

**MALCOLM  
PIRNIE**

INDEPENDENT ENVIRONMENTAL  
ENGINEERS, SCIENTISTS  
AND CONSULTANTS

**A**  
APPENDIX

**A**

APPENDIX



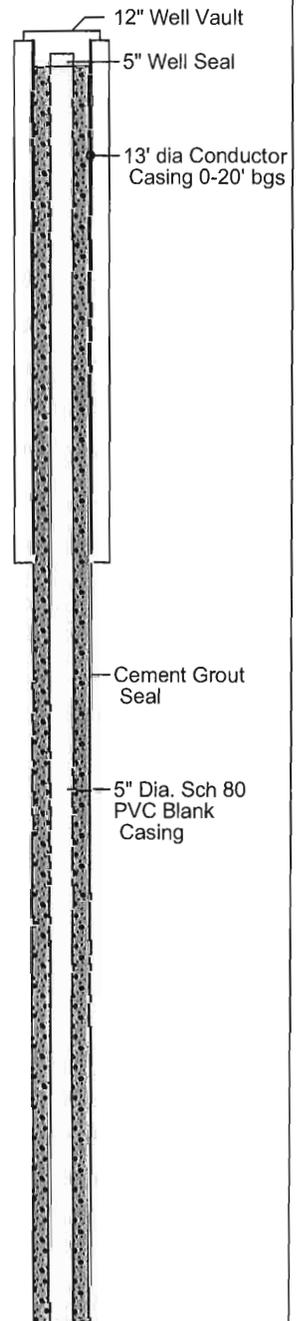


# Lithologic Log for Monitor Well MW-13

Appendix A 2008 Annual Monitoring Report	Start Date : May 29, 2008	Drill Rig : Core Rig
	Finish Date : June 25, 2008	Driller & Helper : Jake, Javier
December 2009	Location : UPCO	Latitude : 33 42' 59.7"
	Logged By : Steve Stacy / M. Branche	Longitude : 112 04' 3"
	Drilling Subcontractor : Yellow Jacket Drilling	

Depth in Feet	USCS	GRAPHIC	DESCRIPTION of Core	Core:			Time	Run (ft)	Recovery (ft)	% Recovery
				% Gravel	% Sand	% Fines				
0			No Cuttings.							
5	SW-SM									
10				40	55	5				
15	SW		-Well-graded SAND with Gravel - tan, gravels are green, gravels are subrounded to sub angular, weak calcite cement, gravels are predominately greenstone, sand is fine- to coarse- grained.	40	55	5				
20										
25			-Well-graded SAND with Gravel, tan, gravels are grayish green, sands are fine-coarse- grained, gravels < 40 mm (fine- to medium- grained), gravels are mostly greenstone, some rhyolite tuff, gravels subangular to subrounded, calcite cement.	45	50	5				
30										
35	GW		Well-graded GRAVEL with Sand, tan, gravels grayish green, sands fine-coarse- grained, gravels < 40 mm (fine- to medium- grained), gravels are mostly greenstone, some rhyolite tuff, gravels subangular to subrounded, calcite cement.	50	45	5				
40										
45			Well-graded GRAVEL with Sand. 8-inch weathered purple GREENSTONE cobble.	50	45	5				
50	SW		-Well-graded GRAVEL with Sand, same as 25, but gravels mostly greenstone with some rhyolitic clasts.							
55				40	55	5				

Well Name: MW-13  
Borehole Dia: Nom. 10"





# Lithologic Log for Monitor Well MW-13

Appendix A  
2008 Annual Monitoring Report

December 2009

Start Date : May 29, 2008  
 Finish Date : June 25, 2008  
 Location : UPCO  
 Logged By : Steve Stacy / M. Branche  
 Drilling Subcontractor : Yellow Jacket Drilling  
 Drill Rig : Core Rig  
 Driller & Helper : Jake, Javier  
 Latitude : 33 42' 59.7"  
 Longitude : 112 04' 3"

Depth in Feet	USCS	GRAPHIC	DESCRIPTION of Core	Core:			Time	Run (ft)	Recovery (ft)	% Recovery	Well Name: MW-13 Borehole Dia: Nom. 10"
				% Gravel	% Sand	% Fines					
50	SW										
55	GW		Well-graded GRAVEL with Sand, well graded, same as above, but clasts < 6 inches, angular to rounded.	70	25	5					
60			5-inch RHYOLITE TUFF cobble.								
65	SW		Well-graded SAND with Gravel , same as above.	45	50	5					
70	GW		Well-graded GRAVEL with Sand, same as above.	55	40	5					
75	SW		Well-graded SAND with Gravel , same as above.	45	50	5					
80	GW		Well-graded GRAVEL with Sand, same as above.	50	45	5					
85	GW		Well-graded GRAVEL with Sand, same as above, but gravels predominantly fine-grained.	50	45	5					
85			8-inch weathered GREENSTONE cobble.								
90											
95											
100	SW		Well-graded SAND with Gravel, same as above, but gravels mostly fine-grained.	40	55	5					



Cement Grout Seal  
5" Dia. Sch 80 PVC Blank Casing



# Lithologic Log for Monitor Well MW-13

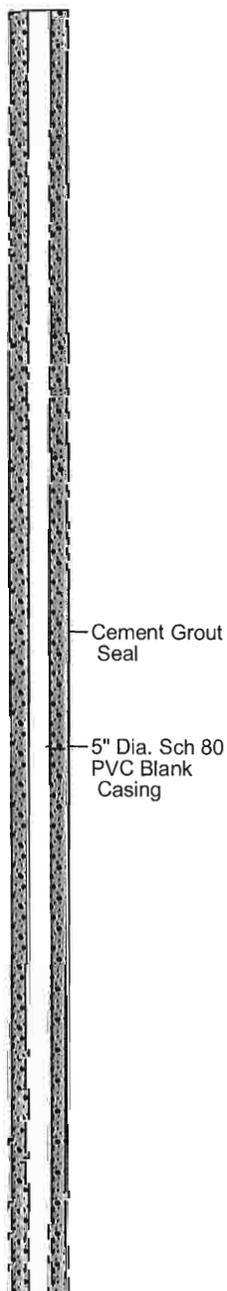
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Appendix A  
2008 Annual Monitoring Report

December 2009

Start Date : May 29, 2008  
 Finish Date : June 25, 2008  
 Location : UPCO  
 Logged By : Steve Stacy / M. Branche  
 Drilling Subcontractor : Yellow Jacket Drilling  
 Drill Rig : Core Rig  
 Driller & Helper : Jake, Javier  
 Latitude : 33 42' 59.7"  
 Longitude : 112 04' 3"

Depth in Feet	USCS	GRAPHIC	DESCRIPTION of Core	Core:			Time	Run (ft)	Recovery (ft)	% Recovery	Well Name: MW-13 Borehole Dia: Nom. 10"
				% Gravel	% Sand	% Fines					
100	SW										
105	GW		Well-graded GRAVEL with Sand, gravels are mostly greenstone with some Granodiorite, clasts < 5 inches. SAND with Gravel, clasts < 3-inches.	60	40						
	SW			40	55	5					
110				55	40	5					
115	GW		Well-graded GRAVEL with Sand, sand brown, gravels green, maroon, gray (black/white), sand fine to medium-grained, gravels fine-grained, clasts < 9-inches, gravels mostly Greenstone with some Granodiorite and Rhyolite. Well cemented.								
120			Well-graded SAND with Gravel, same as above.	40	55	5					
125			Well-graded SAND with Gravel, same as above, sand is fine to medium-grained, gravels are mostly fine to medium-grained, with about 5% coarse grains.	30	65	5					
130	SW		Well-graded SAND with Gravel, same as above, clasts < 5-inches.	45	50	5					
135											
140			Well-graded GRAVEL with Sand, same as above, clasts < 9-inches, more cobbles than previous zones.	50	45	5					
145	GW										
150											





# Lithologic Log for Monitor Well MW-13

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Appendix A  
2008 Annual Monitoring Report

December 2009

Start Date : May 29, 2008  
 Finish Date : June 25, 2008  
 Location : UPCO  
 Logged By : Steve Stacy / M. Branche  
 Drilling Subcontractor : Yellow Jacket Drilling  
 Drill Rig : Core Rig  
 Driller & Helper : Jake, Javier  
 Latitude : 33 42' 59.7"  
 Longitude : 112 04' 3"

Depth in Feet	USCS	GRAPHIC	DESCRIPTION of Core	Core:			Time	Run (ft)	Recovery (ft)	% Recovery	Well Name: MW-13 Borehole Dia: Nom. 10"
				% Gravel	% Sand	% Fines					
150	GW		Well-graded GRAVEL with Sand, same as 127.	60	40						<p>Cement Grout Seal</p> <p>5" Dia. Sch 80 PVC Blank Casing</p>
155											
160	SW		Well-graded SAND with Gravel, clasts < 4-inches. several cobbles < 6-inches.	45	55						
165			several 3-4.5-inch cobbles.								
170	GW		Well-graded GRAVEL with Sand, same as above, clasts < 4-inches, sand is fine- to coarse-grained, gravel is fine- to coarse-grained, gravels angular to rounded, gravels are Greenstone and Granodiorite composition.	55	45	0					
175			12-inch long weathered maroon Greenstone with Calcite in fractures.								
180											
185	SW		Well-graded SAND with Gravel, clasts < 2-inches.	40	60						
190			Well-graded SAND with Gravel, same as above.	40	80						
195	BR		SAND with Gravel same as 186.								
200			Mostly granodiorite, some greenstone clasts, highly fractured, little to no iron oxidation, beginning of transition zone to Granodiorite bedrock.								



# Lithologic Log for Monitor Well MW-13

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Appendix A  
2008 Annual Monitoring Report

December 2009

Start Date : May 29, 2008  
 Finish Date : June 25, 2008  
 Location : UPCO  
 Logged By : Steve Stacy / M. Branche  
 Drilling Subcontractor : Yellow Jacket Drilling  
 Drill Rig : Core Rig  
 Driller & Helper : Jake, Javier  
 Latitude : 33 42' 59.7"  
 Longitude : 112 04' 3"

Depth in Feet	USCS	GRAPHIC	DESCRIPTION of Core	Core:			Time	Run (ft)	Recovery (ft)	% Recovery	Well Name: MW-13 Borehole Dia: Nom. 10"
				% Gravel	% Sand	% Fines					
200			1-inch thick zone below and parallel to an apparent fracture, competent, weathering of Fe minerals in fracture zones.								
205			highly fractured and weathered, Fe oxidation along fracture surfaces, less competent.				2.4	1.4	59		
210							5	3.8	77		
215							5	2	40		
220			GRANODIORITE Bedrock, competent but heavily weathered and fractured, alteration of clay minerals.				5	5	100		
225	BR		competent, not weathered has heavily.				5	4.8	95		Cement Grout Seal
230							5	4.8	95		5" Dia. Sch 80 PVC Blank Casing
235			heavily weathered, high degree of Fe oxidation, CaCO3-filled fractures				5	4.5	90		
240							5	4.7	93		
245			incompetent layer.				5	5	100		
250							5	5	100		

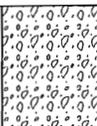
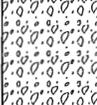
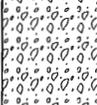
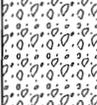
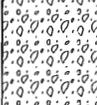
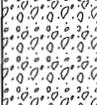
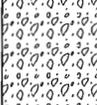
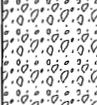
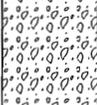
**Lithologic Log for Monitor Well MW-13**

Appendix A  
2008 Annual Monitoring Report

December 2009

Start Date : May 29, 2008  
 Finish Date : June 25, 2008  
 Location : UPCO  
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 Drill Rig : Core Rig  
 Driller & Helper : Jake, Javier  
 Latitude : 33 42' 59.7"  
 Longitude : 112 04' 3"

Well Name: MW-13  
 Borehole Dia: Nom. 10"

Depth in Feet	USCS	GRAPHIC	DESCRIPTION of Core	Core:			Time	Run (ft)	Recovery (ft)	% Recovery
				% Gravel	% Sand	% Fines				
250			alternating competent and incompetent zones, all highly fractured, range in mafic minerals (e.g., mostly more basic, but with xenoliths or areas with more mafic mineralogy), heavy Fe oxidation and CaCO3-filled fractures.					5	5	100
255			GRANODIORITE Bedrock, competent.					5	4.5	90
260			heavily fractured.					5	4.8	95
265								5	5	100
270								5	4.5	90
275	BR		highly competent, CaCO3 filled fractures, low- and high-angle fractures, some Fe oxidation but less than above.					5	5	100
280			highly fractured.					5	3.7	73
285			slickensides on low-angle fracture plane, smooth.					5	4.6	92
290			GRANODIORITE Bedrock, heavily fractured.					5	4.8	95
295			heavily fractured, incompetent.					5	5	100
300			slightly more mafic composition.					5	5	100
			heavily fractured.					5	5	100



Cement Grout Seal  
 5" Dia. Sch 80 PVC Blank Casing



# Lithologic Log for Monitor Well MW-13

Appendix A  
2008 Annual Monitoring Report

December 2009

Start Date : May 29, 2008  
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 Location : UPCO  
 Logged By : Steve Stacy / M. Branche  
 Drilling Subcontractor : Yellow Jacket Drilling  
 Drill Rig : Core Rig  
 Driller & Helper : Jake, Javier,  
 Latitude : 33 42' 59.7"  
 Longitude : 112 04' 3"

Depth in Feet	USCS	GRAPHIC	DESCRIPTION of Core	Core:			Time	Run (ft)	Recovery (ft)	% Recovery	Well Name: MW-13 Borehole Dia: Nom. 10"
				% Gravel	% Sand	% Fines					
300							5	5	100		
305			GRANODIORITE Bedrock, heavily fractured, some slightly more mafic composition.				5	5	100		
310							5	5	100		
315			less fractured and more competent.				5	4.7	93		
320			competent.				5	4.8	97		
325	BR		heavily fractured, competent and incompetent zones, CaCO3-filled fractures.				5	4.7	93		
330							5	5	100		
335							5	4.2	83		
340			slickenslides.				5	4.3	87		
345			GRANODIORITE Bedrock, some xenoliths or areas of more mafic composition, competent and highly fractured, fractures mostly high-angle (e.g., 60 degrees), CaCO3-filled fractures.				5	4.4	88		
350							5	4.9	97		



Cement Grout Seal  
5" Dia. Sch 80 PVC Blank Casing



# Lithologic Log for Monitor Well MW-13

Appendix A  
2008 Annual Monitoring Report

December 2009

Start Date : May 29, 2008  
 Finish Date : June 25, 2008  
 Location : UPCO  
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 Drilling Subcontractor : Yellow Jacket Drilling  
 Drill Rig : Core Rig  
 Driller & Helper : Jake, Javier  
 Latitude : 33 42' 59.7"  
 Longitude : 112 04' 3"

Depth in Feet	USCS	GRAPHIC	DESCRIPTION of Core	Core:			Time	Run (ft)	Recovery (ft)	% Recovery	Well Name: MW-13 Borehole Dia: Nom. 10"
				% Gravel	% Sand	% Fines					
350							5	4.9	97	 <p>Cement Grout Seal</p> <p>5" Dia. Sch 80 PVC Blank Casing</p>	
355							5	5	100		
360							5	4.8	97		
365							5	4.7	93		
370							5	5	100		
375	BR						5	5	100		
380							5	5	100		
385							5	5	100		
390							5	5	100		
395							5	4.8	97		
400							5	4	80		



# Lithologic Log for Monitor Well MW-13

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Appendix A 2008 Annual Monitoring Report  December 2009	Start Date : May 29, 2008	Drill Rig : Core Rig
	Finish Date : June 25, 2008	Driller & Helper : Jake, Javier
	Location : UPCO	
	Logged By : Steve Stacy / M. Branche	Latitude : 33 42' 59.7"
	Drilling Subcontractor : Yellow Jacket Drilling	Longitude : 112 04' 3"

Depth in Feet	USCS	GRAPHIC	DESCRIPTION of Core	Core:			Time	Run (ft)	Recovery (ft)	% Recovery	Well Name: MW-13 Borehole Dia: Nom. 10"
				% Gravel	% Sand	% Fines					
400							5	4	80		
405							5	4.7	93		
410							5	5	100		
415							5	4.7	93		
420							5	5	100		
425	BR						3	2.7	89		
430							2	1.7	83		
435							5	4.52	100		
440							5	5	100		
445							5	4.7	93		
450							5	5	100		





# Lithologic Log for Monitor Well MW-13

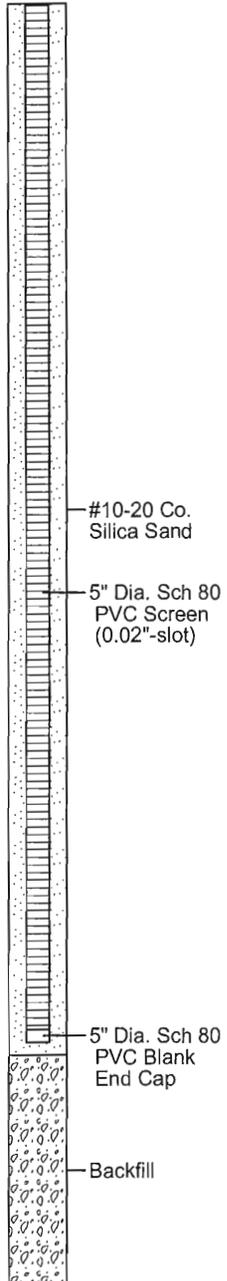
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Appendix A  
2008 Annual Monitoring Report

December 2009

Start Date : May 29, 2008  
 Finish Date : June 25, 2008  
 Location : UPCO  
 Logged By : Steve Stacy / M. Branche  
 Drilling Subcontractor : Yellow Jacket Drilling  
 Drill Rig : Core Rig  
 Driller & Helper : Jake, Javier  
 Latitude : 33 42' 59.7"  
 Longitude : 112 04' 3"

Depth in Feet	USCS	GRAPHIC	DESCRIPTION of Core	Core:			Time	Run (ft)	Recovery (ft)	% Recovery	Well Name: MW-13 Borehole Dia: Nom. 10"
				% Gravel	% Sand	% Fines					
450							5	5	100		
455							5	5	100		
460							5	4.5	90		
465							5	5	100		
470							5	5	100		
475	BR						5	5	100		
480							5	4.7	93		
485							5	4.8	97		
490							5	4.7	93		
495							5	5	100		
500							5	4.8	97		





# Lithologic Log for Monitor Well MW-14

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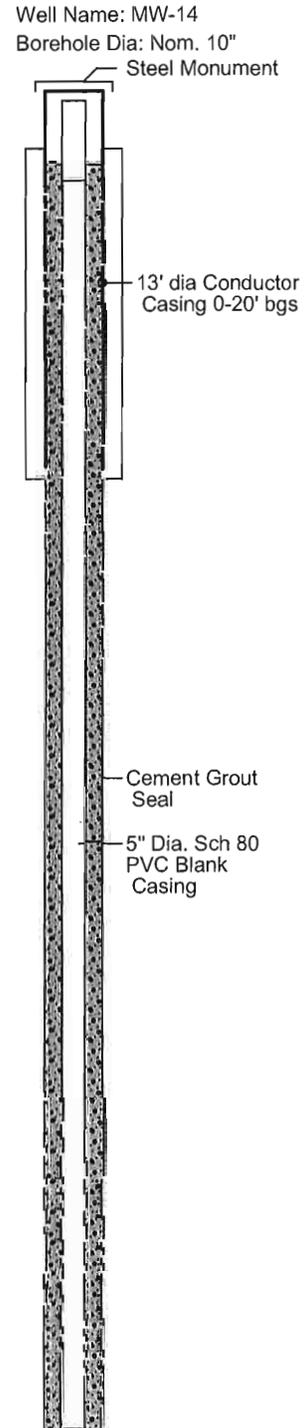
Appendix A  
2008 Annual Monitoring Report

December 2009

Start Date : June 5, 2008  
 Finish Date : June 6, 2008  
 Location : UPCO  
 Logged By : A. Ezeagu  
 Drilling Subcontractor : Yellow Jacket Drilling

Drill Rig : Air Rotary  
 Driller & Helper : Marion  
 Latitude : 33 43' 10"  
 Longitude : 112 04' 14"

Depth in Feet	USCS	GRAPHIC	DESCRIPTION of Cuttings	Cuttings			Time
				% Gravel	% Sand	% Fines	
0	SW		Well-graded SAND, olive brown, gravel clasts are less than 3", subrounded to subangular.	10	85	5	
10	SM		Silty SAND, olive brown. Sand is fine to medium grained, subrounded to subangular.	5	60	35	
20	SW		Well-graded SAND With Gravel, light red. sand is fine to coarse-grained, and rounded to subrounded, gravel clasts are less than 3".	15	85	T	6-5-08
30			GRANODIORITE, weathered.				1320
40							1330
50			GRANODIORITE, weathered.				1343
60	BR						1354
70							1405
80							1410





# Lithologic Log for Monitor Well MW-14

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Appendix A  
2008 Annual Monitoring Report

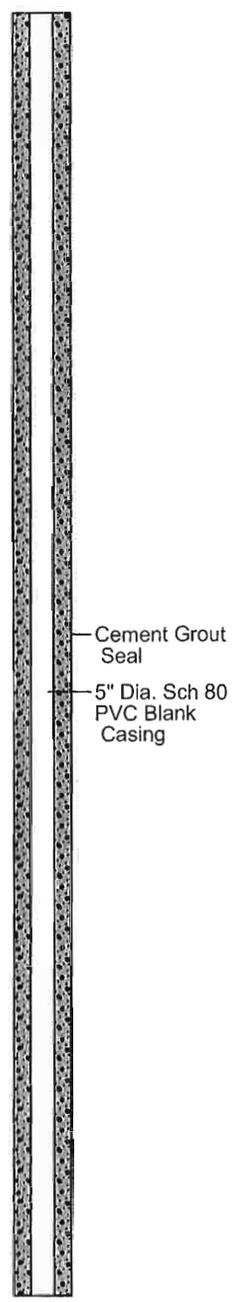
December 2009

Start Date : June 5, 2008  
 Finish Date : June 6, 2008  
 Location : UPCO  
 Logged By : A. Ezeagu  
 Drilling Subcontractor : Yellow Jacket Drilling

Drill Rig : Air Rotary  
 Driller & Helper : Marion  
 Latitude : 33 43' 10"  
 Longitude : 112 04' 14"

Depth in Feet	USCS	GRAPHIC	DESCRIPTION of Cuttings	Cuttings			Time
				% Gravel	% Sand	% Fines	
80							1421
90							1440
100			GRANODIORITE, weathered.				1453
110							
120	BR						
130			GRANODIORITE, some Greenstone cuttings, weathered.				1510
140							
150							1535
160							

Well Name: MW-14  
Borehole Dia: Nom. 10"





# Lithologic Log for Monitor Well MW-14

Appendix A  
2008 Annual Monitoring Report

Start Date : June 5, 2008  
Finish Date : June 6, 2008  
Location : UPCO  
Logged By : A. Ezeagu  
Drilling Subcontractor : Yellow Jacket Drilling

Drill Rig : Air Rotary  
Driller & Helper : Marion  
Latitude : 33 43' 10"  
Longitude : 112 04' 14"

December 2009

Depth in Feet	USCS	GRAPHIC	DESCRIPTION of Cuttings	Cuttings			Time
				% Gravel	% Sand	% Fines	
160							
170			GRANODIORITE, some greenstone cuttings, possibly xenoliths, weathered.				1557
180			GRANODIORITE Bedrock, weathered.				
190							1619
200	BR						
210							1640
220							
230							6-6-08 0902
240							

Well Name: MW-14  
Borehole Dia: Nom. 10"



Cement Grout Seal  
5" Dia. Sch 80 PVC Blank Casing



# Lithologic Log for Monitor Well MW-14

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Appendix A  
2008 Annual Monitoring Report

December 2009

Start Date : June 5, 2008  
Finish Date : June 6, 2008  
Location : UPCO  
Logged By : A. Ezeagu  
Drilling Subcontractor : Yellow Jacket Drilling

Drill Rig : Air Rotary  
Driller & Helper : Marion  
Latitude : 33 43' 10"  
Longitude : 112 04' 14"

Depth in Feet	USCS	GRAPHIC	DESCRIPTION of Cuttings	Cuttings			Time
				% Gravel	% Sand	% Fines	
240							
250						945	
260							
270						1005	
280	BR						
290						1025	
300			GRANODIORITE Bedrock, weathered.				
310						1045	
320							

Well Name: MW-14  
Borehole Dia: Nom. 10"

Cement Grout Seal  
5" Dia. Sch 80 PVC Blank Casing



# Lithologic Log for Monitor Well MW-14

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2008 Annual Monitoring Report

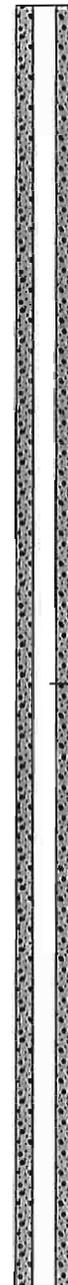
Start Date : June 5, 2008  
Finish Date : June 6, 2008  
Location : UPCO  
Logged By : A. Ezeagu  
Drilling Subcontractor : Yellow Jacket Drilling

Drill Rig : Air Rotary  
Driller & Helper : Marion  
Latitude : 33 43' 10"  
Longitude : 112 04' 14"

December 2009

Depth in Feet	USCS	GRAPHIC	DESCRIPTION of Cuttings	Cuttings			Time
				% Gravel	% Sand	% Fines	
320							
330						1105	
340							
350						1126	
360	BR		GRANODIORITE Bedrock, some Greenstone cuttings.				
370						1158	
380							
390						1220	
400			GRANODIORITE Bedrock.				

Well Name: MW-14  
Borehole Dia: Nom. 10"



Cement Grout Seal  
5" Dia. Sch 80 PVC Blank Casing



# Lithologic Log for Monitor Well MW-14

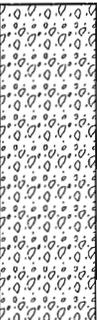
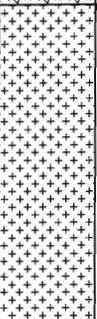
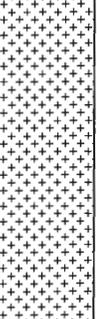
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2008 Annual Monitoring Report

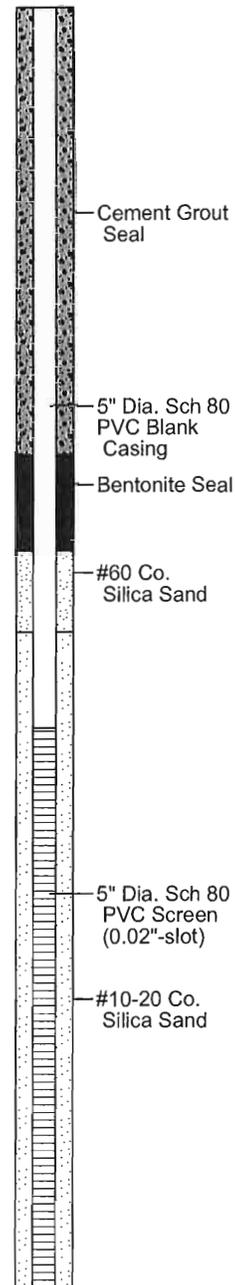
December 2009

Start Date : June 5, 2008  
Finish Date : June 6, 2008  
Location : UPCO  
Logged By : A. Ezeagu  
Drilling Subcontractor : Yellow Jacket Drilling

Drill Rig : Air Rotary  
Driller & Helper : Marion  
Latitude : 33 43' 10"  
Longitude : 112 04' 14"

Depth in Feet	USCS	GRAPHIC	DESCRIPTION of Cuttings	Cuttings			Time
				% Gravel	% Sand	% Fines	
400							
410	BR						1355
420			GREENSTONE Bedrock.				
430							1438
440							
450	BR		GREENSTONE Bedrock, heavily weathered.				1518
460							
470							1552
480							

Well Name: MW-14  
Borehole Dia: Nom. 10"





# Lithologic Log for Monitor Well MW-14

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Appendix A  
2008 Annual Monitoring Report

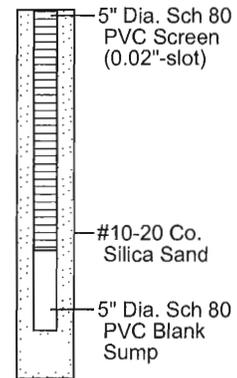
December 2009

Start Date : June 5, 2008  
Finish Date : June 6, 2008  
Location : UPCO  
Logged By : A. Ezeagu  
Drilling Subcontractor : Yellow Jacket Drilling

Drill Rig : Air Rotary  
Driller & Helper : Marion  
Latitude : 33 43' 10"  
Longitude : 112 04' 14"

Depth in Feet	USCS	GRAPHIC	DESCRIPTION of Cuttings	Cuttings			Time
				% Gravel	% Sand	% Fines	
480	BR					1630	
490							
500							
510							
520							
530							
540							
550							
560							

Well Name: MW-14  
Borehole Dia: Nom. 10"





# Lithologic Log for Monitor Well MW-15

(Page 1 of 7)

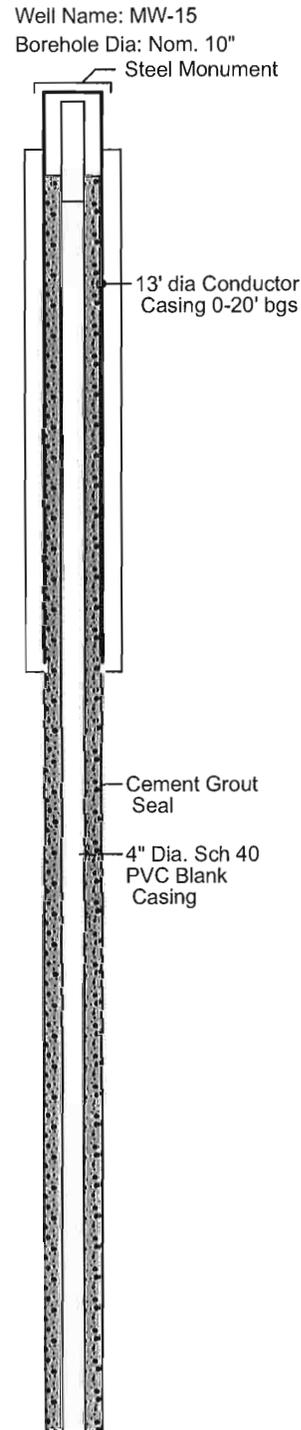
Appendix A  
2008 Annual Monitoring Report

December 2009

Start Date : May 23, 2008  
 Finish Date : May 29, 2008  
 Location : UPCO  
 Logged By : M. Branche  
 Drilling Subcontractor : Yellow Jacket Drilling

Drill Rig : Air Rotary  
 Driller & Helper : Jake, Javier  
 Latitude : 33 43' 9.87"  
 Longitude : 112 04' 13.78"

Depth in Feet	USCS	GRAPHIC	DESCRIPTION of Cuttings	Cuttings		
				% Gravel	% Sand	% Fines
0	SW		DESCRIPTION OF CUTTINGS BASED ON MW-14. Well-graded SAND, olive brown, gravel clasts are less than 3", subrounded to subangular.	10	85	5
10	SM		Silty SAND, olive brown. Sand is fine to medium grained, subrounded to subangular.	5	60	35
20	SW		Well-graded SAND With Gravel, light red. sand is fine to coarse-grained, and rounded to subrounded, gravel clasts are less than 3".	15	85	T
30	BR		GRANODIORITE, weathered.			
40	BR		GRANODIORITE, weathered.			
50	BR		GRANODIORITE, weathered.			





# Lithologic Log for Monitor Well MW-15

(Page 2 of 7)

Appendix A  
2008 Annual Monitoring Report

December 2009

Start Date : May 23, 2008  
Finish Date : May 29, 2008  
Location : UPCO  
Logged By : M. Branche  
Drilling Subcontractor : Yellow Jacket Drilling

Drill Rig : Air Rotary  
Driller & Helper : Jake, Javier  
Latitude : 33 43' 9.87"  
Longitude : 112 04' 13.78"

Well Name: MW-15  
Borehole Dia: Nom. 10"

Depth in Feet	USCS	GRAPHIC	DESCRIPTION of Cuttings	Cuttings		
				% Gravel	% Sand	% Fines
50						
60						
70						
80	BR					
90						
100						

GRANODIORITE, weathered.



Cement Grout Seal  
4" Dia. Sch 40 PVC Blank Casing



# Lithologic Log for Monitor Well MW-15

(Page 3 of 7)

Appendix A  
2008 Annual Monitoring Report

December 2009

Start Date : May 23, 2008

Finish Date : May 29, 2008

Location : UPCO

Logged By : M. Branche

Drilling Subcontractor : Yellow Jacket Drilling

Drill Rig : Air Rotary

Driller & Helper : Jake, Javier

Latitude : 33 43' 9.87"

Longitude : 112 04' 13.78"

Well Name: MW-15  
Borehole Dia: Nom. 10"

Depth in Feet	USCS	GRAPHIC	DESCRIPTION of Cuttings	Cuttings		
				% Gravel	% Sand	% Fines
100						
110						
120						
130	BR		GRANODIORITE, some Greenstone cuttings, weathered.			
140						
150						

Cement Grout Seal  
4" Dia. Sch 40 PVC Blank Casing



# Lithologic Log for Monitor Well MW-15

Appendix A  
2008 Annual Monitoring Report

Start Date : May 23, 2008  
Finish Date : May 29, 2008  
Location : UPCO  
Logged By : M. Branche  
Drilling Subcontractor : Yellow Jacket Drilling

Drill Rig : Air Rotary  
Driller & Helper : Jake, Javier  
Latitude : 33 43' 9.87"  
Longitude : 112 04' 13.78"

December 2009

Depth in Feet	USCS	GRAPHIC	DESCRIPTION of Cuttings	Cuttings			Well Name: MW-15 Borehole Dia: Nom. 10"
				% Gravel	% Sand	% Fines	
150							
160							
170			GRANODIORITE, some greenstone cuttings, possibly xenoliths, weathered.				
180	BR		GRANODIORITE Bedrock, weathered.				Cement Grout Seal 4" Dia. Sch 40 PVC Blank Casing
190							
200							



# Lithologic Log for Monitor Well MW-15

(Page 5 of 7)

Appendix A  
2008 Annual Monitoring Report

December 2009

Start Date : May 23, 2008

Finish Date : May 29, 2008

Location : UPCO

Logged By : M. Branche

Drilling Subcontractor : Yellow Jacket Drilling

Drill Rig : Air Rotary

Driller & Helper : Jake, Javier

Latitude : 33 43' 9.87"

Longitude : 112 04' 13.78"

Well Name: MW-15  
Borehole Dia: Nom. 10"

Depth in Feet	USCS	GRAPHIC	DESCRIPTION of Cuttings	Cuttings					
				% Gravel	% Sand	% Fines			
200	BR		GRANODIORITE Bedrock.						
210									
220									
230									
240									
250									

— Cement Grout Seal  
— 4" Dia. Sch 40 PVC Blank Casing



# Lithologic Log for Monitor Well MW-15

(Page 6 of 7)

Appendix A  
2008 Annual Monitoring Report

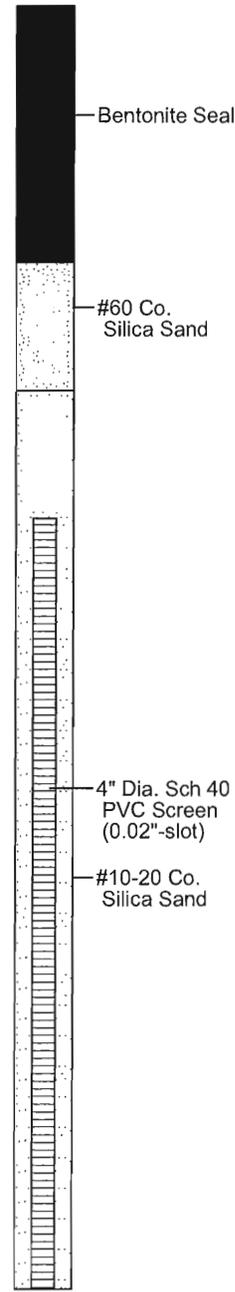
December 2009

Start Date : May 23, 2008  
Finish Date : May 29, 2008  
Location : UPCO  
Logged By : M. Branche  
Drilling Subcontractor : Yellow Jacket Drilling

Drill Rig : Air Rotary  
Driller & Helper : Jake, Javier  
Latitude : 33 43' 9.87"  
Longitude : 112 04' 13.78"

Well Name: MW-15  
Borehole Dia: Nom. 10"

Depth in Feet	USCS	GRAPHIC	DESCRIPTION of Cuttings	Cuttings		
				% Gravel	% Sand	% Fines
250	BR		GRANODIORITE Bedrock, weathered.			
260						
270						
280						
290						
300						





# Lithologic Log for Monitor Well MW-15

(Page 7 of 7)

Appendix A  
2008 Annual Monitoring Report

December 2009

Start Date : May 23, 2008  
Finish Date : May 29, 2008  
Location : UPCO  
Logged By : M. Branche  
Drilling Subcontractor : Yellow Jacket Drilling

Drill Rig : Air Rotary  
Driller & Helper : Jake, Javier  
Latitude : 33 43' 9.87"  
Longitude : 112 04' 13.78"

Depth in Feet	USCS	GRAPHIC	DESCRIPTION of Cuttings	Cuttings			Well Name: MW-15 Borehole Dia: Nom. 10"
				% Gravel	% Sand	% Fines	
300	BR						
310							
320							
330							
340							
350							



# Lithologic Log for Monitor Well SVMW-1

(Page 1 of 5)

Appendix A  
2008 Annual Monitoring Report

December 2009

Start Date : October 21, 2008  
 Finish Date : October 22, 2008  
 Location : UPCO  
 Logged By : S. Stacy / M. Branche  
 Drilling Subcontractor : Yellow Jacket Drilling

Drill Rig : Air Rotary  
 Driller & Helper : Mike and Cole  
 Latitude : 33 42' 52"  
 Longitude : 112 04' 18"

See As-Built Well Construction Diagram

Depth in Feet	USCS	GRAPHIC	DESCRIPTION of Cuttings	CUTTINGS			Time
				% Gravel	% Sand	% Fines	
0							
5	SP		Poorly graded SAND, tan, Sand is fine to coarse-grained, subrounded to rounded.	5	95		1115
10				5	80	15	
15	SM		Silty SAND, tan. Sand is mostly fine to medium-grained, some Granodiorite Gravels. Gravels are subangular and <1.5", and cemented with calcite.				1200
20				10	85	5	
25							1030
30	SW		Well-graded SAND with Gravel, tan. Sand is fine to medium-grained, cemented with calcite. Gravels are grayish-green and gray (black and white), subangular to subrounded and composed of Greenstone and Granodiorite. Fines are of low to medium plasticity.	10	60	30	
35							1045
40				25	75	T	
45	SW		Well-graded SAND with Gravel, Sands are fine to coarse-grained. Gravels are of varied rock types, and are < 1.3 ". Sands are fine to medium-grained, trace Sands adhering to Gravels. Gravels are subangular to subrounded. Calcite cement present.				1055
50							



# Lithologic Log for Monitor Well SVMW-1

(Page 2 of 5)

Appendix A  
2008 Annual Monitoring Report

December 2009

Start Date : October 21, 2008  
 Finish Date : October 22, 2008  
 Location : UPCO  
 Logged By : S. Stacy / M. Branche  
 Drilling Subcontractor : Yellow Jacket Drilling

Drill Rig : Air Rotary  
 Driller & Helper : Mike and Cole  
 Latitude : 33 42' 52"  
 Longitude : 112 04' 18"

See As-Built Well Construction Diagram

Depth in Feet	USCS	GRAPHIC	DESCRIPTION of Cuttings	CUTTINGS			Time
				% Gravel	% Sand	% Fines	
50	GW		Well-graded GRAVEL with Sand, tan, greenish gray. Gravels are angular to rounded, less than 2", mostly Greenstone with some Granodiorite. Sands are rounded to subrounded, fine to coarse-grained, fines adhering to Gravels, calcite cement.	50	45	5	1102
55				60	35	5	
60	SW		Well-graded SAND with Gravel, tan. Sands are fine to coarse-grained. Gravels are fine-grained. Gravels are subangular to subrounded, calcite cement present.	45	50	5	1130
65				25	65	10	
70	SW-SM		Well-graded SAND with Silt and Gravel. Gravels are mostly fine-grained, calcite cement.	25	65	10	1142
75				15	75	10	
80							1154
85							
90							
95							
100							



# Lithologic Log for Monitor Well SVMW-1

(Page 3 of 5)

Appendix A  
2008 Annual Monitoring Report

December 2009

Start Date : October 21, 2008  
 Finish Date : October 22, 2008  
 Location : UPCO  
 Logged By : S. Stacy / M. Branche  
 Drilling Subcontractor : Yellow Jacket Drilling

Drill Rig : Air Rotary  
 Driller & Helper : Mike and Cole  
 Latitude : 33 42' 52"  
 Longitude : 112 04' 18"

See As-Built Well Construction Diagram

Depth in Feet	USCS	GRAPHIC	DESCRIPTION of Cuttings	CUTTINGS			Time
				% Gravel	% Sand	% Fines	
100							
105	SW-SM						1352
110			Well-graded GRAVEL with Sand, tan to greenish gray. Gravels are angular to subrounded, mostly Greenstone with some rhyolite tuff, calcite cement. Sands are fine to coarse-grained.	70	25	5	
115							
120			Gravels mostly fine-grained.	60	40		
125							
130	GW						1510
135							
140				70	30		
145							
150							



# Lithologic Log for Monitor Well SVMW-1

Appendix A 2008 Annual Monitoring Report	Start Date : October 21, 2008	Drill Rig : Air Rotary
	Finish Date : October 22, 2008	Driller & Helper : Mike and Cole
December 2009	Location : UPCO	Latitude : 33 42' 52"
	Logged By : S. Stacy / M. Branche	Longitude : 112 04' 18"
	Drilling Subcontractor : Yellow Jacket Drilling	

Depth in Feet	USCS	GRAPHIC	DESCRIPTION of Cuttings	CUTTINGS			Time
				% Gravel	% Sand	% Fines	
150			Well-graded SAND with Gravel, tan to greenish gray. Gravels are angular to subrounded, mostly Greenstone with some rhyolite tuff, calcite cement. Sands are fine to coarse-grained.	40	60		1528
155							
160							
165	SW						1605
170							
175							1615
180			GRANODIORITE Bedrock. Cuttings are fine-grained, some weathering, iron oxidation.				1630
185							
190	BR						
195							
200			Cuttings are medium-grained to <3" in size.				0905

See As-Built Well Construction Diagram



# Lithologic Log for Monitor Well SVMW-1

Appendix A  
2008 Annual Monitoring Report  
December 2009

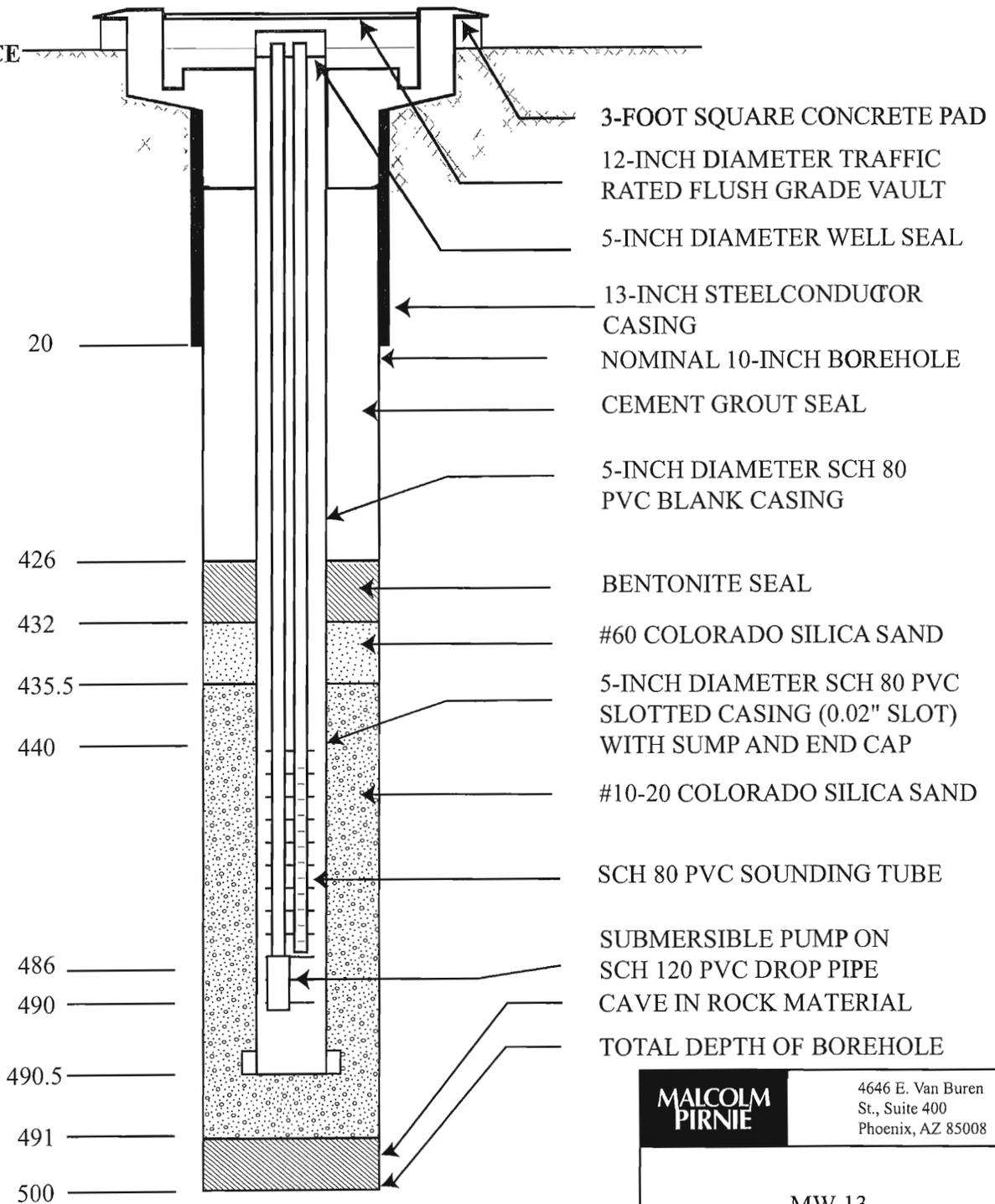
Start Date : October 21, 2008  
Finish Date : October 22, 2008  
Location : UPCO  
Logged By : S. Stacy / M. Branche  
Drilling Subcontractor : Yellow Jacket Drilling  
Drill Rig : Air Rotary  
Driller & Helper : Mike and Cole  
Latitude : 33 42' 52"  
Longitude : 112 04' 18"

Depth in Feet	USCS	GRAPHIC	DESCRIPTION of Cuttings	CUTTINGS			Time
				% Gravel	% Sand	% Fines	
200							
205							0930
210							
215							0945
220	BR						
225							0955
230			Cuttings mostly Gravel				
235							1010
240							
245							
250							

See As-Built Well Construction Diagram

DEPTH  
(FT BGS)

SURFACE

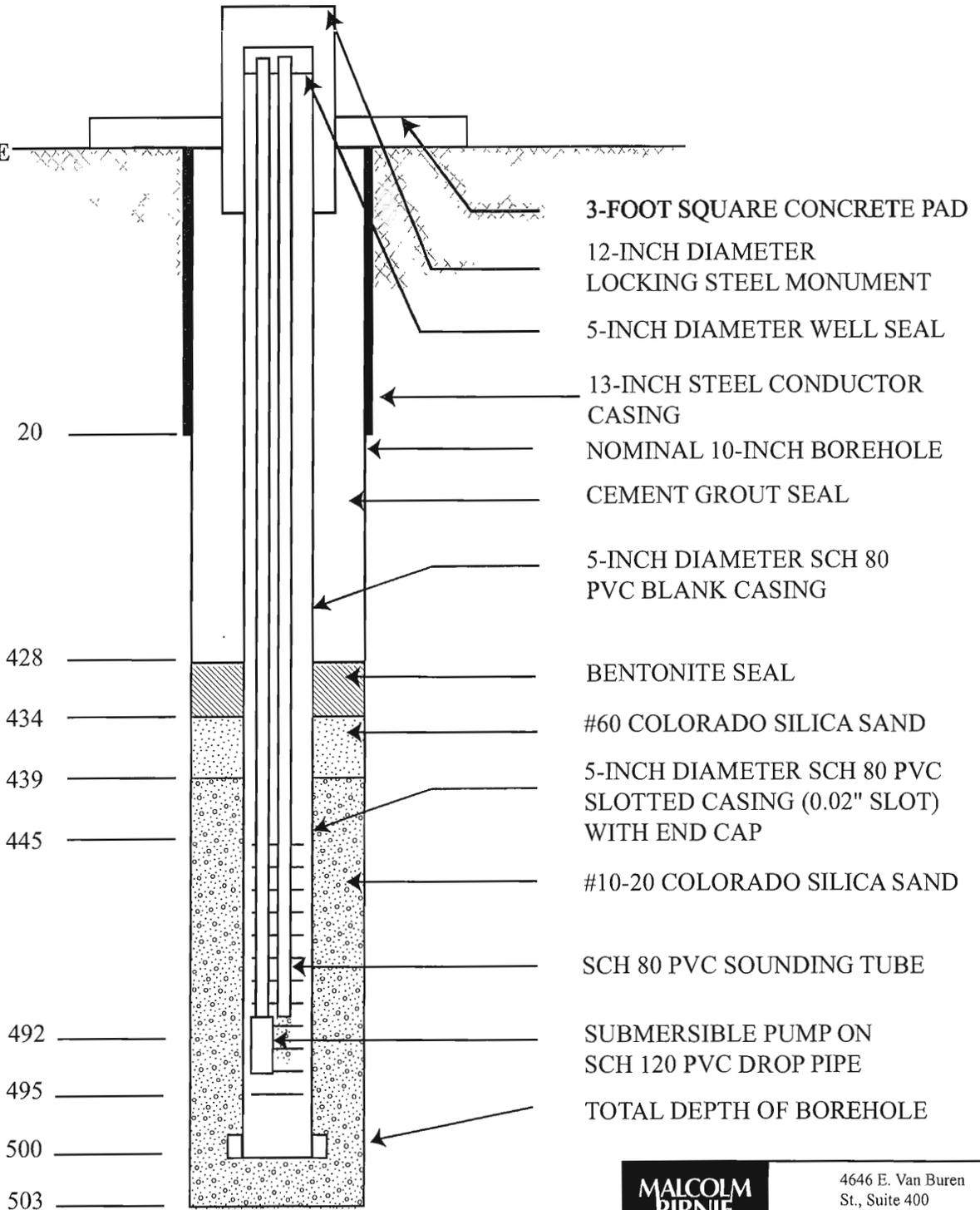


NOT TO SCALE

<b>MALCOLM PIRNIE</b>	4646 E. Van Buren St., Suite 400 Phoenix, AZ 85008
	<p>MW-13 As-Built Construction Diagram 2008 Annual Monitoring Report</p>
December 2009	<b>Appendix A</b>

DEPTH  
(FT BGS)

SURFACE



NOT TO SCALE

**MALCOLM  
PIRNIE**

4646 E. Van Buren  
St., Suite 400  
Phoenix, AZ 85008

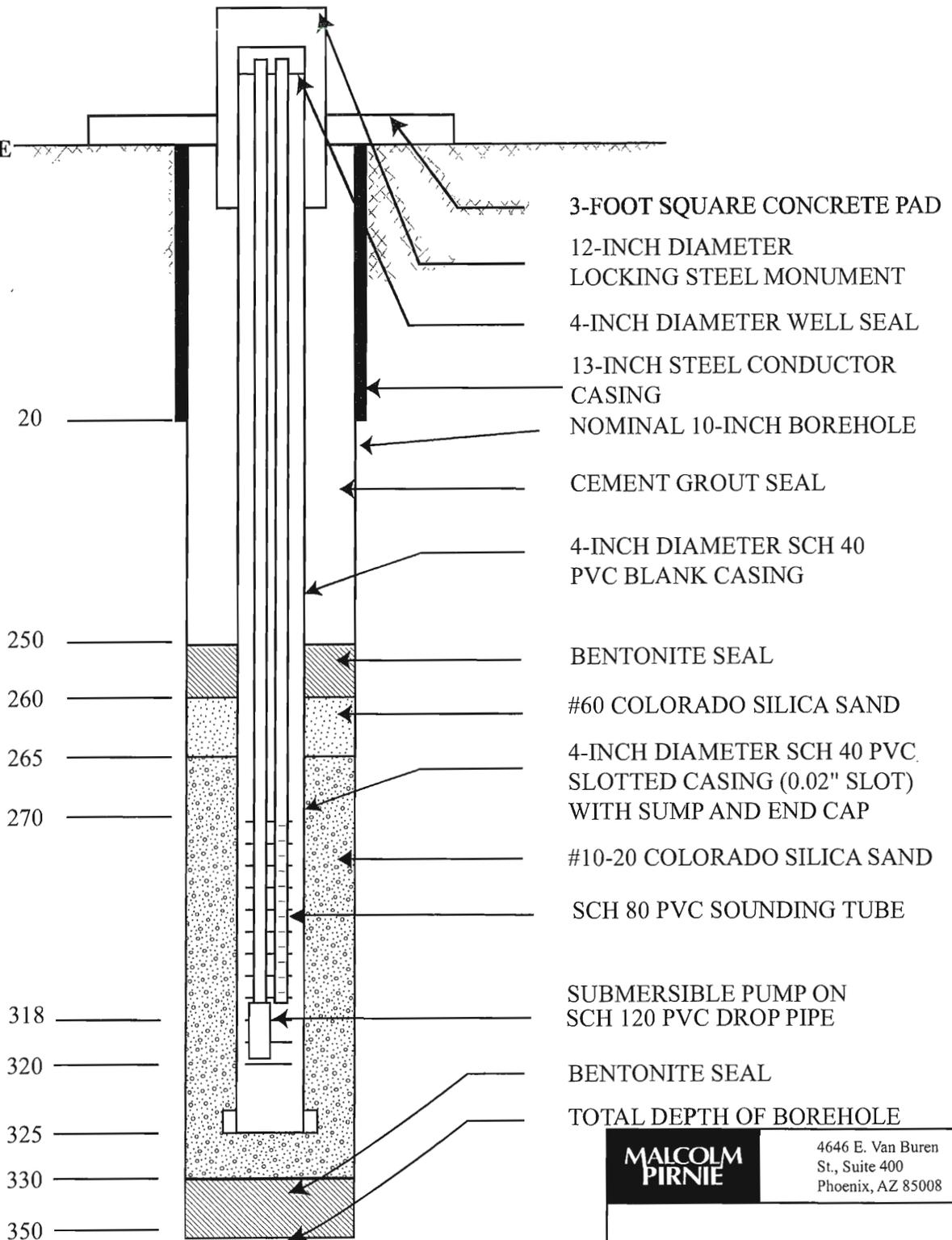
MW-14  
As-Built Construction Diagram  
2008 Annual Monitoring Report

December 2009

Appendix A

DEPTH  
(FT BGS)

SURFACE



NOT TO SCALE

**MALCOLM  
PIRNIE**

4646 E. Van Buren  
St., Suite 400  
Phoenix, AZ 85008

MW-15  
As-Built Construction Diagram  
2008 Annual Monitoring Report

December 2009

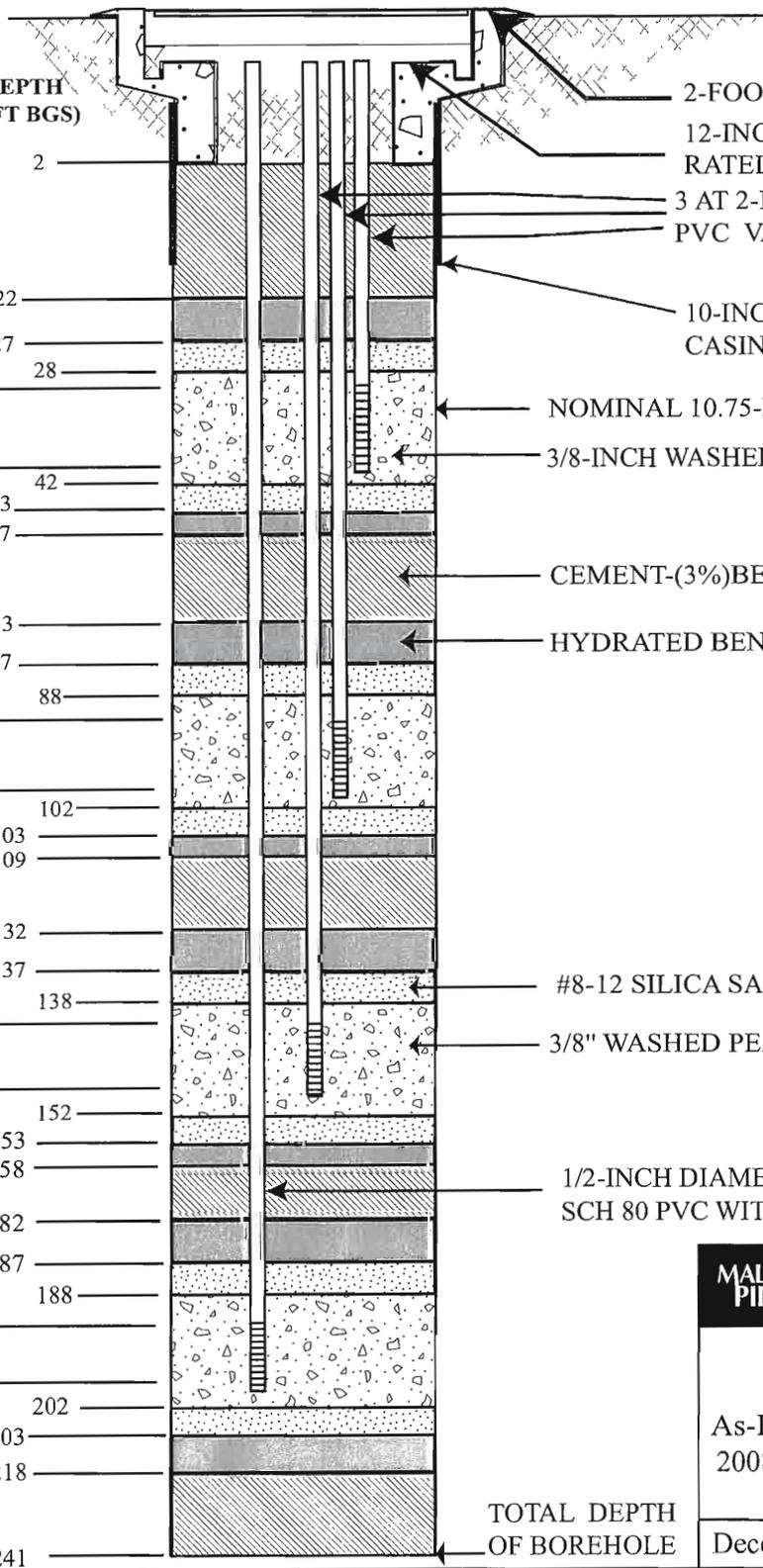
**Appendix A**

NOT TO SCALE

SURFACE

DEPTH  
(FT BGS)

2  
22  
27  
30  
40  
42  
43  
47  
83  
87  
90  
100  
102  
103  
109  
132  
137  
140  
150  
152  
153  
158  
182  
187  
188  
190  
200  
202  
203  
218  
241



2-FOOT SQUARE CONCRETE PAD

12-INCH DIAMETER TRAFFIC RATED FLUSH GRADE VAULT

3 AT 2-INCH DIAMETER SCH 80 PVC VAPOR PORTS

10-INCH STEEL CONDUCTOR CASING

NOMINAL 10.75-INCH BOREHOLE

3/8-INCH WASHED PEA GRAVEL

CEMENT-(3%) BENTONITE GROUT

HYDRATED BENTONITE SEAL

#8-12 SILICA SAND

3/8" WASHED PEA GRAVEL

1/2-INCH DIAMETER 0.040" SLOT SCH 80 PVC WITH ENDCAP

TOTAL DEPTH OF BOREHOLE

**MALCOLM  
PIRNIE**

4646 E. Van Buren  
St., Suite 400  
Phoenix, AZ 85008

SVMW-1  
As-Built Construction Diagram  
2008 Annual Monitoring Report

December 2009

**Appendix A**

**MALCOLM  
PIRNIE**

INDEPENDENT ENVIRONMENTAL  
ENGINEERS, SCIENTISTS  
AND CONSULTANTS

**B**  
APPENDIX

**B**

APPENDIX





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- 158319

Name Universal Precision Co Inc  
Address 25401 W Central Ave  
Phoenix AZ 85027  
Phone No. 480

Generating Location \_\_\_\_\_  
I.D. No. Control # 6526

WR 101432AZ 501 20 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 40CFR Part 261: That each waste has been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulation.

JEFFREY L MCPHEAR 3/20/08 [Signature]  
AUTHORIZED AGENT'S NAME (PRINT) DATE SIGNATURE

**CONTRACTOR**

Name \_\_\_\_\_ Phone No. \_\_\_\_\_  
Address \_\_\_\_\_

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 this waste has been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulation.

AUTHORIZED AGENT'S NAME (PRINT)

DATE

SIGNATURE

**TRANSPORTER**

Name MPE Phone No. 602-275-2804<sup>6233</sup>  
Address 3045 S. 51st Ave Driver's Name Dave 696  
Phoenix AZ 85045 Vehicle's No. BH 467

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

3/20/08 [Signature] 6/20/08 [Signature]  
SHIPMENT DATE DRIVER'S SIGNATURE DELIVERY DATE DRIVER'S SIGNATURE

**DISPOSAL FACILITY**

- BUTTERFIELD STATION FACILITY • 40404 South 99th Avenue • Mobile, Arizona 85239 • (602) 256-0630
- NORTHWEST REGIONAL LANDFILL • 19401 West Deer Valley Road • Surprise, Arizona 85387 • (623) 584-6065
- PAINTED DESERT LANDFILL • 9001 North Porter Avenue • Joseph City, Arizona 86032 • (520) 288-3605
- GRAY WOLF LANDFILL • 23355 East Highway 169 • Mile Post 11 • Dewey, Arizona 86327 • (520) 632-0370
- ONE CACTUS LANDFILL • 21402 North 7th Street • Phoenix, Arizona 85024 • (623) 516-0244
- RONWOOD LANDFILL • 12720 East Highway 287 • Florence, Arizona 85232 • (520) 868-8778

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

NAME (PRINT)

DATE

SIGNATURE

ORIGINAL - WHITE

DISPOSAL FACILITY - YELLOW

TRANSPORTER - PINK

GENERATOR - GOLDENROD



Northwest Regional Landfill  
 19401 Deer Valley Road  
 Surprise, AZ, 85387  
 Ph: 6235846065

Original  
 Ticket# 574671

Customer Name	MP Enviro MP Environmental	Carrier	MP Environmental	Volume
Ticket Date	06/30/2008	Vehicle#	696	
Payment Type	Credit Account	Container	20	
Manual Ticket#		Driver		
Hauling Ticket#		Check#		
Route		Billing #	0000006	
State Waste Code		Gen EPA ID		
Manifest	158319	Grid		
Destination				
PQ				
Profile	101432AZ (Universal Propulsion Co Inc)			
Generator	160-UNIVERSALPROPULSION Universal Propulsion CO			

	Time	Scale	Operator	Inbound	Gross	60840 lb*
In	06/30/2008 10:59:37	Inbound	cangel		Tare	35940 lb
Out	06/30/2008 11:13:04	Outbound	cangel		Net	24900 lb
			* Manual Weight		Tons	12.45

Comments Control # 6526

Product	LD%	Qty	UDM	Rate	Tax	Amount	Origin
1 Non Reg Soil -Tons	100	12.45	Tons				
2 Pceny-Env Fee - Cu	100		%				
3 FUEL-Fuel Surcharg	100		%				
4 ADE-ADEQ Fee	100	12.45	Tons				
5 AFL-Profile Fee	100	1	Each				

Total Tax  
 Total Ticket

Driver's Signature  
 403WM





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- 164549**

No. Universal Production Co.  
Address 25401 N. Central Ave.  
Phoenix AZ 85085  
Phone No. 623-516-3340 Jerry

Generating Location \_\_\_\_\_  
I.D. No. Control # 6575

WR 101432 AZ - Soil - Drill Cuttings 20 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 40CFR Part 261. That each waste has been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulation.

Jerry McPherson

AUTHORIZED AGENT'S NAME (PRINT)

8/19/2008

DATE

[Signature]

SIGNATURE

**CONTRACTOR**

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

Address \_\_\_\_\_

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.

AUTHORIZED AGENT'S NAME (PRINT)

DATE

SIGNATURE

**TRANSPORTER**

Name MRE  
Address 3045 S. 51st Ave.  
Phoenix AZ 85043

Phone No. 602-278-6233  
Driver's Name DAVE  
Vehicle's No. B.n #5049 / 696

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.

8-19-8

SHIPMENT DATE

[Signature]

DRIVER'S SIGNATURE

8-19-8

DELIVERY DATE

[Signature]

DRIVER'S SIGNATURE

**DISPOSAL FACILITY**

- BUTTERFIELD STATION FACILITY • 40404 South 99th Avenue • Mobile, Arizona 85239 • (602) 256-0630
- NORTHWEST REGIONAL LANDFILL • 19401 West Deer Valley Road • Surprise, Arizona 85387 • (623) 524-6065
- PAINTED DESERT LANDFILL • 9001 North Porter Avenue • Joseph City, Arizona 86032 • (520) 288-3606
- GRAY WOLF LANDFILL • 23355 East Highway 189 • Mile Post 11 • Dewey, Arizona 86327 • (520) 632-0370
- LONE CACTUS LANDFILL • 21402 North 7th Street • Phoenix, Arizona 85024 • (623) 516-0244
- IRONWOOD LANDFILL • 12720 East Highway 287 • Florence, Arizona 85232 • (520) 868-8778

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

8-19-08

DATE

[Signature]

SIGNATURE

NAME (PRINT)

ORIGINAL - WHITE

DISPOSAL FACILITY - YELLOW

TRANSPORTER - PINK

GENERATOR - GOLDENROD



Northwest Regional Landfill  
 19401 Deer Valley Road  
 Surprise, AZ, 85387  
 Ph: 6235845065

Original  
 Ticket# 582903

Customer Name	MP Enviro MP Environmental	Carrier	MP Environmental	Volume
Ticket Date	08/19/2008	Vehicle#	696	
Payment Type	Credit Account	Container	20	
Manual Ticket#		Driver		
Hauling Ticket#		Check#		
Route		Billing #	0000086	
State Waste Code		Gen EPA ID		
Manifest	164549	Grid		
Destination				
PO				
Profile	101432AZ (Universal Propulsion Co Inc)			
Generator	160-UNIVERSALPROPULSION Universal Propulsion CO			

	Time	Scale	Operator	Inbound	Gross	
In	08/19/2008 07:50:17	Inbound	LMGarcia			73200 lb
Out	08/19/2008 08:20:09	Outbound	LMGarcia		Tare	36820 lb
					Net	36480 lb
					Tons	18.23

Comments

Product	LD%	Qty	UOM	Rate	Tax	Amount	Origin
1 Non Reg Soil -Tons	100	18.23	Tons				
2 Pcnv-Env Fee - Cu	100		%				
3 FUEL-Fuel Surcharg	100		%				
4 ADE-ADEG Fee	100	18.23	Tons				

Total Tax  
 Total Ticket

Driver's Signature



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- 164550

Name Universal Propulsion Co.  
Address 25401 N. Central Ave.  
Phoenix AZ 85085  
Phone No. 623-516-3340 Jerry

Generating Location \_\_\_\_\_  
I.D. No. Control #6575

UNIT Y  
Material Soil - Drill Cuttings 20 Y  
Quantity 101432 AZ

- 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 40CFR Part 261. That each waste has been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulation.

Jerry L McPherson  
AUTHORIZED AGENT'S NAME (PRINT)

8/19/2008  
DATE

[Signature]  
SIGNATURE

### CONTRACTOR

Name \_\_\_\_\_ Phone No. \_\_\_\_\_  
Address \_\_\_\_\_  
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.

AUTHORIZED AGENT'S NAME (PRINT)

DATE

SIGNATURE

### TRANSPORTER

Name MPR  
Address 3045 S. 51st Ave.  
Phoenix AZ 85043

Phone No. 602-278-6233  
Driver's Name [Signature]  
Vehicle's No. Bin # 419T/6916

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.

8-19-8  
DEPARTURE DATE DRIVER'S SIGNATURE

8-19-8  
DELIVERY DATE DRIVER'S SIGNATURE

### DISPOSAL FACILITY

- BUTTERFIELD STATION FACILITY • 40404 South 99th Avenue • Mobile, Arizona 85239 • (602) 258-0630
- NORTHWEST REGIONAL LANDFILL • 19401 West Deer Valley Road • Surprise, Arizona 85387 • (623) 584-8088
- PAINTED DESERT LANDFILL • 9001 North Porter Avenue • Joseph City, Arizona 86032 • (520) 288-3608
- GRAY WOLF LANDFILL • 23355 East Highway 169 • Mile Post 11 • Dewey, Arizona 86327 • (520) 632-0370
- ONE CACTUS LANDFILL • 21402 North 7th Street • Phoenix, Arizona 85024 • (623) 516-0244
- IRONWOOD LANDFILL • 12720 East Highway 287 • Florence, Arizona 85232 • (520) 868-8778

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

NAME (PRINT)

DATE

SIGNATURE

ORIGINAL - WHITE DISPOSAL FACILITY - YELLOW TRANSPORTER - PINK GENERATOR - GOLDENROD



Northwest Regional Landfill  
 19401 Deer Valley Road  
 Surprise, AZ, 85387  
 Ph: 6235846065

Original  
 Ticket# 583027

Customer Name MP Enviro-~~MP~~ Environmental Carrier MP Environmental  
 Ticket Date 08/19/2008 Vehicle# 696 Volume  
 Payment Type Credit Account Container 20  
 Manual Ticket# Driver  
 Hauling Ticket# Check#  
 Route Billing # 0000086  
 State Waste Code Gen EPA ID  
 Manifest 164550A 70009  
 Destination Grid  
 PO  
 Profile 101432AZ (Universal Propulsion Co Inc)  
 Generator 160-UNIVERSALPROPULSION Universal Propulsion CO

Time	Scale	Operator	Inbound	Gross	
In 08/19/2008 12:52:36	Inbound	LMGarcia		67440 lb	
Out 08/19/2008 12:52:52	Inbound	LMGarcia		Tare 36820 lb*	
		* Manual Weight		Net 30620 lb	
Comments		5044		Tons 15.31	

Product	LDX	Qty	UOM	Rate	Tax	Amount	Origin
1 Non Reg Soil -Tons	100	15.31	Tons				
2 Pcnv-Env Fee - Cu	100		%				
3 FUEL-Fuel Burcharg	100		%				
4 ADE-ADEQ Fee	100	15.31	Tons				

*Rec'd 2 (10) 11/08/08 INT 11/08*

Total Tax  
 Total Ticket

Driver's Signature



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- 164551

Name Universal Production Co.  
Address 25401 N. Central Ave.  
Phoenix AZ 85085  
Phone No. 623-516-3340 Jerry

Generating Location \_\_\_\_\_  
I.D. No. Control # 6575

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

OR 101432 AZ Soil - Drill Cuttings 20 Y

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

Jerry C. McPherson 8/19/2008 [Signature]  
AUTHORIZED AGENT'S NAME (PRINT) DATE SIGNATURE

## CONTRACTOR

Name \_\_\_\_\_ Phone No. \_\_\_\_\_  
Address \_\_\_\_\_

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 waste has been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulation.

\_\_\_\_\_ AUTHORIZED AGENT'S NAME (PRINT) DATE SIGNATURE

## TRANSPORTER

Name MPB  
Address 3045 S. 51st. Ave.  
Phoenix AZ 85043

Phone No. 602-278-6233  
Driver's Name Dave 4779  
Vehicle's No. Bin # ~~4779~~ / 696

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 waste has been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulation.

8-19-8 Dave 8-19-8 Dave  
DEPARTURE DATE DRIVER'S SIGNATURE DELIVERY DATE DRIVER'S SIGNATURE

## DISPOSAL FACILITY

- BUTTERFIELD STATION FACILITY • 40404 South 99th Avenue • Mobile, Arizona 85239 • (602) 256-0630
- NORTHWEST REGIONAL LANDFILL • 19401 West Deer Valley Road • Surprise, Arizona 85387 • (623) 584-8065
- PAINTED DESERT LANDFILL • 9001 North Porter Avenue • Joseph City, Arizona 86032 • (520) 298-3605
- GRAY WOLF LANDFILL • 23355 East Highway 189 • Mile Post 11 • Dewey, Arizona 86327 • (520) 632-0370
- LOVE CACTUS LANDFILL • 21402 North 7th Street • Phoenix, Arizona 85024 • (623) 516-0244
- IRONWOOD LANDFILL • 12720 East Highway 287 • Florence, Arizona 85232 • (520) 868-8778

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

\_\_\_\_\_ 8/19/08 [Signature]  
NAME (PRINT) DATE SIGNATURE



Northwest Regional Landfill  
 19401 Deer Valley Road  
 Surprise, AZ, 85387  
 Ph: 6235846065

Original  
 Ticket# 583016

Customer Name MREnviro MP Environmental Carrier MP Environmental  
 Ticket Date 08/19/2008 Vehicle# 696 Volume  
 Payment Type Credit Account Container  
 Annual Ticket# Driver  
 Hauling Ticket# Check#  
 Route Billing # 0000086  
 State Waste Code Gen EPA ID  
 Manifest 164551  
 Destination A-769051 Grid  
 Profile 101432AZ (Universal Propulsion Co Inc)  
 Generator 160-UNIVERSALPROPULSION Universal Propulsion CO

Time	Scale	Operator	Inbound	Gross	73200 lb
In 08/19/2008 12:16:28	Inbound	LMBarrera		Tare	70400 lb
Out 08/19/2008 12:33:28	Outbound	LMBarrera		Net	2880 lb
Comments 6575 CONTROL #				Tons	1.44

Product	LD%	Qty	UOM	Rate	Tax	Amount	Origin
1 Non Reg Soil -Tons	100	1.44	Tons				
2 Pconv-Env Fee - Cu	100		%				
3 FUEL-Fuel Surcharg	100		%				
4 ADE-ADEQ Fee	100	1.44	Tons				

Dump 3-20 yds out. MIT MP  
 YARD

Total Tax  
 Total Ticket

Driver's Signature



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- 164552**

Name Universal Propulsion Co  
Address 25401 N. Central Ave.  
Phoenix AZ 85085  
Phone No. 623-516-3340

Generating Location \_\_\_\_\_  
I.D. No. Central # 6575

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

WR 101432A2 S:1/Dr.11cuttings 2-20 V

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

AUTHORIZED AGENT'S NAME (PRINT)

DATE

SIGNATURE

**CONTRACTOR**

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

Address \_\_\_\_\_

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.

AUTHORIZED AGENT'S NAME (PRINT)

DATE

SIGNATURE

**TRANSPORTER**

Name MPK Phone No. 602-278-6233

Address 3045 S. 51st Ave. Driver's Name \_\_\_\_\_

Phoenix AZ 85043 Vehicle's No. Bin # 3109

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

DELIVERY DATE

DRIVER'S SIGNATURE

**DISPOSAL FACILITY**

- BUTTERFIELD STATION FACILITY • 40404 South 99th Avenue • Mobile, Arizona 85239 • (602) 256-0630
- NORTHWEST REGIONAL LANDFILL • 19401 West Deer Valley Road • Surprise, Arizona 85387 • (623) 584-8065
- PAINTED DESERT LANDFILL • 9001 North Porter Avenue • Joseph City, Arizona 86032 • (520) 288-3605
- GRAY WOLF LANDFILL • 23355 East Highway 169 • Mile Post 11 • Dewey, Arizona 86327 • (520) 632-0370
- LONE CACTUS LANDFILL • 21402 North 7th Street • Phoenix, Arizona 85024 • (623) 516-0244
- IRONWOOD LANDFILL • 12720 East Highway 287 • Florence, Arizona 85232 • (520) 888-8778

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

NAME (PRINT)

DATE

SIGNATURE

ORIGINAL - WHITE

DISPOSAL FACILITY - YELLOW

TRANSPORTER - PINK

GENERATOR - GOLDENROD



Northwest Regional Landfill  
 19401 Deer Valley Road  
 Surprise, AZ, 85387  
 Phone: 6235846865

Original  
 Ticket# 585897

Customer Name MPEnviro MP Environmental  
 Ticket Date 09/02/2008  
 Payment Type Credit Account  
 Manual Ticket#  
 Hauling Ticket#  
 Route  
 State Waste Code  
 Manifest 164553-164552  
 Destination Grid  
 PG  
 Profile 101432AZ (Universal Propulsion Co Inc)  
 Generator 160-UNIVERSALPROPULSION Universal Propulsion CO

Carrier MP Environmental  
 Vehicle# 881  
 Container 20  
 Driver  
 Check#  
 Billing # 00000000  
 Gen EPA ID

Volume  
 84040 lb  
 37540 lb\*  
 46500 lb  
 23.25

	Time	Scale	Operator	Inbound	Gross	
In	09/02/2008 08:59:33	Inbound	LMGarcia		Tare	37540 lb*
Out	09/02/2008 10:47:35	Outbound	LMGarcia		Net	46500 lb
			* Manual Weight		Tons	23.25

Comments

Product	LD%	Qty	UOM	Rate	Tax	Amount	Origin
1 Non Reg Soil -Tons	100	23.25	Tons				
2 Pcnv-Env Fee - Cu	100		%				
3 FUEL-Fuel Surcharg	100		%				
4 ADE-ADEQ Fee	100	23.25	Tons				

Total Tax  
 Total Ticket

Driver's Signature





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- 164827**

Name Universal Population Co. Inc.

Address 25401 N. Central Ave.  
Phoenix AZ 85027

Phone No. 1 Jerry

Generating Location \_\_\_\_\_

I.D. No. Control #6526

1	0	1	4	3	2	AZ	Soil	20	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 40CFR Part 261: That each waste has been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulation.

Jerry L. M-P Alper  
AUTHORIZED AGENT'S NAME (PRINT)

30 Jun 08  
DATE

[Signature]  
SIGNATURE

**CONTRACTOR**

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

Address \_\_\_\_\_

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.

AUTHORIZED AGENT'S NAME (PRINT)

DATE

SIGNATURE

**TRANSPORTER**

Name MPR

Address 3245 S. 51st Ave.  
Phoenix AZ 85043

Phone No. 602-278-6233

Driver's Name Juan De la Cruz

Vehicle's No. Bin # 4296 TR # 881

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.

130/08  
SHIPMENT DATE

[Signature]  
DRIVER'S SIGNATURE

6-30-08  
DELIVERY DATE

[Signature]  
DRIVER'S SIGNATURE

**DISPOSAL FACILITY**

- BUTTERFIELD STATION FACILITY • 4040 South 99th Avenue • Mobile, Arizona 85239 • (602) 256-0630
- NORTHWEST REGIONAL LANDFILL • 19401 West Deer Valley Road • Surprise, Arizona 85387 • (623) 584-6065
- PAINTED DESERT LANDFILL • 9001 North Porter Avenue • Joseph City, Arizona 86032 • (520) 288-3605
- GRAY WOLF LANDFILL • 23355 East Highway 169 • Mile Post 11 • Dewey, Arizona 86327 • (520) 632-0370
- LONE CACTUS LANDFILL • 21402 North 7th Street • Phoenix, Arizona 85024 • (623) 516-0244
- IRONWOOD LANDFILL • 12720 East Highway 287 • Florence, Arizona 85232 • (520) 868-8778

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

NAME (PRINT)

DATE

SIGNATURE

ORIGINAL - WHITE DISPOSAL FACILITY - YELLOW TRANSPORTER - PINK GENERATOR - GOLDENROD



Northwest Regional Landfill  
 19401 Deer Valley Road  
 Surprise, AZ, 85387  
 Ph: 6235846065

Original  
 Ticket# 574673

Customer Name MPEnviro MP Environmental Carrier MP Environmental  
 Ticket Date 06/30/2008 Vehicle# 881  
 Payment Type Credit Account Container 20  
 Manual Ticket# Driver  
 Hauling Ticket# Check#  
 Route Billing # 0000066  
 State Waste Code Gen EPA ID  
 Manifest 164827  
 Destination Grid  
 PO  
 Profile 101432AZ (Universal Propulsion Co Inc)  
 Generator 160-UNIVERSALPROPULSION Universal Propulsion CO

Volume

Time  
 In 06/30/2008 11:00:33  
 Out 06/30/2008 11:14:47  
 Comments Control # 6526



Inbound Gross 52200 lb\*  
 Tare 25680 lb  
 Net 26520 lb  
 Tons 13.26

Product	LD%	Qty	UOM	Rate	Tax	Amount	Origin
1 Non Reg Soil -Tons	100	13.26	Tons				
2 Pcenv-Env Fee - Cu	100		%				
3 FUEL-Fuel Surcharg	100		%				
4 ADE-ADEG Fee	100	13.26	Tons				

Total Tax  
 Total Ticket



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- 165164**

Name Universal Propulsion Co.  
Address 25401 N. Central  
Phoenix AZ 85085  
Phone No. 623-516-3340

Generating Location \_\_\_\_\_  
I.D. No. Control # 6679

WR 101483  
\_\_\_\_\_  
\_\_\_\_\_

Soil

10

T

- 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 40CFR Part 261: That each waste has been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulation.

Jersey McPherson  
AUTHORIZED AGENT'S NAME (PRINT)

2/20/08  
DATE

[Signature]  
SIGNATURE

**CONTRACTOR**

Name Malcolm Picnic  
Address \_\_\_\_\_

Phone No. 602-797-4634

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.

AUTHORIZED AGENT'S NAME (PRINT)

DATE

SIGNATURE

**TRANSPORTER**

Name MPB  
Address 3045 S. 51st Ave.  
Phoenix AZ 85043

Phone No. 602-278-6233  
Driver's Name JAMAD CHAR  
Vehicle's No. Bin # 4429

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.

2/20/08  
SHIPMENT DATE

[Signature]  
DRIVER'S SIGNATURE

2/21/08  
DELIVERY DATE

[Signature]  
DRIVER'S SIGNATURE

**DISPOSAL FACILITY**

- BUTTERFIELD STATION FACILITY • 40404 South 99th Avenue • Mobile, Arizona 85239 • (602) 256-0630
- NORTHWEST REGIONAL LANDFILL • 19401 West Deer Valley Road • Surprise, Arizona 85387 • (623) 584-6065
- PAINTED DESERT LANDFILL • 9001 North Porter Avenue • Joseph City, Arizona 86032 • (520) 288-3605
- GRAY WOLF LANDFILL • 23355 East Highway 169 • Mile Post 11 • Dewey, Arizona 86327 • (520) 632-0370
- LONE CACTUS LANDFILL • 21402 North 7th Street • Phoenix, Arizona 85024 • (623) 516-0244
- IRONWOOD LANDFILL • 12720 East Highway 287 • Florence, Arizona 85232 • (520) 868-8778

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

NAME (PRINT)

DATE

SIGNATURE

ORIGINAL - WHITE DISPOSAL FACILITY - YELLOW TRANSPORTER - PINK GENERATOR - GOLDENROD

11-21-08 [Signature]



Northwest Regional Landfill  
 19401 Deer Valley Road  
 Surprise, AZ, 85387  
 Ph: 6235046065

Original  
 Ticket# 599705

Customer Name MPEnviro MP Environmental      Carrier # MP Environmental  
 Ticket Date 11/21/2008      Vehicle# 630  
 Payment Type Credit Account      Container 20  
 Manual Ticket#      Driver  
 Hauling Ticket#      Check#  
 Route      Billing \$ 0000086  
 State Waste Code      Gen EPA ID  
 Manifest 165164 165170      Grid  
 Destination  
 PD  
 Profile 10140302 (Universal Propulsion)  
 Generator 150-UNIVERSALPROPULSION Universal Propulsion CO

Volume

Time	Scale	Operator	Inbound	Gross	71920 lb
In 11/21/2008 08:58:28	Inbound	LMGarcia		Tare	37500 lb*
Out 11/21/2008 09:58:45	Inbound	LMGarcia		Net	34420 lb
		* Manual Weight		Tons	17.21

Comments

Product	LD%	Qty	UOM	Rate	Tax	Amount	Origin
1 Cont Soil Pet-Tons	100	17.21	Tons				
2 Recnv-Env Fee - Cu	100		%				
3 FUEL-Fuel Surcharg	100		%				
4 RDE ADED Fee	100	17.21	Tons				

Total Tax  
 Total Ticket

Driver's Signature



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- 165170**

Name Universal Propulsion Co.  
Address 25401 N. Central  
Phoenix AZ 85085  
Phone No. 623-516-3340

Generating Location \_\_\_\_\_  
I.D. No. Control # 6679

UNR 1101483  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Soil 10 T

- 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 40CFR Part 261: That each waste has been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulation.

Tracy C. McPherson  
AUTHORIZED AGENT'S NAME (PRINT)

21 Nov 08  
DATE

[Signature]  
SIGNATURE

**CONTRACTOR**

Name Malcolm Pirnie Co.

Phone No. 602-797-4634

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.

AUTHORIZED AGENT'S NAME (PRINT)

DATE

SIGNATURE

**TRANSPORTER**

Name MPB  
Address 3045 S. 51st Ave.  
Phoenix AZ 85043

Phone No. 602-278-6233  
Driver's Name JAVAD CHAK  
Vehicle's No. Bin # 4296

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.

11/21/08  
SHIPMENT DATE

[Signature]  
DRIVER'S SIGNATURE

11/21/08  
DELIVERY DATE

[Signature]  
DRIVER'S SIGNATURE

**DISPOSAL FACILITY**

- BUTTERFIELD STATION FACILITY • 40404 South 99th Avenue • Mobile, Arizona 85239 • (602) 256-0630
- NORTHWEST REGIONAL LANDFILL • 19401 West Deer Valley Road • Surprise, Arizona 85387 • (623) 584-6065
- PAINTED DESERT LANDFILL • 9001 North Porter Avenue • Joseph City, Arizona 86032 • (520) 288-3605
- GRAY WOLF LANDFILL • 23355 East Highway 169 • Mile Post 11 • Dewey, Arizona 86327 • (520) 632-0370
- LONE CACTUS LANDFILL • 21402 North 7th Street • Phoenix, Arizona 85024 • (623) 516-0244
- IRONWOOD LANDFILL • 12720 East Highway 287 • Florence, Arizona 85232 • (520) 868-8778

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

NAME (PRINT)

DATE

SIGNATURE

ORIGINAL - WHITE DISPOSAL FACILITY - YELLOW TRANSPORTER - PINK GENERATOR - GOLDENROD

11-21-08 [Signature]



Northwest Regional Landfill  
 19401 Deer Valley Road  
 Surprise, AZ, 85387  
 Ph: 6235846065

Original  
 Ticket# 599705

301 5

Customer Name NPEnviro MP Environmental      Carrier : MP Environmental  
 Ticket Date 11/21/2008      Vehicle# 630  
 Payment Type Credit Account      Container 20  
 Manual Ticket#      Driver  
 Hauling Ticket#      Check#  
 Route      Billing # 0000006  
 State Waste Code      Gen EPA ID  
 Manifest 165164 165170      Grid  
 Destination  
 PO  
 Profile 101403AZ (Universal Propulsion)  
 Generator 160-UNIVERSALPROPULSION Universal Propulsion CO

Volume

	Time	Scale	Operator	Inbound	Gross	71920 lb
In	11/21/2008 08:58:28	Inbound	LMGarcia		Tare	37500 lb*
Out	11/21/2008 08:58:45	Inbound	LMGarcia		Net	34420 lb
			* Manual Weight		Tons	17.21

Comments

Product	LDX	Dty	UOM	Rate	Tax	Amount	Origin
1 Cont Soil Pat-Tons	100	17.21	Tons				
2 Presv-Env Fee - Cu	100		%				
3 FUEL-Fuel Surcharg	100		%				
4 RDE-ROEQ Fee	100	17.21	Tons				

Total Tax  
 Total Ticket

Driver's Signature

YOU MUST INDICATE  
YOUR PROFILE NUMBER

# NON-HAZARDOUS LIQUID WASTE TRANSPORTATION TRIP TICKET

173176

195699

## GENERATOR INFORMATION

(MUST BE COMPLETED BY GENERATOR)

MPB Job # 11843

BUSINESS NAME: WPCO LESOA GENERATOR I.D. # \_\_\_\_\_

ADDRESS: 25401 N. Central Ave. TELEPHONE: (602)

CITY: Phoenix STATE: AZ ZIP CODE: 85027

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

WASTE TANK OR TRAP CAPACITY: \_\_\_\_\_ GALLONS

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

GENERATOR / REPRESENTATIVE NAME: Jerry McFerron (PLEASE PRINT)

7/10/08 (DATE SERVICED) \_\_\_\_\_ (GENERATOR / REPRESENTATIVE SIGNATURE)

## TRANSPORTER INFORMATION

(MUST BE COMPLETED BY GENERATOR)

BUSINESS NAME: MPB LESOA TRANSPORTER I.D.# \_\_\_\_\_

ADDRESS: 3045 S. 56th Ave. TELEPHONE: (602) 278-6233

CITY: Phoenix STATE: AZ ZIP CODE: 85043

GALLONS REMOVED: 4000 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.

DRIVER NAME: Dov (PLEASE PRINT)

7-10-08 (DATE AND TIME WASTE TRANSPORTED) \_\_\_\_\_ (DRIVER SIGNATURE)

## TREATMENT / DISPOSAL INFORMATION

LIQUID ENVIRONMENTAL SOLUTIONS  
5159 WEST VAN BUREN STREET • PHOENIX, ARIZONA 85043 • (602) 278-3442

ADEQ PERMIT #: PRU96-172

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: Kevin Brandt (PLEASE PRINT)

7-10-08 (DATE AND TIME WASTE RECEIVED) \_\_\_\_\_ (SITE OPERATOR SIGNATURE)

LIQUID ENVIRONMENTAL SOLUTIONS OF TEXAS, LP  
5159 WEST VAN BUREN ST  
PHOENIX, AZ 85043  
602-278-3442



Thursday, July 10, 2008

Work Order #

Scheduled Date: 7/10/2008 09:03 AM

122871

UNIVERSAL PROPULTION  
25401 N CENTRAL AVE  
  
PHOENIX, AZ 85085  
623-516-3340 017747

MP ENVIRONMENTAL SVCS, INC.  
3045 S. 51ST AVE.  
  
PHOENIX, AZ 85043  
800-458-3036 000447

**Transporter**

MP ENVIRONMENTAL SERVICE

**Facility**

LES-PHOENIX PLANT

[Redacted]

[Redacted]

[Redacted]

NON-INDUSTRIAL 173176 195699 4000.00 3ALLONS

Total This Work Order: 4,000.00

Driver Name:

*Dan*

Signature:

*[Signature]*

YOU MUST INDICATE  
OUR PROFILE NUMBER

# NON-HAZARDOUS LIQUID WASTE TRANSPORTATION TRIP TICKET

173179

## GENERATOR INFORMATION (MUST BE COMPLETED BY GENERATOR)

MPE Job # 11843

BUSINESS NAME: UPCO LESOA GENERATOR I.D. # \_\_\_\_\_  
ADDRESS: 25401 N. Central Ave. TELEPHONE: (623) 516-3340  
CITY: Phoenix STATE: AZ ZIP CODE: 85085

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

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

GENERATOR / REPRESENTATIVE NAME: Jerry McFarland (PLEASE PRINT)  
8/19/2008 (DATE SERVICED) Ashley (GENERATOR / REPRESENTATIVE SIGNATURE)

## TRANSPORTER INFORMATION (MUST BE COMPLETED BY GENERATOR)

BUSINESS NAME: MPE LESOA TRANSPORTER I.D.# \_\_\_\_\_  
ADDRESS: 3045 S 51st Ave TELEPHONE: (602) 278-0333  
CITY: Phoenix STATE: AZ ZIP CODE: 85023  
GALLONS REMOVED: 3000 TRAILER LICENSE PLATE #: 1WE1550

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: David Slovic (PLEASE PRINT)  
8-19-08 (DATE AND TIME WASTE TRANSPORTED) [Signature] (DRIVER SIGNATURE)

## TREATMENT / DISPOSAL INFORMATION

LIQUID ENVIRONMENTAL SOLUTIONS  
5159 WEST VAN BUREN STREET • PHOENIX, ARIZONA 85043 • (602) 278-3442

ADEQ PERMIT #: PRU96-172

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: Pat Generoso (PLEASE PRINT)  
08-19-08 @ 0943h (DATE AND TIME WASTE RECEIVED) [Signature] (SITE OPERATOR SIGNATURE)

LIQUID ENVIRONMENTAL SOLUTIONS OF TEXAS, LP  
5159 WEST VAN BUREN ST  
PHOENIX, AZ 85043  
602-278-3442



Tuesday, August 19, 2008

Work Order #

Scheduled Date: 8/19/2008 09:46 AM

124711

UNIVERSAL PROPULTION  
25401 N CENTRAL AVE  
  
PHOENIX, AZ 85085  
623-516-3340 017747

MP ENVIRONMENTAL SVCS, INC.  
3045 S. 51ST AVE.  
  
PHOENIX, AZ 85043  
800-458-3036 000447

**Transporter**

MP ENVIRONMENTAL SERVICE

**Facility**

LES-PHOENIX PLANT

[REDACTED]

[REDACTED]

[REDACTED]

NON-INDUSTRIAL 173179 195699 5000.00 GALLONS

Total This Work Order: 5,000.00

Driver Name:

*Dow*

Signature:

*[Signature]*



# LIQUID ENVIRONMENTAL SOLUTIONS

## NON-HAZARDOUS WASTE MANIFEST

31995

195699

Generator Name	Name: <u>Unicross Propulsion</u>	Generator Address	Address: <u>23401 Cantel Ave.</u>
	Phone: <u>(623) 576-3340</u>		City: <u>Phoenix</u> State: <u>AZ</u> Zip: <u>85085</u>



Waste Type	<input type="checkbox"/> Grease Trap <input type="checkbox"/> Grit Trap <input type="checkbox"/> Septic/Chemical Toilet <input checked="" type="checkbox"/> Non-Industrial <input type="checkbox"/> Industrial <input type="checkbox"/> Special
------------	---

I certify that the waste material removed from the above premises does not contain any radioactive, flammable, explosive, toxic or hazardous material ("Excluded Waste"). The term "hazardous material" is defined as any one or more pollutant, toxic substance, hazardous substance, solvent or oil as defined in or pursuant to the Resource Conservation and Recovery Act, the Comprehensive Environmental Response Compensation and Liability Act, the Federal Clean Water Act, or any other federal, state or local environmental law, regulation, ordinance, or rule, whether existing as of the date of this agreement or subsequently enacted. I also acknowledge that the Generator shall be responsible for any costs incurred by the Transporter or Disposal Facility in handling or proper disposal of any hazardous waste and that the Generator expressly agrees to defend, indemnify and hold harmless the Transporter from and against any and all damages, costs, fines and liabilities resulting from or arising out of any such hazardous waste.

Generator Rep. Name (please print)	<u>Jerry L. McPherson</u>	Generator Rep. Signature	
------------------------------------	---------------------------	--------------------------	--

Transporter Name	Name: <u>MPE</u>	Transporter Address	Address: <u>3045 S. 51st Ave.</u>
	Phone: <u>(602) 278-6233</u>		City: <u>Phoenix</u> State: <u>AZ</u> Zip: <u>85043</u>

Waste Removed (Gallons)	<u>2650</u>	Date	Time
		<u>9/17/2008</u>	<u>8:30A</u>

I certify that the information above is accurate, and that only the waste certified for removal by the Generator is contained in the servicing vehicle. I am aware that falsification of this manifest may result in prosecution.

Driver Name (please print)	<u>Chad Tucker</u>	Driver Signature	
----------------------------	--------------------	------------------	--

Disposal Facility	<u>Liquid Environmental Solutions of Arizona</u>	Address	<u>5159 West Van Buren Street Phoenix, AZ 85043</u>
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Waste Received (Gallons)	<u>2650</u>	Date	Time
		<u>09-17-08</u>	<u>09:56A</u>

Facility Rep. Name (please print)	<u>Pat Guerrero</u>	Facility Rep. Signature	
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WHITE - Generator Final Copy    YELLOW - Liquid Environmental Solutions Copy    GOLDENROD - Transporter Copy    PINK - Generator 1st Copy

LIQUID ENVIRONMENTAL SOLUTIONS OF TEXAS, LP  
5159 WEST VAN-BUREN ST  
PHOENIX, AZ 85043  
602-278-3442



Wednesday, September 17, 2008

Work Order #

Scheduled Date: 9/17/2008 09:54 AM

**125907**

Service For	
UNIVERSAL PROPULTION 25401 N CENTRAL AVE  PHOENIX, AZ 85085 623-516-3340	017747

Billing Information	
MP ENVIRONMENTAL SVCS, INC. 3045 S. 51ST AVE.  PHOENIX, AZ 85043 800-458-3036	000447

**Transporter**  
MP ENVIRONMENTAL SERVICE

**Facility**  
LES-PHOENIX PLANT

Comments

Notes

Svc Description	Manifest #	Profile #	Qty	UoM
NON-INDUSTRIAL	31995	195699	2650.00	GALLONS
Total This Work Order:			<b>2,650.00</b>	

Driver Name: \_\_\_\_\_

Signature: \_\_\_\_\_

Work Order #

**125907**

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

Form Approved. OMB No. 2050-0039

<b>UNIFORM HAZARDOUS WASTE MANIFEST</b>		1. Generator ID Number 2005750	2. Page 1 of 1	3. Emergency Response Phone 800-424-9313	4. Manifest Tracking Number <b>000527689 FLE</b>	
5. Generator's Name and Mailing Address Universal Properties Co 2549 W Central Phoenix AZ				Generator's Site Address (if different than mailing address)		
Generator's Phone: 602-919-1300						
6. Transporter 1 Company Name Clean Harbors Environmental Services Inc.				U.S. EPA ID Number MAL05272150		
7. Transporter 2 Company Name				U.S. EPA ID Number		
8. Designated Facility Name and Site Address Clean Harbors Arizona LLC 1340 West Lincoln Street Phoenix, AZ, 85007				U.S. EPA ID Number AZ0004548018		
Facility's Phone: (802) 258-8155						
9a. HM	9b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	10. Containers		11. Total Quantity	12. Unit Wt./Vol.	13. Waste Codes
		No.	Type			
	1. NONE, NON HAZARDOUS WASTE LIQUIDS, WATER.	001	TT	5000	G	NONE
	2.					
	3.					
	4.					
14. Special Handling Instructions and Additional Information 3055750  40000 4, 125 lbs						
15. GENERATOR'S/OFFEROR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. If export shipment and I am the Primary Exporter, I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgment of Consent. I certify that the waste minimization statement identified in 40 CFR 262.27(a) (if I am a large quantity generator) or (b) (if I am a small quantity generator) is true.						
Generator's/Offorer's Printed/Typed Name JEFFREY McPHEARIN				Signature [Signature]		Month Day Year 02 05 08
16. International Shipments <input type="checkbox"/> Import to U.S. <input type="checkbox"/> Export from U.S. Port of entry/exit: _____ Transporter signature (for exports only): _____ Date leaving U.S.: _____						
17. Transporter Acknowledgment of Receipt of Materials Transporter 1 Printed/Typed Name JEFFREY HINDEWALTER Signature [Signature] Month Day Year 2 5 08 Transporter 2 Printed/Typed Name Signature _____ Month Day Year _____						
18. Discrepancy 18a. Discrepancy Indication Space <input type="checkbox"/> Quantity <input type="checkbox"/> Type <input type="checkbox"/> Residue <input type="checkbox"/> Partial Rejection <input type="checkbox"/> Full Rejection Manifest Reference Number: _____						
18b. Alternate Facility (or Generator)				U.S. EPA ID Number		
Facility's Phone: _____						
18c. Signature of Alternate Facility (or Generator)				Month Day Year		
19. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)						
1.	2.	3.	4.			
1.	114					
20. Designated Facility Owner or Operator: Certification of receipt of hazardous materials covered by the manifest except as noted in Item 18a						
Printed/Typed Name [Signature]				Signature [Signature]		Month Day Year 02 05 08

**MALCOLM  
PIRNIE**

INDEPENDENT ENVIRONMENTAL  
ENGINEERS, SCIENTISTS  
AND CONSULTANTS

C

APPENDIX



C  
APPENDIX

**Appendix C**  
**Water Level Data UPCO Wells**

<b>Well Identification</b>	<b>Date of Measurement</b>	<b>Measuring Point Elevation (ft amsl)</b>	<b>Depth to Water from Measuring Point (ft)</b>	<b>Groundwater Elevation (ft amsl)</b>
MW-1	12/15/2008	1557.22	208.44	1348.78
	11/21/2008	1557.22	208.36	1348.86
	10/14/2008	1557.22	208.37	1348.85
	9/20/2008	1557.22	208.44	1348.78
	8/29/2008	1557.22	208.55	1348.67
	7/28/2008	1557.22	208.50	1348.72
	6/27/2008	1557.22	208.53	1348.69
	5/27/2008	1557.22	208.37	1348.85
	4/29/2008	1557.22	208.27	1348.95
	3/31/2008	1557.22	208.24	1348.98
	1/14/2008	1557.22	208.37	1348.85
	10/15/2007	1557.22	208.16	1349.06
	7/30/2007	1557.22	207.84	1349.38
	4/9/2007	1557.22	208.03	1349.19
	2/12/2007	1557.22	208.08	1349.14
	11/13/2006	1557.22	208.04	1349.18
	8/28/2006	1557.22	208.04	1349.18
	5/22/2006	1557.22	208.08	1349.14
	3/20/2006	1557.22	207.98	1349.24
	12/22/2005	1557.22	208.15	1349.07
	12/2/2005	1557.22	207.97	1349.25
	10/24/2005	1557.22	208.03	1349.19
	9/22/2005	1557.22	208.03	1349.19
	8/22/2005	1557.22	208.04	1349.18
	7/18/2005	1557.22	208.13	1349.09
	6/27/2005	1557.22	207.82	1349.40
	5/20/2005	1557.22	207.69	1349.53
	4/25/2005	1557.22	207.47	1349.75
	3/15/2005	1557.22	207.36	1349.86
	2/14/2005	1557.22	207.52	1349.70
	1/17/2005	1557.22	207.62	1349.60
12/7/2004	1557.22	207.80	1349.42	
11/22/2004	1557.22	207.71	1349.51	
10/22/2004	1557.22	207.42	1349.80	
9/7/2004	1557.22	207.79	1349.43	
4/16/2004	1557.22	206.66	1350.61	
3/19/2004	1557.22	206.70	1350.57	
1/6/2004	1557.19	206.64	1350.55	

**Appendix C**  
**Water Level Data UPCO Wells**

<b>Well Identification</b>	<b>Date of Measurement</b>	<b>Measuring Point Elevation (ft amsl)</b>	<b>Depth to Water from Measuring Point (ft)</b>	<b>Groundwater Elevation (ft amsl)</b>
MW-2	12/15/2008	1567.62	218.77	1348.85
	11/21/2008	1567.62	218.69	1348.93
	10/14/2008	1567.62	218.69	1348.93
	9/20/2008	1567.62	218.75	1348.87
	8/29/2008	1567.62	218.83	1348.79
	7/28/2008	1567.62	218.81	1348.81
	6/27/2008	1567.62	218.89	1348.73
	5/27/2008	1567.62	218.69	1348.93
	4/29/2008	1567.62	218.54	1349.08
	3/31/2008	1567.62	218.55	1349.07
	1/14/2008	1567.62	218.70	1348.92
	10/15/2007	1567.62	218.45	1349.17
	7/30/2007	1567.62	218.19	1349.43
	4/9/2007	1567.62	218.41	1349.21
	2/12/2007	1567.62	218.48	1349.14
	11/13/2006	1567.62	218.38	1349.24
	8/28/2006	1567.62	218.35	1349.27
	5/22/2006	1567.62	218.43	1349.19
	3/20/2006	1567.62	218.33	1349.29
	12/22/2005	1567.62	218.48	1349.14
	12/2/2005	1567.62	218.34	1349.28
	10/24/2005	1567.62	218.44	1349.18
	9/22/2005	1567.62	218.44	1349.18
	8/22/2005	1567.62	218.43	1349.19
	7/18/2005	1567.62	218.53	1349.09
	6/27/2005	1567.62	218.20	1349.42
	5/20/2005	1567.62	218.06	1349.56
	4/25/2005	1567.62	217.88	1349.74
	3/15/2005	1567.62	217.83	1349.79
	2/14/2005	1567.62	217.93	1349.69
	1/17/2005	1567.62	218.02	1349.60
	12/7/2004	1567.62	218.15	1349.47
11/22/2004	1567.62	218.10	1349.52	
10/22/2004	1567.62	217.62	1350.00	
9/7/2004	1567.62	218.06	1349.56	
4/16/2004	1567.67	217.06	1350.61	
3/19/2004	1567.67	217.40	1350.27	
1/6/2004	1567.51	216.90	1350.61	

**Appendix C**  
**Water Level Data UPCO Wells**

<b>Well Identification</b>	<b>Date of Measurement</b>	<b>Measuring Point Elevation (ft amsl)</b>	<b>Depth to Water from Measuring Point (ft)</b>	<b>Groundwater Elevation (ft amsl)</b>
<b>MW-3</b>	12/15/2008	1583.59	236.59	1347.00
	11/21/2008	1583.59	236.45	1347.14
	10/14/2008	1583.59	236.30	1347.29
	9/20/2008	1583.59	236.10	1347.49
	8/29/2008	1583.59	236.07	1347.52
	7/28/2008	1583.59	235.79	1347.80
	6/27/2008	1583.59	235.66	1347.93
	5/27/2008	1583.59	235.48	1348.11
	4/29/2008	1583.59	235.21	1348.38
	3/31/2008	1583.59	235.42	1348.17
	1/14/2008	1583.59	234.93	1348.66
	10/15/2007	1583.59	234.45	1349.14
	7/30/2007	1583.59	233.52	1350.07
	4/9/2007	1583.59	233.11	1350.48
	2/12/2007	1583.59	232.76	1350.83
	11/13/2006	1583.59	232.82	1350.77
	8/28/2006	1583.59	232.24	1351.35
	5/22/2006	1583.59	231.91	1351.68
	3/21/2006	1583.59	231.59	1352.00
	12/22/2005	1583.59	231.15	1352.44
	11/30/2005	1583.59	231.12	1352.47
	10/24/2005	1583.59	230.94	1352.65
	9/22/2005	1583.59	231.67	1351.92
	8/22/2005	1583.59	230.63	1352.96
	7/18/2005	1583.59	230.61	1352.98
	6/27/2005	1583.59	230.30	1353.29
	5/20/2005	1583.59	230.21	1353.38
	4/25/2005	1583.59	229.94	1353.65
	3/15/2005	1583.59	229.86	1353.73
	2/14/2005	1583.59	229.73	1353.86
1/17/2005	1583.59	229.35	1354.24	
12/7/2004	1583.59	229.03	1354.56	
11/22/2004	1583.59	228.91	1354.68	
10/22/2004	1583.59	227.92	1355.67	
9/7/2004	1583.59	229.10	1354.50	

**Appendix C**  
**Water Level Data UPCO Wells**

<b>Well Identification</b>	<b>Date of Measurement</b>	<b>Measuring Point Elevation (ft amsl)</b>	<b>Depth to Water from Measuring Point (ft)</b>	<b>Groundwater Elevation (ft amsl)</b>
<b>MW-4</b>	12/15/2008	1620.34	274.90	1345.44
	11/21/2008	1620.34	274.70	1345.64
	10/14/2008	1620.34	274.68	1345.66
	9/20/2008	1620.34	274.48	1345.86
	8/29/2008	1620.34	274.40	1345.94
	7/28/2008	1620.34	274.22	1346.12
	6/27/2008	1620.34	274.18	1346.16
	5/27/2008	1620.34	274.05	1346.29
	4/29/2008	1620.34	273.76	1346.58
	3/31/2008	1620.34	274.00	1346.34
	1/14/2008	1620.34	273.81	1346.53
	10/15/2007	1620.34	273.35	1346.99
	7/30/2007	1620.34	272.63	1347.71
	4/9/2007	1620.34	271.66	1348.68
	2/12/2007	1620.34	271.51	1348.83
	11/13/2006	1620.34	271.33	1349.01
	8/28/2006	1620.34	271.82	1348.52
	5/22/2006	1620.34	271.43	1348.91
	3/20/2006	1620.34	271.28	1349.06
	12/22/2005	1620.34	270.80	1349.54
	11/30/2005	1620.34	270.82	1349.52
	10/24/2005	1620.34	270.78	1349.56
	9/22/2005	1620.34	270.44	1349.90
	8/22/2005	1620.34	270.40	1349.94
	7/18/2005	1620.34	270.56	1349.78
	6/27/2005	1620.34	270.26	1350.08
	5/20/2005	1620.34	270.22	1350.12
	4/25/2005	1620.34	270.12	1350.22
	3/15/2005	1620.34	270.15	1350.19
	2/14/2005	1620.34	270.04	1350.30
1/17/2005	1620.34	269.84	1350.50	
12/7/2004	1620.34	269.83	1350.51	
11/22/2004	1620.34	269.58	1350.76	
10/22/2004	1620.34	268.92	1351.42	
9/7/2004	1620.34	269.13	1351.21	

**Appendix C**  
**Water Level Data UPCO Wells**

<b>Well Identification</b>	<b>Date of Measurement</b>	<b>Measuring Point Elevation (ft amsl)</b>	<b>Depth to Water from Measuring Point (ft)</b>	<b>Groundwater Elevation (ft amsl)</b>
<b>MW-5</b>	12/15/2008	1590.45	241.43	1349.02
	11/21/2008	1590.45	241.45	1349.00
	10/14/2008	1590.45	241.43	1349.02
	9/20/2008	1590.45	241.48	1348.97
	8/29/2008	1590.45	241.45	1349.00
	7/28/2008	1590.45	241.44	1349.01
	6/27/2008	1590.45	241.48	1348.97
	5/27/2008	1590.45	241.33	1349.12
	4/29/2008	1590.45	241.28	1349.17
	3/31/2008	1590.45	241.31	1349.14
	1/14/2008	1590.45	241.28	1349.17
	10/15/2007	1590.45	241.12	1349.33
	7/30/2007	1590.45	240.81	1349.64
	4/9/2007	1590.45	241.10	1349.35
	2/12/2007	1590.45	241.09	1349.36
	11/13/2006	1590.45	241.04	1349.41
	8/28/2006	1590.45	240.97	1349.48
	5/22/2006	1590.45	241.07	1349.38
	3/20/2006	1590.45	240.92	1349.53
	12/22/2005	1590.45	240.90	1349.55
	11/30/2005	1590.45	240.81	1349.64
	10/24/2005	1590.45	240.85	1349.60
	9/22/2005	1590.45	240.81	1349.64
	8/22/2005	1590.45	240.81	1349.64
	7/18/2005	1590.45	240.90	1349.55
	6/27/2005	1590.45	240.58	1349.87
	5/20/2005	1590.45	240.48	1349.97
	4/25/2005	1590.45	240.38	1350.07
	3/15/2005	1590.45	240.36	1350.09
	2/14/2005	1590.45	240.44	1350.01
1/17/2005	1590.45	240.47	1349.98	
12/7/2004	1590.45	240.49	1349.96	
11/22/2004	1590.45	240.40	1350.05	
10/22/2004	1590.45	239.67	1350.78	
9/7/2004	1590.45	240.17	1350.28	

**Appendix C**  
**Water Level Data UPCO Wells**

<b>Well Identification</b>	<b>Date of Measurement</b>	<b>Measuring Point Elevation (ft amsl)</b>	<b>Depth to Water from Measuring Point (ft)</b>	<b>Groundwater Elevation (ft amsl)</b>
<b>MW-6</b>	12/15/2008	1548.22	161.89	1386.33
	11/21/2008	1548.22	161.71	1386.51
	10/14/2008	1548.22	161.48	1386.74
	9/20/2008	1548.22	161.33	1386.89
	8/29/2008	1548.22	161.30	1386.92
	7/28/2008	1548.22	161.50	1386.72
	6/27/2008	1548.22	162.08	1386.14
	5/27/2008	1548.22	163.05	1385.17
	4/29/2008	1548.22	164.28	1383.94
	3/31/2008	1548.22	165.42	1382.80
	1/14/2008	1548.22	164.94	1383.28
	10/15/2007	1548.22	163.95	1384.27
	7/30/2007	1548.22	162.92	1385.30
	4/9/2007	1548.22	161.63	1386.59
	2/12/2007	1548.22	161.95	1386.27
	11/13/2006	1548.22	161.11	1387.11
	8/28/2006	1548.22	159.64	1388.58
	5/22/2006	1548.22	157.80	1390.42
	3/20/2006	1548.22	156.61	1391.61
	12/22/2005	1548.22	154.68	1393.54
	11/30/2005	1548.22	154.16	1394.06
	10/24/2005	1548.22	153.11	1395.11
	9/22/2005	1548.22	151.89	1396.33
	8/22/2005	1548.22	150.88	1397.34
	7/18/2005	1548.22	149.61	1398.61
	6/27/2005	1548.22	148.82	1399.40
	5/20/2005	1548.22	148.31	1399.91
	4/25/2005	1548.22	149.74	1398.48
	3/15/2005	1548.22	160.38	1387.84
	2/14/2005	1548.22	162.50	1385.72
1/17/2005	1548.22	162.32	1385.90	
12/7/2004	1548.22	161.99	1386.23	
11/22/2004	1548.22	161.77	1386.45	
10/22/2004	1548.22	161.27	1386.95	
9/7/2004	1548.22	162.22	1386.00	

**Appendix C**  
**Water Level Data UPCO Wells**

<b>Well Identification</b>	<b>Date of Measurement</b>	<b>Measuring Point Elevation (ft amsl)</b>	<b>Depth to Water from Measuring Point (ft)</b>	<b>Groundwater Elevation (ft amsl)</b>
MW-7	12/15/2008	1541.35	161.19	1380.16
	11/21/2008	1541.35	161.22	1380.13
	10/14/2008	1541.35	161.21	1380.14
	9/20/2008	1541.35	160.98	1380.37
	8/29/2008	1541.35	160.85	1380.50
	7/28/2008	1541.35	160.92	1380.43
	6/27/2008	1541.35	160.83	1380.52
	5/27/2008	1541.35	160.63	1380.72
	4/29/2008	1541.35	160.46	1380.89
	3/31/2008	1541.35	160.53	1380.82
	1/14/2008	1541.35	160.61	1380.74
	10/15/2007	1541.35	160.12	1381.23
	7/30/2007	1541.35	159.48	1381.87
	4/9/2007	1541.35	159.30	1382.05
	2/12/2007	1541.35	159.37	1381.98
	11/13/2006	1541.35	159.48	1381.87
	8/28/2006	1541.35	159.54	1381.81
	5/22/2006	1541.35	159.39	1381.96
	3/20/2006	1541.35	158.83	1382.52
	12/22/2005	1541.35	157.73	1383.62
	11/30/2005	1541.35	157.41	1383.94
	10/24/2005	1541.35	157.01	1384.34
	9/22/2005	1541.35	156.37	1384.98
	8/22/2005	1541.35	156.09	1385.26
	7/18/2005	1541.35	155.94	1385.41
	6/27/2005	1541.35	155.60	1385.75
	5/20/2005	1541.35	155.56	1385.79
	4/25/2005	1541.35	155.56	1385.79
	3/15/2005	1541.35	155.48	1385.87
	2/14/2005	1541.35	155.20	1386.15
1/17/2005	1541.35	155.02	1386.33	
12/7/2004	1541.35	154.55	1386.80	
11/22/2004	1541.35	154.14	1387.21	
10/22/2004	1541.35	157.21	1384.14	

**Appendix C**  
**Water Level Data UPCO Wells**

<b>Well Identification</b>	<b>Date of Measurement</b>	<b>Measuring Point Elevation (ft amsl)</b>	<b>Depth to Water from Measuring Point (ft)</b>	<b>Groundwater Elevation (ft amsl)</b>
<b>MW-8</b>	12/15/2008	1542.18	193.35	1348.83
	11/21/2008	1542.18	193.38	1348.80
	10/14/2008	1542.18	193.37	1348.81
	9/20/2008	1542.18	193.35	1348.83
	8/29/2008	1542.18	193.37	1348.81
	7/28/2008	1542.18	193.36	1348.82
	6/27/2008	1542.18	193.39	1348.79
	5/27/2008	1542.18	193.25	1348.93
	4/29/2008	1542.18	193.08	1349.10
	3/31/2008	1542.18	193.17	1349.01
	1/14/2008	1542.18	193.32	1348.86
	10/15/2007	1542.18	193.18	1349.00
	7/30/2007	1542.18	192.71	1349.47
	4/9/2007	1542.18	192.79	1349.39
	2/12/2007	1542.18	193.01	1349.17
	11/13/2006	1542.18	192.98	1349.20
	8/28/2006	1542.18	192.95	1349.23
	5/22/2006	1542.18	192.97	1349.21
	3/20/2006	1542.18	192.83	1349.35
	12/22/2005	1542.18	192.91	1349.27
	11/30/2005	1542.18	192.84	1349.34
	10/24/2005	1542.18	192.89	1349.29
	9/22/2005	1542.18	192.84	1349.34
	8/22/2005	1542.18	192.90	1349.28
	7/18/2005	1542.18	192.88	1349.30
	6/27/2005	1542.18	192.57	1349.61
	5/20/2005	1542.18	192.50	1349.68
	4/25/2005	1542.18	192.29	1349.89
	3/15/2005	1542.18	192.27	1349.91
	2/14/2005	1542.18	192.29	1349.89
1/17/2005	1542.18	192.27	1349.91	
12/7/2004	1542.18	192.29	1349.89	
11/22/2004	1542.18	192.27	1349.91	
10/22/2004	1542.18	193.21	1348.97	

**Appendix C**  
**Water Level Data UPCO Wells**

<b>Well Identification</b>	<b>Date of Measurement</b>	<b>Measuring Point Elevation (ft amsl)</b>	<b>Depth to Water from Measuring Point (ft)</b>	<b>Groundwater Elevation (ft amsl)</b>
<b>MW-9</b>	12/15/2008	1565.60	216.52	1349.08
	11/21/2008	1565.60	216.51	1349.09
	10/14/2008	1565.60	216.46	1349.14
	9/20/2008	1565.60	216.42	1349.18
	8/29/2008	1565.60	216.38	1349.22
	7/28/2008	1565.60	216.34	1349.26
	6/27/2008	1565.60	216.37	1349.23
	5/27/2008	1565.60	216.24	1349.36
	4/29/2008	1565.60	216.15	1349.45
	3/31/2008	1565.60	216.26	1349.34
	1/14/2008	1565.60	216.30	1349.30
	10/15/2007	1565.60	216.16	1349.44
	7/30/2007	1565.60	215.83	1349.77
	4/9/2007	1565.60	216.19	1349.41
	2/12/2007	1565.60	216.12	1349.48
	11/13/2006	1565.60	216.07	1349.53
	8/28/2006	1565.60	215.95	1349.65
	5/22/2006	1565.60	216.03	1349.57
	3/20/2006	1565.60	215.82	1349.78
	12/22/2005	1565.60	215.64	1349.96
	11/30/2005	1565.60	215.70	1349.90
	10/24/2005	1565.60	215.72	1349.88
	9/22/2005	1565.60	215.59	1350.01
	8/22/2005	1565.60	215.57	1350.03
	7/18/2005	1565.60	215.68	1349.92
	6/27/2005	1565.60	215.41	1350.19
5/20/2005	1565.60	215.36	1350.24	
4/25/2005	1565.60	215.34	1350.26	
3/15/2005	1565.60	215.36	1350.24	
2/14/2005	1565.60	215.29	1350.31	

**Appendix C**  
**Water Level Data UPCO Wells**

<b>Well Identification</b>	<b>Date of Measurement</b>	<b>Measuring Point Elevation (ft amsl)</b>	<b>Depth to Water from Measuring Point (ft)</b>	<b>Groundwater Elevation (ft amsl)</b>
<b>MW-10</b>	12/15/2008	1536.11	152.87	1383.24
	11/21/2008	1536.11	152.88	1383.23
	10/14/2008	1536.11	152.83	1383.28
	9/20/2008	1536.11	152.58	1383.53
	8/29/2008	1536.11	152.41	1383.70
	7/28/2008	1536.11	152.48	1383.63
	6/27/2008	1536.11	152.37	1383.74
	5/27/2008	1536.11	152.20	1383.91
	4/29/2008	1536.11	151.98	1384.13
	3/31/2008	1536.11	152.04	1384.07
	1/14/2008	1536.11	151.93	1384.18
	10/15/2007	1536.11	151.45	1384.66
	7/30/2007	1536.11	150.88	1385.23
	4/9/2007	1536.11	150.75	1385.36
	2/12/2007	1536.11	150.63	1385.48
	11/13/2006	1536.11	150.45	1385.66
	8/28/2006	1536.11	150.05	1386.06
	5/22/2006	1536.11	149.66	1386.45
	3/20/2006	1536.11	149.54	1386.57
	12/22/2005	1536.11	149.33	1386.78
	11/30/2005	1536.11	149.27	1386.84
	10/24/2005	1536.11	149.20	1386.91
	9/22/2005	1536.11	148.88	1387.23
	8/22/2005	1536.11	149.02	1387.09
	7/18/2005	1536.11	149.08	1387.03
	6/27/2005	1536.11	149.04	1387.07
	5/20/2005	1536.11	149.33	1386.78
4/25/2005	1536.11	149.56	1386.55	
3/15/2005	1536.11	149.71	1386.40	
2/14/2005	1536.11	149.92	1386.19	

**Appendix C**  
**Water Level Data UPCO Wells**

<b>Well Identification</b>	<b>Date of Measurement</b>	<b>Measuring Point Elevation (ft amsl)</b>	<b>Depth to Water from Measuring Point (ft)</b>	<b>Groundwater Elevation (ft amsl)</b>
<b>MW-11</b>	12/15/2008	1603.35	254.20	1349.15
	11/21/2008	1603.35	254.23	1349.12
	10/14/2008	1603.35	254.23	1349.12
	9/20/2008	1603.35	254.25	1349.10
	8/29/2008	1603.35	254.28	1349.07
	7/28/2008	1603.35	254.26	1349.09
	6/27/2008	1603.35	254.20	1349.15
	5/27/2008	1603.35	254.12	1349.23
	4/29/2008	1603.35	254.13	1349.22
	1/14/2008	1603.35	254.07	1349.28
	10/15/2007	1603.35	253.90	1349.45
	7/30/2007	1603.35	253.51	1349.84
	4/9/2007	1603.35	253.87	1349.48
	2/12/2007	1603.35	253.86	1349.49
	11/13/2006	1603.35	253.80	1349.55
	8/28/2006	1603.35	253.78	1349.57
	5/22/2006	1603.35	253.83	1349.52
3/20/2006	1603.35	253.71	1349.64	
12/22/2005	1603.35	253.68	1349.67	
<b>MW-12</b>	12/15/2008	1557.46	209.50	1347.96
	11/21/2008	1557.46	209.41	1348.05
	10/14/2008	1557.46	209.40	1348.06
	9/20/2008	1557.46	209.50	1347.96
	8/29/2008	1557.46	209.58	1347.88
	7/28/2008	1557.46	209.58	1347.88
	6/27/2008	1557.46	209.63	1347.83
	5/27/2008	1557.46	209.42	1348.04
	4/29/2008	1557.46	209.31	1348.15
	3/31/2008	1557.46	209.31	1348.15
	1/14/2008	1557.46	209.46	1348.00
	10/15/2007	1557.46	209.23	1348.23
	7/30/2007	1557.46	208.85	1348.61
	4/9/2007	1557.46	209.16	1348.30
	2/12/2007	1557.46	209.23	1348.23
	11/13/2006	1557.46	209.14	1348.32
	8/28/2006	1557.46	209.12	1348.34
5/22/2006	1557.46	209.17	1348.29	
3/20/2006	1557.46	209.09	1348.37	
12/22/2005	1557.46	209.16	1348.30	

**Appendix C**  
**Water Level Data UPCO Wells**

<b>Well Identification</b>	<b>Date of Measurement</b>	<b>Measuring Point Elevation (ft amsl)</b>	<b>Depth to Water from Measuring Point (ft)</b>	<b>Groundwater Elevation (ft amsl)</b>
<b>MW-13</b>	12/15/2008	1595.77	246.83	1348.94
	11/21/2008	1595.77	246.78	1348.99
	10/14/2008	1595.77	246.75	1349.02
	9/20/2008	1595.77	246.75	1349.02
	8/29/2008	1595.77	246.82	1348.95
<b>MW-14</b>	12/15/2008	1602.48	264.02	1338.46
	11/21/2008	1602.48	264.15	1338.33
	10/14/2008	1602.48	263.69	1338.79
	9/20/2008	1602.48	263.38	1339.10
	8/29/2008	1602.48	263.25	1339.23
<b>MW-15</b>	12/15/2008	1600.48	262.58	1337.90
	11/21/2008	1600.48	262.45	1338.03
	10/14/2008	1600.48	262.18	1338.30
	9/20/2008	1600.48	262.09	1338.39
	8/29/2008	1600.48	261.95	1338.53

**Appendix C  
Water Level Data  
Private Wells**

<b>Well Identification</b>	<b>Date of Measurement</b>	<b>Measuring Point Elevation (ft amsl)</b>	<b>Depth to Water from Measuring Point (ft)</b>	<b>Groundwater Elevation (ft amsl)</b>
<b>18 East Yearling</b>	3/30/07	1596.79	NA	NA
	5/25/07	1596.79	NA	NA
	6/4/07	1596.79	NA	NA
	6/20/2007	1596.79	NA	NA
	7/30/2007	1596.79	NA	NA
	8/2/2007	1596.79	351.13	1245.66
	8/30/2007	1596.79	346.66	1250.13
	9/12/2007	1596.79	365.49	1231.30
	9/24/2007	1596.79	358.82	1237.97
	9/27/2007	1596.79	365.22	1231.57
	10/15/2007	1596.79	362.45	1234.34
	11/19/2007	1596.79	363.82	1232.97
	12/11/2007	1596.79	360.47	1236.32
	1/14/2008	1596.79	354.74	1242.05
	3/13/2008	1596.79	358.96	1237.83
	5/16/2008	1596.79	350.67	1246.12
	7/28/2008	1596.79	below transducer	NM
	8/29/2008	1596.79	258.19	1338.60
	10/14/2008	1596.79	362.65	1234.14
12/3/2008	1596.79	358.64	1238.15	
12/15/2008	1596.79	358.88	1237.91	
<b>218 East Yearling</b>	3/30/07	1617.01	325.20	1291.81
	5/25/07	1617.01	313.19	1303.82
	6/4/07	1617.01	325.92	1291.09
	6/20/2007	1617.01	317.50	1299.51
	7/30/2007	1617.01	NA	NA
	8/2/2007	1617.01	NA	NA
	8/30/2007	1617.01	313.80	1303.21
	9/12/2007	1617.01	334.26	1282.75
	9/24/2007	1617.01	NA	NA
	9/27/2007	1617.01	317.38	1299.63
	10/15/2007	1617.01	323.81	1293.20
	11/19/2007	1617.01	322.32	1294.69
	12/11/2007	1617.01	315.75	1301.26
	1/14/2008	1617.01	313.32	1303.69
	3/13/2008	1617.01	obstruction	NM
	5/16/2008	1617.01	344.85	1272.16
	7/28/2008	1617.01	316.35	1300.66
	8/29/2008	1617.01	329.46	1287.55
	10/14/2008	1617.01	340.00	1277.01
12/3/2008	1617.01	317.34	1299.67	
12/15/2008	1617.01	313.89	1303.12	

**Appendix C  
Water Level Data  
Private Wells**

<b>Well Identification</b>	<b>Date of Measurement</b>	<b>Measuring Point Elevation (ft amsl)</b>	<b>Depth to Water from Measuring Point (ft)</b>	<b>Groundwater Elevation (ft amsl)</b>
<b>520 East Yearling</b>	3/30/07	1635.71	293.60	1342.11
	5/25/07	1635.71	293.68	1342.03
	6/4/07	1635.71	292.33	1343.38
	6/20/2007	1635.71	292.54	1343.17
	7/30/2007	1635.71	293.69	1342.02
	8/2/2007	1635.71	NA	NA
	8/30/2007	1635.71	292.04	1343.67
	9/12/2007	1635.71	294.56	1341.15
	9/24/2007	1635.71	294.59	1341.12
	9/27/2007	1635.71	295.18	1340.53
	10/15/2007	1635.71	294.94	1340.77
	11/19/2007	1635.71	295.66	1340.05
	12/11/2007	1635.71	295.41	1340.30
	1/14/2008	1635.71	295.30	1340.41
	3/13/2008	1635.71	294.71	1341.00
	5/16/2008	1635.71	295.80	1339.91
	7/28/2008	1635.71	296.54	1339.17
	8/29/2008	1635.71	305.50	1330.21
	10/14/2008	1635.71	297.20	1338.51
	12/3/2008	1635.71	297.37	1338.34
12/15/2008	1635.71	297.42	1338.29	

Note:

Measured depth to water and calculated groundwater elevations may not represent actual static water levels because these are active pumping wells, subject to frequent water level fluctuations

NM = not measured

NA = no access

**MALCOLM  
PIRNIE**

INDEPENDENT ENVIRONMENTAL  
ENGINEERS, SCIENTISTS  
AND CONSULTANTS

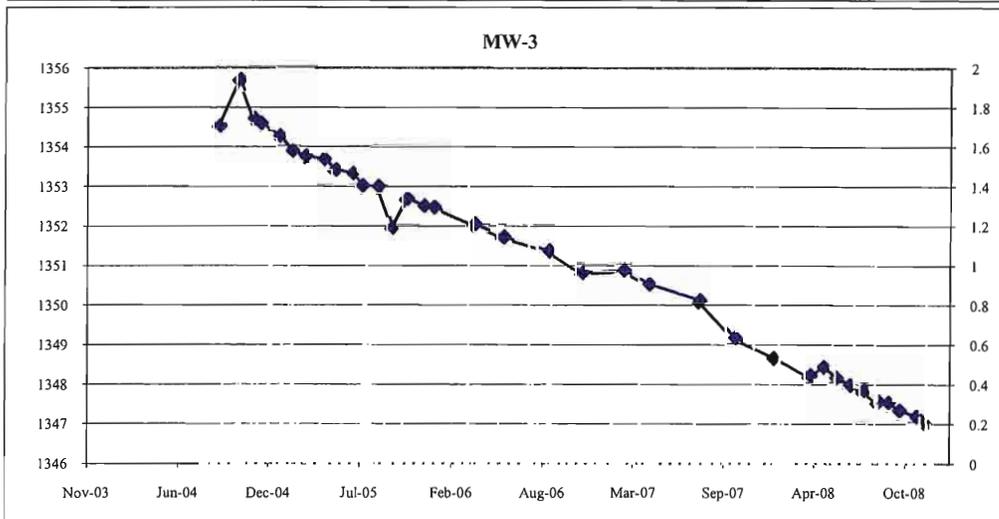
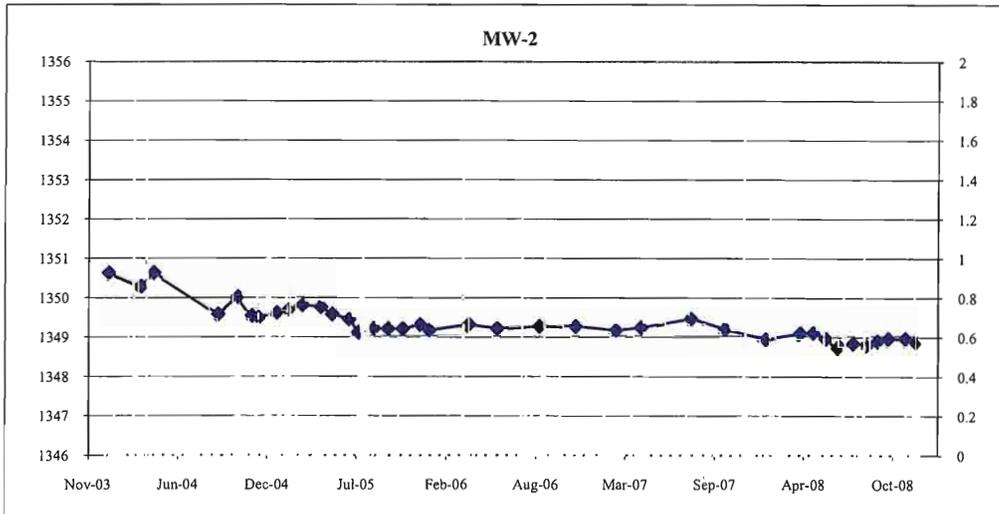
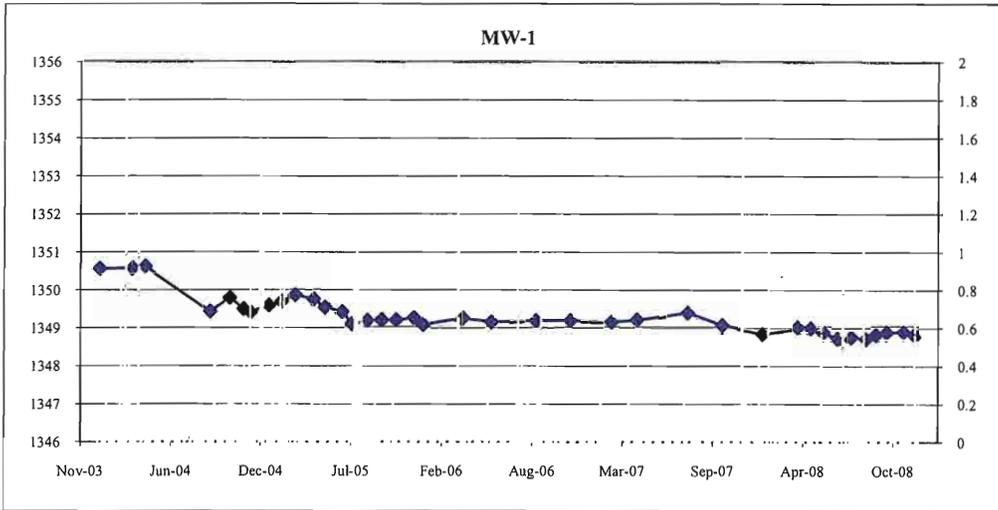
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APPENDIX

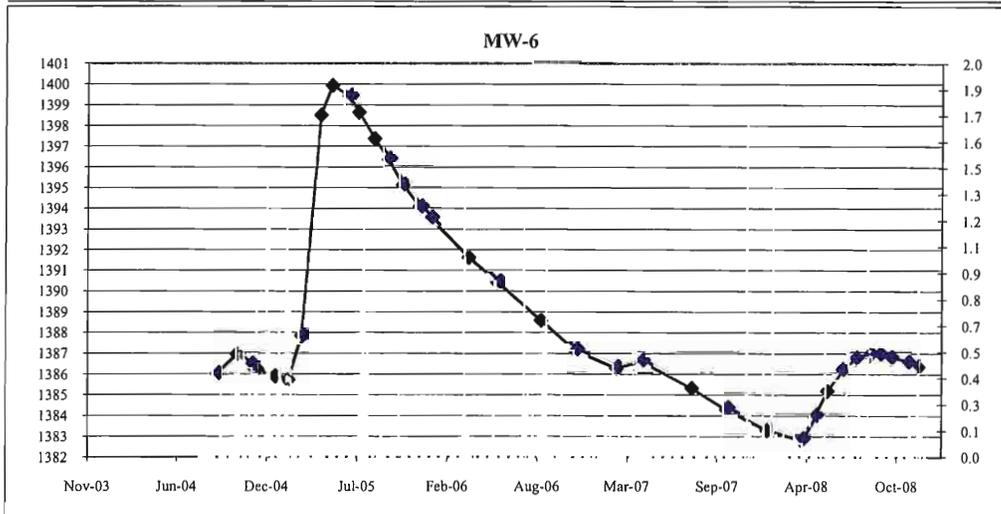
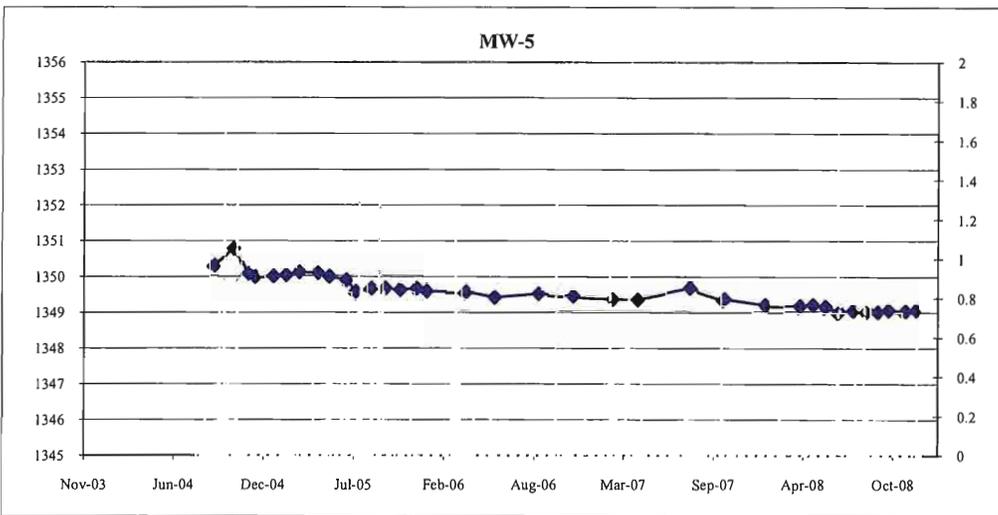
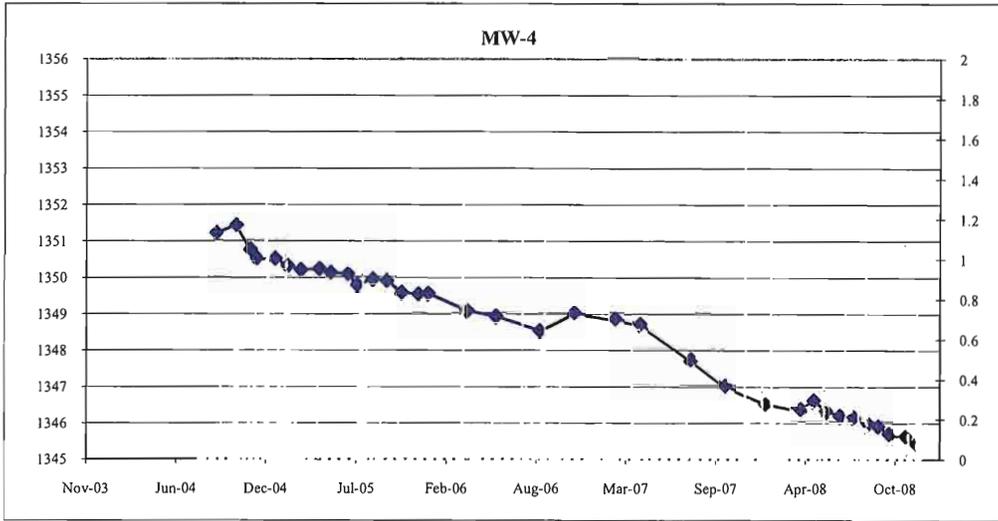
**D**  
APPENDIX



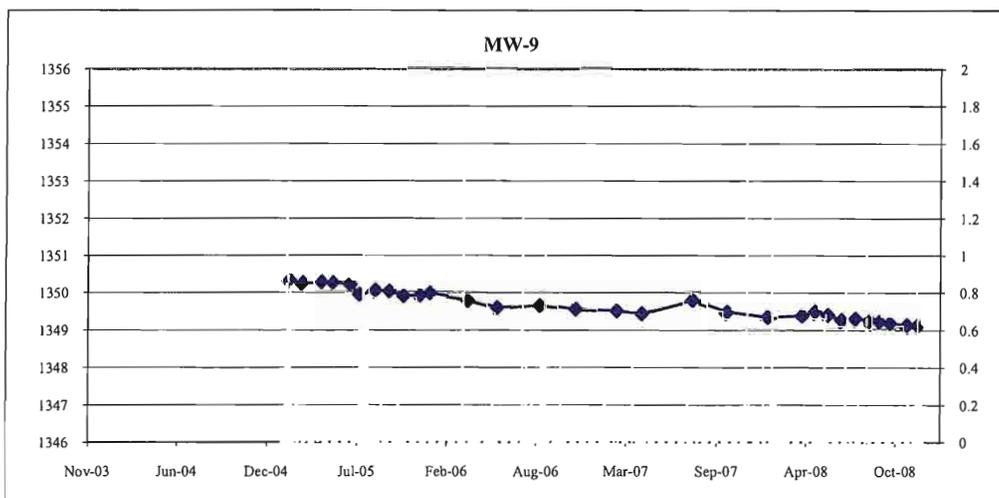
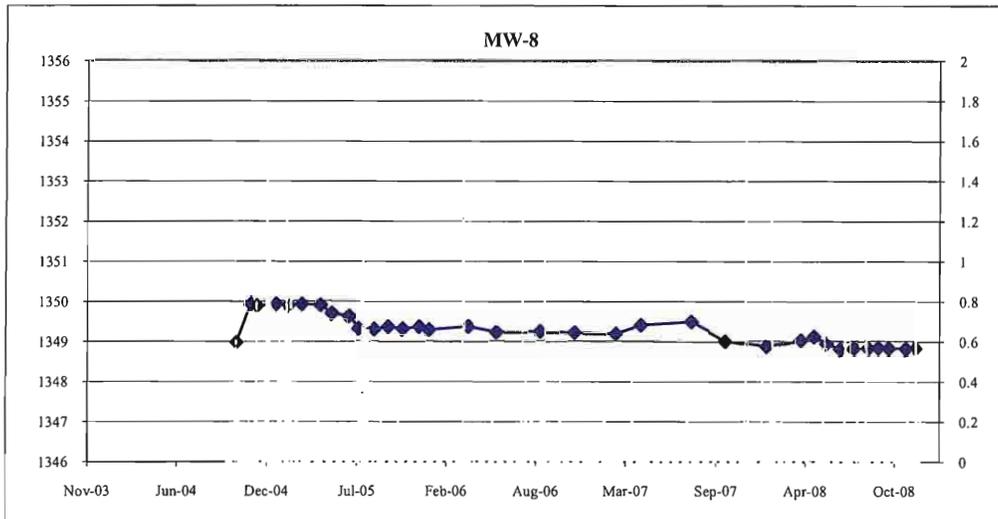
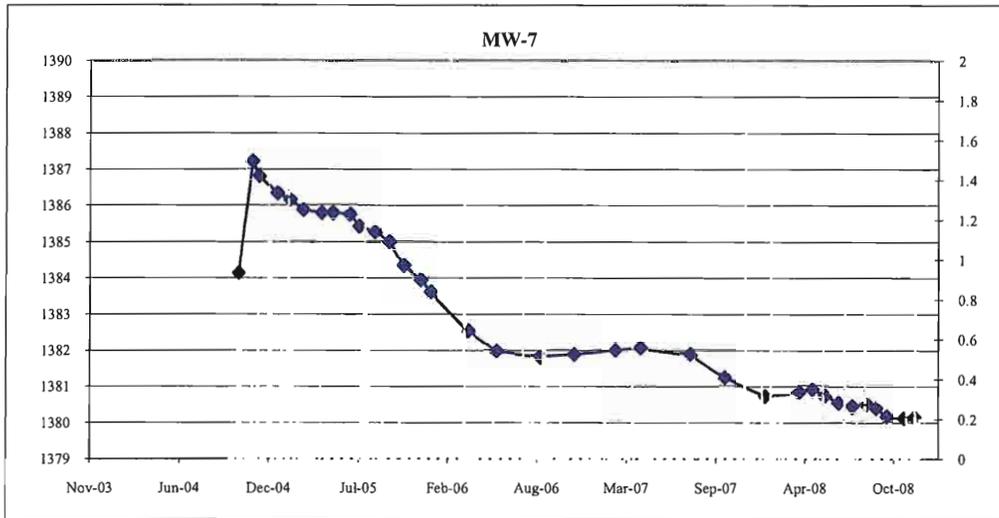
## Appendix D Well Hydrographs (feet amsl) with Precipitation (in/day)



## Appendix D Well Hydrographs (feet amsl) with Precipitation (in/day)

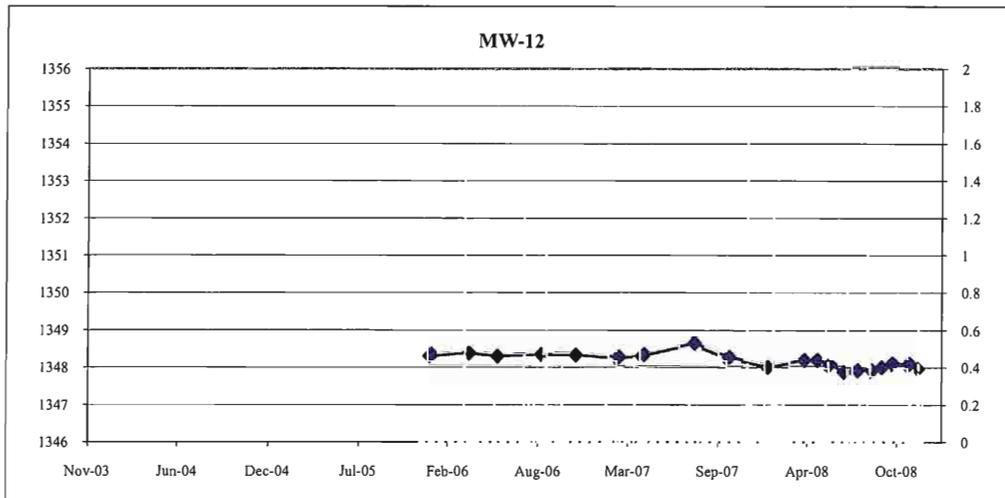
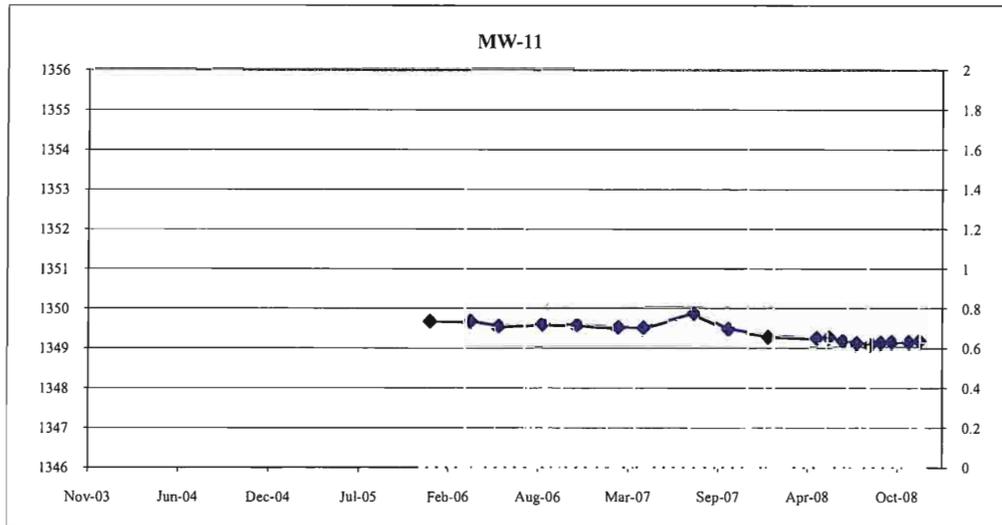
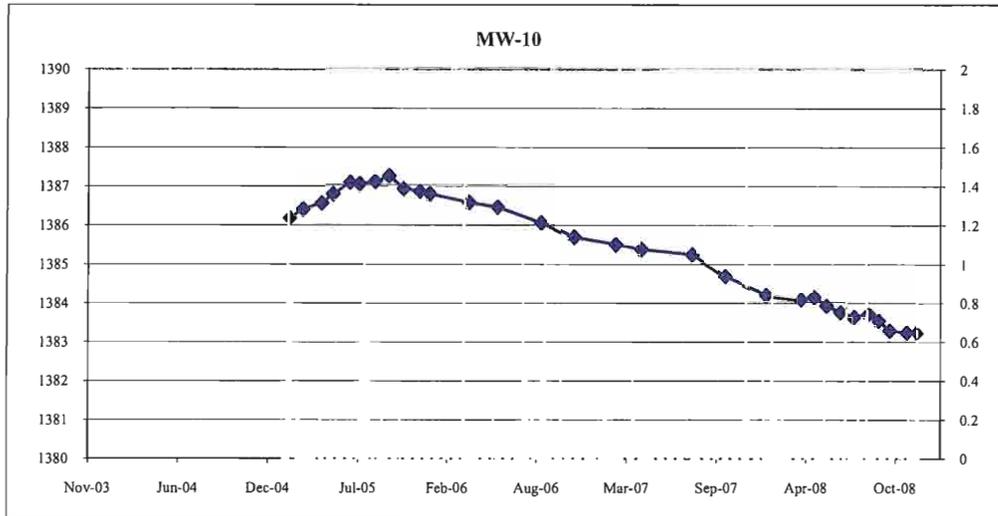


## Appendix D Well Hydrographs (feet amsl) with Precipitation (in/day)



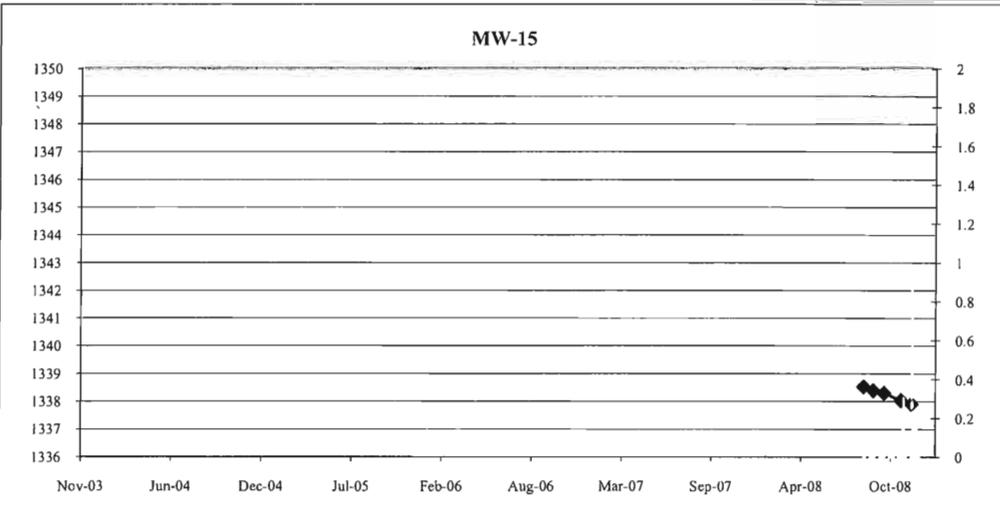
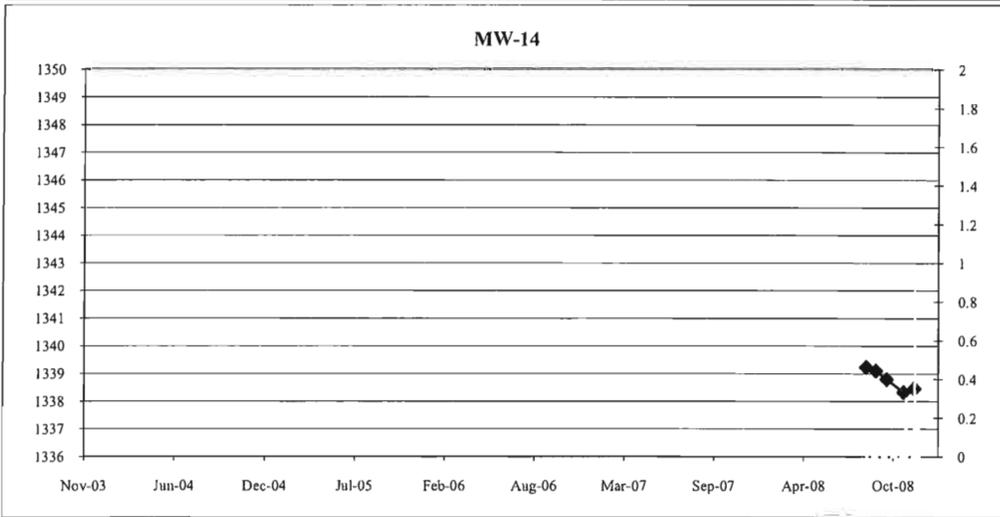
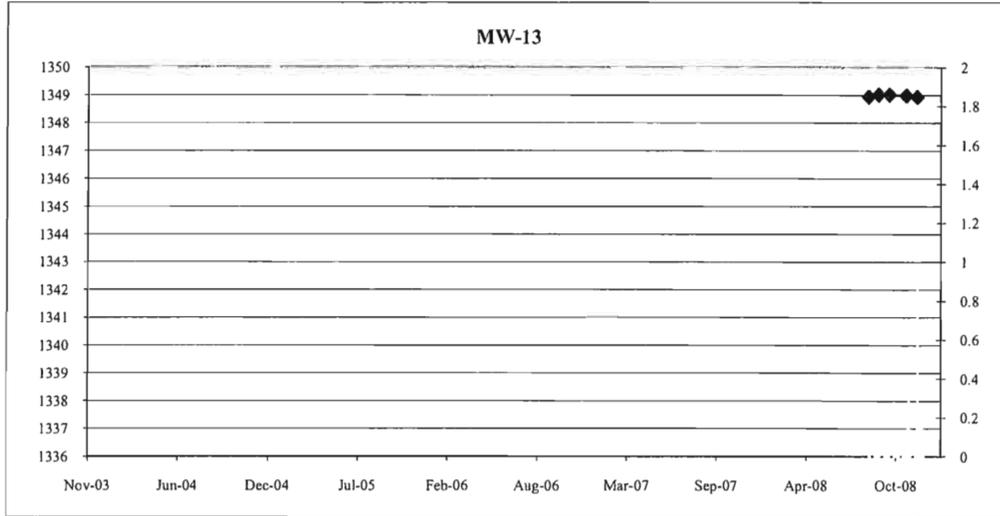
## Appendix D

### Well Hydrographs (feet amsl) with Precipitation (in/day)

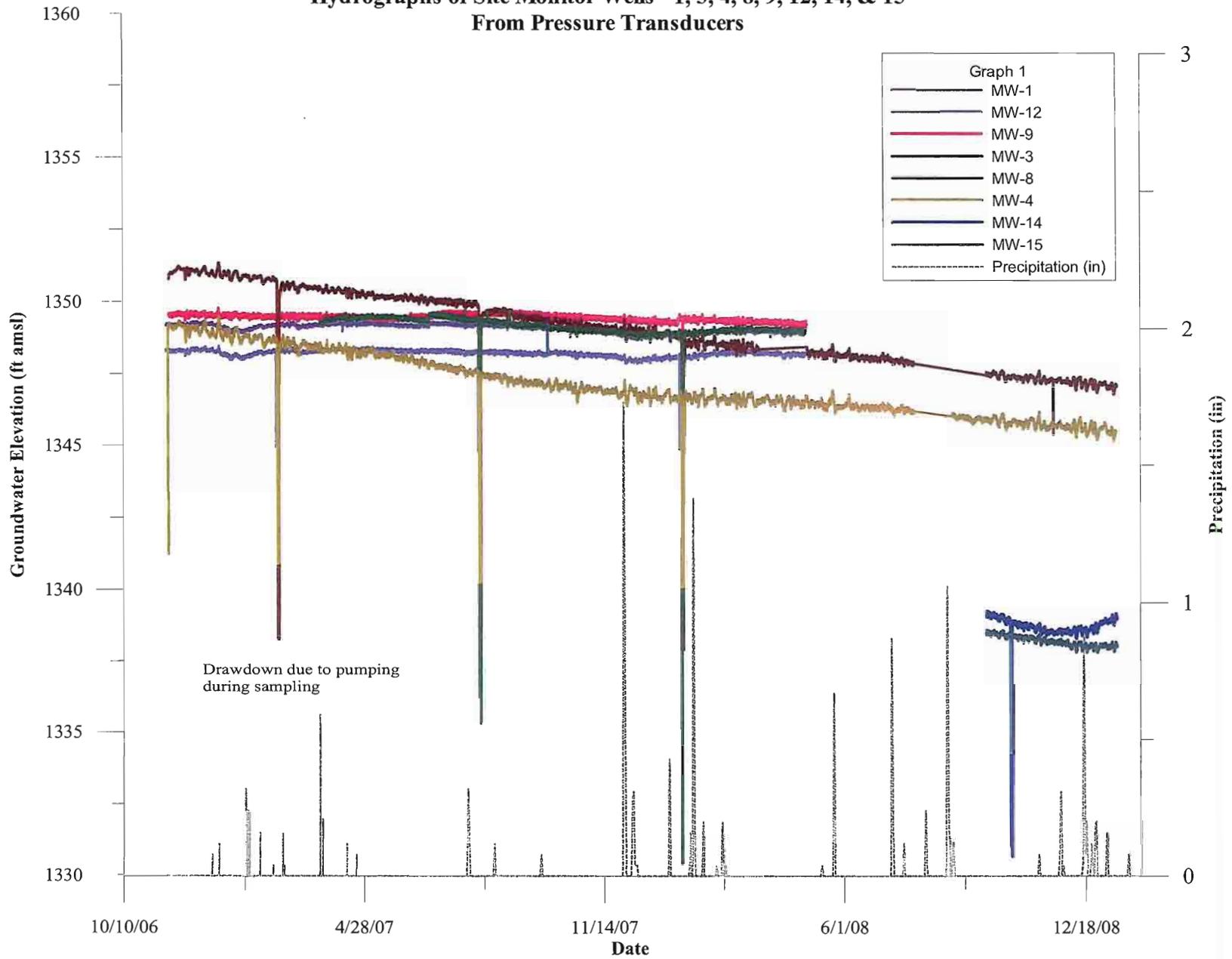


## Appendix D

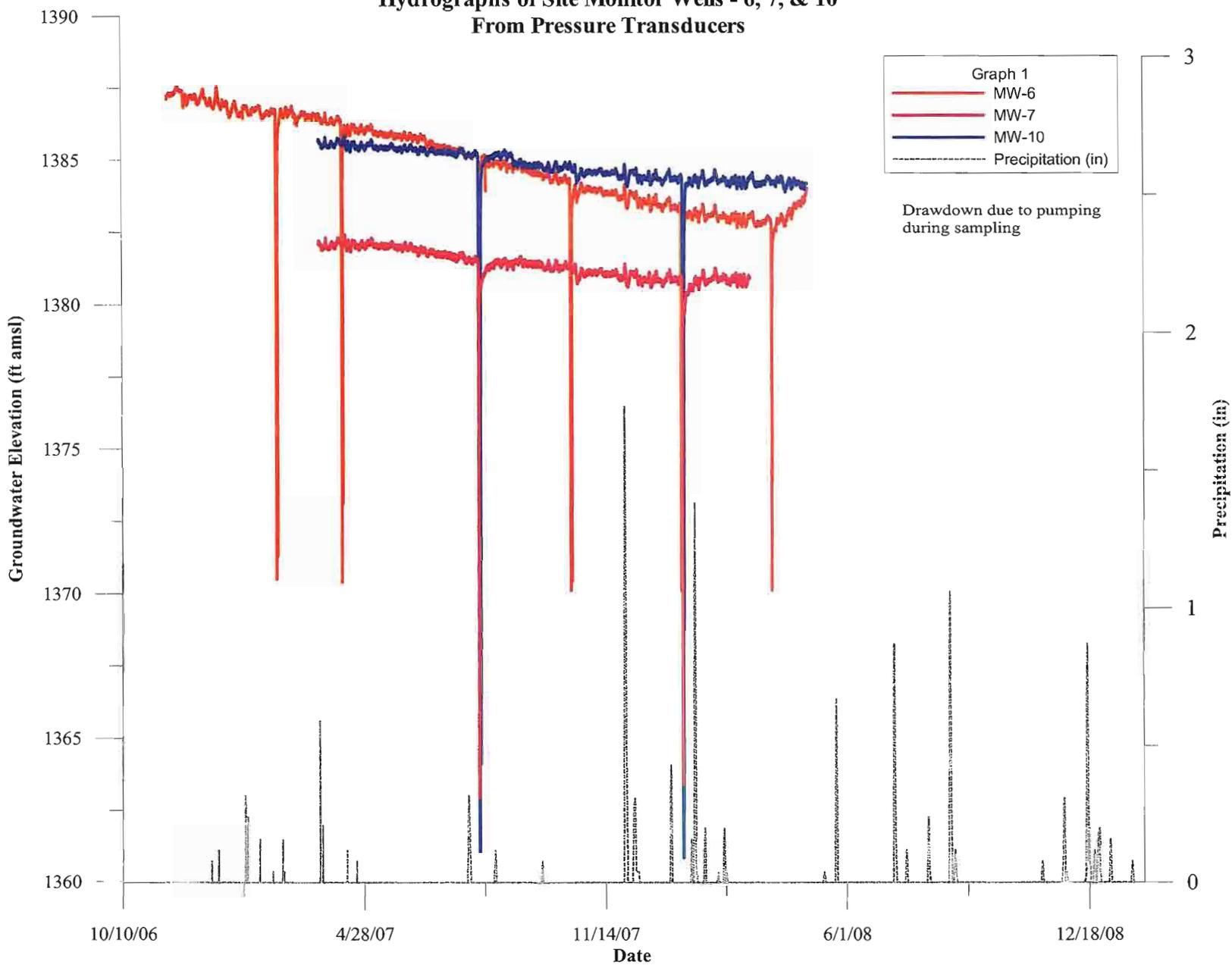
### Well Hydrographs (feet amsl) with Precipitation (in/day)



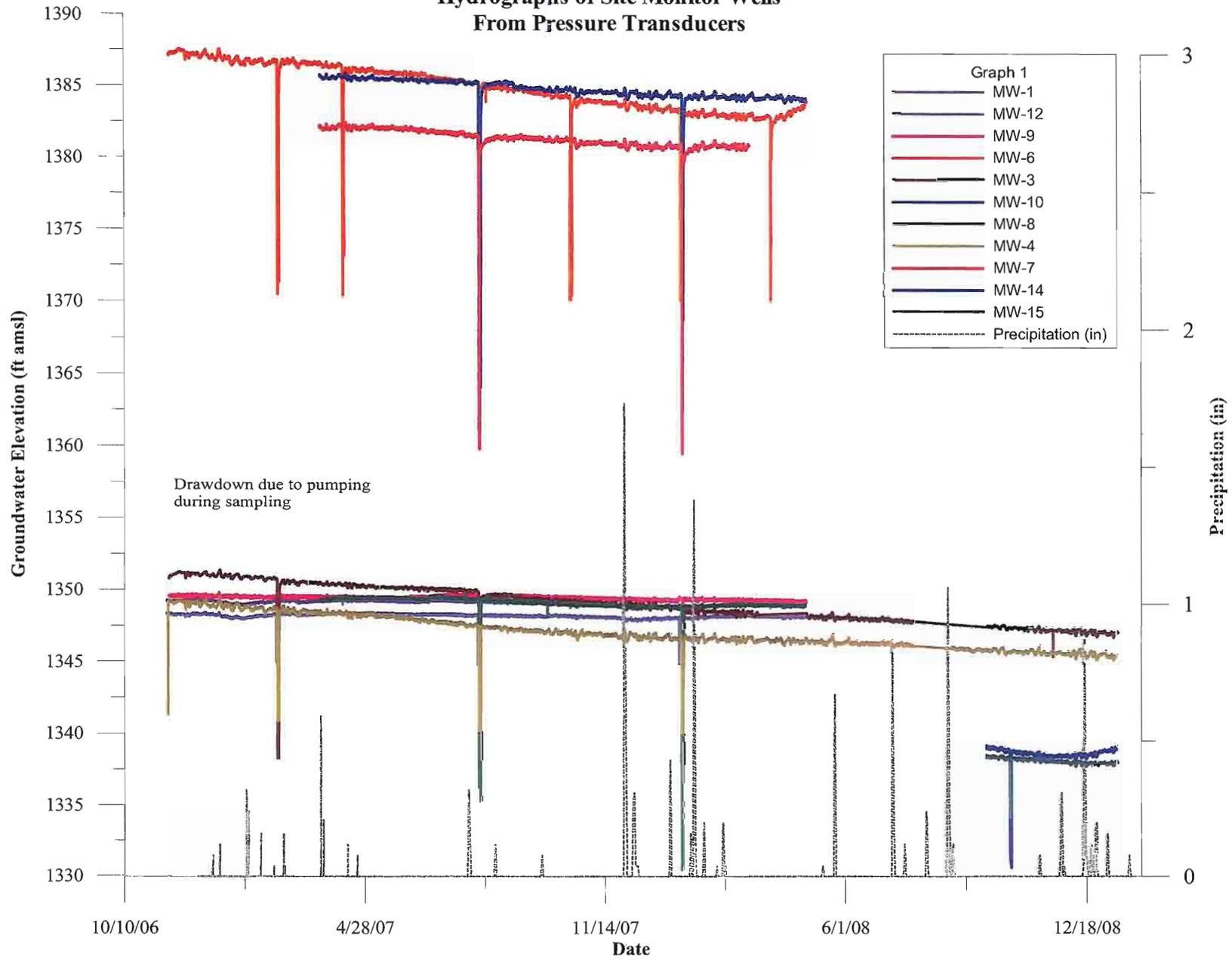
**Appendix D**  
**Hydrographs of Site Monitor Wells - 1, 3, 4, 8, 9, 12, 14, & 15**  
**From Pressure Transducers**



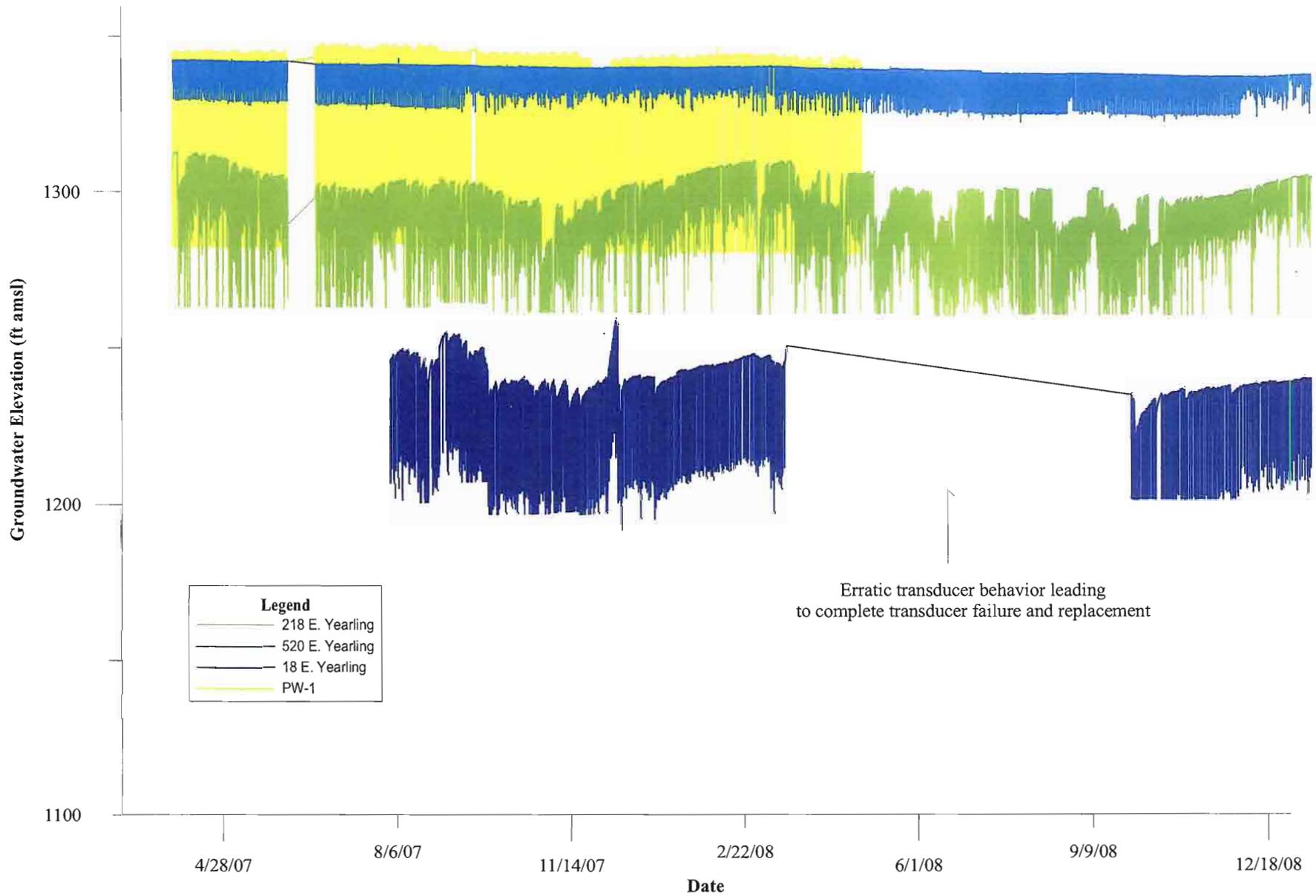
### Appendix D Hydrographs of Site Monitor Wells - 6, 7, & 10 From Pressure Transducers



### Appendix D Hydrographs of Site Monitor Wells From Pressure Transducers



### Appendix D Hydrographs of PW-1 and Private Wells From Pressure Transducers



**MALCOLM  
PIRNIE**

INDEPENDENT ENVIRONMENTAL  
ENGINEERS, SCIENTISTS  
AND CONSULTANTS

**E**

APPENDIX



**E**  
APPENDIX

**Appendix E  
Monitor Well Groundwater Quality Summary**

Parameters	MW-1 1/15/2008	MW-1 3/31/2008	MW-1 10/17/2008	MW-2 1/19/2008	MW-2 3/31/2008	MW-2 7/30/2008	MW-2 10/17/2008	MW-3 1/18/2008	MW-3 7/30/2008	MW-4 1/19/2008	MW-4 7/30/2008	MW-5 1/16/2008	MW-5 3/31/2008	MW-5 7/30/2008	MW-5 10/17/2008	MW-6 1/17/2008
<b>Inorganics (mg/L)</b>																
Arsenic	<0.050	NA	NA	0.0076	NA	NA	NA	0.0053	NA	0.0023	NA	<0.050	NA	NA	NA	<0.050
Barium	0.047	NA	NA	0.081	NA	NA	NA	0.021	NA	0.08	NA	0.051	NA	NA	NA	0.011
Cadmium	<0.0050	NA	NA	0.001	NA	NA	NA	0.001	NA	0.001	NA	<0.0050	NA	NA	NA	<0.0050
Calcium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium	<0.010	NA	NA	0.014	NA	NA	NA	0.002	NA	0.002	NA	0.022	NA	NA	NA	<0.010
Lead	<0.050	NA	NA	0.0015	NA	NA	NA	0.0016	NA	0.0037	NA	<0.050	NA	NA	NA	<0.050
Magnesium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	<0.00020	NA	NA	<0.00020	NA	NA	NA	<0.00020	NA	<0.00020	NA	<0.00020	NA	NA	NA	<0.00020
Potassium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Selenium	<0.050	NA	NA	0.002	NA	NA	NA	0.002	NA	0.002	NA	<0.050	NA	NA	NA	<0.050
Silver	<0.0050	NA	NA	0.001	NA	NA	NA	0.001	NA	0.001	NA	<0.0050	NA	NA	NA	<0.0050
Sodium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perchlorate (ug/L; EPA Method 314.0)	74	76	73	84	86	88	78	<2.0	<2.0	<2.0	<2.0	25	23	24	22	18
Perchlorate (ug/L; EPA Method 332)	NA	NA	NA	NA	NA	NA	NA	0.46	0.69	0.53	0.74	NA	NA	NA	NA	NA
<b>Volatile Organic Compounds (ug/L)</b>																
1,1,1,2-Tetrachloroethane	<1.0	NA	<0.50	<1.0	NA	NA	NA	<1.0	NA	<1.0	NA	<1.0	NA	NA	NA	<1.0
1,1,1-Trichloroethane	<1.0	NA	<0.50	<1.0	NA	<0.50	NA	<1.0	NA	<1.0	NA	<1.0	NA	NA	NA	<1.0
1,1,2,2-Tetrachloroethane	<2.0	NA	<0.50	<2.0	NA	<0.50	NA	<2.0	NA	<2.0	NA	<2.0	NA	NA	NA	<2.0
1,1,2-Trichloroethane	<1.0	NA	<0.50	<1.0	NA	<0.50	NA	<1.0	NA	<1.0	NA	<1.0	NA	NA	NA	<1.0
1,1-Dichloroethane	<1.0	NA	<0.50	<1.0	NA	<0.50	NA	<1.0	NA	<1.0	NA	<1.0	NA	NA	NA	<1.0
1,1-Dichloroethene	<2.0	NA	<0.50	<2.0	NA	<0.50	NA	<2.0	NA	<2.0	NA	<2.0	NA	NA	NA	<2.0
1,1-Dichloropropene	<1.0	NA	<0.50	<1.0	NA	<0.50	NA	<1.0	NA	<1.0	NA	<1.0	NA	NA	NA	<1.0
1,2,3-Trichlorobenzene	<1.0	NA	<1.0	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	NA	NA	<1.0
1,2,3-Trichloropropane	<1.0	NA	<1.0	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	NA	NA	<1.0
1,2,4-Trichlorobenzene	<1.0	NA	<1.0	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	NA	NA	<1.0
1,2,4-Trimethylbenzene	<1.0	NA	<0.50	<1.0	NA	<0.50	NA	<1.0	NA	<1.0	NA	<1.0	NA	NA	NA	<1.0
1,2-Dibromo-3-chloropropane	<2.0	NA	<2.5	<2.0	NA	NA	NA	<2.0	NA	<2.0	NA	<2.0	NA	NA	NA	<2.0
1,2-Dibromoethane (EDB)	<1.0	NA	<0.50	<1.0	NA	<0.50	NA	<1.0	NA	<1.0	NA	<1.0	NA	NA	NA	<1.0
1,2-Dichlorobenzene	<1.0	NA	<0.50	<1.0	NA	<0.50	NA	<1.0	NA	<1.0	NA	<1.0	NA	NA	NA	<1.0
1,2-Dichloroethane	<1.0	NA	<0.50	<1.0	NA	<0.50	NA	<1.0	NA	<1.0	NA	<1.0	NA	NA	NA	<1.0
1,2-Dichloropropane	<1.0	NA	<0.50	<1.0	NA	<0.50	NA	<1.0	NA	<1.0	NA	<1.0	NA	NA	NA	<1.0
1,3,5-Trimethylbenzene	<1.0	NA	<0.50	<1.0	NA	<0.50	NA	<1.0	NA	<1.0	NA	<1.0	NA	NA	NA	<1.0
1,3-Dichlorobenzene	<1.0	NA	<0.50	<1.0	NA	<0.50	NA	<1.0	NA	<1.0	NA	<1.0	NA	NA	NA	<1.0
1,3-Dichloropropane	<1.0	NA	<0.50	<1.0	NA	<0.50	NA	<1.0	NA	<1.0	NA	<1.0	NA	NA	NA	<1.0
1,4-Dichlorobenzene	<1.0	NA	<0.50	<1.0	NA	<0.50	NA	<1.0	NA	<1.0	NA	<1.0	NA	NA	NA	<1.0
1,4-Dioxane	<1.0	NA	<1.0	2.7	NA	2.6 J	NA	<2.0	NA	<1.0	NA	<1.0	NA	NA	NA	<1.0
2,2-Dichloropropane	<1.0	NA	<1.0	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	NA	NA	<1.0
2-Butanone (MEK)	<10	NA	<2.5	<10	NA	<2.5	NA	<10	NA	<10	NA	<10	NA	NA	NA	<10
2-Chlorotoluene	<1.0	NA	<0.50	<1.0	NA	<0.50	NA	<1.0	NA	<1.0	NA	<1.0	NA	NA	NA	<1.0
2-Hexanone	<10	NA	<2.5	<10	NA	<2.5	NA	<10	NA	<10	NA	<10	NA	NA	NA	<10
4-Chlorotoluene	<1.0	NA	<0.50	<1.0	NA	<0.50	NA	<1.0	NA	<1.0	NA	<1.0	NA	NA	NA	<1.0
4-Methyl-2-pentanone (MIBK)	<10	NA	<2.5	<10	NA	<2.5	NA	<10	NA	<10	NA	<10	NA	NA	NA	<10
Acetone	<20	NA	<10	<20	NA	<10	NA	<20	NA	<20	NA	<20	NA	NA	NA	<20
Benzene	<1.0	NA	<0.50	<1.0	NA	<0.50	NA	<1.0	NA	<1.0	NA	<1.0	NA	NA	NA	<1.0
Bromobenzene	<1.0	NA	<0.50	<1.0	NA	<0.50	NA	<1.0	NA	<1.0	NA	<1.0	NA	NA	NA	<1.0
Bromochloromethane	<1.0	NA	<0.50	<1.0	NA	<0.50	NA	<1.0	NA	<1.0	NA	<1.0	NA	NA	NA	<1.0
Bromodichloromethane	<1.0	NA	<0.50	<1.0	NA	<0.50	NA	<1.0	NA	<1.0	NA	<1.0	NA	NA	NA	<1.0
Bromoform	<2.0	NA	<1.0	<2.0	NA	<1.0	NA	<2.0	NA	<2.0	NA	<2.0	NA	NA	NA	<2.0

**Appendix E  
Monitor Well Groundwater Quality Summary**

Parameters	MW-1 1/15/2008	MW-1 3/31/2008	MW-1 10/17/2008	MW-2 1/19/2008	MW-2 3/31/2008	MW-2 7/30/2008	MW-2 10/17/2008	MW-3 1/18/2008	MW-3 7/30/2008	MW-4 1/19/2008	MW-4 7/30/2008	MW-5 1/16/2008	MW-5 3/31/2008	MW-5 7/30/2008	MW-5 10/17/2008	MW-6 1/17/2008
<b>Volatile Organic Compounds (ug/L)</b>																
Bromomethane	<4.0	NA	<1.0	<4.0	NA	<1.0	NA	<4.0	NA	<4.0	NA	<4.0	NA	NA	NA	<4.0
Carbon Disulfide	<5.0	NA	<0.50	<5.0	NA	NA	NA	<5.0	NA	<5.0	NA	<5.0	NA	NA	NA	<5.0
Carbon tetrachloride	<1.0	NA	<0.50	<1.0	NA	<0.50	NA	<1.0	NA	<1.0	NA	<1.0	NA	NA	NA	<1.0
Chlorobenzene	<1.0	NA	<0.50	<1.0	NA	<0.50	NA	<1.0	NA	<1.0	NA	<1.0	NA	NA	NA	<1.0
Chloroethane	<4.0	NA	<1.0	<4.0	NA	<1.0	NA	<4.0	NA	<4.0	NA	<4.0	NA	NA	NA	<4.0
Chloroform	<1.0	NA	<0.50	<1.0	NA	<0.50	NA	<1.0	NA	<1.0	NA	<1.0	NA	NA	NA	<1.0
Chloromethane	<4.0	NA	<1.0	<4.0	NA	<1.0	NA	<4.0	NA	<4.0	NA	<4.0	NA	NA	NA	<4.0
cis-1,2-Dichloroethene	<1.0	NA	<0.50	<1.0	NA	<0.50	NA	<1.0	NA	<1.0	NA	<1.0	NA	NA	NA	<1.0
cis-1,3-Dichloropropene	<1.0	NA	<0.50	<1.0	NA	<0.50	NA	<1.0	NA	<1.0	NA	<1.0	NA	NA	NA	<1.0
Dibromochloromethane	<1.0	NA	<0.50	<1.0	NA	<0.50	NA	<1.0	NA	<1.0	NA	<1.0	NA	NA	NA	<1.0
Dibromomethane	<1.0	NA	<0.50	<1.0	NA	NA	NA	<1.0	NA	<1.0	NA	<1.0	NA	NA	NA	<1.0
Dichlorodifluoromethane	<4.0	NA	<0.50	<4.0	NA	<0.50	NA	<4.0	NA	<4.0	NA	<4.0	NA	NA	NA	<4.0
Ethylbenzene	<2.0	NA	<0.50	<2.0	NA	<0.50	NA	<2.0	NA	<2.0	NA	<2.0	NA	NA	NA	<2.0
Hexachlorobutadiene	<1.0	NA	<1.0	<1.0	NA	NA	NA	<1.0	NA	<1.0	NA	<1.0	NA	NA	NA	<1.0
Iodomethane	<2.0	NA	<2.5	<2.0	NA	NA	NA	<2.0	NA	<2.0	NA	<2.0	NA	NA	NA	<2.0
Isopropylbenzene	<1.0	NA	<0.50	<1.0	NA	NA	NA	<1.0	NA	<1.0	NA	<1.0	NA	NA	NA	<1.0
m,p-Xylenes	NA	NA	NA	NA	NA	<1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylene Chloride	<5.0	NA	<1.0	<5.0	NA	<1.0	NA	<5.0	NA	<5.0	NA	<5.0	NA	NA	NA	<5.0
Methyl-tert-butyl Ether (MTBE)	<5.0	NA	<0.50	<5.0	NA	<0.50	NA	<5.0	NA	<5.0	NA	<5.0	NA	NA	NA	<5.0
Naphthalene	<2.0	NA	<2.5	<2.0	NA	NA	NA	<2.0	NA	<2.0	NA	<2.0	NA	NA	NA	<2.0
n-Butylbenzene	<1.0	NA	<0.50	<1.0	NA	<0.50	NA	<1.0	NA	<1.0	NA	<1.0	NA	NA	NA	<1.0
n-Propylbenzene	<1.0	NA	<0.50	<1.0	NA	<0.50	NA	<1.0	NA	<1.0	NA	<1.0	NA	NA	NA	<1.0
o-Xylene	NA	NA	NA	NA	NA	<0.50	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
p-Isopropyltoluene	<1.0	NA	<0.50	<1.0	NA	<0.50	NA	<1.0	NA	<1.0	NA	<1.0	NA	NA	NA	<1.0
sec-Butylbenzene	<1.0	NA	<0.50	<1.0	NA	<0.50	NA	<1.0	NA	<1.0	NA	<1.0	NA	NA	NA	<1.0
Styrene	<1.0	NA	<0.50	<1.0	NA	<0.50	NA	<1.0	NA	<1.0	NA	<1.0	NA	NA	NA	<1.0
tert-Butylbenzene	<1.0	NA	<0.50	<1.0	NA	<0.50	NA	<1.0	NA	<1.0	NA	<1.0	NA	NA	NA	<1.0
Tetrachloroethene	<1.0	NA	<0.50	<1.0	NA	<0.50	NA	<1.0	NA	<1.0	NA	<1.0	NA	NA	NA	<1.0
Toluene	<2.0	NA	<0.50	<2.0	NA	<0.50	NA	<2.0	NA	<2.0	NA	<2.0	NA	NA	NA	<2.0
trans-1,2-Dichloroethene	<1.0	NA	<0.50	<1.0	NA	<0.50	NA	<1.0	NA	<1.0	NA	<1.0	NA	NA	NA	<1.0
trans-1,3-Dichloropropene	<1.0	NA	<0.50	<1.0	NA	<0.50	NA	<1.0	NA	<1.0	NA	<1.0	NA	NA	NA	<1.0
Trichloroethene	<1.0	NA	<0.50	<1.0	NA	<0.50	NA	<1.0	NA	<1.0	NA	<1.0	NA	NA	NA	<1.0
Trichlorofluoromethane	<4.0	NA	<0.50	<4.0	NA	<0.50	NA	<4.0	NA	<4.0	NA	<4.0	NA	NA	NA	<4.0
Trihalomethanes, Total	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vinyl Acetate	<5.0	NA	<0.50	<5.0	NA	<0.50	NA	<5.0	NA	<5.0	NA	<5.0	NA	NA	NA	<5.0
Vinyl chloride	<1.0	NA	<0.50	<1.0	NA	<0.50	NA	<1.0	NA	<1.0	NA	<1.0	NA	NA	NA	<1.0
Xylenes, Total	<3.0	NA	<1.0	<3.0	NA	NA	NA	<3.0	NA	<3.0	NA	<3.0	NA	NA	NA	<3.0

Notes

- \* = samples collected during additional development
- mg/L = milligrams per liter
- UJ = the reporting limit is considered an estimated value
- J = the analyte was positively identified; however, the result should be considered an estimated value
- ug/L = microgram per liter
- NA = not analyzed
- < = analyte not reported above laboratory detection limit

**Appendix E  
Monitor Well Groundwater Quality Summary**

Parameters	MW-6 3/31/2008	MW-6 7/30/2008	MW-6 10/17/2008	MW-7 1/17/2008	MW-7 8/1/2008	MW-8 1/18/2008	MW-8 7/31/2008	MW-9 1/18/2008	MW-9 8/1/2008	MW-10 1/18/2008	MW-10 7/31/2008	MW-11 1/16/2008	MW-11 8/1/2008	MW-12 1/15/2008	MW-12 7/31/2008	MW-13 8/8/2008
<b>Inorganics (mg/L)</b>																
Arsenic	NA	NA	NA	<0.050	NA	0.047	<0.10	0.0072	NA	0.018	NA	<0.050	NA	<0.050	NA	<0.10
Barium	NA	NA	NA	<0.010	NA	0.0035	<0.010	0.059	NA	0.0094	NA	0.13	NA	0.026	NA	0.071
Cadmium	NA	NA	NA	<0.0050	NA	0.001	<0.0010	0.001	NA	0.001	NA	<0.0050	NA	<0.0050	NA	<0.0010
Calcium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium	NA	NA	NA	<0.010	NA	0.024	0.019	0.002	NA	0.0021	NA	<0.010	NA	<0.010	NA	<0.010
Lead	NA	NA	NA	<0.050	NA	0.0018	<0.015	0.002	NA	0.0015	NA	<0.050	NA	<0.050	NA	<0.015
Magnesium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	NA	NA	NA	<0.00020	NA	<0.00020	<0.00020	<0.00020	NA	<0.00020	NA	<0.00020	NA	<0.00020	NA	<0.00020
Potassium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Selenium	NA	NA	NA	<0.050	NA	0.002	<0.10	0.002	NA	0.002	NA	<0.050	NA	<0.050	NA	<0.10
Silver	NA	NA	NA	<0.0050	NA	0.001	<0.010	0.001	NA	0.001	NA	<0.0050	NA	<0.0050	NA	<0.010
Sodium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perchlorate (ug/L; EPA Method 314.0)	17	17	15	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.6	<2.0	<2.0
Perchlorate (ug/L; EPA Method 332)	NA	NA	NA	0.49	0.73	0.92	0.88	0.68	0.86	0.75	0.87	2.6	2.2	0.66	1.2	250
<b>Volatile Organic Compounds (ug/L)</b>																
1,1,1,2-Tetrachloroethane	NA	NA	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	NA
1,1,1-Trichloroethane	NA	NA	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<0.50
1,1,2,2-Tetrachloroethane	NA	NA	NA	<2.0	NA	<2.0	NA	<2.0	NA	<2.0	NA	<2.0	NA	<2.0	NA	<0.50
1,1,2-Trichloroethane	NA	NA	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<0.50
1,1-Dichloroethane	NA	NA	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<0.50
1,1-Dichloroethene	NA	NA	NA	<2.0	NA	<2.0	NA	<2.0	NA	<2.0	NA	<2.0	NA	<2.0	NA	<0.50
1,1-Dichloropropene	NA	NA	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<0.50
1,2,3-Trichlorobenzene	NA	NA	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0
1,2,3-Trichloropropane	NA	NA	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0
1,2,4-Trichlorobenzene	NA	NA	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0
1,2,4-Trimethylbenzene	NA	NA	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<0.50
1,2-Dibromo-3-chloropropane	NA	NA	NA	<2.0	NA	<2.0	NA	<2.0	NA	<2.0	NA	<2.0	NA	<2.0	NA	NA
1,2-Dibromoethane (EDB)	NA	NA	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<0.50
1,2-Dichlorobenzene	NA	NA	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<0.50
1,2-Dichloroethane	NA	NA	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<0.50
1,2-Dichloropropane	NA	NA	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<0.50
1,3,5-Trimethylbenzene	NA	NA	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<0.50
1,3-Dichlorobenzene	NA	NA	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<0.50
1,3-Dichloropropane	NA	NA	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<0.50
1,4-Dichlorobenzene	NA	NA	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<0.50
1,4-Dioxane	NA	NA	NA	<1.0	NA	<2.0	NA	<2.0	NA	<2.0	NA	<1.0	NA	<1.0	NA	<1.0
2,2-Dichloropropane	NA	NA	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0
2-Butanone (MEK)	NA	NA	NA	<10	NA	<10	NA	<10	NA	<10	NA	<10	NA	<10	NA	<2.5
2-Chlorotoluene	NA	NA	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<0.50
2-Hexanone	NA	NA	NA	<10	NA	<10	NA	<10	NA	<10	NA	<10	NA	<10	NA	<2.5
4-Chlorotoluene	NA	NA	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<0.50
4-Methyl-2-pentanone (MIBK)	NA	NA	NA	<10	NA	<10	NA	<10	NA	<10	NA	<10	NA	<10	NA	<2.5
Acetone	NA	NA	NA	<20	NA	<20	NA	<20	NA	<20	NA	<20	NA	<20	NA	<10
Benzene	NA	NA	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<0.50
Bromobenzene	NA	NA	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<0.50
Bromochloromethane	NA	NA	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<0.50
Bromodichloromethane	NA	NA	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<0.50
Bromoform	NA	NA	NA	<2.0	NA	<2.0	NA	<2.0	NA	<2.0	NA	<2.0	NA	<2.0	NA	<1.0

**Appendix E  
Monitor Well Groundwater Quality Summary**

Parameters	MW-6 3/31/2008	MW-6 7/30/2008	MW-6 10/17/2008	MW-7 1/17/2008	MW-7 8/1/2008	MW-8 1/18/2008	MW-8 7/31/2008	MW-9 1/18/2008	MW-9 8/1/2008	MW-10 1/18/2008	MW-10 7/31/2008	MW-11 1/16/2008	MW-11 8/1/2008	MW-12 1/15/2008	MW-12 7/31/2008	MW-13 8/8/2008
<b>Volatile Organic Compounds (ug/L)</b>																
Bromomethane	NA	NA	NA	<4.0	NA	<4.0	NA	<4.0	NA	<4.0	NA	<4.0	NA	<4.0	NA	<1.0
Carbon Disulfide	NA	NA	NA	<5.0	NA	<5.0	NA	<5.0	NA	<5.0	NA	<5.0	NA	<5.0	NA	NA
Carbon tetrachloride	NA	NA	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<0.50
Chlorobenzene	NA	NA	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<0.50
Chloroethane	NA	NA	NA	<4.0	NA	<4.0	NA	<4.0	NA	<4.0	NA	<4.0	NA	<4.0	NA	<1.0
Chloroform	NA	NA	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<0.50
Chloromethane	NA	NA	NA	<4.0	NA	<4.0	NA	<4.0	NA	<4.0	NA	<4.0	NA	<4.0	NA	<1.0
cis-1,2-Dichloroethene	NA	NA	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<0.50
cis-1,3-Dichloropropene	NA	NA	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<0.50
Dibromochloromethane	NA	NA	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<0.50
Dibromomethane	NA	NA	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	NA
Dichlorodifluoromethane	NA	NA	NA	<4.0	NA	<4.0	NA	<4.0	NA	<4.0	NA	<4.0	NA	<4.0	NA	<0.50
Ethylbenzene	NA	NA	NA	<2.0	NA	<2.0	NA	<2.0	NA	<2.0	NA	<2.0	NA	<2.0	NA	<0.50
Hexachlorobutadiene	NA	NA	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	NA
Iodomethane	NA	NA	NA	<2.0	NA	<2.0	NA	<2.0	NA	<2.0	NA	<2.0	NA	<2.0	NA	NA
Isopropylbenzene	NA	NA	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	NA
m,p-Xylenes	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1.0
Methylene Chloride	NA	NA	NA	<5.0	NA	<5.0	NA	<5.0	NA	<5.0	NA	<5.0	NA	<5.0	NA	<1.0
Methyl-tert-butyl Ether (MTBE)	NA	NA	NA	<5.0	NA	<5.0	NA	<5.0	NA	<5.0	NA	<5.0	NA	<5.0	NA	<0.50
Naphthalene	NA	NA	NA	<2.0	NA	<2.0	NA	<2.0	NA	<2.0	NA	<2.0	NA	<2.0	NA	NA
n-Butylbenzene	NA	NA	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<0.50
n-Propylbenzene	NA	NA	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<0.50
o-Xylene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.50
p-Isopropyltoluene	NA	NA	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<0.50
sec-Butylbenzene	NA	NA	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<0.50
Styrene	NA	NA	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<0.50
tert-Butylbenzene	NA	NA	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<0.50
Tetrachloroethene	NA	NA	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<0.50
Toluene	NA	NA	NA	<2.0	NA	<2.0	NA	<2.0	NA	<2.0	NA	<2.0	NA	<2.0	NA	0.58
trans-1,2-Dichloroethene	NA	NA	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<0.50
trans-1,3-Dichloropropene	NA	NA	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<0.50
Trichloroethene	NA	NA	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<0.50
Trichlorofluoromethane	NA	NA	NA	<4.0	NA	<4.0	NA	<4.0	NA	<4.0	NA	<4.0	NA	<4.0	NA	<0.50
Trihalomethanes, Total	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vinyl Acetate	NA	NA	NA	<5.0	NA	<5.0	NA	<5.0	NA	<5.0	NA	<5.0	NA	<5.0	NA	<0.50
Vinyl chloride	NA	NA	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<0.50
Xylenes, Total	NA	NA	NA	<3.0	NA	<3.0	NA	<3.0	NA	<3.0	NA	<3.0	NA	<3.0	NA	NA

Notes

- \* = samples collected during additional development
- mg/L = milligrams per liter
- UJ = the reporting limit is considered an estimated value
- J = the analyte was positively identified; however, the result should be considered an estimated value
- ug/L = microgram per liter
- NA = not analyzed
- < = analyte not reported above laboratory detection limit

**Appendix E  
Monitor Well Groundwater Quality Summary**

Parameters	MW-13 10/17/2008	MW-14 8/19/2008	MW-14 10/17/2008	MW-15 8/8/2008	MW-15 10/16/2008	POE 1/18/2008	POE 4/2/2008	POE 8/1/2008	POE 10/20/2008	PW-1 1/18/2008	PW-1 4/2/2008	PW-1 8/1/2008	PW-1 10/20/2008
<b>Inorganics (mg/L)</b>													
Arsenic	NA	<0.10	NA	<0.10	NA	0.0092	<0.10	<0.10	<0.10	0.0092	<0.10	<0.10	<0.10
Barium	NA	0.16	NA	0.23	NA	0.0071	<0.010	<0.010	<0.010	0.0043	<0.010	<0.010	<0.010
Cadmium	NA	<0.0010	NA	<0.0010	NA	0.001	<0.0010	<0.0010	<0.0010	0.001	<0.0010	<0.0010	<0.0010
Calcium	NA	NA	NA	NA	NA	26	24	24	23	25	23	22	23
Chromium	NA	0.012	NA	<0.010	NA	0.0026	<0.010	<0.010	<0.010	0.0025	<0.010	<0.010	<0.010
Lead	NA	<0.015	NA	<0.015	NA	0.001	<0.015	<0.015	<0.015	0.001	<0.015	<0.015	<0.015
Magnesium	NA	NA	NA	NA	NA	11	11	11	11	11	10	9.9	11
Mercury	NA	<0.00020	NA	<0.00020	NA	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Potassium	NA	NA	NA	NA	NA	3.7	3.7	4.2	3.9	3.6	3.5	3.9	3.9
Selenium	NA	<0.10	NA	<0.10	NA	0.002	<0.10	<0.10	<0.10	0.0032	<0.10	<0.10	<0.10
Silver	NA	<0.010	NA	<0.010	NA	0.001	<0.010	<0.010	<0.010	0.001	<0.010	<0.010	<0.010
Sodium	NA	NA	NA	NA	NA	59	61	59	58	57	60	65	58
Perchlorate (ug/L; EPA Method 314.0)	220	2.5	<2.0	<2.0	<2.0	2.5	2.4	2.5	2.0	<2.0	<2.0	2.1	2.2
Perchlorate (ug/L; EPA Method 332)	210	2.6	1.1	0.88	0.82	NA	NA	NA	NA	NA	NA	NA	NA
<b>Volatile Organic Compounds (ug/L)</b>													
1,1,1,2-Tetrachloroethane	NA	<1.0	NA	NA	NA	NA	<0.5	<0.5	<0.5	<1.0	NA	NA	<0.50
1,1,1-Trichloroethane	NA	<1.0	NA	<0.50	NA	<0.5	<0.5	<0.5	<0.5	<1.0	<0.50	<0.50 UJ	<0.50
1,1,2,2-Tetrachloroethane	NA	<2.0	NA	<0.50	NA	NA	<0.5	<0.5	<0.5	<2.0	<0.50	<0.50 UJ	<0.50
1,1,2-Trichloroethane	NA	<1.0	NA	<0.50	NA	<0.5	<0.5	<0.5	<0.5	<1.0	<0.50	<0.50 UJ	<0.50
1,1-Dichloroethane	NA	<1.0	NA	<0.50	NA	NA	<0.5	<0.5	<0.5	<1.0	<0.50	<0.50 UJ	0.52
1,1-Dichloroethene	NA	<2.0	NA	<0.50	NA	2.5	<0.5	<0.5	<0.5	4.3	3.5	<0.50 UJ	<0.50
1,1-Dichloropropene	NA	<1.0	NA	<0.50	NA	NA	<0.5	<0.5	<0.5	<1.0	<0.50	<0.50 UJ	<0.50
1,2,3-Trichlorobenzene	NA	<1.0	NA	<1.0	NA	NA	<0.5	<0.5	<0.5	<1.0	<1.0	<1.0 UJ	<1.0
1,2,3-Trichloropropane	NA	<1.0	NA	<1.0	NA	NA	<2	<2	<2	<1.0	<1.0	<1.0 UJ	<1.0
1,2,4-Trichlorobenzene	NA	<1.0	NA	<1.0	NA	<0.5	<0.5	<0.5	<0.5	<1.0	<1.0	<1.0 UJ	<1.0
1,2,4-Trimethylbenzene	NA	<1.0	NA	<0.50	NA	NA	<0.5	<0.5	<0.5	<1.0	<0.50	<0.50 UJ	<0.50
1,2-Dibromo-3-chloropropane	NA	<2.0	NA	NA	NA	NA	<2	<2	<2	<2.0	NA	NA	<2.5
1,2-Dibromoethane (EDB)	NA	<1.0	NA	<0.50	NA	NA	<0.5	<0.5	<0.5	<1.0	<0.50	<0.50 UJ	<0.50
1,2-Dichlorobenzene	NA	<1.0	NA	<0.50	NA	<0.5	<0.5	<0.5	<0.5	<1.0	<0.50	<0.50 UJ	<0.50
1,2-Dichloroethane	NA	<1.0	NA	<0.50	NA	<0.5	<0.5	<0.5	<0.5	<1.0	<0.50	<0.50 UJ	<0.50
1,2-Dichloropropane	NA	<1.0	NA	<0.50	NA	<0.5	<0.5	<0.5	<0.5	<1.0	<0.50	<0.50 UJ	<0.50
1,3,5-Trimethylbenzene	NA	<1.0	NA	<0.50	NA	NA	<0.5	<0.5	<0.5	<1.0	<0.50	<0.50 UJ	<0.50
1,3-Dichlorobenzene	NA	<1.0	NA	<0.50	NA	NA	<0.5	<0.5	<0.5	<1.0	<0.50	<0.50 UJ	<0.50
1,3-Dichloropropane	NA	<1.0	NA	<0.50	NA	NA	<0.5	<0.5	<0.5	<1.0	<0.50	<0.50 UJ	<0.50
1,4-Dichlorobenzene	NA	<1.0	NA	<0.50	NA	<0.5	<0.5	<0.5	<0.5	<1.0	<0.50	<0.50 UJ	<0.50
1,4-Dioxane	NA	1.3	NA	2.7	NA	2.3	3.7	2.5	2.4	2.2	3.0	1.8	1.8
2,2-Dichloropropane	NA	<1.0	NA	<1.0	NA	NA	<0.5	<0.5	<0.5	<1.0	<1.0	<1.0 UJ	<1.0
2-Butanone (MEK)	NA	<10	NA	<2.5	NA	NA	NA	NA	NA	<10	<2.5	<2.5 UJ	<2.5
2-Chlorotoluene	NA	<1.0	NA	<0.50	NA	NA	<0.5	<0.5	<0.5	<1.0	<0.50	<0.50 UJ	<0.50
2-Hexanone	NA	<10	NA	<2.5	NA	NA	NA	NA	NA	<10	<2.5	<2.5 UJ	<2.5
4-Chlorotoluene	NA	<1.0	NA	<0.50	NA	NA	<0.5	<0.5	<0.5	<1.0	<0.50	<0.50 UJ	<0.50
4-Methyl-2-pentanone (MIBK)	NA	<10	NA	<2.5	NA	NA	NA	NA	NA	<10	<2.5	<2.5 UJ	<2.5
Acetone	NA	<20	NA	<10	NA	NA	NA	NA	NA	<20	<10	<10 UJ	<10
Benzene	NA	<1.0	NA	<0.50	NA	<0.5	<0.5	<0.5	<0.5	<1.0	<0.50	<0.50 UJ	<0.50
Bromobenzene	NA	<1.0	NA	<0.50	NA	NA	<0.5	<0.5	<0.5	<1.0	<0.50	<0.50 UJ	<0.50
Bromochloromethane	NA	<1.0	NA	<0.50	NA	NA	<0.5	<0.5	<0.5	<1.0	<0.50	<0.50 UJ	<0.50
Bromodichloromethane	NA	<1.0	NA	<0.50	NA	<0.5	<0.5	<0.5	<0.5	<1.0	<0.50	<0.50 UJ	<0.50
Bromoform	NA	<2.0	NA	2.2	NA	2.2	<0.5	<0.5	<0.5	<2.0	<1.0	<1.0 UJ	<1.0

**Appendix E  
Monitor Well Groundwater Quality Summary**

Parameters	MW-13 10/17/2008	MW-14 8/19/2008	MW-14 10/17/2008	MW-15 8/8/2008	MW-15 10/16/2008	POE 1/18/2008	POE 4/2/2008	POE 8/1/2008	POE 10/20/2008	PW-1 1/18/2008	PW-1 4/2/2008	PW-1 8/1/2008	PW-1 10/20/2008
<b>Volatile Organic Compounds (ug/L)</b>													
Bromomethane	NA	<4.0	NA	<1.0	NA	NA	<0.5	<0.5	<0.5	<4.0	<1.0	<1.0 UJ	<1.0
Carbon Disulfide	NA	<5.0	NA	NA	NA	NA	NA	NA	NA	<5.0	NA	NA	<0.50
Carbon tetrachloride	NA	<1.0	NA	<0.50	NA	<0.5	<0.5	<0.5	<0.5	<1.0	<0.50	<0.50 UJ	<0.50
Chlorobenzene	NA	<1.0	NA	<0.50	NA	<0.5	<0.5	<0.5	<0.5	<1.0	<0.50	<0.50 UJ	<0.50
Chloroethane	NA	<4.0	NA	<1.0	NA	NA	<0.5	<0.5	<0.5	<4.0	<1.0	<1.0 UJ	<1.0
Chloroform	NA	<1.0	NA	0.67	NA	<0.5	<0.5	<0.5	<0.5	<1.0	<0.50	14 J	1.6
Chloromethane	NA	<4.0	NA	<1.0	NA	NA	<0.5	<0.5	<0.5	<4.0	<1.0	<1.0 UJ	<1.0
cis-1,2-Dichloroethene	NA	<1.0	NA	<0.50	NA	<0.5	<0.5	<0.5	<0.5	<1.0	<0.50	<0.50 UJ	<0.50
cis-1,3-Dichloropropene	NA	<1.0	NA	<0.50	NA	NA	<0.5	<0.5	<0.5	<1.0	<0.50	<0.50 UJ	<0.50
Dibromochloromethane	NA	<1.0	NA	<0.50	NA	0.99	<0.5	<0.5	<0.5	<1.0	<0.50	<0.50 UJ	<0.50
Dibromomethane	NA	<1.0	NA	NA	NA	NA	<0.5	<0.5	<0.5	<1.0	NA	NA	<0.50
Dichlorodifluoromethane	NA	<4.0	NA	<0.50	NA	NA	<0.5	<0.5	<0.5	<4.0	<0.50	<0.50 UJ	<0.50
Ethylbenzene	NA	<2.0	NA	<0.50	NA	<0.5	<0.5	<0.5	<0.5	<2.0	<0.50	<0.50 UJ	<0.50
Hexachlorobutadiene	NA	<1.0	NA	NA	NA	NA	<0.5	<0.5	<0.5	<1.0	NA	NA	<1.0
Iodomethane	NA	<2.0	NA	NA	NA	NA	NA	NA	NA	<2.0	NA	NA	<2.5
Isopropylbenzene	NA	<1.0	NA	NA	NA	NA	<0.5	<0.5	<0.5	<1.0	NA	NA	<0.50
m,p-Xylenes	NA	NA	NA	<1.0	NA	<0.5	<1	<1	<1	NA	<1.0	<1.0 UJ	NA
Methylene Chloride	NA	<5.0	NA	<1.0	NA	<0.5	<0.5	<0.5	<0.5	<5.0	<1.0	<1.0 UJ	<1.0
Methyl-tert-butyl Ether (MTBE)	NA	<5.0	NA	<0.50	NA	NA	NA	NA	NA	<5.0	<0.50	<0.50 UJ	<0.50
Naphthalene	NA	<2.0	NA	NA	NA	NA	<0.5	<0.5	<0.5	<2.0	NA	NA	<2.5
n-Butylbenzene	NA	<1.0	NA	<0.50	NA	NA	<0.5	<0.5	<0.5	<1.0	<0.50	<0.50 UJ	<0.50
n-Propylbenzene	NA	<1.0	NA	<0.50	NA	NA	<0.5	<0.5	<0.5	<1.0	<0.50	<0.50 UJ	<0.50
o-Xylene	NA	NA	NA	<0.50	NA	<0.5	<0.5	<0.5	<0.5	NA	<0.50	<0.50 UJ	NA
p-Isopropyltoluene	NA	<1.0	NA	<0.50	NA	NA	<0.5	<0.5	<0.5	<1.0	<0.50	<0.50 UJ	<0.50
sec-Butylbenzene	NA	<1.0	NA	<0.50	NA	NA	<0.5	<0.5	<0.5	<1.0	<0.50	<0.50 UJ	<0.50
Styrene	NA	<1.0	NA	<0.50	NA	<0.5	<0.5	<0.5	<0.5	<1.0	<0.50	<0.50 UJ	<0.50
tert-Butylbenzene	NA	<1.0	NA	<0.50	NA	NA	<0.5	<0.5	<0.5	<1.0	<0.50	<0.50 UJ	<0.50
Tetrachloroethene	NA	<1.0	NA	<0.50	NA	<0.5	<0.5	<0.5	<0.5	<1.0	<0.50	<0.50 UJ	<0.50
Toluene	NA	<2.0	NA	0.77	NA	<0.5	<0.5	<0.5	<0.5	<2.0	<0.50	<0.50 UJ	<0.50
trans-1,2-Dichloroethene	NA	<1.0	NA	<0.50	NA	<0.5	<0.5	<0.5	<0.5	<1.0	<0.50	<0.50 UJ	<0.50
trans-1,3-Dichloropropene	NA	<1.0	NA	<0.50	NA	NA	<0.5	<0.5	<0.5	<1.0	<0.50	<0.50 UJ	<0.50
Trichloroethene	NA	<1.0	NA	<0.50	NA	<0.5	<0.5	<0.5	<0.5	<1.0	<0.50	<0.50 UJ	<0.50
Trichlorofluoromethane	NA	<4.0	NA	<0.50	NA	NA	<0.5	<0.5	<0.5	<4.0	<0.50	<0.50 UJ	<0.50
Trihalomethanes, Total	NA	NA	NA	NA	NA	3.2	NA	NA	NA	NA	NA	NA	NA
Vinyl Acetate	NA	<5.0	NA	<0.50	NA	NA	NA	NA	NA	<5.0	<0.50	<0.50 UJ	<0.50
Vinyl chloride	NA	<1.0	NA	<0.50	NA	<0.5	<0.5	<0.5	<0.5	<1.0	<0.50	<0.50 UJ	<0.50
Xylenes, Total	NA	<3.0	NA	NA	NA	<1.5	NA	NA	NA	<3.0	NA	NA	<1.0

Notes

- \* = samples collected during additional development
- mg/L = milligrams per liter
- UJ = the reporting limit is considered an estimated value
- J = the analyte was positively identified; however, the result should be considered an estimated value
- ug/L = microgram per liter
- NA = not analyzed
- < = analyte not reported above laboratory detection limit

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**F**

APPENDIX



**APPENDIX F  
Historic Private Well Water Quality Data**

Sample ID	Collection Date	Perchlorate (Method 314.0) (ug/L)	Perchlorate (Method 332.0) (ug/L)
16 E. YEARLING	10/15/2008	<2	0.77
	4/1/2008*	<2	2.6
	4/1/2008	<2	2.9
	10/16/2007	<2	0.64
	11/14/2006	<2	0.68
	5/23/2006	<2	NA
	10/28/2005	<2	NA
	4/29/2005	<2	NA
	11/19/2004	<2	NA
18 E. YEARLING	10/15/2008	<2	1.1
	4/1/2008	<2	1.0
	10/16/2007	<2	0.77
	4/4/2007	<2	0.98
	11/14/2006	<2	0.94
	5/23/2006	<2	NA
	10/27/2005	<2	NA
204 E. YEARLING	10/15/2008**	<2	0.73
	10/27/2005	<2	NA
218 E. YEARLING	10/15/2008	<2	0.80
	4/1/2008	<2	1.3
	10/16/2007	<2	0.67
	4/4/2007	<2	0.67
	11/14/2006	<2	0.68
	5/23/2006	<2	NA
	10/28/2005	<2	NA
	11/19/2004	<2	NA
25825 N. 1 <sup>ST</sup> PLACE	10/15/2008	<2	0.97
	4/1/2008	<2	1.1
	10/16/2007	<2	0.89
	4/4/2007	<2	0.93
	11/14/2006	<2	1.0
	5/23/2006	<2	NA
	10/28/2005	<2	NA
	4/28/2005	<2	NA
	11/17/2004	<2	NA
25825 N. 1 <sup>ST</sup> - TAP	4/28/2005	<2	NA
	11/17/2004	<2	NA
25903 N. 2ND ST	10/15/2008	<2	0.84
	4/1/2008	2.2	3.1
	4/4/2007	<2	0.76
	11/14/2006	<2	0.78
	5/23/2006	<2	NA
	10/28/2005	<2	NA
	11/19/2004	<2	NA

**APPENDIX F**  
**Historic Private Well Water Quality Data**

Sample ID	Collection Date	Perchlorate (Method 314.0) (ug/L)	Perchlorate (Method 332.0) (ug/L)
412 E. YEARLING	10/15/2008	<2	1.5
	4/1/2008	<2	2.1
	5/23/2006	<2	NA
	10/28/2005	<2	NA
	4/29/2005	<2	NA
	11/19/2004	<2	NA
520 E. YEARLING	10/15/2008	<2	1.3
	4/1/2008	<2	2.2
	10/16/2007	<2	1.4
	4/4/2007	2.4	1.3
	11/14/2006	<2	1.5
	5/23/2006	<2	NA
	4/28/2005	<2	NA
	11/17/2004	<2	NA
604/616 E YEARLING	10/15/2008	<2	1.1
	4/1/2008	<2	1.5
	10/16/2007	<2	1.0
	4/6/2007	<2	1.2
	11/14/2006	<2	1.1
	5/23/2006	<2	NA
	10/28/2005	<2	NA
	4/29/2005	<2	NA
11/17/2004	<2	NA	
104 E. YEARLING	11/15/2006	<2	2.0
8/20 W. YEARLING	10/15/2008	<2	1.1
	4/4/2008	<2	0.78
	12/28/2007	<2	1.2
106 W. YEARLING	10/15/2008	<2	0.75
	4/1/2008	<2	1.1
	12/28/2007	<2	1.3
122 W. YEARLING	10/13/2008	<2	0.72
	4/1/2008	<2	1.2
	12/28/2007	<2	1.4
424 E. YEARLING	10/15/2008	<2	1.6
	4/1/2008	<2	2.2
	1/19/2008	<2	1.2

Notes:

ug/L = micrograms per liter

< = analyte not reported above laboratory detection limit

\* = well in front yard sampled for comparison purposes, labeled as 16 E. Yearling - N

\*\* = no access to 204 E. Yearling. Well head for 204 E. Yearling located on 218 E. Yearling property. Sample collected from this location.

NA = not analyzed

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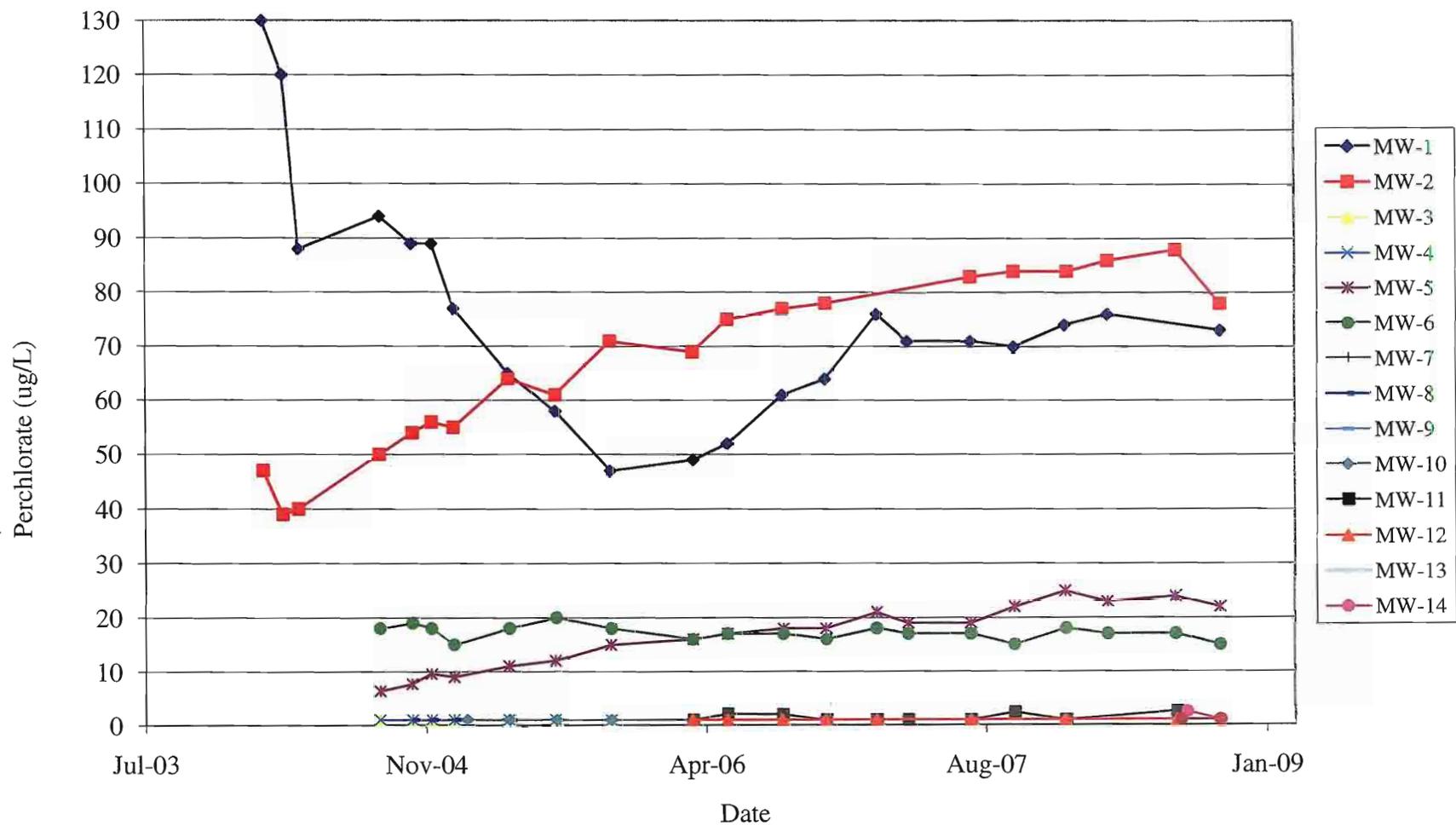
**G**  
APPENDIX

**G**

APPENDIX



## Appendix G Historic Monitor Well Perchlorate Concentration Graph



Note:  
Perchlorate concentration for Monitor Well MW-13  
8/8/2008 = 330 ug/L and  
10/17/2008 = 220 ug/L

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**H**

APPENDIX

**H**  
APPENDIX



**Appendix H**  
**2008 Field Data Summary**

Quarter Sampled	Well ID	Date	Purge Volume (gallons)	Time	Temperature (°C)	Conductivity (µs/cm)	pH
First Quarter 2008	MW-1	1/15/2008	38	14:49	27.93	489	7.64
	MW-1	1/15/2008	75	14:54	28.28	507	7.59
	MW-1	1/15/2008	113	14:59	28.28	508	7.58
	MW-1	1/15/2008	150	15:04	28.25	509	7.57
	MW-2	1/19/2008	36	12:02	27.42	452	7.66
	MW-2	1/19/2008	64	12:05	27.89	453	7.69
	MW-2	1/19/2008	91	12:08	28.01	452	7.70
	MW-2	1/19/2008	118	12:11	27.99	450	7.64
	MW-2	1/19/2008	137	12:13	27.96	450	7.74
	MW-3	1/17/2008	35	8:51	27.27	327	7.88
	MW-3	1/17/2008	63	8:55	27.62	330	8.48
	MW-3	1/17/2008	84	8:58	27.63	330	7.80
	MW-4	1/17/2008	3	10:28	26.09	440	7.74
	MW-4	1/17/2008	7	10:32	26.74	445	7.65
	MW-4	1/17/2008	12	10:36	27.13	448	7.61
	MW-5	1/16/2008	30	9:00	27.31	408	7.81
	MW-5	1/16/2008	55	9:05	27.61	403	7.76
	MW-5	1/16/2008	80	9:10	27.78	400	7.81
	MW-5	1/16/2008	105	9:15	27.78	400	7.86
	MW-5	1/16/2008	135	9:21	27.84	398	7.87
	MW-5	1/16/2008	155	9:25	27.79	396	7.88
	MW-6	1/16/2008	11	11:29	27.22	454	8.05
	MW-6	1/16/2008	22	11:31	27.40	455	7.92
	MW-6	1/16/2008	33	11:33	27.49	458	7.84
	MW-6	1/16/2008	44	11:35	27.30	449	7.82
	MW-6	1/16/2008	55	11:37	26.75	420	7.80
	MW-6	1/16/2008	76	11:41	27.07	447	7.75
	MW-7	1/17/2008	36	15:19	27.45	359	7.76
	MW-7	1/17/2008	60	15:23	27.58	359	7.82
	MW-7	1/17/2008	78	15:26	27.50	358	7.86
	MW-7	1/17/2008	102	15:30	27.51	358	7.87
	MW-7	1/17/2008	126	15:34	27.64	359	7.87
	MW-7	1/17/2008	150	15:38	27.59	358	7.88
	MW-8	1/17/2008	0	11:17	27.82	235	8.69
	MW-8	1/17/2008	5	11:19	28.07	238	8.89
	MW-8	1/17/2008	11	11:21	28.11	235	8.99
	MW-8	1/17/2008	16	11:23	28.02	239	9.01
	MW-9	1/18/2008	21	9:22	27.46	458	7.61
	MW-9	1/18/2008	41	9:26	27.87	460	7.64

**Appendix H**  
**2008 Field Data Summary**

Quarter Sampled	Well ID	Date	Purge Volume (gallons)	Time	Temperature (°C)	Conductivity (µs/cm)	pH
First Quarter 2008 (continued)	MW-9	1/18/2008	62	9:30	27.94	460	7.65
	MW-9	1/18/2008	83	9:34	27.99	458	7.64
	MW-9	1/18/2008	103	9:38	28.04	458	7.66
	MW-9	1/18/2008	124	9:42	27.90	455	7.66
	MW-10	1/17/2008	4	12:30	27.12	383	7.79
	MW-10	1/17/2008	8	12:33	27.8	388	7.72
	MW-10	1/17/2008	11	12:36	28.24	391	7.66
	MW-10	1/17/2008	15	12:39	28.67	393	7.61
	MW-10	1/17/2008	19	12:42	28.70	394	7.59
	MW-10	1/17/2008	23	12:45	28.81	397	7.59
	MW-11	1/16/2008	58	14:30	28.10	625	7.96
	MW-11	1/16/2008	87	14:35	28.33	630	7.74
	MW-11	1/16/2008	115	14:40	28.35	630	7.69
	MW-11	1/16/2008	144	14:45	28.40	632	7.65
	MW-11	1/16/2008	173	14:50	28.46	632	7.65
	MW-11	1/16/2008	202	14:55	28.45	633	7.63
	MW-12	1/15/2008	43	10:19	29.08	509	7.12
	MW-12	1/15/2008	139	10:28	29.10	500	7.41
	MW-12	1/15/2008	182	10:32	29.15	488	7.48
	MW-12	1/15/2008	268	10:40	29.22	479	7.54
MW-12	1/15/2008	321	10:45	29.34	474	7.56	
MW-12	1/15/2008	375	10:50	29.43	472	7.58	
Second Quarter 2008	MW-1	3/31/2008	20	15:01	27.97	517	7.18
	MW-1	3/31/2008	47	15:05	28.60	522	7.23
	MW-1	3/31/2008	73	15:09	28.61	524	7.24
	MW-1	3/31/2008	100	15:13	28.62	526	7.21
	MW-1	3/31/2008	127	15:17	28.66	529	7.18
	MW-2	3/31/2008	30	16:02	28.50	488	7.40
	MW-2	3/31/2008	60	16:06	28.55	483	7.41
	MW-2	3/31/2008	90	16:10	28.59	481	7.43
	MW-2	3/31/2008	120	16:14	28.72	481	7.42
	MW-5	3/31/2008	15	11:15	28.66	438	7.44
	MW-5	3/31/2008	40	11:20	28.81	430	7.48
	MW-5	3/31/2008	65	11:25	28.91	428	7.48
	MW-5	3/31/2008	90	11:30	28.86	428	7.50
	MW-5	3/31/2008	115	11:35	28.85	428	7.52
	MW-5	3/31/2008	140	11:40	28.93	525	7.49
	MW-6	3/31/2008	25	9:43	27.79	485	7.25
	MW-6	3/31/2008	40	9:46	27.88	487	7.30

**Appendix H**  
**2008 Field Data Summary**

Quarter Sampled	Well ID	Date	Purge Volume (gallons)	Time	Temperature (°C)	Conductivity (µs/cm)	pH
Third Quarter 2008	MW-1	parameters not collected due to pump failure					
	MW-2	7/30/2008	33	15:08	28.87	478	7.34
	MW-2	7/30/2008	67	15:11	28.94	474	6.62
	MW-2	7/30/2008	100	15:14	28.86	470	6.72
	MW-3	7/29/2008	22	14:18	29.62	351	6.99
	MW-3	7/29/2008	33	14:20	29.96	355	6.89
	MW-3	7/29/2008	49	14:23	30.12	356	7.24
	MW-3	7/29/2008	65	14:26	30.50	359	7.29
	MW-4	7/29/2008	8	12:58	29.78	484	7.26
	MW-5	7/30/2008	19	12:08	28.89	431	6.67
	MW-5	7/30/2008	50	12:13	29.20	425	6.36
	MW-5	7/30/2008	81	12:18	29.22	422	6.76
	MW-5	7/30/2008	113	12:23	29.24	422	7.02
	MW-5	7/30/2008	144	12:28	29.32	421	7.15
	MW-5	7/30/2008	175	12:33	29.26	419	7.21
	MW-6	7/29/2008	13	10:26	28.71	448	7.19
	MW-6	7/29/2008	26	10:30	29.09	487	6.66
	MW-6	7/29/2008	33	10:32	29.20	487	6.73
	MW-6	7/29/2008	43	10:35	29.37	491	7.06
	MW-6	7/29/2008	53	10:38	29.45	493	7.13
	MW-7	8/1/2008	24	7:52	28.07	374	7.44
	MW-7	8/1/2008	57	7:56	28.21	372	6.64
	MW-7	8/1/2008	89	8:00	28.28	372	6.68
	MW-7	8/1/2008	122	8:04	28.33	370	6.92
	MW-7	8/1/2008	154	8:08	28.36	369	7.10
	MW-7	8/1/2008	186	8:12	28.42	371	7.21
	MW-7	8/1/2008	211	8:15	28.38	370	7.26
	MW-8	7/30/2008	10	8:44	29.21	260	8.05
	MW-8	7/30/2008	16	8:47	29.53	248	8.48
	MW-8	7/30/2008	22	8:50	30.59	246	8.88
	MW-8	7/30/2008	28	8:53	31.00	247	8.94
	MW-8	7/30/2008	34	8:56	31.26	248	9.00
	MW-8	7/30/2008	40	8:59	31.42	248	9.01
	MW-8	7/30/2008	46	9:02	31.51	249	8.99
MW-9	8/1/2008	20	9:21	29.24	493	7.24	
MW-9	8/1/2008	52	9:26	29.58	491	7.14	
MW-9	8/1/2008	85	9:31	29.60	491	7.18	
MW-9	8/1/2008	117	9:36	29.53	490	7.18	
MW-9	8/1/2008	150	9:41	29.63	490	7.22	

**Appendix H**  
**2008 Field Data Summary**

Quarter Sampled	Well ID	Date	Purge Volume (gallons)	Time	Temperature (°C)	Conductivity (µs/cm)	pH
Third Quarter 2008 (continued)	MW-9	8/1/2008	169	9:44	29.57	487	7.23
	MW-10	7/30/2008	13	9:54	29.11	411	7.11
	MW-10	7/30/2008	27	9:58	29.32	411	7.08
	MW-10	7/30/2008	40	10:02	29.58	415	7.13
	MW-10	7/30/2008	53	10:06	29.70	416	7.21
	MW-11	8/1/2008	25	10:57	28.82	659	7.21
	MW-11	8/1/2008	63	11:03	29.04	661	7.16
	MW-11	8/1/2008	100	11:09	29.01	663	7.14
	MW-11	8/1/2008	138	11:15	29.15	667	7.14
	MW-11	8/1/2008	175	11:21	29.15	667	7.14
	MW-11	8/1/2008	213	11:27	29.16	667	7.15
	MW-12	7/31/2008	60	12:51	29.41	525	7.33
	MW-12	7/31/2008	210	13:01	30.00	525	7.15
	MW-12	7/31/2008	360	13:11	30.46	504	7.21
	MW-12	7/31/2008	510	13:21	30.48	494	7.24
	MW-12	7/31/2008	840	13:43	30.64	497	7.23
	MW-12	7/31/2008	990	14:26	30.11	496	7.21
	MW-13	8/8/2008	54	16:19	30.21	715	6.14
	MW-13	8/8/2008	122	16:24	30.24	613	6.15
	MW-13	8/8/2008	204	16:30	30.24	620	6.43
	MW-13	8/8/2008	272	16:35	30.22	576	6.66
	MW-13	8/8/2008	408	16:45	30.25	581	6.93
	MW-13	8/8/2008	558	16:56	30.25	587	7.09
	MW-13	8/8/2008	762	17:11	30.63	580	7.18
	MW-15	8/8/2008	20	13:30	29.07	550	5.43
	MW-15	8/8/2008	54	13:35	29.26	547	5.43
	MW-15	8/8/2008	88	13:40	29.37	548	5.69
	MW-15	8/8/2008	150	13:49	29.38	551	6.07
	MW-15	8/8/2008	184	13:54	29.40	551	6.27
	MW-15	8/8/2008	224	14:00	29.35	551	6.49
MW-15	8/8/2008	292	14:10	29.41	546	6.73	
Fourth Quarter 2008	MW-1	10/17/2008	28	7:42	28.35	473	7.19
	MW-1	10/17/2008	57	7:46	28.56	471	7.21
	MW-1	10/17/2008	85	7:50	28.65	470	7.21
	MW-1	10/17/2008	114	7:54	28.74	470	7.18
	MW-1	10/17/2008	142	7:58	28.75	471	7.18
	MW-2	10/17/2008	30	9:07	28.26	463	7.23
	MW-2	10/17/2008	80	9:12	28.41	460	7.21

**Appendix H**  
**2008 Field Data Summary**

Quarter Sampled	Well ID	Date	Purge Volume (gallons)	Time	Temperature (°C)	Conductivity (µs/cm)	pH
Fourth Quarter 2008 (continued)	MW-2	10/17/2008	110	9:15	28.47	459	7.22
	MW-2	10/17/2008	130	9:17	28.51	458	7.23
	MW-2	10/17/2008	150	9:19	28.51	457	7.23
	MW-5	10/17/2008	25	11:15	29.01	426	7.17
	MW-5	10/17/2008	50	11:20	29.26	417	7.26
	MW-5	10/17/2008	80	11:26	29.37	415	7.28
	MW-5	10/17/2008	100	11:30	29.36	412	7.31
	MW-5	10/17/2008	125	11:35	29.34	407	7.33
	MW-5	10/17/2008	150	11:40	29.37	409	7.33
	MW-5	10/17/2008	175	11:45	29.28	406	7.33
	MW-6	10/16/2008	0	15:44	30.72	488	7.30
	MW-6	10/16/2008	19	15:48	27.63	460	7.05
	MW-6	10/16/2008	38	15:52	28.73	471	7.04
	MW-6	10/16/2008	56	15:56	28.63	470	7.09
	MW-13	10/17/2008	58	13:15	30.12	558	6.94
	MW-13	10/17/2008	174	13:25	30.27	559	7.09
	MW-13	10/17/2008	290	13:35	30.37	558	7.14
	MW-13	10/17/2008	406	13:45	29.90	550	7.12
	MW-13	10/17/2008	522	13:55	29.93	542	7.12
	MW-13	10/17/2008	638	14:05	29.94	535	7.14
	MW-13	10/17/2008	754	14:15	29.96	524	7.14
	MW-13	10/17/2008	870	14:25	29.94	523	7.16
	MW-14	10/16/2008	13	8:40	29.74	743	7.00
	MW-14	10/16/2008	47	8:51	28.89	739	7.25
	MW-14	10/16/2008	126	9:16	30.12	732	7.23
	MW-14	10/16/2008	161	9:27	30.74	738	7.14
	MW-14	10/16/2008	189	9:36	31.16	740	7.14
	MW-14	10/16/2008	224	9:47	31.59	745	7.08
	MW-14	10/16/2008	265	10:00	31.84	746	7.07
	MW-15	10/16/2008	19	14:00	29.40	523	7.10
	MW-15	10/16/2008	44	14:04	29.63	526	7.05
	MW-15	10/16/2008	69	14:08	29.81	523	7.06
	MW-15	10/16/2008	94	14:12	29.74	524	7.08
MW-15	10/16/2008	119	14:16	29.94	524	7.07	
MW-15	10/16/2008	144	14:20	29.97	524	7.07	
MW-15	10/16/2008	6:00	14:22	29.94	524	7.09	

**MALCOLM  
PIRNIE**

INDEPENDENT ENVIRONMENTAL  
ENGINEERS, SCIENTISTS  
AND CONSULTANTS

**I**

APPENDIX



**I**  
APPENDIX

# GROUNDWATER MONITORING DATA VERIFICATION SUMMARY SITE MONITORING WELLS - APRIL 2008

## 1.0 INTRODUCTION

This summary presents data verification results for groundwater samples collected from Universal Propulsion Company, Inc. (UPCO) wells during the April 2008 monitoring event. The data review was performed in accordance with the procedures specified in the Remedial Investigation Workplan Vol. II Quality Assurance Project Plan (QAPP) (Hargis+Associates, Inc. 2004), USEPA Functional Guidelines for Organic and Inorganic Data Review (USEPA, 1999 and 2002), and quality assurance and control parameters set by the project laboratory (TestAmerica).

A total of six groundwater samples were collected and submitted to TestAmerica for the following parameters:

- metals by USEPA Methods 200.7 and 245.1;
- perchlorate by USEPA Method 314.0; and
- volatile organic compounds (VOCs) by USEPA Method 8260B and 524.2.

Additionally, four field quality assurance samples (i.e., field duplicate and trip blanks) were collected and analyzed as part of the sampling program. Table 1 lists the samples and associated analytical parameters.

## 1.1 Data Quality Assessment

Sample results were subject to a Level III data review that includes an evaluation of the following quality control (QC) parameters:

- sample receipt temperatures;
- holding times;
- method blanks;
- laboratory control samples (LCS);
- matrix spike/matrix spike duplicates (MS/MSD);
- field duplicates; and
- surrogates (for organic parameters).

## 1.2 Data Qualifiers

The data qualifiers used to qualify analytical results associated with QC parameters outside data quality objectives are defined below:

- J The analyte was positively identified; however, the result should be considered an estimated value.
- UJ The reporting limit is considered an estimated value.
- R Quality control indicates that the data is not usable

Results qualified as “J” or UJ” are of acceptable data quality and may be used quantitatively to fulfill the objectives of the analytical program, per USEPA guidelines. The results associated with this sampling event required no data qualification.

## 1.3 Sample Preservation and Temperature Upon Laboratory Receipt

Samples were received intact and at the correct temperature ( $4\pm 2^{\circ}$  Celsius) at the project laboratory.

## 1.4 Holding Times

Samples were extracted and analyzed within the holding time limits set by the respective USEPA methods.

## 1.5 Blank Contamination

Method blanks and trip blanks were performed at the required frequencies. Target compounds were not detected in the blanks.

## 1.6 LCS/LCS Duplicate Recovery and Relative Percent Difference

LCS/LCS duplicates were performed at the required frequency and were evaluated based on the following criteria:

- If the analyte recovery was above acceptance limits for LCS or LCS duplicate but the analyte was not detected in the associated batch, then data qualification was not required.
- If the analyte recovery was above acceptance limits for LCS or LCS duplicate and the analyte was detected in the associated batch, then the analyte results were qualified “J”.
- If the analyte recovery was below acceptance limits for LCS or LCS duplicate then the analyte results in the associated analytical batch were qualified (“UJ” for non-detects and “J” for detected results).

- If the analyte recovery was less than 10 percent, the analyte results in the associated analytical batch were rejected and qualified “R”.

Percent recoveries and RPDs for the LCS/LCS duplicate were within acceptance limits.

### **1.7 MS/MSD Recovery and RPD**

MS/MSD samples were performed at the required frequency and were evaluated by the following criteria:

- If MS or MSD recovery for an analyte is above acceptance limits but the analyte is not detected in the associated analytical batch, then data qualification was not required.
- If MS or MSD recovery for an analyte is above acceptance limits and the analyte is detected in the associated analytical batch, the analyte results were qualified “J”.
- Low MS/MSD recoveries for inorganic parameters result in sample qualification of the associated analytical batch.
- Low MS/MSD recoveries for organic parameters result in the data qualification of the unspiked sample rather than the analytical batch.
- Results were not qualified based on non-project specific MS/MSD (i.e., batch QC) recoveries.

Percent recoveries and RPDs for the MS/MSD were within acceptance limits

### **1.8 Field Duplicates**

One field duplicate was collected during this monitoring event and submitted for analysis. The RPD between the field duplicate and its associated samples were calculated and presented in Table 2. Field duplicates were evaluated by the following criteria:

- If an analyte is detected at a concentration greater than five times the method reporting limit, the RPD should be less than 25 percent.
- If an analyte is detected between the sample and field duplicate less than five times the method reporting limit, the difference between the sample and the field duplicate should not exceed the method reporting limit.

The field duplicate met acceptance criteria.

### **1.9 Surrogates**

Surrogates for all organic parameters were recovered within acceptance limits.

## 2.0 Calibration

The second source calibration verification standard had a high recovery for bromoethane. Data qualification was not required since the associated samples were not detected for this analyte.

## 2.1 Completeness Summary

Two types of completeness were calculated for this project: contract and technical. As specified in the project DQOs, the goal for completeness for the site is 90 percent. Results indicated as not reportable by the laboratory are not included in the completeness calculations. The following equations are used to calculate the two types of completeness.

$$\begin{aligned} \% \text{ Contract Completeness} = \\ & \left( \frac{\text{Number of contract compliant results}}{\text{Number of reported results}} \right) \\ & \quad \times 100 \end{aligned}$$

$$\begin{aligned} \% \text{ Technical Completeness} = \\ & \left( \frac{\text{Number of usable results}}{\text{Number of reported results}} \right) \\ & \quad \times 100 \end{aligned}$$

The overall contract completeness included the evaluation of the protocol and contract deviations for holding times, blanks, MS/MSD, and LCS/LCSD attained for the field samples was 100 percent. The technical completeness, which included all QC parameters, attained for the field samples was 100 percent. The completeness results are provided in Table 3. All of the results were considered usable for the intended purposes and the project DQOs have been met.

# PRIVATE WELLS MONITORING DATA VERIFICATION SUMMARY PRIVATE WELLS- APRIL 2008

## 1.0 INTRODUCTION

This summary presents data verification results for private residential wells adjacent to Universal Propulsion Company, Inc. (UPCO) during the April 2008 monitoring event. The data review was performed in accordance with the procedures specified in the Remedial Investigation Workplan Vol. II Quality Assurance Project Plan (QAPP) (Hargis+Associates, Inc. 2004), USEPA Functional Guidelines for Organic and Inorganic Data Review (USEPA, 1999 and 2002), and quality assurance and control parameters set by the project laboratory (TestAmerica).

A total of 13 groundwater samples were collected and submitted to TestAmerica for the following parameters:

- perchlorate by USEPA Method 314.0

Table 4 lists the samples and associated analytical parameters.

## 1.1 Data Quality Assessment

Sample results were subject to a Level III data review that includes an evaluation of the following quality control (QC) parameters:

- sample receipt temperatures;
- holding times;
- method blanks;
- laboratory control samples (LCS); and
- matrix spike/matrix spike duplicates (MS/MSD);

## 1.2 Data Qualifiers

The data qualifiers used to qualify analytical results associated with QC parameters outside data quality objectives are defined below:

- J The analyte was positively identified; however, the result should be considered an estimated value.
- UJ The reporting limit is considered an estimated value.
- R Quality control indicates that the data is not usable

Results qualified as “J” or UJ” are of acceptable data quality and may be used quantitatively to fulfill the objectives of the analytical program, per USEPA guidelines. The results associated with this sampling event required no data qualification.

### **1.3 Sample Preservation and Temperature Upon Laboratory Receipt**

Samples were received intact and at the correct temperature ( $4\pm 2^{\circ}$  Celsius) at the project laboratory except for the following:

- One sample collected on April 4, 2008, was received intact at  $16^{\circ}$  Celsius. Since the sample was received in the laboratory one hour following collection, this temperature outlier did not significantly impact sample results and data qualification was not required.

### **1.4 Holding Times**

Samples were extracted and analyzed within the holding time limits set by the respective USEPA methods.

### **1.5 Blank Contamination**

Method blanks were performed at the required frequencies. Target compounds were not detected in the blanks.

### **1.6 LCS/LCS Duplicate Recovery and Relative Percent Difference**

LCS/LCS duplicates were performed at the required frequency and were evaluated based on the following criteria:

- If the analyte recovery was above acceptance limits for LCS or LCS duplicate but the analyte was not detected in the associated batch, then data qualification was not required.
- If the analyte recovery was above acceptance limits for LCS or LCS duplicate and the analyte was detected in the associated batch, then the analyte results were qualified “J”.
- If the analyte recovery was below acceptance limits for LCS or LCS duplicate then the analyte results in the associated analytical batch were qualified (“UJ” for non-detects and “J” for detected results).
- If the analyte recovery was less than 10 percent, the analyte results in the associated analytical batch were rejected and qualified “R”.

Percent recoveries and RPDs for the LCS/LCS duplicate were within acceptance limits.

## 1.7 MS/MSD Recovery and RPD

MS/MSD samples were performed at the required frequency and were evaluated by the following criteria:

- If MS or MSD recovery for an analyte is above acceptance limits but the analyte is not detected in the associated analytical batch, then data qualification was not required.
- If MS or MSD recovery for an analyte is above acceptance limits and the analyte is detected in the associated analytical batch, the analyte results were qualified "J".
- Low MS/MSD recoveries for inorganic parameters result in sample qualification of the associated analytical batch.
- Low MS/MSD recoveries for organic parameters result in the data qualification of the unspiked sample rather than the analytical batch.
- Results were not qualified based on non-project specific MS/MSD (i.e., batch QC) recoveries.

Percent recoveries and RPDs for the MS/MSD were within acceptance limits.

## 2.0 Completeness Summary

Two types of completeness were calculated for this project: contract and technical. As specified in the project DQOs, the goal for completeness for the site is 90 percent. Results indicated as not reportable by the laboratory are not included in the completeness calculations. The following equations are used to calculate the two types of completeness.

$$\begin{aligned} \% \text{ Contract Completeness} = \\ & \left( \frac{\text{Number of contract compliant results}}{\text{Number of reported results}} \right) \\ & \quad \times 100 \end{aligned}$$

$$\begin{aligned} \% \text{ Technical Completeness} = \\ & \left( \frac{\text{Number of usable results}}{\text{Number of reported results}} \right) \\ & \quad \times 100 \end{aligned}$$

The overall contract completeness included the evaluation of the protocol and contract deviations for holding times, blanks, MS/MSD, and LCS attained for the field samples was 100 percent. The technical completeness, which included all QC parameters, attained for the field samples was 100 percent. The completeness results are provided in Table 5. All of the results were considered usable for the intended purposes and the project DQOs have been met.

**MW Table 1**  
**Sampling and Analysis Schedule**  
**Groundwater Monitoring Data Verification**

<b>Sample ID</b>	<b>Lab ID</b>	<b>Collected</b>	<b>Sample Type</b>	<b>Parameters</b>
MW-5	PRD0024-01	3/31/2008	N	Perchlorate
MW-1	PRD0024-02	3/31/2008	N	Perchlorate
MW-2	PRD0024-03	3/31/2008	N	Perchlorate
MW-6	PRD0024-04	3/31/2008	N	Perchlorate
FD033108	PRD0024-05	3/31/2008	FD of MW-2	Perchlorate
PW-1	PRD0208-01	4/2/2008	N	VOCs, 1,4-Dioxane, Perchlorate, Metals
POE	PRD0208-02	4/2/2008	N	VOCs, 1,4-Dioxane, Perchlorate, Metals
TB040208-A	PRD0208-03	4/2/2008	TB	VOCs
TB040208-B	PRD0208-04	4/2/2008	TB	1,4-Dioxane
TB040208-C	PRD0208-05	4/2/2008	TB	VOCs

Notes:

Metals = arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver. In addition, calcium, magnesium, potassium, and sodium were analyzed for PW-1 and POE

VOCs = volatile organic compounds. PW-1 and TB040208 were analyzed by USEPA Method 8260B;

POE and TB040208-A were analyzed by USEPA Method 524.2.

N = normal field sample

FD = field duplicate

TB = trip blank

**MW Table 2**  
**Field Duplicate Summary**  
**Groundwater Monitoring Data Verification**

Sample ID / Field Duplicate ID	Parameters	Sample Result	Field Duplicate Result	RPD (%)
MW-2/ FD033108	Perchlorate (ug/l)			
	Perchlorate	86	84	8.9

Notes:

RPD = Relative percent difference;  $[(\text{difference})/(\text{average})]*100$

Field duplicate RPD acceptance limits is 25 percent for results greater than 5 times the reporting limit; for results less than 5 times the reporting limit, the difference between sample and field duplicate results should be less than the reporting limit

**MW Table 3  
Completeness Summary  
Groundwater Monitoring Data Verification**

<b>Parameters</b>	<b>Total Number of Samples</b>	<b>Number in Contractual Compliance</b>	<b>Percent Contractual Compliance</b>	<b>Number of Usable Results</b>	<b>Percent Technical Compliance</b>
<b>Perchlorate</b>					
Perchlorate	6	6	100	6	100
<b>VOCs (8260B)</b>					
All analytes	1	1	100	1	100
<b>VOCs (542.2)</b>					
All analytes	2	2	100	2	100
<b>Total Metals</b>					
All analytes	2	2	100	2	100
<b>1,4-Dioxane</b>					
1,4-Dioxane	2	2	100	2	100

**Notes:**

Number of samples used in completeness calculations includes field samples , but not field duplicates or blanks.

Percent Contractual Compliance = (Number of contract compliant results/Number of reported results) \* 100

Percent Technical Compliance = (Number of usable results/Number of reported results) \* 100

**PW Table 4**  
**Sampling and Analysis Schedule**  
**Private Wells Monitoring Data Verification**

<b>Sample ID</b>	<b>Lab ID</b>	<b>Collected</b>	<b>Sample Type</b>	<b>Parameters</b>
18 E Yearling	PRD0159-01	4/1/2008	N	Perchlorate by USEPA Method 314.0
16 E Yearling - N	PRD0122-01	4/1/2008	N	Perchlorate by USEPA Method 314.0
16 E Yearling - O	PRD0124-01	4/1/2008	N	Perchlorate by USEPA Method 314.0
106 W Yearling	PRD0126-01	4/1/2008	N	Perchlorate by USEPA Method 314.0
122 W Yearling	PRD0127-01	4/1/2008	N	Perchlorate by USEPA Method 314.0
218 E Yearling	PRD0128-01	4/1/2008	N	Perchlorate by USEPA Method 314.0
424 E Yearling	PRD0129-01	4/1/2008	N	Perchlorate by USEPA Method 314.0
616/604 E Yearling	PRD0131-01	4/1/2008	N	Perchlorate by USEPA Method 314.0
412 E Yearling	PRD0132-01	4/1/2008	N	Perchlorate by USEPA Method 314.0
520 E Yearling	PRD0148-01	4/1/2008	N	Perchlorate by USEPA Method 314.0
25825 N 1st Place	PRD0134-01	4/1/2008	N	Perchlorate by USEPA Method 314.0
25903 N 2nd Street	PRD0147-01	4/1/2008	N	Perchlorate by USEPA Method 314.0
820 W Yearling	PRD0358-01	4/4/2008	N	Perchlorate by USEPA Method 314.0

Notes:

N = normal field sample

**Table 5**  
**Completeness Summary**  
**Private Wells Monitoring Data Verification**

Parameters	Total Number of Samples	Number in Contractual Compliance	Percent Contractual Compliance	Number of Usable Results	Percent Technical Compliance
<b>Inorganics</b>					
Perchlorate	13	13	100	13	100

Notes:

Percent Contractual Compliance = (Number of contract compliant results/Number of reported results) \* 100

Percent Technical Compliance = (Number of usable results/Number of reported results) \* 100

# **GROUNDWATER MONITORING DATA VERIFICATION SUMMARY SITE MONITORING WELLS - JULY/AUGUST 2008**

## **1.0 INTRODUCTION**

This summary presents data verification results for groundwater samples collected from Universal Propulsion Company, Inc. (UPCO) wells during the July/August 2008 monitoring event. The data review was performed in accordance with the procedures specified in the Remedial Investigation Workplan Vol. II Quality Assurance Project Plan (QAPP) (Hargis+Associates, Inc. 2004), USEPA Functional Guidelines for Organic and Inorganic Data Review (USEPA, 1999 and 2002), and quality assurance and control parameters set by the project laboratory (TestAmerica).

A total of sixteen groundwater samples were collected and submitted to TestAmerica for the following parameters:

- metals by USEPA Methods 200.7 and 245.1;
- perchlorate by USEPA Method 314.0; and
- volatile organic compounds (VOCs) by USEPA Method 8260B and 524.2.

Additionally, four field quality assurance samples (i.e., trip blanks) were collected and analyzed as part of the sampling program. Table 1 lists the samples and associated analytical parameters.

## **1.1 Data Quality Assessment**

Sample results were subject to a Level III data review that includes an evaluation of the following quality control (QC) parameters:

- sample receipt temperatures;
- holding times;
- method blanks;
- laboratory control samples (LCS);
- matrix spike/matrix spike duplicates (MS/MSD); and,
- surrogates (for organic parameters).

Results that required qualification based on the data verification are summarized in Table 2.

## 1.2 Data Qualifiers

The data qualifiers used to qualify analytical results associated with QC parameters outside data quality objectives are defined below:

- J The analyte was positively identified; however, the result should be considered an estimated value.
- UJ The reporting limit is considered an estimated value.
- R Quality control indicates that the data is not usable

Results qualified as "J" or UJ" are of acceptable data quality and may be used quantitatively to fulfill the objectives of the analytical program, per USEPA guidelines. The results associated with this sampling event required no data qualification.

## 1.3 Sample Preservation and Temperature Upon Laboratory Receipt

Samples were received intact and at the correct temperature ( $4\pm 2^{\circ}$  Celsius) at the project laboratory except for the following:

- The samples collected on August 8, 2008, were received intact at  $0.9^{\circ}$  Celsius. This temperature outlier did not significantly impact sample results, so data qualification was not required.

## 1.4 Holding Times

Samples were extracted and analyzed within the holding time limits set by the respective USEPA methods. Sample MW-2 was reanalyzed outside the required holding time, but since the original analysis was reported no data qualification was required.

## 1.5 Blank Contamination

Method blanks and trip blanks were performed at the required frequencies. Target compounds were not detected in the blanks with the following exception:

- Acetone was detected at 12 ug/l in the trip blank collected August 1, 2008. Data qualification was not required because the associated samples were not detected for this analyte.

## 1.6 LCS/LCS Duplicate Recovery and Relative Percent Difference

LCS/LCS duplicates were performed at the required frequency and were evaluated based on the following criteria:

- If the analyte recovery was above acceptance limits for LCS or LCS duplicate but the analyte was not detected in the associated batch, then data qualification was not required.
- If the analyte recovery was above acceptance limits for LCS or LCS duplicate and the analyte was detected in the associated batch, then the analyte results were qualified “J”.
- If the analyte recovery was below acceptance limits for LCS or LCS duplicate then the analyte results in the associated analytical batch were qualified (“UJ” for non-detects and “J” for detected results).
- If the analyte recovery was less than 10 percent, the analyte results in the associated analytical batch were rejected and qualified “R”.

Percent recoveries and RPDs for the LCS/LCS duplicate were within acceptance limits except for the following:

- For the analytical batch P8H1428, the LCS and LCS duplicate recoveries exceeded the control limits for vinyl acetate. Data qualification was not required because the associated samples were not detected for this analyte.
- For the analytical batch P8H2727, the LCS and LCS duplicate recoveries exceeded the control limits for iodomethane. Data qualification was not required because the associated samples were not detected for this analyte.
- For the analytical batch P8H2823, the LCS and LCS duplicate recoveries exceeded the control limits for bromomethane and iodomethane. Data qualification was not required because the associated samples were not detected for these analytes.

### **1.7 MS/MSD Recovery and RPD**

MS/MSD samples were performed at the required frequency and were evaluated by the following criteria:

- If MS or MSD recovery for an analyte is above acceptance limits but the analyte is not detected in the associated analytical batch, then data qualification was not required.
- If MS or MSD recovery for an analyte is above acceptance limits and the analyte is detected in the associated analytical batch, the analyte results were qualified “J”.
- Low MS/MSD recoveries for inorganic parameters result in sample qualification of the associated analytical batch.
- Low MS/MSD recoveries for organic parameters result in the data qualification of the unspiked sample rather than the analytical batch.

- Results were not qualified based on non-project specific MS/MSD (i.e., batch QC) recoveries.

Percent recoveries and RPDs for the MS/MSD were within acceptance limits except for the following:

- The MS/MSD recoveries associated with the analytical batch P8G3117 were outside of acceptance limits for vinyl acetate. Data qualification was not required because the MS/MSD recovery for this analyte was high and the associated samples were not detected for this analyte.
- The MS recovery associated with the analytical batch P8H1131 was outside of acceptance limits for 1,4-Dioxane. Data qualification was not required because the spiked sample was not project-specific (i.e., batch QC).
- The MS/MSD recoveries associated with the analytical batch P8H2034 were below acceptance limits for Barium, Chromium, and Lead. Data qualification was not required because the spiked sample was not project-specific (i.e. batch QC).
- The MS/MSD recoveries associated with the analytical batch P8H2823 were above the acceptance limits for bromomethane and iodomethane. Data qualification was not required because the MS/MSD recoveries for these analytes were high and the associated samples were not detected for these analytes.

## 1.9 Surrogates

Surrogates for all organic parameters were recovered within acceptance limits with the following exceptions:

- The surrogate recovery for dibromofluoromethane in the analytical batch P8H1131 was high for sample MW-2. The associated result for 1,4-dioxane was qualified “J” to indicate a potential high bias.
- The surrogate recovery for toluene-d8 in the analytical batch P8H0646 was high for sample PW-1. The associated results were qualified “J” for detects and “UJ” for non-detects to indicate a potential low bias.

## 2.0 Completeness Summary

Two types of completeness were calculated for this project: contract and technical. As specified in the project DQOs, the goal for completeness for the site is 90 percent. Results indicated as not reportable by the laboratory are not included in the completeness calculations. The following equations are used to calculate the two types of completeness.

$$\begin{aligned} \% \text{ Contract Completeness} = \\ & \left( \frac{\text{Number of contract compliant results}}{\text{Number of reported results}} \right) \\ & \times 100 \end{aligned}$$

$$\begin{aligned} \% \text{ Technical Completeness} = \\ & \left( \frac{\text{Number of usable results}}{\text{Number of reported results}} \right) \\ & \times 100 \end{aligned}$$

The overall contract completeness included the evaluation of the protocol and contract deviations for holding times, blanks, MS/MSD, LCS/LCSD, and surrogates attained for the field samples was 86 percent (out of 432 results, 60 required data qualification). The technical completeness, which included all QC parameters, attained for the field samples was 100 percent. The completeness results are provided in Table 3. All of the results were considered usable for the intended purposes and the project DQOs have been met.

**MW Table 1**  
**Sampling and Analysis Schedule**  
**Groundwater Monitoring Data Verification**

Sample ID	Lab ID	Collected	Sample Type	Parameters
MW-6	PRG1750-01	7/30/2008	N	Perchlorate
MW-5	PRG1750-02	7/30/2008	N	Perchlorate
MW-4	PRG1750-03	7/30/2008	N	Perchlorate
MW-3	PRG1750-04	7/30/2008	N	Perchlorate
MW-2	PRG1750-05	7/30/2008	N	VOCs, 1,4-Dioxane, Perchlorate
TB073008	PRG1750-06	7/30/2008	TB	VOCs, 1,4-Dioxane
MW-8	PRG1823-01	7/31/2008	N	Perchlorate, Metals
MW-10	PRG1823-02	7/31/2008	N	Perchlorate
MW-12	PRG1823-03	7/31/2008	N	Perchlorate
MW-7	PRH0063-01	8/1/2008	N	Perchlorate
MW-9	PRH0063-02	8/1/2008	N	Perchlorate
MW-11	PRH0063-03	8/1/2008	N	Perchlorate
POE	PRH0063-04	8/1/2008	N	VOCs, 1,4-Dioxane, Perchlorate, Metals
PW-1	PRH0063-05	8/1/2008	N	VOCs, 1,4-Dioxane, Perchlorate, Metals
Trip Blank	PRH0063-07	8/1/2008	TB	VOCs
MW-13	PRH0600-01	8/8/2008	N	VOCs, 1,4-Dioxane, Perchlorate, Metals
MW-15	PRH0600-02	8/8/2008	N	VOCs, 1,4-Dioxane, Perchlorate, Metals
TB080808	PRH0600-03	8/8/2008	TB	1,4-Dioxane
MW-14	PRH1157-01	8/19/2008	N	VOCs, 1,4-Dioxane, Perchlorate, Metals
TB081908	PRH1157-02	8/19/2008	TB	VOCs

Notes:

Metals = arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver. In addition, calcium, magnesium, potassium, and sodium were analyzed for PW-1 and POE

VOCs = volatile organic compounds analyzed by USEPA Method 8260B; Sample POE was analyzed by USEPA Method 524.2.

N = normal field sample

TB = trip blank

**MW Table 2**  
**Qualified Results**  
**Groundwater Monitoring Data Verification**

Sample ID	Analyte	Result	Units	Data Qualifier	Comments
MW-2	1,4-Dioxane	2.6	ug/l	J	Qualified due to high surrogate recovery
PW-1	1,1,1-Trichloroethane	ND	ug/l	UJ	Qualified due to low surrogate recovery
PW-1	1,1,1,2-Tetrachloroethane	ND	ug/l	UJ	Qualified due to low surrogate recovery
PW-1	1,1,2-Trichloroethane	ND	ug/l	UJ	Qualified due to low surrogate recovery
PW-1	1,1-Dichloroethane	ND	ug/l	UJ	Qualified due to low surrogate recovery
PW-1	1,1-Dichloroethene	ND	ug/l	UJ	Qualified due to low surrogate recovery
PW-1	1,1-Dichloropropene	ND	ug/l	UJ	Qualified due to low surrogate recovery
PW-1	1,2,3-Trichlorobenzene	ND	ug/l	UJ	Qualified due to low surrogate recovery
PW-1	1,2,3-Trichloropropane	ND	ug/l	UJ	Qualified due to low surrogate recovery
PW-1	1,2,4-Trichlorobenzene	ND	ug/l	UJ	Qualified due to low surrogate recovery
PW-1	1,2,4-Trichloropropene	ND	ug/l	UJ	Qualified due to low surrogate recovery
PW-1	1,2-Dibromoethane (EDB)	ND	ug/l	UJ	Qualified due to low surrogate recovery
PW-1	1,2-Dichlorobenzene	ND	ug/l	UJ	Qualified due to low surrogate recovery
PW-1	1,2-Dichloroethane	ND	ug/l	UJ	Qualified due to low surrogate recovery
PW-1	1,2-Dichloropropane	ND	ug/l	UJ	Qualified due to low surrogate recovery
PW-1	1,3,5-Trimethylbenzene	ND	ug/l	UJ	Qualified due to low surrogate recovery
PW-1	1,3-Dichlorobenzene	ND	ug/l	UJ	Qualified due to low surrogate recovery
PW-1	1,3-Dichloropropane	ND	ug/l	UJ	Qualified due to low surrogate recovery
PW-1	1,4-Dichlorobenzene	ND	ug/l	UJ	Qualified due to low surrogate recovery
PW-1	2,2-Dichloropropane	ND	ug/l	UJ	Qualified due to low surrogate recovery
PW-1	2-Butanone (MEK)	ND	ug/l	UJ	Qualified due to low surrogate recovery
PW-1	2-Chlorotoluene	ND	ug/l	UJ	Qualified due to low surrogate recovery
PW-1	2-Hexanone	ND	ug/l	UJ	Qualified due to low surrogate recovery
PW-1	4-Chlorotoluene	ND	ug/l	UJ	Qualified due to low surrogate recovery
PW-1	4-Methyl-2-pentanone (MIBK)	ND	ug/l	UJ	Qualified due to low surrogate recovery
PW-1	Acetone	ND	ug/l	UJ	Qualified due to low surrogate recovery
PW-1	Benzene	ND	ug/l	UJ	Qualified due to low surrogate recovery
PW-1	Bromobenzene	ND	ug/l	UJ	Qualified due to low surrogate recovery
PW-1	Bromochloromethane	ND	ug/l	UJ	Qualified due to low surrogate recovery
PW-1	Bromodichloromethane	ND	ug/l	UJ	Qualified due to low surrogate recovery
PW-1	Bromoform	ND	ug/l	UJ	Qualified due to low surrogate recovery
PW-1	Bromomethane	ND	ug/l	UJ	Qualified due to low surrogate recovery
PW-1	Carbon tetrachloride	ND	ug/l	UJ	Qualified due to low surrogate recovery
PW-1	Chlorobenzene	ND	ug/l	UJ	Qualified due to low surrogate recovery
PW-1	Chloroethane	ND	ug/l	UJ	Qualified due to low surrogate recovery
PW-1	Chloroform	14	ug/l	J	Qualified due to low surrogate recovery
PW-1	Chloromethane	ND	ug/l	UJ	Qualified due to low surrogate recovery
PW-1	cis-1,2-Dichloroethene	ND	ug/l	UJ	Qualified due to low surrogate recovery
PW-1	cis-1,3-Dichloropropene	ND	ug/l	UJ	Qualified due to low surrogate recovery
PW-1	Dibromochloromethane	ND	ug/l	UJ	Qualified due to low surrogate recovery
PW-1	Dichlorodifluoromethane	ND	ug/l	UJ	Qualified due to low surrogate recovery
PW-1	Ethylbenzene	ND	ug/l	UJ	Qualified due to low surrogate recovery
PW-1	m,p-Xylenes	ND	ug/l	UJ	Qualified due to low surrogate recovery
PW-1	Methyl-tert-butyl Ether (MTBE)	ND	ug/l	UJ	Qualified due to low surrogate recovery
PW-1	Methylene Chloride	ND	ug/l	UJ	Qualified due to low surrogate recovery
PW-1	n-Butylbenzene	ND	ug/l	UJ	Qualified due to low surrogate recovery
PW-1	n-Propylbenzene	ND	ug/l	UJ	Qualified due to low surrogate recovery
PW-1	o-Xylene	ND	ug/l	UJ	Qualified due to low surrogate recovery
PW-1	p-Isopropyltoluene	ND	ug/l	UJ	Qualified due to low surrogate recovery
PW-1	sec-Butylbenzene	ND	ug/l	UJ	Qualified due to low surrogate recovery
PW-1	Styrene	ND	ug/l	UJ	Qualified due to low surrogate recovery
PW-1	tert-Butylbenzene	ND	ug/l	UJ	Qualified due to low surrogate recovery
PW-1	Tetrachloroethene	ND	ug/l	UJ	Qualified due to low surrogate recovery
PW-1	Toluene	ND	ug/l	UJ	Qualified due to low surrogate recovery
PW-1	trans-1,2-Dichloroethene	ND	ug/l	UJ	Qualified due to low surrogate recovery
PW-1	trans-1,3-Dichloropropene	ND	ug/l	UJ	Qualified due to low surrogate recovery
PW-1	Trichloroethene	ND	ug/l	UJ	Qualified due to low surrogate recovery
PW-1	Trichlorofluoromethane	ND	ug/l	UJ	Qualified due to low surrogate recovery
PW-1	Vinyl Acetate	ND	ug/l	UJ	Qualified due to low surrogate recovery
PW-1	Vinyl chloride	ND	ug/l	UJ	Qualified due to low surrogate recovery

Notes:

ug/l = microgram per liter

J = Estimated result

UJ = Estimated detection limit

**MW Table 3**  
**Completeness Summary**  
**Groundwater Monitoring Data Verification**

Parameters	Total Number of Samples	Number in Contractual Compliance	Percent Contractual Compliance	Number of Usable Results	Percent Technical Compliance
<b>Inorganics</b>					
Perchlorate 314.0	16	16	100	16	100
<b>Volatile Organic Compounds (8260)</b>					
All analytes	5	4 <sup>a</sup>	80	5	100
1,4-Dioxane	6	5 <sup>b</sup>	83	6	100
<b>Volatile Organic Compounds (524.2)</b>					
All Analytes	1	1	100	1	1
<b>Metals</b>					
Arsenic	6	6	100	6	100
Barium	6	6	100	6	100
Cadmium	6	6	100	6	100
Calcium	2	2	100	2	100
Chromium	6	6	100	6	100
Lead	6	6	100	6	100
Magnesium	2	2	100	2	100
Mercury	6	6	100	6	100
Potassium	2	2	100	2	100
Selenium	6	6	100	6	100
Silver	6	6	100	6	100
Sodium	2	2	100	2	100

Notes:

Number of samples used in completeness calculations includes field samples, but not blanks.

Percent Contractual Compliance = (Number of contract compliant results/Number of reported results) \* 100

Percent Technical Compliance = (Number of usable results/Number of reported results) \* 100

a = Qualified due to low surrogate recovery

b = Qualified due to high surrogate recovery

# **GROUNDWATER MONITORING DATA VERIFICATION SUMMARY SITE MONITORING WELLS- JANUARY 2008**

## **1.0 INTRODUCTION**

This summary presents data verification results for groundwater samples collected from Universal Propulsion Company, Inc. (UPCO) wells during the January 2008 monitoring event. The data review was performed in accordance with the procedures specified in the Remedial Investigation Workplan Vol. II Quality Assurance Project Plan (QAPP) (Hargis+Associates, Inc. 2004), USEPA Functional Guidelines for Organic and Inorganic Data Review (USEPA, 1999 and 2002), and quality assurance and control parameters set by the project laboratory (TestAmerica).

A total of fourteen groundwater samples were collected and submitted to TestAmerica for the following parameters:

- metals by USEPA Methods 200.7, 200.8, and 245.1;
- perchlorate by USEPA Method 314.0; and
- volatile organic compounds (VOCs) by USEPA Method 8260B and 524.2.

Additionally, seven field quality assurance samples (i.e., field duplicate and trip blanks) were collected and analyzed as part of the sampling program. Table 1 lists the samples and associated analytical parameters.

## **1.1 Data Quality Assessment**

Sample results were subject to a Level III data review that includes an evaluation of the following quality control (QC) parameters:

- sample receipt temperatures;
- holding times;
- method blanks;
- laboratory control samples (LCS);
- matrix spike/matrix spike duplicates (MS/MSD);
- field duplicates; and
- surrogates (for organic parameters).

Results that required qualification based on the data verification are summarized in Table 2.

## **1.2 Data Qualifiers**

The data qualifiers used to qualify analytical results associated with QC parameters outside data quality objectives are defined below:

- J The analyte was positively identified; however, the result should be considered an estimated value.
- UJ The reporting limit is considered an estimated value.
- R Quality control indicates that the data is not usable

Results qualified as “J” or UJ” are of acceptable data quality and may be used quantitatively to fulfill the objectives of the analytical program, per USEPA guidelines. The results associated with this sampling event required no data qualification.

## **1.3 Sample Preservation and Temperature Upon Laboratory Receipt**

Samples were received intact and at the correct temperature ( $4\pm 2^{\circ}$  Celsius) at the project laboratory except for the following:

- The samples collected on January 15, 16, 17, and 18, 2008, were received intact at  $1^{\circ}$  Celsius. This temperature outlier did not significantly impact sample results, so data qualification was not required.

## **1.4 Holding Times**

Samples were extracted and analyzed within the holding time limits set by the respective USEPA methods with the following exception:

- Sample MW-2 was analyzed for 1,4-Dioxane two days outside of the required holding time. The 1,4-Dioxane result was qualified “J” to indicate a potential low bias.

## **1.5 Blank Contamination**

Method blanks and trip blanks were performed at the required frequencies. Target compounds were not detected in the blanks.

## **1.6 LCS/LCS Duplicate Recovery and Relative Percent Difference**

LCS/LCS duplicates were performed at the required frequency and were evaluated based on the following criteria:

- If the analyte recovery was above acceptance limits for LCS or LCS duplicate but the analyte was not detected in the associated batch, then data qualification was not required.
- If the analyte recovery was above acceptance limits for LCS or LCS duplicate and the analyte was detected in the associated batch, then the analyte results were qualified “J”.
- If the analyte recovery was below acceptance limits for LCS or LCS duplicate then the analyte results in the associated analytical batch were qualified (“UJ” for non-detects and “J” for detected results).
- If the analyte recovery was less than 10 percent, the analyte results in the associated analytical batch were rejected and qualified “R”.

Percent recoveries and RPDs for the LCS/LCS duplicate were within acceptance limits except for the following:

- For the analytical batch P8A2538, the LCS and LCS duplicate percent recoveries exceeded the control limits for chloroethane and vinyl acetate. Data qualification was not required because the associated samples were not detected for these analytes.
- For the analytical batch P8A2825, the LCS and LCS duplicate percent recoveries exceeded the control limits for vinyl acetate. Data qualification was not required because the associated samples were not detected for this analyte.
- For the analytical batch P8A3127, the LCS and LCS duplicate percent recoveries exceeded the control limits for dichlorofluoromethane and vinyl acetate. Data qualification was not required because the associated samples were not detected for these analytes.
- For the analytical batch P8B0119, the LCS and LCS duplicate percent recoveries exceeded the control limits for dichlorofluoromethane and vinyl acetate. Data qualification was not required because the associated samples were not detected for these analytes.
- For the analytical batch P8A3127, the RPD between the LCS and LCS duplicate recoveries exceeded the control limits for several analytes. Data qualification was not required because the LCS and LCS duplicate recoveries were within acceptance limits.

### **1.7 MS/MSD Recovery and RPD**

MS/MSD samples were performed at the required frequency and were evaluated by the following criteria:

- If MS or MSD recovery for an analyte is above acceptance limits but the analyte is not detected in the associated analytical batch, then data qualification was not required.
- If MS or MSD recovery for an analyte is above acceptance limits and the analyte is detected in the associated analytical batch, the analyte results were qualified "J".
- Low MS/MSD recoveries for inorganic parameters result in sample qualification of the associated analytical batch.
- Low MS/MSD recoveries for organic parameters result in the data qualification of the unspiked sample rather than the analytical batch.
- Results were not qualified based on non-project specific MS/MSD (i.e., batch QC) recoveries.

Percent recoveries and RPDs for the MS/MSD were within acceptance limits except for the following:

- The MS/MSD recoveries associated with the analytical batch P8A2538 were outside of acceptance limits for chloroethane, chloromethane, tetrachloroethene, and vinyl acetate. Data qualification was not required because the spiked sample was not project-specific (i.e., batch QC).
- The MS/MSD recoveries associated with the analytical batch P8A2825 were outside of acceptance limits for chloroethane. Data qualification was not required because the spiked sample was not project-specific (i.e., batch QC).
- The MS/MSD recoveries associated with the analytical batch P8A3127 were above acceptance limits for chloroethane, chloromethane, dichlorodifluoromethane, methylene chloride, vinyl acetate, and 1,1-Dichloroethane. Data qualification was not required because the associated samples were not detected for these analytes.
- For the analytical batch P8B0119, the RPD between MS and MSD percent recoveries exceeded the control limits for several analytes. Data qualification was not required because the MS and MSD recoveries were within acceptance limits. The MS/MSD recovery associated with this analytical batch was outside the acceptance limits for chloromethane. Data qualification was not required because the MS/MSD recovery for this analyte was high and the associated samples were not detected for this analyte.
- The MS/MSD recovery associated with the analytical batch 8A23061 was outside of acceptance limits for chromium. Data qualification was not required because the spiked sample was not project-specific (i.e., batch QC).
- The MS/MSD recoveries associated with the analytical batch C8A2928 were outside of acceptance limits for tetrachloroethene, m&p-xylenes, and total

xylenes. Data qualification was not required because the spiked sample was not project-specific (i.e., batch QC).

### **1.8 Field Duplicates**

One field duplicate was collected during this monitoring event and submitted for analysis. The RPD between the field duplicate and its associated samples were calculated and presented in Table 3. Field duplicates were evaluated by the following criteria:

- If an analyte is detected at a concentration greater than five times the method reporting limit, the RPD should be less than 25 percent.
- If an analyte is detected between the sample and field duplicate less than five times the method reporting limit, the difference between the sample and the field duplicate should not exceed the method reporting limit.

All field duplicates met acceptance criteria.

### **1.9 Surrogates**

Surrogates for all organic parameters were recovered within acceptance limits.

### **2.0 Calibration**

The second source calibration verification standard associated with several VOC analytical batches had high recoveries for chloroethane and vinyl acetate. Data qualification was not required since the associated samples were not detected for these analytes.

### **2.1 Completeness Summary**

Two types of completeness were calculated for this project: contract and technical. As specified in the project DQOs, the goal for completeness for the site is 90 percent. Results indicated as not reportable by the laboratory are not included in the completeness calculations. The following equations are used to calculate the two types of completeness.

$$\begin{aligned} \% \text{ Contract Completeness} = & \\ & \left( \frac{\text{Number of contract compliant results}}{\text{Number of reported results}} \right) \\ & \times 100 \end{aligned}$$

$$\begin{aligned} \% \text{ Technical Completeness} = & \\ & \left( \frac{\text{Number of usable results}}{\text{Number of reported results}} \right) \\ & \times 100 \end{aligned}$$

The overall contract completeness included the evaluation of the protocol and contract deviations for holding times, blanks, MS/MSD, and LCS attained for the field samples was 100 percent (with the exception of 1,4-Dioxane with 93 percent). The technical completeness, which included all QC parameters, attained for the field samples was 100 percent. The completeness results are provided in Table 4. All of the results were considered usable for the intended purposes and the project DQOs have been met.

**MW Table 1**  
**Sampling and Analysis Schedule**  
**Groundwater Monitoring Data Verification**

Sample ID	Lab ID	Collected	Sample Type	Parameters
MW-12	PRA0956-01	1/15/2008	N	VOCs, 1,4-Dioxane, Perchlorate, Metals
MW-1	PRA0956-02	1/15/2008	N	VOCs, 1,4-Dioxane, Perchlorate, Metals
TB011508	PRA0956-03	1/15/2008	TB	VOCs, 1,4-Dioxane
MW-5	PRA1046-01	1/16/2008	N	VOCs, 1,4-Dioxane, Perchlorate, Metals
MW-11	PRA1046-02	1/16/2008	N	VOCs, 1,4-Dioxane, Perchlorate, Metals
TB011608	PRA1046-03	1/16/2008	TB	VOCs, 1,4-Dioxane
FD011608	PRA1046-04	1/16/2008	FD of MW-5	VOCs, 1,4-Dioxane, Perchlorate, Metals
MW-6	PRA1148-01	1/17/2008	N	VOCs, 1,4-Dioxane, Perchlorate, Metals
MW-7	PRA1148-02	1/17/2008	N	VOCs, 1,4-Dioxane, Perchlorate, Metals
TB011708	PRA1148-03	1/17/2008	TB	VOCs, 1,4-Dioxane
MW-4	PRA1219-01	1/19/2008	N	VOCs, 1,4-Dioxane, Perchlorate, Metals
MW-2	PRA1219-02	1/19/2008	N	VOCs, 1,4-Dioxane, Perchlorate, Metals
MW-10	PRA1222-01	1/18/2008	N	VOCs, 1,4-Dioxane, Perchlorate, Metals
PW-1	PRA1222-02	1/18/2008	N	VOCs, 1,4-Dioxane, Perchlorate, Metals
POE	PRA1222-03	1/18/2008	N	VOCs, 1,4-Dioxane, Perchlorate, Metals
TB011808-B	PRA1222-04	1/18/2008	TB	VOCs, 1,4-Dioxane
TB011808-C	PRA1222-05	1/18/2008	TB	VOCs
MW-9	PRA1222-06	1/18/2008	N	VOCs, 1,4-Dioxane, Perchlorate, Metals
MW-3	PRA1222-07	1/18/2008	N	VOCs, 1,4-Dioxane, Perchlorate, Metals
TB011808-A	PRA1222-08	1/18/2008	TB	VOCs, 1,4-Dioxane
MW-8	PRA1222-09	1/18/2008	N	VOCs, 1,4-Dioxane, Perchlorate, Metals

Notes:

Metals = arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver. In addition, calcium, magnesium, potassium, and sodium were analyzed for PW-1 and POE

VOCs = volatile organic compounds analyzed by USEPA Method 8260B; POE and TB011808-C were analyzed by USEPA Method 524.2.

N = normal field sample

FD = field duplicate

TB = trip blank

**MW Table 2**  
**Qualified Results**  
**Groundwater Monitoring Data Verification**

<b>Sample ID</b>	<b>Analyte</b>	<b>Result</b>	<b>Units</b>	<b>Data Qualifier</b>	<b>Comments</b>
MW-2	1,4-Dioxane	2.7	ug/L	J	Qualified due to holding time exceedance.

Notes:

ug/L - microgram per liter

J = Estimated result

**MW Table 3**  
**Field Duplicate Summary**  
**Groundwater Monitoring Data Verification**

Sample ID / Field Duplicate ID	Parameters	Sample Result	Field Duplicate Result	RPD (%)
MW-5/ FD011608	<b>Metals</b>			
	Arsenic	<0.05	<0.05	NC
	Barium	0.051	0.048	6.1
	Cadmium	<0.005	<0.005	NC
	Chromium	0.022	0.021	4.7
	Lead	<0.05	<0.05	NC
	Mercury	<0.0002	<0.0002	NC
	Selenium	<0.05	<0.05	NC
	Silver	<0.005	<0.005	NC
	<b>Inorganics</b>			
	Perchlorate	25	23	8.3
	<b>Volatile Organic Compounds</b>			
	1,4-Dioxane	<1.0	<1.0	NC
	All Analytes	ND	ND	NC

Notes:

RPD = Relative percent difference;  $[(\text{difference})/(\text{average})]*100$

ND = No analytes detected

NC = Not calculated

Field duplicate RPD acceptance limits is 25 percent for results greater than 5 times the reporting limit; for results less than 5 times the reporting limit, the difference between sample and field duplicate results should be less than the reporting limit

**MW Table 4  
Completeness Summary  
Groundwater Monitoring Data Verification**

Parameters	Total Number of Samples	Number in Contractual Compliance	Percent Contractual Compliance	Number of Usable Results	Percent Technical Compliance
<b>Inorganics</b>					
Perchlorate 314.0	15	15	100	15	100
<b>Volatile Organic Compounds (8260)</b>					
All Analytes	13	13	100	13	100
1,4-Dioxane	14	13 <sup>a</sup>	93	14	100
<b>Volatile Organic Compounds (524.2)</b>					
All Analytes	1	1	100	1	1
<b>Metals</b>					
Arsenic	15	15	100	15	100
Barium	15	15	100	15	100
Cadmium	15	15	100	15	100
Calcium	2	2	100	2	100
Chromium	15	15	100	15	100
Lead	15	15	100	15	100
Magnesium	2	2	100	2	100
Mercury	15	15	100	15	100
Potassium	2	2	100	2	100
Selenium	15	15	100	15	100
Silver	15	15	100	15	100
Sodium	2	2	100	2	100

Notes:

Number of samples used in completeness calculations includes field samples and field duplicates, but not blanks.

Percent Contractual Compliance = (Number of contract compliant results/Number of reported results) \* 100

Percent Technical Compliance = (Number of usable results/Number of reported results) \* 100

a = Qualified due to holding time exceedance.

# GROUNDWATER MONITORING DATA VERIFICATION SUMMARY SITE MONITORING WELLS OCTOBER - 2008

## 1.0 INTRODUCTION

This summary presents data verification results for groundwater samples collected from Universal Propulsion Company, Inc. (UPCO) wells during the October 2008 monitoring event. The data review was performed in accordance with the procedures specified in the Remedial Investigation Workplan Vol. II Quality Assurance Project Plan (QAPP) (Hargis+Associates, Inc. 2004), USEPA Functional Guidelines for Organic and Inorganic Data Review (USEPA, 1999 and 2002), and quality assurance and control parameters set by the project laboratory (TestAmerica).

A total of 10 groundwater samples were collected and submitted to TestAmerica for the following parameters:

- metals by USEPA Methods 200.7, and 245.1;
- perchlorate by USEPA Methods 314.0 and 332.0; and
- volatile organic compounds (VOCs) by USEPA Method 8260B and 524.2.

Additionally, four field quality assurance samples (i.e., field duplicates and trip blanks) were collected and analyzed as part of the sampling program. Table-1 lists the samples and associated analytical parameters.

## 1.1 Data Quality Assessment

Sample results were subject to a Level III data review that includes an evaluation of the following quality control (QC) parameters:

- sample receipt temperatures;
- holding times;
- method blanks;
- laboratory control samples (LCS);
- matrix spike/matrix spike duplicates (MS/MSD);
- field duplicates; and
- surrogates (for organic parameters).

Qualified results are summarized in Table-2.

## 1.2 Data Qualifiers

The data qualifiers used to qualify analytical results associated with QC parameters outside data quality objectives are defined below:

- J The analyte was positively identified; however, the result should be considered an estimated value.
- UJ The reporting limit is considered an estimated value.
- R Quality control indicates that the data is not usable

Results qualified as "J" or UJ" are of acceptable data quality and may be used quantitatively to fulfill the objectives of the analytical program, per USEPA guidelines.

## 1.3 Sample Preservation and Temperature Upon Laboratory Receipt

Samples were received intact and at the correct temperature ( $4\pm 2^{\circ}$  Celsius) at the project laboratory with the following exceptions. Samples received by the laboratory on October 17, 2008 had a temperature of  $1^{\circ}$  Celsius. This temperature outlier did not significantly impact sample results; therefore, data qualification was not required.

## 1.4 Holding Times

Samples were extracted and analyzed within the holding time limits set by the respective USEPA methods.

## 1.5 Blank Contamination

Method blanks and trip blanks were performed at the required frequencies. Target compounds were not detected in the blanks with the following exception:

- Acetone and carbon disulfide were detected above their respective reporting limits in the trip blank received by the laboratory on October 20, 2008 (Sample ID: TB102008). The analytes were not detected in the associated samples; therefore, data qualification was not required.

## 1.6 LCS/LCS Duplicate Recovery and Relative Percent Difference

LCS/LCS duplicates were performed at the required frequency and were evaluated based on the following criteria:

- If the analyte recovery was above acceptance limits for LCS or LCS duplicate but the analyte was not detected in the associated batch, then data qualification was not required.

- If the analyte recovery was above acceptance limits for LCS or LCS duplicate and the analyte was detected in the associated batch, then the analyte results were qualified “J”.
- If the analyte recovery was below acceptance limits for LCS or LCS duplicate then the analyte results in the associated analytical batch were qualified (“UJ” for non-detects and “J” for detected results).
- If the analyte recovery was less than 10 percent, the analyte results in the associated analytical batch were rejected and qualified “R”.

Percent recoveries and RPDs for the LCS/LCS duplicate were within acceptance limits.

### **1.7 MS/MSD Recovery and RPD**

MS/MSD samples were performed at the required frequency and were evaluated by the following criteria:

- If MS or MSD recovery for an analyte is above acceptance limits but the analyte is not detected in the associated analytical batch, then data qualification was not required.
- If MS or MSD recovery for an analyte is above acceptance limits and the analyte is detected in the associated analytical batch, the analyte results were qualified “J”.
- Low MS/MSD recoveries for inorganic parameters result in sample qualification of the associated analytical batch.
- Low MS/MSD recoveries for organic parameters result in the data qualification of the unspiked sample rather than the analytical batch.
- Results were not qualified based on non-project specific MS/MSD (i.e., batch QC) recoveries.

Percent recoveries and RPDs for the MS/MSD duplicate were within acceptance limits except for the following:

- The MSD for analytical batch P8J2114 had low recovery for 1,4-dioxane (79 percent). Data qualification was not required because the MS and LCS were within acceptance limits.
- The MSD for analytical batch P8J2733 had low recovery for 20 analytes and toluene-d8 surrogate (73 percent). Qualified data is provided in Table-2.
- The MS/MSD for analytical batch P8J2134 had recoveries for calcium (114, 256, 339, and 11 percent), magnesium (-228, -92, 21, and -278 percent),

potassium (129 and 154 percent), and sodium (171, 171, and 217 percent) that were outside acceptance limits. Data qualification was not required because the sample results were greater than four times the spiked concentration.

### 1.8 Field Duplicates

Two field duplicates were collected during this monitoring event and submitted for analysis. The RPD between the field duplicates and their associated samples were calculated and presented in Table-3. Field duplicates were evaluated by the following criteria:

- If an analyte is detected at a concentration greater than five times the method reporting limit, the RPD should be less than 25 percent.
- If an analyte is detected between the sample and field duplicate less than five times the method reporting limit, the difference between the sample and the field duplicate should not exceed the method reporting limit.

All field duplicates met acceptance criteria.

### 1.9 Surrogates

Surrogates for all organic parameters were recovered within acceptance limits, with one exception. For sample PW-1, the surrogate recovery for toluene-d8 was below acceptance limits. The associated analytes were qualified UJ, and their reporting limits should be considered an estimated value.

### 2.0 Completeness Summary

Two types of completeness were calculated for this project: contract and technical. As specified in the project DQOs, the goal for completeness for the site is 90 percent. Results indicated as not reportable by the laboratory are not included in the completeness calculations. The following equations are used to calculate the two types of completeness.

$$\begin{aligned} \% \text{ Contract Completeness} = \\ & \left( \frac{\text{Number of contract compliant results}}{\text{Number of reported results}} \right) \\ & \quad \times 100 \end{aligned}$$

$$\begin{aligned} \% \text{ Technical Completeness} = \\ & \left( \frac{\text{Number of usable results}}{\text{Number of reported results}} \right) \\ & \quad \times 100 \end{aligned}$$

The overall contract completeness included the evaluation of the protocol and contract deviations for holding times, blanks, MS/MSD, and LCS/LCSD attained for the field samples was 72 percent. The technical completeness, which included all QC parameters, attained for the field samples was 100 percent. The completeness results are provided in Table-4. All of the results were considered usable for the intended purposes and the project DQOs have been met.

# **GROUNDWATER MONITORING DATA VERIFICATION SUMMARY PRIVATE WELLS OCTOBER - 2008**

## **1.0 INTRODUCTION**

This summary presents data verification results for private residential wells adjacent to Universal Propulsion Company, Inc. (UPCO) during the October 2008 monitoring event. The data review was performed in accordance with the procedures specified in the Remedial Investigation Workplan Vol. II Quality Assurance Project Plan (QAPP) (Hargis+Associates, Inc. 2004), USEPA Functional Guidelines for Inorganic Data Review (USEPA, 2002), and quality assurance and control parameters set by the project laboratory (TestAmerica).

A total of 13 groundwater samples were collected and submitted to TestAmerica for the following parameters:

- Perchlorate by USEPA Method 314.0; and
- perchlorate by USEPA Method 332.0

Table-5 lists the samples and associated analytical parameters.

## **1.1 Data Quality Assessment**

Sample results were subject to a Level III data review that includes an evaluation of the following quality control (QC) parameters:

- sample receipt temperatures;
- holding times;
- method blanks;
- laboratory control samples (LCS); and
- matrix spike/matrix spike duplicates (MS/MSD).

Results did not require qualification based on the data verification.

## **1.2 Data Qualifiers**

The data qualifiers used to qualify analytical results associated with QC parameters outside data quality objectives are defined below:

- J The analyte was positively identified; however, the result should be considered an estimated value.
- UJ The reporting limit is considered an estimated value.
- R Quality control indicates that the data is not usable

Results qualified as “J” or UJ” are of acceptable data quality and may be used quantitatively to fulfill the objectives of the analytical program, per USEPA guidelines. The results associated with this sampling event required no data qualification.

### **1.3 Sample Preservation and Temperature Upon Laboratory Receipt**

Samples were received intact and at the correct temperature ( $4\pm 2^{\circ}$  Celsius) at the project laboratory.

### **1.4 Holding Times**

Samples were extracted and analyzed within the holding time limits set by the respective USEPA methods.

### **1.5 Blank Contamination**

Method blanks were performed at the required frequencies. Target compounds were not detected in the blanks.

### **1.6 LCS/LCS Duplicate Recovery and Relative Percent Difference**

LCS/LCS duplicates were performed at the required frequency and were evaluated based on the following criteria:

- If the analyte recovery was above acceptance limits for LCS or LCS duplicate but the analyte was not detected in the associated batch, then data qualification was not required.
- If the analyte recovery was above acceptance limits for LCS or LCS duplicate and the analyte was detected in the associated batch, then the analyte results were qualified “J”.
- If the analyte recovery was below acceptance limits for LCS or LCS duplicate then the analyte results in the associated analytical batch were qualified (“UJ” for non-detects and “J” for detected results).
- If the analyte recovery was less than 10 percent, the analyte results in the associated analytical batch were rejected and qualified “R”.

Percent recoveries and RPDs for the LCS/LCS duplicate were within acceptance limits.

## 1.7 MS/MSD Recovery and RPD

MS/MSD samples were performed at the required frequency and were evaluated by the following criteria:

- If MS or MSD recovery for an analyte is above acceptance limits but the analyte is not detected in the associated analytical batch, then data qualification was not required.
- If MS or MSD recovery for an analyte is above acceptance limits and the analyte is detected in the associated analytical batch, the analyte results were qualified "J".
- Low MS/MSD recoveries for inorganic parameters result in sample qualification of the associated analytical batch.
- Low MS/MSD recoveries for organic parameters result in the data qualification of the unspiked sample rather than the analytical batch.
- Results were not qualified based on non-project specific MS/MSD (i.e., batch QC) recoveries.

Percent recoveries and RPDs for the MS/MSD were within acceptance limits

## 1.8 Completeness Summary

Two types of completeness were calculated for this project: contract and technical. As specified in the project DQOs, the goal for completeness for the site is 90 percent. Results indicated as not reportable by the laboratory are not included in the completeness calculations. The following equations are used to calculate the two types of completeness.

$$\begin{aligned} \% \text{ Contract Completeness} = & \\ & \left( \frac{\text{Number of contract compliant results}}{\text{Number of reported results}} \right) \\ & \times 100 \end{aligned}$$

$$\begin{aligned} \% \text{ Technical Completeness} = & \\ & \left( \frac{\text{Number of usable results}}{\text{Number of reported results}} \right) \\ & \times 100 \end{aligned}$$

The overall contract completeness included the evaluation of the protocol and contract deviations for holding times, blanks, MS/MSD, and LCS attained for the field samples was 100 percent. The technical completeness, which included all QC parameters, attained for the field samples was 100 percent. The completeness results are provided in Table-6. All of the results were considered usable for the intended purposes and the project DQOs have been met.

**Table 1  
Sampling and Analysis Schedule  
Groundwater Monitoring Report**

<b>Sample ID</b>	<b>Lab ID</b>	<b>Collected</b>	<b>Sample Type</b>	<b>Parameters</b>
MW-15	PRJ1016-01	10/16/2008	N	Perchlorate
TB101708	PRJ1090-01	10/17/2008	TB	VOCs
MW-1	PRJ1090-02/03	10/17/2008	N	VOCs, Perchlorate
MW-2	PRJ1090-04	10/17/2008	N	Perchlorate
MW-14	PRJ1090-05	10/17/2008	N	Perchlorate
MW-5	PRJ1090-06	10/17/2008	N	Perchlorate
MW-13	PRJ1090-07	10/17/2008	N	Perchlorate
MW-6	PRJ1090-08	10/17/2008	N	Perchlorate
FD101708	PRJ1090-09	10/17/2008	FD of MW-13	Perchlorate
TB102008	PRJ1144-01	10/20/2008	TB	VOCs
FD102008	PRJ1144-02	10/20/2008	FD of PW-1	VOCs, Metals
PW-1	PRJ1144-03	10/20/2008	N	Perchlorate, VOCs, Metals
POE	PRJ1144-04	10/20/2008	N	Perchlorate, VOCs, Metals

Notes:

N = normal field sample

FD = field duplicate

TB = trip blank

Metals = arsenic, barium, cadmium, calcium, chromium, lead, magnesium, mercury, potassium, selenium, silver, sodium

VOCs = volatile organic compounds, including 1,4-dioxane, by EPA Method 8260B.

TB102008 was analyzed by EPA Method 8260B and EPA Method 524.2. POE was analyzed by EPA Method 524.2.

Perchlorate = EPA Method 314.0. MW-15, MW-14, MW-13, and FD101708 were also analyzed by EPA Method 332.0.

**Table 2**  
**Qualified Results**  
**Groundwater Monitoring Report**

Sample ID	Analyte	Result	Units	Data Qualifier	Comments
PW-1	1,1,1-Trichloroethane	ND	ug/l	UJ	Qualified due to low surrogate recovery
PW-1	1,1,1,2-Tetrachloroethane	ND	ug/l	UJ	Qualified due to low surrogate recovery
PW-1	1,1,2,2-Tetrachloroethane	ND	ug/l	UJ	Qualified due to low surrogate recovery
PW-1	1,1,2-Trichloroethane	ND	ug/l	UJ	Qualified due to low surrogate recovery
PW-1	1,1-Dichloroethane	0.52	ug/l	J	Qualified due to low surrogate recovery
PW-1	1,1-Dichloroethene	ND	ug/l	UJ	Qualified due to low surrogate recovery and low MS/MSD recovery
PW-1	1,1-Dichloropropene	ND	ug/l	UJ	Qualified due to low surrogate recovery and low MS/MSD recovery
PW-1	1,2,3-Trichlorobenzene	ND	ug/l	UJ	Qualified due to low surrogate recovery
PW-1	1,2,3-Trichloropropane	ND	ug/l	UJ	Qualified due to low surrogate recovery
PW-1	1,2,4-Trichlorobenzene	ND	ug/l	UJ	Qualified due to low surrogate recovery
PW-1	1,2,4-Trimethylbenzene	ND	ug/l	UJ	Qualified due to low surrogate recovery and low MS/MSD recovery
PW-1	1,2-Dibromo-3-chloropropane	ND	ug/l	UJ	Qualified due to low surrogate recovery
PW-1	1,2-Dibromoethane (EDB)	ND	ug/l	UJ	Qualified due to low surrogate recovery
PW-1	1,2-Dichlorobenzene	ND	ug/l	UJ	Qualified due to low surrogate recovery
PW-1	1,2-Dichloroethane	ND	ug/l	UJ	Qualified due to low surrogate recovery
PW-1	1,2-Dichloropropane	ND	ug/l	UJ	Qualified due to low surrogate recovery
PW-1	1,3,5-Trimethylbenzene	ND	ug/l	UJ	Qualified due to low surrogate recovery and low MS/MSD recovery
PW-1	1,3-Dichlorobenzene	ND	ug/l	UJ	Qualified due to low surrogate recovery
PW-1	1,3-Dichloropropane	ND	ug/l	UJ	Qualified due to low surrogate recovery
PW-1	1,4-Dichlorobenzene	ND	ug/l	UJ	Qualified due to low surrogate recovery
PW-1	2,2-Dichloropropane	ND	ug/l	UJ	Qualified due to low surrogate recovery
PW-1	2-Butanone (MEK)	ND	ug/l	UJ	Qualified due to low surrogate recovery
PW-1	2-Chlorotoluene	ND	ug/l	UJ	Qualified due to low surrogate recovery
PW-1	2-Hexanone	ND	ug/l	UJ	Qualified due to low surrogate recovery
PW-1	4-Chlorotoluene	ND	ug/l	UJ	Qualified due to low surrogate recovery
PW-1	4-Methyl-2-pentanone (MIBK)	ND	ug/l	UJ	Qualified due to low surrogate recovery
PW-1	Acetone	ND	ug/l	UJ	Qualified due to low surrogate recovery
PW-1	Benzene	ND	ug/l	UJ	Qualified due to low surrogate recovery
PW-1	Bromobenzene	ND	ug/l	UJ	Qualified due to low surrogate recovery
PW-1	Bromochloromethane	ND	ug/l	UJ	Qualified due to low surrogate recovery
PW-1	Bromodichloromethane	ND	ug/l	UJ	Qualified due to low surrogate recovery
PW-1	Bromoform	ND	ug/l	UJ	Qualified due to low surrogate recovery
PW-1	Bromomethane	ND	ug/l	UJ	Qualified due to low surrogate recovery
PW-1	Carbon disulfide	ND	ug/l	UJ	Qualified due to low surrogate recovery
PW-1	Carbon tetrachloride	ND	ug/l	UJ	Qualified due to low surrogate recovery
PW-1	Chlorobenzene	ND	ug/l	UJ	Qualified due to low surrogate recovery
PW-1	Chloroethane	ND	ug/l	UJ	Qualified due to low surrogate recovery
PW-1	Chloroform	1.6	ug/l	J	Qualified due to low surrogate recovery and field duplicate RPD
PW-1	Chloromethane	ND	ug/l	UJ	Qualified due to low surrogate recovery
PW-1	cis-1,2-Dichloroethene	ND	ug/l	UJ	Qualified due to low surrogate recovery
PW-1	cis-1,3-Dichloropropene	ND	ug/l	UJ	Qualified due to low surrogate recovery and low MS/MSD recovery
PW-1	Dibromochloromethane	ND	ug/l	UJ	Qualified due to low surrogate recovery

**Table 2**  
**Qualified Results**  
**Groundwater Monitoring Report**

Sample ID	Analyte	Result	Units	Data Qualifier	Comments
PW-1	Dibromomethane	ND	ug/l	UJ	Qualified due to low surrogate recovery
PW-1	Dichlorodifluoromethane	ND	ug/l	UJ	Qualified due to low surrogate recovery
PW-1	Ethylbenzene	ND	ug/l	UJ	Qualified due to low surrogate recovery and low MS/MSD recovery
PW-1	Hexachlorobutadiene	ND	ug/l	UJ	Qualified due to low surrogate recovery
PW-1	Iodomethane	ND	ug/l	UJ	Qualified due to low surrogate recovery and low MS/MSD recovery
PW-1	Isopropylbenzene	ND	ug/l	UJ	Qualified due to low surrogate recovery and low MS/MSD recovery
PW-1	Methyl-tert-butyl Ether (MTBE)	ND	ug/l	UJ	Qualified due to low surrogate recovery
PW-1	Methylene Chloride	ND	ug/l	UJ	Qualified due to low surrogate recovery
PW-1	Naphthalene	ND	ug/l	UJ	Qualified due to low surrogate recovery and low MS/MSD recovery
PW-1	n-Butylbenzene	ND	ug/l	UJ	Qualified due to low surrogate recovery and low MS/MSD recovery
PW-1	n-Propylbenzene	ND	ug/l	UJ	Qualified due to low surrogate recovery and low MS/MSD recovery
PW-1	o-Xylene	ND	ug/l	UJ	Qualified due to low surrogate recovery
PW-1	p-Isopropyltoluene	ND	ug/l	UJ	Qualified due to low surrogate recovery and low MS/MSD recovery
PW-1	sec-Butylbenzene	ND	ug/l	UJ	Qualified due to low surrogate recovery and low MS/MSD recovery
PW-1	Styrene	ND	ug/l	UJ	Qualified due to low surrogate recovery and low MS/MSD recovery
PW-1	tert-Butylbenzene	ND	ug/l	UJ	Qualified due to low surrogate recovery and low MS/MSD recovery
PW-1	Tetrachloroethene	ND	ug/l	UJ	Qualified due to low surrogate recovery
PW-1	Toluene	ND	ug/l	UJ	Qualified due to low surrogate recovery and low MS/MSD recovery
PW-1	trans-1,2-Dichloroethene	ND	ug/l	UJ	Qualified due to low surrogate recovery
PW-1	trans-1,3-Dichloropropene	ND	ug/l	UJ	Qualified due to low surrogate recovery and low MS/MSD recovery
PW-1	Trichloroethene	ND	ug/l	UJ	Qualified due to low surrogate recovery
PW-1	Trichlorofluoromethane	ND	ug/l	UJ	Qualified due to low surrogate recovery
PW-1	Vinyl Acetate	ND	ug/l	UJ	Qualified due to low surrogate recovery and low MS/MSD recovery
PW-1	Vinyl chloride	ND	ug/l	UJ	Qualified due to low surrogate recovery and low MS/MSD recovery
PW-1	Xylenes, Total	ND	ug/l	UJ	Qualified due to low surrogate recovery and low MS/MSD recovery

Notes:

ug/l = microgram per liter

J = Estimated result

UJ = Estimated detection limit

**Table 3**  
**Field Duplicate Summary**  
**Groundwater Monitoring Report**

Sample ID / Field Duplicate ID	Parameters	Sample Result	Field Duplicate Result	RPD (%)
MW-13/ FD101708	<b>Inorganics (ug/l)</b>			
	Perchlorate by EPA 314.0	220	220	<1.0
	Perchlorate by EPA 332.0	210.0	210	<1.0
PW-1/ FD102008	<b>VOCs (ug/l)</b>			
	Chloroform	1.6	3.7	<b>79</b>
	1,1-Dichloroethane	0.52	0.54	3.8
	1,4-Dioxane	1.8	2.0	11
	All other analytes	ND	ND	NC
	<b>Metals (mg/l)</b>			
	Arsenic	<0.10	<0.10	NC
	Barium	<0.010	<0.010	NC
	Cadmium	<0.0010	<0.0010	NC
	Calcium	23	24	4.3
	Chromium	<0.010	<0.010	NC
	Lead	<0.015	<0.015	NC
	Magnesium	11	11	<1.0
	Mercury	<0.0002	<0.0002	NC
	Potassium	3.9	4.4	12
Selenium	<0.10	<0.10	NC	
Silver	<0.010	<0.010	NC	
Sodium	58	61	5.0	

Notes:

RPD = Relative percent difference; [(difference)/(average)]\*100

ND = No analytes detected

NC = Not calculated

< = result was not detected above the reporting limit

Field duplicate RPD acceptance limits is 25 percent for results greater than 5 times the reporting limit; for results less than 5 times the reporting limit, the difference between sample and field duplicate results should be less than the reporting limit

Bolded results required data qualification.

**Table 4  
Completeness Summary  
Groundwater Monitoring Report**

Parameters	Total Number of Samples	Number in Contractual Compliance	Percent Contractual Compliance	Number of Usable Results	Percent Technical Compliance
<b>Inorganics</b>					
Perchlorate 314.0	9	9	100	9	100
Perchlorate 332.0	3	3	100	3	100
<b>Volatile Organic Compounds (8260)</b>					
1,1-Dichloroethene	2	1 <sup>a,b</sup>	50	2	100
1,1-Dichloropropene	2	1 <sup>a,b</sup>	50	2	100
1,2,4-Trimethylbenzene	2	1 <sup>a,b</sup>	50	2	100
1,3,5-Trimethylbenzene	2	1 <sup>a,b</sup>	50	2	100
Chloroform	2	1 <sup>a,c</sup>	50	2	100
cis-1,2-Dichloropropene	2	1 <sup>a,b</sup>	50	2	100
Ethylbenzene	2	1 <sup>a,b</sup>	50	2	100
Iodomethane	2	1 <sup>a,b</sup>	50	2	100
Isopropylbenzene	2	1 <sup>a,b</sup>	50	2	100
Naphthalene	2	1 <sup>a,b</sup>	50	2	100
n-Butylbenzene	2	1 <sup>a,b</sup>	50	2	100
n-Propylbenzene	2	1 <sup>a,b</sup>	50	2	100
p-Isopropyltoluene	2	1 <sup>a,b</sup>	50	2	100
sec-Butylbenzene	2	1 <sup>a,b</sup>	50	2	100
Styrene	2	1 <sup>a,b</sup>	50	2	100
tert-Butylbenzene	2	1 <sup>a,b</sup>	50	2	100
Toluene	2	1 <sup>a,b</sup>	50	2	100
trans-1,3-Dichloropropene	2	1 <sup>a,b</sup>	50	2	100
Vinyl Acetate	2	1 <sup>a,b</sup>	50	2	100
Vinyl Chloride	2	1 <sup>a,b</sup>	50	2	100
Xylenes, Total	2	1 <sup>a,b</sup>	50	2	100
1,4-Dioxane	2	2	100	2	100
All other analytes	2	1 <sup>a</sup>	50	2	100
<b>Volatile Organic Compounds (524.2)</b>					
All Analytes	1	1	100	1	1
<b>Metals</b>					
Arsenic	2	2	100	2	100
Barium	2	2	100	2	100
Cadmium	2	2	100	2	100
Calcium	2	2	100	2	100
Chromium	2	2	100	2	100
Lead	2	2	100	2	100
Magnesium	2	2	100	2	100
Mercury	2	2	100	2	100
Potassium	2	2	100	2	100
Selenium	2	2	100	2	100
Silver	2	2	100	2	100
Sodium	2	2	100	2	100

**Notes:**

Number of samples used in completeness calculations includes field samples, but not field duplicates or blanks.

Percent Contractual Compliance = (Number of contract compliant results/Number of reported results) \* 100

Percent Technical Compliance = (Number of usable results/Number of reported results) \* 100

a = Qualified due to low surrogate recovery.

b = Qualified due to low MS/MSD recovery

c = Qualified due to field duplicate RPD

**Table 5**  
**Sampling and Analysis Schedule**  
**Groundwater Monitoring Report**

Sample ID	Lab ID	Collected	Sample Type	Parameters
122 W Yearling	PRJ0724-01	10/13/2008	N	Perchlorate by EPA Method 314.0
122 W Yearling	PRJ0725-01	10/13/2008	N	Perchlorate by EPA Method 314.0
16 E Yearling	PRJ0913-01	10/15/2008	N	Perchlorate by EPA Method 314.0
106 W Yearling	PRJ0915-01	10/15/2008	N	Perchlorate by EPA Method 314.0
18 E Yearling	PRJ0916-01	10/15/2008	N	Perchlorate by EPA Method 314.0
8 W Yearling	PRJ0917-01	10/15/2008	N	Perchlorate by EPA Method 314.0
16 E Yearling	PRJ0918-01	10/15/2008	N	Perchlorate by EPA Method 332.0
25903 N 2 nd St	PRJ0919-01	10/15/2008	N	Perchlorate by EPA Method 314.0
106 W Yearling	PRJ0920-01	10/15/2008	N	Perchlorate by EPA Method 332.0
25825 N 1st Place	PRJ0921-01	10/15/2008	N	Perchlorate by EPA Method 314.0
218 S E Yearling	PRJ0922-01	10/15/2008	N	Perchlorate by EPA Method 314.0
8 W Yearling	PRJ0923-01	10/15/2008	N	Perchlorate by EPA Method 332.0
218 E Yearling	PRJ0924-01	10/15/2008	N	Perchlorate by EPA Method 314.0
424 E Yearling	PRJ0925-01	10/15/2008	N	Perchlorate by EPA Method 314.0
412 E Yearling	PRJ0926-01	10/15/2008	N	Perchlorate by EPA Method 314.0
604/616 E Yearling	PRJ0927-01	10/15/2008	N	Perchlorate by EPA Method 314.0
520 E Yearling	PRJ0928-01	10/15/2008	N	Perchlorate by EPA Method 314.0
18 E Yearling	PRJ0929-01	10/15/2008	N	Perchlorate by EPA Method 332.0
25903 N 2 nd St	PRJ0930-01	10/15/2008	N	Perchlorate by EPA Method 332.0
25825 N 1st Place	PRJ0931-01	10/15/2008	N	Perchlorate by EPA Method 332.0
218 S E Yearling	PRJ0933-01	10/15/2008	N	Perchlorate by EPA Method 332.0
218 E Yearling	PRJ0934-01	10/15/2008	N	Perchlorate by EPA Method 332.0
424 E Yearling	PRJ0936-01	10/15/2008	N	Perchlorate by EPA Method 332.0
412 E Yearling	PRJ0937-01	10/15/2008	N	Perchlorate by EPA Method 332.0

**Table 6**  
**Completeness Summary**  
**Groundwater Monitoring Report**

<b>Parameters</b>	<b>Total Number of Samples</b>	<b>Number in Contractual Compliance</b>	<b>Percent Contractual Compliance</b>	<b>Number of Usable Results</b>	<b>Percent Technical Compliance</b>
<b>Inorganics</b>					
Perchlorate 314.0	13	13	100	13	100
Perchlorate 332.0	13	13	100	13	100

Notes:

Percent Contractual Compliance = (Number of contract compliant results/Number of reported results) \* 100

Percent Technical Compliance = (Number of usable results/Number of reported results) \* 100

# GROUNDWATER MONITORING DATA VERIFICATION SUMMARY PRIVATE WELLS – APRIL 2008

## 1.0 INTRODUCTION

This summary presents data verification results for private residential wells adjacent to Universal Propulsion Company, Inc. (UPCO) during the April 2008 monitoring event. The data review was performed in accordance with the procedures specified in the Remedial Investigation Workplan Vol. II Quality Assurance Project Plan (QAPP) (Hargis+Associates, Inc. 2004), USEPA Functional Guidelines for Inorganic Data Review (USEPA, 2002), and quality assurance and control parameters set by the project laboratory (TestAmerica).

A total of 13 groundwater samples were collected and submitted to TestAmerica for the following parameters:

- perchlorate by USEPA Method 332.0

Table 1 lists the samples and associated analytical parameters.

## 1.1 Data Quality Assessment

Sample results were subject to a Level III data review that includes an evaluation of the following quality control (QC) parameters:

- sample receipt temperatures;
- holding times;
- method blanks;
- laboratory control samples (LCS); and
- matrix spike/matrix spike duplicates (MS/MSD).

Results did not require qualification based on the data verification.

## 1.2 Data Qualifiers

The data qualifiers used to qualify analytical results associated with QC parameters outside data quality objectives are defined below:

- J The analyte was positively identified; however, the result should be considered an estimated value.

UJ The reporting limit is considered an estimated value.

R Quality control indicates that the data is not usable

Results qualified as “J” or UJ” are of acceptable data quality and may be used quantitatively to fulfill the objectives of the analytical program, per USEPA guidelines. The results associated with this sampling event required no data qualification.

### **1.3 Sample Preservation and Temperature Upon Laboratory Receipt**

Samples were received intact and at the correct temperature ( $4\pm 2^\circ$  Celsius) at the project laboratory except for the following:

- One sample collected on April 4, 2008, was received intact at  $16^\circ$  Celsius. Since the sample was received at the laboratory one hour following collection, this temperature outlier did not significantly impact sample results and data qualification was not required.

### **1.4 Holding Times**

Samples were extracted and analyzed within the holding time limits set by the respective USEPA methods.

### **1.5 Blank Contamination**

Method blanks were performed at the required frequencies. Target compounds were not detected in the blanks.

### **1.6 LCS/LCS Duplicate Recovery and Relative Percent Difference**

LCS/LCS duplicates were performed at the required frequency and were evaluated based on the following criteria:

- If the analyte recovery was above acceptance limits for LCS or LCS duplicate but the analyte was not detected in the associated batch, then data qualification was not required.
- If the analyte recovery was above acceptance limits for LCS or LCS duplicate and the analyte was detected in the associated batch, then the analyte results were qualified “J”.
- If the analyte recovery was below acceptance limits for LCS or LCS duplicate then the analyte results in the associated analytical batch were qualified (“UJ” for non-detects and “J” for detected results).
- If the analyte recovery was less than 10 percent, the analyte results in the associated analytical batch were rejected and qualified “R”.

Percent recoveries and RPDs for the LCS/LCS duplicate were within acceptance limits.

### 1.7 MS/MSD Recovery and RPD

MS/MSD samples were performed at the required frequency and were evaluated by the following criteria:

- If MS or MSD recovery for an analyte is above acceptance limits but the analyte is not detected in the associated analytical batch, then data qualification was not required.
- If MS or MSD recovery for an analyte is above acceptance limits and the analyte is detected in the associated analytical batch, the analyte results were qualified "J".
- Low MS/MSD recoveries for inorganic parameters result in sample qualification of the associated analytical batch.
- Low MS/MSD recoveries for organic parameters result in the data qualification of the unspiked sample rather than the analytical batch.
- Results were not qualified based on non-project specific MS/MSD (i.e., batch QC) recoveries.

Percent recoveries and RPDs for the MS/MSD were within acceptance limits

### 1.8 Completeness Summary

Two types of completeness were calculated for this project: contract and technical. As specified in the project DQOs, the goal for completeness for the site is 90 percent. Results indicated as not reportable by the laboratory are not included in the completeness calculations. The following equations are used to calculate the two types of completeness.

$$\begin{aligned} \% \text{ Contract Completeness} = & \\ & \left( \frac{\text{Number of contract compliant results}}{\text{Number of reported results}} \right) \\ & \times 100 \end{aligned}$$

$$\begin{aligned} \% \text{ Technical Completeness} = & \\ & \left( \frac{\text{Number of usable results}}{\text{Number of reported results}} \right) \\ & \times 100 \end{aligned}$$

The overall contract completeness included the evaluation of the protocol and contract deviations for holding times, blanks, MS/MSD, and LCS attained for the field samples was 100 percent. The technical completeness, which included all QC parameters,

attained for the field samples was 100 percent. The completeness results are provided in Table 2. All of the results were considered usable for the intended purposes and the project DQOs have been met.

**Table 1**  
**Sampling and Analysis Schedule**  
**Groundwater Monitoring Data Verification**

<b>Sample ID</b>	<b>Lab ID</b>	<b>Collected</b>	<b>Sample Type</b>	<b>Parameters</b>
18 E Yearling	PRD0175-01	4/1/2008	N	Perchlorate by USEPA Method 332.0
16 E Yearling - N	PRD0164-01	4/1/2008	N	Perchlorate by USEPA Method 332.0
16 E Yearling - O	PRD0165-01	4/1/2008	N	Perchlorate by USEPA Method 332.0
106 W Yearling	PRD0167-01	4/1/2008	N	Perchlorate by USEPA Method 332.0
122 W Yearling	PRD0171-01	4/1/2008	N	Perchlorate by USEPA Method 332.0
218 E Yearling	PRD0174-01	4/1/2008	N	Perchlorate by USEPA Method 332.0
424 E Yearling	PRD0176-01	4/1/2008	N	Perchlorate by USEPA Method 332.0
616/604 E Yearling	PRD0179-01	4/1/2008	N	Perchlorate by USEPA Method 332.0
412 E Yearling	PRD0166-01	4/1/2008	N	Perchlorate by USEPA Method 332.0
520 E Yearling	PRD0173-01	4/1/2008	N	Perchlorate by USEPA Method 332.0
25825 N 1st Place	PRD0168-01	4/1/2008	N	Perchlorate by USEPA Method 332.0
25903 N 2nd Street	PRD0172-01	4/1/2008	N	Perchlorate by USEPA Method 332.0
820 W Yearling	PRD0395-01	4/4/2008	N	Perchlorate by USEPA Method 332.0

Notes:

N = normal field sample

**Table 2**  
**Completeness Summary**  
**Groundwater Monitoring Data Verification**

<b>Parameters</b>	<b>Total Number of Samples</b>	<b>Number in Contractual Compliance</b>	<b>Percent Contractual Compliance</b>	<b>Number of Usable Results</b>	<b>Percent Technical Compliance</b>
<b>Inorganics</b>					
Perchlorate 332.0	13	13	100	13	100

Notes:

Percent Contractual Compliance = (Number of contract compliant results/Number of reported results) \* 100

Percent Technical Compliance = (Number of usable results/Number of reported results) \* 100

# GROUNDWATER MONITORING DATA VERIFICATION SUMMARY SITE MONITORING WELLS - JULY/AUGUST 2008

## 1.0 INTRODUCTION

This summary presents data verification results for groundwater samples collected from Universal Propulsion Company, Inc. (UPCO) wells during the July/August 2008 monitoring event. The data review was performed in accordance with the procedures specified in the Remedial Investigation Workplan Vol. II Quality Assurance Project Plan (QAPP) (Hargis+Associates, Inc. 2004), USEPA Functional Guidelines for Inorganic Data Review (USEPA, 2002), and quality assurance and control parameters set by the project laboratory (TestAmerica).

A total of eleven groundwater samples were collected and submitted to TestAmerica for the following parameters:

- perchlorate by USEPA Method 332.0

Table 1 lists the samples and associated analytical parameters.

## 1.1 Data Quality Assessment

Sample results were subject to a Level III data review that includes an evaluation of the following quality control (QC) parameters:

- sample receipt temperatures;
- holding times;
- method blanks;
- laboratory control samples (LCS);
- matrix spike/matrix spike duplicates (MS/MSD);
- field duplicates; and
- surrogates (for organic parameters).

Results did not require qualification based on the data verification.

## 1.2 Data Qualifiers

The data qualifiers used to qualify analytical results associated with QC parameters outside data quality objectives are defined below:

- J The analyte was positively identified; however, the result should be considered an estimated value.
- UJ The reporting limit is considered an estimated value.
- R Quality control indicates that the data is not usable

Results qualified as “J” or UJ” are of acceptable data quality and may be used quantitatively to fulfill the objectives of the analytical program, per USEPA guidelines. The results associated with this sampling event required no data qualification.

### **1.3 Sample Preservation and Temperature Upon Laboratory Receipt**

Samples were received intact and at the correct temperature ( $4\pm 2^{\circ}$  Celsius) at the project laboratory except for the following:

- The samples collected on August 8, 2008, were received intact at  $0.9^{\circ}$  Celsius. This temperature outlier did not significantly impact sample results, so data qualification was not required.

### **1.4 Holding Times**

Samples were extracted and analyzed within the holding time limits set by the respective USEPA methods.

### **1.5 Blank Contamination**

Method blanks were performed at the required frequencies. Target compounds were not detected in the blanks.

### **1.6 LCS/LCS Duplicate Recovery and Relative Percent Difference**

LCS/LCS duplicates were performed at the required frequency and were evaluated based on the following criteria:

- If the analyte recovery was above acceptance limits for LCS or LCS duplicate but the analyte was not detected in the associated batch, then data qualification was not required.
- If the analyte recovery was above acceptance limits for LCS or LCS duplicate and the analyte was detected in the associated batch, then the analyte results were qualified “J”.
- If the analyte recovery was below acceptance limits for LCS or LCS duplicate then the analyte results in the associated analytical batch were qualified (“UJ” for non-detects and “J” for detected results).

- If the analyte recovery was less than 10 percent, the analyte results in the associated analytical batch were rejected and qualified “R”.

Percent recoveries for the LCS were within acceptance limits.

### 1.7 MS/MSD Recovery and RPD

MS/MSD samples were performed at the required frequency and were evaluated by the following criteria:

- If MS or MSD recovery for an analyte is above acceptance limits but the analyte is not detected in the associated analytical batch, then data qualification was not required.
- If MS or MSD recovery for an analyte is above acceptance limits and the analyte is detected in the associated analytical batch, the analyte results were qualified “J”.
- Low MS/MSD recoveries for inorganic parameters result in sample qualification of the associated analytical batch.
- Low MS/MSD recoveries for organic parameters result in the data qualification of the unspiked sample rather than the analytical batch.
- Results were not qualified based on non-project specific MS/MSD (i.e., batch QC) recoveries.

Percent recoveries and RPDs for the MS/MSD were within acceptance limits

### 1.8 Completeness Summary

Two types of completeness were calculated for this project: contract and technical. As specified in the project DQOs, the goal for completeness for the site is 90 percent. Results indicated as not reportable by the laboratory are not included in the completeness calculations. The following equations are used to calculate the two types of completeness.

$$\begin{aligned} \% \text{ Contract Completeness} = & \\ & \left( \frac{\text{Number of contract compliant results}}{\text{Number of reported results}} \right) \\ & \times 100 \end{aligned}$$

$$\begin{aligned} \% \text{ Technical Completeness} = & \\ & \left( \frac{\text{Number of usable results}}{\text{Number of reported results}} \right) \\ & \times 100 \end{aligned}$$

The overall contract completeness included the evaluation of the protocol and contract deviations for holding times, blanks, MS/MSD, and LCS attained for the field samples was 100 percent. The technical completeness, which included all QC parameters, attained for the field samples was 100 percent. The completeness results are provided in Table 2. All of the results were considered usable for the intended purposes and the project DQOs have been met.

**Table 1**  
**Sampling and Analysis Schedule Groundwater Monitoring Data Verification**

<b>Sample ID</b>	<b>Lab ID</b>	<b>Collected</b>	<b>Sample Type</b>	<b>Parameters</b>
MW-4	PRG1750-03	7/30/2008	N	Perchlorate by USEPA Method 332.0
MW-3	PRG1750-04	7/30/2008	N	Perchlorate by USEPA Method 332.0
MW-8	PRG1823-01	7/31/2008	N	Perchlorate by USEPA Method 332.0
MW-10	PRG1823-02	7/31/2008	N	Perchlorate by USEPA Method 332.0
MW-12	PRG1823-03	7/31/2008	N	Perchlorate by USEPA Method 332.0
MW-7	PRH0063-01	8/1/2008	N	Perchlorate by USEPA Method 332.0
MW-9	PRH0063-02	8/1/2008	N	Perchlorate by USEPA Method 332.0
MW-11	PRH0063-03	8/1/2008	N	Perchlorate by USEPA Method 332.0
MW-13	PRH0600-01	8/8/2008	N	Perchlorate by USEPA Method 332.1
MW-15	PRH0600-02	8/8/2008	N	Perchlorate by USEPA Method 332.2
MW-14	PRH1157-01	8/19/2008	N	Perchlorate by USEPA Method 332.3

Notes:

N = normal field sample

**Table 2**  
**Completeness Summary**  
**Groundwater Monitoring Data Verification**

<b>Parameters</b>	<b>Total Number of Samples</b>	<b>Number in Contractual Compliance</b>	<b>Percent Contractual Compliance</b>	<b>Number of Usable Results</b>	<b>Percent Technical Compliance</b>
<b>Inorganics</b>					
Perchlorate 332.0	11	11	100	11	100

Notes:

Number of samples used in completeness calculations includes field samples and field duplicates, but not blanks.

Percent Contractual Compliance = (Number of contract compliant results/Number of reported results) \* 100

Percent Technical Compliance = (Number of usable results/Number of reported results) \* 100

# DATA VERIFICATION SUMMARY FOR SOIL-VAPOR MONITOR WELL SAMPLES

## 1.0 INTRODUCTION

This summary presents data verification results for the development of the soil-vapor monitoring well at the Universal Propulsion Company, Inc. (UPCO) during November 2008. The data review was performed in accordance with the procedures specified in the Remedial Investigation Workplan Vol. II Quality Assurance Project Plan (QAPP) (Hargis+Associates, Inc. 2004), USEPA Functional Guidelines for Organic Data Review (USEPA, 1999), and quality assurance and control parameters set by the project laboratory (TestAmerica).

A total of 4 samples were collected and submitted to TestAmerica for the following parameters:

- Volatile organic compounds by USEPA Method TO-15

Table 1 lists the samples and associated analytical parameters.

## 1.1 Data Quality Assessment

Sample results were subject to a Level III data review that includes an evaluation of the following quality control (QC) parameters:

- sample receipt temperatures;
- holding times;
- method blanks; and
- laboratory control samples (LCS).

Results did not require qualification based on the data verification.

## 1.2 Data Qualifiers

The data qualifiers used to qualify analytical results associated with QC parameters outside data quality objectives are defined below:

- J The analyte was positively identified; however, the result should be considered an estimated value.
- UJ The reporting limit is considered an estimated value.

R Quality control indicates that the data is not usable

Results qualified as “J” or UJ” are of acceptable data quality and may be used quantitatively to fulfill the objectives of the analytical program, per USEPA guidelines. The results associated with this sampling event required no data qualification.

### **1.3 Sample Preservation and Temperature Upon Laboratory Receipt**

Samples were received intact and at the correct temperature (ambient) at the project laboratory.

### **1.4 Holding Times**

Samples were extracted and analyzed within the holding time limits set by the respective USEPA methods.

### **1.5 Blank Contamination**

Method blanks were performed at the required frequencies. Target compounds were not detected in the blanks.

### **1.6 LCS/LCS Duplicate Recovery and Relative Percent Difference**

LCS/LCS duplicates were performed at the required frequency and were evaluated based on the following criteria:

- If the analyte recovery was above acceptance limits for LCS or LCS duplicate but the analyte was not detected in the associated batch, then data qualification was not required.
- If the analyte recovery was above acceptance limits for LCS or LCS duplicate and the analyte was detected in the associated batch, then the analyte results were qualified “J”.
- If the analyte recovery was below acceptance limits for LCS or LCS duplicate then the analyte results in the associated analytical batch were qualified (“UJ” for non-detects and “J” for detected results).
- If the analyte recovery was less than 10 percent, the analyte results in the associated analytical batch were rejected and qualified “R”.

Percent recoveries and RPDs for the LCS/LCS duplicate were within acceptance limits with the following exceptions:

- The LCS duplicate for analytical batch P8K1512 had high recovery for 1,2,4-trichlorobenzene and hexachlorobutadiene. Data qualification was not required because the associated samples were not detected for these analytes.
- The LCS and LCS duplicate for analytical batch P8K1921 had low recoveries for 1,2,4-trichlorobenzene and hexachlorobutadiene. Data qualification was not required because the associated samples were not analyzed for these parameters.

## 1.7 Completeness Summary

Two types of completeness were calculated for this project: contract and technical. As specified in the project DQOs, the goal for completeness for the site is 90 percent. Results indicated as not reportable by the laboratory are not included in the completeness calculations. The following equations are used to calculate the two types of completeness.

$$\begin{aligned} \% \text{ Contract Completeness} = \\ & \left( \frac{\text{Number of contract compliant results}}{\text{Number of reported results}} \right) \\ & \times 100 \end{aligned}$$

$$\begin{aligned} \% \text{ Technical Completeness} = \\ & \left( \frac{\text{Number of usable results}}{\text{Number of reported results}} \right) \\ & \times 100 \end{aligned}$$

The overall contract completeness included the evaluation of the protocol and contract deviations for holding times, blanks, and LCS/LCSD attained for the field samples was 100 percent. The technical completeness, which included all QC parameters, attained for the field samples was 100 percent. The completeness results are provided in Table 2. All of the results were considered usable for the intended purposes and the project DQOs have been met.

**Table 1**  
**Sampling and Analysis Schedule**  
**Groundwater Monitoring Report**

<b>Sample ID</b>	<b>Lab ID</b>	<b>Collected</b>	<b>Sample Type</b>	<b>Parameters</b>
SVMW-1-30-40	PRK0738-01	11/13/2008	N	VOCs
SVMW-1-90-100	PRK0738-02	11/13/2008	N	VOCs
SVMW-1-140-150	PRK0738-03	11/13/2008	N	VOCs
SVMW-1-190-200	PRK0738-04	11/13/2008	N	VOCs

**Table 2**  
**Completeness Summary**  
**Groundwater Monitoring Report**

Parameters	Total Number of Samples	Number in Contractual Compliance	Percent Contractual Compliance	Number of Usable Results	Percent Technical Compliance
<b>Volatile Organic Compounds by EPA Method TO-15</b>					
All analytes	4	4	100	4	100

Notes:

Percent Contractual Compliance = (Number of contract compliant results/Number of reported results) \* 100

Percent Technical Compliance = (Number of usable results/Number of reported results) \* 100

# GROUNDWATER MONITORING DATA VERIFICATION SUMMARY SITE MONITORING WELLS- JANUARY 2008

## 1.0 INTRODUCTION

This summary presents data verification results for groundwater samples collected from Universal Propulsion Company, Inc. (UPCO) wells during the January 2008 monitoring event. The data review was performed in accordance with the procedures specified in the Remedial Investigation Workplan Vol. II Quality Assurance Project Plan (QAPP) (Hargis+Associates, Inc. 2004), USEPA Functional Guidelines for Inorganic Data Review (USEPA, 2002), and quality assurance and control parameters set by the project laboratory (TestAmerica).

A total of eight groundwater samples were collected and submitted to TestAmerica for the following parameters:

- perchlorate by USEPA Method 332.0

Table 1 lists the samples and associated analytical parameters.

## 1.1 Data Quality Assessment

Sample results were subject to a Level III data review that includes an evaluation of the following quality control (QC) parameters:

- sample receipt temperatures;
- holding times;
- method blanks;
- laboratory control samples (LCS);
- matrix spike/matrix spike duplicates (MS/MSD);
- field duplicates; and
- surrogates (for organic parameters).

Results did not require qualification based on the data verification.

## 1.2 Data Qualifiers

The data qualifiers used to qualify analytical results associated with QC parameters outside data quality objectives are defined below:

- J The analyte was positively identified; however, the result should be considered an estimated value.
- UJ The reporting limit is considered an estimated value.
- R Quality control indicates that the data is not usable

Results qualified as “J” or UJ” are of acceptable data quality and may be used quantitatively to fulfill the objectives of the analytical program, per USEPA guidelines. The results associated with this sampling event required no data qualification.

### **1.3 Sample Preservation and Temperature Upon Laboratory Receipt**

Samples were received intact and at the correct temperature ( $4\pm 2^{\circ}$  Celsius) at the project laboratory except for the following:

- The samples collected on January 15, 16, 17, and 18, 2008, were received intact at  $1^{\circ}$  Celsius. This temperature outlier did not significantly impact sample results, so data qualification was not required.

### **1.4 Holding Times**

Samples were extracted and analyzed within the holding time limits set by the respective USEPA methods.

### **1.5 Blank Contamination**

Method blanks and trip blanks were performed at the required frequencies. Target compounds were not detected in the blanks.

### **1.6 LCS/LCS Duplicate Recovery and Relative Percent Difference**

LCS/LCS duplicates were performed at the required frequency and were evaluated based on the following criteria:

- If the analyte recovery was above acceptance limits for LCS or LCS duplicate but the analyte was not detected in the associated batch, then data qualification was not required.
- If the analyte recovery was above acceptance limits for LCS or LCS duplicate and the analyte was detected in the associated batch, then the analyte results were qualified “J”.
- If the analyte recovery was below acceptance limits for LCS or LCS duplicate then the analyte results in the associated analytical batch were qualified (“UJ” for non-detects and “J” for detected results).

- If the analyte recovery was less than 10 percent, the analyte results in the associated analytical batch were rejected and qualified “R”.

Percent recoveries and RPDs for the LCS/LCS duplicate were within acceptance limits.

### 1.7 MS/MSD Recovery and RPD

MS/MSD samples were performed at the required frequency and were evaluated by the following criteria:

- If MS or MSD recovery for an analyte is above acceptance limits but the analyte is not detected in the associated analytical batch, then data qualification was not required.
- If MS or MSD recovery for an analyte is above acceptance limits and the analyte is detected in the associated analytical batch, the analyte results were qualified “J”.
- Low MS/MSD recoveries for inorganic parameters result in sample qualification of the associated analytical batch.
- Low MS/MSD recoveries for organic parameters result in the data qualification of the unspiked sample rather than the analytical batch.
- Results were not qualified based on non-project specific MS/MSD (i.e., batch QC) recoveries.

Percent recoveries and RPDs for the MS/MSD were within acceptance limits

### 1.8 Completeness Summary

Two types of completeness were calculated for this project: contract and technical. As specified in the project DQOs, the goal for completeness for the site is 90 percent. Results indicated as not reportable by the laboratory are not included in the completeness calculations. The following equations are used to calculate the two types of completeness.

$$\begin{aligned} \% \text{ Contract Completeness} = & \\ & \left( \frac{\text{Number of contract compliant results}}{\text{Number of reported results}} \right) \\ & \times 100 \end{aligned}$$

$$\begin{aligned} \% \text{ Technical Completeness} = & \\ & \left( \frac{\text{Number of usable results}}{\text{Number of reported results}} \right) \\ & \times 100 \end{aligned}$$

The overall contract completeness included the evaluation of the protocol and contract deviations for holding times, blanks, MS/MSD, and LCS attained for the field samples was 100 percent. The technical completeness, which included all QC parameters, attained for the field samples was 100 percent. The completeness results are provided in Table 2. All of the results were considered usable for the intended purposes and the project DQOs have been met.

**Table 1**  
**Sampling and Analysis Schedule**  
**Groundwater Monitoring Data Verification**

<b>Sample ID</b>	<b>Lab ID</b>	<b>Collected</b>	<b>Sample Type</b>	<b>Parameters</b>
MW-12	PRA0958-01	1/15/2008	N	Perchlorate by USEPA Method 332.0
MW-7	PRA1149-01	1/17/2008	N	Perchlorate by USEPA Method 332.0
MW-4	PRA1225-01	1/19/2008	N	Perchlorate by USEPA Method 332.0
MW-11	PRA1048-01	1/16/2008	N	Perchlorate by USEPA Method 332.0
MW-9	PRA1223-01	1/18/2008	N	Perchlorate by USEPA Method 332.0
MW-3	PRA1223-02	1/18/2008	N	Perchlorate by USEPA Method 332.0
MW-8	PRA1223-03	1/18/2008	N	Perchlorate by USEPA Method 332.0
MW-10	PRA1223-04	1/18/2008	N	Perchlorate by USEPA Method 332.0

Notes:

N = normal field sample

**Table 2**  
**Completeness Summary**  
**Groundwater Monitoring Data Verification**

Parameters	Total Number of Samples	Number in Contractual Compliance	Percent Contractual Compliance	Number of Usable Results	Percent Technical Compliance
<b>Inorganics</b>					
Perchlorate 332.0	8	8	100	8	100

Notes:

Number of samples used in completeness calculations includes field samples and field duplicates, but not blanks.

Percent Contractual Compliance = (Number of contract compliant results/Number of reported results) \* 100

Percent Technical Compliance = (Number of usable results/Number of reported results) \* 100

**MALCOLM  
PIRNIE**

INDEPENDENT ENVIRONMENTAL  
ENGINEERS, SCIENTISTS  
AND CONSULTANTS

**J**

APPENDIX



**J**  
APPENDIX

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