



Harding ESE, Inc.

700 North Bell Avenue

Suite 200

Pittsburgh, PA 15106 Telephone: 412/279-6661

Fax: 412/279-8567 Home Page: www.mactec.com

May 2, 2002

55568

Mr. George Dawes Supervisor, Technical Services Molycorp, Inc. 300 Caldwell Avenue Washington, PA 15301

Report to Summarize Sampling Activities Washington, Pennsylvania Site

Dear Mr. Dawes:

Harding ESE, Inc. (Harding ESE) has prepared this report to summarize the sampling activities performed at the Molycorp, Inc. (Molycorp) Site, in Washington, Pennsylvania (Figure 1). Sampling was performed for groundwater, surface water, and creek sediments at pre-determined locations. Site monitoring and sampling was conducted between March 11, and March 13, 2002 in accordance with the approved Proposal for the Site. Figure 2 shows each sampling location.

Severn Trent Laboratories, Inc. (STL) of St. Louis, Missouri performed sample analysis. Tables 1 through 3 provide a summary of the results of the analysis.

This report has been prepared for the sole use of Molycorp, Inc., and only intended beneficiaries of our work. No other party should rely on the information contained herein without prior written consent of Harding ESE.

Methodology

Harding ESE collected samples at the Molycorp, Inc. Site during the week of March 11, 2002. This event consisted of collection of groundwater levels, well redevelopment, well sampling, surface water sampling, and sediment sampling.

Well Sampling

On March 11, 2002, Harding ESE measured water levels at wells addressed in the approved Proposal for the Site. Terra Testing, Inc. (Terra Testing) of Washington, Pennsylvania, under supervision of Harding ESE personnel, redeveloped the following wells prior to sampling:

BR-1	BR-2	M-2	M-4	M-8
M-10	M-13	M-18	M-20	MW-24
MW-25	MW-26	MW-27	MW-28	MW-29
MW-31	UG-4			

Well redevelopment consisted of surging, as necessary to remove sediment from certain wells, and pumping until the well produced consistently low turbidity water. Indicator parameters (Turbidity, Temperature, pH, Conductivity) were monitored and logged. Well Development and Sampling Forms are provided in this report as Attachment I.

Mr. George Dawes Molycorp, Inc. 55568 May 2, 2002 Page 2

Upon completion of redevelopment at the addressed wells, Harding ESE collected samples at each location. Prior to collection at each well, Harding ESE personnel repeated water level measurements to ensure recovery had occurred. Samples were collected by using a peristaltic pump and dedicated tubing using "low flow, low stress" procedures (i.e., minimal drawdown and turbidity less than 50 nephelometric turbidity units "NTU"). Each water sample was filtered in the field using a 0.45-micron filter.

PADEP personnel were onsite March 12, 2002 to "split" samples with Harding ESE. PADEP collected split samples from wells BR-1, MW-25, M-2, and M-18.

During redevelopment, Harding ESE and Terra Testing repaired the inner Poly Vinyl Chloride (PVC) riser at MW-10. The riser was apparently damaged in the past and was not accessible for redevelopment or sampling. The existing riser was cut out and replaced with a new one.

Surface Water and Sediment Sampling

Surface water and Sediment samples were collected from four locations in Chartiers Creek. These locations were identified by Molycorp personnel and have been identified as SS-1, SS-3, SS-4, SS-6, for the sediment samples and CR-1, CR-2, CR-3, and CR-4 for the surface water samples. Figure 2 shows each sampling location.

Surface water samples were collected by completely submersing a non-preserved transfer bottle into Chartiers Creek and filtering it into the correct laboratory supplied container using 0.45-micron filters.

Sediment samples were collected from the same locations as the surface water samples at a depth of 0 to 3 inches in Chartiers Creek.

Analytical

Samples collected at the Molycorp, Inc. site were sent to STL in St. Louis, Missouri for analysis of isotopes of Uranium (U), Thorium (Th), and Radium (Ra). Specifically, analysis was performed for U²³⁵, U²³⁸, Th²³⁰, Th²³², Ra²²⁶, and Ra²²⁸. A summary of analytical results is in Table 1, Table 2, and Table 3.

We trust that this satisfies your requirements for the Sampling Activities performed at the Molycorp, Inc. facility. If you have any questions, please do not hesitate to contact us at (412) 279-6661.

Sincerely,

Harding ESE, Inc.

A MACTEC Company

Wayne K. Swinehart Staff Scientist

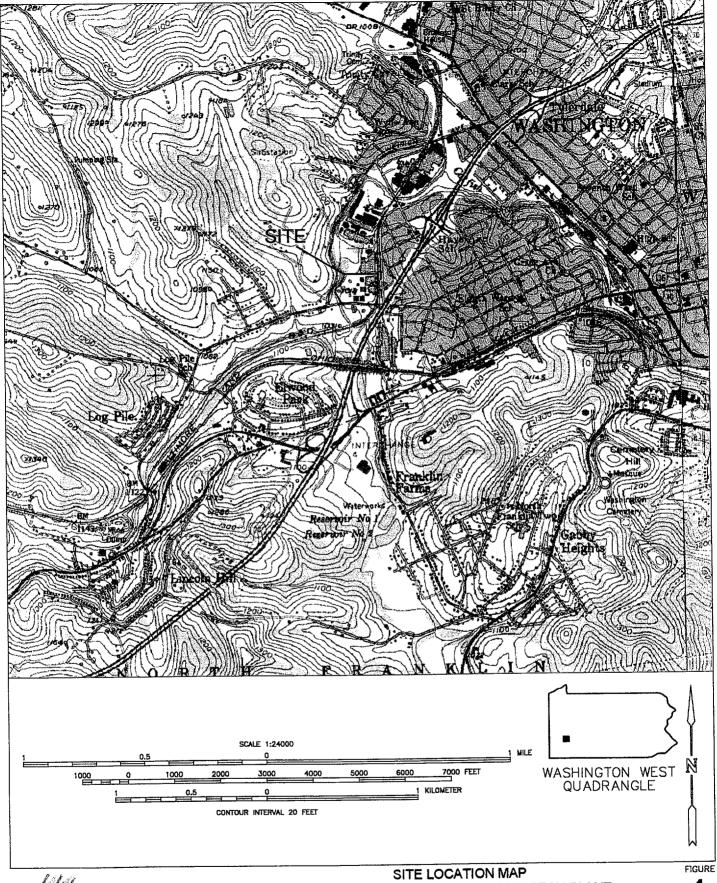
Dayne M. Crowley

Principal Hydrogeologist

WKS/DMC/jlp



FIGURES



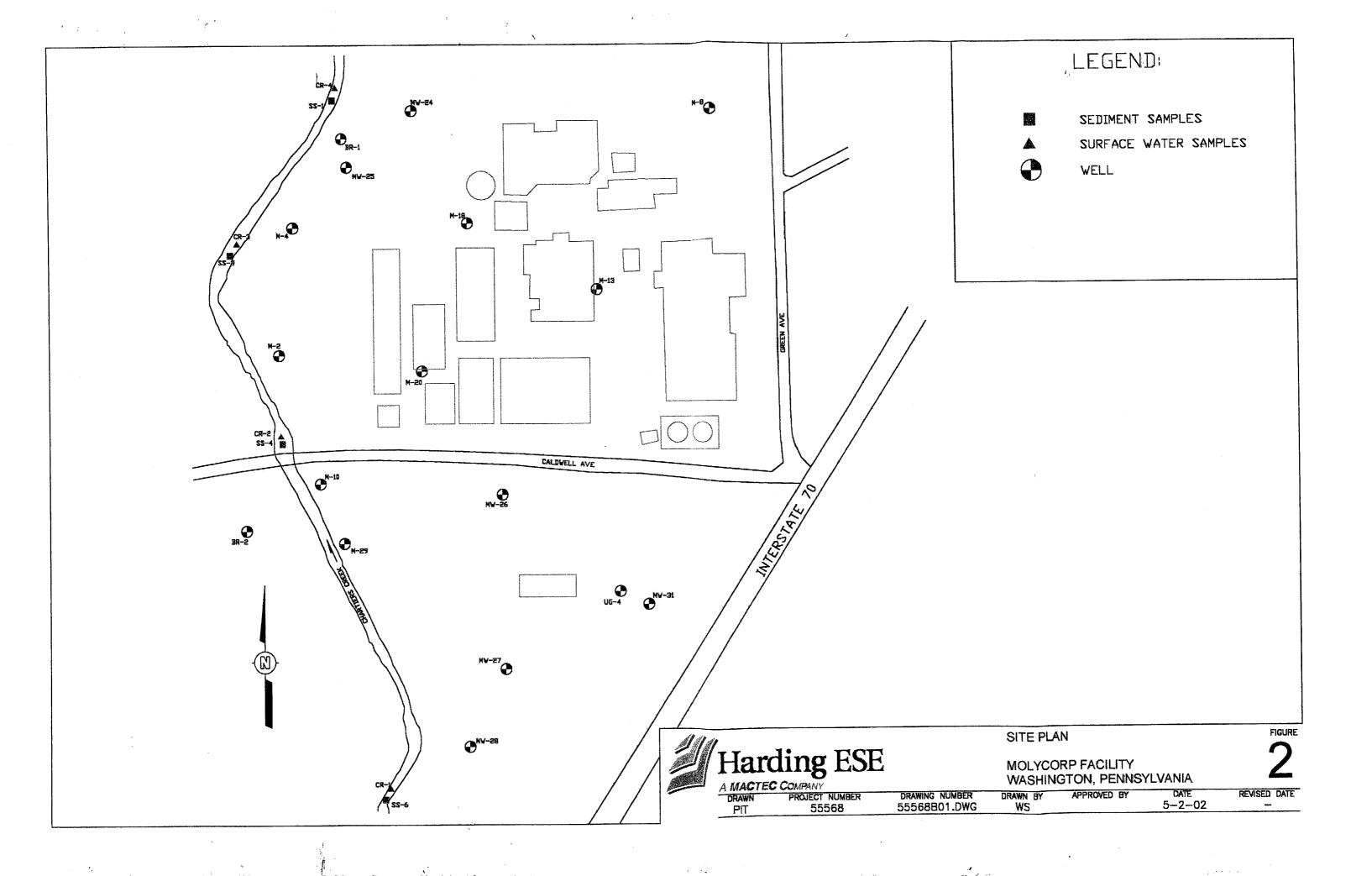


SITE LOCATION MAP
MOLYCORP WASHINGTON PLANT
CANTON TOWNSHIP
WASHINGTON COUNTY

1

A MACTEC COMPANY

DRAWN PROJECT NUMBER DRAWING NUMBER DRAWN BY APPROVED BY DATE REVISED DATE
PIT 55351 55351A01.DWG WS 2-27-02



TABLES

Table 1 Summary Radiological Testing Results Groundwater Sampling
Molycorp, Inc. Site - Washington, Pennsylvania

Well ID	M-	28	M-28	DUP	M-:	29	M-	10	BR		BR	
,, vii 1D	Result	T.U. ⁽¹⁾										
	(pCi/L) ⁽²⁾		(pCi/L) ⁽²⁾		(pCi/L) ⁽²⁾		(pCi/L) ⁽²⁾	(+/-)	(pCi/L) ⁽²⁾	(+/-)	(pCi/L) ⁽²⁾	(+/-)
	(PCI/L)	(1/-)	(PC#13)	(',)	(10.12)		\(\frac{1}{2}\)					
Radionuclide						0.15	0.14	0.19	0.94	0.25	0.25	0.14
Radium - 226	0.29	0.17	0.14	0.13		0.17	0.14					0.45
Radium - 228	0.64	0.40	0.67	0.41	0.60	0.40	0.46	0.40		0.40		
Thorium - 228	0.05	0.13	-0.038	0.077	0.041	0.086	0.010	0.055	0.012	0.066		0.092
Thorium - 230	0.91	0.39	0.67	0.33	0.52	0.30	0.27	0.18	0.34	0.21	0.79	0.32
Thorium - 232	0.037	0.092		0.039	0.06	0.10	0.020	0.052	-0.012	0.018		0.10
Uranium - 234	1.29	0.51	1.13	0.43	0.76	0.34	2.18	0.65	0.41	0.24		0.24
Uranium - 235	0.08		-0.00003	0.079		0.10	0.060	0.095	0	0	0.10	0.16
Uranium - 238	0.91	0.42		0.4		0.25	1.59	0.52	0.08	0.13	0.07	0.13
Grantin - 250	0.51											
Physical Characteristics												
Water Level (ft-TOC)	10.50				10.82		9.75		2.33		9.00	
` '	12.29				8.40		11.15		12.14		13.50	
Temperature (°C)					1.08		0.834		2.98		3.47	
Spec. Conductance (mS)	1.73						7.63		8.63		6.87	
pH (S.U.)	7.30				7.04						4.80	
Turbidity (ntu)	198.0				999		102	L	161		4.80	

Notes: (1) T.U. indicates Total Uncertainty
(2) pCi/L indicates pico Curies per liter
(3) All samples field filtered.

Table 1 (Continued) Summary Radiological Testing Results Groundwater Sampling Molycorp, Inc. Site - Washington, Pennsylvania

Well ID	MW	'-25	M-	-2	M-2 I	OUP	M-	18	MW	-24	MV	
	Result	T.U. ⁽¹⁾										
	(pCi/L) ⁽²⁾	(+/-)										
Radionuclide												
Radium - 226	0.28	0.18	0.12	0.14	0.14	0.17	0.32	0.20	0.22	0.20	0.07	0.12
Radium - 228	0.56	0.43	0.57	0.43	0.40	0.54	0.48	0.52	0.52	0.48	0.41	0.47
Thorium - 228	0.005	0.049	-0.047	0.082	-0.01	0.11	0.07	0.12	0.08	0.11	0.05	0.13
Thorium - 230	0.32	0.19	0.37	0.24	0.19	0.18	0.55	0.36	1.02	0.41	0.48	0.31
Thorium - 232	0.004	0.048	0.07	0.12	0.07	0.13	0.09	0.15	0.018	0.063	0.026	0.091
Uranium - 234	1.77	0.64	1.20	0.50	1.13	0.48	0.82	0.48	0.55	0.34	0.81	0.35
Uranium - 235	0.21	0.22	0.19	0.22	0.27	0.24	0.15	0.21	0.16	0.18	0.028	0.072
Uranium - 238	1.22	0.51	0.89	0.40	0.97	0.43	0.65	0.42	0.12	0.17	0.62	0.31
Physical Characteristics												
Water Level (ft-TOC)	7.98		8.01				8.54		8.52		9.59	
Temperature (℃)	10.65		11.83				14.98		13.25		11.89	
Spec. Conductance (mS)	2.39		1.20				3.47		1.67		1.39	
pH (S.U.)	7.10		6.94				10.00		10.17		6.94	
Turbidity (ntu)	999		618				999		999		90.30	

Notes: (1) T.U. indicates Total Uncertainty
(2) pCi/L indicates pico Curries per liter

(3) All samples field filtered.

Table 1 (Continued)
Summary Radiological Testing Results
Groundwater Sampling
Molycorp, Inc. Site - Washington, Pennsylvania

Well ID	M-	13	M	-8	M-	26	M-	31	UG	-4	M-:		M-:	
	Result	T.U. ⁽¹⁾	Result	T.U. ⁽¹⁾	Result	T.U. ⁽¹⁾	Result	T.U. ⁽¹⁾	Result	T.U. ⁽¹⁾	Result	T.U. ⁽¹⁾	Result	T.U. ⁽¹⁾
	(pCi/L) ⁽²⁾		(pCi/L) ⁽²⁾	(+/-)	(pCi/L) ⁽²⁾	(+/-)	(pCi/L) ⁽²⁾	(+/-)	(pCi/L) ⁽²⁾	(+/-)	(pCi/L) ⁽²⁾	(+/-)	(pCi/L) ⁽²⁾	(+/-)
Radionuclide	AP = = = y		```` <u>`</u>		, ,, ,, ,, ,, ,, ,, ,, ,, ,, ,, ,, ,, ,									0.00
Radium - 226	0.34	0.18	0.09	0.14	0.34	0.18	0.05	0.12	0.09	0.13	0.27	0.18	0.71	0.23
Radium - 228	0.23	0.53	0.09	0.43	0.80	0.51	0.21	0.45	0.22	0.40	0.07	0.45	0.30	0.41
Thorium - 228	0.013	0.069	0.01	0.053	0.019	0.089	-0.01	0.078	0.05	0.10				0.15
Thorium - 230	0.32	0.21	0.62	0.28	0.44	0.22	0.55	0.26	0.51	0.25	0.59	0.29	0.37	0.21
Thorium - 232	-0.006	0.013	0.020	0.073	-0.038	0.028	0.059	0.087	0.033	0.07	-0.021	0.022	0.1	0.12
Uranium - 234	1.19	0.41	1.52	0.51	1.30	0.48	0.78	0.33	0.50	0.27	0.32	0.21	0.44	0.24
Uranium - 235	0.048	0.088	0.13	0.14	0.30	0.23	0.13	0.13	0.14	0.15		0.13	0.13	0.14
Uranium - 238	0.86	0.34	1.49	0.5	0.83	0.37	0.23	0.19	0.34	0.22	0.18	0.16	0.011	0.059
Physical Characteristics														
Water Level (ft-TOC)	10.92		6.02		2.45		18.90		7.30		7.61		8.80	
Temperature (℃)	12.61		10.88		12.35		13.80		12.16		11.65		16.03	
Spec. Conductance (mS)	2.44		1.14		0.822		1.99		1.81		0.85		1.44	
pH (S.U.)	6.60		7.06		6.99		7.17		7.27		9.78		7.40	
Turbidity (ntu)	47.8		107		30		999		449		18.3		999	

(1) T.U. indicates Total Uncertainty

Notes: (2) pCi/L indicates pico Curries per liter

(3) All samples field filtered.

Table 2
Summary Radiological Testing Results
Surface Water Sampling
Molycorp, Inc. Site - Washington, Pennsylvania

Uranium - 235

Uranium - 238

Stream ID	CR	t-1	CR	k-2	CF	R-3	CR	4
	Result	T.U. ⁽¹⁾						
	(pCi/L) ⁽²⁾	(+/-)						
Radionuclide								
Radium - 226	0.06	0.12	0.12	0.13	0.03	0.12	-0.003	0.11
Radium - 228	0.31	0.39	0.23	0.38	0.02	0.37	0.16	0.37
Thorium - 228	-0.046	0.034	0.026	0.076	-0.015	0.022	-0.022	0.026
Thorium - 230	0.80	0.35	0.11	0.12	0.22	0.21	0.61	0.32
Thorium - 232	0.040	0.083	-0.030	0.025	-0.045	0.038	-0.007	0.014
Uranium - 234	0.28	0.20	0.31	0.20	0.33	0.20	0.41	0.25

0.12

0.15

0.048

0.24

0.086

0.17

0.1

0.18

0.039

0.40

0.078

0.25

Notes: (1) T.U. indicates Total Uncertainty
(2) pCi/L indicates pico Curies per liter

0.028

0.21

-0.024

0.31

Table 3
Summary Radiological Testing Results
Sediment Sampling
Molycorp, Inc. Site - Washington, Pennsylvania

Sediment ID	SS	-1	SS-1	DUP	SS	-3	SS	-4	SS	-6
	Result	T.U. ⁽¹⁾								
	(pCi/g) ⁽²⁾	(+/-)								
Radionuclide										
Radium - 226	1.59	0.34	1.55	0.34	1.23	0.29	1.59	0.34	1.11	0.28
Radium - 228	1.52	0.42	1.55	0.46	1.05	0.40	1.32	0.40	1.36	0.41
Thorium - 228	1.46	0.51	1.17	0.45	1.25	0.39	1.53	0.51	0.83	0.31
Thorium - 230	1.40	0.49	1.36	0.50	0.98	0.33	1.08	0.39	0.98	0.34
Thorium - 232	1.02	0.39	1.13	0.43	0.73	0.27	1.08	0.39	0.68	0.26
Uranium - 234	0.95	0.35	-	-	0.73	0.28	0.96	0.35	1.02	0.37
Uranium - 235	0.18	0.15	-	-	0.067	0.078	0.19	0.15	0.13	0.13
Uranium - 238	1.24	0.41	-	-	0.93	0.32	1.02	0.37	0.79	0.31

Notes: (1) T.U. indicates Total Uncertainty

(2) pCi/g indicates pico Curies per gram

ATTACHMENT I

Well Identif	ication	M-18	Well	Condition	6000		, , , , , , , , , , , , , , , , , , ,		2*
Redevelop	ment								
	Prepumpin	ıg Water Lev	el	8.43	ft-TOC	Date	3-11-02	Time	10:35
	Depth of V	Vell			ft-TOC	Water col	<u> </u>	Well Vol	-
	Redevelop	ment pumpi	ng rate		gpm	Start time	<u>1:53</u>	End Time	1:23
			1 well vol	2 well vol	3 well vol	4 well vol	5 well vol	6 well vol	End
•	Time		0	5	10	25	30		
	Temp.	Deg. C	12.72	13.61	14.15	13.71	14.98		
	S.Cond	mS	3.01	3.34	3.44	3.41	3.47		
	рН	S.U.	9.40	9.79	9.94	9.70	10.00		
	Turbidity	ntu	999	999	999	429.0	991		
	Tot Vol Pu	ımped (gal)		>	5 GAL	1000	1600		
Presample		vel els at all site el measurem							
	Presample	e Water Leve	əl	8.54	_ft-TOC	Date	3-12-02	. Time	14:15
	Post Sam	pling Water	Level		_ft-TOC	Date		_Time	
Sampling	Informatio	on							
	Sampling	devise:	Penis	TALTIC	Pump		_Pump rate	1602	MIN
	Sample d	escription:							
	Sample T	urbidity	L/00	· ·	Other				
	Sample co	oll. time	16:00	-	•	it sample co い PADE	ollected by c	others	Ves/No
	Sample P	reservation	HNO3	······································		ole field filte		Yes No	-
	Sample Io	lentification	MW- M-18-	-0303	·····	_Chain of C	Custody#	93194	
	Laborator	y Severn Tre	ent Laborato	ories - St. L	ouis	Airbill Nun	nber	79050	1/70007
Remarks	Were ?	ey arive	3 Ren	DING					·
	Drawd	own to 1	1,001						
	`								

Well Identifi	cation	M-2	Well	Condition	6000				
Redevelop	ment								
	Prepumpir	ig Water Lev	el .	7.89	ft-TOC	Date	3-11-02	Time	10:03
	Depth of V	Vell	,		ft-TOC	Water col		Well Vol	
	Redevelor	oment pumpi	ng rate		gpm	Start time	1:10 Pm	End Time	1:40
	Time		1 well vol	2 well vol	3 well vol	4 well-vol	5 well vol	6 well vol	End
	Time Temp.	Deg. C	11.20	11.20	11.86	11.48	4.83		
	S.Cond	mS	1.17	1.19	1.19	1.17	1. 20		
	pH Hq	S.U.	6.85	6.91	7-726.9		6. 94		
	Turbidity	ntu	999.0	177.0	999.0	999.0	BB 618	,	
		ımped (gal)	2.5 cm		2 cm	16n	3 GAL		
Presampl	Water lev	els at all site	wells are to nents for pro	o be measu esampling s	red within a should be co	1 to 2 hour onducted the	e day follow	l prior to san ing developi	ment `
	Presamp	e Water Lev	el	8.01	_ft-TOC	Date	3-12.02	_ Time	14115
	Post Sam	pling Water	Level	**************************************	_ft-TOC	Date		_Time	
Sampling	Informati	on							
	Sampling	devise:	PeristA	LTIC PU	<u>~P</u>		_Pump rate	= 16 oz /	MIN
	Sample o	lescription:	-72-	•					
	Sample 1	urbidity	4100		Other				
	Sample o	coll. time	15:00			lit sample co	ollected by o	others	(Yes) No
	Sample F	Preservation	HNO			ple field filte	red (Yes/ No	-
	Sample I	dentification	300	HMW-M-	<u>a-0302</u>	Chain of 0	Custody #	012194	
	Laborato	ry Severn Tr	ent Laborat	tories - St. I	ouis	Airbill Nur	nber	7905 O	1/70007
Remarks	War 1	Day AFTER	2 00	lac voc		····			
	Drau	odown	to 101						
	`								

	pment And ite, Washing									
Well Identif	ication /	n w #2	5 Well	Condition	COJD				ا المستوع ا	
Redevelop	ment								÷.	er ço
	Prepumping	n Water Lev	el	7.77	ft-TOC	Date	3-11-02	Time	9:45	
	Depth of W		•		ft-TOC	Water col		Well Vol	· · ·	
	Departor vv	CII	•		100	vvaici coi		, , , , , , , , , , , , , , , , , , , ,	······································	
	Redevelop	ment pumpi	ng rate		gpm	Start time	10:30	End Time	12:15	
			1 well vol		1	4 well vol	5 well vol	6 well vol	End	
	Time	0	J		20min		100 min			Į
	Temp.	Deg. C	10.44	9,75	11.17	11.60	10.65			
	S.Cond	mS	2.47	2.65	2.54	2.40	2.39			
	рН	S.U.	7.25	7,27	7.64	7.07	7.30			1
	Turbidity	ntu	999.0	278.0	999.0	799.0	999.0	·	<u> </u>	1
	Tot Vol Pu	mped (gal)		1,5941	1/99/	1 gal	. 25 un	<u> </u>	<u> </u>]
Presampl	Water leve	els at all site	nents for pre					prior to sar ing develop Time		_
	Post Samr	oling Water	l evel		 ft-TOC	Date		- Time		
Sampling	Informatio	Ü	2010.					_		-
	Sampling	devise:	Peris	TALTIC	Pump		_Pump rate	-80z	/min	
,	Sample de	escription:								_
	Sample To	urbidity	4100	_	Other					_
	Sample co	oll. time	13:00	_		lit sample co		others	Yes / No	
	Sample Pi	reservation	HNO,		•	ple field filte		Yes / No	_	
	Sample Id	entification	Mylin	€ HMU)-MW25-0	_{≩o} Çhain of (Custody#	012194		

Laboratory Severn Trent Laboratories - St. Louis Airbill Number 7905 01/70007

Remarks Stop Between Vol-2 and Vol 3 to Let well Recharge

SLOW WALL RECHMEE, WALT 'LLHOLD BOTHOUS REMAINS

MINIMAL Drawdown While pumping.

Well Identi	fication	BR-L	Wel	I Condition	(000)				
Redevelo	oment								
	Prepumpin	g Water Le	vel	8.98	ft-TOC	Date	3 11-02	Time	9 40
	Depth of W	/ell			_ft-TOC	Water col		Well Vol	
	Redevelop	ment pump	ing rate		_gpm	Start time		End Time	
	Time Temp. S.Cond pH Turbidity Tot Vol Pu	Deg. C mS S.U. ntu mped (gal)	1 well vol 0 12.98 3.60 6.97 999,0	2 well vol 5 m : /3, 3 9 3, 5 3 7. 0 8 8/. 3 3 94/.	10 min 13.72 3.51 6.88 16.6	13,7/ 3.50 6.90 13,5	20min 13.50 3.47 4.89	1	End
Presamp	Water leve	els at all site	ments for pr					d prior to sar ving develop	
Samalia		pling Water	Level		_ft-TOC	Date		_Time	
Sampiing	g Informatio		2	2			Disease wat	- O	,
	Sampling Sample de	escription:	V LERISTA Wyte	ritie Pi	Other	-Chon	zed to	clear b	1 3/19/02
	•	reservation	- 1	3-12-02	Was sam	lit sample o	ered	Yes/ No	Yes/No
	•	lentification				Chain of			/7 0002
Remarks	: <u>Wate</u>	r 15	Very Constant	deep 1	Blue C		Filter	did not	

	opment And S ite, Washingt		/Ivania			,			
Well Identif	ication _	31	Wel	I Condition	600	d			
Redevelop	oment			11/30	シ ア			- 3	
	Prepumping	Water Lev	el	18:85	ft-TOC	Date	3-12.0	Time	23:54
	Depth of We	ell		.	ft-TOC	Water col		Well Vol	*****
	Redevelopn	nent pumpi	ng rate		gpm	Start time	12:35	End Time	1:30
			1 well vol	2 well vol	3 well vol	 			End
	Time Temp.	Deg. C	12.93	13.10	13.32	13,62	13.84	13,80	
	S.Cond	mS	1.91	1.94	1,98	2,00	1.98	1.99	
	pH Turbidity	S.U.	7,/2 999.0	6.88	999,0			7.17	
	Tot Vol Pun		1GA1	4GAI	2 GA1	2 GA		3 GAI	
Presampl		s at all site measurem Water Leve	ents for pro				r time period le day follow 3-13-0 →	ing develop	
Sampling	Information	1			-				
	Sampling d	evise:	Peris	taltic f	Pump		Pump rate	·	
	Sample des	scription:		,,					
	Sample Tu	rbidity	2100	_	Other				
	Sample col	l. time	16:10		Was a spl	lit sample c	ollected by	others	Yes / (Qo
	Sample Pre	eservation	HW03		_Was sam	ple field filte	ered	(es) No	
	Sample Ide	entification	Hmw-	M31-03	<u>></u>	_Chain of	Custody #	012194	<u> </u>
	Laboratory	Severn Tre	ent Laborat	ories - St. L	ouis .	Airbill Nu	mber	7903 4	843 9090
Remarks	Draw	down	to 19	.11					

Molycorp Si	ite, Washing	ton, Pennsy				A		0 7	-11
Well Identifi	ication 4	mw-24	' Wel	I Condition	6000	<u> </u>		2	Flash
Redevelop	ment		1	11.18 02					
	Prepumping	g Water Lev	el	à.31	ft-TOC	Date	3-12-02	Time	2:39
	Depth of W	/ell			ft-TOC	Water col		Well Vol	
	Redevelop	ment pumpi	ng rate		gpm	Start time	3:15	End Time	4:00
	Time Temp.	Deg. C	1 well vol 6	2 well voi 5 /0.82	3 well vol	18	20	25	
	S.Cond pH	mS S.U.	9.38	7.10	0.785	0.748	7,02	6.99	2
	Turbidity Tot Vol Pu	mped (gal)	58,0 1GA1	122.0 1GA	304,0 2 GAI	133,0 1 GAI	IGAI	30.3	
Presampl	Water leve	els at all site	nents for pro	o be measu esampling s				ring develo	
Sampling	Informatio	_						_	
pg	Sampling Sample de	devise:	Perista	the Pu	mp		_ Pump rate	e	·
	Sample Ti		<u> </u>		Other				
	Sample co	oll. time	15:20		Was a sp	lit sample c	ollected by	others	Yes / N6
	Sample P	reservation	HNO	D ₃	_Was sam	ple field filte	ered	Yes/ No	
	Sample Id	entification	HMW.	- M26-0	030.9-	Chain of	Custody #	0/219	.4
	Laborator	y Severn Tr	ent Laborat	ories - St. L	ouis.	Airbill Nu			4843 2020
Remarks	Pup	ip Z	7/4	Betu	16E N	2 an	13	and	3 and 4
	<u>Drau</u>	down	to 4	1.351					

Well Development And Sampling Form

Vell Identifica	ation _	M - 8	Well	Condition _	GOOD		· · · · · · · · · · · · · · · · · · ·	2" FLUSH	1
tedevelopm	ent								•
P	repumping	Water Leve	el _	6.06	ft-TOC	Date .	3 - 11-02	Time	10:50
D	epth of We	ell	-		ft-TOC	Water col		Well Vol	
R	edevelopr	nent pumpi	ng rate		gpm	Start time	7:50	End Time	
Г	T		1 well vol	2 well vol	3 well vol	4 well vol	5 well vol	6 well vol	End
T	ime		0	5	10	7 30	35	45	
ļ	emp.	Deg. C	10.50	10.68	序 32	11. 28	11:41	10.88	
	Cond .	mS	1.02	1.63	1.06	1.14	1. 11	1.14	
 	Н	S.U.	7.29	7.35	7.22	7.15	7. 11	7.06	
L2	urbidity	ntu	582.0	999	999	999	999	107	
<u></u>	ot Vol Pur		->	2 644	3644	1 CAL	- S GA &	2 642	
Ľ	Ot VOI 1 di	inped (gai)		1 4 4 7 7 7	1 2 4 4 4	1 1000	1 7	1 2 0"	<u> </u>
	Vater level	s at all site		o be measur					
V	valer leve	measurem	ens ior pre	ssampung s	nodia be co	Jiiducted the	e day lollow	ing develop	HIGH
F	Presample	Water Leve	əl	6.02	ft-TOC	Date	3-13-02	_Time	11340
F	ost Samp	ling Water l	Level		_ft-TOC	Date		_Time	
ampling Ir	nformation	1							
5	Sampling o	levise:	Perist	alter f	Cump		_Pump rate	<u> 2003</u>	-Imi
5	Sample de	scription:							
Ş	Sample Tu	rbidity	C100	_	Other				
(Sample co	II. time	11:45	_	Was a sp	lit sample co	ollected by o	others	Yes (No)
	Sample Pr	eservation	-HNO	3	_Was sam	ple field filte	red	Yes No	-
9	Sample Ide	entification	HMW-M	NT-030		_Chain of C	Custody #	01219	1
l	Laboratory	Severn Tre	ent Laborat	ories - St. L	ouis	Airbill Nun	nber	7903	1843 9
Remarks _	Mac (ONFIMULAG	TO DAY	of MAR	4°2 Em	- Pue 6 a	Q (0 w	PATE.	····
•	Drawd	own t	ro 8.3	391,	Огарри	d 1,0	in l	mui.3.	5 Ce C
	_								

Well Development And Molycorp Site, Washir	
141 111 1 120 11	 \ <i>\</i> /-

.

ell Identific	ation	M-13	Well	Condition	6000			2" PLUSH	
edevelopr	nent	BLACK TO P							
•		ing Water Lev	۵i	10.84	ft-TOC	Date	3-11-02	Time	10:45
1	Prepump	ing water Lev	с і .	10.84	11-100	Date			,
1	Depth of	Well			ft-TOC	Water col		Well Vol	
	Redevelo	opment pumpi	ng rate		_gpm	Start time	15:50	End Time	16:10
ſ			1 well vol	2 well vol	3 well vol	4 well vol	5 well vol	6 well vol	End
1	Time		0	5	20				
Ì	Temp.	Deg. C	14,26	8:14.62	12.41				
	S.Cond	mS	2.36	2.52	244				
	рН	S.U.	6.48	6.39	6.60				
	Turbidity	ntu	730	92.9	4755				
		oumped (gal)	>	3692	1 GAL				
	Presam	ple Water Lev	el	10.92	_ft-TOC	Date	3-13-03	Time	10:45
		mpling Water			 ft-TOC	Date		 _Time	
ampling	Informa	tion							
	Samplin	ig devise:	Peristo	iltic Pu	mp		Pump rate	e <u>802/w</u>	i Um:
	Sample	description:							
	Sample	Turbidity	4100	_	Other				
	Sample	coll. time	10:50		Was a sp	olit sample c	collected by	others	Yes /(No)
	Sample	Preservation	_ HNX)3	Was sam	ple field filte	ered	(es / No	
	Sample	Identification	HMW-1	M13-03	03-		Custody #	012194	1
	Laborat	ory Severn Tr	ent Labora	tories - St. l	Louis	Airbill Nu	mber	1903	7893 90
Remarks	Har	Day AFTER	4 CAL		ECHAROE			<u> </u>	
	Dra	udown t	0 12.9	<u>ə' </u>					

	cation	BR-2	_ Wel	II Condition	Go.	od_		2 -	
Redevelopr	nent			11:25			3-12-0	2_	0/1///
F	Prepumping	g Water Lev	/el	2.60	ft-TOC	Date	3 12	Time	01:46
Ţ	Depth of W	/ell			ft-TOC	Water col	,	Well Vol	
!	Redevelop	ment pumpi	ing rate		_gpm	Start time	2:30	End Time	2:55
·	Time Temp. S.Cond pH Turbidity Tot Vol Pu	Deg. C mS S.U. ntu	1 well vol 0 11. 78 2. 97 8. 61 627.0 1 GA1	12.04 2.58 8-72	10 11.92 2.97 8.71	4 well vol 15 12.05 2.78 8.71 158.0 3GA1	20 12.14 2.98 8,63		End
Presample	Water leve	els at all site	ments for pr	to be measuresampling s	red within a should be co	onducted th	r time period e day follow 3-13-02	ring develop	mpling ment 15:40
	Post Sam	pling Water	Level		_ft-TOC	Date		_Time	
Sampling	Informatio)n							
	Sampling	devise:	Paris	taltic f	Sump		Pump rate	e	
	Cample d	ocarintian:	•		•				
	Sample u	escription:							
	Sample T	•	2100		Other				
·	•	urbidity	<u>2100</u> 15:45	<u> </u>		lit sample c	collected by	others	Yes (No
·	Sample To	urbidity	15:45		Was a sp	olit sample c		others	Yes (No
	Sample Co	urbidity oll. time reservation	15: 45 HUE		Was a sp Was sam	ple field filte		_	
	Sample Consumption Sample Posample In	urbidity oll. time reservation dentification	15: 45 +WE HMW-)3	Was a sp _ Was sam 3 <i>0</i>	ple field filte	ered Custody#	@ / No	

Well Development And Sampling Form Molycorp Site, Washington, Pennsylvania

Vell Identifica	ation	M-10	Well	Condition .	RISER I	Bout Rep	ACED	2*	?ar
tedevelopm	nent								
Р	repumpin	g Water Lev	el .	9.43	ft-TOC	Date	3-11-02	Time	11:00
	Depth of W	/ell			ft-TOC	Water col		Well Vol	
F	Redevelop	ment pumpi	ng rate		_gpm	Start time	9:45	End Time	18:05
Γ		1	1 well vol	2 well vol	3 well vo	I 4 well vol	5 well vol	6 well vol	End
1	Time		0	5	10	15	20		
j-	Гетр.	Deg. C	10.38	10.90	10.97	11.08	11.15		
i	S.Cond	mS	. 651	.687	.746	1800	.834		
	Н	S.U.	8.0	7.77	7.69	7.44	7.63		
	Turbidity	ntu	999	999	999	249.0	102.0		
[·	Tot Vol Pu	ımped (gal)	1 GAL	3 64L	2 646	3941	<u> </u>	<u> </u>	
		e Water Leve		9,25	_ft-TOC ft-TOC	Date Date	3-/3-02	_Time Time	14:50
		pling Water	Level		_π-100	Date		_ 111116	
Sampling !	mormatic	J11							
	Sampling	devise:	Perist	tattic 1	Pump		_Pump rate	e	
	Sample de	escription:					····		
	Sample T	urbidity	4100	-	Other				
	Sample c	oll. time	14:55		Was a s	olit sample o	ollected by	others	Yes (Nà
	Sample P	reservation	HNO	3	Was san	nple field filte	ered	(es / No	
	Sample Id	dentification	HMW-1	M10-030	2	Chain of	Custody#	01219	3
	Laborator	y Severn Tr	ent Laborat	tories - St. I	Louis	Airbill Nu	mber	7903 4	843 920
Remarks	WELL	DRIED UP	AF TEYL	1 GAL P.	414 ED			<u></u>	
	Dawd	own t	6 9,8	7.			·		

Well Development And Sampling Form Molycorp Site, Washington, Pennsylvania

Well Identifi	cation	M-29	Wel	I Condition	COOD			<u>" </u>	
Redevelop	ment								
	Prepumping	g Water Lev	el .	10.63	ft-TOC	Date	3-11-02	Time	H: 05
	Depth of W	/ell			_ft-TOC	Water col		Well Vol	
	Redevelop	ment pumpi	ng rate		_gpm	Start time	9:00	End Time	9:38
			1 well vol	2 well vol	3 well vol		5 well vol	6 well vol	End
	Time		0	จ๊	10	35			
	Temp.	Deg. C	9.34	8.86	8.40	* NO RE	CHARVE	<u> </u>	
	S.Cond	mS	1.07	1.07	1.08				
	рН	S.U.	7.28	7. 03	7.04				
	Turbidity	ntu	999	999	999				
	Tot Vol Pu	mped (gal)	1 GAL	. 25 GAL	. 5 GAL		<u></u>	1	<u> </u>
	Water leve	el measuren	nents for pre	esampling s	should be co	onducted the	e day follow	d prior to sar ring develop	ment
	Presample	e Water Lev	el	10.22	ft-TOC	Date 1	3 <u>-13-02</u>	Time	14:10
	Post Sam	pling Water	Level		_ft-TOC	Date		Time	
Sampling	Informatio	n							
i	Sampling	devise:	Perista	altic F	ump_		_Pump rate	e	
••	Sample de	escription:							
	Sample Ti	urbidity	6100	·	Other				
	Sample co	oll. time	14:30		Was a sp	lit sample c	ollected by	others	Yes AND
	Sample P	reservation	HNO	3	_Was sam	ple field filte	ered	Yes No	
	Sample Id	lentification	HMW-	<u> M29-c</u>	1302	_Chain of	Custody#	012193	<u>ک</u>
	Laborator	y Severn Tr	ent Laborat	ories - St. l	_ouis	Airbill Nur	mber	7903 4	843 924
Remarks	War	DRYUR	c / c+c	Scen	RECHME	ξ	<u></u>		
	Dr	audown	1 to	13.8'					
	Hiah	turbidi	to bef	ine filt	en, low	after.			

	pment And S te, Washingt								
Well Identifi	cation _	28	Well	Condition _	G 00	<u>d</u>			2~
Redevelop	ment			11:10 3-11-02 10:48					
	Prepumping	Water Lev	el .	10,48	ft-TOC	Date	3-15-05	Time	
	Depth of We	ell			ft-TOC	Water col		Well Vol	
	Redevelopn	nent pumpi	ng rate		gpm	Start time	10:20 A	#nd Time	10:50
Presampl	Time Temp. S.Cond pH Turbidity Tot Voi Pun e Water Lev Water level Water level Presample Post Samp	ei s at all site I measuren Water Lev	nents for pro	5 12.14 2.00 7,36 284.0 2 GAI.	/0 /2./9 /.87 /28.0 /28.0 /26A) red within a hould be o	15 12.15 1.81 7.28 33.45. 13 GA/	20 12.29 1.73 7.30 9.78.0 9.86.0 9.86.0 Time period ne day follow	prior to sa	mpling
Sampling	Information	n	0						
	Sampling o		_ Peris	taltic P	ump_		Pump rate	·	
	Sample de	scription:							
	Sample Tu	ırbidity	6100	Live.	Other				
	Sample co	II. time	13:45		Was a sp	olit sample	collected by o	others	Yes / No
	Sample Pr	eservation	HN03		_Was sam	ple field filt	ered	Yes / No	»
	Sample Ide	entification	HMW-M	128-63		Chain of	Custody #	01219	13
	Laboratory	Severn Tı	rent Labora	tories - St. L	ouis.	Airbill Nu	ımber	79034	1843 9240
Remarks	_ Draw	down -	to +0/3	5 10,55					

Well Development And Sampling Form
Molycorp Síte, Washington, Pennsylvania

ell Identific	cation _	27	Well	I Condition	God	od_			
edevelopi	ment			11:13					
	Prepumping	g Water Lev	rel :	7.56	ft-TOC	Date	3-12-0	े Time	22:18
	Depth of We	ell			ft-TOC	Water col		Well Vol	
	Redevelopr	ment pumpi	ng rate		gpm	Start time	11:00	End Time	11:28
[1 well vol	2 well vol	3 well vol	4 well vol	5 well vol	6 well vol	End
	Time		0	5	10	15	20		
	Temp.	Deg. C	11.47		11.94	11.63	11.65	<u> </u>	
	S.Cond	mS	9.80	9.78		9.82	9.78		
-	pH Turbidity	S.U.	45.2	9.78 5/13	9.45	28.0			
	Tot Vol Pur	<u> </u>	2 GAI	3 GA/	3GA/	3GA1			
	Post Samp	oling Water	Level	7.61	_ _ft-TOC	Date	3-13-0	_ _Time	
ampling	Informatio	n							
	Sampling o	devise:	Peris	taltic 1	Gemp		_Pump rate	e	
	Sample de	escription:							
	Sample Tu	ırbidity	3 2100	_	Other				
	Sample co	oll. time	13:20	_	Was a spl	it sample c	ollected by	others	Yes /(Ng
	Sample Pr	eservation	HNOS	3	_Was sam	ole field filte	ered	Yes / No	
	Sample Ide	entification	HMW-	M27-03	<u></u>	_Chain of	Custody #	012194	/
temarks	•	Severn Tr	ent Laborat	ories - St. L	ouis - 3	Airbill Nur	mber	7903 4	4843 924
	Drawo	down	to 8.6	4'		····			····

	opment And ite, Washing	, -	/Ivania			ı			
Well Identif	ication _	UG4	Wel	Condition _	600	d			
Redevelop	ment					11,15			
	Prepumping	y Water Lev	el .	7.43	ft-TOC	Date	3-11-02	Time	77:23
	Depth of W	ell			ft-TOC	Water col		Well Vol	
	Redevelopr	ment pumpi	ng rate		gpm	Start time	///35	End Time	12:05
			1 well vol	2 well vol	3 well vol	4 well vol	5 well vol	6 well vol	End
	Time		0	5	10	15	20	25	
	Temp.	Deg. C	11/21	11.98	11.99	12.18		12.16	
	S.Cond pH	mS S.U.	7.24	7.81	7.22	7.27	7.13	7.27	
	Turbidity	ntu	192.0	798.0	972.0				
	Tot Vol Pur		3 GA1	3 GM/	26A1			3 GA1	
Sampling	•	Water Level		7/30	_ft-TOC _ft-TOC	Date Date	3-13-02	_Time	13:00
oumpg	Sampling of		Pacial	altic Peu			Pump rate	2	
	Camping (JC 415C.		MIC TOU	ry			<u> </u>	
	Sample de	scription:							
	Sample Tu	ırbidity	6100	_	Other	, <u> </u>			
	Sample co	II. time	13:05	_	Was a sp	lit sample co	ollected by	others	Yes / (NG)
	Sample Pr	eservation	HNO.	3	_Was sam	ple field filte	red	Yes / No	
	Sample Ide	entification	Hmw-	164-03) <u>)</u>	_Chain of 0	Custody #	0/2/9	ich
	Laboratory	Severn Tre	ent Laborat	ories - St. L	ouis	Airbill Nur	nber	7903 4	1843 9240
Remarks	_Oran	odown	to 7	,65!					·
						,			

ell Identification	M-20	Wel	I Condition	6000			2 71	0 5 H
	8 LACK TOT							
edevelopment								
Prepu	mping Water	Level	8.94	ft-TOC	Date	3-11-02	Time	10140
Depth	of Well			ft-TOC	Water col		Well Vol	<u></u>
Rede	velopment pu	mping rate		_gpm	Start time	15:12 BB	End Time	15:37
		1 well vol	2 well vol	3 weil vol	4 well vol	5 well vol	6 well vol	End
Time		0	\$ 10	15	25	30		
Temp	Deg.			16.03	15.90	16.03		
S.Co			1.45	1.46	1.45	1.44		
рН	S.U	. 7.65	7.43	7.42	7.41	7.40		
Turbi			999	991	957	997		
	ol Pumped (g		5 GAL	3 cm	2 cm	5 cm		
		site wells are t irements for pr				e day follow	ing develop	
Pres	ample Water	Level	8.80	_ft-TOC	Date	3/102	_Time	10:10
Post	Sampling Wa	ater Level		_ft-TOC	Date		_Time	
ımpling Infor	mation							
Sam	pling devise:	Peris	taltic Pun	p " water		_Pump rate	202/w	Via.
Sam	ple descriptio	n: Dark,	"C cuddy	" water				
Sam	ple Turbidity	२०० ३०० विस्	ne filter	Other	***************************************			
Sam	ple coll. time	10:20		Was a sp	lit sample c	ollected by	others	Yes (No)
Sam	ple Preserva	tion <u>H</u> 100	3	Was sam	ple field filte	ered	(es) No	-
Sam	ple Identifica	tion HMW-	M30-0	302-	Chain of	Custody#	012194	1
Lab	oratory Sever	n Trent Labora	tories - St. I	Louis	Airbill Nu	mber	7903	489463
emarks <u>g.a</u>	CK WHIER					<u></u>		
\mathcal{D}	awdown -	to 9.10						
			 					

Well Identific	ation	M -4	Well	Condition	<u>6000</u>			4" wa	
Redevelopn	nent								
F	Prepumping	g Water Lev	el .	9. 70	ft-TOC	Date	3-11-02	Time	10:05
[Depth of W	ell			ft-TOC	Water col	<u>.725</u>	Well Vol	
i	Redevelop	ment pumpi	ng rate		gpm	Start time	12:23	_End Time	13 60
			1 well vol	2 well vol			5 well vol	6 well vol	End
<u> </u>	Time		0	3 1711	10 MIN				
L	Temp.	Deg. C	11,04	71.84	11.00	11.89			
1-	S.Cond	mS CU	0.9/2		1.26	1.37			
	pH Turbidih	S.U.	72,5 736 0	7.11	- 89	1450	 	<u> </u>	
	Turbidity	ntu mped (gal)	736 0				<u> </u>	<u> </u>	
L	101 VOI PU	mpeu (gai)	<u> </u>	3741	162	90.3			
Presample	Waterie	امير				•			
•	Water leve	els at all site	wells are to nents for pre	be measu esampling s	red within a should be co	1 to 2 hour anducted th	time period e day follow	d prior to sar ving develop	mpling ment
	Presample	e Water Leve	el	9.59	_ft-TOC	Date	3/02	_Time	8:50
	Post Samp	oling Water	Level		_ft-TOC	Date		_Time	
Sampling	Informatio								
	Sampling	devise:	Peristalt	ic Pump			_Pump rat	e 802/v	nin wousome b
	Sample de	escription:	Blu, k	out lie	pher th	nan BR	-1, fitt	er took a	wousome b
	Sample T		到00	_	Other				
	Sample co	oll, time	9:45	_	Was a sp	lit sample c	ollected by	others	Yes (No)
	Sample P	reservation	HN02		_Was sam	ple field filte	ered	(Yes)/ No	
	Sample Id	lentification	HMW-	M4-030	2	_Chain of	Custody#	013194	·4
	Laborator	y Severn Tr	ent Laborat	ories - St. I	ouis .	Airbiil Nu	mber	7903 4	1844 6367
Remarks	Sami	ole turn	nd cle	ar by	3-19	-02			
	Drai	idoun	to re	- 2 10	2.241				

ell Identification		WW - 24	Well Condition		6000				2"
developi	ment								
Ī	Prepumpir	ng Water Lev	/el	8.58	ft-TOC	Date	3-11-02	Time	10)20
	Depth of Well				ft-TOC	Water col		Well Vol	
	Redevelopment pumping rate				_gpm	Start time	14:30	End Time	
Ī			1 well vol	2 well vol	3 well vol	4 well vol	5 well vol	6 well vol	End
	Time		0	5	10	20	25		
	Temp.	Deg. C	12.56	19 46	12.59	12.91	13. 45		
İ	S.Cond	mS	1.77	1.71	1,70	1.71	1.67		
	pH	S.U.	11.06	10.53	10.50	1.55	10.17		
	Turbidity	ntu	999	85.0	12.93	220.4	999		
		umped (gal)		3 646	ian	1644	1 cm		
	Presamp	le Water Lev	rel	8.52	_ft-TOC	Date	3-13-01	z_Time	8:15
	·	npling Water		<u> </u>	ft-TOC	Date	3 7 3 0 1	Time	
mpling	Informati	on							
	Sampling	devise:	<u> Per 1</u>	STALTIC	PUMP	<u> </u>	_Pump rate	e <u> </u>	/min
	Sample of	description:							
	Sample	Furbidity	4/00	_	Other				
	Sample o	coll. time	8:30		Was a sp	lit sample c	ollected by		Yes / No
	Sample I	reservation ب	<u>#NO;</u> Imw		Was sam	ple field filte	ered	Yes / No	
				4-03 03	<u> </u>	Chain of (Custody#	01319	4
	Laborato	ry Severn Ti			_ouis	Airbill Nui	mber	7903 4	144636
	~	_		#					
emarks	<u>Drau</u>	odown	to 9	.0′,					