APPENDIX 7-N-F

Slug Test Plots and Time-Drawdown Data

A Q T E S O L V R E S U L T S
Version 1.10

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TEST DESCRIPTION

Data set..... DH1SLUG1.AQT
Data set title..... DH-1A SPRING CANYON SLUG INJECT. TEST #1
Company..... EarthFax Engineering
Project..... UC-192-06
Client..... CO-OP Mine
Location..... Huntington Canyon
Test date..... 9-25-91
Test well..... DH-1A

Knowns and Constants:
No. of data points..... 1389
Radius of well casing..... 0.1
Radius of well..... 0.1
Aquifer saturated thickness..... 70
Well screen length..... 20
Static height of water in well..... 70
Log(Re/Rw)..... 4.94
A, B, C..... 0.000, 0.000, 6.905

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ANALYTICAL METHOD

Bouwer-Rice (Unconfined Aquifer Slug Test)

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RESULTS FROM STATISTICAL CURVE MATCHING

STATISTICAL MATCH PARAMETER ESTIMATES

	Estimate		Std. Error
K =	1.0142E-004	+/-	7.9107E-006
y0 =	5.8607E-001	+/-	5.9286E-003

ANALYSIS OF MODEL RESIDUALS

residual = calculated - observed
weighted residual = residual * weight

Weighted Residual Statistics:
Number of residuals..... 174
Number of estimated parameters.... 2
Degrees of freedom..... 172
Residual mean..... 2.459E-005
Residual standard deviation..... 0.0367

Residual variance..... 0.001347

Model Residuals:

Time	Observed	Calculated	Residual	Weight
0.016667	1.0033	0.58527	0.41803	1
0.033333	0.76386	0.58446	0.1794	1
0.05	0.62418	0.58367	0.040515	1
0.066667	0.57429	0.58287	-0.0085768	1
0.083333	0.49447	0.58207	-0.0876	1
0.1	0.53438	0.58127	-0.046893	1
0.11667	0.57429	0.58048	-0.0061882	1
0.13333	0.59425	0.57968	0.014566	1
0.15	0.57879	0.57889	-0.0001014	1
0.16667	0.57429	0.5781	-0.0038094	1
0.18333	0.57429	0.57731	-0.003019	1
0.2	0.57429	0.57652	-0.0022292	1
0.21667	0.57429	0.57573	-0.0014404	1
0.23333	0.57429	0.57494	-0.00065321	1
0.25	0.56431	0.57416	-0.0098466	1
0.26667	0.56431	0.57337	-0.0090611	1
0.28333	0.56431	0.57259	-0.0082771	1
0.3	0.56431	0.5718	-0.0074938	1
0.31667	0.56431	0.57102	-0.0067115	1
0.33333	0.56431	0.57024	-0.0059307	1
0.35	0.56431	0.56946	-0.0051506	1
0.36667	0.56431	0.56868	-0.0043715	1
0.38333	0.56431	0.5679	-0.0035939	1
0.4	0.55434	0.56713	-0.012787	1
0.41667	0.55434	0.56635	-0.012011	1
0.43333	0.55434	0.56558	-0.011237	1
0.45	0.55434	0.5648	-0.010463	1
0.46667	0.55434	0.56403	-0.0096902	1
0.48333	0.55434	0.56326	-0.008919	1
0.5	0.55434	0.56249	-0.0081484	1
0.51667	0.55884	0.56172	-0.0028789	1
0.53333	0.55434	0.56095	-0.0066108	1
0.55	0.55434	0.56018	-0.0058434	1
0.56667	0.55434	0.55942	-0.005077	1
0.58333	0.54436	0.55865	-0.014292	1
0.6	0.54436	0.55789	-0.013528	1
0.61667	0.54436	0.55712	-0.012765	1
0.63333	0.54436	0.55636	-0.012003	1
0.65	0.54886	0.5556	-0.0067416	1
0.66667	0.54436	0.55484	-0.010481	1
0.68333	0.54436	0.55408	-0.0097229	1
0.7	0.54436	0.55332	-0.0089648	1
0.71667	0.54436	0.55257	-0.0082078	1
0.73333	0.53438	0.55181	-0.017432	1
0.75	0.54436	0.55106	-0.0066973	1
0.76667	0.54436	0.5503	-0.0059434	1
0.78333	0.53438	0.54955	-0.015171	1
0.8	0.53438	0.5488	-0.014419	1
0.81667	0.53438	0.54805	-0.013668	1
0.83333	0.53438	0.5473	-0.012919	1
0.85	0.53438	0.54655	-0.01217	1

0.86667	0.53438	0.5458	-0.011422	1
0.88333	0.53438	0.54506	-0.010676	1
0.9	0.53438	0.54431	-0.0099305	1
0.91667	0.53438	0.54357	-0.0091858	1
0.93333	0.53438	0.54282	-0.0084426	1
0.95	0.53888	0.54208	-0.0031999	1
0.96667	0.53438	0.54134	-0.0069583	1
0.98333	0.5244	0.5406	-0.016198	1
1	0.5244	0.53986	-0.015459	1
1.0167	0.5244	0.53912	-0.014719	1
1.0333	0.5244	0.53838	-0.013984	1
1.05	0.5289	0.53765	-0.0087462	1
1.0667	0.5244	0.53691	-0.012509	1
1.0833	0.5244	0.53618	-0.011778	1
1.1	0.5244	0.53544	-0.011043	1
1.1167	0.5244	0.53471	-0.010309	1
1.1333	0.5244	0.53398	-0.0095807	1
1.15	0.5244	0.53325	-0.0088488	1
1.1667	0.5244	0.53252	-0.008118	1
1.1833	0.5244	0.53179	-0.0073925	1
1.2	0.5289	0.53106	-0.0021636	1
1.2167	0.5244	0.53034	-0.0059357	1
1.2333	0.51443	0.52961	-0.015183	1
1.25	0.51443	0.52889	-0.014457	1
1.2667	0.51443	0.52816	-0.013732	1
1.2833	0.51443	0.52744	-0.013013	1
1.3	0.51443	0.52672	-0.01229	1
1.3167	0.51443	0.526	-0.011568	1
1.3333	0.51443	0.52528	-0.010851	1
1.35	0.51443	0.52456	-0.010132	1
1.3667	0.51443	0.52384	-0.0094126	1
1.3833	0.51443	0.52313	-0.0086989	1
1.4	0.51443	0.52241	-0.0079819	1
1.4167	0.51443	0.5217	-0.0072659	1
1.4333	0.51443	0.52099	-0.0065552	1
1.45	0.51443	0.52027	-0.0058411	1
1.4667	0.51443	0.51956	-0.0051281	1
1.4833	0.51443	0.51885	-0.0044202	1
1.5	0.51443	0.51814	-0.0037091	1
1.5167	0.51443	0.51743	-0.002999	1
1.5333	0.51443	0.51672	-0.002294	1
1.55	0.50445	0.51602	-0.011566	1
1.5667	0.50445	0.51531	-0.010859	1
1.5833	0.50445	0.51461	-0.010157	1
1.6	0.50445	0.5139	-0.0094512	1
1.6167	0.50445	0.5132	-0.0087469	1
1.6333	0.50445	0.5125	-0.0080477	1
1.65	0.50445	0.5118	-0.0073453	1
1.6667	0.50445	0.51109	-0.0066438	1
1.6833	0.50445	0.5104	-0.0059475	1
1.7	0.50445	0.5097	-0.005248	1
1.7167	0.50445	0.509	-0.0045494	1
1.7333	0.50445	0.50831	-0.003856	1
1.75	0.50445	0.50761	-0.0031593	1
1.7667	0.50445	0.50691	-0.0024636	1
1.7833	0.50445	0.50622	-0.001773	1
1.8	0.50445	0.50553	-0.0010792	1
1.8167	0.50445	0.50484	-0.0003863	1

1.8333	0.50445	0.50415	0.00030148	1
1.85	0.50445	0.50346	0.00099245	1
1.8667	0.50445	0.50277	0.0016825	1
1.8833	0.50445	0.50208	0.0023674	1
1.9	0.49447	0.50139	-0.0069244	1
1.9167	0.49447	0.50071	-0.0062372	1
1.9333	0.49447	0.50003	-0.0055551	1
1.95	0.49447	0.49934	-0.0048697	1
1.9667	0.49447	0.49866	-0.0041854	1
1.9833	0.49447	0.49798	-0.003506	1
2	0.49447	0.49729	-0.0028235	1
2.0167	0.49447	0.49661	-0.0021419	1
2.0333	0.49447	0.49594	-0.0014653	1
2.05	0.49447	0.49526	-0.00078562	1
2.0667	0.49447	0.49458	-0.00010684	1
2.0833	0.49447	0.4939	0.00056696	1
2.1	0.49447	0.49323	0.0012439	1
2.1167	0.49447	0.49255	0.0019199	1
2.1333	0.49447	0.49188	0.0025909	1
2.15	0.49447	0.4912	0.0032651	1
2.1667	0.49447	0.49053	0.0039383	1
2.1833	0.49447	0.48986	0.0046066	1
2.2	0.49447	0.48919	0.005278	1
2.2167	0.49447	0.48852	0.0059485	1
2.2333	0.49447	0.48786	0.006614	1
2.25	0.48449	0.48719	-0.0026973	1
2.2667	0.49447	0.48652	0.0079504	1
2.2833	0.49447	0.48586	0.0086132	1
2.3	0.48449	0.48519	-0.00070086	1
2.3167	0.48449	0.48453	-3.5871E-005	1
2.3333	0.49447	0.48387	0.010604	1
2.35	0.48449	0.4832	0.0012874	1
2.3667	0.48449	0.48254	0.0019497	1
2.3833	0.48449	0.48188	0.0026071	1
2.4	0.48449	0.48122	0.0032675	1
2.4167	0.48449	0.48056	0.0039271	1
2.4333	0.48449	0.47991	0.0045818	1
2.45	0.48449	0.47925	0.0052395	1
2.4667	0.48449	0.47859	0.0058964	1
2.4833	0.48449	0.47794	0.0065484	1
2.5	0.48449	0.47729	0.0072035	1
2.5167	0.48449	0.47663	0.0078576	1
2.5333	0.48449	0.47598	0.008507	1
2.55	0.48449	0.47533	0.0091594	1
2.5667	0.48449	0.47468	0.0098108	1
2.5833	0.48449	0.47403	0.010458	1
2.6	0.48449	0.47338	0.011107	1
2.6167	0.48449	0.47273	0.011756	1
2.6333	0.48449	0.47209	0.0124	1
2.65	0.48449	0.47144	0.013047	1
2.6667	0.48449	0.4708	0.013693	1
2.6833	0.48449	0.47016	0.014335	1
2.7	0.48449	0.46951	0.014979	1
2.7167	0.48449	0.46887	0.015623	1
2.7333	0.479	0.46823	0.010771	1
2.75	0.48449	0.46759	0.016903	1
2.7667	0.47452	0.46695	0.0075739	1
2.7833	0.47452	0.46631	0.0082101	1

2.8	0.47452	0.46567	0.0088492	1
2.8167	0.479	0.46503	0.013967	1
2.8333	0.47452	0.4644	0.010121	1
2.85	0.47452	0.46376	0.010757	1
2.8667	0.47452	0.46313	0.011393	1
2.8833	0.47452	0.4625	0.012024	1
2.9	0.47452	0.46186	0.012658	1

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RESULTS FROM VISUAL CURVE MATCHING

VISUAL MATCH PARAMETER ESTIMATES

	Estimate
K =	1.0142E-004
y0 =	5.8607E-001

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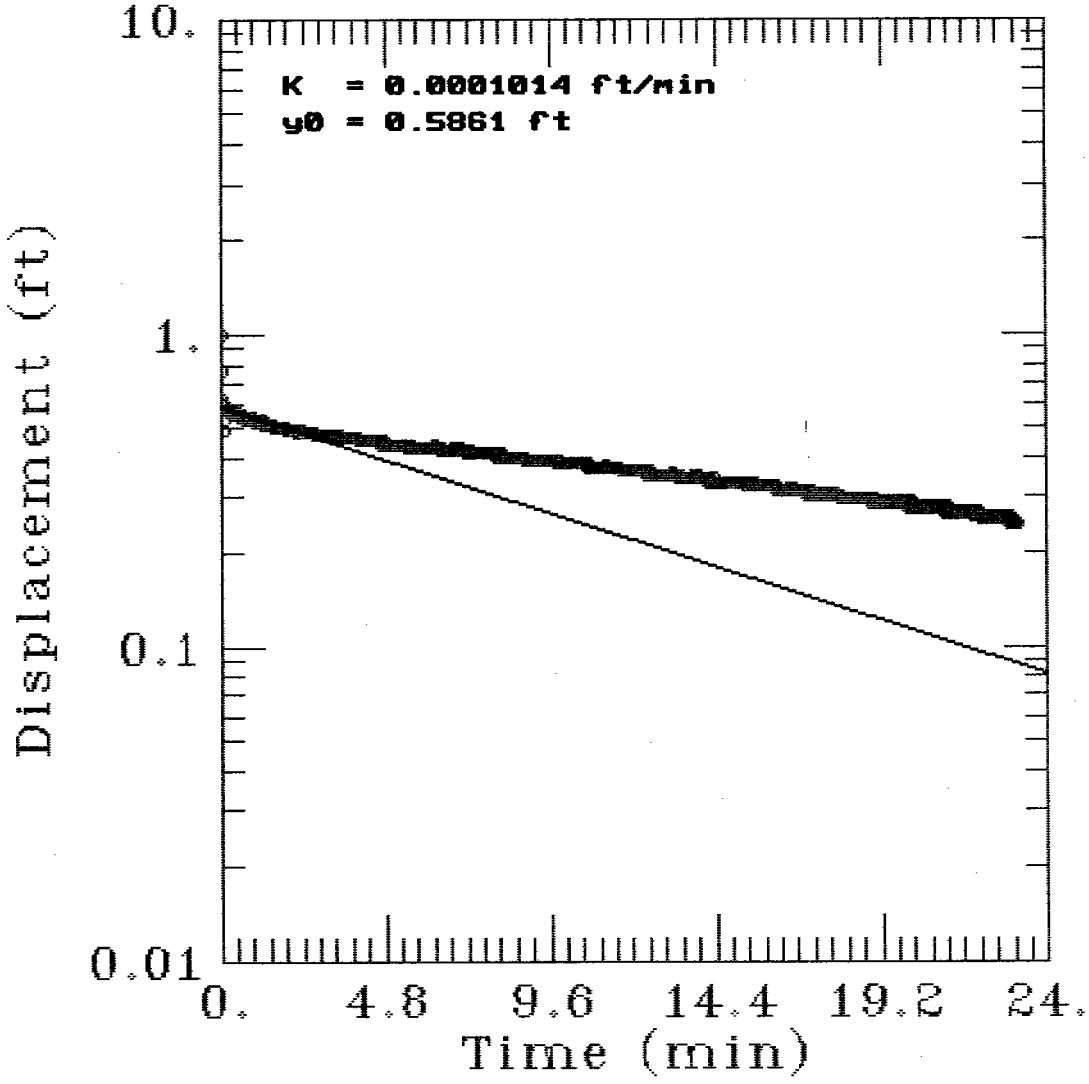
DH-1A SPRING CANYON SLUG INJECT. TEST #1



A Q T E S O L V R E S U L T S
Version 1.10

05/12/92 01:09:28

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TEST DESCRIPTION

Data set..... STDH1AS3.AQT
Data set title..... DH-1A STORRS SLUG INJECTION TEST #3
Company..... EarthFax Engineering
Project..... UC-192-06
Client..... CO-OP Mine
Location..... Huntington Canyon
Test date..... 9-25-91
Test well..... DH-1A

Knowns and Constants:
No. of data points..... 1406
Radius of well casing..... 0.1
Radius of well..... 0.1
Aquifer saturated thickness..... 97
Well screen length..... 95
Static height of water in well..... 97
Log(Re/Rw)..... 5.784
A, B, C..... 0.000, 0.000, 12.295

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ANALYTICAL METHOD

Bouwer-Rice (Unconfined Aquifer Slug Test)

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RESULTS FROM STATISTICAL CURVE MATCHING

STATISTICAL MATCH PARAMETER ESTIMATES

	Estimate		Std. Error
K =	2.1560E-005	+/-	3.2967E-007
y0 =	4.2164E-001	+/-	3.7066E-003

ANALYSIS OF MODEL RESIDUALS

residual = calculated - observed
weighted residual = residual * weight

Weighted Residual Statistics:
Number of residuals..... 1406
Number of estimated parameters.... 2
Degrees of freedom..... 1404
Residual mean..... -0.0002625
Residual standard deviation..... 0.04893
Residual variance..... 0.002394

Model Residuals:

Time	Observed	Calculated	Residual	Weight
2.7319E-009	1.6201	0.42164	1.1985	1
0.016667	1.2207	0.42115	0.79955	1
0.033333	1.1209	0.42065	0.70025	1
0.05	0.64886	0.42015	0.22871	1
0.066667	0.17236	0.41966	-0.2473	1
0.083333	0.29947	0.41916	-0.11969	1
0.1	0.42198	0.41867	0.0033118	1
0.11667	0.47189	0.41817	0.053716	1
0.13333	0.42198	0.41768	0.004299	1
0.15	0.39931	0.41719	-0.017878	1
0.16667	0.37206	0.4167	-0.044636	1
0.18333	0.44922	0.4162	0.033015	1
0.2	0.42198	0.41571	0.0062665	1
0.21667	0.44922	0.41522	0.033997	1
0.23333	0.37206	0.41473	-0.042673	1
0.25	0.39931	0.41424	-0.014934	1
0.26667	0.37206	0.41376	-0.041695	1
0.28333	0.39931	0.41327	-0.013957	1
0.3	0.37206	0.41278	-0.04072	1
0.31667	0.39931	0.41229	-0.012983	1
0.33333	0.37206	0.41181	-0.039746	1
0.35	0.39931	0.41132	-0.012011	1
0.36667	0.37206	0.41084	-0.038775	1
0.38333	0.39931	0.41035	-0.011041	1
0.4	0.39931	0.40987	-0.010557	1
0.41667	0.39931	0.40938	-0.010073	1
0.43333	0.37206	0.4089	-0.03684	1
0.45	0.39931	0.40842	-0.0091078	1
0.46667	0.39931	0.40794	-0.008626	1
0.48333	0.37206	0.40745	-0.035395	1
0.5	0.39931	0.40697	-0.0076641	1
0.51667	0.39931	0.40649	-0.007184	1
0.53333	0.37206	0.40601	-0.033954	1
0.55	0.37206	0.40554	-0.033475	1
0.56667	0.37206	0.40506	-0.032997	1
0.58333	0.39931	0.40458	-0.0052693	1
0.6	0.37206	0.4041	-0.032042	1
0.61667	0.37206	0.40363	-0.031565	1
0.63333	0.37206	0.40315	-0.031089	1
0.65	0.39931	0.40267	-0.0033635	1
0.66667	0.39931	0.4022	-0.0028885	1
0.68333	0.39931	0.40172	-0.002414	1
0.7	0.39931	0.40125	-0.0019401	1
0.71667	0.37206	0.40078	-0.028717	1
0.73333	0.37206	0.4003	-0.028244	1
0.75	0.39931	0.39983	-0.00052175	1
0.76667	0.39931	0.39936	-5.0068E-005	1
0.78333	0.39931	0.39889	0.00042103	1
0.8	0.37206	0.39842	-0.026358	1
0.81667	0.39931	0.39795	0.0013616	1
0.83333	0.39931	0.39748	0.0018311	1
0.85	0.37206	0.39701	-0.02495	1

0.86667	0.37206	0.39654	-0.024482	1
0.88333	0.39931	0.39607	0.0032361	1
0.9	0.39931	0.39561	0.0037033	1
0.91667	0.39931	0.39514	0.00417	1
0.93333	0.39931	0.39467	0.0046362	1
0.95	0.39931	0.39421	0.0051018	1
0.96667	0.39931	0.39374	0.0055668	1
0.98333	0.39931	0.39328	0.0060313	1
1	0.37206	0.39281	-0.020755	1
1.0167	0.39931	0.39235	0.0069587	1
1.0333	0.37206	0.39189	-0.019829	1
1.05	0.39931	0.39143	0.0078838	1
1.0667	0.39931	0.39096	0.0083456	1
1.0833	0.39931	0.3905	0.0088067	1
1.1	0.39931	0.39004	0.0092674	1
1.1167	0.39931	0.38958	0.0097276	1
1.1333	0.39931	0.38912	0.010187	1
1.15	0.37206	0.38866	-0.016604	1
1.1667	0.32213	0.38821	-0.066075	1
1.1833	0.32213	0.38775	-0.065617	1
1.2	0.32213	0.38729	-0.06516	1
1.2167	0.34938	0.38683	-0.037453	1
1.2333	0.39931	0.38638	0.012933	1
1.25	0.37206	0.38592	-0.013861	1
1.2667	0.37206	0.38547	-0.013406	1
1.2833	0.34938	0.38501	-0.035631	1
1.3	0.37206	0.38456	-0.012497	1
1.3167	0.39931	0.3841	0.015207	1
1.3333	0.32213	0.38365	-0.06152	1
1.35	0.34938	0.3832	-0.033817	1
1.3667	0.34938	0.38275	-0.033365	1
1.3833	0.34938	0.38229	-0.032914	1
1.4	0.39931	0.38184	0.017467	1
1.4167	0.34938	0.38139	-0.032012	1
1.4333	0.37206	0.38094	-0.0088825	1
1.45	0.34938	0.38049	-0.031113	1
1.4667	0.39931	0.38004	0.019266	1
1.4833	0.34938	0.3796	-0.030216	1
1.5	0.34938	0.37915	-0.029768	1
1.5167	0.34938	0.3787	-0.029321	1
1.5333	0.34938	0.37825	-0.028874	1
1.55	0.34938	0.37781	-0.028428	1
1.5667	0.34938	0.37736	-0.027982	1
1.5833	0.34938	0.37692	-0.027537	1
1.6	0.34938	0.37647	-0.027092	1
1.6167	0.34938	0.37603	-0.026648	1
1.6333	0.34938	0.37558	-0.026205	1
1.65	0.34938	0.37514	-0.025762	1
1.6667	0.34938	0.3747	-0.025319	1
1.6833	0.34938	0.37426	-0.024877	1
1.7	0.34938	0.37382	-0.024435	1
1.7167	0.32213	0.37337	-0.051244	1
1.7333	0.34938	0.37293	-0.023554	1
1.75	0.32213	0.37249	-0.050364	1
1.7667	0.32213	0.37205	-0.049925	1
1.7833	0.32213	0.37162	-0.049486	1
1.8	0.34938	0.37118	-0.021797	1
1.8167	0.32213	0.37074	-0.048609	1

1.8333	0.34938	0.3703	-0.020922	1
1.85	0.32213	0.36987	-0.047735	1
1.8667	0.34938	0.36943	-0.020049	1
1.8833	0.32213	0.36899	-0.046863	1
1.9	0.34938	0.36856	-0.019178	1
1.9167	0.32213	0.36812	-0.045993	1
1.9333	0.34938	0.36769	-0.018309	1
1.95	0.32213	0.36726	-0.045125	1
1.9667	0.34938	0.36682	-0.017442	1
1.9833	0.32213	0.36639	-0.044259	1
2	0.34938	0.36596	-0.016577	1
2.0167	0.32213	0.36553	-0.043395	1
2.0333	0.34938	0.36509	-0.015714	1
2.05	0.34938	0.36466	-0.015283	1
2.0667	0.34938	0.36423	-0.014853	1
2.0833	0.34938	0.3638	-0.014423	1
2.1	0.32213	0.36337	-0.041244	1
2.1167	0.34938	0.36295	-0.013565	1
2.1333	0.34938	0.36252	-0.013137	1
2.15	0.32213	0.36209	-0.03996	1
2.1667	0.34938	0.36166	-0.012282	1
2.1833	0.32213	0.36124	-0.039106	1
2.2	0.34938	0.36081	-0.01143	1
2.2167	0.32213	0.36038	-0.038254	1
2.2333	0.32213	0.35996	-0.037829	1
2.25	0.34938	0.35953	-0.010154	1
2.2667	0.34938	0.35911	-0.0097301	1
2.2833	0.32213	0.35869	-0.036557	1
2.3	0.34938	0.35826	-0.0088835	1
2.3167	0.32213	0.35784	-0.035711	1
2.3333	0.32213	0.35742	-0.035289	1
2.35	0.34938	0.357	-0.007617	1
2.3667	0.32213	0.35658	-0.034446	1
2.3833	0.34938	0.35616	-0.0067753	1
2.4	0.34938	0.35574	-0.0063551	1
2.4167	0.34938	0.35532	-0.0059354	1
2.4333	0.34938	0.3549	-0.0055164	1
2.45	0.34938	0.35448	-0.0050976	1
2.4667	0.32213	0.35406	-0.031929	1
2.4833	0.34938	0.35364	-0.0042619	1
2.5	0.34938	0.35322	-0.0038446	1
2.5167	0.32213	0.35281	-0.030678	1
2.5333	0.32213	0.35239	-0.030262	1
2.55	0.34938	0.35198	-0.002596	1
2.5667	0.32213	0.35156	-0.029431	1
2.5833	0.34938	0.35115	-0.0017661	1
2.6	0.34938	0.35073	-0.0013518	1
2.6167	0.34938	0.35032	-0.00093796	1
2.6333	0.32213	0.3499	-0.027775	1
2.65	0.32213	0.34949	-0.027362	1
2.6667	0.34938	0.34908	0.00030037	1
2.6833	0.32213	0.34867	-0.026538	1
2.7	0.32213	0.34826	-0.026127	1
2.7167	0.34938	0.34785	0.0015343	1
2.7333	0.34938	0.34744	0.0019445	1
2.75	0.32213	0.34703	-0.024896	1
2.7667	0.32213	0.34662	-0.024486	1
2.7833	0.34938	0.34621	0.0031726	1

2.8	0.34938	0.3458	0.0035811	1
2.8167	0.32213	0.34539	-0.023261	1
2.8333	0.34938	0.34498	0.0043964	1
2.85	0.34938	0.34458	0.0048035	1
2.8667	0.32213	0.34417	-0.02204	1
2.8833	0.34938	0.34376	0.0056159	1
2.9	0.32213	0.34336	-0.021228	1
2.9167	0.34938	0.34295	0.0064267	1
2.9333	0.34938	0.34255	0.0068311	1
2.95	0.34938	0.34214	0.0072353	1
2.9667	0.34938	0.34174	0.007639	1
2.9833	0.34938	0.34134	0.008042	1
3	0.34938	0.34094	0.0084447	1
3.0167	0.32213	0.34053	-0.018403	1
3.0333	0.34938	0.34013	0.0092485	1
3.05	0.34938	0.33973	0.0096499	1
3.0667	0.34938	0.33933	0.010051	1
3.0833	0.32213	0.33893	-0.016799	1
3.1	0.34938	0.33853	0.010851	1
3.1167	0.34938	0.33813	0.01125	1
3.1333	0.34938	0.33773	0.011649	1
3.15	0.32213	0.33733	-0.015203	1
3.1667	0.32213	0.33693	-0.014805	1
3.1833	0.34938	0.33654	0.012843	1
3.2	0.34938	0.33614	0.01324	1
3.2167	0.32213	0.33574	-0.013614	1
3.2333	0.34938	0.33535	0.014032	1
3.25	0.34938	0.33495	0.014428	1
3.2667	0.34938	0.33456	0.014823	1
3.2833	0.32213	0.33416	-0.012032	1
3.3	0.34938	0.33377	0.015612	1
3.3167	0.34938	0.33337	0.016006	1
3.3333	0.34938	0.33298	0.016399	1
3.35	0.32213	0.33259	-0.010458	1
3.3667	0.34938	0.3322	0.017184	1
3.3833	0.34938	0.3318	0.017576	1
3.4	0.34938	0.33141	0.017968	1
3.4167	0.32213	0.33102	-0.0088914	1
3.4333	0.29947	0.33063	-0.031161	1
3.45	0.34938	0.33024	0.019139	1
3.4667	0.32213	0.32985	-0.0077213	1
3.4833	0.32213	0.32946	-0.0073323	1
3.5	0.29947	0.32907	-0.029604	1
3.5167	0.34938	0.32869	0.020695	1
3.5333	0.32213	0.3283	-0.0061677	1
3.55	0.32213	0.32791	-0.0057803	1
3.5667	0.29947	0.32752	-0.028053	1
3.5833	0.34938	0.32714	0.022243	1
3.6	0.32213	0.32675	-0.0046212	1
3.6167	0.32213	0.32637	-0.0042357	1
3.6333	0.27222	0.32598	-0.053761	1
3.65	0.34938	0.3256	0.023784	1
3.6667	0.34938	0.32521	0.024168	1
3.6833	0.32213	0.32483	-0.0026985	1
3.7	0.29947	0.32445	-0.024975	1
3.7167	0.29947	0.32406	-0.024592	1
3.7333	0.32213	0.32368	-0.0015503	1
3.75	0.27222	0.3233	-0.051078	1

3.7667	0.29947	0.32292	-0.023447	1
3.7833	0.29947	0.32254	-0.023066	1
3.8	0.29947	0.32216	-0.022686	1
3.8167	0.27222	0.32178	-0.049555	1
3.8333	0.29947	0.3214	-0.021926	1
3.85	0.29947	0.32102	-0.021547	1
3.8667	0.29947	0.32064	-0.021168	1
3.8833	0.27222	0.32026	-0.04804	1
3.9	0.27222	0.31988	-0.047662	1
3.9167	0.29947	0.3195	-0.020035	1
3.9333	0.29947	0.31913	-0.019658	1
3.95	0.27222	0.31875	-0.046531	1
3.9667	0.29947	0.31838	-0.018905	1
3.9833	0.29947	0.318	-0.01853	1
4	0.29947	0.31762	-0.018155	1
4.0167	0.27222	0.31725	-0.04503	1
4.0333	0.29947	0.31688	-0.017406	1
4.05	0.29947	0.3165	-0.017032	1
4.0667	0.29947	0.31613	-0.016658	1
4.0833	0.27222	0.31576	-0.043536	1
4.1	0.29947	0.31538	-0.015913	1
4.1167	0.29947	0.31501	-0.015541	1
4.1333	0.29947	0.31464	-0.015169	1
4.15	0.27222	0.31427	-0.042048	1
4.1667	0.29947	0.3139	-0.014427	1
4.1833	0.29947	0.31353	-0.014057	1
4.2	0.29947	0.31316	-0.013687	1
4.2167	0.27222	0.31279	-0.040568	1
4.2333	0.29947	0.31242	-0.012949	1
4.25	0.29947	0.31205	-0.01258	1
4.2667	0.29947	0.31168	-0.012212	1
4.2833	0.27222	0.31131	-0.039095	1
4.3	0.29947	0.31095	-0.011477	1
4.3167	0.29947	0.31058	-0.01111	1
4.3333	0.27222	0.31021	-0.037994	1
4.35	0.27222	0.30985	-0.037628	1
4.3667	0.27222	0.30948	-0.037262	1
4.3833	0.29947	0.30912	-0.0096475	1
4.4	0.27222	0.30875	-0.036533	1
4.4167	0.27222	0.30839	-0.036168	1
4.4333	0.29947	0.30802	-0.0085548	1
4.45	0.29947	0.30766	-0.0081914	1
4.4667	0.29947	0.3073	-0.0078284	1
4.4833	0.27222	0.30694	-0.034716	1
4.5	0.27222	0.30657	-0.034354	1
4.5167	0.29947	0.30621	-0.0067421	1
4.5333	0.27222	0.30585	-0.033631	1
4.55	0.29947	0.30549	-0.0060201	1
4.5667	0.29947	0.30513	-0.0056597	1
4.5833	0.29947	0.30477	-0.0052999	1
4.6	0.29947	0.30441	-0.0049403	1
4.6167	0.27222	0.30405	-0.031831	1
4.6333	0.27222	0.30369	-0.031473	1
4.65	0.29947	0.30333	-0.0038642	1
4.6667	0.27222	0.30298	-0.030756	1
4.6833	0.27222	0.30262	-0.030399	1
4.7	0.27222	0.30226	-0.030042	1
4.7167	0.29947	0.30191	-0.0024353	1

4.7333	0.29947	0.30155	-0.0020793	1
4.75	0.27222	0.30119	-0.028974	1
4.7667	0.27222	0.30084	-0.028618	1
4.7833	0.29947	0.30048	-0.0010134	1
4.8	0.29947	0.30013	-0.00065883	1
4.8167	0.27222	0.29977	-0.027555	1
4.8333	0.29947	0.29942	4.8794E-005	1
4.85	0.29947	0.29907	0.00040209	1
4.8667	0.27222	0.29872	-0.026495	1
4.8833	0.27222	0.29836	-0.026143	1
4.9	0.29947	0.29801	0.0014593	1
4.9167	0.29947	0.29766	0.0018109	1
4.9333	0.27222	0.29731	-0.025088	1
4.95	0.27222	0.29696	-0.024737	1
4.9667	0.29947	0.29661	0.0028631	1
4.9833	0.29947	0.29626	0.0032128	1
5	0.29947	0.29591	0.0035624	1
5.0167	0.27222	0.29556	-0.023338	1
5.0333	0.29947	0.29521	0.0042601	1
5.05	0.29947	0.29486	0.0046084	1
5.0667	0.29947	0.29451	0.0049563	1
5.0833	0.27222	0.29417	-0.021946	1
5.1	0.29947	0.29382	0.0056507	1
5.1167	0.29947	0.29347	0.0059974	1
5.1333	0.29947	0.29313	0.0063434	1
5.15	0.27222	0.29278	-0.020561	1
5.1667	0.29947	0.29244	0.0070348	1
5.1833	0.29947	0.29209	0.0073796	1
5.2	0.29947	0.29175	0.0077242	1
5.2167	0.27222	0.2914	-0.019182	1
5.2333	0.29947	0.29106	0.0084121	1
5.25	0.29947	0.29071	0.0087555	1
5.2667	0.29947	0.29037	0.0090985	1
5.2833	0.29947	0.29003	0.009441	1
5.3	0.29947	0.28969	0.0097832	1
5.3167	0.29947	0.28935	0.010125	1
5.3333	0.27222	0.289	-0.016784	1
5.35	0.27222	0.28866	-0.016443	1
5.3667	0.29947	0.28832	0.011148	1
5.3833	0.29947	0.28798	0.011488	1
5.4	0.27222	0.28764	-0.015422	1
5.4167	0.27222	0.2873	-0.015083	1
5.4333	0.29947	0.28696	0.012506	1
5.45	0.29947	0.28663	0.012844	1
5.4667	0.29947	0.28629	0.013183	1
5.4833	0.27222	0.28595	-0.01373	1
5.5	0.29947	0.28561	0.013858	1
5.5167	0.29947	0.28528	0.014195	1
5.5333	0.29947	0.28494	0.014531	1
5.55	0.27222	0.2846	-0.012383	1
5.5667	0.29947	0.28427	0.015203	1
5.5833	0.29947	0.28393	0.015538	1
5.6	0.27222	0.2836	-0.011377	1
5.6167	0.27222	0.28326	-0.011042	1
5.6333	0.27222	0.28293	-0.010708	1
5.65	0.29947	0.28259	0.016876	1
5.6667	0.27222	0.28226	-0.010041	1
5.6833	0.27222	0.28193	-0.0097081	1

5.7	0.29947	0.2816	0.017875	1
5.7167	0.29947	0.28126	0.018207	1
5.7333	0.29947	0.28093	0.018539	1
5.75	0.27222	0.2806	-0.00838	1
5.7667	0.29947	0.28027	0.019201	1
5.7833	0.29947	0.27994	0.019532	1
5.8	0.29947	0.27961	0.019862	1
5.8167	0.27222	0.27928	-0.0070582	1
5.8333	0.29947	0.27895	0.020521	1
5.85	0.29947	0.27862	0.02085	1
5.8667	0.29947	0.27829	0.021179	1
5.8833	0.29947	0.27796	0.021507	1
5.9	0.29947	0.27763	0.021835	1
5.9167	0.29947	0.27731	0.022163	1
5.9333	0.27222	0.27698	-0.0047603	1
5.95	0.27222	0.27665	-0.0044335	1
5.9667	0.27222	0.27633	-0.004107	1
5.9833	0.29947	0.276	0.023469	1
6	0.29947	0.27568	0.023794	1
6.0167	0.29947	0.27535	0.02412	1
6.0333	0.24956	0.27503	-0.025466	1
6.05	0.29947	0.2747	0.024769	1
6.0667	0.27222	0.27438	-0.0021569	1
6.0833	0.27222	0.27405	-0.0018334	1
6.1	0.27222	0.27373	-0.00151	1
6.1167	0.29947	0.27341	0.026063	1
6.1333	0.27222	0.27308	-0.00086463	1
6.15	0.27222	0.27276	-0.00054242	1
6.1667	0.29947	0.27244	0.027029	1
6.1833	0.29947	0.27212	0.027351	1
6.2	0.27222	0.2718	0.00042176	1
6.2167	0.27222	0.27148	0.00074246	1
6.2333	0.29947	0.27116	0.028313	1
6.25	0.29947	0.27084	0.028633	1
6.2667	0.27222	0.27052	0.0017021	1
6.2833	0.27222	0.2702	0.0020211	1
6.3	0.27222	0.26988	0.0023399	1
6.3167	0.29947	0.26956	0.029908	1
6.3333	0.27222	0.26924	0.0029762	1
6.35	0.27222	0.26893	0.0032939	1
6.3667	0.22229	0.26861	-0.046319	1
6.3833	0.29947	0.26829	0.031178	1
6.4	0.29947	0.26798	0.031495	1
6.4167	0.27222	0.26766	0.0045607	1
6.4333	0.24956	0.26734	-0.017784	1
6.45	0.29947	0.26703	0.032442	1
6.4667	0.29947	0.26671	0.032757	1
6.4833	0.27222	0.2664	0.0058214	1
6.5	0.29947	0.26608	0.033386	1
6.5167	0.24956	0.26577	-0.01621	1
6.5333	0.27222	0.26546	0.0067631	1
6.55	0.27222	0.26514	0.0070763	1
6.5667	0.24956	0.26483	-0.015271	1
6.5833	0.29947	0.26452	0.034951	1
6.6	0.27222	0.26421	0.0080135	1
6.6167	0.22229	0.26389	-0.041605	1
6.6333	0.22229	0.26358	-0.041294	1
6.65	0.29947	0.26327	0.036197	1

6.6667	0.27222	0.26296	0.0092581	1
6.6833	0.22229	0.26265	-0.040362	1
6.7	0.24956	0.26234	-0.012782	1
6.7167	0.24956	0.26203	-0.012472	1
6.7333	0.22229	0.26172	-0.039433	1
6.75	0.22229	0.26141	-0.039125	1
6.7667	0.22229	0.26111	-0.038816	1
6.7833	0.24956	0.2608	-0.011238	1
6.8	0.24956	0.26049	-0.01093	1
6.8167	0.22229	0.26018	-0.037893	1
6.8333	0.24956	0.25988	-0.010316	1
6.85	0.24956	0.25957	-0.01001	1
6.8667	0.27222	0.25926	0.012957	1
6.8833	0.22229	0.25896	-0.036668	1
6.9	0.24956	0.25865	-0.0090921	1
6.9167	0.24956	0.25835	-0.008787	1
6.9333	0.22229	0.25804	-0.035752	1
6.95	0.22229	0.25774	-0.035448	1
6.9667	0.24956	0.25743	-0.0078737	1
6.9833	0.24956	0.25713	-0.0075702	1
7	0.24956	0.25683	-0.0072668	1
7.0167	0.22229	0.25652	-0.034234	1
7.0333	0.22229	0.25622	-0.033931	1
7.05	0.24956	0.25592	-0.0063589	1
7.0667	0.22229	0.25562	-0.033327	1
7.0833	0.22229	0.25532	-0.033026	1
7.1	0.24956	0.25501	-0.0054543	1
7.1167	0.24956	0.25471	-0.0051534	1
7.1333	0.24956	0.25441	-0.004853	1
7.15	0.22229	0.25411	-0.031823	1
7.1667	0.24956	0.25381	-0.004253	1
7.1833	0.24956	0.25351	-0.0039537	1
7.2	0.24956	0.25321	-0.0036546	1
7.2167	0.22229	0.25292	-0.030626	1
7.2333	0.24956	0.25262	-0.0030576	1
7.25	0.24956	0.25232	-0.0027595	1
7.2667	0.24956	0.25202	-0.0024618	1
7.2833	0.22229	0.25172	-0.029435	1
7.3	0.24956	0.25143	-0.0018676	1
7.3167	0.24956	0.25113	-0.0015709	1
7.3333	0.24956	0.25083	-0.0012748	1
7.35	0.22229	0.25054	-0.028249	1
7.3667	0.24956	0.25024	-0.00068321	1
7.3833	0.24956	0.24995	-0.00038812	1
7.4	0.24956	0.24965	-9.3197E-005	1
7.4167	0.22229	0.24936	-0.027069	1
7.4333	0.24956	0.24906	0.00049542	1
7.45	0.24956	0.24877	0.0007893	1
7.4667	0.22229	0.24848	-0.026187	1
7.4833	0.22229	0.24818	-0.025894	1
7.5	0.22229	0.24789	-0.025601	1
7.5167	0.24956	0.2476	0.0019612	1
7.5333	0.24956	0.24731	0.0022531	1
7.55	0.22229	0.24702	-0.024725	1
7.5667	0.24956	0.24672	0.0028364	1
7.5833	0.24956	0.24643	0.0031273	1
7.6	0.24956	0.24614	0.0034181	1
7.6167	0.22229	0.24585	-0.023561	1

7.6333	0.24956	0.24556	0.0039984	1
7.65	0.24956	0.24527	0.0042882	1
7.6667	0.24956	0.24498	0.0045776	1
7.6833	0.22229	0.24469	-0.022404	1
7.7	0.24956	0.2444	0.0051552	1
7.7167	0.24956	0.24412	0.0054436	1
7.7333	0.24956	0.24383	0.0057314	1
7.75	0.22229	0.24354	-0.021251	1
7.7667	0.24956	0.24325	0.0063065	1
7.7833	0.24956	0.24297	0.0065933	1
7.8	0.24956	0.24268	0.00688	1
7.8167	0.22229	0.24239	-0.020104	1
7.8333	0.24956	0.24211	0.0074522	1
7.85	0.24956	0.24182	0.0077379	1
7.8667	0.22229	0.24154	-0.019247	1
7.8833	0.24956	0.24125	0.008308	1
7.9	0.24956	0.24097	0.0085927	1
7.9167	0.24956	0.24068	0.008877	1
7.9333	0.24956	0.2404	0.0091608	1
7.95	0.22229	0.24012	-0.017826	1
7.9667	0.24956	0.23983	0.0097278	1
7.9833	0.24956	0.23955	0.010011	1
8	0.24956	0.23927	0.010293	1
8.0167	0.22229	0.23898	-0.016694	1
8.0333	0.24956	0.2387	0.010857	1
8.05	0.24956	0.23842	0.011139	1
8.0667	0.24956	0.23814	0.01142	1
8.0833	0.22229	0.23786	-0.015569	1
8.1	0.24956	0.23758	0.011982	1
8.1167	0.24956	0.2373	0.012262	1
8.1333	0.22229	0.23702	-0.014728	1
8.15	0.22229	0.23674	-0.014448	1
8.1667	0.24956	0.23646	0.013101	1
8.1833	0.24956	0.23618	0.01338	1
8.2	0.22229	0.2359	-0.013612	1
8.2167	0.24956	0.23562	0.013937	1
8.2333	0.24956	0.23535	0.014215	1
8.25	0.24956	0.23507	0.014492	1
8.2667	0.22229	0.23479	-0.0125	1
8.2833	0.22229	0.23451	-0.012223	1
8.3	0.22229	0.23424	-0.011947	1
8.3167	0.24956	0.23396	0.0156	1
8.3333	0.22229	0.23368	-0.011394	1
8.35	0.22229	0.23341	-0.011119	1
8.3667	0.22229	0.23313	-0.010843	1
8.3833	0.24956	0.23286	0.016702	1
8.4	0.22229	0.23258	-0.010294	1
8.4167	0.22229	0.23231	-0.010019	1
8.4333	0.22229	0.23204	-0.0097453	1
8.45	0.24956	0.23176	0.017798	1
8.4667	0.24956	0.23149	0.018072	1
8.4833	0.22229	0.23122	-0.0089251	1
8.5	0.24956	0.23094	0.018618	1
8.5167	0.24956	0.23067	0.01889	1
8.5333	0.22229	0.2304	-0.0081078	1
8.55	0.22229	0.23013	-0.0078359	1
8.5667	0.22229	0.22985	-0.0075644	1
8.5833	0.22229	0.22958	-0.0072933	1

8.6	0.24956	0.22931	0.020248	1
8.6167	0.22229	0.22904	-0.0067519	1
8.6333	0.22229	0.22877	-0.0064818	1
8.65	0.24956	0.2285	0.021058	1
8.6667	0.24956	0.22823	0.021328	1
8.6833	0.24956	0.22796	0.021597	1
8.7	0.24956	0.22769	0.021866	1
8.7167	0.24956	0.22743	0.022135	1
8.7333	0.24956	0.22716	0.022403	1
8.75	0.22229	0.22689	-0.0045993	1
8.7667	0.24956	0.22662	0.022938	1
8.7833	0.24956	0.22635	0.023206	1
8.8	0.22229	0.22609	-0.0037972	1
8.8167	0.22229	0.22582	-0.0035305	1
8.8333	0.22229	0.22555	-0.0032642	1
8.85	0.24956	0.22529	0.024272	1
8.8667	0.24956	0.22502	0.024538	1
8.8833	0.24956	0.22476	0.024803	1
8.9	0.22229	0.22449	-0.0022017	1
8.9167	0.24956	0.22423	0.025333	1
8.9333	0.22229	0.22396	-0.0016724	1
8.95	0.22229	0.2237	-0.0014081	1
8.9667	0.24956	0.22343	0.026126	1
8.9833	0.24956	0.22317	0.026389	1
9	0.24956	0.22291	0.026653	1
9.0167	0.22229	0.22264	-0.00035438	1
9.0333	0.24956	0.22238	0.027178	1
9.05	0.24956	0.22212	0.027441	1
9.0667	0.24956	0.22186	0.027703	1
9.0833	0.22229	0.2216	0.00069426	1
9.1	0.24956	0.22133	0.028226	1
9.1167	0.24956	0.22107	0.028487	1
9.1333	0.24956	0.22081	0.028748	1
9.15	0.22229	0.22055	0.0017381	1
9.1667	0.24956	0.22029	0.029268	1
9.1833	0.24956	0.22003	0.029528	1
9.2	0.24956	0.21977	0.029788	1
9.2167	0.24956	0.21951	0.030047	1
9.2333	0.24956	0.21925	0.030306	1
9.25	0.24956	0.219	0.030565	1
9.2667	0.24956	0.21874	0.030823	1
9.2833	0.22229	0.21848	0.0038109	1
9.3	0.24956	0.21822	0.031339	1
9.3167	0.24956	0.21796	0.031596	1
9.3333	0.24956	0.21771	0.031853	1
9.35	0.24956	0.21745	0.03211	1
9.3667	0.24956	0.21719	0.032367	1
9.3833	0.24956	0.21694	0.032623	1
9.4	0.22229	0.21668	0.0056088	1
9.4167	0.22229	0.21643	0.0058644	1
9.4333	0.24956	0.21617	0.03339	1
9.45	0.24956	0.21592	0.033645	1
9.4667	0.24956	0.21566	0.033899	1
9.4833	0.22229	0.21541	0.0068838	1
9.5	0.24956	0.21515	0.034408	1
9.5167	0.24956	0.2149	0.034662	1
9.5333	0.24956	0.21464	0.034915	1
9.55	0.22229	0.21439	0.0078985	1

9.5667	0.22229	0.21414	0.0081514	1
9.5833	0.24956	0.21389	0.035674	1
9.6	0.24956	0.21363	0.035926	1
9.6167	0.24956	0.21338	0.036178	1
9.6333	0.24956	0.21313	0.03643	1
9.65	0.24956	0.21288	0.036681	1
9.6667	0.22229	0.21263	0.0096627	1
9.6833	0.22229	0.21238	0.0099134	1
9.7	0.24956	0.21213	0.037434	1
9.7167	0.24956	0.21188	0.037684	1
9.7333	0.24956	0.21163	0.037934	1
9.75	0.22229	0.21138	0.010914	1
9.7667	0.24956	0.21113	0.038433	1
9.7833	0.24956	0.21088	0.038682	1
9.8	0.22229	0.21063	0.011661	1
9.8167	0.22229	0.21038	0.01191	1
9.8333	0.24956	0.21013	0.039428	1
9.85	0.24956	0.20988	0.039676	1
9.8667	0.24956	0.20964	0.039923	1
9.8833	0.22229	0.20939	0.0129	1
9.9	0.19965	0.20914	-0.0094925	1
9.9167	0.19965	0.2089	-0.0092458	1
9.9333	0.24956	0.20865	0.040911	1
9.95	0.22229	0.2084	0.013887	1
9.9667	0.24956	0.20816	0.041403	1
9.9833	0.19965	0.20791	-0.0082619	1
10	0.24956	0.20767	0.041893	1
10.017	0.22229	0.20742	0.014869	1
10.033	0.19965	0.20718	-0.0075274	1
10.05	0.24956	0.20693	0.042628	1
10.067	0.22229	0.20669	0.015602	1
10.083	0.22229	0.20645	0.015845	1
10.1	0.19965	0.2062	-0.006551	1
10.117	0.24956	0.20596	0.043603	1
10.133	0.24956	0.20572	0.043845	1
10.15	0.22229	0.20547	0.016818	1
10.167	0.17236	0.20523	-0.032869	1
10.183	0.24956	0.20499	0.044572	1
10.2	0.24956	0.20475	0.044814	1
10.217	0.17236	0.2045	-0.032144	1
10.233	0.19965	0.20426	-0.0046135	1
10.25	0.19965	0.20402	-0.004372	1
10.267	0.19965	0.20378	-0.0041309	1
10.283	0.17236	0.20354	-0.031181	1
10.3	0.19965	0.2033	-0.0036508	1
10.317	0.24956	0.20306	0.046499	1
10.333	0.24956	0.20282	0.046738	1
10.35	0.17236	0.20258	-0.030222	1
10.367	0.17236	0.20234	-0.029983	1
10.383	0.24956	0.2021	0.047455	1
10.4	0.19965	0.20187	-0.0022161	1
10.417	0.17236	0.20163	-0.029267	1
10.433	0.19965	0.20139	-0.0017406	1
10.45	0.19965	0.20115	-0.0015025	1
10.467	0.19965	0.20091	-0.0012648	1
10.483	0.17236	0.20068	-0.028319	1
10.5	0.17236	0.20044	-0.028081	1
10.517	0.19965	0.2002	-0.00055455	1

10.533	0.19965	0.19997	-0.00031931	1
10.55	0.17236	0.19973	-0.027373	1
10.567	0.19965	0.1995	0.00015315	1
10.583	0.24956	0.19926	0.050298	1
10.6	0.19965	0.19903	0.00062309	1
10.617	0.17236	0.19879	-0.026432	1
10.633	0.19965	0.19856	0.0010919	1
10.65	0.19965	0.19832	0.0013266	1
10.667	0.17236	0.19809	-0.025729	1
10.683	0.17236	0.19786	-0.025496	1
10.7	0.17236	0.19762	-0.025262	1
10.717	0.19965	0.19739	0.0022613	1
10.733	0.17236	0.19716	-0.024797	1
10.75	0.17236	0.19692	-0.024564	1
10.767	0.19965	0.19669	0.002959	1
10.783	0.19965	0.19646	0.0031901	1
10.8	0.19965	0.19623	0.0034223	1
10.817	0.17236	0.196	-0.023636	1
10.833	0.19965	0.19577	0.0038846	1
10.85	0.19965	0.19553	0.004116	1
10.867	0.19965	0.1953	0.0043471	1
10.883	0.17236	0.19507	-0.022713	1
10.9	0.19965	0.19484	0.0048072	1
10.917	0.19965	0.19461	0.0050375	1
10.933	0.17236	0.19438	-0.022024	1
10.95	0.17236	0.19415	-0.021794	1
10.967	0.19965	0.19392	0.0057254	1
10.983	0.19965	0.1937	0.0059533	1
11	0.17236	0.19347	-0.021108	1
11.017	0.17236	0.19324	-0.020879	1
11.033	0.17236	0.19301	-0.020652	1
11.05	0.19965	0.19278	0.0068661	1
11.067	0.19965	0.19256	0.007094	1
11.083	0.17236	0.19233	-0.01997	1
11.1	0.19965	0.1921	0.0075476	1
11.117	0.19965	0.19188	0.0077747	1
11.133	0.19965	0.19165	0.0080001	1
11.15	0.17236	0.19142	-0.019063	1
11.167	0.19965	0.1912	0.0084529	1
11.183	0.19965	0.19097	0.0086776	1
11.2	0.17236	0.19075	-0.018387	1
11.217	0.17236	0.19052	-0.018161	1
11.233	0.19965	0.1903	0.0093526	1
11.25	0.19965	0.19007	0.0095776	1
11.267	0.19965	0.18985	0.0098022	1
11.283	0.17236	0.18962	-0.017265	1
11.3	0.19965	0.1894	0.010249	1
11.317	0.19965	0.18918	0.010473	1
11.333	0.19965	0.18895	0.010696	1
11.35	0.17236	0.18873	-0.016371	1
11.367	0.17236	0.18851	-0.016148	1
11.383	0.19965	0.18829	0.011364	1
11.4	0.19965	0.18806	0.011586	1
11.417	0.17236	0.18784	-0.015482	1
11.433	0.19965	0.18762	0.012029	1
11.45	0.19965	0.1874	0.012251	1
11.467	0.19965	0.18718	0.012472	1
11.483	0.17236	0.18696	-0.014598	1

11.5	0.19965	0.18674	0.012913	1
11.517	0.19965	0.18652	0.013134	1
11.533	0.19965	0.1863	0.013353	1
11.55	0.17236	0.18608	-0.013717	1
11.567	0.17236	0.18586	-0.013497	1
11.583	0.19965	0.18564	0.014012	1
11.6	0.19965	0.18542	0.014231	1
11.617	0.17236	0.1852	-0.01284	1
11.633	0.19965	0.18498	0.014668	1
11.65	0.19965	0.18476	0.014887	1
11.667	0.17236	0.18455	-0.012185	1
11.683	0.17236	0.18433	-0.011968	1
11.7	0.19965	0.18411	0.01554	1
11.717	0.19965	0.18389	0.015757	1
11.733	0.17236	0.18368	-0.011317	1
11.75	0.17236	0.18346	-0.011099	1
11.767	0.17236	0.18324	-0.010883	1
11.783	0.19965	0.18303	0.016623	1
11.8	0.19965	0.18281	0.016839	1
11.817	0.17236	0.18259	-0.010235	1
11.833	0.17236	0.18238	-0.01002	1
11.85	0.19965	0.18216	0.017485	1
11.867	0.17236	0.18195	-0.0095894	1
11.883	0.17236	0.18174	-0.0093757	1
11.9	0.19965	0.18152	0.018129	1
11.917	0.19965	0.18131	0.018344	1
11.933	0.17236	0.18109	-0.0087333	1
11.95	0.17236	0.18088	-0.0085192	1
11.967	0.17236	0.18067	-0.0083054	1
11.983	0.19965	0.18045	0.019197	1
12	0.17236	0.18024	-0.0078798	1
12.017	0.17236	0.18003	-0.0076668	1
12.033	0.17236	0.17982	-0.0074552	1
12.05	0.19965	0.1796	0.020047	1
12.067	0.17236	0.17939	-0.0070304	1
12.083	0.17236	0.17918	-0.0068196	1
12.1	0.17236	0.17897	-0.0066078	1
12.117	0.19965	0.17876	0.020894	1
12.133	0.17236	0.17855	-0.0061862	1
12.15	0.17236	0.17834	-0.0059752	1
12.167	0.19965	0.17812	0.021526	1
12.183	0.19965	0.17792	0.021735	1
12.2	0.17236	0.1777	-0.0053448	1
12.217	0.17236	0.17749	-0.0051347	1
12.233	0.19965	0.17729	0.022364	1
12.25	0.19965	0.17708	0.022573	1
12.267	0.17236	0.17687	-0.0045073	1
12.283	0.17236	0.17666	-0.0042995	1
12.3	0.17236	0.17645	-0.0040907	1
12.317	0.19965	0.17624	0.023408	1
12.333	0.19965	0.17604	0.023615	1
12.35	0.17236	0.17583	-0.003467	1
12.367	0.19965	0.17562	0.024031	1
12.383	0.19965	0.17541	0.024237	1
12.4	0.17236	0.17521	-0.0028454	1
12.417	0.17236	0.175	-0.0026383	1
12.433	0.19965	0.17479	0.024857	1
12.45	0.19965	0.17459	0.025064	1

12.467	0.19965	0.17438	0.02527	1
12.483	0.17236	0.17417	-0.0018148	1
12.5	0.17236	0.17397	-0.001609	1
12.517	0.19965	0.17376	0.025887	1
12.533	0.19965	0.17356	0.026091	1
12.55	0.17236	0.17335	-0.000994	1
12.567	0.19965	0.17315	0.026501	1
12.583	0.19965	0.17295	0.026704	1
12.6	0.19965	0.17274	0.026909	1
12.617	0.17236	0.17254	-0.00017703	1
12.633	0.17236	0.17233	2.5699E-005	1
12.65	0.19965	0.17213	0.027519	1
12.667	0.17236	0.17193	0.00043287	1
12.683	0.17236	0.17173	0.00063488	1
12.7	0.19965	0.17152	0.028128	1
12.717	0.19965	0.17132	0.028331	1
12.733	0.17236	0.17112	0.0012419	1
12.75	0.17236	0.17092	0.0014442	1
12.767	0.19965	0.17071	0.028936	1
12.783	0.19965	0.17051	0.029137	1
12.8	0.17236	0.17031	0.0020483	1
12.817	0.17236	0.17011	0.0022497	1
12.833	0.17236	0.16991	0.0024495	1
12.85	0.19965	0.16971	0.02994	1
12.867	0.17236	0.16951	0.002851	1
12.883	0.17236	0.16931	0.0030501	1
12.9	0.17236	0.16911	0.0032503	1
12.917	0.19965	0.16891	0.03074	1
12.933	0.19965	0.16871	0.030939	1
12.95	0.17236	0.16851	0.0038481	1
12.967	0.17236	0.16831	0.0040472	1
12.983	0.19965	0.16811	0.031535	1
13	0.17236	0.16792	0.0044437	1
13.017	0.17236	0.16772	0.0046422	1
13.033	0.19965	0.16752	0.032129	1
13.05	0.19965	0.16732	0.032327	1
13.067	0.17236	0.16712	0.0052351	1
13.083	0.17236	0.16693	0.0054314	1
13.1	0.19965	0.16673	0.032919	1
13.117	0.19965	0.16653	0.033116	1
13.133	0.17236	0.16634	0.0060215	1
13.15	0.17236	0.16614	0.0062181	1
13.167	0.19965	0.16595	0.033705	1
13.183	0.19965	0.16575	0.033899	1
13.2	0.19965	0.16555	0.034095	1
13.217	0.17236	0.16536	0.0070011	1
13.233	0.19965	0.16516	0.034485	1
13.25	0.19965	0.16497	0.034681	1
13.267	0.17236	0.16477	0.0075856	1
13.283	0.17236	0.16458	0.0077792	1
13.3	0.19965	0.16439	0.035264	1
13.317	0.19965	0.16419	0.035458	1
13.333	0.19965	0.164	0.035651	1
13.35	0.17236	0.16381	0.0085549	1
13.367	0.19965	0.16361	0.036038	1
13.383	0.19965	0.16342	0.036231	1
13.4	0.17236	0.16323	0.0091339	1
13.417	0.17236	0.16303	0.0093268	1

13.433	0.17236	0.16284	0.0095184	1
13.45	0.19965	0.16265	0.037001	1
13.467	0.19965	0.16246	0.037193	1
13.483	0.17236	0.16227	0.010094	1
13.5	0.17236	0.16207	0.010286	1
13.517	0.19965	0.16188	0.037767	1
13.533	0.19965	0.16169	0.037958	1
13.55	0.17236	0.1615	0.010859	1
13.567	0.19965	0.16131	0.03834	1
13.583	0.19965	0.16112	0.038529	1
13.6	0.19965	0.16093	0.03872	1
13.617	0.17236	0.16074	0.01162	1
13.633	0.19965	0.16055	0.039099	1
13.65	0.19965	0.16036	0.039288	1
13.667	0.19965	0.16017	0.039478	1
13.683	0.17236	0.15998	0.012376	1
13.7	0.19965	0.15979	0.039855	1
13.717	0.19965	0.15961	0.040044	1
13.733	0.17236	0.15942	0.012942	1
13.75	0.17236	0.15923	0.01313	1
13.767	0.19965	0.15904	0.040608	1
13.783	0.19965	0.15885	0.040795	1
13.8	0.17236	0.15867	0.013693	1
13.817	0.17236	0.15848	0.013881	1
13.833	0.14973	0.15829	-0.0085632	1
13.85	0.19965	0.15811	0.041544	1
13.867	0.19965	0.15792	0.041731	1
13.883	0.17236	0.15773	0.014626	1
13.9	0.14973	0.15755	-0.0078172	1
13.917	0.19965	0.15736	0.042289	1
13.933	0.19965	0.15718	0.042474	1
13.95	0.17236	0.15699	0.01537	1
13.967	0.17236	0.1568	0.015555	1
13.983	0.19965	0.15662	0.04303	1
14	0.19965	0.15644	0.043215	1
14.017	0.17236	0.15625	0.01611	1
14.033	0.17236	0.15607	0.016293	1
14.05	0.19965	0.15588	0.043768	1
14.067	0.19965	0.1557	0.043952	1
14.083	0.12245	0.15552	-0.033065	1
14.1	0.14973	0.15533	-0.0056013	1
14.117	0.19965	0.15515	0.044502	1
14.133	0.19965	0.15497	0.044685	1
14.15	0.17236	0.15478	0.017578	1
14.167	0.14973	0.1546	-0.0048693	1
14.183	0.19965	0.15442	0.045232	1
14.2	0.19965	0.15424	0.045415	1
14.217	0.12245	0.15405	-0.031603	1
14.233	0.12245	0.15387	-0.031422	1
14.25	0.14973	0.15369	-0.0039599	1
14.267	0.14973	0.15351	-0.0037783	1
14.283	0.12245	0.15333	-0.030878	1
14.3	0.12245	0.15315	-0.030697	1
14.317	0.19965	0.15297	0.046684	1
14.333	0.14973	0.15279	-0.0030559	1
14.35	0.12245	0.15261	-0.030155	1
14.367	0.14973	0.15242	-0.0026949	1
14.383	0.14973	0.15225	-0.0025158	1

14.4	0.17236	0.15207	0.020294	1
14.417	0.12245	0.15189	-0.029436	1
14.433	0.14973	0.15171	-0.0019776	1
14.45	0.14973	0.15153	-0.0017983	1
14.467	0.17236	0.15135	0.021011	1
14.483	0.12245	0.15117	-0.028721	1
14.5	0.12245	0.15099	-0.028543	1
14.517	0.14973	0.15081	-0.0010842	1
14.533	0.14973	0.15064	-0.00090701	1
14.55	0.12245	0.15046	-0.028009	1
14.567	0.14973	0.15028	-0.0005511	1
14.583	0.14973	0.1501	-0.00037453	1
14.6	0.17236	0.14993	0.022433	1
14.617	0.12245	0.14975	-0.0273	1
14.633	0.12245	0.14957	-0.027124	1
14.65	0.14973	0.1494	0.00033288	1
14.667	0.14973	0.14922	0.00050947	1
14.683	0.12245	0.14905	-0.026595	1
14.7	0.14973	0.14887	0.00086098	1
14.717	0.14973	0.14869	0.0010369	1
14.733	0.14973	0.14852	0.0012117	1
14.75	0.12245	0.14834	-0.025893	1
14.767	0.14973	0.14817	0.0015626	1
14.783	0.14973	0.14799	0.0017366	1
14.8	0.14973	0.14782	0.0019116	1
14.817	0.12245	0.14764	-0.025194	1
14.833	0.14973	0.14747	0.0022598	1
14.85	0.14973	0.1473	0.0024341	1
14.867	0.14973	0.14712	0.0026082	1
14.883	0.12245	0.14695	-0.024499	1
14.9	0.14973	0.14678	0.0029548	1
14.917	0.14973	0.1466	0.0031283	1
14.933	0.14973	0.14643	0.0033005	1
14.95	0.12245	0.14626	-0.023806	1
14.967	0.14973	0.14608	0.0036465	1
14.983	0.14973	0.14591	0.0038181	1
15	0.14973	0.14574	0.0039906	1
15.017	0.12245	0.14557	-0.023117	1
15.033	0.12245	0.1454	-0.022946	1
15.05	0.14973	0.14522	0.0045058	1
15.067	0.14973	0.14505	0.0046774	1
15.083	0.12245	0.14488	-0.022432	1
15.1	0.14973	0.14471	0.0050191	1
15.117	0.14973	0.14454	0.0051902	1
15.133	0.14973	0.14437	0.00536	1
15.15	0.12245	0.1442	-0.021749	1
15.167	0.12245	0.14403	-0.021579	1
15.183	0.14973	0.14386	0.0058703	1
15.2	0.14973	0.14369	0.0060404	1
15.217	0.12245	0.14352	-0.02107	1
15.233	0.14973	0.14335	0.0063789	1
15.25	0.14973	0.14318	0.0065483	1
15.267	0.14973	0.14301	0.0067176	1
15.283	0.12245	0.14284	-0.020394	1
15.3	0.14973	0.14268	0.0070544	1
15.317	0.14973	0.14251	0.0072231	1
15.333	0.14973	0.14234	0.0073905	1
15.35	0.12245	0.14217	-0.019721	1

15.367	0.14973	0.142	0.0077268	1
15.383	0.14973	0.14184	0.0078937	1
15.4	0.14973	0.14167	0.0080613	1
15.417	0.12245	0.1415	-0.019051	1
15.433	0.14973	0.14133	0.0083951	1
15.45	0.14973	0.14117	0.0085621	1
15.467	0.14973	0.141	0.008729	1
15.483	0.12245	0.14084	-0.018385	1
15.5	0.12245	0.14067	-0.018219	1
15.517	0.14973	0.1405	0.0092274	1
15.533	0.14973	0.14034	0.0093925	1
15.55	0.12245	0.14017	-0.017722	1
15.567	0.12245	0.14001	-0.017556	1
15.583	0.14973	0.13984	0.0098886	1
15.6	0.14973	0.13968	0.010054	1
15.617	0.12245	0.13951	-0.017061	1
15.633	0.14973	0.13935	0.010383	1
15.65	0.14973	0.13918	0.010548	1
15.667	0.14973	0.13902	0.010712	1
15.683	0.12245	0.13885	-0.016405	1
15.7	0.14973	0.13869	0.01104	1
15.717	0.14973	0.13853	0.011204	1
15.733	0.14973	0.13836	0.011366	1
15.75	0.12245	0.1382	-0.01575	1
15.767	0.14973	0.13804	0.011693	1
15.783	0.14973	0.13787	0.011855	1
15.8	0.14973	0.13771	0.012018	1
15.817	0.12245	0.13755	-0.015099	1
15.833	0.12245	0.13739	-0.014937	1
15.85	0.14973	0.13722	0.012505	1
15.867	0.14973	0.13706	0.012667	1
15.883	0.12245	0.1369	-0.014452	1
15.9	0.14973	0.13674	0.01299	1
15.917	0.14973	0.13658	0.013152	1
15.933	0.14973	0.13642	0.013312	1
15.95	0.12245	0.13626	-0.013806	1
15.967	0.14973	0.1361	0.013635	1
15.983	0.14973	0.13594	0.013795	1
16	0.12245	0.13577	-0.013325	1
16.017	0.12245	0.13561	-0.013164	1
16.033	0.14973	0.13545	0.014275	1
16.05	0.14973	0.13529	0.014435	1
16.067	0.12245	0.13513	-0.012685	1
16.083	0.12245	0.13498	-0.012526	1
16.1	0.14973	0.13482	0.014913	1
16.117	0.14973	0.13466	0.015073	1
16.133	0.14973	0.1345	0.015231	1
16.15	0.12245	0.13434	-0.01189	1
16.167	0.14973	0.13418	0.015549	1
16.183	0.14973	0.13402	0.015706	1
16.2	0.14973	0.13387	0.015865	1
16.217	0.12245	0.13371	-0.011257	1
16.233	0.14973	0.13355	0.01618	1
16.25	0.14973	0.13339	0.016338	1
16.267	0.12245	0.13323	-0.010784	1
16.283	0.12245	0.13308	-0.010628	1
16.3	0.14973	0.13292	0.01681	1
16.317	0.14973	0.13276	0.016967	1

16.333	0.12245	0.13261	-0.010157	1
16.35	0.12245	0.13245	-0.010001	1
16.367	0.14973	0.13229	0.017436	1
16.383	0.14973	0.13214	0.017591	1
16.4	0.12245	0.13198	-0.0095324	1
16.417	0.12245	0.13183	-0.0093763	1
16.433	0.14973	0.13167	0.018059	1
16.45	0.14973	0.13152	0.018214	1
16.467	0.14973	0.13136	0.01837	1
16.483	0.12245	0.13121	-0.008756	1
16.5	0.14973	0.13105	0.018679	1
16.517	0.14973	0.1309	0.018834	1
16.533	0.14973	0.13074	0.018988	1
16.55	0.12245	0.13059	-0.0081377	1
16.567	0.14973	0.13043	0.019297	1
16.583	0.14973	0.13028	0.01945	1
16.6	0.14973	0.13013	0.019604	1
16.617	0.14973	0.12997	0.019758	1
16.633	0.14973	0.12982	0.01991	1
16.65	0.14973	0.12967	0.020064	1
16.667	0.14973	0.12951	0.020217	1
16.683	0.12245	0.12936	-0.0069106	1
16.7	0.14973	0.12921	0.020522	1
16.717	0.14973	0.12906	0.020675	1
16.733	0.14973	0.1289	0.020827	1
16.75	0.12245	0.12875	-0.006301	1
16.767	0.14973	0.1286	0.021131	1
16.783	0.14973	0.12845	0.021282	1
16.8	0.14973	0.1283	0.021434	1
16.817	0.12245	0.12814	-0.0056942	1
16.833	0.14973	0.12799	0.021736	1
16.85	0.14973	0.12784	0.021888	1
16.867	0.14973	0.12769	0.022039	1
16.883	0.12245	0.12754	-0.0050912	1
16.9	0.14973	0.12739	0.02234	1
16.917	0.14973	0.12724	0.02249	1
16.933	0.14973	0.12709	0.02264	1
16.95	0.12245	0.12694	-0.0044902	1
16.967	0.14973	0.12679	0.02294	1
16.983	0.14973	0.12664	0.023089	1
17	0.14973	0.12649	0.023239	1
17.017	0.12245	0.12634	-0.0038919	1
17.033	0.12245	0.12619	-0.0037435	1
17.05	0.14973	0.12604	0.023686	1
17.067	0.12245	0.1259	-0.0034453	1
17.083	0.12245	0.12575	-0.0032974	1
17.1	0.14973	0.1256	0.024131	1
17.117	0.14973	0.12545	0.02428	1
17.133	0.12245	0.1253	-0.0028529	1
17.15	0.12245	0.12515	-0.0027048	1
17.167	0.12245	0.12501	-0.0025568	1
17.183	0.14973	0.12486	0.02487	1
17.2	0.14973	0.12471	0.025018	1
17.217	0.12245	0.12456	-0.002115	1
17.233	0.12245	0.12442	-0.0019686	1
17.25	0.14973	0.12427	0.025458	1
17.267	0.12245	0.12412	-0.0016746	1
17.283	0.12245	0.12398	-0.0015288	1

17.3	0.14973	0.12383	0.025898	1
17.317	0.14973	0.12369	0.026044	1
17.333	0.14973	0.12354	0.026189	1
17.35	0.12245	0.12339	-0.00094452	1
17.367	0.12245	0.12325	-0.00079866	1
17.383	0.14973	0.1231	0.026626	1
17.4	0.12245	0.12296	-0.00050833	1
17.417	0.12245	0.12281	-0.00036299	1
17.433	0.14973	0.12267	0.027061	1
17.45	0.14973	0.12252	0.027206	1
17.467	0.14973	0.12238	0.027351	1
17.483	0.12245	0.12224	0.00021493	1
17.5	0.14973	0.12209	0.027639	1
17.517	0.14973	0.12195	0.027784	1
17.533	0.12245	0.1218	0.00064701	1
17.55	0.12245	0.12166	0.00079099	1
17.567	0.14973	0.12152	0.028215	1
17.583	0.14973	0.12137	0.028358	1
17.6	0.12245	0.12123	0.001221	1
17.617	0.12245	0.12109	0.0013643	1
17.633	0.14973	0.12094	0.028787	1
17.65	0.14973	0.1208	0.02893	1
17.667	0.12245	0.12066	0.0017924	1
17.683	0.12245	0.12052	0.0019341	1
17.7	0.07253	0.12037	-0.047843	1
17.717	0.12245	0.12023	0.0022189	1
17.733	0.12245	0.12009	0.0023601	1
17.75	0.12245	0.11995	0.0025021	1
17.767	0.12245	0.11981	0.0026439	1
17.783	0.14973	0.11967	0.030065	1
17.8	0.12245	0.11952	0.0029261	1
17.817	0.12245	0.11938	0.0030674	1
17.833	0.14973	0.11924	0.030488	1
17.85	0.14973	0.1191	0.030629	1
17.867	0.14973	0.11896	0.030769	1
17.883	0.14973	0.11882	0.030909	1
17.9	0.09982	0.11868	-0.01886	1
17.917	0.14973	0.11854	0.03119	1
17.933	0.14973	0.1184	0.031329	1
17.95	0.12245	0.11826	0.0041891	1
17.967	0.09982	0.11812	-0.018301	1
17.983	0.09982	0.11798	-0.018162	1
18	0.14973	0.11784	0.031887	1
18.017	0.12245	0.1177	0.0047465	1
18.033	0.14973	0.11757	0.032165	1
18.05	0.14973	0.11743	0.032304	1
18.067	0.14973	0.11729	0.032443	1
18.083	0.07253	0.11715	-0.04462	1
18.1	0.09982	0.11701	-0.017191	1
18.117	0.14973	0.11687	0.032857	1
18.133	0.14973	0.11674	0.032994	1
18.15	0.07253	0.1166	-0.044068	1
18.167	0.09982	0.11646	-0.01664	1
18.183	0.14973	0.11632	0.033407	1
18.2	0.09982	0.11619	-0.016365	1
18.217	0.12245	0.11605	0.0064019	1
18.233	0.09982	0.11591	-0.016092	1
18.25	0.14973	0.11577	0.033955	1

18.267	0.14973	0.11564	0.034092	1
18.283	0.12245	0.1155	0.006948	1
18.3	0.07253	0.11537	-0.042835	1
18.317	0.14973	0.11523	0.034501	1
18.333	0.12245	0.11509	0.0073563	1
18.35	0.12245	0.11496	0.0074923	1
18.367	0.12245	0.11482	0.0076282	1
18.383	0.14973	0.11469	0.035043	1
18.4	0.12245	0.11455	0.0078987	1
18.417	0.12245	0.11442	0.0080341	1
18.433	0.09982	0.11428	-0.014461	1
18.45	0.09982	0.11415	-0.014326	1
18.467	0.14973	0.11401	0.035719	1
18.483	0.07253	0.11388	-0.041347	1
18.5	0.09982	0.11374	-0.013923	1
18.517	0.09982	0.11361	-0.013788	1
18.533	0.07253	0.11347	-0.040945	1
18.55	0.07253	0.11334	-0.040811	1
18.567	0.09982	0.11321	-0.013387	1
18.583	0.09982	0.11307	-0.013254	1
18.6	0.12245	0.11294	0.0095098	1
18.617	0.09982	0.11281	-0.012987	1
18.633	0.07253	0.11267	-0.040144	1
18.65	0.09982	0.11254	-0.012721	1
18.667	0.09982	0.11241	-0.012588	1
18.683	0.07253	0.11228	-0.039746	1
18.7	0.07253	0.11214	-0.039613	1
18.717	0.09982	0.11201	-0.012191	1
18.733	0.09982	0.11188	-0.012059	1
18.75	0.07253	0.11175	-0.039217	1
18.767	0.09982	0.11161	-0.011795	1
18.783	0.09982	0.11148	-0.011663	1
18.8	0.09982	0.11135	-0.011532	1
18.817	0.12245	0.11122	0.01123	1
18.833	0.07253	0.11109	-0.038559	1
18.85	0.09982	0.11096	-0.011138	1
18.867	0.07253	0.11083	-0.038297	1
18.883	0.07253	0.1107	-0.038167	1
18.9	0.07253	0.11057	-0.038036	1
18.917	0.09982	0.11044	-0.010615	1
18.933	0.09982	0.11031	-0.010485	1
18.95	0.09982	0.11018	-0.010355	1
18.967	0.07253	0.11004	-0.037515	1
18.983	0.09982	0.10992	-0.010096	1
19	0.09982	0.10979	-0.0099656	1
19.017	0.07253	0.10966	-0.037126	1
19.033	0.09982	0.10953	-0.009707	1
19.05	0.09982	0.1094	-0.0095775	1
19.067	0.09982	0.10927	-0.0094482	1
19.083	0.07253	0.10914	-0.03661	1
19.1	0.09982	0.10901	-0.0091908	1
19.117	0.09982	0.10888	-0.0090619	1
19.133	0.09982	0.10875	-0.008934	1
19.15	0.07253	0.10863	-0.036095	1
19.167	0.07253	0.1085	-0.035967	1
19.183	0.09982	0.10837	-0.0085496	1
19.2	0.07253	0.10824	-0.035711	1
19.217	0.07253	0.10811	-0.035584	1

19.233	0.07253	0.10799	-0.035457	1
19.25	0.09982	0.10786	-0.0080389	1
19.267	0.09982	0.10773	-0.0079114	1
19.283	0.09982	0.1076	-0.0077848	1
19.3	0.07253	0.10748	-0.034948	1
19.317	0.07253	0.10735	-0.034821	1
19.333	0.07253	0.10722	-0.034694	1
19.35	0.07253	0.1071	-0.034568	1
19.367	0.09982	0.10697	-0.0071511	1
19.383	0.09982	0.10685	-0.0070254	1
19.4	0.07253	0.10672	-0.034189	1
19.417	0.09982	0.10659	-0.0067729	1
19.433	0.09982	0.10647	-0.0066477	1
19.45	0.09982	0.10634	-0.0065219	1
19.467	0.09982	0.10622	-0.0063962	1
19.483	0.07253	0.10609	-0.033561	1
19.5	0.09982	0.10597	-0.006146	1
19.517	0.09982	0.10584	-0.0060207	1
19.533	0.09982	0.10572	-0.0058963	1
19.55	0.09982	0.10559	-0.0057714	1
19.567	0.07253	0.10547	-0.032937	1
19.583	0.07253	0.10534	-0.032813	1
19.6	0.09982	0.10522	-0.0053981	1
19.617	0.09982	0.10509	-0.0052737	1
19.633	0.09982	0.10497	-0.0051503	1
19.65	0.09982	0.10485	-0.0050262	1
19.667	0.09982	0.10472	-0.0049023	1
19.683	0.07253	0.1046	-0.032069	1
19.7	0.07253	0.10448	-0.031946	1
19.717	0.09982	0.10435	-0.0045321	1
19.733	0.09982	0.10423	-0.0044095	1
19.75	0.09982	0.10411	-0.0042863	1
19.767	0.09982	0.10398	-0.0041632	1
19.783	0.07253	0.10386	-0.031331	1
19.8	0.09982	0.10374	-0.0039183	1
19.817	0.07253	0.10362	-0.031086	1
19.833	0.09982	0.10349	-0.0036739	1
19.85	0.09982	0.10337	-0.0035516	1
19.867	0.09982	0.10325	-0.0034294	1
19.883	0.07253	0.10313	-0.030598	1
19.9	0.07253	0.10301	-0.030476	1
19.917	0.09982	0.10288	-0.0030644	1
19.933	0.07253	0.10276	-0.030234	1
19.95	0.09982	0.10264	-0.002822	1
19.967	0.07253	0.10252	-0.029991	1
19.983	0.07253	0.1024	-0.02987	1
20	0.07253	0.10228	-0.029749	1
20.017	0.07253	0.10216	-0.029628	1
20.033	0.09982	0.10204	-0.0022183	1
20.05	0.09982	0.10192	-0.0020977	1
20.067	0.07253	0.1018	-0.029267	1
20.083	0.07253	0.10168	-0.029148	1
20.1	0.09982	0.10156	-0.0017374	1
20.117	0.07253	0.10144	-0.028907	1
20.133	0.09982	0.10132	-0.0014982	1
20.15	0.09982	0.1012	-0.0013784	1
20.167	0.07253	0.10108	-0.028549	1
20.183	0.07253	0.10096	-0.02843	1

20.2	0.07253	0.10084	-0.028311	1
20.217	0.07253	0.10072	-0.028191	1
20.233	0.09982	0.1006	-0.00078314	1
20.25	0.09982	0.10048	-0.00066423	1
20.267	0.09982	0.10037	-0.00054545	1
20.283	0.09982	0.10025	-0.00042753	1
20.3	0.09982	0.10013	-0.00030903	1
20.317	0.07253	0.10001	-0.027481	1
20.333	0.07253	0.099893	-0.027363	1
20.35	0.07253	0.099775	-0.027245	1
20.367	0.07253	0.099657	-0.027127	1
20.383	0.09982	0.09954	0.00027995	1
20.4	0.09982	0.099422	0.00039761	1
20.417	0.09982	0.099305	0.00051513	1
20.433	0.07253	0.099188	-0.026658	1
20.45	0.09982	0.099071	0.00074905	1
20.467	0.07253	0.098954	-0.026424	1
20.483	0.09982	0.098838	0.00098243	1
20.5	0.09982	0.098721	0.0010993	1
20.517	0.09982	0.098604	0.0012159	1
20.533	0.09982	0.098488	0.0013318	1
20.55	0.09982	0.098372	0.0014482	1
20.567	0.09982	0.098255	0.0015645	1
20.583	0.07253	0.09814	-0.02561	1
20.6	0.07253	0.098024	-0.025494	1
20.617	0.09982	0.097908	0.0019118	1
20.633	0.07253	0.097793	-0.025263	1
20.65	0.09982	0.097678	0.0021425	1
20.667	0.09982	0.097562	0.0022579	1
20.683	0.09982	0.097447	0.0023725	1
20.7	0.09982	0.097332	0.0024877	1
20.717	0.09982	0.097217	0.0026028	1
20.733	0.09982	0.097103	0.002717	1
20.75	0.09982	0.096988	0.0028318	1
20.767	0.09982	0.096874	0.0029464	1
20.783	0.09982	0.09676	0.0030603	1
20.8	0.09982	0.096645	0.0031746	1
20.817	0.09982	0.096531	0.0032889	1
20.833	0.07253	0.096418	-0.023888	1
20.85	0.07253	0.096304	-0.023774	1
20.867	0.07253	0.09619	-0.02366	1
20.883	0.09982	0.096077	0.0037431	1
20.9	0.09982	0.095963	0.0038567	1
20.917	0.09982	0.09585	0.0039701	1
20.933	0.09982	0.095737	0.0040827	1
20.95	0.09982	0.095624	0.0041959	1
20.967	0.07253	0.095511	-0.022981	1
20.983	0.07253	0.095399	-0.022869	1
21	0.07253	0.095286	-0.022756	1
21.017	0.09982	0.095173	0.0046466	1
21.033	0.09982	0.095062	0.0047584	1
21.05	0.09982	0.094949	0.0048707	1
21.067	0.09982	0.094837	0.004983	1
21.083	0.09982	0.094726	0.0050944	1
21.1	0.09982	0.094614	0.0052064	1
21.117	0.07253	0.094502	-0.021972	1
21.133	0.07253	0.094391	-0.021861	1
21.15	0.09982	0.094279	0.0055408	1

21.167	0.09982	0.094168	0.0056523	1
21.183	0.09982	0.094057	0.0057629	1
21.2	0.09982	0.093946	0.0058741	1
21.217	0.09982	0.093835	0.0059851	1
21.233	0.07253	0.093725	-0.021195	1
21.25	0.09982	0.093614	0.0062062	1
21.267	0.09982	0.093503	0.0063168	1
21.283	0.07253	0.093393	-0.020863	1
21.3	0.07253	0.093283	-0.020753	1
21.317	0.07253	0.093173	-0.020643	1
21.333	0.09982	0.093063	0.0067568	1
21.35	0.09982	0.092953	0.0068668	1
21.367	0.09982	0.092843	0.0069767	1
21.383	0.09982	0.092734	0.0070858	1
21.4	0.09982	0.092625	0.0071954	1
21.417	0.09982	0.092515	0.0073049	1
21.433	0.09982	0.092406	0.0074136	1
21.45	0.07253	0.092297	-0.019767	1
21.467	0.07253	0.092188	-0.019658	1
21.483	0.09982	0.09208	0.0077402	1
21.5	0.09982	0.091971	0.0078491	1
21.517	0.09982	0.091862	0.0079578	1
21.533	0.09982	0.091754	0.0080657	1
21.55	0.09982	0.091646	0.0081742	1
21.567	0.09982	0.091537	0.0082825	1
21.583	0.09982	0.09143	0.0083901	1
21.6	0.07253	0.091322	-0.018792	1
21.617	0.07253	0.091214	-0.018684	1
21.633	0.07253	0.091107	-0.018577	1
21.65	0.07253	0.090999	-0.018469	1
21.667	0.07253	0.090891	-0.018361	1
21.683	0.07253	0.090785	-0.018255	1
21.7	0.09982	0.090677	0.0091426	1
21.717	0.09982	0.09057	0.0092498	1
21.733	0.09982	0.090464	0.0093562	1
21.75	0.07253	0.090357	-0.017827	1
21.767	0.09982	0.09025	0.00957	1
21.783	0.07253	0.090144	-0.017614	1
21.8	0.07253	0.090037	-0.017507	1
21.817	0.07253	0.089931	-0.017401	1
21.833	0.09982	0.089825	0.0099947	1
21.85	0.09982	0.089719	0.010101	1
21.867	0.09982	0.089613	0.010207	1
21.883	0.09982	0.089508	0.010312	1
21.9	0.09982	0.089402	0.010418	1
21.917	0.09982	0.089296	0.010524	1
21.933	0.07253	0.089191	-0.016661	1
21.95	0.07253	0.089086	-0.016556	1
21.967	0.07253	0.088981	-0.016451	1
21.983	0.09982	0.088876	0.010944	1
22	0.07253	0.088771	-0.016241	1
22.017	0.07253	0.088666	-0.016136	1
22.033	0.07253	0.088562	-0.016032	1
22.05	0.09982	0.088457	0.011363	1
22.067	0.09982	0.088353	0.011467	1
22.083	0.09982	0.088249	0.011571	1
22.1	0.09982	0.088145	0.011675	1
22.117	0.09982	0.08804	0.01178	1

22.133	0.07253	0.087937	-0.015407	1
22.15	0.09982	0.087833	0.011987	1
22.167	0.07253	0.087729	-0.015199	1
22.183	0.07253	0.087626	-0.015096	1
22.2	0.07253	0.087523	-0.014993	1
22.217	0.07253	0.087419	-0.014889	1
22.233	0.07253	0.087316	-0.014786	1
22.25	0.07253	0.087213	-0.014683	1
22.267	0.07253	0.08711	-0.01458	1
22.283	0.09982	0.087008	0.012812	1
22.3	0.09982	0.086905	0.012915	1
22.317	0.09982	0.086802	0.013018	1
22.333	0.09982	0.0867	0.01312	1
22.35	0.09982	0.086598	0.013222	1
22.367	0.09982	0.086495	0.013325	1
22.383	0.09982	0.086394	0.013426	1
22.4	0.07253	0.086292	-0.013762	1
22.417	0.09982	0.08619	0.01363	1
22.433	0.09982	0.086088	0.013732	1
22.45	0.07253	0.085987	-0.013457	1
22.467	0.07253	0.085885	-0.013355	1
22.483	0.07253	0.085784	-0.013254	1
22.5	0.09982	0.085683	0.014137	1
22.517	0.09982	0.085581	0.014239	1
22.533	0.07253	0.085481	-0.012951	1
22.55	0.09982	0.08538	0.01444	1
22.567	0.09982	0.085279	0.014541	1
22.583	0.09982	0.085179	0.014641	1
22.6	0.09982	0.085078	0.014742	1
22.617	0.09982	0.084977	0.014843	1
22.633	0.04991	0.084877	-0.034967	1
22.65	0.09982	0.084777	0.015043	1
22.667	0.09982	0.084677	0.015143	1
22.683	0.09982	0.084577	0.015243	1
22.7	0.09982	0.084477	0.015343	1
22.717	0.09982	0.084378	0.015442	1
22.733	0.09982	0.084278	0.015542	1
22.75	0.09982	0.084179	0.015641	1
22.767	0.09982	0.084079	0.015741	1
22.783	0.04991	0.083981	-0.034071	1
22.8	0.07253	0.083881	-0.011351	1
22.817	0.04991	0.083782	-0.033872	1
22.833	0.07253	0.083684	-0.011154	1
22.85	0.0226	0.083585	-0.060985	1
22.867	0.0226	0.083486	-0.060886	1
22.883	0.0226	0.083388	-0.060788	1
22.9	0.04991	0.083289	-0.033379	1
22.917	0.04991	0.083191	-0.033281	1
22.933	0.04991	0.083093	-0.033183	1
22.95	0.04991	0.082995	-0.033085	1
22.967	0.09982	0.082897	0.016923	1
22.983	0.04991	0.082799	-0.032889	1
23	0.0226	0.082702	-0.060102	1
23.017	0.04991	0.082604	-0.032694	1
23.033	0.04991	0.082507	-0.032597	1
23.05	0.04991	0.082409	-0.032499	1
23.067	0.04991	0.082312	-0.032402	1
23.083	0.04991	0.082215	-0.032305	1

23.1	0.04991	0.082118	-0.032208	1
23.117	0.04991	0.082021	-0.032111	1
23.133	0.04991	0.081924	-0.032014	1
23.15	0.0226	0.081828	-0.059228	1
23.167	0.04991	0.081731	-0.031821	1
23.183	0.04991	0.081635	-0.031725	1
23.2	0.04991	0.081538	-0.031628	1
23.217	0.04991	0.081442	-0.031532	1
23.233	0.04991	0.081346	-0.031436	1
23.25	0.04991	0.08125	-0.03134	1
23.267	0.04991	0.081154	-0.031244	1
23.283	0.04991	0.081059	-0.031149	1
23.3	0.04991	0.080963	-0.031053	1
23.317	0.04991	0.080867	-0.030957	1
23.333	0.04991	0.080772	-0.030862	1
23.35	0.04991	0.080677	-0.030767	1
23.367	0.04991	0.080581	-0.030671	1
23.383	0.04991	0.080487	-0.030577	1
23.4	0.04991	0.080392	-0.030482	1
23.417	0.04991	0.080297	-0.030387	1

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RESULTS FROM VISUAL CURVE MATCHING

VISUAL MATCH PARAMETER ESTIMATES

	Estimate
K =	2.1560E-005
y0 =	4.2164E-001

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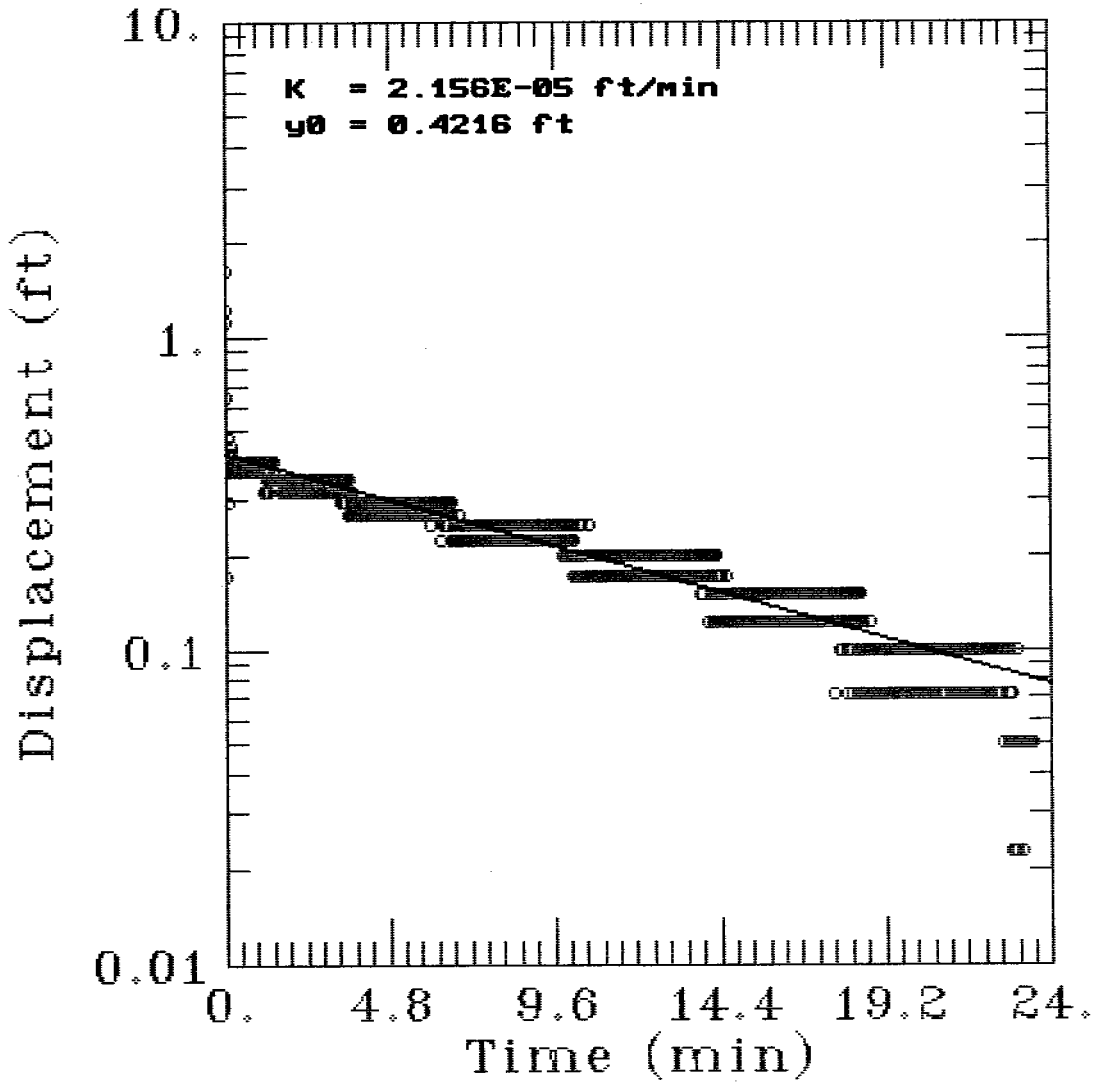
DH-1A STORRS SLUG INJECTION TEST #3



Model Residuals:

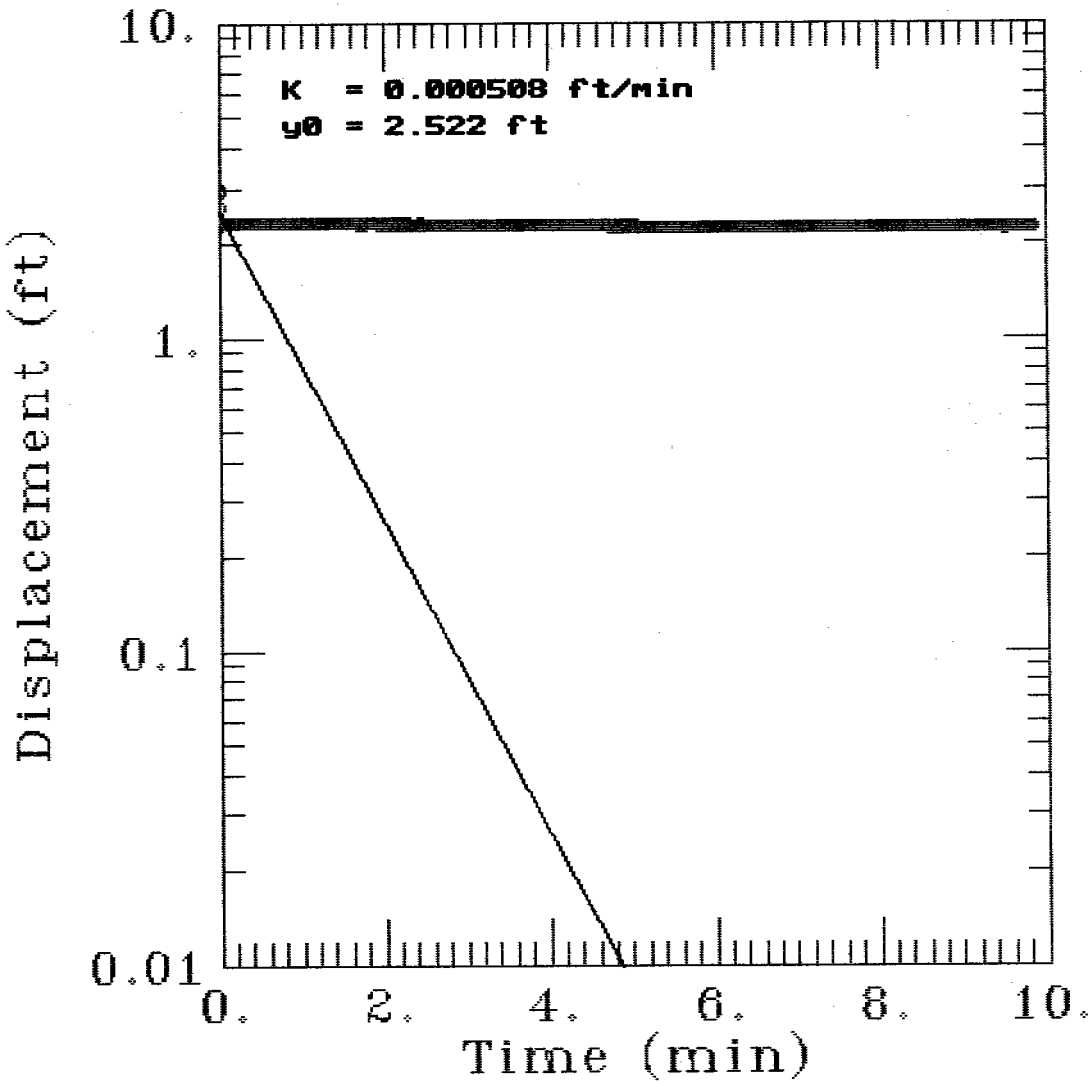
Time	Observed	Calculated	Residual	Weight
0.0083333	2.5909	2.498	0.092898	1
0.033333	2.3412	2.428	-0.086775	1
0.041667	2.3412	2.4051	-0.063872	1
0.058333	2.3412	2.3599	-0.018712	1
0.066667	2.3412	2.3377	0.0035497	1
0.075	2.3412	2.3156	0.025601	1
0.083333	2.3412	2.2938	0.047444	1

RESULTS FROM VISUAL CURVE MATCHING

VISUAL MATCH PARAMETER ESTIMATES

	Estimate
K =	5.0803E-004
y0 =	2.5218E+000

DH-1A PANTHER SLUG WITHDRAWAL TEST #1



A Q T E S O L V R E S U L T S
Version 1.10

05/12/92 01:41:47

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TEST DESCRIPTION

Data set..... DH1PANB1.AQT
Data set title..... DH-1A PANTHER SLUG WITHDRAWAL TEST #1
Company..... EarthFax Engineering
Project..... UC-192-06
Client..... CO-OP Mine
Location..... Huntington Canyon
Test date..... 9-25-91
Test well..... DH-1A

Knowns and Constants:
No. of data points..... 1183
Radius of well casing..... 0.1
Radius of well..... 0.1
Aquifer saturated thickness..... 70
Well screen length..... 60
Static height of water in well..... 70
Log(Re/Rw)..... 5.36
A, B, C..... 0.000, 0.000, 11.189

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ANALYTICAL METHOD

Bouwer-Rice (Unconfined Aquifer Slug Test)

==========

RESULTS FROM STATISTICAL CURVE MATCHING

STATISTICAL MATCH PARAMETER ESTIMATES

	Estimate		Std. Error
K =	5.0803E-004	+/-	1.9809E-004
y0 =	2.5218E+000	+/-	6.3316E-002

ANALYSIS OF MODEL RESIDUALS

residual = calculated - observed
weighted residual = residual * weight

Weighted Residual Statistics:
Number of residuals..... 7
Number of estimated parameters.... 2
Degrees of freedom..... 5
Residual mean..... 1.909E-005
Residual standard deviation..... 0.06857
Residual variance..... 0.004702

A Q T E S O L V R E S U L T S
Version 1.10

05/12/92 00:26:51

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TEST DESCRIPTION

Data set..... DH2SLUG1.AQT
Data set title..... DH-2 SPRING CANYON SLUG INJECT. TEST #1
Company..... EarthFax Engineering
Project..... UC-192-06
Client..... CO-OP Mine
Location..... Huntington Canyon
Test date..... 9-25-91
Test well..... DH-1A

Knowns and Constants:
No. of data points..... 1293
Radius of well casing..... 0.0625
Radius of well..... 0.1
Aquifer saturated thickness..... 160
Well screen length..... 20
Static height of water in well..... 160
Log(Re/Rw)..... 5.446
A, B, C..... 0.000, 0.000, 6.905

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ANALYTICAL METHOD

Bouwer-Rice (Unconfined Aquifer Slug Test)

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RESULTS FROM STATISTICAL CURVE MATCHING

STATISTICAL MATCH PARAMETER ESTIMATES

	Estimate		Std. Error
K =	8.9157E-006	+/-	1.2254E-006
y0 =	6.1118E-001	+/-	2.4554E-003

ANALYSIS OF MODEL RESIDUALS

residual = calculated - observed
weighted residual = residual * weight

Weighted Residual Statistics:
Number of residuals..... 172
Number of estimated parameters.... 2
Degrees of freedom..... 170
Residual mean..... 4.871E-007
Residual standard deviation..... 0.01495
Residual variance..... 0.0002234

Model Residuals:

Time	Observed	Calculated	Residual	Weight
0.016667	0.74844	0.61101	0.13743	1
0.033333	0.7185	0.61084	0.10766	1
0.15	0.66861	0.60964	0.058968	1
0.16667	0.61871	0.60947	0.0092381	1
0.18333	0.60873	0.6093	-0.00057175	1
0.2	0.59875	0.60913	-0.010382	1
0.21667	0.59875	0.60896	-0.010211	1
0.25	0.59875	0.60862	-0.0098711	1
0.26667	0.59875	0.60845	-0.0097011	1
0.28333	0.59875	0.60828	-0.0095312	1
0.3	0.59875	0.60811	-0.0093612	1
0.31667	0.59875	0.60794	-0.0091913	1
0.33333	0.59875	0.60777	-0.0090215	1
0.35	0.59875	0.6076	-0.0088517	1
0.36667	0.59875	0.60743	-0.0086819	1
0.38333	0.59875	0.60726	-0.0085123	1
0.4	0.59875	0.60709	-0.0083426	1
0.41667	0.59875	0.60692	-0.008173	1
0.43333	0.59875	0.60675	-0.0080035	1
0.45	0.59875	0.60658	-0.007834	1
0.46667	0.59875	0.60641	-0.0076645	1
0.48333	0.59875	0.60625	-0.0074951	1
0.5	0.59875	0.60608	-0.0073257	1
0.51667	0.59875	0.60591	-0.0071564	1
0.53333	0.59875	0.60574	-0.0069872	1
0.55	0.59875	0.60557	-0.0068179	1
0.56667	0.59875	0.6054	-0.0066487	1
0.58333	0.59454	0.60523	-0.01069	1
0.6	0.59875	0.60506	-0.0063106	1
0.61667	0.59875	0.60489	-0.0061415	1
0.63333	0.59875	0.60472	-0.0059726	1
0.65	0.59875	0.60455	-0.0058036	1
0.66667	0.59875	0.60438	-0.0056347	1
0.68333	0.59875	0.60422	-0.0054659	1
0.7	0.59875	0.60405	-0.0052971	1
0.71667	0.59875	0.60388	-0.0051283	1
0.73333	0.59875	0.60371	-0.0049597	1
0.75	0.59875	0.60354	-0.004791	1
0.76667	0.59875	0.60337	-0.0046224	1
0.78333	0.59875	0.6032	-0.0044539	1
0.8	0.59875	0.60304	-0.0042853	1
0.81667	0.59875	0.60287	-0.0041168	1
0.83333	0.59875	0.6027	-0.0039485	1
0.85	0.59875	0.60253	-0.0037801	1
0.86667	0.59875	0.60236	-0.0036117	1
0.88333	0.59875	0.60219	-0.0034435	1
0.9	0.59875	0.60203	-0.0032752	1
0.91667	0.59875	0.60186	-0.003107	1
0.93333	0.59875	0.60169	-0.002939	1
0.95	0.59875	0.60152	-0.0027708	1
0.96667	0.59875	0.60135	-0.0026028	1
0.98333	0.59875	0.60118	-0.0024348	1

1	0.59875	0.60102	-0.0022668	1
1.0167	0.59875	0.60085	-0.0020986	1
1.0333	0.59875	0.60068	-0.0019314	1
1.05	0.59875	0.60051	-0.0017633	1
1.0667	0.59875	0.60035	-0.0015952	1
1.0833	0.59875	0.60018	-0.0014281	1
1.1	0.59875	0.60001	-0.0012601	1
1.1167	0.59875	0.59984	-0.0010922	1
1.1333	0.59875	0.59968	-0.00092529	1
1.15	0.59875	0.59951	-0.00075743	1
1.1667	0.59875	0.59934	-0.00058962	1
1.1833	0.59875	0.59917	-0.00042285	1
1.2	0.59454	0.59901	-0.0044651	1
1.2167	0.59875	0.59884	-8.746E-005	1
1.2333	0.59875	0.59867	7.9163E-005	1
1.25	0.59875	0.5985	0.00024674	1
1.2667	0.59875	0.59834	0.00041428	1
1.2833	0.59875	0.59817	0.00058076	1
1.3	0.59875	0.598	0.0007482	1
1.3167	0.59875	0.59783	0.00091559	1
1.3333	0.59875	0.59767	0.0010819	1
1.35	0.59875	0.5975	0.0012492	1
1.3667	0.59875	0.59733	0.0014165	1
1.3833	0.59875	0.59717	0.0015827	1
1.4	0.59875	0.597	0.0017498	1
1.4167	0.58877	0.59683	-0.008063	1
1.4333	0.59875	0.59667	0.002083	1
1.45	0.59875	0.5965	0.00225	1
1.4667	0.59875	0.59633	0.002417	1
1.4833	0.59875	0.59617	0.0025829	1
1.5	0.58877	0.596	-0.0072302	1
1.5167	0.58877	0.59583	-0.0070633	1
1.5333	0.58877	0.59567	-0.0068976	1
1.55	0.58877	0.5955	-0.0067308	1
1.5667	0.58877	0.59533	-0.0065641	1
1.5833	0.58877	0.59517	-0.0063985	1
1.6	0.58877	0.595	-0.0062319	1
1.6167	0.58877	0.59484	-0.0060653	1
1.6333	0.58877	0.59467	-0.0058998	1
1.65	0.58877	0.5945	-0.0057334	1
1.6667	0.58877	0.59434	-0.0055669	1
1.6833	0.58877	0.59417	-0.0054016	1
1.7	0.58877	0.59401	-0.0052353	1
1.7167	0.58877	0.59384	-0.005069	1
1.7333	0.58877	0.59367	-0.0049037	1
1.75	0.58877	0.59351	-0.0047376	1
1.7667	0.58877	0.59334	-0.0045714	1
1.7833	0.58877	0.59318	-0.0044063	1
1.8	0.58877	0.59301	-0.0042403	1
1.8167	0.58877	0.59284	-0.0040743	1
1.8333	0.58877	0.59268	-0.0039093	1
1.85	0.58877	0.59251	-0.0037434	1
1.8667	0.58877	0.59235	-0.0035776	1
1.8833	0.58877	0.59218	-0.0034128	1
1.9	0.58877	0.59202	-0.003247	1
1.9167	0.58877	0.59185	-0.0030813	1
1.9333	0.58877	0.59169	-0.0029166	1
1.95	0.58877	0.59152	-0.002751	1

1.9667	0.58877	0.59136	-0.0025854	1
1.9833	0.58877	0.59119	-0.0024209	1
2	0.58877	0.59103	-0.0022554	1
2.0167	0.58877	0.59086	-0.0020899	1
2.0333	0.58877	0.5907	-0.0019255	1
2.05	0.58877	0.59053	-0.0017602	1
2.0667	0.58877	0.59036	-0.0015949	1
2.0833	0.58877	0.5902	-0.0014306	1
2.1	0.58877	0.59004	-0.0012654	1
2.1167	0.58877	0.58987	-0.0011003	1
2.1333	0.58877	0.58971	-0.00093613	1
2.15	0.58877	0.58954	-0.00077105	1
2.1667	0.58877	0.58938	-0.00060603	1
2.1833	0.58877	0.58921	-0.00044204	1
2.2	0.58877	0.58905	-0.00027711	1
2.2167	0.58877	0.58888	-0.00011222	1
2.2333	0.58877	0.58872	5.163E-005	1
2.25	0.58877	0.58855	0.00021642	1
2.2667	0.58877	0.58839	0.00038117	1
2.2833	0.58877	0.58823	0.00054489	1
2.3	0.58877	0.58806	0.00070954	1
2.3167	0.58877	0.5879	0.00087415	1
2.3333	0.58877	0.58773	0.0010377	1
2.35	0.58877	0.58757	0.0012022	1
2.3667	0.58877	0.5874	0.0013667	1
2.3833	0.58877	0.58724	0.0015302	1
2.4	0.58877	0.58708	0.0016945	1
2.4167	0.58877	0.58691	0.0018589	1
2.4333	0.58877	0.58675	0.0020222	1
2.45	0.58877	0.58658	0.0021864	1
2.4667	0.58877	0.58642	0.0023506	1
2.4833	0.58456	0.58626	-0.0016962	1
2.5	0.58877	0.58609	0.0026779	1
2.5167	0.58877	0.58593	0.002842	1
2.5333	0.58877	0.58577	0.003005	1
2.55	0.58877	0.5856	0.0031689	1
2.5667	0.58456	0.58544	-0.00087713	1
2.5833	0.58877	0.58527	0.0034958	1
2.6	0.58877	0.58511	0.0036596	1
2.6167	0.58877	0.58495	0.0038234	1
2.6333	0.58877	0.58478	0.0039861	1
2.65	0.58877	0.58462	0.0041498	1
2.6667	0.58877	0.58446	0.0043135	1
2.6833	0.58877	0.58429	0.0044761	1
2.7	0.58877	0.58413	0.0046397	1
2.7167	0.58877	0.58397	0.0048032	1
2.7333	0.58877	0.5838	0.0049656	1
2.75	0.58877	0.58364	0.0051291	1
2.7667	0.58877	0.58348	0.0052924	1
2.7833	0.58877	0.58332	0.0054548	1
2.8	0.58877	0.58315	0.0056181	1
2.8167	0.58877	0.58299	0.0057813	1
2.8333	0.58877	0.58283	0.0059435	1
2.85	0.58877	0.58266	0.0061067	1
2.8667	0.58877	0.5825	0.0062698	1
2.8833	0.58877	0.58234	0.0064318	1
2.9	0.58877	0.58218	0.0065948	1
2.9167	0.58877	0.58201	0.0067578	1

2.9333	0.58877	0.58185	0.0069197	1
2.95	0.58877	0.58169	0.0070826	1
2.9667	0.58456	0.58152	0.0030354	1
2.9833	0.58877	0.58136	0.0074073	1

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RESULTS FROM VISUAL CURVE MATCHING

VISUAL MATCH PARAMETER ESTIMATES

	Estimate
K =	8.9157E-006
y0 =	6.1118E-001

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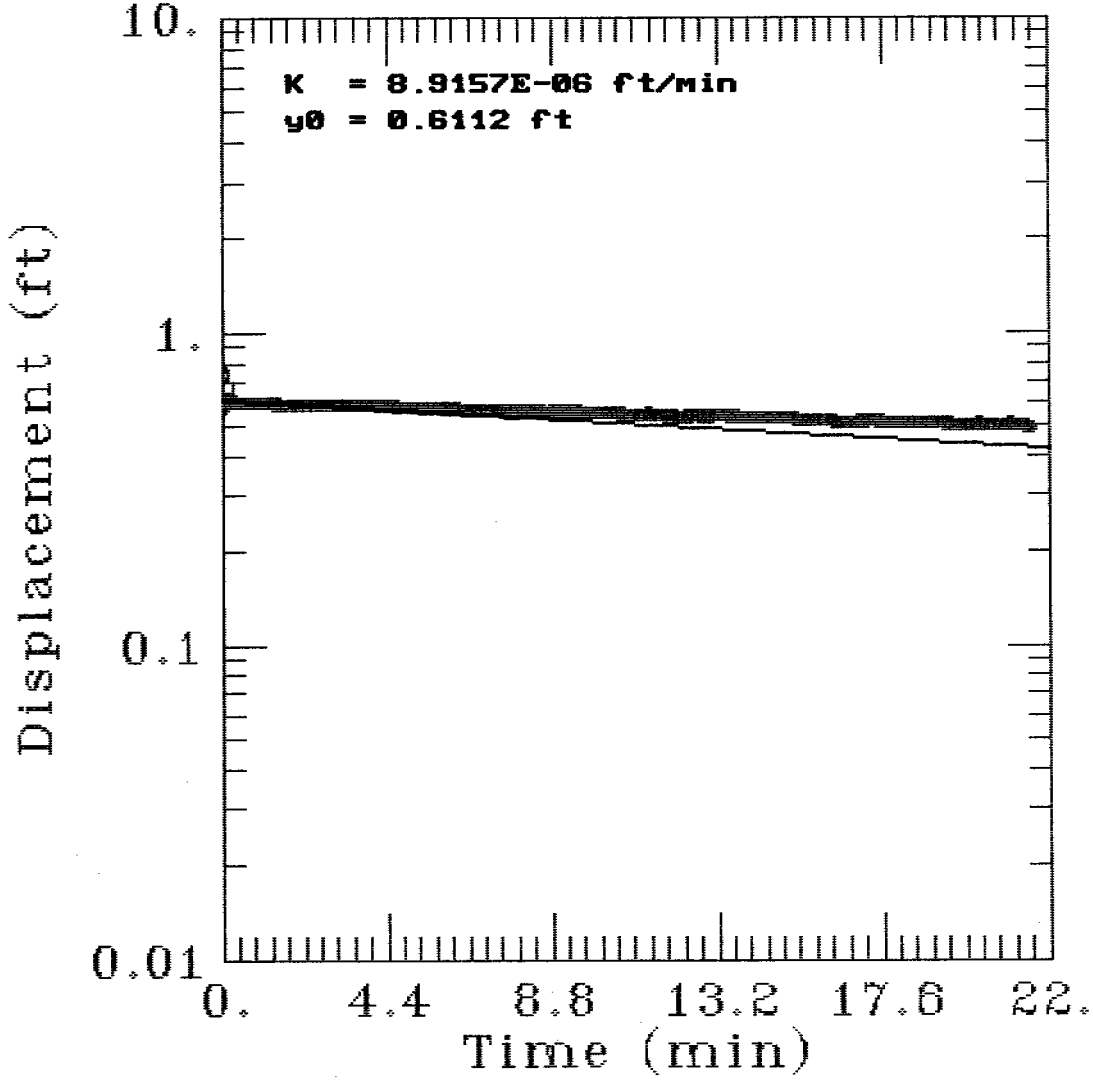
DH-2 SPRING CANYON SLUG INJECT. TEST #1



A Q T E S O L V R E S U L T S
Version 1.10

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TEST DESCRIPTION

Data set..... STDH2S3.AQT
Data set title..... DH-2 STORRS SLUG INJECTION TEST #3
Company..... EarthFax Engineering
Project..... UC-192-06
Client..... CO-OP Mine
Location..... Huntington Canyon
Test date..... 9-25-91
Test well..... DH-1A

Knowns and Constants:
No. of data points..... 941
Radius of well casing..... 0.1
Radius of well..... 0.1
Aquifer saturated thickness..... 106
Well screen length..... 104
Static height of water in well..... 335
Log(Re/Rw)..... 6.78
A, B, C..... 0.000, 0.000, 12.441

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ANALYTICAL METHOD

Bouwer-Rice (Unconfined Aquifer Slug Test)

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RESULTS FROM STATISTICAL CURVE MATCHING

STATISTICAL MATCH PARAMETER ESTIMATES

	Estimate		Std. Error
K =	5.4463E-002	+/-	5.0463E-002
y0 =	8.2896E-001	+/-	4.4838E-001

ANALYSIS OF MODEL RESIDUALS

residual = calculated - observed
weighted residual = residual * weight

Weighted Residual Statistics:
Number of residuals..... 4
Number of estimated parameters.... 2
Degrees of freedom..... 2
Residual mean..... 0.00599
Residual standard deviation..... 0.2297
Residual variance..... 0.05277

Model Residuals:

Time	Observed	Calculated	Residual	Weight
0.0016667	0.75421	0.62748	0.12673	1
0.0033333	0.24438	0.47497	-0.23059	1
0.005	0.30484	0.35953	-0.054688	1
0.0066667	0.45465	0.27214	0.18251	1

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RESULTS FROM VISUAL CURVE MATCHING

VISUAL MATCH PARAMETER ESTIMATES

	Estimate
K =	5.4463E-002
y0 =	8.2896E-001

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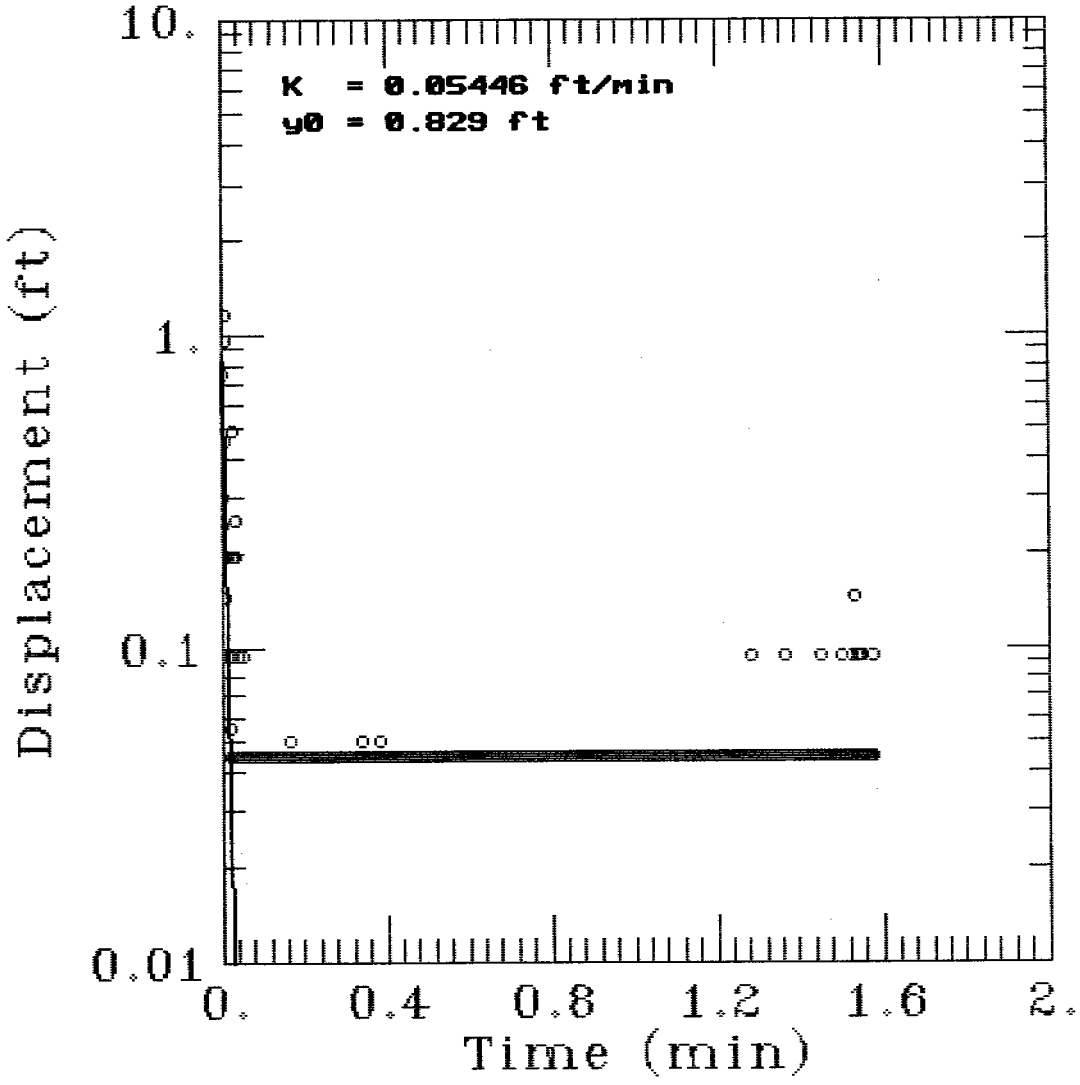
DH-2 STORRS SLUG INJECTION TEST #3



A Q T E S O L V R E S U L T S
Version 1.10

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TEST DESCRIPTION

Data set..... DH2PANS2.AQT
Data set title..... DH-2 PANTHER SLUG INJECTION TEST #2
Company..... EARTHFAX ENGINEERING
Project..... UC-192-06
Client..... CO-OP MINE
Location..... BEAR CANYON MINE
Test date..... 1-17-92
Test well..... DH-2

Knowns and Constants:
No. of data points..... 1389
Radius of well casing..... 0.1
Radius of well..... 0.1
Aquifer saturated thickness..... 88
Well screen length..... 86
Static height of water in well..... 190
Log(Re/Rw)..... 6.259
A, B, C..... 0.000, 0.000, 12.108

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ANALYTICAL METHOD

Bouwer-Rice (Unconfined Aquifer Slug Test)

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RESULTS FROM STATISTICAL CURVE MATCHING

STATISTICAL MATCH PARAMETER ESTIMATES

	Estimate		Std. Error
K =	1.7629E-005	+/-	1.1944E-006
y0 =	5.7739E-001	+/-	5.0445E-003

ANALYSIS OF MODEL RESIDUALS

residual = calculated - observed
weighted residual = residual * weight

Weighted Residual Statistics:
Number of residuals..... 287
Number of estimated parameters.... 2
Degrees of freedom..... 285
Residual mean..... -1.023E-005
Residual standard deviation..... 0.03926
Residual variance..... 0.001541

Model Residuals:

Time	Observed	Calculated	Residual	Weight
0.083333	0.54905	0.57506	-0.02601	1
0.1	0.54905	0.5746	-0.025546	1
0.11667	0.54905	0.57413	-0.025083	1
0.13333	0.54905	0.57367	-0.024619	1
0.15	0.62737	0.57321	0.054164	1
0.16667	0.57747	0.57274	0.0047266	1
0.18333	0.54905	0.57228	-0.023231	1
0.2	0.54905	0.57182	-0.022769	1
0.21667	0.54905	0.57136	-0.022308	1
0.23333	0.54905	0.5709	-0.021846	1
0.25	0.3494	0.57044	-0.22104	1
0.26667	0.44922	0.56998	-0.12076	1
0.28333	0.827	0.56952	0.25748	1
0.3	0.49914	0.56906	-0.069915	1
0.31667	0.57747	0.5686	0.0088739	1
0.33333	0.54905	0.56814	-0.019087	1
0.35	0.57747	0.56768	0.0097914	1
0.36667	0.54905	0.56722	-0.01817	1
0.38333	0.54905	0.56676	-0.017713	1
0.4	0.54905	0.56631	-0.017255	1
0.41667	0.54905	0.56585	-0.016798	1
0.43333	0.54905	0.56539	-0.016341	1
0.45	0.54905	0.56493	-0.015885	1
0.46667	0.57747	0.56448	0.012991	1
0.48333	0.54905	0.56402	-0.014973	1
0.5	0.57747	0.56357	0.013902	1
0.51667	0.54905	0.56311	-0.014063	1
0.53333	0.57747	0.56266	0.014811	1
0.55	0.54905	0.5622	-0.013154	1
0.56667	0.54905	0.56175	-0.012701	1
0.58333	0.54905	0.5613	-0.012247	1
0.6	0.57747	0.56084	0.016626	1
0.61667	0.54905	0.56039	-0.011341	1
0.63333	0.54905	0.55994	-0.010889	1
0.65	0.57747	0.55949	0.017983	1
0.66667	0.54905	0.55904	-0.0099855	1
0.68333	0.54905	0.55858	-0.0095343	1
0.7	0.54905	0.55813	-0.0090834	1
0.71667	0.54905	0.55768	-0.0086329	1
0.73333	0.54905	0.55723	-0.0081828	1
0.75	0.54905	0.55678	-0.007733	1
0.76667	0.54905	0.55633	-0.0072836	1
0.78333	0.57747	0.55588	0.021585	1
0.8	0.54905	0.55544	-0.0063858	1
0.81667	0.57747	0.55499	0.022483	1
0.83333	0.67728	0.55454	0.12274	1
0.85	0.14974	0.55409	-0.40435	1
0.86667	0.64887	0.55364	0.095225	1
0.88333	0.54905	0.5532	-0.0041478	1
0.9	0.54905	0.55275	-0.0037013	1
0.91667	0.57747	0.55231	0.025165	1
0.93333	0.54905	0.55186	-0.0028093	1

0.95	0.54905	0.55141	-0.0023639	1
0.96667	0.57747	0.55097	0.026501	1
0.98333	0.54905	0.55052	-0.0014741	1
1	0.54905	0.55008	-0.0010297	1
1.0167	0.54905	0.54964	-0.0005856	1
1.0333	0.57747	0.54919	0.028278	1
1.05	0.57747	0.54875	0.028721	1
1.0667	0.57747	0.54831	0.029164	1
1.0833	0.57747	0.54786	0.029607	1
1.1	0.54905	0.54742	0.001629	1
1.1167	0.57747	0.54698	0.030491	1
1.1333	0.54905	0.54654	0.0025122	1
1.15	0.57747	0.5461	0.031373	1
1.1667	0.54905	0.54566	0.0033944	1
1.1833	0.57747	0.54522	0.032255	1
1.2	0.54905	0.54478	0.0042748	1
1.2167	0.57747	0.54434	0.033135	1
1.2333	0.54905	0.5439	0.0051538	1
1.25	0.54905	0.54346	0.0055929	1
1.2667	0.54905	0.54302	0.0060316	1
1.2833	0.54905	0.54258	0.0064698	1
1.3	0.57747	0.54214	0.035328	1
1.3167	0.54905	0.5417	0.0073455	1
1.3333	0.54905	0.54127	0.0077826	1
1.35	0.57747	0.54083	0.03664	1
1.3667	0.57747	0.54039	0.037076	1
1.3833	0.57747	0.53996	0.037512	1
1.4	0.54905	0.53952	0.0095281	1
1.4167	0.54905	0.53909	0.0099637	1
1.4333	0.57747	0.53865	0.038819	1
1.45	0.57747	0.53822	0.039254	1
1.4667	0.57747	0.53778	0.039688	1
1.4833	0.57747	0.53735	0.040122	1
1.5	0.57747	0.53691	0.040556	1
1.5167	0.57747	0.53648	0.040989	1
1.5333	0.57747	0.53605	0.041422	1
1.55	0.54905	0.53562	0.013435	1
1.5667	0.54905	0.53518	0.013867	1
1.5833	0.52757	0.53475	-0.0071809	1
1.6	0.52757	0.53432	-0.0067492	1
1.6167	0.57747	0.53389	0.043582	1
1.6333	0.57747	0.53346	0.044013	1
1.65	0.52757	0.53303	-0.0054564	1
1.6667	0.54905	0.5326	0.016454	1
1.6833	0.49914	0.53217	-0.033026	1
1.7	0.52757	0.53174	-0.0041667	1
1.7167	0.57747	0.53131	0.046163	1
1.7333	0.54905	0.53088	0.018171	1
1.75	0.49914	0.53045	-0.03131	1
1.7667	0.54905	0.53002	0.019028	1
1.7833	0.49914	0.52959	-0.030454	1
1.8	0.49914	0.52917	-0.030027	1
1.8167	0.49914	0.52874	-0.0296	1
1.8333	0.49914	0.52831	-0.029173	1
1.85	0.52757	0.52789	-0.00031639	1
1.8667	0.52757	0.52746	0.00010979	1
1.8833	0.52757	0.52703	0.00053537	1
1.9	0.54905	0.52661	0.022441	1

1.9167	0.49914	0.52618	-0.027044	1
1.9333	0.52757	0.52576	0.0018105	1
1.95	0.49914	0.52533	-0.026195	1
1.9667	0.52757	0.52491	0.0026591	1
1.9833	0.54905	0.52449	0.024563	1
2	0.49914	0.52406	-0.024924	1
2.0167	0.54905	0.52364	0.025409	1
2.0333	0.49914	0.52322	-0.024078	1
2.05	0.52757	0.5228	0.0047741	1
2.0667	0.52757	0.52237	0.0051961	1
2.0833	0.49914	0.52195	-0.022812	1
2.1	0.49914	0.52153	-0.022391	1
2.1167	0.49914	0.52111	-0.02197	1
2.1333	0.49914	0.52069	-0.021549	1
2.15	0.52757	0.52027	0.0073009	1
2.1667	0.52757	0.51985	0.0077209	1
2.1833	0.52757	0.51943	0.0081403	1
2.2	0.52757	0.51901	0.0085597	1
2.2167	0.52757	0.51859	0.0089787	1
2.2333	0.52757	0.51817	0.0093971	1
2.25	0.52757	0.51775	0.0098155	1
2.2667	0.52757	0.51734	0.010233	1
2.2833	0.49914	0.51692	-0.017779	1
2.3	0.49914	0.5165	-0.017362	1
2.3167	0.49914	0.51608	-0.016945	1
2.3333	0.49914	0.51567	-0.016528	1
2.35	0.49914	0.51525	-0.016112	1
2.3667	0.52757	0.51484	0.012734	1
2.3833	0.49914	0.51442	-0.015281	1
2.4	0.49914	0.51401	-0.014865	1
2.4167	0.49914	0.51359	-0.01445	1
2.4333	0.49914	0.51318	-0.014036	1
2.45	0.49914	0.51276	-0.013622	1
2.4667	0.49914	0.51235	-0.013208	1
2.4833	0.49914	0.51193	-0.012794	1
2.5	0.49914	0.51152	-0.012381	1
2.5167	0.49914	0.51111	-0.011968	1
2.5333	0.49914	0.5107	-0.011556	1
2.55	0.49914	0.51028	-0.011143	1
2.5667	0.52757	0.50987	0.017698	1
2.5833	0.52757	0.50946	0.01811	1
2.6	0.52757	0.50905	0.018521	1
2.6167	0.52757	0.50864	0.018932	1
2.6333	0.52757	0.50823	0.019343	1
2.65	0.49914	0.50782	-0.0086772	1
2.6667	0.52757	0.50741	0.020163	1
2.6833	0.49914	0.507	-0.0078578	1
2.7	0.49914	0.50659	-0.0074485	1
2.7167	0.49914	0.50618	-0.0070395	1
2.7333	0.52757	0.50577	0.021799	1
2.75	0.52757	0.50536	0.022207	1
2.7667	0.52757	0.50495	0.022615	1
2.7833	0.49914	0.50455	-0.0054074	1
2.8	0.49914	0.50414	-0.005	1
2.8167	0.49914	0.50373	-0.004593	1
2.8333	0.52757	0.50333	0.024243	1
2.85	0.52757	0.50292	0.02465	1
2.8667	0.49914	0.50251	-0.0033742	1

2.8833	0.49914	0.50211	-0.0029688	1
2.9	0.49914	0.5017	-0.0025634	1
2.9167	0.52757	0.5013	0.026272	1
2.9333	0.52757	0.50089	0.026676	1
2.95	0.52757	0.50049	0.02708	1
2.9667	0.52757	0.50009	0.027485	1
2.9833	0.49914	0.49968	-0.00054196	1
3	0.49914	0.49928	-0.00013855	1
3.0167	0.49914	0.49888	0.00026453	1
3.0333	0.49914	0.49847	0.00066705	1
3.05	0.49914	0.49807	0.0010695	1
3.0667	0.49914	0.49767	0.0014716	1
3.0833	0.52757	0.49727	0.030303	1
3.1	0.52757	0.49687	0.030705	1
3.1167	0.49914	0.49646	0.0026757	1
3.1333	0.49914	0.49606	0.0030763	1
3.15	0.49914	0.49566	0.0034768	1
3.1667	0.52757	0.49526	0.032307	1
3.1833	0.52757	0.49486	0.032707	1
3.2	0.52757	0.49446	0.033106	1
3.2167	0.49914	0.49406	0.0050752	1
3.2333	0.49914	0.49367	0.0054739	1
3.25	0.52757	0.49327	0.034302	1
3.2667	0.49914	0.49287	0.0062707	1
3.2833	0.49914	0.49247	0.0066683	1
3.3	0.49914	0.49207	0.0070659	1
3.3167	0.52757	0.49168	0.035893	1
3.3333	0.49914	0.49128	0.0078599	1
3.35	0.52757	0.49088	0.036687	1
3.3667	0.49914	0.49049	0.0086528	1
3.3833	0.49914	0.49009	0.0090486	1
3.4	0.49914	0.4897	0.0094442	1
3.4167	0.49914	0.4893	0.0098396	1
3.4333	0.44922	0.48891	-0.039686	1
3.45	0.47766	0.48851	-0.010851	1
3.4667	0.52757	0.48812	0.039453	1
3.4833	0.52757	0.48772	0.039847	1
3.5	0.49914	0.48733	0.011811	1
3.5167	0.49914	0.48694	0.012204	1
3.5333	0.52757	0.48654	0.041027	1
3.55	0.44922	0.48615	-0.03693	1
3.5667	0.44922	0.48576	-0.036537	1
3.5833	0.44922	0.48537	-0.036145	1
3.6	0.47766	0.48497	-0.0073136	1
3.6167	0.44922	0.48458	-0.035362	1
3.6333	0.47766	0.48419	-0.0065311	1
3.65	0.47766	0.4838	-0.0061402	1
3.6667	0.49914	0.48341	0.01573	1
3.6833	0.44922	0.48302	-0.0338	1
3.7	0.47766	0.48263	-0.0049696	1
3.7167	0.44922	0.48224	-0.03302	1
3.7333	0.44922	0.48185	-0.032631	1
3.75	0.44922	0.48146	-0.032242	1
3.7667	0.47766	0.48107	-0.0034132	1
3.7833	0.47766	0.48069	-0.003025	1
3.8	0.44922	0.4803	-0.031077	1
3.8167	0.44922	0.47991	-0.030689	1
3.8333	0.47766	0.47952	-0.001862	1

3.85	0.49914	0.47913	0.020005	1
3.8667	0.44922	0.47875	-0.029528	1
3.8833	0.44922	0.47836	-0.029142	1
3.9	0.47766	0.47798	-0.00031556	1
3.9167	0.49914	0.47759	0.02155	1
3.9333	0.44922	0.4772	-0.027984	1
3.95	0.44922	0.47682	-0.027599	1
3.9667	0.47766	0.47643	0.0012259	1
3.9833	0.49914	0.47605	0.02309	1
4	0.44922	0.47567	-0.026445	1
4.0167	0.44922	0.47528	-0.026061	1
4.0333	0.47766	0.4749	0.0027621	1
4.05	0.47766	0.47451	0.0031455	1
4.0667	0.44922	0.47413	-0.024911	1
4.0833	0.47766	0.47375	0.0039111	1
4.1	0.47766	0.47337	0.0042936	1
4.1167	0.44922	0.47298	-0.023764	1
4.1333	0.44922	0.4726	-0.023383	1
4.15	0.47766	0.47222	0.0054389	1
4.1667	0.47766	0.47184	0.0058202	1
4.1833	0.44922	0.47146	-0.022239	1
4.2	0.44922	0.47108	-0.021859	1
4.2167	0.44922	0.4707	-0.021478	1
4.2333	0.47766	0.47032	0.0073416	1
4.25	0.47766	0.46994	0.0077213	1
4.2667	0.44922	0.46956	-0.020339	1
4.2833	0.44922	0.46918	-0.01996	1
4.3	0.47766	0.4688	0.0088583	1
4.3167	0.47766	0.46842	0.0092368	1
4.3333	0.44922	0.46805	-0.018825	1
4.35	0.44922	0.46767	-0.018447	1
4.3667	0.47766	0.46729	0.01037	1
4.3833	0.44922	0.46691	-0.017693	1
4.4	0.44922	0.46654	-0.017316	1
4.4167	0.47766	0.46616	0.011501	1
4.4333	0.47766	0.46578	0.011877	1
4.45	0.44922	0.46541	-0.016187	1
4.4667	0.44922	0.46503	-0.015811	1
4.4833	0.44922	0.46466	-0.015436	1
4.5	0.47766	0.46428	0.013379	1
4.5167	0.44922	0.46391	-0.014686	1
4.5333	0.44922	0.46353	-0.014312	1
4.55	0.44922	0.46316	-0.013938	1
4.5667	0.47766	0.46278	0.014876	1
4.5833	0.47766	0.46241	0.01525	1
4.6	0.44922	0.46204	-0.012817	1
4.6167	0.44922	0.46166	-0.012444	1
4.6333	0.47766	0.46129	0.016369	1
4.65	0.44922	0.46092	-0.011699	1
4.6667	0.44922	0.46055	-0.011327	1
4.6833	0.44922	0.46018	-0.010955	1
4.7	0.47766	0.4598	0.017856	1
4.7167	0.44922	0.45943	-0.010213	1
4.7333	0.44922	0.45906	-0.009842	1
4.75	0.44922	0.45869	-0.0094713	1
4.7667	0.47766	0.45832	0.019339	1
4.7833	0.44922	0.45795	-0.0087312	1
4.8	0.44922	0.45758	-0.0083615	1

4.8167	0.47766	0.45721	0.020448	1
4.8333	0.47766	0.45684	0.020817	1
4.85	0.47766	0.45647	0.021186	1

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RESULTS FROM VISUAL CURVE MATCHING

VISUAL MATCH PARAMETER ESTIMATES

	Estimate
K =	1.7629E-005
y0 =	5.7739E-001

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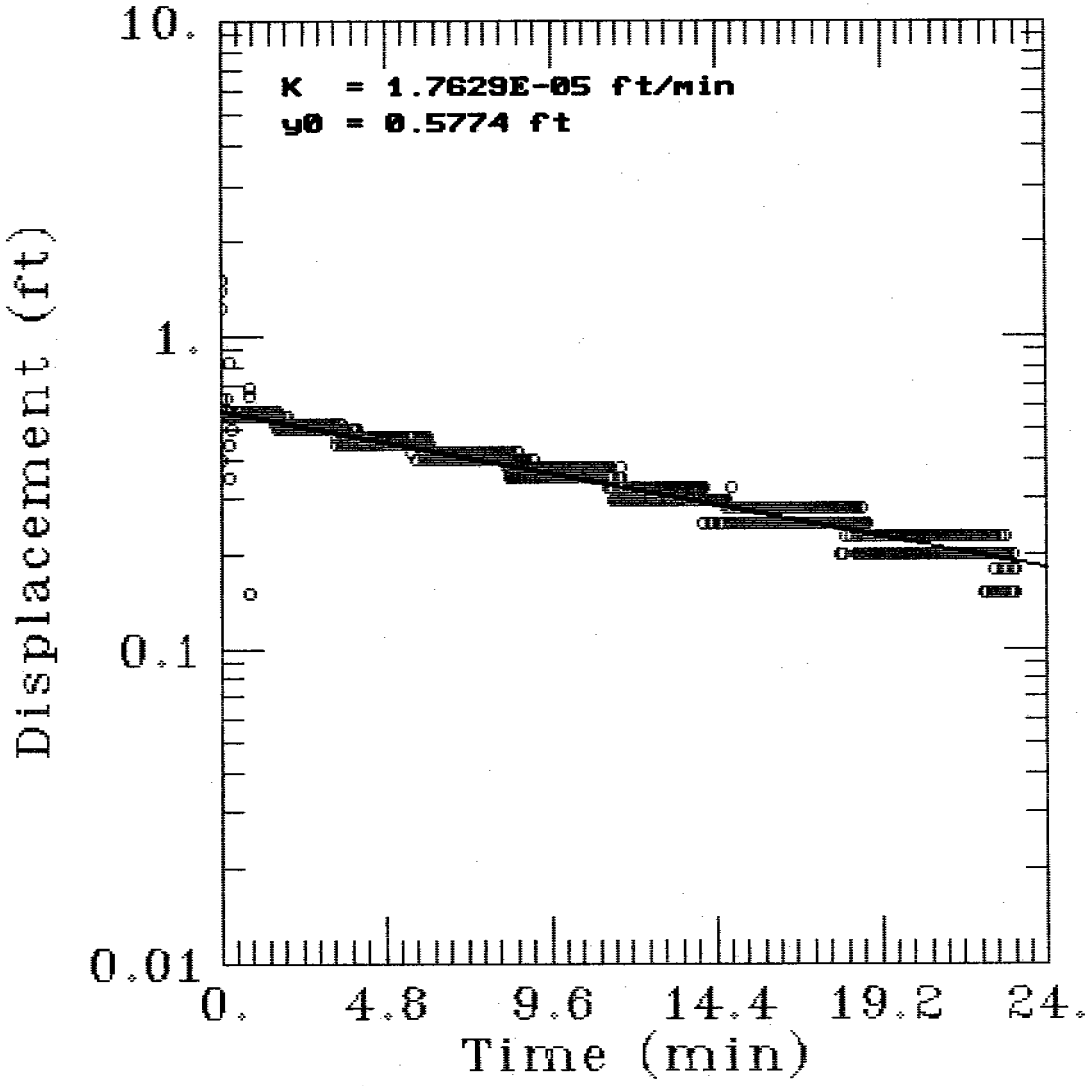
DH-2 PANTHER SLUG INJECTION TEST #2



A Q T E S O L V R E S U L T S
Version 1.10

05/12/92 00:31:40

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TEST DESCRIPTION

Data set..... DH3SLUG1.AQT
Data set title..... DH-3 SPRING CANYON SLUG INJECT. TEST #1
Company..... EarthFax Engineering
Project..... UC-192-06
Client..... CO-OP Mine
Location..... Huntington Canyon
Test date..... 9-25-91
Test well..... DH-1A

Knowns and Constants:
No. of data points..... 1684
Radius of well casing..... 0.1
Radius of well..... 0.1
Aquifer saturated thickness..... 50
Well screen length..... 20
Static height of water in well..... 50
Log(Re/Rw)..... 4.728
A, B, C..... 0.000, 0.000, 6.905

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ANALYTICAL METHOD

Bouwer-Rice (Unconfined Aquifer Slug Test)

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RESULTS FROM STATISTICAL CURVE MATCHING

STATISTICAL MATCH PARAMETER ESTIMATES

	Estimate		Std. Error
K =	4.0617E-005	+/-	3.2767E-006
y0 =	6.0298E-001	+/-	2.8161E-003

ANALYSIS OF MODEL RESIDUALS

residual = calculated - observed
weighted residual = residual * weight

Weighted Residual Statistics:
Number of residuals..... 179
Number of estimated parameters.... 2
Degrees of freedom..... 177
Residual mean..... 1.704E-006
Residual standard deviation..... 0.01828
Residual variance..... 0.0003342

Model Residuals:

Time	Observed	Calculated	Residual	Weight
0.016667	0.7684	0.60264	0.16576	1
0.033333	0.75842	0.60229	0.15613	1
0.05	0.57879	0.60195	-0.02316	1
0.066667	0.56882	0.6016	-0.032785	1
0.083333	0.59875	0.60126	-0.0025104	1
0.1	0.59875	0.60092	-0.0021661	1
0.11667	0.59875	0.60057	-0.001822	1
0.13333	0.59875	0.60023	-0.0014782	1
0.15	0.59875	0.59988	-0.0011344	1
0.16667	0.59875	0.59954	-0.00079087	1
0.18333	0.59875	0.5992	-0.0004477	1
0.2	0.58877	0.59885	-0.010085	1
0.21667	0.59875	0.59851	0.00023845	1
0.23333	0.59875	0.59817	0.00058102	1
0.25	0.59875	0.59783	0.00092361	1
0.26667	0.58877	0.59748	-0.008714	1
0.28333	0.58877	0.59714	-0.008372	1
0.3	0.58877	0.5968	-0.00803	1
0.31667	0.58877	0.59646	-0.0076882	1
0.33333	0.58877	0.59612	-0.0073468	1
0.35	0.58877	0.59578	-0.0070054	1
0.36667	0.58877	0.59543	-0.0066642	1
0.38333	0.58877	0.59509	-0.0063234	1
0.4	0.58877	0.59475	-0.0059826	1
0.41667	0.58877	0.59441	-0.0056419	1
0.43333	0.58877	0.59407	-0.0053017	1
0.45	0.58877	0.59373	-0.0049615	1
0.46667	0.58877	0.59339	-0.0046214	1
0.48333	0.58877	0.59305	-0.0042818	1
0.5	0.58877	0.59271	-0.0039421	1
0.51667	0.58877	0.59237	-0.0036027	1
0.53333	0.58877	0.59203	-0.0032636	1
0.55	0.58877	0.59169	-0.0029245	1
0.56667	0.58877	0.59136	-0.0025857	1
0.58333	0.58877	0.59102	-0.0022472	1
0.6	0.58877	0.59068	-0.0019087	1
0.61667	0.58877	0.59034	-0.0015704	1
0.63333	0.57879	0.59	-0.011212	1
0.65	0.58877	0.58966	-0.00089459	1
0.66667	0.58877	0.58933	-0.00055688	1
0.68333	0.57879	0.58899	-0.010199	1
0.7	0.57879	0.58865	-0.0098622	1
0.71667	0.57879	0.58832	-0.0095252	1
0.73333	0.57879	0.58798	-0.0091883	1
0.75	0.57879	0.58764	-0.0088516	1
0.76667	0.57879	0.58731	-0.0085151	1
0.78333	0.58877	0.58697	0.0018012	1
0.8	0.57879	0.58663	-0.0078427	1
0.81667	0.57879	0.5863	-0.0075068	1
0.83333	0.57879	0.58596	-0.0071711	1
0.85	0.57879	0.58563	-0.0068356	1
0.86667	0.57879	0.58529	-0.0065002	1

0.88333	0.57879	0.58496	-0.0061651	1
0.9	0.57879	0.58462	-0.0058301	1
0.91667	0.57879	0.58429	-0.0054954	1
0.93333	0.57879	0.58395	-0.0051608	1
0.95	0.57879	0.58362	-0.0048264	1
0.96667	0.57879	0.58328	-0.0044923	1
0.98333	0.57879	0.58295	-0.0041583	1
1	0.57879	0.58261	-0.0038245	1
1.0167	0.57879	0.58228	-0.0034908	1
1.0333	0.57879	0.58195	-0.0031575	1
1.05	0.57879	0.58161	-0.0028242	1
1.0667	0.57879	0.58128	-0.0024911	1
1.0833	0.57879	0.58095	-0.0021584	1
1.1	0.57879	0.58062	-0.0018257	1
1.1167	0.57879	0.58028	-0.0014931	1
1.1333	0.57879	0.57995	-0.001161	1
1.15	0.57879	0.57962	-0.00082885	1
1.1667	0.57879	0.57929	-0.00049689	1
1.1833	0.57879	0.57896	-0.00016532	1
1.2	0.57879	0.57862	0.00016626	1
1.2167	0.57879	0.57829	0.00049765	1
1.2333	0.57879	0.57796	0.00082865	1
1.25	0.57879	0.57763	0.0011597	1
1.2667	0.56882	0.5773	-0.0084795	1
1.2833	0.57879	0.57697	0.0018209	1
1.3	0.56882	0.57664	-0.0078186	1
1.3167	0.57879	0.57631	0.0024816	1
1.3333	0.56882	0.57598	-0.0071585	1
1.35	0.56882	0.57565	-0.0068286	1
1.3667	0.56882	0.57532	-0.006499	1
1.3833	0.56882	0.57499	-0.0061697	1
1.4	0.56882	0.57466	-0.0058403	1
1.4167	0.56882	0.57433	-0.0055112	1
1.4333	0.56882	0.574	-0.0051825	1
1.45	0.56882	0.57367	-0.0048537	1
1.4667	0.56882	0.57335	-0.0045252	1
1.4833	0.56882	0.57302	-0.004197	1
1.5	0.56882	0.57269	-0.0038688	1
1.5167	0.56882	0.57236	-0.0035408	1
1.5333	0.56882	0.57203	-0.0032132	1
1.55	0.56882	0.57171	-0.0028856	1
1.5667	0.56882	0.57138	-0.0025582	1
1.5833	0.56882	0.57105	-0.0022312	1
1.6	0.56882	0.57072	-0.0019041	1
1.6167	0.56882	0.5704	-0.0015772	1
1.6333	0.56882	0.57007	-0.0012507	1
1.65	0.56882	0.56974	-0.00092426	1
1.6667	0.56882	0.56942	-0.00059795	1
1.6833	0.56882	0.56909	-0.00027203	1
1.7	0.56882	0.56877	5.3903E-005	1
1.7167	0.5289	0.56844	-0.03954	1
1.7333	0.56882	0.56811	0.00070501	1
1.75	0.56882	0.56779	0.0010304	1
1.7667	0.56882	0.56746	0.0013556	1
1.7833	0.55884	0.56714	-0.0082996	1
1.8	0.56882	0.56681	0.0020052	1
1.8167	0.56882	0.56649	0.0023298	1
1.8333	0.56882	0.56617	0.0026541	1

1.85	0.56882	0.56584	0.0029783	1
1.8667	0.55884	0.56552	-0.0066776	1
1.8833	0.56882	0.56519	0.0036261	1
1.9	0.56882	0.56487	0.0039498	1
1.9167	0.56882	0.56455	0.0042733	1
1.9333	0.56882	0.56422	0.0045964	1
1.95	0.56882	0.5639	0.0049196	1
1.9667	0.56882	0.56358	0.0052425	1
1.9833	0.55884	0.56325	-0.0044149	1
2	0.55884	0.56293	-0.0040923	1
2.0167	0.55884	0.56261	-0.0037699	1
2.0333	0.55884	0.56229	-0.0034479	1
2.05	0.55884	0.56197	-0.0031258	1
2.0667	0.55884	0.56164	-0.002804	1
2.0833	0.55884	0.56132	-0.0024825	1
2.1	0.57879	0.561	0.017789	1
2.1167	0.56882	0.56068	0.0081403	1
2.1333	0.56882	0.56036	0.0084612	1
2.15	0.55884	0.56004	-0.0011979	1
2.1667	0.55884	0.55972	-0.00087714	1
2.1833	0.55884	0.5594	-0.00055677	1
2.2	0.55884	0.55908	-0.00023639	1
2.2167	0.55884	0.55876	8.3802E-005	1
2.2333	0.55884	0.55844	0.00040362	1
2.25	0.55884	0.55812	0.00072345	1
2.2667	0.55884	0.5578	0.0010431	1
2.2833	0.55884	0.55748	0.0013624	1
2.3	0.55884	0.55716	0.0016816	1
2.3167	0.55884	0.55684	0.0020007	1
2.3333	0.55884	0.55652	0.0023195	1
2.35	0.55884	0.5562	0.0026382	1
2.3667	0.55884	0.55588	0.0029567	1
2.3833	0.55884	0.55557	0.0032749	1
2.4	0.55884	0.55525	0.0035931	1
2.4167	0.55884	0.55493	0.0039111	1
2.4333	0.56882	0.55461	0.014209	1
2.45	0.55884	0.55429	0.0045464	1
2.4667	0.55884	0.55398	0.0048638	1
2.4833	0.55884	0.55366	0.0051809	1
2.5	0.55884	0.55334	0.005498	1
2.5167	0.55884	0.55303	0.0058149	1
2.5333	0.54886	0.55271	-0.0038485	1
2.55	0.55884	0.55239	0.006448	1
2.5667	0.55884	0.55208	0.0067644	1
2.5833	0.55884	0.55176	0.0070804	1
2.6	0.55884	0.55144	0.0073964	1
2.6167	0.54886	0.55113	-0.0022678	1
2.6333	0.55884	0.55081	0.0080277	1
2.65	0.54886	0.5505	-0.0016369	1
2.6667	0.54886	0.55018	-0.0013216	1
2.6833	0.54886	0.54987	-0.0010067	1
2.7	0.54886	0.54955	-0.00069177	1
2.7167	0.54886	0.54924	-0.00037703	1
2.7333	0.54886	0.54892	-6.2655E-005	1
2.75	0.54886	0.54861	0.00025173	1
2.7667	0.54886	0.54829	0.00056593	1
2.7833	0.54886	0.54798	0.00087976	1
2.8	0.54886	0.54767	0.0011936	1

2.8167	0.54886	0.54735	0.0015073	1
2.8333	0.54886	0.54704	0.0018206	1
2.85	0.54886	0.54673	0.0021339	1
2.8667	0.54886	0.54641	0.002447	1
2.8833	0.54886	0.5461	0.0027597	1
2.9	0.54886	0.54579	0.0030725	1
2.9167	0.54886	0.54547	0.0033856	1
2.9333	0.54886	0.54516	0.0036967	1
2.95	0.54886	0.54485	0.0040095	1
2.9667	0.54886	0.54454	0.0043221	1
2.9833	0.54886	0.54423	0.0046327	1

==

RESULTS FROM VISUAL CURVE MATCHING

VISUAL MATCH PARAMETER ESTIMATES

	Estimate
K =	4.0617E-005
y0 =	6.0298E-001

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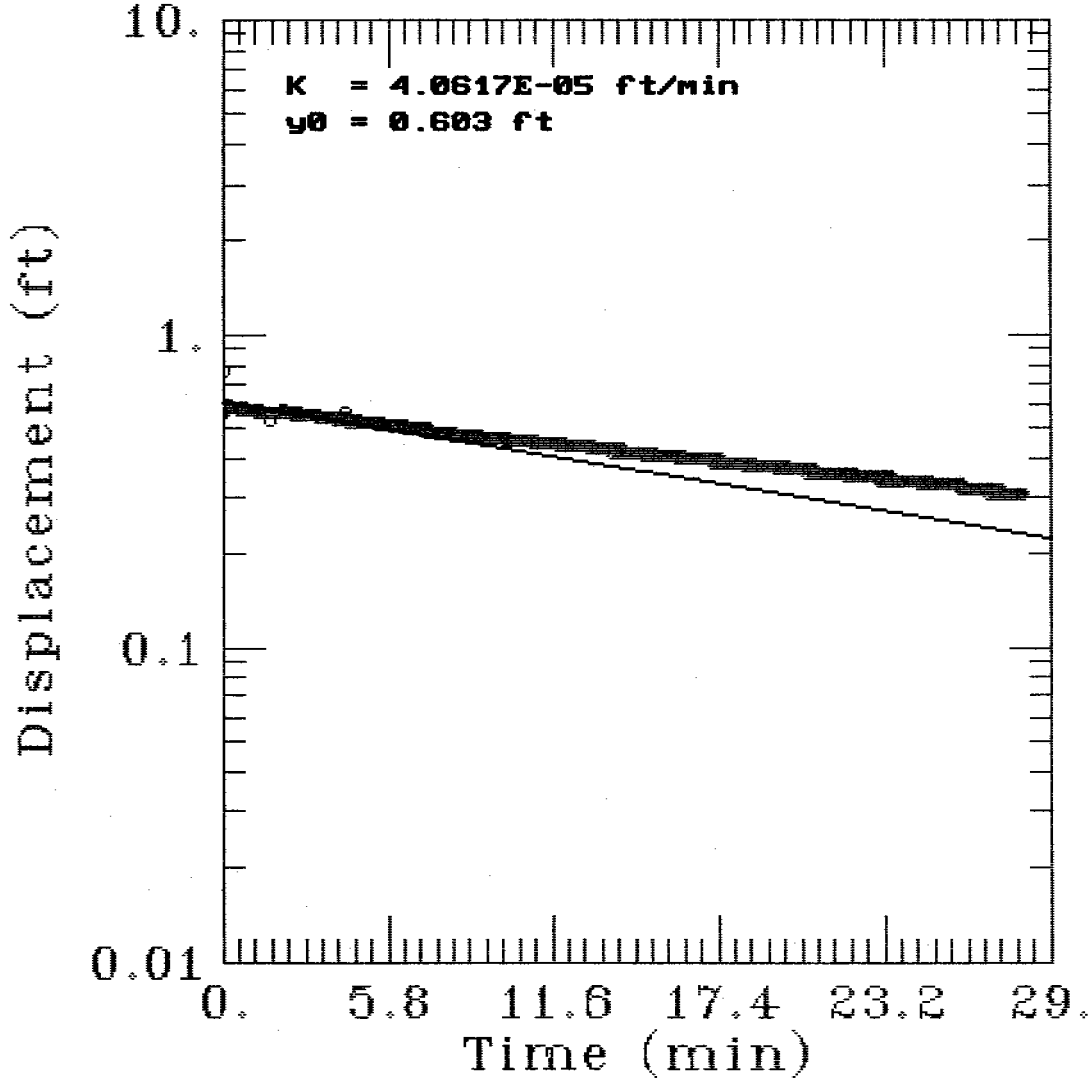
DH-3 SPRING CANYON SLUG INJECT. TEST #1



A Q T E S O L V R E S U L T S
Version 1.10

05/12/92 02:15:19

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TEST DESCRIPTION

Data set..... DH3STSL2.AQT
Data set title..... DH-3 STORRS SLUG INJECTION TEST #2

Knowns and Constants:
No. of data points..... 2000
Radius of well casing..... 0.1
Radius of well..... 0.1
Aquifer saturated thickness..... 127
Well screen length..... 110
Static height of water in well..... 127
Log(Re/Rw)..... 6.05
A, B, C..... 0.000, 0.000, 12.519

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ANALYTICAL METHOD

Bouwer-Rice (Unconfined Aquifer Slug Test)

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RESULTS FROM STATISTICAL CURVE MATCHING

STATISTICAL MATCH PARAMETER ESTIMATES

	Estimate		Std. Error
K =	5.9972E-006	+/-	3.7281E-008
y0 =	6.3024E-001	+/-	1.3504E-003

ANALYSIS OF MODEL RESIDUALS

residual = calculated - observed
weighted residual = residual * weight

Weighted Residual Statistics:
Number of residuals..... 1996
Number of estimated parameters.... 2
Degrees of freedom..... 1994
Residual mean..... -0.0002397
Residual standard deviation..... 0.02511
Residual variance..... 0.0006303

Model Residuals:

Time	Observed	Calculated	Residual	Weight

0.2	0.74344	0.62749	0.11595	1
0.21667	0.54375	0.62726	-0.083514	1
0.23333	0.59917	0.62704	-0.027866	1
0.25	0.59367	0.62681	-0.033138	1
0.26667	0.54924	0.62658	-0.077341	1
0.28333	0.59917	0.62635	-0.027183	1
0.31667	0.59367	0.6259	-0.032228	1
0.33333	0.59367	0.62567	-0.032	1
0.35	0.59917	0.62544	-0.026273	1
0.36667	0.59367	0.62522	-0.031546	1
0.38333	0.59917	0.62499	-0.025818	1
0.4	0.59367	0.62476	-0.031091	1
0.41667	0.64359	0.62453	0.019056	1
0.43333	0.59367	0.62431	-0.030637	1
0.45	0.69352	0.62408	0.06944	1
0.46667	0.54375	0.62385	-0.080104	1
0.48333	0.54924	0.62363	-0.074387	1
0.5	0.59367	0.6234	-0.02973	1
0.51667	0.59367	0.62317	-0.029504	1
0.53333	0.59367	0.62295	-0.029277	1
0.55	0.59367	0.62272	-0.029051	1
0.56667	0.59917	0.62249	-0.023324	1
0.58333	0.59917	0.62227	-0.023098	1
0.6	0.59917	0.62204	-0.022872	1
0.61667	0.59367	0.62182	-0.028146	1
0.63333	0.59367	0.62159	-0.02792	1
0.65	0.59367	0.62136	-0.027694	1
0.66667	0.54924	0.62114	-0.071898	1
0.68333	0.59367	0.62091	-0.027243	1
0.7	0.59367	0.62069	-0.027017	1
0.71667	0.59367	0.62046	-0.026791	1
0.73333	0.59367	0.62024	-0.026566	1
0.75	0.59367	0.62001	-0.026341	1
0.76667	0.54924	0.61979	-0.070545	1
0.78333	0.59367	0.61956	-0.02589	1
0.8	0.59367	0.61933	-0.025665	1
0.81667	0.59367	0.61911	-0.02544	1
0.83333	0.59367	0.61888	-0.025215	1
0.85	0.54924	0.61866	-0.06942	1
0.86667	0.59367	0.61844	-0.024765	1
0.88333	0.59367	0.61821	-0.02454	1
0.9	0.59367	0.61799	-0.024316	1
0.91667	0.59367	0.61776	-0.024091	1
0.93333	0.59367	0.61754	-0.023867	1
0.95	0.59367	0.61731	-0.023642	1
0.96667	0.59367	0.61709	-0.023418	1
0.98333	0.54924	0.61686	-0.067623	1
1	0.59367	0.61664	-0.022969	1
1.0167	0.59367	0.61642	-0.022745	1
1.0333	0.59367	0.61619	-0.022521	1
1.05	0.59367	0.61597	-0.022297	1
1.0667	0.59367	0.61574	-0.022073	1
1.0833	0.59367	0.61552	-0.02185	1
1.1	0.59367	0.6153	-0.021626	1
1.1167	0.59367	0.61507	-0.021402	1
1.1333	0.59367	0.61485	-0.021179	1
1.15	0.59367	0.61463	-0.020955	1
1.1667	0.59367	0.6144	-0.020732	1

1.1833	0.59367	0.61418	-0.020509	1
1.2	0.59367	0.61396	-0.020286	1
1.2167	0.59367	0.61373	-0.020062	1
1.2333	0.54924	0.61351	-0.064269	1
1.25	0.59367	0.61329	-0.019616	1
1.2667	0.59367	0.61306	-0.019393	1
1.2833	0.59367	0.61284	-0.019171	1
1.3	0.54924	0.61262	-0.063378	1
1.3167	0.59367	0.6124	-0.018725	1
1.3333	0.54924	0.61217	-0.062933	1
1.35	0.59367	0.61195	-0.01828	1
1.3667	0.59367	0.61173	-0.018058	1
1.3833	0.59367	0.61151	-0.017836	1
1.4	0.59367	0.61128	-0.017613	1
1.4167	0.59367	0.61106	-0.017391	1
1.4333	0.59367	0.61084	-0.017169	1
1.45	0.59367	0.61062	-0.016947	1
1.4667	0.59367	0.6104	-0.016725	1
1.4833	0.59917	0.61017	-0.011004	1
1.5	0.55473	0.60995	-0.055222	1
1.5167	0.59367	0.60973	-0.01606	1
1.5333	0.59367	0.60951	-0.015839	1
1.55	0.59367	0.60929	-0.015617	1
1.5667	0.59917	0.60907	-0.0098955	1
1.5833	0.59367	0.60884	-0.015174	1
1.6	0.55473	0.60862	-0.053893	1
1.6167	0.59367	0.6084	-0.014732	1
1.6333	0.54924	0.60818	-0.058941	1
1.65	0.59367	0.60796	-0.01429	1
1.6667	0.59367	0.60774	-0.014069	1
1.6833	0.59367	0.60752	-0.013848	1
1.7	0.59367	0.6073	-0.013627	1
1.7167	0.59917	0.60708	-0.0079063	1
1.7333	0.59367	0.60686	-0.013186	1
1.75	0.59367	0.60664	-0.012965	1
1.7667	0.59367	0.60641	-0.012745	1
1.7833	0.59367	0.60619	-0.012524	1
1.8	0.59367	0.60597	-0.012304	1
1.8167	0.59367	0.60575	-0.012084	1
1.8333	0.59367	0.60553	-0.011864	1
1.85	0.59367	0.60531	-0.011644	1
1.8667	0.54924	0.60509	-0.055854	1
1.8833	0.59367	0.60487	-0.011204	1
1.9	0.59367	0.60465	-0.010984	1
1.9167	0.59367	0.60443	-0.010764	1
1.9333	0.59367	0.60421	-0.010545	1
1.95	0.59367	0.60399	-0.010325	1
1.9667	0.59367	0.60378	-0.010105	1
1.9833	0.59367	0.60356	-0.0098861	1
2	0.59367	0.60334	-0.0096667	1
2.0167	0.59917	0.60312	-0.0039474	1
2.0333	0.59367	0.6029	-0.0092283	1
2.05	0.54924	0.60268	-0.053439	1
2.0667	0.59367	0.60246	-0.0087901	1
2.0833	0.54924	0.60224	-0.053001	1
2.1	0.59367	0.60202	-0.0083523	1
2.1167	0.54924	0.6018	-0.052563	1
2.1333	0.54924	0.60158	-0.052345	1

2.15	0.54924	0.60137	-0.052126	1
2.1667	0.54924	0.60115	-0.051908	1
2.1833	0.59367	0.60093	-0.0072592	1
2.2	0.59367	0.60071	-0.0070408	1
2.2167	0.54924	0.60049	-0.051252	1
2.2333	0.59367	0.60027	-0.0066043	1
2.25	0.59367	0.60006	-0.0063861	1
2.2667	0.55473	0.59984	-0.045108	1
2.2833	0.54924	0.59962	-0.05038	1
2.3	0.59367	0.5994	-0.0057321	1
2.3167	0.59367	0.59918	-0.0055143	1
2.3333	0.59917	0.59897	0.0002034	1
2.35	0.59367	0.59875	-0.0050789	1
2.3667	0.59917	0.59853	0.00063875	1
2.3833	0.59367	0.59831	-0.0046438	1
2.4	0.59367	0.5981	-0.0044263	1
2.4167	0.59367	0.59788	-0.0042089	1
2.4333	0.54924	0.59766	-0.048422	1
2.45	0.59367	0.59744	-0.0037745	1
2.4667	0.59367	0.59723	-0.0035573	1
2.4833	0.59917	0.59701	0.0021596	1
2.5	0.59367	0.59679	-0.0031234	1
2.5167	0.59367	0.59658	-0.0029065	1
2.5333	0.59367	0.59636	-0.0026897	1
2.55	0.59367	0.59614	-0.002473	1
2.5667	0.59367	0.59593	-0.0022563	1
2.5833	0.59367	0.59571	-0.0020398	1
2.6	0.59367	0.59549	-0.0018233	1
2.6167	0.59367	0.59528	-0.0016068	1
2.6333	0.59367	0.59506	-0.0013906	1
2.65	0.59367	0.59484	-0.0011743	1
2.6667	0.59367	0.59463	-0.00095804	1
2.6833	0.59367	0.59441	-0.00074203	1
2.7	0.59367	0.5942	-0.00052597	1
2.7167	0.59367	0.59398	-0.00030999	1
2.7333	0.59367	0.59376	-9.4211E-005	1
2.75	0.59367	0.59355	0.00012162	1
2.7667	0.59367	0.59333	0.00033736	1
2.7833	0.59917	0.59312	0.0060529	1
2.8	0.59367	0.5929	0.00076849	1
2.8167	0.59367	0.59269	0.00098401	1
2.8333	0.59367	0.59247	0.0011993	1
2.85	0.59367	0.59226	0.0014147	1
2.8667	0.59367	0.59204	0.0016299	1
2.8833	0.59367	0.59182	0.001845	1
2.9	0.59367	0.59161	0.0020601	1
2.9167	0.59367	0.59139	0.0022752	1
2.9333	0.59367	0.59118	0.00249	1
2.95	0.59367	0.59097	0.0027049	1
2.9667	0.59367	0.59075	0.0029197	1
2.9833	0.59367	0.59054	0.0031339	1
3	0.59367	0.59032	0.003349	1
3.0167	0.59367	0.59011	0.0035639	1
3.0333	0.59367	0.58989	0.0037775	1
3.05	0.59367	0.58968	0.0039923	1
3.0667	0.59367	0.58946	0.0042067	1
3.0833	0.59367	0.58925	0.0044208	1
3.1	0.59367	0.58904	0.004635	1

3.1167	0.59367	0.58882	0.0048491	1
3.1333	0.59367	0.58861	0.005063	1
3.15	0.59367	0.58839	0.0052769	1
3.1667	0.59367	0.58818	0.0054908	1
3.1833	0.59367	0.58797	0.0057045	1
3.2	0.59367	0.58775	0.0059182	1
3.2167	0.59367	0.58754	0.0061318	1
3.2333	0.59367	0.58732	0.0063453	1
3.25	0.59917	0.58711	0.012059	1
3.2667	0.59367	0.5869	0.0067722	1
3.2833	0.59367	0.58668	0.0069854	1
3.3	0.59367	0.58647	0.0071986	1
3.3167	0.59367	0.58626	0.0074118	1
3.3333	0.59367	0.58605	0.0076248	1
3.35	0.59367	0.58583	0.0078378	1
3.3667	0.59367	0.58562	0.0080507	1
3.3833	0.59367	0.58541	0.0082635	1
3.4	0.59367	0.58519	0.0084763	1
3.4167	0.59367	0.58498	0.008689	1
3.4333	0.59367	0.58477	0.0089015	1
3.45	0.59367	0.58456	0.009114	1
3.4667	0.59367	0.58434	0.0093265	1
3.4833	0.59917	0.58413	0.015039	1
3.5	0.59367	0.58392	0.0097511	1
3.5167	0.59367	0.58371	0.0099634	1
3.5333	0.59367	0.58349	0.010175	1
3.55	0.59367	0.58328	0.010387	1
3.5667	0.59367	0.58307	0.0106	1
3.5833	0.59367	0.58286	0.010811	1
3.6	0.59367	0.58265	0.011023	1
3.6167	0.59367	0.58244	0.011235	1
3.6333	0.59367	0.58222	0.011447	1
3.65	0.59367	0.58201	0.011658	1
3.6667	0.59367	0.5818	0.01187	1
3.6833	0.59367	0.58159	0.012081	1
3.7	0.59367	0.58138	0.012292	1
3.7167	0.59367	0.58117	0.012504	1
3.7333	0.59367	0.58096	0.012715	1
3.75	0.59367	0.58074	0.012926	1
3.7667	0.59367	0.58053	0.013137	1
3.7833	0.59367	0.58032	0.013348	1
3.8	0.59367	0.58011	0.013559	1
3.8167	0.59367	0.5799	0.01377	1
3.8333	0.59367	0.57969	0.013981	1
3.85	0.59367	0.57948	0.014191	1
3.8667	0.59367	0.57927	0.014402	1
3.8833	0.59367	0.57906	0.014612	1
3.9	0.59367	0.57885	0.014823	1
3.9167	0.59367	0.57864	0.015033	1
3.9333	0.59367	0.57843	0.015243	1
3.95	0.59367	0.57822	0.015454	1
3.9667	0.59367	0.57801	0.015664	1
3.9833	0.59367	0.5778	0.015874	1
4	0.59367	0.57759	0.016084	1
4.0167	0.59367	0.57738	0.016294	1
4.0333	0.59367	0.57717	0.016504	1
4.05	0.54375	0.57696	-0.033207	1
4.0667	0.59367	0.57675	0.016923	1

4.0833	0.59367	0.57654	0.017133	1
4.1	0.59367	0.57633	0.017342	1
4.1167	0.54924	0.57612	-0.026878	1
4.1333	0.59367	0.57591	0.017761	1
4.15	0.54924	0.5757	-0.02646	1
4.1667	0.59367	0.57549	0.018179	1
4.1833	0.59367	0.57528	0.018389	1
4.2	0.59367	0.57507	0.018598	1
4.2167	0.59367	0.57486	0.018807	1
4.2333	0.59367	0.57465	0.019016	1
4.25	0.59367	0.57445	0.019224	1
4.2667	0.59367	0.57424	0.019433	1
4.2833	0.59367	0.57403	0.019642	1
4.3	0.59367	0.57382	0.01985	1
4.3167	0.59367	0.57361	0.020059	1
4.3333	0.59367	0.5734	0.020267	1
4.35	0.59367	0.57319	0.020476	1
4.3667	0.59367	0.57299	0.020684	1
4.3833	0.59367	0.57278	0.020892	1
4.4	0.59367	0.57257	0.021101	1
4.4167	0.59367	0.57236	0.021309	1
4.4333	0.59367	0.57215	0.021517	1
4.45	0.59367	0.57195	0.021725	1
4.4667	0.59367	0.57174	0.021932	1
4.4833	0.59367	0.57153	0.02214	1
4.5	0.59367	0.57132	0.022348	1
4.5167	0.59367	0.57111	0.022556	1
4.5333	0.59367	0.57091	0.022763	1
4.55	0.59367	0.5707	0.022971	1
4.5667	0.59367	0.57049	0.023178	1
4.5833	0.54375	0.57028	-0.026535	1
4.6	0.54375	0.57008	-0.026327	1
4.6167	0.54924	0.56987	-0.02063	1
4.6333	0.59367	0.56966	0.024007	1
4.65	0.59367	0.56946	0.024214	1
4.6667	0.59367	0.56925	0.024421	1
4.6833	0.59367	0.56904	0.024628	1
4.7	0.54375	0.56884	-0.025086	1
4.7167	0.59367	0.56863	0.025041	1
4.7333	0.54375	0.56842	-0.024672	1
4.75	0.54375	0.56822	-0.024466	1
4.7667	0.54924	0.56801	-0.018769	1
4.7833	0.54375	0.5678	-0.024053	1
4.8	0.54375	0.5676	-0.023846	1
4.8167	0.49931	0.56739	-0.06808	1
4.8333	0.54375	0.56718	-0.023434	1
4.85	0.59367	0.56698	0.026692	1
4.8667	0.59367	0.56677	0.026898	1
4.8833	0.54375	0.56657	-0.022816	1
4.9	0.54375	0.56636	-0.02261	1
4.9167	0.54375	0.56615	-0.022404	1
4.9333	0.54375	0.56595	-0.022198	1
4.95	0.54375	0.56574	-0.021993	1
4.9667	0.54375	0.56554	-0.021787	1
4.9833	0.54924	0.56533	-0.016092	1
5	0.54375	0.56513	-0.021376	1
5.0167	0.54375	0.56492	-0.021171	1
5.0333	0.54375	0.56472	-0.020965	1

5.05	0.54375	0.56451	-0.02076	1
5.0667	0.54375	0.5643	-0.020555	1
5.0833	0.54375	0.5641	-0.02035	1
5.1	0.54375	0.56389	-0.020145	1
5.1167	0.54375	0.56369	-0.01994	1
5.1333	0.54375	0.56349	-0.019735	1
5.15	0.54375	0.56328	-0.01953	1
5.1667	0.54375	0.56308	-0.019326	1
5.1833	0.49931	0.56287	-0.063561	1
5.2	0.54375	0.56267	-0.018916	1
5.2167	0.54375	0.56246	-0.018712	1
5.2333	0.54375	0.56226	-0.018508	1
5.25	0.54375	0.56205	-0.018303	1
5.2667	0.54375	0.56185	-0.018099	1
5.2833	0.59367	0.56164	0.032025	1
5.3	0.54375	0.56144	-0.017691	1
5.3167	0.54375	0.56124	-0.017487	1
5.3333	0.49931	0.56103	-0.061723	1
5.35	0.54375	0.56083	-0.017079	1
5.3667	0.54375	0.56062	-0.016875	1
5.3833	0.54375	0.56042	-0.016671	1
5.4	0.54375	0.56022	-0.016468	1
5.4167	0.49931	0.56001	-0.060704	1
5.4333	0.54375	0.55981	-0.01606	1
5.45	0.54375	0.55961	-0.015857	1
5.4667	0.54375	0.5594	-0.015654	1
5.4833	0.54375	0.5592	-0.01545	1
5.5	0.54375	0.559	-0.015247	1
5.5167	0.54375	0.55879	-0.015044	1
5.5333	0.54375	0.55859	-0.014841	1
5.55	0.54375	0.55839	-0.014638	1
5.5667	0.54375	0.55818	-0.014435	1
5.5833	0.54375	0.55798	-0.014232	1
5.6	0.54375	0.55778	-0.014029	1
5.6167	0.49931	0.55758	-0.058267	1
5.6333	0.54375	0.55737	-0.013624	1
5.65	0.54375	0.55717	-0.013421	1
5.6667	0.54375	0.55697	-0.013219	1
5.6833	0.54375	0.55677	-0.013017	1
5.7	0.54375	0.55656	-0.012814	1
5.7167	0.49931	0.55636	-0.057052	1
5.7333	0.54375	0.55616	-0.01241	1
5.75	0.54924	0.55596	-0.0067176	1
5.7667	0.54375	0.55576	-0.012006	1
5.7833	0.54375	0.55555	-0.011804	1
5.8	0.54375	0.55535	-0.011602	1
5.8167	0.54375	0.55515	-0.0114	1
5.8333	0.54375	0.55495	-0.011198	1
5.85	0.54375	0.55475	-0.010996	1
5.8667	0.54375	0.55454	-0.010795	1
5.8833	0.54375	0.55434	-0.010593	1
5.9	0.54375	0.55414	-0.010392	1
5.9167	0.54375	0.55394	-0.01019	1
5.9333	0.49931	0.55374	-0.054429	1
5.95	0.54375	0.55354	-0.009788	1
5.9667	0.54375	0.55334	-0.0095868	1
5.9833	0.54375	0.55314	-0.0093857	1
6	0.54375	0.55293	-0.0091847	1

6.0167	0.54375	0.55273	-0.0089837	1
6.0333	0.54375	0.55253	-0.0087829	1
6.05	0.49931	0.55233	-0.053022	1
6.0667	0.54375	0.55213	-0.0083813	1
6.0833	0.54375	0.55193	-0.0081807	1
6.1	0.54375	0.55173	-0.0079801	1
6.1167	0.54375	0.55153	-0.0077796	1
6.1333	0.54375	0.55133	-0.0075792	1
6.15	0.54375	0.55113	-0.0073788	1
6.1667	0.54375	0.55093	-0.0071785	1
6.1833	0.54375	0.55073	-0.0069783	1
6.2	0.54375	0.55053	-0.0067782	1
6.2167	0.54375	0.55033	-0.006578	1
6.2333	0.54375	0.55013	-0.0063781	1
6.25	0.54375	0.54993	-0.0061782	1
6.2667	0.49931	0.54973	-0.050418	1
6.2833	0.49931	0.54953	-0.050219	1
6.3	0.54375	0.54933	-0.0055788	1
6.3167	0.54375	0.54913	-0.0053792	1
6.3333	0.54375	0.54893	-0.0051797	1
6.35	0.54375	0.54873	-0.0049801	1
6.3667	0.54375	0.54853	-0.0047807	1
6.3833	0.54375	0.54833	-0.0045814	1
6.4	0.54375	0.54813	-0.0043821	1
6.4167	0.54375	0.54793	-0.0041829	1
6.4333	0.54375	0.54773	-0.0039838	1
6.45	0.54375	0.54753	-0.0037847	1
6.4667	0.54375	0.54734	-0.0035857	1
6.4833	0.54375	0.54714	-0.0033869	1
6.5	0.54375	0.54694	-0.003188	1
6.5167	0.54375	0.54674	-0.0029892	1
6.5333	0.54375	0.54654	-0.0027906	1
6.55	0.54375	0.54634	-0.0025919	1
6.5667	0.54375	0.54614	-0.0023933	1
6.5833	0.54375	0.54594	-0.0021949	1
6.6	0.54375	0.54575	-0.0019965	1
6.6167	0.54375	0.54555	-0.0017981	1
6.6333	0.54375	0.54535	-0.0015999	1
6.65	0.49931	0.54515	-0.045842	1
6.6667	0.54375	0.54495	-0.0012035	1
6.6833	0.54375	0.54476	-0.0010056	1
6.7	0.54375	0.54456	-0.00080757	1
6.7167	0.54375	0.54436	-0.00060963	1
6.7333	0.54375	0.54416	-0.00041188	1
6.75	0.54375	0.54396	-0.00021408	1
6.7667	0.54375	0.54377	-1.6358E-005	1
6.7833	0.54375	0.54357	0.00018118	1
6.8	0.54375	0.54337	0.00037876	1
6.8167	0.54375	0.54317	0.00057627	1
6.8333	0.54375	0.54298	0.00077358	1
6.85	0.54375	0.54278	0.00097095	1
6.8667	0.54375	0.54258	0.0011682	1
6.8833	0.54375	0.54238	0.0013653	1
6.9	0.54375	0.54219	0.0015625	1
6.9167	0.54375	0.54199	0.0017596	1
6.9333	0.54375	0.54179	0.0019565	1
6.95	0.54375	0.5416	0.0021534	1
6.9667	0.54375	0.5414	0.0023503	1

6.9833	0.54375	0.5412	0.0025469	1
7	0.54375	0.54101	0.0027437	1
7.0167	0.54375	0.54081	0.0029403	1
7.0333	0.54375	0.54061	0.0031368	1
7.05	0.49931	0.54042	-0.041107	1
7.0667	0.54375	0.54022	0.0035297	1
7.0833	0.54375	0.54002	0.003726	1
7.1	0.54375	0.53983	0.0039222	1
7.1167	0.49931	0.53963	-0.040322	1
7.1333	0.54375	0.53944	0.0043145	1
7.15	0.54375	0.53924	0.0045106	1
7.1667	0.49931	0.53904	-0.039733	1
7.1833	0.54375	0.53885	0.0049024	1
7.2	0.54375	0.53865	0.0050983	1
7.2167	0.54375	0.53846	0.0052941	1
7.2333	0.54375	0.53826	0.0054897	1
7.25	0.54375	0.53806	0.0056853	1
7.2667	0.54375	0.53787	0.0058809	1
7.2833	0.54375	0.53767	0.0060763	1
7.3	0.54375	0.53748	0.0062717	1
7.3167	0.54375	0.53728	0.0064671	1
7.3333	0.54375	0.53709	0.0066623	1
7.35	0.54375	0.53689	0.0068575	1
7.3667	0.54375	0.5367	0.0070527	1
7.3833	0.54375	0.5365	0.0072476	1
7.4	0.49931	0.53631	-0.036997	1
7.4167	0.54375	0.53611	0.0076376	1
7.4333	0.54375	0.53592	0.0078323	1
7.45	0.49931	0.53572	-0.036413	1
7.4667	0.54375	0.53553	0.0082219	1
7.4833	0.54375	0.53533	0.0084164	1
7.5	0.54375	0.53514	0.008611	1
7.5167	0.54375	0.53494	0.0088055	1
7.5333	0.54375	0.53475	0.0089998	1
7.55	0.54375	0.53456	0.0091942	1
7.5667	0.54375	0.53436	0.0093885	1
7.5833	0.54375	0.53417	0.0095826	1
7.6	0.54375	0.53397	0.0097768	1
7.6167	0.54375	0.53378	0.0099709	1
7.6333	0.49931	0.53359	-0.034275	1
7.65	0.54375	0.53339	0.010359	1
7.6667	0.54375	0.5332	0.010553	1
7.6833	0.54375	0.533	0.010746	1
7.7	0.54375	0.53281	0.01094	1
7.7167	0.54375	0.53262	0.011134	1
7.7333	0.54375	0.53242	0.011327	1
7.75	0.54375	0.53223	0.011521	1
7.7667	0.54375	0.53204	0.011714	1
7.7833	0.54375	0.53184	0.011907	1
7.8	0.54375	0.53165	0.012101	1
7.8167	0.54375	0.53146	0.012294	1
7.8333	0.54375	0.53126	0.012487	1
7.85	0.54375	0.53107	0.01268	1
7.8667	0.54375	0.53088	0.012873	1
7.8833	0.54375	0.53068	0.013066	1
7.9	0.54375	0.53049	0.013259	1
7.9167	0.54375	0.5303	0.013452	1
7.9333	0.54375	0.53011	0.013644	1

7.95	0.54375	0.52991	0.013837	1
7.9667	0.54375	0.52972	0.01403	1
7.9833	0.54375	0.52953	0.014222	1
8	0.54375	0.52934	0.014415	1
8.0167	0.49931	0.52914	-0.029833	1
8.0333	0.54375	0.52895	0.014799	1
8.05	0.54375	0.52876	0.014992	1
8.0667	0.54375	0.52857	0.015184	1
8.0833	0.54375	0.52837	0.015376	1
8.1	0.54375	0.52818	0.015568	1
8.1167	0.54375	0.52799	0.01576	1
8.1333	0.54375	0.5278	0.015952	1
8.15	0.49931	0.52761	-0.028297	1
8.1667	0.54375	0.52741	0.016335	1
8.1833	0.54375	0.52722	0.016527	1
8.2	0.49931	0.52703	-0.027722	1
8.2167	0.54375	0.52684	0.01691	1
8.2333	0.54375	0.52665	0.017101	1
8.25	0.54375	0.52646	0.017293	1
8.2667	0.54375	0.52627	0.017484	1
8.2833	0.54375	0.52607	0.017675	1
8.3	0.54375	0.52588	0.017867	1
8.3167	0.54375	0.52569	0.018058	1
8.3333	0.49931	0.5255	-0.026191	1
8.35	0.54375	0.52531	0.01844	1
8.3667	0.54375	0.52512	0.018631	1
8.3833	0.49931	0.52493	-0.025619	1
8.4	0.54375	0.52474	0.019012	1
8.4167	0.54375	0.52455	0.019203	1
8.4333	0.50479	0.52436	-0.019566	1
8.45	0.54375	0.52417	0.019584	1
8.4667	0.54375	0.52398	0.019775	1
8.4833	0.49931	0.52378	-0.024475	1
8.5	0.54375	0.52359	0.020155	1
8.5167	0.54375	0.5234	0.020346	1
8.5333	0.49931	0.52321	-0.023904	1
8.55	0.54375	0.52302	0.020726	1
8.5667	0.54375	0.52283	0.020916	1
8.5833	0.49931	0.52264	-0.023334	1
8.6	0.54375	0.52245	0.021296	1
8.6167	0.54375	0.52226	0.021486	1
8.6333	0.49931	0.52207	-0.022764	1
8.65	0.54375	0.52188	0.021865	1
8.6667	0.54375	0.52169	0.022055	1
8.6833	0.49931	0.52151	-0.022195	1
8.7	0.54375	0.52132	0.022434	1
8.7167	0.54375	0.52113	0.022624	1
8.7333	0.54375	0.52094	0.022813	1
8.75	0.54375	0.52075	0.023002	1
8.7667	0.54375	0.52056	0.023192	1
8.7833	0.54375	0.52037	0.023381	1
8.8	0.54375	0.52018	0.02357	1
8.8167	0.54375	0.51999	0.023759	1
8.8333	0.54375	0.5198	0.023948	1
8.85	0.49931	0.51961	-0.020303	1
8.8667	0.54375	0.51942	0.024326	1
8.8833	0.54375	0.51924	0.024514	1
8.9	0.54375	0.51905	0.024703	1

8.9167	0.54375	0.51886	0.024892	1
8.9333	0.49931	0.51867	-0.01936	1
8.95	0.54375	0.51848	0.025269	1
8.9667	0.54375	0.51829	0.025457	1
8.9833	0.54375	0.5181	0.025646	1
9	0.54375	0.51792	0.025834	1
9.0167	0.49931	0.51773	-0.018418	1
9.0333	0.54375	0.51754	0.02621	1
9.05	0.54375	0.51735	0.026398	1
9.0667	0.54375	0.51716	0.026586	1
9.0833	0.54375	0.51698	0.026774	1
9.1	0.54375	0.51679	0.026962	1
9.1167	0.54375	0.5166	0.02715	1
9.1333	0.54375	0.51641	0.027338	1
9.15	0.54375	0.51622	0.027525	1
9.1667	0.54375	0.51604	0.027713	1
9.1833	0.54375	0.51585	0.027901	1
9.2	0.54375	0.51566	0.028088	1
9.2167	0.49931	0.51547	-0.016165	1
9.2333	0.54375	0.51529	0.028463	1
9.25	0.54375	0.5151	0.02865	1
9.2667	0.49931	0.51491	-0.015603	1
9.2833	0.54375	0.51473	0.029024	1
9.3	0.49383	0.51454	-0.020709	1
9.3167	0.49931	0.51435	-0.015042	1
9.3333	0.54375	0.51416	0.029585	1
9.35	0.49931	0.51398	-0.014668	1
9.3667	0.54375	0.51379	0.029959	1
9.3833	0.54375	0.5136	0.030146	1
9.4	0.49931	0.51342	-0.014108	1
9.4167	0.54375	0.51323	0.030519	1
9.4333	0.54375	0.51304	0.030705	1
9.45	0.54375	0.51286	0.030892	1
9.4667	0.49931	0.51267	-0.013362	1
9.4833	0.49931	0.51249	-0.013175	1
9.5	0.49931	0.5123	-0.012989	1
9.5167	0.54375	0.51211	0.031637	1
9.5333	0.49931	0.51193	-0.012617	1
9.55	0.54375	0.51174	0.032009	1
9.5667	0.54375	0.51155	0.032195	1
9.5833	0.49931	0.51137	-0.012059	1
9.6	0.54375	0.51118	0.032567	1
9.6167	0.54375	0.511	0.032753	1
9.6333	0.54375	0.51081	0.032938	1
9.65	0.49931	0.51063	-0.011316	1
9.6667	0.54375	0.51044	0.03331	1
9.6833	0.54375	0.51025	0.033495	1
9.7	0.44938	0.51007	-0.06069	1
9.7167	0.54375	0.50988	0.033866	1
9.7333	0.49383	0.5097	-0.015869	1
9.75	0.49931	0.50951	-0.010204	1
9.7667	0.49383	0.50933	-0.015498	1
9.7833	0.54375	0.50914	0.034607	1
9.8	0.49383	0.50896	-0.015128	1
9.8167	0.54375	0.50877	0.034977	1
9.8333	0.54375	0.50859	0.035161	1
9.85	0.49383	0.5084	-0.014574	1
9.8667	0.49383	0.50822	-0.014389	1

9.8833	0.54375	0.50803	0.035716	1
9.9	0.49931	0.50785	-0.0085396	1
9.9167	0.49931	0.50766	-0.008355	1
9.9333	0.54375	0.50748	0.036269	1
9.95	0.49383	0.5073	-0.013466	1
9.9667	0.49383	0.50711	-0.013282	1
9.9833	0.49383	0.50693	-0.013097	1
10	0.49383	0.50674	-0.012913	1
10.017	0.54375	0.50656	0.037191	1
10.033	0.49383	0.50638	-0.012545	1
10.05	0.49383	0.50619	-0.012361	1
10.067	0.49383	0.50601	-0.012177	1
10.083	0.54375	0.50582	0.037927	1
10.1	0.54375	0.50564	0.038111	1
10.117	0.44938	0.50546	-0.056075	1
10.133	0.49383	0.50527	-0.011442	1
10.15	0.49383	0.50509	-0.011258	1
10.167	0.54375	0.5049	0.038846	1
10.183	0.49383	0.50472	-0.010892	1
10.2	0.49931	0.50454	-0.0052277	1
10.217	0.54375	0.50435	0.039396	1
10.233	0.49383	0.50417	-0.010341	1
10.25	0.54375	0.50399	0.039762	1
10.267	0.49383	0.5038	-0.0099743	1
10.283	0.54375	0.50362	0.040128	1
10.3	0.49383	0.50344	-0.0096086	1
10.317	0.44938	0.50326	-0.053875	1
10.333	0.49383	0.50307	-0.0092431	1
10.35	0.49383	0.50289	-0.0090599	1
10.367	0.49383	0.50271	-0.0088768	1
10.383	0.49383	0.50252	-0.0086948	1
10.4	0.44938	0.50234	-0.052962	1
10.417	0.49383	0.50216	-0.0083289	1
10.433	0.44938	0.50198	-0.052597	1
10.45	0.49383	0.50179	-0.0079643	1
10.467	0.49383	0.50161	-0.0077816	1
10.483	0.44938	0.50143	-0.05205	1
10.5	0.49383	0.50125	-0.0074175	1
10.517	0.44938	0.50106	-0.051685	1
10.533	0.54375	0.50088	0.042866	1
10.55	0.49383	0.5007	-0.0068712	1
10.567	0.49383	0.50052	-0.0066889	1
10.583	0.49383	0.50034	-0.0065077	1
10.6	0.44938	0.50016	-0.050775	1
10.617	0.49383	0.49997	-0.0061434	1
10.633	0.49383	0.49979	-0.0059624	1
10.65	0.54375	0.49961	0.04414	1
10.667	0.49383	0.49943	-0.0055985	1
10.683	0.44938	0.49925	-0.049868	1
10.7	0.49383	0.49907	-0.0052359	1
10.717	0.44938	0.49888	-0.049504	1
10.733	0.49383	0.4987	-0.0048736	1
10.75	0.49383	0.49852	-0.004692	1
10.767	0.49383	0.49834	-0.0045105	1
10.783	0.49383	0.49816	-0.0043301	1
10.8	0.49383	0.49798	-0.0041487	1
10.817	0.49383	0.4978	-0.0039673	1
10.833	0.49383	0.49762	-0.0037872	1

10.85	0.49383	0.49744	-0.003606	1
10.867	0.49383	0.49725	-0.0034248	1
10.883	0.49383	0.49707	-0.0032448	1
10.9	0.49383	0.49689	-0.0030638	1
10.917	0.49383	0.49671	-0.0028829	1
10.933	0.49383	0.49653	-0.0027031	1
10.95	0.49383	0.49635	-0.0025223	1
10.967	0.44938	0.49617	-0.046792	1
10.983	0.49383	0.49599	-0.0021619	1
11	0.49383	0.49581	-0.0019813	1
11.017	0.49383	0.49563	-0.0018008	1
11.033	0.49383	0.49545	-0.0016214	1
11.05	0.49383	0.49527	-0.001441	1
11.067	0.49383	0.49509	-0.0012606	1
11.083	0.49383	0.49491	-0.0010814	1
11.1	0.49383	0.49473	-0.00090121	1
11.117	0.49383	0.49455	-0.00072105	1
11.133	0.49383	0.49437	-0.00054204	1
11.15	0.49383	0.49419	-0.00036202	1
11.167	0.49383	0.49401	-0.00018207	1
11.183	0.49383	0.49383	-3.2534E-006	1
11.2	0.44938	0.49365	-0.044273	1
11.217	0.49383	0.49347	0.00035633	1
11.233	0.49383	0.4933	0.00053495	1
11.25	0.49383	0.49312	0.00071458	1
11.267	0.49383	0.49294	0.00089414	1
11.283	0.44938	0.49276	-0.043377	1
11.3	0.49383	0.49258	0.001252	1
11.317	0.49383	0.4924	0.0014314	1
11.333	0.49383	0.49222	0.0016096	1
11.35	0.49383	0.49204	0.0017888	1
11.367	0.44938	0.49186	-0.042482	1
11.383	0.49383	0.49168	0.002146	1
11.4	0.44938	0.4915	-0.042125	1
11.417	0.44938	0.49133	-0.041946	1
11.433	0.49383	0.49115	0.0026819	1
11.45	0.49383	0.49097	0.0028608	1
11.467	0.49383	0.49079	0.0030395	1
11.483	0.44938	0.49061	-0.041233	1
11.5	0.49383	0.49043	0.0033958	1
11.517	0.49383	0.49026	0.0035744	1
11.533	0.49383	0.49008	0.0037519	1
11.55	0.44938	0.4899	-0.04052	1
11.567	0.44938	0.48972	-0.040341	1
11.583	0.49383	0.48954	0.004286	1
11.6	0.44938	0.48937	-0.039986	1
11.617	0.49383	0.48919	0.0046425	1
11.633	0.49383	0.48901	0.0048195	1
11.65	0.44938	0.48883	-0.039452	1
11.667	0.49383	0.48865	0.0051756	1
11.683	0.44938	0.48848	-0.039098	1
11.7	0.49383	0.4883	0.0055303	1
11.717	0.49383	0.48812	0.0057082	1
11.733	0.49383	0.48795	0.0058848	1
11.75	0.49383	0.48777	0.0060625	1
11.767	0.44938	0.48759	-0.03821	1
11.783	0.49383	0.48741	0.0064166	1
11.8	0.44938	0.48724	-0.037856	1

11.817	0.49383	0.48706	0.0067715	1
11.833	0.49383	0.48688	0.0069478	1
11.85	0.49383	0.4867	0.0071251	1
11.867	0.49383	0.48653	0.0073024	1
11.883	0.49383	0.48635	0.0074785	1
11.9	0.49383	0.48617	0.0076556	1
11.917	0.44938	0.486	-0.036617	1
11.933	0.49383	0.48582	0.0080085	1
11.95	0.49383	0.48564	0.0081854	1
11.967	0.49383	0.48547	0.0083623	1
11.983	0.49383	0.48529	0.008538	1
12	0.49383	0.48512	0.0087147	1
12.017	0.49383	0.48494	0.0088913	1
12.033	0.44938	0.48476	-0.035383	1
12.05	0.49383	0.48459	0.0092434	1
12.067	0.49383	0.48441	0.0094199	1
12.083	0.44938	0.48423	-0.034855	1
12.1	0.49383	0.48406	0.0097715	1
12.117	0.44938	0.48388	-0.034502	1
12.133	0.49383	0.48371	0.010123	1
12.15	0.44938	0.48353	-0.034151	1
12.167	0.49383	0.48335	0.010475	1
12.183	0.49383	0.48318	0.01065	1
12.2	0.49383	0.483	0.010826	1
12.217	0.49383	0.48283	0.011002	1
12.233	0.49383	0.48265	0.011177	1
12.25	0.49383	0.48248	0.011352	1
12.267	0.44938	0.4823	-0.032922	1
12.283	0.49383	0.48213	0.011703	1
12.3	0.49383	0.48195	0.011878	1
12.317	0.49383	0.48178	0.012054	1
12.333	0.49383	0.4816	0.012228	1
12.35	0.49383	0.48143	0.012404	1
12.367	0.44938	0.48125	-0.031871	1
12.383	0.49383	0.48108	0.012753	1
12.4	0.49383	0.4809	0.012928	1
12.417	0.44938	0.48073	-0.031347	1
12.433	0.44938	0.48055	-0.031173	1
12.45	0.49383	0.48038	0.013452	1
12.467	0.49383	0.4802	0.013627	1
12.483	0.49383	0.48003	0.013801	1
12.5	0.44938	0.47985	-0.030474	1
12.517	0.49383	0.47968	0.014151	1
12.533	0.44938	0.47951	-0.030126	1
12.55	0.49383	0.47933	0.014499	1
12.567	0.49383	0.47916	0.014673	1
12.583	0.49383	0.47898	0.014847	1
12.6	0.49383	0.47881	0.015021	1
12.617	0.44938	0.47863	-0.029254	1
12.633	0.49383	0.47846	0.015369	1
12.65	0.44938	0.47829	-0.028907	1
12.667	0.49383	0.47811	0.015717	1
12.683	0.49383	0.47794	0.01589	1
12.7	0.49383	0.47777	0.016064	1
12.717	0.49383	0.47759	0.016238	1
12.733	0.44938	0.47742	-0.028039	1
12.75	0.49383	0.47724	0.016585	1
12.767	0.44938	0.47707	-0.027691	1

12.783	0.49383	0.4769	0.016931	1
12.8	0.49383	0.47672	0.017105	1
12.817	0.49383	0.47655	0.017279	1
12.833	0.49383	0.47638	0.017451	1
12.85	0.44938	0.47621	-0.026825	1
12.867	0.49383	0.47603	0.017798	1
12.883	0.44938	0.47586	-0.02648	1
12.9	0.49383	0.47569	0.018144	1
12.917	0.49383	0.47551	0.018317	1
12.933	0.49383	0.47534	0.018489	1
12.95	0.49383	0.47517	0.018662	1
12.967	0.49383	0.47499	0.018835	1
12.983	0.49383	0.47482	0.019007	1
13	0.49383	0.47465	0.01918	1
13.017	0.49383	0.47448	0.019353	1
13.033	0.49383	0.47431	0.019525	1
13.05	0.49383	0.47413	0.019697	1
13.067	0.49383	0.47396	0.01987	1
13.083	0.44938	0.47379	-0.024409	1
13.1	0.49383	0.47362	0.020214	1
13.117	0.49383	0.47344	0.020386	1
13.133	0.49383	0.47327	0.020558	1
13.15	0.49383	0.4731	0.02073	1
13.167	0.44938	0.47293	-0.023548	1
13.183	0.49383	0.47276	0.021074	1
13.2	0.44938	0.47258	-0.023204	1
13.217	0.49383	0.47241	0.021418	1
13.233	0.49383	0.47224	0.021589	1
13.25	0.49383	0.47207	0.021761	1
13.267	0.49383	0.4719	0.021933	1
13.283	0.49383	0.47173	0.022104	1
13.3	0.49383	0.47155	0.022275	1
13.317	0.49383	0.47138	0.022447	1
13.333	0.49383	0.47121	0.022618	1
13.35	0.44938	0.47104	-0.021661	1
13.367	0.44938	0.47087	-0.021489	1
13.383	0.49383	0.4707	0.023131	1
13.4	0.49383	0.47053	0.023303	1
13.417	0.44938	0.47036	-0.020976	1
13.433	0.49383	0.47019	0.023644	1
13.45	0.44938	0.47001	-0.020635	1
13.467	0.49383	0.46984	0.023987	1
13.483	0.49383	0.46967	0.024157	1
13.5	0.49383	0.4695	0.024328	1
13.517	0.49383	0.46933	0.024499	1
13.533	0.49383	0.46916	0.024669	1
13.55	0.44938	0.46899	-0.019611	1
13.567	0.49383	0.46882	0.02501	1
13.583	0.49383	0.46865	0.02518	1
13.6	0.44938	0.46848	-0.0191	1
13.617	0.49383	0.46831	0.025521	1
13.633	0.49383	0.46814	0.025691	1
13.65	0.49383	0.46797	0.025861	1
13.667	0.44938	0.4678	-0.018419	1
13.683	0.49383	0.46763	0.026201	1
13.7	0.44938	0.46746	-0.018079	1
13.717	0.49383	0.46729	0.026541	1
13.733	0.49383	0.46712	0.02671	1

13.75	0.49383	0.46695	0.026881	1
13.767	0.44938	0.46678	-0.017399	1
13.783	0.49383	0.46661	0.02722	1
13.8	0.49383	0.46644	0.027389	1
13.817	0.49383	0.46627	0.027559	1
13.833	0.44938	0.4661	-0.016722	1
13.85	0.49383	0.46593	0.027898	1
13.867	0.49383	0.46576	0.028067	1
13.883	0.49383	0.46559	0.028236	1
13.9	0.49383	0.46542	0.028406	1
13.917	0.49383	0.46525	0.028575	1
13.933	0.49383	0.46509	0.028743	1
13.95	0.49383	0.46492	0.028913	1
13.967	0.49383	0.46475	0.029082	1
13.983	0.49383	0.46458	0.02925	1
14	0.49383	0.46441	0.02942	1
14.017	0.49383	0.46424	0.029589	1
14.033	0.49383	0.46407	0.029757	1
14.05	0.49383	0.4639	0.029926	1
14.067	0.49383	0.46374	0.030095	1
14.083	0.49383	0.46357	0.030262	1
14.1	0.49383	0.4634	0.030431	1
14.117	0.49383	0.46323	0.0306	1
14.133	0.49383	0.46306	0.030768	1
14.15	0.49383	0.46289	0.030936	1
14.167	0.49383	0.46273	0.031105	1
14.183	0.49383	0.46256	0.031272	1
14.2	0.49383	0.46239	0.031441	1
14.217	0.49383	0.46222	0.031609	1
14.233	0.49383	0.46205	0.031776	1
14.25	0.49383	0.46189	0.031945	1
14.267	0.49383	0.46172	0.032113	1
14.283	0.49383	0.46155	0.03228	1
14.3	0.44938	0.46138	-0.012002	1
14.317	0.49383	0.46121	0.032616	1
14.333	0.44938	0.46105	-0.011667	1
14.35	0.49383	0.46088	0.032951	1
14.367	0.49383	0.46071	0.033119	1
14.383	0.49383	0.46054	0.033285	1
14.4	0.49383	0.46038	0.033453	1
14.417	0.49383	0.46021	0.033621	1
14.433	0.44938	0.46004	-0.010663	1
14.45	0.49383	0.45988	0.033955	1
14.467	0.49383	0.45971	0.034122	1
14.483	0.49383	0.45954	0.034289	1
14.5	0.49383	0.45937	0.034456	1
14.517	0.49383	0.45921	0.034623	1
14.533	0.49383	0.45904	0.03479	1
14.55	0.49383	0.45887	0.034957	1
14.567	0.49383	0.45871	0.035124	1
14.583	0.49383	0.45854	0.03529	1
14.6	0.49383	0.45837	0.035457	1
14.617	0.49383	0.45821	0.035624	1
14.633	0.49383	0.45804	0.03579	1
14.65	0.49383	0.45787	0.035956	1
14.667	0.49383	0.45771	0.036123	1
14.683	0.49383	0.45754	0.036289	1
14.7	0.49383	0.45737	0.036455	1

14.717	0.49383	0.45721	0.036622	1
14.733	0.49383	0.45704	0.036787	1
14.75	0.49383	0.45688	0.036954	1
14.767	0.49383	0.45671	0.03712	1
14.783	0.49383	0.45654	0.037286	1
14.8	0.49383	0.45638	0.037452	1
14.817	0.44938	0.45621	-0.006832	1
14.833	0.49383	0.45605	0.037783	1
14.85	0.49383	0.45588	0.037949	1
14.867	0.49383	0.45571	0.038115	1
14.883	0.49383	0.45555	0.03828	1
14.9	0.49383	0.45538	0.038446	1
14.917	0.49383	0.45522	0.038612	1
14.933	0.49383	0.45505	0.038777	1
14.95	0.49383	0.45489	0.038942	1
14.967	0.49383	0.45472	0.039108	1
14.983	0.49383	0.45456	0.039273	1
15	0.49383	0.45439	0.039438	1
15.017	0.49383	0.45423	0.039604	1
15.033	0.49383	0.45406	0.039768	1
15.05	0.49383	0.4539	0.039933	1
15.067	0.49383	0.45373	0.040099	1
15.083	0.4439	0.45357	-0.0096671	1
15.1	0.49383	0.4534	0.040428	1
15.117	0.49383	0.45324	0.040593	1
15.133	0.49383	0.45307	0.040757	1
15.15	0.49383	0.45291	0.040922	1
15.167	0.49383	0.45274	0.041087	1
15.183	0.49383	0.45258	0.041251	1
15.2	0.49383	0.45241	0.041416	1
15.217	0.49383	0.45225	0.041581	1
15.233	0.49383	0.45209	0.041744	1
15.25	0.49383	0.45192	0.041909	1
15.267	0.49383	0.45176	0.042073	1
15.283	0.49383	0.45159	0.042237	1
15.3	0.49383	0.45143	0.042401	1
15.317	0.4439	0.45126	-0.0073643	1
15.333	0.49383	0.4511	0.042729	1
15.35	0.49383	0.45094	0.042893	1
15.367	0.49383	0.45077	0.043058	1
15.383	0.49383	0.45061	0.043221	1
15.4	0.49383	0.45045	0.043385	1
15.417	0.49383	0.45028	0.043549	1
15.433	0.49383	0.45012	0.043712	1
15.45	0.49383	0.44995	0.043876	1
15.467	0.49383	0.44979	0.04404	1
15.483	0.4439	0.44963	-0.0057276	1
15.5	0.44938	0.44946	-8.3895E-005	1
15.517	0.49383	0.4493	0.04453	1
15.533	0.49383	0.44914	0.044692	1
15.55	0.49383	0.44897	0.044856	1
15.567	0.49383	0.44881	0.045019	1
15.583	0.4439	0.44865	-0.0047481	1
15.6	0.49383	0.44848	0.045345	1
15.617	0.49383	0.44832	0.045509	1
15.633	0.49383	0.44816	0.045671	1
15.65	0.4439	0.448	-0.004096	1
15.667	0.49383	0.44783	0.045997	1

15.683	0.4439	0.44767	-0.0037707	1
15.7	0.49383	0.44751	0.046322	1
15.717	0.4439	0.44734	-0.0034447	1
15.733	0.49383	0.44718	0.046647	1
15.75	0.4439	0.44702	-0.00312	1
15.767	0.49383	0.44686	0.046973	1
15.783	0.4439	0.4467	-0.0027955	1
15.8	0.49383	0.44653	0.047297	1
15.817	0.4439	0.44637	-0.0024702	1
15.833	0.49383	0.44621	0.047621	1
15.85	0.49383	0.44605	0.047784	1
15.867	0.4439	0.44588	-0.0019837	1
15.883	0.4439	0.44572	-0.0018223	1
15.9	0.4439	0.44556	-0.00166	1
15.917	0.4439	0.4454	-0.0014978	1
15.933	0.4439	0.44524	-0.0013366	1
15.95	0.4439	0.44507	-0.0011744	1
15.967	0.4439	0.44491	-0.0010124	1
15.983	0.49383	0.44475	0.049079	1
16	0.4439	0.44459	-0.00068937	1
16.017	0.44938	0.44443	0.0049525	1
16.033	0.4439	0.44427	-0.00036661	1
16.05	0.49383	0.4441	0.049725	1
16.067	0.4439	0.44394	-4.3116E-005	1
16.083	0.4439	0.44378	0.00011757	1
16.1	0.4439	0.44362	0.00027917	1
16.117	0.39945	0.44346	-0.044009	1
16.133	0.4439	0.4433	0.00060123	1
16.15	0.4439	0.44314	0.00076265	1
16.167	0.4439	0.44298	0.00092402	1
16.183	0.4439	0.44282	0.0010844	1
16.2	0.4439	0.44265	0.0012456	1
16.217	0.4439	0.44249	0.0014068	1
16.233	0.4439	0.44233	0.001567	1
16.25	0.4439	0.44217	0.001728	1
16.267	0.4439	0.44201	0.001889	1
16.283	0.49383	0.44185	0.051979	1
16.3	0.4439	0.44169	0.0022099	1
16.317	0.4439	0.44153	0.0023708	1
16.333	0.4439	0.44137	0.0025306	1
16.35	0.4439	0.44121	0.0026913	1
16.367	0.4439	0.44105	0.002852	1
16.383	0.4439	0.44089	0.0030116	1
16.4	0.4439	0.44073	0.0031722	1
16.417	0.4439	0.44057	0.0033326	1
16.433	0.4439	0.44041	0.0034921	1
16.45	0.4439	0.44025	0.0036525	1
16.467	0.4439	0.44009	0.0038128	1
16.483	0.4439	0.43993	0.0039721	1
16.5	0.39945	0.43977	-0.040318	1
16.517	0.4439	0.43961	0.0042924	1
16.533	0.4439	0.43945	0.0044516	1
16.55	0.4439	0.43929	0.0046116	1
16.567	0.4439	0.43913	0.0047715	1
16.583	0.4439	0.43897	0.0049305	1
16.6	0.4439	0.43881	0.0050903	1
16.617	0.4439	0.43865	0.0052501	1
16.633	0.4439	0.43849	0.0054089	1

16.65	0.4439	0.43833	0.0055686	1
16.667	0.4439	0.43817	0.0057282	1
16.683	0.4439	0.43801	0.0058868	1
16.7	0.4439	0.43785	0.0060463	1
16.717	0.39945	0.43769	-0.038244	1
16.733	0.4439	0.43754	0.0063642	1
16.75	0.4439	0.43738	0.0065235	1
16.767	0.4439	0.43722	0.0066827	1
16.783	0.4439	0.43706	0.006841	1
16.8	0.4439	0.4369	0.0070002	1
16.817	0.4439	0.43674	0.0071592	1
16.833	0.39945	0.43658	-0.037133	1
16.85	0.4439	0.43642	0.0074763	1
16.867	0.4439	0.43626	0.0076352	1
16.883	0.4439	0.43611	0.0077931	1
16.9	0.39945	0.43595	-0.036498	1
16.917	0.39945	0.43579	-0.036339	1
16.933	0.4439	0.43563	0.0082684	1
16.95	0.4439	0.43547	0.0084271	1
16.967	0.4439	0.43531	0.0085856	1
16.983	0.4439	0.43516	0.0087432	1
17	0.4439	0.435	0.0089017	1
17.017	0.4439	0.43484	0.0090601	1
17.033	0.4439	0.43468	0.0092175	1
17.05	0.4439	0.43452	0.0093757	1
17.067	0.4439	0.43437	0.009534	1
17.083	0.4439	0.43421	0.0096912	1
17.1	0.4439	0.43405	0.0098493	1
17.117	0.4439	0.43389	0.010007	1
17.133	0.4439	0.43374	0.010164	1
17.15	0.4439	0.43358	0.010322	1
17.167	0.4439	0.43342	0.01048	1
17.183	0.4439	0.43326	0.010637	1
17.2	0.4439	0.43311	0.010795	1
17.217	0.4439	0.43295	0.010953	1
17.233	0.4439	0.43279	0.011109	1
17.25	0.4439	0.43263	0.011267	1
17.267	0.4439	0.43248	0.011424	1
17.283	0.4439	0.43232	0.011581	1
17.3	0.4439	0.43216	0.011738	1
17.317	0.4439	0.432	0.011896	1
17.333	0.4439	0.43185	0.012052	1
17.35	0.4439	0.43169	0.012209	1
17.367	0.4439	0.43153	0.012367	1
17.383	0.4439	0.43138	0.012523	1
17.4	0.44938	0.43122	0.01816	1
17.417	0.4439	0.43106	0.012837	1
17.433	0.4439	0.43091	0.012993	1
17.45	0.39945	0.43075	-0.0313	1
17.467	0.4439	0.43059	0.013307	1
17.483	0.4439	0.43044	0.013463	1
17.5	0.4439	0.43028	0.013619	1
17.517	0.39945	0.43012	-0.030674	1
17.533	0.4439	0.42997	0.013932	1
17.55	0.4439	0.42981	0.014088	1
17.567	0.4439	0.42966	0.014245	1
17.583	0.4439	0.4295	0.0144	1
17.6	0.4439	0.42934	0.014557	1

17.617	0.4439	0.42919	0.014713	1
17.633	0.39945	0.42903	-0.029582	1
17.65	0.4439	0.42888	0.015025	1
17.667	0.39945	0.42872	-0.029269	1
17.683	0.4439	0.42856	0.015336	1
17.7	0.4439	0.42841	0.015492	1
17.717	0.4439	0.42825	0.015648	1
17.733	0.4439	0.4281	0.015803	1
17.75	0.39945	0.42794	-0.028491	1
17.767	0.4439	0.42779	0.016115	1
17.783	0.4439	0.42763	0.01627	1
17.8	0.4439	0.42747	0.016425	1
17.817	0.4439	0.42732	0.016581	1
17.833	0.4439	0.42716	0.016736	1
17.85	0.4439	0.42701	0.016891	1
17.867	0.4439	0.42685	0.017047	1
17.883	0.4439	0.4267	0.017201	1
17.9	0.4439	0.42654	0.017357	1
17.917	0.4439	0.42639	0.017512	1
17.933	0.4439	0.42623	0.017666	1
17.95	0.4439	0.42608	0.017821	1
17.967	0.4439	0.42592	0.017977	1
17.983	0.4439	0.42577	0.018131	1
18	0.39945	0.42561	-0.026164	1
18.017	0.4439	0.42546	0.018441	1
18.033	0.4439	0.42531	0.018595	1
18.05	0.4439	0.42515	0.01875	1
18.067	0.4439	0.425	0.018904	1
18.083	0.4439	0.42484	0.019058	1
18.1	0.4439	0.42469	0.019213	1
18.117	0.4439	0.42453	0.019368	1
18.133	0.4439	0.42438	0.019521	1
18.15	0.4439	0.42422	0.019676	1
18.167	0.4439	0.42407	0.01983	1
18.183	0.4439	0.42392	0.019984	1
18.2	0.4439	0.42376	0.020138	1
18.217	0.39945	0.42361	-0.024158	1
18.233	0.4439	0.42345	0.020446	1
18.25	0.39945	0.4233	-0.02385	1
18.267	0.4439	0.42315	0.020754	1
18.283	0.4439	0.42299	0.020907	1
18.3	0.4439	0.42284	0.021061	1
18.317	0.4439	0.42268	0.021215	1
18.333	0.4439	0.42253	0.021368	1
18.35	0.4439	0.42238	0.021522	1
18.367	0.4439	0.42222	0.021676	1
18.383	0.4439	0.42207	0.021829	1
18.4	0.4439	0.42192	0.021983	1
18.417	0.4439	0.42176	0.022136	1
18.433	0.4439	0.42161	0.022289	1
18.45	0.4439	0.42146	0.022442	1
18.467	0.4439	0.4213	0.022596	1
18.483	0.4439	0.42115	0.022748	1
18.5	0.4439	0.421	0.022902	1
18.517	0.4439	0.42085	0.023055	1
18.533	0.4439	0.42069	0.023207	1
18.55	0.4439	0.42054	0.02336	1
18.567	0.4439	0.42039	0.023514	1

18.583	0.4439	0.42023	0.023666	1
18.6	0.4439	0.42008	0.023819	1
18.617	0.4439	0.41993	0.023972	1
18.633	0.4439	0.41978	0.024124	1
18.65	0.4439	0.41962	0.024277	1
18.667	0.4439	0.41947	0.024429	1
18.683	0.4439	0.41932	0.024581	1
18.7	0.4439	0.41917	0.024734	1
18.717	0.4439	0.41901	0.024887	1
18.733	0.4439	0.41886	0.025038	1
18.75	0.4439	0.41871	0.025191	1
18.767	0.4439	0.41856	0.025343	1
18.783	0.4439	0.41841	0.025495	1
18.8	0.4439	0.41825	0.025647	1
18.817	0.4439	0.4181	0.025799	1
18.833	0.4439	0.41795	0.025951	1
18.85	0.4439	0.4178	0.026103	1
18.867	0.39945	0.41764	-0.018195	1
18.883	0.4439	0.41749	0.026406	1
18.9	0.4439	0.41734	0.026558	1
18.917	0.4439	0.41719	0.02671	1
18.933	0.4439	0.41704	0.026861	1
18.95	0.4439	0.41689	0.027013	1
18.967	0.4439	0.41674	0.027165	1
18.983	0.4439	0.41658	0.027316	1
19	0.4439	0.41643	0.027467	1
19.017	0.39945	0.41628	-0.016831	1
19.033	0.39945	0.41613	-0.01668	1
19.05	0.4439	0.41598	0.027921	1
19.067	0.39945	0.41583	-0.016377	1
19.083	0.4439	0.41568	0.028223	1
19.1	0.39945	0.41553	-0.016075	1
19.117	0.4439	0.41537	0.028526	1
19.133	0.4439	0.41522	0.028676	1
19.15	0.4439	0.41507	0.028828	1
19.167	0.4439	0.41492	0.028979	1
19.183	0.4439	0.41477	0.029129	1
19.2	0.39945	0.41462	-0.01517	1
19.217	0.4439	0.41447	0.029431	1
19.233	0.4439	0.41432	0.029581	1
19.25	0.39945	0.41417	-0.014718	1
19.267	0.4439	0.41402	0.029883	1
19.283	0.4439	0.41387	0.030032	1
19.3	0.4439	0.41372	0.030183	1
19.317	0.4439	0.41357	0.030334	1
19.333	0.4439	0.41342	0.030484	1
19.35	0.4439	0.41327	0.030634	1
19.367	0.4439	0.41312	0.030785	1
19.383	0.4439	0.41297	0.030934	1
19.4	0.4439	0.41282	0.031084	1
19.417	0.4439	0.41267	0.031235	1
19.433	0.4439	0.41252	0.031384	1
19.45	0.4439	0.41237	0.031534	1
19.467	0.4439	0.41222	0.031685	1
19.483	0.4439	0.41207	0.031834	1
19.5	0.4439	0.41192	0.031984	1
19.517	0.4439	0.41177	0.032134	1
19.533	0.4439	0.41162	0.032283	1

19.55	0.4439	0.41147	0.032433	1
19.567	0.4439	0.41132	0.032583	1
19.583	0.4439	0.41117	0.032731	1
19.6	0.4439	0.41102	0.032881	1
19.617	0.4439	0.41087	0.033031	1
19.633	0.4439	0.41072	0.03318	1
19.65	0.4439	0.41057	0.033329	1
19.667	0.4439	0.41042	0.033479	1
19.683	0.4439	0.41027	0.033627	1
19.7	0.4439	0.41012	0.033777	1
19.717	0.4439	0.40997	0.033926	1
19.733	0.4439	0.40983	0.034074	1
19.75	0.4439	0.40968	0.034224	1
19.767	0.4439	0.40953	0.034373	1
19.783	0.4439	0.40938	0.034521	1
19.8	0.4439	0.40923	0.03467	1
19.817	0.4439	0.40908	0.034819	1
19.833	0.4439	0.40893	0.034967	1
19.85	0.4439	0.40878	0.035116	1
19.867	0.4439	0.40864	0.035265	1
19.883	0.4439	0.40849	0.035413	1
19.9	0.4439	0.40834	0.035562	1
19.917	0.4439	0.40819	0.03571	1
19.933	0.39398	0.40804	-0.014062	1
19.95	0.39945	0.40789	-0.0084435	1
19.967	0.4439	0.40774	0.036155	1
19.983	0.4439	0.4076	0.036303	1
20	0.4439	0.40745	0.036451	1
20.017	0.4439	0.4073	0.036599	1
20.033	0.4439	0.40715	0.036747	1
20.05	0.39945	0.407	-0.0075549	1
20.067	0.4439	0.40686	0.037043	1
20.083	0.4439	0.40671	0.037191	1
20.1	0.4439	0.40656	0.037339	1
20.117	0.4439	0.40641	0.037487	1
20.133	0.4439	0.40627	0.037634	1
20.15	0.39945	0.40612	-0.0066682	1
20.167	0.39945	0.40597	-0.0065203	1
20.183	0.39945	0.40582	-0.0063734	1
20.2	0.4439	0.40568	0.038224	1
20.217	0.39945	0.40553	-0.0060779	1
20.233	0.4439	0.40538	0.038519	1
20.25	0.4439	0.40523	0.038667	1
20.267	0.4439	0.40509	0.038814	1
20.283	0.39945	0.40494	-0.0054893	1
20.3	0.4439	0.40479	0.039108	1
20.317	0.39945	0.40464	-0.0051944	1
20.333	0.4439	0.4045	0.039402	1
20.35	0.39945	0.40435	-0.0049007	1
20.367	0.39398	0.4042	-0.010223	1
20.383	0.39945	0.40406	-0.0046071	1
20.4	0.39398	0.40391	-0.00993	1
20.417	0.39945	0.40376	-0.0043129	1
20.433	0.4439	0.40362	0.040283	1
20.45	0.4439	0.40347	0.04043	1
20.467	0.4439	0.40332	0.040577	1
20.483	0.39945	0.40318	-0.0037269	1
20.5	0.4439	0.40303	0.04087	1

20.517	0.39945	0.40288	-0.0034333	1
20.533	0.4439	0.40274	0.041163	1
20.55	0.39945	0.40259	-0.0031408	1
20.567	0.39398	0.40244	-0.0084642	1
20.583	0.39945	0.4023	-0.0028485	1
20.6	0.39398	0.40215	-0.008172	1
20.617	0.34951	0.40201	-0.052496	1
20.633	0.39398	0.40186	-0.0078801	1
20.65	0.39945	0.40171	-0.0022638	1
20.667	0.4439	0.40157	0.042333	1
20.683	0.34951	0.40142	-0.051912	1
20.7	0.4439	0.40128	0.042624	1
20.717	0.39398	0.40113	-0.0071498	1
20.733	0.39398	0.40098	-0.0070046	1
20.75	0.4439	0.40084	0.043061	1
20.767	0.39398	0.40069	-0.0067127	1
20.783	0.39398	0.40055	-0.0065676	1
20.8	0.39398	0.4004	-0.0064218	1
20.817	0.4439	0.40026	0.043644	1
20.833	0.39398	0.40011	-0.0061311	1
20.85	0.39398	0.39997	-0.0059854	1
20.867	0.39398	0.39982	-0.0058397	1
20.883	0.39398	0.39968	-0.005695	1
20.9	0.39398	0.39953	-0.0055495	1
20.917	0.4439	0.39938	0.044516	1
20.933	0.39398	0.39924	-0.0052594	1
20.95	0.4439	0.39909	0.044806	1
20.967	0.39398	0.39895	-0.0049687	1
20.983	0.39398	0.3988	-0.0048243	1
21	0.39398	0.39866	-0.0046791	1
21.017	0.39398	0.39851	-0.0045339	1
21.033	0.39398	0.39837	-0.0043897	1
21.05	0.39398	0.39822	-0.0042446	1
21.067	0.39398	0.39808	-0.0040996	1
21.083	0.34951	0.39794	-0.048426	1
21.1	0.39398	0.39779	-0.0038106	1
21.117	0.39398	0.39765	-0.0036658	1
21.133	0.39398	0.3975	-0.0035218	1
21.15	0.39398	0.39736	-0.0033771	1
21.167	0.39398	0.39721	-0.0032324	1
21.183	0.4439	0.39707	0.046831	1
21.2	0.39398	0.39692	-0.002944	1
21.217	0.39398	0.39678	-0.0027995	1
21.233	0.39398	0.39664	-0.0026559	1
21.25	0.39398	0.39649	-0.0025114	1
21.267	0.39398	0.39635	-0.0023671	1
21.283	0.39398	0.3962	-0.0022236	1
21.3	0.39398	0.39606	-0.0020793	1
21.317	0.39398	0.39592	-0.0019351	1
21.333	0.39398	0.39577	-0.0017918	1
21.35	0.39398	0.39563	-0.0016477	1
21.367	0.39398	0.39548	-0.0015036	1
21.383	0.39398	0.39534	-0.0013605	1
21.4	0.39398	0.3952	-0.0012165	1
21.417	0.39398	0.39505	-0.0010726	1
21.433	0.39398	0.39491	-0.00092961	1
21.45	0.39398	0.39477	-0.00078581	1
21.467	0.39398	0.39462	-0.00064206	1

21.483	0.39398	0.39448	-0.00049922	1
21.5	0.39398	0.39434	-0.00035557	1
21.517	0.39398	0.39419	-0.00021198	1
21.533	0.39398	0.39405	-6.9296E-005	1
21.55	0.39398	0.39391	7.4194E-005	1
21.567	0.39398	0.39376	0.00021763	1
21.583	0.39398	0.39362	0.00036016	1
21.6	0.39398	0.39348	0.00050349	1
21.617	0.39398	0.39333	0.00064677	1
21.633	0.39398	0.39319	0.00078914	1
21.65	0.39398	0.39305	0.00093232	1
21.667	0.39398	0.3929	0.0010754	1
21.683	0.39398	0.39276	0.0012177	1
21.7	0.39398	0.39262	0.0013607	1
21.717	0.39398	0.39248	0.0015037	1
21.733	0.39398	0.39233	0.0016457	1
21.75	0.39398	0.39219	0.0017886	1
21.767	0.39398	0.39205	0.0019314	1
21.783	0.39398	0.39191	0.0020733	1
21.8	0.39398	0.39176	0.002216	1
21.817	0.39398	0.39162	0.0023587	1
21.833	0.39398	0.39148	0.0025004	1
21.85	0.39398	0.39134	0.002643	1
21.867	0.39398	0.39119	0.0027855	1
21.883	0.39398	0.39105	0.0029271	1
21.9	0.39398	0.39091	0.0030695	1
21.917	0.39398	0.39077	0.0032118	1
21.933	0.39398	0.39063	0.0033533	1
21.95	0.34951	0.39048	-0.040974	1
21.967	0.39398	0.39034	0.0036377	1
21.983	0.39398	0.3902	0.003779	1
22	0.34951	0.39006	-0.040549	1
22.017	0.39398	0.38992	0.0040631	1
22.033	0.39398	0.38978	0.0042042	1
22.05	0.39398	0.38963	0.0043462	1
22.067	0.39398	0.38949	0.0044881	1
22.083	0.39398	0.38935	0.004629	1
22.1	0.39398	0.38921	0.0047708	1
22.117	0.39398	0.38907	0.0049126	1
22.133	0.39398	0.38893	0.0050534	1
22.15	0.39398	0.38878	0.005195	1
22.167	0.39398	0.38864	0.0053366	1
22.183	0.39398	0.3885	0.0054773	1
22.2	0.34951	0.38836	-0.038851	1
22.217	0.39398	0.38822	0.0057601	1
22.233	0.39398	0.38808	0.0059007	1
22.25	0.34951	0.38794	-0.038428	1
22.267	0.39398	0.3878	0.0061832	1
22.283	0.39398	0.38766	0.0063236	1
22.3	0.39398	0.38752	0.0064648	1
22.317	0.39398	0.38737	0.0066059	1
22.333	0.39398	0.38723	0.0067461	1
22.35	0.39398	0.38709	0.0068871	1
22.367	0.39398	0.38695	0.0070281	1
22.383	0.39398	0.38681	0.0071681	1
22.4	0.39398	0.38667	0.007309	1
22.417	0.39398	0.38653	0.0074498	1
22.433	0.34951	0.38639	-0.03688	1

22.45	0.39398	0.38625	0.0077304	1
22.467	0.39398	0.38611	0.007871	1
22.483	0.39398	0.38597	0.0080108	1
22.5	0.34951	0.38583	-0.036319	1
22.517	0.39398	0.38569	0.0082918	1
22.533	0.39398	0.38555	0.0084314	1
22.55	0.39398	0.38541	0.0085718	1
22.567	0.39398	0.38527	0.0087122	1
22.583	0.39398	0.38513	0.0088516	1
22.6	0.34951	0.38499	-0.035478	1
22.617	0.34951	0.38485	-0.035338	1
22.633	0.39398	0.38471	0.0092714	1
22.65	0.39398	0.38457	0.0094115	1
22.667	0.39398	0.38443	0.0095515	1
22.683	0.39398	0.38429	0.0096906	1
22.7	0.39398	0.38415	0.0098306	1
22.717	0.39398	0.38401	0.0099705	1
22.733	0.39398	0.38387	0.010109	1
22.75	0.39398	0.38373	0.010249	1
22.767	0.39398	0.38359	0.010389	1
22.783	0.39398	0.38345	0.010528	1
22.8	0.39398	0.38331	0.010667	1
22.817	0.39398	0.38317	0.010807	1
22.833	0.39398	0.38303	0.010946	1
22.85	0.39398	0.38289	0.011085	1
22.867	0.39398	0.38276	0.011225	1
22.883	0.39398	0.38262	0.011363	1
22.9	0.39398	0.38248	0.011503	1
22.917	0.39398	0.38234	0.011642	1
22.933	0.39398	0.3822	0.01178	1
22.95	0.39398	0.38206	0.011919	1
22.967	0.34951	0.38192	-0.032412	1
22.983	0.39398	0.38178	0.012197	1
23	0.34951	0.38164	-0.032134	1
23.017	0.34951	0.38151	-0.031995	1
23.033	0.39398	0.38137	0.012613	1
23.05	0.34951	0.38123	-0.031718	1
23.067	0.39398	0.38109	0.01289	1
23.083	0.39398	0.38095	0.013028	1
23.1	0.39398	0.38081	0.013167	1
23.117	0.39398	0.38067	0.013306	1
23.133	0.39398	0.38054	0.013444	1
23.15	0.39398	0.3804	0.013582	1
23.167	0.39398	0.38026	0.013721	1
23.183	0.39398	0.38012	0.013858	1
23.2	0.39398	0.37998	0.013997	1
23.217	0.39398	0.37984	0.014135	1
23.233	0.39398	0.37971	0.014273	1
23.25	0.39398	0.37957	0.014411	1
23.267	0.39398	0.37943	0.014549	1
23.283	0.39398	0.37929	0.014686	1
23.3	0.39398	0.37916	0.014825	1
23.317	0.39398	0.37902	0.014963	1
23.333	0.39398	0.37888	0.0151	1
23.35	0.39398	0.37874	0.015238	1
23.367	0.39398	0.3786	0.015376	1
23.383	0.39398	0.37847	0.015513	1
23.4	0.39398	0.37833	0.015651	1

23.417	0.39398	0.37819	0.015788	1
23.433	0.39398	0.37805	0.015925	1
23.45	0.39398	0.37792	0.016063	1
23.467	0.39398	0.37778	0.0162	1
23.483	0.39398	0.37764	0.016337	1
23.5	0.39398	0.37751	0.016475	1
23.517	0.39398	0.37737	0.016612	1
23.533	0.39398	0.37723	0.016749	1
23.55	0.39398	0.37709	0.016886	1
23.567	0.39398	0.37696	0.017023	1
23.583	0.39398	0.37682	0.01716	1
23.6	0.39398	0.37668	0.017297	1
23.617	0.39398	0.37655	0.017434	1
23.633	0.39398	0.37641	0.017571	1
23.65	0.39398	0.37627	0.017708	1
23.667	0.39398	0.37614	0.017845	1
23.683	0.39398	0.376	0.017981	1
23.7	0.39398	0.37586	0.018118	1
23.717	0.39398	0.37573	0.018255	1
23.733	0.39398	0.37559	0.018391	1
23.75	0.39398	0.37545	0.018527	1
23.767	0.39398	0.37532	0.018664	1
23.783	0.39398	0.37518	0.0188	1
23.8	0.39398	0.37504	0.018937	1
23.817	0.39398	0.37491	0.019073	1
23.833	0.39398	0.37477	0.019209	1
23.85	0.39398	0.37463	0.019345	1
23.867	0.39398	0.3745	0.019482	1
23.883	0.39398	0.37436	0.019617	1
23.9	0.39398	0.37423	0.019754	1
23.917	0.39398	0.37409	0.01989	1
23.933	0.34406	0.37395	-0.029895	1
23.95	0.39398	0.37382	0.020161	1
23.967	0.39398	0.37368	0.020298	1
23.983	0.39945	0.37355	0.025903	1
24	0.39398	0.37341	0.020569	1
24.017	0.39398	0.37328	0.020705	1
24.033	0.39398	0.37314	0.02084	1
24.05	0.39398	0.373	0.020976	1
24.067	0.39398	0.37287	0.021112	1
24.083	0.39398	0.37273	0.021247	1
24.1	0.39398	0.3726	0.021382	1
24.117	0.39398	0.37246	0.021518	1
24.133	0.39398	0.37233	0.021653	1
24.15	0.39398	0.37219	0.021788	1
24.167	0.39398	0.37206	0.021924	1
24.183	0.39398	0.37192	0.022059	1
24.2	0.39398	0.37179	0.022194	1
24.217	0.39398	0.37165	0.022329	1
24.233	0.34951	0.37152	-0.022006	1
24.25	0.39398	0.37138	0.022599	1
24.267	0.39398	0.37125	0.022734	1
24.283	0.39398	0.37111	0.022869	1
24.3	0.39398	0.37098	0.023004	1
24.317	0.39398	0.37084	0.023139	1
24.333	0.39398	0.37071	0.023273	1
24.35	0.39398	0.37057	0.023408	1
24.367	0.39398	0.37044	0.023543	1

24.383	0.39398	0.3703	0.023677	1
24.4	0.34951	0.37017	-0.020658	1
24.417	0.39398	0.37003	0.023947	1
24.433	0.39398	0.3699	0.024081	1
24.45	0.39398	0.36976	0.024216	1
24.467	0.39398	0.36963	0.02435	1
24.483	0.39398	0.3695	0.024484	1
24.5	0.39398	0.36936	0.024619	1
24.517	0.39398	0.36923	0.024753	1
24.533	0.39398	0.36909	0.024887	1
24.55	0.39398	0.36896	0.025021	1
24.567	0.39398	0.36882	0.025155	1
24.583	0.39398	0.36869	0.025289	1
24.6	0.34951	0.36856	-0.019047	1
24.617	0.39398	0.36842	0.025557	1
24.633	0.39398	0.36829	0.025691	1
24.65	0.39398	0.36816	0.025825	1
24.667	0.39398	0.36802	0.025959	1
24.683	0.34406	0.36789	-0.023828	1
24.7	0.34951	0.36775	-0.018244	1
24.717	0.39398	0.36762	0.02636	1
24.733	0.39398	0.36749	0.026493	1
24.75	0.34406	0.36735	-0.023293	1
24.767	0.39398	0.36722	0.026761	1
24.783	0.34951	0.36709	-0.017576	1
24.8	0.29958	0.36695	-0.067373	1
24.817	0.39398	0.36682	0.027161	1
24.833	0.29958	0.36669	-0.067106	1
24.85	0.34406	0.36655	-0.022493	1
24.867	0.39398	0.36642	0.027561	1
24.883	0.39398	0.36629	0.027693	1
24.9	0.34406	0.36615	-0.022093	1
24.917	0.39398	0.36602	0.02796	1
24.933	0.39398	0.36589	0.028093	1
24.95	0.39398	0.36575	0.028226	1
24.967	0.39398	0.36562	0.028359	1
24.983	0.29958	0.36549	-0.065909	1
25	0.39398	0.36536	0.028624	1
25.017	0.29958	0.36522	-0.065643	1
25.033	0.39398	0.36509	0.02889	1
25.05	0.39398	0.36496	0.029023	1
25.067	0.39398	0.36482	0.029155	1
25.083	0.39398	0.36469	0.029288	1
25.1	0.39398	0.36456	0.02942	1
25.117	0.34406	0.36443	-0.020367	1
25.133	0.34951	0.3643	-0.014785	1
25.15	0.34951	0.36416	-0.014652	1
25.167	0.34406	0.36403	-0.01997	1
25.183	0.39398	0.3639	0.030082	1
25.2	0.39398	0.36377	0.030215	1
25.217	0.39398	0.36363	0.030347	1
25.233	0.39398	0.3635	0.030479	1
25.25	0.29958	0.36337	-0.063789	1
25.267	0.39398	0.36324	0.030743	1
25.283	0.29958	0.36311	-0.063525	1
25.3	0.34406	0.36297	-0.018913	1
25.317	0.34406	0.36284	-0.018781	1
25.333	0.39398	0.36271	0.03127	1

25.35	0.39398	0.36258	0.031403	1
25.367	0.39398	0.36245	0.031535	1
25.383	0.29958	0.36231	-0.062734	1
25.4	0.34406	0.36218	-0.018122	1
25.417	0.34406	0.36205	-0.01799	1
25.433	0.39398	0.36192	0.032061	1
25.45	0.34406	0.36179	-0.017728	1
25.467	0.34406	0.36166	-0.017596	1
25.483	0.34406	0.36152	-0.017465	1
25.5	0.34406	0.36139	-0.017333	1
25.517	0.34406	0.36126	-0.017202	1
25.533	0.39398	0.36113	0.032849	1
25.55	0.29958	0.361	-0.061419	1
25.567	0.34406	0.36087	-0.016808	1
25.583	0.34406	0.36074	-0.016677	1
25.6	0.29958	0.36061	-0.061026	1
25.617	0.34406	0.36047	-0.016415	1
25.633	0.34406	0.36034	-0.016284	1
25.65	0.29958	0.36021	-0.060633	1
25.667	0.34406	0.36008	-0.016022	1
25.683	0.29958	0.35995	-0.060371	1
25.7	0.34406	0.35982	-0.01576	1
25.717	0.34406	0.35969	-0.015629	1
25.733	0.34951	0.35956	-0.010049	1
25.75	0.34406	0.35943	-0.015368	1
25.767	0.29958	0.3593	-0.059717	1
25.783	0.34406	0.35917	-0.015107	1
25.8	0.34406	0.35904	-0.014977	1
25.817	0.29958	0.35891	-0.059326	1
25.833	0.29958	0.35878	-0.059196	1
25.85	0.34406	0.35865	-0.014585	1
25.867	0.34406	0.35851	-0.014455	1
25.883	0.34406	0.35838	-0.014325	1
25.9	0.34406	0.35825	-0.014194	1
25.917	0.34406	0.35812	-0.014064	1
25.933	0.34406	0.35799	-0.013934	1
25.95	0.34406	0.35786	-0.013804	1
25.967	0.34406	0.35773	-0.013674	1
25.983	0.34406	0.3576	-0.013544	1
26	0.34406	0.35747	-0.013414	1
26.017	0.34406	0.35734	-0.013284	1
26.033	0.34406	0.35721	-0.013154	1
26.05	0.34406	0.35708	-0.013024	1
26.067	0.29958	0.35695	-0.057374	1
26.083	0.34406	0.35683	-0.012765	1
26.1	0.34406	0.3567	-0.012635	1
26.117	0.34406	0.35657	-0.012505	1
26.133	0.34406	0.35644	-0.012376	1
26.15	0.34406	0.35631	-0.012246	1
26.167	0.34406	0.35618	-0.012117	1
26.183	0.34406	0.35605	-0.011988	1
26.2	0.34406	0.35592	-0.011858	1
26.217	0.34406	0.35579	-0.011728	1
26.233	0.34406	0.35566	-0.0116	1
26.25	0.29958	0.35553	-0.05595	1
26.267	0.34406	0.3554	-0.011341	1
26.283	0.34406	0.35527	-0.011212	1
26.3	0.34406	0.35514	-0.011083	1

26.317	0.29958	0.35501	-0.055433	1
26.333	0.34406	0.35488	-0.010825	1
26.35	0.34406	0.35476	-0.010696	1
26.367	0.34406	0.35463	-0.010566	1
26.383	0.34406	0.3545	-0.010438	1
26.4	0.34406	0.35437	-0.010309	1
26.417	0.34406	0.35424	-0.01018	1
26.433	0.34406	0.35411	-0.010052	1
26.45	0.34406	0.35398	-0.0099228	1
26.467	0.34406	0.35385	-0.0097939	1
26.483	0.34406	0.35373	-0.0096658	1
26.5	0.34406	0.3536	-0.009537	1
26.517	0.34406	0.35347	-0.0094082	1
26.533	0.34406	0.35334	-0.0092803	1
26.55	0.34406	0.35321	-0.0091516	1
26.567	0.34406	0.35308	-0.009023	1
26.583	0.34406	0.35296	-0.0088952	1
26.6	0.34406	0.35283	-0.0087667	1
26.617	0.29958	0.3527	-0.053118	1
26.633	0.34406	0.35257	-0.0085105	1
26.65	0.34406	0.35244	-0.0083822	1
26.667	0.34406	0.35231	-0.0082538	1
26.683	0.34406	0.35219	-0.0081263	1
26.7	0.34406	0.35206	-0.0079981	1
26.717	0.34406	0.35193	-0.0078699	1
26.733	0.29958	0.3518	-0.052222	1
26.75	0.34406	0.35167	-0.0076144	1
26.767	0.34406	0.35155	-0.0074863	1
26.783	0.34406	0.35142	-0.0073591	1
26.8	0.34406	0.35129	-0.0072311	1
26.817	0.34406	0.35116	-0.0071032	1
26.833	0.34406	0.35104	-0.0069761	1
26.85	0.34406	0.35091	-0.0068482	1
26.867	0.34406	0.35078	-0.0067205	1
26.883	0.34406	0.35065	-0.0065935	1
26.9	0.34406	0.35053	-0.0064658	1
26.917	0.29958	0.3504	-0.050818	1
26.933	0.34406	0.35027	-0.0062113	1
26.95	0.34406	0.35014	-0.0060838	1
26.967	0.34406	0.35002	-0.0059563	1
26.983	0.29958	0.34989	-0.05031	1
27	0.34406	0.34976	-0.0057022	1
27.017	0.34406	0.34963	-0.0055748	1
27.033	0.34406	0.34951	-0.0054483	1
27.05	0.34406	0.34938	-0.005321	1
27.067	0.34406	0.34925	-0.0051938	1
27.083	0.34406	0.34913	-0.0050673	1
27.1	0.34406	0.349	-0.0049402	1
27.117	0.34406	0.34887	-0.0048131	1
27.133	0.29958	0.34875	-0.049167	1
27.15	0.34406	0.34862	-0.0045599	1
27.167	0.34406	0.34849	-0.0044329	1
27.183	0.34406	0.34837	-0.0043068	1
27.2	0.34406	0.34824	-0.0041799	1
27.217	0.34406	0.34811	-0.0040531	1
27.233	0.34406	0.34799	-0.0039271	1
27.25	0.34406	0.34786	-0.0038004	1
27.267	0.34406	0.34773	-0.0036737	1

27.283	0.34406	0.34761	-0.0035478	1
27.3	0.34406	0.34748	-0.0034213	1
27.317	0.34406	0.34735	-0.0032947	1
27.333	0.34406	0.34723	-0.003169	1
27.35	0.34406	0.3471	-0.0030426	1
27.367	0.34406	0.34698	-0.0029162	1
27.383	0.34406	0.34685	-0.0027906	1
27.4	0.34406	0.34672	-0.0026643	1
27.417	0.34406	0.3466	-0.002538	1
27.433	0.34406	0.34647	-0.0024126	1
27.45	0.34406	0.34635	-0.0022864	1
27.467	0.34406	0.34622	-0.0021603	1
27.483	0.34406	0.34609	-0.002035	1
27.5	0.34406	0.34597	-0.0019089	1
27.517	0.34406	0.34584	-0.001783	1
27.533	0.29958	0.34572	-0.046138	1
27.55	0.34406	0.34559	-0.0015319	1
27.567	0.34406	0.34547	-0.001406	1
27.583	0.34406	0.34534	-0.001281	1
27.6	0.34406	0.34522	-0.0011552	1
27.617	0.29958	0.34509	-0.04551	1
27.633	0.34406	0.34496	-0.00090462	1
27.65	0.34406	0.34484	-0.000779	1
27.667	0.29958	0.34471	-0.045133	1
27.683	0.34406	0.34459	-0.00052866	1
27.7	0.34406	0.34446	-0.00040318	1
27.717	0.34406	0.34434	-0.00027775	1
27.733	0.34406	0.34421	-0.00015311	1
27.75	0.29958	0.34409	-0.044508	1
27.767	0.34406	0.34396	9.753E-005	1
27.783	0.34406	0.34384	0.00022203	1
27.8	0.34406	0.34371	0.00034724	1
27.817	0.29958	0.34359	-0.044008	1
27.833	0.34406	0.34346	0.00059676	1
27.85	0.34406	0.34334	0.00072183	1
27.867	0.29958	0.34321	-0.043633	1
27.883	0.34406	0.34309	0.00097109	1
27.9	0.34406	0.34296	0.001096	1
27.917	0.34406	0.34284	0.0012209	1
27.933	0.34406	0.34271	0.001345	1
27.95	0.34406	0.34259	0.0014698	1
27.967	0.34406	0.34247	0.0015945	1
27.983	0.34406	0.34234	0.0017185	1
28	0.34406	0.34222	0.0018432	1
28.017	0.34406	0.34209	0.0019678	1
28.033	0.34406	0.34197	0.0020916	1
28.05	0.34406	0.34184	0.0022161	1
28.067	0.34406	0.34172	0.0023406	1
28.083	0.34406	0.3416	0.0024643	1
28.1	0.34406	0.34147	0.0025887	1
28.117	0.29958	0.34135	-0.041767	1
28.133	0.29958	0.34122	-0.041643	1
28.15	0.34406	0.3411	0.0029608	1
28.167	0.34406	0.34097	0.0030851	1
28.183	0.34406	0.34085	0.0032085	1
28.2	0.29958	0.34073	-0.041147	1
28.217	0.34406	0.3406	0.0034567	1
28.233	0.34406	0.34048	0.00358	1

28.25	0.34406	0.34036	0.0037039	1
28.267	0.34406	0.34023	0.0038279	1
28.283	0.34406	0.34011	0.003951	1
28.3	0.29958	0.33999	-0.040405	1
28.317	0.34406	0.33986	0.0041987	1
28.333	0.34406	0.33974	0.0043217	1
28.35	0.34406	0.33961	0.0044454	1
28.367	0.29958	0.33949	-0.039911	1
28.383	0.34406	0.33937	0.004692	1
28.4	0.34406	0.33924	0.0048155	1
28.417	0.34406	0.33912	0.0049391	1
28.433	0.34406	0.339	0.0050618	1
28.45	0.34406	0.33887	0.0051853	1
28.467	0.34406	0.33875	0.0053087	1
28.483	0.34406	0.33863	0.0054313	1
28.5	0.29958	0.33851	-0.038925	1
28.517	0.34406	0.33838	0.0056778	1
28.533	0.34406	0.33826	0.0058003	1
28.55	0.34406	0.33814	0.0059235	1
28.567	0.34406	0.33801	0.0060466	1
28.583	0.34406	0.33789	0.006169	1
28.6	0.34406	0.33777	0.006292	1
28.617	0.29958	0.33764	-0.038065	1
28.633	0.34406	0.33752	0.0065372	1
28.65	0.34406	0.3374	0.0066601	1
28.667	0.34406	0.33728	0.006783	1
28.683	0.34406	0.33715	0.0069051	1
28.7	0.34406	0.33703	0.0070279	1
28.717	0.34406	0.33691	0.0071506	1
28.733	0.29958	0.33679	-0.037207	1
28.75	0.34406	0.33666	0.0073952	1
28.767	0.34406	0.33654	0.0075178	1
28.783	0.34406	0.33642	0.0076396	1
28.8	0.34406	0.3363	0.0077621	1
28.817	0.29958	0.33618	-0.036595	1
28.833	0.34406	0.33605	0.0080062	1
28.85	0.34406	0.33593	0.0081286	1
28.867	0.34406	0.33581	0.0082509	1
28.883	0.34406	0.33569	0.0083725	1
28.9	0.34406	0.33557	0.0084947	1
28.917	0.34406	0.33544	0.0086169	1
28.933	0.34406	0.33532	0.0087383	1
28.95	0.34406	0.3352	0.0088604	1
28.967	0.34406	0.33508	0.0089825	1
28.983	0.34406	0.33496	0.0091038	1
29	0.34406	0.33483	0.0092257	1
29.017	0.34406	0.33471	0.0093477	1
29.033	0.29958	0.33459	-0.035011	1
29.05	0.34406	0.33447	0.0095907	1
29.067	0.34406	0.33435	0.0097125	1
29.083	0.34406	0.33423	0.0098335	1
29.1	0.34406	0.3341	0.0099552	1
29.117	0.34406	0.33398	0.010077	1
29.133	0.34406	0.33386	0.010198	1
29.15	0.29958	0.33374	-0.034161	1
29.167	0.34406	0.33362	0.010441	1
29.183	0.29958	0.3335	-0.033918	1
29.2	0.34406	0.33338	0.010683	1

29.217	0.34406	0.33326	0.010804	1
29.233	0.29958	0.33313	-0.033555	1
29.25	0.29958	0.33301	-0.033434	1
29.267	0.34406	0.33289	0.011168	1
29.283	0.34406	0.33277	0.011288	1
29.3	0.34406	0.33265	0.011409	1
29.317	0.29958	0.33253	-0.03295	1
29.333	0.34406	0.33241	0.011651	1
29.35	0.34406	0.33229	0.011772	1
29.367	0.34406	0.33217	0.011893	1
29.383	0.29958	0.33205	-0.032467	1
29.4	0.34406	0.33193	0.012134	1
29.417	0.34406	0.33181	0.012255	1
29.433	0.34406	0.33169	0.012375	1
29.45	0.34406	0.33156	0.012496	1
29.467	0.34406	0.33144	0.012616	1
29.483	0.34406	0.33132	0.012736	1
29.5	0.34406	0.3312	0.012857	1
29.517	0.29958	0.33108	-0.031502	1
29.533	0.34406	0.33096	0.013098	1
29.55	0.34406	0.33084	0.013218	1
29.567	0.34406	0.33072	0.013339	1
29.583	0.34406	0.3306	0.013458	1
29.6	0.29414	0.33048	-0.036341	1
29.617	0.34406	0.33036	0.013699	1
29.633	0.34406	0.33024	0.013819	1
29.65	0.34406	0.33012	0.013939	1
29.667	0.29958	0.33	-0.030421	1
29.683	0.29414	0.32988	-0.035742	1
29.7	0.34406	0.32976	0.014299	1
29.717	0.34406	0.32964	0.014419	1
29.733	0.29958	0.32952	-0.029942	1
29.75	0.29414	0.3294	-0.035262	1
29.767	0.34406	0.32928	0.014778	1
29.783	0.34406	0.32916	0.014897	1
29.8	0.24965	0.32904	-0.079393	1
29.817	0.29958	0.32892	-0.029343	1
29.833	0.34406	0.3288	0.015256	1
29.85	0.34406	0.32868	0.015376	1
29.867	0.34406	0.32856	0.015495	1
29.883	0.34406	0.32845	0.015614	1
29.9	0.34406	0.32833	0.015734	1
29.917	0.34406	0.32821	0.015853	1
29.933	0.34406	0.32809	0.015972	1
29.95	0.34406	0.32797	0.016092	1
29.967	0.34406	0.32785	0.016211	1
29.983	0.34406	0.32773	0.01633	1
30	0.34406	0.32761	0.016449	1
30.017	0.29958	0.32749	-0.027912	1
30.033	0.34406	0.32737	0.016687	1
30.05	0.29958	0.32725	-0.027674	1
30.067	0.24965	0.32713	-0.077485	1
30.083	0.34406	0.32702	0.017044	1
30.1	0.34406	0.3269	0.017163	1
30.117	0.29958	0.32678	-0.027198	1
30.133	0.34406	0.32666	0.0174	1
30.15	0.29414	0.32654	-0.032401	1
30.167	0.34406	0.32642	0.017638	1

30.183	0.34406	0.3263	0.017756	1
30.2	0.34406	0.32619	0.017875	1
30.217	0.34406	0.32607	0.017994	1
30.233	0.34406	0.32595	0.018112	1
30.25	0.29958	0.32583	-0.02625	1
30.267	0.24965	0.32571	-0.076061	1
30.283	0.29414	0.32559	-0.031453	1
30.3	0.34406	0.32547	0.018585	1
30.317	0.29414	0.32536	-0.031216	1
30.333	0.34406	0.32524	0.018822	1
30.35	0.29958	0.32512	-0.02554	1
30.367	0.29414	0.325	-0.030861	1
30.383	0.34406	0.32488	0.019176	1
30.4	0.34406	0.32477	0.019295	1
30.417	0.34406	0.32465	0.019413	1
30.433	0.29414	0.32453	-0.03039	1
30.45	0.24965	0.32441	-0.074762	1
30.467	0.29414	0.32429	-0.030153	1
30.483	0.29414	0.32418	-0.030036	1
30.5	0.24965	0.32406	-0.074408	1
30.517	0.29414	0.32394	-0.0298	1
30.533	0.29414	0.32382	-0.029683	1
30.55	0.29414	0.3237	-0.029565	1
30.567	0.29958	0.32359	-0.024007	1
30.583	0.29414	0.32347	-0.02933	1
30.6	0.29414	0.32335	-0.029212	1
30.617	0.24965	0.32323	-0.073584	1
30.633	0.29414	0.32312	-0.028977	1
30.65	0.29414	0.323	-0.02886	1
30.667	0.29414	0.32288	-0.028742	1
30.683	0.29414	0.32277	-0.028625	1
30.7	0.29414	0.32265	-0.028508	1
30.717	0.29414	0.32253	-0.02839	1
30.733	0.29414	0.32241	-0.028273	1
30.75	0.24965	0.3223	-0.072646	1
30.767	0.24965	0.32218	-0.072529	1
30.783	0.29414	0.32206	-0.027922	1
30.8	0.29414	0.32194	-0.027805	1
30.817	0.24965	0.32183	-0.072177	1
30.833	0.24965	0.32171	-0.072061	1
30.85	0.29414	0.32159	-0.027454	1
30.867	0.29958	0.32148	-0.021897	1
30.883	0.24965	0.32136	-0.07171	1
30.9	0.29414	0.32124	-0.027103	1
30.917	0.29414	0.32113	-0.026986	1
30.933	0.29414	0.32101	-0.02687	1
30.95	0.24965	0.32089	-0.071243	1
30.967	0.29414	0.32078	-0.026636	1
30.983	0.29414	0.32066	-0.02652	1
31	0.29414	0.32054	-0.026403	1
31.017	0.29414	0.32043	-0.026287	1
31.033	0.29414	0.32031	-0.026171	1
31.05	0.34406	0.32019	0.023866	1
31.067	0.29414	0.32008	-0.025938	1
31.083	0.29414	0.31996	-0.025822	1
31.1	0.29414	0.31985	-0.025705	1
31.117	0.29414	0.31973	-0.025589	1
31.133	0.29414	0.31961	-0.025473	1

31.15	0.29414	0.3195	-0.025357	1
31.167	0.29414	0.31938	-0.02524	1
31.183	0.29414	0.31926	-0.025125	1
31.2	0.29414	0.31915	-0.025008	1
31.217	0.24965	0.31903	-0.069382	1
31.233	0.29414	0.31892	-0.024777	1
31.25	0.29414	0.3188	-0.024661	1
31.267	0.29414	0.31868	-0.024544	1
31.283	0.24965	0.31857	-0.068919	1
31.3	0.29414	0.31845	-0.024313	1
31.317	0.29414	0.31834	-0.024197	1
31.333	0.29414	0.31822	-0.024082	1
31.35	0.24965	0.31811	-0.068456	1
31.367	0.29414	0.31799	-0.02385	1
31.383	0.29414	0.31788	-0.023735	1
31.4	0.24965	0.31776	-0.068109	1
31.417	0.24965	0.31764	-0.067994	1
31.433	0.24965	0.31753	-0.067879	1
31.45	0.29414	0.31741	-0.023273	1
31.467	0.29414	0.3173	-0.023157	1
31.483	0.24965	0.31718	-0.067533	1
31.5	0.29414	0.31707	-0.022927	1
31.517	0.29414	0.31695	-0.022812	1
31.533	0.29414	0.31684	-0.022697	1
31.55	0.29414	0.31672	-0.022582	1
31.567	0.29414	0.31661	-0.022466	1
31.583	0.29414	0.31649	-0.022352	1
31.6	0.29414	0.31638	-0.022236	1
31.617	0.29414	0.31626	-0.022121	1
31.633	0.29414	0.31615	-0.022007	1
31.65	0.29414	0.31603	-0.021892	1
31.667	0.29414	0.31592	-0.021776	1
31.683	0.29414	0.3158	-0.021662	1
31.7	0.29414	0.31569	-0.021547	1
31.717	0.29414	0.31557	-0.021432	1
31.733	0.29414	0.31546	-0.021318	1
31.75	0.24965	0.31534	-0.065693	1
31.767	0.29414	0.31523	-0.021088	1
31.783	0.29414	0.31511	-0.020974	1
31.8	0.24965	0.315	-0.065349	1
31.817	0.29414	0.31488	-0.020745	1
31.833	0.29414	0.31477	-0.020631	1
31.85	0.29414	0.31466	-0.020516	1
31.867	0.29414	0.31454	-0.020402	1
31.883	0.24965	0.31443	-0.064778	1
31.9	0.29414	0.31431	-0.020173	1
31.917	0.29414	0.3142	-0.020059	1
31.933	0.29414	0.31409	-0.019945	1
31.95	0.24965	0.31397	-0.064321	1
31.967	0.29414	0.31386	-0.019716	1
31.983	0.29414	0.31374	-0.019603	1
32	0.29414	0.31363	-0.019488	1
32.017	0.29414	0.31351	-0.019374	1
32.033	0.29414	0.3134	-0.019261	1
32.05	0.29414	0.31329	-0.019147	1
32.067	0.29414	0.31317	-0.019033	1
32.083	0.24965	0.31306	-0.063409	1
32.1	0.29414	0.31295	-0.018805	1

32.117	0.29414	0.31283	-0.018691	1
32.133	0.29414	0.31272	-0.018578	1
32.15	0.29414	0.3126	-0.018464	1
32.167	0.29414	0.31249	-0.01835	1
32.183	0.29414	0.31238	-0.018237	1
32.2	0.29414	0.31226	-0.018123	1
32.217	0.24965	0.31215	-0.0625	1
32.233	0.29414	0.31204	-0.017897	1
32.25	0.29414	0.31192	-0.017783	1
32.267	0.24965	0.31181	-0.06216	1
32.283	0.24965	0.3117	-0.062047	1
32.3	0.29414	0.31158	-0.017443	1
32.317	0.29414	0.31147	-0.01733	1
32.333	0.29414	0.31136	-0.017217	1
32.35	0.24965	0.31124	-0.061594	1
32.367	0.29414	0.31113	-0.01699	1
32.383	0.29414	0.31102	-0.016878	1
32.4	0.29414	0.3109	-0.016764	1
32.417	0.24965	0.31079	-0.061141	1
32.433	0.29414	0.31068	-0.016539	1
32.45	0.29414	0.31057	-0.016426	1
32.467	0.29414	0.31045	-0.016312	1
32.483	0.29414	0.31034	-0.0162	1
32.5	0.29414	0.31023	-0.016087	1
32.517	0.29414	0.31011	-0.015974	1
32.533	0.24965	0.31	-0.060352	1
32.55	0.24965	0.30989	-0.060239	1
32.567	0.29414	0.30978	-0.015636	1
32.583	0.29414	0.30966	-0.015524	1
32.6	0.29414	0.30955	-0.015411	1
32.617	0.24965	0.30944	-0.059789	1
32.633	0.29414	0.30933	-0.015187	1
32.65	0.29414	0.30921	-0.015074	1
32.667	0.24965	0.3091	-0.059451	1
32.683	0.29414	0.30899	-0.014849	1
32.7	0.24965	0.30888	-0.059227	1
32.717	0.29414	0.30876	-0.014624	1
32.733	0.24965	0.30865	-0.059003	1
32.75	0.29414	0.30854	-0.0144	1
32.767	0.24965	0.30843	-0.058778	1
32.783	0.29414	0.30832	-0.014176	1
32.8	0.24965	0.3082	-0.058554	1
32.817	0.29414	0.30809	-0.013952	1
32.833	0.29414	0.30798	-0.01384	1
32.85	0.29414	0.30787	-0.013728	1
32.867	0.29414	0.30776	-0.013616	1
32.883	0.29414	0.30764	-0.013505	1
32.9	0.29414	0.30753	-0.013393	1
32.917	0.29414	0.30742	-0.013281	1
32.933	0.29414	0.30731	-0.013169	1
32.95	0.29414	0.3072	-0.013057	1
32.967	0.24965	0.30709	-0.057436	1
32.983	0.29414	0.30697	-0.012834	1
33	0.29414	0.30686	-0.012723	1
33.017	0.24965	0.30675	-0.057101	1
33.033	0.29414	0.30664	-0.0125	1
33.05	0.29414	0.30653	-0.012388	1
33.067	0.24965	0.30642	-0.056767	1

33.083	0.29414	0.30631	-0.012166	1
33.1	0.29414	0.30619	-0.012054	1
33.117	0.29414	0.30608	-0.011943	1
33.133	0.29414	0.30597	-0.011832	1
33.15	0.29414	0.30586	-0.01172	1
33.167	0.24965	0.30575	-0.056099	1
33.183	0.29414	0.30564	-0.011498	1
33.2	0.29414	0.30553	-0.011387	1
33.217	0.29414	0.30542	-0.011276	1
33.233	0.29414	0.30531	-0.011165	1
33.25	0.29414	0.30519	-0.011054	1
33.267	0.24965	0.30508	-0.055433	1
33.283	0.29414	0.30497	-0.010833	1
33.3	0.29414	0.30486	-0.010721	1
33.317	0.29414	0.30475	-0.01061	1
33.333	0.24965	0.30464	-0.05499	1
33.35	0.29414	0.30453	-0.010389	1
33.367	0.24965	0.30442	-0.054768	1
33.383	0.24965	0.30431	-0.054658	1
33.4	0.29414	0.3042	-0.010057	1
33.417	0.29414	0.30409	-0.0099466	1
33.433	0.29414	0.30398	-0.0098365	1
33.45	0.29414	0.30387	-0.0097258	1
33.467	0.29414	0.30376	-0.0096151	1

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RESULTS FROM VISUAL CURVE MATCHING

VISUAL MATCH PARAMETER ESTIMATES

	Estimate
K =	5.9972E-006
y0 =	6.3024E-001

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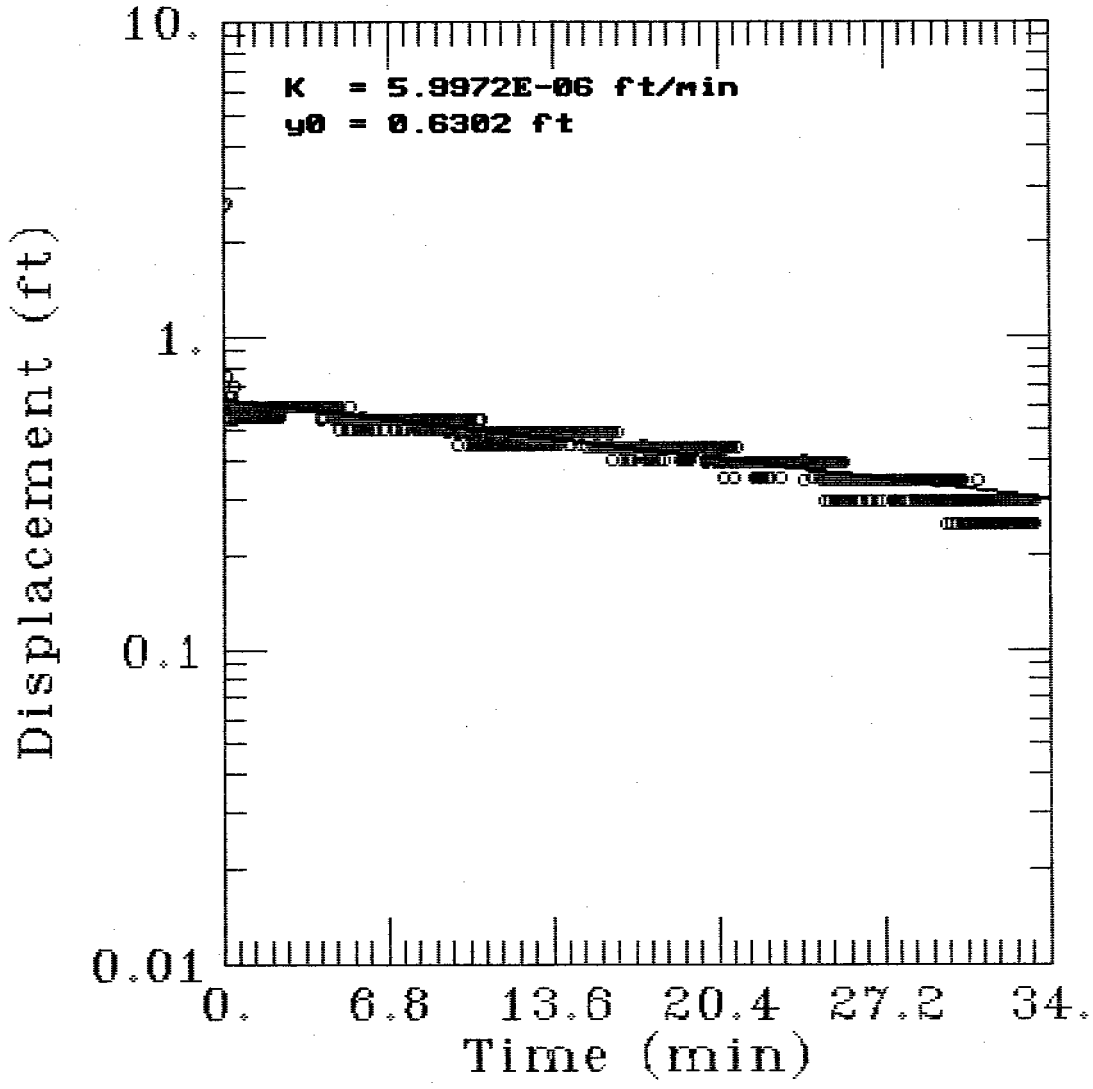
DH-3 STORRS SLUG INJECTION TEST #2



A Q T E S O L V R E S U L T S
Version 1.10

05/12/92 00:59:25

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TEST DESCRIPTION

Data set..... DH3PANS2.AQT
Data set title..... DH-3 PANTHER SLUG INJECTION TEST #2
Company..... EARTHFAX ENGINEERING
Project..... UC-192-06
Client..... CO-OP MINE
Location..... BEAR CANYON MINE
Test date..... 1-17-92
Test well..... DH-2

Knowns and Constants:
No. of data points..... 2000
Radius of well casing..... 0.1
Radius of well..... 0.1
Aquifer saturated thickness..... 72
Well screen length..... 70
Static height of water in well..... 72
Log(Re/Rw)..... 5.441
A, B, C..... 0.000, 0.000, 11.627

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ANALYTICAL METHOD

Bouwer-Rice (Unconfined Aquifer Slug Test)

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RESULTS FROM STATISTICAL CURVE MATCHING

STATISTICAL MATCH PARAMETER ESTIMATES

	Estimate		Std. Error
K =	6.6492E-005	+/-	8.3072E-006
y0 =	7.1181E-001	+/-	2.3288E-002

ANALYSIS OF MODEL RESIDUALS

residual = calculated - observed
weighted residual = residual * weight

Weighted Residual Statistics:
Number of residuals..... 175
Number of estimated parameters.... 2
Degrees of freedom..... 173
Residual mean..... 0.0002855
Residual standard deviation..... 0.1296
Residual variance..... 0.0168

Model Residuals:

Time	Observed	Calculated	Residual	Weight
0.066667	1.9962	0.70374	1.2925	1
0.083333	1.6843	0.70174	0.98256	1
0.11667	0.59886	0.69774	-0.098884	1
0.13333	0.59886	0.69576	-0.096898	1
0.15	0.7363	0.69378	0.042524	1
0.16667	0.63651	0.6918	-0.055291	1
0.18333	0.63651	0.68983	-0.053321	1
0.2	0.63651	0.68787	-0.051356	1
0.21667	0.63651	0.68591	-0.049398	1
0.23333	0.59886	0.68395	-0.085094	1
0.25	0.59886	0.68201	-0.083147	1
0.26667	0.63651	0.68006	-0.043555	1
0.28333	0.59886	0.67813	-0.079268	1
0.3	0.59886	0.6762	-0.077337	1
0.31667	0.59886	0.67427	-0.075412	1
0.33333	0.63651	0.67235	-0.035842	1
0.35	0.59886	0.67044	-0.071577	1
0.36667	0.59886	0.66853	-0.069668	1
0.38333	0.59886	0.66662	-0.067764	1
0.4	0.63651	0.66473	-0.028216	1
0.41667	0.59886	0.66283	-0.063973	1
0.43333	0.59886	0.66095	-0.062086	1
0.45	0.59886	0.65906	-0.060203	1
0.46667	0.59886	0.65719	-0.058327	1
0.48333	0.63651	0.65532	-0.018805	1
0.5	0.63651	0.65345	-0.016939	1
0.51667	0.63651	0.65159	-0.015078	1
0.53333	0.63651	0.64973	-0.013223	1
0.55	0.63651	0.64788	-0.011373	1
0.56667	0.59886	0.64604	-0.047178	1
0.58333	0.63651	0.6442	-0.0076883	1
0.6	0.63651	0.64236	-0.0058538	1
0.61667	0.59886	0.64053	-0.041675	1
0.63333	0.54896	0.63871	-0.089751	1
0.65	0.54896	0.63689	-0.087932	1
0.66667	0.54896	0.63508	-0.086118	1
0.68333	0.58661	0.63327	-0.04666	1
0.7	0.58661	0.63147	-0.044857	1
0.71667	0.54896	0.62967	-0.080708	1
0.73333	0.58661	0.62788	-0.041265	1
0.75	0.54896	0.62609	-0.077127	1
0.76667	0.54896	0.6243	-0.075345	1
0.78333	0.58661	0.62253	-0.035917	1
0.8	0.58661	0.62075	-0.034144	1
0.81667	0.58661	0.61899	-0.032376	1
0.83333	0.54896	0.61722	-0.068264	1
0.85	0.54896	0.61547	-0.066506	1
0.86667	0.54896	0.61371	-0.064754	1
0.88333	0.54896	0.61197	-0.063006	1
0.9	0.54896	0.61022	-0.061263	1
0.91667	0.58661	0.60849	-0.021876	1
0.93333	0.54896	0.60675	-0.057793	1

0.95	0.58661	0.60503	-0.018415	1
0.96667	0.58661	0.6033	-0.016692	1
0.98333	0.58661	0.60158	-0.014974	1
1	0.54896	0.59987	-0.050911	1
1.0167	0.58661	0.59816	-0.011553	1
1.0333	0.54896	0.59646	-0.0475	1
1.05	0.54896	0.59476	-0.045801	1
1.0667	0.58661	0.59307	-0.0064574	1
1.0833	0.58661	0.59138	-0.0047693	1
1.1	0.54896	0.58969	-0.040735	1
1.1167	0.58661	0.58802	-0.0014054	1
1.1333	0.58661	0.58634	0.00026839	1
1.15	0.58661	0.58467	0.0019384	1
1.1667	0.54896	0.58301	-0.034046	1
1.1833	0.58661	0.58135	0.0052631	1
1.2	0.58661	0.57969	0.0069189	1
1.2167	0.58661	0.57804	0.0085699	1
1.2333	0.58661	0.57639	0.010215	1
1.25	0.58661	0.57475	0.011857	1
1.2667	0.58661	0.57312	0.013494	1
1.2833	0.58661	0.57148	0.015125	1
1.3	0.54896	0.56986	-0.020897	1
1.3167	0.58661	0.56823	0.018376	1
1.3333	0.54896	0.56662	-0.017657	1
1.35	0.54896	0.565	-0.016043	1
1.3667	0.49905	0.56339	-0.064343	1
1.3833	0.58661	0.56179	0.02482	1
1.4	0.54896	0.56019	-0.01123	1
1.4167	0.54896	0.55859	-0.0096342	1
1.4333	0.53671	0.557	-0.020294	1
1.45	0.53671	0.55542	-0.018708	1
1.4667	0.49905	0.55384	-0.054786	1
1.4833	0.49905	0.55226	-0.053209	1
1.5	0.53671	0.55069	-0.013976	1
1.5167	0.49905	0.54912	-0.050068	1
1.5333	0.49905	0.54756	-0.048505	1
1.55	0.53671	0.546	-0.0092855	1
1.5667	0.53671	0.54444	-0.0077304	1
1.5833	0.53671	0.54289	-0.0061807	1
1.6	0.49905	0.54134	-0.042294	1
1.6167	0.49905	0.5398	-0.040753	1
1.6333	0.49905	0.53827	-0.039216	1
1.65	0.53671	0.53673	-2.3013E-005	1
1.6667	0.53671	0.5352	0.0015057	1
1.6833	0.53671	0.53368	0.0030291	1
1.7	0.53671	0.53216	0.0045491	1
1.7167	0.49905	0.53065	-0.031595	1
1.7333	0.49905	0.52913	-0.030085	1
1.75	0.53671	0.52763	0.0090823	1
1.7667	0.53671	0.52612	0.010585	1
1.7833	0.53671	0.52463	0.012083	1
1.8	0.53671	0.52313	0.013577	1
1.8167	0.53671	0.52164	0.015067	1
1.8333	0.49905	0.52016	-0.021108	1
1.85	0.53671	0.51868	0.018033	1
1.8667	0.53671	0.5172	0.01951	1
1.8833	0.49905	0.51573	-0.016677	1
1.9	0.53671	0.51426	0.022452	1

1.9167	0.53671	0.51279	0.023916	1
1.9333	0.49905	0.51133	-0.012284	1
1.95	0.53671	0.50988	0.026832	1
1.9667	0.53671	0.50843	0.028284	1
1.9833	0.49905	0.50698	-0.0079284	1
2	0.49905	0.50553	-0.0064844	1
2.0167	0.53671	0.50409	0.032615	1
2.0333	0.53671	0.50266	0.03405	1
2.05	0.49905	0.50123	-0.002178	1
2.0667	0.49905	0.4998	-0.00075045	1
2.0833	0.53671	0.49838	0.038332	1
2.1	0.53671	0.49696	0.039752	1
2.1167	0.53671	0.49554	0.041167	1
2.1333	0.53671	0.49413	0.042578	1
2.15	0.49905	0.49273	0.006325	1
2.1667	0.49905	0.49132	0.0077284	1
2.1833	0.53671	0.48992	0.046787	1
2.2	0.53671	0.48853	0.048182	1
2.2167	0.49905	0.48714	0.011914	1
2.2333	0.53671	0.48575	0.05096	1
2.25	0.49905	0.48437	0.014684	1
2.2667	0.48682	0.48299	0.0038333	1
2.2833	0.53671	0.48161	0.055098	1
2.3	0.48682	0.48024	0.0065798	1
2.3167	0.49905	0.47887	0.020178	1
2.3333	0.49905	0.47751	0.021541	1
2.35	0.44914	0.47615	-0.027009	1
2.3667	0.44914	0.47479	-0.025653	1
2.3833	0.48682	0.47344	0.013378	1
2.4	0.48682	0.47209	0.014727	1
2.4167	0.53671	0.47075	0.065961	1
2.4333	0.44914	0.46941	-0.020269	1
2.45	0.44914	0.46807	-0.018932	1
2.4667	0.44914	0.46674	-0.017599	1
2.4833	0.48682	0.46541	0.02141	1
2.5	0.48682	0.46408	0.022736	1
2.5167	0.44914	0.46276	-0.013623	1
2.5333	0.44914	0.46145	-0.012305	1
2.55	0.44914	0.46013	-0.010991	1
2.5667	0.44914	0.45882	-0.0096806	1
2.5833	0.48682	0.45751	0.029305	1
2.6	0.48682	0.45621	0.030608	1
2.6167	0.44914	0.45491	-0.0057722	1
2.6333	0.44914	0.45362	-0.0044773	1
2.65	0.44914	0.45233	-0.0031853	1
2.6667	0.44914	0.45104	-0.001897	1
2.6833	0.48682	0.44975	0.037067	1
2.7	0.48682	0.44847	0.038348	1
2.7167	0.48682	0.44719	0.039625	1
2.7333	0.44914	0.44592	0.003218	1
2.75	0.44914	0.44465	0.0044881	1
2.7667	0.48682	0.44339	0.043435	1
2.7833	0.48682	0.44212	0.044697	1
2.8	0.44914	0.44086	0.0082758	1
2.8167	0.44914	0.43961	0.0095315	1
2.8333	0.44914	0.43836	0.010783	1
2.85	0.44914	0.43711	0.012031	1
2.8667	0.48682	0.43586	0.050956	1

2.8833	0.44914	0.43462	0.014517	1
2.9	0.44914	0.43339	0.015755	1
2.9167	0.44914	0.43215	0.016989	1
2.9333	0.44914	0.43092	0.018217	1
2.95	0.48682	0.42969	0.057127	1
2.9667	0.44914	0.42847	0.020673	1
2.9833	0.48682	0.42725	0.059568	1

RESULTS FROM VISUAL CURVE MATCHING

VISUAL MATCH PARAMETER ESTIMATES

	Estimate
K =	6.6492E-005
y0 =	7.1181E-001

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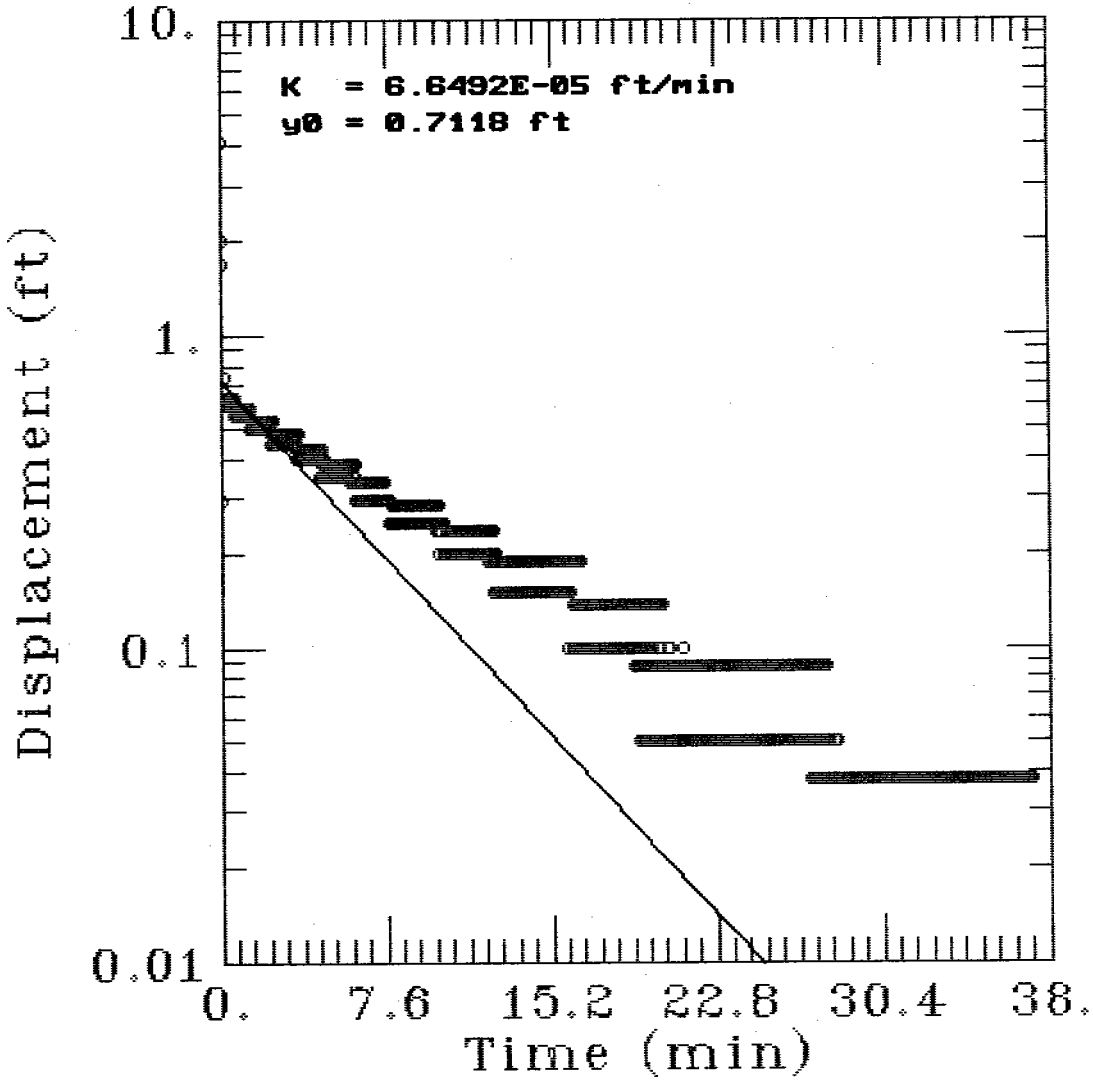
DH-3 PANTHER SLUG INJECTION TEST #2



A Q T E S O L V R E S U L T S
Version 1.10

04/25/94 11:35:16

TEST DESCRIPTION

Data set..... dh4slu#2.aqt
Data set title..... DH-4 SLUG TEST #2
Company..... EARTHFAX ENGINEERING, INC.
Project..... UC-192-09
Client..... CO-OP MINING COMPANY
Location..... BEAR CANYON MINE
Test date..... 3-14-94
Test well..... DH-4

Knowns and Constants:
No. of data points..... 2000
Radius of well casing..... 0.0625
Radius of well..... 0.099
Aquifer saturated thickness..... 177.7
Well screen length..... 20
Static height of water in well..... 177.7
Log(Re/Rw)..... 5.519
A, B, C..... 0.000, 0.000, 6.946

ANALYTICAL METHOD

Bouwer-Rice (Unconfined Aquifer Slug Test)

RESULTS FROM STATISTICAL CURVE MATCHING

STATISTICAL MATCH PARAMETER ESTIMATES

	Estimate		Std. Error
K =	1.1330E-004	+/-	5.0615E-007
y0 =	1.9690E-001	+/-	6.1032E-004

ANALYSIS OF MODEL RESIDUALS

residual = calculated - observed
weighted residual = residual * weight

Weighted Residual Statistics:
Number of residuals..... 2000
Number of estimated parameters.... 2
Degrees of freedom..... 1998
Residual mean..... 0.00022
Residual standard deviation..... 0.007172
Residual variance..... 5.144E-005

Model Residuals:

Time	Observed	Calculated	Residual	Weight
0.025	0.27845	0.19587	0.08258	1
0.041667	0.24004	0.19519	0.044855	1
0.058333	0.19203	0.1945	-0.0024723	1
0.075	0.14403	0.19382	-0.049792	1
0.091667	0.13442	0.19314	-0.058724	1
0.10833	0.13442	0.19247	-0.058049	1
0.125	0.16323	0.1918	-0.028565	1
0.14167	0.19203	0.19112	0.00090539	1
0.15833	0.22084	0.19046	0.030384	1
0.175	0.24004	0.18979	0.05025	1
0.19167	0.24004	0.18913	0.050914	1
0.20833	0.23044	0.18846	0.041975	1
0.225	0.21124	0.18781	0.023434	1
0.24167	0.18243	0.18715	-0.0047187	1
0.25833	0.16323	0.18649	-0.023264	1
0.275	0.16323	0.18584	-0.022612	1
0.29167	0.16323	0.18519	-0.021962	1
0.30833	0.17283	0.18454	-0.011714	1
0.325	0.18243	0.1839	-0.0014686	1
0.34167	0.19203	0.18326	0.0087746	1
0.35833	0.20164	0.18261	0.019026	1
0.375	0.20164	0.18198	0.019664	1
0.39167	0.20164	0.18134	0.020301	1
0.40833	0.19203	0.18071	0.011325	1
0.425	0.18243	0.18007	0.002357	1
0.44167	0.17283	0.17944	-0.0066132	1
0.45833	0.16323	0.17882	-0.015586	1
0.475	0.16323	0.17819	-0.01496	1
0.49167	0.17283	0.17757	-0.0047369	1
0.50833	0.17283	0.17695	-0.0041159	1

0.525	0.18243	0.17633	0.006103	1
0.54167	0.18243	0.17571	0.0067197	1
0.55833	0.18243	0.1751	0.0073343	1
0.575	0.18243	0.17448	0.0079467	1
0.59167	0.17283	0.17387	-0.001043	1
0.60833	0.17283	0.17326	-0.00043489	1
0.625	0.16323	0.17266	-0.0094289	1
0.64167	0.16323	0.17205	-0.008825	1
0.65833	0.16323	0.17145	-0.0082232	1
0.675	0.16323	0.17085	-0.0076235	1
0.69167	0.16323	0.17026	-0.007026	1
0.70833	0.17283	0.16966	0.0031695	1
0.725	0.17283	0.16907	0.0037629	1
0.74167	0.17283	0.16848	0.0043542	1
0.75833	0.17283	0.16789	0.0049435	1
0.775	0.16323	0.1673	-0.0040693	1
0.79167	0.16323	0.16671	-0.0034842	1
0.80833	0.16323	0.16613	-0.0029011	1
0.825	0.16323	0.16555	-0.00232	1
0.84167	0.16323	0.16497	-0.001741	1
0.85833	0.16323	0.16439	-0.001164	1
0.875	0.16323	0.16382	-0.00058899	1
0.89167	0.16323	0.16325	-1.6019E-005	1
0.90833	0.16323	0.16268	0.00055495	1
0.925	0.16323	0.16211	0.0011239	1
0.94167	0.16323	0.16154	0.0016909	1
0.95833	0.16323	0.16097	0.0022559	1
0.975	0.15363	0.16041	-0.0067811	1
0.99167	0.15363	0.15985	-0.00622	1
1.0083	0.15363	0.15929	-0.005661	1
1.025	0.15363	0.15873	-0.0051038	1
1.0417	0.15363	0.15818	-0.0045486	1
1.0583	0.15363	0.15763	-0.0039954	1
1.075	0.15363	0.15707	-0.0034441	1
1.0917	0.15363	0.15652	-0.0028947	1
1.1083	0.15363	0.15598	-0.0023472	1
1.125	0.15363	0.15543	-0.0018017	1
1.1417	0.15363	0.15489	-0.001258	1
1.1583	0.15363	0.15435	-0.00071633	1
1.175	0.15363	0.15381	-0.00017648	1
1.1917	0.15363	0.15327	0.00036148	1
1.2083	0.15363	0.15273	0.00089753	1
1.225	0.15363	0.1522	0.0014317	1
1.2417	0.14403	0.15167	-0.0076359	1
1.2583	0.14403	0.15114	-0.0071055	1
1.275	0.14403	0.15061	-0.0065769	1
1.2917	0.14403	0.15008	-0.0060501	1
1.3083	0.14403	0.14956	-0.0055252	1

1.325	0.14403	0.14903	-0.0050021	1
1.3417	0.14403	0.14851	-0.0044808	1
1.3583	0.14403	0.14799	-0.0039614	1
1.375	0.14403	0.14747	-0.0034438	1
1.3917	0.14403	0.14696	-0.002928	1
1.4083	0.14403	0.14644	-0.002414	1
1.425	0.14403	0.14593	-0.0019018	1
1.4417	0.14403	0.14542	-0.0013914	1
1.4583	0.14403	0.14491	-0.00088279	1
1.475	0.14403	0.14441	-0.00037593	1
1.4917	0.14403	0.1439	0.00012915	1
1.5083	0.14403	0.1434	0.00063243	1
1.525	0.14403	0.1429	0.001134	1
1.5417	0.14403	0.1424	0.0016338	1
1.5583	0.14403	0.1419	0.0021318	1
1.575	0.13442	0.1414	-0.0069819	1
1.5917	0.13442	0.14091	-0.0064873	1
1.6083	0.13442	0.14041	-0.0059945	1
1.625	0.13442	0.13992	-0.0055034	1
1.6417	0.13442	0.13943	-0.005014	1
1.6583	0.13442	0.13895	-0.0045263	1
1.675	0.13442	0.13846	-0.0040403	1
1.6917	0.13442	0.13798	-0.003556	1
1.7083	0.13442	0.13749	-0.0030735	1
1.725	0.13442	0.13701	-0.0025926	1
1.7417	0.13442	0.13653	-0.0021133	1
1.7583	0.13442	0.13606	-0.0016358	1
1.775	0.13442	0.13558	-0.0011599	1
1.7917	0.13442	0.13511	-0.00068573	1
1.8083	0.13442	0.13463	-0.0002132	1
1.825	0.13442	0.13416	0.0002577	1
1.8417	0.13442	0.13369	0.00072695	1
1.8583	0.13442	0.13323	0.0011945	1
1.875	0.13442	0.13276	0.0016605	1
1.8917	0.13442	0.1323	0.0021249	1
1.9083	0.13442	0.13183	0.0025876	1
1.925	0.13442	0.13137	0.0030487	1
1.9417	0.13442	0.13091	0.0035082	1
1.9583	0.13442	0.13045	0.003966	1
1.975	0.12482	0.13	-0.0051777	1
1.9917	0.12482	0.12954	-0.004723	1
2.0083	0.12482	0.12909	-0.00427	1
2.025	0.12482	0.12864	-0.0038184	1
2.0417	0.12482	0.12819	-0.0033685	1
2.0583	0.12482	0.12774	-0.0029202	1
2.075	0.12482	0.12729	-0.0024734	1
2.0917	0.12482	0.12685	-0.0020282	1
2.1083	0.12482	0.1264	-0.0015845	1

2.125	0.12482	0.12596	-0.0011424	1
2.1417	0.12482	0.12552	-0.00070182	1
2.1583	0.12482	0.12508	-0.00026281	1
2.175	0.12482	0.12465	0.00017469	1
2.1917	0.12482	0.12421	0.00061065	1
2.2083	0.12482	0.12377	0.0010451	1
2.225	0.12482	0.12334	0.001478	1
2.2417	0.12482	0.12291	0.0019094	1
2.2583	0.12482	0.12248	0.0023393	1
2.275	0.12482	0.12205	0.0027677	1
2.2917	0.12482	0.12163	0.0031946	1
2.3083	0.11522	0.1212	-0.0059801	1
2.325	0.12482	0.12078	0.0040439	1
2.3417	0.12482	0.12035	0.0044663	1
2.3583	0.11522	0.11993	-0.0047128	1
2.375	0.11522	0.11951	-0.0042933	1
2.3917	0.11522	0.1191	-0.0038753	1
2.4083	0.11522	0.11868	-0.0034587	1
2.425	0.11522	0.11826	-0.0030437	1
2.4417	0.11522	0.11785	-0.00263	1
2.4583	0.11522	0.11744	-0.0022178	1
2.475	0.11522	0.11703	-0.0018071	1
2.4917	0.11522	0.11662	-0.0013978	1
2.5083	0.11522	0.11621	-0.00098989	1
2.525	0.11522	0.1158	-0.00058343	1
2.5417	0.11522	0.1154	-0.00017839	1
2.5583	0.11522	0.11499	0.00022521	1
2.575	0.11522	0.11459	0.00062742	1
2.5917	0.11522	0.11419	0.0010282	1
2.6083	0.11522	0.11379	0.0014276	1
2.625	0.11522	0.11339	0.0018256	1
2.6417	0.11522	0.113	0.0022222	1
2.6583	0.11522	0.1126	0.0026174	1
2.675	0.11522	0.11221	0.0030113	1
2.6917	0.11522	0.11182	0.0034037	1
2.7083	0.10562	0.11143	-0.0058052	1
2.725	0.11522	0.11104	0.0041845	1
2.7417	0.10562	0.11065	-0.0050271	1
2.7583	0.10562	0.11026	-0.0046401	1
2.775	0.10562	0.10987	-0.0042545	1
2.7917	0.10562	0.10949	-0.0038702	1
2.8083	0.10562	0.10911	-0.0034872	1
2.825	0.10562	0.10873	-0.0031056	1
2.8417	0.10562	0.10835	-0.0027253	1
2.8583	0.10562	0.10797	-0.0023464	1
2.875	0.10562	0.10759	-0.0019688	1
2.8917	0.10562	0.10721	-0.0015924	1
2.9083	0.10562	0.10684	-0.0012175	1

2.925	0.10562	0.10646	-0.00084379	1
2.9417	0.10562	0.10609	-0.00047142	1
2.9583	0.10562	0.10572	-0.00010037	1
2.975	0.10562	0.10535	0.0002694	1
2.9917	0.10562	0.10498	0.00063788	1
3.0083	0.10562	0.10461	0.0010051	1
3.025	0.10562	0.10425	0.001371	1
3.0417	0.10562	0.10388	0.0017356	1
3.0583	0.10562	0.10352	0.0020989	1
3.075	0.10562	0.10316	0.002461	1
3.0917	0.10562	0.1028	0.0028218	1
3.1083	0.10562	0.10244	0.0031813	1
3.125	0.10562	0.10208	0.0035396	1
3.1417	0.10562	0.10172	0.0038967	1
3.1583	0.10562	0.10137	0.0042525	1
3.175	0.10562	0.10101	0.004607	1
3.1917	0.09602	0.10066	-0.0046397	1
3.2083	0.09602	0.10031	-0.0042876	1
3.225	0.09602	0.099957	-0.0039368	1
3.2417	0.09602	0.099607	-0.0035872	1
3.2583	0.09602	0.099259	-0.0032388	1
3.275	0.09602	0.098912	-0.0028916	1
3.2917	0.09602	0.098566	-0.0025457	1
3.3083	0.09602	0.098221	-0.002201	1
3.325	0.09602	0.097877	-0.0018574	1
3.3417	0.09602	0.097535	-0.0015151	1
3.3583	0.09602	0.097194	-0.0011739	1
3.375	0.09602	0.096854	-0.00083399	1
3.3917	0.09602	0.096515	-0.00049523	1
3.4083	0.09602	0.096178	-0.00015768	1
3.425	0.09602	0.095841	0.00017872	1
3.4417	0.09602	0.095506	0.00051394	1
3.4583	0.09602	0.095172	0.00084797	1
3.475	0.09602	0.094839	0.0011808	1
3.4917	0.09602	0.094507	0.0015126	1
3.5083	0.09602	0.094177	0.0018431	1
3.525	0.09602	0.093848	0.0021725	1
3.5417	0.09602	0.093519	0.0025007	1
3.5583	0.09602	0.093192	0.0028278	1
3.575	0.09602	0.092866	0.0031538	1
3.5917	0.09602	0.092541	0.0034786	1
3.6083	0.09602	0.092218	0.0038022	1
3.625	0.09602	0.091895	0.0041248	1
3.6417	0.08642	0.091574	-0.0051538	1
3.6583	0.08642	0.091254	-0.0048335	1
3.675	0.08642	0.090934	-0.0045143	1
3.6917	0.08642	0.090616	-0.0041963	1
3.7083	0.09602	0.090299	0.0057206	1

3.725	0.08642	0.089984	-0.0035635	1
3.7417	0.08642	0.089669	-0.0032488	1
3.7583	0.08642	0.089355	-0.0029352	1
3.775	0.08642	0.089043	-0.0026226	1
3.7917	0.08642	0.088731	-0.0023112	1
3.8083	0.08642	0.088421	-0.0020009	1
3.825	0.08642	0.088112	-0.0016916	1
3.8417	0.08642	0.087803	-0.0013834	1
3.8583	0.08642	0.087496	-0.0010763	1
3.875	0.08642	0.08719	-0.0007703	1
3.8917	0.08642	0.086885	-0.00046534	1
3.9083	0.08642	0.086581	-0.00016147	1
3.925	0.08642	0.086279	0.00014137	1
3.9417	0.08642	0.085977	0.00044314	1
3.9583	0.08642	0.085676	0.00074384	1
3.975	0.08642	0.085376	0.0010435	1
3.9917	0.08642	0.085078	0.0013421	1
4.0083	0.08642	0.08478	0.0016397	1
4.025	0.08642	0.084484	0.0019362	1
4.0417	0.08642	0.084188	0.0022317	1
4.0583	0.08642	0.083894	0.0025261	1
4.075	0.08642	0.0836	0.0028196	1
4.0917	0.08642	0.083308	0.003112	1
4.1083	0.08642	0.083017	0.0034034	1
4.125	0.08642	0.082726	0.0036937	1
4.1417	0.08642	0.082437	0.0039831	1
4.1583	0.08642	0.082149	0.0042714	1
4.175	0.08642	0.081861	0.0045587	1
4.1917	0.08642	0.081575	0.004845	1
4.2083	0.08642	0.08129	0.0051303	1
4.225	0.07681	0.081005	-0.0041953	1
4.2417	0.07681	0.080722	-0.003912	1
4.2583	0.07681	0.08044	-0.0036297	1
4.275	0.07681	0.080158	-0.0033483	1
4.2917	0.07681	0.079878	-0.003068	1
4.3083	0.07681	0.079599	-0.0027886	1
4.325	0.07681	0.07932	-0.0025102	1
4.3417	0.07681	0.079043	-0.0022328	1
4.3583	0.07681	0.078766	-0.0019563	1
4.375	0.07681	0.078491	-0.0016808	1
4.3917	0.07681	0.078216	-0.0014063	1
4.4083	0.07681	0.077943	-0.0011327	1
4.425	0.07681	0.07767	-0.00086011	1
4.4417	0.07681	0.077398	-0.00058845	1
4.4583	0.07681	0.077128	-0.00031775	1
4.475	0.07681	0.076858	-4.7982E-005	1
4.4917	0.07681	0.076589	0.00022084	1
4.5083	0.07681	0.076321	0.00048871	1

4.525	0.07681	0.076054	0.00075565	1
4.5417	0.07681	0.075788	0.0010217	1
4.5583	0.07681	0.075523	0.0012867	1
4.575	0.07681	0.075259	0.0015509	1
4.5917	0.07681	0.074996	0.0018141	1
4.6083	0.07681	0.074734	0.0020764	1
4.625	0.07681	0.074472	0.0023378	1
4.6417	0.07681	0.074212	0.0025983	1
4.6583	0.07681	0.073952	0.0028578	1
4.675	0.07681	0.073694	0.0031165	1
4.6917	0.07681	0.073436	0.0033742	1
4.7083	0.07681	0.073179	0.0036311	1
4.725	0.07681	0.072923	0.003887	1
4.7417	0.07681	0.072668	0.0041421	1
4.7583	0.07681	0.072414	0.0043962	1
4.775	0.07681	0.07216	0.0046495	1
4.7917	0.07681	0.071908	0.0049019	1
4.8083	0.07681	0.071657	0.0051534	1
4.825	0.07681	0.071406	0.005404	1
4.8417	0.07681	0.071156	0.0056538	1
4.8583	0.07681	0.070907	0.0059027	1
4.875	0.07681	0.070659	0.0061507	1
4.8917	0.06721	0.070412	-0.0032022	1
4.9083	0.06721	0.070166	-0.0029559	1
4.925	0.06721	0.069921	-0.0027105	1
4.9417	0.06721	0.069676	-0.0024659	1
4.9583	0.06721	0.069432	-0.0022223	1
4.975	0.06721	0.069189	-0.0019794	1
4.9917	0.06721	0.068947	-0.0017374	1
5.0083	0.06721	0.068706	-0.0014963	1
5.025	0.06721	0.068466	-0.001256	1
5.0417	0.06721	0.068226	-0.0010165	1
5.0583	0.06721	0.067988	-0.00077787	1
5.075	0.06721	0.06775	-0.00054007	1
5.0917	0.06721	0.067513	-0.00030311	1
5.1083	0.06721	0.067277	-6.6969E-005	1
5.125	0.06721	0.067042	0.00016833	1
5.1417	0.06721	0.066807	0.00040282	1
5.1583	0.06721	0.066574	0.00063647	1
5.175	0.06721	0.066341	0.00086932	1
5.1917	0.06721	0.066109	0.0011014	1
5.2083	0.06721	0.065877	0.0013326	1
5.225	0.06721	0.065647	0.001563	1
5.2417	0.06721	0.065417	0.0017926	1
5.2583	0.06721	0.065189	0.0020214	1
5.275	0.06721	0.064961	0.0022494	1
5.2917	0.06721	0.064733	0.0024766	1
5.3083	0.06721	0.064507	0.002703	1

5.325	0.06721	0.064281	0.0029286	1
5.3417	0.06721	0.064057	0.0031535	1
5.3583	0.06721	0.063832	0.0033775	1
5.375	0.06721	0.063609	0.0036008	1
5.3917	0.06721	0.063387	0.0038232	1
5.4083	0.06721	0.063165	0.0040449	1
5.425	0.06721	0.062944	0.0042659	1
5.4417	0.06721	0.062724	0.004486	1
5.4583	0.06721	0.062505	0.0047054	1
5.475	0.06721	0.062286	0.004924	1
5.4917	0.06721	0.062068	0.0051419	1
5.5083	0.06721	0.061851	0.005359	1
5.525	0.06721	0.061635	0.0055753	1
5.5417	0.06721	0.061419	0.0057909	1
5.5583	0.05761	0.061204	-0.0035943	1
5.575	0.06721	0.06099	0.0062197	1
5.5917	0.06721	0.060777	0.0064331	1
5.6083	0.05761	0.060564	-0.0029544	1
5.625	0.05761	0.060353	-0.0027425	1
5.6417	0.05761	0.060141	-0.0025314	1
5.6583	0.06721	0.059931	0.0072789	1
5.675	0.05761	0.059721	-0.0021115	1
5.6917	0.05761	0.059513	-0.0019026	1
5.7083	0.05761	0.059304	-0.0016945	1
5.725	0.05761	0.059097	-0.001487	1
5.7417	0.05761	0.05889	-0.0012803	1
5.7583	0.05761	0.058684	-0.0010744	1
5.775	0.05761	0.058479	-0.0008691	1
5.7917	0.05761	0.058275	-0.00066456	1
5.8083	0.05761	0.058071	-0.00046075	1
5.825	0.05761	0.057868	-0.00025764	1
5.8417	0.05761	0.057665	-5.5237E-005	1
5.8583	0.05761	0.057464	0.00014646	1
5.875	0.05761	0.057263	0.00034743	1
5.8917	0.05761	0.057062	0.00054772	1
5.9083	0.05761	0.056863	0.00074729	1
5.925	0.05761	0.056664	0.00094618	1
5.9417	0.05761	0.056466	0.0011444	1
5.9583	0.05761	0.056268	0.0013419	1
5.975	0.05761	0.056071	0.0015387	1
5.9917	0.05761	0.055875	0.0017348	1
6.0083	0.05761	0.05568	0.0019302	1
6.025	0.05761	0.055485	0.0021249	1
6.0417	0.05761	0.055291	0.002319	1
6.0583	0.05761	0.055098	0.0025124	1
6.075	0.05761	0.054905	0.0027051	1
6.0917	0.05761	0.054713	0.0028971	1
6.1083	0.05761	0.054521	0.0030885	1

6.125	0.05761	0.054331	0.0032792	1
6.1417	0.05761	0.054141	0.0034692	1
6.1583	0.05761	0.053951	0.0036586	1
6.175	0.05761	0.053763	0.0038473	1
6.1917	0.05761	0.053575	0.0040353	1
6.2083	0.05761	0.053387	0.0042227	1
6.225	0.05761	0.053201	0.0044094	1
6.2417	0.05761	0.053014	0.0045955	1
6.2583	0.05761	0.052829	0.0047809	1
6.275	0.05761	0.052644	0.0049657	1
6.2917	0.05761	0.05246	0.0051498	1
6.3083	0.05761	0.052277	0.0053333	1
6.325	0.05761	0.052094	0.0055162	1
6.3417	0.05761	0.051912	0.0056984	1
6.3583	0.05761	0.05173	0.0058799	1
6.375	0.05761	0.051549	0.0060609	1
6.3917	0.05761	0.051369	0.0062412	1
6.4083	0.05761	0.051189	0.0064208	1
6.425	0.04801	0.05101	-0.0030001	1
6.4417	0.04801	0.050832	-0.0028217	1
6.4583	0.05761	0.050654	0.0069561	1
6.475	0.04801	0.050477	-0.0024668	1
6.4917	0.05761	0.0503	0.0073098	1
6.5083	0.05761	0.050124	0.0074857	1
6.525	0.04801	0.049949	-0.001939	1
6.5417	0.04801	0.049774	-0.0017643	1
6.5583	0.04801	0.0496	-0.0015902	1
6.575	0.04801	0.049427	-0.0014167	1
6.5917	0.04801	0.049254	-0.0012438	1
6.6083	0.04801	0.049082	-0.0010716	1
6.625	0.04801	0.04891	-0.0008999	1
6.6417	0.04801	0.048739	-0.00072883	1
6.6583	0.04801	0.048568	-0.00055837	1
6.675	0.04801	0.048398	-0.0003885	1
6.6917	0.04801	0.048229	-0.00021922	1
6.7083	0.04801	0.048061	-5.0536E-005	1
6.725	0.04801	0.047892	0.00011756	1
6.7417	0.04801	0.047725	0.00028507	1
6.7583	0.04801	0.047558	0.00045199	1
6.775	0.04801	0.047392	0.00061833	1
6.7917	0.04801	0.047226	0.00078409	1
6.8083	0.04801	0.047061	0.00094926	1
6.825	0.04801	0.046896	0.0011139	1
6.8417	0.04801	0.046732	0.0012779	1
6.8583	0.04801	0.046569	0.0014413	1
6.875	0.04801	0.046406	0.0016042	1
6.8917	0.04801	0.046243	0.0017665	1
6.9083	0.04801	0.046082	0.0019283	1

6.925	0.04801	0.045921	0.0020894	1
6.9417	0.03841	0.04576	-0.0073499	1
6.9583	0.04801	0.0456	0.0024101	1
6.975	0.04801	0.04544	0.0025696	1
6.9917	0.04801	0.045281	0.0027285	1
7.0083	0.04801	0.045123	0.0028869	1
7.025	0.04801	0.044965	0.0030447	1
7.0417	0.04801	0.044808	0.003202	1
7.0583	0.03841	0.044651	-0.0062413	1
7.075	0.04801	0.044495	0.0035149	1
7.0917	0.04801	0.044339	0.0036705	1
7.1083	0.03841	0.044184	-0.0057744	1
7.125	0.03841	0.04403	-0.0056199	1
7.1417	0.04801	0.043876	0.0041341	1
7.1583	0.03841	0.043722	-0.0053124	1
7.175	0.03841	0.043569	-0.0051595	1
7.1917	0.03841	0.043417	-0.0050071	1
7.2083	0.03841	0.043265	-0.0048553	1
7.225	0.03841	0.043114	-0.0047039	1
7.2417	0.03841	0.042963	-0.0045531	1
7.2583	0.03841	0.042813	-0.0044029	1
7.275	0.03841	0.042663	-0.0042531	1
7.2917	0.03841	0.042514	-0.0041039	1
7.3083	0.03841	0.042365	-0.0039552	1
7.325	0.03841	0.042217	-0.003807	1
7.3417	0.03841	0.042069	-0.0036594	1
7.3583	0.03841	0.041922	-0.0035122	1
7.375	0.03841	0.041776	-0.0033656	1
7.3917	0.03841	0.041629	-0.0032195	1
7.4083	0.04801	0.041484	0.0065261	1
7.425	0.03841	0.041339	-0.0029288	1
7.4417	0.03841	0.041194	-0.0027842	1
7.4583	0.03841	0.04105	-0.0026401	1
7.475	0.03841	0.040907	-0.0024966	1
7.4917	0.03841	0.040763	-0.0023535	1
7.5083	0.03841	0.040621	-0.0022109	1
7.525	0.03841	0.040479	-0.0020688	1
7.5417	0.03841	0.040337	-0.0019273	1
7.5583	0.03841	0.040196	-0.0017862	1
7.575	0.03841	0.040056	-0.0016456	1
7.5917	0.03841	0.039915	-0.0015055	1
7.6083	0.03841	0.039776	-0.0013659	1
7.625	0.03841	0.039637	-0.0012268	1
7.6417	0.03841	0.039498	-0.0010881	1
7.6583	0.03841	0.03936	-0.00094998	1
7.675	0.03841	0.039222	-0.00081231	1
7.6917	0.03841	0.039085	-0.00067513	1
7.7083	0.03841	0.038948	-0.00053843	1

7.725	0.03841	0.038812	-0.0004022	1
7.7417	0.03841	0.038676	-0.00026645	1
7.7583	0.03841	0.038541	-0.00013117	1
7.775	0.03841	0.038406	3.625E-006	1
7.7917	0.03841	0.038272	0.00013796	1
7.8083	0.03841	0.038138	0.00027181	1
7.825	0.03841	0.038005	0.00040521	1
7.8417	0.03841	0.037872	0.00053813	1
7.8583	0.03841	0.037739	0.0006706	1
7.875	0.02881	0.037607	-0.0087974	1
7.8917	0.02881	0.037476	-0.0086659	1
7.9083	0.03841	0.037345	0.0010652	1
7.925	0.03841	0.037214	0.0011958	1
7.9417	0.03841	0.037084	0.001326	1
7.9583	0.03841	0.036954	0.0014557	1
7.975	0.03841	0.036825	0.0015849	1
7.9917	0.03841	0.036696	0.0017137	1
8.0083	0.03841	0.036568	0.0018421	1
8.025	0.02881	0.03644	-0.00763	1
8.0417	0.03841	0.036313	0.0020974	1
8.0583	0.02881	0.036186	-0.0073756	1
8.075	0.03841	0.036059	0.002351	1
8.0917	0.03841	0.035933	0.0024771	1
8.1083	0.03841	0.035807	0.0026028	1
8.125	0.03841	0.035682	0.002728	1
8.1417	0.03841	0.035557	0.0028528	1
8.1583	0.03841	0.035433	0.0029772	1
8.175	0.03841	0.035309	0.0031011	1
8.1917	0.03841	0.035185	0.0032246	1
8.2083	0.03841	0.035062	0.0033477	1
8.225	0.03841	0.03494	0.0034703	1
8.2417	0.02881	0.034817	-0.0060075	1
8.2583	0.02881	0.034696	-0.0058857	1
8.275	0.03841	0.034574	0.0038357	1
8.2917	0.02881	0.034453	-0.0056434	1
8.3083	0.02881	0.034333	-0.0055229	1
8.325	0.03841	0.034213	0.0041972	1
8.3417	0.02881	0.034093	-0.0052832	1
8.3583	0.02881	0.033974	-0.0051639	1
8.375	0.02881	0.033855	-0.0050451	1
8.3917	0.02881	0.033737	-0.0049267	1
8.4083	0.02881	0.033619	-0.0048087	1
8.425	0.02881	0.033501	-0.0046911	1
8.4417	0.02881	0.033384	-0.0045739	1
8.4583	0.02881	0.033267	-0.0044572	1
8.475	0.03841	0.033151	0.0052592	1
8.4917	0.02881	0.033035	-0.0042249	1
8.5083	0.02881	0.032919	-0.0041093	1

8.525	0.02881	0.032804	-0.0039942	1
8.5417	0.02881	0.032689	-0.0038795	1
8.5583	0.02881	0.032575	-0.0037651	1
8.575	0.02881	0.032461	-0.0036512	1
8.5917	0.02881	0.032348	-0.0035376	1
8.6083	0.02881	0.032235	-0.0034245	1
8.625	0.02881	0.032122	-0.0033118	1
8.6417	0.02881	0.032009	-0.0031994	1
8.6583	0.02881	0.031897	-0.0030875	1
8.675	0.02881	0.031786	-0.0029759	1
8.6917	0.02881	0.031675	-0.0028647	1
8.7083	0.02881	0.031564	-0.0027539	1
8.725	0.02881	0.031454	-0.0026435	1
8.7417	0.02881	0.031344	-0.0025335	1
8.7583	0.02881	0.031234	-0.0024239	1
8.775	0.02881	0.031125	-0.0023147	1
8.7917	0.02881	0.031016	-0.0022058	1
8.8083	0.02881	0.030907	-0.0020973	1
8.825	0.02881	0.030799	-0.0019892	1
8.8417	0.02881	0.030691	-0.0018815	1
8.8583	0.02881	0.030584	-0.0017741	1
8.875	0.02881	0.030477	-0.0016672	1
8.8917	0.02881	0.030371	-0.0015606	1
8.9083	0.02881	0.030264	-0.0014544	1
8.925	0.02881	0.030159	-0.0013485	1
8.9417	0.02881	0.030053	-0.001243	1
8.9583	0.02881	0.029948	-0.0011379	1
8.975	0.02881	0.029843	-0.0010332	1
8.9917	0.02881	0.029739	-0.00092878	1
9.0083	0.02881	0.029635	-0.00082478	1
9.025	0.02881	0.029531	-0.00072112	1
9.0417	0.02881	0.029428	-0.00061783	1
9.0583	0.02881	0.029325	-0.00051491	1
9.075	0.02881	0.029222	-0.00041234	1
9.0917	0.02881	0.02912	-0.00031013	1
9.1083	0.02881	0.029018	-0.00020828	1
9.125	0.02881	0.028917	-0.00010679	1
9.1417	0.02881	0.028816	-5.6559E-006	1
9.1583	0.02881	0.028715	9.5137E-005	1
9.175	0.02881	0.028614	0.00019557	1
9.1917	0.02881	0.028514	0.00029565	1
9.2083	0.02881	0.028415	0.00039538	1
9.225	0.02881	0.028315	0.00049476	1
9.2417	0.02881	0.028216	0.0005938	1
9.2583	0.02881	0.028118	0.00069248	1
9.275	0.02881	0.028019	0.00079083	1
9.2917	0.02881	0.027921	0.00088883	1
9.3083	0.02881	0.027824	0.00098648	1

9.325	0.02881	0.027726	0.0010838	1
9.3417	0.01921	0.027629	-0.0084192	1
9.3583	0.02881	0.027533	0.0012774	1
9.375	0.02881	0.027436	0.0013737	1
9.3917	0.02881	0.02734	0.0014697	1
9.4083	0.02881	0.027245	0.0015653	1
9.425	0.01921	0.027149	-0.0079394	1
9.4417	0.02881	0.027054	0.0017555	1
9.4583	0.02881	0.02696	0.0018502	1
9.475	0.01921	0.026866	-0.0076555	1
9.4917	0.02881	0.026772	0.0020384	1
9.5083	0.02881	0.026678	0.0021321	1
9.525	0.01921	0.026585	-0.0073746	1
9.5417	0.02881	0.026492	0.0023184	1
9.5583	0.02881	0.026399	0.002411	1
9.575	0.02881	0.026307	0.0025033	1
9.5917	0.02881	0.026215	0.0025954	1
9.6083	0.02881	0.026123	0.002687	1
9.625	0.02881	0.026032	0.0027784	1
9.6417	0.02881	0.025941	0.0028695	1
9.6583	0.01921	0.02585	-0.0066398	1
9.675	0.01921	0.025759	-0.0065494	1
9.6917	0.02881	0.025669	0.0031407	1
9.7083	0.02881	0.02558	0.0032305	1
9.725	0.01921	0.02549	-0.0062801	1
9.7417	0.02881	0.025401	0.0034091	1
9.7583	0.02881	0.025312	0.0034979	1
9.775	0.02881	0.025224	0.0035865	1
9.7917	0.02881	0.025135	0.0036747	1
9.8083	0.02881	0.025047	0.0037626	1
9.825	0.02881	0.02496	0.0038502	1
9.8417	0.02881	0.024872	0.0039375	1
9.8583	0.02881	0.024785	0.0040245	1
9.875	0.01921	0.024699	-0.0054888	1
9.8917	0.02881	0.024612	0.0041976	1
9.9083	0.01921	0.024526	-0.0053163	1
9.925	0.01921	0.024441	-0.0052306	1
9.9417	0.01921	0.024355	-0.0051451	1
9.9583	0.02881	0.02427	0.0045401	1
9.975	0.01921	0.024185	-0.004975	1
9.9917	0.02881	0.0241	0.0047096	1
10.008	0.01921	0.024016	-0.0048061	1
10.025	0.01921	0.023932	-0.0047221	1
10.042	0.01921	0.023848	-0.0046384	1
10.058	0.01921	0.023765	-0.004555	1
10.075	0.01921	0.023682	-0.0044719	1
10.092	0.01921	0.023599	-0.004389	1
10.108	0.01921	0.023517	-0.0043065	1

10.125	0.01921	0.023434	-0.0042243	1
10.142	0.01921	0.023352	-0.0041423	1
10.158	0.01921	0.023271	-0.0040606	1
10.175	0.01921	0.023189	-0.0039792	1
10.192	0.01921	0.023108	-0.0038981	1
10.208	0.01921	0.023027	-0.0038173	1
10.225	0.02881	0.022947	0.0058632	1
10.242	0.01921	0.022866	-0.0036565	1
10.258	0.01921	0.022787	-0.0035765	1
10.275	0.01921	0.022707	-0.0034968	1
10.292	0.01921	0.022627	-0.0034174	1
10.308	0.01921	0.022548	-0.0033383	1
10.325	0.01921	0.022469	-0.0032594	1
10.342	0.01921	0.022391	-0.0031808	1
10.358	0.01921	0.022313	-0.0031025	1
10.375	0.01921	0.022234	-0.0030245	1
10.392	0.01921	0.022157	-0.0029467	1
10.408	0.01921	0.022079	-0.0028692	1
10.425	0.01921	0.022002	-0.002792	1
10.442	0.0096	0.021925	-0.012325	1
10.458	0.01921	0.021848	-0.0026384	1
10.475	0.02881	0.021772	0.0070381	1
10.492	0.01921	0.021696	-0.0024858	1
10.508	0.01921	0.02162	-0.0024099	1
10.525	0.01921	0.021544	-0.0023343	1
10.542	0.01921	0.021469	-0.0022589	1
10.558	0.01921	0.021394	-0.0021839	1
10.575	0.01921	0.021319	-0.002109	1
10.592	0.01921	0.021244	-0.0020344	1
10.608	0.01921	0.02117	-0.0019602	1
10.625	0.01921	0.021096	-0.0018861	1
10.642	0.01921	0.021022	-0.0018123	1
10.658	0.01921	0.020949	-0.0017388	1
10.675	0.01921	0.020876	-0.0016655	1
10.692	0.01921	0.020802	-0.0015925	1
10.708	0.01921	0.02073	-0.0015198	1
10.725	0.01921	0.020657	-0.0014472	1
10.742	0.01921	0.020585	-0.001375	1
10.758	0.01921	0.020513	-0.001303	1
10.775	0.01921	0.020441	-0.0012312	1
10.792	0.01921	0.02037	-0.0011597	1
10.808	0.01921	0.020299	-0.0010885	1
10.825	0.01921	0.020228	-0.0010175	1
10.842	0.01921	0.020157	-0.00094674	1
10.858	0.01921	0.020086	-0.00087627	1
10.875	0.01921	0.020016	-0.000806	1
10.892	0.01921	0.019946	-0.00073598	1
10.908	0.01921	0.019876	-0.00066625	1

10.925	0.01921	0.019807	-0.00059672	1
10.942	0.01921	0.019737	-0.00052743	1
10.958	0.01921	0.019668	-0.00045842	1
10.975	0.01921	0.0196	-0.00038961	1
10.992	0.01921	0.019531	-0.00032105	1
11.008	0.01921	0.019463	-0.00025277	1
11.025	0.01921	0.019395	-0.00018468	1
11.042	0.01921	0.019327	-0.00011683	1
11.058	0.01921	0.019259	-4.926E-005	1
11.075	0.01921	0.019192	1.8114E-005	1
11.092	0.01921	0.019125	8.5253E-005	1
11.108	0.01921	0.019058	0.00015212	1
11.125	0.01921	0.018991	0.00021879	1
11.142	0.01921	0.018925	0.00028522	1
11.158	0.01921	0.018859	0.00035139	1
11.175	0.01921	0.018793	0.00041736	1
11.192	0.01921	0.018727	0.0004831	1
11.208	0.01921	0.018661	0.00054858	1
11.225	0.01921	0.018596	0.00061386	1
11.242	0.01921	0.018531	0.00067891	1
11.258	0.01921	0.018466	0.0007437	1
11.275	0.01921	0.018402	0.0008083	1
11.292	0.01921	0.018337	0.00087268	1
11.308	0.01921	0.018273	0.00093679	1
11.325	0.01921	0.018209	0.0010007	1
11.342	0.01921	0.018146	0.0010644	1
11.358	0.01921	0.018082	0.0011279	1
11.375	0.01921	0.018019	0.0011911	1
11.392	0.01921	0.017956	0.0012541	1
11.408	0.01921	0.017893	0.0013169	1
11.425	0.01921	0.01783	0.0013795	1
11.442	0.01921	0.017768	0.0014419	1
11.458	0.01921	0.017706	0.001504	1
11.475	0.01921	0.017644	0.001566	1
11.492	0.01921	0.017582	0.0016277	1
11.508	0.01921	0.017521	0.0016891	1
11.525	0.01921	0.01746	0.0017504	1
11.542	0.01921	0.017398	0.0018115	1
11.558	0.01921	0.017338	0.0018723	1
11.575	0.01921	0.017277	0.001933	1
11.592	0.0096	0.017217	-0.0076166	1
11.608	0.01921	0.017156	0.0020536	1
11.625	0.01921	0.017096	0.0021137	1
11.642	0.01921	0.017037	0.0021735	1
11.658	0.01921	0.016977	0.002233	1
11.675	0.01921	0.016918	0.0022924	1
11.692	0.01921	0.016858	0.0023516	1
11.708	0.01921	0.016799	0.0024105	1

11.725	0.01921	0.016741	0.0024693	1
11.742	0.01921	0.016682	0.0025279	1
11.758	0.01921	0.016624	0.0025862	1
11.775	0.01921	0.016566	0.0026443	1
11.792	0.01921	0.016508	0.0027023	1
11.808	0.01921	0.01645	0.00276	1
11.825	0.01921	0.016392	0.0028176	1
11.842	0.01921	0.016335	0.0028749	1
11.858	0.01921	0.016278	0.002932	1
11.875	0.01921	0.016221	0.002989	1
11.892	0.01921	0.016164	0.0030457	1
11.908	0.01921	0.016108	0.0031022	1
11.925	0.01921	0.016051	0.0031586	1
11.942	0.01921	0.015995	0.0032147	1
11.958	0.01921	0.015939	0.0032706	1
11.975	0.0096	0.015884	-0.0062836	1
11.992	0.01921	0.015828	0.003382	1
12.008	0.01921	0.015773	0.0034373	1
12.025	0.01921	0.015718	0.0034925	1
12.042	0.0096	0.015663	-0.0060625	1
12.058	0.01921	0.015608	0.0036022	1
12.075	0.01921	0.015553	0.0036568	1
12.092	0.0096	0.015499	-0.0058988	1
12.108	0.01921	0.015445	0.0037654	1
12.125	0.0096	0.015391	-0.0057905	1
12.142	0.01921	0.015337	0.0038733	1
12.158	0.01921	0.015283	0.0039269	1
12.175	0.01921	0.01523	0.0039804	1
12.192	0.01921	0.015176	0.0040337	1
12.208	0.01921	0.015123	0.0040867	1
12.225	0.01921	0.01507	0.0041396	1
12.242	0.0096	0.015018	-0.0054177	1
12.258	0.01921	0.014965	0.0042448	1
12.275	0.0096	0.014913	-0.0053128	1
12.292	0.01921	0.014861	0.0043494	1
12.308	0.0096	0.014809	-0.0052087	1
12.325	0.01921	0.014757	0.0044531	1
12.342	0.01921	0.014705	0.0045048	1
12.358	0.01921	0.014654	0.0045562	1
12.375	0.01921	0.014603	0.0046074	1
12.392	0.01921	0.014551	0.0046585	1
12.408	0.01921	0.014501	0.0047094	1
12.425	0.01921	0.01445	0.0047601	1
12.442	0.0096	0.014399	-0.0047993	1
12.458	0.01921	0.014349	0.004861	1
12.475	0.0096	0.014299	-0.0046988	1
12.492	0.01921	0.014249	0.0049612	1
12.508	0.01921	0.014199	0.005011	1

12.525	0.01921	0.014149	0.0050607	1
12.542	0.01921	0.0141	0.0051102	1
12.558	0.01921	0.01405	0.0051595	1
12.575	0.01921	0.014001	0.0052087	1
12.592	0.0096	0.013952	-0.0043524	1
12.608	0.01921	0.013904	0.0053064	1
12.625	0.0096	0.013855	-0.0042549	1
12.642	0.01921	0.013806	0.0054035	1
12.658	0.0096	0.013758	-0.0041582	1
12.675	0.0096	0.01371	-0.0041101	1
12.692	0.01921	0.013662	0.0055479	1
12.708	0.01921	0.013614	0.0055957	1
12.725	0.0096	0.013567	-0.0039667	1
12.742	0.0096	0.013519	-0.0039193	1
12.758	0.01921	0.013472	0.005738	1
12.775	0.01921	0.013425	0.0057851	1
12.792	0.0096	0.013378	-0.0037779	1
12.808	0.01921	0.013331	0.0058789	1
12.825	0.0096	0.013284	-0.0036845	1
12.842	0.01921	0.013238	0.005972	1
12.858	0.0096	0.013192	-0.0035917	1
12.875	0.0096	0.013146	-0.0035456	1
12.892	0.0096	0.0131	-0.0034996	1
12.908	0.01921	0.013054	0.0061562	1
12.925	0.01921	0.013008	0.0062019	1
12.942	0.0096	0.012963	-0.0033626	1
12.958	0.0096	0.012917	-0.0033173	1
12.975	0.0096	0.012872	-0.0032721	1
12.992	0.0096	0.012827	-0.0032271	1
13.008	0.0096	0.012782	-0.0031822	1
13.025	0.0096	0.012738	-0.0031375	1
13.042	0.0096	0.012693	-0.003093	1
13.058	0.0096	0.012649	-0.0030486	1
13.075	0.0096	0.012604	-0.0030043	1
13.092	0.0096	0.01256	-0.0029603	1
13.108	0.0096	0.012516	-0.0029163	1
13.125	0.01921	0.012473	0.0067374	1
13.142	0.01921	0.012429	0.0067811	1
13.158	0.0096	0.012385	-0.0027855	1
13.175	0.0096	0.012342	-0.0027421	1
13.192	0.0096	0.012299	-0.002699	1
13.208	0.0096	0.012256	-0.002656	1
13.225	0.0096	0.012213	-0.0026131	1
13.242	0.0096	0.01217	-0.0025704	1
13.258	0.01921	0.012128	0.0070822	1
13.275	0.0096	0.012085	-0.0024854	1
13.292	0.01921	0.012043	0.0071669	1
13.308	0.0096	0.012001	-0.002401	1

13.325	0.0096	0.011959	-0.002359	1
13.342	0.0096	0.011917	-0.0023172	1
13.358	0.0096	0.011876	-0.0022755	1
13.375	0.0096	0.011834	-0.002234	1
13.392	0.0096	0.011793	-0.0021926	1
13.408	0.0096	0.011751	-0.0021513	1
13.425	0.0096	0.01171	-0.0021102	1
13.442	0.0096	0.011669	-0.0020693	1
13.458	0.0096	0.011628	-0.0020285	1
13.475	0.01921	0.011588	0.0076222	1
13.492	0.01921	0.011547	0.0076627	1
13.508	0.0096	0.011507	-0.0019069	1
13.525	0.0096	0.011467	-0.0018666	1
13.542	0.0096	0.011427	-0.0018265	1
13.558	0.0096	0.011387	-0.0017866	1
13.575	0.0096	0.011347	-0.0017467	1
13.592	0.0096	0.011307	-0.001707	1
13.608	0.0096	0.011268	-0.0016675	1
13.625	0.0096	0.011228	-0.0016281	1
13.642	0.0096	0.011189	-0.0015888	1
13.658	0.0096	0.01115	-0.0015497	1
13.675	0.0096	0.011111	-0.0015107	1
13.692	0.01921	0.011072	0.0081382	1
13.708	0.0096	0.011033	-0.0014331	1
13.725	0.0096	0.010995	-0.0013945	1
13.742	0.0096	0.010956	-0.0013561	1
13.758	0.01921	0.010918	0.0082922	1
13.775	0.0096	0.01088	-0.0012796	1
13.792	0.0096	0.010841	-0.0012415	1
13.808	0.0096	0.010804	-0.0012036	1
13.825	0.0096	0.010766	-0.0011658	1
13.842	0.0096	0.010728	-0.0011281	1
13.858	0.0096	0.010691	-0.0010906	1
13.875	0.0096	0.010653	-0.0010532	1
13.892	0.0096	0.010616	-0.001016	1
13.908	0.0096	0.010579	-0.00097885	1
13.925	0.0096	0.010542	-0.00094184	1
13.942	0.0096	0.010505	-0.00090496	1
13.958	0.0096	0.010468	-0.00086823	1
13.975	0.0096	0.010432	-0.00083161	1
13.992	0.0096	0.010395	-0.00079512	1
14.008	0.0096	0.010359	-0.00075878	1
14.025	0.0096	0.010323	-0.00072254	1
14.042	0.0096	0.010286	-0.00068643	1
14.058	0.0096	0.01025	-0.00065046	1
14.075	0.0096	0.010215	-0.00061461	1
14.092	0.0096	0.010179	-0.00057887	1
14.108	0.0096	0.010143	-0.00054328	1

14.125	0.0096	0.010108	-0.0005078	1
14.142	0.0096	0.010072	-0.00047244	1
14.158	0.01921	0.010037	0.0091728	1
14.175	0.0096	0.010002	-0.00040211	1
14.192	0.0096	0.0099671	-0.00036712	1
14.208	0.0096	0.0099323	-0.00033228	1
14.225	0.0096	0.0098975	-0.00029753	1
14.242	0.0096	0.0098629	-0.0002629	1
14.258	0.0096	0.0098284	-0.00022842	1
14.275	0.0096	0.009794	-0.00019404	1
14.292	0.0096	0.0097598	-0.00015978	1
14.308	0.0096	0.0097257	-0.00012566	1
14.325	0.0096	0.0096916	-9.1632E-005	1
14.342	0.0096	0.0096577	-5.7728E-005	1
14.358	0.0096	0.009624	-2.3963E-005	1
14.375	0.0096	0.0095903	9.7044E-006	1
14.392	0.0096	0.0095567	4.3254E-005	1
14.408	0.0096	0.0095233	7.6666E-005	1
14.425	0.0096	0.00949	0.00010998	1
14.442	0.0096	0.0094568	0.00014318	1
14.458	0.0096	0.0094238	0.00017624	1
14.475	0.0096	0.0093908	0.00020921	1
14.492	0.0096	0.0093579	0.00024206	1
14.508	0.0096	0.0093252	0.00027478	1
14.525	0.0096	0.0092926	0.0003074	1
14.542	0.0096	0.0092601	0.00033991	1
14.558	0.0096	0.0092277	0.00037228	1
14.583	0.0096	0.0091793	0.00042065	1
14.6	0.0096	0.0091472	0.00045277	1
14.617	0.0096	0.0091152	0.00048477	1
14.633	0.0096	0.0090834	0.00051663	1
14.65	0.0096	0.0090516	0.00054841	1
14.667	0.0096	0.0090199	0.00058008	1
14.683	0.0096	0.0089884	0.00061161	1
14.7	0.0096	0.0089569	0.00064305	1
14.717	0.0096	0.0089256	0.00067439	1
14.733	0.0096	0.0088944	0.00070559	1
14.75	0.0096	0.0088633	0.00073671	1
14.767	0.0096	0.0088323	0.00076772	1
14.783	0.0096	0.0088014	0.0007986	1
14.8	0.0096	0.0087706	0.00082938	1
14.817	0.0096	0.0087399	0.00086007	1
14.833	0.0096	0.0087094	0.00089062	1
14.85	0.0096	0.0086789	0.00092109	1
14.867	0.0096	0.0086485	0.00095145	1
14.883	0.0096	0.0086183	0.00098169	1
14.9	0.0096	0.0085882	0.0010118	1
14.917	0.0096	0.0085581	0.0010419	1

14.933	0.0096	0.0085282	0.0010718	1
14.95	0.0096	0.0084984	0.0011016	1
14.967	0.0096	0.0084686	0.0011314	1
14.983	0.0096	0.008439	0.001161	1
15	0.0096	0.0084095	0.0011905	1
15.017	0.0096	0.0083801	0.0012199	1
15.033	0.0096	0.0083508	0.0012492	1
15.05	0.0096	0.0083216	0.0012784	1
15.067	0.0096	0.0082925	0.0013075	1
15.083	0.0096	0.0082635	0.0013365	1
15.1	0.0096	0.0082346	0.0013654	1
15.117	0.0096	0.0082058	0.0013942	1
15.133	0.0096	0.0081771	0.0014229	1
15.15	0.0096	0.0081485	0.0014515	1
15.167	0.0096	0.00812	0.00148	1
15.183	0.0096	0.0080916	0.0015084	1
15.2	0.0096	0.0080633	0.0015367	1
15.217	0.0096	0.0080351	0.0015649	1
15.233	0.0096	0.008007	0.001593	1
15.25	0.0096	0.0079789	0.0016211	1
15.267	0.0096	0.007951	0.001649	1
15.283	0.0096	0.0079232	0.0016768	1
15.3	0.0096	0.0078955	0.0017045	1
15.317	0.0096	0.0078679	0.0017321	1
15.333	0.0096	0.0078404	0.0017596	1
15.35	0.01921	0.007813	0.011397	1
15.367	0.0096	0.0077856	0.0018144	1
15.383	0.0096	0.0077584	0.0018416	1
15.4	0.0096	0.0077313	0.0018687	1
15.417	0.0096	0.0077042	0.0018958	1
15.433	0.0096	0.0076773	0.0019227	1
15.45	0.0096	0.0076504	0.0019496	1
15.467	0.0096	0.0076237	0.0019763	1
15.483	0.0096	0.007597	0.002003	1
15.5	0.0096	0.0075704	0.0020296	1
15.517	0.0096	0.007544	0.002056	1
15.533	0.0096	0.0075176	0.0020824	1
15.55	0.0096	0.0074913	0.0021087	1
15.567	0.0096	0.0074651	0.0021349	1
15.583	0.0096	0.007439	0.002161	1
15.6	0.0096	0.007413	0.002187	1
15.617	0.0096	0.007387	0.002213	1
15.633	0.0096	0.0073612	0.0022388	1
15.65	0.0096	0.0073354	0.0022646	1
15.667	0.0096	0.0073098	0.0022902	1
15.683	0.0096	0.0072842	0.0023158	1
15.7	0.0096	0.0072587	0.0023413	1
15.717	0.0096	0.0072333	0.0023667	1

15.733	0.0096	0.0072081	0.0023919	1
15.75	0.0096	0.0071828	0.0024172	1
15.767	0.0096	0.0071577	0.0024423	1
15.783	0.0096	0.0071327	0.0024673	1
15.8	0.0096	0.0071077	0.0024923	1
15.817	0.0096	0.0070829	0.0025171	1
15.833	0.0096	0.0070581	0.0025419	1
15.85	0.0096	0.0070334	0.0025666	1
15.867	0.0096	0.0070088	0.0025912	1
15.883	0.0096	0.0069843	0.0026157	1
15.9	0.0096	0.0069599	0.0026401	1
15.917	0.0096	0.0069355	0.0026645	1
15.933	0.0096	0.0069113	0.0026887	1
15.95	0.0096	0.0068871	0.0027129	1
15.967	0.0096	0.006863	0.002737	1
15.983	0.0096	0.006839	0.002761	1
16	0.0096	0.0068151	0.0027849	1
16.017	0.0096	0.0067912	0.0028088	1
16.033	0.0096	0.0067675	0.0028325	1
16.05	0.0096	0.0067438	0.0028562	1
16.067	0.0096	0.0067202	0.0028798	1
16.083	0.0096	0.0066967	0.0029033	1
16.1	0.0096	0.0066733	0.0029267	1
16.117	0.0096	0.00665	0.00295	1
16.133	0.0096	0.0066267	0.0029733	1
16.15	0.0096	0.0066035	0.0029965	1
16.167	0.0096	0.0065804	0.0030196	1
16.183	0.0096	0.0065574	0.0030426	1
16.2	0.0096	0.0065345	0.0030655	1
16.217	0.0096	0.0065116	0.0030884	1
16.233	0.0096	0.0064889	0.0031111	1
16.25	0.0096	0.0064662	0.0031338	1
16.267	0.0096	0.0064435	0.0031565	1
16.283	0.0096	0.006421	0.003179	1
16.3	0.0096	0.0063986	0.0032014	1
16.317	0.0096	0.0063762	0.0032238	1
16.333	0.0096	0.0063539	0.0032461	1
16.35	0.0096	0.0063317	0.0032683	1
16.367	0.0096	0.0063095	0.0032905	1
16.383	0.0096	0.0062874	0.0033126	1
16.4	0.0096	0.0062654	0.0033346	1
16.417	0.0096	0.0062435	0.0033565	1
16.442	0.0096	0.0062108	0.0033892	1
16.458	0.0096	0.0061891	0.0034109	1
16.475	0.0096	0.0061674	0.0034326	1
16.492	0.0096	0.0061459	0.0034541	1
16.508	0.0096	0.0061244	0.0034756	1
16.525	0.0096	0.006103	0.003497	1

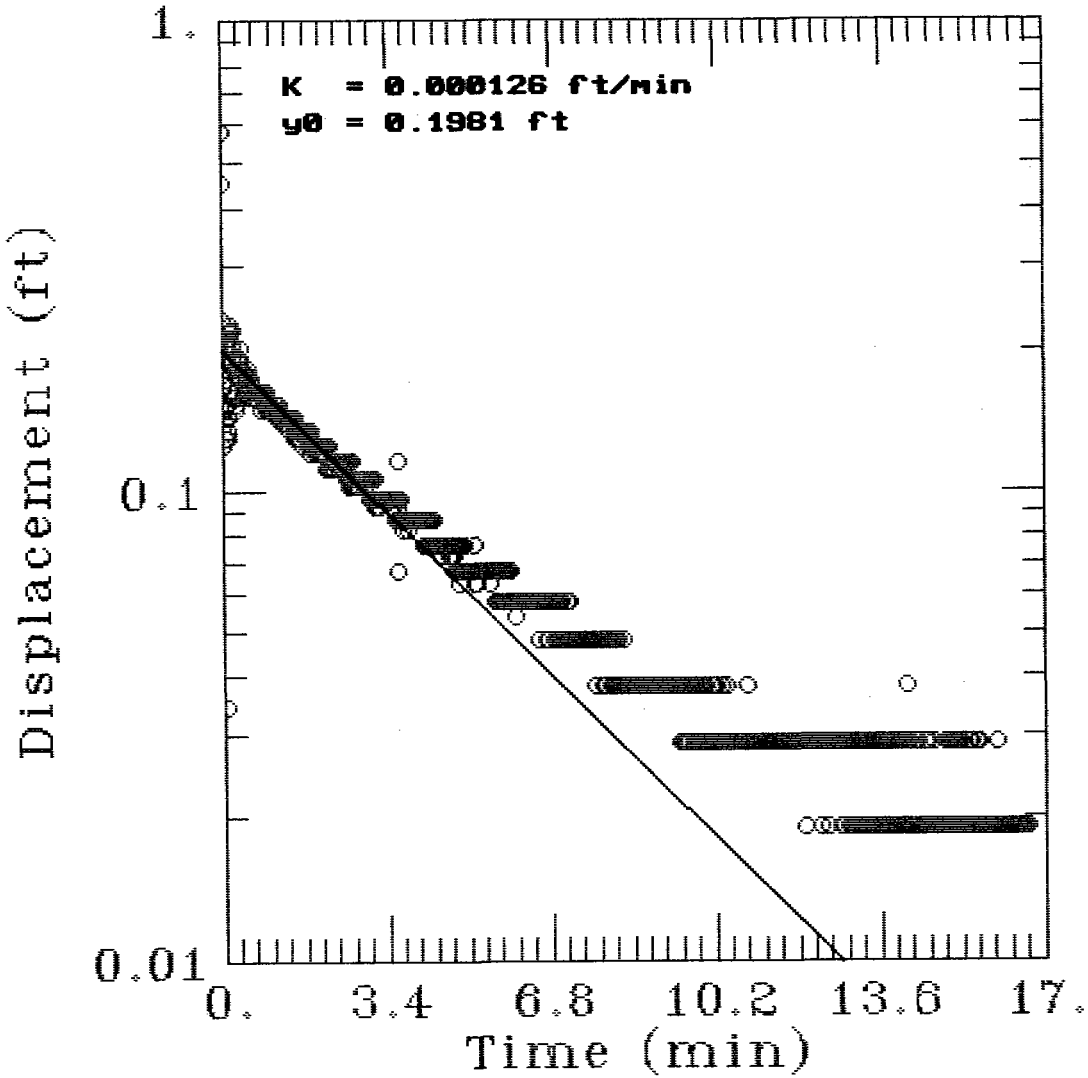
16.542	0.0096	0.0060816	0.0035184	1
16.558	0.0096	0.0060603	0.0035397	1
16.575	0.0096	0.0060391	0.0035609	1
16.592	0.0096	0.006018	0.003582	1
16.608	0.0096	0.005997	0.003603	1
16.625	0.0096	0.005976	0.003624	1
16.658	0.0096	0.0059343	0.0036657	1
16.675	0.0096	0.0059135	0.0036865	1
16.692	0.0096	0.0058928	0.0037072	1
16.708	0.0096	0.0058722	0.0037278	1

RESULTS FROM VISUAL CURVE MATCHING

VISUAL MATCH PARAMETER ESTIMATES

	Estimate
K =	1.1330E-004
y0 =	1.9690E-001

DH-4 BAIL TEST #2



A Q T E S O L V R E S U L T S
Version 1.10

04/25/94 11:50:18

TEST DESCRIPTION

Data set..... dh4bai#2.aqt
Data set title..... DH-4 BAIL TEST #2
Company..... EARTHFAX ENGINEERING, INC.
Project..... UC-192-09
Client..... CO-OP MINING COMPANY
Location..... BEAR CANYON MINE
Test date..... 3-14-94
Test well..... DH-4

Knowns and Constants:
No. of data points..... 2000
Radius of well casing..... 0.0625
Radius of well..... 0.099
Aquifer saturated thickness..... 177.7
Well screen length..... 20
Static height of water in well..... 177.7
Log(Re/Rw)..... 5.519
A, B, C..... 0.000, 0.000, 6.946

ANALYTICAL METHOD

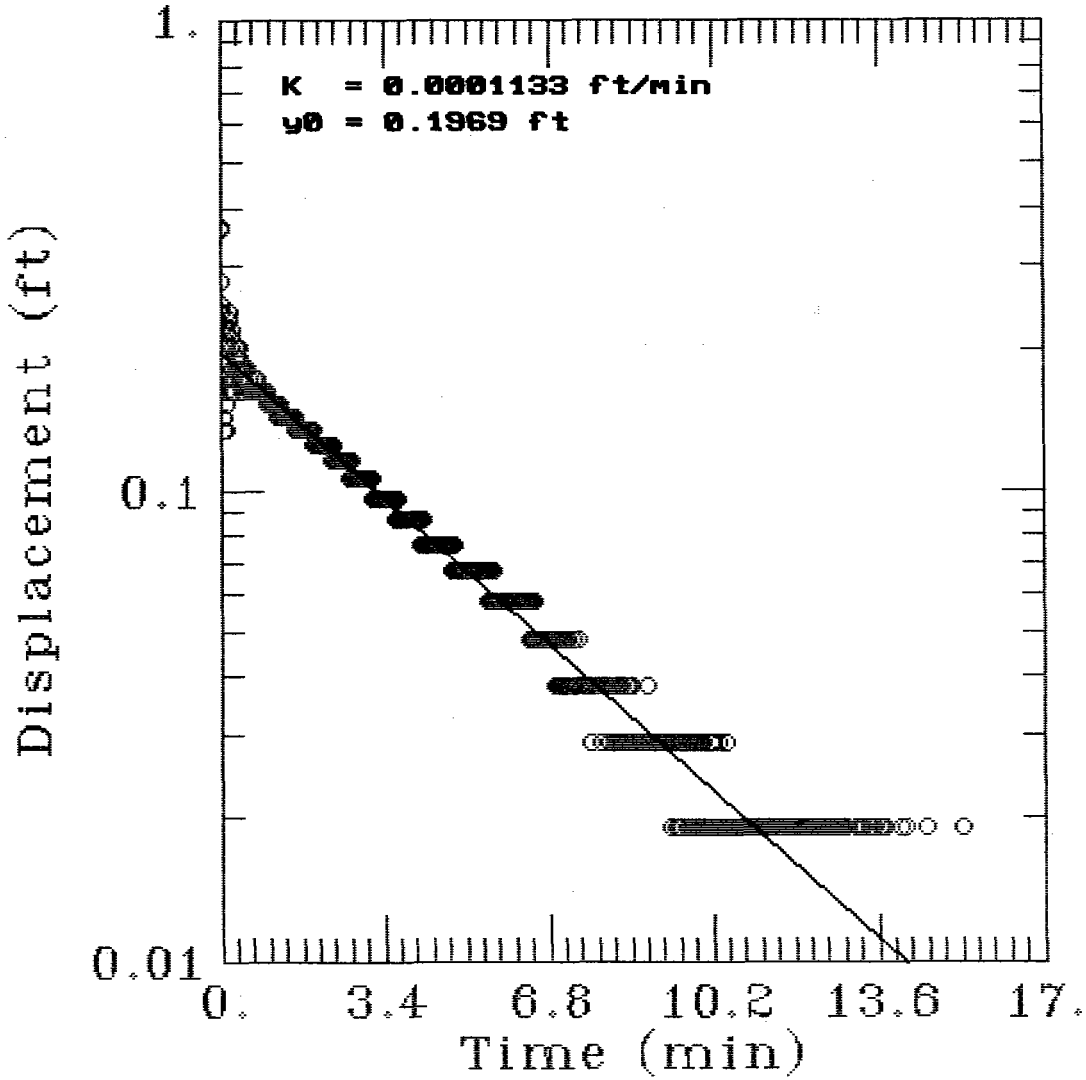
Bouwer-Rice (Unconfined Aquifer Slug Test)

RESULTS FROM STATISTICAL CURVE MATCHING

STATISTICAL MATCH PARAMETER ESTIMATES

	Estimate		Std. Error
K =	1.2604E-004	+/-	6.2655E-006
y0 =	1.9807E-001	+/-	3.3820E-003

DH-4 SLUG TEST #2



APPENDIX 7-N-G

Stratigraphic Logs and Completion Diagrams for In-Mine Drillholes DH-1A, DH-2, DH-3 and DH-4

KEY TO SYMBOLS

SANDSTONE

MUDSTONE

MUDDY SANDSTONE

SANDY MUDSTONE

SHALE

COAL

CEMENT

BENTONITE

20-40 MESH SILICA SAND

CORE SAMPLE

Project Name: GROUND WATER INVESTIGATION Owner/Client: CO-OP MINING COMPANY	Boring/Well Number: DH-1A Boring/Well Location: 395059.18 N 2112761.51 E
Project Number: UC-192-06	Reference Elevation: 7535.71 Reference Point: MINE FLOOR
Date Drilled: 06 AUG 1991 Logged by: JDG	Drilling Contractor: CO-OP MINE PERSONNEL Drilling Method: HYDRAULIC ROTARY Rig Type: DIAMEC 251
First occurrence of G.W.: 114.0' Static W.L.: 114.0' Dates Measured: 06 AUG 91 21 APR 92	Boring Depth (ft): 535' Well Depth (ft): 171' Boring Diameter (in): 2.9"

DEPTH (FT)	GRAPHICAL LOG	LITHOLOGIC DESCRIPTION AND OBSERVATIONS	SAMPLE LOC.	WELL COMPLETION DETAILS
0		COAL: Bottom coal. Good core.		Slip Cap with Cover
		MUDSTONE: Gray. Hard. Good core. Carbonaceous banding.		
10		SANDSTONE: Very Fine grained. Sub-rounded grains. Finely laminated. Gray to light gray color. Occasional carbonaceous stringers.		
20		Medium cross-bed sets.		Cement
30		Carbonaceous stringers.		
40		Carbonaceous stringers.		
50		Gray-white color with dark gray carbonaceous stringers on cross-beds.		
		SANDY MUDSTONE: Fine laminations. Varying proportions of sand and silt.		
60		SANDSTONE: Clean, with carbonaceous stringers on cross-beds between intervals of clean sand.		
70		Carbonaceous stringers and low angle cross-beds.		Bentonite Grout
80				
90		COAL: Hiawatha Coal seam.		
100				

Project Name: GROUND WATER INVESTIGATION Owner/Client: CO-OP MINING COMPANY	Boring/Well Number: DH-1A Boring/Well Location: 395059.18 N 2112761.51 E
Project Number: UC-192-06	Reference Elevation: 7535.71 Reference Point: MINE FLOOR
Date Drilled: 06 AUG 1991 Logged by: JOG	Drilling Contractor: CO-OP MINE PERSONNEL Drilling Method: HYDRAULIC ROTARY Rig Type: DIAMEC 251
First occurrence of G.W.: 114.0' Static W.L.: 114.0' Dates Measured: 06 AUG 91 21 APR 92	Boring Depth (Ft): 535' Well Depth (Ft): 171' Boring Diameter (in): 2.9"

DEPTH (FT)	GRAPHICAL LOG	LITHOLOGIC DESCRIPTION AND OBSERVATIONS	SAMPLE LOC.	WELL COMPLETION DETAILS
100		SANDSTONE: Light gray-white colored. Spring Canyon Tongue of the Star Point Sandstone.		
		Fine-medium, rounded grains. Laminated.		
110		Fewer carbonaceous stringers. Low angle cross-beds.		
120				1.5" PVC Casing
		Carbonaceous stringers increase.		
130		Horizontal laminations. Massive bedded.		
140				20-40 Mesh Silica Sand
150		Massive bedded. Fine-medium grained. Low angle cross-beds. Dark minerals.		
160				1.5" PVC Slot Screen
		Locally dense carbonaceous stringers.		
170		Fining to fine-very fine grained.		Threaded End Plug
		Coarsening to fine-medium grained.		
180		MUDDY SANDSTONE: Dark gray colored.		Cement Plug
190		MUDSTONE: Sandy. Dark brown-gray colored. Mancos No. 1.		
		SANDY MUDSTONE: Marbled.		
200				

Project Name: GROUND WATER INVESTIGATION Owner/Client: CO-OP MINING COMPANY	Boring/Well Number: DH-1A Boring/Well Location: 395059.18 N 2112761.51 E
Project Number: UC-192-06	Reference Elevation: 7535.71 Reference Point: MINE FLOOR
Date Drilled: 06 AUG 1991 Logged by: JDG	Drilling Contractor: CO-OP MINE PERSONNEL Drilling Method: HYDRAULIC ROTARY Rig Type: DIAMEC 251
First occurrence of G.W.: 114.0' Static W.L.: 114.0' Dates Measured: 06 AUG 91 21 APR 92	Boring Depth (ft): 535' Well Depth (ft): 171' Boring Diameter (in): 2.9"

DEPTH (FT)	GRAPHICAL LOG	LITHOLOGIC DESCRIPTION AND OBSERVATIONS	SAMPLE LOC.	WELL COMPLETION DETAILS
200		SANDY MUDSTONE: Alternating marbled and laminated muddy inter-beds.		
210				
220		MUDSTONE: Gray-brown colored. Marbled. Laminated.		
230		SANDY MUDSTONE: Marbled. Laminated. Laminations increasing. Sand decreasing. Sandy.		
240				
250		SANDSTONE: Fine-very fine grained. Clean. Low angle cross-beds. Storre Tongue of the Star Point Sandstone.		
260		MUDDY SANDSTONE: Laminated. Marbled. Bioturbated. Sand and mud proportions vary locally.		
270				
280				
290		SANDSTONE: Clean. Low angle cross-beds. occasional carbonaceous stringers.		
300				

Project Name: GROUND WATER INVESTIGATION Owner/Client: CO-OP MINING COMPANY	Boring/Well Number: DH-1A Boring/Well Location: 395059.18 N 2112761.51 E
Project Number: UC-192-06	Reference Elevation: 7535.71 Reference Point: MINE FLOOR
Date Drilled: 06 AUG 1991 Logged by: JDG	Drilling Contractor: CO-OP MINE PERSONNEL Drilling Method: HYDRAULIC ROTARY Rig Type: DIAMEC 251
First occurrence of G.W.: 114.0' Static W.L.: 114.0' Dates Measured: 06 AUG 91 21 APR 92	Boring Depth (ft): 535' Well Depth (ft): 171' Boring Diameter (in): 2.9"

DEPTH (FT)	GRAPHICAL LOG	LITHOLOGIC DESCRIPTION AND OBSERVATIONS	SAMPLE LOC.	WELL COMPLETION DETAILS
300		SANDSTONE: Occasional carbonaceous partings. Pyritized fracture.		
310		MUDDY SANDSTONE: Mud increasing downward. Laminated. Bioturbated.		
320				
330				
340		MUDSTONE: Occasionally sandy. Marbled. Laminated. Dark gray colored. Locally bioturbated. Mancos No. 2.		
350				
360				
370				
380		SANDY MUDSTONE: Marbled. Bioturbated. Varies to mudstone locally.		
390				
400				

Project Name: GROUND WATER INVESTIGATION Owner/Client: CO-OP MINING COMPANY	Boring/Well Number: DH-1A Boring/Well Location: 395059.18 N 2112761.51 E
Project Number: UC-192-06	Reference Elevation: 7535.71 Reference Point: MINE FLOOR
Date Drilled: 06 AUG 1991 Logged by: JDG	Drilling Contractor: CO-OP MINE PERSONNEL Drilling Method: HYDRAULIC ROTARY Rig Type: DIAMEC 251
First occurrence of G.W.: 114.0' Static W.L.: 114.0' Dates Measured: 06 AUG 91 21 APR 92	Boring Depth (Ft): 535' Well Depth (Ft): 171' Boring Diameter (in): 2.9"

DEPTH (FT)	GRAPHICAL LOG	LITHOLOGIC DESCRIPTION AND OBSERVATIONS	SAMPLE LOC.	WELL COMPLETION DETAILS
400		SANDY MUDSTONE:		
		SANDSTONE: Low angle cross-beds. Fine-coarse grained. Dark minerals. Occasional muddy partings. Thin-medium bedding. Moderate-poor sorting. Appears to be more pourous than upper units. Panther Tongue of the Star Point Sandstone.		
410				
420				
430		Circulation loss.		
440				
450				
460		Mud-lined fracture.		
470				
		Losing circulation.		
480				
		Muddy bands in white sandstone increasing.		
490				
500				

Project Name: GROUND WATER INVESTIGATION Owner/Client: CO-OP MINING COMPANY	Boring/Well Number: DH-1A Boring/Well Location: 395059.18 N 2112761.51 E
Project Number: UC-192-06	Reference Elevation: 7535.71 Reference Point: MINE FLOOR
Date Drilled: 06 AUG 1991 Logged by: JDG	Drilling Contractor: CO-OP MINE PERSONNEL Drilling Method: HYDRAULIC ROTARY Rig Type: DIAMEC 251
First occurrence of G.W.: 114.0' Static W.L.: 114.0' Dates Measured: 06 AUG 91 21 APR 92	Boring Depth (ft): 535' Well Depth (ft): 171' Boring Diameter (in): 2.9"

DEPTH (FT)	GRAPHICAL LOG	LITHOLOGIC DESCRIPTION AND OBSERVATIONS	SAMPLE LOC.	WELL COMPLETION DETAILS
500		SANDSTONE:		
		SANDY MUDSTONE: White colored, fine to medium grained sandstone grading to dark gray-brown mudstone. Heavily bioturbated.		Cement Plug
510		SHALE: Mancos Shale.		
520				
530				
540				
550				
560				
570				
580				
590				
600				

EARTHFAX ENGINEERING, INC. DRILLING LOG

Project Name: GROUND WATER INVESTIGATION Owner/Client: CO-OP MINING COMPANY	Boring/Well Number: DH-2 Boring/Well Location: 397775.88 N 2112519.39 E
Project Number: UC-192-06	Reference Elevation: 7557.18 Reference Point: MINE FLOOR
Date Drilled: 16 DEC 1991 Logged by: JDG & AM	Drilling Contractor: CO-OP MINE PERSONNEL Drilling Method: HYDRAULIC ROTARY Rig Type: DIAMEC 251
First occurrence of G.W.: 22.98 Static W.L.: 22.98 Dates Measured: 16 DEC 91 21 APR 92	Boring Depth (ft): 530' Well Depth (ft): 190' Boring Diameter (in): 2.9"

DEPTH (FT)	GRAPHICAL LOG	LITHOLOGIC DESCRIPTION AND OBSERVATIONS	SAMPLE LOC.	WELL COMPLETION DETAILS
0		SANDSTONE: Light gray sandstone.		Slip Cap with Cover
10				
20				
30				
40		Light gray sandstone.		Cement
50		Muddy (dark brown cuttings).		1.5" PVC Casing
60		Light gray sandstone resumes		
70				
80				
90		Clean light gray sandstone.		Bentonite Grout
		COAL: Hiawatha Coal seam.		
100				

Project Name: GROUND WATER INVESTIGATION Owner/Client: CO-OP MINING COMPANY	Boring/Well Number: DH-2 Boring/Well Location: 397775.88 N 2112519.39 E
Project Number: UC-192-06	Reference Elevation: 7557.18 Reference Point: MINE FLOOR
Date Drilled: 16 DEC 1991 Logged by: JDG & AM	Drilling Contractor: CO-OP MINE PERSONNEL Drilling Method: HYDRAULIC ROTARY Rig Type: DIAMEC 251
First occurrence of G.W.: 22.98' Static W.L.: 22.98 Dates Measured: 16 DEC 91 21 APR 92	Boring Depth (Ft): 530' Well Depth (Ft): 190' Boring Diameter (in): 2.9"

DEPTH (FT)	GRAPHICAL LOG	LITHOLOGIC DESCRIPTION AND OBSERVATIONS	SAMPLE LOC	WELL COMPLETION DETAILS
100		COAL: Hiawatha Coal seam		
		SANDSTONE: Clean light gray sandstone. Spring Canyon Tongue of the Star Point Sandstone.		
110		Carbonaceous stringers		
		Light gray. Clean.		Bentonite Grout
120				1.5" PVC Casing
130				
140				
150				20-40 Mesh Silica Sand
160				
170				
180				1.5" PVC Slot Screen
190		MUDDY SANDSTONE: Muddy sandstone/sandy mudstone, gradational Bioturbated. Clean interbeds at 198'		Threaded End Plug Bentonite Plug
200				

Project Name: GROUND WATER INVESTIGATION Owner/Client: CO-OP MINING COMPANY	Boring/Well Number: DH-2 Boring/Well Location: 397775.88 N 2112519.39 E
Project Number: UC-192-06	Reference Elevation: 7557.18 Reference Point: MINE FLOOR
Date Drilled: 16 DEC 1991 Logged by: JDG & AM	Drilling Contractor: CO-OP MINE PERSONNEL Drilling Method: HYDRAULIC ROTARY Rig Type: DIAMEC 251
First occurrence of G.W.: 22.98' Static W.L.: 22.98' Dates Measured: 16 DEC 91 21 APR 92	Boring Depth (ft): 530' Well Depth (ft): 190' Boring Diameter (in): 2.9"

DEPTH (FT)	GRAPHICAL LOG	LITHOLOGIC DESCRIPTION AND OBSERVATIONS	SAMPLE LOC.	WELL COMPLETION DETAILS
200		MUDDY SANDSTONE: Carbonaceous stringers.		
		SANDY MUDSTONE: Grades to mudstone. Bioturbated. Top of Mancos No. 1.		
210				
220		Gradational muddy sandstone/sandy mudstone		Bentonite Plug
230				
240		SANDSTONE: White-light gray colored. Occasional mud in cuttings. Storrs Tongue of the Star Point Sandstone.		
250				
260				
270				
280				
290				
300				

Project Name: GROUND WATER INVESTIGATION Owner/Client: CO-OP MINING COMPANY	Boring/Well Number: DH-2 Boring/Well Location: 397775.88 N 2112519.39 E
Project Number: UC-192-06	Reference Elevation: 7557.18 Reference Point: MINE FLOOR
Date Drilled: 16 DEC 1991 Logged by: JDG & AM	Drilling Contractor: CO-OP MINE PERSONNEL Drilling Method: HYDRAULIC ROTARY Rig Type: DIAMEC 251
First occurrence of G.W.: 22.98' Static W.L.: 22.98' Dates Measured: 16 DEC 91 21 APR 92	Boring Depth (ft): 530' Well Depth (ft): 190' Boring Diameter (in): 2.9"

DEPTH (FT)	GRAPHICAL LOG	LITHOLOGIC DESCRIPTION AND OBSERVATIONS	SAMPLE LOC	WELL COMPLETION DETAILS
300		SANDSTONE: Light gray. Clean.		
310				
320				Bentonite Plug
330				
		MUDDY SANDSTONE: Muddy sandstone/sandy mudstone, gradational. Carbonaceous laminations		
340				
		MUDSTONE: Top of Moncos No. 2.		
350				
360				
370				
380				
390		SANDY MUDSTONE: Bioturbated.		
400				

Project Name: GROUND WATER INVESTIGATION Owner/Client: CO-OP MINING COMPANY	Boring/Well Number: DH-2 Boring/Well Location: 397775.88 N 2112519.39 E
Project Number: UC-192-06	Reference Elevation: 7557.18 Reference Point: MINE FLOOR
Date Drilled: 16 DEC 1991 Logged by: JDG & AM	Drilling Contractor: CO-OP MINE PERSONNEL Drilling Method: HYDRAULIC ROTARY Rig Type: DIAMEC 251
First occurrence of G.W.: 22.98' Static W.L.: 22.98' Dates Measured: 16 DEC 91 21 APR 92	Boring Depth (ft): 530' Well Depth (ft): 190' Boring Diameter (in): 2.9"

DEPTH (FT)	GRAPHICAL LOG	LITHOLOGIC DESCRIPTION AND OBSERVATIONS	SAMPLE LOC	WELL COMPLETION DETAILS
400		SANDY MUDSTONE. Bioturbated.		
410				
420				
		SANDSTONE. Sandstone. Light gray colored. Fine to coarse grained. Dark minerals. Occasional muddy parting. Panther Tongue of the Star Point Sandstone.		Bentonite Plug
430				
440				
450				
460				
470				
480				
490				
500				

Project Name: GROUND WATER INVESTIGATION Owner/Client: CO-OP MINING COMPANY	Boring/Well Number: DH-2 Boring/Well Location: 397775.88 N 2112519.39 E
Project Number: UC-192-06	Reference Elevation: 7557.18 Reference Point: MINE FLOOR
Date Drilled: 16 DEC 1991 Logged by: JOG & AM	Drilling Contractor: CO-OP MINE PERSONNEL Drilling Method: HYDRAULIC ROTARY Rig Type: DIAMEC 251
First occurrence of G.W.: 22.98' Static W.L.: 22.98' Dates Measured: 16 DEC 91 21 APR 92	Boring Depth (ft): 530' Well Depth (ft): 190' Boring Diameter (in): 2.9"

DEPTH (FT)	GRAPHICAL LOG	LITHOLOGIC DESCRIPTION AND OBSERVATIONS	SAMPLE LOC	WELL COMPLETION DETAILS
500		SANDSTONE — Light gray colored. Fine-coarse grained. Dark minerals. Occasional muddy parting. Bioturbated. Increasing appearance of mud.		
510		SHALE: Mancos Shale.		
520				Bentonite Grout
530				
540				
550				
560				
570				
580				
590				
600				

Project Name: GROUND WATER INVESTIGATION Owner/Client: CO-OP MINING COMPANY	Boring/Well Number: DH-3 Boring/Well Location: 394514.78 N 2113242.89 E
Project Number: UC-192-06	Reference Elevation: 7520.94 Reference Point: MINE FLOOR
Date Drilled: 29 JAN 1992 Logged by: JRP	Drilling Contractor: CO-OP MINE PERSONNEL Drilling Method: HYDRAULIC ROTARY Rig Type: DIAMEC 251
First occurrence of G.W.: 125.28' Static W.L.: 125.28' Dates Measured: 29 JAN 92 21 APR 92	Boring Depth (ft): 545' Well Depth (ft): 190' Boring Diameter (in): 2.9"

DEPTH (FT)	GRAPHICAL LOG	LITHOLOGIC DESCRIPTION AND OBSERVATIONS	SAMPLE LOC.	WELL COMPLETION DETAILS
0		COAL: Floor of mine.		Slip Cap with Cover
		MUDSTONE: Brown colored drilling fluid return.		
10				
		SANDSTONE: Gray colored drilling fluid return.		
20				
30				
40				Cement
50				1 5" PVC Casing
		Loss of drilling fluids		
60				
70				
80				
90		COAL: Hiawatha Coal seam.		Bentonite Grout
		SANDSTONE: Spring Canyon Tongue of the Star Point Sandstone		
100				

Project Name: GROUND WATER INVESTIGATION Owner/Client: CO-OP MINING COMPANY	Boring/Well Number: DH-3 Boring/Well Location: 394514.78 N 2113242.89 E
Project Number: UC-192-06	Reference Elevation: 7520.94 Reference Point: MINE FLOOR
Date Drilled: 29 JAN 1992 Logged by: JRP	Drilling Contractor: CO-OP MINE PERSONNEL Drilling Method: HYDRAULIC ROTARY Rig Type: DIAMEC 251
First occurrence of G.W.: 125.28' Static W.L.: 125.28' Dates Measured: 29 JAN 92 21 APR 92	Boring Depth (ft): 545' Well Depth (ft): 190' Boring Diameter (in): 2.9"

DEPTH (FT)	GRAPHICAL LOG	LITHOLOGIC DESCRIPTION AND OBSERVATIONS	SAMPLE LOG	WELL COMPLETION DETAILS
100		SANDSTONE: Drilled blind. No sample.		
110				
120				1.5" PVC Casing
130				
140				20-40 Mesh Silica Sand
150				
160				
170				
180		MUDDY SANDSTONE: Muddy sandstone/sandy mudstone. Fine-very fine grained. Gray colored. Massive-laminated bedding. Bioturbated. Well cemented. Very hard. Reacts with HCl		1.5" PVC Slot Screen
190		Top of Moncos No. 1		Threaded End Plug Bentonite Plug
200				

Project Name: GROUND WATER INVESTIGATION Owner/Client: CO-OP MINING COMPANY	Boring/Well Number: DH-3 Boring/Well Location: 394514.78 N 2113242.89 E
Project Number: UC-192-06	Reference Elevation: 7520.94 Reference Point: MINE FLOOR
Date Drilled: 29 JAN 1992 Logged by: JRP	Drilling Contractor: CO-OP MINE PERSONNEL Drilling Method: HYDRAULIC ROTARY Rig Type: DIAMEC 251
First occurrence of G.W.: 125.28' Static W.L.: 125.28' Dates Measured: 29 JAN 92 21 APR 92	Boring Depth (ft): 545' Well Depth (ft): 190' Boring Diameter (in): 2.9"

DEPTH (FT)	GRAPHICAL LOG	LITHOLOGIC DESCRIPTION AND OBSERVATIONS	SAMPLE LOC.	WELL COMPLETION DETAILS
200		SANDY MUDSTONE: Sandy mudstone/muddy sandstone Gradational contacts. Medium-very fine grained. Dull luster. Gritty-smooth feel. Unweathered. Sandy units are gray (5Y6/1). Muddy units are gray-brown (5Y4/1). Hard. Predominantly quartz with minor dark minerals. Mica along muddy partings. Laminated. Low angle cross-beds. Bioturbated. Non-fractured. Cores are in excellent condition.		
210				
220				Bentonite Plug
230		SANDSTONE: Sandstone/muddy sandstone. Gray colored. Fine grained. Storrs Tongue of the Star Point Sandstone.		
240		Muddy and bioturbated.		
250		Laminated and bioturbated.		
260		Sand increasing.		
270				
280				
290		Sand and muddy sand.		
300				

Project Name: GROUND WATER INVESTIGATION Owner/Client: CO-OP MINING COMPANY	Boring/Well Number: DH-3 Boring/Well Location: 394514.78 N 2113242.89 E
Project Number: UC-192-06	Reference Elevation: 7520.94 Reference Point: MINE FLOOR
Date Drilled: 29 JAN 1992 Logged by: JRP	Drilling Contractor: CO-OP MINE PERSONNEL Drilling Method: HYDRAULIC ROTARY Rig Type: DIAMEC 251
First occurrence of G.W.: 125.28' Static W.L.: 125.28' Dates Measured: 29 JAN 92 21 APR 92	Boring Depth (ft): 545' Well Depth (ft): 190' Boring Diameter (in): 2.9"

DEPTH (FT)	GRAPHICAL LOG	LITHOLOGIC DESCRIPTION AND OBSERVATIONS	SAMPLE LOC.	WELL COMPLETION DETAILS
300		SANDSTONE		
		Clean Sand.		
310				
		Muddier and bioturbated.		
320				
				Bentonite Plug
330				
		Grading to muddy sand.		
340		SANDY MUDSTONE Muddy sandstone/sandy mudstone. Gradational contacts. Dark gray-brown colored.		
350		Top of Moncos No. 2.		
360				
370		Sandy mudstone/mudstone		
380				
390		Sandy mudstone/muddy sandstone		
400				

Project Name: GROUND WATER INVESTIGATION Owner/Client: CO-OP MINING COMPANY	Boring/Well Number: DH-3 Boring/Well Location: 394514.78 N 2113242.89 E
Project Number: UC-192-06	Reference Elevation: 7520.94 Reference Point: MINE FLOOR
Date Drilled: 29 JAN 1992 Logged by: JRP	Drilling Contractor: CO-OP MINE PERSONNEL Drilling Method: HYDRAULIC ROTARY Rig Type: DIAMEC 251
First occurrence of G.W.: 125.28' Static W.L.: 125.28' Dates Measured: 29 JAN 92 21 APR 92	Boring Depth (ft): 545' Well Depth (ft): 190' Boring Diameter (in): 2.9"

DEPTH (FT)	GRAPHICAL LOG	LITHOLOGIC DESCRIPTION AND OBSERVATIONS	SAMPLE LOC.	WELL COMPLETION DETAILS
400		SANDY MUDSTONE:		
410				
420				
		SANDSTONE: Medium-fine grained. Sub-angular to sub-rounded grain texture. Moderate sorting. Little or no weathering. Gray colored with dark minerals. Hard. Predominantly quartz, with muscovite along muddy partings. Calcite cement. Massive bedded with laminations locally. Bioturbated. Few fractures. Core is in excellent condition. Panther Tongue of the Star Point Sandstone		Bentonite Grout
430				
440				
450				
460				
470				
480				
490				
500				

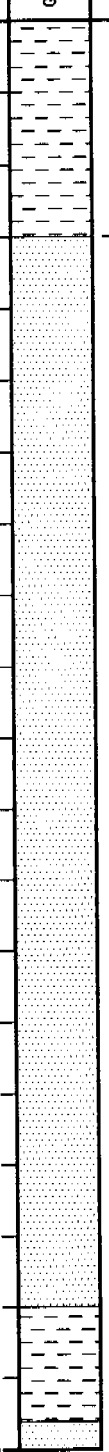
Project Name: GROUND WATER INVESTIGATION Owner/Client: CO-OP MINING COMPANY	Boring/Well Number: DH-3 Boring/Well Location: 394514.78 N 2113242.89 E
Project Number: UC-192-D6	Reference Elevation: 7520.94 Reference Point: MINE FLOOR
Date Drilled: 29 JAN 1992 Logged by: JRP	Drilling Contractor: CO-OP MINE PERSONNEL Drilling Method: HYDRAULIC ROTARY Rig Type: DIAMEC 251
First occurrence of G.W.: 125.28' Static W.L.: 125.28' Dates Measured: 29 JAN 92 21 APR 92	Boring Depth (ft): 545' Well Depth (ft): 190' Boring Diameter (in): 2.9"

DEPTH (FT)	GRAPHICAL LOG	LITHOLOGIC DESCRIPTION AND OBSERVATIONS	SAMPLE LOC	WELL COMPLETION DETAILS
500		SANDSTONE:		
510				
520		SHALE: Mancos Shale.		Bentonite Plug
530				
540				
550				
560				
570				
580				
590				
600				

EARTHFAX ENGINEERING, INC.

Project Name: GROUNDWATER INVESTIGATION Owner/Client: CO-OP MINING COMPANY	Boring/Well Number: DH-4 Boring/Well Location: N399277.59 E22111993.14
Project Number: UC-192-09	Reference Elevation (ft): 7610.22 Reference Point: MINE FLOOR
Date Drilled: 1-31-94 Logged By: CR	Drilling Contractor: CO-OP MINE PERSONNEL Drilling Method: HYDRAULIC ROTARY Rig Type: DIAMEC 251
First Occurrence of G.W. (ft): 57 Static W.L. (ft): 62.30 Date Measured: 1-31-94	Boring Depth (ft): 238 Well Depth (ft): 238 Boring Diameter (in): 2.9

DEPTH (FT) | GRAPHICAL LOG | STRATIGRAPHIC DESCRIPTION AND OBSERVATIONS | WELL COMPLETION DETAILS

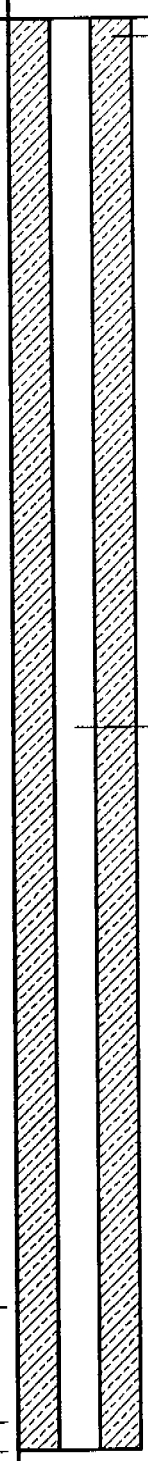


0 - 15' MUDSTONE: Blackhawk Fm.

15 - 90' SANDSTONE: Gray.

90 - 98' MUDSTONE:

98 - 100' SANDSTONE:



0 - 100'
Bentonite Grout

0 - 100'
1.5 " Flush Thread PVC Casing, Sch 40

EarthFax

EARTHFAX ENGINEERING, INC.

Project Name: GROUNDWATER INVESTIGATION Owner/Client: CO-OP MINING COMPANY	Boring/Well Number: DH-4 Boring/Well Location: N399277.59 E22111993.14
Project Number: UC-192-09	Reference Elevation (ft): 7610.22 Reference Point: MINE FLOOR
Date Drilled: 1-31-94 Logged By: CR	Drilling Contractor: CO-OP MINE PERSONNEL Drilling Method: HYDRAULIC ROTARY Rig Type: DIAMEC 251
First Occurrence of G.W. (ft): 57 Static W.L. (ft): 62.30 Date Measured: 1-31-94	Boring Depth (ft): 238 Well Depth (ft): 238 Boring Diameter (in): 2.9

DEPTH (FT) | GRAPHICAL LOG

STRATIGRAPHIC DESCRIPTION AND OBSERVATIONS

100 – 111' SANDSTONE:

111 – 112' MUDSTONE:

112 – 116' SANDSTONE:

116 – 120' COAL: Hiawatha Seam.

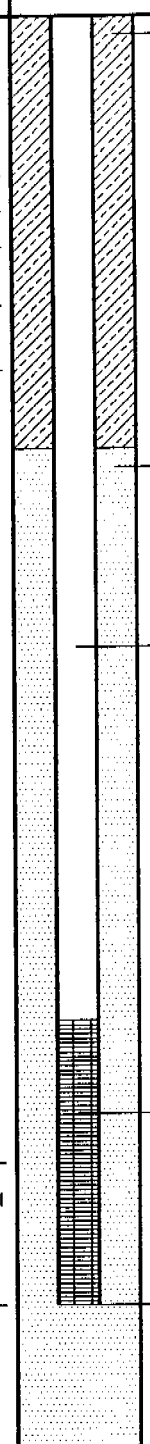
120 – 122' MUDSTONE: Starpoint Sandstone Spring Canyon Tongue.

122 – 180' SANDSTONE:
Very fine grained sandstone with occasional muddy partings and bioturbations.

180 – 190' MUDDY SANDSTONE:
Muddy laminations occurring at low angles with occasional bioturbations.

190 – 200' SANDSTONE:
Clean sandstone with occasional bioturbations. Alternating muddy sandstone/sandstone.

WELL COMPLETION DETAILS



100 – 130'
Bentonite Grout

130 – 200'
20/40-Mesh Silica Sand

100 – 170'
1.5 " Flush Thread PVC Casing, Sch 40

170 – 190'
1.5" PVC 10-Slot Screen, Sch 40

TD = 190'

EarthFax

EARTHFAX ENGINEERING, INC.

Project Name: GROUNDWATER INVESTIGATION Owner/Client: CO-OP MINING COMPANY	Boring/Well Number: DH-4 Boring/Well Location: N399277.59 E22111993.14
Project Number: UC-192-09	Reference Elevation (ft): 7610.22 Reference Point: MINE FLOOR
Date Drilled: 1-31-94 Logged By: CR	Drilling Contractor: CO-OP MINE PERSONNEL Drilling Method: HYDRAULIC ROTARY Rig Type: DIAMEC 251
First Occurrence of G.W. (ft): 57 Static W.L. (ft): 62.30 Date Measured: 1-31-94	Boring Depth (ft): 238 Well Depth (ft): 238 Boring Diameter (in): 2.9

DEPTH (FT)	GRAPHICAL LOG	STRATIGRAPHIC DESCRIPTION AND OBSERVATIONS	WELL COMPLETION DETAILS
200		200 - 202' SANDSTONE:	200 - 238' 20/40-Mesh Silica Sand
205		202 - 209' MUDDY SANDSTONE: Mud fraction increasing, increasing bioturbations.	
210		209 - 218' SANDY MUDSTONE: Mancos No. 1 Tongue.	
215			
220		218 - 238' MUDDY SANDSTONE:	
225			
230			
235			
240			

EarthFax

APPENDIX 7-N-H

Groundwater Analytical Reports for May 8, 1992 Sampling Round of In-Mine Monitoring Wells DH-1A, DH-2, and DH-3.

CHEMTECH

ANALYTICAL LABORATORY

6100 S. STRATLER
MURRAY, UTAH 84107
PHONE: (801) 262-7299
FAX: (801) 262-7378

DATE: 6-04-92

TO: Co-op Mining
P.O. Box 1245
Huntington, Utah 84528

SAMPLE ID: Lab #U077637 - Project #C-192-06, DH-1, 5-08-92

DATE SUBMITTED: 5-13-92

CERTIFICATE OF ANALYSIS

PARAMETER	DETECTED
TDS, mg/l	285
Hardness as $CaCO_3$, mg/l	162
Boron as B, mg/l	<.05
Alkalinity as $CaCO_3$, mg/l	94
Bicarbonate as HCO_3, mg/l	110
Carbonate as CO_3, mg/l	2.3
Hydroxide as OH, mg/l	0
Chloride as Cl, mg/l	4.9
Fluoride as F, mg/l	0.28
Ammonia as NH_3-N, mg/l	<.2
Nitrate as NO_3-N, mg/l	0.42
Phosphate as PO_4-P, mg/l	0.129
Sulfate as SO_4, mg/l	128
Sulfide as S, mg/l	<.1

Rex Henderson

CHEMTECH

ANALYTICAL LABORATORY

6100 S. STRATLER
MURRAY, UTAH 84107
PHONE: (801) 262-7299
FAX: (801) 262-7378

DATE: 6-04-92

TO: Co-op Mining
P.O. Box 1245
Huntington, Utah 84528

SAMPLE ID: Lab #U077637 - Project #C-192-06, DH-1, 5-08-92

DATE SUBMITTED: 5-13-92

CERTIFICATE OF ANALYSIS

PARAMETER	DETECTED
Aluminum as Al (Diss), mg/l	0.2
Arsenic as As (Diss), mg/l	<.05
Barium as Ba (Diss), mg/l	0.071
Cadmium as Cd (Diss), mg/l	<.01
Calcium as Ca (Diss), mg/l	38.9
Chromium as Cr (Diss), mg/l	0.025
Copper as Cu (Diss), mg/l	<.01
Iron as Fe (Diss), mg/l	0.505
Lead as Pb (Diss), mg/l	<.01
Magnesium as Mg (Diss), mg/l	20.1
Manganese as Mn (Diss), mg/l	0.062
Mercury as Hg (Diss), mg/l	<.0005
Molybdenum as Mo (Diss), mg/l	0.058
Nickel as Ni (Diss), mg/l	<.01
Potassium as K, mg/l	31.2
Selenium as Se, mg/l	<.005
Sodium as Na, mg/l	14.1
Zinc as Zn, mg/l	<.01
Oil & Grease, mg/l	2.0

Rex Henderson

CHEMTECH

ANALYTICAL LABORATORY

6100 S. STRATLER
MURRAY, UTAH 84107
PHONE: (801) 262-7299
FAX: (801) 262-7378

DATE: 6-04-92

TO: Co-op Mining
P.O. Box 1245
Huntington, Utah 84528

SAMPLE ID: Lab #U077638 - Project #C-192-06, DH-2, 5-08-92

DATE SUBMITTED: 5-13-92

CERTIFICATE OF ANALYSIS

PARAMETER	DETECTED
TDS, mg/l	330
Hardness as $CaCO_3$, mg/l	321
Boron as B, mg/l	0.064
Alkalinity as $CaCO_3$, mg/l	285
Bicarbonate as HCO_3, mg/l	340
Carbonate as CO_3, mg/l	3.5
Hydroxide as OH, mg/l	0
Chloride as Cl, mg/l	4.2
Fluoride as F, mg/l	0.18
Ammonia as NH_3-N, mg/l	0.64
Nitrate as NO_3-N, mg/l	0.74
Phosphate as PO_4-P, mg/l	0.025
Sulfate as SO_4, mg/l	33
Sulfide as S, mg/l	<.1

Rex Henderson

CHEMTECH

ANALYTICAL LABORATORY

6100 S. STRATLER
MURRAY, UTAH 84107
PHONE: (801) 262-7299
FAX: (801) 262-7378

DATE: 6-04-92

TO: Co-op Mining
P.O. Box 1245
Huntington, Utah 84528

SAMPLE ID: Lab #U077638 - Project #C-192-06, DH-2, 5-08-92

DATE SUBMITTED: 5-13-92

CERTIFICATE OF ANALYSIS

PARAMETER	DETECTED
Aluminum as Al (Diss), mg/l	<.1
Arsenic as As (Diss), mg/l	<.05
Barium as Ba (Diss), mg/l	0.127
Cadmium as Cd (Diss), mg/l	<.01
Calcium as Ca (Diss), mg/l	51.9
Chromium as Cr (Diss), mg/l	<.01
Copper as Cu (Diss), mg/l	<.01
Iron as Fe (Diss), mg/l	0.280
Lead as Pb (Diss), mg/l	0.030
Magnesium as Mg (Diss), mg/l	29.5
Manganese as Mn (Diss), mg/l	0.101
Mercury as Hg (Diss), mg/l	<.0005
Molybdenum as Mo (Diss), mg/l	0.010
Nickel as Ni (Diss), mg/l	<.01
Potassium as K, mg/l	1.5
Selenium as Se, mg/l	<.005
Sodium as Na, mg/l	8.8
Zinc as Zn, mg/l	<.01
Oil & Grease, mg/l	<.5

Rex Henderson

CHEMTECH

ANALYTICAL LABORATORY

6100 S. STRATLER
MURRAY, UTAH 84107
PHONE: (801) 262-7299
FAX: (801) 262-7378

DATE: 6-04-92

TO: Co-op Mining
P.O. Box 1245
Huntington, Utah 84528

SAMPLE ID: Lab #U077639 - Project #C-192-06, DH-3, 5-07-92

DATE SUBMITTED: 5-13-92

CERTIFICATE OF ANALYSIS

PARAMETER	DETECTED
TDS, mg/l	339
Hardness as $CaCO_3$, mg/l	307
Boron as B, mg/l	0.061
Alkalinity as $CaCO_3$, mg/l	294
Bicarbonate as HCO_3, mg/l	336
Carbonate as CO_3, mg/l	11.5
Hydroxide as OH, mg/l	0
Chloride as Cl, mg/l	4.2
Fluoride as F, mg/l	0.16
Ammonia as NH_3-N, mg/l	0.22
Nitrate as NO_3-N, mg/l	<.5
Phosphate as PO_4-P, mg/l	0.027
Sulfate as SO_4, mg/l	38
Sulfide as S, mg/l	<.1

Rex Henderson

CHEMTECH

ANALYTICAL LABORATORY

6100 S. STRATLER
MURRAY, UTAH 84107
PHONE: (801) 262-7299
FAX: (801) 262-7378

DATE: 6-04-92

TO: Co-op Mining
P.O. Box 1245
Huntington, Utah 84528

SAMPLE ID: Lab #U077639 - Project #C-192-06, DH-3, 5-07-92

DATE SUBMITTED: 5-13-92

CERTIFICATE OF ANALYSIS

PARAMETER	DETECTED
Aluminum as Al (Diss), mg/l	<.1
Arsenic as As (Diss), mg/l	<.05
Barium as Ba (Diss), mg/l	0.129
Cadmium as Cd (Diss), mg/l	<.01
Calcium as Ca (Diss), mg/l	50.9
Chromium as Cr (Diss), mg/l	<.01
Copper as Cu (Diss), mg/l	<.01
Iron as Fe (Diss), mg/l	0.220
Lead as Pb (Diss), mg/l	<.01
Magnesium as Mg (Diss), mg/l	28.9
Manganese as Mn (Diss), mg/l	0.232
Mercury as Hg (Diss), mg/l	<.0005
Molybdenum as Mo (Diss), mg/l	<.01
Nickel as Ni (Diss), mg/l	<.01
Potassium as K, mg/l	2.6
Selenium as Se, mg/l	<.005
Sodium as Na, mg/l	15.2
Zinc as Zn, mg/l	<.01
Oil & Grease, mg/l	<.5

Rex Henderson

APPENDIX 7-N-I

Groundwater Analytical Reports for 1994 Quarterly Sampling Rounds of In-Mine Monitoring Wells DH-1A, DH-2, DH-3 and DH-4.

COMMERCIAL TESTING & ENGINEERING CO.
GENERAL OFFICES: 1919 SOUTH HIGHLAND AVE., SUITE 210-B, LOMBARD, ILLINOIS 60148 • TEL: 708-953-9300 FAX: 708-953-9306
SINCE 1908
Member of the SGS Group (Societe Generale de Surveillance)

PLEASE ADDRESS ALL CORRESPONDENCE TO:
P.O. BOX 1020, HUNTINGTON, UT 84528
TEL: (801) 653-2311
FAX: (801) 653-2436

March 24, 1993

CO-OP MINE
P.O. Box 1245
Huntington UT 84528

Sample identification by
CO-OP MINE

Kind of sample reported to us Water

DTL-1A
Rec'd 1030 hr.
Sampled 1344 hr.

Sample taken at Co-op

Sample taken by Co-op

Date sampled February 18, 1993

Date received February 19, 1993

Analysis report no. 59-12891

Parameter	Result	MDL	Units	Method	Analyzed Date/Time/Analyst
Acidity	0	1	mg/l $CaCO_3$	EPA 305.1	03-04-1993 10:20 LS
Alkalinity, Bicarbonate	207	1	mg/l $CaCO_3$	EPA 310.1	03-04-1993 10:20 LS
Alkalinity, Total	170	1	mg/l $CaCO_3$	EPA 310.1	03-04-1993 10:20 LS
Aluminum	0.99	.5	mg/l	EPA 202.1	03-08-1993 12:45 ED
Anions	5.84	----	meq/l	---------	---------- ----- --
Arsenic	0.001	.002	mg/l	EPA 206.2	03-22-1993 08:55 ED
Barium	0.03	.03	mg/l	EPA 208.1	03-08-1993 12:45 ED
Boron	0.08	.01	mg/l	EPA 212.3	03-09-1993 10:00 LM
Cadmium	0.000	.00	mg/l	EPA 213.2	03-17-1993 08:15 ED
Calcium	41.9	.1	mg/l	EPA 215.1	03-04-1993 13:30 ED
Cations	6.07	----	meq/l	---------	---------- ----- --
Chloride	0.1	.1	mg/l	EPA 325.3	03-08-1993 08:00 LM
Chromium	0.00	.001	mg/l	EPA 218.2	03-09-1993 09:56 ED
Conductivity	560	2	umhos/cm	EPA 120.1	03-04-1993 15:30 LS
Copper	0.000	.01	mg/l	EPA 220.1	03-05-1993 10:00 ED
Fluoride	0.16	.01	mg/l	EPA 340.2	02-24-1993 09:00 LS
Hardness, Total	224	1	mg/l $CaCO_3$	---------	03-04-1993 13:30 ED
Iron	2.24	.02	mg/l	EPA 236.1	03-05-1993 08:40 ED
Iron, Dissolved	0.90	.02	mg/l	EPA 236.1	03-05-1993 08:40 ED
Lead	0.000	.001	mg/l	EPA 239.2	03-08-1993 14:20 ED
Magnesium	29.00	.01	mg/l	EPA 242.1	03-04-1993 13:30 ED
Manganese	0.07	.01	mg/l	EPA 243.1	03-05-1993 08:40 ED
Mercury	0.000	.002	mg/l	EPA 245.1	03-23-1993 13:55 ED
Molybdenum	0.00	.1	mg/l	EPA 246.1	03-08-1993 12:45 ED

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

Manager, Huntington Laboratory

OVER 40 BRANCH LABORATORIES STRATEGICALLY LOCATED IN PRINCIPAL COAL MINING AREAS, TIDEWATER AND GREAT LAKES PORTS, AND RIVER LOADING FACILITIES

TERMS AND CONDITIONS ON REVERSE

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TEL: (801) 653-2311
FAX: (801) 653-2436

March 24, 1993

CO-OP MINE
P.O. Box 1245
Huntington UT 84528

Sample identification by
CO-OP MINE

Kind of sample reported to us Water

DTL-1A
Rec'd 1030 hr.
Sampled 1344 hr.

Sample taken at Co-op

Sample taken by Co-op

Date sampled February 18, 1993

Date received February 19, 1993

Analysis report no. 59-12891

Parameter	Result	MDL	Units	Method	Analyzed Date/Time/Analyst
Nickel	0.02	.02	mg/l	EPA 249.1	03-05-1993 10:20 ED
Nitrogen, Ammonia	0.05	.01	mg/l	EPA 350.3	03-05-1993 08:30 LS
Nitrogen, Nitrate	0.03	.01	mg/l	EPA 353.3	02-19-1993 11:00 LM
Nitrogen, Nitrite	0.00	.01	mg/l	EPA 354.1	02-19-1993 11:00 LM
Oil & Grease	1.3	1	mg/l	EPA 413.1	03-03-1993 08:00 LM
Phosphorus, Total	0.01	.01	mg/l	EPA 365.2	03-01-1993 09:00 LM
Potassium	39.30	.01	mg/l	EPA 258.1	03-04-1993 13:30 ED
Selenium	0.020	.002	mg/l	EPA 270.2	03-22-1993 08:55 ED
Sodium	13.40	.01	mg/l	EPA 273.1	03-04-1993 13:30 ED
Solids, Settleable	0.0	.5	mg/l	EPA 160.5	03-01-1993 08:00 LM
Solids, Total Dissolved	352.0	.5	mg/l	EPA 160.1	02-26-1993 12:30 LM
Solids, Total Suspended	28.0	.5	mg/l	EPA 160.2	02-26-1993 12:30 LM
Sulfate	120.0	.1	mg/l	EPA 375.4	03-08-1993 08:50 LS
Sulfide	1.60	.1	mg/l	EPA 376.1	03-01-1993 08:00 LM
Zinc	0.07	.01	mg/l	EPA 289.1	03-05-1993 10:00 ED
Cation/Anion Balance	2.00	----	%	---------	---------- ----- --

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

Manager, Huntington Laboratory

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PLEASE ADDRESS ALL CORRESPONDENCE TO:
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FAX: (801) 653-2436

June 18, 1993

CO-OP MINE
P.O. Box 1245
Huntington UT 84528

Sample identification by
CO-OP MINE

Kind of sample reported to us Water

Sample taken at Co-op

Sample taken by Co-op

Date sampled May 26, 1993

Date received May 26, 1993

DH-1A
Rec'd 0830 hr.
Sampled 0710 hr.

NOTE: Due to lab error, Zinc bottle was unperserved.
Fluoride was not distilled.

Analysis report no. 59-13105

Parameter	Result	MDL	Units	Method	Analyzed Date/Time/Analyst
Acidity	0	1	mg/l $CaCO_3$	EPA 305.1	05-26-1993 13:00 LS
Alkalinity, Bicarbonate	352	2	mg/l $CaCO_3$	EPA 310.1	05-26-1993 13:00 LS
Alkalinity, Carbonate	0	1	mg/l $CaCO_3$	EPA 310.1	05-26-1993 13:00 LS
Alkalinity, Total	289	2	mg/l $CaCO_3$	EPA 310.1	05-26-1993 13:00 LS
Aluminum	<1.00	1	mg/l	EPA 202.1	06-15-1993 12:40 ED
Anions	10.95	----	meq/l	---------	---------- ----- --
Arsenic	<0.003	.003	mg/l	EPA 206.2	06-07-1993 14:35 ED
Barium	<0.20	.2	mg/l	EPA 208.1	06-15-1993 11:50 ED
Boron	0.11	.04	mg/l	EPA 212.3	06-14-1993 15:00 LM
Cadmium	<0.0002	.0002	mg/l	EPA 213.2	06-04-1993 14:15 ED
Calcium	66.6	.03	mg/l	EPA 215.1	06-07-1993 09:20 ED
Cations	9.83	----	meq/l	---------	---------- ----- --
Chloride	24.9	.5	mg/l	EPA 325.3	06-03-1993 10:00 LM
Chromium	<0.0002	.0003	mg/l	EPA 218.2	06-10-1993 12:25 ED
Copper	<0.030	.03	mg/l	EPA 220.1	06-14-1993 16:55 ED
Fluoride	0.11	.02	mg/l	EPA 340.2	06-02-1993 07:30 LS
Hardness, Total	391	.03	mg/l $CaCO_3$	---------	06-07-1993 09:20 ED
Iron	0.40	.05	mg/l	EPA 236.1	06-14-1993 09:25 ED
Iron, Dissolved	0.40	.05	mg/l	EPA 236.1	06-07-1993 11:05 ED
Lead	<0.030	.003	mg/l	EPA 239.2	06-09-1993 11:05 ED
Magnesium	54.60	.007	mg/l	EPA 242.1	06-07-1993 10:00 ED
Manganese	0.05	.03	mg/l	EPA 243.1	06-07-1993 10:40 ED
Mercury	0.0017	.0002	mg/l	EPA 245.1	06-17-1993 15:30 ED
Molybdenum	<0.20	.2	mg/l	EPA 246.1	06-16-1993 11:20 ED

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

Manager, Huntington Laboratory

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June 18, 1993

CO-OP MINE
P.O. Box 1245
Huntington UT 84528

Sample identification by
CO-OP MINE

Kind of sample reported to us Water

Sample taken at Co-op

Sample taken by Co-op

Date sampled May 26, 1993

Date received May 26, 1993

DH-1A
Rec'd 0830 hr.
Sampled 0710 hr.

NOTE: Due to lab error, Zinc bottle was unperserved.
Fluoride was not distilled.

Analysis report no. 59-13105

Parameter	Result	MDL	Units	Method	Analyzed Date/Time/Analyst
Nickel	<0.08	.08	mg/l	EPA 249.1	06-15-1993 10:10 ED
Nitrogen, Ammonia	<0.08	.08	mg/l	EPA 350.3	06-09-1993 10:15 LS
Nitrogen, Nitrate	0.09	.01	mg/l	EPA 353.3	05-28-1993 10:30 LM
Nitrogen, Nitrite	<0.02	.02	mg/l	EPA 354.1	05-26-1993 11:00 LM
Oil & Grease	0.3	1	mg/l	EPA 413.1	06-11-1993 07:30 LM
Phosphorus, Total	0.014	.008	mg/l	EPA 365.2	06-09-1993 13:30 LM
Potassium	24.00	.1	mg/l	EPA 258.1	06-07-1993 12:05 ED
Selenium	0.004	.004	mg/l	EPA 270.2	06-08-1993 13:35 ED
Sodium	32.50	.2	mg/l	EPA 273.1	06-07-1993 11:30 ED
Solids, Settleable	<0.5	.5	mg/l	EPA 160.5	05-26-1993 14:00 LS
Solids, Total Dissolved	597.0	14	mg/l	EPA 160.1	06-02-1993 10:30 LM
Solids, Total Suspended	19.0	7	mg/l	EPA 160.2	06-02-1993 10:30 LM
Sulfate	220.0	1	mg/l	EPA 375.4	06-07-1993 10:15 LS
Sulfide	1.40	.1	mg/l	EPA 376.1	05-28-1993 14:00 LM
Zinc	0.07	.03	mg/l	EPA 289.1	06-15-1993 09:20 ED
Cation/Anion Balance	-5.39	----	%	---------	---------- ----- --

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

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FAX: (801) 653-2436

October 14, 1993

CO-OP MINE
P.O. Box 1245
Huntington UT 84528

Sample identification by
CO-OP MINE

ID:DH-1A

Kind of sample reported to us: Water

Rec'd 1030 hr.
Sampled 1842 hr.

Sample taken at: Co-op

Sample taken by: Co-op

NOTE: NITRATE HOLDING TIME EXPIRED WHEN RECEIVED AT LAB!
FLUORIDE NOT DISTILLED.

Date sampled: August 31, 1993

Date received: September 3, 1993

Analysis report no. 59-13482

Parameter	Result	MDL	Units	Method		Analyzed Date/Time/Analyst	
Alkalinity, Bicarbonate	341	2	mg/l	$CaCO_3$	EPA 310.1	09-14-1993 1030	LS
Alkalinity, Carbonate	0	1	mg/l	$CaCO_3$	EPA 310.1	09-14-1993 1030	LS
Alkalinity, Total	280	2	mg/l	$CaCO_3$	EPA 310.1	09-14-1993 1030	LS
Aluminum	2	.05	mg/l		EPA 200.7	09-15-1993 1616	SE
Anions	8.39	----	meq/l		---	---	--
Arsenic	<0.002	.002	mg/l		EPA 206.2	09-21-1993 1015	SM
Barium	0.2	.005	mg/l		EPA 200.7	09-15-1993 1616	SE
Boron	0.08	.01	mg/l		EPA 200.7	09-16-1993 0130	SE
Cadmium	<0.0050	.005	mg/l		EPA 200.7	09-15-1993 1616	SE
Calcium	82.0	.1	mg/l		EPA 200.7	09-15-1993 1616	SE
Cations	8.48	----	meq/l		---	---	--
Chloride	7.4	.5	mg/l		EPA 325.3	09-07-1993 1300	LM
Chromium	<0.0	.005	mg/l		EPA 200.7	09-15-1993 1616	SE
Copper	0.01	.005	mg/l		EPA 200.7	09-15-1993 1616	SE
Fluoride	0.20	.02	mg/l		EPA 340.2	09-13-1993 1400	LS
Hardness, Total	381.8	.03	mg/l	$CaCO_3$	---	09-15-1993 1616	SE
Iron	0.55	.01	mg/l		EPA 200.7	09-15-1993 1616	SE
Lead	<0.050	.05	mg/l		EPA 200.7	09-15-1993 1616	SE
Magnesium	43.00	.1	mg/l		EPA 200.7	09-15-1993 1616	SE
Manganese	0.15	.01	mg/l		EPA 200.7	09-15-1993 1616	SE
Mercury	<0.0040	.0002	mg/l		EPA 245.1	09-21-1993 1000	SM
Molybdenum	<0.1	.1	mg/l		EPA 200.7	09-15-1993 1616	SE
Nickel	<0.01	.01	mg/l		EPA 200.7	09-15-1993 1616	SE
Nitrogen, Ammonia	0.25	.08	mg/l		EPA 350.3	09-22-1993 0800	LS

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

Manager, Huntington Laboratory

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FAX: (801) 653-2436

October 14, 1993

CO-OP MINE
P.O. Box 1245
Huntington UT 84528

Sample identification by
CO-OP MINE

ID:DH-1A

Kind of sample reported to us: Water

Rec'd 1030 hr.
Sampled 1842 hr.

Sample taken at: Co-op

Sample taken by: Co-op

NOTE: NITRATE HOLDING TIME EXPIRED WHEN RECEIVED AT LAB!
FLUORIDE NOT DISTILLED.

Date sampled: August 31, 1993

Date received: September 3, 1993

Analysis report no. 59-13482

Parameter	Result	MDL	Units	Method	Analyzed Date/Time/Analyst	
Nitrogen, Nitrate	0.07	.01	mg/l	EPA 353.3	09-17-1993 0830	LM
Nitrogen, Nitrite	0.02	.02	mg/l	EPA 354.1	09-03-1993 1300	LM
Oil & Grease	<1	1	mg/l	EPA 413.1	09-08-1993 1310	LM
Phosphorus, Total	<0.008	.008	mg/l	EPA 365.2	09-15-1993 0720	LM
Potassium	1.4	.1	mg/l	EPA 200.7	09-15-1993 1616	SE
Selenium	<0.004	.002	mg/l	EPA 270.2	09-20-1993 1900	SM
Sodium	19.0	.1	mg/l	EPA 200.7	09-15-1993 1616	SE
Solids, Total Dissolved	514	14	mg/l	EPA 160.1	09-03-1993 1130	LM
Sulfate	130	1	mg/l	EPA 375.4	09-24-1993 0800	LS
Sulfide	<0.9	.1	mg/l	EPA 376.1	09-03-1993 1515	ED
Zinc	0.16	.005	mg/l	EPA 200.7	09-15-1993 1616	SE
Cation/Anion Balance	0.51	----	%	---------	----------	--

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

Manager, Huntington Laboratory

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FAX: (801) 653-2436

December 16, 1993

CO-OP MINE
P.O. Box 1245
Huntington UT 84528

Sample identification by
CO-OP MINE

DH-1A

Kind of sample reported to us Water

Rec'd 1700 hr.
Sampled 0913 hr.

Sample taken at Co-op

NOTE: Holding time expired when Sulfate was run.

Sample taken by Co-op

Date sampled October 26, 1993

Date received October 26, 1993

Analysis report no. 59-13672A

Parameter	Result	MDL	Units		Method	Analyzed Date/Time/Analyst		
Alkalinity, Bicarbonate	276	2	mg/l	$CaCO_3$	EPA 310.1	11-01-1993	1212	LS
Alkalinity, Carbonate	<1	1	mg/l	$CaCO_3$	EPA 310.1	11-01-1993	1212	LS
Alkalinity, Total	276	2	mg/l	$CaCO_3$	EPA 310.1	11-01-1993	1212	LS
Aluminum	<2	1	mg/l		EPA 202.1	12-06-1993	1330	DW
Anions	7.20	----	meq/l		---------	----------	-----	--
Arsenic	<0.010	.003	mg/l		EPA 206.2	11-23-1993	1115	DW
Boron	0.10	.04	mg/l		EPA 212.3	12-09-1993	1330	LM
Cadmium	<0.0200	.0002	mg/l		EPA 213.2	11-05-1993	1125	ED
Calcium	66.0	.03	mg/l		EPA 215.1	11-08-1993	1450	ED
Cations	7.20	----	meq/l		---------	----------	-----	--
Chloride	7.0	.5	mg/l		EPA 325.3	11-22-1993	0930	LM
Conductivity	682.00	0.2	umhos/cm		EPA 120.1	10-28-1993	0945	ED
Copper	<0.20	.03	mg/l		EPA 220.1	11-09-1993	1520	ED
Hardness, Total	338.0	.03	mg/l	$CaCO_3$	---------	11-08-1993	1450	ED
Iron	0.58	.05	mg/l		EPA 236.1	11-08-1993	1315	ED
Iron, Dissolved	<0.20	.05	mg/l		EPA 236.1	12-08-1993	0920	ED
Lead	<0.400	.003	mg/l		EPA 239.2	11-05-1993	1000	ED
Magnesium	42.00	.007	mg/l		EPA 242.1	11-08-1993	1630	ED
Manganese	0.08	.03	mg/l		EPA 243.1	11-08-1993	1100	ED
Manganese, Dissolved	<0.1	.03	mg/l		EPA 243.1	12-02-1993	0830	DW
Molybdenum	0.2	.2	mg/l		EPA 246.1	12-06-1993	1620	DW
Nitrogen, Ammonia	<0.08	.08	mg/l		EPA 350.3	11-08-1993	1000	LS
Nitrogen, Nitrate	<0.10	.01	mg/l		EPA 353.3	11-03-1993	1000	LM
Nitrogen, Nitrite	0.00	.02	mg/l		EPA 354.1	10-27-1993	1100	LM

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

Manager, Huntington Laboratory

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FAX: (801) 653-2436

December 16, 1993

CO-OP MINE
P.O. Box 1245
Huntington UT 84528

Sample identification by
CO-OP MINE

DH-1A

Kind of sample reported to us Water

Rec'd 1700 hr.
Sampled 0913 hr.

Sample taken at Co-op

NOTE: Holding time expired when Sulfate was run.

Sample taken by Co-op

Date sampled October 26, 1993

Date received October 26, 1993

Analysis report no. 59-13672A

Parameter	Result	MDL	Units	Method	Analyzed Date/Time/Analyst
Phosphorus, Ortho	0.000	.003	mg/l	EPA 365.2	10-27-1993 1130 LM
Potassium	20.0	.1	mg/l	EPA 258.1	11-09-1993 1315 ED
Selenium	<0.010	.004	mg/l	EPA 270.2	12-02-1993 1400 DW
Sodium	11.0	.2	mg/l	EPA 273.1	11-09-1993 1135 ED
Solids, Settleable	<0.5	.5	mg/l	EPA 160.5	10-27-1993 0740 LM
Solids, Total Dissolved	395	14	mg/l	EPA 160.1	10-29-1993 0730 LM
Solids, Total Suspended	11	7	mg/l	EPA 160.2	11-02-1993 0800 LM
Sulfate	70	1	mg/l	EPA 375.4	12-09-1993 0900 LS
Zinc	0.05	.03	mg/l	EPA 289.1	12-06-1993 1500 DW
Cation/Anion Balance	0.50	----	%	---------	---------- ----- --

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

Manager, Huntington Laboratory

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PLEASE ADDRESS ALL CORRESPONDENCE TO:
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FAX: (801) 653-2436

March 24, 1993

CO-OP MINE
P.O. Box 1245
Huntington UT 84528

Sample identification by
CO-OP MINE

Kind of sample reported to us Water

DH-2
Rec'd 1630 hr.
Sampled 1403 hr.

Sample taken at Co-op

Sample taken by Co-op

Date sampled February 22, 1993

Date received February 23, 1993

Analysis report no. 59-12897

Parameter	Result	MDL	Units	Method	Analyzed Date/Time/Analyst
Acidity	2	1	mg/l $CaCO_3$	EPA 305.1	03-04-1993 10:20 LS
Alkalinity, Bicarbonate	344	1	mg/l $CaCO_3$	EPA 310.1	03-04-1993 10:20 LS
Alkalinity, Total	282	1	mg/l $CaCO_3$	EPA 310.1	03-04-1993 10:20 LS
Aluminum	0.00	.5	mg/l	EPA 202.1	03-08-1993 12:45 ED
Anions	6.15	----	meq/l	---------	---------- ----- --
Arsenic	0.003	.002	mg/l	EPA 206.2	03-22-1993 08:55 ED
Barium	0.00	.03	mg/l	EPA 208.1	03-08-1993 12:45 ED
Boron	0.11	.01	mg/l	EPA 212.3	03-09-1993 10:00 LM
Cadmium	0.001	.00	mg/l	EPA 213.2	03-17-1993 08:15 ED
Calcium	70.4	.1	mg/l	EPA 215.1	03-04-1993 13:30 ED
Cations	6.66	----	meq/l	---------	---------- ----- --
Chloride	0.8	.1	mg/l	EPA 325.3	03-08-1993 08:00 LM
Chromium	0.00	.001	mg/l	EPA 218.2	03-19-1993 09:56 ED
Copper	0.000	.01	mg/l	EPA 220.1	03-05-1993 10:00 ED
Fluoride	0.15	.01	mg/l	EPA 340.2	02-24-1993 09:00 LS
Hardness, Total	316	1	mg/l $CaCO_3$	---------	03-04-1993 13:30 ED
Iron	0.51	.02	mg/l	EPA 236.1	03-05-1993 08:40 ED
Iron, Dissolved	0.41	.02	mg/l	EPA 236.1	03-05-1993 08:40 ED
Lead	0.000	.001	mg/l	EPA 239.2	03-08-1993 14:20 ED
Magnesium	34.00	.01	mg/l	EPA 242.1	03-04-1993 13:30 ED
Manganese	0.09	.01	mg/l	EPA 243.1	03-05-1993 08:40 ED
Mercury	0.900	.002	mg/l	EPA 245.1	03-22-1993 13:55 ED
Molybdenum	0.00	.1	mg/l	EPA 246.1	03-08-1993 12:45 ED
Nickel	0.06	.02	mg/l	EPA 249.1	03-05-1993 10:00 ED

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

Manager, Huntington Laboratory

OVER 40 BRANCH LABORATORIES STRATEGICALLY LOCATED IN PRINCIPAL COAL MINING AREAS, TIDEWATER AND GREAT LAKES PORTS, AND RIVER LOADING FACILITI

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TERMS AND CONDITIONS ON REVERSE

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P.O. BOX 1020, HUNTINGTON, UT 84528
TEL: (801) 653-2311
FAX: (801) 653-2436

March 24, 1993

CO-OP MINE
P.O. Box 1245
Huntington UT 84528

Sample identification by
CO-OP MINE

Kind of sample reported to us Water

DH-2
Rec'd 1630 hr.
Sampled 1403 hr.

Sample taken at Co-op

Sample taken by Co-op

Date sampled February 22, 1993

Date received February 23, 1993

Analysis report no. 59-12897

Parameter	Result	MDL	Units	Method	Analyzed Date/Time/Analyst
Nitrogen, Ammonia	0.03	.01	mg/l	EPA 350.3	03-05-1993 08:30 LS
Nitrogen, Nitrate	0.03	.01	mg/l	EPA 353.3	02-19-1993 11:00 LM
Nitrogen, Nitrite	0.00	.01	mg/l	EPA 354.1	02-19-1993 11:00 LM
Oil & Grease	0.0	1	mg/l	EPA 413.1	03-03-1993 08:00 LM
Phosphorus, Total	0.00	.01	mg/l	EPA 365.2	03-01-1993 09:00 LM
Potassium	0.00	.01	mg/l	EPA 258.1	03-04-1993 13:30 ED
Selenium	0.022	.002	mg/l	EPA 270.2	03-22-1993 08:55 ED
Sodium	8.10	.01	mg/l	EPA 273.1	03-04-1993 13:30 ED
Solids, Settleable	0.0	.5	mg/l	EPA 160.5	03-01-1993 08:00 LM
Solids, Total Dissolved	356.0	.5	mg/l	EPA 160.1	02-26-1993 12:30 LM
Solids, Total Suspended	2.0	.5	mg/l	EPA 160.2	02-26-1993 12:30 LM
Sulfate	30.0	.1	mg/l	EPA 375.4	03-08-1993 08:50 LS
Sulfide	3.40	.1	mg/l	EPA 376.1	03-01-1993 08:00 LM
Zinc	0.07	.01	mg/l	EPA 289.1	03-05-1993 10:20 ED
Cation/Anion Balance	3.91	----	%	---------	---------- ----- --

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

Manager, Huntington Laboratory

OVER 40 BRANCH LABORATORIES STRATEGICALLY LOCATED IN PRINCIPAL COAL MINING AREAS, TIDEWATER AND GREAT LAKES PORTS, AND RIVER LOADING FACILITIE

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TERMS AND CONDITIONS ON REVERSE

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FAX: (801) 653-2436

June 18, 1993

CO-OP MINE
P.O. Box 1245
Huntington UT 84528

Sample identification by
CO-OP MINE

Kind of sample reported to us Water

DH-2
Rec'd 0830 hr.
Sampled 0920 hr.

Sample taken at Co-op

Sample taken by Co-op

Date sampled May 25, 1993

Date received May 26, 1993

NOTE: Due to lab error, Zinc bottle was unperserved.
Fluoride was not distilled.

Analysis report no. 59-13104

Parameter	Result	MDL	Units	Method	Analyzed Date/Time/Analyst
Acidity	0	1	mg/l $CaCO_3$	EPA 305.1	05-26-1993 13:00 LS
Alkalinity, Bicarbonate	340	2	mg/l $CaCO_3$	EPA 310.1	05-26-1993 13:00 LS
Alkalinity, Carbonate	0	1	mg/l $CaCO_3$	EPA 310.1	05-26-1993 13:00 LS
Alkalinity, Total	279	2	mg/l $CaCO_3$	EPA 310.1	05-26-1993 13:00 LS
Aluminum	<1.00	1	mg/l	EPA 202.1	06-15-1993 12:40 ED
Anions	6.18	----	meq/l	---------	---------- ----- --
Arsenic	<0.003	.003	mg/l	EPA 206.2	06-07-1993 14:35 ED
Barium	0.20	.2	mg/l	EPA 208.1	06-15-1993 11:50 ED
Boron	0.17	.04	mg/l	EPA 212.3	06-14-1993 15:00 LM
Cadmium	<0.0002	.0002	mg/l	EPA 213.2	06-04-1993 14:15 ED
Calcium	68.3	.03	mg/l	EPA 215.1	06-07-1993 09:20 ED
Cations	6.14	----	meq/l	---------	---------- ----- --
Chloride	3.9	.5	mg/l	EPA 325.3	06-03-1993 10:00 LM
Chromium	<0.0002	.0003	mg/l	EPA 218.2	06-10-1993 12:25 ED
Copper	<0.030	.03	mg/l	EPA 220.1	06-14-1993 16:55 ED
Fluoride	0.15	.02	mg/l	EPA 340.2	06-02-1993 07:30 LS
Hardness, Total	293	.03	mg/l $CaCO_3$	---------	06-07-1993 09:20 ED
Iron	0.55	.05	mg/l	EPA 236.1	06-07-1993 11:05 ED
Lead	<0.003	.003	mg/l	EPA 239.2	06-09-1993 11:05 ED
Magnesium	29.80	.007	mg/l	EPA 242.1	06-07-1993 10:00 ED
Manganese	0.08	.03	mg/l	EPA 243.1	06-07-1993 10:40 ED
Mercury	<0.0002	.0002	mg/l	EPA 245.1	06-17-1993 15:30 ED
Molybdenum	<0.20	.2	mg/l	EPA 246.1	06-16-1993 11:20 ED
Nickel	<0.08	.08	mg/l	EPA 249.1	06-15-1993 10:10 ED

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

Manager, Huntington Laboratory

AMERICAN COUNCIL OF INDEPENDENT LABORATORIES

OVER 40 BRANCH LABORATORIES STRATEGICALLY LOCATED IN PRINCIPAL COAL MINING AREAS, TIDEWATER AND GREAT LAKES PORTS, AND RIVER LOADING FACILITIE

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TEL: (801) 653-2311
FAX: (801) 653-2436

June 18, 1993

CO-OP MINE
P.O. Box 1245
Huntington UT 84528

Sample identification by
CO-OP MINE

Kind of sample reported to us Water

DH-2
Rec'd 0830 hr.
Sampled 0920 hr.

Sample taken at Co-op

Sample taken by Co-op

Date sampled May 25, 1993

Date received May 26, 1993

NOTE: Due to lab error, Zinc bottle was unperserved.
Fluoride was not distilled.

Analysis report no. 59-13104

Parameter	Result	MDL	Units	Method	Analyzed Date/Time/Analyst
Nitrogen, Ammonia	0.08	.08	mg/l	EPA 350.3	06-09-1993 10:15 LS
Nitrogen, Nitrate	0.07	.01	mg/l	EPA 353.3	05-28-1993 10:30 LM
Nitrogen, Nitrite	<0.02	.02	mg/l	EPA 354.1	05-26-1993 11:00 LM
Oil & Grease	<1.0	1	mg/l	EPA 413.1	06-11-1993 07:30 LM
Phosphorus, Total	0.005	.008	mg/l	EPA 365.2	06-09-1993 13:30 LM
Potassium	2.00	.1	mg/l	EPA 258.1	06-07-1993 12:05 ED
Selenium	<0.004	.004	mg/l	EPA 270.2	06-08-1993 13:35 ED
Sodium	5.40	.2	mg/l	EPA 273.1	06-07-1993 11:30 ED
Solids, Settleable	<0.5	.5	mg/l	EPA 160.5	05-26-1993 14:00 LS
Solids, Total Dissolved	346.0	14	mg/l	EPA 160.1	06-02-1993 10:30 LM
Solids, Total Suspended	0.0	7	mg/l	EPA 160.2	06-02-1993 10:30 LM
Sulfate	30.0	1	mg/l	EPA 375.4	06-07-1993 10:15 LS
Sulfide	1.00	.1	mg/l	EPA 376.1	05-28-1993 14:00 LM
Zinc	<0.03	.03	mg/l	EPA 289.1	06-15-1993 09:20 ED
Cation/Anion Balance	-0.28	----	%	---------	---------- ----- --

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

Manager, Huntington Laboratory

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P.O. BOX 1020, HUNTINGTON, UT 84528
TEL: (801) 653-2311
FAX: (801) 653-2436

November 1, 1993

CO-OP MINE
P.O. Box 1245
Huntington UT 84528

Sample identification by
CO-OP MINE

DH-2

Kind of sample reported to us: Water

Rec'd 1030 hr.
Sampled 1812 hr.

Sample taken at: Co-op

Sample taken by: Co-op

Date sampled: August 31, 1993

Date received: September 3, 1993

NOTE: Fluoride not distilled. Possilbe matrix interference with Arsenic and Selenium. Nitrite holding time expired when received at Lab.

Analysis report no. 59-13483

Parameter	Result	MDL	Units		Method	Analyzed Date/Time/Analyst
Alkalinity, Bicarbonate	330	2	mg/l	$CaCO_3$	EPA 310.1	09-14-1993 1030 LS
Alkalinity, Carbonate	<1	1	mg/l	$CaCO_3$	EPA 310.1	09-14-1993 1030 LS
Alkalinity, Total	271	2	mg/l	$CaCO_3$	EPA 310.1	09-14-1993 1030 LS
Aluminum	<1	1	mg/l		EPA 202.1	10-28-1993 1630 ED
Anions	5.90	----	meq/l		---------	---------- ----- --
Arsenic	0.010	.003	mg/l		EPA 206.2	10-29-1993 1450 ED
Barium	<1.0	.2	mg/l		EPA 208.1	10-28-1993 1720 ED
Boron	0.08	.04	mg/l		EPA 212.3	10-28-1993 1330 LM
Cadmium	<0.0200	.0002	mg/l		EPA 213.2	10-11-1993 1000 ED
Calcium	65.0	.03	mg/l		EPA 215.1	10-12-1993 1330 ED
Cations	7.20	----	meq/l		---------	---------- ----- --
Chloride	4.2	.5	mg/l		EPA 325.3	09-07-1993 1300 LM
Chromium	<0.1	.0003	mg/l		EPA 218.2	10-15-1993 0950 ED
Copper	<0.05	.03	mg/l		EPA 220.1	10-27-1993 1550 ED
Fluoride	0.21	.02	mg/l		EPA 340.2	09-13-1993 1400 LS
Hardness, Total	311.0	.03	mg/l	$CaCO_3$	---------	10-12-1993 1330 ED
Iron	2.17	.05	mg/l		EPA 236.1	10-12-1993 1700 ED
Lead	<0.200	.003	mg/l		EPA 239.2	10-15-1993 1040 ED
Magnesium	36.00	.007	mg/l		EPA 242.1	10-18-1993 1405 ED
Manganese	0.06	.03	mg/l		EPA 243.1	10-12-1993 1730 ED
Mercury	0.0003	.0002	mg/l		EPA 245.1	10-12-1993 1530 ED
Molybdenum	<0.2	.2	mg/l		EPA 246.1	10-29-1993 1105 ED
Nickel	<1.00	.08	mg/l		EPA 249.1	10-27-1993 1150 ED
Nitrogen, Ammonia	0.21	.08	mg/l		EPA 350.3	09-22-1993 0800

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

Manager, Huntington Laboratory

OVER 40 BRANCH LABORATORIES STRATEGICALLY LOCATED IN PRINCIPAL COAL MINING AREAS, TIDEWATER AND GREAT LAKES PORTS, AND RIVER LOADING FACILITIES

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TEL: (801) 653-2311
FAX: (801) 653-2436

November 1, 1993

CO-OP MINE
P.O. Box 1245
Huntington UT 84528

Sample identification by
CO-OP MINE

DH-2

Kind of sample reported to us: Water

Rec'd 1030 hr.
Sampled 1812 hr.

Sample taken at: Co-op

Sample taken by: Co-op

Date sampled: August 31, 1993

Date received: September 3, 1993

NOTE: Fluoride not distilled. Possilbe matrix interference with Arsenic and Selerium. Nitrite holding time expired when received at Lab.

Analysis report no. 59-13483

Parameter	Result	MDL	Units	Method	Analyzed Date/Time/Analyst	
Nitrogen, Nitrate	0.02	.01	mg/l	EPA 353.3	09-17-1993 0830	LM
Nitrogen, Nitrite	0.01	.02	mg/l	EPA 354.1	09-03-1993 1300	LM
Oil & Grease	<1	1	mg/l	EPA 413.1	09-08-1993 1310	LM
Phosphorus, Total	<0.008	.008	mg/l	EPA 365.2	09-15-1993 0720	LM
Potassium	2.0	.1	mg/l	EPA 258.1	10-13-1993 1250	ED
Selenium	0.009	.004	mg/l	EPA 270.2	10-24-1993 1610	ED
Sodium	22.9	.2	mg/l	EPA 273.1	10-18-1993 1650	ED
Solids, Total Dissolved	353	14	mg/l	EPA 160.1	09-03-1993 1130	LM
Sulfate	26	1	mg/l	EPA 375.4	09-24-1993 0800	LS
Sulfide	<0.9	.1	mg/l	EPA 376.1	09-03-1993 1515	ED
Zinc	<0.03	.03	mg/l	EPA 289.1	10-27-1993 1300	ED
Cation/Anion Balance	9.80	----	%	---------	---------- -----	--

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

Manager, Huntington Laboratory

OVER 40 BRANCH LABORATORIES STRATEGICALLY LOCATED IN PRINCIPAL COAL MINING AREAS, TIDEWATER AND GREAT LAKES PORTS, AND RIVER LOADING FACILITIE

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FAX: (801) 653-2436

December 10, 1993

CO-OP MINE
P.O. Box 1245
Huntington UT 84528

Sample identification by
CO-OP MINE

DH-2

Kind of sample reported to us Water

Rec'd 1445 hr.
Sampled 0945 hr.

Sample taken at Co-op

Sample taken by Co-op

NOTE: Holding time expired when Sulfate was run.

Date sampled October 29, 1993

Date received October 29, 1993

Analysis report no. 59-13691

Parameter	Result	MDL	Units		Method	Analyzed Date/Time/Analyst		
lkalinity, Bicarbonate	350	2	mg/l	$CaCO_3$	EPA 310.1	11-05-1993	0845	LS
.lkalinity, Carbonate	<1	1	mg/l	$CaCO_3$	EPA 310.1	11-05-1993	0845	LS
Alkalinity, Total	287	2	mg/l	$CaCO_3$	EPA 310.1	11-05-1993	0845	LS
Aluminum	<2	1	mg/l		EPA 202.1	12-06-1993	1330	DW
Anions	4.80	----	meq/l		---------	----------	-----	--
Arsenic	<0.010	.003	mg/l		EPA 206.2	11-23-1993	1115	DW
Boron	<0.10	.04	mg/l		EPA 212.3	12-09-1993	1530	LM
Cadmium	<0.0200	.0002	mg/l		EPA 213.2	11-05-1993	1125	ED
Calcium	75.0	.03	mg/l		EPA 215.1	11-08-1993	1450	ED
Cations	4.80	----	meq/l		---------	----------	-----	--
Chloride	5.0	.5	mg/l		EPA 325.3	11-22-1993	0930	LM
Conductivity	465.00	0.2	umhos/cm		EPA 120.1	11-29-1993	1500	LS
Copper	<0.20	.03	mg/l		EPA 220.1	11-09-1993	1520	ED
Hardness, Total	237.0	.03	mg/l	$CaCO_3$	---------	11-08-1993	1450	ED
Iron	0.74	.05	mg/l		EPA 236.1	11-08-1993	1315	ED
Iron, Dissolved	<0.20	.05	mg/l		EPA 236.1	12-08-1993	0920	ED
Lead	<0.400	.003	mg/l		EPA 239.2	11-05-1993	1000	ED
Magnesium	34.00	.007	mg/l		EPA 242.1	11-08-1993	1630	ED
Manganese	0.09	.03	mg/l		EPA 243.1	11-08-1993	1100	ED
Manganese, Dissolved	<0.1	.03	mg/l		EPA 243.1	12-08-1993	1010	ED
Molybdenum	0.3	.2	mg/l		EPA 246.1	12-06-1993	1620	DW
Nitrogen, Ammonia	<0.08	.08	mg/l		EPA 350.3	11-08-1993	1000	LS
Nitrogen, Nitrate	<0.10	.01	mg/l		EPA 353.3	11-10-1993	1030	LM
Nitrogen, Nitrite	0.00	.02	mg/l		EPA 354.1	10-30-1993	0920	LM

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

Manager, Huntington Laboratory

OVER 40 BRANCH LABORATORIES STRATEGICALLY LOCATED IN PRINCIPAL COAL MINING AREAS, TIDEWATER AND GREAT LAKES PORTS, AND RIVER LOADING FACILITIES

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PLEASE ADDRESS ALL CORRESPONDENCE TO:
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TEL: (801) 653-2311
FAX: (801) 653-2436

December 10, 1993

CO-OP MINE
P.O. Box 1245
Huntington UT 84528

Sample identification by
CO-OP MINE

DH-2

Rec'd 1445 hr.
Sampled 0945 hr.

NOTE: Holding time expired when Sulfate was run.

Kind of sample reported to us Water

Sample taken at Co-op

Sample taken by Co-op

Date sampled October 29, 1993

Date received October 29, 1993

Analysis report no. 59-13691

Parameter	Result	MDL	Units	Method	Analyzed Date/Time/Analyst
Phosphorus, Ortho	0.006	.003	mg/l	EPA 365.2	10-30-1993 1000 LM
Potassium	<10.0	.1	mg/l	EPA 258.1	11-09-1993 1315 ED
Selenium	<0.010	.004	mg/l	EPA 270.2	12-02-1993 1400 DW
Sodium	<10.0	.2	mg/l	EPA 273.1	11-09-1993 1135 ED
Solids, Total Dissolved	290	14	mg/l	EPA 160.1	11-02-1993 0730 LM
Sulfate	28	1	mg/l	EPA 375.4	12-08-1993 0945 LS
Zinc	<0.02	.03	mg/l	EPA 289.1	12-06-1993 1500 DW
Cation/Anion Balance	-1.80	----	%	---------	---------- ----- --

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

Manager, Huntington Laboratory

OVER 40 BRANCH LABORATORIES STRATEGICALLY LOCATED IN PRINCIPAL COAL MINING AREAS, TIDEWATER AND GREAT LAKES PORTS, AND RIVER LOADING FACILITIES

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PLEASE ADDRESS ALL CORRESPONDENCE TO:
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TEL: (801) 653-2311
FAX: (801) 653-2436

April 14, 1993

CO-OP MINE
P.O. Box 1245
Huntington UT 84528

Sample identification by
CO-OP MINE

Kind of sample reported to us: Water

DH-3
Rec'd 1030 hr.
Sampled 0906 hr.

Sample taken at: Co-op

Sample taken by: Co-op

Date sampled: February 19, 1993

Date received: February 19, 1993

ADDED CARBONATES

Analysis report no. 59-12892

arameter	Result	MDL	Units	Method	Analyzed Date/Time/Analyst
Acidity	0	1	mg/l $CaCO_3$	EPA 305.1	03-04-1993 10:20 LS
Alkalinity, Bicarbonate	256	1	mg/l $CaCO_3$	EPA 310.1	03-04-1993 10:20 LS
Alkalinity, Carbonate	03-04-1993	1	mg/l $CaCO_3$	EPA 310.1	03-04-1993 10:20 LS
Alkalinity, Total	205	1	mg/l $CaCO_3$	EPA 310.1	03-04-1993 10:20 LS
Aluminum	0.00	.5	mg/l	EPA 202.1	03-08-1993 12:45 ED
Anions	5.04	----	meq/l	---------	---------- ----- --
Arsenic	0.001	.002	mg/l	EPA 206.2	03-22-1993 08:55 ED
Barium	0.00	.03	mg/l	EPA 208.1	03-08-1993 12:45 ED
Boron	0.08	.01	mg/l	EPA 212.3	03-09-1993 10:00 LM
Cadmium	0.000	.00	mg/l	EPA 213.2	03-17-1993 08:15 ED
Calcium	67.8	.1	mg/l	EPA 215.1	03-04-1993 13:30 ED
Cations	6.20	----	meq/l	---------	---------- ----- --
Chloride	4.4	.1	mg/l	EPA 325.3	03-08-1993 08:00 LM
Chromium	0.00	.001	mg/l	EPA 218.2	03-19-1993 09:56 ED
Copper	0.000	.01	mg/l	EPA 220.1	03-05-1993 10:20 ED
Fluoride	0.16	.01	mg/l	EPA 340.2	02-24-1993 09:00 LS
Hardness, Total	301	1	mg/l $CaCO_3$	---------	03-04-1993 13:30 ED
Iron	1.59	.02	mg/l	EPA 236.1	03-05-1993 08:40 ED
Iron, Dissolved	1.40	.02	mg/l	EPA 236.1	03-05-1993 08:40 ED
Lead	0.000	.001	mg/l	EPA 239.2	03-08-1993 14:20 ED
Magnesium	32.00	.01	mg/l	EPA 242.1	03-04-1993 13:30 ED
Manganese	0.37	.01	mg/l	EPA 243.1	03-05-1993 08:40 ED
Mercury	0.060	.002	mg/l	EPA 245.1	03-23-1993 13:55 ED
Molybdenum	0.00	.1	mg/l	EPA 246.1	03-08-1993 12:45 ED

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

Manager, Huntington Laboratory

OVER 40 BRANCH LABORATORIES STRATEGICALLY LOCATED IN PRINCIPAL COAL MINING AREAS, TIDEWATER AND GREAT LAKES PORTS, AND RIVER LOADING FACILITIES

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P.O. BOX 1020, HUNTINGTON, UT 84528
TEL: (801) 653-2311
FAX: (801) 653-2436

April 14, 1993

CO-OP MINE
P.O. Box 1245
Huntington UT 84528

Sample identification by
CO-OP MINE

Kind of sample reported to us: Water

DH-3
Rec'd 1030 hr.
Sampled 0906 hr.

Sample taken at: Co-op

Sample taken by: Co-op

Date sampled: February 19, 1993

Date received: February 19, 1993

ADDED CARBONATES

Analysis report no. 59-12892

arameter	Result	MDL	Units	Method	Analyzed Date/Time/Analyst
Nickel	0.02	.02	mg/l	EPA 249.1	03-05-1993 10:20 ED
Nitrogen, Ammonia	0.05	.01	mg/l	EPA 350.3	03-05-1993 08:30 LS
Nitrogen, Nitrate	0.03	.01	mg/l	EPA 353.3	02-19-1993 11:00 LM
Nitrogen, Nitrite	0.00	.01	mg/l	EPA 354.1	02-19-1993 11:00 LM
Oil & Grease	0.6	1	mg/l	EPA 413.1	03-03-1993 08:00 LM
Phosphorus, Total	0.01	.01	mg/l	EPA 365.2	03-01-1993 09:00 LM
Potassium	0.00	.01	mg/l	EPA 258.1	03-04-1993 13:30 ED
Selenium	0.019	.002	mg/l	EPA 270.2	03-22-1993 08:55 ED
Sodium	4.30	.01	mg/l	EPA 273.1	03-04-1993 13:30 ED
Solids, Settleable	0.0	.5	mg/l	EPA 160.5	03-01-1993 08:00 LM
Solids, Total Dissolved	342.0	.5	mg/l	EPA 160.1	02-26-1993 12:30 LM
Solids, Total Suspended	8.0	.5	mg/l	EPA 160.2	02-26-1993 12:30 LM
Sulfate	44.0	.1	mg/l	EPA 375.4	03-08-1993 08:50 LS
Sulfide	1.60	.1	mg/l	EPA 376.1	03-01-1993 08:00 LM
Zinc	0.07	.01	mg/l	EPA 289.1	03-05-1993 10:20 ED
Cation/Anion Balance	9.15	----	%	---------	---------- ----- --

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

Manager, Huntington Laboratory

COMMERCIAL TESTING & ENGINEERING CO.
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PLEASE ADDRESS ALL CORRESPONDENCE TO:
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TEL: (801) 653-2311
FAX: (801) 653-2436

July 9, 1993

CO-OP MINE
P.O. Box 1245
Huntington UT 84528

Sample identification by
CO-OP MINE

Kind of sample reported to us: Water

Sample taken at: Co-op

Sample taken by: Co-op

Date sampled: May 28, 1993

Date received: May 28, 1993

DH-3
Rec'd 1255 hr.
Sampled 1200 hr.

NOTE: Due to fast transport time, sample was unable to chill. Fluoride was not distilled.

Analysis report no. 59-13120

ameter	Result	MDL	Units	Method	Analyzed Date/Time/Analyst
Alkalinity, Bicarbonate	340	2	mg/l HCO_3	EPA 310.1	06-08-1993 12:00 LS
Alkalinity, Carbonate	0	1	mg/l CO_3	EPA 310.1	06-08-1993 12:00 LS
Alkalinity, Total	279	2	mg/l $CaCO_3$	EPA 310.1	06-08-1993 12:00 LS
Aluminum	<1.00	1	mg/l	EPA 202.1	06-15-1993 12:40 ED
Anions	6.18	----	meq/l	---------	---------- ----- --
Arsenic	0.013	.003	mg/l	EPA 206.2	07-07-1993 09:50 ED
Barium	<0.20	.2	mg/l	EPA 208.1	06-15-1993 11:50 ED
Boron	0.11	.04	mg/l	EPA 212.3	06-14-1993 15:00 LM
Cadmium	<0.0002	.0002	mg/l	EPA 213.2	06-09-1993 13:10 ED
Calcium	64.6	.03	mg/l	EPA 215.1	06-14-1993 11:20 ED
Cations	5.81	----	meq/l	---------	---------- ----- --
Chloride	4.5	.5	mg/l	EPA 325.3	06-03-1993 10:00 LM
Chromium	<0.0003	.0003	mg/l	EPA 218.2	06-10-1993 12:25 ED
Copper	<0.030	.03	mg/l	EPA 220.1	06-14-1993 16:55 ED
Fluoride	0.12	.02	mg/l	EPA 340.2	06-02-1993 07:30 LS
Hardness, Total	283	.03	mg/l $CaCO_3$	---------	06-14-1993 11:20 ED
Iron	1.64	.05	mg/l	EPA 236.1	06-14-1993 09:25 ED
Iron, Dissolved	0.08	.05	mg/l	EPA 236.1	06-14-1993 09:25 ED
Magnesium	29.60	.007	mg/l	EPA 242.1	06-14-1993 11:40 ED
Manganese	0.03	.03	mg/l	EPA 243.1	06-14-1993 10:40 ED
Mercury	<0.0002	.0002	mg/l	EPA 245.1	06-17-1993 15:30 ED
Molybdenum	<0.20	.2	mg/l	EPA 246.1	06-16-1993 11:20 ED
Nickel	<0.08	.08	mg/l	EPA 249.1	06-15-1993 10:10 ED
Nitrogen, Ammonia	0.08	.08	mg/l	EPA 350.3	06-09-1993 10:15 LS

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

Manager, Huntington Laboratory

OVER 40 BRANCH LABORATORIES STRATEGICALLY LOCATED IN PRINCIPAL COAL MINING AREAS, TIDEWATER AND GREAT LAKES PORTS, AND RIVER LOADING FACILITIES

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FAX: (801) 653-2436

July 9, 1993

CO-OP MINE
P.O. Box 1245
Huntington UT 84528

Sample identification by
CO-OP MINE

Kind of sample reported to us: Water

Sample taken at: Co-op

Sample taken by: Co-op

Date sampled: May 28, 1993

Date received: May 28, 1993

DH-3
Rec'd 1255 hr.
Sampled 1200 hr.

NOTE: Due to fast transport time, sample was unable to chill. Fluoride was not distilled.

Analysis report no. 59-13120

ameter	Result	MDL	Units	Method	Analyzed Date/Time/Analyst
Nitrogen, Nitrate	0.01	.01	mg/l	EPA 353.3	05-28-1993 10:30 LM
Nitrogen, Nitrite	<0.02	.02	mg/l	EPA 354.1	05-28-1993 15:00 LM
Oil & Grease	<1.0	1	mg/l	EPA 413.1	06-11-1993 07:30 LM
Phosphorus, Total	0.01	.008	mg/l	EPA 365.2	06-09-1993 13:30 LM
Potassium	0.50	.1	mg/l	EPA 258.1	06-14-1993 12:30 ED
Selenium	0.004	.004	mg/l	EPA 270.2	07-06-1993 12:30 ED
Sodium	3.30	.2	mg/l	EPA 273.1	06-14-1993 12:10 ED
Solids, Settleable	<0.5	.5	mg/l	EPA 160.5	05-28-1993 15:00 LM
Solids, Total Dissolved	349.0	14	mg/l	EPA 160.1	06-07-1993 13:00 LS
Solids, Total Suspended	1.0	7	mg/l	EPA 160.2	06-07-1993 13:00 LS
Sulfate	29.0	1	mg/l	EPA 375.4	06-14-1993 12:40 LS
Sulfide	23.00	.9	mg/l	EPA 376.1	05-28-1993 14:00 LM
Zinc	0.06	.03	mg/l	EPA 289.1	06-15-1993 09:20 ED
Cation/Anion Balance	-3.01	----	%	---------	---------- ----- --

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

Manager, Huntington Laboratory

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October 14, 1993

CO-OP MINE
P.O. Box 1245
Huntington UT 84528

Sample identification by
CO-OP MINE

ID:DH-3

Kind of sample reported to us: Water

Rec'd 1030 hr.
Sampled 1740 hr.

Sample taken at: Co-op

NOTE:NITRATE HOLDING TIME EXPIRED WHEN RECEIVED AT LAB.

Sample taken by: Co-op

NOTE: DUE TO SPILLAGE IN LAB, METALS WERE RUN ON PLAIN BOTTLE. FLUORIDE NOT DISTILLED.

Date sampled: August 31, 1993

Date received: September 3, 1993

Analysis report no. 59-13481

Parameter	Result	MDL	Units		Method	Analyzed Date/Time/Analyst	
Alkalinity, Bicarbonate	329	2	mg/l	$CaCO_3$	EPA 310.1	09-08-1993 1220	LS
Alkalinity, Carbonate	0	1	mg/l	$CaCO_3$	EPA 310.1	09-08-1993 1220	LS
Alkalinity, Total	270	2	mg/l	$CaCO_3$	EPA 310.1	09-08-1993 1220	ED
Aluminum	<1	.05	mg/l		EPA 200.7	09-15-1993 1616	SE
Anions	5.92	----	meq/l		---------	---------- -----	--
Arsenic	<0.002	.002	mg/l		EPA 206.2	09-21-1993 1015	SM
Barium	0.1	.005	mg/l		EPA 200.7	09-15-1993 1616	SE
Boron	<0.05	.01	mg/l		EPA 200.7	09-16-1993 0130	SE
Cadmium	<0.0050	.005	mg/l		EPA 200.7	09-15-1993 1616	SE
Calcium	52.0	.1	mg/l		EPA 200.7	09-15-1993 1616	SE
Cations	4.92	----	meq/l		---------	---------- -----	--
Chloride	5.3	.5	mg/l		EPA 325.3	09-07-1993 1300	LM
Chromium	<0.0	.005	mg/l		EPA 200.7	09-15-1993 1616	SE
Copper	<0.01	.005	mg/l		EPA 200.7	09-15-1993 1616	SE
Fluoride	0.17	.02	mg/l		EPA 340.2	09-13-1993 1400	LS
Hardness, Total	236.9	.03	mg/l	$CaCO_3$	---------	09-15-1993 1616	SE
Iron	0.23	.01	mg/l		EPA 200.7	09-15-1993 1616	SE
Lead	<0.050	.05	mg/l		EPA 200.7	09-15-1993 1616	SE
Magnesium	26.00	.1	mg/l		EPA 200.7	09-15-1993 1616	SE
Manganese	<0.01	.01	mg/l		EPA 200.7	09-15-1993 1616	SE
Mercury	<0.0004	.0002	mg/l		EPA 245.1	09-21-1993 1000	SM
Molybdenum	<0.1	.1	mg/l		EPA 200.7	09-15-1993 1616	SE
Nickel	0.02	.01	mg/l		EPA 200.7	09-15-1993 1616	SE
Nitrogen, Ammonia	<0.08	.08	mg/l		EPA 350.3	09-22-1993 0800	LS

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

Manager, Huntington Laboratory

OVER 40 BRANCH LABORATORIES STRATEGICALLY LOCATED IN PRINCIPAL COAL MINING AREAS, TIDEWATER AND GREAT LAKES PORTS, AND RIVER LOADING FACILITIES

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PLEASE ADDRESS ALL CORRESPONDENCE TO:
P.O. BOX 1020, HUNTINGTON, UT 84528
TEL: (801) 653-2311
FAX: (801) 653-2436

October 14, 1993

CO-OP MINE
P.O. Box 1245
Huntington UT 84528

Sample identification by
CO-OP MINE

ID:DH-3

Kind of sample reported to us: Water

Rec'd 1030 hr.
Sampled 1740 hr.

Sample taken at: Co-op

NOTE:NITRATE HOLDING TIME EXPIRED WHEN RECEIVED AT LAB.

Sample taken by: Co-op

NOTE: DUE TO SPILLAGE IN LAB, METALS WERE RUN ON PLAIN BOTTLE. FLUORIDE NOT DISTILLED.

Date sampled: August 31, 1993

Date received: September 3, 1993

Analysis report no. 59-13481

Parameter	Result	MDL	Units	Method	Analyzed Date/Time/Analyst
Nitrogen, Nitrate	0.03	.01	mg/l	EPA 353.3	09-17-1993 0830 LM
Nitrogen, Nitrite	0.01	.02	mg/l	EPA 354.1	09-03-1993 1300 LM
Oil & Grease	<1	1	mg/l	EPA 413.1	09-08-1993 1310 LM
Phosphorus, Total	<0.008	.008	mg/l	EPA 365.2	09-15-1993 0720 LM
Potassium	1.9	.1	mg/l	EPA 200.7	09-15-1993 1616 SE
Selenium	<0.002	.002	mg/l	EPA 270.2	09-20-1993 1900 SM
Sodium	3.3	.1	mg/l	EPA 200.7	09-15-1993 1616 SE
Solids, Total Dissolved	317	14	mg/l	EPA 160.1	09-03-1993 1130 LM
Sulfate	24	1	mg/l	EPA 375.4	09-24-1993 0800 LS
Sulfide	<0.9	.1	mg/l	EPA 376.1	09-03-1993 1515 ED
Zinc	<0.01	.005	mg/l	EPA 200.7	09-15-1993 1616 SE
Cation/Anion Balance	-9.16	----	%	---------	---------- ----- --

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

Manager, Huntington Laboratory

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December 9, 1993

CO-OP MINE
P.O. Box 1245
Huntington UT 84528

Sample identification by
CO-OP MINE

DH-3S

Kind of sample reported to us Water

Rec'd 1200 hr.
Sampled 1210 hr.

Sample taken at Co-op

Sample taken by Co-op

NOTE: Holding times expired when Sulfate and TDS were run.

Date sampled October 21, 1993

Date received October 22, 1993

Analysis report no. 59-13661

Parameter	Result	MDL	Units		Method	Analyzed Date/Time/Analyst	
Alkalinity, Bicarbonate	355	2	mg/l	$CaCO_3$	EPA 310.1	10-28-1993 1850	LS
Alkalinity, Carbonate	<1	1	mg/l	$CaCO_3$	EPA 310.1	10-28-1993 1850	LS
Alkalinity, Total	291	2	mg/l	$CaCO_3$	EPA 310.1	10-28-1993 1850	ED
Aluminum	<2	1	mg/l		EPA 202.1	12-06-1993 1330	DW
Anions	6.30	----	meq/l		---------	---------- -----	--
Arsenic	0.020	.003	mg/l		EPA 206.2	11-23-1993 1115	DW\
Boron	0.10	.04	mg/l		EPA 212.3	12-07-1993 1400	LM
Cadmium	<0.0200	.0002	mg/l		EPA 213.2	11-05-1993 1125	ED
Calcium	84.0	.03	mg/l		EPA 215.1	11-08-1993 1450	ED
Cations	7.30	----	meq/l		---------	---------- -----	--
Chloride	5.0	.5	mg/l		EPA 325.3	11-19-1993 1000	LM
Conductivity	582.00	0.2	umhos/cm		EPA 120.1	10-28-1993 0945	ED
Copper	<0.20	.03	mg/l		EPA 220.1	11-09-1993 1520	ED
Hardness, Total	366.0	.03	mg/l	$CaCO_3$	---------	11-08-1993 1450	ED
Iron	1.62	.05	mg/l		EPA 236.1	11-08-1993 1315	ED
Iron, Dissolved	<0.20	.05	mg/l		EPA 236.1	12-01-1993 1500	DW
Lead	<0.400	.003	mg/l		EPA 239.2	11-05-1993 1000	ED
Magnesium	38.00	.007	mg/l		EPA 242.1	11-08-1993 1630	ED
Manganese	0.07	.03	mg/l		EPA 243.1	11-08-1993 1100	ED
Manganese, Dissolved	<0.1	.03	mg/l		EPA 243.1	12-02-1993 0830	DW
Molybdenum	<0.2	.2	mg/l		EPA 246.1	12-06-1993 1620	DW
Nitrogen, Ammonia	<0.08	.08	mg/l		EPA 350.3	11-08-1993 1000	LS
Nitrogen, Nitrate	<0.10	.01	mg/l		EPA 353.3	10-23-1993 0955	LM
Nitrogen, Nitrite	0.01	.02	mg/l		EPA 354.1	10-23-1993 0935	LM

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

Manager, Huntington Laboratory

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TEL: (801) 653-2311
FAX: (801) 653-2436

December 9, 1993

CO-OP MINE
P.O. Box 1245
Huntington UT 84528

Sample identification by
CO-OP MINE

DH-3S

Kind of sample reported to us Water

Rec'd 1200 hr.
Sampled 1210 hr.

Sample taken at Co-op

Sample taken by Co-op

NOTE: Holding times expired when Sulfate and TDS were run.

Date sampled October 21, 1993

Date received October 22, 1993

Analysis report no. 59-13661

Parameter	Result	MDL	Units	Method	Analyzed Date/Time/Analyst		
hosphorus, Ortho	0.001	.003	mg/l	EPA 365.2	10-23-1993	0930	LM
otassium	<10.0	.1	mg/l	EPA 258.1	11-09-1993	1315	ED
Selenium	<0.010	.004	mg/l	EPA 270.2	12-02-1993	1400	ED
Sodium	<10.0	.2	mg/l	EPA 273.1	11-09-1993	1135	ED
Solids, Total Dissolved	317	14	mg/l	EPA 160.1	10-29-1993	0730	LM
Sulfate	24	1	mg/l	EPA 375.4	11-30-1993	1000	LS
Zinc	<0.02	.03	mg/l	EPA 289.1	12-06-1993	1500	DW
Cation/Anion Balance	7.30	----	%	---------	----------	-----	--

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

Manager, Huntington Laboratory

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FAX: (801) 653-2436

February 28, 1994

CO-OP MINE
P.O. Box 1245
Huntington UT 84528

Sample identification by
CO-OP MINE

DH-4

Kind of sample reported to us Water

Rec'd 1310 hr.
Sampled No Sample Time or Date Given

Sample taken at Co-op

Sample taken by Co-op

Date sampled ------

Date received February 16, 1994

Analysis report no. 59-13903

Parameter	Result	MDL	Units	Method	Analyzed Date/Time/Analyst		
lkalinity, Bicarbonate	345	1	mg/l as HCO_3	SM4500-CO_2-D	02-21-1994	1330	LS
alkalinity, Carbonate	<1	1	mg/l as CO_3	SM4500-CO_2-D	02-21-1994	1330	LS
Alkalinity, Total	283	1	mg/l as $CaCO_3$	EPA 310.1	02-21-1994	1330	LS
Aluminum, Dissolved	<2	2	mg/l	EPA 202.1	02-22-1994	1400	DW
Anions	6.40	----	meq/l	---------	----------	-----	--
Arsenic, Total	<0.01	0.01	mg/l	EPA 206.2	02-24-1994	1630	DW
Boron, Dissolved	0.1	0.1	mg/l	EPA 212.3	02-23-1994	1600	LM
Cadmium, Dissolved	<0.02	0.02	mg/l	EPA 213.1	02-22-1994	1630	DW
Calcium, Dissolved	73	1	mg/l	EPA 215.1	02-22-1994	1000	DW
Cations	6.40	----	meq/l	---------	----------	-----	--
Chloride	3	1	mg/l	SM4500-Cl-B	02-21-1994	1430	LS
Conductivity	555	1	umhos/cm	SM2510-B	02-24-1994	0940	ED
Copper, Dissolved	<0.2	0.2	mg/l	EPA 220.1	02-23-1994	0730	DW
Hardness, Total	314	1	mg/l as $CaCO_3$	SM2340-B	02-22-1994	1000	DW
Iron, Total	0.4	0.2	mg/l	EPA 236.1	02-17-1994	1430	DW
Iron, Dissolved	<0.2	0.2	mg/l	EPA 236.1	02-21-1994	1630	DW
Lead, Dissolved	<0.2	0.2	mg/l	EPA 239.1	02-23-1994	0900	DW
Magnesium, Dissolved	32	1	mg/l	EPA 242.1	02-22-1994	1130	DW
Manganese, Total	<0.1	0.1	mg/l	EPA 243.1	02-17-1994	1500	DW
Manganese, Dissolved	<0.1	0.1	mg/l	EPA 243.1	02-22-1994	0730	DW
Molybdenum, Dissolved	<0.2	0.2	mg/l	EPA 246.1	02-22-1994	1430	DW
Nitrogen, Ammonia	<0.4	0.4	mg/l	EPA 350.3	02-18-1994	0945	ED
Nitrogen, Nitrate-Nitrite	0.3	0.1	mg/l	EPA 353.3	02-16-1994	1330	LM
Nitrogen, Nitrite	<0.01	0.01	mg/l	EPA 354.1	02-16-1994	1510	LM

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

Manager, Huntington Laboratory

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FAX: (801) 653-2436

February 28, 1994

CO-OP MINE
P.O. Box 1245
Huntington UT 84528

Sample identification by
CO-OP MINE

DH-4

Rec'd 1310 hr.
Sampled No Sample Time or Date Given

Kind of sample reported to us Water

Sample taken at Co-op

Sample taken by Co-op

Date sampled ------

Date received February 16, 1994

Analysis report no. 59-13903

Parameter	Result	MDL	Units	Method	Analyzed Date/Time/Analyst
Phosphorous, Ortho-PO_4	<0.02	0.02	mg/l	SM4500-P-E	02-17-1994 1130 LM
Potassium, Dissolved	2	2	mg/l	EPA 258.1	02-21-1994 1700 DW
Selenium, Total	<0.01	0.01	mg/l	EPA 270.2	02-24-1994 1300 DW
Sodium, Dissolved	4	1	mg/l	EPA 273.1	02-22-1994 0800 DW
Solids, Total Dissolved	342	10	mg/l	EPA 160.1	02-17-1994 0830 LM
Sulfate	30	1	mg/l	EPA 375.4	02-21-1994 1045 LS
Zinc, Dissolved	<0.03	0.03	mg/l	EPA 289.1	02-22-1994 1600 DW
Cation/Anion Balance	0.60	----	%		

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

Larry Stout

Manager, Huntington Laboratory

COMMERCIAL TESTING & ENGINEERING CO.

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PLEASE ADDRESS ALL CORRESPONDENCE TO:
P.O. BOX 1020, HUNTINGTON, UT 84528
TEL: (801) 653-2311
FAX: (801) 653-2436

June 14, 1994

CO-OP MINE
P.O. Box 1245
Huntington UT 84528

Sample identification by
CO-OP MINE

DH-4

Rec'd 1250 hr.
Sampled 1356 hr.

Kind of sample reported to us Water

Sample taken at Co-op

Sample taken by Co-op

Date sampled May 31, 1994

Date received June 1, 1994

Analysis report no. 59-14103

Parameter	Result	MDL	Units	Method	Analyzed Date/Time/Analyst
Alkalinity, Bicarbonate	395	1	mg/l as HCO_3	SM2320-B	06-06-1994 1055 LS
Alkalinity, Carbonate	<1	1	mg/l as CO_3	SM2320-B	06-06-1994 1055 LS
Alkalinity, Total	324	1	mg/l as $CaCO_3$	EPA 310.1	06-06-1994 1055 LS
Aluminum, Dissolved	<2	2	mg/l	EPA 202.1	06-07-1994 1000 DW
Anions	7.20	----	meq/l	---------	---------- ----- --
Arsenic, Dissolved	<0.01	0.01	mg/l	EPA 206.2	06-08-1994 1130 DW
Boron, Dissolved	0.4	0.1	mg/l	EPA 212.3	06-09-1994 1130 LM
Cadmium, Dissolved	<0.02	0.02	mg/l	EPA 213.1	06-07-1994 0900 DW
Calcium, Dissolved	68	1	mg/l	EPA 215.1	06-06-1994 1400 DW
Cations	6.00	----	meq/l	---------	---------- ----- --
Chloride	3	1	mg/l	SM4500-Cl-B	06-01-1994 1220 LS
Conductivity	593	1	umhos/cm	SM2510-B	06-02-1994 1500 ED
Copper, Dissolved	<0.2	0.2	mg/l	EPA 220.1	06-07-1994 0730 DW
Hardness, Total	293	1	mg/l as $CaCO_3$	SM2340-B	06-06-1994 1400 DW
Iron, Total	<0.2	0.2	mg/l	EPA 236.1	06-09-1994 1015 DW
Iron, Dissolved	<0.2	0.2	mg/l	EPA 236.1	06-06-1994 0830 DW
Lead, Dissolved	<0.2	0.2	mg/l	EPA 239.1	06-06-1994 1700 DW
Magnesium, Dissolved	30	1	mg/l	EPA 242.1	06-06-1994 1500 DW
Manganese, Total	<0.1	0.1	mg/l	EPA 243.1	06-09-1994 1100 DW
Manganese, Dissolved	<0.1	0.1	mg/l	EPA 243.1	06-06-1994 0715 DW
Molybdenum, Dissolved	<0.2	0.2	mg/l	EPA 246.1	06-07-1994 1100 DW
Nitrogen, Ammonia	<0.4	0.4	mg/l	EPA 350.3	06-01-1994 1330 ED
Nitrogen, Nitrate-Nitrite	<0.1	0.1	mg/l	EPA 353.3	06-07-1994 1600 LM
Nitrogen, Nitrite	<0.01	0.01	mg/l	EPA 354.1	06-02-1994 1005 LM

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

Larry Stout D

Manager, Huntington Laboratory

OVER 40 BRANCH LABORATORIES STRATEGICALLY LOCATED IN PRINCIPAL COAL MINING AREAS, TIDEWATER AND GREAT LAKES PORTS, AND RIVER LOADING FACILITIE

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TEL: (801) 653-2311
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June 14, 1994

CO-OP MINE
P.O. Box 1245
Huntington UT 84528

Sample identification by
CO-OP MINE

DH-4

Rec'd 1250 hr.
Sampled 1356 hr.

Kind of sample reported to us Water

Sample taken at Co-op

Sample taken by Co-op

Date sampled May 31, 1994

Date received June 1, 1994

Analysis report no. 59-14103

Parameter	Result	MDL	Units	Method	Analyzed Date/Time/Analyst	
Phosphorous, Ortho-PO_4	<0.02	0.02	mg/l	SM4500-P-E	06-01-1994 1345	LM
Potassium, Dissolved	<2	2	mg/l	EPA 258.1	06-06-1994 1115	DW
Selenium, Dissolved	<0.01	0.01	mg/l	EPA 270.2	06-08-1994 0800	DW
Sodium, Dissolved	3	1	mg/l	EPA 273.1	06-06-1994 1230	DW
Solids, Total Dissolved	350	10	mg/l	EPA 160.1	06-03-1994 0800	LM
Sulfate	30	1	mg/l	EPA 375.4	06-08-1994 1330	LS
Zinc, Dissolved	0.03	0.03	mg/l	EPA 289.1	06-07-1994 0830	DW
Cation/Anion Balance	9.10	----	%			

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

Larry Hart SD

Manager, Huntington Laboratory

COMMERCIAL TESTING & ENGINEERING CO.
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TEL: (801) 653-2311
FAX: (801) 653-2436

September 15, 1994

CO-OP MINE
P.O. Box 1245
Huntington UT 84528

Sample identification by
CO-OP MINE

DH-4

Kind of sample reported to us Water

Rec'd 1230 hr.
Sampled 1105 hr.

Sample taken at Co-op

Sample taken by Co-op

NOTE: Dissolved metals filtered at Lab.

Date sampled August 31, 1994

Date received August 31, 1994

Analysis report no. 59-14375

Parameter	Result	MDL	Units	Method	Analyzed Date/Time/Analyst	
Alkalinity, Bicarbonate	361	1	mg/l as HCO_3	SM2320-B	09-01-1994 0830	LS
Alkalinity, Carbonate	<1	1	mg/l as CO_3	SM2320-B	09-01-1994 0830	LS
Alkalinity, Total	296	1	mg/l as $CaCO_3$	EPA 310.1	09-01-1994 0830	LS
Aluminum, Dissolved	<2	2	mg/l	EPA 202.1	09-08-1994 1530	DW
Anions	6.60	----	meq/l	---------	---------- -----	--
Arsenic, Dissolved	<0.01	0.01	mg/l	EPA 206.2	09-02-1994 1100	ED
Boron, Dissolved	0.1	0.1	mg/l	EPA 212.3	09-14-1994 1300	LM
Cadmium, Dissolved	<0.02	0.02	mg/l	EPA 213.1	09-08-1994 1200	DW
Calcium, Dissolved	73	5	mg/l	EPA 215.1	09-09-1994 0930	DW
Cations	6.30	----	meq/l	---------	---------- -----	--
Chloride	5	1	mg/l	SM4500-Cl-B	09-06-1994 1200	LS
Conductivity	565	1	umhos/cm	SM2510-B	09-07-1994 1015	ED
Copper, Dissolved	<0.2	0.2	mg/l	EPA 220.1	09-08-1994 1200	DW
Hardness, Total	314	10	mg/l as $CaCO_3$	SM2340-B	09-09-1994 0930	DW
Iron, Total	<0.2	0.2	mg/l	EPA 236.1	09-13-1994 1030	DW
Iron, Dissolved	<0.2	0.2	mg/l	EPA 236.1	09-09-1994 1430	DW
Lead, Dissolved	<0.2	0.2	mg/l	EPA 239.1	09-08-1994 1100	DW
Magnesium, Dissolved	32	2	mg/l	EPA 242.1	09-09-1994 1030	DW
Manganese, Total	<0.2	0.2	mg/l	EPA 243.1	09-13-1994 1000	DW
Manganese, Dissolved	<0.2	0.2	mg/l	EPA 243.1	09-09-1994 1330	DW
Molybdenum, Dissolved	<0.2	0.2	mg/l	EPA 246.1	09-09-1994 1800	DW
Nitrogen, Ammonia	<0.4	0.4	mg/l	EPA 350.3	09-08-1994 0930	ED
Nitrogen, Nitrate-Nitrite	<0.1	0.1	mg/l	EPA 353.3	09-08-1994 1030	LM
Nitrogen, Nitrite	<0.01	0.01	mg/l	EPA 354.1	09-01-1994 1100	LM

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

Larry Stout

Manager, Huntington Laboratory

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TEL: (801) 653-2311
FAX: (801) 653-2436

September 15, 1994

CO-OP MINE
P.O. Box 1245
Huntington UT 84528

Sample identification by
CO-OP MINE

DH-4

Kind of sample reported to us Water

Rec'd 1230 hr.
Sampled 1105 hr.

Sample taken at Co-op

Sample taken by Co-op

NOTE: Dissolved metals filtered at Lab.

Date sampled August 31, 1994

Date received August 31, 1994

Analysis report no. 59-14375

Parameter	Result	MDL	Units	Method	Analyzed Date/Time/Analyst
Phosphorous, Ortho-PO_4	<0.02	0.02	mg/l	SM4500-P-E	09-01-1994 1030 LM
Potassium, Dissolved	<5	5	mg/l	EPA 258.1	09-09-1994 1300 DW
Selenium, Dissolved	<0.01	0.01	mg/l	EPA 270.2	09-06-1994 1030 ED
Sodium, Dissolved	<5	5	mg/l	EPA 273.1	09-09-1994 1230 DW
Solids, Total Dissolved	400	10	mg/l	EPA 160.1	09-02-1994 1500 LM
Sulfate	26	1	mg/l	EPA 375.4	09-08-1994 1030 LS
Zinc, Dissolved	<0.03	0.03	mg/l	EPA 289.1	09-08-1994 1330 DW
Cation/Anion Balance	-2.50	----	%		

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

Larry Stout CD

Manager, Huntington Laboratory

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November 10, 1994

CO-OP MINE
P.O. Box 1245
Huntington UT 84528

Sample identification by
CO-OP MINE

DH-4

Kind of sample reported to us Water

Rec'd 1630 hr.
Sampled 1118 hr.

Sample taken at Co-op

NOTE: Dissolved metals filtered at Lab.

Sample taken by Co-op

Date sampled October 27, 1994

Date received October 27, 1994

Analysis report no. 59-14521

Parameter	Result	MDL	Units	Method	Analyzed Date/Time/Analyst		
Alkalinity, Bicarbonate	354	1	mg/l as HCO_3	SM2320-B	10-31-1994	0810	LS
Alkalinity, Carbonate	<1	1	mg/l as CO_3	SM2320-B	10-31-1994	0810	LS
Alkalinity, Total	290	1	mg/l as $CaCO_3$	EPA 310.1	10-31-1994	0810	LS
Aluminum, Dissolved	<2	2	mg/l	EPA 202.1	11-02-1994	1600	DW
Anions	6.60	----	meq/l	---------	----------	-----	--
Arsenic, Dissolved	<0.01	0.01	mg/l	EPA 206.2	10-31-1994	1530	DW
Boron, Dissolved	0.1	0.1	mg/l	EPA 212.3	11-03-1994	1330	LM
Cadmium, Dissolved	<0.02	0.02	mg/l	EPA 213.1	11-02-1994	1730	DW
Calcium, Dissolved	70	5	mg/l	EPA 215.1	11-01-1994	1500	DW
Cations	6.30	----	meq/l	---------	----------	-----	--
Chloride	7	1	mg/l	SM4500-Cl-B	10-31-1994	0800	LS
Conductivity	591	1	umhos/cm	SM2510-B	11-01-1994	0930	ED
Copper, Dissolved	<0.2	0.2	mg/l	EPA 220.1	11-03-1994	1230	DW
Hardness, Total	302	10	mg/l as $CaCO_3$	SM2340-B	11-01-1994	1500	DW
Iron, Total	0.2	0.2	mg/l	EPA 236.1	11-02-1994	1200	DW
Iron, Dissolved	<0.2	0.2	mg/l	EPA 236.1	11-02-1994	1200	DW
Lead, Dissolved	<0.2	0.2	mg/l	EPA 239.1	11-02-1994	1700	DW
Magnesium, Dissolved	31	2	mg/l	EPA 242.1	11-02-1994	0730	DW
Manganese, Total	<0.2	0.2	mg/l	EPA 243.1	11-02-1994	1100	DW
Manganese, Dissolved	<0.2	0.2	mg/l	EPA 243.1	11-02-1994	1100	DW
Molybdenum, Dissolved	<0.2	0.2	mg/l	EPA 246.1	10-31-1994	1730	DW
Nitrogen, Ammonia	<0.4	0.4	mg/l	EPA 350.3	11-04-1994	0915	ED
Nitrogen, Nitrate-Nitrite	<0.1	0.1	mg/l	EPA 353.3	11-02-1994	0930	LM
Nitrogen, Nitrite	<0.01	0.01	mg/l	EPA 354.1	10-28-1994	0730	LM

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

Manager, Huntington Laboratory

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November 10, 1994

CO-OP MINE
P.O. Box 1245
Huntington UT 84528

Sample identification by
CO-OP MINE

DH-4

Kind of sample reported to us Water

Rec'd 1630 hr.
Sampled 1118 hr.

Sample taken at Co-op

NOTE: Dissolved metals filtered at Lab.

Sample taken by Co-op

Date sampled October 27, 1994

Date received October 27, 1994

Analysis report no. 59-14521

Parameter	Result	MDL	Units	Method	Analyzed Date/Time/Analyst
Phosphorous, Ortho-PO_4	<0.02	0.02	mg/l	SM4500-P-E	10-28-1994 0930 LM
Potassium, Dissolved	<5	5	mg/l	EPA 258.1	11-02-1994 0900 DW
Selenium, Dissolved	<0.01	0.01	mg/l	EPA 270.2	10-31-1994 1400 DW
Sodium, Dissolved	6	5	mg/l	EPA 273.1	11-02-1994 0930 DW
Solids, Total Dissolved	350	10	mg/l	EPA 160.1	11-01-1994 0830 LS
Sulfate	28	1	mg/l	EPA 375.4	11-02-1994 1000 LS
Zinc, Dissolved	<0.03	0.03	mg/l	EPA 289.1	11-03-1994 1300 DW
Cation/Anion Balance	-2.10	----	%		

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

Manager, Huntington Laboratory

State of Utah
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF WILDLIFE RESOURCES

1596 West North Temple
Salt Lake City, Utah 84116-3195

an equal opportunity employer

We are also concerned about the **effects of subsidence on wildlife.** Generally speaking, impacts of subsidence lie in two general areas: hydrologic ecosystems and terrestrial ecosystems. The following is offered for your information.

Subsidence can result in drying up of impounded water bodies or modification to flows at seeps, springs, perennial or even intermittent channels. This can result from the capture in subsidence cracks of water and its resultant migration into other geological strata. Some strata may not allow water to discharge to the surface. Such an impact can have serious consequence to a local area's wildlife in that drinking water may become reduced in value or unavailable to terrestrial animals.

Seep or springs providing flow during periods when wildlife are present represent a critical valued resource to all of the local area's wildlife. Most wildlife have small and limited home ranges. As a result, when one of these critical valued aquatic resources is lost, the animal does not have the physical capability of "packing his bag" and moving to another area of acceptable habitat. Those few species that have such a physical capability usually find the home ranges in adjoining areas already filled to capacity. It is for that reason that the Division holds firm to the philosophy that each and every seep and spring is critical resource for wildlife.

In the event that coal mining results in subsidence that impacts the flows at seeps and springs, mitigation is anticipated. An impact would be deemed substantial if the daily flow from a seep or spring was reduced by 50% or more. Mitigation that would be expected is simply the replacement of the water. Unquestionably, there would be many techniques that could achieve this goal: guzzlers are considered to be the most effective technique. They should be fenced with a 3-rail/pole fence having a maximum height of 42 inches. Clearance between the ground and the bottom pole, as well as space between the top two poles, should be at least 14 inches. This will allow passage of wildlife while disallowing domestic livestock.

Aquatic life, particularly hydrophytes, invertebrates, mollusks and fishes could suffer due to reduced or lost flows. It is even possible that subsidence fractures could expose undesirable mineral deposits to aquatic systems. If such situations were to occur, aquatic and terrestrial animals would either perish or be forced to reduce the size of their use areas. Ultimately, the carrying capacity of the area for wildlife would be reduced.

Increased flows resulting from subsidence that may appear as a benefit could, in actuality, mean that some other aquatic system has lost flows. But benefits are possible if subsidence cracks access an isolated hydrologic basin.

Reduced or lost flows in surface water systems and ground water systems can negatively impact terrestrial habitats. Mesic habitats (riparian, wetland and aspen types) associated with those systems could be degraded by the reduction or loss of water. In all ecological situations (desert, submontane and montane) riparian or wetland ecosystems due to their high level of biological productivity, limited acreage and intense use by wildlife, represent a critical valued habitat. Similar comments can be made for the aspen habitat in the montane ecological situation.

Beyond problems associated with aquatic systems, subsidence impacts to terrestrial wildlife and habitat are primarily associated with surface movement of the earth. However, methane gas has been known to travel along subsidence fractures to the surface. The escaping gas affects rhizobium in the soil and can kill adjacent rhizobium dependent vegetation.

The surface cracks alone have little impact on wildlife. It is possible that individual animals could perish in some of these holes or cracks. It has even been suggested that the movement in the earth could collapse the burrows of small rodents, thus trapping and killing them. At this point in time, I doubt whether that is a valid concern in that small rodents are extremely abundant. Since subsidence occurs over such small and limited areas, impacts to rodents would not be of consequence.

Most rodents probably have trouble with their burrows caving at times anyway. Thus they are adapted to digging around such cave-ins. It is likely that cracks and surface displacement created by subsidence represent escape cover for small animals, and to some degree, access points for burrowing animals.

Subsidence has caused escarpment failures. When raptor nests exist in the escarpments, such failures would be of negative consequence, since raptors typically return to reuse their nests over the years. Where escarpment failure occurs and there are not raptor nests, such failure could create suitable raptor nesting habitat.

Many surface displacement lines from subsidence in Utah's coal mining areas are utilized extensively by big game as travel corridors. These fracture lines, once they become filled in, represent a flat trail on which the animals can easily walk around the contours of a mountain or across ridge tops.