



# *Final Remedial Investigation Report*

*West Central Phoenix  
East Grand Avenue WQARF Site*



Volume III of III: Appendices E through K

June 2006

**APPENDIX E**  
**WELL COMPLETION DIAGRAMS**

Tamper-Resistant  
Traffic-Rated  
Flush-Mounted  
Vault

Top of Casing Elevation = 1108.73'

4" Flush-Threaded  
Sch. 40 PVC Blank  
Well Casing

Concrete  
Grout

# WCP-28

ADWR Number

55-568218

Latitude

33° 29'19.84"

Longitude

112° 07'15.15"

Top of Casing Elevation (ft AMSL)

1108.73

Static Water Elevation (ft AMSL) & Date

999.98 - June 04, 1998

Installation Date

May 26, 1998

Drilling Method

Dual Wall Air Percussion

Drilling Contractor

THF Drilling

Development Technique and Date

Bailed and pumped on June 1, 1998  
160 gallons of water removed

Wyoming Bentonite  
Pellets

89.5'

Filter Pack  
Colorado #8 - 12  
Silica Sand

94.5'

99.5'

4" Flush Threaded  
Sch. 40 PVC Well Screen  
0.01" Slot Size

108.75'

4" PVC Threaded  
Bottom Cap

139.5'

141.5'

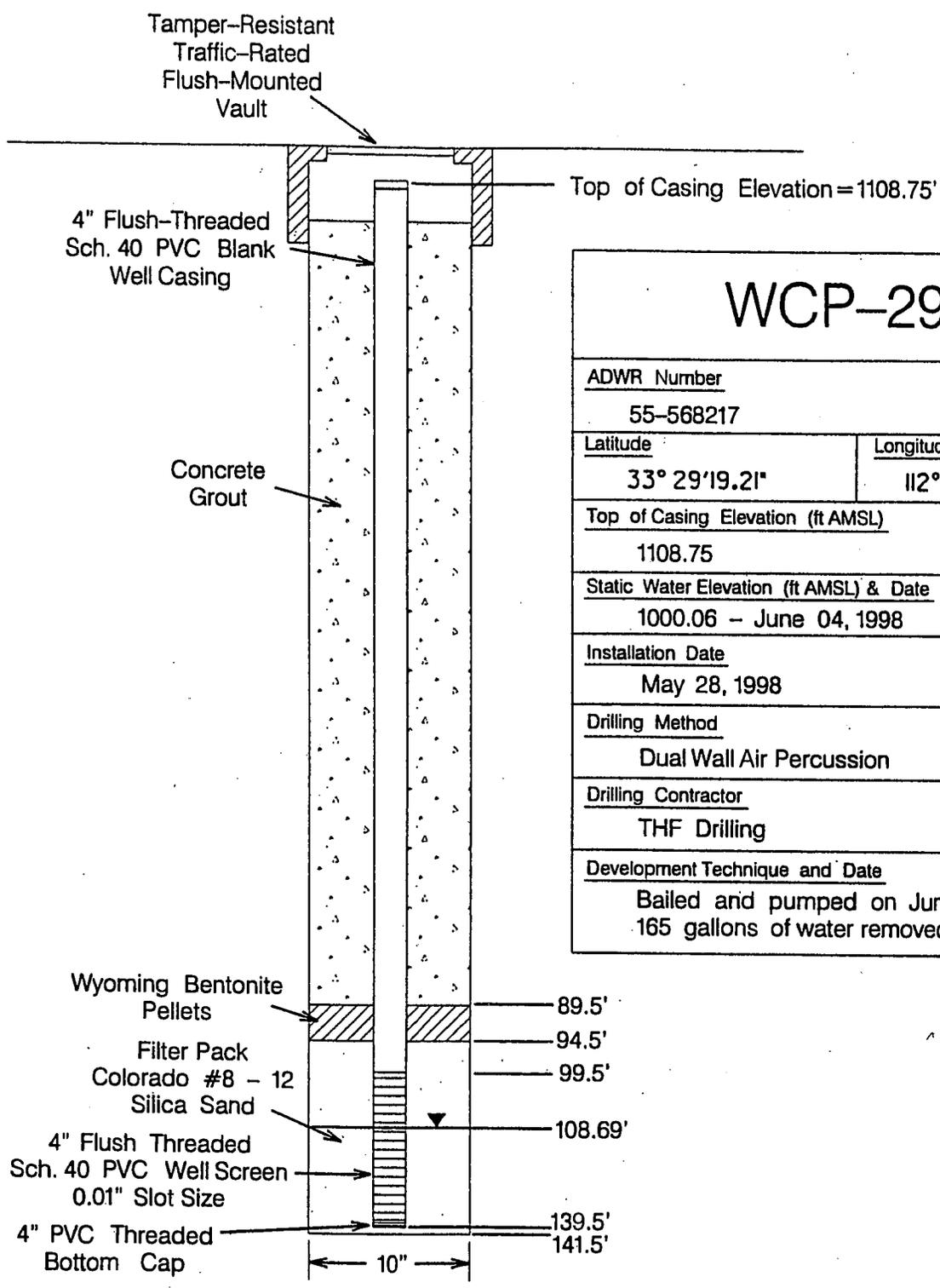
10"

NOT TO SCALE

ARIZONA  
DEPARTMENT OF  
ENVIRONMENTAL  
QUALITY

Monitor Well WCP-28  
Completion Diagram  
WCP East Grand Avenue WQARF Site

**WESTON**  
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202 E. Earll Dr. Suite 460  
Phoenix, AZ 85012



<h1>WCP-29</h1>	
<u>ADWR Number</u> 55-568217	
<u>Latitude</u> 33° 29'19.21"	<u>Longitude</u> 112° 07'15.03"
<u>Top of Casing Elevation (ft AMSL)</u> 1108.75	
<u>Static Water Elevation (ft AMSL) &amp; Date</u> 1000.06 - June 04, 1998	
<u>Installation Date</u> May 28, 1998	
<u>Drilling Method</u> Dual Wall Air Percussion	
<u>Drilling Contractor</u> THF Drilling	
<u>Development Technique and Date</u> Bailed and pumped on June 1, 1998 165 gallons of water removed	

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Monitor Well WCP-29  
Completion Diagram  
WCP East Grand Avenue WQARF Site

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12/2/98

DESIGNED BY: J. W. HARRIS, P.E. CHECKED BY: J. W. HARRIS, P.E. DATE: 12/2/98

Tamper-Resistant  
Traffic-Rated  
Flush-Mounted  
Vault

Top of Casing Elevation = 1108.78'

4" Flush-Threaded  
Sch. 40 PVC Blank  
Well Casing

Concrete  
Grout

# WCP-30

ADWR Number

55-568219

Latitude

33° 29'19.13"

Longitude

112° 07'19.03"

Top of Casing Elevation (ft AMSL)

1108.78

Static Water Elevation (ft AMSL) & Date

998.38 - June 04, 1998

Installation Date

May 27, 1998

Drilling Method

Dual Wall Air Percussion

Drilling Contractor

THF Drilling

Development Technique and Date

Bailed and pumped on June 1, 1998  
160 gallons of water removed

Wyoming Bentonite  
Pellets

Filter Pack

Colorado #8 - 12  
Silica Sand

4" Flush Threaded  
Sch. 40 PVC Well Screen  
0.01" Slot Size

4" PVC Threaded  
Bottom Cap

89.5'

94.5'

99.5'

110.40'

139.5'

141.5'

10"

NOT TO SCALE

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QUALITY

Monitor Well WCP-30  
Completion Diagram  
WCP East Grand Avenue WQARF Site

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Tamper-Resistant, Traffic-Rated,  
Flush-Mounted Vault

Top of Casing Elevation = 1,110.40'

Locking Cap

4" Inside Diameter  
Flush-Threaded  
Sch. 40 PVC  
Well Casing

Neat Cement

Bentonite Seal

Filter Pack  
Colorado #10-20  
Silica Sand

4" Flush-Threaded  
Sch. 40 PVC  
0.010-inch  
Slot Size  
Well Screen

4" PVC Threaded End Cap

100'

105'

110'

116.95'

150'

# WCP-40

ADWR Number

55-575869

Latitude

33°29'23"

Longitude

112°07'12"

Top of Casing Elevation (ft AMSL)

1,110.40'

Static Water Elevation (ft AMSL)

993.45' - 10/25/1999

Installation Date(s)

September 27-28, 1999

Drilling Method

10" Hollow Stem Auger

Drilling Contractor

Heber Mining and Exploration

Development Technique

Bailed and pumped on 10/13/1999  
~198 gallons of water removed

Not To Scale

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Monitor Well WCP-40  
Completion Diagram  
WCP East Grand Avenue WQARF Site

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Tamper-Resistant, Traffic-Rated,  
Flush-Mounted Vault

Top of Casing Elevation = 1,108.11'

Locking Cap

4" Inside Diameter  
Flush-Threaded  
Sch. 40 PVC  
Well Casing

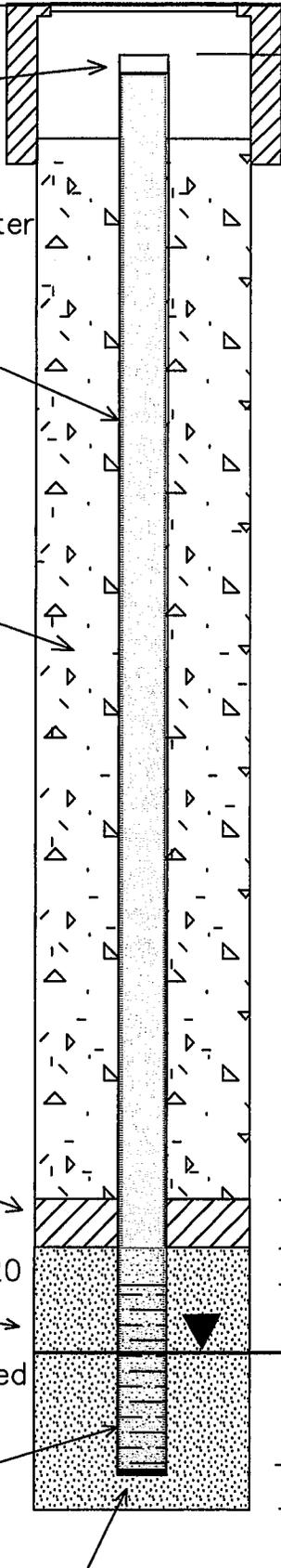
Neat Cement

Bentonite Seal

Filter Pack  
Colorado #10-20  
Silica Sand

4" Flush-Threaded  
Sch. 40 PVC  
0.010-inch  
Slot Size  
Well Screen

4" PVC Threaded End Cap



# WCP-41

ADWR Number  
55-575871

Latitude  
33°29'17"

Longitude  
112°07'12"

Top of Casing Elevation (ft AMSL)  
1,108.11'

Static Water Elevation (ft AMSL)  
992.35' - 10/25/1999

Installation Date(s)  
September 30, 1999

Drilling Method  
10" Hollow Stem Auger

Drilling Contractor  
Heber Mining and Exploration

Development Technique  
Bailed and pumped on 10/13/1999  
~168 gallons of water removed

Not To Scale

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ENVIRONMENTAL  
QUALITY

Monitor Well WCP-41  
Completion Diagram  
WCP East Grand Avenue WQARF Site

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11/22/99 11:58 AM

Tamper-Resistant, Traffic-Rated,  
Flush-Mounted Vault

Top of Casing Elevation = 1,109.69'

# WCP-42

ADWR Number

55-575875

Latitude

33°29'22"

Longitude

112°07'19"

Top of Casing Elevation (ft AMSL)

1,109.69'

Static Water Elevation (ft AMSL)

991.36' - 10/25/1999

Installation Date(s)

October 4, 1999

Drilling Method

10" Hollow Stem Auger

Drilling Contractor

Heber Mining and Exploration

Development Technique

Bailed and pumped on 10/13/1999  
~188 gallons of water removed

Locking Cap

4" Inside Diameter  
Flush-Threaded  
Sch. 40 PVC  
Well Casing

Neat Cement

Bentonite Seal

Filter Pack  
Colorado #10-20  
Silica Sand

4" Flush-Threaded  
Sch. 40 PVC  
0.010-inch  
Slot Size  
Well Screen

4" PVC Threaded End Cap

98'  
103'  
108.5'  
118.33'  
148.5'  
150'

Not To Scale

ARIZONA  
DEPARTMENT OF  
ENVIRONMENTAL  
QUALITY

Monitor Well WCP-42  
Completion Diagram  
WCP East Grand Avenue WQARF Site

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Tamper-Resistant, Traffic-Rated,  
Flush-Mounted Vault

Top of Casing Elevation = 1,111.59'

Locking Cap

4" Inside Diameter  
Flush-Threaded  
Sch. 40 PVC  
Well Casing

Neat Cement

# WCP-43

ADWR Number

55-575870

Latitude

33°29'23"

Longitude

112°07'07"

Top of Casing Elevation (ft AMSL)

1,111.59'

Static Water Elevation (ft AMSL)

995.37' - 10/25/1999

Installation Date(s)

October 12, 1999

Drilling Method

10" Hollow Stem Auger

Drilling Contractor

Heber Mining and Exploration

Development Technique

Bailed and pumped on 10/14/1999  
~178 gallons of water removed

Bentonite Seal

Filter Pack  
Colorado #10-20  
Silica Sand

95'

100'

106'

4" Flush-Threaded  
Sch. 40 PVC  
0.010-inch  
Slot Size  
Well Screen

116.22'

146'

147'

4" PVC Threaded End Cap

Not To Scale

ARIZONA  
DEPARTMENT OF  
ENVIRONMENTAL  
QUALITY

Monitor Well WCP-43  
Completion Diagram  
WCP East Grand Avenue WQARF Site

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Tamper-Resistant, Traffic-Rated,  
Flush-Mounted Vault

Top of Casing Elevation = 1,104.33'

Locking Cap

4" Inside Diameter  
Flush-Threaded  
Sch. 40 PVC  
Well Casing

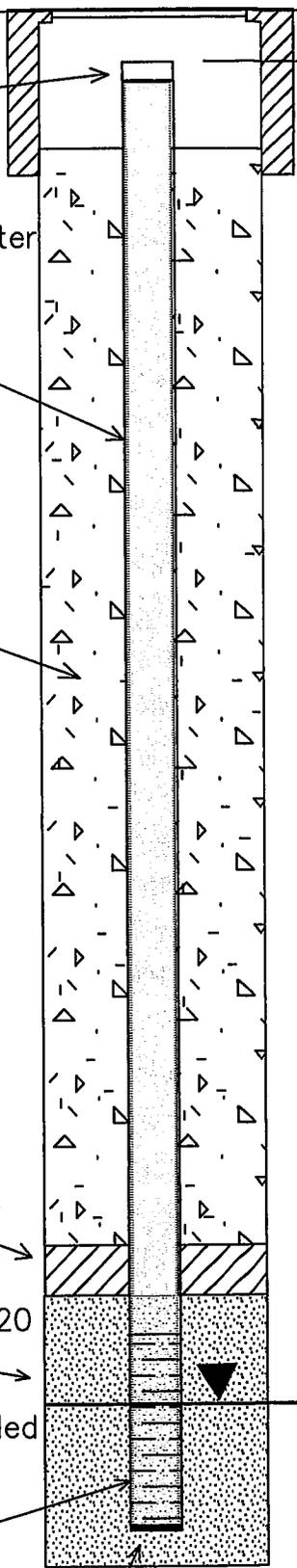
Neat Cement

Bentonite Seal

Filter Pack  
Colorado #10-20  
Silica Sand

4" Flush-Threaded  
Sch. 40 PVC  
0.010-inch  
Slot Size  
Well Screen

4" PVC Threaded End Cap



97.8'  
102.8'  
108'  
116.58'  
148'  
150'

# WCP-44

<u>ADWR Number</u> 55-575872	
<u>Latitude</u> 33°29'11"	<u>Longitude</u> 112°07'21"
<u>Top of Casing Elevation (ft AMSL)</u> 1,104.33'	
<u>Static Water Elevation (ft AMSL)</u> 987.75' - 12/7/1999	
<u>Installation Date(s)</u> December 1, 1999	
<u>Drilling Method</u> 10" Hollow Stem Auger	
<u>Drilling Contractor</u> Heber Mining and Exploration	
<u>Development Technique</u> Surged, bailed and pumped on 12/07/1999 ~195 gallons of water removed	

Not To Scale

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QUALITY

Monitor Well WCP-44  
Completion Diagram  
WCP East Grand Avenue WQARF Site

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Tamper-Resistant, Traffic-Rated,  
Flush-Mounted Vault

Top of Casing Elevation = 1,107.10'

Locking Cap

4" Inside Diameter  
Flush-Threaded  
Sch. 40 PVC  
Well Casing

Neat Cement

Bentonite Seal

Filter Pack  
Colorado #10-20  
Silica Sand

4" Flush-Threaded  
Sch. 40 PVC  
0.010-inch  
Slot Size  
Well Screen

4" PVC Threaded End Cap

97'  
102'  
108'  
118.18'  
148'  
150'

# WCP-45

ADWR Number

55-575873

Latitude

33°29'17"

Longitude

112°07'24"

Top of Casing Elevation (ft AMSL)

1,107.10'

Static Water Elevation (ft AMSL)

988.92' - 10/25/1999

Installation Date(s)

October 6, 1999

Drilling Method

10" Hollow Stem Auger

Drilling Contractor

Heber Mining and Exploration

Development Technique

Bailed and pumped on 10/14/1999  
~168 gallons of water removed

Not To Scale

ARIZONA  
DEPARTMENT OF  
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QUALITY

Monitor Well WCP-45  
Completion Diagram  
WCP East Grand Avenue WQARF Site

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Tamper-Resistant, Traffic-Rated,  
Flush-Mounted Vault

Top of Casing Elevation = 1,109.29'

Locking Cap

4" Inside Diameter  
Flush-Threaded  
Sch. 40 PVC  
Well Casing

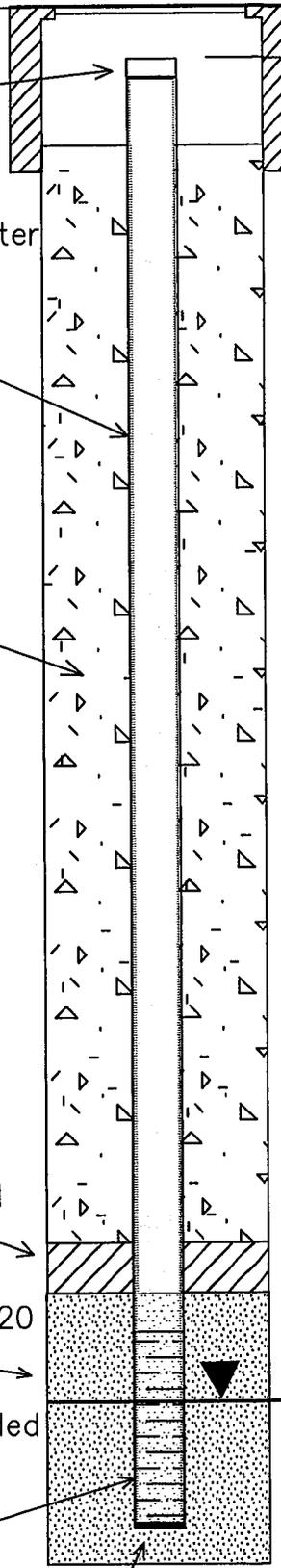
Neat Cement

Bentonite Seal

Filter Pack  
Colorado #10-20  
Silica Sand

4" Flush-Threaded  
Sch. 40 PVC  
0.010-inch  
Slot Size  
Well Screen

4" PVC Threaded End Cap



# WCP-46

ADWR Number

55-575874

Latitude

33°29'20"

Longitude

112°07'24"

Top of Casing Elevation (ft AMSL)

1,109.29'

Static Water Elevation (ft AMSL)

991.06' - 12/3/1999

Installation Date(s)

December 3, 1999

Drilling Method

10" Hollow Stem Auger

Drilling Contractor

Heber Mining and Exploration

Development Technique

Surged, bailed and pumped on  
12/07/1999 ~178 gallons of  
water removed

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Not To Scale

ARIZONA  
DEPARTMENT OF  
ENVIRONMENTAL  
QUALITY

Monitor Well WCP-46  
Completion Diagram  
WCP East Grand Avenue WQARF Site



2702 North Third Street, Suite 2001  
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Tamper-Resistant, Traffic-Rated,  
Flush-Mounted Vault

Top of Casing Elevation = 1,108.45'

Locking Cap

4" Inside Diameter  
Flush-Threaded  
Sch. 40 PVC  
Well Casing

Neat Cement

Bentonite Seal

Filter Pack  
Colorado #10-20  
Silica Sand

4" Flush-Threaded  
Sch. 40 PVC  
0.010-inch  
Slot Size  
Well Screen

4" PVC Threaded End Cap

92.5'  
102.5'  
112.5'  
123.0'  
152.5'  
153'

# WCP-47

ADWR Number

55-584133

Latitude

33°29'19.63"

Longitude

112°07'30.06"

Top of Casing Elevation (ft AMSL)

1,108.45'

Static Water Elevation (ft AMSL)

985.45' - 01/16/2001

Installation Date(s)

January 15-16, 2001

Drilling Method

10" Hollow Stem Auger

Drilling Contractor

Heber Mining and Exploration

Development Technique

Purge, bail, swab, surge on  
02/07/2001

~212 gallons of water removed

Not To Scale

ARIZONA  
DEPARTMENT OF  
ENVIRONMENTAL  
QUALITY

Monitor Well WCP-47  
Completion Diagram  
WCP East Grand Avenue WQARF Site

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Tamper-Resistant, Traffic-Rated,  
Flush-Mounted Vault

Top of Casing Elevation = 1,107.04'

Locking Cap

4" Inside Diameter  
Flush-Threaded  
Sch. 40 PVC  
Well Casing

Neat Cement

Bentonite Seal

Filter Pack  
Colorado #10-20  
Silica Sand

4" Flush-Threaded  
Sch. 40 PVC  
0.010-inch  
Slot Size  
Well Screen

4" PVC Threaded End Cap

210'  
220'  
225'  
117.45'  
245'  
301'

# WCP-48

ADWR Number

55-575868

Latitude

33°29'17"

Longitude

112°07'24"

Top of Casing Elevation (ft AMSL)

1,107.04'

Static Water Elevation (ft AMSL)

989.59' - 06/20/2000

Installation Date(s)

June 12-20, 2000

Drilling Method

Mud Rotary

Drilling Contractor

Water Development Corporation (WDC)

Development Technique

Bail, surge, bail and pump on  
06/22/2000  
~1260 gallons of water removed

Not To Scale

ARIZONA  
DEPARTMENT OF  
ENVIRONMENTAL  
QUALITY

Monitor Well WCP-48  
Completion Diagram  
WCP East Grand Avenue WQARF Site

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Tamper-Resistant, Traffic-Rated,  
Flush-Mounted Vault

Top of Casing Elevation = 1,108.89'

Locking Cap

4" Inside Diameter  
Flush-Threaded  
Sch. 40 PVC  
Well Casing

Neat Cement

Bentonite Seal

Filter Pack  
Colorado #10-20  
Silica Sand

4" Flush-Threaded  
Sch. 40 PVC  
0.010-inch  
Slot Size  
Well Screen

4" PVC Threaded End Cap

99'  
104'  
109'  
119.1'  
149'  
151'

# WCP-83

ADWR Number  
55-584131

Latitude 33°29'17.89"	Longitude 112°07'06.55"
--------------------------	----------------------------

Top of Casing Elevation (ft AMSL)  
1,108.89'

Static Water Elevation (ft AMSL)  
989.79' - 01/22/2001

Installation Date(s)  
January 22-23, 2001

Drilling Method  
10" Hollow Stem Auger

Drilling Contractor  
Heber Mining and Exploration

Development Technique  
Pump, bail, swab, surge on  
02/07/2001  
~570 gallons of water removed

Not To Scale

ARIZONA  
DEPARTMENT OF  
ENVIRONMENTAL  
QUALITY

Monitor Well WCP-83  
Completion Diagram  
WCP East Grand Avenue WQARF Site

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Tamper-Resistant, Traffic-Rated,  
Flush-Mounted Vault

Top of Casing Elevation = 1,109.04'

Locking Cap

4" Inside Diameter  
Flush-Threaded  
Sch. 40 PVC  
Well Casing

# WCP-84

ADWR Number

55-584132

Latitude

33°29'19.70"

Longitude

112°07'12.26"

Top of Casing Elevation (ft AMSL)

1,109.04'

Static Water Elevation (ft AMSL)

989.04' - 01/25/2001

Installation Date(s)

January 26-29, 2001

Drilling Method

10" Hollow Stem Auger

Drilling Contractor

Heber Mining and Exploration

Development Technique

Bailed and pumped on 02/06/2001  
~500-570 gallons of water  
removed

Neat Cement

Bentonite Seal

Filter Pack  
Colorado #10-20  
Silica Sand

4" Flush-Threaded  
Sch. 40 PVC  
0.010-inch  
Slot Size  
Well Screen

4" PVC Threaded End Cap

98'

103'

108.5'

120.0'

148.5'

151'

Not To Scale

ARIZONA  
DEPARTMENT OF  
ENVIRONMENTAL  
QUALITY

Monitor Well WCP-84  
Completion Diagram  
WCP East Grand Avenue WQARF Site

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Tamper-Resistant, Traffic-Rated,  
Flush-Mounted Vault

Top of Casing Elevation = 1,113.10'

Locking Cap

4" Inside Diameter  
Flush-Threaded  
Sch. 40 PVC  
Well Casing

Neat Cement

Bentonite Seal

Filter Pack  
Colorado #10-20  
Silica Sand

4" Flush-Threaded  
Sch. 40 PVC  
0.010-inch  
Slot Size  
Well Screen

4" PVC Threaded End Cap

99'  
104'  
109'  
121.0'  
149'  
151.5'

# WCP-85

ADWR Number

55-584666

Latitude

33°29'23.36"

Longitude

112°06'59.42"

Top of Casing Elevation (ft AMSL)

1,113.10'

Static Water Elevation (ft AMSL)

992.10' - 01/09/2001

Installation Date(s)

January 8-9, 2001

Drilling Method

10" Hollow Stem Auger

Drilling Contractor

Heber Mining and Exploration

Development Technique

Bail, surge, bail, pump on  
01/11/2001

~425 gallons of water removed

Not To Scale

ARIZONA  
DEPARTMENT OF  
ENVIRONMENTAL  
QUALITY

Monitor Well WCP-85  
Completion Diagram  
WCP East Grand Avenue WQARF Site

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Phoenix, Arizona 85004

Tamper-Resistant, Traffic-Rated,  
Flush-Mounted Vault

Top of Casing Elevation = 1,105.54'

Locking Cap

4" Inside Diameter  
Flush-Threaded  
Sch. 40 PVC  
Well Casing

Neat Cement

Bentonite Seal

Filter Pack  
Colorado #10-20  
Silica Sand

4" Flush-Threaded  
Sch. 40 PVC  
0.010-inch  
Slot Size  
Well Screen

4" PVC Threaded End Cap

100'  
105'  
110'  
119.9'  
150'  
151'

# WCP-86

ADWR Number

55-584903

Latitude

33°29'12.57"

Longitude

112°07'17.52"

Top of Casing Elevation (ft AMSL)

1,105.54'

Static Water Elevation (ft AMSL)

985.64' - 01/11/2001

Installation Date(s)

January 15-16, 2001

Drilling Method

10" Hollow Stem Auger

Drilling Contractor

Heber Mining and Exploration

Development Technique

Bail, pump, swab, surge on  
02/07/2001

~450 gallons of water removed

Not To Scale

ARIZONA  
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QUALITY

Monitor Well WCP-86  
Completion Diagram  
WCP East Grand Avenue WQARF Site

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Tamper-Resistant, Traffic-Rated,  
Flush-Mounted Vault

Top of Casing Elevation = 1,105.63'

Locking Cap

4" Inside Diameter  
Flush-Threaded  
Sch. 40 PVC  
Well Casing

Neat Cement

Bentonite Seal

Filter Pack  
Colorado #10-20  
Silica Sand

4" Flush-Threaded  
Sch. 40 PVC  
0.010-inch  
Slot Size  
Well Screen

4" PVC Threaded End Cap

102'  
107'  
112.5'  
121.5'  
152.5'  
153'

# WCP-87

ADWR Number

55-585041

Latitude

33°29'13.99"

Longitude

112°07'24.32"

Top of Casing Elevation (ft AMSL)

1,105.63'

Static Water Elevation (ft AMSL)

984.13' - 01/29/2001

Installation Date(s)

January 26-29, 2001

Drilling Method

10" Hollow Stem Auger

Drilling Contractor

Heber Mining and Exploration

Development Technique

Bail, surge, pump, swab on  
02/09/2001

~480 gallons of water removed

Not To Scale

ARIZONA  
DEPARTMENT OF  
ENVIRONMENTAL  
QUALITY

Monitor Well WCP-87  
Completion Diagram  
WCP East Grand Avenue WQARF Site

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Tamper-Resistant, Traffic-Rated,  
Flush-Mounted Vault

Top of Casing Elevation = 1,104.47'

Locking Cap

4" Inside Diameter  
Flush-Threaded  
Sch. 40 PVC  
Well Casing

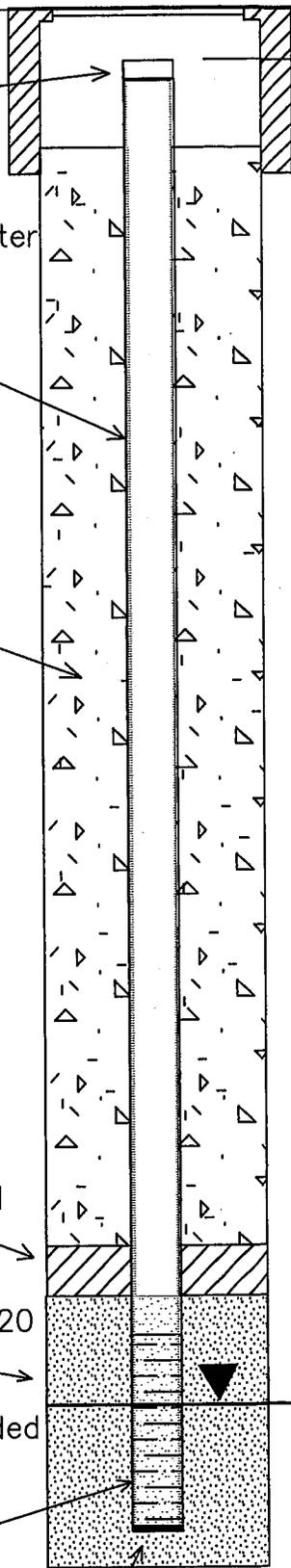
Neat Cement

Bentonite Seal

Filter Pack  
Colorado #10-20  
Silica Sand

4" Flush-Threaded  
Sch. 40 PVC  
0.010-inch  
Slot Size  
Well Screen

4" PVC Threaded End Cap



# WCP-88

ADWR Number

55-585117

Latitude

33°29'10.41"

Longitude

112°07'26.72"

Top of Casing Elevation (ft AMSL)

1,104.47'

Static Water Elevation (ft AMSL)

983.67' - 01/31/2001

Installation Date(s)

January 30-31, 2001

Drilling Method

10" Hollow Stem Auger

Drilling Contractor

Heber Mining and Exploration

Development Technique

Bail, swab, surge, pump on  
02/08/2001

~440 gallons of water removed

Not To Scale

ARIZONA  
DEPARTMENT OF  
ENVIRONMENTAL  
QUALITY

Monitor Well WCP-88  
Completion Diagram  
WCP East Grand Avenue WQARF Site

**WESTON**  
SOLUTIONS

2702 North Third Street, Suite 2001  
Phoenix, Arizona 85004

Tamper-Resistant, Traffic-Rated,  
Flush-Mounted Vault

Top of Casing Elevation = 1,105.53'

Locking Cap

4" Inside Diameter  
Flush-Threaded  
Sch. 40 PVC  
Well Casing

Neat Cement

Bentonite Seal

Filter Pack  
Colorado #10-20  
Silica Sand

4" Flush-Threaded  
Sch. 40 PVC  
0.010-inch  
Slot Size  
Well Screen

4" PVC Threaded End Cap

101'  
106'  
113'  
122.9'  
153'  
155'

# WCP-89

ADWR Number

55-585116

Latitude

33°29'10.07"

Longitude

112°07'40.39"

Top of Casing Elevation (ft AMSL)

1,105.53'

Static Water Elevation (ft AMSL)

982.63' - 02/02/2001

Installation Date(s)

February 1-2, 2001

Drilling Method

10" Hollow Stem Auger

Drilling Contractor

Heber Mining and Exploration

Development Technique

Bail, purge, swab, surge on  
02/08/2001

~520 gallons of water removed

Not To Scale

ARIZONA  
DEPARTMENT OF  
ENVIRONMENTAL  
QUALITY

Monitor Well WCP-89  
Completion Diagram  
WCP East Grand Avenue WQARF Site

**WESTON**  
SOLUTIONS

2702 North Third Street, Suite 2001  
Phoenix, Arizona 85004

Tamper-Resistant, Traffic-Rated,  
Flush-Mounted Vault

Top of Casing Elevation = 1,113.73'

Locking Cap

4" Inside Diameter  
Flush-Threaded  
Sch. 40 PVC  
Well Casing

Neat Cement

Bentonite Seal

Filter Pack  
Colorado #10-20  
Silica Sand

4" Flush-Threaded  
Sch. 40 PVC  
0.010-inch  
Slot Size  
Well Screen

4" PVC Threaded End Cap

98'  
108'  
118'  
127.0'  
158'  
160'

# WCP-90

ADWR Number

55-584665

Latitude

33°29'26.65"

Longitude

112°07'32.32"

Top of Casing Elevation (ft AMSL)

1,113.73'

Static Water Elevation (ft AMSL)

986.73' - 01/18/2001

Installation Date(s)

January 17-19, 2001

Drilling Method

10" Hollow Stem Auger

Drilling Contractor

Heber Mining and Exploration

Development Technique

Bail, pump, swab, surge on  
02/08/2001

~130 gallons of water removed

Not To Scale

ARIZONA  
DEPARTMENT OF  
ENVIRONMENTAL  
QUALITY

Monitor Well WCP-90  
Completion Diagram  
WCP East Grand Avenue WQARF Site

**WESTON**  
SOLUTIONS<sup>SM</sup>  
2702 North Third Street, Suite 2001  
Phoenix, Arizona 85004

Tamper-Resistant, Traffic-Rated,  
Flush-Mounted Vault

Top of Casing Elevation = 1,098.56'

Locking Cap

4" Inside Diameter  
Flush-Threaded  
Sch. 40 PVC  
Well Casing

Neat Cement

Bentonite Seal

Filter Pack  
Colorado #10-20  
Silica Sand

4" Flush-Threaded  
Sch. 40 PVC  
0.010-inch  
Slot Size  
Well Screen

4" PVC Threaded End Cap

100'  
104.5'  
109'  
117.20'  
149'  
151'

# WCP-92

ADWR Number

55-586975

Latitude

33°28'56.63"

Longitude

112°07'31.39"

Top of Casing Elevation (ft AMSL)

1,098.56'

Static Water Elevation (ft AMSL)

981.36' - 07/17/2001

Installation Date(s)

July 16-17, 2001

Drilling Method

10" Hollow Stem Auger

Drilling Contractor

Heber Mining and Exploration

Development Technique

Bail, surge, bail, overpump on  
07/26/2001  
~887 gallons of water removed

Not To Scale

ARIZONA  
DEPARTMENT OF  
ENVIRONMENTAL  
QUALITY

Monitor Well WCP-92  
Completion Diagram  
WCP East Grand Avenue WQARF Site

**WESTON**  
SOLUTIONS

2702 North Third Street, Suite 2001  
Phoenix, Arizona 85004

Tamper-Resistant, Traffic-Rated,  
Flush-Mounted Vault

Top of Casing Elevation = 1,106.71'

Locking Cap

4" Inside Diameter  
Flush-Threaded  
Sch. 40 PVC  
Well Casing

# WCP-93

ADWR Number

55-587463

Latitude

33°29'15.86"

Longitude

112°07'17.94"

Top of Casing Elevation (ft AMSL)

1,106.71'

Static Water Elevation (ft AMSL)

987.51' - 07/25/2001

Installation Date(s)

July 24-25, 2001

Drilling Method

10" Hollow Stem Auger

Drilling Contractor

Heber Mining and Exploration

Development Technique

Bail, surge, bail, overpump on  
07/27/2001

~715 gallons of water removed

Neat Cement

Bentonite Seal

Filter Pack  
Colorado #10-20  
Silica Sand

4" Flush-Threaded  
Sch. 40 PVC  
0.010-inch  
Slot Size  
Well Screen

4" PVC Threaded End Cap

98.6'

103.6'

109'

117.20'

149'

151'

Not To Scale

ARIZONA  
DEPARTMENT OF  
ENVIRONMENTAL  
QUALITY

Monitor Well WCP-93  
Completion Diagram  
WCP East Grand Avenue WQARF Site

**WESTON**  
SOLUTIONS  
2702 North Third Street, Suite 2001  
Phoenix, Arizona 85004

Tamper-Resistant, Traffic-Rated,  
Flush-Mounted Vault

Top of Casing Elevation = 1,101.57'

Locking Cap

4" Inside Diameter  
Flush-Threaded  
Sch. 40 PVC  
Well Casing

Neat Cement

Bentonite Seal

Filter Pack  
Colorado #10-20  
Silica Sand

4" Flush-Threaded  
Sch. 40 PVC  
0.010-inch  
Slot Size  
Well Screen

4" PVC Threaded End Cap

102'

105'

110'

120.20'

150'

151'

# WCP-94

ADWR Number

55-586979

Latitude

33°29'00.35"

Longitude

112°07'44.31"

Top of Casing Elevation (ft AMSL)

1,101.57'

Static Water Elevation (ft AMSL)

981.37' - 07/19/2001

Installation Date(s)

July 18-19, 2001

Drilling Method

10" Hollow Stem Auger

Drilling Contractor

Heber Mining and Exploration

Development Technique

Bail, surge, bail, overpump on  
07/26/2001

~954 gallons of water removed

Not To Scale

ARIZONA  
DEPARTMENT OF  
ENVIRONMENTAL  
QUALITY

Monitor Well WCP-94  
Completion Diagram  
WCP East Grand Avenue WQARF Site

**WESTON**  
SOLUTIONS

2702 North Third Street, Suite 2001  
Phoenix, Arizona 85004

Tamper-Resistant, Traffic-Rated,  
Flush-Mounted Vault

Top of Casing Elevation = 1,114.22'

Locking Cap

4" Inside Diameter  
Flush-Threaded  
Sch. 40 PVC  
Well Casing

Neat Cement

# WCP-95

ADWR Number

55-586978

Latitude

33°29'27.81"

Longitude

112°07'02.84"

Top of Casing Elevation (ft AMSL)

1,114.22'

Static Water Elevation (ft AMSL)

1005.32' - 07/6/2001

Installation Date(s)

July 5-6, 2001

Drilling Method

10" Hollow Stem Auger

Drilling Contractor

Heber Mining and Exploration

Development Technique

Bail, surge, bail, overpump on  
07/12/2001

~450 gallons of water removed

Bentonite Seal

Filter Pack  
Colorado #10-20  
Silica Sand

4" Flush-Threaded  
Sch. 40 PVC  
0.010-inch  
Slot Size  
Well Screen

4" PVC Threaded End Cap

89'

94'

99'

108.9'

139'

140'

Not To Scale

ARIZONA  
DEPARTMENT OF  
ENVIRONMENTAL  
QUALITY

Monitor Well WCP-95  
Completion Diagram  
WCP East Grand Avenue WQARF Site

**WESTON**  
SOLUTIONS  
2702 North Third Street, Suite 2001  
Phoenix, Arizona 85004

Tamper-Resistant, Traffic-Rated,  
Flush-Mounted Vault

Top of Casing Elevation = 1,101.29'

Locking Cap

4" Inside Diameter  
Flush-Threaded  
Sch. 40 PVC  
Well Casing

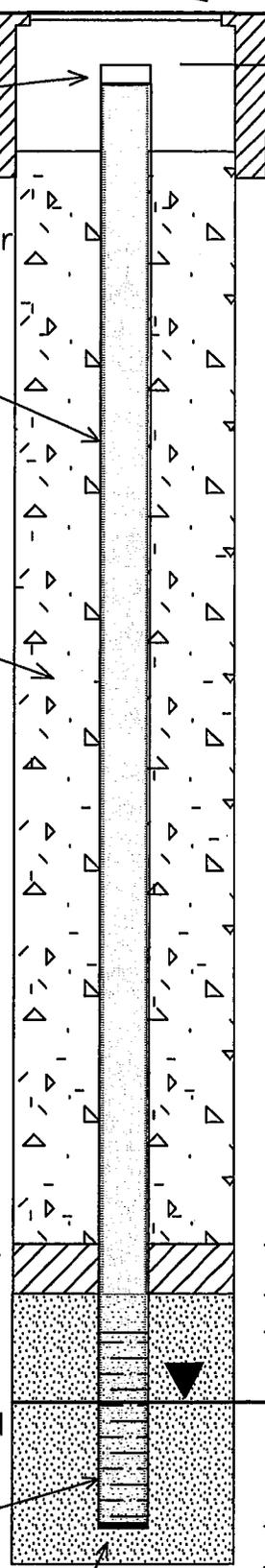
Neat Cement

Bentonite Seal

Filter Pack  
Colorado #10-20  
Silica Sand

4" Flush-Threaded  
Sch. 40 PVC  
0.010-inch  
Slot Size  
Well Screen

4" PVC Threaded End Cap



99.5'  
104.5'  
109.5'  
118.7'  
149.5'  
151'

# WCP-96

ADWR Number  
55-587616

<u>Latitude</u> 33°29'04.01"	<u>Longitude</u> 112°07'32.61"
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Top of Casing Elevation (ft AMSL)  
1,101.29'

Static Water Elevation (ft AMSL)  
982.59' - 07/23/2001

Installation Date(s)  
July 20-23, 2001

Drilling Method  
10" Hollow Stem Auger

Drilling Contractor  
Heber Mining and Exploration

Development Technique  
Bail, surge, bail, overpump on  
07/27/2001  
~880 gallons of water removed

Not To Scale

ARIZONA  
DEPARTMENT OF  
ENVIRONMENTAL  
QUALITY

Monitor Well WCP-96  
Completion Diagram  
WCP East Grand Avenue WQARF Site

**WESTON**  
SOLUTIONS  
2702 North Third Street, Suite 2001  
Phoenix, Arizona 85004





Tamper-Resistant, Traffic-Rated,  
Flush-Mounted Vault

Top of Casing Elevation = 1,111.28'

Locking Cap

4" Inside Diameter  
Flush-Threaded  
Sch. 40 PVC  
Well Casing

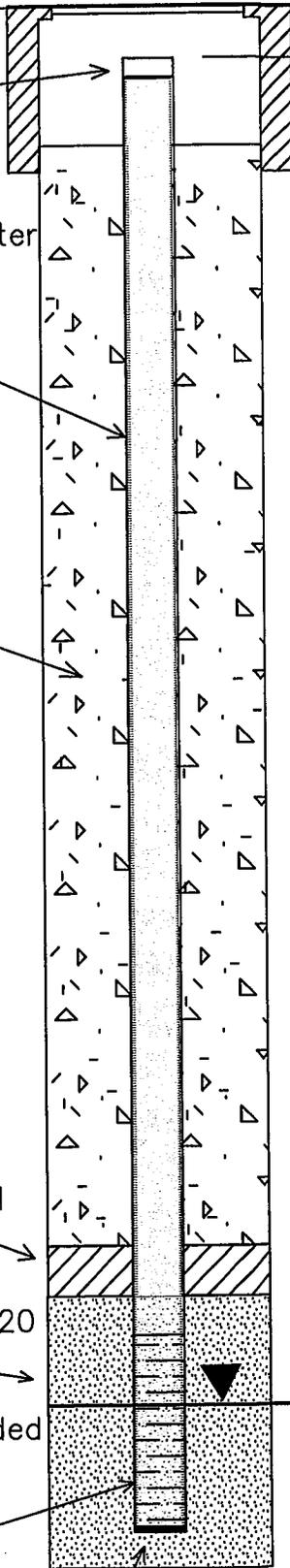
Neat Cement

Bentonite Seal

Filter Pack  
Colorado #10-20  
Silica Sand

4" Flush-Threaded  
Sch. 40 PVC  
0.010-inch  
Slot Size  
Well Screen

4" PVC Threaded End Cap



98'  
103'  
108'  
116.28'  
148'  
151'

# WCP-99

<u>ADWR Number</u> 55-589557	
<u>Latitude</u> 33°29'23.42"	<u>Longitude</u> 112°06'55.39"
<u>Top of Casing Elevation (ft AMSL)</u> 1,111.28'	
<u>Static Water Elevation (ft AMSL)</u> 995.08' 11/15/2001	
<u>Installation Date(s)</u> November 14-15, 2001	
<u>Drilling Method</u> CME-95 Hollow Stem Auger	
<u>Drilling Contractor</u> Heber Mining and Exploration	
<u>Development Technique</u> Bail, Surge, bail, overpump on 11/26/01 ~ 257.5 gallons of water removed	

Not To Scale

ARIZONA  
DEPARTMENT OF  
ENVIRONMENTAL  
QUALITY

Monitor Well WCP-99  
Completion Diagram  
WCP East Grand Avenue WQARF Site

**WESTON**  
SOLUTIONS<sup>SM</sup>  
2702 North Third Street, Suite 2001  
Phoenix, Arizona 85004



Tamper-Resistant, Traffic-Rated,  
Flush-Mounted Vault

Top of Casing Elevation = 1,108.20'

Locking Cap

4" Inside Diameter  
Flush-Threaded  
Sch. 40 PVC  
Well Casing

Neat Cement

Bentonite Seal

Filter Pack  
Colorado #10-20  
Silica Sand

4" Flush-Threaded  
Sch. 40 PVC  
0.010-inch  
Slot Size  
Well Screen

4" PVC Threaded End Cap

104.5'

109'

114'

124.25'

154'

156'

# WCP-200

ADWR Number

55-589559

Latitude

33°29'17.99"

Longitude

112°07'20.66"

Top of Casing Elevation (ft AMSL)

1,108.20'

Static Water Elevation (ft AMSL)

983.95' 11/19/2001

Installation Date(s)

November 16 & 19, 2001

Drilling Method

CME-95 Hollow Stem Auger

Drilling Contractor

Heber Mining and Exploration

Development Technique

Bail, surge, bail, overpump on 11/26/01  
~ 520 gallons of water removed

Not To Scale

ARIZONA  
DEPARTMENT OF  
ENVIRONMENTAL  
QUALITY

Monitor Well WCP-200  
Completion Diagram  
WCP East Grand Avenue WQARF Site

**WESTON**  
SOLUTIONS

2702 North Third Street, Suite 2001  
Phoenix, Arizona 85004

Tamper-Resistant, Traffic-Rated,  
Flush-Mounted Vault

Top of Casing Elevation = 1,106.65'

Locking Cap

4" Inside Diameter  
Flush-Threaded  
Sch. 40 PVC  
Well Casing

Neat Cement

# WCP-201

ADWR Number

55-589527

Latitude

33°29'15.85"

Longitude

112°07'21.22"

Top of Casing Elevation (ft AMSL)

1,106.65'

Static Water Elevation (ft AMSL)

983.35' 12/03/2001

Installation Date(s)

November 30 & December 3, 2001

Drilling Method

CME-95 Hollow Stem Auger

Drilling Contractor

Heber Mining and Exploration

Development Technique

Bail, surge, bail, overpump on 12/11/01  
~ 1005 gallons of water removed

Bentonite Seal

Filter Pack  
Colorado #10-20  
Silica Sand

104'

108.7'

114'

4" Flush-Threaded  
Sch. 40 PVC  
0.010-inch  
Slot Size  
Well Screen

123.3'

154'

156'

4" PVC Threaded End Cap

Not To Scale

089/01

H:\M\Rebekah\wcp\well completion diagrams\wcp40diag

ARIZONA  
DEPARTMENT OF  
ENVIRONMENTAL  
QUALITY

Monitor Well WCP-201  
Completion Diagram  
WCP East Grand Avenue WQARF Site

**WESTON**  
SOLUTIONS<sup>SM</sup>  
2702 North Third Street, Suite 2001  
Phoenix, Arizona 85004

Tamper-Resistant, Traffic-Rated,  
Flush-Mounted Vault

Top of Casing Elevation = 1,100.90'

Locking Cap

4" Inside Diameter  
Flush-Threaded  
Sch. 40 PVC  
Well Casing

Neat Cement

# WCP-202

ADWR Number

55-589529

Latitude

33°29'06.19"

Longitude

112°07'26.10"

Top of Casing Elevation (ft AMSL)

1,100.90'

Static Water Elevation (ft AMSL)

980.70' 12/05/2001

Installation Date(s)

December 4-5, 2001

Drilling Method

CME-95 Hollow Stem Auger

Drilling Contractor

Heber Mining and Exploration

Development Technique

Bail, surge, bail, overpump on 12/10/01  
~ 937.5 gallons of water removed

Bentonite Seal

Filter Pack  
Colorado #10-20  
Silica Sand

101'

106'

111'

120.2'

151'

152'

4" Flush-Threaded  
Sch. 40 PVC  
0.010-inch  
Slot Size  
Well Screen

4" PVC Threaded End Cap

Not To Scale

ARIZONA  
DEPARTMENT OF  
ENVIRONMENTAL  
QUALITY

Monitor Well WCP-202  
Completion Diagram  
WCP East Grand Avenue WQARF Site

**WESTON**  
SOLUTIONS  
2702 North Third Street, Suite 2001  
Phoenix, Arizona 85004

Tamper-Resistant, Traffic-Rated,  
Flush-Mounted Vault

Top of Casing Elevation = 1,111.90'

Locking Cap

4" Inside Diameter  
Flush-Threaded  
Sch. 40 PVC  
Well Casing

Neat Cement

Bentonite Seal

Filter Pack  
Colorado #10-20  
Silica Sand

4" Flush-Threaded  
Sch. 40 PVC  
0.010-inch  
Slot Size  
Well Screen

4" PVC Threaded End Cap

# WCP-203

ADWR Number

55-590060

Latitude

33°29'23.47"

Longitude

112°07'40.50"

Top of Casing Elevation (ft AMSL)

1,111.90'

Static Water Elevation (ft AMSL)

981.21' 12/18/2001

Installation Date(s)

December 17 & 18, 2001

Drilling Method

CME-95 Hollow Stem Auger

Drilling Contractor

Heber Mining and Exploration

Development Technique

Bail, surge, bail, overpump on 12/20/01  
~ 1002.5 gallons of water removed

104.5'

109'

121.5'

130.7

161.5'

162'

Not To Scale

ARIZONA  
DEPARTMENT OF  
ENVIRONMENTAL  
QUALITY

Monitor Well WCP-203  
Completion Diagram  
WCP East Grand Avenue WQARF Site



2702 North Third Street, Suite 2001  
Phoenix, Arizona 85004

Tamper-Resistant, Traffic-Rated,  
Flush-Mounted Vault

Top of Casing Elevation = 1,097.47'

Locking Cap

4" Inside Diameter  
Flush-Threaded  
Sch. 40 PVC  
Well Casing

Neat Cement

Bentonite Seal

Filter Pack  
Colorado #10-20  
Silica Sand

4" Flush-Threaded  
Sch. 40 PVC  
0.010-inch  
Slot Size  
Well Screen

4" PVC Threaded End Cap

# WCP-204

ADWR Number

55-589528

Latitude

33°28'54.78"

Longitude

112°07'49.65"

Top of Casing Elevation (ft AMSL)

1,097.47'

Static Water Elevation (ft AMSL)

976.97' 11/29/2001

Installation Date(s)

November 28-29, 2001

Drilling Method

CME-95 Hollow Stem Auger

Drilling Contractor

Heber Mining and Exploration

Development Technique

Bail, surge, bail, overpump on 12/10/01  
~ 1050 gallons of water removed

100.5'

105'

110'

120.5'

150'

151'

Not To Scale

ARIZONA  
DEPARTMENT OF  
ENVIRONMENTAL  
QUALITY

Monitor Well WCP-204  
Completion Diagram  
WCP East Grand Avenue WQARF Site

**WESTON**  
SOLUTIONS<sup>SM</sup>  
2702 North Third Street, Suite 2001  
Phoenix, Arizona 85004

**APPENDIX F**  
**INVESTIGATON DERIVED WASTE DISPOSAL DOCUMENTATION**





BSF - 03136 A  
SITE WM WASTE PROFILE NUMBER

WASTE PROFILE APPROVAL REQUEST

WM to complete this area.

WM Initiator: \_\_\_\_\_  
Location: \_\_\_\_\_  
Telephone: ( ) \_\_\_\_\_  
Fax: ( ) \_\_\_\_\_

Action Requested:  New Waste Approval  
 Up-Date Approval - Previous Number: \_\_\_\_\_  
Disposal Site Requested:  Butterfield Station  Northwest Regional  
 Copper Mountain  Lone Cactus  PenRob  Kettleman Hills  
Management Method Requested:  Landfill  Solidification  
 Other: \_\_\_\_\_

2. GENERATOR INFORMATION

a) Generator's Name: Ray S. Weston / UWR  
b) Generating Facility's Address: 2930 W. Osborn  
City: PHOENIX State: AZ Zip: \_\_\_\_\_  
Telephone: ( ) \_\_\_\_\_ Fax: ( ) \_\_\_\_\_  
c) Generator's Representative:  
Name: Richard Findlay  
Title: Geologist  
Telephone: (602) 279-1255 Fax: (602) 279-8986  
d) Emergency/Information Contact:  
Title: \_\_\_\_\_  
Telephone: ( ) \_\_\_\_\_

e) State/Provincial/Local Registration No.: \_\_\_\_\_  
Generator's EPA Id. No.: \_\_\_\_\_  
Industry Description/SIC Code: \_\_\_\_\_  
f) Billing Information:  
Customer's Name: Philip Services Corp  
Customer's Mailing Address: 1801 W. WATKINS  
City: PHOENIX State: AZ Zip: 85027  
g) Billing Contact: D. Michael / R. Bolan  
Telephone: 602 252-1186  
Fax: ( ) 602-2521680

3. WASTE STREAM INFORMATION

DESCRIPTION  
a) Name of Waste: Drill Cuttings  
b) Process Generating Waste: (describe fully) SITE CHARACTERIZATION

c) Color <u>Brown</u>	d) Odor (describe): <u>NONE</u>	e) Physical State @ 70° F <input checked="" type="checkbox"/> Solid <input type="checkbox"/> Liquid <input type="checkbox"/> Gas <input type="checkbox"/> Sludge <input type="checkbox"/> Other	f) Layers <input checked="" type="checkbox"/> Single Layer <input type="checkbox"/> Multi-Layer	g) Free Liquids <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No h) pH: Range <u>6.8 to 7.3</u>
--------------------------	------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------

l) Liquid Flash Point:  <73° F  73°-99° F  100°-139° F  140°-199° F  >200° F  Not Applicable

j) Chemical Composition (List all constituents (including halogenated organics, debris, and UHC's) present in any concentration and submit representative analysis):

Constituents	Composition %	Constituents	Composition %
<u>Soil</u>	<u>98-100%</u>		
<u>Debris</u>	<u>1-2%</u>		

k) Waste Properties:  Oxidizer  Pyrophoric  
 Explosive  Radioactive  
 Carcinogen  Infectious  
 Shock Sensitive  Water Reactive  
 Acid Reactive  Alkaline Reactive  
 Autopolymerizable

TOTAL COMPOSITION MUST EQUAL OR EXCEED 100%

- l) Does the waste represented by this profile contain any of the Carcinogens which require OSHA notification? (List in Section 3-j) . . . . .  Yes  No
- m) Does the waste represented by this profile contain Dioxins? (List in Section 3-j) . . . . .  Yes  No
- n) Does the waste represented by this profile contain Asbestos? . . . . .  Yes  No  
If yes . . . . .  Friable  Non-Friable
- o) Does the waste represented by this profile contain Benzene? . . . . .  Yes  No  
If yes, concentration . . . . . ppm  
Is the waste subject to Benzene waste operations NESHA? . . . . .  Yes  No
- p) Is the waste subject to RCRA Subpart CC controls . . . . .  Yes  No  
If yes, volatile organic concentration . . . . . ppm
- q) Does the waste contain any Class I or Class II ozone-depleting substances? . . . . .  Yes  No
- r) Does the waste contain debris? (List in Section 3-j) . . . . .  Yes  No
- s) Is this waste a treatment residue of a waste which was previously a characteristically hazardous waste? . . . . .  Yes  No  
If yes, describe the waste, applicable code(s), and the process generating the waste prior to treatment. \_\_\_\_\_

**4. SHIPPING INFORMATION**

- a) This waste will be shipped in (type of container)  Bulk  Steel Drums \_\_\_\_\_ gal.  Belloff 20 Size  
 End Dump  Bally Dump  Other Drums \_\_\_\_\_ type  Other \_\_\_\_\_
- b) Estimated Annual Amount 200  Tons  Yards  Drums  Other (specify) \_\_\_\_\_
- c) Shipping Frequency (Per):  Month  Quarter  Year  One Time  Other \_\_\_\_\_
- d) Is this a U.S. Department of Transportation (USOON) Hazardous Material? (If no skip d, e and f.)  Yes  No What State \_\_\_\_\_
- e) Reportable Quantity (lbs., kgs.): \_\_\_\_\_ f) Hazard Class/ID #: \_\_\_\_\_
- g) USDOT Shipping Name: \_\_\_\_\_
- h) Personal Protective Equipment Requirements: \_\_\_\_\_
- i) Transporter/Transfer Station: \_\_\_\_\_

**5. GENERATOR'S CERTIFICATION** (Please check appropriate responses, sign and date below.)

- a) Is this a USEPA hazardous waste (40 CFR Part 261)? If the answer is no, skip to b.  Yes  No  
 a-1) If yes, identify ALL USEPA listed and characteristic waste code numbers (D, E, K, P, U) \_\_\_\_\_
- a-2) If a characteristic hazardous waste, do underlying hazardous constituents (UHC's) apply? (If yes, list in section 3-j)  Yes  No
- a-3) Does this waste contain debris, (If yes, list size and type in Chemical Composition - 3-j)  Yes  No
- b) Is this a state hazardous waste?  Yes  No  
 Identify ALL state hazardous waste codes \_\_\_\_\_
- c) Is the waste from a CERCLA (40 CFR 300, Appendix B) or state mandated cleanup?  Yes  No  
 If yes, attach Record of Decision (ROD), 104/106 or 122 order or court order that governs site cleanup activity. For state mandated cleanup, provide relevant documentation.
- d) Does the waste represented by this waste profile sheet contain radioactive material, or is disposal regulated by the Nuclear Regulatory Commission?  Yes  No
- e) Does the waste represented by this waste profile sheet contain concentrations of Polychlorinated Biphenyls (PCBs) regulated by 40 CFR 761? (If yes, list in Chemical Compositions 3-j)  Yes  No  
 e-1) If yes, were the PCBs imported into the U.S.?  Yes  No
- f) Do the waste profile sheet and all attachments contain true and accurate descriptions of the waste material, and has all relevant information within the possession of the Generator regarding known or suspected hazards pertaining to the waste been disclosed to the Contractor?  Yes  No
- g) Will all changes which occur in the character of the waste be identified by the Generator and disclosed to the Contractor prior to providing the waste to the Contractor?  Yes  No

**h) Certification:**

The certification must be signed by the generator, or the generator's authorized representative, and indicates that a first hand knowledge of the wastes' characteristics is known.

I hereby certify that all information is truly representative of the above described waste as defined in 40 CFR-261-Appendix I. I agree to notify Waste Management if there is a change in the waste stream information as submitted for permit. I also authorize Waste Management to periodically reanalyze the waste, at my expense. I also certify that all samples were collected according to EPA Method SW-846 and the samples were analyzed by a qualified/certified laboratory and that the appropriate chain of custody was attached. I further certify that the wastes submitted for disposal are not designated as Hazardous by Federal or state regulations.

Date: 11/23/99 Company: Roy F. Weston, Inc.  
 Printed Name: Richard C. Fridlay Signature: Richard C. Fridlay

Check here if additional information is attached. Indicate the number of attached pages \_\_\_\_\_

**6. WASTE MANAGEMENT'S DECISION** (For WM use only)

- a) Management Method  Landfill  Nonhazardous Solidification  Bio Remediation  
 Other (specify) \_\_\_\_\_
- b) Proposed Ultimate Management Facility: \_\_\_\_\_
- c) Precautions, Special Handling Procedures, or Limitation on Approval: \_\_\_\_\_
- d) Waste Form \_\_\_\_\_ e) Source \_\_\_\_\_ f) System Type \_\_\_\_\_
- Special Waste Decision  Approved  Disapproved
- Special Waste Approvals Person Signature: \_\_\_\_\_ Date: \_\_\_\_\_



B5F - 03151 A  
SITE WM WASTE PROFILE NUMBER

COPY

1. WASTE PROFILE APPROVAL REQUEST

WM to complete this area.

WM Initiator: \_\_\_\_\_  
Location: \_\_\_\_\_  
Telephone: ( ) \_\_\_\_\_  
Fax: ( ) \_\_\_\_\_

Action Requested:  New Waste Approval  
 Up-Data Approval - Previous Number: \_\_\_\_\_  
Disposal Site Requested:  Butterfield Station  Northwest Regional  
 Copper Mountain  Lone Cactus  PenRob  Kettleman Hills  
Management Method Requested:  Landfill  Solidification  
 Other: \_\_\_\_\_

2. GENERATOR INFORMATION

a) Generator's Name: ADSD - NWR  
b) Generating Facility's Address: 2930 W. Osborn  
City: Phoenix State: AZ Zip: 85017  
Telephone: (602) 259-1186 Fax: (602) 259-1180  
c) Generator's Representative:  
Name: Ana Vargas  
Title: \_\_\_\_\_  
Telephone: ( ) \_\_\_\_\_ Fax: ( ) \_\_\_\_\_  
d) Emergency/Information Contact  
Title: \_\_\_\_\_  
Telephone: ( ) \_\_\_\_\_

e) State/Provincial/Local Registration No.: \_\_\_\_\_  
Generator's EPA Id. No.: \_\_\_\_\_  
Industry Description/SIC Code: \_\_\_\_\_  
f) Billing Information:  
Customer's Name: PSC-Allwade  
Customer's Mailing Address: 1801 W. Watkins  
City: Phoenix State: AZ Zip: 85017  
g) Billing Contact: Jim Davis  
Telephone: (602) 259-1186  
Fax: (602) 259-1180

3. WASTE STREAM INFORMATION

DESCRIPTION

a) Name of Waste: Drilling Cuttings  
b) Process Generating Waste: (describe fully) \_\_\_\_\_  
Site Characterization by PCE  
UNKNOWN SOURCE FOR PCE (Tetrachloroethene)

c) Color <u>Brown</u>	d) Odor (describe): <u>none</u>	e) Physical State @ 70° F <input checked="" type="checkbox"/> Solid <input type="checkbox"/> Liquid <input type="checkbox"/> Gas <input type="checkbox"/> Sludge <input type="checkbox"/> Other	f) Layers <input checked="" type="checkbox"/> Single Layer <input type="checkbox"/> Multi-Layer	g) Free Liquids <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No h) pH: Range <u>6.8 to 7.3</u>
--------------------------	------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------

i) Liquid Flash Point:  <73° F  73°-99° F  100°-139° F  140°-199° F  >200° F  Not Applicable

j) Chemical Composition (List all constituents (including halogenated organics, debris, and UHC's) present in any concentration and submit representative analysis):

Constituents	Composition %	Constituents	Composition %
<u>Soil</u>	<u>98-100</u>		

TOTAL COMPOSITION MUST EQUAL OR EXCEED 100%

k) Waste Properties:  Oxidizer  Pyrophoric  
 Explosive  Radioactive  
 Carcinogen  Infectious  
 Shock Sensitive  Water Reactive  
 Acid Reactive  Alkaline Reactive  
 Autopolymerizable

- l) Does the waste represented by this profile contain any of the Carcinogens which require OSHA notification? (List in Section 3-1).....  Yes  No
- m) Does the waste represented by this profile contain Dioxins? (List in Section 3-1).....  Yes  No
- n) Does the waste represented by this profile contain Asbestos?.....  Yes  No  
If yes.....  Friable  Non-Friable
- o) Does the waste represented by this profile contain Benzene?.....  Yes  No  
If yes, concentration..... ppm  
Is the waste subject to Benzene waste operations NESHAP?.....  Yes  No
- p) Is the waste subject to RCRA Subpart CC controls.....  Yes  No  
If yes, volatile organic concentration..... ppm
- q) Does the waste contain any Class I or Class II ozone-depleting substances?.....  Yes  No
- r) Does the waste contain debris? (List in Section 3-1).....  Yes  No
- s) Is this waste a treatment residue of a waste which was previously a characteristically hazardous waste?.....  Yes  No  
If yes, describe the waste, applicable code(s), and the process generating the waste prior to treatment. \_\_\_\_\_

COPY

SHIPPING INFORMATION

- a) This waste will be shipped in (type of container) ... b) Estimated Annual Amount: 200 Tons ... c) Shipping Frequency (Per): Quarter ... d) Is this a U.S. Department of Transportation (USDOT) Hazardous Material? ... e) Reportable Quantity (lbs., kgs.): none ... f) Hazard Class/ID #: ... g) USDOT Shipping Name: none ... h) Personal Protective Equipment Requirements: none ... i) Transporter/Transfer Station: Allwaste

5. GENERATOR'S CERTIFICATION (Please check appropriate responses, sign and date below.)

- a) Is this a USEPA hazardous waste (40 CFR Part 261)? If the answer is no, skip to b ... a-1) If yes, identify ALL USEPA listed and characteristic waste code numbers (D, F, K, P, U) ... a-2) If a characteristic hazardous waste, do underlying hazardous constituents (UHCs) apply? ... a-3) Does this waste contain debris, (if yes, list size and type in Chemical Composition - 3-)? ... b) Is this a state hazardous waste? ... c) Is the waste from a CERCLA (40 CFR 300, Appendix B) or state mandated cleanup? ... d) Does the waste represented by this waste profile sheet contain radioactive material, or is disposal regulated by the Nuclear Regulatory Commission? ... e) Does the waste represented by this waste profile sheet contain concentrations of Polychlorinated Biphenyls (PCBs) regulated by 40 CFR 761? ... f) Do the waste profile sheet and all attachments contain true and accurate descriptions of the waste material, and has all relevant information within the possession of the Generator regarding known or suspected hazards pertaining to the waste been disclosed to the Contractor? ... g) Will all changes which occur in the character of the waste be identified by the Generator and disclosed to the Contractor prior to providing the waste to the Contractor?

h) Certification:

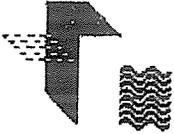
The certification must be signed by the generator, or the generator's authorized representative, and indicates that a first hand knowledge of the wastes' characteristics is known. I hereby certify that all information is truly representative of the above described waste as defined in 40 CFR-261-Appendix L I agree to notify Waste Management if there is a change in the waste stream information as submitted for permit. I also authorize Waste Management to periodically reanalyze the waste, at my expense. I also certify that all samples were collected according to EPA Method SW-846 and the samples were analyzed by a qualified/certified laboratory and that the appropriate chain of custody was attached. I further certify that the wastes submitted for disposal are not designated as Hazardous by Federal or state regulations.

Date: 1/7/00 Company: ADEQ Printed Name: Ana I. Vargas Signature: Ana Irette Vargas

Check here if additional information is attached. Indicate the number of attached pages

6. WASTE MANAGEMENT'S DECISION (For WM use only.)

- a) Management Method: Landfill, Nonhazardous Solidification, Bio Remediation, Other ... b) Proposed Ultimate Management Facility: ... c) Precautions, Special Handling Procedures, or Limitation on Approval: ... d) Waste Form, e) Source, f) System Type ... Special Waste Decision: Approved, Disapproved ... Special Waste Approvals Person Signature: Date:



RESOURCE RECOVERY TECHNIQUES OF ARIZONA, INC.

5159 West Van Buren Street Phoenix, Arizona 85043

(602) 278-3442 Fax (602) 278-1561

COPY

WASTE CODE

9313

GENERATOR'S LIQUID PROFILE SHEET

WASTE CODE

PROFILE CODE

PLEASE PRINT IN INK OR TYPE

INSTRUCTIONS FOR COMPLETING THIS FORM ARE ATTACHED

Renewal Date of Service Agreement:

RRTA Sales Rep #:

A. WHERE IS THE WASTE GENERATED?

- 1. Generator Name: ADEQ VLSB
- 2. Facility Address (site of waste generation): 27th Ave + Osborn
- 3. Generator City, State: Phoenix AZ
- 4. Zip Code: \_\_\_\_\_
- 5. Generator USEPA ID#: \_\_\_\_\_
- 6. Generator State ID#: \_\_\_\_\_
- 7. Technical Contact: Joni Davis
- 8. Phone: (602) 252-1186

B. WHERE ARE RESOURCE RECOVERY TECHNIQUES INVOICES SENT?

- 1. Generating Facility (A, above), or
- 2. Company Name: Phillip Services
- 3. Phone: (602) 252-1181
- 4. Address: 1801 W Watkins
- 5. City, State: Phoenix AZ
- 6. Zip Code: 85007

C. PHYSICAL CHARACTERISTICS OF WASTE:

- 1. Name of Waste: Drill Cuttings
- 2. Process Generating Waste: Investigation - Drilling
- 3. Special Handling Instructions: \_\_\_\_\_

4. Color <u>Brown</u>	5. Does the waste have a strong incidental odor? <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes if so, describe: _____	6. Physical State @70F / 21C: <input checked="" type="checkbox"/> Solid <input type="checkbox"/> Semi-Solid <input type="checkbox"/> Liquid <input type="checkbox"/> Powder Other: _____	7. Layers <input type="checkbox"/> Multi-layered <input type="checkbox"/> Bi-layered <input checked="" type="checkbox"/> Single Phased	8. Specific Gravity: Range _____	9. Free Liquids: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Volume: _____
--------------------------	------------------------------------------------------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------	-------------------------------------	----------------------------------------------------------------------------------------------------------

- 10. pH:  ≤ 2  > 2 - < 6  6 - 8  > 8 - ≤ 12.5  ≥ 12.5  Range  NA
- 11. Flash Point:  None  < 140F / 60C  140F - 199F / 60C - 83C  200F / 93C  Closed Cup  Open Cup

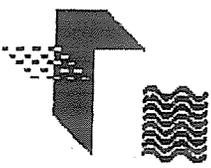
D. TRANSPORTATION INFORMATION

- 1. Method of Shipment:  Bulk Liquid  Bulk Sludge  Bulk Solid  Drum / Box  Other \_\_\_\_\_
- 2. Annual Amounts / Units: Est 20T - 200T
- 3. Supplemental Information: \_\_\_\_\_
- 4. Is this a DOT hazardous material?  No  Yes (if so, complete 5, 6 & 7)
- 5. Hazard Class / ID#: \_\_\_\_\_
- 6. Reportable Quantities / Units (gals.) \_\_\_\_\_
- 7. Shipping Name: \_\_\_\_\_

Check Box if additional information is attached.

Turn Page and Continue Side 2.





# RESOURCE RECOVERY TECHNIQUES OF ARIZONA, INC.

5159 West Van Buren Street Phoenix, Arizona 85043

(602) 278-3442 Fax (602) 278-1561

## GENERATOR'S LIQUID PROFILE SHEET

PLEASE PRINT IN INK OR TYPE

### E. CHEMICAL COMPOSITION

1.	RANGE MIN.-MAX.
Soil	95 - 100 %
Plastic debris	0 - 5 %
Water	5 - 1 %
	- %
	- %
	- %
	- %

2. Does this waste contain any of the following (provide concentration if known):

NO or LESS THAN or ACTUAL

PCB'S	<input checked="" type="checkbox"/>	<input type="checkbox"/> < 50 ppm	ppm
Cyanides	<input checked="" type="checkbox"/>	<input type="checkbox"/> < 50 ppm	ppm
Sulfides	<input checked="" type="checkbox"/>	<input type="checkbox"/> < 50 ppm	ppm
Phenolics	<input checked="" type="checkbox"/>	<input type="checkbox"/> < 50 ppm	ppm

Please note: The chemical composition total in the maximum column must be greater than or equal to 100%

Totals: \_\_\_\_\_ %

### E. METALS

1. Does this waste contain any of the following metals (provide concentration if known):

<del>Arsenic</del>	<input type="checkbox"/> < 5 or _____ ppm	<del>Barium</del>	<input type="checkbox"/> < 100 or _____ ppm	<del>Calcium</del>	<input type="checkbox"/> < 1 or _____ ppm
<del>Chromium</del>	<input type="checkbox"/> < 5 or _____ ppm	<del>Lead</del>	<input type="checkbox"/> < 5 or _____ ppm	<del>Mercury</del>	<input type="checkbox"/> < 0.2 or _____ ppm
<del>Selenium</del>	<input type="checkbox"/> < 1 or _____ ppm	<del>Silver</del>	<input type="checkbox"/> < 5 or _____ ppm	<del>Copper</del>	<input type="checkbox"/> < 5 or _____ ppm
<del>Nickel</del>	<input type="checkbox"/> < 5 or _____ ppm	<del>Zinc</del>	<input type="checkbox"/> < 5 or _____ ppm		

2. Indicate method used to determine concentration (if provided):  E P TOX  TCLP, or  Total

### G. GENERATOR CERTIFICATION

By signing this profile sheet, the generator certifies that unless clearly stated above or in attachments:

- This waste is not a listed hazardous waste based on the following generator knowledge/testing:
  - CESQG - The generator has characterized his wastes and does not generate more than 100 kg/month of hazardous waste.
  - RCRA Empty - The waste material was generated from the clean-out of a RCRA empty vessel.
  - No listed waste generated - The generator is aware of the RCRA regulations and does not generate any RCRA listed waste streams including spent solvents.
  - Used Oil - The generator has not mixed any hazardous waste into his used oil. Also, obtain a total halogen test showing the material is below 1000 ppm during prequalification.
- The waste is not characteristic hazardous waste based on the following generator knowledge/testing:
  - (CESQG) - The generator has characterized his wastes and does not generate more than 100 kg/month hazardous waste.
  - (No characteristic waste generated) - The generator is aware of the RCRA regulations and based on knowledge or test data, certifies that he does not generate any characteristic hazardous waste.
  - (Used oil) - The generator has not mixed any hazardous waste into his used oil. If ignitable waste is mixed with the oil, the mixture is not ignitable. If other characteristic hazardous waste is mixed with the used oil, the mixture passes all characteristics. The generator has also obtained a total halogen test showing the material is 1000 ppm during pre-qualification.
- If Used Oil Boxes are Checked, Used Oil must be reclaimed if it fails TCLP.
- This waste does not contain regulated quantities of PCB's (Polychlorinated Biphenyls).
- This sheet and its attachments contain true and accurate description of the waste material. All relevant information regarding known or suspected hazards in the possession of the generator have been disclosed.
- Resource Recovery Techniques Definition of Liquid Waste (Form NHLW-002) has been read, signed and attached.

1. Signature Ana I. Vargas  
 Name (Type or Print) Ana I. Vargas

5. Title Project Manager  
 7. Date 3/27/01



**VADOSE ZONE INVESTIGATION & PHASE III MONITOR WELLS**

**Soil Bin    #298  
                 #143  
                 #309  
                 #233  
                 #131  
                 #115**

**Water        1,000 gal.**





▲ Environmental Services  
 ▲ Hazardous Waste Transportation  
 ▲ Hazardous Materials Management  
 ▲ General Engineering Construction

### Allwaste Transportation & Remediation Inc.

1801 W. Watkins • Phoenix, AZ 85007  
 (602) 252-1186 • FAX (602) 252-1680

# 221-13588

PO: \_\_\_\_\_  
 DATE: 3-7

CUSTOMER <u>Weston-NUR</u>	DELIVER TO <u>Butter Field</u>
ADDRESS _____	ADDRESS _____
CITY _____	CITY _____
CONTACT _____	CONTACT _____
CUST. PHONE _____	CUST. PHONE _____

SPECIAL EQUIP INSTRUCTIONS: \_\_\_\_\_ (FORKLIFT, PLACARD, ADD'L STOPS, ETC.)

MANIFEST NO. \_\_\_\_\_

QTY.	HAZ	DESCRIPTION	WT	HRS	MILES	RATE	AMOUNT
		transport via #143 to Butter Field unload & return to ATR yd		3.0			
			10.05			30-	301.50
							580-
							581.50

DRIVER NAME: Bob Francis TRK NO.: 738 TLR NO.: \_\_\_\_\_  
 BEGINNING TIME: 2:00 / ARRIVAL TIME: \_\_\_\_\_  
 UNLOADING TIME: (START) 3:00 (STOP) 3:20  
 LOADING TIME: (START) \_\_\_\_\_ (STOP) \_\_\_\_\_  
 PAPERWORK DELAY \_\_\_\_\_  
 LEAVE SITE: \_\_\_\_\_ END \_\_\_\_\_  
 LEAVE SITE: \_\_\_\_\_ END 5:00  
 SIGNATURE: \_\_\_\_\_ RECEIVED BY: \_\_\_\_\_

**TERMS:** Net 30 days. Consignee to pay any legal fees for collection of delinquent accounts, plus the legal rate of interest of 1 1/2% per month or 18% per year will be charged for all past due accounts. We make all deliveries inside curb and on lot at customer's risk only and accept no responsibility for damages resulting from such deliveries. Claims for short or damage or overcharge must be filed with this receipt within 10 days.



PLEASE CALL OFFICE 24 HRS IN ADVANCE WITH SHIPPING NOTICE

FOR OFFICE USE ONLY

NON-HAZARDOUS WASTE MANIFEST

Customer Acct. No. Ticket No.

GENERATOR

WM BSF 0705

Name ADED-VUOR
Address 2930 W. DUBOIN PHOENIX AZ
Phone No.

Generating Location SAME

I.D. No.

Table with columns: PROFILE APPROVAL NO, WASTE DESCRIPTION, QUANTITY, UNITS, UNIT. Row 1: BSF, 03151A, Drill Cuttings, 15, Y, D-DRUM

I hereby certify that the above listed material(s), is (are) not a hazardous waste as defined by 40 CFR Part 261: That each waste has been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulation.

Ana I. Vargas 2/18/00 Ana Vargas
AUTHORIZED AGENT'S NAME (PRINT) DATE SIGNATURE

CONTRACTOR

Name Philip S. Davis
Address 1801 W. WATKINS PHOENIX AZ

Phone No. 602-252-1186

I hereby certify that the above listed material(s), is (are) not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law: That each waste has been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulation.

JOHN DAVIS 3/3/00 John Davis
AUTHORIZED AGENT'S NAME (PRINT) DATE SIGNATURE

TRANSPORTER

Name Allwise Transportation
Address 1801 W. WATKINS PHOENIX AZ 85007

Phone No. 602-252-1186

Driver's Name

Vehicle's No. BU 143

I hereby certify that the above listed material(s), is (are) not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law: That each waste has been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulation.

2/2/00 DRIVER'S SIGNATURE DELIVERY DATE DRIVER'S SIGNATURE

DISPOSAL FACILITY

BUTTERFIELD STATION FACILITY
40404 S. 99th Avenue • Mobile, Arizona 85239 • (602) 256-0630

I hereby certify that the above material has been accepted and that information presented on this document are true and accurate.

A. Keates 3/3/00 A. Keates
NAME DATE SIGNATURE

DRIVER: PLEASE SIGN HERE

*Driver F*

WMI Butterfield Landfill  
40404 S. 99th Avenue  
Mobile, AZ 85239  
Phone (602) 256-0630 Fax (602) 256-0639

TICKET#  
28980

HAULER NAME	TRUCK #	OPERATOR	TIME IN	TIME OUT	DATE
ALLW	738		14:48	15:21	03/07/2000

CUSTOMER: PHIL/ELT / PHILIP SERVICES/ELTEX  
GENERATOR: ADEQ-V / ADEQ-VWR  
ORIGIN: PHOE / PHOENIX  
PROFILE #: 03151A  
MANIFEST: 07057  
MAS#: 0000054  
P.O. ;  
COMMENT:

GROSS: 47620 LBS  
TARE: 27520 LBS  
NET: 20100 LBS

BUTTERFIELD FACILITY CERTIFIES THAT THE ABOVE REFERENCED WASTE WAS TREATED AND/OR DISPOSED AT BUTTERFIELD STATION FACILITY ON THE ABOVE DATE.

SOURCES

OTHER INFORMATION



THE PUBLIC WEIGHTMASTER'S CERTIFICATE OF WEIGHT AND MEASURE THIS IS TO CERTIFY THAT THE FOLLOWING DESCRIBED MERCHANDISE WAS WEIGHED AND COUNTED OR MEASURED BY A PUBLIC OR DEPUTY WEIGHTMASTER, AND WHEN PROPERLY SIGNED AND SEALED, SHALL BE A PRIMA FACIE EVIDENCE OF ACCURACY OF THE WEIGHT SHOWN AS PRESCRIBED BY THE LAW.

WASTE MANAGEMENT

IN: Judy Hinkle      B: WMSCALE      OUT: Judy Hinkle      B: WMSCALE

MATERIAL CODE/DESCRIPTION	QUANTITY	MEASURE	RATE	AMOUNT
650 / SPECIAL WASTE/ BULK TONS	10.05	T		

03/21/00

10:43

505 837 8870

ROY F WESTON

PHOENIX

009/015



Environmental Services
Hazardous Waste Transportation
Hazardous Materials Management
General Engineering Construction

Allwaste Transportation & Remediation Inc.

1801 W. Watkins • Phoenix, AZ 85007
(602) 252-1186 • FAX (602) 252-1680

221-13406

PO:
DATE: 3/1/2000

CUSTOMER: Weston-JWR
DELIVER TO: Buttefield Station
ADDRESS, CITY, CONTACT, CUST. PHONE fields

SPECIAL EQUIP INSTRUCTIONS:
(FORKLIFT, PLACARDS, ADD'L STOPS, ETC.)
MANIFEST NO.

Table with columns: QTY, HAZ, DESCRIPTION, WT, HRS, MILES, RATE, AMOUNT. Includes handwritten entry: 'Take two full containers to Waste Management' and '26 bags disposal'.

DRIVER NAME: Jean Buckley
TRK NO.: 150
TLR NO.: 755

BEGINNING TIME: 10:00 A
ARRIVAL TIME:
LOADING TIME: (START) (STOP)
LEAVE SITE: END 3:30 P
SIGNATURE:
ARRIVAL TIME:
UNLOADING TIME: (START) (STOP)
PAPERWORK DELAY
LEAVE SITE: END
RECEIVED BY:

TERMS: Net 30 days. Consignee to pay any legal fees for collection of delinquent accounts, plus the legal rate of interest of 1 1/2 % per month or 18 % per year will be charged for all past due accounts. We make all deliveries inside curb and on lot at customer's risk only and accept no responsibility for damages resulting from such deliveries. Claims for short or damage or overcharge must be filed with this receipt within 10 days.



PLEASE CALL 24 HRS IN ADVANCE WITH SHIPPING NOTICE

FOR OFFICE USE ONLY

NON-HAZARDOUS WASTE MANIFEST

Customer Acct. No.

Ticket No.

GENERATOR

WM BSF

0705

Name ADEQ - VWR

Generating Location same

Address 2930 W. Osborn  
Phoenix Az

Phone No.

I.D. No.

PROFILE APPROVAL NO.	WASTE DESCRIPTION	QUANTITY	UNITS	UNIT
BSF 03151A	Drill Cuttings	15	Y	D - DRUM
				B - BAG
				C - CARTON
				T - TONS
				Y - YARDS
				O - OTHER

I hereby certify that the above listed material(s), is (are) not a hazardous waste as defined by 40 CFR Part 261: That each waste has been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulation.

Ana I. Varzas

2/18/00

Ana Varzas

AUTHORIZED AGENT'S NAME (PRINT)

DATE

SIGNATURE

CONTRACTOR

Name Philip Services

Phone No. 602-252-1186

Address 1801 W. Watkins Phoenix Az 85007

I hereby certify that the above listed material(s), is (are) not a hazardous waste as defined by 40CFR Part 261 or any applicable state law: That each waste has been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulation.

Wm Gully

3/1/2000

Wm Gully

AUTHORIZED AGENT'S NAME (PRINT)

DATE

SIGNATURE

TRANSPORTER

Name Allwaste Transportation

Phone No. 602-252-1186

Address 1801 W. Watkins

Phoenix Az

Driver's Name

Vehicle's No. BW 233

I hereby certify that the above listed material(s), is (are) not a hazardous waste as defined by 40CFR Part 261 or any applicable state law: That each waste has been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulation.

3/1/2000

Wm Gully

3/1/2000

Wm Gully

SHIPMENT DATE

DRIVER'S SIGNATURE

DELIVERY DATE

DRIVER'S SIGNATURE

DISPOSAL FACILITY

BUTTERFIELD STATION FACILITY

40404 S. 99th Avenue • Mobile, Arizona 85239 • (602) 256-0630

I hereby certify that the above material has been accepted and that information presented on this document are true and accurate.

Andreei ROSNES

3/1/00

Andreei Rosnes

NAME

DATE

SIGNATURE

ORIGINAL - WHITE

DISPOSAL FACILITY - YELLOW

TRANSPORTER - PINK

GENERATOR - GOLDENROD



PLEASE CALL AND FILE 24 HRS IN ADVANCE WITH SHIPPING NOTICE

FOR OFFICE USE ONLY

NON-HAZARDOUS WASTE MANIFEST

Customer Acct. No.

Ticket No.

GENERATOR

WM BSF

0705

Name ADEQ-VWR

Generating Location Same

Address 2930 W. Ashlan

Phoenix Az 85007

Phone No.

I.D. No.

PROFILE APPROVAL NO.	WASTE DESCRIPTION	QUANTITY	UNITS
BSF	DRILL CUTTINGS	15	Y

- UNIT
- D - DRUM
- B - BAG
- C - CARTON
- T - TONS
- Y - YARDS
- O - OTHER

I hereby certify that the above listed material(s), is (are) not a hazardous waste as defined by 40 CFR Part 261: That each waste has been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulation.

Ana I. Vargas AUTHORIZED AGENT'S NAME (PRINT)

2/18/00 DATE

Ana Vargas SIGNATURE

CONTRACTOR

Name PHILIP SERVICES

Phone No. 602-252-1186

Address 1801 W. WATKINS

Phoenix Az 85007

I hereby certify that the above listed material(s), is (are) not a hazardous waste as defined by 40CFR Part 261 or any applicable state law: That each waste has been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulation.

Jim B. U. AUTHORIZED AGENT'S NAME (PRINT)

3/1/2000 DATE

Jim B. U. SIGNATURE

TRANSPORTER

Name Allwaste Transportation

Phone No. 602-252-1186

Address 1801 W. WATKINS

Driver's Name

Phoenix Az 85007

Vehicle's No. Bin 309

I hereby certify that the above listed material(s), is (are) not a hazardous waste as defined by 40CFR Part 261 or any applicable state law: That each waste has been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulation.

3/1/2000 SHIPMENT DATE Jim B. U. DRIVER'S SIGNATURE

3/1/2000 DELIVERY DATE Jim B. U. DRIVER'S SIGNATURE

DISPOSAL FACILITY

BUTTERFIELD STATION FACILITY 40404 S. 99th Avenue • Mobile, Arizona 85239 • (602) 256-0630

I hereby certify that the above material has been accepted and that information presented on this document are true and accurate.

Arceli Posadas NAME

3/1/00 DATE

Arceli Posadas SIGNATURE

DRIVER PLEASE SIGN HERE

*[Handwritten Signature]*

WMI Butterfield Landfill  
40404 S. 99th Avenue  
Mobile, AZ 85239  
Phone (602) 256-0630 Fax (602) 256-0639

TICKET NO  
38191

HAULER NAME	TRUCK #	OPERATOR	TIME IN	TIME OUT	DATE
ALLW	750		11:47	13:04	03/01/2000

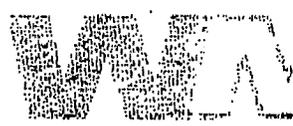
CUSTOMER: PHILI/ELT / PHILIP SERVICES/ELTEX  
GENERATOR: ADEQ-V / ADEQ-VWR  
ORIGIN: PHOE / PHOENIX  
PROFILE #: 03151A  
MANIFEST: 07056  
MAS#: 0000054  
P.O. :  
COMMENT:

GROSS: 93260 LBS  
TARE: 39500 LBS  
NET: 53760 LBS

BUTTERFIELD FACILITY CERTIFIES THAT THE ABOVE REFERENCED WASTE WAS TREATED AND/OR DISPOSED AT BUTTERFIELD STATION FACILITY ON THE ABOVE DATE.

SOURCES

OTHER INFORMATION



THE PUBLIC WEIGHMASTER'S CERTIFICATE OF WEIGHT AND MEASURE THIS IS TO CERTIFY THAT THE FOLLOWING DESCRIBED MERCHANDISE WAS WEIGHED AND COUNTED OR MEASURED BY A PUBLIC OR DEPUTY WEIGHMASTER, AND WHEN PROPERLY SIGNED AND SEALED, SHALL BE A PRIMA FACIE EVIDENCE OF ACCURACY OF THE WEIGHT SHOWN AS PRESCRIBED BY THE LAW.

WASTE MANAGEMENT

IN: Judy Hinkle      B: WMSCALE      OUT: Judy Hinkle      B: WMSCALE

MATERIAL CODE/DESCRIPTION	QUANTITY	MEASURE	RATE	AMOUNT
650 / SPECIAL WASTE/ BULK TONS	26.88	T		



Environmental Services  
 Hazardous Waste Transportation  
 Hazardous Materials Management  
 General Engineering Construction

### Allwaste Transportation & Remediation Inc.

1801 W. Watkins • Phoenix, AZ 85007  
 (602) 252-1186 • FAX (602) 252-1680

221-13148

PO: \_\_\_\_\_

DATE: 2/2/2000

CUSTOMER <u>Weston - VWR</u>	DELIVER TO _____
ADDRESS _____	ADDRESS _____
CITY _____	CITY _____
CONTACT _____	CONTACT _____
CUST. PHONE _____	CUST. PHONE _____

SPECIAL EQUIP INSTRUCTIONS		(FORKLIFT, PLACARDS, ADD'L STOPS, ETC.)	MANIFEST NO.			
QTY.	HAZ	DESCRIPTION	WT.	HRS.	MILES	AMOUNT
		Take <del>to</del> FULL containers to Metrol Dupont. return to Philip Phoenix				580
		Profile fee				100
			8.40		30	252 <sup>B</sup>
BIN INFORMATION						
Dropped Off						
Picked Up						

DRIVER NAME: Jim Gullon TRK NO.: 750 TLR NO.: 755  
 BEGINNING TIME: 10:30A ARRIVAL TIME: \_\_\_\_\_  
 LOADING TIME: (START) \_\_\_\_\_ (STOP) \_\_\_\_\_  
 UNLOADING TIME: (START) \_\_\_\_\_ (STOP) \_\_\_\_\_  
 LEAVE SITE: \_\_\_\_\_ END 330P PAPERWORK DELAY \_\_\_\_\_  
 SIGNATURE: \_\_\_\_\_ LEAVE SITE: \_\_\_\_\_ END \_\_\_\_\_  
 RECEIVED BY: \_\_\_\_\_

**TERMS:** Net 30 days. Consignee to pay any legal fees for collection of delinquent accounts, plus the legal rate of interest of 1 1/2 % per month or 18 % per year will be charged for all past due accounts.  
 We make all deliveries inside curb and on lot at customer's risk only and accept no responsibility for damages resulting from such deliveries.  
 Claims for short or damage or overcharge must be filed with this receipt within 10 days.



PLEASE CALL LANDFILL 24 HRS IN ADVANCE WITH SHIPPING NOTICE

NON-HAZARDOUS WASTE MANIFEST

FOR OFFICE USE ONLY

Customer Acct. No.

Ticket No.

GENERATOR

WM BSF

070

Name ADEQ - VWR

Generating Location same

Address 2930 W. Osborn  
Phoenix, AZ

Phone No.

I.D. No.

PROFILE APPROVAL NO.	WASTE DESCRIPTION	QUANTITY	UNITS	UNIT
BSF	Drill Cuttings	15	Y	D - DRUM
				B - BAG
				C - CARTON
				T - TONS
				Y - YARDS
				O - OTHER

I hereby certify that the above listed material(s), is (are) not a hazardous waste as defined by 40 CFR Part 261: That each waste has been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulation.

Ana I. Vargas  
AUTHORIZED AGENT'S NAME (PRINT)

2/18/00  
DATE

Ana Vargas  
SIGNATURE

CONTRACTOR

Name Philip Services

Phone No. 602-252-1186

Address 1801 W. Watkins  
Phoenix AZ 85007

I hereby certify that the above listed material(s), is (are) not a hazardous waste as defined by 40CFR Part 261 or any applicable state law: That each waste has been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulation.

Jim Gullett  
AUTHORIZED AGENT'S NAME (PRINT)

2/23/2000  
DATE

Jim Gullett  
SIGNATURE

TRANSPORTER

Name Allwaste transportation

Phone No. 602-252-1186

Address 1801 W. Watkins

Driver's Name

Phoenix AZ

Vehicle's No. BU 298

I hereby certify that the above listed material(s), is (are) not a hazardous waste as defined by 40CFR Part 261 or any applicable state law: That each waste has been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulation.

2/23/2000  
SHIPMENT DATE

Jim Gullett  
DRIVER'S SIGNATURE

2/23/2000  
DELIVERY DATE

Jim Gullett  
DRIVER'S SIGNATURE

DISPOSAL FACILITY

BUTTERFIELD STATION FACILITY

40404 S. 99th Avenue • Mobile, Arizona 85239 • (602) 256-0630

I hereby certify that the above material has been accepted and that information presented on this document are true and accurate.

Judy Kinkade  
NAME

2-23-00  
DATE

Judy Kinkade  
SIGNATURE

37015

ORIGINAL - WHITE

DISPOSAL FACILITY - YELLOW

TRANSPORTER - PINK

GENERATOR - GOLDENROD

DRIVER: PLEASE SIGN HERE

WMI Butterfield Landfill  
40404 S. 99th Avenue  
Mobile, AZ 85239  
Phone (602) 256-0630 Fax (602) 256-0630

TICKET #  
37015

HAULER NAME	TRUCK #	OPERATOR	TIME IN	TIME OUT	DATE
ALLW	750B		12:30	14:00	02/23/2000

CUSTOMER: PHILI/ELT / PHILIP SERVICES/ELYEX  
GENERATOR: ADEQ-V / ADEQ-VWR  
ORIGIN: PHOE / PHOENIX  
PROFILE #: 03151A  
MANIFEST: 07058  
MAS#: 0000054  
P.O.:  
COMMENT:

GROSS: 28360 LBS  
TARE: 11560 LBS  
NET: 16800 LBS

BUTTERFIELD FACILITY CERTIFIES THAT THE ABOVE REFERENCED WASTE WAS TREATED AND/OR DISPOSED AT BUTTERFIELD STATION FACILITY ON THE ABOVE DATE.

SOURCES

OTHER INFORMATION

THE PUBLIC WEIGHMASTER'S CERTIFICATE OF WEIGHT AND MEASURE THIS IS TO CERTIFY THAT THE FOLLOWING DESCRIBED MERCHANDISE WAS WEIGHED AND COUNTED OR MEASURED BY A PUBLIC OR DEPUTY WEIGHMASTER, AND WHEN PROPERLY SIGNED AND SEALED, SHALL BE A PRIMA FACIE EVIDENCE OF ACCURACY OF THE WEIGHT SHOWN AS PRESCRIBED BY THE LAW.



WASTE MANIFEST

IN: Judy Hinkle      B: WMSCALE      OUT: Judy Hinkle      B: WMSCALE

MATERIAL CODE/DESCRIPTION	QUANTITY	MEASURE	RATE	AMOUNT
571 / PROFILE FEE	1.00	U		
650 / SPECIAL WASTE/ BULK TONS	8.40	T		





PLEASE CALL AND FILL 24 HRS IN ADVANCE WITH SHIPPING NOTICE

NON-HAZARDOUS WASTE MANIFEST

FOR OFFICE USE ONLY

Customer Acct. No.  
Manifest No.  
Ticket No.

**GENERATOR**

WM BSF 0696

Name ROY F. WESTON/VWR

Generating Location SAME

Address 2930 W. OSBORN, PHOENIX, AZ 85017

ATTN: RICHARD FINDLAY

Phone No. 602 279-1255

I.D. No. \_\_\_\_\_

PROFILE APPROVAL NO.	WASTE DESCRIPTION	QUANTITY	UNITS	UNIT
BFS 03136A	DRILL CUTTINGS	10	Y	D - DRUM
		10.70		B - BAG
				C - CARTON
				T - TONS
				Y - YARDS
				O - OTHER

I hereby certify that the above listed material(s), is (are) not a hazardous waste as defined by 40 CFR Part 261: That each waste has been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulation.

ALL DAVIS FOR ROY F. WESTON 12/14/99 Jan Davis  
AUTHORIZED AGENT'S NAME (PRINT) DATE SIGNATURE

**CONTRACTOR**

Name PHILIP SERVICES/ALLWASTE

Phone No. 602-252-1186

Address 1801 W. WATKINS, PHOENIX, AZ 85007

I hereby certify that the above listed material(s), is (are) not a hazardous waste as defined by 40CFR Part 261 or any applicable state law: That each waste has been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulation.

Jan DAVIS 12/14/99 Jan Davis  
AUTHORIZED AGENT'S NAME (PRINT) DATE SIGNATURE

**TRANSPORTER**

Name ALLWASTE TRANSPORTATION & REMEDIATION, INC

Phone No. 602-252-1186

Address 1801 W. WATKINS  
PHOENIX, AZ 85007

Driver's Name \_\_\_\_\_  
Vehicle's No. (BIH #) 115

I hereby certify that the above listed material(s), is (are) not a hazardous waste as defined by 40CFR Part 261 or any applicable state law: That each waste has been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulation.

Paul Leonard  
SHIPMENT DATE DRIVER'S SIGNATURE DELIVERY DATE DRIVER'S SIGNATURE

**DISPOSAL FACILITY**

**BUTTERFIELD STATION FACILITY**

40404 S. 99th Avenue • Mobile, Arizona 85239 • (602) 256-0630

I hereby certify that the above material has been accepted and that information presented on this document are true and accurate.

Jacky Hunt 12-17-99 Ed Hunt # 25371  
NAME DATE SIGNATURE

DRIVER: PLEASE SIGN HERE

*Bob Tillis*

WMI Butterfield Landfill  
40404 S. 99th Avenue  
Mobile, AZ 85239  
Phone (602) 256-0630 Fax (602) 256-0639

TICKET NBR

25371

HAULER NAME	TRUCK #	OPERATOR	TIME IN	TIME OUT	DATE
ALLW	738		08:45	09:14	12/17/1999

CUSTOMER: PCS/ALL / PCS/ALLWASTE  
GENERATOR: ROY / ROY F. WESTON VWR  
ORIGIN: PHOE / PHOENIX  
PROFILE #: 03136A  
MANIFEST: 06969  
MAS#: 0000037  
P.O. :  
COMMENT: BIN #115

GROSS: 48760 LBS  
TARE: 27360 LBS  
NET: 21400 LBS

BUTTERFIELD FACILITY CERTIFIES THAT THE ABOVE REFERENCED WASTE WAS TREATED AND/OR DISPOSED AT BUTTERFIELD STATION FACILITY ON THE ABOVE DATE.

SOURCES

OTHER INFORMATION



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### WASTE MANAGEMENT

IN: Judy Hinkle B: WMSCALE OUT: Judy Hinkle B: WMSCALE

MATERIAL CODE/DESCRIPTION	QUANTITY	MEASURE	RATE	AMOUNT
650 / SPECIAL WASTE/ BULK TONS	10.70	T		



▲ Environmental Services  
 ▲ Hazardous Waste Transportation  
 ▲ Hazardous Materials Management  
 ▲ General Engineering Construction

# Allwaste Transportation & Remediation Inc.

1801 W. Watkins • Phoenix, AZ 85007  
 (602) 252-1186 • FAX (602) 252-1680

221-12511

PO.: \_\_\_\_\_  
 DATE: 12/15/99

CUSTOMER <u>Western - VWR</u>	DELIVER TO <u>Butterfield</u>
ADDRESS _____	ADDRESS _____
CITY _____	CITY _____
CONTACT _____	CONTACT _____
CUST. PHONE _____	CUST. PHONE _____

SPECIAL EQUIP INSTRUCTIONS \_\_\_\_\_ (FORKLIFT, PLACARDS, ADD'L STOPS, ETC.) \_\_\_\_\_ MANIFEST NO. \_\_\_\_\_

QTY.	HAZ	DESCRIPTION	WT	HRS	MILES	RATE	AMOUNT
		Take bin to Butterfield For disposal					280
		Disposal - 115 min chg.	1.28			<del>30</del>	115.00 <del>30</del>
			BIN INFORMATION Dropped On _____ Picked Up _____ <u>13/1</u>				
							3450

DRIVER NAME: \_\_\_\_\_ TRK NO.: \_\_\_\_\_ TLR NO.: \_\_\_\_\_

BEGINNING TIME: _____ / ARRIVAL TIME: _____	ARRIVAL TIME: _____
LOADING TIME: (START) _____ (STOP) _____	UNLOADING TIME: (START) _____ (STOP) _____
LEAVE SITE: _____ END _____	PAPERWORK DELAY _____
SIGNATURE: _____	LEAVE SITE: _____ END _____
	RECEIVED BY: _____

**TERMS:** Net 30 days. Consignee to pay any legal fees for collection of delinquent accounts, plus the legal rate of interest of 1½ % per month or 18 % per year will be charged for all past due accounts. We make all deliveries inside curb and on lot at customer's risk only and accept no responsibility for damages resulting from such deliveries. Claims for short or damage or overcharge must be filed with this receipt within 10 days.



PLEASE CALL AND FILE 24 HRS IN ADVANCE WITH SHIPPING NOTICE

FOR OFFICE USE ONLY

NON-HAZARDOUS WASTE MANIFEST BN 131

Customer Acct. No.

Ticket No.

GENERATOR

WM BSF 10696

Name ROY F. WESTON/VWR

Generating Location SAME

Address 2930 W. OSBORN, PHOENIX, AZ 85017

ATTN: RICHARD FINDLAY

602 279-1255

Phone No.

I.D. No.

PROFILE APPROVAL NO.	WASTE DESCRIPTION	QUANTITY	UNITS	UNIT
BFS 03136A	DRILL CUTTINGS	10	Y	D - DRUM B - BAG C - CARTON T - TONS Y - YARDS O - OTHER

I hereby certify that the above listed material(s), is (are) not a hazardous waste as defined by 40 CFR Part 261: That each waste has been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulation.

Jamie Davis for Roy F. Weston 12/15/99 Jamie Davis

AUTHORIZED AGENT'S NAME (PRINT)

DATE

SIGNATURE

CONTRACTOR

Name PHILIP SERVICES/ALLWASTE

Phone No. 602-252-1186

Address 1801 W. WATKINS, PHOENIX, AZ 85007

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Jamie Davis for Philip Services 12/15/99 Jamie Davis

AUTHORIZED AGENT'S NAME (PRINT)

DATE

SIGNATURE

TRANSPORTER

Name ALLWASTE TRANSPORTATION & REMEDIATION, INC

Phone No. 602-252-1186

Address 1801 W. WATKINS

Driver's Name

PHOENIX, AZ 85007

(BIN #)

Vehicle's No.

131

I hereby certify that the above listed material(s), is (are) not a hazardous waste as defined by 40CFR Part 261 or any applicable state law: That each waste has been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulation.

12/15/99

SHIPMENT DATE

Jamie Davis

DRIVER'S SIGNATURE

12/15/99

DELIVERY DATE

Jamie Davis

DRIVER'S SIGNATURE

DISPOSAL FACILITY

BUTTERFIELD STATION FACILITY

40404 S. 99th Avenue • Mobile, Arizona 85239 • (602) 256-0630

I hereby certify that the above material has been accepted and that information presented on this document are true and accurate.

Tom Butterfield

NAME

12/15

DATE

Jamie Davis

SIGNATURE

DRIVER: PLEASE SIGN HERE

*[Signature]*

WMI Butterfield Landfill  
40404 S. 99th Avenue  
Mobile, AZ 85239  
Phone (602) 256-0630 Fax (602) 256-0639

TICKET NO.  
24887

HAULER NAME	TRUCK #	OPERATOR	TIME IN	TIME OUT	DATE
ALLW	750A		10:11	11:43	12/15/1999

CUSTOMER: PCS/ALL / PCS/ALLWASTE  
GENERATOR: ROY F. / ROY F. WESTON / PYRAMID  
ORIGIN: PHOE / PHOENIX  
PROFILE #: 03137A  
MANIFEST: 06965  
MAS#: 0000037  
P.O. :  
COMMENT:

GROSS: 31300 LBS  
TARE: 28740 LBS  
NET: 2560 LBS

BUTTERFIELD FACILITY CERTIFIES THAT THE ABOVE REFERENCED WASTE WAS TREATED AND/OR DISPOSED AT BUTTERFIELD STATION FACILITY ON THE ABOVE DATE.

SOURCES

OTHER INFORMATION



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WASTE MANAGEMENT

IN: LORI DUFFIELD B: WMSCALE OUT: JACK KOLOPANIS B: WMSCALE

MATERIAL CODE/DESCRIPTION	QUANTITY	MEASURE	RATE	AMOUNT
650 / SPECIAL WASTE/ BULK TONS	1.28	T		
671 / PROFILE FEE	1.00	U		



NON-HAZARDOUS LIQUID WASTE  
TRANSPORTATION TRIP TICKET

11015

GENERATOR INFORMATION

(MUST BE COMPLETED BY GENERATOR)

PROFILE NUMBER  
6386

BUSINESS NAME: Weston-VWR-ADEQ RRTA GENERATOR I.D. # ROY 2305

ADDRESS: 29th ave. Ochs TELEPHONE: \_\_\_\_\_

WASTE REMOVED FROM: \_\_\_\_\_ SEPTIC / CHEMICAL TOILET \_\_\_\_\_ NON-INDUSTRIAL  
\_\_\_\_\_ GREASE TRAP \_\_\_\_\_ INDUSTRIAL  
\_\_\_\_\_ GRIT TRAP \_\_\_\_\_  SPECIAL

WASTE TANK OR TRAP CAPACITY: 1000 GALLONS  
I CERTIFY THAT THE WASTE MATERIAL REMOVED FROM THE ABOVE PREMISES CONTAINS NO HAZARDOUS MATERIALS.

GENERATOR / REPRESENTATIVE NAME: Det Francis  
(PLEASE PRINT)  
12-17-99 (DATE SERVICED) [Signature] (GENERATOR / REPRESENTATIVE SIGNATURE)

TRANSPORTER INFORMATION

(MUST BE COMPLETED BY TRANSPORTER)

BUSINESS NAME: Allwaste RRTA TRANSPORTER I.D. # \_\_\_\_\_

ADDRESS: 1301 W. Watkins TELEPHONE: 252-1186

REGULATORY REGISTRATION #: \_\_\_\_\_ RRTA VEHICLE I.D. #: GT17374 -VT120

GALLONS REMOVED: 1000

I CERTIFY THAT THE INFORMATION PROVIDED ABOVE IS CORRECT, AND THAT ONLY THE WASTE CERTIFIED FOR REMOVAL BY THE GENERATOR IS CONTAINED IN THE SERVICE VEHICLE. I AM AWARE THAT FALSIFICATION OF THIS TRIP TICKET MAY RESULT IN PROSECUTION.

DRIVER NAME: Det Francis  
(PLEASE PRINT)  
12-17-99 (DATE AND TIME WASTE TRANSPORTED) [Signature] (DRIVER SIGNATURE)

TREATMENT / DISPOSAL INFORMATION

RESOURCE RECOVERY TECHNIQUES of ARIZONA, INC.  
5159 WEST VAN BUREN STREET • PHOENIX, ARIZONA 85043 • (602) 278-3442

ADEQ PERMIT #: ARM 96-172

I CERTIFY THAT I HAVE BEEN AUTHORIZED BY THE ARIZONA DEPARTMENT OF ENVIROMENTAL QUALITY TO ACCEPT THE ABOVE SPECIFIED WASTE AND THAT I HAVE HANDLED THE WASTE IN ACCORDANCE WITH THE REQUIREMENTS OUTLINED IN THAT AUTHORIZATION.

SITE OPERATOR NAME: GS K. P. G.  
(PLEASE PRINT)  
12-17-99 (DATE AND TIME WASTE RECEIVED) [Signature] (SITE OPERATOR SIGNATURE)



**RESOURCE RECOVERY TECHNIQUES of ARIZONA, INC.**

5159 West Van Buren Street  
 Phoenix, Arizona 85043  
 (602) 278-3442 Fax (602) 278-1561

COPY 4

RECEIVING INFORMATION	
DATE:	12/17/99
WORK ORDER:	46835
TRANSPORTER:	ALLW001
UNIT NUMBER:	ALLWC01-0131
DESIGN CAPACITY:	5000
TIME IN:	9:42 AM
TIME OUT:	9:50 AM
LOAD ACCEPTED BY: GARY	
DRIVER'S NAME: BRET	
DRIVER'S SIGNATURE: <i>[Signature]</i>	

LABORATORY ANALYSIS	
FLASH POINT:	>145
PH:	7.7
SPECIFIC GRAVITY:	1.018
CHEMICAL OXYGEN DEMAND:	<15,000
WASTE TYPE	UNITS/GALLON
A	
B	0
C	0
D	0
E	1,000
F	0
G	0
TOTAL VOLUME RECEIVED	
	1,000

TRIP TICKET #	GENERATOR	ID NUMBER	GENERATOR ADDRESS	TELEPHONE NO.
11015	Roy F Weston / VWR	ROY2305	2930 W. Osborn Phoenix, AZ	(602) 279-1255

WASTE CODE	WASTE PROFILE	BILLING ACCOUNT	UNITS/GALONS	UNIT PRICE	TOTAL PRICE
4014	8388	ALLW001	1,000		
WORK ORDER TOTALS			1,000		



**DEEP WELL INSTALLATION**

**Soil Bin #210**

**#075**





PLEASE CALL LANDFILL 24 HRS IN ADVANCE WITH SHIPPING NOTICE

# NON-HAZARDOUS WASTE MANIFEST

Customer Acct. No. \_\_\_\_\_  
Ticket No. \_\_\_\_\_

## GENERATOR

WM BSE 0707

Name ADEQ - VWR

Generating Location same

Address 2930 W. Osborn  
Phoenix Az 85017

Phone No. \_\_\_\_\_

I.D. No. \_\_\_\_\_

PROFILE APPROVAL NO.	WASTE DESCRIPTION	QUANTITY	UNITS	UNIT
<input type="checkbox"/>	<u>03151A</u>	<u>Drill cuttings</u>	<u>12</u>	<u>Y</u>
<input type="checkbox"/>				
<input type="checkbox"/>				

UNIT  
 D- DRUM  
 B- BAG  
 C- CARTON  
 T- TONS  
Y- YARDS  
 O- OTHER

I hereby certify that the above listed material(s), is (are) not a hazardous waste as defined by 40 CFR Part 261. That each waste has been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulation.

Ana T. Vargas  
AUTHORIZED AGENT'S NAME (PRINT)

8/15/00  
DATE

Ana Vargas  
SIGNATURE

## CONTRACTOR

Name Philip S. Woods

Phone No. 602-252-1186

Address 1801 W. Watkins, Phoenix Az

85007

I hereby certify that the above listed material(s), is (are) not a hazardous waste as defined by 40CFR Part 261 or any applicable state law. That each waste has been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulation.

Jan Davis  
AUTHORIZED AGENT'S NAME (PRINT)

8/14/00  
DATE

Jan Davis  
SIGNATURE

## TRANSPORTER

Name Alvord Transportation

Phone No. 602-252-1186

Address 1801 W. Watkins

Driver's Name V. S. Talle

Phoenix Az 85007

Vehicle's No. 750

I hereby certify that the above listed material(s), is (are) not a hazardous waste as defined by 40CFR Part 261 or any applicable state law. That each waste has been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulation.

SHIPMENT DATE \_\_\_\_\_

DRIVER'S SIGNATURE \_\_\_\_\_

8/17/00  
DELIVERY DATE

Jan G. Lo  
DRIVER'S SIGNATURE

## DISPOSAL FACILITY

**BUTTERFIELD STATION FACILITY**  
40404 S. 99th Avenue • Mobile, Arizona 85239 • (602) 256-0630

I hereby certify that the above material has been accepted and that information presented on this document are true and accurate.

July 17/00  
NAME

8/17/00  
DATE

July 17/00  
SIGNATURE

67192

GENERATOR - GOLDENKOO



PLEASE CALL 1-800-451-7244 24 HRS IN ADVANCE WITH SHIPMENT DATE

002 232 1000 P. 03/04

# NON-HAZARDOUS WASTE MANIFEST

Customer Acct. No. \_\_\_\_\_  
Ticket No. \_\_\_\_\_

## GENERATOR

WM BSP 0707

Name ADED ADED  
Address 3930 W Osborn  
Phoenix, Az  
Phone No. \_\_\_\_\_

Generating Location Same  
I.D. No. \_\_\_\_\_

PROFILE APPROVAL NO.	WASTE DESCRIPTION	QUANTITY	UNITS
<input type="checkbox"/>	<u>Drill cuttings</u>	<u>12</u>	<u>YARDS</u>
<input type="checkbox"/>		<u>9.76</u>	
<input type="checkbox"/>			

- UNIT -
- D - DRUM
- B - BAG
- C - CARTON
- T - TONS
- Y - YARDS
- O - OTHER

I hereby certify that the above listed material(s), is (are) not a hazardous waste as defined by 40 CFR Part 261: That each waste has been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulation.

Ana I. Vargas  
AUTHORIZED AGENT'S NAME (PRINT)

8/15/00  
DATE

Ana Vargas  
SIGNATURE

## CONTRACTOR

Name PHILIP SANCHEZ  
Address 1801 W WATKINS  
Phoenix Az 85007

Phone No. 1002 252 1186  
I hereby certify that the above listed material(s), is (are) not a hazardous waste as defined by 40CFR Part 261 or any applicable state law: That each waste has been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulation.

Van DAVIS  
AUTHORIZED AGENT'S NAME (PRINT)

8/14/00  
DATE

Van DAVIS  
SIGNATURE

## TRANSPORTER

Name Allstate Transportation  
Address 1801 W WATKINS  
Phoenix Az 85007

Phone No. 1002 252 1186  
Driver's Name Jerry Kelly  
Vehicle's No. 210

I hereby certify that the above listed material(s), is (are) not a hazardous waste as defined by 40CFR Part 261 or any applicable state law: That each waste has been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulation.

SHIPMENT DATE

DRIVER'S SIGNATURE

8/17/2000  
DELIVERY DATE

Jerry Kelly  
DRIVER'S SIGNATURE

## DISPOSAL FACILITY

**BUTTERFIELD STATION FACILITY**  
40404 S. 99th Avenue • Mobile, Arizona 85239 • (602) 256-0630

I hereby certify that the above material has been accepted and that information presented on this document are true and accurate.

Judy Smith  
NAME

8/17/00  
DATE

Judy Smith  
SIGNATURE

17172

DRIVER: PLEASE SIGN HERE

*[Handwritten Signature]*

WMI Butterfield Landfill  
 40404 S. 99th Avenue  
 Mobile, AZ 85239  
 Phone (602) 256-0630 Fax (602) 256-0639

TICKET NO  
 67192

HAULER NAME	TRUCK #	OPERATOR	TIME IN	TIME OUT	DATE
ALLW	750		14:02	14:02	08/17/2000

CUSTOMER: PHIL/ELT / PHILIP SERVICES/ELTEX  
 GENERATOR: ADEQ-V / ADEQ-VWR GROSS: 59840 LBS  
 ORIGIN: PHOE / PHOENIX TARE: 40320 LBS  
 PROFILE #: 03151A NET: 19520 LBS  
 MANIFEST: 07074  
 MAS#: 0000054  
 P.O.:  
 COMMENT:

BUTTERFIELD FACILITY CERTIFIES THAT THE ABOVE REFERENCED WASTE WAS TREATED AND/OR DISPOSED AT BUTTERFIELD STATION FACILITY ON THE ABOVE DATE.

SOURCES OTHER INFORMATION

THE PUBLIC WEIGHTMASTER'S CERTIFICATE OF WEIGHT AND MEASURE THIS IS TO CERTIFY THAT THE FOLLOWING DESCRIBED MERCHANDISE WAS WEIGHED AND COUNTED OR MEASURED BY A PUBLIC OR DEPUTY WEIGHTMASTER, AND WHEN PROPERLY SIGNED AND SEALED, SHALL BE A PRIMA FACIE EVIDENCE OF ACCURACY OF THE WEIGHT SHOWN AS PRESCRIBED BY THE LAW.

IN: Judy Winkle B. UNSCALE	OUT: Judy Winkle B. UNSCALE	QUANTITY	MEASURE	RATE	AMOUNT
650 / SPECIAL WASTE/ BULK TONS		9.76	T		
FUELT / Fuel Charge (Tons)		9.76	T		



**PHASE IV MONITOR WELLS**

**Soil Bin #262  
#078  
#1913  
#192  
#294**





▲ Environmental Services  
 ▲ Hazardous Waste Transportation  
 ▲ Hazardous Materials Management  
 ▲ General Engineering Construction

# Allwaste Transportation & Remediation Inc.

1801 W. Watkins • Phoenix, AZ 85007  
 (602) 252-1186 • FAX (602) 252-1680

221- 16796

PO.: \_\_\_\_\_  
 DATE: 4-11-01

CUSTOMER <u>Weston - WSR</u>	DELIVER TO _____
ADDRESS _____	ADDRESS _____
CITY _____	CITY _____
CONTACT _____	CONTACT _____
CUST. PHONE _____	CUST. PHONE _____

SPECIAL EQUIP. INSTRUCTIONS: \_\_\_\_\_ (FORKLIFT, PLACARDS, ADD'L STOPS, ETC.) \_\_\_\_\_ MANIFEST NO. \_\_\_\_\_

QTY.	HAZ	DESCRIPTION	WT	HRS	MILES	RATE	AMOUNT
		Deliver loaded bin to landfill					280
		DISPOSED	10.25			30	307.5
							587.5

DRIVER NAME: Bryan TRK NO.: 738 TLR NO.: \_\_\_\_\_

BEGINNING TIME: _____ / ARRIVAL TIME: _____	ARRIVAL TIME: _____
LOADING TIME: (START) _____ (STOP) _____	UNLOADING TIME: (START) _____ (STOP) _____
LEAVE SITE: _____ END _____	PAPERWORK DELAY _____
SIGNATURE: _____	LEAVE SITE: _____ END _____
	RECEIVED BY: _____

**TERMS:** Net 30 days. Consignee to pay any legal fees for collection of delinquent accounts, plus the legal rate of interest of 1 1/2 % per month or 18 % per year will be charged for all past due accounts. We make all deliveries inside curb and on lot at customer's risk only and accept no responsibility for damages resulting from such deliveries. Claims for short or damage or overcharge must be filed with this receipt within 10 days.

YOU MUST INDICATE  
YOUR PROFILE NUMBER

# NON-HAZARDOUS ~~SOLID~~ WASTE TRANSPORTATION TRIP TICKET

68843

9313

## GENERATOR INFORMATION

(MUST BE COMPLETED BY GENERATOR)

BUSINESS NAME: ADSD - VWR RRTA GENERATOR I.D. # \_\_\_\_\_

ADDRESS: 27th Ave + Osborn TELEPHONE: ( ) \_\_\_\_\_

CITY: Phoenix AZ STATE: \_\_\_\_\_ ZIP CODE: \_\_\_\_\_

WASTE REMOVED FROM: \_\_\_\_\_ SEPTIC / CHEMICAL TOILET \_\_\_\_\_ NON-INDUSTRIAL

X Drill Cuttings \_\_\_\_\_ GREASE TRAP \_\_\_\_\_ INDUSTRIAL

\_\_\_\_\_ GRIT TRAP \_\_\_\_\_ SPECIAL

WASTE TANK OR TRAP CAPACITY: 10 Est TONS Bin Ck 294  
I CERTIFY THAT THE WASTE MATERIAL REMOVED FROM THE ABOVE PREMISES CONTAINS NO HAZARDOUS MATERIALS.

GENERATOR / REPRESENTATIVE NAME: Anna I. Vargas

(DATE SERVICED) 3/28/01 (PLEASE PRINT)  
(GENERATOR / REPRESENTATIVE SIGNATURE) Anna I. Vargas

## TRANSPORTER INFORMATION

(MUST BE COMPLETED BY GENERATOR)

BUSINESS NAME: Allwaste transportation RRTA GENERATOR I.D. # \_\_\_\_\_

ADDRESS: 1801 W. Watkins TELEPHONE: (602) 252-1186

CITY: Phoenix STATE: AZ ZIP CODE: 85007

TONS GALLONS REMOVED: 10.25 TRAILER LICENSE PLATE #: \_\_\_\_\_

I CERTIFY THAT THE INFORMATION PROVIDED ABOVE IS CORRECT, AND THAT ONLY THE WASTE CERTIFIED FOR REMOVAL BY THE GENERATOR IS CONTAINED IN THE SERVICE VEHICLE. I AM AWARE THAT FALSIFICATION OF THIS TRIP TICKET MAY RESULT IN PROSECUTION.

DRIVERS NAME: JAM. DAVIS  
(PLEASE PRINT)

4/11/01 (DATE AND TIME WASTE TRANSPORTED) Jam Davis (DRIVER SIGNATURE)

## TREATMENT / DISPOSAL INFORMATION

RESOURCE RECOVERY TECHNIQUES of ARIZONA, INC. Southwest Regional  
5159 WEST VAN BUREN STREET • PHOENIX, ARIZONA 85043 • (602) 278-3442

ADEQ PERMIT #: PRM 96-172

I CERTIFY THAT I HAVE BEEN AUTHORIZED BY THE ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY TO ACCEPT THE ABOVE SPECIFIED WASTE AND THAT I HAVE HANDLED THE WASTE IN ACCORDANCE WITH THE REQUIREMENTS OUTLINED IN THAT AUTHORIZATION.

SITE OPERATOR NAME: ALAN CHARBONNEAU  
(PLEASE PRINT)

4/11/01 (DATE AND TIME WASTE RECEIVED) Alan Charbonneau (SITE OPERATOR SIGNATURE)

# Southwest Regional Landfill

24427 S. Highway 85  
 Buckeye, AZ 85326  
 Tel: (623) 393-0085  
 (An Allied Waste Industries Operation)

001042  
 RESOURCE RECOVERY TECHNOLOGY  
 BRIAN BIDELESPACH  
 5159 W. VAN BUREN ST.  
 PHOENIX AZ 85043

SITE	TICKET	GRID
20	095772	
WEIGHMASTER		
DATE IN	TIME IN	
04/11/01	11:07	
DATE OUT	TIME OUT	
04/11/01	11:08	
VEHICLE	ROLL OFF	
RRT 738		
REFERENCE	ORIGIN	

Manual Gross Weight 81220 LB      Inbound - Charge ticket  
 Stored Tare Weight 40240 LB  
 Net Weight 40980 LB

QTY.	UNIT	DESCRIPTION	RATE	EXTENSION	TAX	TOTAL
<del>20.49</del> 10.25	TON	GARBAGE				

SW                      755005972

HOURS OF OPERATION - MON THRU SAT 6:00A TO 4:00P

SIGNATURE *Bay J. Cross*

NET AMOUNT
TENDERED
CHANGE
CHECK NO.



▲ Environmental Services  
 ▲ Hazardous Waste Transportation  
 ▲ Hazardous Materials Management  
 ▲ General Engineering Construction

# Allwaste Transportation & Remediation Inc.

1801 W. Watkins • Phoenix, AZ 85007  
 (602) 252-1186 • FAX (602) 252-1680

221-17270

PO.: \_\_\_\_\_  
 DATE: 4/11/02

CUSTOMER <u>WESTON VWR</u> ADDRESS _____ CITY _____ CONTACT _____ CUST. PHONE _____	DELIVER TO <u>SWR</u> ADDRESS _____ CITY _____ CONTACT _____ CUST. PHONE _____
-------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------

SPECIAL EQUIP. INSTRUCTIONS:		(FORKLIFT, PLACARDS, ADD'L STOPS, ETC.)	MANIFEST NO.				
QTY.	HAZ	DESCRIPTION	WT	HRS	MILES	RATE	AMOUNT
		Deliver loaded bins to landfill		<del>5.00</del>		<del>10.00</del>	<del>50.00</del>
			2				50.00
		Disposal	14.70			30.00	441.00
BIN INFORMATION							
			Dropped Off	Picked Up			
			1913	1913			
			192	192			100.00

DRIVER NAME: _____	TRK NO.: _____	TLR NO.: _____
BEGINNING TIME: <u>145</u> / ARRIVAL TIME: _____ LOADING TIME: (START) _____ (STOP) _____ LEAVE SITE: _____ END _____ SIGNATURE: _____	ARRIVAL TIME: _____ UNLOADING TIME: (START) _____ (STOP) _____ PAPERWORK DELAY _____ LEAVE SITE: _____ END <u>500</u> RECEIVED BY: _____	

**TERMS:** Net 30 days. Consignee to pay any legal fees for collection of delinquent accounts, plus the legal rate of interest of 1½% per month or 18% per year will be charged for all past due accounts. We make all deliveries inside curb and on lot at customer's risk only and accept no responsibility for damages resulting from such deliveries. Claims for short or damage or overcharge must be filed with this receipt within 10 days.

YOU MUST INDICATE  
YOUR PROFILE NUMBER

# NON-HAZARDOUS LIQUID WASTE TRANSPORTATION TRIP TICKET

68846

9313

## GENERATOR INFORMATION

(MUST BE COMPLETED BY GENERATOR)

BUSINESS NAME: ADEQ-VWR RRTA GENERATOR I.D. # \_\_\_\_\_

ADDRESS: 27th Ave + Osborn TELEPHONE: (\_\_\_\_) \_\_\_\_\_

CITY: Phoenix STATE: AZ ZIP CODE: 85043

WASTE REMOVED FROM:

X Drill Cuttings       SEPTIC / CHEMICAL TOILET       NON-INDUSTRIAL

GREASE TRAP       INDUSTRIAL

GRIT TRAP       SPECIAL

WASTE TANK OR TRAP CAPACITY: 10 est TONS 1913ML  
I CERTIFY THAT THE WASTE MATERIAL REMOVED FROM THE ABOVE PREMISES CONTAINS NO HAZARDOUS MATERIALS.

GENERATOR / REPRESENTATIVE NAME: Ana I. Vargas  
(PLEASE PRINT)  
Ana I. Vargas  
(GENERATOR / REPRESENTATIVE SIGNATURE)

(DATE SERVICED) 3/28/01

## TRANSPORTER INFORMATION

(MUST BE COMPLETED BY GENERATOR)

BUSINESS NAME: Allwaste Transportation RRTA GENERATOR I.D. # \_\_\_\_\_

ADDRESS: 1801 W Watkins TELEPHONE: (602) 252-1186

CITY: Phoenix STATE: AZ ZIP CODE: 85007

~~TONS~~  
GALLONS REMOVED: 7.35

TRAILER LICENSE PLATE #: \_\_\_\_\_

I CERTIFY THAT THE INFORMATION PROVIDED ABOVE IS CORRECT, AND THAT ONLY THE WASTE CERTIFIED FOR REMOVAL BY THE GENERATOR IS CONTAINED IN THE SERVICE VEHICLE. I AM AWARE THAT FALSIFICATION OF THIS TRIP TICKET MAY RESULT IN PROSECUTION.

DRIVERS NAME: JAMI DAVIS  
(PLEASE PRINT)  
Jami Davis  
(DRIVER SIGNATURE)

(DATE AND TIME WASTE TRANSPORTED) 4/11/01

## TREATMENT / DISPOSAL INFORMATION

RESOURCE RECOVERY TECHNIQUES of ARIZONA, INC. Southwest Regional  
5159 WEST VAN BUREN STREET • PHOENIX, ARIZONA 85043 • (602) 278-3442

ADEQ PERMIT #: PRM 96-172

I CERTIFY THAT I HAVE BEEN AUTHORIZED BY THE ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY TO ACCEPT THE ABOVE SPECIFIED WASTE AND THAT I HAVE HANDLED THE WASTE IN ACCORDANCE WITH THE REQUIREMENTS OUTLINED IN THAT AUTHORIZATION.

SITE OPERATOR NAME: ALAN CHARBONNETAL  
(PLEASE PRINT)  
Alan Charbonnetal  
(SITE OPERATOR SIGNATURE)

(DATE AND TIME WASTE RECEIVED) 4/11/01

YOU MUST INDICATE  
YOUR PROFILE NUMBER

# NON-HAZARDOUS ~~SOLID~~ WASTE TRANSPORTATION TRIP TICKET

68844

9313

## GENERATOR INFORMATION

(MUST BE COMPLETED BY GENERATOR)

BUSINESS NAME: ADEQ-VWR RRTA GENERATOR I.D. # \_\_\_\_\_

ADDRESS: 27th Ave + Osborn TELEPHONE: ( ) \_\_\_\_\_

CITY: Phoenix STATE: AZ ZIP CODE: 85043

WASTE REMOVED FROM: \_\_\_\_\_ SEPTIC / CHEMICAL TOILET \_\_\_\_\_ NON-INDUSTRIAL

X Drill Cuttings \_\_\_\_\_ GREASE TRAP \_\_\_\_\_ INDUSTRIAL

\_\_\_\_\_ GRIT TRAP \_\_\_\_\_ SPECIAL

WASTE TANK OR TRAP CAPACITY: 10 556 GALLONS tons Bin 192

I CERTIFY THAT THE WASTE MATERIAL REMOVED FROM THE ABOVE PREMISES CONTAINS NO HAZARDOUS MATERIALS.

GENERATOR / REPRESENTATIVE NAME: \_\_\_\_\_ Ana I. Vargas

3/28/01

(DATE SERVICED)

(PLEASE PRINT)

(GENERATOR / REPRESENTATIVE SIGNATURE)

## TRANSPORTER INFORMATION

(MUST BE COMPLETED BY GENERATOR)

BUSINESS NAME: Allwaste Transportation RRTA GENERATOR I.D. # \_\_\_\_\_

ADDRESS: 1801 W. Watkins TELEPHONE: (602) 252-1186

CITY: Phoenix STATE: AZ ZIP CODE: 85007

tons  
GALLONS REMOVED: 7.35 TRAILER LICENSE PLATE #: \_\_\_\_\_

I CERTIFY THAT THE INFORMATION PROVIDED ABOVE IS CORRECT, AND THAT ONLY THE WASTE CERTIFIED FOR REMOVAL BY THE GENERATOR IS CONTAINED IN THE SERVICE VEHICLE. I AM AWARE THAT FALSIFICATION OF THIS TRIP TICKET MAY RESULT IN PROSECUTION.

DRIVERS NAME: Jami Davis  
(PLEASE PRINT)

4/11/01

(DATE AND TIME WASTE TRANSPORTED)

Jami Davis

(DRIVER SIGNATURE)

## TREATMENT / DISPOSAL INFORMATION

RESOURCE RECOVERY TECHNIQUES of ARIZONA, INC. Southwest Regional  
5159 WEST VAN BUREN STREET • PHOENIX, ARIZONA 85043 • (602) 278-3442

ADEQ PERMIT #: PRN 96-172

I CERTIFY THAT I HAVE BEEN AUTHORIZED BY THE ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY TO ACCEPT THE ABOVE SPECIFIED WASTE AND THAT I HAVE HANDLED THE WASTE IN ACCORDANCE WITH THE REQUIREMENTS OUTLINED IN THAT AUTHORIZATION.

SITE OPERATOR NAME: Alan Charbonneau  
(PLEASE PRINT)

04/11/01

(DATE AND TIME WASTE RECEIVED)

Alan Charbonneau

(SITE OPERATOR SIGNATURE)

# Southwest Regional Landfill

24427 S. Highway 85

Buckeye, AZ 85326

Tel: (623) 393-0085

(An Allied Waste Industries Operation)

001042

RESOURCE RECOVERY TECHNOLOGY

BRIAN BIDELESPACH

5159 W. VAN BUREN ST.

PHOENIX AZ 85043

SITE 20	TICKET 095815	GRID
WEIGHMASTER		
DATE IN 04/11/01	TIME IN 15:04	
DATE OUT 04/11/01	TIME OUT 15:05	
VEHICLE RRT 738	ROLL OFF	
REFERENCE	ORIGIN	

Manual Gross Weight 69640 LB  
 Stored Tare Weight 40240 LB  
 Net Weight 29400 LB

Inbound - Charge ticket

QTY.	UNIT	DESCRIPTION	RATE	EXTENSION	TAX	TOTAL
14.70	TON	GARBAGE				

SW

755005972

NET AMOUNT
TENDERED
CHANGE
CHECK NO.

HOURS OF OPERATION - MON THRU SAT 6:00A TO 4:00P

SIGNATURE *Bryan L. Grogg*



▲ Environmental Services  
 ▲ Hazardous Waste Transportation  
 ▲ Hazardous Materials Management  
 ▲ General Engineering Construction

# Allwaste Transportation & Remediation Inc.

1801 W. Watkins • Phoenix, AZ 85007  
 (602) 252-1186 • FAX (602) 252-1680

221-17253

PO.: \_\_\_\_\_  
 DATE: 4/24/07

CUSTOMER <u>veston ywr</u>	DELIVER TO <u>Southwest Reg</u>
ADDRESS _____	ADDRESS _____
CITY _____	CITY _____
CONTACT _____	CONTACT _____
CUST. PHONE _____	CUST. PHONE _____

SPECIAL EQUIP. INSTRUCTIONS:		(FORKLIFT, PLACARDS, ADD'L STOPS, ETC.)	MANIFEST NO.				
QTY.	HAZ	DESCRIPTION	WT	HRS	MILES	RATE	AMOU
		load bins take them to SWR Dump return to P52 yard unload.					
		2 bins				280	560
			1851			30	555
		BIN INFORMATION:					
		Dropped Off	Picked Up				
		78	78				
		262	262				
							1115

DRIVER NAME: <u>Bryan</u>	TRK NO.: <u>738</u>	TLR NO.: <u>R0738</u>
BEGINNING TIME: <u>145</u> / ARRIVAL TIME: _____	ARRIVAL TIME: _____	
LOADING TIME: (START) _____ (STOP) _____	UNLOADING TIME: (START) _____ (STOP) _____	
LEAVE SITE: _____ END _____	PAPERWORK DELAY _____	
SIGNATURE: _____	LEAVE SITE: _____ END <u>530</u>	
	RECEIVED BY: _____	

**TERMS:** Net 30 days. Consignee to pay any legal fees for collection of delinquent accounts, plus the legal rate of interest of 1½% per month or 18% per year will be charged for all past due accounts. We make all deliveries inside curb and on lot at customer's risk only and accept no responsibility for damages resulting from such deliveries. Claims for short or damage or overcharge must be filed with this receipt within 10 days.

YOU MUST INDICATE  
YOUR PROFILE NUMBER

**NON-HAZARDOUS ~~WASTE~~ WASTE  
TRANSPORTATION TRIP TICKET**

68848

9313

**GENERATOR INFORMATION**

(MUST BE COMPLETED BY GENERATOR)

BUSINESS NAME: ADEQ - VWR RRTA GENERATOR I.D. # \_\_\_\_\_

ADDRESS: 27th Ave + Osborn TELEPHONE: ( ) \_\_\_\_\_

CITY: Phoenix STATE: AZ ZIP CODE: 85043

WASTE REMOVED FROM: \_\_\_\_\_ SEPTIC / CHEMICAL TOILET \_\_\_\_\_ NON-INDUSTRIAL

X Drill Cuttings \_\_\_\_\_ GREASE TRAP \_\_\_\_\_ INDUSTRIAL

\_\_\_\_\_ GRIT TRAP \_\_\_\_\_ SPECIAL

WASTE TANK OR TRAP CAPACITY: 10 est tons Bin 078 GALLONS

I CERTIFY THAT THE WASTE MATERIAL REMOVED FROM THE ABOVE PREMISES CONTAINS NO HAZARDOUS MATERIALS.

GENERATOR / REPRESENTATIVE NAME: Ana E. Vargas

3/28/01 (DATE SERVICED) Ana E. Vargas (PLEASE PRINT)  
Ana E. Vargas (GENERATOR / REPRESENTATIVE SIGNATURE)

**TRANSPORTER INFORMATION**

(MUST BE COMPLETED BY GENERATOR)

BUSINESS NAME: Allwaste Transportation RRTA GENERATOR I.D. # \_\_\_\_\_

ADDRESS: 1801 W Watkins TELEPHONE: (602) 252-1186

CITY: Phoenix STATE: AZ ZIP CODE: 85007

tons 9.25 GALLONS REMOVED: \_\_\_\_\_ TRAILER LICENSE PLATE #: \_\_\_\_\_

I CERTIFY THAT THE INFORMATION PROVIDED ABOVE IS CORRECT, AND THAT ONLY THE WASTE CERTIFIED FOR REMOVAL BY THE GENERATOR IS CONTAINED IN THE SERVICE VEHICLE. I AM AWARE THAT FALSIFICATION OF THIS TRIP TICKET MAY RESULT IN PROSECUTION.

DRIVERS NAME: JAMI DAVIS (PLEASE PRINT)

4/4/01 (DATE AND TIME WASTE TRANSPORTED) Jami Davis (DRIVER SIGNATURE)

**TREATMENT / DISPOSAL INFORMATION**

RESOURCE RECOVERY TECHNIQUES of ARIZONA, INC. Southwest Reg -  
5159 WEST VAN BUREN STREET • PHOENIX, ARIZONA 85043 • (602) 278-3442

ADEQ PERMIT #: PR4 96-172

I CERTIFY THAT I HAVE BEEN AUTHORIZED BY THE ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY TO ACCEPT THE ABOVE SPECIFIED WASTE AND THAT I HAVE HANDLED THE WASTE IN ACCORDANCE WITH THE REQUIREMENTS OUTLINED IN THAT AUTHORIZATION.

SITE OPERATOR NAME: ARAN CHARBENHEAY (PLEASE PRINT)

4/04/01 (DATE AND TIME WASTE RECEIVED) Aran Charbenheay (SITE OPERATOR SIGNATURE)

YOU MUST INDICATE  
YOUR PROFILE NUMBER

# NON-HAZARDOUS ~~SOLID~~ WASTE TRANSPORTATION TRIP TICKET

68845

9313

## GENERATOR INFORMATION

(MUST BE COMPLETED BY GENERATOR)

BUSINESS NAME: ADEQ - VUSR RRTA GENERATOR I.D. # \_\_\_\_\_

ADDRESS: 27th Ave + Osborn TELEPHONE: ( ) \_\_\_\_\_

CITY: Phoenix STATE: AZ ZIP CODE: \_\_\_\_\_

WASTE REMOVED FROM:

<input checked="" type="checkbox"/> Drill cuttings	<input type="checkbox"/> SEPTIC / CHEMICAL TOILET	<input type="checkbox"/> NON-INDUSTRIAL
<input type="checkbox"/>	<input type="checkbox"/> GREASE TRAP	<input type="checkbox"/> INDUSTRIAL
<input type="checkbox"/>	<input type="checkbox"/> GRIT TRAP	<input type="checkbox"/> SPECIAL

WASTE TANK OR TRAP CAPACITY: 10 TONS ~~GALLONS~~ Ben 262  
I CERTIFY THAT THE WASTE MATERIAL REMOVED FROM THE ABOVE PREMISES CONTAINS NO HAZARDOUS MATERIALS.

GENERATOR / REPRESENTATIVE NAME: Ana I. Vargas  
(PLEASE PRINT)  
Ana I. Vargas  
(GENERATOR / REPRESENTATIVE SIGNATURE)

(DATE SERVICED)

## TRANSPORTER INFORMATION

(MUST BE COMPLETED BY GENERATOR)

BUSINESS NAME: Alvise Transportation RRTA GENERATOR I.D. # \_\_\_\_\_

ADDRESS: 1801 W Watkins TELEPHONE: (602) 252-1186

CITY: Phoenix STATE: AZ ZIP CODE: 85007

~~TONS~~ TONS REMOVED: 9.26 TRAILER LICENSE PLATE #: \_\_\_\_\_

I CERTIFY THAT THE INFORMATION PROVIDED ABOVE IS CORRECT, AND THAT ONLY THE WASTE CERTIFIED FOR REMOVAL BY THE GENERATOR IS CONTAINED IN THE SERVICE VEHICLE. I AM AWARE THAT FALSIFICATION OF THIS TRIP TICKET MAY RESULT IN PROSECUTION.

DRIVERS NAME: JAMI DAVIS  
(PLEASE PRINT)  
4/4/01  
(DATE AND TIME WASTE TRANSPORTED)  
Jami Davis  
(DRIVER SIGNATURE)

## TREATMENT / DISPOSAL INFORMATION

RESOURCE RECOVERY TECHNIQUES OF ARIZONA, INC. Southwest Regional  
5159 WEST VAN BUREN STREET • PHOENIX, ARIZONA 85043 • (602) 278-3442

ADEQ PERMIT #: PRM 96-172

I CERTIFY THAT I HAVE BEEN AUTHORIZED BY THE ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY TO ACCEPT THE ABOVE SPECIFIED WASTE AND THAT I HAVE HANDLED THE WASTE IN ACCORDANCE WITH THE REQUIREMENTS OUTLINED IN THAT AUTHORIZATION.

SITE OPERATOR NAME: Alan Charlson  
(PLEASE PRINT)  
4/4/01  
(DATE AND TIME WASTE RECEIVED)  
Alan Charlson  
(SITE OPERATOR SIGNATURE)

# Southwest Regional Landfill

24427 S. Highway 85  
 Buckeye, AZ 85326  
 Tel: (623) 393-0085  
 (An Allied Waste Industries Operation)

001042  
 RESOURCE RECOVERY TECHNOLOGY  
 BRIAN BIDELESPACH  
 5159 W. VAN BUREN ST.  
 PHOENIX AZ 85043

SITE 20	TICKET 095309	GRID
WEIGHMASTER		
DATE IN 04/04/01	TIME IN 15:04	
DATE OUT 04/04/01	TIME OUT 15:05	
VEHICLE RRT 738	ROLL OFF	
REFERENCE	ORIGIN	

Manual Gross Weight 77260 LB      Inbound - Charge ticket  
 Stored Tare Weight 40240 LB  
 Net Weight 37020 LB

QTY.	UNIT	DESCRIPTION	RATE	EXTENSION	TAX	TOTAL
18.51	TON	GARBAGE				

SW 755005972

HOURS OF OPERATION - MON THRU SAT 6:00A TO 4:00P

SIGNATURE *Byron L. Lloyd*

<b>NET AMOUNT</b>
TENDERED
CHANGE
CHECK NO.



**PHASE V MONITOR WELLS**

**Soil Bin    #318  
              #294  
              #289  
              #0S2**



**STRAIGHT BILL OF LADING**  
**ORIGINAL - NOT NEGOTIABLE**

Shipper's No. \_\_\_\_\_

CARRIER: Allwaste Transportation

SCAC \_\_\_\_\_ Carrier's No. \_\_\_\_\_ Date \_\_\_\_\_

**TO:** S.W. Regional  
 Consignee 24427 S. Highway 85  
 Street  
 Destination Buckeye AZ Zip 85326

**FROM:** ADEQ - VWR  
 Shipper  
 Street  
 Origin  
 Zip

Route: \_\_\_\_\_ Vehicle Number \_\_\_\_\_ U.S. DOT Hazmat Reg. No. \_\_\_\_\_

No. Shipping Units	HM	Kind of Packages, Description of Articles (IF HAZARDOUS MATERIALS - PROPER SHIPPING NAME)	HAZARD CLASS	I.D. Number	PACKING GROUP	WEIGHT (subject to correction)	RATE	LABELS REQUIRED (or exemption)
		<u>NON HAZARDOUS DRILLING CUTTINGS</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>154</u>		
		<u>Bin# 318</u>						
		<u>204D</u>						
		<u>755-41-3004-010</u>						

Remit C.O.D. to: Bill To PSC  
 Address: 1801 W. Watkins  
 City: Phoenix State: AZ Zip: 85007

**C. O. D. FEE:**  
 Prepaid  Collect  \$  
**Freight Charges**  
 PREPAID  COLLECT

NOTE - Where the rate is dependent on value, shippers are required to state specifically in writing the agreed or declared value of the property. The agreed or declared value of the property is hereby specifically stated by the shipper to be not exceeding \$ \_\_\_\_\_ Per \_\_\_\_\_

RECEIVED, subject to the classifications and lawfully filed tariffs in effect on the date of issue of this Bill of Lading, the property described above in apparent good order, except as noted (contents and condition of contents of packages unknown), marked, consigned, and destined as indicated above which said carrier (the word carrier being understood throughout this contract as meaning any person or corporation in possession of the property under the contract) agrees to carry to its usual place of delivery at said destination, if on its route, otherwise to deliver to another carrier on the route to said destination. It is mutually agreed as to each carrier of all or any of, said property over all or any portion of said route to destination and as to each party at any time interested in all or any said property, that every service to be performed hereunder shall be subject to all the bill of lading terms and conditions in the governing classification on the date of shipment.

Shipper hereby certifies that he is familiar with all the bill of lading terms and conditions in the governing classification and the said terms and conditions are hereby agreed to by the shipper and accepted for himself and his assigns.

This is to certify that the above-named materials are properly classified, described, packaged, marked and labeled and are in proper condition for transportation according to the applicable regulations of the Department of Transportation.

PLACARDS REQUIRED  PLACARDS SUPPLIED  YES  NO - FURNISHED BY CARRIER

SHIPPER: \_\_\_\_\_ CARRIER: Allwaste  
 PER: \_\_\_\_\_ PER: [Signature]  
 DATE: \_\_\_\_\_ DATE: \_\_\_\_\_

EMERGENCY RESPONSE TELEPHONE NUMBER: \_\_\_\_\_ Monitored at all times the Hazardous Material is in transportation including storage incidental to transportation (172.604).

# STRAIGHT BILL OF LADING

ORIGINAL - NOT NEGOTIABLE

Shipper's No. \_\_\_\_\_

CARRIER: Allwaste Transportation

SCAC \_\_\_\_\_ Carrier's No. \_\_\_\_\_ Date \_\_\_\_\_

TO: S.W. REGIONAL  
 Consignee 24487 S Highway 85  
 Street \_\_\_\_\_  
 Destination Buckeye AZ Zip 85326

FROM: ADEQ - VWS  
 Shipper \_\_\_\_\_  
 Street \_\_\_\_\_  
 Origin \_\_\_\_\_ Zip \_\_\_\_\_

Route: \_\_\_\_\_ Vehicle Number \_\_\_\_\_ U.S. DOT Hazmat Reg. No. \_\_\_\_\_

No. Shipping Units	HM	Kind of Packages, Description of Articles (IF HAZARDOUS MATERIALS - PROPER SHIPPING NAME)	HAZARD CLASS	I.D. Number	PACKING GROUP	WEIGHT (subject to correction)	RATE	LABELS REQUIRED (or exemption)
		<u>NON HAZARDOUS Drill Cuttings</u>	<u>---</u>	<u>---</u>	<u>---</u>	<u>15.4</u>		
		<u>Bin # 294</u>						
		<u>204D</u>						
		<u>755-41-3004-009</u>						

Remit C.O.D. to: Bill PSC  
 Address: 1801 W. Watkins  
 City: Phoenix State: AZ Zip: 85007

**C. O. D. FEE:**  
 Prepaid  Collect   
**COD Amt: \$**

NOTE - Where the rate is dependent on value, shippers are required to state specifically in writing the agreed or declared value of the property. The agreed or declared value of the property is hereby specifically stated by the shipper to be not exceeding \$ \_\_\_\_\_ Per \_\_\_\_\_

**FREIGHT CHARGES**  
 PREPAID  COLLECT

RECEIVED, subject to the classifications and lawfully filed tariffs in effect on the date of issue of this Bill of Lading, the property described above in apparent good order, except as noted (contents and condition of contents of packages unknown), marked, consigned, and destined as indicated above which said carrier (the word carrier being understood throughout this contract as meaning any person or corporation in possession of the property under the contract) agrees to carry to its usual place of delivery at said destination, if on its route, otherwise to deliver to another carrier on the route to said destination. It is mutually agreed as to each carrier of all or any of, said property over all or any portion of said route to destination and as to each party at any time interested in all or any said property, that every service to be performed hereunder shall be subject to all the bill of lading terms and conditions in the governing classification on the date of shipment.

Shipper hereby certifies that he is familiar with all the bill of lading terms and conditions in the governing classification and the said terms and conditions are hereby agreed to by the shipper and accepted for himself and his assigns.

**PLACARDS REQUIRED**  **PLACARDS SUPPLIED**  YES  NO - FURNISHED BY CARRIER  
 DRIVERS SIGNATURE: \_\_\_\_\_

SHIPPER: \_\_\_\_\_  
 PER: \_\_\_\_\_  
 DATE: \_\_\_\_\_

CARRIER: Allwaste  
 PER: [Signature]  
 DATE: \_\_\_\_\_

EMERGENCY RESPONSE TELEPHONE NUMBER: \_\_\_\_\_

Monitored at all times the Hazardous Material is in transportation including storage incidental to transportation (172.604).

# Southwest Regional Landfill

24427 S. Highway 85  
 Buckeye, AZ 85326  
 Tel: (623) 393-0085  
 (An Allied Waste Industries Operation)

002009

PHILIPS TRANSPORTATION & REM  
 JAMI DAVIS  
 1801 W. WATKINS  
 PHOENIX AZ 85007

SITE -20	TICKET 109763	GRID
WEIGHMASTER JOY		
DATE IN 10/01/01	TIME IN 16:22	
DATE OUT 10/01/01	TIME OUT 16:23	
VEHICLE PT 755	2	ROLL OFF
REFERENCE 003	ORIGIN	

Manual Gross Weight	76480	LB	Inbound - Charge ticket
Manual Tare Weight	37720	LB	
Net Weight	38760	LB	

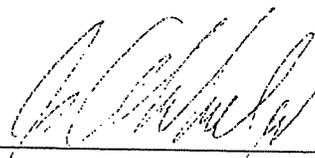
QTY.	UNIT	DESCRIPTION	RATE	EXTENSION	TAX	TOTAL
19.38	TON	SOLID WASTE 1				

SW

755Y13004-009-0010

NET AMOUNT
TENDERED
CHANGE
CHECK NO.

SIGNATURE





▲ Environmental Services  
 ▲ Hazardous Waste Transportation  
 ▲ Hazardous Materials Management  
 ▲ General Engineering Construction

# Allwaste Transportation & Remediation Inc.

1801 W. Watkins • Phoenix, AZ 85007  
 (602) 252-1186 • FAX (602) 252-1680

221-19101

PO: \_\_\_\_\_

DATE: 10-15-01

CUSTOMER <u>Weston - VWR</u>	DELIVER TO _____
ADDRESS _____	ADDRESS _____
CITY _____	CITY _____
CONTACT _____	CONTACT _____
CUST. PHONE _____	CUST. PHONE _____

SPECIAL EQUIP INSTRUCTIONS	(FORKLIFT, PLACARDS, ADD'L STOPS, ETC.)	MANIFEST NO.
----------------------------	-----------------------------------------	--------------

QTY.	HAZ	DESCRIPTION	WT	HRS	MILES	RATE	AMOUNT
		Deliver Loaded BINS TO SPW Regional	2 bins			280 <sup>00</sup>	560 <sup>00</sup>
		Disposed	15.36			23 <sup>00</sup>	353 <sup>50</sup>
							913 <sup>25</sup>
			BIN INFORMATION				
			Dropped Off	Picked Up			
			<u>5/2</u>				
			<u>289</u>				

DRIVER NAME: <u>Jeff Chamberland</u>	TRK NO.: <u>738</u>	TLR NO.: <u>738</u>
--------------------------------------	---------------------	---------------------

BEGINNING TIME: <u>6:00</u> / ARRIVAL TIME: _____	ARRIVAL TIME: <u>9:00</u>
LOADING TIME: (START) _____ (STOP) _____	UNLOADING TIME: (START) <u>8:10</u> (STOP) <u>9:20</u>
LEAVE SITE: _____ END _____	PAPERWORK DELAY _____
SIGNATURE: _____	LEAVE SITE: <u>9:30</u> END <u>11:00</u>
	RECEIVED BY: _____

**TERMS:** Net 30 days. Consignee to pay any legal fees for collection of delinquent accounts, plus the legal rate of interest of 1½% per month or 18% per year will be charged for all past due accounts. We make all deliveries inside curb and on lot at customer's risk only and accept no responsibility for damages resulting from such deliveries. Claims for short or damage or overcharge must be filed with this receipt within 10 days.

# THIS MEMORANDUM

Is an acknowledgement that a bill of lading has been issued and is not the Original Bill of Lading, nor a copy or duplicate, covering the property named herein, and is intended solely for filing or record.

Shipper's No. \_\_\_\_\_

CARRIER: AMERICAN TRANSPORTATION

SCAC \_\_\_\_\_ Carrier's No. \_\_\_\_\_ Date \_\_\_\_\_

TO: 500 REGENT  
 Consignee 240 ST S Highway 70  
 Street ...  
 Destination ... Zip ...

FROM: ADDED - NEW  
 Shipper  
 Street  
 Origin Zip

Route: \_\_\_\_\_ Vehicle Number \_\_\_\_\_ U.S. DOT Hazmat Reg. No. \_\_\_\_\_

No. Shipping Units	HM	Kind of Packages, Description of Articles (IF HAZARDOUS MATERIALS - PROPER SHIPPING NAME)	HAZARD CLASS	I.D. Number	PACKING GROUP	WEIGHT (subject to correction)	RATE	LABELS REQUIRED (or exemption)
		<u>NON HAZARDOUS</u>	<u>---</u>	<u>---</u>	<u>---</u>	<u>50</u>	<u>---</u>	<u>---</u>
		<u>...</u>						
		<u>...</u>		<u>8-10-15-01</u>				
		<u>...</u>						
		<u>...</u>						

Remit C.O.D. to: ...  
 Address: ...  
 City: ... State: ... Zip: ...

C. O. D. FEE:  
 Prepaid   
 Collect  \$  
**COD Amt: \$**

NOTE - Where the rate is dependent on value, shippers are required to state specifically in writing the agreed or declared value of the property. The agreed or declared value of the property is hereby specifically stated by the shipper to be not exceeding \$ \_\_\_\_\_ Per \_\_\_\_\_

Subject to Section 7 of the conditions, if this shipment is to be delivered to the consignee without recourse on the consignor, the consignor shall sign the following statement:  
 The carrier shall not make delivery of this shipment without payment of freight and all other lawful charges.  
 (Signature of Consignor)

FREIGHT CHARGES  
 PREPAID  COLLECT

RECEIVED, subject to the classifications and lawfully filed tariffs in effect on the date of issue of this Bill of Lading, the property described above in apparent good order, except as noted (contents and condition of contents of packages unknown), marked, consigned, and destined as indicated above which said carrier (the word carrier being understood throughout this contract as meaning any person or corporation in possession of the property under the contract) agrees to carry to its usual place of delivery at said destination, if on its route, otherwise to deliver to another carrier on the route to said destination. It is mutually agreed as to each carrier of all or any of, said property over all or any portion of said route to destination and as to each party at any time interested in all or any said property, that every service to be performed hereunder shall be subject to all the bill of lading terms and conditions in the governing classification on the date of shipment.

Shipper hereby certifies that he is familiar with all the bill of lading terms and conditions in the governing classification and the said terms and conditions are hereby agreed to by the shipper and accepted for himself and his assigns.

**PLACARDS REQUIRED**

**PLACARDS SUPPLIED**

YES  NO - FURNISHED BY CARRIER  
 DRIVERS SIGNATURE: \_\_\_\_\_

SHIPPER: \_\_\_\_\_  
 PER: \_\_\_\_\_  
 DATE: \_\_\_\_\_

CARRIER: ...  
 PER: ...  
 DATE: \_\_\_\_\_

EMERGENCY RESPONSE TELEPHONE NUMBER: \_\_\_\_\_

Monitored at all times the Hazardous Material is in transportation including storage incidental to transportation (172.604).

# THIS MEMORANDUM

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Shipper's No. \_\_\_\_\_

CARRIER: Airwest Transportation

SCAC \_\_\_\_\_ Carrier's No. \_\_\_\_\_ Date \_\_\_\_\_

TO: SW. REGIONAL  
 Consignee 4437 S Highway 85  
 Street Phoenix AZ  
 Destination Zip 85036

FROM: ADEQ - NLR  
 Shipper \_\_\_\_\_  
 Street \_\_\_\_\_  
 Origin \_\_\_\_\_ Zip \_\_\_\_\_

Route: \_\_\_\_\_ Vehicle Number \_\_\_\_\_ U.S. DOT Hazmat Reg. No. \_\_\_\_\_

No. Shipping Units	HM	Kind of Packages, Description of Articles (IF HAZARDOUS MATERIALS - PROPER SHIPPING NAME)	HAZARD CLASS	I.D. Number	PACKING GROUP	WEIGHT (subject to correction)	RATE	LABELS REQUIRED (or exemption)
		<u>NON HAZARDOUS</u>	—	—	—	<u>154</u>	—	—
		<u>2.11 (10-13-01)</u>						
		<u>2.11 (10-13-01)</u>						
		<u>72041-2004-011</u>						

Remit C.O.D. to: SW. REGIONAL  
 Address: 4437 S Highway 85  
 City: Phoenix State: AZ Zip: 85036

C. O. D. FEE:  
 Prepaid   
 Collect  \$  
**COD Amt: \$**

NOTE - Where the rate is dependent on value, shippers are required to state specifically in writing the agreed or declared value of the property. The agreed or declared value of the property is hereby specifically stated by the shipper to be not exceeding \$ \_\_\_\_\_ Per \_\_\_\_\_

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 The carrier shall not make delivery of this shipment without payment of freight and all other lawful charges.  
 (Signature of Consignor)  
**FREIGHT CHARGES**  
 PREPAID  COLLECT

RECEIVED, subject to the classifications and lawfully filed tariffs in effect on the date of issue of this Bill of Lading, the property described above in apparent good order, except as noted (contents and condition of contents of packages unknown), marked, consigned, and destined as indicated above which said carrier (the word carrier being understood throughout this contract as meaning any person or corporation in possession of the property under the contract) agrees to carry to its usual place of delivery at said destination, if on its route, otherwise to deliver to another carrier on the route to said destination. It is mutually agreed as to each carrier of all or any of, said property over all or any portion of said route to destination and as to each party at any time interested in all or any said property, that every service to be performed hereunder shall be subject to all the bill of lading terms and conditions in the governing classification on the date of shipment.  
 Shipper hereby certifies that he is familiar with all the bill of lading terms and conditions in the governing classification and the said terms and conditions are hereby agreed to by the shipper and accepted for himself and his assigns.

This is to certify that the above-named materials are properly classified, described, packaged, marked and labeled and are in proper condition for transportation according to the applicable regulations of the Department of Transportation.  
 Per \_\_\_\_\_

**PLACARDS REQUIRED**

**PLACARDS SUPPLIED**

YES  NO - FURNISHED BY CARRIER  
 DRIVERS SIGNATURE: \_\_\_\_\_

SHIPPER: \_\_\_\_\_

CARRIER: Airwest

PER: \_\_\_\_\_

PER: \_\_\_\_\_

DATE: \_\_\_\_\_

DATE: \_\_\_\_\_

EMERGENCY RESPONSE TELEPHONE NUMBER: ( ) \_\_\_\_\_

Monitored at all times the Hazardous Material is in transportation including storage incidental to transportation (172.604).

# Southwest Regional Landfill

24427 S. Highway 85  
 Buckeye, AZ 85326  
 Tel: (623) 393-0085  
 (An Allied Waste Industries Operation)

SITE 20	TICKET 110705	GRID
WEIGHMASTER JOV		
DATE IN 10/15/01	TIME IN 09:34	
DATE OUT 10/15/01	TIME OUT 09:34	
VEHICLE PT 738 2/2	ROLL OFF	
REFERENCE 003	ORIGIN	

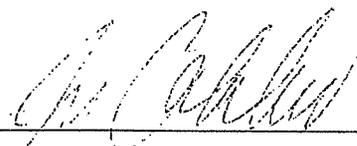
002009  
 PHILIPS TRANSPORTATION & REM  
 JAMI DAVIS  
 1801 W. WATKINS  
 PHOENIX AZ 85007

Manual Gross Weight 58400 LB      Inbound - Charge ticket  
 Manual Tare Weight 37680 LB  
 Net Weight 30720 LB

QTY.	UNIT	DESCRIPTION	RATE	EXTENSION	TAX	TOTAL
15.36	TON	SOLID WASTE 1				

SW      755Y13004-011,-012

NET AMOUNT
TENDERED
CHANGE
CHECK NO.

SIGNATURE 



**PHASE VI MONITOR WELLS**

**Soil Bins #252  
#122  
#311  
#2204**





▲ Environmental Services  
 ▲ Hazardous Waste Transportation  
 ▲ Hazardous Materials Management  
 ▲ General Engineering Construction

# Allwaste Transportation & Remediation Inc.

1801 W. Watkins • Phoenix, AZ 85007  
 (602) 252-1186 • FAX (602) 252-1680

221-19834

PO: \_\_\_\_\_  
 DATE: 1-21-02

CUSTOMER <u>WESTON - VWR</u>	DELIVER TO _____
ADDRESS _____	ADDRESS _____
CITY _____	CITY _____
CONTACT _____	CONTACT _____
CUST. PHONE _____	CUST. PHONE _____

SPECIAL EQUIP INSTRUCTIONS: \_\_\_\_\_ (FORKLIFT, PLACARDS, ADD'L STOPS, ETC.)  
 MANIFEST NO. \_\_\_\_\_

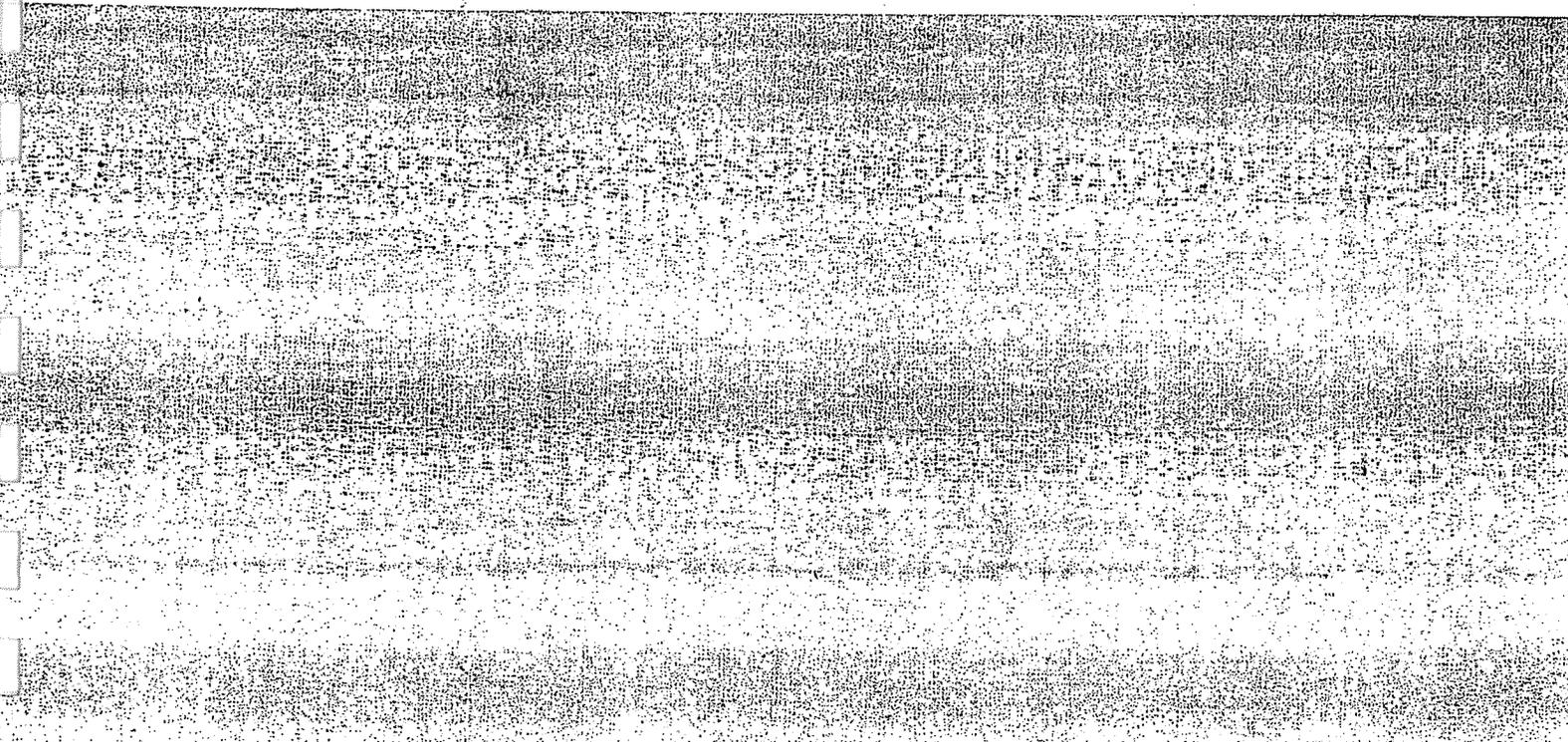
QTY.	HAZ	DESCRIPTION	WT	HRS	MILES	RATE	AMOUNT
		<u>Deliver 2 bins to SW Regional</u>				<u>280</u>	<u>560</u>
			<u>19.62</u>			<u>23</u>	<u>451.26</u>
		<u>Dumped</u>	<u>252</u>				
			<u>122</u>				<u>1011.26</u>

BIN INFORMATION	
Dropped Off	Picked Up
<u>252</u>	
<u>122</u>	

DRIVER NAME: J. Chamberland TRK NO.: 738 TLR NO.: 738 75

BEGINNING TIME: 9:30 / ARRIVAL TIME: \_\_\_\_\_  
 LOADING TIME: (START) \_\_\_\_\_ (STOP) \_\_\_\_\_  
 LEAVE SITE: \_\_\_\_\_ END \_\_\_\_\_  
 SIGNATURE: \_\_\_\_\_  
 ARRIVAL TIME: 11:00  
 UNLOADING TIME: (START) 11:05 (STOP) 12:00  
 PAPERWORK DELAY \_\_\_\_\_  
 LEAVE SITE: 12:30 END 1:30  
 RECEIVED BY: \_\_\_\_\_

**TERMS:** Net 30 days. Consignee to pay any legal fees for collection of delinquent accounts, plus the legal rate of interest of 1 1/2 % per month or 18 % per year will be charged for all past due accounts. We make all deliveries inside curb and on lot at customer's risk only and accept no responsibility for damages resulting from such deliveries. Claims for short or damage or overcharge must be filed with this receipt within 10 days.



# THIS MEMORANDUM

Is an acknowledgement that a bill of lading has been issued and is not the Original Bill of Lading, nor a copy or duplicate, covering the property named herein, and is intended solely for filing or record.

Shipper's No. \_\_\_\_\_

CARRIER: Airwest Transportation

SCAC \_\_\_\_\_ Carrier's No. \_\_\_\_\_ Date 1-21-02

TO: SW Regional  
 Consignee 9443705. H.W. BS  
 Street \_\_\_\_\_  
 Destination Buena Vista AZ Zip \_\_\_\_\_

FROM: ADEQ  
 Shipper \_\_\_\_\_  
 Street \_\_\_\_\_  
 Origin \_\_\_\_\_ Zip \_\_\_\_\_

Route: \_\_\_\_\_ Vehicle Number \_\_\_\_\_ U.S. DOT Hazmat Reg. No. \_\_\_\_\_

No. Shipping Units	HM	Kind of Packages, Description of Articles (IF HAZARDOUS MATERIALS - PROPER SHIPPING NAME)	HAZARD CLASS	I.D. Number	PACKING GROUP	WEIGHT (subject to correction)	RATE	LABELS REQUIRED (or exemption)
		<u>DRILL CUTTINGS</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>40 lbs</u>		<u>—</u>
		<u>755-41-3004-015</u>						
		<u>-016</u>						
		<u>755-41-3002</u>						

Remit C.O.D. to:  
 Address: \_\_\_\_\_  
 City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_

**C. O. D. FEE:**  
 Prepaid   
 Collect  \$ \_\_\_\_\_

NOTE - Where the rate is dependent on value, shippers are required to state specifically in writing the agreed or declared value of the property. The agreed or declared value of the property is hereby specifically stated by the shipper to be not exceeding \$ \_\_\_\_\_ Per \_\_\_\_\_

Subject to Section 7 of the conditions, if this shipment is to be delivered to the consignee without recourse on the consignee, the consignor shall sign the following statement:  
 The carrier shall not make delivery of this shipment without payment of freight and all other lawful charges.  
 (Signature of Consignor)

**FREIGHT CHARGES**  
 PREPAID  COLLECT

RECEIVED, subject to the classifications and lawfully filed tariffs in effect on the date of issue of this Bill of Lading, the property described above in apparent good order, except as noted (contents and condition of contents of packages unknown), marked, consigned, and destined as indicated above which said carrier (the word carrier being understood throughout this contract as meaning any person or corporation in possession of the property under the contract) agrees to carry to its usual place of delivery at said destination, if on its route, otherwise to deliver to another carrier on the route to said destination. It is mutually agreed as to each carrier of all or any of, said property over all or any portion of said route to destination and as to each party at any time interested in all or any said property, that every service to be performed hereunder shall be subject to all the bill of lading terms and conditions in the governing classification on the date of shipment.  
 Shipper hereby certifies that he is familiar with all the bill of lading terms and conditions in the governing classification and the said terms and conditions are hereby agreed to by the shipper and accepted for himself and his assigns.

This is to certify that the above-named materials are properly classified, described, packaged, marked and labeled and are in proper condition for transportation according to the applicable regulations of the Department of Transportation.

**PLACARDS REQUIRED**

**PLACARDS SUPPLIED**

YES  NO - FURNISHED BY CARRIER  
 DRIVERS SIGNATURE: \_\_\_\_\_

SHIPPER: ADEQ  
 PER: \_\_\_\_\_  
 DATE: 1-21-02  
 EMERGENCY RESPONSE TELEPHONE NUMBER: \_\_\_\_\_

CARRIER: Airwest  
 PER: [Signature]  
 DATE: 1-21-02  
 Monitored at all times the Hazardous Material is in transportation including storage incidental to transportation (172.604).

**Southwest Regional Landfill**

24427 S. Highway 85  
 Buckeye, AZ 85326  
 Tel: (623) 393-0085  
 An Allied Waste Industries Operation)

002009  
 PHILIPS TRANSPORTATION & REM  
 JAMI DAVIS  
 1801 W. WATKINS  
 PHOENIX AZ 85007

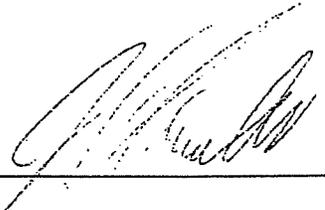
SITE 20	TICKET 117857	GRID
WEIGHMASTER JOY		
DATE IN 01/21/02	TIME IN 12:29	
DATE OUT 01/21/02	TIME OUT 12:30	
VEHICLE PT 738 2/2	ROLL OFF	
REFERENCE 003	ORIGIN	

Manual Gross Weight 77740 LB      Inbound - Charge ticket  
 Manual Tare Weight 38500 LB  
 Net Weight 39240 LB

QTY.	UNIT	DESCRIPTION	RATE	EXTENSION	TAX	TOTAL
19.62	TON	SOLID WASTE 1				

SW      755Y13004-015-016

NET AMOUNT
TENDERED
CHANGE
CHECK NO.

SIGNATURE 



# THIS MEMORANDUM

Is an acknowledgement that a bill of lading has been issued and is not the Original Bill of Lading, nor a copy or duplicate, covering the property named herein, and is intended solely for filing or record.

Shipper's No. \_\_\_\_\_

CARRIER: Allstate Transportation SCAC \_\_\_\_\_ Carrier's No. \_\_\_\_\_ Date 1-30-02

TO: S.W. Regional  
 Consignee 244270 S. Hwy 85  
 Street \_\_\_\_\_  
 Destination Buckeye AZ Zip \_\_\_\_\_

FROM: ADEQ - VWR  
 Shipper \_\_\_\_\_  
 Street \_\_\_\_\_  
 Origin \_\_\_\_\_ Zip \_\_\_\_\_

Route: 0 Vehicle Number \_\_\_\_\_ U.S. DOT Hazmat Reg. No. \_\_\_\_\_

No. Shipping Units	HM	Kind of Packages, Description of Articles (IF HAZARDOUS MATERIALS - PROPER SHIPPING NAME)	HAZARD CLASS	I.D. Number	PACKING GROUP	WEIGHT (subject to correction)	RATE	LABELS REQUIRED (or exemption)
		<u>Drill cuttings</u>	<u>8</u>	<u>8</u>	<u>4</u>	<u>40 yds</u>		
		<u>755-VI-3004-017</u>						
		<u>755-VI-3004-018</u>						
		<u>Bulbs 2504 + 311</u>						

Remit C.O.D. to:  
 Address: \_\_\_\_\_  
 City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_

**COD** Amt: \$ \_\_\_\_\_  
 C. O. D. FEE:  
 Prepaid  Collect  \$ \_\_\_\_\_

NOTE - Where the rate is dependent on value, shippers are required to state specifically in writing the agreed or declared value of the property. The agreed or declared value of the property is hereby specifically stated by the shipper to be not exceeding \$ \_\_\_\_\_ Per \_\_\_\_\_  
 Subject to Section 7 of the conditions, if this shipment is to be delivered to the consignee without recourse on the consignor, the consignor shall sign the following statement: The carrier shall not make delivery of this shipment without payment of freight and all other lawful charges.  
 (Signature of Consignor) \_\_\_\_\_

RECEIVED, subject to the classifications and lawfully filed tariffs in effect on the date of issue of this Bill of Lading, the property described above in apparent good order, except as noted (contents and condition of contents of packages unknown), marked, consigned, and destined as indicated above which said carrier (the word carrier being understood throughout this contract as meaning any person or corporation in possession of the property under the contract) agrees to carry to its usual place of delivery at said destination, if on its route, otherwise to deliver to another carrier on the route to said destination. It is mutually agreed as to each carrier of all or any of, said property over all or any portion of said route to destination and as to each party at any time interested in all or any said property, that every service to be performed hereunder shall be subject to all the bill of lading terms and conditions in the governing classification on the date of shipment.  
 Shipper hereby certifies that he is familiar with all the bill of lading terms and conditions in the governing classification and the said terms and conditions are hereby agreed to by the shipper and accepted for himself and his assigns.

This is to certify that the above-named materials are properly classified, described, packaged, marked and labeled and are in proper condition for transportation according to the applicable regulations of the Department of Transportation.  
 PLACARDS REQUIRED  PLACARDS SUPPLIED  YES  NO - FURNISHED BY CARRIER DRIVERS SIGNATURE: \_\_\_\_\_

SHIPPER: ADZQ  
 PER: \_\_\_\_\_  
 DATE: \_\_\_\_\_

CARRIER: Allstate  
 PER: ADZQ  
 DATE: 1130102

EMERGENCY RESPONSE TELEPHONE NUMBER: \_\_\_\_\_  
 Monitored at all times the Hazardous Material is in transportation including storage incidental to transportation (172.604).

# Southwest Regional Landfill

24427 S. Highway 85  
 Buckeye, AZ 85326  
 Tel: (623) 393-0085  
 (An Allied Waste Industries Operation)

002009  
 PHILIPS TRANSPORTATION & REM  
 JAMI DAVIS  
 1801 W. WATKINS  
 PHOENIX AZ 85007

SITE 20	TICKET 118995	GRID
WEIGHMASTER JOY		
DATE IN 02/04/02	TIME IN 09:11	
DATE OUT 02/04/02	TIME OUT 09:12	
VEHICLE PT 738 2	ROLL OFF	
REFERENCE 003	ORIGIN	

Manual Gross Weight 70520 LB  
 Stored Tare Weight 25520 LB  
 Net Weight 45000 LB

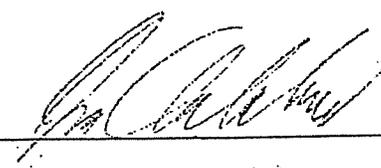
Inbound - Charge ticket

QTY.	UNIT	DESCRIPTION	RATE	EXTENSION	TAX	TOTAL
22.50	TON	SOLID WASTE 1				

SW 755Y13004-017,018

NET AMOUNT
TENDED
CHANGE
CHECK NO.

SIGNATURE



**GROUNDWATER SAMPLING – ROUND 1 & 2**





## City of Phoenix

WATER SERVICES DEPARTMENT  
POLLUTION CONTROL DIVISION

February 25, 2000

Mr. John R. Peterson  
Project Manager  
Roy F. Weston, Inc  
202 E. Earll Drive, Suite 460  
Phoenix, Arizona 85012-2634

**RE: Manhole Entry Permit for discharge of purge groundwater generated from sampling activities as part of the ongoing remedial investigation in the West Central Phoenix (WCP) East Grand Avenue Plume Site.**

Dear Mr. Peterson:

I am in receipt of your letter of February 22, 2000, in which you requested to discharge approximately 800 gallons of purged groundwater generated from monitoring wells located within the WCP East Grand Avenue Plume Site, Phoenix, Arizona.

Approval is hereby granted for the discharge of approximately 800 gallons of purged well water. This discharge is anticipated to occur sometime during the period of February 28, 2000 through March 3, 2000, to the City of Phoenix manhole #403, in Quarter Section 16-22.

This approval is based on a thorough review of the results of the laboratory analysis submitted in your letter of February 22, 2000. Our review indicates the parameters listed in the Phoenix City Code, Chapter 28, Section 28-8 were analyzed and the results reported by EPA methods 8260 Volatile Organics. All concentrations were found to be less than the Phoenix City Code Prohibited Substances and Instantaneous Effluent Limitations.

It is the opinion of the City of Phoenix Pollution Control Division that the wastewater meets all requirements under Chapter 28. The wastewater is also determined not to be in sufficient quantity to injure or interfere with any sewage treatment process, cause corrosive structural damage, constitute a hazard to humans, or create any hazard to the sewer system, or in the receiving waters of the sewage treatment plant.

Please submit your final status report within five (5) days of the last date of discharge. This report shall include the date(s) of discharge, time of day this discharge occurred, and the total gallonage.



## City of Phoenix

Mr. John Peteson  
Project Manager.  
Page 2  
February 25, 2000

Should you have any questions, please contact me at (602)-534-2078. Our office hours are 8:00 a.m. to 5:00 p.m., Monday through Friday.

Sincerely,

A handwritten signature in cursive script that reads "Richard A. Thayer".

Richard A. Thayer  
Senior Water Quality Inspector  
h:\Westonmhp-00PC-029

Attachment

c: Kenneth Karnes, Chief Water Quality Inspector



## City of Phoenix

WATER SERVICES DEPARTMENT  
POLLUTION CONTROL DIVISION

### MANHOLE ENTRY PERMIT

The City of Phoenix, acting through the Water Services Department, hereby issues a manhole permit to: Geotechnical and Environmental Consultants, Inc.

Roy F. Weston, Inc.  
202 East Earll Drive, Suite 460  
Phoenix, Arizona 85012-2634

hereinafter called Permittee, for the purpose of entering a City of Phoenix manhole no. 403 in Quarter Section 16-22 to dispose of purged groundwater brought to the surface during groundwater well operations at:

The West Central Phoenix East Grand Avenue Plume Site in  
Phoenix, Arizona 85009

The manhole entry permit is issued in accordance with Phoenix City Code Chapter 28 Sections 28-8 and 28-27 and subject to the following conditions:

1. That the only activities authorized by the permit are for the purposes of removal of the contained purged groundwater wastewater, and that the Permittee conduct no other activity while entering upon the public property authorized by this permit.
2. That the Permittee's activities be conducted only within the time period of February 28, 2000, through March 3, 2000, unless authorized in writing by the Water Services Director for an extension of time, or unless revoked earlier, and that the Permittee notify the Water Services Department in advance of each separate entry.
3. Permittee shall submit a final status report within five (5) days of the date of discharge. This report shall include the date(s) of discharge, time of day this discharge occurred, and the total gallonage.
4. Permittee shall incur cost of \$1.2242 per one hundred cubic feet (or current rate as established by water accounting) of ground water discharged.
5. That the Permittee, when finished with the removal and discharge activities, replace to the satisfaction of the Water Services Director, any manhole covers or other disturbances to the City of Phoenix sewer lines that the Permittee caused during the course of the Permittee activities.



## City of Phoenix

6. That the Permittee obtain a street closure permit for restrictions of all streets, sidewalks, and alleys. Manholes located in major streets require street closure. Contact City of Phoenix Street Transportation (602-262-6235) for street closure procedures and permit.
  
7. That the Permittee agrees to save and hold harmless, the City, any of its departments, agencies, officers or employees from all costs and damages occurred by any of the above from any damage to any person or property whatsoever which is caused by the activity, condition or event arising out of the negligent performance or nonperformance of any of the provisions of this permit by the Permittee any of the Permittee's agents, or any of the Permittee's independent contractors. The above costs incurred by the City, any of its departments, agencies, officers or employees shall include in the event of any action, court cost, expensive litigation and reasonable attorney fees. When any of the above costs and/or damages occur as aforesaid, the Permittee assumes the burden of proof that the negligent activity, condition or event did not cause such cost damage or other expense the City may incur.

The Permittee agrees to the condition set forth in this permit, and understands that all activities done under the conditions of this permit should conform to the laws of the City of Phoenix and the State of Arizona.

Dated this 1<sup>st</sup> day of March, 2000.

John R. Peterson  
Permittee

Dated this 25<sup>th</sup> day of February, 2000.

CITY OF PHOENIX,  
a municipal corporation

By: Kenneth Karnes  
Kenneth Karnes  
Chief Water Quality Inspector  
Water Services Department  
h:\Westonmhp-00PC-029

**GROUNDWATER SAMPLING – ROUND 3**





## City of Phoenix

WATER SERVICES DEPARTMENT  
POLLUTION CONTROL DIVISION

March 2, 2000

Mr. John R. Peterson  
Project Manager  
Roy F. Weston, Inc  
202 E. Earll Drive, Suite 460  
Phoenix, Arizona 85012-2634

**RE: Manhole Entry Permit for discharge of purge groundwater generated from sampling activities as part of the ongoing remedial investigation in the West Central Phoenix (WCP) East Grand Avenue Plume Site.**

Dear Mr. Peterson:

Per your phone call on March 2, 2000, in which you requested to discharge approximately 1200 gallons of purged groundwater generated from monitoring wells located within the WCP East Grand Avenue Plume Site, Phoenix, Arizona.

Approval is hereby granted for the discharge of approximately 1200 gallons of purged well water. This discharge is anticipated to occur sometime during the period of March 6, 2000 through March 10, 2000, to the City of Phoenix manhole #403, in Quarter Section 16-22.

This approval is based on the results of the laboratory analysis submitted in your letter of February 22, 2000. Our review indicates the parameters listed in the Phoenix City Code, Chapter 28, Section 28-8 were analyzed and the results reported by EPA methods 8260 Volatile Organics. All concentrations were found to be less than the Phoenix City Code Prohibited Substances and Instantaneous Effluent Limitations.

It is the opinion of the City of Phoenix Pollution Control Division that the wastewater meets all requirements under Chapter 28. The wastewater is also determined not to be in sufficient quantity to injure or interfere with any sewage treatment process, cause corrosive structural damage, constitute a hazard to humans, or create any hazard to the sewer system, or in the receiving waters of the sewage treatment plant.

Please submit your final status report within five (5) days of the last date of discharge. This report shall include the date(s) of discharge, time of day this discharge occurred, and the total gallonage.



## City of Phoenix

Mr. John Peteson  
Project Manager.  
Page 2  
March 2, 2000

Should you have any questions, please contact me at (602)-534-2078. Our office hours are 8:00 a.m. to 5:00 p.m., Monday through Friday.

Sincerely,

A handwritten signature in cursive script that reads "Richard A. Thayer".

Richard A. Thayer  
Senior Water Quality Inspector  
h:\Westonmhp-00PC-030

Attachment

c: Kenneth Karnes, Chief Water Quality Inspector



## City of Phoenix

WATER SERVICES DEPARTMENT  
POLLUTION CONTROL DIVISION

### MANHOLE ENTRY PERMIT

The City of Phoenix, acting through the Water Services Department, hereby issues a manhole permit to:

Roy F. Weston, Inc.  
202 East Earll Drive, Suite 460  
Phoenix, Arizona 85012-2634

hereinafter called Permittee, for the purpose of entering a City of Phoenix manhole no. 403 in Quarter Section 16-22 to dispose of purged groundwater brought to the surface during groundwater well operations at:

The West Central Phoenix East Grand Avenue Plume Site in  
Phoenix, Arizona 85009

The manhole entry permit is issued in accordance with Phoenix City Code Chapter 28 Sections 28-8 and 28-27 and subject to the following conditions:

1. That the only activities authorized by the permit are for the purposes of removal of the contained purged groundwater wastewater, and that the Permittee conduct no other activity while entering upon the public property authorized by this permit.
2. That the Permittee's activities be conducted only within the time period of March 6, 2000, through March 10, 2000, unless authorized in writing by the Water Services Director for an extension of time, or unless revoked earlier, and that the Permittee notify the Water Services Department in advance of each separate entry.
3. Permittee shall take samples of the purge groundwater while discharging into manhole 403 in Quarter Section 16-22 and analyze for those parameters listed as Instantaneous Effluent Limitations in the Phoenix City Code, Section 28-8. All parameters shall be analyzed using methods established by Title 40 code of Federal Regulations Part 136 or as stated in the transmittal letter attached.
4. Permittee shall submit analytical results as established in Section 3 of this permit within thirty (30) days of completing discharge of waters.
5. Permittee shall submit a final status report within five (5) days of the date of discharge. This report shall include the date(s) of discharge, time of day this discharge occurred, and the total gallonage.

6. Permittee shall incur cost of \$1.2242 per one hundred cubic feet (or current rate as established by water accounting) of ground water discharged.
7. That the Permittee, when finished with the removal and discharge activities, replace to the satisfaction of the Water Services Director, any manhole covers or other disturbances to the City of Phoenix sewer lines that the Permittee caused during the course of the Permittee activities.
8. That the Permittee obtain a street closure permit for restrictions of all streets, sidewalks, and alleys. Manholes located in major streets require street closure. Contact City of Phoenix Street Transportation (602-262-6235) for street closure procedures and permit.
9. That the Permittee agrees to save and hold harmless, the City, any of its departments, agencies, officers or employees from all costs and damages occurred by any of the above from any damage to any person or property whatsoever which is caused by the activity, condition or event arising out of the negligent performance or nonperformance of any of the provisions of this permit by the Permittee any of the Permittee's agents, or any of the Permittee's independent contractors. The above costs incurred by the City, any of its departments, agencies, officers or employees shall include in the event of any action, court cost, expensive litigation and reasonable attorney fees. When any of the above costs and/or damages occur as aforesaid, the Permittee assumes the burden of proof that the negligent activity, condition or event did not cause such cost damage or other expense the City may incur.

The Permittee agrees to the condition set forth in this permit, and understands that all activities done under the conditions of this permit should conform to the laws of the City of Phoenix and the State of Arizona.

Dated this 3<sup>rd</sup> day of March, 2000.

John R. Peterson  
Permittee

Dated this 3<sup>rd</sup> day of March, 2000.

CITY OF PHOENIX,  
a municipal corporation

By: Kenneth Karnes  
Kenneth Karnes  
Chief Water Quality Inspector  
Water Services Department  
h:\Westonmhp-00PC-030

**GROUNDWATER SAMPLING – ROUND 4**





## City of Phoenix

WATER SERVICES DEPARTMENT  
POLLUTION CONTROL DIVISION

Winner of the  
Carl Bertelsmann  
Prize for



June 8, 2000

Mr. Richard C. Findlay  
Geologist  
Roy F. Weston, Inc  
Suite 2001  
2702 North Third Street  
Phoenix, Arizona 85004-4600

**RE: Manhole Entry Permit for discharge of purge groundwater generated from sampling activities as part of the ongoing remedial investigation in the West Central Phoenix (WCP) East Grand Avenue Plume Water Quality Assurance Revolving Fund (WQARF) Registry Site.**

Dear Mr. Findlay:

Per your letter of May 12, 2000, in which you requested to discharge approximately 500 gallons of purged groundwater generated from monitoring wells located within the WCP East Grand Avenue Plume Water Quality Assurance Revolving Fund Registry Site, Phoenix, Arizona. The purged groundwater will be generated from sampling events scheduled for June 5-14, 2000.

Approval is hereby granted for the discharge of approximately 500 gallons of purged well water. This discharge is anticipated to occur sometime during the period of June 8, 2000, through June 14, 2000, to the City of Phoenix manhole #403, in Quarter Section 16-22.

This approval is based on the results of the laboratory analysis submitted in your letter of May 11, 2000. Our review indicates the parameters listed in the Phoenix City Code, Chapter 28, Section 28-8 were analyzed and the results reported by EPA methods 8260 B Volatile Organic compounds, 13 priority pollutant metals with EPA Method 200.7, and pH with EPA Method 150.1. All concentrations were found to be less than the Phoenix City Code Prohibited Substances and Instantaneous Effluent Limitations.

It is the opinion of the City of Phoenix Pollution Control Division that the wastewater meets all requirements under Chapter 28. The wastewater is also determined not to be in sufficient quantity to injure or interfere with any sewage treatment process, cause corrosive structural damage, constitute a hazard to humans, or create any hazard to the sewer system, or in the receiving waters of the sewage treatment plant.



## City of Phoenix

Mr. Richard C. Findlay  
Geologist  
Page 2  
June 8, 2000

Please submit your final status report within ten (10) days of the last date of discharge. This report shall include the date(s) of discharge, time of day this discharge occurred, and the total gallonage.

Should you have any questions, please contact me at (602)-534-2078. Our office hours are 8:00 a.m. to 5:00 p.m., Monday through Friday.

Sincerely,

A handwritten signature in cursive script that reads "Richard A. Thayer".

Richard A. Thayer  
Senior Water Quality Inspector  
h:\WESTONMHP00PC-091

Attachment

c: Kenneth Karnes, Chief Water Quality Inspector



# City of Phoenix

WATER SERVICES DEPARTMENT  
POLLUTION CONTROL DIVISION

Winner of the  
Carl Bertelsmann  
Prize for



## MANHOLE ENTRY PERMIT

The City of Phoenix, acting through the Water Services Department, hereby issues a manhole permit to:

Roy F. Weston, Inc.  
Suite 2001  
2702 North Third Street  
Phoenix, Arizona 85004-4600

hereinafter called Permittee, for the purpose of entering a City of Phoenix manhole no. 403 in Quarter Section 16-22 to dispose of purged groundwater brought to the surface during groundwater well operations at:

The West Central Phoenix East Grand Avenue Plume  
Water Quality Assurance Revolving Fund  
Phoenix, Arizona 85009

The manhole entry permit is issued in accordance with Phoenix City Code Chapter 28 Sections 28-8 and 28-27 and subject to the following conditions:

1. That the only activities authorized by the permit are for the purposes of removal of the contained purged groundwater wastewater, and that the Permittee conduct no other activity while entering upon the public property authorized by this permit.
2. That the Permittee's activities be conducted only within the time period of June 8, 2000, through June 14, 2000, unless authorized in writing by the Water Services Director for an extension of time, or unless revoked earlier, and that the Permittee notify the Water Services Department in advance of each separate entry.
3. A sample of the ground water is to be collected prior to entry of Manhole No. 403 in Quarter section 16-22 and analyzed for those parameters listed as Instantaneous Effluent Limitations in the Phoenix City Code, Section 28-8. All parameters shall be analyzed using methods established by Title 40 Code of Federal Regulations Part 136 or as stated in the transmittal letter attached.
4. Permittee shall submit analytical results as established in Section 3 of this permit within thirty (30) days of completion.
5. Permittee shall submit a final status report within ten (10) days of the date of discharge. This report shall include the date(s) of discharge, time of day this discharge occurred, and the total gallonage.



## City of Phoenix

6. Permittee shall incur cost of \$1.2242 per one hundred cubic feet (or current rate as established by water accounting) of ground water discharged.
7. That the Permittee, when finished with the removal and discharge activities, replace to the satisfaction of the Water Services Director, any manhole covers or other disturbances to the City of Phoenix sewer lines that the Permittee caused during the course of the Permittee activities.
8. That the Permittee obtain a street closure permit for restrictions of all streets, sidewalks, and alleys. Manholes located in major streets require street closure. Contact City of Phoenix Street Transportation (602-262-6235) for street closure procedures and permit.
9. That the Permittee agrees to save and hold harmless, the City, any of its departments, agencies, officers or employees from all costs and damages occurred by any of the above from any damage to any person or property whatsoever which is caused by the activity, condition or event arising out of the negligent performance or nonperformance of any of the provisions of this permit by the Permittee any of the Permittee's agents, or any of the Permittee's independent contractors. The above costs incurred by the City, any of its departments, agencies, officers or employees shall include in the event of any action, court cost, expensive litigation and reasonable attorney fees. When any of the above costs and/or damages occur as aforesaid, the Permittee assumes the burden of proof that the negligent activity, condition or event did not cause such cost damage or other expense the City may incur.

The Permittee agrees to the condition set forth in this permit, and understands that all activities done under the conditions of this permit should conform to the laws of the City of Phoenix and the State of Arizona.

Dated this 9 day of June, 2000.

*Jose Dilla*  
Permittee

Dated this 8th day of June, 2000.

CITY OF PHOENIX,  
a municipal corporation

By: *Kenneth Karnes*

Kenneth Karnes  
Chief Water Quality Inspector  
Water Services Department  
h:\WESTON00PC-091

**GROUNDWATER SAMPLING – ROUND 5**





## City of Phoenix

WATER SERVICES DEPARTMENT  
POLLUTION CONTROL DIVISION

September 15, 2000

Mr. Richard C. Findlay  
Geologist  
Roy F. Weston, Inc  
Suite 2001  
2702 North Third Street  
Phoenix, Arizona 85004-4600

**RE: Manhole Entry Permit for discharge of purge groundwater generated from sampling activities as part of the ongoing ADEQ remedial investigation in the West Central Phoenix (WCP) East Grand Avenue Plume Water Quality Assurance Revolving Fund (WQARF) Registry Site.**

Dear Mr. Findlay:

Per your letter of August 14, 2000, in which you requested to discharge approximately 900 gallons of purged groundwater generated from monitoring wells located within the WCP East Grand Avenue Plume Water Quality Assurance Revolving Fund Registry Site, Phoenix, Arizona. The purged groundwater will be generated from sampling events scheduled for September 18 through September 26, 2000.

Approval is hereby granted for the discharge of approximately 900 gallons of purged well water. This discharge is anticipated to occur sometime during the period of September 18, 2000, through September 26, 2000, to the City of Phoenix manhole #403, in Quarter Section 16-22.

This approval is based on the results of the laboratory analysis submitted in your letter of August 14, 2000. Our review indicates the parameters listed in the Phoenix City Code, Chapter 28, Section 28-8 were analyzed and the results reported by EPA methods 8260 B Volatile Organic compounds, 13 priority pollutant metals with EPA Method 200.7, and pH with EPA Method 150.1. All concentrations were found to be less than the Phoenix City Code Prohibited Substances and Instantaneous Effluent Limitations.

It is the opinion of the City of Phoenix Pollution Control Division that the wastewater meets all requirements under Chapter 28. The wastewater is also determined not to be in sufficient quantity to injure or interfere with any sewage treatment process, cause corrosive structural damage, constitute a hazard to humans, or create any hazard to the sewer system, or in the receiving waters of the sewage treatment plant.



## City of Phoenix

Mr. Richard C. Findlay  
Geologist  
Page 2  
September 15, 2000

Please submit your final status report within ten (10) days of the last date of discharge. This report shall include the date(s) of discharge, time of day this discharge occurred, and the total gallonage.

Should you have any questions, please contact me at (602)-534-2078. Our office hours are 8:00 a.m. to 5:00 p.m., Monday through Friday.

Sincerely,

A handwritten signature in cursive script that reads "Richard A. Thayer".

Richard A. Thayer  
Senior Water Quality Inspector  
h:\WESTONMHP00PC-120

Attachment

c: Kenneth Karnes, Chief Water Quality Inspector



## City of Phoenix

WATER SERVICES DEPARTMENT  
POLLUTION CONTROL DIVISION

September 15, 2000

Mr. Richard C. Findlay  
Geologist  
Roy F. Weston, Inc  
Suite 2001  
2702 North Third Street  
Phoenix, Arizona 85004-4600

**RE: Manhole Entry Permit for discharge of purge groundwater generated from sampling activities as part of the ongoing ADEQ remedial investigation in the West Central Phoenix (WCP) East Grand Avenue Plume Water Quality Assurance Revolving Fund (WQARF) Registry Site.**

Dear Mr. Findlay:

Per your letter of August 14, 2000, in which you requested to discharge approximately 900 gallons of purged groundwater generated from monitoring wells located within the WCP East Grand Avenue Plume Water Quality Assurance Revolving Fund Registry Site, Phoenix, Arizona. The purged groundwater will be generated from sampling events scheduled for September 18 through September 29, 2000.

Approval is hereby granted for the discharge of approximately 900 gallons of purged well water. This discharge is anticipated to occur sometime during the period of September 18, 2000, through September 29, 2000, to the City of Phoenix manhole #403, in Quarter Section 16-22.

This approval is based on the results of the laboratory analysis submitted in your letter of August 14, 2000. Our review indicates the parameters listed in the Phoenix City Code, Chapter 28, Section 28-8 were analyzed and the results reported by EPA methods 8260 B Volatile Organic compounds, 13 priority pollutant metals with EPA Method 200.7, and pH with EPA Method 150.1. All concentrations were found to be less than the Phoenix City Code Prohibited Substances and Instantaneous Effluent Limitations.

It is the opinion of the City of Phoenix Pollution Control Division that the wastewater meets all requirements under Chapter 28. The wastewater is also determined not to be in sufficient quantity to injure or interfere with any sewage treatment process, cause corrosive structural damage, constitute a hazard to humans, or create any hazard to the sewer system, or in the receiving waters of the sewage treatment plant.



## City of Phoenix

Mr. Richard C. Findlay  
Geologist  
Page 2  
September 15, 2000

Please submit your final status report within ten (10) days of the last date of discharge. This report shall include the date(s) of discharge, time of day this discharge occurred, and the total gallonage.

Should you have any questions, please contact me at (602)-534-2078. Our office hours are 8:00 a.m. to 5:00 p.m., Monday through Friday.

Sincerely,

A handwritten signature in cursive script that reads "Richard A. Thayer".

Richard A. Thayer  
Senior Water Quality Inspector  
h:\WESTONMHP00PC-120

Attachment

c: Kenneth Karnes, Chief Water Quality Inspector



## City of Phoenix

WATER SERVICES DEPARTMENT  
POLLUTION CONTROL DIVISION

### MANHOLE ENTRY PERMIT

The City of Phoenix, acting through the Water Services Department, hereby issues a manhole permit to:

Roy F. Weston, Inc.  
(on behalf of ADEQ)  
Suite 2001  
2702 North Third Street  
Phoenix, Arizona 85004-4600

hereinafter called Permittee, for the purpose of entering a City of Phoenix manhole no. 403 in Quarter Section 16-22 to dispose of purged groundwater brought to the surface during groundwater well operations at:

The West Central Phoenix East Grand Avenue Plume  
Water Quality Assurance Revolving Fund  
Phoenix, Arizona 85009

The manhole entry permit is issued in accordance with Phoenix City Code Chapter 28 Sections 28-8 and 28-27 and subject to the following conditions:

1. That the only activities authorized by the permit are for the purposes of removal of the contained purged groundwater wastewater, and that the Permittee conduct no other activity while entering upon the public property authorized by this permit.
2. That the Permittee's activities be conducted only within the time period of September 18, 2000, through September 29, 2000, unless authorized in writing by the Water Services Director for an extension of time, or unless revoked earlier, and that the Permittee notify the Water Services Department in advance of each separate entry.
3. A sample of the ground water is to be collected prior to entry of Manhole No. 403 in Quarter section 16-22 and analyzed for those parameters listed as Instantaneous Effluent Limitations in the Phoenix City Code, Section 28-8. All parameters shall be analyzed using methods established by Title 40 Code of Federal Regulations Part 136 or as stated in the transmittal letter attached.
4. Permittee shall submit analytical results as established in Section 3 of this permit within thirty (30) days of completion.
5. Permittee shall submit a final status report within ten (10) days of the date of discharge. This report shall include the date(s) of discharge, time of day this discharge occurred, and the total gallonage.



## City of Phoenix

WATER SERVICES DEPARTMENT  
POLLUTION CONTROL DIVISION

### MANHOLE ENTRY PERMIT

The City of Phoenix, acting through the Water Services Department, hereby issues a manhole permit to:

Roy F. Weston, Inc.  
(on behalf of ADEQ)  
Suite 2001  
2702 North Third Street  
Phoenix, Arizona 85004-4600

hereinafter called Permittee, for the purpose of entering a City of Phoenix manhole no. 403 in Quarter Section 16-22 to dispose of purged groundwater brought to the surface during groundwater well operations at:

The West Central Phoenix East Grand Avenue Plume  
Water Quality Assurance Revolving Fund  
Phoenix, Arizona 85009

The manhole entry permit is issued in accordance with Phoenix City Code Chapter 28 Sections 28-8 and 28-27 and subject to the following conditions:

1. That the only activities authorized by the permit are for the purposes of removal of the contained purged groundwater wastewater, and that the Permittee conduct no other activity while entering upon the public property authorized by this permit.
2. That the Permittee's activities be conducted only within the time period of September 18, 2000, through September 26, 2000, unless authorized in writing by the Water Services Director for an extension of time, or unless revoked earlier, and that the Permittee notify the Water Services Department in advance of each separate entry.
3. A sample of the ground water is to be collected prior to entry of Manhole No. 403 in Quarter section 16-22 and analyzed for those parameters listed as Instantaneous Effluent Limitations in the Phoenix City Code, Section 28-8. All parameters shall be analyzed using methods established by Title 40 Code of Federal Regulations Part 136 or as stated in the transmittal letter attached.
4. Permittee shall submit analytical results as established in Section 3 of this permit within thirty (30) days of completion.
5. Permittee shall submit a final status report within ten (10) days of the date of discharge. This report shall include the date(s) of discharge, time of day this discharge occurred, and the total gallonage.



## City of Phoenix

6. Permittee shall incur cost of \$1.2242 per one hundred cubic feet (or current rate as established by water accounting) of ground water discharged.
7. That the Permittee, when finished with the removal and discharge activities, replace to the satisfaction of the Water Services Director, any manhole covers or other disturbances to the City of Phoenix sewer lines that the Permittee caused during the course of the Permittee activities.
8. That the Permittee obtain a street closure permit for restrictions of all streets, sidewalks, and alleys. Manholes located in major streets require street closure. Contact City of Phoenix Street Transportation (602-262-6235) for street closure procedures and permit.
9. That the Permittee agrees to save and hold harmless, the City, any of its departments, agencies, officers or employees from all costs and damages occurred by any of the above from any damage to any person or property whatsoever which is caused by the activity, condition or event arising out of the negligent performance or nonperformance of any of the provisions of this permit by the Permittee any of the Permittee's agents, or any of the Permittee's independent contractors. The above costs incurred by the City, any of its departments, agencies, officers or employees shall include in the event of any action, court cost, expensive litigation and reasonable attorney fees. When any of the above costs and/or damages occur as aforesaid, the Permittee assumes the burden of proof that the negligent activity, condition or event did not cause such cost damage or other expense the City may incur.

The Permittee agrees to the condition set forth in this permit, and understands that all activities done under the conditions of this permit should conform to the laws of the City of Phoenix and the State of Arizona.

Dated this 19<sup>th</sup> day of September, 2000.

John R. Peterson for R.F. Weston  
Permittee

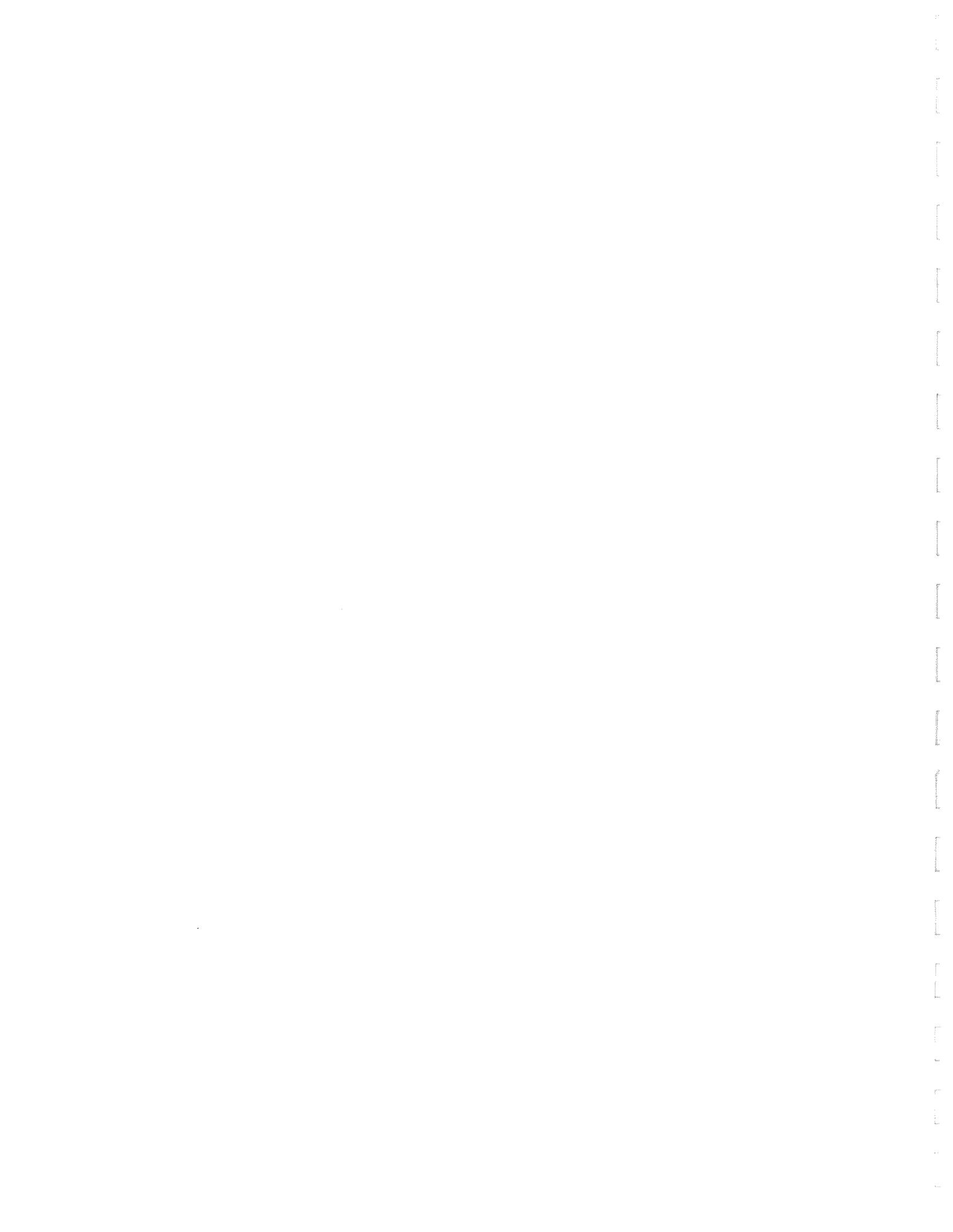
Dated this 15<sup>th</sup> day of September, 2000.

CITY OF PHOENIX,  
a municipal corporation

By: Kenneth Karnes  
Kenneth Karnes  
Chief Water Quality Inspector  
Water Services Department  
h:\WESTON00PC-120



**GROUNDWATER SAMPLING – ROUND 6**





## City of Phoenix

WATER SERVICES DEPARTMENT  
POLLUTION CONTROL DIVISION

November 17, 2000

Mr. Richard C. Findlay  
Geologist  
Roy F. Weston, Inc  
Suite 2001  
2702 North Third Street  
Phoenix, Arizona 85004-4600

**RE: Manhole Entry Permit for discharge of purge groundwater generated from sampling activities as part of the ongoing ADEQ remedial investigation in the West Central Phoenix (WCP) East Grand Avenue Plume Water Quality Assurance Revolving Fund (WQARF) Registry Site.**

Dear Mr. Findlay:

Per your letter of November 13, 2000, in which you requested to discharge approximately 900 gallons of purged groundwater generated from monitoring wells located within the WCP East Grand Avenue Plume Water Quality Assurance Revolving Fund Registry Site, Phoenix, Arizona. The purged groundwater will be generated from sampling events scheduled for December 4, through December 15, 2000.

Approval is hereby granted for the discharge of approximately 900 gallons of purged well water. This discharge is anticipated to occur sometime during the period of December 4, 2000, through December 15, 2000, to the City of Phoenix manhole #403, in Quarter Section 16-22.

This approval is based on the results of the laboratory analysis submitted in your letter of November 13, 2000. Our review indicates the parameters listed in the Phoenix City Code, Chapter 28, Section 28-8 were analyzed and the results reported by EPA methods 8260 B Volatile Organic compounds, 13 priority pollutant metals with EPA Method 200.7, and pH with EPA Method 150.1. All concentrations were found to be less than the Phoenix City Code Prohibited Substances and Instantaneous Effluent Limitations.

It is the opinion of the City of Phoenix Pollution Control Division that the wastewater meets all requirements under Chapter 28. The wastewater is also determined not to be in sufficient quantity to injure or interfere with any sewage treatment process, cause corrosive structural damage, constitute a hazard to humans, or create any hazard to the sewer system, or in the receiving waters of the sewage treatment plant.



## City of Phoenix

Mr. Richard C. Findlay  
Geologist  
Page 2  
November 17, 2000

Please submit your final status report within ten (10) days of the last date of discharge. This report shall include the date(s) of discharge, time of day this discharge occurred, and the total gallonage.

Should you have any questions, please contact me at (602)-534-2078. Our office hours are 8:00 a.m. to 5:00 p.m., Monday through Friday.

Sincerely,

A handwritten signature in cursive script that reads "Richard A. Thayer".

Richard A. Thayer  
Senior Water Quality Inspector  
h:\WESTON00PC-158

Attachment

c: Kenneth Karnes, Chief Water Quality Inspector



## City of Phoenix

WATER SERVICES DEPARTMENT  
POLLUTION CONTROL DIVISION

### MANHOLE ENTRY PERMIT

The City of Phoenix, acting through the Water Services Department, hereby issues a manhole permit to:

Roy F. Weston, Inc.  
(on behalf of ADEQ)  
Suite 2001  
2702 North Third Street  
Phoenix, Arizona 85004-4600

hereinafter called Permittee, for the purpose of entering a City of Phoenix manhole no. 403 in Quarter Section 16-22 to dispose of purged groundwater brought to the surface during groundwater well operations at:

The West Central Phoenix East Grand Avenue Plume  
Water Quality Assurance Revolving Fund  
Phoenix, Arizona 85009

The manhole entry permit is issued in accordance with Phoenix City Code Chapter 28 Sections 28-8 and 28-27 and subject to the following conditions:

1. That the only activities authorized by the permit are for the purposes of removal of the contained purged groundwater wastewater, and that the Permittee conduct no other activity while entering upon the public property authorized by this permit.
2. That the Permittee's activities be conducted only within the time period of December 4, 2000, through December 14, 2000, unless authorized in writing by the Water Services Director for an extension of time, or unless revoked earlier, and that the Permittee notify the Water Services Department in advance of each separate entry.
3. A sample of the ground water is to be collected prior to entry of Manhole No. 403 in Quarter section 16-22 and analyzed for those parameters listed as Instantaneous Effluent Limitations in the Phoenix City Code, Section 28-8. All parameters shall be analyzed using methods established by Title 40 Code of Federal Regulations Part 136 or as stated in the transmittal letter attached.
4. Permittee shall submit analytical results as established in Section 3 of this permit within thirty (30) days of completion.
5. Permittee shall submit a final status report within ten (10) days of the date of discharge. This report shall include the date(s) of discharge, time of day this discharge occurred, and the total gallonage.



## City of Phoenix

6. Permittee shall incur cost of \$1.2242 per one hundred cubic feet (or current rate as established by water accounting) of ground water discharged.
7. That the Permittee, when finished with the removal and discharge activities, replace to the satisfaction of the Water Services Director, any manhole covers or other disturbances to the City of Phoenix sewer lines that the Permittee caused during the course of the Permittee activities.
8. That the Permittee obtain a street closure permit for restrictions of all streets, sidewalks, and alleys. Manholes located in major streets require street closure. Contact City of Phoenix Street Transportation (602-262-6235) for street closure procedures and permit.
9. That the Permittee agrees to save and hold harmless, the City, any of its departments, agencies, officers or employees from all costs and damages occurred by any of the above from any damage to any person or property whatsoever which is caused by the activity, condition or event arising out of the negligent performance or nonperformance of any of the provisions of this permit by the Permittee any of the Permittee's agents, or any of the Permittee's independent contractors. The above costs incurred by the City, any of its departments, agencies, officers or employees shall include in the event of any action, court cost, expensive litigation and reasonable attorney fees. When any of the above costs and/or damages occur as aforesaid, the Permittee assumes the burden of proof that the negligent activity, condition or event did not cause such cost damage or other expense the City may incur.

The Permittee agrees to the condition set forth in this permit, and understands that all activities done under the conditions of this permit should conform to the laws of the City of Phoenix and the State of Arizona.

Dated this 17<sup>th</sup> day of November, 2000.

Alan R. Peterson for Roy J. Weston  
Permittee

Dated this 17<sup>th</sup> day of November, 2000.

CITY OF PHOENIX,  
a municipal corporation

By: Kenneth Karnes

Kenneth Karnes  
Chief Water Quality Inspector  
Water Services Department  
h:\WESTON00PC-158

**GROUNDWATER SAMPLING – ROUND 7**





## City of Phoenix

WATER SERVICES DEPARTMENT  
POLLUTION CONTROL DIVISION

February 14, 2001

Mr. Richard C. Findlay  
Geologist  
Roy F. Weston, Inc  
Suite 2001  
2702 North Third Street  
Phoenix, Arizona 85004-4600

**RE: Manhole Entry Permit for discharge of purge groundwater generated from sampling activities as part of the ongoing remedial investigation in the West Central Phoenix-(WCP) East Grand Avenue Plume Site.**

Dear Mr. Findlay:

I am in receipt of your letter of February 13, 2001, in which you requested to discharge approximately 8,000 gallons of purged groundwater generated from monitoring wells located within the WCP East Grand Avenue Plume Site, Phoenix, Arizona.

Approval is hereby granted for the discharge of approximately 8,000 gallons of purged well water. This discharge is anticipated to occur sometime during the period of February 21, 2001 through March 7, 2001, to the City of Phoenix manhole #403, in Quarter Section 16-22.

This approval is based on a thorough review of the results of the laboratory analysis submitted in your letter of February 13, 2001. Our review indicates the parameters listed in the Phoenix City Code, Chapter 28, Section 28-8 were analyzed and the results reported by EPA methods 8260 Volatile Organics. All concentrations were found to be less than the Phoenix City Code Prohibited Substances and Instantaneous Effluent Limitations.

It is the opinion of the City of Phoenix Pollution Control Division that the wastewater meets all requirements under Chapter 28. The wastewater is also determined not to be in sufficient quantity to injure or interfere with any sewage treatment process, cause corrosive structural damage, constitute a hazard to humans, or create any hazard to the sewer system, or in the receiving waters of the sewage treatment plant.

Please submit your final status report within ten (10) days of the last date of discharge. This report shall include the date(s) of discharge, time of day this discharge occurred, and the total gallonage.



## City of Phoenix

Mr. Richard C. Findlay  
Geologist  
Page 2  
February 14, 2001

Should you have any questions, please contact me at (602)-534-2078. Our office hours are 8:00 a.m. to 5:00 p.m., Monday through Friday.

Sincerely,

A handwritten signature in cursive script that reads "Richard A. Thayer".

Richard A. Thayer  
Senior Water Quality Inspector  
h:\WESTON01PC-028

Attachment

c: Kenneth Karnes, Chief Water Quality Inspector



## City of Phoenix

WATER SERVICES DEPARTMENT  
POLLUTION CONTROL DIVISION

### MANHOLE ENTRY PERMIT

The City of Phoenix, acting through the Water Services Department, hereby issues a manhole permit to: Geotechnical and Environmental Consultants, Inc.

Roy F. Weston, Inc.  
On behalf of ADEQ  
Suite 2001  
2702 North Third Street  
Phoenix, Arizona 85012-2634

hereinafter called Permittee, for the purpose of entering a City of Phoenix manhole no. 403 in Quarter Section 16-22 to dispose of purged groundwater brought to the surface during groundwater well operations at:

The West Central Phoenix East Grand Avenue Plume Site in  
Phoenix, Arizona 85009

The manhole entry permit is issued in accordance with Phoenix City Code Chapter 28 Sections 28-8 and 28-27 and subject to the following conditions:

1. That the only activities authorized by the permit are for the purposes of removal of the contained purged groundwater wastewater, and that the Permittee conduct no other activity while entering upon the public property authorized by this permit.
2. That the Permittee's activities be conducted only within the time period of February 21, 2001, through March 7, 2001, unless authorized in writing by the Water Services Director for an extension of time, or unless revoked earlier, and that the Permittee notify the Water Services Department in advance of each separate entry.
3. A sample of the ground water is to be collected prior to entry of Manhole No. 403 in Quarter section 16-22 and analyzed for those parameters listed as Instantaneous Effluent Limitations in the Phoenix city Code, section 28-8. Also, samples shall be analyzed for 13-priority pollutant metals in accordance with EPA method 200.7 and pH in accordance with EPA method 150.1.
4. Permittee shall submit analytical results as established in Section 3 of this permit within in thirty (30) days of completion. Permittee shall submit a final status report within ten (10) days of the date of discharge. This report shall include the date(s) of discharge, time of day this discharge occurred, and the total gallonage.
5. Permittee shall submit a final status report within ten (10) days of the date of discharge. This report shall include the date(s) of discharge, time of day this discharge occurred, and the total gallonage.



## City of Phoenix

6. Permittee shall incur cost of \$1.2242 per one hundred cubic feet (or current rate as established by water accounting) of ground water discharged.
7. That the Permittee, when finished with the removal and discharge activities, replace to the satisfaction of the Water Services Director, any manhole covers or other disturbances to the City of Phoenix sewer lines that the Permittee caused during the course of the Permittee activities.
8. That the Permittee obtain a street closure permit for restrictions of all streets, sidewalks, and alleys. Manholes located in major streets require street closure. Contact City of Phoenix Street Transportation (602-262-6235) for street closure procedures and permit.
9. That the Permittee agrees to save and hold harmless, the City, any of its departments, agencies, officers or employees from all costs and damages occurred by any of the above from any damage to any person or property whatsoever which is caused by the activity, condition or event arising out of the negligent performance or nonperformance of any of the provisions of this permit by the Permittee any of the Permittee's agents, or any of the Permittee's independent contractors. The above costs incurred by the City, any of its departments, agencies, officers or employees shall include in the event of any action, court cost, expensive litigation and reasonable attorney fees. When any of the above costs and/or damages occur as aforesaid, the Permittee assumes the burden of proof that the negligent activity, condition or event did not cause such cost damage or other expense the City may incur.

The Permittee agrees to the condition set forth in this permit, and understands that all activities done under the conditions of this permit should conform to the laws of the City of Phoenix and the State of Arizona.

Dated this 16 day of February, 2001.

Richard C. P. [Signature]  
Permittee

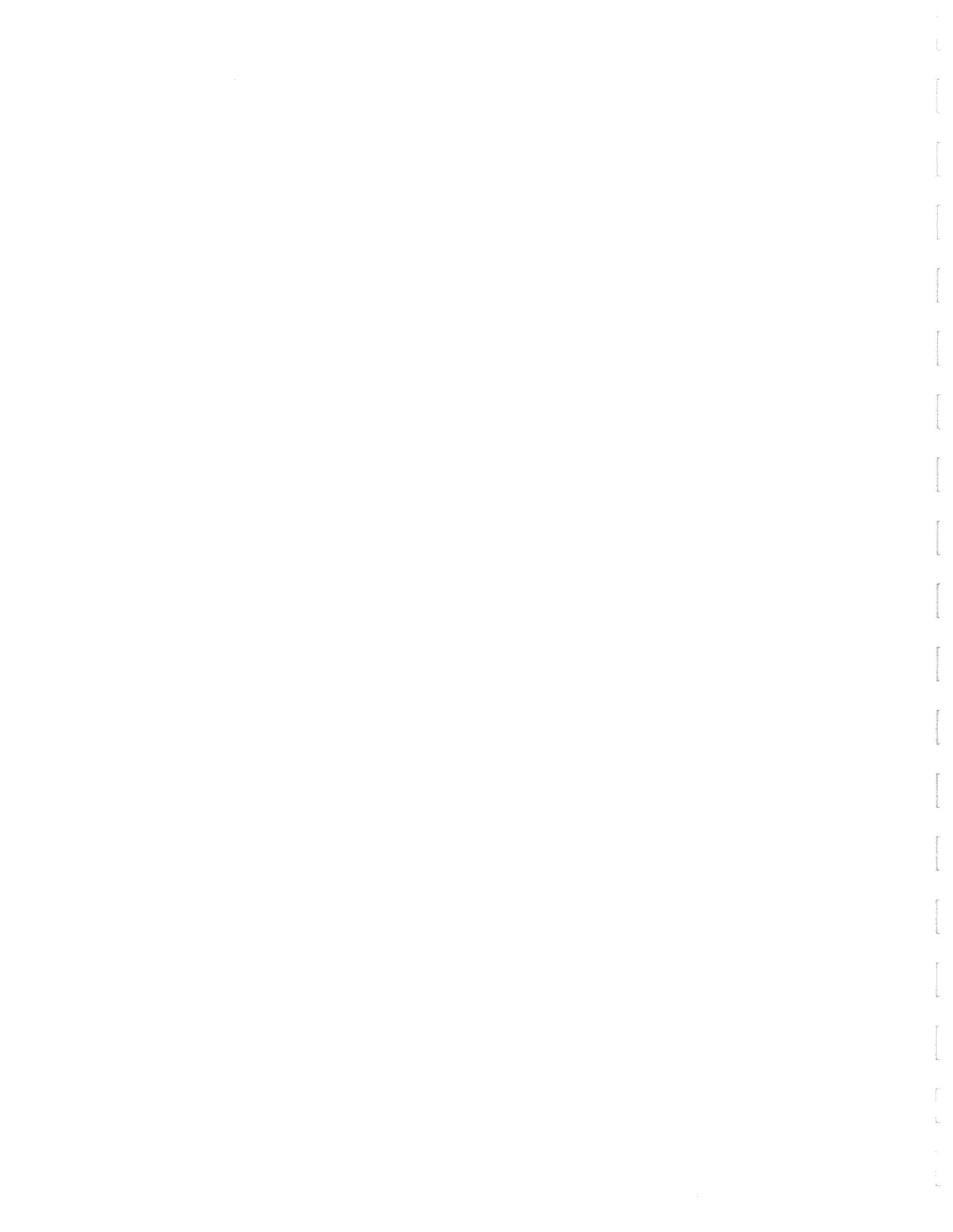
Dated this 14<sup>th</sup> day of February, 2001.

CITY OF PHOENIX,  
a municipal corporation

By:

[Signature]  
Kenneth Karnes  
Chief Water Quality Inspector  
Water Services Department  
h:\WESTON01PC-028

**GROUNDWATER SAMPLING – ROUND 8**





## City of Phoenix

WATER SERVICES DEPARTMENT  
POLLUTION CONTROL DIVISION

April 18, 2001

**FILE**

Mr. Richard C. Findlay  
Geologist  
Roy F. Weston, Inc  
Suite 2001  
2702 North Third Street  
Phoenix, Arizona 85004-4600

**RE: Manhole Entry Permit for discharge of purge groundwater generated from sampling activities as part of the ongoing remedial investigation in the West Central Phoenix (WCP) East Grand Avenue Plume Site.**

Dear Mr. Findlay:

I am in receipt of your letter of April 10, 2001, in which you requested to discharge approximately 1,500 gallons of purged groundwater generated from monitoring wells located within the WCP East Grand Avenue Plume Site, Phoenix, Arizona.

Approval is hereby granted for the discharge of approximately 1,500 gallons of purged well water. This discharge is anticipated to occur sometime during the period of April 23, 2001 through May 11, 2001, to the City of Phoenix manhole #403, in Quarter Section 16-22.

This approval is based on the historical data submitted in your letter of February 13, 2001. Our review indicates the parameters listed in the Phoenix City Code, Chapter 28, Section 28-8 were analyzed and the results reported by EPA methods 8260 Volatile Organics. All concentrations were found to be less than the Phoenix City Code Prohibited Substances and Instantaneous Effluent Limitations.

It is the opinion of the City of Phoenix Pollution Control Division that the wastewater meets all requirements under Chapter 28. The wastewater is also determined not to be in sufficient quantity to injure or interfere with any sewage treatment process, cause corrosive structural damage, constitute a hazard to humans, or create any hazard to the sewer system, or in the receiving waters of the sewage treatment plant.

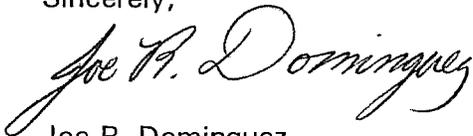
Please submit your final status report within ten (10) days of the last date of discharge. This report shall include the date(s) of discharge, time of day this discharge occurred, and the total gallonage.

Mr. Richard C. Findlay  
April 18, 2001  
Page 2

Additionally, a sample of the purged groundwater will be collected and analyzed for VOCs and metals prior to discharge into the City of Phoenix Sanitary Sewer. Submit these results within 30 days of completing the discharge.

Should you have any questions, please contact me at (602)-534-2078. Our office hours are 8:00 a.m. to 5:00 p.m., Monday through Friday.

Sincerely,

A handwritten signature in cursive script that reads "Joe R. Dominguez".

Joe R. Dominguez  
Water Quality Inspector  
g:\WESTONMPH-069

Attachment

c: Kenneth Karnes, Chief Water Quality Inspector



## City of Phoenix

### MANHOLE ENTRY PERMIT

The City of Phoenix, acting through the Water Services Department, hereby issues a manhole permit to:

Roy F. Weston, Inc.  
On behalf of ADEQ  
Suite 2001  
2702 North Third Street  
Phoenix, Arizona 85012-2634

hereinafter called Permittee, for the purpose of entering a City of Phoenix manhole no. 403 in Quarter Section 16-22 to dispose of purged groundwater brought to the surface during groundwater well operations at:

The West Central Phoenix East Grand Avenue Plume Site in  
Phoenix, Arizona 85009

The manhole entry permit is issued in accordance with Phoenix City Code Chapter 28 Sections 28-8 and 28-27 and subject to the following conditions:

1. That the only activities authorized by the permit are for the purposes of removal of the contained purged groundwater wastewater, and that the Permittee conduct no other activity while entering upon the public property authorized by this permit.
2. That the Permittee's activities be conducted only within the time period of April 23, 2001, through May 11, 2001, unless authorized in writing by the Water Services Director for an extension of time, or unless revoked earlier, and that the Permittee notify the Water Services Department in advance of each separate entry.
3. A sample of the ground water is to be collected prior to entry of Manhole No. 403 in Quarter section 16-22 and analyzed for those parameters listed as Instantaneous Effluent Limitations in the Phoenix city Code, section 28-8. Also, samples shall be analyzed for 13-priority pollutant metals in accordance with EPA method 200.7 and pH in accordance with EPA method 150.1.
4. Permittee shall submit analytical results as established in Section 3 of this permit within thirty (30) days of completion. Permittee shall submit a final status report within ten (10) days of the date of discharge. This report shall include the date(s) of discharge, time of day this discharge occurred, and the total gallonage.
5. Permittee shall submit a final status report within ten (10) days of the date of discharge. This report shall include the date(s) of discharge, time of day this discharge occurred, and the total gallonage.

6. Permittee shall incur cost of \$1.2242 per one hundred cubic feet (or current rate as established by water accounting) of ground water discharged.
7. That the Permittee, when finished with the removal and discharge activities, replace to the satisfaction of the Water Services Director, any manhole covers or other disturbances to the City of Phoenix sewer lines that the Permittee caused during the course of the Permittee activities.
8. That the Permittee obtain a street closure permit for restrictions of all streets, sidewalks, and alleys. Manholes located in major streets require street closure. Contact City of Phoenix Street Transportation (602-262-6235) for street closure procedures and permit.
9. That the Permittee agrees to save and hold harmless, the City, any of its departments, agencies, officers or employees from all costs and damages occurred by any of the above from any damage to any person or property whatsoever which is caused by the activity, condition or event arising out of the negligent performance or nonperformance of any of the provisions of this permit by the Permittee any of the Permittee's agents, or any of the Permittee's independent contractors. The above costs incurred by the City, any of its departments, agencies, officers or employees shall include in the event of any action, court cost, expensive litigation and reasonable attorney fees. When any of the above costs and/or damages occur as aforesaid, the Permittee assumes the burden of proof that the negligent activity, condition or event did not cause such cost damage or other expense the City may incur.

The Permittee agrees to the condition set forth in this permit, and understands that all activities done under the conditions of this permit should conform to the laws of the City of Phoenix and the State of Arizona.

Dated this 24 day of April, 2001.

Richard C. P. Olay  
Permittee

Dated this 24 day of April, 2001.

CITY OF PHOENIX,  
a municipal corporation

By: Kenneth Karnes  
Kenneth Karnes  
Chief Water Quality Inspector  
Water Services Department  
g:\WESTONMPH-069

**AQUIFER TEST**





## City of Phoenix

WATER SERVICES DEPARTMENT  
POLLUTION CONTROL DIVISION

June 26, 2001

Mr. Richard C. Findlay  
Geologist  
Roy F. Weston, Inc  
Suite 2001  
2702 North Third Street  
Phoenix, Arizona 85004-4600

**RE: Manhole Entry Permit for discharge of purge groundwater generated from sampling activities as part of the ongoing remedial investigation in the West Central Phoenix (WCP) East Grand Avenue Plume Site.**

Dear Mr. Findlay:

I am in receipt of your letter of June 15, 2001 in which you requested to discharge approximately 60,000 gallons of purged groundwater generated from monitoring wells located within the WCP East Grand Avenue Plume Site, Phoenix, Arizona.

Approval is hereby granted for the discharge of approximately 60,000 gallons of purged well water. This discharge is anticipated to occur sometime during the period of June 27, 2001 through July 6, 2001, to the City of Phoenix manhole #403, in Quarter Section 16-22.

This approval is based on a thorough review of the results of the laboratory analysis submitted in your letter of and June 15, 2001. Our review indicates the parameters listed in the Phoenix City Code, Chapter 28, Section 28-8 were analyzed and the results reported by EPA methods 8260 Volatile Organics. All concentrations were found to be less than the Phoenix City Code Prohibited Substances and Instantaneous Effluent Limitations.

It is the opinion of the City of Phoenix Pollution Control Division that the wastewater meets all requirements under Chapter 28. The wastewater is also determined not to be in sufficient quantity to injure or interfere with any sewage treatment process, cause corrosive structural damage, constitute a hazard to humans, or create any hazard to the sewer system, or in the receiving waters of the sewage treatment plant.

Please submit your final status report within ten (10) days of the last date of discharge. This report shall include the date(s) of discharge, time of day this discharge occurred, and the total gallonage.



## City of Phoenix

Mr. Richard C. Findlay  
Geologist  
Page 2  
June 26, 2001

Should you have any questions, please contact me at (602)-534-2078. Our office hours are 8:00 a.m. to 5:00 p.m., Monday through Friday.

Sincerely,

A handwritten signature in cursive script that reads "Richard A. Thayer".

Richard A. Thayer  
Senior Water Quality Inspector  
h:\WESTON01PC-109

Attachment

c: Kenneth Karnes, Chief Water Quality Inspector



## City of Phoenix

WATER SERVICES DEPARTMENT  
POLLUTION CONTROL DIVISION

### MANHOLE ENTRY PERMIT

The City of Phoenix, acting through the Water Services Department, hereby issues a manhole permit to:

Roy F. Weston, Inc.  
On behalf of ADEQ  
Suite 2001  
2702 North Third Street  
Phoenix, Arizona 85012-2634

hereinafter called Permittee, for the purpose of entering a City of Phoenix manhole no. 403 in Quarter Section 16-22 to dispose of purged groundwater brought to the surface during groundwater well operations at:

The West Central Phoenix East Grand Avenue Plume Site in  
Phoenix, Arizona 85009

The manhole entry permit is issued in accordance with Phoenix City Code Chapter 28 Sections 28-8 and 28-27 and subject to the following conditions:

1. That the only activities authorized by the permit are for the purposes of removal of the contained purged groundwater wastewater, and that the Permittee conduct no other activity while entering upon the public property authorized by this permit.
2. That the Permittee's activities be conducted only within the time period of June 27, 2001, through July 6, 2001, unless authorized in writing by the Water Services Director for an extension of time, or unless revoked earlier, and that the Permittee notify the Water Services Department in advance of each separate entry.
3. Permittee shall submit a final status report within ten (10) days of the date of discharge. This report shall include the date(s) of discharge, time of day this discharge occurred, and the total gallonage.
4. Permittee shall incur cost of \$1.2242 per one hundred cubic feet (or current rate as established by water accounting) of ground water discharged.
5. That the Permittee, when finished with the removal and discharge activities, replace to the satisfaction of the Water Services Director, any manhole covers or other disturbances to the City of Phoenix sewer lines that the Permittee caused during the course of the Permittee activities.



## City of Phoenix

6. That the Permittee obtain a street closure permit for restrictions of all streets, sidewalks, and alleys. Manholes located in major streets require street closure. Contact City of Phoenix Street Transportation (602-262-6235) for street closure procedures and permit.
7. That the Permittee agrees to save and hold harmless, the City, any of its departments, agencies, officers or employees from all costs and damages occurred by any of the above from any damage to any person or property whatsoever which is caused by the activity, condition or event arising out of the negligent performance or nonperformance of any of the provisions of this permit by the Permittee any of the Permittee's agents, or any of the Permittee's independent contractors. The above costs incurred by the City, any of its departments, agencies, officers or employees shall include in the event of any action, court cost, expensive litigation and reasonable attorney fees. When any of the above costs and/or damages occur as aforesaid, the Permittee assumes the burden of proof that the negligent activity, condition or event did not cause such cost damage or other expense the City may incur.

The Permittee agrees to the condition set forth in this permit, and understands that all activities done under the conditions of this permit should conform to the laws of the City of Phoenix and the State of Arizona.

Dated this 28 day of June, 2001.

David Matz  
Permittee

Dated this 27th day of June, 2001.

CITY OF PHOENIX,  
a municipal corporation

By: Kenny Karnes  
Kenneth Karnes  
Chief Water Quality Inspector  
Water Services Department  
h:\WESTON01PC-109

**GROUNDWATER SAMPLING – ROUND 9**





## City of Phoenix

WATER SERVICES DEPARTMENT  
POLLUTION CONTROL DIVISION

June 7, 2001

Mr. Richard C. Findlay  
Geologist  
Roy F. Weston, Inc  
Suite 2001  
2702 North Third Street  
Phoenix, Arizona 85004-4600

**RE: Manhole Entry Permit for discharge of purge groundwater generated from sampling activities as part of the ongoing remedial investigation in the West Central Phoenix (WCP) East Grand Avenue Plume Site.**

Dear Mr. Findlay:

I am in receipt of your letter of May 30, 2001, in which you requested to discharge approximately 1500 gallons of purged groundwater generated from monitoring wells located within the WCP East Grand Avenue Plume Site, Phoenix, Arizona.

Approval is hereby granted for the discharge of approximately 1500 gallons of purged well water. This discharge is anticipated to occur sometime during the period of June 8, 2001 through June 19, 2001, to the City of Phoenix manhole #403, in Quarter Section 16-22.

This approval is based on a thorough review of the results of the laboratory analysis submitted in your letter of May 30, 2001. Our review indicates the parameters listed in the Phoenix City Code, Chapter 28, Section 28-8 were analyzed and the results reported by EPA methods 8260 Volatile Organics. All concentrations were found to be less than the Phoenix City Code Prohibited Substances and Instantaneous Effluent Limitations.

It is the opinion of the City of Phoenix Pollution Control Division that the wastewater meets all requirements under Chapter 28. The wastewater is also determined not to be in sufficient quantity to injure or interfere with any sewage treatment process, cause corrosive structural damage, constitute a hazard to humans, or create any hazard to the sewer system, or in the receiving waters of the sewage treatment plant.

Please submit your final status report within ten (10) days of the last date of discharge. This report shall include the date(s) of discharge, time of day this discharge occurred, and the total gallonage.



## City of Phoenix

Mr. Richard C. Findlay  
Geologist  
Page 2  
June 7, 2001

Should you have any questions, please contact me at (602)-534-2078. Our office hours are 8:00 a.m. to 5:00 p.m., Monday through Friday.

Sincerely,

A handwritten signature in cursive script that reads "Richard A. Thayer".

Richard A. Thayer  
Senior Water Quality Inspector  
h:\WESTON01PC-104

Attachment

c: Kenneth Karnes, Chief Water Quality Inspector



## City of Phoenix

WATER SERVICES DEPARTMENT  
POLLUTION CONTROL DIVISION

### MANHOLE ENTRY PERMIT

The City of Phoenix, acting through the Water Services Department, hereby issues a manhole permit to:

Roy F. Weston, Inc.  
On behalf of ADEQ  
Suite 2001  
2702 North Third Street  
Phoenix, Arizona 85012-2634

hereinafter called Permittee, for the purpose of entering a City of Phoenix manhole no. 403 in Quarter Section 16-22 to dispose of purged groundwater brought to the surface during groundwater well operations at:

The West Central Phoenix East Grand Avenue Plume Site in  
Phoenix, Arizona 85009

The manhole entry permit is issued in accordance with Phoenix City Code Chapter 28 Sections 28-8 and 28-27 and subject to the following conditions:

1. That the only activities authorized by the permit are for the purposes of removal of the contained purged groundwater wastewater, and that the Permittee conduct no other activity while entering upon the public property authorized by this permit.
2. That the Permittee's activities be conducted only within the time period of June 8, 2001, through June 19, 2001, unless authorized in writing by the Water Services Director for an extension of time, or unless revoked earlier, and that the Permittee notify the Water Services Department in advance of each separate entry.
3. Permittee shall submit a final status report within ten (10) days of the date of discharge. This report shall include the date(s) of discharge, time of day this discharge occurred, and the total gallonage.
4. Permittee shall incur cost of \$1.2242 per one hundred cubic feet (or current rate as established by water accounting) of ground water discharged.
5. That the Permittee, when finished with the removal and discharge activities, replace to the satisfaction of the Water Services Director, any manhole covers or other disturbances to the City of Phoenix sewer lines that the Permittee caused during the course of the Permittee activities.



## City of Phoenix

6. That the Permittee obtain a street closure permit for restrictions of all streets, sidewalks, and alleys. Manholes located in major streets require street closure. Contact City of Phoenix Street Transportation (602-262-6235) for street closure procedures and permit.
7. That the Permittee agrees to save and hold harmless, the City, any of its departments, agencies, officers or employees from all costs and damages occurred by any of the above from any damage to any person or property whatsoever which is caused by the activity, condition or event arising out of the negligent performance or nonperformance of any of the provisions of this permit by the Permittee any of the Permittee's agents, or any of the Permittee's independent contractors. The above costs incurred by the City, any of its departments, agencies, officers or employees shall include in the event of any action, court cost, expensive litigation and reasonable attorney fees. When any of the above costs and/or damages occur as aforesaid, the Permittee assumes the burden of proof that the negligent activity, condition or event did not cause such cost damage or other expense the City may incur.

The Permittee agrees to the condition set forth in this permit, and understands that all activities done under the conditions of this permit should conform to the laws of the City of Phoenix and the State of Arizona.

Dated this 11<sup>th</sup> day of June, 2001.

Alan Peterson for Roy F. Weston, Inc.  
Permittee

Dated this 7<sup>th</sup> day of June, 2001.

CITY OF PHOENIX,  
a municipal corporation

By: Kenneth Karnes  
Kenneth Karnes  
Chief Water Quality Inspector  
Water Services Department  
h:\WESTON01PC-104

**GROUNDWATER SAMPLING – ROUND 10**





## City of Phoenix

WATER SERVICES DEPARTMENT  
POLLUTION CONTROL DIVISION

June 21, 2001

Mr. Richard C. Findlay  
Geologist  
Roy F. Weston, Inc  
Suite 2001  
2702 North Third Street  
Phoenix, Arizona 85004-4600

**RE: Manhole Entry Permit for discharge of purge groundwater generated from sampling activities as part of the ongoing remedial investigation in the West Central Phoenix (WCP) East Grand Avenue Plume Site.**

Dear Mr. Findlay:

I am in receipt of your letter of May 30, 2001, and June 15, 2001 in which you requested to discharge approximately 3,000 gallons of purged groundwater generated from monitoring wells located within the WCP East Grand Avenue Plume Site, Phoenix, Arizona.

Approval is hereby granted for the discharge of approximately 3,000 gallons of purged well water. This discharge is anticipated to occur sometime during the period of June 22, 2001 through July 6, 2001, to the City of Phoenix manhole #403, in Quarter Section 16-22.

This approval is based on a thorough review of the results of the laboratory analysis submitted in your letter of May 30, 2001 and June 15, 2001. Our review indicates the parameters listed in the Phoenix City Code, Chapter 28, Section 28-8 were analyzed and the results reported by EPA methods 8260 Volatile Organics. All concentrations were found to be less than the Phoenix City Code Prohibited Substances and Instantaneous Effluent Limitations.

It is the opinion of the City of Phoenix Pollution Control Division that the wastewater meets all requirements under Chapter 28. The wastewater is also determined not to be in sufficient quantity to injure or interfere with any sewage treatment process, cause corrosive structural damage, constitute a hazard to humans, or create any hazard to the sewer system, or in the receiving waters of the sewage treatment plant.

Please submit your final status report within ten (10) days of the last date of discharge. This report shall include the date(s) of discharge, time of day this discharge occurred, and the total gallonage.



## City of Phoenix

Mr. Richard C. Findlay  
Geologist  
Page 2  
June 21, 2001

Should you have any questions, please contact me at (602)-534-2078. Our office hours are 8:00 a.m. to 5:00 p.m., Monday through Friday.

Sincerely,

A handwritten signature in cursive script that reads "Richard A. Thayer".

Richard A. Thayer  
Senior Water Quality Inspector  
h:\WESTON01PC-104

Attachment

c: Kenneth Karnes, Chief Water Quality Inspector



## City of Phoenix

WATER SERVICES DEPARTMENT  
POLLUTION CONTROL DIVISION

### MANHOLE ENTRY PERMIT

The City of Phoenix, acting through the Water Services Department, hereby issues a manhole permit to:

Roy F. Weston, Inc.  
On behalf of ADEQ  
Suite 2001  
2702 North Third Street  
Phoenix, Arizona 85012-2634

hereinafter called Permittee, for the purpose of entering a City of Phoenix manhole no. 403 in Quarter Section 16-22 to dispose of purged groundwater brought to the surface during groundwater well operations at:

The West Central Phoenix East Grand Avenue Plume Site in  
Phoenix, Arizona 85009

The manhole entry permit is issued in accordance with Phoenix City Code Chapter 28 Sections 28-8 and 28-27 and subject to the following conditions:

1. That the only activities authorized by the permit are for the purposes of removal of the contained purged groundwater wastewater, and that the Permittee conduct no other activity while entering upon the public property authorized by this permit.
2. That the Permittee's activities be conducted only within the time period of June 22, 2001, through July 6, 2001, unless authorized in writing by the Water Services Director for an extension of time, or unless revoked earlier, and that the Permittee notify the Water Services Department in advance of each separate entry.
3. Permittee shall submit a final status report within ten (10) days of the date of discharge. This report shall include the date(s) of discharge, time of day this discharge occurred, and the total gallonage.
4. Permittee shall incur cost of \$1.2242 per one hundred cubic feet (or current rate as established by water accounting) of ground water discharged.
5. That the Permittee, when finished with the removal and discharge activities, replace to the satisfaction of the Water Services Director, any manhole covers or other disturbances to the City of Phoenix sewer lines that the Permittee caused during the course of the Permittee activities.



## City of Phoenix

6. That the Permittee obtain a street closure permit for restrictions of all streets, sidewalks, and alleys. Manholes located in major streets require street closure. Contact City of Phoenix Street Transportation (602-262-6235) for street closure procedures and permit.
7. That the Permittee agrees to save and hold harmless, the City, any of its departments, agencies, officers or employees from all costs and damages occurred by any of the above from any damage to any person or property whatsoever which is caused by the activity, condition or event arising out of the negligent performance or nonperformance of any of the provisions of this permit by the Permittee any of the Permittee's agents, or any of the Permittee's independent contractors. The above costs incurred by the City, any of its departments, agencies, officers or employees shall include in the event of any action, court cost, expensive litigation and reasonable attorney fees. When any of the above costs and/or damages occur as aforesaid, the Permittee assumes the burden of proof that the negligent activity, condition or event did not cause such cost damage or other expense the City may incur.

The Permittee agrees to the condition set forth in this permit, and understands that all activities done under the conditions of this permit should conform to the laws of the City of Phoenix and the State of Arizona.

Dated this 26 day of June, 2001.

Richard C. Pridley for Weston, Inc.  
Permittee

Dated this 26<sup>th</sup> day of June, 2001.

CITY OF PHOENIX,  
a municipal corporation

By: Kenneth Karnes  
Kenneth Karnes  
Chief Water Quality Inspector  
Water Services Department  
h:\WESTON01PC-104

**GROUNDWATER SAMPLING – ROUND 11**





## City of Phoenix

WATER SERVICES DEPARTMENT  
POLLUTION CONTROL DIVISION

August 1, 2001

Mr. Richard C. Findlay  
Geologist  
Roy F. Weston, Inc  
Suite 2001  
2702 North Third Street  
Phoenix, Arizona 85004-4600

**RE: Manhole Entry Permit for discharge of purge groundwater generated from sampling activities as part of the ongoing remedial investigation in the West Central Phoenix (WCP) East Grand Avenue Plume Site.**

Dear Mr. Findlay:

I am in receipt of your letter of July 23, 2001 in which you requested to discharge approximately 2,000 gallons of purged groundwater generated from monitoring wells located within the WCP East Grand Avenue Plume Site, Phoenix, Arizona.

Approval is hereby granted for the discharge of approximately 2,000 gallons of purged well water. This discharge is anticipated to occur sometime during the period of August 2, 2001 through August 17, 2001, to the City of Phoenix manhole #403, in Quarter Section 16-22.

A sample of the groundwater is to be collected prior to discharge to Manhole 403 in quarter section 16-22 and analyzed for those parameters listed as Instantaneous Effluent Limitations in the Phoenix city Code, Section 28-8. All parameters shall be analyzed using methods established by title 40 Code of Federal Regulations Part 136 or as stated in the transmittal letter attached.

Please submit your final status report within ten (10) days of the last date of discharge. This report shall include the date(s) of discharge, time of day this discharge occurred, and the total gallonage.



## City of Phoenix

Mr. Richard C. Findlay  
Geologist  
Page 2  
August 1, 2001

Should you have any questions, please contact me at (602)-534-2078. Our office hours are 8:00 a.m. to 5:00 p.m., Monday through Friday.

Sincerely,

A handwritten signature in cursive script that reads "Richard A. Thayer".

Richard A. Thayer  
Senior Water Quality Inspector  
h:\WESTON01PC-135

Attachment

c: Kenneth Karnes, Chief Water Quality Inspector



## City of Phoenix

WATER SERVICES DEPARTMENT  
POLLUTION CONTROL DIVISION

### MANHOLE ENTRY PERMIT

The City of Phoenix, acting through the Water Services Department, hereby issues a manhole permit to:

Roy F. Weston, Inc.  
On behalf of ADEQ  
Suite 2001  
2702 North Third Street  
Phoenix, Arizona 85012-2634

hereinafter called Permittee, for the purpose of entering a City of Phoenix manhole no. 403 in Quarter Section 16-22 to dispose of purged groundwater brought to the surface during groundwater well operations at:

The West Central Phoenix East Grand Avenue Plume Site in  
Phoenix, Arizona 85009

The manhole entry permit is issued in accordance with Phoenix City Code Chapter 28 Sections 28-8 and 28-27 and subject to the following conditions:

1. That the only activities authorized by the permit are for the purposes of removal of the contained purged groundwater wastewater, and that the Permittee conduct no other activity while entering upon the public property authorized by this permit.
2. That the Permittee's activities be conducted only within the time period of August 2, 2001, through August 17, 2001, unless authorized in writing by the Water Services Director for an extension of time, or unless revoked earlier, and that the Permittee notify the Water Services Department in advance of each separate entry.
3. A sample of the ground water is to be collected prior to entry of Manhole 403 in Quarter Section 17-19 and analyzed for those parameters listed as Instantaneous Effluent Limitations in the Phoenix City Code, Section 28-8. All parameters shall be analyzed using methods established by title 40 Code of Federal Regulations Part 136 or as stated in the transmittal letter attached.
4. Permittee shall submit a final status report within ten (10) days of the date of discharge. This report shall include the date(s) of discharge, time of day this discharge occurred, and the total gallonage.
5. Permittee shall incur cost of \$1.2242 per one hundred cubic feet (or current rate as established by water accounting) of ground water discharged.

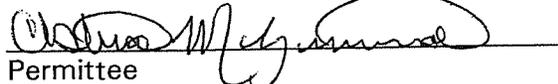


# City of Phoenix

- 6. That the Permittee, when finished with the removal and discharge activities, replace to the satisfaction of the Water Services Director, any manhole covers or other disturbances to the City of Phoenix sewer lines that the Permittee caused during the course of the Permittee activities.
- 7. That the Permittee obtain a street closure permit for restrictions of all streets, sidewalks, and alleys. Manholes located in major streets require street closure. Contact City of Phoenix Street Transportation (602-262-6235) for street closure procedures and permit.
- 8. That the Permittee agrees to save and hold harmless, the City, any of its departments, agencies, officers or employees from all costs and damages occurred by any of the above from any damage to any person or property whatsoever which is caused by the activity, condition or event arising out of the negligent performance or nonperformance of any of the provisions of this permit by the Permittee any of the Permittee's agents, or any of the Permittee's independent contractors. The above costs incurred by the City, any of its departments, agencies, officers or employees shall include in the event of any action, court cost, expensive litigation and reasonable attorney fees. When any of the above costs and/or damages occur as aforesaid, the Permittee assumes the burden of proof that the negligent activity, condition or event did not cause such cost damage or other expense the City may incur.

The Permittee agrees to the condition set forth in this permit, and understands that all activities done under the conditions of this permit should conform to the laws of the City of Phoenix and the State of Arizona.

Dated this 2 day of August, 2001.

  
Permittee

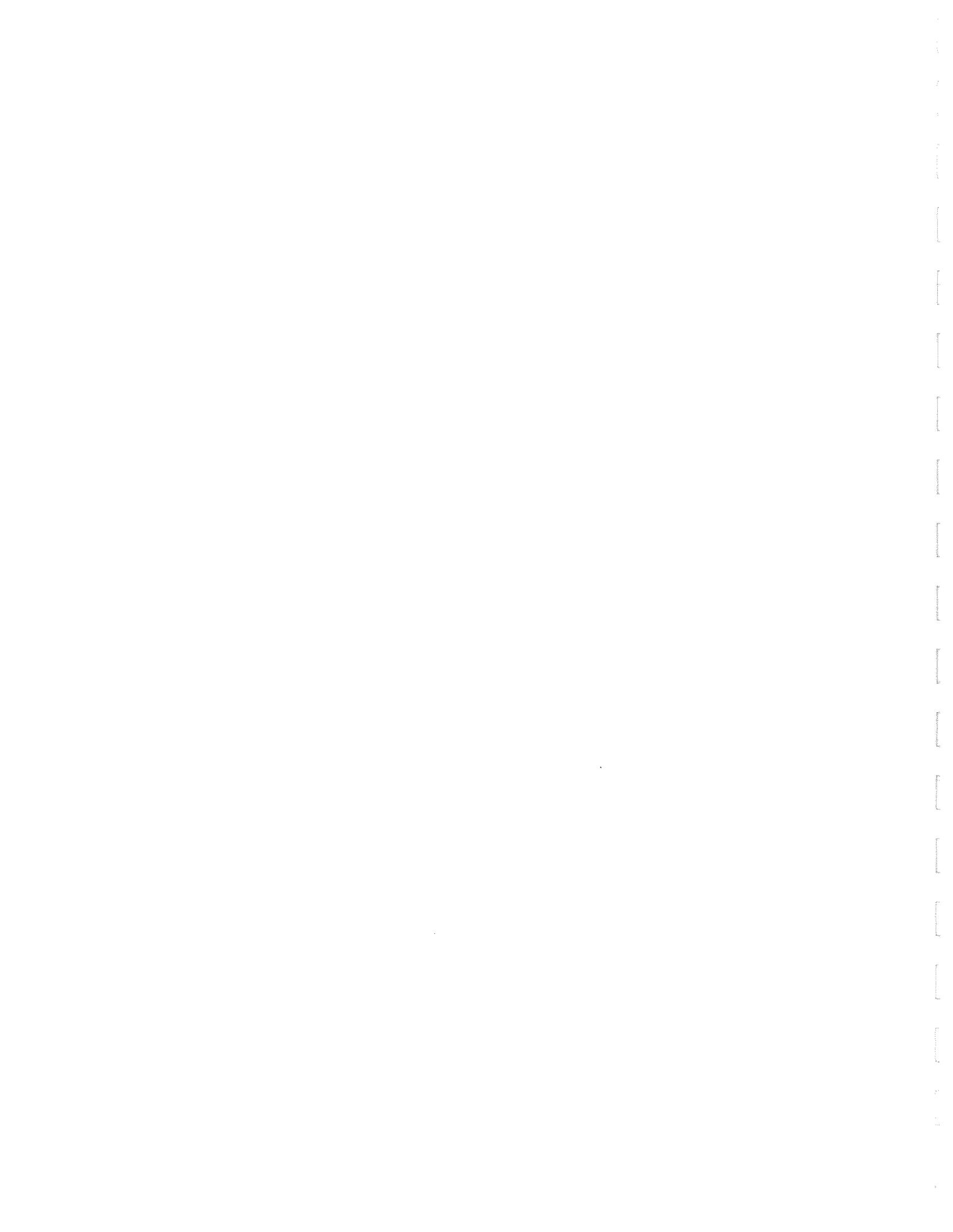
Dated this 1st day of August, 2001.

CITY OF PHOENIX,  
a municipal corporation

By: 

Kenneth Karnes  
Chief Water Quality Inspector  
Water Services Department  
h:\WESTON01PC-135

**GROUNDWATER SAMPLING – ROUND 12**





## City of Phoenix

WATER SERVICES DEPARTMENT  
POLLUTION CONTROL DIVISION

September 17, 2001

Mr. Richard C. Findlay  
Geologist  
Roy F. Weston, Inc  
Suite 2001  
2702 North Third Street  
Phoenix, Arizona 85004-4600

**RE: Manhole Entry Permit for discharge of purge groundwater generated from sampling activities as part of the ongoing remedial investigation in the West Central Phoenix (WCP) East Grand Avenue Plume Site.**

Dear Mr. Findlay:

I am in receipt of your letter of September 10, 2001 in which you requested to discharge approximately 500 gallons of purged groundwater generated from monitoring wells located within the WCP East Grand Avenue Plume Site, Phoenix, Arizona.

Approval is hereby granted for the discharge of approximately 500 gallons of purged well water. This discharge is anticipated to occur sometime during the period of September 18, 2001, through September 25, 2001, to the City of Phoenix manhole #403, in Quarter Section 16-22.

A sample of the groundwater is to be collected prior to discharge to Manhole 403 in quarter section 16-22 and analyzed for those parameters listed as Instantaneous Effluent Limitations in the Phoenix city Code, Section 28-8. All parameters shall be analyzed using methods established by title 40 Code of Federal Regulations Part 136 or as stated in the transmittal letter attached.

Please submit your final status report within ten (10) days of the last date of discharge. This report shall include the date(s) of discharge, time of day this discharge occurred, and the total gallonage.



## City of Phoenix

Mr. Richard C. Findlay  
Geologist  
Page 2  
September 17, 2001

Should you have any questions, please contact me at (602)-534-2078. Our office hours are 8:00 a.m. to 5:00 p.m., Monday through Friday.

Sincerely,

A handwritten signature in cursive script that reads "Richard A. Thayer".

Richard A. Thayer  
Senior Water Quality Inspector  
h:\WESTON01PC-153

Attachment

c: Kenneth Karnes, Chief Water Quality Inspector



## City of Phoenix

WATER SERVICES DEPARTMENT  
POLLUTION CONTROL DIVISION

### MANHOLE ENTRY PERMIT

The City of Phoenix, acting through the Water Services Department, hereby issues a manhole permit to:

Roy F. Weston, Inc.  
On behalf of ADEQ  
Suite 2001  
2702 North Third Street  
Phoenix, Arizona 85012-2634

hereinafter called Permittee, for the purpose of entering a City of Phoenix manhole no. 403 in Quarter Section 16-22 to dispose of purged groundwater brought to the surface during groundwater well operations at:

The West Central Phoenix East Grand Avenue Plume Site in  
Phoenix, Arizona 85009

The manhole entry permit is issued in accordance with Phoenix City Code Chapter 28 Sections 28-8 and 28-27 and subject to the following conditions:

1. That the only activities authorized by the permit are for the purposes of discharging 500 gallons of purged groundwater wastewater, and that the Permittee conduct no other activity while entering upon the public property authorized by this permit.
2. That the Permittee's activities be conducted only within the time period of September 18, 2001, through September 25, 2001, unless authorized in writing by the Water Services Director for an extension of time, or unless revoked earlier, and that the Permittee notify the Water Services Department in advance of each separate entry.
3. A sample of the ground water is to be collected prior to entry of Manhole 403 in Quarter Section 17-19 and analyzed for those parameters listed as Instantaneous Effluent Limitations in the Phoenix City Code, Section 28-8. All parameters shall be analyzed using methods established by title 40 Code of Federal Regulations Part 136 or as stated in the transmittal letter attached.
4. Permittee shall submit a final status report within ten (10) days of the date of discharge. This report shall include the date(s) of discharge, time of day this discharge occurred, and the total gallonage.
5. Permittee shall incur cost of \$1.2242 per one hundred cubic feet (or current rate as established by water accounting) of ground water discharged.



## City of Phoenix

6. That the Permittee, when finished with the removal and discharge activities, replace to the satisfaction of the Water Services Director, any manhole covers or other disturbances to the City of Phoenix sewer lines that the Permittee caused during the course of the Permittee activities.
7. That the Permittee obtain a street closure permit for restrictions of all streets, sidewalks, and alleys. Manholes located in major streets require street closure. Contact City of Phoenix Street Transportation (602-262-6235) for street closure procedures and permit.
8. That the Permittee agrees to save and hold harmless, the City, any of its departments, agencies, officers or employees from all costs and damages occurred by any of the above from any damage to any person or property whatsoever which is caused by the activity, condition or event arising out of the negligent performance or nonperformance of any of the provisions of this permit by the Permittee any of the Permittee's agents, or any of the Permittee's independent contractors. The above costs incurred by the City, any of its departments, agencies, officers or employees shall include in the event of any action, court cost, expensive litigation and reasonable attorney fees. When any of the above costs and/or damages occur as aforesaid, the Permittee assumes the burden of proof that the negligent activity, condition or event did not cause such cost damage or other expense the City may incur.

The Permittee agrees to the condition set forth in this permit, and understands that all activities done under the conditions of this permit should conform to the laws of the City of Phoenix and the State of Arizona.

Dated this 21 day of September, 2001.

Richard C. P. Day for Weston, Inc.  
Permittee

Dated this 18<sup>th</sup> day of September, 2001.

CITY OF PHOENIX,  
a municipal corporation

By:

Kenneth Karnes  
Kenneth Karnes  
Chief Water Quality Inspector  
Water Services Department  
h:\WESTON01PC-153

**DEVELOPMENT WATER**





## City of Phoenix

WATER SERVICES DEPARTMENT  
POLLUTION CONTROL DIVISION

September 28, 2001

Mr. Richard C. Findlay  
Geologist  
Roy F. Weston, Inc  
Suite 2001  
2702 North Third Street  
Phoenix, Arizona 85004-4600

**RE: Manhole Entry Permit for discharge of purge groundwater generated from sampling activities as part of the ongoing remedial investigation in the West Central Phoenix (WCP) East Grand Avenue Plume Site.**

Dear Mr. Findlay:

I am in receipt of your letter of September 25, 2001 in which you requested to discharge approximately 10,500 gallons of purged groundwater generated from monitoring wells located within the WCP East Grand Avenue Plume Site, Phoenix, Arizona.

Based upon analytical results submitted in your letter of September 25, 2001, approval is hereby granted for the discharge of approximately 10,500 gallons of purged well water. This discharge is anticipated to occur sometime during the period of October 8, 2001, through October 19, 2001, to the City of Phoenix manhole #403, in Quarter Section 16-22.

Please submit your final status report within ten (10) days of the last date of discharge. This report shall include the date(s) of discharge, time of day this discharge occurred, and the total gallonage.

Should you have any questions, please contact me at (602)-534-2078. Our office hours are 8:00 a.m. to 5:00 p.m., Monday through Friday.

Sincerely,

A handwritten signature in cursive script that reads "Richard A. Thayer".

Richard A. Thayer  
Senior Water Quality Inspector  
h:\WESTON01PC-158

Attachment

c: Kenneth Karnes, Chief Water Quality Inspector



## City of Phoenix

WATER SERVICES DEPARTMENT  
POLLUTION CONTROL DIVISION

### MANHOLE ENTRY PERMIT

The City of Phoenix, acting through the Water Services Department, hereby issues a manhole permit to:

Roy F. Weston, Inc.  
On behalf of ADEQ  
Suite 2001  
2702 North Third Street  
Phoenix, Arizona 85012-2634

hereinafter called Permittee, for the purpose of entering a City of Phoenix manhole no. 403 in Quarter Section 16-22 to dispose of purged groundwater brought to the surface during groundwater well operations at:

The West Central Phoenix East Grand Avenue Plume Site in  
Phoenix, Arizona 85009

The manhole entry permit is issued in accordance with Phoenix City Code Chapter 28 Sections 28-8 and 28-27 and subject to the following conditions:

1. That the only activities authorized by the permit are for the purposes of discharging 10,500 gallons of purged groundwater wastewater, and that the Permittee conduct no other activity while entering upon the public property authorized by this permit.
2. That the Permittee's activities be conducted only within the time period of October 8, 2001, through October 19, 2001, unless authorized in writing by the Water Services Director for an extension of time, or unless revoked earlier, and that the Permittee notify the Water Services Department in advance of each separate entry.
3. Permittee shall submit a final status report within ten (10) days of the date of discharge. This report shall include the date(s) of discharge, time of day this discharge occurred, and the total gallonage.
4. Permittee shall incur cost of \$1.2242 per one hundred cubic feet (or current rate as established by water accounting) of ground water discharged.
5. That the Permittee, when finished with the removal and discharge activities, replace to the satisfaction of the Water Services Director, any manhole covers or other disturbances to the City of Phoenix sewer lines that the Permittee caused during the course of the Permittee activities.



## City of Phoenix

6. That the Permittee obtain a street closure permit for restrictions of all streets, sidewalks, and alleys. Manholes located in major streets require street closure. Contact City of Phoenix Street Transportation (602-262-6235) for street closure procedures and permit.
7. That the Permittee agrees to save and hold harmless, the City, any of its departments, agencies, officers or employees from all costs and damages occurred by any of the above from any damage to any person or property whatsoever which is caused by the activity, condition or event arising out of the negligent performance or nonperformance of any of the provisions of this permit by the Permittee any of the Permittee's agents, or any of the Permittee's independent contractors. The above costs incurred by the City, any of its departments, agencies, officers or employees shall include in the event of any action, court cost, expensive litigation and reasonable attorney fees. When any of the above costs and/or damages occur as aforesaid, the Permittee assumes the burden of proof that the negligent activity, condition or event did not cause such cost damage or other expense the City may incur.

The Permittee agrees to the condition set forth in this permit, and understands that all activities done under the conditions of this permit should conform to the laws of the City of Phoenix and the State of Arizona.

Dated this 28 day of September, 2001.

*David M. West*  
Permittee

Dated this 27<sup>th</sup> day of September, 2001.

CITY OF PHOENIX,  
a municipal corporation

By:

*Kenneth Karnes*

Kenneth Karnes  
Chief Water Quality Inspector  
Water Services Department  
h:\WESTON01PC-158



**GROUNDWATER SAMPLING – ROUND 13**





## City of Phoenix

WATER SERVICES DEPARTMENT  
POLLUTION CONTROL DIVISION

October 12, 2001

Mr. David Martz  
Environmental Technician  
Roy F. Weston, Inc  
Suite 2001  
2702 North Third Street  
Phoenix, Arizona 85004-4600

**RE: Manhole Entry Permit for discharge of purge groundwater generated from sampling activities as part of the ongoing remedial investigation in the West Central Phoenix (WCP) East Grand Avenue Plume Site.**

Dear Mr. Martz:

I am in receipt of your letter of October 11, 2001 in which you requested to discharge approximately 1,500 gallons of purged groundwater generated from monitoring wells located within the WCP East Grand Avenue Plume Site, Phoenix, Arizona.

Based upon analytical results submitted in your letter of October 11, 2001, approval is hereby granted for the discharge of approximately 1,500 gallons of purged well water. This discharge is anticipated to occur sometime during the period of October 29, 2001, through November 16, 2001, to the City of Phoenix manhole #403, in Quarter Section 16-22.

A sample of the ground water is to be collected prior to discharge to Manhole No. 306, Quarter Section 17-19 and analyzed for those parameters listed as Instantaneous Effluent Limitations in the Phoenix City Code, Section 28-8. All parameters shall be analyzed using methods established by Title 40 Code of Federal Regulations Part 136 or as stated in the transmittal letter attached.

It is the opinion of the City of Phoenix Pollution Control Division that the purged groundwater meet all requirements under Chapter 28. The purged groundwater is not to be in sufficient quantity to injure or interfere with any sewage treatment process, cause corrosive structural damage, constitute a hazard to humans, or create any hazard to the sewer system, or in the receiving waters of the sewage treatment plant.

Please submit your final status report within ten (10) days of the last date of discharge. This report shall include the date(s) of discharge, time of day this discharge occurred, and the total gallonage.



## City of Phoenix

Mr. David Martz  
Environmental Technician  
Page 2  
October 12, 2001

Should you have any questions, please contact me at (602)-534-2078. Our office hours are 8:00 a.m. to 5:00 p.m., Monday through Friday.

Sincerely,

A handwritten signature in cursive script that reads "Richard A. Thayer".

Richard A. Thayer  
Senior Water Quality Inspector  
h:\WESTON01PC-175

Attachment

c: Kenneth Karnes, Chief Water Quality Inspector



## City of Phoenix

WATER SERVICES DEPARTMENT  
POLLUTION CONTROL DIVISION

### MANHOLE ENTRY PERMIT

The City of Phoenix, acting through the Water Services Department, hereby issues a manhole permit to:

Roy F. Weston, Inc.  
On behalf of ADEQ  
Suite 2001  
2702 North Third Street  
Phoenix, Arizona 85012-2634

hereinafter called Permittee, for the purpose of entering a City of Phoenix manhole no. 403 in Quarter Section 16-22 to dispose of purged groundwater brought to the surface during groundwater well operations at:

The West Central Phoenix East Grand Avenue Plume Site in  
Phoenix, Arizona 85009

The manhole entry permit is issued in accordance with Phoenix City Code Chapter 28 Sections 28-8 and 28-27 and subject to the following conditions:

1. That the only activities authorized by the permit are for the purposes of discharging 1,500 gallons of purged groundwater wastewater, and that the Permittee conduct no other activity while entering upon the public property authorized by this permit.
2. That the Permittee's activities be conducted only within the time period of October 29, 2001, through November 16, 2001, unless authorized in writing by the Water Services Director for an extension of time, or unless revoked earlier, and that the Permittee notify the Water Services Department in advance of each separate entry.
3. A sample of the ground water is to be collected prior to discharge to Manhole No. 306, Quarter Section 17-19 and analyzed for those parameters listed as Instantaneous Effluent Limitations in the Phoenix City Code, Section 28-8. All parameters shall be analyzed using methods established by Title 40 Code of Federal Regulations Part 136 or as stated in the transmittal letter attached.
4. Permittee shall submit a final status report within ten (10) days of the date of discharge. This report shall include the date(s) of discharge, time of day this discharge occurred, and the total gallonage.
5. Permittee shall incur cost of \$1.2242 per one hundred cubic feet (or current rate as established by water accounting) of ground water discharged.

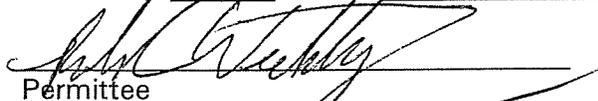


## City of Phoenix

6. That the Permittee, when finished with the removal and discharge activities, replace to the satisfaction of the Water Services Director, any manhole covers or other disturbances to the City of Phoenix sewer lines that the Permittee caused during the course of the Permittee activities.
7. That the Permittee obtain a street closure permit for restrictions of all streets, sidewalks, and alleys. Manholes located in major streets require street closure. Contact City of Phoenix Street Transportation (602-262-6235) for street closure procedures and permit.
8. That the Permittee agrees to save and hold harmless, the City, any of its departments, agencies, officers or employees from all costs and damages occurred by any of the above from any damage to any person or property whatsoever which is caused by the activity, condition or event arising out of the negligent performance or nonperformance of any of the provisions of this permit by the Permittee any of the Permittee's agents, or any of the Permittee's independent contractors. The above costs incurred by the City, any of its departments, agencies, officers or employees shall include in the event of any action, court cost, expensive litigation and reasonable attorney fees. When any of the above costs and/or damages occur as aforesaid, the Permittee assumes the burden of proof that the negligent activity, condition or event did not cause such cost damage or other expense the City may incur.

The Permittee agrees to the condition set forth in this permit, and understands that all activities done under the conditions of this permit should conform to the laws of the City of Phoenix and the State of Arizona.

Dated this 15 day of October, 2001.

  
Permittee

Dated this 12~~th~~ day of October, 2001.

CITY OF PHOENIX,  
a municipal corporation

By:   
Kenneth Karnes  
Chief Water Quality Inspector  
Water Services Department  
h:\WESTON01PC-175

**GROUNDWATER SAMPLING – ROUND 14  
& DEVELOPMENT WATER**





## City of Phoenix

WATER SERVICES DEPARTMENT  
POLLUTION CONTROL DIVISION

December 07, 2001

Mr. Richard C. Findlay  
Geologist  
Roy F. Weston, Inc.  
Suite 2001  
2702 North Third Street  
Phoenix, Arizona 85004-4600

**RE: Manhole Entry Permit for discharge of purge groundwater generated from sampling activities as part of the ongoing remedial investigation in the West Central Phoenix (WCP) East Grand Avenue Plume Site.**

Dear Mr. Findlay:

I am in receipt of your letter of November 29, 2001 in which you requested to discharge approximately 3,000 gallons of purged groundwater generated from monitoring wells located within the WCP East Grand Avenue Plume Site, Phoenix, Arizona.

Based upon analytical results submitted in your letter of November 29, 2001, approval is hereby granted for the discharge of approximately 3,000 gallons of purged well water. This discharge is anticipated to occur sometime during the period of December 10, 2001, through December 21, 2001, to the City of Phoenix manhole #403, in Quarter Section 16-22.

It is the opinion of the City of Phoenix Pollution Control Division that the purged groundwater meet all requirements under Chapter 28. The purged groundwater is not to be in sufficient quantity to injure or interfere with any sewage treatment process, cause corrosive structural damage, constitute a hazard to humans, or create any hazard to the sewer system, or in the receiving waters of the sewage treatment plant.

Please submit your final status report within ten (10) days of the last date of discharge. This report shall include the date(s) of discharge, time of day this discharge occurred, and the total gallonage.



## City of Phoenix

Mr. Richard C. Findlay  
Geologist  
Page 2  
December 7, 2001

Should you have any questions, please contact me at (602)-534-2078. Our office hours are 8:00 a.m. to 5:00 p.m., Monday through Friday.

Sincerely,

A handwritten signature in cursive script that reads "Richard A. Thayer".

Richard A. Thayer  
Senior Water Quality Inspector  
h:\WESTON01PC-203

Attachment

c: Kenneth Karnes, Chief Water Quality Inspector



## City of Phoenix

WATER SERVICES DEPARTMENT  
POLLUTION CONTROL DIVISION

### MANHOLE ENTRY PERMIT

The City of Phoenix, acting through the Water Services Department, hereby issues a manhole permit to:

Roy F. Weston, Inc.  
On behalf of ADEQ  
Suite 2001  
2702 North Third Street  
Phoenix, Arizona 85012-2634

hereinafter called Permittee, for the purpose of entering a City of Phoenix manhole no. 403 in Quarter Section 16-22 to dispose of purged groundwater brought to the surface during groundwater well operations at:

The West Central Phoenix East Grand Avenue Plume Site in  
Phoenix, Arizona 85009

The manhole entry permit is issued in accordance with Phoenix City Code Chapter 28 Sections 28-8 and 28-27 and subject to the following conditions:

1. That the only activities authorized by the permit are for the purposes of discharging 3,000 gallons of purged groundwater wastewater, and that the Permittee conduct no other activity while entering upon the public property authorized by this permit.
2. That the Permittee's activities be conducted only within the time period of December 10, 2001, through December 21, 2001, unless authorized in writing by the Water Services Director for an extension of time, or unless revoked earlier, and that the Permittee notify the Water Services Department in advance of each separate entry.
3. Permittee shall submit a final status report within ten (10) days of the date of discharge. This report shall include the date(s) of discharge, time of day this discharge occurred, and the total gallonage.
4. Permittee shall incur cost of \$1.2242 per one hundred cubic feet (or current rate as established by water accounting) of ground water discharged.
5. That the Permittee, when finished with the removal and discharge activities, replace to the satisfaction of the Water Services Director, any manhole covers or other disturbances to the City of Phoenix sewer lines that the Permittee caused during the course of the Permittee activities.



## City of Phoenix

6. That the Permittee obtain a street closure permit for restrictions of all streets, sidewalks, and alleys. Manholes located in major streets require street closure. Contact City of Phoenix Street Transportation (602-262-6235) for street closure procedures and permit.
7. That the Permittee agrees to save and hold harmless, the City, any of its departments, agencies, officers or employees from all costs and damages occurred by any of the above from any damage to any person or property whatsoever which is caused by the activity, condition or event arising out of the negligent performance or nonperformance of any of the provisions of this permit by the Permittee any of the Permittee's agents, or any of the Permittee's independent contractors. The above costs incurred by the City, any of its departments, agencies, officers or employees shall include in the event of any action, court cost, expensive litigation and reasonable attorney fees. When any of the above costs and/or damages occur as aforesaid, the Permittee assumes the burden of proof that the negligent activity, condition or event did not cause such cost damage or other expense the City may incur.

The Permittee agrees to the condition set forth in this permit, and understands that all activities done under the conditions of this permit should conform to the laws of the City of Phoenix and the State of Arizona.

Dated this 10 day of December, 2001.

Rick Finlay for Ray F. Weston for ADEQ  
Permittee

Dated this 7th day of December, 2001.

CITY OF PHOENIX,  
a municipal corporation

By: Kenneth Karnes  
Kenneth Karnes  
Chief Water Quality Inspector  
Water Services Department  
h:\WESTON01PC-203

**GROUNDWATER SAMPLING – ROUND 15**





## City of Phoenix

WATER SERVICES DEPARTMENT  
POLLUTION CONTROL DIVISION

February 13, 2002

Mr. Dave Martz  
Environmental Technician  
Roy F. Weston, Inc.  
Suite 2001  
2702 North Third Street  
Phoenix, Arizona 85004-4600

**RE: Manhole Entry Permit for discharge of purge groundwater generated from sampling activities as part of the ongoing remedial investigation in the West Central Phoenix (WCP) East Grand Avenue Plume Site.**

Dear Mr. Martz:

I am in receipt of your letter of February 12, 2002 in which you requested to discharge approximately 12,000 gallons of purged groundwater generated from monitoring wells located within the WCP East Grand Avenue Plume Site, Phoenix, Arizona.

Based upon analytical results submitted in your letter of February 12, 2002, approval is hereby granted for the discharge of approximately 12,000 gallons of purged well water. This discharge is anticipated to occur sometime during the period of February 22, 2002, through February 28, 2002, to the City of Phoenix manhole #403, in Quarter Section 16-22.

It is the opinion of the City of Phoenix Pollution Control Division that the purged groundwater meet all requirements under Chapter 28. The purged groundwater is determined not to be in sufficient quantity to injure or interfere with any sewage treatment process, cause corrosive structural damage, constitute a hazard to humans, or create any hazard to the sewer system, or in the receiving waters of the sewage treatment plant.

Please submit your final status report within ten (10) days of the last date of discharge. This report shall include the date(s) of discharge, time of day this discharge occurred, and the total gallonage.

h:WestonMHP403-02PC-031



## City of Phoenix

Mr. Dave Martz  
Environmental Technician  
Page 2  
February 13, 2002

Should you have any questions, please contact me at (602)-534-2078. Our office hours are 8:00 a.m. to 5:00 p.m., Monday through Friday.

Sincerely,

A handwritten signature in cursive script that reads "Richard A. Thayer".

Richard A. Thayer  
Senior Water Quality Inspector  
h:\WESTONMHP403-02PC-031

Attachment

c: Kenneth Karnes, Chief Water Quality Inspector



## City of Phoenix

WATER SERVICES DEPARTMENT  
POLLUTION CONTROL DIVISION

### MANHOLE ENTRY PERMIT

The City of Phoenix, acting through the Water Services Department, hereby issues a manhole permit to:

Roy F. Weston, Inc.  
On behalf of ADEQ  
Suite 2001  
2702 North Third Street  
Phoenix, Arizona 85012-2634

hereinafter called Permittee, for the purpose of entering a City of Phoenix manhole no. 403 in Quarter Section 16-22 to dispose of purged groundwater brought to the surface during groundwater well operations at:

The West Central Phoenix East Grand Avenue Plume Site in  
Phoenix, Arizona 85009

The manhole entry permit is issued in accordance with Phoenix City Code Chapter 28 Sections 28-8 and 28-27 and subject to the following conditions:

1. That the only activities authorized by the permit are for the purposes of discharging 12,000 gallons of purged groundwater wastewater, and that the Permittee conduct no other activity while entering upon the public property authorized by this permit.
2. That the Permittee's activities be conducted only within the time period of February 22, 2002, through February 28, 2002, unless authorized in writing by the Water Services Director for an extension of time, or unless revoked earlier, and that the Permittee notify the Water Services Department in advance of each separate entry.
3. Permittee shall submit a final status report within ten (10) days of the date of discharge. This report shall include the date(s) of discharge, time of day this discharge occurred, and the total gallonage.
4. Permittee shall incur cost of \$1.2242 per one hundred cubic feet (or current rate as established by water accounting) of ground water discharged.
5. That the Permittee, when finished with the removal and discharge activities, replace to the satisfaction of the Water Services Director, any manhole covers or other disturbances to the City of Phoenix sewer lines that the Permittee caused during the course of the Permittee activities.



## City of Phoenix

6. That the Permittee obtain a street closure permit for restrictions of all streets, sidewalks, and alleys. Manholes located in major streets require street closure. Contact City of Phoenix Street Transportation (602-262-6235) for street closure procedures and permit.
7. That the Permittee agrees to save and hold harmless, the City, any of its departments, agencies, officers or employees from all costs and damages occurred by any of the above from any damage to any person or property whatsoever which is caused by the activity, condition or event arising out of the negligent performance or nonperformance of any of the provisions of this permit by the Permittee any of the Permittee's agents, or any of the Permittee's independent contractors. The above costs incurred by the City, any of its departments, agencies, officers or employees shall include in the event of any action, court cost, expensive litigation and reasonable attorney fees. When any of the above costs and/or damages occur as aforesaid, the Permittee assumes the burden of proof that the negligent activity, condition or event did not cause such cost damage or other expense the City may incur.

The Permittee agrees to the condition set forth in this permit, and understands that all activities done under the conditions of this permit should conform to the laws of the City of Phoenix and the State of Arizona.

Dated this 25 day of February, 2002.

David M. [Signature]  
Permittee

Dated this 14<sup>th</sup> day of February, 2002.

CITY OF PHOENIX,  
a municipal corporation

By: Kenneth Karnes [Signature]  
Kenneth Karnes  
Chief Water Quality Inspector  
Water Services Department  
h:\WESTONMHP403-02PC-031

**APPENDIX G**  
**ELECTRONIC ANALYTICAL DATA**

Investigation Derived Waste Analytical Results  
Laboratory Analytical Reports – Soil Samples  
Laboratory Analytical Reports – Hydropunch® Samples  
Laboratory Analytical Reports – Groundwater Samples

**APPENDIX I**  
**SOIL PHYSICAL TEST RESULTS**



**ATL, Inc.**  
 CONSTRUCTION QUALITY CONTROL  
 GEOTECHNICAL CONSULTANTS

**PHOENIX - CORPORATE OFFICE**  
 2912 W. Clarendon • Phoenix, AZ 85017  
 (602) 241-1097 • Fax (602) 277-1306  
[www.atlquality.com](http://www.atlquality.com)

**Client:** Roy F. Weston  
**Address:** 202 E. Earll Drive, Ste 46  
 Phoenix, AZ 85012  
**Project:** 200092-090-002, VW&R  
**Sample ID:** Various, See Below  
**Sample:** Soil in shelly tubes

**ATL Job No.:** 299141  
**ATL Lab No.:** See below  
**Sample Date:** 09/15/00  
**Sampled By:** Client

Lab No.	Sample ID	Void Ratio	Air Filled Porosity (%)	H <sub>2</sub> O Porosity (%)	Total Porosity (%)	Moisture Content (%)	Dry Density (pcf)	Specific Gravity	Total Organic (%)
99-1023	SB-14-036	0.459	12.3	19.2	31.5	10.6	112.7	2.641	3.6
99-1024	SB-14-056	0.585	20.3	16.6	36.9	9.6	107.7	2.740	2.8
99-1025	SB-14-111	0.869	9.8	36.7	46.5	26.2	87.3	2.620	4.6
99-1026	SB-15-167	0.876	3.4	43.3	46.7	31.7	85.2	2.566	5.8
99-1027	SB-17-006	1.021	27.7	22.9	50.5	17.9	79.6	2.581	5.3
99-1028	SB-17--071	0.768	18.4	25.0	43.4	16.6	93.9	2.665	5.3
99-1029	SB-17-106	0.617	11.4	26.7	38.2	17.1	97.4	2.528	4.1
99-1030	SB-17-136	0.889	17.1	30.0	47.1	21.9	85.4	2.590	3.1

Remarks:

Respectfully Submitted,

Reviewed By:   
 Input By: EJB

  
 Ammi Osorio  
 Laboratory Engineer

**TUCSON**  
 (520) 623-4547  
 Fax (520) 623-4603

**FLAGSTAFF**  
 (520) 522-0347  
 Fax (520) 522-0350

**GLOBE**  
 (520) 425-8999  
 Fax (520) 425-9507

**HUACHUCA CITY**  
 (520) 456-0087  
 Fax (520) 456-0080

**LAS VEGAS**  
 (702) 871-0492  
 Fax (702) 871-2642



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 www.atlquality.com

**REPORT OF SIEVE ANALYSIS - SOILS & AGGREGATE**

**CLIENT:** Roy F. Weston  
 202 E. Earl, Ste 46  
 Phoenix, AZ 85012

**PROJECT NAME:** 20092-090-002, VW&R

**ATTENTION:** Project Manager

**SAMPLE ID.:** SB-14-036

**TEST DATE:** 12/04/99

**ATL JOB NO.:** 299141

**ATL LAB NO.:** 99-1023

**LAB METHOD:** ASTM D422

**SAMPLED BY:** Client

**TESTED BY:** JL/MC

**MATERIAL:** Brown,  
Silty sand

**REPORT DATE:** 02/17/00

SIEVE	WT. RETAINED	%RET.	% PASSING	SPECS
3"	0	0	100	
2 1/2"	0	0	100	
2"	0	0	100	
1 1/2"	0	0	100	
1"	0	0	100	
3/4"	0	0	100	
1/2"	15	3	97	
3/8"	0	0	97	
1/4"	19	4	94	
#4	22	4	89	
#8	67	13	77	
#10	17	3		
Minus #10			73.6	
+10 Total	139			W.B.W. (WET): 83.8
Minus #10 Wet	387			W.B.W. (DRY): 83.5
Minus #10 Dry	386			W.A.W.: 45.7
Total	525			ELUTRIATION: 37.8
#16	5.0	4.4	69.2	
#30	9.5	8.4	60.8	
#40	5.2	4.6	56.2	
#50	4.9	4.3	51.9	
#100	9.1	8.0	43.9	
#200	10.7	9.4		
Minus #200	1.3		34.5	
Total	45.7			

SAMPLE PREPARATION	
Plus # 10 Wt.:	139
Minus # 10 Wt.:	387
Total Weight:	526

HYGROSCOPIC MOISTURE	
Wet Wt.:	33.4
Dry Wt.:	33.3
Hygros. Factor:	0.99701

FACTORS	
Coarse	0.190570
Fine	0.880535

Remarks:

Respectfully Submitted:

Reviewed By:  AO

Input By:

  
 Armi Osorio  
 Laboratory Engineer

**HYDROMETER ANALYSIS  
(ASTM D422)**



CLIENT : Roy F. Weston  
202 E. Earl, Ste 46  
Phoenix, AZ 85012

DATE : 12/04/99

PROJECT : 20092-090-002, VW&R  
MATERIAL: Brown, silty sand  
SAMPLE ID.: SB-14-036

LAB. NO.: 99-1023  
JOB NO.: 299141  
DATE RCVD: 11/04/99  
SAMPLED BY: Client

SAMPLE WT.(WBW-dry) = 83.5 (GMS) SOIL PASSING #10 SIEVE = 73.6 %

SPECIFIC GRAVITY OF SOIL SAMPLE = 2.640

ELAPSED TIME (MIN)	TIME	TEMP. (oC)	CORR.(K) USING (TAB. 3)	HYDROMETER READING		CORR. READING	EFFECTIVE DEPTH (CMS)	PARTICLE SIZE (M.M)	PERCENT FINER IN SUSPENSION
				(WATER)	(W/SOIL)				
0	START								
	01:01 PM	23.3	0.01316	1.0038	1.0180	1.0143	11.5	0.0294	20.2
2	01:03 PM	23.3	0.01316	1.0038	1.0130	1.0093	12.9	0.0304	13.1
5	01:06 PM	23.3	0.01316	1.0038	1.0100	1.0063	13.6	0.0196	8.9
15	01:16 PM	23.3	0.01316	1.0038	1.0080	1.0043	14.2	0.0117	6.0
30	01:31 PM	23.3	0.01316	1.0038	1.0070	1.0033	14.4	0.0084	4.6
60	02:01 PM	23.3	0.01316	1.0038	1.0060	1.0023	14.7	0.0059	3.2
250	05:11 PM	23.3	0.01316	1.0038	1.0050	1.0013	15.0	0.0030	1.8
12/05/99 1440	01:01 PM	22.8	0.01324	1.0038	1.0045	1.0008	15.1	0.0013	1.1

Remarks:

Reviewed By: AO  
Input By: AO

Respectfully Submitted:

*Ammi Osorio*  
Ammi Osorio  
Laboratory Engineer

Client: Roy F. Weston  
 Project: 20092-090-002, VW&R  
 Material Source:

SB-14-036



ATL Job No: 299141  
 ATL Lab No: 99-1023  
 Date Rvcd: 11/04/99  
 Sample Date: 09/08/99

**Void Ratio**

$$e = \frac{\text{Volume of Voids}}{\text{Volume of Solids}}$$

$$\text{Volume of Solids (V}_s) = \frac{\text{Weight of Solids}}{\text{Specific Gravity} * \text{Unit Weight of Water}}$$

$$\text{Weight of Solids (W}_s) = \frac{\text{Wet Density}}{1 + \text{Moisture Content}}$$

$$\text{Volume of Voids (V}_v) = \text{Total Volume} - \text{Volume of Solids}$$

Total Volume 1  
 Wet Density 124.7  
 Moisture Content 10.60%  
 Specific Gravity 2.641  
 Unit Weight of Water 62.3

Weight of Solids (W<sub>s</sub>) 112.749  
 Volume of Solids (V<sub>s</sub>) 0.685  
 Volume of Voids (V<sub>v</sub>) 0.315

**Void Ratio** 0.459

**Porosity** 31.5%

To compute for air filled porosity(n <sub>a</sub> )	=	$\frac{V_a(n)}{(V_v)}$
To compute for water filled porosity(n <sub>w</sub> )	=	$\frac{V_w(n)}{(V_v)}$
Volume of Air(V <sub>a</sub> )	=	V <sub>v</sub> - V <sub>w</sub>
Volume of Water(V <sub>w</sub> )	=	$\frac{\text{Weight of water}}{\text{Unit wt. of water}}$
Weight of water	=	Wet Density - Dry Density
Dry Density	=	$\frac{\text{Wet Density}}{1 + \text{Moisture Content}}$
Dry Density	=	112.749
Weight of water	=	11.951
Volume of Water(V <sub>w</sub> )	=	0.192
Volume of Air(V <sub>a</sub> )	=	0.123
<b>Air filled porosity(n<sub>a</sub>)</b>	=	<b>12.3%</b>
<b>Water filled porosity(n<sub>w</sub>)</b>	=	<b>19.2%</b>



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**www.atlquality.com**

**REPORT OF SIEVE ANALYSIS - SOILS & AGGREGATE**

**CLIENT:** Roy F. Weston  
 202 E. Earl, Ste 46  
 Phoenix, AZ 85012

**PROJECT NAME:** 20092-090-002, VW&R

**ATTENTION:** Project Manager

**SAMPLE ID.:** SB-14-056

**TEST DATE:** 12/04/99

**ATL JOB NO.:** 299141

**ATL LAB NO.:** 99-1024

**LAB METHOD:** ASTM D422

**SAMPLED BY:** Client

**TESTED BY:** JL/MC

**MATERIAL:** Brown,  
Silty sand

**REPORT DATE:** 02/17/00

SIEVE	WT. RETAINED	%RET	% PASSING	SPECS
3"	0	0	100	
2 1/2"	0	0	100	
2"	0	0	100	
1 1/2"	0	0	100	
1"	0	0	100	
3/4"	0	0	100	
1/2"	0	0	100	
3/8"	14	3	97	
1/4"	20	4	93	
#4	13	3	91	
#8	29	6	85	
#10	9	2		
Minus #10			83.2	
+10 Total	86			91.5
Minus #10 Wet	426			91.2
Minus #10 Dry	424			62.9
Total	510			28.3
#16	6.7	6.1	77.1	
#30	11.9	10.9	66.2	
#40	7.0	6.4	59.8	
#50	7.7	7.0	52.8	
#100	19.6	17.9	34.9	
#200	9.4	8.6		
Minus #200	0.6		26.3	
Total	62.9			

SAMPLE PREPARATION	
Plus # 10 Wt.:	86
Minus # 10 Wt.:	426
Total Weight:	512

HYGROSCOPIC MOISTURE	
Wet Wt. :	27.4
Dry Wt.:	27.3
Hygros. Factor:	0.99635

FACTORS	
Coarse	0.195984
Fine	0.912451

Remarks:

Respectfully Submitted:

Reviewed By:  AO  
 Input By:

  
 Ammi Osorio  
 Laboratory Engineer

HYDROMETER ANALYSIS  
(ASTM D422)

CLIENT : Roy F. Weston  
202 E. Earl, Ste 46  
Phoenix, AZ 85012

DATE : 12/04/99  
LAB. NO.: 99-1024  
JOB NO.: 299141  
DATE RCVD: 11/04/99  
SAMPLED BY: Client

PROJECT : 20092-090-002, VW&R  
MATERIAL: Brown, silty sand  
SAMPLE ID.: SB-14-056

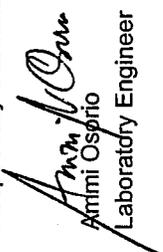
SAMPLE WT.(WBW-dry) = 91.2 (GMS) SOIL PASSING #10 SIEVE = 83.2 %

SPECIFIC GRAVITY OF SOIL SAMPLE = 2.740

ELAPSED TIME (MIN)	TIME	TEMP. (oC)	CORR.(K) USING (TAB. 3)	HYDROMETER READING		CORR. READING	EFFECTIVE DEPTH (CMS)	PARTICLE SIZE (M.M)	PERCENT FINER IN SUSPENSION
				(WATER)	(W/SOIL)				
0	START								
0	01:09 PM	23.3	0.01278	1.0038	1.0180	1.0143	11.5	0.0294	20.5
2	01:11 PM	23.3	0.01278	1.0038	1.0150	1.0113	12.3	0.0304	16.2
5	01:14 PM	23.3	0.01278	1.0038	1.0130	1.0093	12.9	0.0196	13.3
15	01:24 PM	23.3	0.01278	1.0038	1.0120	1.0083	13.1	0.0117	11.9
30	01:39 PM	23.3	0.01278	1.0038	1.0110	1.0073	13.4	0.0084	10.4
60	02:09 PM	23.3	0.01278	1.0038	1.0100	1.0063	13.6	0.0059	9.0
250	05:19 PM	23.3	0.01278	1.0038	1.0080	1.0043	14.2	0.0030	6.1
12/05/99 1440	01:09 PM	22.8	0.01286	1.0038	1.0065	1.0028	14.6	0.0013	4.0

Remarks:

Reviewed By:   
Input By: AO

Respectfully Submitted:  
  
Ammi Osorio  
Laboratory Engineer

Client: Roy F. Weston  
 Project: 20092-090-002, VW&R  
 Material Source:

SB-14-056



ATL Job No: 299141  
 ATL Lab No: 99-1024  
 Date Rvcd: 11/04/99  
 Sample Date: 09/08/99

**Void Ratio**

$$e = \frac{\text{Volume of Voids}}{\text{Volume of Solids}}$$

$$\text{Volume of Solids (V}_s) = \frac{\text{Weight of Solids}}{\text{Specific Gravity} * \text{Unit Weight of Water}}$$

$$\text{Weight of Solids (W}_s) = \frac{\text{Wet Density}}{1 + \text{Moisture Content}}$$

$$\text{Volume of Voids (V}_v) = \text{Total Volume} - \text{Volume of Solids}$$

Total Volume 1  
 Wet Density 118.06  
 Moisture Content 9.60%  
 Specific Gravity 2.74  
 Unit Weight of Water 62.3

Weight of Solids (W<sub>s</sub>) 107.719  
 Volume of Solids (V<sub>s</sub>) 0.631  
 Volume of Voids (V<sub>v</sub>) 0.369

**Void Ratio** 0.585

**Porosity** 36.9%

To compute for air filled porosity(n <sub>a</sub> )	=	$\frac{V_a(n)}{(V_v)}$
To compute for water filled porosity(n <sub>w</sub> )	=	$\frac{V_w(n)}{(V_v)}$
Volume of Air(V <sub>a</sub> )	=	V <sub>v</sub> - V <sub>w</sub>
Volume of Water(V <sub>w</sub> )	=	$\frac{\text{Weight of water}}{\text{Unit wt. of water}}$
Weight of water	=	Wet Density - Dry Density
Dry Density	=	$\frac{\text{Wet Density}}{1 + \text{Moisture Content}}$
Dry Density	=	107.719
Weight of water	=	10.341
Volume of Water(V <sub>w</sub> )	=	0.166
Volume of Air(V <sub>a</sub> )	=	0.203
<b>Air filled porosity(n<sub>a</sub>)</b>	=	20.3%
<b>Water filled porosity(n<sub>w</sub>)</b>	=	16.6%



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 www.atlquality.com

**REPORT OF SIEVE ANALYSIS - SOILS & AGGREGATE**

**CLIENT:** Roy F. Weston  
 202 E. Earl, Ste 46  
 Phoenix, AZ 85012

**PROJECT NAME:** 20092-090-002, VW&R

**ATTENTION:** Project Manager

**SAMPLE ID.:** SB-14-111

**TEST DATE:** 12/04/99

**ATL JOB NO.:** 299141

**ATL LAB NO.:** 99-1025

**LAB METHOD:** ASTM D422

**SAMPLED BY:** Client

**TESTED BY:** JL/MC

**MATERIAL:** Brown, clayey silt

**REPORT DATE:** 02/17/00

SIEVE	WT. RETAINED	%RET	% PASSING	SPECS
3"	0	0	100	
2 1/2"	0	0	100	
2"	0	0	100	
1 1/2"	0	0	100	
1"	0	0	100	
3/4"	0	0	100	
1/2"	0	0	100	
3/8"	0	0	100	
1/4"	0	0	100	
#4	0	0	100	
#8	3	1	99	
#10	2	1		
Minus #10			98.6	
+10 Total	6			W.B.W. (WET): 62.8
Minus #10 Wet	401			W.B.W. (DRY): 62.2
Minus #10 Dry	398			W.A.W: 11.0
Total	403			ELUTRIATION: 51.2
#16	0.3	0.5	98.1	
#30	0.2	0.3	97.8	
#40	0.3	0.5	97.3	
#50	0.4	0.6	96.7	
#100	1.6	2.5	94.2	
#200	7.0	11.1		
Minus #200	1.2		83.1	
Total	11.0			

SAMPLE PREPARATION	
Plus # 10 Wt.:	6
Minus # 10 Wt.:	401
Total Weight:	407

HYGROSCOPIC MOISTURE	
Wet Wt.:	22.6
Dry Wt.:	22.4
Hygros. Factor:	0.99115

FACTORS	
Coarse	0.247924
Fine	1.584269

Remarks:

Reviewed By:  AO  
 Input By:

Respectfully Submitted:

  
 Arimi Osorio  
 Laboratory Engineer

**HYDROMETER ANALYSIS  
(ASTM D422)**

CLIENT : Roy F. Weston  
202 E. Earl, Ste 46  
Phoenix, AZ 85012

DATE : 12/04/99

LAB. NO.: 99-1025  
JOB NO.: 299141  
DATE RCVD: 11/04/99  
SAMPLED BY: Client

PROJECT : 20092-090-002, VW&R  
MATERIAL: Brown, clayey silt  
SAMPLE ID.: SB-14-111

SAMPLE WT.(WBW-dry) = 62.2 (GMS) SOIL PASSING #10 SIEVE = 98.6 %

SPECIFIC GRAVITY OF SOIL SAMPLE = 2.620

ELAPSED TIME (MIN)	TIME	TEMP. (oC)	CORR.(K) USING (TAB. 3)	HYDROMETER READING		CORR. READING	EFFECTIVE DEPTH (CMS)	PARTICLE SIZE (M.M)	PERCENT FINER IN SUSPENSION
				(WATER)	(W/SOIL)				
0	START								
0	01:23 PM	23.3	0.01324	1.0038	1.0230	1.0193	10.2	0.0294	49.4
2	01:25 PM	23.3	0.01324	1.0038	1.0200	1.0163	11.0	0.0304	41.7
5	01:28 PM	23.3	0.01324	1.0038	1.0150	1.0113	12.3	0.0196	28.8
15	01:38 PM	23.3	0.01324	1.0038	1.0110	1.0073	13.4	0.0117	18.6
30	01:53 PM	23.3	0.01324	1.0038	1.0090	1.0053	13.9	0.0084	13.5
60	02:23 PM	23.3	0.01324	1.0038	1.0080	1.0043	14.2	0.0059	10.9
250	05:33 PM	23.9	0.01315	1.0038	1.0050	1.0013	15.0	0.0030	3.2
12/05/99 1440	01:23 PM	22.8	0.01332	1.0038	1.0045	1.0008	15.1	0.0013	1.9

Remarks:

Respectfully Submitted:

Reviewed By:   
Input By: AO

  
Ammi Osorio  
Laboratory Engineer

Client: Roy F. Weston  
 Project: 20092-090-002, VW&R  
 Material Source:

SB-14-111



ATL Job No: 299141  
 ATL Lab No: 99-1025  
 Date Rvcd: 11/04/99  
 Sample Date: 09/08/99

**Void Ratio**

$$e = \frac{\text{Volume of Voids}}{\text{Volume of Solids}}$$

$$\text{Volume of Solids (V}_s) = \frac{\text{Weight of Solids}}{\text{Specific Gravity} * \text{Unit Weight of Water}}$$

$$\text{Weight of Solids (W}_s) = \frac{\text{Wet Density}}{1 + \text{Moisture Content}}$$

$$\text{Volume of Voids (V}_v) = \text{Total Volume} - \text{Volume of Solids}$$

Total Volume 1  
 Wet Density 110.2  
 Moisture Content 26.20%  
 Specific Gravity 2.62  
 Unit Weight of Water 62.3

Weight of Solids (W<sub>s</sub>) 87.322  
 Volume of Solids (V<sub>s</sub>) 0.535  
 Volume of Voids (V<sub>v</sub>) 0.465

**Void Ratio** 0.869

**Porosity** 46.5%

$$\text{To compute for air filled porosity}(n_a) = \frac{V_a(n)}{V_v}$$

$$\text{To compute for water filled porosity}(n_w) = \frac{V_w(n)}{V_v}$$

$$\text{Volume of Air}(V_a) = V_v - V_w$$

$$\text{Volume of Water}(V_w) = \frac{\text{Weight of water}}{\text{Unit wt. of water}}$$

$$\text{Weight of water} = \text{Wet Density} - \text{Dry Density}$$

$$\text{Dry Density} = \frac{\text{Wet Density}}{1 + \text{Moisture Content}}$$

$$\text{Dry Density} = 87.322$$

$$\text{Weight of water} = 22.878$$

$$\text{Volume of Water}(V_w) = 0.367$$

$$\text{Volume of Air}(V_a) = 0.098$$

$$\text{Air filled porosity}(n_a) = 9.8\%$$

$$\text{Water filled porosity}(n_w) = 36.7\%$$



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**REPORT OF SIEVE ANALYSIS - SOILS & AGGREGATE**

**CLIENT:** Roy F. Weston  
 202 E. Earl, Ste 46  
 Phoenix, AZ 85012

**PROJECT NAME:** 20092-090-002, VW&R

**ATTENTION:** Project Manager

**SAMPLE ID.:** SB-15-167

**TEST DATE:** 12/04/99

**ATL JOB NO.:** 299141

**ATL LAB NO.:** 99-1026

**LAB METHOD:** ASTM D422

**SAMPLED BY:** Client

**TESTED BY:** JL/MC

**MATERIAL:** Brown,  
 clayey silt

**REPORT DATE:** 02/17/00

SIEVE	WT. RETAINED	%RET	% PASSING	SPECS
3"	0	0	100	
2 1/2"	0	0	100	
2"	0	0	100	
1 1/2"	0	0	100	
1"	0	0	100	
3/4"	0	0	100	
1/2"	0	0	100	
3/8"	0	0	100	
1/4"	0	0	100	
#4	0	0	100	
#8	0	0	100	
#10	0	0	100	
Minus #10			100.0	
+10 Total	0			58.6
Minus #10 Wet	401			57.7
Minus #10 Dry	395			10.5
Total	395			47.2
#16	0.4	0.7	99.3	
#30	1.2	2.1	97.2	
#40	0.7	1.2	96.0	
#50	0.8	1.4	94.6	
#100	2.3	4.0	90.6	
#200	3.3	5.7		
Minus #200	1.8		84.9	
Total	10.5			

SAMPLE PREPARATION	
Plus # 10 Wt.:	0
Minus # 10 Wt.:	401
Total Weight:	401

HYGROSCOPIC MOISTURE	
Wet Wt. :	33.9
Dry Wt.:	33.4
Hygros. Factor:	0.98525

FACTORS
Coarse
Fine
1.732031

Remarks:

Reviewed By:  
 Input By:

Respectfully Submitted:

Armi Osorio  
 Laboratory Engineer

HYDROMETER ANALYSIS  
(ASTM D422)

CLIENT : Roy F. Weston  
202 E. Earl, Ste 46  
Phoenix, AZ 85012

DATE : 12/05/99

PROJECT : 2092-090-002, VW&R  
MATERIAL: Brown, clayey silt  
SAMPLE ID.: SB-15-167

LAB. NO.: 99-1026  
JOB NO.: 299141  
DATE RCVD: 11/04/99  
SAMPLED BY: Client

SAMPLE WT.(WBW-dry) = 57.7 (GMS) SOIL PASSING #10 SIEVE = 100.0 %

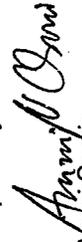
SPECIFIC GRAVITY OF SOIL SAMPLE = 2.570

ELAPSED TIME (MIN)	TIME	TEMP. (oC)	CORR.(K) USING (TAB. 3)	HYDROMETER READING		CORR. READING	EFFECTIVE DEPTH (CMS)	PARTICLE SIZE (M.M)	PERCENT FINER IN SUSPENSION
				(WATER)	(W/SOIL)				
0	START 09:04 AM	21.7	0.01371	1.0038	1.0300	1.0263	8.4	0.0294	74.4
2	09:06 AM	21.7	0.01371	1.0038	1.0240	1.0203	9.9	0.0304	57.4
5	09:09 AM	21.7	0.01371	1.0038	1.0190	1.0153	11.3	0.0196	43.2
15	09:19 AM	21.7	0.01371	1.0038	1.0150	1.0113	12.3	0.0117	31.9
30	09:34 AM	21.7	0.01371	1.0038	1.0120	1.0083	13.1	0.0084	23.4
60	10:04 AM	21.7	0.01371	1.0038	1.0110	1.0073	13.4	0.0059	20.6
250	01:14 PM	21.7	0.01371	1.0038	1.0070	1.0033	14.4	0.0030	9.2
12/06/99 1440	09:04 AM	21.7	0.01371	1.0038	1.0055	1.0018	14.8	0.0013	5.0

Remarks:

Reviewed By:   
Input By: AO

Respectfully Submitted:

  
Ammi Osorio  
Laboratory Engineer

Client: Roy F. Weston  
 Project: 20092-090-002, VW&R  
 Material Source:

SB-15-167



ATL Job No: 299141  
 ATL Lab No: 99-1026  
 Date Rvcd: 11/04/99  
 Sample Date: 09/08/99

**Void Ratio**

$$e = \frac{\text{Volume of Voids}}{\text{Volume of Solids}}$$

$$\text{Volume of Solids (V}_s) = \frac{\text{Weight of Solids}}{\text{Specific Gravity} * \text{Unit Weight of Water}}$$

$$\text{Weight of Solids (W}_s) = \frac{\text{Wet Density}}{1 + \text{Moisture Content}}$$

$$\text{Volume of Voids (V}_v) = \text{Total Volume} - \text{Volume of Solids}$$

Total Volume 1  
 Wet Density 112.2  
 Moisture Content 31.70%  
 Specific Gravity 2.566  
 Unit Weight of Water 62.3

Weight of Solids (W<sub>s</sub>) 85.194  
 Volume of Solids (V<sub>s</sub>) 0.533  
 Volume of Voids (V<sub>v</sub>) 0.467

**Void Ratio** **0.876**

**Porosity** **46.7%**

To compute for air filled porosity(n <sub>a</sub> )	=	$\frac{V_a(n)}{(V_v)}$
To compute for water filled porosity(n <sub>w</sub> )	=	$\frac{V_w(n)}{(V_v)}$
Volume of Air(V <sub>a</sub> )	=	V <sub>v</sub> - V <sub>w</sub>
Volume of Water(V <sub>w</sub> )	=	$\frac{\text{Weight of water}}{\text{Unit wt. of water}}$
Weight of water	=	Wet Density - Dry Density
Dry Density	=	$\frac{\text{Wet Density}}{1 + \text{Moisture Content}}$
Dry Density	=	85.194
Weight of water	=	27.006
Volume of Water(V <sub>w</sub> )	=	0.433
Volume of Air(V <sub>a</sub> )	=	0.034
<b>Air filled porosity(n<sub>a</sub>)</b>	=	<b>3.4%</b>
<b>Water filled porosity(n<sub>w</sub>)</b>	=	<b>43.3%</b>



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**REPORT OF SIEVE ANALYSIS - SOILS & AGGREGATE**

**CLIENT:** Roy F. Weston  
 202 E. Earl, Ste 46  
 Phoenix, AZ 85012

**PROJECT NAME:** 20092-090-002, VW&R

**ATTENTION:** Project Manager

**SAMPLE ID.:** SB-17-006

**TEST DATE:** 12/04/99

**ATL JOB NO.:** 299141

**ATL LAB NO.:** 99-1027

**LAB METHOD:** ASTM D422

**SAMPLED BY:** Client

**TESTED BY:** JL/MC

**MATERIAL:** Brown, clayey silt

**REPORT DATE:** 02/17/00

SIEVE	WT. RETAINED	%RET	% PASSING	SPECS
3"	0	0	100	
2 1/2"	0	0	100	
2"	0	0	100	
1 1/2"	0	0	100	
1"	0	0	100	
3/4"	0	0	100	
1/2"	0	0	100	
3/8"	0	0	100	
1/4"	0	0	100	
#4	0	0	100	
#8	0	0	100	
#10	1	0		
Minus #10			99.8	
+10 Total	1			W.B.W. (WET): 71.8
Minus #10 Wet	387			W.B.W. (DRY): 71.5
Minus #10 Dry	386			W.A.W: 12.1
Total	386			ELUTRIATION: 59.4
#16	0.2	0.3	99.5	
#30	0.1	0.1	99.4	
#40	0.1	0.1	99.3	
#50	0.2	0.3	99.0	
#100	2.4	3.3	95.6	
#200	7.5	10.5		
Minus #200	1.6		85.2	
Total	12.1			

SAMPLE PREPARATION	
Plus # 10 Wt.:	1
Minus # 10 Wt.:	387
Total Weight:	388

HYGROSCOPIC MOISTURE	
Wet Wt.:	27.1
Dry Wt.:	27.0
Hygros. Factor:	0.99631

FACTORS	
Coarse	0.258818
Fine	1.395383

Remarks:

Reviewed By:  AO  
 Input By:

Respectfully Submitted:

  
 Armi Osorio  
 Laboratory Engineer

**HYDROMETER ANALYSIS  
(ASTM D422)**

CLIENT : Roy F. Weston  
 202 E. Earl, Ste 46  
 Phoenix, AZ 85012

PROJECT : 20092-090-002, VW&R  
 MATERIAL: Soil  
 SAMPLE ID.: SB-17-006

DATE : 12/04/99

LAB. NO.: 99-1027  
 JOB NO.: 299141  
 DATE RCVD: 11/04/99  
 SAMPLED BY: Client

SAMPLE WT.(WBW-dry) = 71.5 (GMS) SOIL PASSING #10 SIEVE = 99.8 %

SPECIFIC GRAVITY OF SOIL SAMPLE = 2.580

ELAPSED TIME (MIN)	TIME	TEMP. (oC)	CORR.(K) USING (TAB. 3)	HYDROMETER READING		CORR. READING	EFFECTIVE DEPTH (CMS)	PARTICLE SIZE (M.M)	PERCENT FINER IN SUSPENSION
				(WATER)	(W/SOIL)				
0	START								
0	01:43 PM	23.3	0.01341	1.00375	1.03000	1.02625	8.4	0.0294	59.8
2	01:45 PM	23.3	0.01341	1.00375	1.02700	1.02325	9.2	0.0304	53.0
5	01:48 PM	23.3	0.01341	1.00375	1.02300	1.01925	10.2	0.0196	43.9
15	01:58 PM	23.3	0.01341	1.00375	1.01900	1.01525	11.3	0.0117	34.8
30	02:13 PM	23.3	0.01341	1.00375	1.01700	1.01325	11.8	0.0084	30.2
60	02:43 PM	23.3	0.01341	1.00375	1.01500	1.01125	12.3	0.0059	25.6
250	05:53 PM	23.9	0.01331	1.00375	1.01100	1.00725	13.4	0.0030	16.5
1440	01:43 PM	22.8	0.01349	1.00375	1.00850	1.00475	14.0	0.0013	10.8

Remarks:

Respectfully Submitted:

Reviewed By:   
 Input By: AO

  
 Armi Osgofo  
 Laboratory Engineer

Client: Roy F. Weston  
 Project: 20092-090-002, VW&R  
 Material Source:

SB-17-006



ATL Job No: 299141  
 ATL Lab No: 99-1027  
 Date Rvcd: 11/04/99  
 Sample Date: 09/08/99

**Void Ratio**

$$e = \frac{\text{Volume of Voids}}{\text{Volume of Solids}}$$

$$\text{Volume of Solids (V}_s) = \frac{\text{Weight of Solids}}{\text{Specific Gravity} * \text{Unit Weight of Water}}$$

$$\text{Weight of Solids (W}_s) = \frac{\text{Wet Density}}{1 + \text{Moisture Content}}$$

$$\text{Volume of Voids (V}_v) = \text{Total Volume} - \text{Volume of Solids}$$

Total Volume 1  
 Wet Density 93.8  
 Moisture Content 17.90%  
 Specific Gravity 2.581  
 Unit Weight of Water 62.3

Weight of Solids (W<sub>s</sub>) 79.559  
 Volume of Solids (V<sub>s</sub>) 0.495  
 Volume of Voids (V<sub>v</sub>) 0.505

**Void Ratio** 1.021

**Porosity** 50.5%

$$\text{To compute for air filled porosity}(n_a) = \frac{V_a(n)}{V_v}$$

$$\text{To compute for water filled porosity}(n_w) = \frac{V_w(n)}{V_v}$$

$$\text{Volume of Air}(V_a) = V_v - V_w$$

$$\text{Volume of Water}(V_w) = \frac{\text{Weight of water}}{\text{Unit wt. of water}}$$

$$\text{Weight of water} = \text{Wet Density} - \text{Dry Density}$$

$$\text{Dry Density} = \frac{\text{Wet Density}}{1 + \text{Moisture Content}}$$

$$\text{Dry Density} = 79.559$$

$$\text{Weight of water} = 14.241$$

$$\text{Volume of Water}(V_w) = 0.229$$

$$\text{Volume of Air}(V_a) = 0.277$$

$$\text{Air filled porosity}(n_a) = 27.7\%$$

$$\text{Water filled porosity}(n_w) = 22.9\%$$



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**REPORT OF SIEVE ANALYSIS - SOILS & AGGREGATE**

**CLIENT:** Roy F. Weston  
 202 E. Earl, Ste 46  
 Phoenix, AZ 85012

**PROJECT NAME:** 20092-090-002, VW&R

**ATTENTION:** Project Manager

**SAMPLE ID.:** SB-17-071

**TEST DATE:** 12/04/99

**ATL JOB NO.:** 299141

**ATL LAB NO.:** 99-1028

**LAB METHOD:** ASTM D422

**SAMPLED BY:** Client

**TESTED BY:** JL/MC

**MATERIAL:** Brown,  
silty sand

**REPORT DATE:** 02/17/00

SIEVE	WT. RETAINED	% RET.	% PASSING	SPECS
3"	0	0	100	
2 1/2"	0	0	100	
2"	0	0	100	
1 1/2"	0	0	100	
1"	0	0	100	
3/4"	0	0	100	
1/2"	0	0	100	
3/8"	0	0	100	
1/4"	38	8	92	
#4	47	10	82	
#8	90	19	63	
#10	16	3		
Minus #10			59.8	
+10 Total	190			W.B.W. (WET): 76.9
Minus #10 Wet	284			W.B.W. (DRY): 76.6
Minus #10 Dry	283			W.A.W.: 26.8
Total	473			ELUTRIATION: 49.8
#16	4.3	3.4	56.4	
#30	5.3	4.1	52.3	
#40	3.1	2.4	49.9	
#50	3.3	2.6	47.3	
#100	5.2	4.1	43.3	
#200	5.0	3.9		
Minus #200	0.6		39.4	
Total	26.8			

SAMPLE PREPARATION	
Plus # 10 Wt.:	190
Minus # 10 Wt.:	284
Total Weight:	474

HYGROSCOPIC MOISTURE	
Wet Wt. :	28.9
Dry Wt.:	28.8
Hygros. Factor:	0.99654

FACTORS	
Coarse	0.211230
Fine	0.780371

Remarks:

Reviewed By:  
 Input By:

AO

Respectfully Submitted:

Ammi Osofo  
 Laboratory Engineer

HYDROMETER ANALYSIS  
(ASTM D422)

CLIENT : Roy F. Weston  
202 E. Earl, Ste 46  
Phoenix, AZ 85012

DATE : 12/04/99  
LAB. NO.: 99-1028  
JOB NO.: 299141  
DATE RCVD: 11/04/99  
SAMPLED BY: Client

PROJECT : 20092-090-002, VW&R  
MATERIAL: Brown, silty sand  
SAMPLE ID.: SB-17-071

SAMPLE WT. (WBW-dry) = 76.6 (GMS) SOIL PASSING #10 SIEVE = 59.8 %

SPECIFIC GRAVITY OF SOIL SAMPLE = 2.665

ELAPSED TIME (MIN)	TIME	TEMP. (°C)	CORR. USING (TAB. 3)	HYDROMETER READING		CORR. READING	EFFECTIVE DEPTH (CMS)	PARTICLE SIZE (M.M)	PERCENT FINER IN SUSPENSION
				(WATER)	(W/SOIL)				
0	START								
0	01:53 PM	23.3	0.01304	1.0038	1.0300	1.0263	8.4	0.0294	32.8
2	01:55 PM	23.3	0.01304	1.0038	1.0240	1.0203	9.9	0.0304	25.3
5	01:58 PM	23.3	0.01304	1.0038	1.0210	1.0173	10.7	0.0196	21.6
15	02:08 PM	23.3	0.01304	1.0038	1.0160	1.0123	12.1	0.0117	15.3
30	02:23 PM	23.3	0.01304	1.0038	1.0140	1.0103	12.6	0.0084	12.8
60	02:53 PM	23.3	0.01304	1.0038	1.0110	1.0073	13.4	0.0059	9.1
250	06:03 PM	23.9	0.01295	1.0038	1.0080	1.0043	14.2	0.0030	5.3
12/05/99 1440	01:53 PM	22.8	0.01312	1.0038	1.0050	1.0013	15.0	0.0013	1.6

Remarks:

Reviewed By:   
Input By: AD

Respectfully Submitted:

  
Ahmi Osoyo  
Laboratory Engineer

Client: Roy F. Weston  
 Project: 20092-090-002, VW&R  
 Material Source:



ATL Job No: 299141  
 ATL Lab No: 99-1028  
 Date Rvcd: 11/04/99  
 Sample Date: 09/08/99

Void Ratio

$$e = \frac{\text{Volume of Voids}}{\text{Volume of Solids}}$$

$$\text{Volume of Solids (V}_s) = \frac{\text{Weight of Solids}}{\text{Specific Gravity} * \text{Unit Weight of Water}}$$

$$\text{Weight of Solids (W}_s) = \frac{\text{Wet Density}}{1 + \text{Moisture Content}}$$

$$\text{Volume of Voids (V}_v) = \text{Total Volume} - \text{Volume of Solids}$$

Total Volume 1  
 Wet Density 109.5  
 Moisture Content 16.60%  
 Specific Gravity 2.665  
 Unit Weight of Water 62.3

Weight of Solids (W<sub>s</sub>) 93.911  
 Volume of Solids (V<sub>s</sub>) 0.566  
 Volume of Voids (V<sub>v</sub>) 0.434

Void Ratio 0.768

Porosity 43.4%

$$\text{To compute for air filled porosity}(n_a) = \frac{V_a(n)}{V_v}$$

$$\text{To compute for water filled porosity}(n_w) = \frac{V_w(n)}{V_v}$$

$$\text{Volume of Air}(V_a) = V_v - V_w$$

$$\text{Volume of Water}(V_w) = \frac{\text{Weight of water}}{\text{Unit wt. of water}}$$

$$\text{Weight of water} = \text{Wet Density} - \text{Dry Density}$$

$$\text{Dry Density} = \frac{\text{Wet Density}}{1 + \text{Moisture Content}}$$

$$\text{Dry Density} = 93.911$$

$$\text{Weight of water} = 15.589$$

$$\text{Volume of Water}(V_w) = 0.250$$

$$\text{Volume of Air}(V_a) = 0.184$$

$$\text{Air filled porosity}(n_a) = 18.4\%$$

$$\text{Water filled porosity}(n_w) = 25.0\%$$



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**REPORT OF SIEVE ANALYSIS - SOILS & AGGREGATE**

**CLIENT:** Roy F. Weston  
 202 E. Earl, Ste 46  
 Phoenix, AZ 85012

**PROJECT NAME:** 20092-090-002, VW&R

**ATTENTION:** Project Manager

**SAMPLE ID.:** SB-17-106

**TEST DATE:** 12/04/99

**ATL JOB NO.:** 299141

**ATL LAB NO.:** 99-1029

**LAB METHOD:** ASTM D422

**SAMPLED BY:** Client

**TESTED BY:** JL/MC

**MATERIAL:** Brown,  
silty sand

**REPORT DATE:** 02/17/00

SIEVE	WT. RETAINED	% RET.	% PASSING	SPECS
3"	0	0	100	
2 1/2"	0	0	100	
2"	0	0	100	
1 1/2"	0	0	100	
1"	0	0	100	
3/4"	0	0	100	
1/2"	6	2	98	
3/8"	18	6	92	
1/4"	21	7	86	
#4	11	4	82	
#8	37	12	70	
#10	12	4		
Minus #10			66.2	
+10 Total	105			W.B.W. (WET): 89.2
Minus #10 Wet	208			W.B.W. (DRY): 88.2
Minus #10 Dry	206			W.A.W.: 49.4
Total	311			ELUTRIATION: 38.8
#16	11.3	8.5	57.7	
#30	15.1	11.3	46.4	
#40	6.8	5.1	41.3	
#50	4.7	3.5	37.8	
#100	6.4	4.8	33.0	
#200	4.8	3.6		
Minus #200	0.3		29.3	
Total	49.4			

SAMPLE PREPARATION	
Plus # 10 Wt.:	105
Minus # 10 Wt.:	208
Total Weight:	313

HYGROSCOPIC MOISTURE	
Wet Wt. :	25.8
Dry Wt.:	25.5
Hygros. Factor:	0.98837

FACTORS	
Coarse	0.321567
Fine	0.751285

Remarks:

Reviewed By:  
 Input By:

Respectfully Submitted:

*Ammi Osorio*  
 Ammi Osorio  
 Laboratory Engineer

**HYDROMETER ANALYSIS**  
(ASTM D422)

CLIENT : Roy F. Weston  
202 E. Earl, Ste 46  
Phoenix, AZ 85012

DATE : 12/05/99

PROJECT : 20092-090-002, VW&R  
MATERIAL: Brown, silty sand  
SAMPLE ID.: SB-17-106

LAB. NO.: 99-1029  
JOB NO.: 299141  
DATE RCVD: 11/04/99  
SAMPLED BY: Client

SAMPLE WT.(WBW-dry) = 88.2 (GMS) SOIL PASSING #10 SIEVE = 66.2 %

SPECIFIC GRAVITY OF SOIL SAMPLE = 2.530

ELAPSED TIME (MIN)	TIME	TEMP. (°C)	CORR.(K) USING (TAB. 3)	HYDROMETER READING		CORR. READING	EFFECTIVE DEPTH (CMS)	PARTICLE SIZE (M.M)	PERCENT FINER IN SUSPENSION
				(WATER)	(W/SOIL)				
0	10:28 AM	23.3	0.01362	1.0038	1.0250	1.0213	9.7	0.0294	26.4
2	10:30 AM	23.3	0.01362	1.0038	1.0200	1.0163	11.0	0.0304	20.2
5	10:33 AM	23.3	0.01362	1.0038	1.0180	1.0143	11.5	0.0196	17.7
15	10:43 AM	23.3	0.01362	1.0038	1.0160	1.0123	12.1	0.0117	15.2
30	10:58 AM	23.3	0.01362	1.0038	1.0140	1.0103	12.6	0.0084	12.7
60	11:28 AM	23.3	0.01362	1.0038	1.0120	1.0083	13.1	0.0059	10.2
250	02:38 PM	23.3	0.01362	1.0038	1.0090	1.0053	13.9	0.0030	6.5
1440	12/06/99 10:28 AM	23.3	0.01362	1.0038	1.0070	1.0033	14.4	0.0013	4.0

Remarks:

Reviewed By:   
Input By: AO

Respectfully Submitted:

  
Ammi Osorio  
Laboratory Engineer

Client: Roy F. Weston  
 Project: 20092-090-002, VW&R  
 Material Source:



SB-17-106

ATL Job No: 299141  
 ATL Lab No: 99-1029  
 Date Rvcd: 11/04/99  
 Sample Date: 09/08/99

**Void Ratio**

$$e = \frac{\text{Volume of Voids}}{\text{Volume of Solids}}$$

$$\text{Volume of Solids (V}_s) = \frac{\text{Weight of Solids}}{\text{Specific Gravity} * \text{Unit Weight of Water}}$$

$$\text{Weight of Solids (W}_s) = \frac{\text{Wet Density}}{1 + \text{Moisture Content}}$$

$$\text{Volume of Voids (V}_v) = \text{Total Volume} - \text{Volume of Solids}$$

---

Total Volume	1
Wet Density	114.03
Moisture Content	17.10%
Specific Gravity	2.528
Unit Weight of Water	62.3

Weight of Solids (W <sub>s</sub> )	97.378
Volume of Solids (V <sub>s</sub> )	0.618
Volume of Voids (V <sub>v</sub> )	0.382

**Void Ratio**                      **0.617**

**Porosity**                              **38.2%**

To compute for air filled porosity(n<sub>a</sub>)                      =                       $\frac{V_a(n)}{V_v}$

To compute for water filled porosity(n<sub>w</sub>)                      =                       $\frac{V_w(n)}{V_v}$

Volume of Air(V<sub>a</sub>)                                                      =                      V<sub>v</sub> - V<sub>w</sub>

Volume of Water(V<sub>w</sub>)                                                      =                       $\frac{\text{Weight of water}}{\text{Unit wt. of water}}$

Weight of water                                                              =                      Wet Density - Dry Density

Dry Density                                                                      =                       $\frac{\text{Wet Density}}{1 + \text{Moisture Content}}$

Dry Density                                                                      =                      97.378

Weight of water                                                                =                      16.652

Volume of Water(V<sub>w</sub>)                                                        =                      0.267

Volume of Air(V<sub>a</sub>)                                                              =                      0.114

**Air filled porosity(n<sub>a</sub>)**                                                      =                      **11.4%**

**Water filled porosity(n<sub>w</sub>)**                                                      =                      **26.7%**



**ATL, INC.**  
 CONSTRUCTION QUALITY CONTROL  
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**REPORT OF SIEVE ANALYSIS - SOILS & AGGREGATE**

**PHOENIX - CORPORATE OFFICE**  
 2912 W. Clarendon • Phoenix, AZ 85017  
 (602) 241-1097 • Fax (602) 277-1306  
 www.atlquality.com

**CLIENT:** Roy F. Weston  
 202 E. Earl, Ste 46  
 Phoenix, AZ 85012

**PROJECT NAME:** 20092-090-002, VW&R

**ATTENTION:** Project Manager

**SAMPLE ID.:** SB-17-136

**TEST DATE:** 12/04/99  
**ATL JOB NO.:** 299141  
**ATL LAB NO.:** 99-1030  
**LAB METHOD:** ASTM D422  
**SAMPLED BY:** Client  
**TESTED BY:** JL/MC  
**MATERIAL:** Brown,  
 silty sand

**REPORT DATE:** 02/17/00

SIEVE	WT. RETAINED	%RET	% PASSING	SPECS
3"	0	0	100	
2 1/2"	0	0	100	
2"	0	0	100	
1 1/2"	0	0	100	
1"	0	0	100	
3/4"	0	0	100	
1/2"	0	0	100	
3/8"	0	0	100	
1/4"	0	0	100	
#4	0	0	100	
#8	28	6	94	
#10	7	1		
Minus #10			92.1	
+10 Total	35			63.1
Minus #10 Wet	412			62.7
Minus #10 Dry	410			36.0
Total	444			26.7
#16	6.5	9.6	82.6	
#30	5.6	8.2	74.4	
#40	2.8	4.1	70.2	
#50	2.9	4.3	66.0	
#100	5.9	8.7	57.3	
#200	8.1	11.9		
Minus #200	4.2		45.4	
Total	36.0			

SAMPLE PREPARATION	
Plus # 10 Wt.:	35
Minus # 10 Wt.:	412
Total Weight:	447

HYGROSCOPIC MOISTURE	
Wet Wt.:	31.1
Dry Wt.:	30.9
Hygros. Factor:	0.99357

FACTORS	
Coarse	0.224972
Fine	1.469808

Remarks:

Reviewed By:  
 Input By:

AO

Respectfully Submitted:

*Ammi Osorio*  
 Ammi Osorio  
 Laboratory Engineer





Client: Roy F. Weston  
 Project: 20092-090-002, VW&R  
 Material Source:

SB-17-136

ATL Job No: 299141  
 ATL Lab No: 99-1030  
 Date Rvcd: 11/04/99  
 Sample Date: 09/08/99

**Void Ratio**

$$e = \frac{\text{Volume of Voids}}{\text{Volume of Solids}}$$

$$\text{Volume of Solids (V}_s) = \frac{\text{Weight of Solids}}{\text{Specific Gravity} * \text{Unit Weight of Water}}$$

$$\text{Weight of Solids (W}_s) = \text{Wet Density} * (1 + \text{Moisture Content})$$

$$\text{Volume of Voids (V}_v) = \text{Total Volume} - \text{Volume of Solids}$$

Total Volume 1  
 Wet Density 104.1  
 Moisture Content 21.90%  
 Specific Gravity 2.59  
 Unit Weight of Water 62.3

Weight of Solids (W<sub>s</sub>) 85.398  
 Volume of Solids (V<sub>s</sub>) 0.529  
 Volume of Voids (V<sub>v</sub>) 0.471

**Void Ratio** 0.889

**Porosity** 47.1%

To compute for air filled porosity(n <sub>a</sub> )	=	$\frac{V_a(n)}{(V_v)}$
To compute for water filled porosity(n <sub>w</sub> )	=	$\frac{V_w(n)}{(V_v)}$
Volume of Air(V <sub>a</sub> )	=	V <sub>v</sub> - V <sub>w</sub>
Volume of Water(V <sub>w</sub> )	=	$\frac{\text{Weight of water}}{\text{Unit wt. of water}}$
Weight of water	=	Wet Density - Dry Density
Dry Density	=	$\frac{\text{Wet Density}}{1 + \text{Moisture Content}}$
Dry Density	=	85.398
Weight of water	=	18.702
Volume of Water(V <sub>w</sub> )	=	0.300
Volume of Air(V <sub>a</sub> )	=	0.171
<b>Air filled porosity(n<sub>a</sub>)</b>	=	17.1%
<b>Water filled porosity(n<sub>w</sub>)</b>	=	30.0%



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**Letter of Transmittal**

**TO: Roy F. Weston**  
**202 E. Earl, Ste 46**  
**Phoenix, AZ 85012**

Date: April 7, 2000	Job No 299141
Attn: Mr. Larry Phillips	
Re: 20092-090-002 (VW&R)	

**WE ARE SENDING YOU**  Attached  Under Separate cover via \_\_\_\_\_ the following items:

- Geotechnical Report  Prints  Plans  Samples  Specifications  
 Copy of letter  Change Order  \_\_\_\_\_

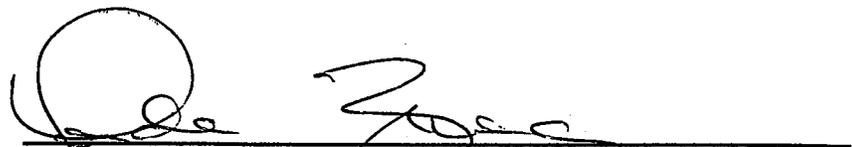
COPIES	DATE	NO.	DESCRIPTION
1		1	Summary of Permeability Test Results

**THESE ARE TRANSMITTED as checked below:**

- For your use  Approved as submitted  Resubmit \_\_\_\_\_ copies for approval  
 For your approval  Approved as noted  Submit \_\_\_\_\_ copies for distribution  
 As requested  Returned for corrections  Return \_\_\_\_\_ corrected prints  
 For review and comment  \_\_\_\_\_  
 FOR BIDS DUE \_\_\_\_\_ 19 \_\_\_\_  PRINTS RETURNED AFTER LOAN TO US

**REMARKS:**

**SIGNED:**

  
 Yolanda Rivera, Sender

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 (520) 623-4547  
 Fax (520) 623-4603

**FLAGSTAFF**  
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 Fax (520) 522-0350

**GLOBE**  
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 (520) 456-0087  
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 (702) 871-0492  
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**SUMMARY OF PERMEABILITY TEST RESULTS**

**Client:** Roy F. Weston  
 202 E. Earl, Ste 46  
 Phoenix, Arizona 85012

**Job No.:** 299141  
**Date Sampled:** 9/8-16/99  
**Sampled by:** Client  
**Date Submitted:** 04/07/00  
**Material Source:** See Below

**Project Name:** 20092-090-002 (VW&R)  
**Attention:** Larry Phillips

Material Description	Lab. No.:	Permeability, <i>k</i> cm/sec	Remarks
SB-14-036	99-1023	8.46 x 10 <sup>-4</sup>	
SB-14-056	99-1024	4.23 x 10 <sup>-2</sup>	
SB-14-111	99-1025	1.69 x 10 <sup>-3</sup>	
SB-15-167	99-1026	1.05 x 10 <sup>-2</sup>	
SB-17-006	99-1027	-	See Note*
SB-17-071	99-1028	2.12 x 10 <sup>-3</sup>	
SB-17-106	99-1029	6.35 x 10 <sup>-3</sup>	
SB-17-106	99-1030	4.23 x 10 <sup>-3</sup>	

Note: Sample was disturbed, unable to run test

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 Fax (520) 456-0089

**LAS VEGAS**  
 (702) 871-0492  
 Fax (702) 871-3643

**PERMEABILITY WORKSHEET  
FALLING HEAD**

Client: Roy F. Weston Lab No.: 99-1023  
 Project: VW-R (20092-090-002) Tube No.: 1  
 Project No.: 299141 Description: SB-14-036

DATE	INITIAL TIME	ELAPSED TIME	DIFFERENCE TIME sec	HEIGHT OF HEAD cm	DIFFERENCE HEIGHT OF HEAD cm	PERMEABILITY, k cm/sec	REMARKS
12/20/99	01:15 PM						Pre-soak
12/23/99	01:15 PM						Empty
12/23/99	01:20 PM			335.28			Refill
12/23/99	01:20 PM	02:20 PM	3600	332.23	3.05	$8.46 \times 10^{-4}$	Refill after reading was taken
12/23/99	02:25 PM	03:25 PM	3600	332.23	3.05	$8.46 \times 10^{-4}$	Refill after reading was taken
12/23/00	03:30 PM	04:30 PM	3600	332.23	3.05	$8.46 \times 10^{-4}$	Termination of test

Permeability, k cm/sec =  $8.46 \times 10^{-4}$

Remarks:

Input By: AO

Reviewed By:

Submitted By:

*Armani Osorio*  
 Armani Osorio  
 Laboratory Engineer

**PERMEABILITY WORKSHEET  
FALLING HEAD**

Client: Roy F. Weston Lab No.: 99-1024  
 Project: VW-R (20092-090-002) Tube No.: 2  
 Project No.: 299141 Description: SB-14-056

DATE	INITIAL TIME	ELAPSED TIME	DIFFERENCE TIME sec	HEIGHT OF HEAD cm	DIFFERENCE HEIGHT OF HEAD cm	PERMEABILITY, k cm/sec	REMARKS
01/04/00	02:30 PM						Pre-soak
01/05/00	02:30 PM						Empty
01/05/00	02:35 PM			426.72			Refill
01/05/00	02:40 PM	03:40 PM	3600	274.32	152.4	$4.23 \times 10^{-2}$	Refill after reading was taken
01/05/00	03:45 PM	04:45 PM	3600	274.32	152.4	$4.23 \times 10^{-2}$	Refill after reading was taken
01/05/00	04:50 PM	05:50 PM	3600	274.32	152.4	$4.23 \times 10^{-2}$	Termination of test

Submitted By: *[Signature]*  
 Ammi Osorio  
 Laboratory Engineer

Permeability, k cm/sec =  $4.23 \times 10^{-2}$

Remarks:

Input By: AO

Reviewed By:

*[Signature]*

**PERMEABILITY WORKSHEET  
FALLING HEAD**

Client: Roy F. Weston  
 Project: VW-R (20092-090-002)  
 Project No.: 299141

Lab No.: 99-1025  
 Tube No.: 1  
 Description: SB-14-111

DATE	INITIAL TIME	ELAPSED TIME	DIFFERENCE TIME sec	HEIGHT OF HEAD cm	DIFFERENCE HEIGHT OF HEAD cm	PERMEABILITY, k cm/sec	REMARKS
02/10/00	03:00 PM						Pre-soak
02/11/00	03:00 PM						Ca'nt determine
02/13/00	03:20 PM			335.28			Refill
02/14/00	03:30 PM	05:40 PM	7800	321.31	13.97	$3.88 \times 10^{-3}$	Refill after reading was taken
02/15/00	03:30 PM	04:57 PM	4800	326.39	8.89	$1.71 \times 10^{-3}$	Refill after reading was taken
02/16/00	02:30 PM						Refill
02/16/00	02:30 PM	03:58 PM	3600	326.39	8.89	$1.69 \times 10^{-3}$	Refill after reading was taken
02/16/00	04:00 PM	05:28 PM	3600	326.39	8.89	$1.69 \times 10^{-3}$	Termination of test

Permeability, k cm/sec =  $1.69 \times 10^{-3}$

Remarks:

Input By: AO

Reviewed By: 

Submitted By:

  
 Avni Osorio  
 Laboratory Engineer

**PERMEABILITY WORKSHEET  
FALLING HEAD**

Client: Roy F. Weston  
 Project: VW-R (20092-090-002)  
 Project No.: 299141

Lab No.: 99-1026  
 Tube No.: 2  
 Description: SB-15-167

DATE	INITIAL TIME	ELAPSED TIME	DIFFERENCE TIME sec	HEIGHT OF HEAD cm	DIFFERENCE HEIGHT OF HEAD cm	PERMEABILITY, k cm/sec	REMARKS
02/22/00	01:00 PM						Pre-soak
02/23/00	01:00 PM						Ca'nt determine
02/23/00	01:30 PM			426.72			Refill
02/23/00	02:00 PM	02:02 PM	120	425.45	1.27	$1.05 \times 10^{-2}$	Refill after reading was taken
02/23/00	03:00 PM	03:01 PM	60	426.085	0.635	$1.05 \times 10^{-2}$	Refill after reading was taken
02/23/00	04:04 PM	04:05 PM	60	426.085	0.635	$1.05 \times 10^{-2}$	Termination of test

Permeability, k cm/sec =  $1.05 \times 10^{-2}$

Remarks:

Input By: AO

Reviewed By:

Submitted By:

*Amir Oşorio*  
 Amir Oşorio  
 Laboratory Engineer

**PERMEABILITY WORKSHEET  
FALLING HEAD**

Client: Roy F. Weston  
 Project: VW-R (20092-090-002)  
 Project No.: 299141

Lab No.: 99-1027  
 Tube No.:  
 Description: SB-17-006

DATE	INITIAL TIME	ELAPSED TIME	DIFFERENCE TIME sec	HEIGHT OF HEAD cm	DIFFERENCE HEIGHT OF HEAD cm	PERMEABILITY, $k$ cm/sec	REMARKS
							Sample was disturbed

Permeability,  $k$  cm/sec =   
 Remarks: Unable to run the test, sample was too disturbed  
 Input By: AO  
 Reviewed By:

Submitted By:  
  
 Almir Osorio  
 Laboratory Engineer

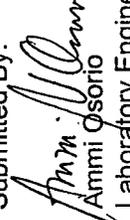


**PERMEABILITY WORKSHEET  
FALLING HEAD**

Client: Roy F. Weston  
 Project: VW&R, 20092-090-002  
 Project No.: 299141  
 Lab No.: 99-1028  
 Tube No.: 1  
 Description: SB-B17-071

DATE	INITIAL TIME	ELAPSED TIME	DIFFERENCE TIME sec	HEIGHT OF HEAD cm	DIFFERENCE HEIGHT OF HEAD cm	PERMEABILITY, k cm/sec	REMARKS
03/10/00	01:00 PM						Pre-soak
03/11/00	12:00 PM			335.28			Refill
03/11/00	12:30 PM	12:35 PM	300	334.01	1.27	$4.23 \times 10^{-3}$	Refill after reading was taken
03/11/00	01:30 PM	01:35 PM	300	334.01	1.27	$4.23 \times 10^{-3}$	Refill after reading was taken
03/11/00	02:30 PM	02:35 PM	300	334.645	0.635	$2.12 \times 10^{-3}$	Refill after reading was taken
03/11/00	03:35 PM	03:40 PM	300	334.645	0.635	$2.12 \times 10^{-3}$	Refill after reading was taken
03/11/00	03:50 PM	03:55 PM	300	334.645	0.635	$2.12 \times 10^{-3}$	Terminated the test

Permeability, k cm/sec =  $2.12 \times 10^{-3}$

Submitted By:   
 Ammi Osorio  
 Laboratory Engineer

Remarks:  
 Input By: AO  
 Reviewed By: 

**PERMEABILITY WORKSHEET  
FALLING HEAD**

Client: Roy F. Weston  
 Project: VW-R (20092-090-002)  
 Project No.: 299141

Lab No.: 99-1029  
 Tube No.: 2  
 Description: SB-17-106

DATE	INITIAL TIME	ELAPSED TIME	DIFFERENCE TIME sec	HEIGHT OF HEAD cm	DIFFERENCE HEIGHT OF HEAD cm	PERMEABILITY, k cm/sec	REMARKS
03/13/00	09:00 AM						Pre-soak
03/14/00	10:00 AM			426.72			Refill
03/14/00	10:15 AM	10:20 AM	300	423.545	3.175	$1.05 \times 10^{-2}$	Refill after reading was taken
03/14/00	11:20 AM	11:25 AM	300	423.545	3.175	$1.05 \times 10^{-2}$	Refill after reading was taken
03/14/00	12:25 PM	12:30 PM	300	423.545	3.175	$1.05 \times 10^{-2}$	Refill after reading was taken
03/14/00	01:30 PM	01:35 PM	300	423.545	3.175	$1.05 \times 10^{-2}$	Refill after reading was taken
03/14/00	02:30 PM	02:35 PM	300	424.815	1.905	$6.35 \times 10^{-3}$	Refill after reading was taken
03/14/00	03:30 PM	03:35 PM	300	424.815	1.905	$6.35 \times 10^{-3}$	Refill after reading was taken
03/14/00	04:30 PM	04:35 PM	300	424.815	1.905	$6.35 \times 10^{-3}$	Terminated the tests

Permeability, k cm/sec =  $6.35 \times 10^{-3}$

Remarks:

Input By: AO

Reviewed By:

Submitted By:

*Armi Osorio*  
 Armi Osorio  
 Laboratory Engineer



**PERMEABILITY WORKSHEET  
FALLING HEAD**

Client: Roy F. Weston  
 Project: VW-R (20092-090-002)  
 Project No.: 299141

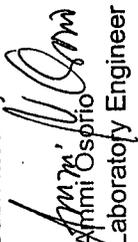
Lab No.: 99-1030  
 Tube No.: 2  
 Description: SB-17-136

DATE	INITIAL TIME	ELAPSED TIME	DIFFERENCE TIME sec	HEIGHT OF HEAD cm	DIFFERENCE HEIGHT OF HEAD cm	PERMEABILITY, k cm/sec	REMARKS
03/10/00	12:00 PM						Pre-soak
03/11/00	12:00 PM			426.72			Refill
03/11/00	12:35 PM	12:40 PM	300	424.815	1.905	$6.35 \times 10^{-3}$	Refill after reading was taken
03/11/00	01:40 PM	01:45 PM	300	424.815	1.905	$6.35 \times 10^{-3}$	Refill after reading was taken
03/11/00	02:45 PM	02:50 PM	300	424.815	1.905	$6.35 \times 10^{-3}$	Refill after reading was taken
03/11/00	03:50 PM	03:55 PM	300	425.45	1.27	$4.23 \times 10^{-3}$	Refill after reading was taken
03/11/00	04:00 PM	04:05 PM	300	425.45	1.27	$4.23 \times 10^{-3}$	Refill after reading was taken
03/11/00	04:30 PM	04:35 PM	300	425.45	1.27	$4.23 \times 10^{-3}$	Terminated tests

Permeability, k cm/sec =  $4.23 \times 10^{-3}$

Remarks:  
 Input By: AO  
 Reviewed By:



Submitted By:  
  
 Almiri Osorio  
 Laboratory Engineer



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(602) 241-1097 • Fax (602) 277-1306

### Letter of Transmittal

**O: Roy F. Weston**  
202 E. Earl, Ste 46  
Phoenix, AZ 85012

Date: <b>March 28, 2001</b>	Job No <b>201022</b>
Attn: <b>Richard Findlay</b>	
Re: <b>East Grand Avenue</b>	

**WE ARE SENDING YOU** x Attached  Under Separate cover via \_\_\_\_\_ the following items:

- Geotechnical Report     Prints     Plans     Samples     Specifications
- Copy of letter     Change Order     \_\_\_\_\_

COPIES	DATE	NO.	DESCRIPTION
1	02/14/01		Laboratory Tests : Bulk Density, Moisture Falling Head Permeability Content,
			Total Organic Content, Grain Size Distribution, Including Porosity
			Calculations

**THESE ARE TRANSMITTED** as checked below:

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**REMARKS:**

SIGNED:

*Mayra Olivas*  
\_\_\_\_\_  
Mayra Olivas, Sender

201022  
 See below  
 1/08/01 to 1/27/01  
 Client

ATL Job No.:  
 ATL Lab No.:  
 Sample Date:  
 Sampled By:

Client: Roy F. Weston  
 Address: 202 E. Earll Drive, Ste 46  
 Phoenix, AZ 85012  
 Project: East Grand Avenue  
 Sample ID: Various, See Below  
 Sample Soil in Shelby tubes

**SUMMARY OF LABORATORY ANALYSIS**

Lab No.	Sample ID	Void Ratio	Air Filled Porosity (%)	H <sub>2</sub> O Porosity (%)	Total Porosity (%)	Moisture Content (%)	Dry Density (pcf)	Specific Gravity	Total Organic (%)	Organic Matter (%)	Permeability (Falling Head) (cm/sec)
01-0347	WCP-MW-085-126	0.825	0.9	44.3	45.2	30.4	90.9	2.662	0.72	0.20	2.1 x 10 <sup>-6</sup>
01-0348	WCP-MW-084-126	0.459	2.2	29.3	31.4	15.6	116.8	2.735	0.36	0.10	9.7 x 10 <sup>-5</sup>
01-0349	WCP-MW-084-141	0.917	3.5	44.4	47.8	31.5	87.8	-	0.83	0.23	2.7 x 10 <sup>-6</sup>
01-0350	WCP-MW-084-151	0.444	2.5	28.3	30.8	15.1	116.7	2.705	0.39	0.11	8.9 x 10 <sup>-4</sup>
01-0351	WCP-MW-047-126	0.413	3.1	26.1	29.2	13.6	119.6	2.714	0.79	0.22	1.8 x 10 <sup>-5</sup>
01-0352	WCP-MW-087-131	0.686	4.3	36.4	40.7	22.5	100.8	2.728	0.50	0.14	2.8 x 10 <sup>-6</sup>
01-0353	WCP-MW-087-151	0.365	0.4	26.3	26.8	13.3	123.2	-	0.76	0.21	1.8 x 10 <sup>-6</sup>
01-0354	WCP-MW-088-131	0.713	1.9	39.7	41.6	24.9	99.3	2.729	0.76	0.21	1.3 x 10 <sup>-5</sup>
01-0355	WCP-MW-087-126	NT	NT	NT	NT	NT	NT	NT	NT	NT	1.7 x 10 <sup>-4</sup>

Respectfully Submitted,

*Miguel M. Cancino*  
 Miguel M. Cancino  
 Laboratory Supervisor

Remarks: NT = Not tested

Reviewed By:  
 Input By: AO





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**REPORT OF SIEVE ANALYSIS - SOILS & AGGREGATE**

**CLIENT:** Roy F. Weston  
202 E. Earl, Ste 46  
Phoenix, AZ 85012

**PROJECT NAME:** East Grand Avenue

**ATTENTION:** Richard Findlay

**SAMPLE ID.:** WCP-MW-047-126

**TEST DATE:** 02/14/01  
**ATL JOB NO.:** 201022  
**ATL LAB NO.:** 01-0351  
**LAB METHOD:** ASTM D422  
**SAMPLED BY:** Client  
**TESTED BY:** DJ  
**MATERIAL:** Brown,  
silty sand  
**REPORT DATE:** 03/16/01

SIEVE	WT. RETAINED	%RET.	% PASSING	SPECS
3"				
2 1/2"				
2"				
1 1/2"				
1"				
3/4"	0	0	100	
1/2"	4	1	99	
3/8"	10	2	97	
1/4"	19	5	92	
#4	21	5	87	
#8	8	2	85	
#10	17	4		
Minus #10			81.0	
+10 Total	78			51.8
Minus #10 Wet	342			50.7
Minus #10 Dry	334.5			37.8
Total	413			12.9
#16	10.8	17.3	63.7	
#30	9.4	15.1	48.7	
#40	3.7	5.9	42.7	
#50	4.1	6.5	36.2	
#100	5.7	9.1	27.1	
#200	3.6	5.8		
Minus #200	0.4		21.2	
Total	37.8			

SAMPLE PREPARATION	
Plus # 10 Wt.:	78.3
Minus # 10 Wt.:	341.8
Total Weight:	420.1

HYGROSCOPIC MOISTURE	
Wet Wt. :	11.8
Dry Wt.:	11.5
Hygros. Factor:	0.97876

FACTORS	
Coarse	0.242230
Fine	1.599582

Remarks:

Reviewed By: *[Signature]*  
Input By: AO

Respectfully Submitted:  
*[Signature]*  
Miguel M. Zancino  
Laboratory Supervisor

HYDROMETER ANALYSIS  
(ASTM D422)



CLIENT : Roy F. Weston  
202 E. Earl, Ste 46  
Phoenix, AZ 85012

DATE : 03/05/01

LAB. NO.: 01-0351  
JOB NO.: 201022  
DATE RCVD: 02/14/01  
SAMPLED BY: Client

PROJECT : East Grand Avenue  
MATERIAL: Brown, silty sand  
SAMPLE ID: WCP-MW-047-126

SAMPLE WT.(WBW-dry) = 50.7 (gm) SOIL PASSING #10 SIEVE = 81.0 %

SPECIFIC GRAVITY OF SOIL SAMPLE = 2.714

ELAPSED TIME (MIN)	TIME	TEMP. (oC)	CORR. USING (TAB. 3)	HYDROMETER READING		CORR. READING	EFFECTIVE DEPTH (cm)	PARTICLE SIZE (mm)	PERCENT FINER IN SUSPENSION
				(WATER)	(W/SOIL)				
0	START 12:55 PM	21.1	0.01323	1.0043	1.0108	1.0065	13.5	0.0294	16.4
2	12:57 PM	21.1	0.01323	1.0043	1.0083	1.0040	14.1	0.0304	10.1
5	01:00 PM	21.1	0.01323	1.0043	1.0083	1.0040	14.1	0.0196	10.1
15	01:10 PM	21.1	0.01323	1.0043	1.0078	1.0035	14.2	0.0117	8.9
30	01:25 PM	21.1	0.01323	1.0043	1.0068	1.0025	14.5	0.0084	6.3
60	01:55 PM	22.2	0.01308	1.0043	1.0065	1.0023	14.6	0.0059	5.7
250	05:05 PM	22.2	0.01308	1.0043	1.0055	1.0013	14.8	0.0030	3.2
03/06/01 1440	12:55 PM	21.7	0.01309	1.0043	1.0055	1.0013	14.8	0.0013	3.2

Remarks:

Respectfully Submitted:  
*Miguel M. Cancino*  
Miguel M. Cancino  
Laboratory Supervisor

Reviewed By: *AO*  
Input By: AO



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(602) 241-1097 • Fax (602) 277-1306

**Client:** Roy F. Weston  
**Project:** East Grand Avenue  
**Material Source:** WCP-MW-047-126

**ATL Job No:** 201022  
**ATL Lab No:** 01-0351  
**Date Rvcd:** 02/14/01  
**Sample Date:** 01/15/01

Void Ratio

$$e = \frac{\text{Volume of Voids}}{\text{Volume of Solids}}$$

$$\text{Volume of Solids (V}_s) = \frac{\text{Weight of Solids}}{\text{Specific Gravity} \times \text{Unit Weight of Water}}$$

$$\text{Weight of Solids (W}_s) = \frac{\text{Wet Density}}{1 + \text{Moisture Content}}$$

$$\text{Volume of Voids (V}_v) = \text{Total Volume} - \text{Volume of Solids}$$

Total Volume 1  
Wet Density 135.9  
Moisture Content 13.60%  
Specific Gravity 2.714  
Unit Weight of Water 62.3

Weight of Solids (W<sub>s</sub>) 119.630  
Volume of Solids (V<sub>s</sub>) 0.708  
Volume of Voids (V<sub>v</sub>) 0.292

Void Ratio **0.413**

Porosity **29.2%**

To compute for air filled porosity(n <sub>a</sub> )	=	$\frac{V_a(n)}{V_v}$
To compute for water filled porosity(n <sub>w</sub> )	=	$\frac{V_w(n)}{V_v}$
Volume of Air(V <sub>a</sub> )	=	V <sub>v</sub> - V <sub>w</sub>
Volume of Water(V <sub>w</sub> )	=	$\frac{\text{Weight of water}}{\text{Unit wt. of water}}$
Weight of water	=	Wet Density - Dry Density
Dry Density	=	$\frac{\text{Wet Density}}{1 + \text{Moisture Content}}$
Dry Density	=	119.630
Weight of water	=	16.270
Volume of Water(V <sub>w</sub> )	=	0.261
Volume of Air(V <sub>a</sub> )	=	0.031
Air filled porosity(n <sub>a</sub> )	=	3.1%
Water filled porosity(n <sub>w</sub> )	=	26.1%



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**REPORT OF SIEVE ANALYSIS - SOILS & AGGREGATE**

**CLIENT:** Roy F. Weston  
202 E. Earl, Ste 46  
Phoenix, AZ 85012

**PROJECT NAME:** East Grand Avenue

**ATTENTION:** Richard Findlay

**SAMPLE ID.:** WCP-MW-084-126

**TEST DATE:** 02/14/01

**ATL JOB NO.:** 201022

**ATL LAB NO.:** 01-0348

**LAB METHOD:** ASTM D422

**SAMPLED BY:** Client

**TESTED BY:** DJ

**MATERIAL:** Brown,  
clayey sand

**REPORT DATE:** 03/16/01

SIEVE	WT. RETAINED	%RET.	% PASSING	SPECS
3"				
2 1/2"				
2"				
1 1/2"				
1"				
3/4"	0	0	100	
1/2"	19	4	96	
3/8"	1	0	95	
1/4"	5	1	94	
#4	5	1	93	
#8	23	5	88	
#10	8	2		
Minus #10			86.5	
+10 Total	60			50.9
Minus #10 Wet	394			49.9
Minus #10 Dry	386.0			33.0
Total	446			16.9
#16	7.2	12.4	74.1	
#30	7.0	12.2	61.9	
#40	3.3	5.8	56.2	
#50	3.2	5.6	50.6	
#100	5.3	9.1	41.5	
#200	6.3	10.9		
Minus #200	0.8		30.6	
Total	33.0			

SAMPLE PREPARATION	
Plus # 10 Wt.:	60.3
Minus # 10 Wt.:	393.3
Total Weight:	453.6

HYGROSCOPIC MOISTURE	
Wet Wt. :	10.0
Dry Wt.:	9.8
Hygros. Factor:	0.98002

FACTORS	
Coarse	0.224050
Fine	1.734194

Remarks:

Reviewed By: *AO*  
Input By: AO

Respectfully Submitted:  
*Miguel M. Cancino*  
Miguel M. Cancino  
Laboratory Supervisor



HYDROMETER ANALYSIS  
(ASTM D422)

DATE : 03/05/01  
 LAB. NO.: 01-0348  
 JOB NO.: 201022  
 DATE RCVD: 02/14/01  
 SAMPLED BY: Client

CLIENT : Roy F. Weston  
 202 E. Earl, Ste 46  
 Phoenix, AZ 85012

PROJECT : East Grand Avenue  
 MATERIAL: Brown, clayey sand  
 SAMPLE ID.: WCP-MW-084-126

SAMPLE WT.(WBW-dry) = 49.9 (gm) SOIL PASSING #10 SIEVE = 86.5 %

SPECIFIC GRAVITY OF SOIL SAMPLE = 2.735

ELAPSED TIME (MIN)	TIME	TEMP. (°C)	CORR.(K) USING (TAB. 3)	HYDROMETER READING		CORR. READING	EFFECTIVE DEPTH (cm)	PARTICLE SIZE (mm)	PERCENT FINER IN SUSPENSION
				(WATER)	(W/SOIL)				
0	START 12:10 PM	21.1	0.01314	1.0043	1.0118	1.0075	13.2	0.0294	20.5
2	12:02 PM	21.1	0.01314	1.0043	1.0078	1.0035	14.2	0.0304	9.6
5	12:15 PM	21.1	0.01314	1.0043	1.0068	1.0025	14.5	0.0196	6.8
15	12:25 PM	21.1	0.01314	1.0043	1.0068	1.0025	14.5	0.0117	6.8
30	12:40 PM	21.1	0.01314	1.0043	1.0058	1.0015	14.8	0.0084	4.1
60	01:10 PM	21.1	0.01314	1.0043	1.0050	1.0008	15.0	0.0059	2.0
250	04:20 PM	22.2	0.01299	1.0043	1.0045	1.0003	15.1	0.0030	0.7
03/06/01 1440	12:10 PM	21.1	0.01314	1.0043	1.0045	1.0003	15.1	0.0013	0.7

Remarks:

Respectfully Submitted:

*Miguel M. Cancino*  
 Miguel M. Cancino  
 Laboratory Supervisor

Reviewed By: *Am*  
 Input By: AO



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**Client:** Roy F. Weston  
**Project:** East Grand Avenue  
**Material Source:** WCP-MW-084-126

**ATL Job No:** 201022  
**ATL Lab No:** 01-0348  
**Date Rvcd:** 02/14/01  
**Sample Date:** 01/24/01

Void Ratio

$$e = \frac{\text{Volume of Voids}}{\text{Volume of Solids}}$$

$$\text{Volume of Solids (V}_s) = \frac{\text{Weight of Solids}}{\text{Specific Gravity} \times \text{Unit Weight of Water}}$$

$$\text{Weight of Solids (W}_s) = \frac{\text{Wet Density}}{1 + \text{Moisture Content}}$$

$$\text{Volume of Voids (V}_v) = \text{Total Volume} - \text{Volume of Solids}$$

---

Total Volume 1  
Wet Density 135.04  
Moisture Content 15.60%  
Specific Gravity 2.735  
Unit Weight of Water 62.3

Weight of Solids (W<sub>s</sub>) 116.817  
Volume of Solids (V<sub>s</sub>) 0.686  
Volume of Voids (V<sub>v</sub>) 0.314

Void Ratio **0.459**

Porosity **31.4%**

$$\text{To compute for air filled porosity}(n_a) = \frac{V_a(n)}{V_v}$$

$$\text{To compute for water filled porosity}(n_w) = \frac{V_w(n)}{V_v}$$

$$\text{Volume of Air}(V_a) = V_v - V_w$$

$$\text{Volume of Water}(V_w) = \frac{\text{Weight of water}}{\text{Unit wt. of water}}$$

$$\text{Weight of water} = \text{Wet Density} - \text{Dry Density}$$

$$\text{Dry Density} = \frac{\text{Wet Density}}{1 + \text{Moisture Content}}$$

$$\text{Dry Density} = 116.817$$

$$\text{Weight of water} = 18.223$$

$$\text{Volume of Water}(V_w) = 0.293$$

$$\text{Volume of Air}(V_a) = 0.022$$

$$\text{Air filled porosity}(n_a) = 2.2\%$$

$$\text{Water filled porosity}(n_w) = 29.3\%$$



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**Client:** Roy F. Weston  
**Project:** East Grand Avenue  
**Material Source:** WCP-MW-084-141

**ATL Job No:** 201022  
**ATL Lab No:** 01-0349  
**Date Rvcd:** 02/14/01  
**Sample Date:** 01/24/01

**Void Ratio**

$$e = \frac{\text{Volume of Voids}}{\text{Volume of Solids}}$$

$$\text{Volume of Solids (V}_s) = \frac{\text{Weight of Solids}}{\text{Specific Gravity} \times \text{Unit Weight of Water}}$$

$$\text{Weight of Solids (W}_s) = \frac{\text{Wet Density}}{1 + \text{Moisture Content}}$$

$$\text{Volume of Voids (V}_v) = \text{Total Volume} - \text{Volume of Solids}$$

Total Volume	1	
Wet Density	115.4	
Moisture Content	31.50%	
Specific Gravity	2.7	assumed
Unit Weight of Water	62.3	

Weight of Solids (W <sub>s</sub> )	87.757
Volume of Solids (V <sub>s</sub> )	0.522
Volume of Voids (V <sub>v</sub> )	0.478

**Void Ratio**                      **0.917**

**Porosity**                              **47.8%**

To compute for air filled porosity(n <sub>a</sub> )	=	$\frac{V_a(n)}{V_v}$
To compute for water filled porosity(n <sub>w</sub> )	=	$\frac{V_w(n)}{V_v}$
Volume of Air(V <sub>a</sub> )	=	V <sub>v</sub> - V <sub>w</sub>
Volume of Water(V <sub>w</sub> )	=	$\frac{\text{Weight of water}}{\text{Unit wt. of water}}$
Weight of water	=	Wet Density - Dry Density
Dry Density	=	$\frac{\text{Wet Density}}{1 + \text{Moisture Content}}$
Dry Density	=	87.757
Weight of water	=	27.643
Volume of Water(V <sub>w</sub> )	=	0.444
Volume of Air(V <sub>a</sub> )	=	0.035
Air filled porosity(n <sub>a</sub> )	=	3.5%
Water filled porosity(n <sub>w</sub> )	=	44.4%



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**REPORT OF SIEVE ANALYSIS - SOILS & AGGREGATE**

**CLIENT:** Roy F. Weston  
 202 E. Earl, Ste 46  
 Phoenix, AZ 85012

**PROJECT NAME:** East Grand Avenue

**ATTENTION:** Richard Findlay

**SAMPLE ID.:** WCP-MW-084-151

**TEST DATE:** 02/14/01

**ATL JOB NO.:** 201022

**ATL LAB NO.:** 01-0350

**LAB METHOD:** ASTM D422

**SAMPLED BY:** Client

**TESTED BY:** DJ

**MATERIAL:** Brown,  
 silty, clayey sand

**REPORT DATE:** 03/16/01

SIEVE	WT. RETAINED	%RET.	% PASSING	SPECS
3"				
2 1/2"				
2"				
1 1/2"				
1"				
3/4"				
1/2"		0	0	100
3/8"		7	1	99
1/4"		12	2	96
#4		10	2	94
#8		42	8	87
#10		25	5	
Minus #10			81.9	
+10 Total	97			100.6
Minus #10 Wet	441			99.4
Minus #10 Dry	436.1			88.2
Total	533			11.2
#16	19.1	15.7	66.1	
#30	30.8	25.4	40.8	
#40	13.5	11.1	29.7	
#50	12.2	10.1	19.6	
#100	10.0	8.3	11.3	
#200	2.4	2.0		
Minus #200	0.1		9.3	
Total	88.2			

SAMPLE PREPARATION	
Plus # 10 Wt.:	96.6
Minus # 10 Wt.:	441.4
Total Weight:	538.0

HYGROSCOPIC MOISTURE	
Wet Wt.:	10.9
Dry Wt.:	10.8
Hygros. Factor:	0.98805

FACTORS	
Coarse	0.187714
Fine	0.823627

Remarks:

Reviewed By: *AW*  
 Input By: AO

Respectfully Submitted:  
*Miguel M. Cancino*  
 Miguel M. Cancino  
 Laboratory Supervisor



**HYDROMETER ANALYSIS  
(ASTM D422)**

CLIENT : Roy F. Weston  
 202 E. Earl, Ste 46  
 Phoenix, AZ 85012

DATE : 03/05/01

LAB. NO.: 01-0350  
 JOB NO.: 201022  
 DATE RCVD: 02/14/01  
 SAMPLED BY: Client

PROJECT : East Grand Avenue  
 MATERIAL: Brown, silty, clayey sand  
 SAMPLE ID.: WCP-MW-084-151

SAMPLE WT. (WBW-dry) = 99.4 (gm) SOIL PASSING #10 SIEVE = 81.9 %

SPECIFIC GRAVITY OF SOIL SAMPLE = 2.705

ELAPSED TIME (MIN)	TIME	TEMP. (oC)	CORR. USING (TAB. 3)	HYDROMETER READING		CORR. READING	EFFECTIVE DEPTH (cm)	PARTICLE SIZE (mm)	PERCENT FINER IN SUSPENSION
				(WATER)	(W/SOIL)				
0	START 12:31 PM	21.1	0.01323	1.0043	1.0103	1.0060	13.6	0.0294	7.8
2	12:33 PM	21.1	0.01323	1.0043	1.0073	1.0030	14.4	0.0304	3.9
5	12:36 PM	21.1	0.01323	1.0043	1.0068	1.0025	14.5	0.0196	3.3
15	12:46 PM	21.1	0.01323	1.0043	1.0065	1.0023	14.6	0.0117	2.9
30	01:01 PM	21.1	0.01323	1.0043	1.0065	1.0023	14.6	0.0084	2.9
60	01:31 PM	22.8	0.01293	1.0043	1.0063	1.0020	14.6	0.0059	2.6
250	04:41 PM	22.8	0.01293	1.0043	1.0053	1.0010	14.9	0.0030	1.3
03/06/01 1440	12:31 PM	21.1	0.01323	1.0043	1.0053	1.0010	14.9	0.0013	1.3

Remarks:

Reviewed By: *[Signature]*  
 Input By: AO

Respectfully Submitted:  
*[Signature]*  
 Miguel M. Cancino  
 Laboratory Supervisor



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(602) 241-1097 • Fax (602) 277-1306

**Client:** Roy F. Weston  
**Project:** East Grand Avenue  
**Material Source:** WCP-MW-084-151

**ATL Job No:** 201022  
**ATL Lab No:** 01-0350  
**Date Rvcd:** 02/14/01  
**Sample Date:** 01/25/01

Void Ratio

$$e = \frac{\text{Volume of Voids}}{\text{Volume of Solids}}$$

$$\text{Volume of Solids (V}_s) = \frac{\text{Weight of Solids}}{\text{Specific Gravity} \times \text{Unit Weight of Water}}$$

$$\text{Weight of Solids (W}_s) = \frac{\text{Wet Density}}{1 + \text{Moisture Content}}$$

$$\text{Volume of Voids (V}_v) = \text{Total Volume} - \text{Volume of Solids}$$

---

Total Volume	1
Wet Density	134.3
Moisture Content	15.10%
Specific Gravity	2.705
Unit Weight of Water	62.3
Weight of Solids (W <sub>s</sub> )	116.681
Volume of Solids (V <sub>s</sub> )	0.692
Volume of Voids (V <sub>v</sub> )	0.308

Void Ratio                      **0.444**

Porosity                              **30.8%**

To compute for air filled porosity(n <sub>a</sub> )	=	$\frac{V_a(n)}{V_v}$
To compute for water filled porosity(n <sub>w</sub> )	=	$\frac{V_w(n)}{V_v}$
Volume of Air(V <sub>a</sub> )	=	V <sub>v</sub> - V <sub>w</sub>
Volume of Water(V <sub>w</sub> )	=	$\frac{\text{Weight of water}}{\text{Unit wt. of water}}$
Weight of water	=	Wet Density - Dry Density
Dry Density	=	$\frac{\text{Wet Density}}{1 + \text{Moisture Content}}$
Dry Density	=	116.681
Weight of water	=	17.619
Volume of Water(V <sub>w</sub> )	=	0.283
Volume of Air(V <sub>a</sub> )	=	0.025
Air filled porosity(n <sub>a</sub> )	=	2.5%
Water filled porosity(n <sub>w</sub> )	=	28.3%



HYDROMETER ANALYSIS  
(ASTM D422)



CLIENT : Roy F. Weston  
202 E. Earl, Ste 46  
Phoenix, AZ 85012

DATE : 03/05/01

LAB. NO.: 01-0347  
JOB NO.: 201022  
DATE RCVD: 02/14/01  
SAMPLED BY: Client

PROJECT : East Grand Avenue  
MATERIAL: Brown, sandy, silty clay  
SAMPLE ID.: WCP-MW-085-126

SAMPLE WT.(WBW-dry) = 48.7 (gm) SOIL PASSING #10 SIEVE = 91.1 %

SPECIFIC GRAVITY OF SOIL SAMPLE = 2.662

ELAPSED TIME (MIN)	TIME	TEMP. (oC)	CORR. USING (TAB. 3)	HYDROMETER READING		CORR. READING	EFFECTIVE DEPTH (cm)	PARTICLE SIZE (mm)	PERCENT FINER IN SUSPENSION
				(WATER)	(W/SOIL)				
0	START								
	11:38 AM	21.1	0.01343	1.0043	1.0150	1.0108	12.3	0.0294	32.2
2	11:40 AM	21.1	0.01343	1.0043	1.0133	1.0090	12.8	0.0304	27.0
5	11:43 AM	21.1	0.01343	1.0043	1.0118	1.0075	13.2	0.0196	22.5
15	11:53 AM	21.1	0.01343	1.0043	1.0103	1.0060	13.6	0.0117	18.0
30	12:08 PM	21.1	0.01343	1.0043	1.0098	1.0055	13.7	0.0084	16.5
60	12:38 PM	21.1	0.01343	1.0043	1.0088	1.0045	14.0	0.0059	13.5
250	03:48 PM	22.2	0.01327	1.0043	1.0073	1.0030	14.4	0.0030	9.0
03/06/01 1440	11:38 AM	22.2	0.01327	1.0043	1.0063	1.0020	14.6	0.0013	6.0

Remarks:

Reviewed By: *AM*  
Input By: AO

Respectfully Submitted:  
*Miguel M. Cancino*  
Miguel M. Cancino  
Laboratory Supervisor



# ATL, Inc.

CONSTRUCTION QUALITY ASSURANCE  
GEOTECHNICAL / ENVIRONMENTAL CONSULTANTS

**PHOENIX - CORPORATE OFFICE**  
2912 W. Clarendon Ave. • Phoenix, AZ 85017-4609  
(602) 241-1097 • Fax (602) 277-1306

**Client:** Roy F. Weston  
**Project:** East Grand Avenue  
**Material Source:** WCP-MW-085-126

**ATL Job No:** 201022  
**ATL Lab No:** 01-0347  
**Date Rvcd:** 02/14/01  
**Sample Date:** 01/08/01

### Void Ratio

$$e = \frac{\text{Volume of Voids}}{\text{Volume of Solids}}$$

$$\text{Volume of Solids (V}_s) = \frac{\text{Weight of Solids}}{\text{Specific Gravity} \times \text{Unit Weight of Water}}$$

$$\text{Weight of Solids (W}_s) = \frac{\text{Wet Density}}{1 + \text{Moisture Content}}$$

$$\text{Volume of Voids (V}_v) = \text{Total Volume} - \text{Volume of Solids}$$

---

Total Volume	1
Wet Density	118.5
Moisture Content	30.4%
Specific Gravity	2.662
Unit Weight of Water	62.3

Weight of Solids (W <sub>s</sub> )	90.874
Volume of Solids (V <sub>s</sub> )	0.548
Volume of Voids (V <sub>v</sub> )	0.452

**Void Ratio**                      **0.825**

**Porosity**                              **45.2%**

$$\text{To compute for air filled porosity}(n_a) = \frac{V_a(n)}{V_v}$$

$$\text{To compute for water filled porosity}(n_w) = \frac{V_w(n)}{V_v}$$

$$\text{Volume of Air}(V_a) = V_v - V_w$$

$$\text{Volume of Water}(V_w) = \frac{\text{Weight of water}}{\text{Unit wt. of water}}$$

$$\text{Weight of water} = \text{Wet Density} - \text{Dry Density}$$

$$\text{Dry Density} = \frac{\text{Wet Density}}{1 + \text{Moisture Content}}$$

$$\text{Dry Density} = 90.874$$

$$\text{Weight of water} = 27.626$$

$$\text{Volume of Water}(V_w) = 0.443$$

$$\text{Volume of Air}(V_a) = 0.009$$

$$\text{Air filled porosity}(n_a) = 0.9\%$$

$$\text{Water filled porosity}(n_w) = 44.3\%$$



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**REPORT OF SIEVE ANALYSIS - SOILS & AGGREGATE**

**CLIENT:** Roy F. Weston  
 202 E. Earl, Ste 46  
 Phoenix, AZ 85012

**PROJECT NAME:** East Grand Avenue

**ATTENTION:** Richard Findlay

**SAMPLE ID.:** WCP-MW-087-131

**TEST DATE:** 02/14/01

**ATL JOB NO.:** 201022

**ATL LAB NO.:** 01-0352

**LAB METHOD:** ASTM D422

**SAMPLED BY:** Client

**TESTED BY:** DJ

**MATERIAL:** Brown,  
sandy clay

**REPORT DATE:** 03/16/01

SIEVE	WT. RETAINED	% RET	% PASSING	SPECS
3"				
2 1/2"				
2"				
1 1/2"				
1"				
3/4"				
1/2"				
3/8"				
1/4"				
#4				
#8				
#10				
Minus #10			100.0	
+10 Total	0			51.1
Minus #10 Wet	0			49.5
Minus #10 Dry	0.0			7.9
Total	0			41.6
#16	0.0	0.0	100.0	
#30	0.2	0.4	99.6	
#40	0.3	0.5	99.0	
#50	0.5	0.9	98.1	
#100	2.6	5.2	92.9	
#200	3.9	7.9		
Minus #200	0.5		85.0	
Total	7.9			

SAMPLE PREPARATION	
Plus # 10 Wt.:	0.0
Minus # 10 Wt.:	420.1
Total Weight:	420.1

HYGROSCOPIC MOISTURE	
Wet Wt.:	11.7
Dry Wt.:	11.4
Hygros. Factor:	0.96846

FACTORS
Fine
2.019895

Remarks:

Reviewed By: *AW*  
 Input By: AO

Respectfully Submitted:  
*Miguel M. Cancino*  
 Miguel M. Cancino  
 Laboratory Supervisor

HYDROMETER ANALYSIS  
(ASTM D422)

CLIENT : Roy F. Weston  
 202 E. Earl, Ste 46  
 Phoenix, AZ 85012

PROJECT : East Grand Avenue  
 MATERIAL: Brown, sandy clay  
 SAMPLE ID.: WCP-MW-087-131

DATE : 03/05/01

LAB. NO.: 01-0352  
 JOB NO.: 201022  
 DATE RCVD: 02/14/01  
 SAMPLED BY: Client

SAMPLE WT. (WBW-dry) = 49.5 (gm) SOIL PASSING #10 SIEVE = 100.0 %

SPECIFIC GRAVITY OF SOIL SAMPLE = 2.728

ELAPSED TIME (MIN)	TIME	TEMP. (oC)	CORR. USING (TAB. 3)	HYDROMETER READING		CORR. READING	EFFECTIVE DEPTH (cm)	PARTICLE SIZE (mm)	PERCENT FINER IN SUSPENSION
				(WATER)	(W/SOIL)				
0	START								
	11:51 AM	21.1	0.01317	1.0043	1.0255	1.0213	9.5	0.0294	67.8
2	11:53 AM	21.1	0.01317	1.0043	1.0175	1.0133	11.7	0.0304	42.3
5	11:56 AM	21.1	0.01317	1.0043	1.0138	1.0095	12.7	0.0196	30.3
15	12:06 PM	21.1	0.01317	1.0043	1.0110	1.0068	13.4	0.0117	21.5
30	12:21 PM	21.1	0.01317	1.0043	1.0098	1.0055	13.7	0.0084	17.5
60	12:51 PM	21.7	0.01300	1.0043	1.0090	1.0048	13.9	0.0059	15.1
250	04:01 PM	22.2	0.01301	1.0043	1.0058	1.0015	14.8	0.0030	4.8
03/06/01 1440	11:51 AM	21.1	0.01317	1.0043	1.0050	1.0008	15.0	0.0013	2.4

Remarks:

Respectfully Submitted:

*Miguel M. Cancino*  
 Miguel M. Cancino  
 Laboratory Supervisor

Reviewed By: *AO*  
 Input By: AO





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**Client:** Roy F. Weston  
**Project:** East Grand Avenue  
**Material Source:** WCP-MW-087-131

**ATL Job No:** 201022  
**ATL Lab No:** 01-0352  
**Date Rvcd:** 02/14/01  
**Sample Date:** 01/27/01

Void Ratio

$$e = \frac{\text{Volume of Voids}}{\text{Volume of Solids}}$$

$$\text{Volume of Solids (V}_s) = \frac{\text{Weight of Solids}}{\text{Specific Gravity} \times \text{Unit Weight of Water}}$$

$$\text{Weight of Solids (W}_s) = \frac{\text{Wet Density}}{1 + \text{Moisture Content}}$$

$$\text{Volume of Voids (V}_v) = \text{Total Volume} - \text{Volume of Solids}$$

Total Volume 1  
Wet Density 123.5  
Moisture Content 22.50%  
Specific Gravity 2.728  
Unit Weight of Water 62.3

Weight of Solids (W<sub>s</sub>) 100.816  
Volume of Solids (V<sub>s</sub>) 0.593  
Volume of Voids (V<sub>v</sub>) 0.407

Void Ratio **0.686**

Porosity **40.7%**

$$\text{To compute for air filled porosity}(n_a) = \frac{V_a(n)}{V_v}$$

$$\text{To compute for water filled porosity}(n_w) = \frac{V_w(n)}{V_v}$$

$$\text{Volume of Air}(V_a) = V_v - V_w$$

$$\text{Volume of Water}(V_w) = \frac{\text{Weight of water}}{\text{Unit wt. of water}}$$

$$\text{Weight of water} = \text{Wet Density} - \text{Dry Density}$$

$$\text{Dry Density} = \frac{\text{Wet Density}}{1 + \text{Moisture Content}}$$

$$\text{Dry Density} = 100.816$$

$$\text{Weight of water} = 22.684$$

$$\text{Volume of Water}(V_w) = 0.364$$

$$\text{Volume of Air}(V_a) = 0.043$$

$$\text{Air filled porosity}(n_a) = 4.3\%$$

$$\text{Water filled porosity}(n_w) = 36.4\%$$



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(602) 241-1097 • Fax (602) 277-1306

**Client:** Roy F. Weston  
**Project:** East Grand Avenue  
**Material Source:** WCP-MW-087-151

**ATL Job No:** 201022  
**ATL Lab No:** 01-0353  
**Date Rvcd:** 02/14/01  
**Sample Date:** 01/27/01

Void Ratio

$$e = \frac{\text{Volume of Voids}}{\text{Volume of Solids}}$$

$$\text{Volume of Solids (V}_s) = \frac{\text{Weight of Solids}}{\text{Specific Gravity} \times \text{Unit Weight of Water}}$$

$$\text{Weight of Solids (W}_s) = \frac{\text{Wet Density}}{1 + \text{Moisture Content}}$$

$$\text{Volume of Voids (V}_v) = \text{Total Volume} - \text{Volume of Solids}$$

---

Total Volume	1	
Wet Density	139.6	
Moisture Content	13.31%	
Specific Gravity	2.7	assumed
Unit Weight of Water	62.3	

Weight of Solids (W <sub>s</sub> )	123.202
Volume of Solids (V <sub>s</sub> )	0.732
Volume of Voids (V <sub>v</sub> )	0.268

Void Ratio **0.365**

Porosity **26.8%**

To compute for air filled porosity(n <sub>a</sub> )	=	$\frac{V_a(n)}{V_v}$
To compute for water filled porosity(n <sub>w</sub> )	=	$\frac{V_w(n)}{V_v}$
Volume of Air(V <sub>a</sub> )	=	V <sub>v</sub> - V <sub>w</sub>
Volume of Water(V <sub>w</sub> )	=	$\frac{\text{Weight of water}}{\text{Unit wt. of water}}$
Weight of water	=	Wet Density - Dry Density
Dry Density	=	$\frac{\text{Wet Density}}{1 + \text{Moisture Content}}$
Dry Density	=	123.202
Weight of water	=	16.398
Volume of Water(V <sub>w</sub> )	=	0.263
Volume of Air(V <sub>a</sub> )	=	0.004
Air filled porosity(n <sub>a</sub> )	=	0.4%
Water filled porosity(n <sub>w</sub> )	=	26.3%



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**REPORT OF SIEVE ANALYSIS - SOILS & AGGREGATE**

**CLIENT:** Roy F. Weston  
202 E. Earl, Ste 46  
Phoenix, AZ 85012

**PROJECT NAME:** East Grand Avenue

**ATTENTION:** Richard Findlay

**SAMPLE ID.:** WCP-MW-085-126  
088-131

**TEST DATE:** 02/14/01  
**ATL JOB NO.:** 201022  
**ATL LAB NO.:** 01-0354  
**LAB METHOD:** ASTM D422  
**SAMPLED BY:** Client  
**TESTED BY:** DJ  
**MATERIAL:** Brown,  
sandy silty clay  
**REPORT DATE:** 03/16/01

SIEVE	WT. RETAINED	%RET	% PASSING	SPECS
3"				
2 1/2"				
2"				
1 1/2"				
1"				
3/4"				
1/2"				
3/8"				
1/4"				
#4				
#8	0	0	100	
#10	1	2		
Minus #10			98.0	
+10 Total	1			W.B.W. (WET): 51.0
Minus #10 Wet	0			W.B.W. (DRY): 49.3
Minus #10 Dry	0.0			W.A.W: 10.7
Total	1			ELUTRIATION: 38.6
#16	0.1	0.2	97.8	
#30	0.2	0.5	97.3	
#40	0.3	0.6	96.7	
#50	0.5	0.9	95.8	
#100	3.0	6.0	89.8	
#200	6.0	12.2		
Minus #200	0.7		79.7	
Total	11.7			

SAMPLE PREPARATION	
Plus # 10 Wt.:	1.0
Minus # 10 Wt.:	416.7
Total Weight:	417.7

HYGROSCOPIC MOISTURE	
Wet Wt. :	11.3
Dry Wt.:	10.9
Hygros. Factor:	0.96726

FACTORS
Fine
2.029150

Remarks:

Reviewed By: *AW*  
Input By: AO

Respectfully Submitted:  
*Miguel M. Cancino*  
Miguel M. Cancino  
Laboratory Supervisor



HYDROMETER ANALYSIS  
(ASTM D422)

CLIENT : Roy F. Weston  
 202 E. Earl, Ste 46  
 Phoenix, AZ 85012

DATE : 03/05/01

LAB. NO.: 01-0354  
 JOB NO.: 201022  
 DATE RCVD: 02/14/01  
 SAMPLED BY: Client

PROJECT : East Grand Avenue  
 MATERIAL: Brown, sandy silty clay  
 SAMPLE ID.: WCP-MW-085-126-  
 088-131

SAMPLE WT.(WBW-dry) = 49.3 (gm) SOIL PASSING #10 SIEVE = 100.0 %

SPECIFIC GRAVITY OF SOIL SAMPLE = 2.729

ELAPSED TIME (MIN)	TIME	TEMP. (oC)	CORR. USING (TAB. 3)	HYDROMETER READING		CORR. READING	EFFECTIVE DEPTH (cm)	PARTICLE SIZE (mm)	PERCENT FINER IN SUSPENSION
				(WATER)	(W/SOIL)				
0	START 12:10 PM	21.1	0.01317	1.0043	1.0228	1.0185	10.3	0.0294	59.2
2	12:12 PM	21.1	0.01317	1.0043	1.0158	1.0115	12.1	0.0304	36.8
5	12:15 PM	21.1	0.01317	1.0043	1.0135	1.0093	12.7	0.0196	29.6
15	12:25 PM	21.1	0.01317	1.0043	1.0103	1.0060	13.6	0.0117	19.2
30	12:40 PM	21.7	0.01300	1.0043	1.0090	1.0048	13.9	0.0084	15.2
60	01:10 PM	21.7	0.01300	1.0043	1.0080	1.0038	14.2	0.0059	12.0
250	04:20 PM	22.2	0.01301	1.0043	1.0060	1.0018	14.7	0.0030	5.6
03/06/01 1440	12:10 PM	21.1	0.01317	1.0043	1.0045	1.0003	15.1	0.0013	0.8

Remarks:

Reviewed By: *AW*  
 Input By: AO

Respectfully Submitted:  
*Miguel M. Cancino*  
 Miguel M. Cancino  
 Laboratory Supervisor



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(602) 241-1097 • Fax (602) 277-1306

**Client:** Roy F. Weston  
**Project:** East Grand Avenue  
**Material Source:**

WCP-MW-085-126  
*088-131*

**ATL Job No:** 201022  
**ATL Lab No:** 01-0354  
**Date Rvcd:** 02/14/01  
**Sample Date:** 01/20/01

Void Ratio

$$e = \frac{\text{Volume of Voids}}{\text{Volume of Solids}}$$

$$\text{Volume of Solids (V}_s) = \frac{\text{Weight of Solids}}{\text{Specific Gravity} \times \text{Unit Weight of Water}}$$

$$\text{Weight of Solids (W}_s) = \frac{\text{Wet Density}}{1 + \text{Moisture Content}}$$

$$\text{Volume of Voids (V}_v) = \text{Total Volume} - \text{Volume of Solids}$$

---

Total Volume	1
Wet Density	124.0
Moisture Content	24.90%
Specific Gravity	2.729
Unit Weight of Water	62.3

Weight of Solids (W <sub>s</sub> )	99.279
Volume of Solids (V <sub>s</sub> )	0.584
Volume of Voids (V <sub>v</sub> )	0.416

Void Ratio                      **0.713**

Porosity                              **41.6%**

$$\text{To compute for air filled porosity}(n_a) = \frac{V_a(n)}{V_v}$$

$$\text{To compute for water filled porosity}(n_w) = \frac{V_w(n)}{V_v}$$

$$\text{Volume of Air}(V_a) = V_v - V_w$$

$$\text{Volume of Water}(V_w) = \frac{\text{Weight of water}}{\text{Unit wt. of water}}$$

$$\text{Weight of water} = \text{Wet Density} - \text{Dry Density}$$

$$\text{Dry Density} = \frac{\text{Wet Density}}{1 + \text{Moisture Content}}$$

$$\text{Dry Density} = 99.279$$

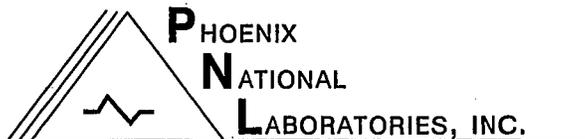
$$\text{Weight of water} = 24.721$$

$$\text{Volume of Water}(V_w) = 0.397$$

$$\text{Volume of Air}(V_a) = 0.019$$

$$\text{Air filled porosity}(n_a) = 1.9\%$$

$$\text{Water filled porosity}(n_w) = 39.7\%$$



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## PROPERTIES OF SOILS

QUALITY TESTING, INSPECTION, AND ENGINEERING SERVICES  
4209 SOUTH 43RD PLACE • PHOENIX, AZ 85040 • 602/431-8887 • FAX 602/431-8889

CLIENT	PROJECT	CLIENT ORDER NO.
Roy F. Weston	ADEQ VW&R	26864
SERVICE LOCATION	PNL PROJECT NO.	REPORT DATE
PNL Laboratory	22-19160	11/01/2001
DATE RECEIVED	RECEIVED BY	PNL LABORATORY NO.
08/21/2001	Alexander Zuran III	9101808

SAMPLE DATA					
Sample ID:	WCP-92-121	Sampled By:	Client	Date Sampled:	Unknown
Sample Description:	Material delivered in two 2" diameter x 6" long brass sleeves.				

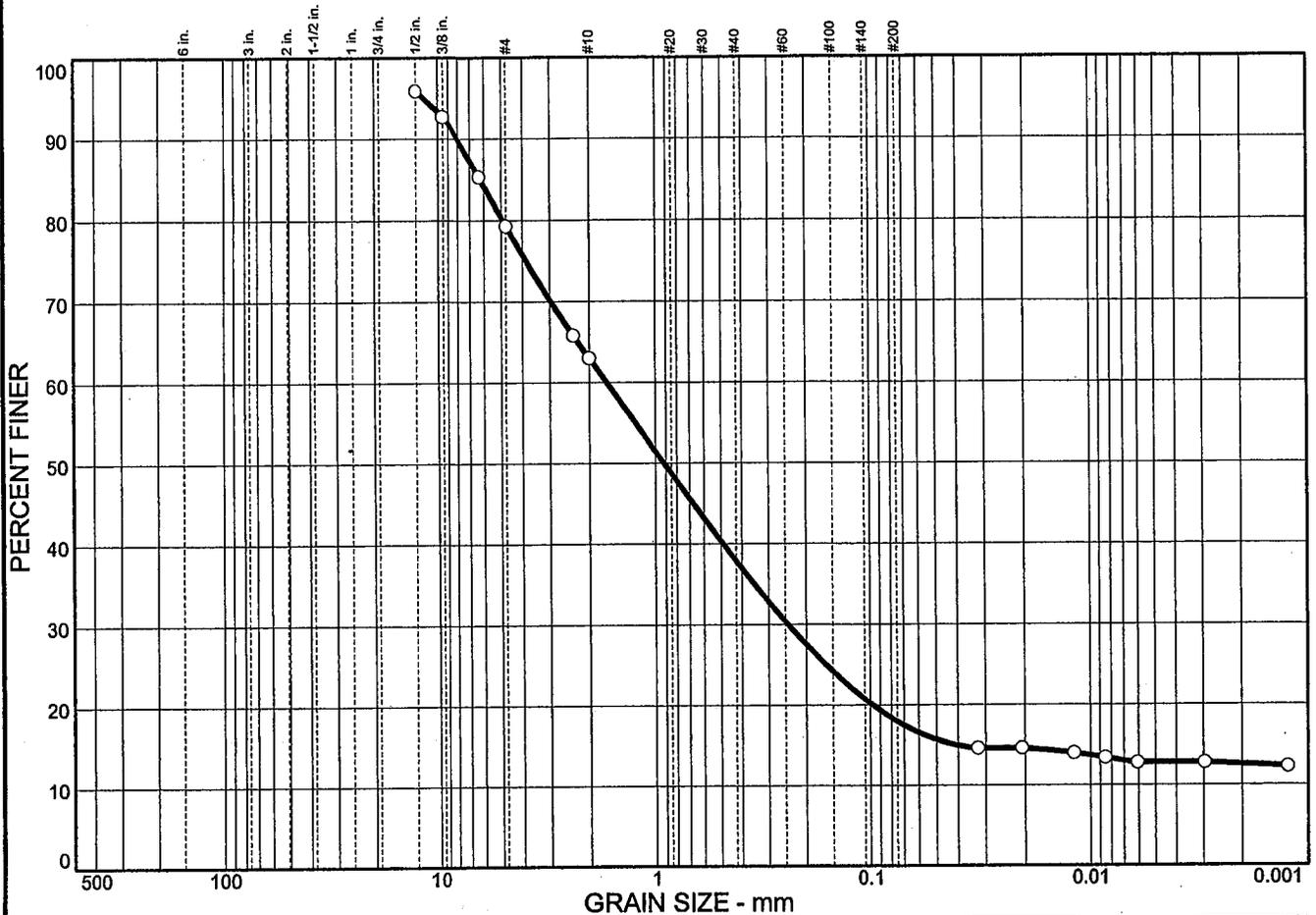
TEST RESULTS			
Test	Method	Result	Remarks
Moisture Content	ASTM D2216	10.7%	
Bulk Density	ASTM D2937	2.24 g/cm <sup>3</sup> Wet 2.023 g/cm <sup>3</sup> Dry	
Permeability	ASTM D2434	$k = 7.4 \times 10^{-6}$ cm/s	@ 68°F
Porosity	Calculated	30.9%	Assuming Spec. Gravity 2.65
Total Organic Carbon	Walkley-Black	None Detectable	
Grain Size Analysis	ASTM D422	See attached particle size distribution report	

PNL warrants that the above services and report were performed under the appropriate standard of care, including the skill and judgement that is reasonably expected from similarly situated technical personnel. No other warranty, guaranty, or representation, either expressed or implied is included or intended.

REVIEWED BY

*Alex Zuran*

# Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
		61.3	5.2	12.8

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1/2 in.	95.9		
3/8 in.	92.7		
1/4 in.	85.3		
#4	79.3		
#8	65.8		
#10	63.0		

**Soil Description**

**Atterberg Limits**  
 PL= N/A      LL= N/A      PI= N/A

**Coefficients**  
 D<sub>85</sub>= 6.26      D<sub>60</sub>= 1.67      D<sub>50</sub>= 0.918  
 D<sub>30</sub>= 0.243      D<sub>15</sub>= 0.0407      D<sub>10</sub>=  
 C<sub>u</sub>=  
 C<sub>c</sub>=

**Classification**  
 USCS= N/A      AASHTO= N/A

**Remarks**

\* (no specification provided)

Sample No.: 9101808  
 Location: WCP-92-121

Source of Sample:

Date: 11/01/2001  
 Elev./Depth: N/A

**PHOENIX NATIONAL  
 LABORATORIES, INC.**

Client: Roy F. Weston  
 Project: VWR ADEQ Facility

Project No: 22-19160

Plate



**P**HOENIX  
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**L**ABORATORIES, INC.

# PROPERTIES OF SOILS

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CLIENT	PROJECT	CLIENT ORDER NO.
Roy F. Weston	ADEQ VW&R	26864
SERVICE LOCATION	PNL PROJECT NO.	REPORT DATE
PNL Laboratory	22-19160	11/01/2001
DATE RECEIVED	RECEIVED BY	PNL LABORATORY NO.
08/21/2001	Alexander Zuran III	9101809

SAMPLE DATA				
Sample ID:	WCP-92-135	Sampled By:	Client	Date Sampled: Unknown
Sample Description:	Material delivered in two 2" diameter x 6" long brass sleeves.			

TEST RESULTS			
Test	Method	Result	Remarks
Moisture Content	ASTM D2216	22.1%	
Bulk Density	ASTM D2937	1.99 g/cm <sup>3</sup> Wet 1.631 g/cm <sup>3</sup> Dry	
Permeability	ASTM D2434	k = 1.8 x 10 <sup>-6</sup> cm/s	@ 68°F
Porosity	Calculated	50.6%	Assuming Spec. Gravity 2.70
Total Organic Carbon	Walkley-Black	None Detectable	
Grain Size Analysis	ASTM D422	See attached particle size distribution report	

PNL warrants that the above services and report were performed under the appropriate standard of care, including the skill and judgement that is reasonably expected from similarly situated technical personnel. No other warranty, guaranty, or representation, either expressed or implied is included or intended.

REVIEWED BY \_\_\_\_\_

*Alex Zuran*





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**N**ATIONAL  
**L**ABORATORIES, INC.

# PROPERTIES OF SOILS

QUALITY TESTING, INSPECTION, AND ENGINEERING SERVICES  
4209 SOUTH 43RD PLACE • PHOENIX, AZ 85040 • 602/431-8887 • FAX 602/431-8889

CLIENT	PROJECT	CLIENT ORDER NO.
Roy F. Weston	ADEQ VW&R	26864
SERVICE LOCATION	PNL PROJECT NO.	REPORT DATE
PNL Laboratory	22-19160	11/08/2001
DATE RECEIVED	RECEIVED BY	PNL LABORATORY NO.
08/21/2001	Alexander Zuran III	9101810

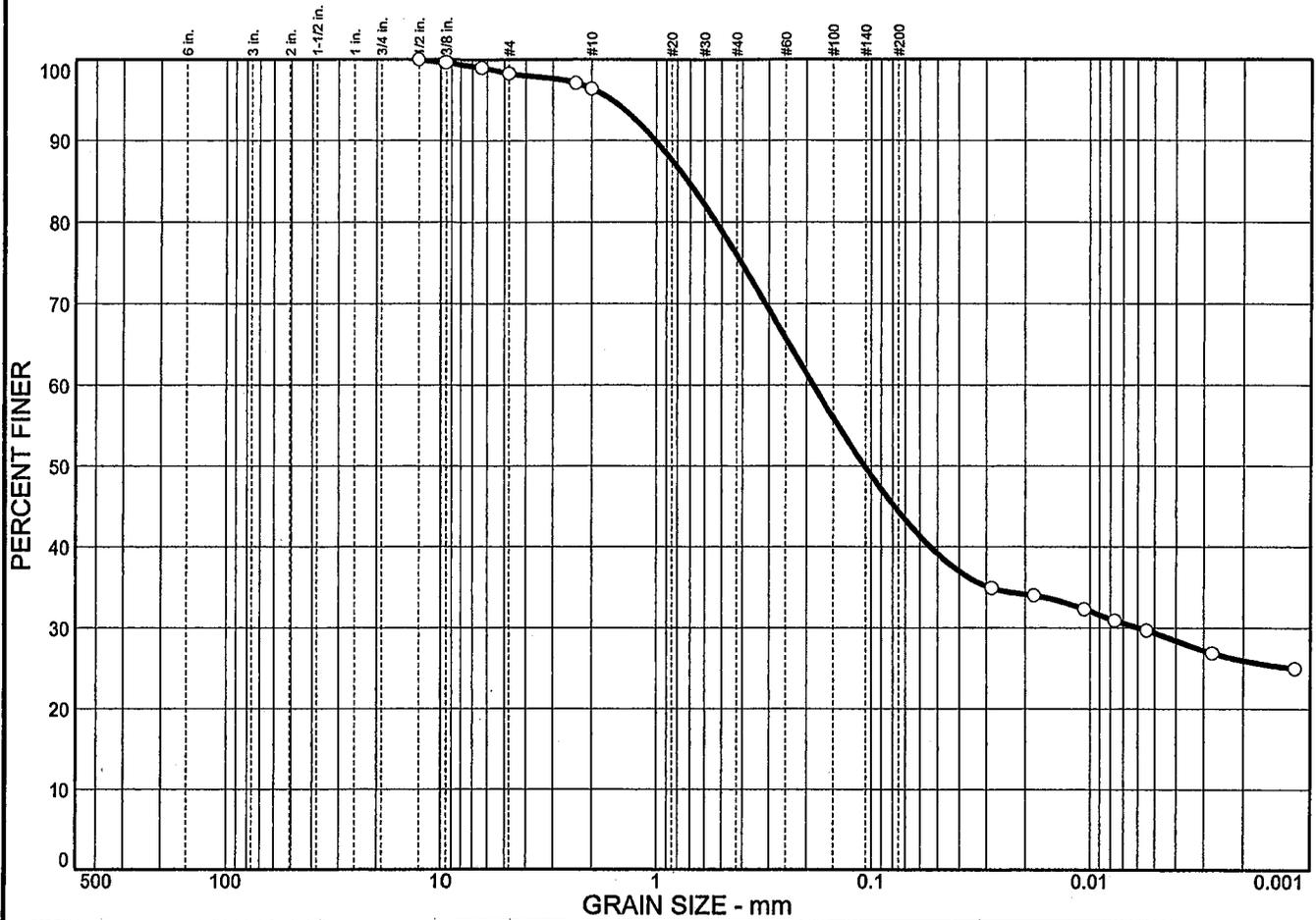
SAMPLE DATA					
Sample ID:	WCP-92-145	Sampled By:	Client	Date Sampled:	Unknown
Sample Description:	Material delivered in three 2" diameter x 6" long brass sleeves.				

TEST RESULTS			
Test	Method	Result	Remarks
Moisture Content	ASTM D2216	21.1%	
Bulk Density	ASTM D2937	2.058 g/cm <sup>3</sup> Wet 1.699 g/cm <sup>3</sup> Dry	
Permeability	ASTM D2434	k = 1.4 x 10 <sup>-5</sup> cm/s	@ 68°F
Porosity	Calculated	47%	Assuming Spec. Gravity 2.65
Total Organic Carbon	Walkley-Black	None Detectable	
Grain Size Analysis	ASTM D422	See attached particle size distribution report	

PNL warrants that the above services and report were performed under the appropriate standard of care, including the skill and judgement that is reasonably expected from similarly situated technical personnel. No other warranty, guaranty, or representation, either expressed or implied is included or intended.

REVIEWED BY

# Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	1.7	54.0	14.9	29.4

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1/2 in.	100.0		
3/8 in.	99.6		
1/4 in.	99.0		
#4	98.3		
#8	97.1		
#10	96.4		

**Soil Description**

**Atterberg Limits**

PL= N/A      LL= N/A      PI= N/A

**Coefficients**

D<sub>85</sub>= 0.718      D<sub>60</sub>= 0.186      D<sub>50</sub>= 0.107  
D<sub>30</sub>= 0.0059      D<sub>15</sub>=      D<sub>10</sub>=  
C<sub>u</sub>=      C<sub>c</sub>=

**Classification**

USCS= N/A      AASHTO= N/A

**Remarks**

\* (no specification provided)

Sample No.: 9101810  
Location: WCP-92-145

Source of Sample:

Date: 11/08/2001  
Elev./Depth: N/A

**PHOENIX NATIONAL  
LABORATORIES, INC.**

Client: Roy F. Weston  
Project: VWR ADEQ Facility

Project No: 22-19160

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QUALITY TESTING, INSPECTION, AND ENGINEERING SERVICES  
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## PROPERTIES OF SOILS

CLIENT	PROJECT	CLIENT ORDER NO.
Roy F. Weston	ADEQ VW&R	26864
SERVICE LOCATION	PNL PROJECT NO.	REPORT DATE
PNL Laboratory	22-19160	11/01/2001
DATE RECEIVED	RECEIVED BY	PNL LABORATORY NO.
08/21/2001	Alexander Zuran III	9101811

SAMPLE DATA					
Sample ID:	WCP-93-121	Sampled By:	Client	Date Sampled:	Unknown
Sample Description:	Material delivered in three 2" diameter x 6" long brass sleeves.				

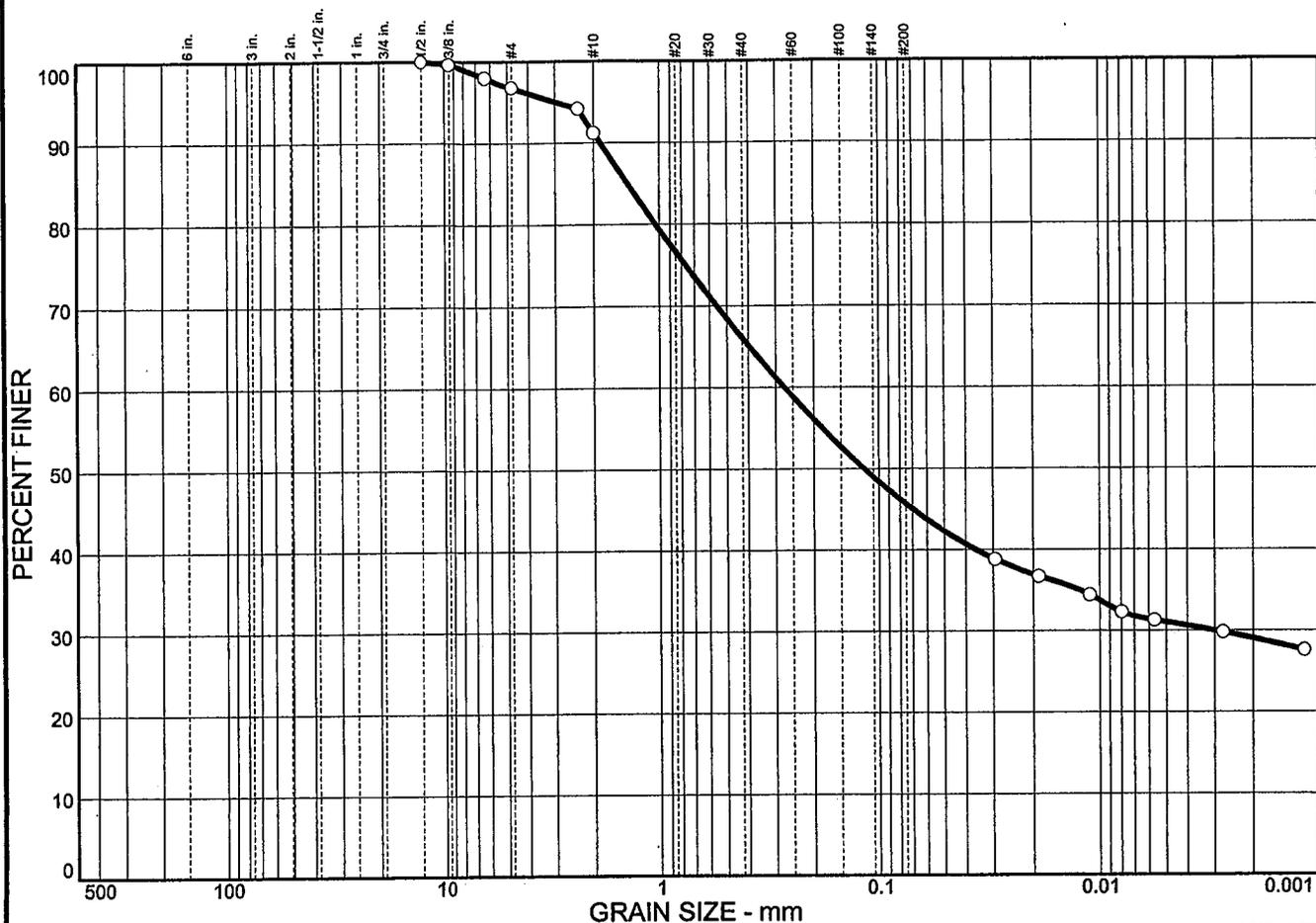
TEST RESULTS			
Test	Method	Result	Remarks
Moisture Content	ASTM D2216	21.1%	
Bulk Density	ASTM D2937	2.020 g/cm <sup>3</sup> Wet 1.668 g/cm <sup>3</sup> Dry	
Permeability	ASTM D2434	k = 2.6 x 10 <sup>-6</sup> cm/s	@ 68°F
Porosity	Calculated	49.0%	Assuming Spec. Gravity 2.70
Total Organic Carbon	Walkley-Black	None Detectable	
Grain Size Analysis	ASTM D422	See attached particle size distribution report	

PNL warrants that the above services and report were performed under the appropriate standard of care, including the skill and judgement that is reasonably expected from similarly situated technical personnel. No other warranty, guaranty, or representation, either expressed or implied is included or intended.

REVIEWED BY \_\_\_\_\_

*Alexander Zuran*

# Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	3.2	51.2	14.6	31.0

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1/2 in.	100.0		
3/8 in.	99.6		
1/4 in.	98.0		
#4	96.8		
#8	94.2		
#10	91.2		

**Soil Description**

PL= N/A      **Atterberg Limits**      LL= N/A      PI= N/A

**Coefficients**

D<sub>85</sub>= 1.41      D<sub>60</sub>= 0.274      D<sub>50</sub>= 0.117  
D<sub>30</sub>= 0.0030      D<sub>15</sub>=      D<sub>10</sub>=  
C<sub>u</sub>=      C<sub>c</sub>=

USCS= N/A      **Classification**      AASHTO= N/A

**Remarks**

\* (no specification provided)

Sample No.: 9101811  
Location: WCP-93-121

Source of Sample:

Date: 11/01/2001  
Elev./Depth: N/A

PHOENIX NATIONAL  
LABORATORIES, INC.

Client: Roy F. Weston  
Project: VWR ADEQ Facility

Project No: 22-19160

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**L**ABORATORIES, INC.

# PROPERTIES OF SOILS

QUALITY TESTING, INSPECTION, AND ENGINEERING SERVICES  
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CLIENT	PROJECT	CLIENT ORDER NO.
Roy F. Weston	ADEQ VW&R	26864
SERVICE LOCATION	PNL PROJECT NO.	REPORT DATE
PNL Laboratory	22-19160	11/08/2001
DATE RECEIVED	RECEIVED BY	PNL LABORATORY NO.
08/21/2001	Alexander Zuran III	9101812

SAMPLE DATA					
Sample ID:	WCP-93-131	Sampled By:	Client	Date Sampled:	Unknown
Sample Description:	Material delivered in three 2" diameter x 6" long brass sleeves.				

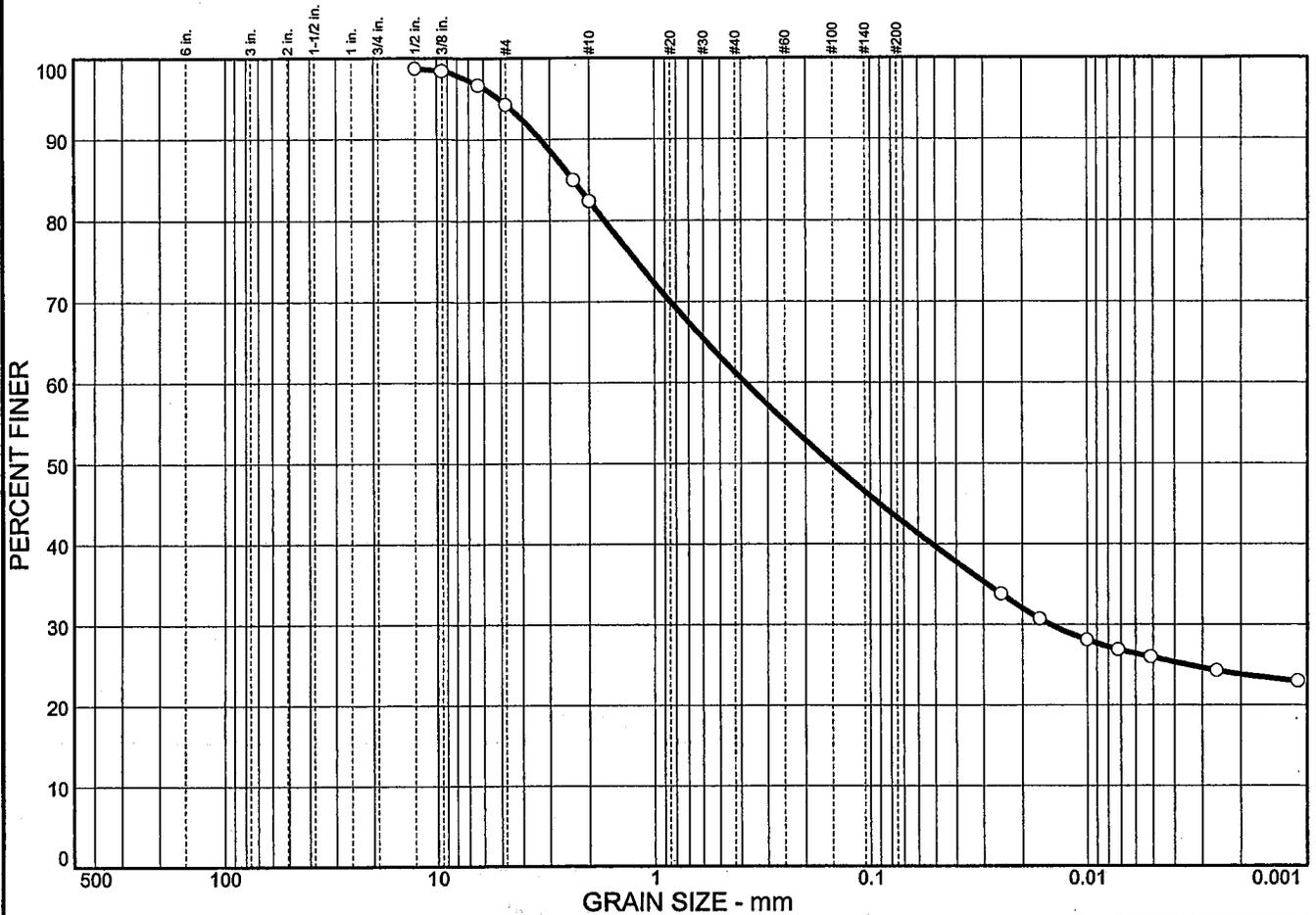
TEST RESULTS			
Test	Method	Result	Remarks
Moisture Content	ASTM D2216	22.5%	
Bulk Density	ASTM D2937	1.798 g/cm <sup>3</sup> Wet 1.467 g/cm <sup>3</sup> Dry	
Permeability	ASTM D2434	k = 8.5 x 10 <sup>-6</sup> cm/s	@ 68°F
Porosity	Calculated	54.8%	Assuming Spec. Gravity 2.65
Total Organic Carbon	Walkley-Black	None Detectable	
Grain Size Analysis	ASTM D422	See attached particle size distribution report	

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REVIEWED BY

*Alexander Zuran*

# Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
		51.0	17.3	25.9

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1/2 in.	98.7		
3/8 in.	98.4		
1/4 in.	96.7		
#4	94.3		
#8	85.0		
#10	82.4		

**Soil Description**

**Atterberg Limits**

PL= N/A      LL= N/A      PI= N/A

**Coefficients**

D<sub>85</sub>= 2.36      D<sub>60</sub>= 0.382      D<sub>50</sub>= 0.152  
 D<sub>30</sub>= 0.0148      D<sub>15</sub>=      D<sub>10</sub>=  
 C<sub>u</sub>=      C<sub>c</sub>=

**Classification**

USCS= N/A      AASHTO= N/A

**Remarks**

\* (no specification provided)

Sample No.: 9101812  
 Location: WCP-93-131

Source of Sample:

Date: 11/08/2001  
 Elev./Depth: N/A

<h2 style="margin: 0;">PHOENIX NATIONAL LABORATORIES, INC.</h2>	<p>Client: Roy F. Weston                  Project: VWR ADEQ Facility                  Project No: 22-19160</p>
	<p>Plate</p>



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CLIENT	PROJECT	CLIENT ORDER NO.
Roy F. Weston	ADEQ VW&R	26864
SERVICE LOCATION	PNL PROJECT NO.	REPORT DATE
PNL Laboratory	22-19160	10/30/2001
DATE RECEIVED	RECEIVED BY	PNL LABORATORY NO.
08/21/2001	Alexander Zuran III	9101813

SAMPLE DATA					
Sample ID:	WCP-93-146	Sampled By:	Client	Date Sampled:	Unknown
Sample Description:	Material delivered in two 2" diameter x 6" long brass sleeves.				

TEST RESULTS			
Test	Method	Result	Remarks
Moisture Content	ASTM D2216	15.2%	
Bulk Density	ASTM D2937	1.994gms/cm <sup>3</sup> Wet 1.732gms/cm <sup>3</sup> Dry	
Permeability	ASTM D2434	$k = 4.3 \times 10^{-6}$	@ 68°F
Porosity	Calculated	44.4%	Assumed Spec. Gravity 2.70
Total Organic Carbon	Walkley-Black	None Detectable	
Grain Size Analysis	ASTM D422	See attached particle size distribution report	

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*Alexander Zuran*





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# PROPERTIES OF SOILS

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CLIENT	PROJECT	CLIENT ORDER NO.
Roy F. Weston	ADEQ VW&R	26864
SERVICE LOCATION	PNL PROJECT NO.	REPORT DATE
PNL Laboratory	22-19160	11/01/2001
DATE RECEIVED	RECEIVED BY	PNL LABORATORY NO.
08/21/2001	Alexander Zuran III	9101814

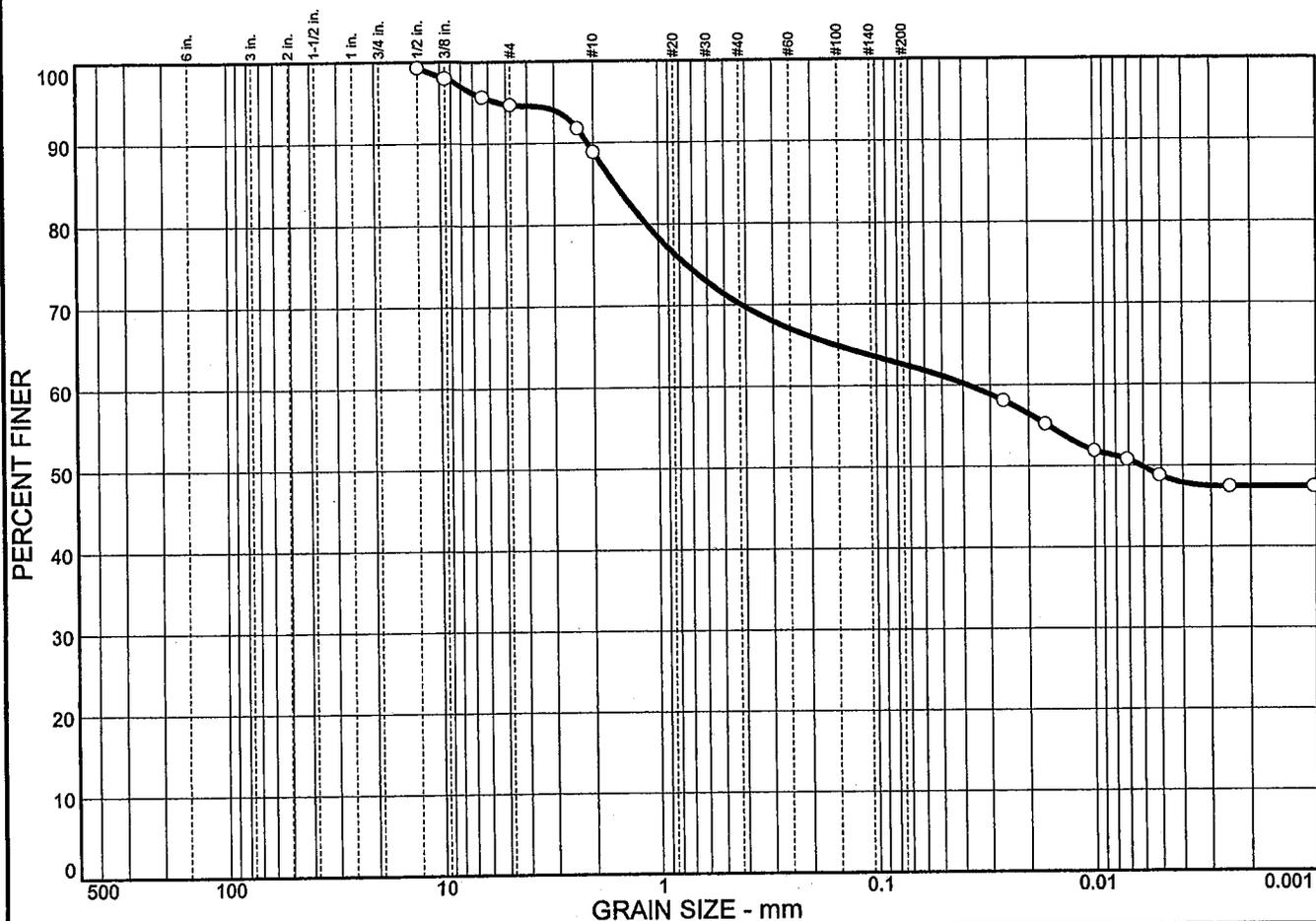
SAMPLE DATA					
Sample ID:	WCP-95-131	Sampled By:	Client	Date Sampled:	Unknown
Sample Description:	Material delivered in two 2" diameter x 6" long brass sleeves.				

TEST RESULTS			
Test	Method	Result	Remarks
Moisture Content	ASTM D2216	24.4%	
Bulk Density	ASTM D2937	1.986 g/cm <sup>3</sup> Wet 1.597 g/cm <sup>3</sup> Dry	
Permeability	ASTM D2434	k = 1.4 x 10 <sup>-5</sup> cm/s	@ 68°F
Porosity	Calculated	51.6%	Assuming Spec. Gravity 2.65
Total Organic Carbon	Walkley-Black	None Detectable	
Grain Size Analysis	ASTM D422	See attached particle size distribution report	

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REVIEWED BY Alex Zuran

# Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
		32.1	13.9	48.7

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1/2 in.	99.3		
3/8 in.	98.0		
1/4 in.	95.7		
#4	94.7		
#8	91.8		
#10	88.9		

**Soil Description**

**Atterberg Limits**  
 PL= N/A      LL= N/A      PI= N/A

**Coefficients**  
 D<sub>85</sub>= 1.60      D<sub>60</sub>= 0.0378      D<sub>50</sub>= 0.0062  
 D<sub>30</sub>=              D<sub>15</sub>=              D<sub>10</sub>=  
 C<sub>u</sub>=              C<sub>c</sub>=

**Classification**  
 USCS= N/A      AASHTO= N/A

**Remarks**

\* (no specification provided)

Sample No.: 9101814      Source of Sample:      Date: 11/01/2001  
 Location: WCP-95-131      Elev./Depth: N/A

<h2 style="margin: 0;">PHOENIX NATIONAL LABORATORIES, INC.</h2>	Client: Roy F. Weston Project: VWR ADEQ Facility Project No: 22-19160
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# PROPERTIES OF SOILS

QUALITY TESTING, INSPECTION, AND ENGINEERING SERVICES  
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CLIENT	PROJECT	CLIENT ORDER NO.
Roy F. Weston	ADEQ VW&R	26864
SERVICE LOCATION	PNL PROJECT NO.	REPORT DATE
PNL Laboratory	22-19160	11/01/2001
DATE RECEIVED	RECEIVED BY	PNL LABORATORY NO.
08/21/2001	Alexander Zuran III	9101815

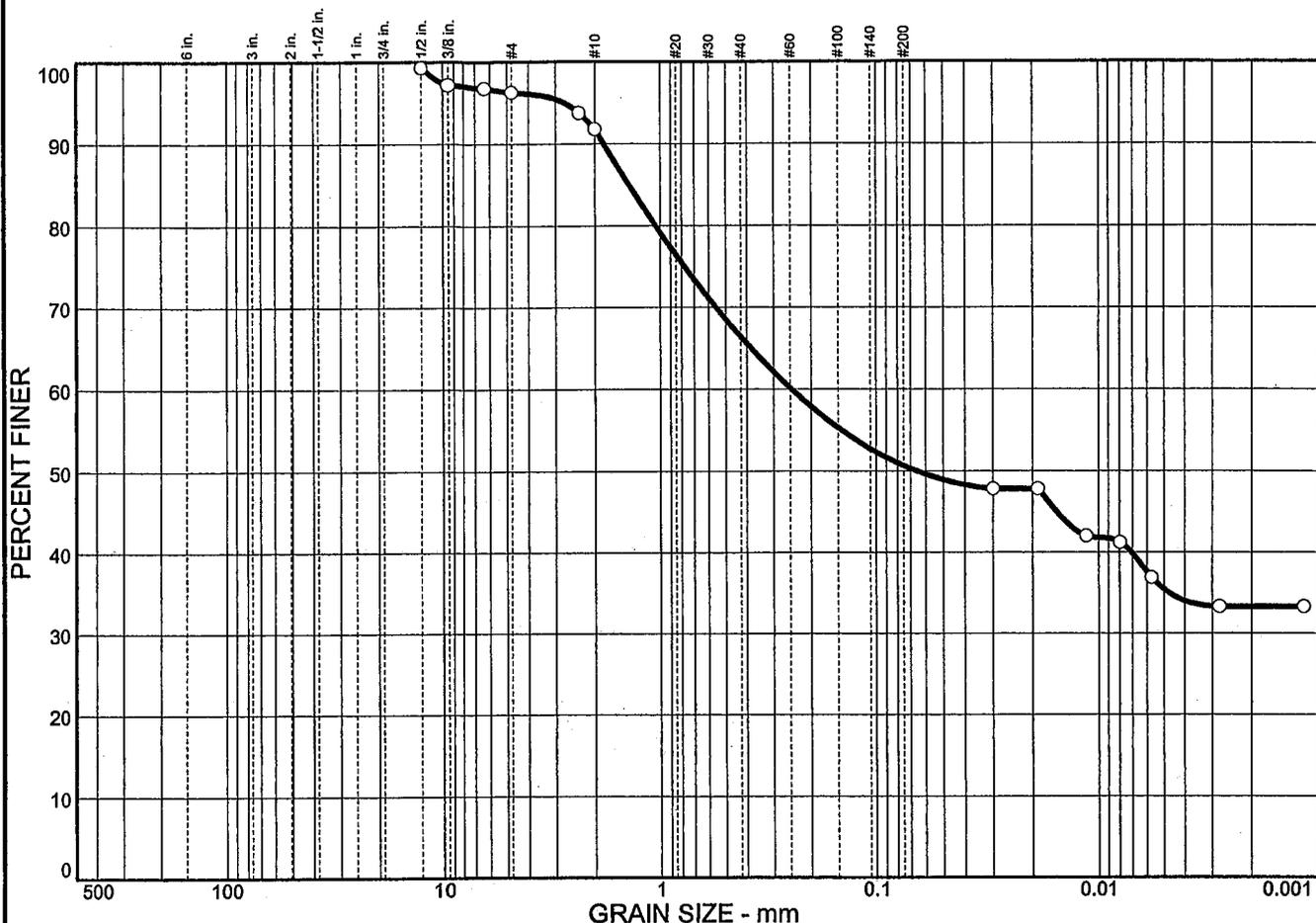
SAMPLE DATA					
Sample ID:	WCP-95-140	Sampled By:	Client	Date Sampled:	Unknown
Sample Description:	Material delivered in two 2" diameter x 6" long brass sleeves.				

TEST RESULTS			
Test	Method	Result	Remarks
Moisture Content	ASTM D2216	25.1%	
Bulk Density	ASTM D2937	1.994 g/cm <sup>3</sup> Wet 1.557 g/cm <sup>3</sup> Dry	
Permeability	ASTM D2434	$k = 6.7 \times 10^{-8}$	@ 68°F
Porosity	Calculated	53.0%	Assuming Spec. Gravity 2.65
Total Organic Carbon	Walkley-Black	None Detectable	
Grain Size Analysis	ASTM D422	See attached particle size distribution report	

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# Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
		45.7	15.2	35.4

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1/2 in.	99.3		
3/8 in.	97.2		
1/4 in.	96.8		
#4	96.3		
#8	93.8		
#10	91.8		

**Soil Description**

**Atterberg Limits**

PL= N/A      LL= N/A      PI= N/A

**Coefficients**

D<sub>85</sub>= 1.40      D<sub>60</sub>= 0.247      D<sub>50</sub>= 0.0656  
D<sub>30</sub>=              D<sub>15</sub>=              D<sub>10</sub>=  
C<sub>u</sub>=              C<sub>c</sub>=

**Classification**

USCS=              AASHTO= N/A

**Remarks**

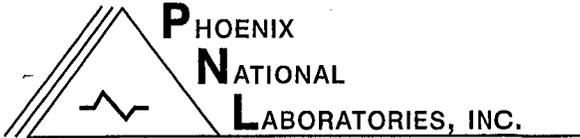
\* (no specification provided)

Sample No.: 9101815  
Location: WCP-95-140

Source of Sample:

Date: 10/30/2001  
Elev./Depth: N/A

<h2 style="margin: 0;">PHOENIX NATIONAL LABORATORIES, INC.</h2>	<p>Client: Roy F. Weston  Project: VWR ADEQ Facility  Project No: 22-19160</p>
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# PROPERTIES OF SOILS

QUALITY TESTING, INSPECTION, AND ENGINEERING SERVICES  
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<b>CLIENT</b>	<b>PROJECT</b>	<b>CLIENT ORDER NO.</b>
Roy F. Weston	ADEQ VW&R	26864
<b>SERVICE LOCATION</b>	<b>PNL PROJECT NO.</b>	<b>REPORT DATE</b>
PNL Laboratory	22-19160	11/01/2001
<b>DATE RECEIVED</b>	<b>RECEIVED BY</b>	<b>PNL LABORATORY NO.</b>
08/21/2001	Alexander Zuran III	9101816

SAMPLE DATA				
<b>Sample ID:</b>	WCP-96-121	<b>Sampled By:</b>	Client	<b>Date Sampled:</b> Unknown
<b>Sample Description:</b>	Material delivered in three 2" diameter x 6" long brass sleeves.			

TEST RESULTS			
Test	Method	Result	Remarks
Moisture Content	ASTM D2216	12.8%	
Bulk Density	ASTM D2937	2.137 g/cm <sup>3</sup> Wet 1.895 g/cm <sup>3</sup> Dry	
Permeability	ASTM D2434	k = 1.3 x 10 <sup>-5</sup> cm/s	@ 68°F
Porosity	Calculated	36.6%	Assuming Spec. Gravity 2.65
Total Organic Carbon	Walkley-Black	None Detectable	
Grain Size Analysis	ASTM D422	See attached particle size distribution report	

PNL warrants that the above services and report were performed under the appropriate standard of care, including the skill and judgement that is reasonably expected from similarly situated technical personnel. No other warranty, guaranty, or representation, either expressed or implied is included or intended.

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*Alexander Zuran*





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# PROPERTIES OF SOILS

QUALITY TESTING, INSPECTION, AND ENGINEERING SERVICES  
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CLIENT	PROJECT	CLIENT ORDER NO.
Roy F. Weston	ADEQ VW&R	26864
SERVICE LOCATION	PNL PROJECT NO.	REPORT DATE
PNL Laboratory	22-19160	11/01/2001
DATE RECEIVED	RECEIVED BY	PNL LABORATORY NO.
08/21/2001	Alexander Zuran III	9101817

SAMPLE DATA					
Sample ID:	WCP-96-136	Sampled By:	Client	Date Sampled:	Unknown
Sample Description:	Material delivered in two 2" diameter x 6" long brass sleeves.				

TEST RESULTS			
Test	Method	Result	Remarks
Moisture Content	ASTM D2216	19.2%	
Bulk Density	ASTM D2937	1.998 g/cm <sup>3</sup> Wet 1.676 g/cm <sup>3</sup> Dry	
Permeability	ASTM D2434	k = 4.3 x 10 <sup>-6</sup> cm/s	@ 68°F
Porosity	Calculated	47.9%	Assuming Spec. Gravity 2.70
Total Organic Carbon	Walkley-Black	None Detectable	
Grain Size Analysis	ASTM D422	See attached particle size distribution report	

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# PROPERTIES OF SOILS

QUALITY TESTING, INSPECTION, AND ENGINEERING SERVICES  
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CLIENT	PROJECT	CLIENT ORDER NO.
Roy F. Weston	ADEQ VW&R	26864
SERVICE LOCATION	PNL PROJECT NO.	REPORT DATE
PNL Laboratory	22-19160	11/05/2001
DATE RECEIVED	RECEIVED BY	PNL LABORATORY NO.
08/21/2001	Alexander Zuran III	9101818

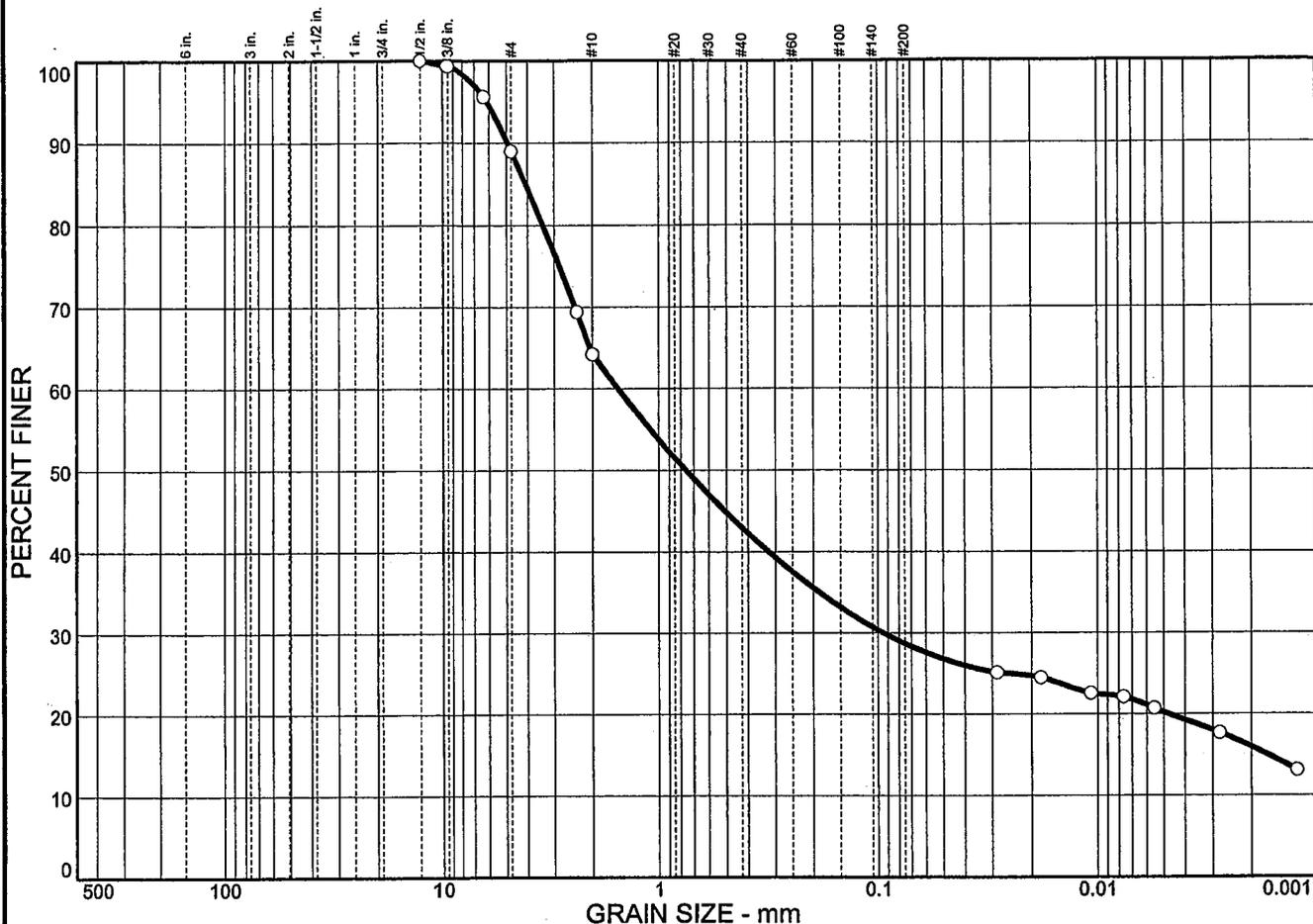
SAMPLE DATA					
Sample ID:	WCP-96-151	Sampled By:	Client	Date Sampled:	Unknown
Sample Description:	Material delivered in three 2" diameter x 6" long brass sleeves.				

TEST RESULTS			
Test	Method	Result	Remarks
Moisture Content	ASTM D2216	37.2%	
Bulk Density	ASTM D2937	1.795 g/cm <sup>3</sup> Wet 1.309 g/cm <sup>3</sup> Dry	
Permeability	ASTM D2434	k = 1.4 x 10 <sup>-8</sup> cm/s	@ 68°F
Porosity	Calculated	64%	Assuming Spec. Gravity 2.65
Total Organic Carbon	Walkley-Black	None Detectable	
Grain Size Analysis	ASTM D422	See attached particle size distribution report	

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# Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	11.0	60.3	8.5	20.2

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1/2 in.	100.0		
3/8 in.	99.3		
1/4 in.	95.6		
#4	89.0		
#8	69.4		
#10	64.2		

**Soil Description**

PL= N/A      **Atterberg Limits**      LL= N/A      PI= N/A

**Coefficients**

D<sub>85</sub>= 4.07      D<sub>60</sub>= 1.53      D<sub>50</sub>= 0.761  
D<sub>30</sub>= 0.0943      D<sub>15</sub>= 0.0017      D<sub>10</sub>=  
C<sub>u</sub>=

USCS= N/A      **Classification**      AASHTO= N/A

**Remarks**

\* (no specification provided)

Sample No.: 9101818  
Location: WCP-96-151

Source of Sample:

Date: 11/05/2001  
Elev./Depth: N/A

**PHOENIX NATIONAL  
LABORATORIES, INC.**

Client: Roy F. Weston  
Project: VWR ADEQ Facility

Project No: 22-19160

Plate



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# PROPERTIES OF SOILS

QUALITY TESTING, INSPECTION, AND ENGINEERING SERVICES  
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<b>CLIENT</b>	<b>PROJECT</b>	<b>CLIENT ORDER NO.</b>
Roy F. Weston	ADEQ VW&R	26864
<b>SERVICE LOCATION</b>	<b>PNL PROJECT NO.</b>	<b>REPORT DATE</b>
PNL Laboratory	22-19160	11/05/2001
<b>DATE RECEIVED</b>	<b>RECEIVED BY</b>	<b>PNL LABORATORY NO.</b>
08/21/2001	Alexander Zuran III	9101819

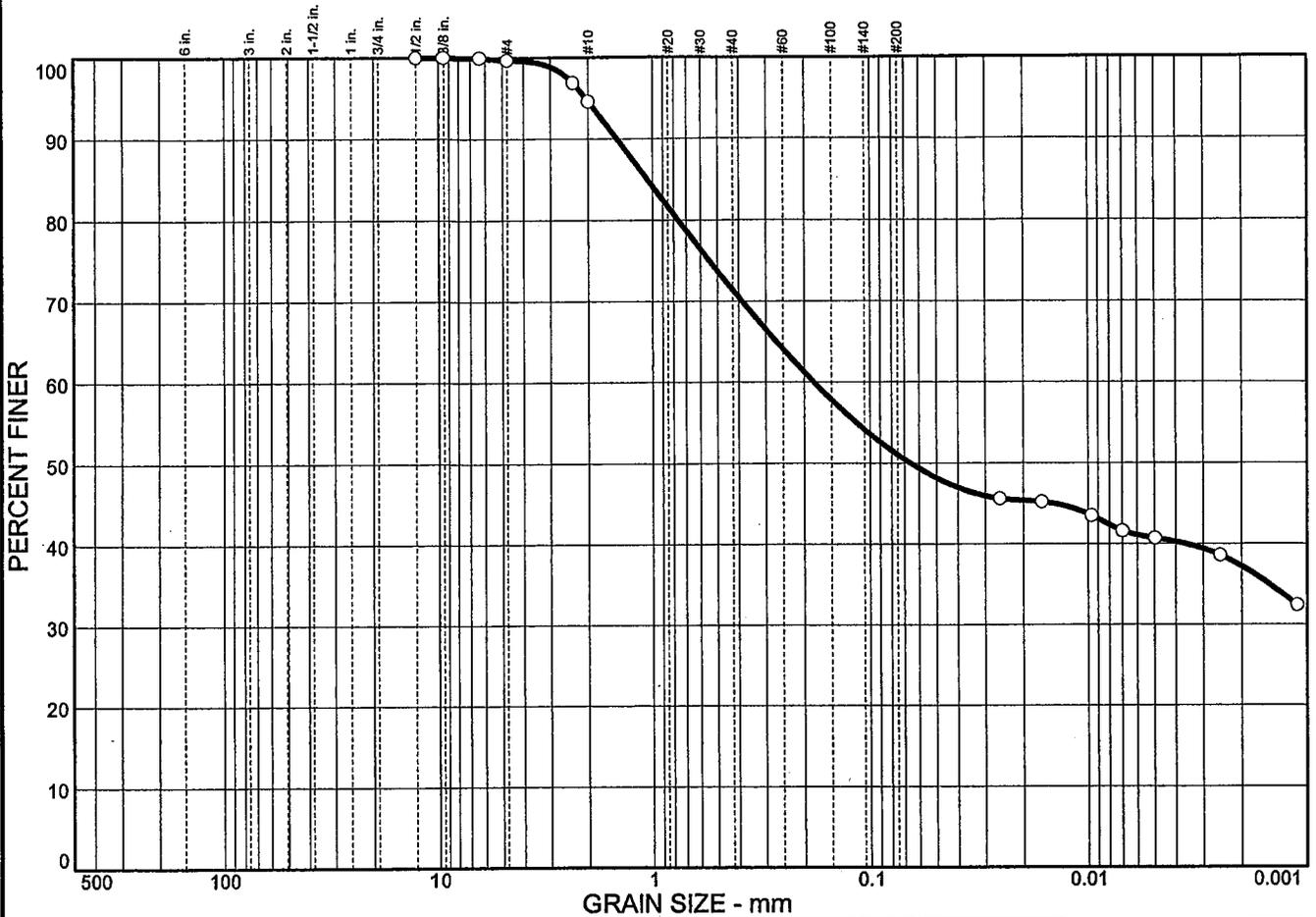
SAMPLE DATA				
<b>Sample ID:</b>	WCP-97-126	<b>Sampled By:</b>	Client	<b>Date Sampled:</b> Unknown
<b>Sample Description:</b>	Material delivered in two 2" diameter x 6" long brass sleeves.			

TEST RESULTS			
Test	Method	Result	Remarks
Moisture Content	ASTM D2216	28.5%	
Bulk Density	ASTM D2937	1.870 g/cm <sup>3</sup> Wet 1.456 g/cm <sup>3</sup> Dry	
Permeability	ASTM D2434	k = 2.3 x 10 <sup>-6</sup> cm/s	@ 68°F
Porosity	Calculated	57.3%	Assuming Spec. Gravity 2.65
Total Organic Carbon	Walkley-Black	None Detectable	
Grain Size Analysis	ASTM D422	See attached particle size distribution report	

PNL warrants that the above services and report were performed under the appropriate standard of care, including the skill and judgement that is reasonably expected from similarly situated technical personnel. No other warranty, guaranty, or representation, either expressed or implied is included or intended.

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# Particle Size Distribution Report



<b>% COBBLES</b>	<b>% GRAVEL</b>	<b>% SAND</b>	<b>% SILT</b>	<b>% CLAY</b>
0.0	0.3	48.7	10.3	40.7

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1/2 in.	100.0		
3/8 in.	100.0		
1/4 in.	100.0		
#4	99.7		
#8	96.9		
#10	94.6		

**Soil Description**

**Atterberg Limits**

PL= N/A      LL= N/A      PI= N/A

**Coefficients**

D<sub>85</sub>= 1.06      D<sub>60</sub>= 0.181      D<sub>50</sub>= 0.0659  
D<sub>30</sub>=              D<sub>15</sub>=              D<sub>10</sub>=  
C<sub>u</sub>=              C<sub>c</sub>=

**Classification**

USCS= N/A      AASHTO= N/A

**Remarks**

\* (no specification provided)

Sample No.: 9101819  
Location: WCP-97-126

Source of Sample:

Date: 11/05/2001  
Elev./Depth: N/A

PHOENIX NATIONAL  
LABORATORIES, INC.

Client: Roy F. Weston  
Project: VWR ADEQ Facility

Project No: 22-19160

Plate



**P**HOENIX  
**N**ATIONAL  
**L**ABORATORIES, INC.

# PROPERTIES OF SOILS

QUALITY TESTING, INSPECTION, AND ENGINEERING SERVICES  
4209 SOUTH 43RD PLACE • PHOENIX, AZ 85040 • 602/431-8887 • FAX 602/431-8889

CLIENT	PROJECT	CLIENT ORDER NO.
Roy F. Weston	ADEQ VW&R	26864
SERVICE LOCATION	PNL PROJECT NO.	REPORT DATE
PNL Laboratory	22-19160	11/08/2001
DATE RECEIVED	RECEIVED BY	PNL LABORATORY NO.
08/21/2001	Alexander Zuran III	9101820

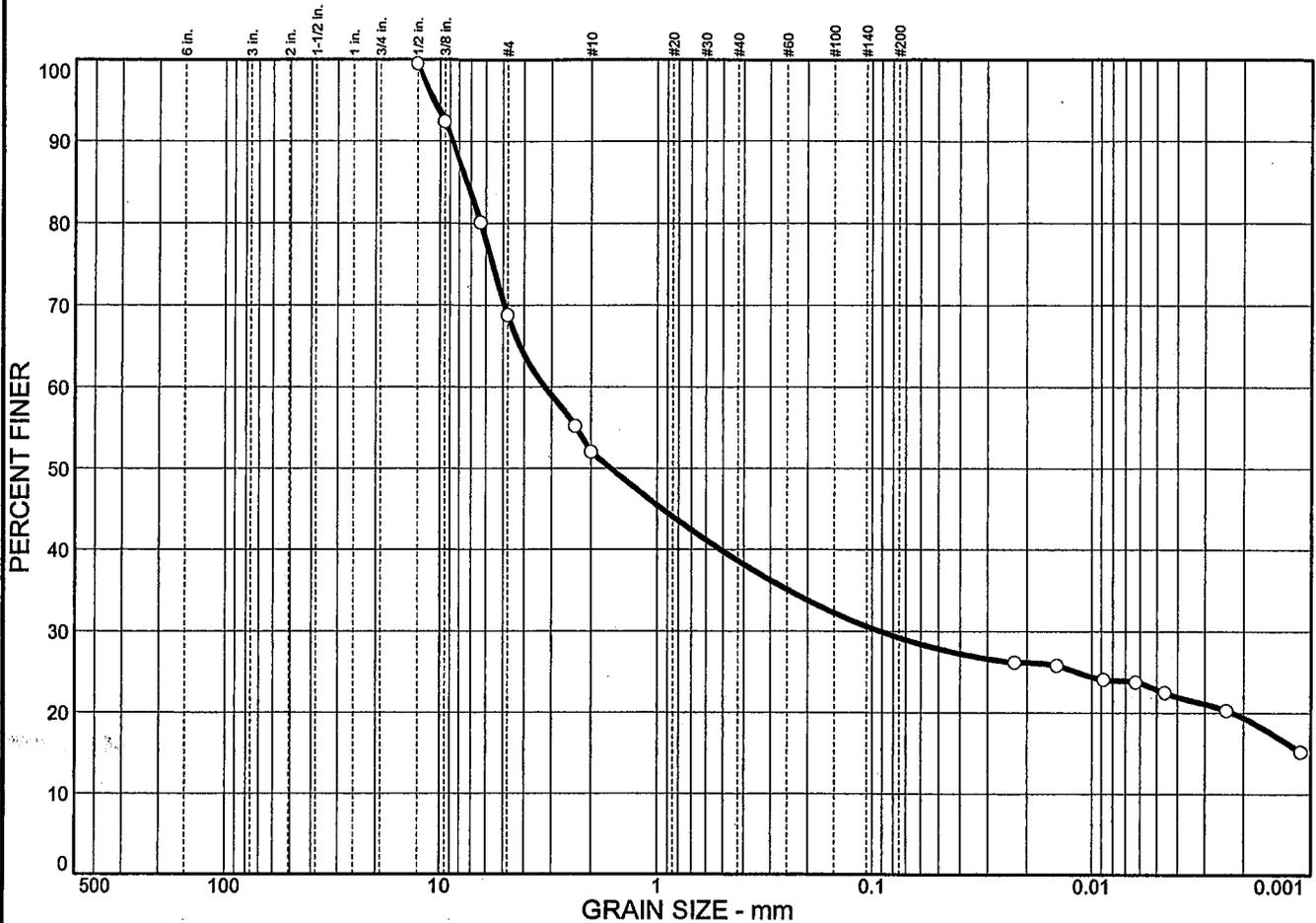
SAMPLE DATA					
Sample ID.:	WCP-97-136	Sampled By:	Client	Date Sampled:	Unknown
Sample Description:	Material delivered in three 2" diameter x 6" long brass sleeves.				

TEST RESULTS			
Test	Method	Result	Remarks
Moisture Content	ASTM D2216	30.2%	
Bulk Density	ASTM D2937	1.824 g/cm <sup>3</sup> Wet 1.402 g/cm <sup>3</sup> Dry	
Permeability	ASTM D2434	k = 2.0 x 10 <sup>-7</sup> cm/s	@ 68°F
Porosity	Calculated	60.2%	Assuming Spec. Gravity 2.70
Total Organic Carbon	Walkley-Black	None Detectable	
Grain Size Analysis	ASTM D422	See attached particle size distribution report	

PNL warrants that the above services and report were performed under the appropriate standard of care, including the skill and judgement that is reasonably expected from similarly situated technical personnel. No other warranty, guaranty, or representation, either expressed or implied is included or intended.

REVIEWED BY

# Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
		39.6	6.3	22.9

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1/2 in.	99.5		
3/8 in.	92.4		
1/4 in.	80.1		
#4	68.8		
#8	55.2		
#10	52.0		

**Soil Description**

**Atterberg Limits**  
 PL= N/A      LL= N/A      PI= N/A

**Coefficients**  
 D<sub>85</sub>= 7.32      D<sub>60</sub>= 3.22      D<sub>50</sub>= 1.64  
 D<sub>30</sub>= 0.0918      D<sub>15</sub>=      D<sub>10</sub>=  
 C<sub>u</sub>=      C<sub>c</sub>=

**Classification**  
 USCS= N/A      AASHTO= N/A

**Remarks**

\* (no specification provided)

Sample No.: 9101820  
 Location: WCP-97-136

Source of Sample:

Date: 11/08/2001  
 Elev./Depth: N/A

PHOENIX NATIONAL  
 LABORATORIES, INC.

Client: Roy F. Weston  
 Project: VWR ADEQ Facility

Project No: 22-19160

Plate



**P**HOENIX  
**N**ATIONAL  
**L**ABORATORIES, INC.

# PROPERTIES OF SOILS

QUALITY TESTING, INSPECTION, AND ENGINEERING SERVICES

4209 SOUTH 43RD PLACE • PHOENIX, AZ 85040 • 602/431-8887 • FAX 602/431-8889

CLIENT	PROJECT	CLIENT ORDER NO.
Roy F. Weston	ADEQ VW&R	26864
SERVICE LOCATION	PNL PROJECT NO.	REPORT DATE
PNL Laboratory	22-19160	11/05/2001
DATE RECEIVED	RECEIVED BY	PNL LABORATORY NO.
08/21/2001	Alexander Zuran III	9101821

SAMPLE DATA					
Sample ID:	WCP-97-151	Sampled By:	Client	Date Sampled:	Unknown
Sample Description:	Material delivered in three 2" diameter x 6" long brass sleeves.				

TEST RESULTS			
Test	Method	Result	Remarks
Moisture Content	ASTM D2216	22.7%	
Bulk Density	ASTM D2937	1.971 g/cm <sup>3</sup> Wet 1.607 g/cm Dry	
Permeability	ASTM D2434	$k = 5.9 \times 10^{-6}$ cm/s	@ 68°F
Porosity	Calculated	51.5%	Assuming Spec. Gravity 2.70
Total Organic Carbon	Walkley-Black	None Detectable	
Grain Size Analysis	ASTM D422	See attached particle size distribution report	

PNL warrants that the above services and report were performed under the appropriate standard of care, including the skill and judgement that is reasonably expected from similarly situated technical personnel. No other warranty, guaranty, or representation, either expressed or implied is included or intended.

REVIEWED BY





Univar USA Inc.  
1804 N. 20<sup>th</sup> Street  
Nampa, ID 83687

Telephone: 208/888-1094  
Fax: 208/884-1602



June 21, 2004

Ms. Ana Vargas, Project Manager  
Arizona Department of Environmental Quality  
Superfund Programs Section, Waste Programs Division  
1110 West Washington Street  
Phoenix, AZ 85007

Re: Univar USA Inc. Comments  
March 2004 Draft Remedial Investigation Report  
West Central Phoenix, East Grand Avenue WQARF Site

Dear Ana,

Univar USA Inc. (Univar) appreciates the opportunity to provide comments on the March 2004 Draft Remedial Investigation Report (draft RI Report) for the West Central Phoenix, East Grand Avenue WQARF Site (Site). In general the draft RI Report was comprehensive and well-prepared. However, there are a few key points that Univar believes may require additional consideration. These include:

- The presence of additional identified and unidentified sources that have contributed to groundwater contamination in the Site.
- The absence of Site-specific inorganic water quality data; and the use of historic, regional data to draw conclusions regarding general Site water quality conditions.
- Analysis of the impacts on the two SRP wells located within the Site, and the affects of groundwater pumping at these wells on the groundwater flow direction and gradient.

Univar's detailed comments are included in the attachment and are referenced to applicable sections of the draft RI Report. If you have questions or need additional information, please contact me or Gail Clement at 480-314-9499.

Sincerely,

*Michael Gaudette / One*  
Michael Gaudette  
Senior Project Manager

w/attachment

cc. James Hooper  
Gail Clement

Post-it* Fax Note	7671	Date	6/22/04	# of pages	7
To	Ana Vargas	From	Gail Clement		
Co./Dept.		Co.			
Phone #		Phone #			
Fax #	602/771-4272	Fax #			

**Univar USA Inc. Draft Remedial Investigation Report Comments  
West Central Phoenix, East Grand Avenue WQARF Site**

<b>West Central Phoenix, East Grand Avenue RI Report</b>		
<b>Page</b>	<b>Paragraph</b>	<b>Comment</b>
xvii	1	Univar recommends that the word "apparent" be removed preceding "sources of contamination". Other sources of contamination of volatile organic compounds (VOCs) in the EGA Site, including chlorinated compounds, benzene, and other petroleum products have been identified and described in subsequent sections of the RI report.
xix	2	The discussion implies that the source of contamination to the monitoring well, WCP-94, is the former VW&R facility. The plume configuration and results of sampling do not support a conclusion that the source of contamination at WCP-94 is the VW&R facility.
1-3	2	Chlorothene was included in the VW&R inventory list, not chloroethene. Chlorothene is a synonym for 1,1,1-TCA.
1-11	4 <sup>th</sup> bullet	Groundwater flow direction is from the northeast to southwest, not northwest to southwest.
1-12	2	Considering the very high concentrations of VOCs that have been found in groundwater collected from WCP-28 and WCP-29 and the unknown sources of contamination to the east of the former VW&R facility, why weren't soil samples collected and submitted for VOC analyses when WCP-28 and WCP-29 were installed? What were the results of the FID screening?
1-13	2	The former VW&R facility is not the only source of contamination from COCs in groundwater at the Site. Other sources of the COCs are present both upgradient and down gradient of the former VW&R facility. Univar suggests that this paragraph be revised to acknowledge the presence of other sources of COCs.
	Figures 1.1, 2.1, etc.	<p>Univar believes that there are several additional sources of VOC contamination that have affected groundwater quality at the Site. The plume configuration depicted on various RI figures does not appear to represent the actual water quality data. Specifically, TCE contamination found at WCP-94 appears to originate from an additional, undefined source in relatively near proximity to the well. COC concentrations in groundwater samples collected from monitoring wells located between WCP-94 and WCP-88 (the MWB wells, WCP-96 and WCP-89) have been appreciably below their applicable MCLs. Depiction of one plume downgradient of the VW&amp;R facility, which includes WCP-94, does not appear to be supported by the actual water quality data.</p> <p>In addition, an unidentified TCE source is present upgradient of the former VW&amp;R facility. The upgradient TCE plume appears to merge into the plume originating from the former VW&amp;R facility.</p>
2-6	1	Is there a timeline or written history documenting the lining sequence of the SRP Grand Canal?
2-6	4	What map is being referenced? Is the referenced map Figure 2-5 of Appendix D? What is the date of the map?
2-7	2	Did the visual inspection of the Grand Canal confirm the condition of Canal lining depicted in Figure 2-5 of Appendix D?
2-8	5	It is unclear how the conclusion was drawn that both SRP wells, 10.5E-7.5N

**Univar USA Inc. Draft Remedial Investigation Report Comments  
West Central Phoenix, East Grand Avenue WQARF Site**

2-10	2	and 11.2E-7.7N, influence groundwater flow and gradient in the EGA. 10.5E-7.5N does appear to influence the flow to a more westerly direction. The influence of 11.2E-7.7N is described as "less clear". Is there any evidence that 11.2E-7.7N has an influence on the direction of groundwater flow? If so, what is the influence and what are the data?
2-11 & 2-12	all	These sections describe the step drawdown test and aquifer and recovery test conducted by WESTON. Univar recognizes that WESTON was constrained to use existing monitoring wells and that the limited pumping rates and well construction were not optimal for conducting an appropriate aquifer test. However, the calculated values for hydraulic conductivity (189 -258 ft/day) and the average linear velocity of groundwater (2.4 to 8.6 ft/day) appear to be larger than expected for the lithologies present at the Site. The observed drawdown response may have been due to initial elastic storage effects and delayed yield effects. Univar recommends that the aquifer and recovery test data be further evaluated considering delayed drainage and leaky aquifer models and the possibility of effects for partial penetration.
2-14	1	According to page 2-8 of the RI, hydraulic gradients at the EGA Site range between 0.025 to 0.0020 ft/ft, What was the basis for selection of the gradients used to calculate the average linear velocity of groundwater? In particular, why wasn't the lower range of hydraulic gradients included in the velocity calculations?
2-14	2	<p>During the Remedial Investigation, groundwater was not analyzed for inorganic water quality parameters at the Site. Instead, the results of previous regional studies were referenced and used as the basis to draw conclusions about the general groundwater quality at the Site. No Site-specific data were provided.</p> <p>In March 2003, during the first quarter of water quality monitoring performed by Univar, Site-specific groundwater samples were analyzed for inorganic compounds. The results of these analyses are included in the December 2003 Semiannual Groundwater Monitoring Report, First and Second Quarters 2003, prepared by G. M. Clement &amp; Associates, Inc. for Univar. Nitrate concentrations were found to be above or near the primary MCL in groundwater samples collected from Site monitoring wells, including WCP-46, WCP-40 and WCP-100. The 2003 groundwater sampling results do not support the conclusion that the water is acceptable for domestic purposes.</p>
2-15	5	PCE was detected at a concentration of 220 micrograms per kilogram at the UPS site in a soil sample collected between 9 and 11 feet below ground surface. Clearly, this high concentration of PCE detected in shallow soils did not originate from off-gassing of VOCs present at low concentrations in the groundwater. This concentration is not insignificant and represents a potential source of PCE to groundwater. Was the source of PCE found in soils at the UPS site identified? Was the full extent of degree of PCE contamination at the UPS site defined?
2-19	2	According to ADEQ's CERCLA Site Investigation, a release of VOCS and metals occurred at the Mogul facility. Groundwater data confirm that Mogul monitoring wells contained VOCs, particularly TCE, benzene and 1,2-DCA at concentrations above their respective MCLs. What is the current status of the

**Univar USA Inc. Draft Remedial Investigation Report Comments  
West Central Phoenix, East Grand Avenue WQARF Site**

		investigation at the former Mogul facility? Is ADEQ pursuing Mogul as a source of groundwater contamination in the EGA site?
7-2 & 7-3	All	The section discusses contaminants that are not Contaminants of Concern (COCs) at the EGA Site. Univar requests that ADEQ clarify that the source of BTEX and 1,2-DCA contamination did not originate from the former VW&R facility.
7-3	3	The paragraph refers to both 1,2-DCA and 1,1-DCA. Should all references be to 1,2-DCA?
7-7	2	Univar suggests rephrasing the last sentence of the paragraph for clarity.
7-8	4	The concentrations of contaminants found in groundwater at the Site also appear to have been influenced by the sampling methods.
7-11 7-12	5 1	The RI notes that PCE and TCE concentrations in samples from WCP-28 during Rounds 2 and 4 appear to be anomalously high and that local minor variations in groundwater flow may have contributed to the anomalous readings. There was apparently no pumping of the two SRP wells immediately before or during the sampling; and there is no evidence that local groundwater variations in flow occurred at the time of sampling. Other potential sources that may have contributed to contamination found in WCP-28, WCP-93 and up gradient of the VW&R facility have not been fully evaluated.
7-14	All	Only 2 data sets that were collected at different times are used to compare purging methods and to draw conclusions.
7-14 thru 7- 16	All	PDB sampling results appear to have provided useful data, but some cross contamination was identified that included acetone.
7-15	3	Univar agrees that the traditional purge and sample methods may be more appropriate to obtain average aquifer water quality concentrations.
7-16	2	There were no deep PDB samples collected in WCP-16, WCP-17 according to Table 7-26.  The paragraph concludes that contaminant concentrations increase with depth away from the VW&R facility, implying that contaminant concentrations increase with depth away from the source. TCE PDB sample concentrations at WCP-94 were highest closest to the groundwater-vadose zone interface. The contaminant pattern indicates the source of TCE contamination to WCP-94 is near by.
7-16	4	Contaminant concentrations increase with depth at WCP-87 and WCP-93. The PDB results at WCP-93 indicate that some source(s) of contamination to WCP-93 may not be located in the immediate vicinity of WCP-93, and may include other sources upgradient of the VW&R facility.
7-16 7-17	5 1 & 2	To what standard is the vertical extent of contamination being defined, the applicable MCLs or MDLs? Only very low concentrations of 1,1-DCE have been found in samples collected from WCP-48 and VOCs in hydropunch samples collected at 182 feet in SB-17 were not detected above the applicable MDLs. The data indicate that the vertical extent of groundwater contamination appears to be within the range of 153 feet to 182 feet bgs.
7-18 & 7-19	Section 7.6.2	Univar requests that the section title or text be clarified to note that the additional sources are not related to VW&R. There is no discussion in this or

**Univar USA Inc. Draft Remedial Investigation Report Comments  
West Central Phoenix, East Grand Avenue WQARF Site**

		<p>other sections regarding what ADEQ is doing or intends to do regarding the other sources.</p> <p>Univar believes that the TCE contamination found at WCP-94 originates from an additional, undefined source in relatively near proximity to the well. COC concentrations in groundwater samples collected from monitoring wells located between WCP-94 and WCP-88 (the MWB wells, WCP-96 and WCP-89) have been appreciably below their applicable MCLs. In addition, the water quality pattern of the PDB samples collected in WCP-94 indicates that the source of TCE contamination to WCP-94 is nearby.</p>
7-18	2	Water quality data for WCP-41 and WCP-83 are sufficient to support stating that there is an upgradient source of contamination. The upgradient extent of TCE contamination has not been defined.
7-19 & 7-20	Section 7.7	Inorganic and Natural Attenuation Parameters were analyzed for samples collected by Univar in March 2003. The results of these analyses are included in the December 2003 Semiannual Groundwater Monitoring Report, First and Second Quarters 2003, prepared by G. M. Clement & Associates, Inc. for Univar.
7-24	1	Based on the Site water quality data, TCE concentrations found in WCP-94 do not appear to be associated with the upgradient plume and most likely originate from an additional, undefined source. Depiction of one plume downgradient of the VW&R facility, which includes WCP-94, does not appear to be supported by the actual water quality data.
7-27	2	There is a very significant difference between the actual and estimated downgradient extent of contamination. Contaminant degradation may also be occurring in the areas where UST releases have caused the addition of hydrocarbon sources to the groundwater to support localized in situ biodegradation. The results of the March 2003 sampling indicate that limited in situ biodegradation is occurring at the Site.
8-1	1 <sup>st</sup> bullet & new 2 <sup>nd</sup> bullet under groundwater	Univar requests that ADEQ consider rephrasing 1 <sup>st</sup> bullet: "One of the primary sources of groundwater contamination in the WCP East Grand Avenue ...". Univar requests that ADEQ consider adding a 2 <sup>nd</sup> bullet to replace the 4 <sup>th</sup> bullet: "Additional sources of VOCs have been identified in groundwater at the Site, including an unidentified, upgradient TCE source, an unidentified down gradient TCE source near WCP-94, a down gradient VOC source at the former Mogul facility, and multiple down and cross gradient sources of benzene and other petroleum products."
8-1	2nd bullet	The lateral extent of TCE contamination has not been defined in the upgradient direction at WCP-83. The upgradient source of TCE contamination is not related to the former VW&R facility.
8-2	1 <sup>st</sup> bullet	Only very low concentrations of 1,1-DCE have been found in samples collected from WCP-48; and VOCs in hydropunch samples collected at 182 feet in SB-17 were not detected above the applicable MDLs. The data indicate that the vertical extent of groundwater contamination appears to be within the range of 153 feet to 182 feet bgs.

**Univar USA Inc. Draft Remedial Investigation Report Comments  
West Central Phoenix, East Grand Avenue WQARF Site**

<b>Land &amp; Water Report, Appendix D</b>		
<b>Page</b>	<b>Paragraph</b>	<b>Comment</b>
1-2	3	The VW&R facility has been named as the primary source of VOCs, but other sources of VOCs are present both up and down gradient of the former VW&R facility. Additional sources of VOCs have been identified in groundwater at the Site, including an unidentified, upgradient TCE source, an unidentified down gradient TCE source near WCP-94, a down gradient VOC source at the former Mogul facility, and multiple down and cross gradient sources of benzene and other petroleum products. Univar check names used to describe company.
1-3	1&2	During the Remedial Investigation, groundwater was not analyzed for inorganic water quality parameters at the Site. Instead, the results of previous regional studies performed by SRP or others were referenced and used as the basis to draw conclusions about the general groundwater quality at the Site. Some of these studies are very broad in scope and date to the 1980s. In addition, the actual well-specific water quality data used to describe the general water quality were not provided. Without well-specific data it is impossible to determine if the conclusions are supported by the actual data.  In March 2003, during the first quarter of water quality monitoring performed by Univar, Site-specific groundwater samples were analyzed for inorganic compounds. The results of these analyses are included in the December 2003 Semiannual Groundwater Monitoring Report, First and Second Quarters 2003, prepared by G. M. Clement & Associates, Inc. for Univar. Nitrate concentrations were found to be above or near the primary MCL in groundwater samples collected from Site monitoring wells, including WCP-46, WCP-40 and WCP-100. The 2003 groundwater sampling results do not support the conclusion that nitrates are within "regulatory guidelines".
1-3	3	As evidenced by the groundwater quality data and the descriptions of the UST releases within the EGA Site in Chapter 2 of the RI report, the listed UST releases have documented impacts to Site groundwater quality.
2-5	2	Nitrate concentrations were found to be above or near the primary the MCL in groundwater samples collected from some Site monitoring wells during the March 2003 sampling. Nitrate contamination would have to be considered during evaluation of well field expansion.
2-5 2-6	5 1	SRP wells 10.5E-7.5N and 11.2E-7.7N are described as affected by TCE contamination. No well-specific water quality data were presented to support this conclusion. How do the TCE concentrations relate to MCLs and Irrigation standards? Without well-specific data it is impossible to determine if the information provided is supported by the actual data.
2-6	2	TCE concentrations are reported to increase in 11.2E-7.7N during years of higher pumpage. No well-specific water quality data were presented to support this statement. The source of contamination to the SRP well was not identified. Based on review of reported data, the EGA plume does not appear to have affected this upgradient SRP well to the west.

**Univar USA Inc. Draft Remedial Investigation Report Comments  
West Central Phoenix, East Grand Avenue WQARF Site**

2-6	3	What are the water quality criteria that water sources discharging to the SRP Grand Canal must meet? How do these criteria compare to the water quality found at SRP wells, 10.5E-7.5N and 11.2E-7.7N?
2-7	1	

<b>West Central Phoenix, East Grand Avenue RI Report</b>			
<b>Page</b>	<b>Para.</b>	<b>Comment</b>	<b>Response</b>
xvii	1	Univar recommends that the word "apparent" be removed preceding "sources of contamination". Other sources of contamination of volatile organic compounds (VOCs) in the EGA Site, including chlorinated compounds, benzene, and other petroleum products have been identified and described in subsequent sections of the RI report.	<i>The word "apparent" has been deleted from the text.</i>
xix	2	The discussion implies that the source of contamination to the monitoring well WCP-94, is the former VW&R facility. The plume configuration and results of sampling do not support a conclusion that the source of contamination at WCP-94 is the VW&R facility.	<i>The data does not definitively indicate that the source of TCE in WCP-94 is unrelated to the main contaminant plume; however, the possibility that the concentrations of TCE in WCP-94 are the result of an additional contaminant source downgradient from the main contaminant plume is presented elsewhere in the text. The Executive Summary has been amended to also indicate that possibility.</i>  <i>Note: ADEQ sampled WCP-94 in September 2005. TCE was not detected in that well above laboratory reporting limits during that sampling event.</i>
1-3	2	Chlorothene was included in the VW&R inventory list, not chloroethene. Chloroethene is a synonym for 1,1,1-TCA.	<i>The reference to chloroethene on page 1-3 and in the Executive Summary has been replaced with chlorothene. However, "chloroethene", "chlorothene" or "cloroethene", all refer to 1,1,1-TCA (See <a href="http://www.chemindustry.com/chemicals/251432.html">http://www.chemindustry.com/chemicals/251432.html</a> for additional names)</i>
1-11	4 <sup>th</sup> bullet	Groundwater flow direction is from the northeast to southwest, not northwest to southwest.	<i>The bulleted information indicates that groundwater flow direction at the Site was variable in response to pumping of SRP Well 10.5E-7.5N. When that well was being pumped, the general groundwater flow direction was to the northwest. When the SRP Well was not being pumped, the general flow direction was to the southwest. The RI text has been clarified.</i>
1-12	2	Considering the very high concentrations of VOCs that have been found in groundwater collected from WCP-28 and WCP-29 and the unknown sources of contamination to the east of the former VW&R facility, why weren't soil samples collected and submitted for VOC analyses when WCP-28 and WCP-29 were installed? What were the results of the FID screening?	<i>The focus of this part of the investigation was on groundwater. Results of field screening with the FID were 0.0 in all samples. A composite sample of drill cuttings was collected from each borehole and analyzed for VOCs for disposal characterization. No VOCs were detected above the laboratory reporting limit.</i>
1-13	2	The former VW&R facility is not the only source of contamination from COCs in groundwater at the Site. Other sources of the COCs are present both upgradient and down gradient of the former VW&R facility. Univar suggests that this paragraph be revised to acknowledge the presence of other sources of COCs.	<i>This paragraph discusses the results of the groundwater investigation occurring during Phase II only. As indicated in the text, based on the available data at that time, the VW&amp;R facility was indicated as "a source" of groundwater contamination. The text does not imply that the VW&amp;R facility is the only source of groundwater contamination. ADEQ has acknowledged the presence of additional potential sources of COCs in appropriate sections throughout the text.</i>
	Figures 1.1, 2.1, etc.	Univar believes that there are several additional sources of VOC contamination that have affected groundwater quality at the Site. The plume configuration depicted on various RI figures does not appear to represent the actual water quality data. Specifically, TCE contamination found at WCP-94	<i>Figures 1-1 and 2-1 do not show the contaminant plume boundary. These figures represent the boundary of the entire WCP EGA WQARF Site as is indicated in the legend. Groundwater contaminant plume boundaries are depicted in figures found in Section 7.</i>

<b>West Central Phoenix, East Grand Avenue RI Report</b>			
<b>Page</b>	<b>Para.</b>	<b>Comment</b>	<b>Response</b>
		<p>appears to originate from an additional, undefined source in relatively near proximity to the well. COC concentrations in groundwater samples collected from monitoring wells located between WCP-94 and WCP-88 (the MWB wells, WCP-96 and WCP-89) have been appreciable below their applicable MCLs. Depiction of one plume downgradient of the VW&amp;R facility, which includes WCP-94, does not appear to be supported by the actual water quality data.</p> <p>In addition, an unidentified TCE source is present upgradient of the former VW&amp;R facility. The upgradient TCE plume appears to merge into the plume originating from the former VW&amp;R facility.</p>	<p><i>The groundwater contaminant plume does not include WCP-94 for any of the contaminants of concern.</i></p> <p><i>It is important to note that the highest levels of trace soil contamination were in borings sampled to the northeast of the former VW&amp;R facility (1994). Note that the episodic pumping of 11.2E-7.7N and 10.5E-7.5N may have affected groundwater flow gradients over the course of time that source contamination was present at the VW&amp;R facility.</i></p> <p><i>ADEQ has not been able to identify the source of TCE contamination upgradient to the VW&amp;R facility. The low concentrations of TCE in groundwater attributable to the upgradient source do not allow identification of the source area by examining the concentration gradient. Further, ADEQ could not identify any facilities in the area of the upgradient TCE plume that would have used TCE. ADEQ is not aware of any other reasonable or cost effective investigative technique that would identify the source area for the upgradient TCE contamination.</i></p>
2-6	1	Is there a timeline or written history documenting the lining sequence of the SRP Grand Canal?	<i>Information provided by SRP regarding the lining of the Grand Canal did not include dates for when particular sections were lined.</i>
2-6	4	What map is being referenced? Is the referenced map Figure 2-5 of Appendix D? What is the date of the map?	<i>The map referred to is Figure 2-5 of Appendix D. Information contained on the map was as of 2000. A clear reference to the map has been added to the text and the date of the information has been added to the figure.</i>
2-7	2	Did the visual inspection of the Grand Canal confirm the condition of Canal lining depicted in Figure 2-5 of Appendix D?	<i>The visual survey confirmed the condition of the Canal lining from 19<sup>th</sup> Avenue to 27<sup>th</sup> Avenue. It appeared that both banks and the bottom were lined from 27<sup>th</sup> Avenue to 39<sup>th</sup> Avenue. Information from SRP (from which the map was derived) indicates the stretch from 27<sup>th</sup> Avenue to 39<sup>th</sup> Avenue is intermittently lined on the bottom and both banks and lined on the bottom and one bank.</i>
2-8 & 2-10	5	It is unclear how the conclusion was drawn that both SRP wells, 10.5E-7.5N and 11.2E-7.7N, influence groundwater flow and gradient in the EGA. 10.5E-7.5N does appear to influence the flow to a more westerly direction. The influence of 11.2E-7.7N is described as "less clear". Is there any evidence that 11.2E7.7N has an influence on the direction of groundwater flow? If so, what is the influence and what are the data?	<i>The text "...are influenced by the operation of the SRP irrigation wells" has been changed to "...are influenced by the operation of SRP well 10.5E-7.5N". The report states on page 2-10 that the "... impact of pumping in 11.2E-7.7N on groundwater and the contaminant plume is less clear than the impact of 10.5E-7.5N". Although direct evidence has not been found confirming 11.2E-7.7N's impact on groundwater, its impact can not be discounted. The only definitive way to confirm 11.2E-7.7N's influence on groundwater in the EGA is to pump the well and examine its effects on groundwater levels in EGA monitor wells.</i>
2-11 & 2-12	All	These sections describe the step drawdown test and aquifer and recovery test conducted by Weston. Univar recognizes that Weston was constrained to use existing monitoring wells and that the limited pumping rates and well construction were not optimal for conducting an appropriate aquifer test. However, the calculated values for hydraulic conductivity (189-258 ft/day) and the average linear velocity of	<i>ADEQ believes that the calculated hydraulic conductivity values are within typical ranges for lithology at the EGA. According to Domenico &amp; Schwartz (1990), typical ranges of hydraulic conductivity for coarse sands can be as high as 1700 ft/day. Up to 85% of the materials found between 128 ft and 146 ft bgs in borings WCP-42 and WCP-83 are coarse-grained sand and gravel. Although lithologic</i>

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		groundwater (2.4 to 8.6 ft/day) appear to be larger than expected for the lithologies present at the Site. The observed drawdown response may have been due to initial elastic storage effects and delayed yield effects. Univar recommends that the aquifer and recovery test data be further evaluated considering delayed drainage and leaky aquifer models and the possibility of effects for partial penetration.	<p><i>logs indicate the presence of sandy clay (CL) throughout the screened portion of the test well (WCP-29), evidence from the aquifer test (34.7 gpm, 2.95 ft total drawdown) indicates otherwise.</i></p> <p><i>The chosen aquifer analytical methods: Theis Unconfined, Theis Recovery, and the Cooper &amp; Jacob Approximation techniques, are consistent with the hydrogeological description of the site and the stated assumptions given for each. The observed drawdown response in the test well (WCP-29) and each of the observation wells is typical of unconfined aquifers. Aquifer test data does not provide evidence of delayed yield effect or elastic storage effects.</i></p>
2-14	1	According to page 2-8 of the RI, hydraulic gradients at the EGA Site range between 0.025 to 0.0020 ft/ft. What was the basis for selection of the gradients used to calculate the average linear velocity of groundwater? In particular, why wasn't the lower range of hydraulic gradients included in the velocity calculations?	<p><i>Page 2-8 refers to hydraulic gradients obtained from January 2002 data. Average linear velocity calculations presented in Section 2.7.3.3 were based on data collected during the Aquifer Test in May 2001. The hydraulic gradients listed on page 2-14 were used to calculate the average linear velocity of groundwater at the EGA. The high and low ranges of hydraulic conductivity, effective porosity, and hydraulic gradient were used to obtain the average linear groundwater velocity of 2.4 to 8.6 ft/day.</i></p>
2-14	2	<p>During the Remedial Investigation, groundwater was not analyzed for inorganic water quality parameters at the Site. Instead, the results of previous regional studies were referenced and used as the basis to draw conclusions about the general groundwater quality at the Site. No Site-specific data were provided.</p> <p>In March 2003, during the first quarter of water quality monitoring performed by Univar, Site-specific groundwater samples were analyzed for inorganic compounds. The results of these analyses are included in the December 2004 Semiannual Groundwater Monitoring Report, First and Second Quarters 2003, prepared by G.M. Clement &amp; Associates, Inc. for Univar. Nitrate concentrations were found to be above or near the primary MCL in groundwater samples collected from Site monitoring wells, including WCP-46, WCP-40 and WCP-100. The 2003 groundwater sampling results do not support the conclusion that the water is acceptable for domestic purposes.</p>	<p><i>Regional water quality for the western portion of the SRV is discussed in this paragraph to describe general water quality issues in the area. Site specific conclusions were not drawn because site specific data had not been collected at the time of document preparation. In addition, the cutoff date for data to be presented in the Draft RI Report was January 2002.</i></p> <p><i>The text states, "Generally, groundwater within the western portion of the SRV is acceptable for domestic...uses. However, concentrations of ...nitrate...exceed drinking water standards at certain locations within the SRV."</i></p>
2-15	5	PCE was detected at a concentration of 220 micrograms per kilogram at the UPS site in a soil sample collected between 9 and 11 feet below ground surface. Clearly, this high concentration of PCE detected in shallow soils did not originate from off-gassing of VOCs present at low concentrations in the groundwater. This concentration is not insignificant and represents a potential source of PCE to groundwater. Was the source of PCE found in soils at the UPS site identified? Was the full extent of degree	<p><i>The LUST file case numbers for the UPS facility were closed July 1998. Based on the closure letter, the vertical extent of laboratory detectable soil contamination was defined to less than 60 feet bgs and the lateral extent was defined to a radius of approximately 15 feet around the release locations. PCE was detected in only one boring out of five advanced during the 1996 Site Characterization for the UPS facility. The location of PCE was near the used/new oil USTs. The concentration of PCE in the</i></p>

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		of PCE contamination at the UPS site defined?	<p><i>soil was below regulatory standards in effect at that time and currently in effect regulatory standards (e.g., GPL of 1,300 µg/kg and the residential SRL of 53,000 µg/kg).</i></p> <p><i>Note: The releases at the Southwest Roofing facility (LUST #_2593.01) impacted groundwater, while the releases at the UPS facility (LUST #1034. 01, .02, .03) did not.</i></p>
2-19	2	According to ADEQ's CERCLA Site Investigation, a release of VOCs and metals occurred at the Mogul facility. Groundwater data confirm that Mogul monitoring wells contained VOCs, particularly TCE, benzene and 1,2-DCA at concentrations above their respective MCLs. What is the current status of the investigation at the former Mogul facility? Is ADEQ pursuing Mogul as source of groundwater contamination in the EGA site?	<p><i>At the time the Draft RI Report was issued, the TCE concentrations detected beneath the Mogul facility ranged from 4 to 9 µg/L (Section 7.6.2.1). Recent groundwater quality data (September 2005) obtained from well WCP-92, which is downgradient of the Mogul facility, did not detect TCE or any other VOC's above method detection limits.</i></p> <p><i>The Mogul facility is not considered part of the WCP EGA site. ADEQ may conduct additional investigative work in the future under the appropriate environmental program.</i></p>
7-2 & 7-3	All	The section discusses contaminants that are not Contaminants of Concern (COCs) at the EGA Site. Univar requests that ADEQ clarify that the source of BTEX and 1,2-DCA contamination did not originate from the former VW&R facility.	<p><i>The text does not imply VW&amp;R is the source of BTEX and 1,2-DCA; however, the text has been clarified to read:</i></p> <p><i>Page 7-2, Paragraph 3: "BTEX constituents were typically detected in wells located on or near documented LUST sites <b>downgradient from the VW&amp;R facility</b> and were generally highest in ENT-MW-2, WCP-44, and WCP-202. Concentrations of these compounds in monitor wells located on the VW&amp;R facility were either below the MDL... <b>indicating that the VW&amp;R facility is not the source of BTEX constituents in groundwater.</b>"</i></p> <p><i>Page 7-3, Paragraph 2: "...The exceedances of the AWQS/MCL observed in the Mogul wells appear to be localized in that area <b>and unrelated to the main contaminant plume</b>, therefore, 1,2-DCA is not <b>considered to be a</b> contaminant of concern.</i></p>
7-3	3	The paragraph refers to both 1,2-DCA and 1,1-DCA. Should all references be to 1,2-DCA?	<i>The paragraph is discussing only 1,2-DCA. The text has been corrected so that only 1,2-DCA is mentioned.</i>
7-7	2	Univar suggests rephrasing the last sentence of the paragraph for clarity.	<i>The sentence has been rephrased to... "The unsaturated zone directly above the water table (i.e., approximately 116 feet bgs to 126 feet bgs) is also located at a lithologic transition from coarse to fine-grained materials.</i>
7-8	4	The concentrations of contaminants found in groundwater at the Site also appear to have been influenced by the sampling methods.	<i>Concentrations of groundwater contaminants were likely influenced by decreases in groundwater elevation and sampling methods.</i>
7-11 7-12	5 1	The RI notes that PCE and TCE concentrations in samples from WCP-28 during Rounds 2 and 4 appear to be anomalously high and that local minor variations in groundwater flow may have contributed to the anomalous readings. There was apparently no pumping of the two SRP wells immediately before or	<i>Although there is no data to indicate groundwater variations, that was one potential theory for the increased concentrations of PCE and TCE during Rounds 2 and 4. Data collected subsequent to Rounds 2 and 4 do not indicate concentrations of PCE and TCE in WCP-28 are influenced from an upgradient source. The</i>

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		during the sampling; and there is no evidence that local groundwater variations in flow occurred at the time of sampling. Other potential sources that may have contributed to contamination found in WCP-28, WCP-93 and up gradient of the VW&R facility have not been fully evaluated.	<i>reason for the anomalously high concentrations in WCP-28 remains unexplained.</i>  <i>Please see response to "Figures 1.1, 2.1, etc." on Pages 1 and 2 above regarding upgradient sources.</i>
7-14	All	Only 2 data sets that were collected at different times are used to compare purging methods and to draw conclusions.	<i>Although only two data sets were used to compare purging methods and draw conclusions, the data is consistent with published industry comparisons of low-flow purge versus traditional three-casing volume purge methods.</i>
7-14 Thru 7-16	All	PDB sampling results appear to have provided useful data, but some cross contamination was identified that included acetone.	<i>Acetone, which is a common laboratory contaminant, may be introduced to the PDB sampler in water used during the sampler's construction. Because acetone does not easily move through the PDB sampler, it may persist in the sampler, resulting in a false positive after sampler recovery and analysis. ADEQ does not believe that the positive concentrations of acetone in the PDB sample results affect the overall quality of the data.</i>
7-15	3	Univar agrees that the traditional purge and sample methods may be more appropriate to obtain average aquifer water quality concentrations.	<i>No response necessary.</i>
7-16	4	Contaminant concentrations increase with depth at WCP-87 and WCP-93. The PDB results at WCP-93 indicate that some source(s) of contamination to WCP-93 may not be located in the immediate vicinity of WCP-93, and may include other sources upgradient of the VW&R facility.	<i>Based on analysis of all groundwater data collected during the RI at WCP-93 and surrounding wells, the source of contaminants in that well appear to be the VW&amp;R facility.</i>  <i>Please see response to "Figures 1.1, 2.1, etc." on Pages 1 and 2 above regarding upgradient sources.</i>
7-16 7-17	5 1 & 2	To what standard is the vertical extent of contamination being defined, the applicable MCLs or MDLs? Only very low concentrations of 1,1-DCE have been found in samples collected from WCP-48 and VOCs in Hydropunch samples collected at 182 feet in SB-17 were not detected above the applicable MDLs. The data indicate that the vertical extent of groundwater contamination appears to be within the range of 153 feet to 182 feet bgs.	<i>Hydropunch® samples collected from SB-16 and SB-17, in 1999, indicated that contaminants present at 141 feet bgs were below the AWQS/MCL. In 2001, Hydropunch samples collected from WCP-87 and WCP-200 indicated VOC contaminants significantly greater than the AWQS/MCLs for 1,1-DCE, TCE, and PCE at 152 feet bgs and 153 feet bgs, respectively. The comparison of 1999 Hydropunch samples and 2001 Hydropunch samples indicate that contaminants may have migrated vertically in the two years between sampling. Although 1999 Hydropunch results for SB-17 at 182 feet bgs were not above the MDLs, based on the indications of vertical migration, these results may not be indicative of the current vertical extent of contamination particularly in downgradient wells such as WCP-200 and WCP-87. Other than WCP-48 groundwater data, there are no groundwater data deeper than 153 ft bgs in this area. Therefore, the vertical extent of contamination (i.e., where COCs are less than or meet the applicable AWQS/MCL) is within the range of 153 feet bgs and 235 feet bgs.</i>
7-18 & 7-19	Section 7.6.2	Univar requests that the section title or text be clarified to note that the additional sources are not related to VW&R. There is no discussion in this or other sections regarding what ADEQ is doing or intends to do regarding the other sources.	<i>The first sentence of Section 7.6.2 has been changed to read "An additional potential TCE source upgradient <b>and separate</b> from the VW&amp;R facility..."</i>  <i>Throughout the document, the source of contamination in WCP-94 is described as unclear. The data collected</i>

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		Univar believes that the TCE contamination found at WCP-94 originates from an additional, undefined source in relatively near proximity to the well. COC concentrations in groundwater samples collected from monitoring wells located between WCP-94 and WCP-88 (the MWB wells, WCP-96 and WCP-89) have been appreciably below their applicable MCLs. In addition, the water quality pattern of the PDB samples collected in WCP-94 indicates that the source of TCE contamination to WCP-94 is nearby.	<p><i>up to January 2002 and presented in the RI does not definitively indicate that concentrations of TCE in WCP-94 are attributable to an unknown nearby source or that they are attributable to the main contaminant plume. Although concentrations of TCE in some of the MWB wells located upgradient from WCP-94 may be below the MCL, these wells are screened approximately 15 -20 feet shallower than WCP-94. Because of the construction differences between the MWB wells and WCP-94, TCE concentrations in MWB wells cannot solely be used to discount the potential that WCP-94 may be attributable to the main contaminant plume. Additionally, based on groundwater contaminant transport calculations provided in Section 7.8.3, WCP-94 is well within the 16,000-foot estimated downgradient migration distance calculated for TCE. As indicated in the text, the contaminant plume shape and size at the EGA Site has been affected by many factors including pumping of the SRP well, petroleum hydrocarbon contamination at the UPS/Southwest Roofing and Fedmart sites and associated SVE systems operation, and changes in groundwater flow and gradient due to lining of the Grand Canal. Vertical and horizontal heterogeneities in the aquifer material may also alter the transport route of any given contaminant plume.</i></p> <p><i>Please see response to "Figures 1.1, 2.1, etc." on Pages 1 and 2 above regarding upgradient sources.</i></p> <p><i>Note: ADEQ sampled WCP-94 in September 2005. TCE was not detected above laboratory reporting limits in that well.</i></p>
7-18	2	Water quality data for WCP-41 and WCP-83 are sufficient to support stating that there is an upgradient source of contamination. The upgradient extent of TCE contamination has not been defined.	<p><i>Based on the proximity of WCP-41 to the center of the TCE plume, the data does not definitively suggest that TCE in WCP-41 is not attributable to the VW&amp;R facility.</i></p> <p><i>Please see response to "Figures 1.1, 2.1, etc." on Pages 1 and 2 above regarding upgradient sources.</i></p>
7-19 & 7-20	Section 7.7	Inorganic and Natural Attenuation Parameters were analyzed for samples collected by Univar in March 2003. The results of these analyses are included in the December 2003 Semiannual Groundwater Monitoring Report, First and Second Quarters 2003, prepared by G.M. Clement & Associates, Inc. for Univar.	<p><i>The cutoff date for data to be presented in the Draft RI Report was January 2002.</i></p> <p><i>All monitoring reports submitted by G.M. Clement &amp; Associates are available in the public file and the information therein will be taken into consideration in future activities for the EGA site.</i></p>
7-24	1	Based on the Site water quality data, TCE concentrations found in WCP-94 do not appear to be associated with the upgradient plume and most likely originate from an additional, undefined source. Depiction of one plume downgradient of the VW&R facility, which includes WCP-94, does not appear to be supported by the actual water quality data.	<p><i>TCE contamination detected in WCP-94 is not included in any of the groundwater plume maps presented in the RI (Figures 7-38 through 7-40). WCP-94 is included in the <b>boundary</b> delineated for the WCP EGA WQARF Site. The WQARF Site boundary is not indicative of a single contaminant plume but encompasses the entire area of affected groundwater.</i></p>

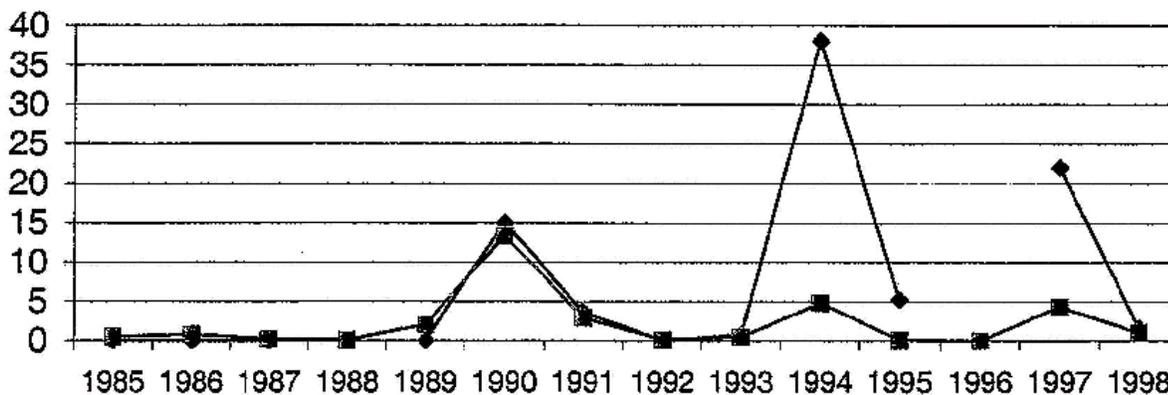
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			<i>Please see response to "Page 7-18 &amp; 7-19-Section 7.6.2" on Pages 5 and 6 above regarding WCP-94 and upgradient sources.</i>
7-27	2	There is a very significant difference between the actual and estimated downgradient extent of contamination. Contaminant degradation may also be occurring in the areas where UST releases have caused the addition of hydrocarbon sources to the groundwater to support localized in situ biodegradation. The results of the March 2003 sampling indicate that limited in situ biodegradation is occurring at the Site.	<i>The RI states that in situ biodegradation may be occurring.</i>
8-1	1 <sup>st</sup> bullet & new 2 <sup>nd</sup> bullet under groundwater	Univar requests that ADEQ consider rephrasing 1 <sup>st</sup> bullet: "One of the primary sources of groundwater contamination in the WCP East Grand Avenue..." Univar requests that ADEQ consider adding a 2 <sup>nd</sup> bullet to replace the 4 <sup>th</sup> bullet: "Additional sources of VOCs have been identified in groundwater at the Site, including an unidentified, upgradient TCE source, an unidentified down gradient TCE source near WCP-94, a down gradient VOC source at the former Mogul facility, and multiple down and cross gradient sources of benzene and other petroleum products."	<i>ADEQ believes no changes are necessary in this section.</i>  <i>Please see responses to "Figures 1.1, 2.1, etc." on Pages 1 and 2 of this letter, "Page 2-19" on page 4 of this letter, as well as "Page 7-18 &amp; 7-19-Section 7.6.2" on Pages 5 and 6 of this letter regarding upgradient sources.</i>
8-1	2 <sup>nd</sup> bullet	The lateral extent of TCE contamination has not been defined in the upgradient direction at WCP-83. The upgradient source of TCE contamination is not related to the former VW&R facility.	<i>Please see response to "Figures 1.1, 2.1, etc." on Pages 1 and 2 of this letter regarding upgradient sources.</i>
8-2	1 <sup>st</sup> bullet	Only very low concentrations of 1,1-DCE have been found in samples collected from WCP-48; and VOCs in Hydropunch samples collected at 182 feet in SB-17 were not detected above the applicable MDLs. The data indicate that the vertical extent of groundwater contamination appears to be within the range of 153 feet to 182 feet bgs.	<i>Hydropunch® samples collected from SB-16 and SB-17, in 1999, indicated that contaminants present at 141 feet bgs were below the AWQS. In 2001, Hydropunch samples collected from WCP-87 and WCP-200 indicated VOC contaminants significantly greater than the AWQSs for 1,1-DCE, TCE, and PCE at 152 feet bgs and 153 feet bgs, respectively. The comparison of 1999 Hydropunch samples and 2001 Hydropunch samples indicate that contaminants may have migrated vertically in the two years between sampling. Although 1999 Hydropunch results for SB-17 at 182 feet bgs were not above the MDLs, based on the indications of vertical migration, these results may not be indicative of the current vertical extent of contamination particularly in downgradient wells such as WCP-200 and WCP-87. Other than WCP-48 groundwater data, there are groundwater data deeper than 153 ft bgs in this area. Therefore, the vertical extent of contamination (i.e., where COCs are less than or meet the applicable AWQS) is within the range of 153 feet bgs and 235 feet bgs.</i>

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1-2	3	The VW&R facility has been named as the primary source of VOCs, but other sources of VOCs are present both up and down gradient of the former VW&R facility. Additional sources of VOCs have been identified in groundwater at the Site, including down gradient TCE source near WCP-94, a down gradient VOC source at the former Mogul facility, and multiple down and cross gradient sources of benzene and other petroleum products.	<i>Please see responses to “Figures 1.1, 2.1, etc.” on Pages 1 and 2 of this letter, “Page 2-19” on page 4 of this letter, as well as “Page 7-18 &amp; 7-19-Section 7.6.2” on Pages 5 and 6 of this letter regarding upgradient sources.</i>
1-3	1 & 2	<p>During the Remedial Investigation, groundwater was not analyzed for inorganic water quality parameters at the Site. Instead, the results of previous regional studies were referenced and used as the basis to draw conclusions about the general groundwater quality at the Site. No Site-specific data were provided.</p> <p>In March 2003, during the first quarter of water quality monitoring performed by Univar, Site-specific groundwater samples were analyzed for inorganic compounds. The results of these analyses are included in the December 2004 Semiannual Groundwater Monitoring Report, First and Second Quarters 2003, prepared by G.M. Clement &amp; Associates, Inc. for Univar. Nitrate concentrations were found to be above or near the primary MCL in groundwater samples collected from Site monitoring wells, including WCP-46, WCP-40 and WCP-100. The 2003 groundwater sampling results do not support the conclusion that nitrates are within “regulatory guidelines”.</p>	<p><i>The cutoff date for data to be presented in the Draft RI Report was January 2002.</i></p> <p><i>Regional water quality for the western portion of the SRV is discussed in this paragraph to describe general water quality issues in the area. Site specific conclusions were not drawn because site specific data had not been collected at the time of document preparation.</i></p> <p><i>The text states, “Generally, groundwater within the western portion of the SRV is acceptable for domestic...uses. However, concentrations of ...nitrate...exceed drinking water standards at certain locations within the SRV.”</i></p>
1-3	3	As evidenced by the groundwater quality data and the descriptions of the UST releases within the EGA Site in Chapter 2 of the RI report, the listed UST releases have documented impacts to Site groundwater quality.	<i>Text has been amended to read “...<b>have impacted</b> groundwater quality...”</i>
2-5	2	Nitrate concentrations were found to be above or near the primary MCL in groundwater samples collected from some Site monitoring wells during the March 2003 sampling. Nitrate contamination would have to be considered during evaluation of well field expansion.	<p><i>The cutoff date for data to be presented in the Draft RI Report was January 2002.</i></p> <p><i>At the time the decision is made to expand the well field for the EGA site, ADEQ will evaluate all the necessary factors which would contribute to, or impact the attenuation or investigation of the plume.</i></p>
2-5 2-6	5 1	SRP wells 10.5E-7.5N and 11.2E-7.7N are described as affected by TCE contamination. No well-specific water quality data were presented to support this conclusion. How do the TCE concentrations relate to MCLs and irrigation standards? Without well-specific data it is impossible to determine if the information provided is supported by the actual data.	<i>Data supplied by SRP (SRP, 2001) indicate TCE in SRP Well 10.5E-7.5N was detected at concentrations of &lt;0.5µg/L to approximately 4 µg/L in years 1982 through 1999. Concentrations of TCE in Well 11.2E-7.5N during the same period ranged from &lt;0.5 µg/L to 40 µg/L. These concentrations do not exceed AWQS for irrigation uses (1,300 µg/L) but some sample results did exceed the AWQS/MCL of 5 µg/L.</i>
2-6	2	TCE concentrations are reported to increase in 11.2E-7.7N during years of higher pumpage. No well-specific water quality data were presented to support this statement. The source of contamination to the SRP well was not identified. Based on review of reported data, the EGA plume does not appear to have affected this upgradient SRP well to the west.	<i>An SRP provided chart with supporting data can be found on the next page. The source(s) of TCE contamination in 11.2E-7.7N can not be definitively determined based on current known data.</i>

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2-6 2-7	3 1	What are the water quality criteria that water sources discharging to the SRP Grand Canal must meet? How do these criteria compare to the water quality found at SRP wells, 10.5E-7.5N and 11.2E-7.7N?	Discharges to the SRP Canal must be permitted through the Arizona Pollutant Discharge Elimination System (AZPDES) Program and approved by SRP. Water quality criteria vary depending on type of discharge received.

Comparison of SRP Well Annual Pumpage and Observed TCE Concentrations

Well 11.2E7.7N



Source: Salt River Project, 2001. Letter to Ms. Ana Vargas, Arizona Department of Environmental Quality, entitled "SRP Wells and Water Demand in the West Central Phoenix WQARF Area". Dated June 26, 2001.

Well ID	Date Sampled	Top of Casing (ft)	Depth to Groundwater (ft)	Groundwater Elevation (ft amsl)	Target Analytes by EPA Method 8260B (ug/L)						
					PCE	TCE	1,1-DCE	cis-1,2-DCE	1,2-DCA	Benzene	Other Detected Analytes
<b>ADEQ Aquifer Water Quality Standard</b>					<b>5</b>	<b>5</b>	<b>7</b>	<b>70</b>	<b>5</b>	<b>5</b>	
WCP-92	09/16/05	1098.45	131.61	966.84	ND	ND	ND	ND	ND	ND	
WCP-94	09/16/05	1101.36	135.12	966.24	ND	ND	ND	ND	ND	ND	Eromodichloromethane = 2.4 ug/L Chloroform = 15 ug/L
WCP-202	09/16/05	1100.81	133.28	967.53	ND	ND	ND	ND	<b>87</b>	<b>24</b>	Isopropylbenzene = 7.0 ug/L
WCP-204	09/16/05	1097.31	131.38	965.93	ND	ND	ND	ND	ND	ND	
EB	09/16/05	-	-	-	ND	ND	ND	ND	ND	ND	2-Hexanone = 62 ug/L 2-Butanone (MIBK) = 170 ug/L Acetone = 190 ug/L
TB	09/16/05	-	-	-	ND	ND	ND	ND	ND	ND	

Notes:

VOCs = Volatile organic compounds      ug/L = micrograms per liter      ft amsl = feet above mean sea level  
 1,1-DCA = 1,1-dichloroethane      TCE = Trichloroethene      cis-1,2-DCE = cis-1,2-dichloroethene  
 1,1-DCE = 1,1-dichloroethene      PCE = Tetrachloroethene  
 EB = Equipment Blank      TB = Trip Blank  
 Bold results indicate value greater than or equal to the ADEQ Aquifer Water Quality Standard.



# **Remedial Objectives Report**

## **West Central Phoenix East Grand Avenue Site Phoenix, Arizona**

**June 2006**

**Prepared by**  
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### APPENDIX A PROPOSED RO REPORT COMMENTS

#### ACRONYMS

A.A.C.	Arizona Administrative Code
A.R.S.	Arizona Revised Statutes
ADEQ	Arizona Department of Environmental Quality
1,1-DCE	1,1-dichloroethylene
EGA	East Grand Avenue
FS	feasibility study
GPL	groundwater protection level
PCE	tetrachloroethylene, tetrachloroethene, Perc
RI	remedial investigation
RO	remedial objective
SRL	soil remediation level
SRP	Salt River Project
SVE	soil vapor extraction
TCE	trichloroethylene, trichloroethene
VW&R	Van Waters & Rogers
WCP	West Central Phoenix
Weston	Weston Solutions, Inc.
WQARF	Water Quality Assurance Revolving Fund

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## 1.0 INTRODUCTION

The Arizona Department of Environmental Quality (ADEQ) has prepared this Proposed Remedial Objectives (RO) report for the West Central Phoenix (WCP) East Grand Avenue (EGA) Water Quality Assurance Revolving Fund (WQARF) Registry site to meet the requirements established under Arizona Administrative Code (A.A.C.) R18-16-406. This report relies upon the Land and Water Use Report (Use Report) prepared by Weston Solutions, Inc. (Weston) for the site dated March 2004 and the comments received on the Proposed RO report dated December 2005.

Remedial Objectives (ROs) are established for the current and reasonably foreseeable uses of land and waters of the state that have been or are threatened to be affected by a release of a hazardous substance. The rule specifies that the reasonably foreseeable uses of land are those likely to occur at the site, and the reasonably foreseeable uses of water are those likely to occur within one hundred years unless site-specific information suggests a longer time period is more appropriate [R18-16-406(D)]. Reasonably foreseeable uses are those likely to occur, based on information provided by water providers, well owners, land owners, government agencies, and others. Not every use identified in the Use Report will have a corresponding RO. Uses identified in the Use Report may or may not be addressed based on information gathered during the public involvement process, limitations of WQARF, and whether the use is reasonably foreseeable.

The ROs chosen for the site will be evaluated in the feasibility study (FS). The FS will evaluate specific remedial measures and strategies required to meet the ROs and propose a reference remedy and at least two alternative remedies, all capable of meeting the ROs. The proposed remedies will also be generally compatible with the future land use specified by the land owner. Because the future land and water uses at the site are generally not specific, the mechanism to achieve the ROs may be an insurance policy or environmental protection fund that could be drawn on in the future. Possible mechanisms to achieve the ROs will be evaluated in the FS and presented in the FS report.

### Definitions

**Remedial Strategy:** One or a combination of the six general strategies identified in Paragraph B.4 of A.R.S. §49-282.06 and further defined in rules promulgated in accordance with this statute. In general, these strategies are as follows: *plume remediation, physical containment, controlled migration, source control, monitoring, and no action.*

**Remedial Measure:** A specific action taken in conjunction with remedial strategies as part of the remedy to achieve one or more of the remedial objectives. For example, remedial measures may include well replacement, well modification, water treatment, provision of replacement water supplies, and engineering controls.

**Reference Remedy:** A combination of remedial strategies and remedial measures which, as a whole, is capable of achieving remedial objectives. The reference remedy is compared with the alternative remedies for purposes of selecting a proposed remedy at the conclusion of the feasibility study.

**Alternative Remedy:** A combination of remedial strategies and remedial measures different from the reference remedy that is capable of achieving remedial objectives. The alternative remedies are compared with the reference remedy for purposes of selecting a proposed remedy at the conclusion of the feasibility study.

This report has been prepared with stakeholder input gathered during the August 31, 2004 WCP community advisory board meeting and public meeting, as well as written comments received on the Proposed RO report 30-day public comment period. This final report includes a responsiveness summary to written comments received from the public during the comment period. Upon completion of the final RO Report, the final remedial investigation (RI) report will be available to the public.

The ROs must be stated in the following terms: 1) protecting against the loss or impairment of each use; 2) restoring, replacing, or otherwise providing for each use; 3) when action is needed to protect against or provide for the use; and 4) how long action is needed to protect or provide for the use.

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## **2.0 REMEDIAL OBJECTIVES FOR LAND USE**

The zoning pattern in the area has been long established and there are no foreseeable changes for the future. Land uses for the properties and within the WCP EGA site area are expected to remain predominantly industrial (A-2) or light industrial (A-1).

Century Wheel and Rim, a distributor of undercarriage and transportation parts, currently occupies the former Van Waters & Rogers (V&R) facility and has stated that there are no foreseeable changes to the use of the property.

Soil sampling analytical results at the VW&R facility confirmed the presence of PCE, TCE, and 1,1-DCE beneath the facility; however detectable concentrations of the contaminants of concern in soil did not exceed their respective Arizona Soil Remediation Levels (SRLs) or minimum Groundwater Protection Levels (GPLs).

Based on the above information, no remedial objectives are needed for this use.

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### 3.0 REMEDIAL OBJECTIVES FOR GROUNDWATER USE

Six current and/or potential groundwater uses were identified within the WCP EGA site: 1) the current and future use of groundwater in the WCP EGA site for drinking water purposes by the Michigan Trailer Park; 2) the current and future use of groundwater in the WCP EGA site for drinking water purposes by Danone Waters of America; and 3) the current and future use of SRP irrigation wells.

The chemicals of concern in the groundwater at the WCP EGA site are tetrachloroethylene (PCE), trichloroethylene (TCE) and 1,1-dichloroethylene (1,1-DCE) (See Figures 1, 2 and 3). The concentrations in groundwater of the three primary contaminants of concern have exceeded the Arizona Aquifer Water Quality Standards (AWQSs) in several locations. Maximum concentrations of PCE, TCE, and 1,1-DCE detected in groundwater samples collected from around the WCP EGA site during the September 2004 sampling activities are 190 µg/L (WCP-200), 260 µg/L (WCP-201), and 68 µg/L (WCP-200), respectively. Historical concentrations (March and April 1997) of PCE and TCE detected in samples from monitor well WCP-16 located on the VW&R facility have been as high as 1,800 µg/L and 2,700 µg/L, respectively. VOC concentrations in groundwater have declined at the former VW&R facility since 2003. The aerial extent of the VOC plume contaminants were likely influenced by decreases in groundwater elevation and the continued operation of VW&R's source area treatment system. Note that decreases in groundwater elevation most likely enhanced the localized recovery of VOCs via VW&R's soil vapor extraction system.

#### **Michigan Trailer Park**

The Michigan Trailer Park (MTP), located west of the VW&R facility at 3135 Grand Avenue, is a 150-pad mobile home and RV park with a current average year-round occupancy of 90 pads. The sole water supply source for the park is from a 400-foot well (MTP-1) located on the MTP property. The well, which is cross gradient to the WCP EGA site and close to SRP Well 10.5E-7.5N, has an approximate pumping capacity of 85 to 100 gallons per minute and serves approximately 135 to 180 residents.

VOC analyses have also been conducted on samples collected from MTP-1. In the past, PCE and TCE have been detected below the AWQS of 5 µg/L established for each compound. PCE has been detected at a concentration of 0.8 µg/L and TCE has been detected at concentrations ranging from 0.3 µg/L to 0.6 µg/L. In September 2005, PCE and TCE were not detected above method reporting limits.

The RO for the MTP current and future drinking water use of the well is:

**To protect, replace, or otherwise provide alternative water supply should use of the MTP drinking water well be lost in the future due to changes in groundwater flow direction that would contaminate the well with PCE, TCE and/or 1,1-DCE contamination emanating from the WCP EGA site.**

#### **Danone Waters of North America**

Danone Waters of North America, formerly owned by McKesson Water Inc., operates a water processing, bottling, and distribution plant approximately one-half mile southwest (down gradient) of the WCP EGA site boundary. The business has been at their present location since 1974 and expanded their facility a couple of years ago. Danone operates a 952-foot well located on the property, which has a pumping capacity of 225 gallons per minute. Danone samples the well regularly and results have not shown detectable concentrations of VOCs. Prior to bottling, groundwater undergoes several treatment steps including reverse osmosis. The company has discussed the feasibility of installing an additional well on-site for back up purposes although no decisions have been made at this time.

The RO for the Danone Waters current and future drinking water use of the well is:

**To protect, replace, or otherwise provide alternative water supply should use of the Danone Waters drinking water well be lost in the future due to contamination of the deeper aquifer by the PCE, TCE and/or 1,1-DCE contamination emanating from WCP EGA site.**

---

### **SRP Municipal and Irrigation Use**

SRP owns several irrigation wells in the area and will continue to need operational wells to supplement surface water supplies. SRP wells 10.5E-5.7N and 11.2E-7.7N are located crossgradient and upgradient, respectively, from the contamination in the WCP EGA site.

Depth-to-groundwater data collected in April 1999 indicated that groundwater flow and gradient are influenced by the operation of the SRP irrigation wells. Groundwater flow directions during the April 1999 monitoring event, when SRP was pumping from 10.5E-7.5N, were toward the west-northwest beneath the WCP EGA Site. Groundwater elevation data for the remaining monthly monitoring events indicate that groundwater generally flows toward the west-southwest beneath the WCP EGA Site.

The RO for the SRP current and future municipal and irrigation use of the wells is:

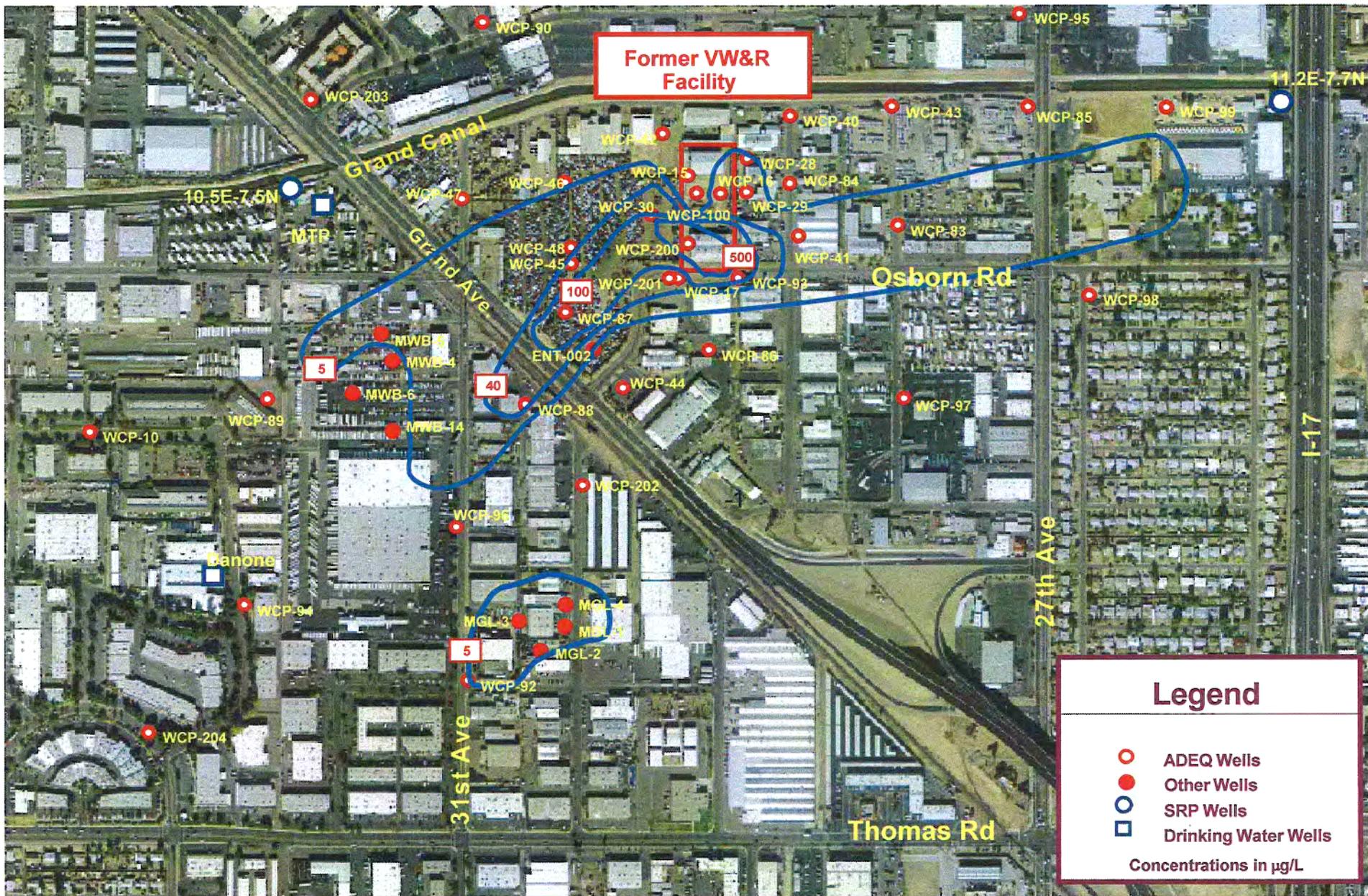
**To protect, replace, or otherwise provide alternative water supply should use of the SRP wells be lost in the future due to contamination of the wells with PCE, TCE and/or 1,1-DCE contamination emanating from the WCP EGA site.**

## **FIGURES**



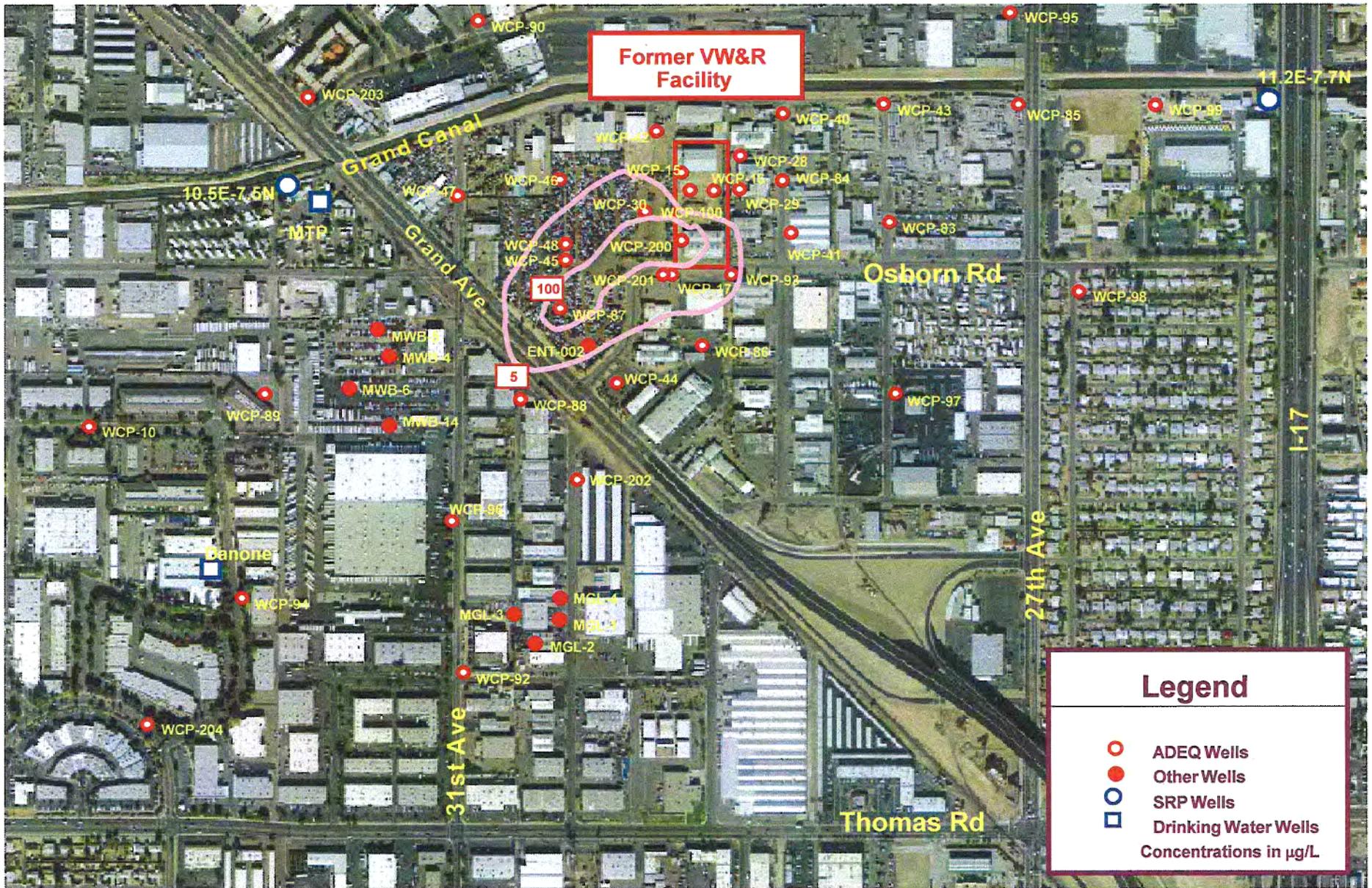
**ADEQ**  
Arizona Department of Environmental Quality

Figure 1  
WCP EGA PCE Concentrations - January 2002



**ADEQ**  
Arizona Department of Environmental Quality

Figure 2  
WCP EGA TCE Concentrations - January 2002



**ADEQ**  
Arizona Department  
of Environmental Quality

Figure 3  
WCP EGA 1,1-DCE Concentrations - January 2002

**APPENDIX A**

**PROPOSED RO REPORT COMMENTS**

Univar USA Inc.  
 1804 N. 20<sup>th</sup> Street  
 Nampa, ID 83687  
 T 208 888 1094  
 F 208 884 1602  
 www.univarusa.com

C.T.S. 123137  
1-33968



February 6, 2006

Ms. Ana Vargas, Project Manager  
 Arizona Department of Environmental Quality  
 1110 W. Washington Street  
 4415B-1  
 Phoenix, AZ 85007

Re: Univar's Comments  
 Proposed Remedial Objectives Report  
 West Central Phoenix East Grand Avenue WQARF Site  
 Phoenix, Arizona

Dear Ms. Vargas:

Univar USA Inc. has prepared this letter to present comments pertaining to the Proposed Remedial Objectives Report for the West Central Phoenix East Grand Avenue WQARF site. Our comments are as follows:

Page #	Paragraph #	Comment
4	1	The Proposed RO report notes there are six current and/or potential groundwater uses, but the Proposed RO report does not clearly list or explain the six uses.
4	2	The wells that are associated with the highest PCE and TCE concentrations are not identified.
4	2	The dates of sampling when the highest PCE and TCE concentrations were found are not identified.
4	2	To provide current factual information regarding groundwater quality concentration trends, Univar suggests that a conclusion sentence be added noting that VOC concentrations in groundwater have declined at the former VW&R facility since 2003; and the aerial extent of the VOC plume has stabilized.
5	2	In addition to a source of VOCs at the former VW&R facility, there is an upgradient source of TCE as identified in Figure 2. The identity of the Responsible Party for this upgradient source of TCE is not known. What is ADEQ's process to determine responsibility if: <ul style="list-style-type: none"> <li>• The MTP drinking water well is lost in the future?</li> </ul>
5	5	

6	2	<ul style="list-style-type: none"> <li>• The Damone Waters drinking water well is lost in the future?</li> <li>• The SRP groundwater supply is threatened?</li> </ul>
5	2	The word "contaminated" appears to be incorrect as used in this paragraph and should be replaced with the word "contaminate".
5	3	Have well design parameters such as the total well depth and the perforated intervals for the future Damone Waters production well been determined?
5	6	The identified SRP well numbers appear to be incorrect and are not the well numbers identified in the figures. It appears that SRP well number 10.5E-7.5N should replace SRP well number 9.5E-7.7N; and SRP well number 11.2E-7.7N should replace SRP well number 8.5E-7.5N.
5	6	There are no data to support the concern that the upgradient SRP well, SRP Well 11.2E-7.7N, has the potential to be affected by contamination originating from the WCP EGA site. Why is this SRP well included in the proposed RO Report?
6	2	The proposed RO for the SRP wells indicates that the groundwater supply "may be needed as soon as is technically feasible". The uppermost groundwater in this area is contaminated with inorganic compounds, including nitrates and total dissolved solids that do not originate from the WCP EGA Site. In light of the ambient inorganic water quality conditions, what specifically is meant by the phrase "may be needed as soon as is technically feasible"? How will the presence of inorganic contaminants such as nitrate and total dissolved solids affect SRP's ability to use the groundwater?

Univar appreciates the opportunity to provide comments on the Proposed Remedial Objectives Report for this site. We would also appreciate if you would share potential dates with us for any public meeting pertaining to the Proposed Remedial Objectives Report so we can attend. If you have any questions related to our comments, please contact our consultant, Gail Clement at 480/314-9499 or myself at 208/888-1094.

Sincerely,



Michael Gaudette  
 Senior Project Manager

cc: Jim Hooper, Univar, Director, Environmental Affairs Department  
 Gail Clement, G.M. Clement & Associates Inc.

West Central Phoenix, Proposed RO Report			
Page	Para.	Comment	Response
4	1	The Proposed RO report notes there are six current and/or potential groundwater uses, but the Proposed RO report does not clearly list or explain the six uses.	<p><i>The six uses are:</i></p> <ol style="list-style-type: none"> <li>1. <i>Current use of groundwater for drinking purposes by Michigan Trailer Park</i></li> <li>2. <i>Future use of groundwater for drinking purposes by Michigan Trailer Park</i></li> <li>3. <i>Current use of groundwater for drinking purposes by Danone Waters</i></li> <li>4. <i>Future use of groundwater for drinking purposes by Danone Waters</i></li> <li>5. <i>Current use of SRP irrigation wells</i></li> <li>6. <i>Future use of SRP irrigation wells</i></li> </ol> <p><i>These are summarized in the 1<sup>st</sup> paragraph.</i></p>
4	2	The wells that are associated with the highest PCE and TCE concentrations are not identified.	<i>The well that is associated with the highest PCE and TCE concentrations is WCP-16. This information has been added to the text.</i>
4	2	The dates of sampling when the highest PCE and TCE concentrations were found are not identified.	<i>The highest PCE and TCE concentrations were found between March and April 1997. This information has been added to the text.</i>
4	2	To provide current factual information regarding groundwater quality concentration trends, Univar suggests that a conclusion sentence be added noting that VOC concentrations in groundwater have declined at the former VW&R facility since 2003; and the aerial extent of the VOC plume has stabilized.	<i>The following sentence has been added at the end of the paragraph: "VOC concentrations in groundwater have declined at the former VW&amp;R facility since 2003. The aerial extent of the VOC plume contaminants were likely influenced by decreases in groundwater elevation and the continued operation of VW&amp;R's source area treatment system. Note that decreases in groundwater elevation most likely enhanced the localized recovery of VOCs via VW&amp;R's soil vapor extraction system."</i>
5 5 6	2 5 2	In addition to a source of VOCs at the former VW&R facility, there is an upgradient source of TCE as identified in Figure 2. The identity of the Responsible Party for this upgradient source of TCE is not known. What is ADEQ's process to determine responsibility if: <ul style="list-style-type: none"> <li>• The MTP drinking water well is lost in the future?</li> <li>• The Danone Waters drinking water well is lost in the future?</li> <li>• The SRP groundwater supply is threatened?</li> </ul>	<p><i>ADEQ has not been able to identify the source of TCE contamination upgradient to the VW&amp;R facility. The low concentrations of TCE in groundwater attributable to the upgradient source do not allow identification of the source area by examining the concentration gradient. Further, ADEQ could not identify any facilities in the area of the upgradient TCE plume that would have used TCE. ADEQ is not aware of any other reasonable or cost effective investigative technique that would identify the source area for the upgradient TCE contamination.</i></p> <p><i>Because remedial investigations have not located the source area for the upgradient TCE contamination, a responsible party search cannot be conducted to determine who might be liable for this contamination.</i></p>
5	2	The word "contaminated" appears to be incorrect as used in this paragraph and should be replaced with the word "contaminate".	<i>The text has been corrected and the word changed from "contaminated" to "contaminate".</i>
5	3	Have well design parameters such as the total well depth and the perforated intervals for the future Danone Waters production well been determined?	<i>No.</i>
5	6	The identified SRP well numbers appear to be incorrect and are not the well numbers identified in the figures. It appears that SRP well number 10.5E-	<i>The text has been corrected.</i>

<b>West Central Phoenix, Proposed RO Report</b>			
<b>Page</b>	<b>Para.</b>	<b>Comment</b>	<b>Response</b>
		7.5N should replace SRP well number 9.5E-7.7N; and SRP well number 11.2E-7.7N should replace SRP well number 8.5E-7.5N.	
5	6	There are no data to support the concern that the upgradient SRP well, SRP Well 11.2E-7.7N, has the potential to be affected by contamination originating from the WCP EGA site. Why is this SRP well included in the proposed RO Report?	<i>Although direct evidence has not been found confirming 11.2E-7.7N's impact on groundwater, its impact can not be discounted. The only definitive way to confirm 11.2E-7.7N's influence on groundwater in the EGA is to pump the well and examine its effects on groundwater levels in EGA monitor wells.</i>
6	2	The proposed RO for the SRP wells indicates that the groundwater supply "may be needed as soon as is technically feasible". The uppermost groundwater in this area is contaminated with inorganic compounds, including nitrates and total dissolved solids that do not originate from the WCP EGA Site. In light of the ambient inorganic water quality conditions, what specifically is meant by the phrase "may be needed as soon as is technically feasible"? How will the presence of inorganic contaminants such as nitrate and total dissolved solids affect SRP's ability to use the groundwater?	<i>The following response to Univar's question was received from SRP in an e-mail to ADEQ dated May 11, 2006:  "SRP does not anticipate naturally occurring inorganic compounds in the groundwater beneath the referenced project area to impact its ability to use groundwater from the production wells. Currently, the water is used for irrigation which is not a concern. However, there is the indication a municipal water treatment plant may be built near that area in the future to meet the water supply needs of the fast growing communities in the West Valley. Under that scenario, groundwater would be expected to be an important component as is the case elsewhere such plants currently operate. The presence of inorganic constituents would then be subjected to treatment and/or blending processes that meet the desired water quality standard."</i>

**Ana Vargas - RE: WCP East Grand Avenue Site - Proposed Remedial Objectives ( RO) Report**

**From:** "AMADI PHILIP U (PHYL)" <puamadi@srpnet.com>  
**To:** "Ana Vargas" <Vargas.Ana@azdeq.gov>  
**Date:** 2/15/06 4:51:25 PM  
**Subject:** RE: WCP East Grand Avenue Site - Proposed Remedial Objectives ( RO) Report  
**CC:** "CASIRARO DANIEL J (DAN)" <djcasira@srpnet.com>

C.T.S. 123138  
1-33968

Hi Ana:

Here are some comments on the proposed RO Report -

- I. The figures you attached show SRP Well 10.5E-7.5N is located cross-gradient from the plume and Well 11.2E7.7N is located up-gradient from the plume. However, the text references SRP Well 9.5E-7.7N as being located cross-gradient from the plume and Well 8.5E-7.5N being located up-gradient; unfortunately none of these two (last referenced) Wells is shown on the figures. The report also says that pumping Well 9.5E-7.7N causes the lower sand and gravel system contamination to migrate to the northwest. Please have your consultant clarify and correct these confusing statements. Obviously, Wells 10.5E-7.5N and 11.2E-7.7N need to be protected based on their location relative to the plume.
  
- II. SRP would also like to see more protection provided to its supply wells to the extent possible. What the RO is proposing for other wells likely to be impacted is to "protect, replace or otherwise provide an alternative water supply". However, for SRP wells, the RO is saying "protect for use of SRP --- as soon as technically feasible--- for as long as the level of contamination --- threatens or prohibits its use".
  
- III. SRP's supply wells are very vital resource and obviously, the ADEQ recognizes that fact. SRP would demand equal protection of these wells just as proposed for the rest of non-SRP wells potentially threatened by the plume. The extent and degree of protection of SRP wells should not be limited by technical feasibility, fate and transport of contamination. The same conditions should apply as in the case of the other potentially exposed wells qualifying for replacement or alternative water supply source.

Please keep us posted as you address these issues of concern. Thanks.

Phyl

Environmental Compliance Department  
Salt River Project, PAB 352  
1521 N. Project Drive  
Tempe, AZ 85281-1206  
Ph: (602) 236-2183; Fax: (602) 236-3407  
E-Mail: puamadi@srpnet.com

**From:** Ana Vargas [mailto:Vargas.Ana@azdeq.gov]  
**Sent:** Tuesday, January 17, 2006 11:34 AM

<b>West Central Phoenix, Proposed RO Report</b>	
<b>Comment</b>	<b>Response</b>
<p>The figures you attached show SRP Well 10.5E-7.5N is located cross gradient from the plume and Well 11.2E7.7N is located up-gradient from the plume. However, the text references SRP Well 9.5E-7.7N as being located cross-gradient from the plume and Well 8.5E-7.5N being located up-gradient; unfortunately none of these two (last referenced) Wells is shown on the figures. The report also says that pumping Well 9.5E-7.7 N causes the lower sand and gravel system contamination to migrate to the northwest. Please have your consultant clarify and correct these confusing statements. Obviously, Wells 10.5E-7.5N and 11.2E-7.7N need to be protected based on their location relative to the plume.</p>	<p><i>The text has been corrected to indicate the correct wells are 10.5E-7.5N and 11.2E-7.7N.</i></p> <p><i>Depth-to-groundwater data collected in April 1999 indicated that groundwater flow and gradient are influenced by the operation of the SRP irrigation wells. Groundwater flow directions during the April 1999 monitoring event, when SRP was pumping from 10.5E-7.5N, were toward the west-northwest beneath the WCP East Grand Avenue WQARF Site. Groundwater elevation data for the remaining monthly monitoring events indicate that groundwater generally flows toward the west-southwest beneath the WCP East Grand Avenue WQARF Site.</i></p> <p><i>The statement referring to the lower sand and gravel system contamination was in error. It has been replaced with the information presented in the above paragraph.</i></p>
<p>SRP would also like to see more protection provided to its supply wells to the extent possible. What the RO is proposing for other wells likely to be impacted is to "protect, replace or otherwise provide an alternative water supply". However, for SRP wells, the RO is saying "protect for use of SRP---as soon as technically feasible---for as long as the level of contamination---threatens or prohibits its use". SRP's supply wells are very vital resource and obviously, the ADEQ recognizes that fact. SRP would demand equal protection of these wells just as proposed for the rest of non-SRP wells potentially threatened by the plume. The extent and degree of protection of SRP wells should not be limited by technical feasibility, fate and transport of contamination. The same conditions should apply as in the case of the other potentially exposed wells qualifying for replacement or alternative water supply source.</p>	<p><i>The RO for the SRP wells has been changed to read as follows:</i></p> <p><i>"To protect, replace, or otherwise provide alternative water supply should use of the SRP wells be lost in the future due to contamination of the wells with PCE, TCE and/or 1,1-DCE contamination emanating from the WCP EGA site."</i></p>