



## Ground Loop Design Borehole Design Project Report - 4/3/2015

<b>Project Name:</b> Geothermal Design	
<b>Designer Name:</b> Designer	
<b>Date:</b> 4/3/2015	<b>Project Start Date:</b> 4/3/2015
<b>Client Name:</b> Test Design	
<b>Address Line 1:</b>	
<b>Address Line 2:</b>	
<b>City:</b> Metropolis	<b>Phone:</b>
<b>State:</b> CA	<b>Fax:</b>
<b>Zip:</b> 12345	<b>Email:</b>

### Calculation Results

Design Method:	<i>Monthly</i>	COOLING	HEATING
Total Length (ft):		12600.0	12600.0
Borehole Number:		42	42
Borehole Length (ft):		300.0	300.0
Ground Temperature Change (°F):		N/A	N/A
Peak Unit Inlet (°F):		86.7	31.1
Peak Unit Outlet (°F):		95.4	26.1
Total Unit Capacity (kBtu/Hr):		344.7	378.8
Peak Load (kBtu/Hr):		344.7	378.8
Peak Demand (kW):		24.5	26.3
Heat Pump EER/COP:		14.0	4.4
Seasonal Heat Pump EER/COP:		17.6	4.2
Avg. Annual Power (kWh):		3.75E+4	3.42E+4
System Flow Rate (gpm):		86.2	94.7

### Input Parameters

Fluid		Soil	
Flow Rate	3.0 gpm/ton	Ground Temperature:	43.8 °F
Fluid:	24.1413995673348% Propylene Glycol	Thermal Conductivity:	0.58 Btu/(h*ft**°F)
Specific Heat (Cp):	0.96 Btu/(°F*lbm)	Thermal Diffusivity:	0.38 ft^2/day
Density (rho):	64.0 lb/ft^3		
Piping			
Pipe Type:		1 1/4 in. (32 mm)	
Flow Type:		Turbulent - SDR11	
Pipe Resistance:		0.105 h*ft**°F/Btu	
U-Tube Configuration:		Single	
Radial Pipe Placement:		Average	
Borehole Diameter:		5.00 in	
Grout Thermal Conductivity:		0.85 Btu/(h*ft**°F)	
Borehole Thermal Resistance:		0.236 h*ft**°F/Btu	

### Input Parameters (Cont.)

Pattern		Modeling Time Period	
Vertical Grid Arrangement:	6 x 7	Prediction Time:	20.0 years
Borehole Number:	42	Long Term Soil Temperatures:	
Borehole Separation:	20.0 ft	<i>Cooling:</i>	43.8 °F
Bores Per Circuit	1	<i>Heating:</i>	43.8 °F
Fixed Length Mode	On		
Grid File	None		
File:			
Default Heat Pumps		Optional Hybrid Loads	
Manufacturer:	WaterFurnace	Cooling	Heating
Series:	Envision Com. ND Vert. (Full)	Geo Peak (%)	100% 100%
Design Heat Pump Inlet Load Temperatures:		Geo Total (%)	100% 100%
	<i>Cooling (WB)      Heating (DB)</i>	Hybrid Peak (%)	0 % 0 %
Water to Air:	67 °F      70 °F	Hybrid Total (%)	0 % 0 %
Water to Water:	55 °F      100 °F		
Extra kW		Loads File	
Pump Power	0.0 kW	<i>Report Example.zon</i>	
Cooling Tower Pump:	0.0 kW		
Cooling Tower Fan:	0.0 kW		
Additional Power	0.0 kW		
Loads			
Design Day Loads			
<i>Time of Day</i>	<i>Heat Gains (kBtu/Hr)</i>	<i>Heat Losses (kBtu/Hr)</i>	Annual Equivalent Full-Load Hours <i>COOLING</i> 1908 <i>HEATING</i> 1220
8 a.m. - Noon	254.8	378.8	
Noon - 4 p.m.	337.5	237.7	
4 p.m. - 8 p.m.	344.7	212.8	
8 p.m. - 8 a.m.	275.1	345.3	Days Occupied per Week: 7.0
Monthly Loads on Next Page			

	Cooling				Heating			
	Total	(kBtu)	Peak	(kBtu/hr)	Total	(kBtu)	Peak	(kBtu/hr)
January	576		34		122743		399	
February	2215		81		82873		352	
March	13404		123		51188		272	
April	24062		138		25205		235	
May	73990		260		9659		148	
June	119183		337		4090		110	
July	161268		345		815		37	
August	127950		292		1665		77	
September	91947		335		9451		141	
October	32529		222		27158		207	
November	8355		139		56812		283	
December	2269		59		94694		321	
<b>Total</b>	<b>657747</b>				<b>486352</b>			
<b>Hours at Peak</b>			<b>3.0</b>				<b>3.0</b>	

Monthly Inlet Temperature Results			
	Temp. (°F)	Month	
Average Temperature			
Maximum Average Temperature	80.1	236	
Minimum Average Temperature	34.2	2	
Peak Temperature			
Maximum Peak Temperature	86.7	236	
Minimum Peak Temperature	31.1	14	

**Key**

**Heat Extraction Rate From (+) or To (-) Borehole**

**Total Pump Power**

Time (Months)	Q (Btu/hr*ft)	Power (kW-hr)	TBorehole (°F)	Tf (°F)	ExWT (°F)	EWT (°F)	MinEWT (°F)	MaxEWT (°F)
1	9.76	8976.77	43.80	43.80	43.80	43.80	43.80	43.80
2	6.18	6666.20	35.21	32.91	31.59	34.22	34.22	34.22
3	2.37	4560.43	37.43	35.98	35.14	36.81	32.14	37.44
4	-0.97	2997.95	40.58	40.02	39.70	40.34	36.18	41.85
5	-8.39	4205.09	43.70	43.93	44.06	43.79	40.55	46.08
6	-14.57	6297.13	50.60	52.58	53.71	51.45	48.60	54.03
7	-20.29	8724.79	56.94	60.38	62.35	58.42	56.60	63.32
8	-16.72	7451.10	63.11	67.90	70.64	65.16	63.79	71.57
9	-11.26	5772.38	61.24	65.19	67.45	62.94	62.47	69.56
10	-1.92	3541.96	56.96	59.62	61.14	58.10	57.13	63.70

11	3.69	4401.52	48.69	49.14	49.40	48.88	47.13	55.25
12	7.28	7077.64	42.96	42.09	41.59	42.58	40.05	46.75
13	9.61	9409.19	38.86	37.14	36.16	38.12	34.71	40.72
14	6.19	6620.86	35.92	33.65	32.36	34.95	31.14	36.05
15	2.38	4538.90	38.12	36.66	35.83	37.50	32.81	38.13
16	-0.97	2993.17	41.25	40.69	40.37	41.01	36.84	42.52
17	-8.40	4219.60	44.33	44.56	44.69	44.42	41.17	46.72
18	-14.58	6327.36	51.19	53.17	54.30	52.04	49.19	54.62
19	-20.31	8769.91	57.49	60.94	62.90	58.97	57.15	63.88
20	-16.74	7489.26	63.63	68.42	71.16	65.68	64.31	72.09
21	-11.27	5795.48	61.73	65.68	67.94	63.42	62.95	70.05
22	-1.93	3544.68	57.41	60.07	61.60	58.55	57.58	64.15
23	3.69	4391.48	49.10	49.56	49.82	49.30	47.54	55.67
24	7.29	7056.59	43.34	42.47	41.97	42.97	40.43	47.14
25	9.62	9379.66	39.22	37.50	36.51	38.48	35.07	41.08
26	6.20	6600.42	36.26	33.99	32.69	35.29	31.46	36.39
27	2.38	4533.11	38.31	36.85	36.01	37.69	32.99	38.32
28	-0.97	2994.05	41.13	40.56	40.24	40.88	36.71	42.39
29	-8.40	4212.71	44.03	44.26	44.39	44.13	40.87	46.42
30	-14.57	6310.19	50.85	52.84	53.97	51.70	48.86	54.29
31	-20.30	8753.99	57.30	60.74	62.71	58.77	56.96	63.68
32	-16.74	7503.94	63.82	68.62	71.36	65.88	64.51	72.29
33	-11.29	5834.57	62.53	66.49	68.75	64.23	63.76	70.86
34	-1.93	3554.49	58.89	61.55	63.08	60.03	59.06	65.64
35	3.71	4346.02	51.05	51.51	51.77	51.25	49.49	57.64
36	7.33	6943.28	45.49	44.61	44.11	45.11	42.57	49.30
37	9.68	9217.34	41.26	39.53	38.54	40.52	37.09	43.12
38	6.24	6496.09	38.03	35.74	34.44	37.05	33.21	38.16
39	2.40	4486.85	39.87	38.40	37.56	39.24	34.52	39.87
40	-0.96	2984.10	42.66	42.09	41.77	42.41	38.22	43.93
41	-8.41	4247.94	45.52	45.75	45.88	45.62	42.35	47.92
42	-14.60	6386.50	52.32	54.31	55.44	53.17	50.32	55.76
43	-20.35	8873.70	58.74	62.19	64.16	60.22	58.39	65.13
44	-16.78	7608.71	65.22	70.02	72.77	67.28	65.90	73.70
45	-11.31	5900.53	63.86	67.82	70.09	65.56	65.09	72.21
46	-1.93	3563.95	60.16	62.83	64.36	61.30	60.33	66.92
47	3.72	4319.16	52.27	52.73	52.99	52.47	50.70	58.87
48	7.35	6883.11	46.69	45.81	45.31	46.31	43.76	50.50
49	9.71	9126.09	42.47	40.73	39.74	41.73	38.28	44.33

50	6.26	6426.60	39.27	36.97	35.66	38.28	34.43	39.39
51	2.41	4450.90	41.15	39.67	38.83	40.52	35.78	41.15
52	-0.96	2976.75	43.96	43.40	43.07	43.72	39.51	45.24
53	-8.42	4279.99	46.83	47.06	47.19	46.93	43.65	49.23
54	-14.63	6455.07	53.60	55.59	56.73	54.46	51.59	57.05
55	-20.38	8979.70	59.98	63.44	65.41	61.46	59.64	66.39
56	-16.82	7703.38	66.44	71.26	74.01	68.50	67.12	74.94
57	-11.34	5961.88	65.06	69.03	71.30	66.76	66.29	73.43
58	-1.94	3573.47	61.33	64.00	65.53	62.47	61.50	68.11
59	3.73	4295.31	53.40	53.86	54.12	53.60	51.83	60.01
60	7.37	6830.06	47.78	46.90	46.40	47.41	44.85	51.60
61	9.74	9048.53	43.53	41.79	40.80	42.79	39.34	45.40
62	6.29	6370.75	40.30	38.00	36.69	39.31	35.45	40.42
63	2.42	4423.65	42.17	40.68	39.84	41.53	36.78	42.17
64	-0.96	2971.81	44.97	44.40	44.07	44.72	40.50	46.24
65	-8.43	4305.18	47.82	48.05	48.18	47.92	44.63	50.22
66	-14.65	6509.00	54.59	56.58	57.72	55.44	52.57	58.03
67	-20.42	9064.94	60.96	64.42	66.40	62.44	60.61	67.38
68	-16.85	7780.41	67.42	72.24	74.99	69.48	68.10	75.93
69	-11.35	6012.18	66.02	70.00	72.28	67.73	67.26	74.41
70	-1.94	3581.71	62.27	64.95	66.48	63.42	62.44	69.06
71	3.73	4276.49	54.33	54.79	55.05	54.52	52.75	60.94
72	7.39	6786.19	48.72	47.83	47.33	48.34	45.78	52.54
73	9.76	8982.79	44.46	42.72	41.72	43.71	40.26	46.33
74	6.30	6323.02	41.21	38.90	37.59	40.22	36.34	41.33
75	2.43	4400.76	43.05	41.57	40.72	42.42	37.65	43.05
76	-0.96	2968.14	45.81	45.23	44.91	45.56	41.33	47.08
77	-8.44	4325.26	48.59	48.82	48.95	48.69	45.40	50.99
78	-14.66	6547.80	55.28	57.28	58.42	56.14	53.26	58.73
79	-20.44	9121.34	61.60	65.06	67.04	63.08	61.25	68.02
80	-16.86	7828.95	68.02	72.85	75.61	70.09	68.71	76.54
81	-11.37	6043.93	66.62	70.60	72.88	68.33	67.85	75.01
82	-1.94	3587.27	62.87	65.55	67.09	64.02	63.04	69.67
83	3.74	4264.47	54.93	55.39	55.65	55.13	53.36	61.56
84	7.40	6758.96	49.31	48.43	47.92	48.93	46.37	53.14
85	9.78	8942.71	45.04	43.29	42.29	44.29	40.83	46.91
86	6.31	6294.01	41.77	39.47	38.15	40.78	36.90	41.89
87	2.43	4386.70	43.61	42.12	41.27	42.97	38.20	43.61
88	-0.96	2965.93	46.36	45.79	45.46	46.12	41.88	47.64

89	-8.44	4339.91	49.15	49.37	49.50	49.24	45.94	51.55
90	-14.67	6578.89	55.84	57.83	58.97	56.69	53.81	59.29
91	-20.45	9170.60	62.15	65.62	67.60	63.64	61.80	68.58
92	-16.88	7873.68	68.57	73.40	76.16	70.64	69.26	77.10
93	-11.38	6073.35	67.17	71.15	73.43	68.88	68.40	75.57
94	-1.94	3592.39	63.41	66.09	67.63	64.56	63.58	70.21
95	3.74	4254.31	55.46	55.92	56.18	55.65	53.88	62.09
96	7.41	6735.79	49.82	48.94	48.43	49.44	46.88	53.65
97	9.79	8908.52	45.54	43.79	42.79	44.79	41.33	47.41
98	6.32	6269.24	42.27	39.95	38.63	41.27	37.39	42.38
99	2.44	4374.72	44.10	42.61	41.75	43.46	38.68	44.10
100	-0.96	2964.16	46.85	46.27	45.94	46.60	42.36	48.12
101	-8.45	4352.87	49.63	49.85	49.98	49.73	46.42	52.03
102	-14.68	6606.35	56.32	58.31	59.45	57.17	54.29	59.77
103	-20.47	9214.16	62.63	66.10	68.08	64.12	62.28	69.06
104	-16.90	7913.30	69.06	73.89	76.65	71.13	69.74	77.59
105	-11.39	6099.46	67.65	71.64	73.92	69.36	68.88	76.05
106	-1.94	3597.03	63.88	66.57	68.10	65.03	64.05	70.69
107	3.74	4245.54	55.92	56.38	56.64	56.11	54.34	62.55
108	7.42	6715.66	50.27	49.39	48.88	49.89	47.32	54.10
109	9.80	8878.78	45.98	44.23	43.23	45.23	41.76	47.85
110	6.33	6247.66	42.70	40.38	39.06	41.71	37.81	42.82
111	2.44	4364.32	44.53	43.04	42.18	43.89	39.10	44.53
112	-0.96	2962.69	47.28	46.70	46.37	47.03	42.78	48.55
113	-8.45	4364.51	50.06	50.28	50.41	50.15	46.85	52.46
114	-14.69	6630.98	56.75	58.74	59.88	57.60	54.71	60.20
115	-20.48	9253.23	63.06	66.53	68.51	64.55	62.71	69.49
116	-16.91	7947.31	69.47	74.30	77.07	71.54	70.15	78.01
117	-11.39	6112.75	67.89	71.88	74.16	69.60	69.12	76.30
118	-1.95	3598.35	64.01	66.70	68.24	65.16	64.18	70.82
119	3.75	4243.82	56.01	56.47	56.73	56.21	54.43	62.65
120	7.42	6710.32	50.39	49.51	49.00	50.01	47.44	54.23
121	9.81	8860.22	46.26	44.51	43.51	45.51	42.04	48.13
122	6.34	6221.13	43.24	40.92	39.60	42.25	38.35	43.36
123	2.45	4343.49	45.42	43.92	43.06	44.77	39.98	45.41
124	-0.96	2959.24	48.44	47.86	47.53	48.19	43.93	49.72
125	-8.46	4401.83	51.40	51.62	51.75	51.49	48.18	53.80
126	-14.72	6710.88	58.11	60.11	61.25	58.97	56.07	61.57
127	-20.53	9373.31	64.36	67.83	69.82	65.85	64.00	70.80

128	-16.95	8046.98	70.65	75.50	78.27	72.73	71.34	79.21
129	-11.42	6178.35	69.06	73.07	75.35	70.78	70.30	77.49
130	-1.95	3610.37	65.17	67.86	69.40	66.32	65.34	71.99
131	3.75	4222.95	57.14	57.60	57.86	57.34	55.56	63.79
132	7.43	6662.12	51.50	50.61	50.11	51.12	48.55	55.34
133	9.83	8789.15	47.35	45.60	44.59	46.60	43.12	49.22
134	6.36	6169.92	44.31	41.99	40.66	43.32	39.41	44.43
135	2.46	4319.35	46.48	44.98	44.12	45.84	41.03	46.48
136	-0.95	2956.74	49.51	48.93	48.60	49.26	44.99	50.78
137	-8.48	4432.47	52.46	52.69	52.81	52.56	49.23	54.87
138	-14.74	6774.99	59.18	61.18	62.32	60.03	57.13	62.64
139	-20.56	9474.96	65.43	68.91	70.90	66.92	65.07	71.88
140	-16.98	8139.63	71.73	76.59	79.36	73.81	72.42	80.30
141	-11.44	6239.53	70.13	74.14	76.44	71.85	71.38	78.58
142	-1.95	3622.00	66.22	68.92	70.47	67.38	66.40	73.06
143	3.76	4204.68	58.17	58.63	58.89	58.37	56.59	64.83
144	7.45	6619.46	52.51	51.62	51.12	52.13	49.55	56.36
145	9.86	8726.20	48.35	46.59	45.58	47.59	44.11	50.22
146	6.37	6124.57	45.29	42.96	41.63	44.29	40.38	45.41
147	2.47	4298.18	47.46	45.95	45.09	46.81	41.99	47.45
148	-0.95	2954.99	50.48	49.90	49.57	50.23	45.95	51.76
149	-8.49	4461.24	53.43	53.66	53.79	53.53	50.20	55.85
150	-14.77	6834.90	60.15	62.16	63.30	61.01	58.11	63.63
151	-20.60	9569.97	66.41	69.90	71.89	67.90	66.06	72.88
152	-17.01	8226.36	72.72	77.58	80.36	74.80	73.41	81.31
153	-11.46	6296.92	71.12	75.13	77.43	72.84	72.36	79.58
154	-1.96	3633.25	67.19	69.90	71.44	68.35	67.37	74.04
155	3.77	4188.49	59.12	59.58	59.84	59.32	57.53	65.79
156	7.46	6581.30	53.44	52.55	52.05	53.06	50.48	57.29
157	9.88	8669.79	49.26	47.50	46.49	48.51	45.02	51.14
158	6.39	6083.94	46.19	43.86	42.53	45.19	41.27	46.31
159	2.47	4279.39	48.36	46.85	45.99	47.71	42.88	48.35
160	-0.95	2953.82	51.38	50.80	50.46	51.13	46.84	52.66
161	-8.50	4488.44	54.33	54.56	54.69	54.43	51.09	56.75
162	-14.79	6891.29	61.06	63.06	64.21	61.92	59.01	64.53
163	-20.63	9659.42	67.32	70.81	72.80	68.81	66.96	73.79
164	-17.05	8308.17	73.63	78.50	81.29	75.72	74.33	82.23
165	-11.48	6351.17	72.03	76.05	78.35	73.75	73.27	80.51
166	-1.96	3644.17	68.09	70.80	72.35	69.25	68.26	74.95

167	3.77	4173.99	59.99	60.46	60.72	60.19	58.41	66.68
168	7.48	6546.80	54.31	53.42	52.91	53.93	51.34	58.16
169	9.90	8618.75	50.11	48.35	47.34	49.36	45.86	51.99
170	6.40	6047.19	47.03	44.69	43.36	46.03	42.10	47.15
171	2.48	4262.55	49.19	47.68	46.82	48.55	43.71	49.19
172	-0.95	2953.11	52.22	51.63	51.30	51.97	47.67	53.50
173	-8.51	4514.29	55.17	55.39	55.52	55.27	51.92	57.59
174	-14.81	6944.68	61.90	63.91	65.05	62.76	59.84	65.38
175	-20.66	9744.12	68.16	71.66	73.66	69.66	67.81	74.65
176	-17.07	8385.73	74.48	79.36	82.15	76.58	75.18	83.10
177	-11.50	6402.69	72.87	76.91	79.21	74.60	74.12	81.37
178	-1.97	3654.77	68.92	71.64	73.19	70.09	69.10	75.80
179	3.78	4160.91	60.81	61.28	61.54	61.01	59.22	67.51
180	7.49	6515.38	55.11	54.22	53.71	54.73	52.14	58.97
181	9.91	8572.22	50.91	49.14	48.13	50.15	46.65	52.78
182	6.42	6013.70	47.81	45.47	44.13	46.81	42.87	47.93
183	2.48	4247.34	49.97	48.46	47.59	49.33	44.48	49.97
184	-0.95	2952.78	53.00	52.41	52.08	52.75	48.44	54.28
185	-8.51	4538.93	55.95	56.18	56.30	56.05	52.70	58.37
186	-14.82	6995.41	62.68	64.69	65.84	63.54	60.62	66.16
187	-20.69	9824.62	68.95	72.45	74.45	70.45	68.60	75.44
188	-17.10	8459.55	75.28	80.17	82.96	77.37	75.98	83.91
189	-11.52	6451.80	73.67	77.70	80.01	75.40	74.92	82.17
190	-1.97	3665.08	69.70	72.43	73.98	70.87	69.88	76.59
191	3.78	4149.00	61.58	62.05	62.31	61.78	59.99	68.28
192	7.50	6486.47	55.87	54.98	54.47	55.49	52.89	59.73
193	9.93	8529.33	51.65	49.88	48.87	50.90	47.39	53.53
194	6.43	5982.84	48.55	46.21	44.87	47.55	43.60	48.66
195	2.49	4233.48	50.71	49.19	48.32	50.06	45.20	50.70
196	-0.95	2952.75	53.73	53.14	52.81	53.48	49.17	55.01
197	-8.52	4562.35	56.68	56.91	57.03	56.78	53.42	59.10
198	-14.84	7043.23	63.41	65.42	66.57	64.27	61.35	66.90
199	-20.72	9900.23	69.68	73.19	75.19	71.18	69.33	76.18
200	-17.13	8528.86	76.02	80.91	83.71	78.11	76.72	84.65
201	-11.54	6497.99	74.40	78.45	80.76	76.13	75.66	82.92
202	-1.97	3674.96	70.43	73.16	74.71	71.60	70.61	77.33
203	3.79	4138.28	62.29	62.76	63.02	62.49	60.70	69.00
204	7.51	6460.27	56.57	55.68	55.16	56.19	53.59	60.44
205	9.94	8490.47	52.35	50.57	49.56	51.59	48.07	54.22



206	6.44	5954.89	49.23	46.88	45.54	48.23	44.28	49.35
207	2.49	4221.02	51.39	49.87	49.00	50.74	45.87	51.38
208	-0.95	2952.97	54.41	53.82	53.49	54.16	49.84	55.69
209	-8.53	4584.63	57.36	57.59	57.72	57.46	54.10	59.79
210	-14.86	7088.82	64.10	66.11	67.26	64.96	62.03	67.59
211	-20.75	9972.62	70.37	73.88	75.89	71.88	70.02	76.88
212	-17.15	8595.40	76.71	81.61	84.41	78.81	77.41	85.36
213	-11.55	6542.38	75.09	79.15	81.46	76.83	76.35	83.63
214	-1.98	3684.59	71.12	73.84	75.40	72.29	71.30	78.02
215	3.79	4128.44	62.96	63.43	63.70	63.16	61.37	69.68
216	7.52	6436.00	57.23	56.34	55.82	56.85	54.25	61.10
217	9.95	8454.43	53.00	51.22	50.21	52.24	48.72	54.88
218	6.45	5928.99	49.88	47.53	46.18	48.87	44.92	49.99
219	2.50	4209.58	52.03	50.51	49.64	51.38	46.51	52.02
220	-0.95	2953.39	55.06	54.47	54.13	54.80	50.48	56.34
221	-8.54	4606.02	58.01	58.23	58.36	58.10	54.74	60.43
222	-14.87	7132.53	64.74	66.76	67.91	65.61	62.68	68.24
223	-20.77	10042.03	71.03	74.54	76.54	72.53	70.67	77.54
224	-17.18	8659.28	77.37	82.28	85.08	79.48	78.07	86.03
225	-11.57	6585.03	75.75	79.81	82.13	77.49	77.01	84.30
226	-1.98	3693.97	71.77	74.50	76.06	72.94	71.95	78.68
227	3.79	4119.35	63.60	64.07	64.34	63.80	62.01	70.33
228	7.53	6413.42	57.86	56.96	56.45	57.47	54.87	61.73
229	9.97	8420.88	53.62	51.84	50.82	52.85	49.33	55.50
230	6.45	5904.89	50.49	48.13	46.79	49.48	45.52	50.60
231	2.50	4199.01	52.64	51.12	50.25	51.99	47.11	52.63
232	-0.95	2953.98	55.67	55.08	54.74	55.41	51.08	56.95
233	-8.55	4626.63	58.62	58.84	58.97	58.71	55.35	61.05
234	-14.89	7174.51	65.36	67.38	68.53	66.22	63.29	68.85
235	-20.80	10108.74	71.64	75.16	77.17	73.15	71.29	78.16
236	-17.20	8720.75	78.00	82.91	85.72	80.10	78.70	86.67
237	-11.59	6626.12	76.38	80.44	82.76	78.12	77.64	84.93
238	-1.98	3703.11	72.38	75.12	76.68	73.55	72.57	79.31
239	3.80	4110.93	64.20	64.67	64.94	64.41	62.61	70.94
240	7.53	6392.32	58.45	57.56	57.04	58.07	55.47	62.33