

$$T = \frac{528\ Q \log_{10}(r_{MW\text{-}13}/r_{MW\text{-}12})}{s_{MW\text{-}12} - s_{MW\text{-}13}}$$

For $Q = 180$ gpm
$r_{MW\text{-}12} = 45$ feet
$r_{MW\text{-}13} = 150$ feet
$s_{MW\text{-}12} = 5.9$ feet
and $s_{MW\text{-}13} = 3.1$ feet,
the calculation of T is:

$$T = \frac{528\ (180\ \text{gpm})\ \log_{10}(150\ \text{ft}/45\ \text{ft})}{5.9\ \text{ft} - 3.1\ \text{ft}}$$

$$\mathbf{T = 17{,}748\ gal/day/ft}$$

3. Using the MW-12 and MW-13 data, but assuming <u>unconfined</u> conditions; a saturated thickness, b, equal to 75 feet; and the base of the aquifer at an elevation of 4900 feet, T may be calculated using:

$$K = \frac{2.30\ Q \log_{10}(r_2/r_1)}{\pi\ (h^2_2 - h^2_1)} \quad \text{(Lohman, Eq 31, } LT^{-1} \text{ units)}$$

and $T = Kb$

with appropriate conversion factors, the combined equation becomes:

$$T = \frac{1055\ b\ Q\ \log_{10}(r_{MW\text{-}13}/r_{MW\text{-}12})}{(h_{MW\text{-}13})^2 - (h_{MW\text{-}12})^2}$$

For $Q = 180$ gpm
$b = 75$ ft
$r_{MW\text{-}12} = 45$ ft
$r_{MW\text{-}13} = 150$ ft
$h_{MW\text{-}12} = 69.1$ ft (75 ft - 5.9 ft)
$h_{MW\text{-}13} = 71.9$ ft (75 ft - 3.1 ft)

$$T = \frac{1055\ (75\ \text{ft})\ (180\ \text{gpm})\ \log_{10}(150\ \text{ft}/45\ \text{ft})}{(71.9\ \text{ft})^2 - (69.1\ \text{ft})^2}$$

T = 18863 gal/day/ft

II. UPPER FLOW ZONE (from Draft Effectiveness Report)

A. Calculation of In Situ Field Permeability, K

1. Using the pump test drawdown values measured after the pump was shut off, the permeability may be calculated with:

$$K = \frac{d^2 \ln(2\, m\, L/D)}{8\, L\, (t_2 - t_1)} \quad \ln (H_1/H_2)$$

(Hvorslev, 1951)*

* Case G, well point-filter in uniform sand, for variable head tests with the condition $m\, L/D > 4$ (see Figure 1).

Where:

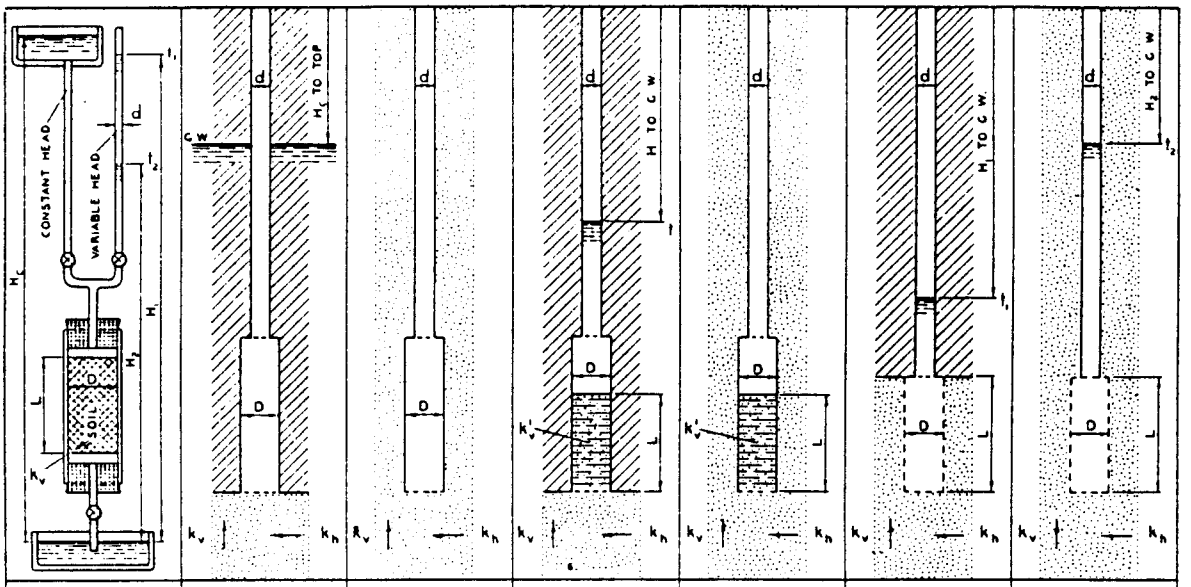
K_h = Horizontal Coefficient of Permeability
K_v = Vertical Coefficient of Permeability
m = Transformation Ratio = $\sqrt{K_h/K_v}$
d = Diameter, standpipe
D = Diameter, intake pipe
L = Length of intake
t = time
H_1 = Drawdown at time t_1
H_2 = Drawdown at time t_2

2. An example of the calculations for Recovery Well PW-1 follows: Using these parameters for Recovery Well PW-1,

m = 3 (approximated)
d = 25.4 cm
D = 25.4 cm
L = 304.8 cm
m L/D = 36 > 4

Hvorslev's equation reduces to

$$K_h = \frac{1.13}{t_2 - t_1} \quad \ln (H_1/H_2)$$

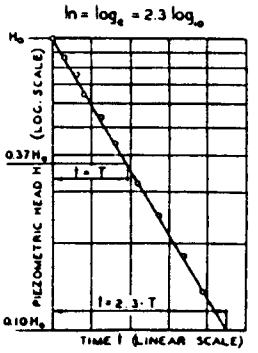


LABORATORY PERMEAMETER (CONSOLIDOMETER) A	FLUSH BOTTOM AT IMPERVIOUS BOUNDARY B	FLUSH BOTTOM IN UNIFORM SOIL C	SOIL IN CASING AT IMPERVIOUS BOUNDARY D	SOIL IN CASING IN UNIFORM SOIL E	WELL POINT-FILTER AT IMPERVIOUS BOUNDARY F	WELL POINT-FILTER IN UNIFORM SOIL G

CASE	CONSTANT HEAD	VARIABLE HEAD	BASIC TIME LAG
A	$k_v = \frac{4 \cdot q \cdot L}{\pi \cdot D^2 \cdot H_c}$	$k_v = \frac{d^2 \cdot L}{D^2 \cdot (t_2 - t_1)} \ln \frac{H_1}{H_2}$ $k_v = \frac{L}{t_2 - t_1} \ln \frac{H_1}{H_2}$ FOR $d = D$	$k_v = \frac{d^2 \cdot L}{D^2 \cdot T}$ $k_v = \frac{L}{T}$ FOR $d = D$
B	$k_m = \frac{q}{2 \cdot D \cdot H_c}$	$k_m = \frac{\pi \cdot d^2}{8 \cdot D \cdot (t_2 - t_1)} \ln \frac{H_1}{H_2}$ $k_m = \frac{\pi \cdot D}{8 \cdot (t_2 - t_1)} \ln \frac{H_1}{H_2}$ FOR $d = D$	$k_m = \frac{\pi d^2}{8 \cdot D \cdot T}$ $k_m = \frac{\pi \cdot D}{8 \cdot T}$ FOR $d = D$
C	$k_m = \frac{q}{2.75 \cdot D \cdot H_c}$	$k_m = \frac{\pi \cdot d^2}{11 \cdot D \cdot (t_2 - t_1)} \ln \frac{H_1}{H_2}$ $k_m = \frac{\pi \cdot D}{11 (t_2 - t_1)} \ln \frac{H_1}{H_2}$ FOR $d = D$	$k_m = \frac{\pi \cdot d^2}{11 \cdot D \cdot T}$ $k_m = \frac{\pi \cdot D}{11 \cdot T}$ FOR $d = D$
D	$k'_v = \frac{4 \cdot q \cdot \left[\frac{\pi}{8} \cdot \frac{k'_v}{k_v} \cdot \frac{D}{m} + L\right]}{\pi \cdot D^2 \cdot H_c}$	$k'_v = \frac{d^2 \left[\frac{\pi}{8} \cdot \frac{k'_v}{k_v} \cdot \frac{D}{m} + L\right]}{D^2 \cdot (t_2 - t_1)} \ln \frac{H_1}{H_2}$ $k_v = \frac{\frac{\pi}{8} \cdot \frac{D}{m} + L}{t_2 - t_1} \ln \frac{H_1}{H_2}$ FOR $k'_v = k_v$, $d = D$	$k'_v = \frac{d^2 \cdot \left[\frac{\pi}{8} \cdot \frac{k'_v}{k_v} \cdot \frac{D}{m}\right] + L}{D^2 \cdot T}$ $k_v = \frac{\frac{\pi}{8} \cdot \frac{D}{m} + L}{T}$ FOR $k'_v = k_v$, $d = D$
E	$k'_v = \frac{4 \cdot q \cdot \left[\frac{\pi}{11} \cdot \frac{k'_v}{k_v} \cdot \frac{D}{m} + L\right]}{\pi \cdot D^2 \cdot H_c}$	$k'_v = \frac{d^2 \left[\frac{\pi}{11} \cdot \frac{k'_v}{k_v} \cdot \frac{D}{m} + L\right]}{D^2 \cdot (t_2 - t_1)} \ln \frac{H_1}{H_2}$ $k_v = \frac{\frac{\pi}{11} \cdot \frac{D}{m} + L}{t_2 - t_1} \ln \frac{H_1}{H_2}$ FOR $k'_v = k_v$, $d = D$	$k'_v = \frac{d^2 \cdot \left[\frac{\pi}{11} \cdot \frac{k'_v}{k_v} \cdot \frac{D}{m} + L\right]}{D^2 \cdot T}$ $k'_v = \frac{\frac{\pi}{11} \cdot \frac{D}{m} + L}{T}$ FOR $k'_v = k_v$, $d = D$
F	$k_h = \frac{q \cdot \ln \left[\frac{2mL}{D} + \sqrt{1 + \left(\frac{2mL}{D}\right)^2}\right]}{2 \cdot \pi \cdot L \cdot H_c}$	$k_h = \frac{d^2 \cdot \ln \left[\frac{2mL}{D} + \sqrt{1 + \left(\frac{2mL}{D}\right)^2}\right]}{8 \cdot L \cdot (t_2 - t_1)} \ln \frac{H_1}{H_2}$ $k_h = \frac{d^2 \cdot \ln \left(\frac{4mL}{D}\right)}{8 \cdot L \cdot (t_2 - t_1)} \ln \frac{H_1}{H_2}$ FOR $\frac{2mL}{D} > 4$	$k_h = \frac{d^2 \cdot \ln \left[\frac{2mL}{D} + \sqrt{1 + \left(\frac{2mL}{D}\right)^2}\right]}{8 \cdot L \cdot T}$ $k_h = \frac{d^2 \cdot \ln \left(\frac{4mL}{D}\right)}{8 \cdot L \cdot T}$ FOR $\frac{2mL}{D} > 4$
G	$k_h = \frac{q \ln \left[\frac{mL}{D} + \sqrt{1 + \left(\frac{mL}{D}\right)^2}\right]}{2 \pi \cdot L \cdot H_c}$	$k_h = \frac{d^2 \cdot \ln \left[\frac{mL}{D} + \sqrt{1 + \left(\frac{mL}{D}\right)^2}\right]}{8 \cdot L \cdot (t_2 - t_1)} \ln \frac{H_1}{H_2}$ $k_h = \frac{d^2 \cdot \ln \left(\frac{2mL}{D}\right)}{8 \cdot L \cdot (t_2 - t_1)} \ln \frac{H_1}{H_2}$ FOR $\frac{mL}{D} > 4$	$k_h = \frac{d^2 \cdot \ln \left[\frac{mL}{D} + \sqrt{1 + \left(\frac{mL}{D}\right)^2}\right]}{8 \cdot L \cdot T}$ $k_h = \frac{d^2 \cdot \ln \left(\frac{2mL}{D}\right)}{8 \cdot L \cdot T}$ FOR $\frac{mL}{D} > 4$

NOTATION

D = DIAM. INTAKE, SAMPLE, CM
d = DIAMETER, STANDPIPE, CM
L = LENGTH, INTAKE, SAMPLE, CM
H_c = CONSTANT PIEZ. HEAD, CM
H_1 = PIEZ. HEAD FOR $t = t_1$, CM
H_2 = PIEZ. HEAD FOR $t = t_2$, CM
q = FLOW OF WATER, CM^3/SEC.
t = TIME, SEC.
T = BASIC TIME LAG, SEC.
k'_v = VERT. PERM. CASING, CM/SEC.
k_v = VERT. PERM. GROUND, CM/SEC.
k_h = HORZ. PERM. GROUND, CM/SEC.
k_m = MEAN COEFF. PERM., CM/SEC.
m = TRANSFORMATION RATIO
$k_m = \sqrt{k_h \cdot k_v}$ $m = \sqrt{k_h / k_v}$
$\ln = \log_e = 2.3 \log_{10}$



DETERMINATION BASIC TIME LAG T

ASSUMPTIONS

SOIL AT INTAKE, INFINITE DEPTH AND DIRECTIONAL ISOTROPY (k_v AND k_h CONSTANT) - NO DISTURBANCE, SEGREGATION, SWELLING OR CONSOLIDATION OF SOIL - NO SEDIMENTATION OR LEAKAGE - NO AIR OR GAS IN SOIL, WELL POINT, OR PIPE - HYDRAULIC LOSSES IN PIPES, WELL POINT OR FILTER NEGLIGIBLE

Formulas for determination of permeability

Figure 1.

009194

The permeability for various values of H_1, H_2, t_1, t_2 was calculated, then averaged for a reported value as shown in Table 1 below.

Table 1

H_1 (ft)	t_1 (sec)	H_2 (ft)	t_2 (sec)	$\ln(H_1/H_2)$	t_2-t_1(sec)	K_h(cm/sec)
1.98	0	1.90	120	0.041	120	3.86×10^{-4}
1.94	45	1.86	210	0.042	165	2.88×10^{-4}
1.88	150	1.73	360	0.083	210	4.47×10^{-4}
1.80	300	1.66	600	0.081	300	3.05×10^{-4}
1.63	720	1.50	1080	0.083	360	2.61×10^{-4}
1.50	1080	0.93	3000	0.478	1920	2.81×10^{-4}
0.93	3000	0.42	6000	0.795	3000	2.99×10^{-4}

average K_h: 3.24×10^{-4} cm/sec

Table 2 provides a summary of field permeabilities for all eight Recovery Wells and MW-16.

Table 2

Well No.	In situ field permeabilities (cm/sec)
PW-1	3.24×10^{-4}
MW-16	2.39×10^{-4}
MW-18	3.46×10^{-4}
MW-23	2.53×10^{-3}
MW-24	4.36×10^{-4}
MW-25	4.50×10^{-4}
MW-26	3.56×10^{-4}
MW-27	2.90×10^{-3}
MW-28	2.91×10^{-5}

B. Calculation of Radius of Influence, r_o

1. Using the permeabilities calculated with Hvorslev's equation and a well drawdown equal to the upper flow zone saturated thickness, the Radius of Influence (r_o) at each well location may be calculated with the following equation:

$$r_o = C (H - h_w) \sqrt{K}$$ (Sichardt's method, U.S. Department of the Army, 1971)

Where:

r_o = Radius of Influence, ft
C = Empirical Relation of K vs. r
H = Height of water table (saturated thickness), ft
h_w = Head of water in well, ft
K = Coefficient of Permeability, microns/sec

2. An example of the calculations for Recovery Well PW-1 follows:

C = 3 (for a single well)
K_h = 3.24×10^{-4} cm/sec = 3.24 microns/sec
$H-h_w$ = 10 ft
r_o = 3 (10ft) ($\sqrt{3.24}$)
r_o = 54 ft

Table 3 provides a summary of calculated Radii of Influence for all eight Recovery Wells and MW-16.

Table 3

Well No.	Calculated Radius of Influence (ft)
PW-1	54
MW-16	46
MW-18	56
MW-23	136
MW-24	63
MW-25	93
MW-26	57
MW-27	162
MW-28	35

C. Calculation of Transmissivity, T

1. Using the permeability values calculated with Hvorslev's equation and an upper flow zone saturated thickness of 10 feet, the Transmissivity, T, for each well location may be calculated with the following equation:

$$T = k\,b$$

Where:

T = Transmissivity
k = Permeability
b = saturated thickness

2. An example of the calculations for Recovery Well PW-1 follows:

$k = 3.24 \times 10^{-4}$ cm/sec = 0.28 m/day
b = 10 ft = 3.05 m

T = (0.28 m/day) (3.05 m) (80.5 gal/day/ft per m^2/day)
= **68.7 gal/day/ft**

Table 4 provides a summary of Transmissivity values for all eight Recovery Wells and MW-16.

Table 4

Well No.	Transmissivity, T (gal/day/ft)
PW-1	68.7
MW-16	50.7
MW-18	73.7
MW-23	536.4
MW-24	92.5
MW-25	95.5
MW-26	75.5
MW-27	615.0
MW-28	6.2

D. Calculation of Storage Coefficient, S

1. Using the Transmissivity, T, and Radius of Influence, r_o, values previously calculated, as well as the elapsed time from pump test start to finish, the Storage Coefficient, S, for each well location may be calculated with:

$$S = 2.25\, T \left(\frac{t}{r^2} \right)_o \qquad \text{(Lohman, Eq 59, Dimensionless)}$$

Where:

S = Storage Coefficient
T = Transmissivity
t = time
r_o = Radius of Influence

2. An example of the calculation for Recovery Well PW-1 follows:

T = 68.7 gal/day/ft = 0.84 m^2/day
t = 4332 min = 3.0 days
r_o = 54 ft = 16.5 m

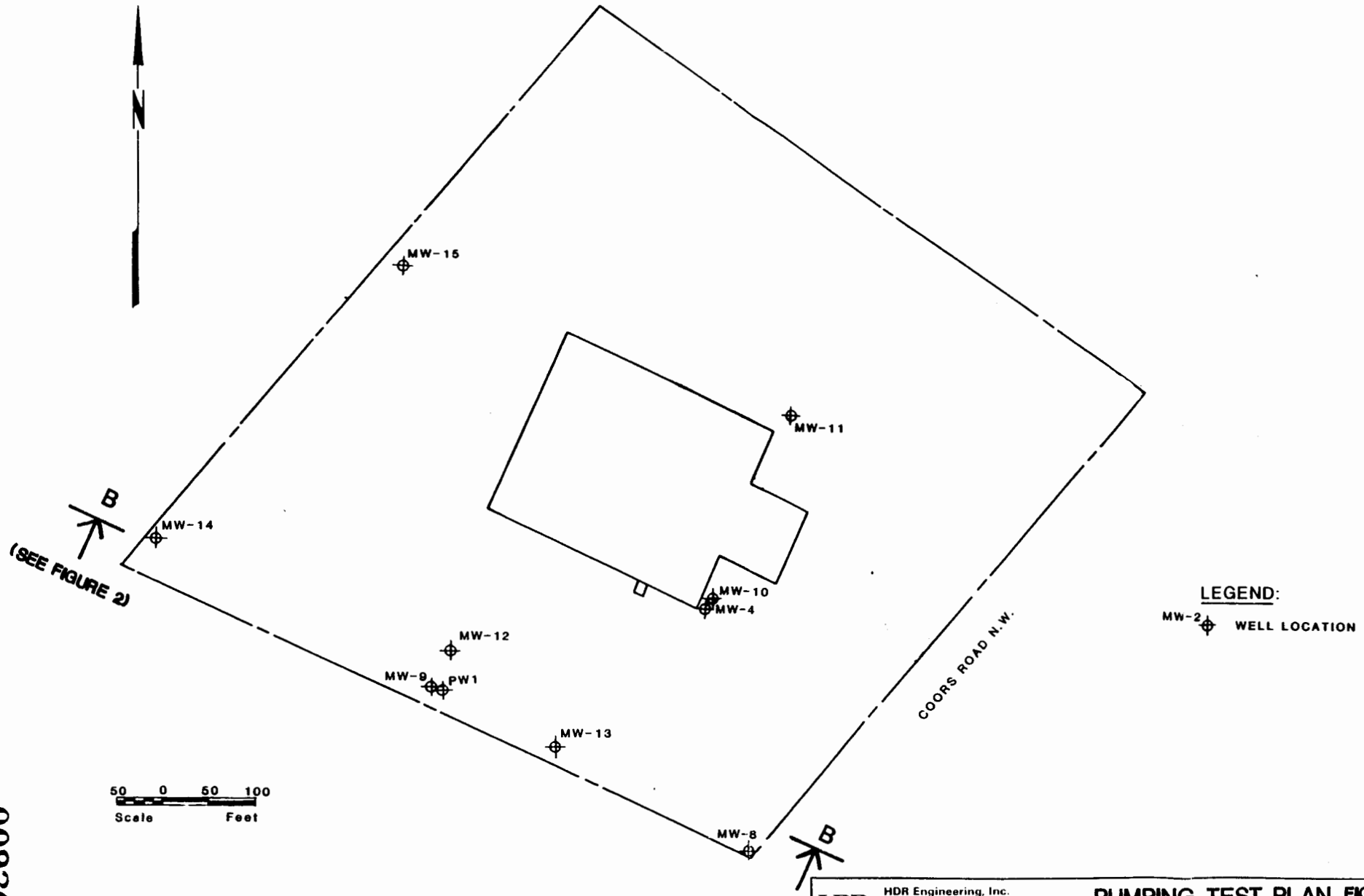
$$S = \frac{2.25\ (0.84\ m^2/day)\ (3.0\ days)}{(16.5\ m)^2}$$

S = 0.0205

Table 5 provides a summary of Storage Coefficient values for all eight Recovery Wells and MW-16.

Table 5

Well No.	Storage Coefficient, S
PW-1	0.0205
MW-16	0.0217
MW-18	0.0144
MW-23	0.0261
MW-24	0.0214
MW-25	0.0095
MW-26	0.0207
MW-27	0.0206
MW-28	0.0045



REFERENCE: SPARTON TECH. INC. SURVEY BY DENNEY-GROSS & ASSOC., INC., DATED 10/5/84

HDR

HDR Engineering, Inc.
Suite 125
12700 Hillcrest Road
Dallas, Texas
75230 2096

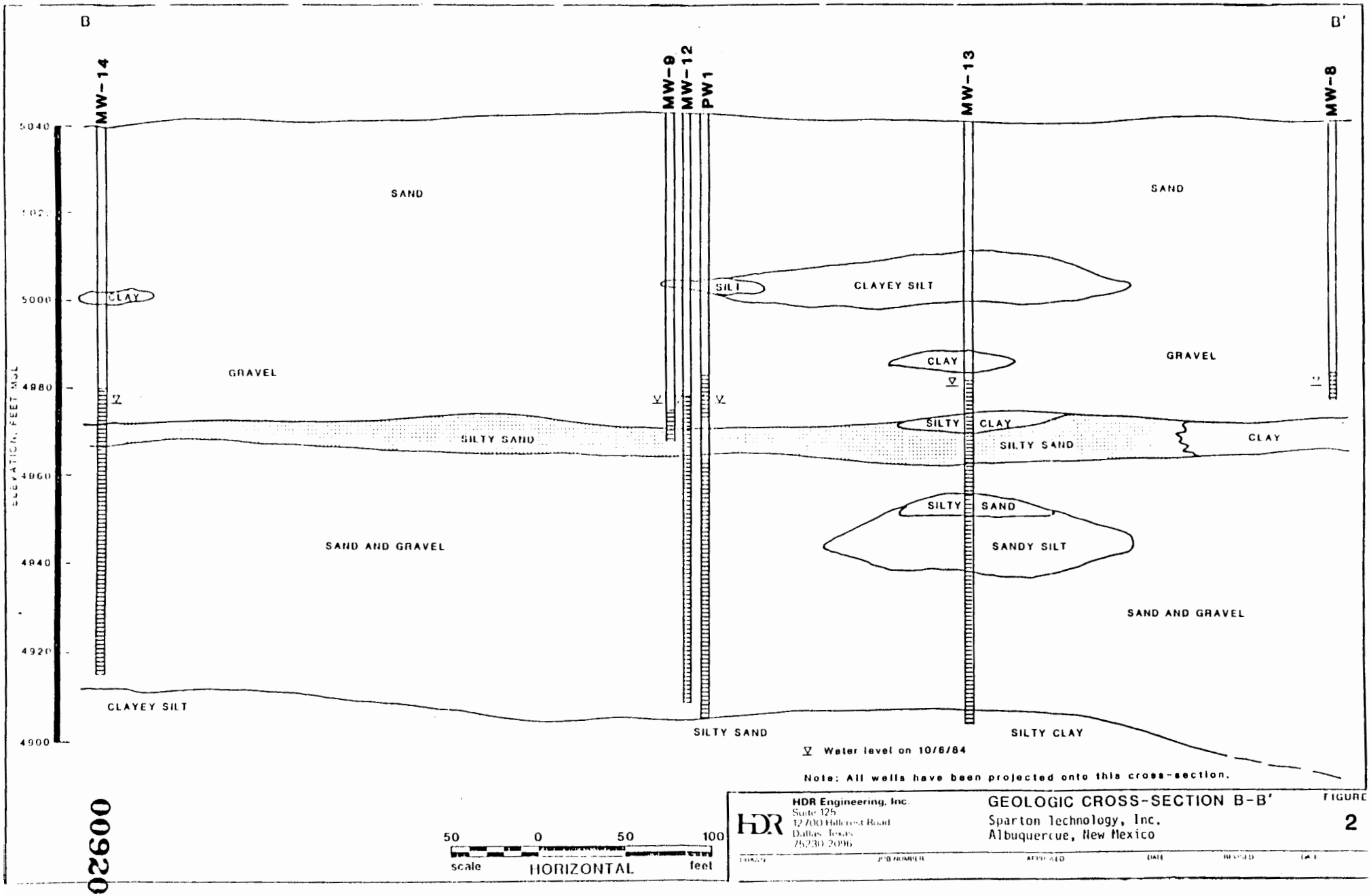
PUMPING TEST PLAN

Sparton Technology, Inc.
Albuquerque, New Mexico

FIGURE 1

DRAWN | JOB NUMBER | APPROVED | DATE | HI

009201



HDR Engineering, Inc.
Suite 125
12700 Hillcrest Road
Dallas, Texas
75230-2096

GEOLOGIC CROSS-SECTION B-B'
Sparton Technology, Inc.
Albuquerque, New Mexico

FIGURE 2

DRAWN | JOB NUMBER | APPROVED | DATE | REVISED | DATE

009202

25 HOUR PUMPING TEST WELL PW-1

DRAWDOWN RECOVERY

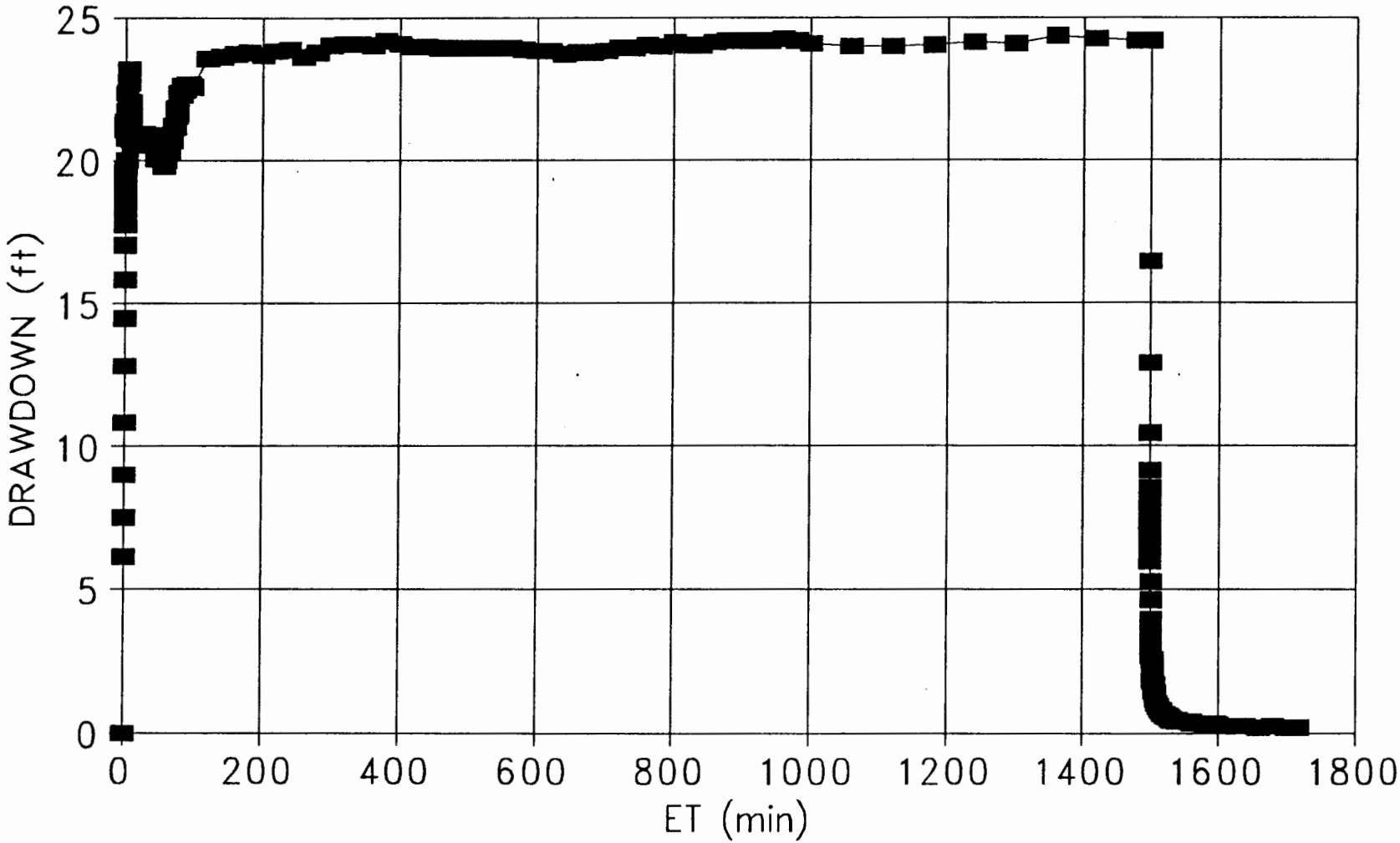


FIGURE 3

25 HOUR PUMPING TEST WELL MW-12

DRAWDOWN RECOVERY

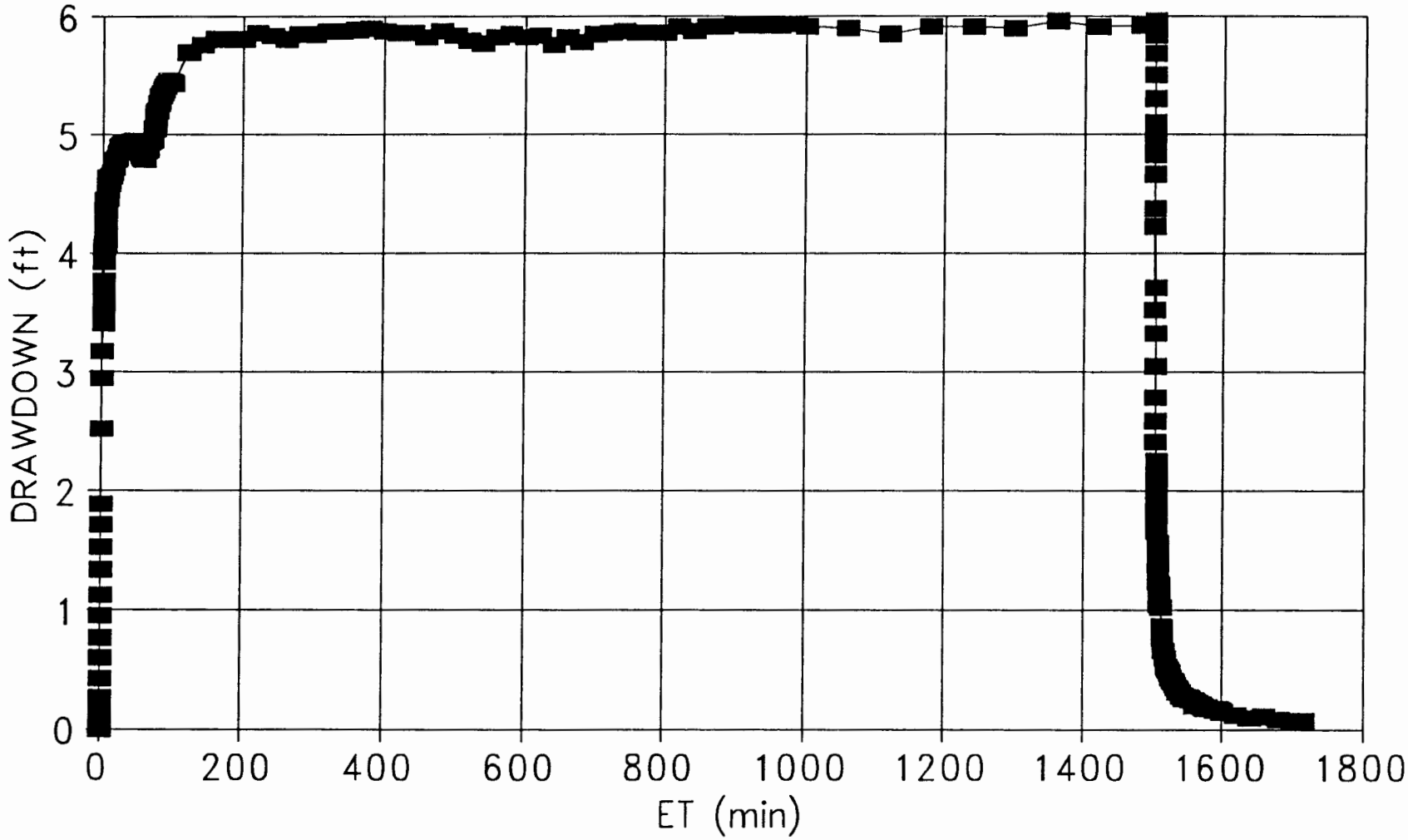


FIGURE 4

009204

25 HOUR PUMPING TEST WELL MW-13

DRAWDOWN RECOVERY

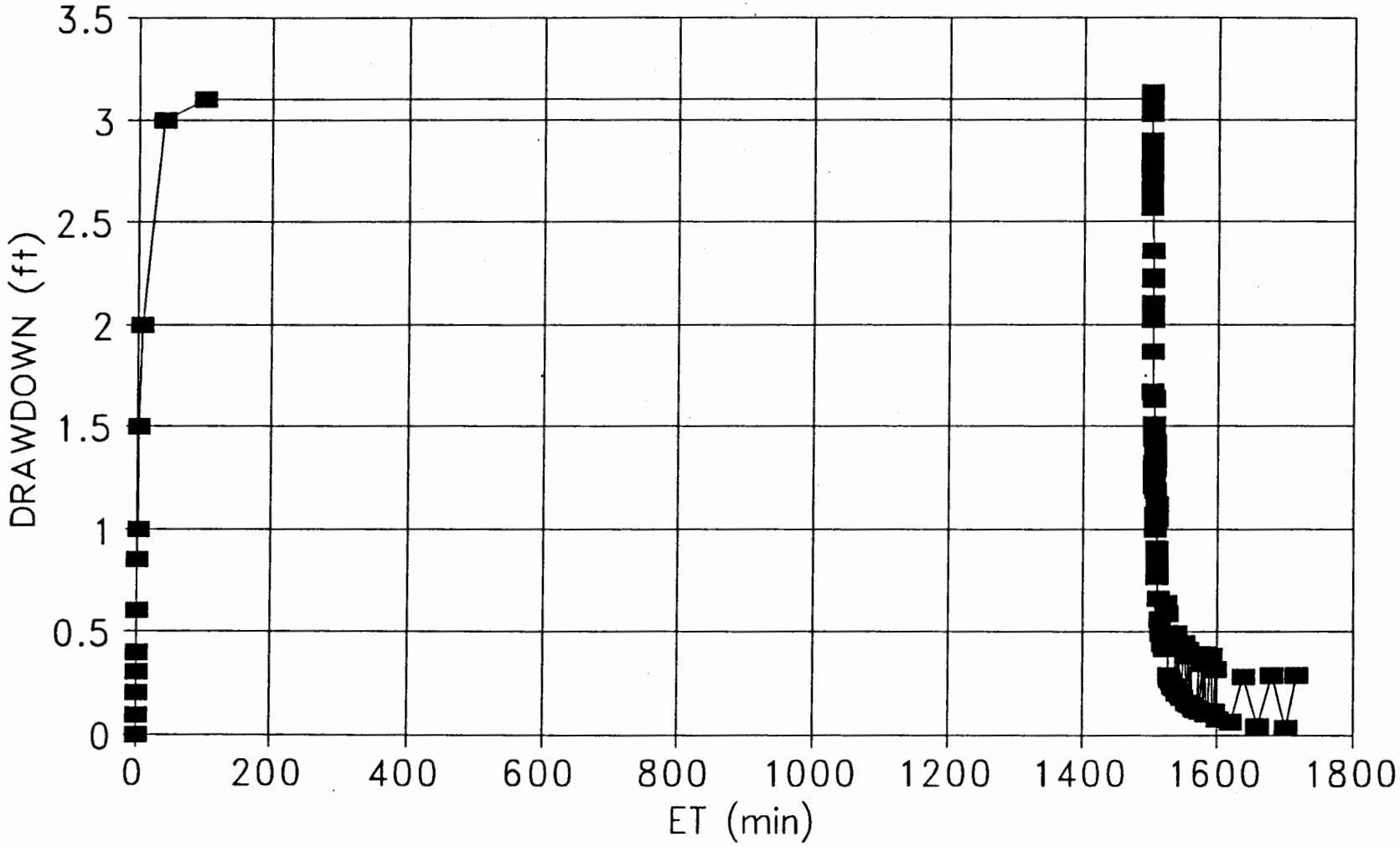


FIGURE 5

009205

25 HOUR PUMPING TEST WELL MW-14

DRAWDOWN RECOVERY

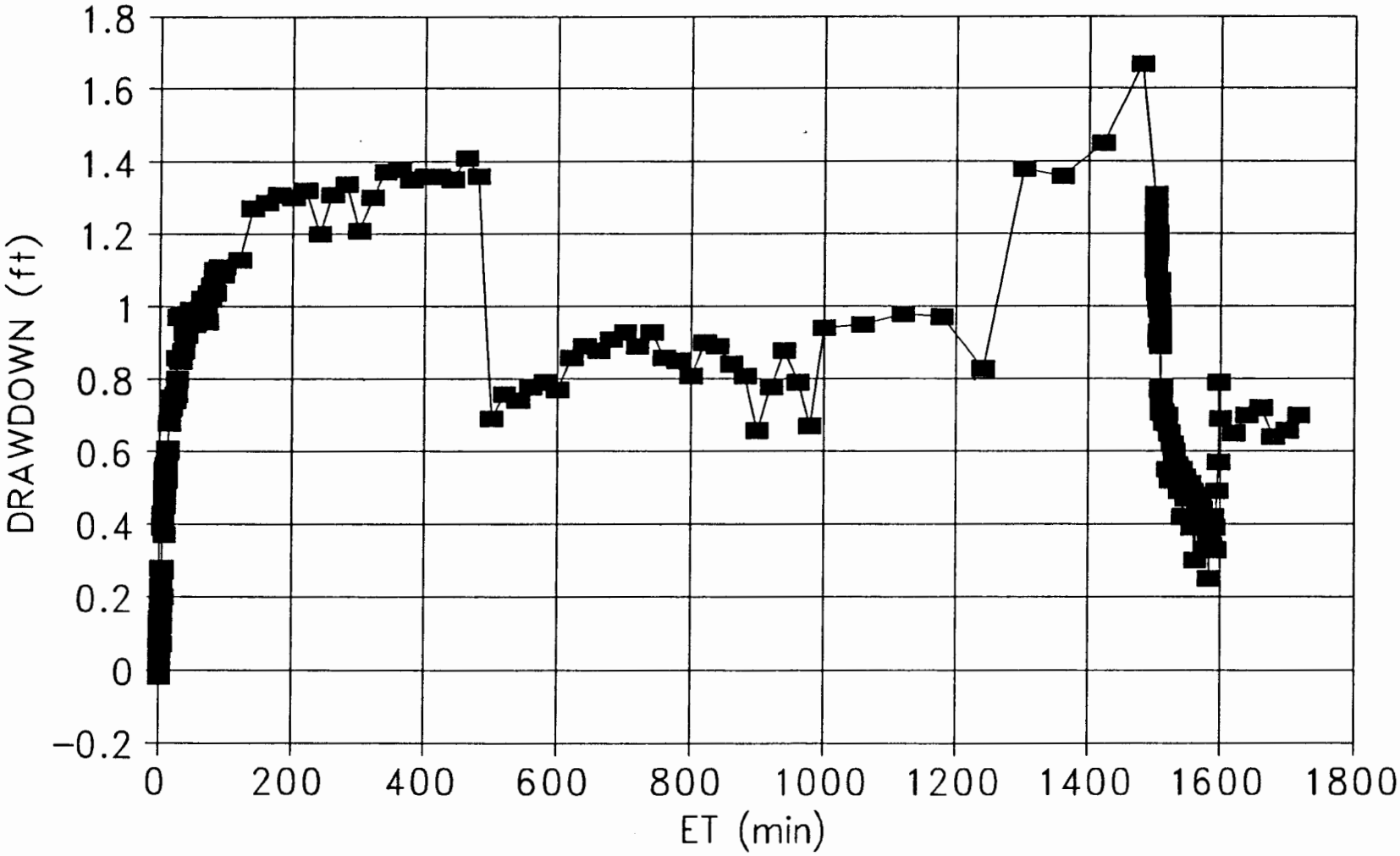


FIGURE 6

902600

25 HOUR PUMPING TEST WELL PW-1

DRAWDOWN RECOVERY

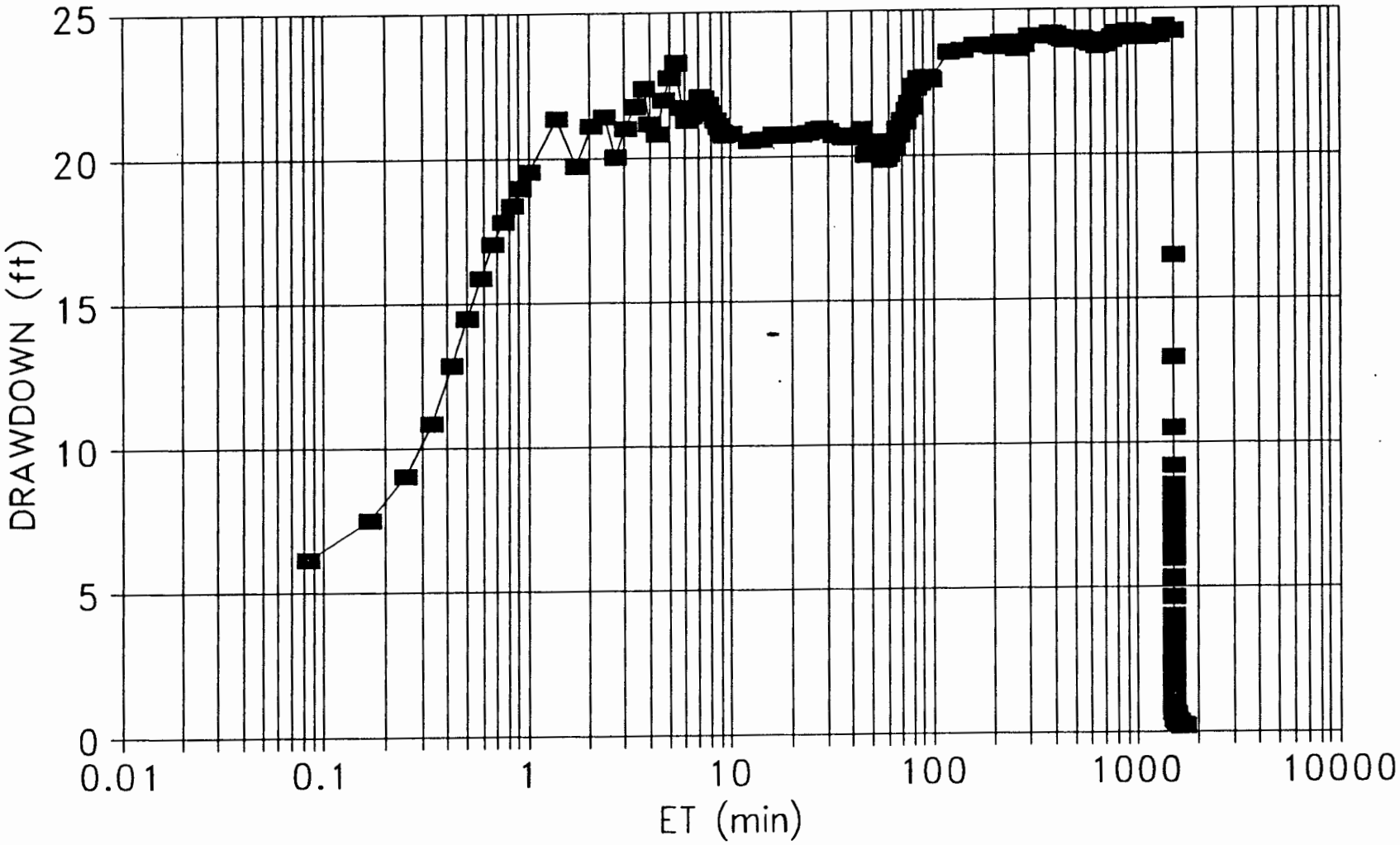


FIGURE 7

009207

25 HOUR PUMPING TEST WELL MW-12

DRAWDOWN RECOVERY

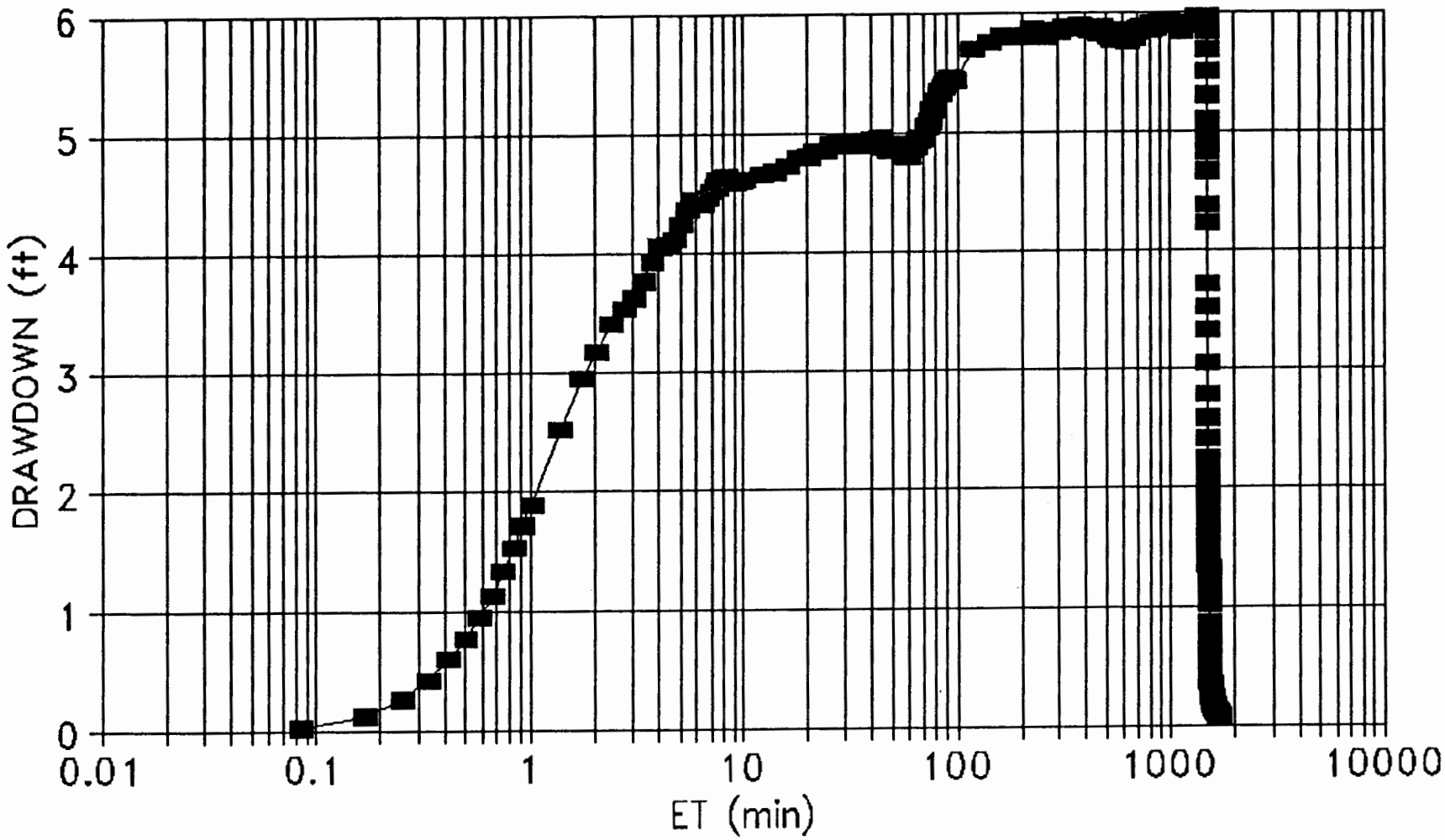


FIGURE 8

25 HOUR PUMPING TEST WELL MW-13

DRAWDOWN RECOVERY

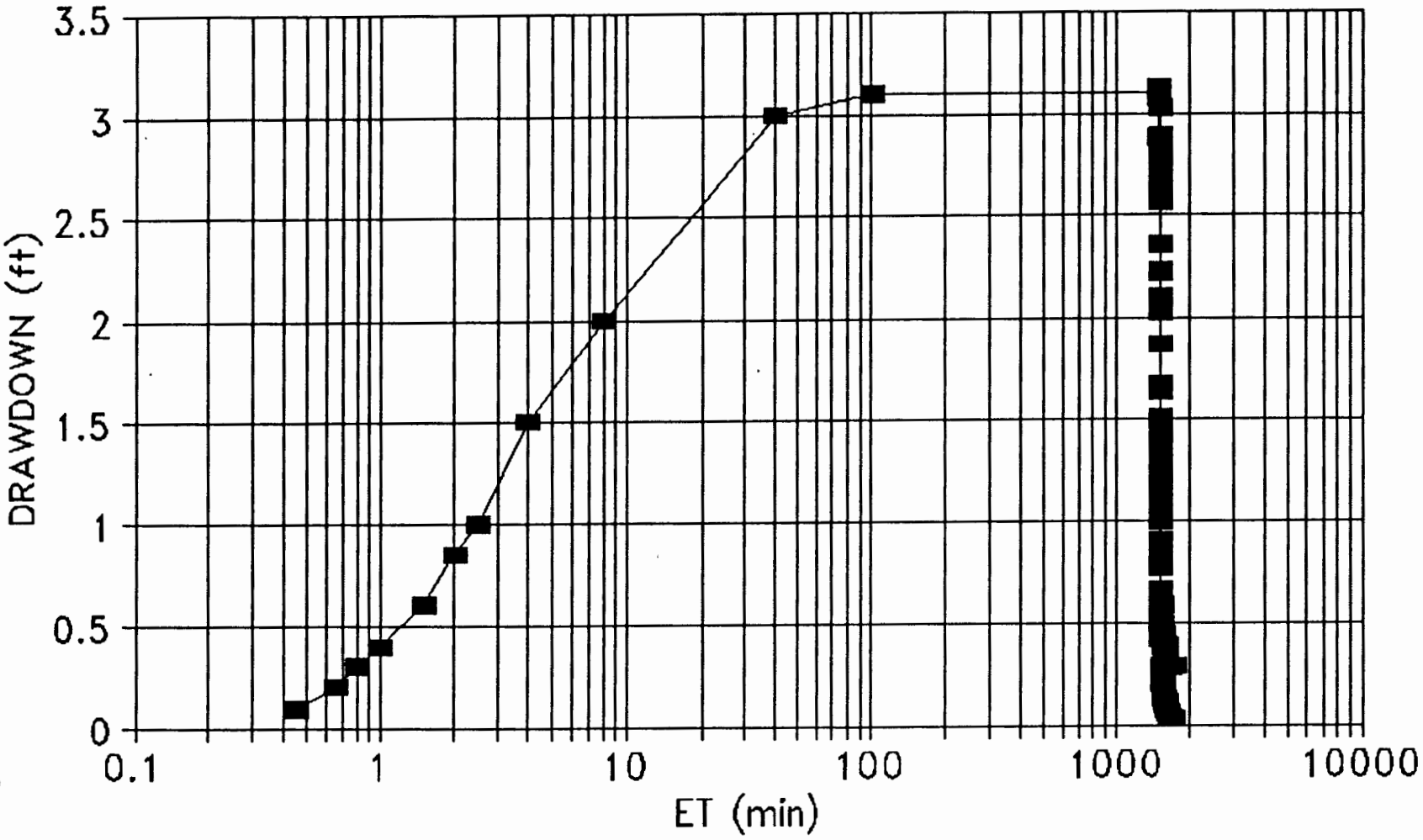


FIGURE 9

009209

25 HOUR PUMPING TEST WELL MW-14

DRAWDOWN RECOVERY

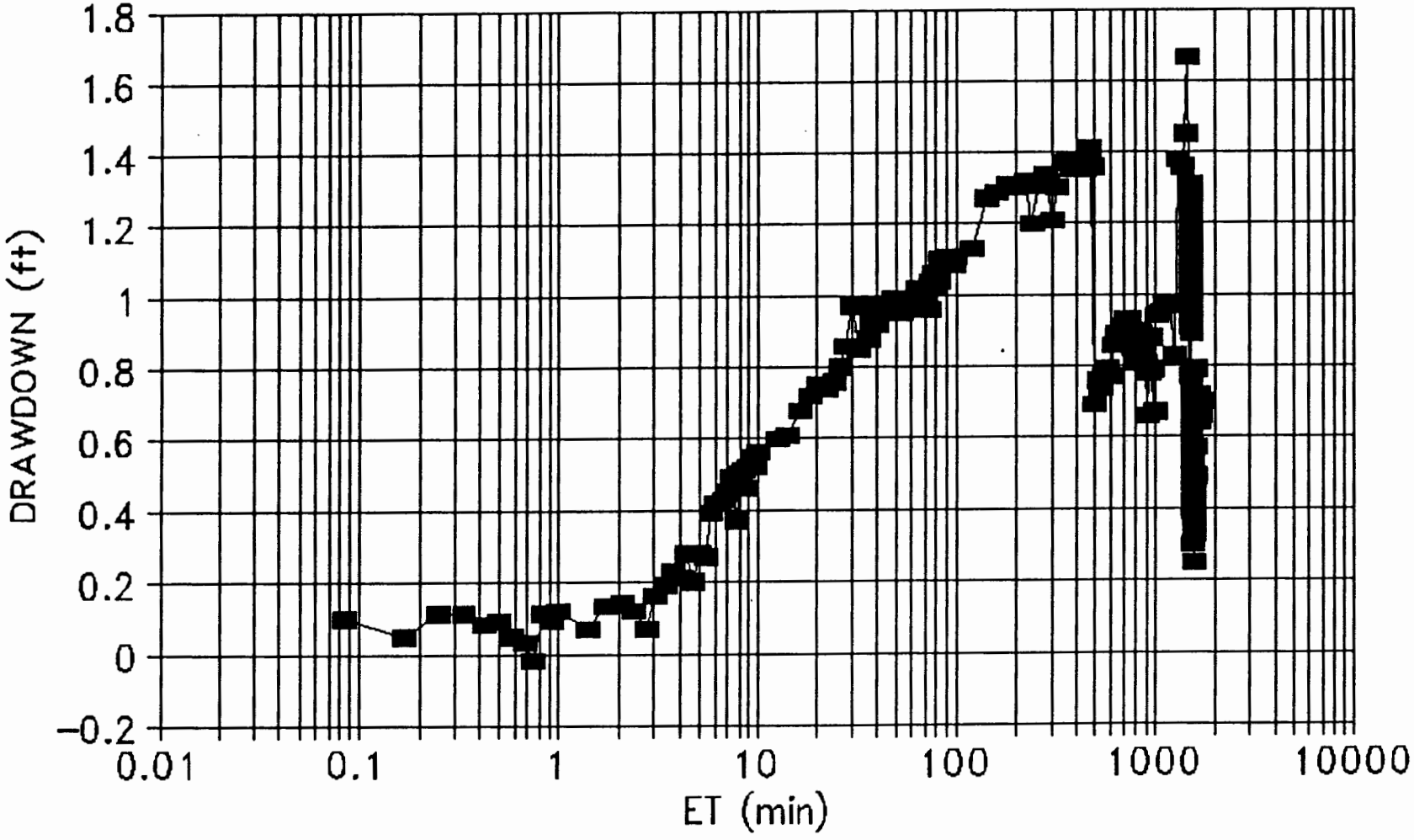


FIGURE 10

2 HOUR PUMPING TEST WELL PW-1

DRAWDOWN

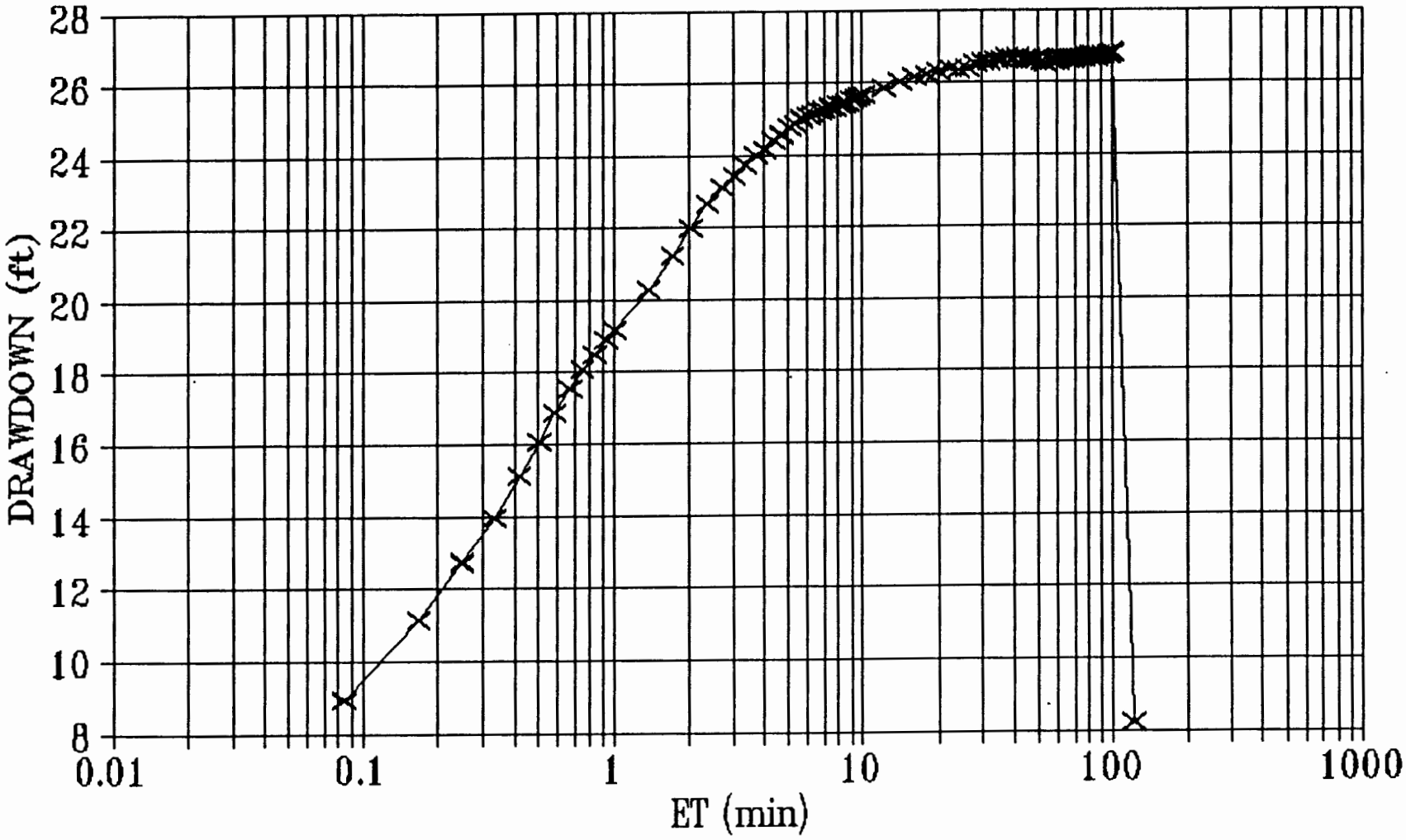


FIGURE 11