GE
159 Plastics Avenue
Pittsfield, MA 01201
USA

Transmitted Via Overnight Courier

October 30, 2006

Mr. Dean Tagliaferro
U.S. Environmental Protection Agency
c/o Weston Solutions, Inc.
10 Lyman Street
Pittsfield, MA 01201

Re: **GE-Pittsfield/Housatonic River Site**
Groundwater Management Area 1 (GECD310)
Evaluation of Additional Recovery Measures and
Proposal to Install LNAPL Recovery Well – 60s Complex

Dear Mr. Tagliaferro:

In the August 30, 2006 *Plant Site 1 Groundwater Management Area NAPL Monitoring Report for Spring 2006* (Spring 2006 NAPL Report), the General Electric Company (GE) summarized the results of activities performed from January through June 2006 related to the monitoring and recovery of non-aqueous phase liquid (NAPL) at the Plant Site 1 Groundwater Management Area (GMA 1) and proposed modifications to certain NAPL monitoring activities. As discussed in that report, GE had installed several monitoring wells to assess recent LNAPL observations in the former scrapyard area within East Street Area 2-South/60s Complex. The extent of LNAPL in this area appears to have been delineated based on the results of monitoring conducted at the wells installed in this area, as illustrated on the attached Figure 1. However, based on the proximity of the edge of LNAPL to the Housatonic River in this area, GE indicated in the Spring 2006 NAPL Report that additional LNAPL containment/recovery measures beyond the use of the existing sentinel wells may be appropriate.

Accordingly, in the Spring 2006 NAPL Report, GE proposed to evaluate the location and specifications of potential groundwater/LNAPL recovery wells within this area and to submit the results of that evaluation, including a proposal for future actions to EPA. This letter provides the results of that evaluation and GE's proposal to install an additional recovery well in the former scrapyard area.

As part of this evaluation, GE has reviewed the available LNAPL monitoring and recovery data from its wells within the former scrapyard area, including the results of prior LNAPL recovery testing performed in spring 2005. GE has also conducted groundwater flow modeling to assess the potential configuration of automated groundwater/LNAPL recovery systems in this area. In the interim, while this evaluation was conducted, GE increased the LNAPL monitoring/manual removal frequency in this area to act protectively as an early notification and temporary containment/recovery measure.

LNAPL Monitoring and Recovery Results

The extent of light non-aqueous phase liquid (LNAPL) observed in this area during the previous year is illustrated on Figure 1. The majority of LNAPL within this area has been observed in wells GMA1-15, GMA1-16, and GMA1-19, while a small pocket of LNAPL has also been consistently observed in wells 13 and 14, located to the south of Building 64. GE has installed several soil borings and monitoring wells beyond the primary LNAPL body in this area to further define the extent of LNAPL, including borings RAA4-M19, RAA4-M21, RAA4-M23, and RAA4-K25 and wells GMA1-20 through GMA1-23, none of which contained NAPL. Well GMA1-24 (located to the east of the northern portion of Building 68) was also installed to act as a sentinel well to the south-southwest of well GMA1-19. This well has been monitored a total of 15 times since it was installed in spring 2006 and a very small amount of LNAPL (measured thickness of 0.01 ft.) was observed a single time, on July 13, 2006. Since that one monitoring event, LNAPL has not been observed in well GMA 1-24, and LNAPL has never been observed in well 19, located approximately 60 feet south of GMA1-24.

Trace amounts of LNAPL have also been sporadically observed in well HR-G2-RW-1, an angled well located near the Cell G2 sheetpile containment barrier. This well was installed into NAPL-impacted sediment beneath the Housatonic River in accordance with GE's January 15, 2001 *Revised Contingency Plan for NAPL Remaining in Cell G2*, as conditionally approved by EPA in a letter dated January 18, 2001. Specifically, in the past five years, this well has been monitored a total of 66 times and LNAPL was detected on 18 occasions at the minimum measurable thickness of 0.01 feet and on four other occasions at a thickness of 0.02 feet. No LNAPL has been observed in sentinel well HR-G2-MW-2 located behind this sheetpile barrier, or HR-G2-MW-1 or HR-G2-MW-3, located at either end of the sheetpile barrier, during this timeframe.

Wells GMA1-15 and GMA1-16 were installed in spring 2003, while well GMA1-19 was installed in spring 2005. These wells are currently monitored on a weekly basis as part of GE's NAPL monitoring program and any recoverable quantities of LNAPL are manually removed. All LNAPL monitoring and recovery data at wells GMA1-15, GMA1-16, and GMA1-19 since their installations is summarized in Tables 1 through 3. The groundwater elevations and observed LNAPL thicknesses recorded during those monitoring rounds is displayed on the attached graphs. Approximately 16 gallons of LNAPL has been removed from these wells as part of GE's NAPL monitoring program.

Groundwater Flow Modeling

To determine the location and specifications of potential LNAPL recovery wells in the former scrapyard area, a groundwater flow model was constructed to identify the capture zones of various potential automated recovery systems in this area. The model was run to simulate both high and low groundwater conditions (i.e., spring and fall), including an extended analysis to assess the scenario that the presence of LNAPL extended beyond the observed locations to the next set of sentinel wells. The results of those modeling activities, provided as Appendix A to this letter, show that a single groundwater recovery well located approximately midway between wells GMA1-19 and GMA1-16 and set to maintain a groundwater drawdown depth of approximately 2.5 feet would provide hydraulic control over the entire southern portion of the scrapyard area (including the outer ring of sentinel wells) under any of these scenarios, preventing any migration of LNAPL from this area to the Housatonic River. As discussed below, GE proposes to install recovery well RW-3 at this location.

Proposed Activities

Based on the results of the groundwater flow modeling discussed above, GE believes that a single LNAPL recovery well located near the downgradient edge of the known LNAPL extent between monitoring wells GMA1-16 and GMA1-19 will be sufficient to contain and recover the LNAPL in this area. Therefore, GE proposes to install recovery well RW-3 at this approximate location, as illustrated on Figure 1. The actual location of the recovery well, which is outside of the 200-foot buffer zone related to the Housatonic River, may be slightly altered to accommodate the connection of the system to GE's groundwater treatment facility or to limit the impact on future restoration activities in this area.

The proposed recovery well will be 12 inches in diameter and constructed with 20 feet of 0.04-inch slotted screen installed to a depth of approximately 30 feet below grade (i.e., extending to just above the static water table, which is at an elevation of approximately 975 feet AMSL or 10 feet below grade in this area). GE proposes to install an automated recovery system in this well that is similar to the one currently utilized in well RS-1(S). Specifically, well RW-3 is proposed to be equipped with a groundwater extraction pump and an oil recovery pump. The cone of depression created by the groundwater extraction pump set at a drawdown elevation of approximately 971 – 971.75 feet was estimated to provide sufficient hydraulic control in this area in GE's groundwater flow model. However, as a conservative measure, GE will initially set the groundwater extraction pumps to maintain a drawdown elevation of approximately 967.5 to 969 feet.

Following EPA approval of this proposal, GE will finalize detailed plans for the collection system and install the new recovery well. If those plans require a significant change in the location of the recovery well, GE will inform EPA of the revised well location prior to installation. Groundwater removed by the system will be routed to GE's existing treatment facility in Building 64G, utilizing existing piping networks to the extent practical. A small containment facility will be constructed near the recovery well to house the system controls and to accumulate LNAPL removed from the well until it is properly disposed by GE. As with GE's other automated recovery systems at East Street Area 2-South, GE will check the LNAPL storage system for leaks or other problems on a daily basis from Monday through Friday and will perform monitoring and preventative maintenance activities on a weekly basis. The system will include tank high level and leak detection alarm system shutdowns. NAPL will be removed at a minimum of once every 30 days.

Once the recovery system is activated and the initial results have been assessed, GE will re-evaluate its manual NAPL monitoring activities in this area. Any modifications will be proposed in GE's semi-annual NAPL monitoring reports for GMA 1.

Please call Andrew Silfer or me if you have any questions regarding this proposal.

Sincerely,

Richard W. Gates /AJS for

Richard W. Gates
Remediation Project Manager

Enclosures
V:\GE_Pittsfield_CD_GMA_1\Reports and Presentations\60s Complex NAPL Prop\55262196LtrRpt.doc

cc: T. Conway, EPA (cover letter only)
H. Inglis, EPA (CD-ROM)
R. Howell, EPA (CD-ROM, cover letter only)
K.C. Mitkevicius, USACE (CD-ROM)
L. Palmieri, Weston (2 hard copies and CD-ROM)
A. Symington, MDEP (cover letter only)
J. Rothchild, MDEP (cover letter only)
S. Steenstrup, MDEP (2 copies)
T. Angus, MDEP (cover letter only)
J. Ruberto, Mayor, City of Pittsfield
Pittsfield Commissioner of Public Health
T. Hickey, Director, PEDA
J. Bernstein, Bernstein, Cushner & Kimmel
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M. Carroll, GE (cover letter only)
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J. Nuss, BBL
J. Bieke, Goodwin Procter
J. Ciampa, SPECTRA
J. Porter, Mintz, Levin
R. Nasman, Berkshire Gas
M. Booher, Leboeuf, Lamb, Greene & MacRae, L.L.P.
I. Murarka, Ish, Inc.
K. Hylton, KHES, LLC
D. Mauro, META
Public Information Repositories
GE Internal Repositories

Tables

TABLE 1
ROUTINE GROUNDWATER ELEVATION AND NAPL MONITORING DATA FOR WELL GMA1-15

GROUNDWATER MANAGEMENT AREA 1
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS

Well Name	Measuring Point Elev (Ft.)	Date	Depth to Water (feet BMP)	Depth to LNAPL (feet BMP)	LNAPL Thickness (feet)	Total Depth (feet BMP)	Corrected Water Elev. (feet)	LNAPL Removed (Liters)
GMA1-15	988.59	7/9/2003	15.82	15.68	0.14	17.81	972.90	0.000
GMA1-15	988.59	7/18/2003	16.00	15.71	0.29	17.82	972.86	0.179
GMA1-15	988.59	7/24/2003	15.96	15.66	0.30	17.83	972.91	0.185
GMA1-15	988.59	7/31/2003	16.15	15.91	0.24	17.84	972.66	0.148
GMA1-15	988.59	8/8/2003	15.45	15.13	0.32	17.84	973.44	0.197
GMA1-15	988.59	8/14/2003	14.70	13.58	1.12	17.83	974.93	0.691
GMA1-15	988.59	8/21/2003	15.20	14.21	0.99	17.84	974.31	0.611
GMA1-15	988.59	8/28/2003	15.92	14.99	0.93	17.84	973.53	0.574
GMA1-15	988.59	9/2/2003	15.31	14.79	0.52	17.84	973.76	0.321
GMA1-15	988.59	9/11/2003	15.35	14.52	0.83	17.83	974.01	0.215
GMA1-15	988.59	9/18/2003	15.41	14.72	0.69	17.85	973.82	0.426
GMA1-15	988.59	9/25/2003	14.50	13.45	1.05	17.85	975.07	0.648
GMA1-15	988.59	10/2/2003	13.08	12.40	0.68	17.84	976.14	0.420
GMA1-15	988.59	10/9/2003	14.74	13.35	1.39	17.84	975.14	0.858
GMA1-15	988.59	10/16/2003	13.85	13.30	0.55	17.84	975.25	0.339
GMA1-15	988.59	10/23/2003	14.90	13.55	1.35	17.84	974.95	0.833
GMA1-15	988.59	10/30/2003	13.40	12.65	0.75	17.84	975.89	0.463
GMA1-15	988.59	11/7/2003	14.13	12.92	1.21	17.84	975.59	0.747
GMA1-15	988.59	11/11/2003	13.98	13.11	0.87	17.85	975.42	0.537
GMA1-15	988.59	11/20/2003	13.41	13.12	0.29	17.85	975.45	0.179
GMA1-15	988.59	12/17/2003	13.42	12.53	0.89	17.83	976.00	0.549
GMA1-15	988.59	2/25/2004	15.66	14.87	0.79	17.83	973.66	0.487
GMA1-15	988.59	3/26/2004	14.78	14.03	0.75	17.84	974.51	0.463
GMA1-15	988.59	3/31/2004	13.40	12.72	0.68	17.83	975.82	0.429
GMA1-15	988.59	4/12/2004	15.04	13.89	1.15	17.82	974.62	0.000
GMA1-15	988.59	5/26/2004	14.00	13.00	1.00	17.82	975.52	0.617
GMA1-15	988.59	6/23/2004	15.45	14.75	0.70	17.84	973.79	0.432
GMA1-15	988.59	7/23/2004	15.81	15.05	0.76	17.83	973.49	0.469
GMA1-15	988.59	8/26/2004	15.14	14.20	0.94	17.85	974.32	0.592
GMA1-15	988.59	9/22/2004	13.20	12.55	0.65	17.83	975.99	0.401
GMA1-15	988.59	10/11/2004	14.64	13.67	0.97	17.87	974.85	0.000
GMA1-15	988.59	11/17/2004	14.75	13.85	0.90	17.84	974.68	0.555
GMA1-15	988.59	12/16/2004	14.56	13.33	1.23	17.83	975.17	0.759
GMA1-15	988.59	1/17/2005	14.46	13.35	1.11	17.83	975.16	0.685
GMA1-15	988.59	2/16/2005	14.75	13.90	0.85	17.84	974.63	0.524
GMA1-15	988.59	3/28/2005	15.40	14.52	0.88	17.84	974.01	0.543
GMA1-15	988.59	4/18/2005	14.70	13.96	0.74	17.84	974.58	0.000
GMA1-15	988.59	5/20/2005	15.45	14.61	0.84	17.84	973.92	0.518
GMA1-15	988.59	5/31/2005	15.14	14.55	0.59	17.85	974.00	0.958
GMA1-15	988.59	6/1/2005	15.03	14.56	0.47	17.85	974.00	1.223
GMA1-15	988.59	6/2/2005	14.85	14.55	0.30	17.85	974.02	0.544
GMA1-15	988.59	6/3/2005	14.97	14.67	0.30	17.85	973.90	0.352
GMA1-15	988.59	6/15/2005	15.56	15.02	0.54	17.84	973.53	0.333

TABLE 1

ROUTINE GROUNDWATER ELEVATION AND NAPL MONITORING DATA FOR WELL GMA1-15

GROUNDWATER MANAGEMENT AREA 1

GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS

Well Name	Measuring Point Elev (Ft.)	Date	Depth to Water (feet BMP)	Depth to LNAPL (feet BMP)	LNAPL Thickness (feet)	Total Depth (feet BMP)	Corrected Water Elev. (feet)	LNAPL Removed (Liters)
GMA1-15	988.59	7/26/2005	15.60	15.00	0.60	17.84	973.55	0.370
GMA1-15	988.59	8/23/2005	15.91	15.55	0.36	17.83	973.01	0.222
GMA1-15	988.59	9/26/2005	17.30	16.25	1.05	17.83	972.27	0.648
GMA1-15	988.59	10/24/2005	14.64	13.70	0.94	17.83	974.82	0.000
GMA1-15	988.59	11/21/2005	14.82	14.30	0.52	17.84	974.25	0.321
GMA1-15	988.59	12/20/2005	15.00	14.55	0.45	17.84	974.01	0.278
GMA1-15	988.59	1/17/2006	13.70	13.40	0.30	17.85	975.17	0.185
GMA1-15	988.59	2/10/2006	13.50	13.30	0.20	17.85	975.28	0.000
GMA1-15	988.59	3/27/2006	16.20	15.35	0.85	17.84	973.18	0.494
GMA1-15	988.59	4/10/2006	15.68	15.14	0.54	17.91	973.41	0.000
GMA1-15	988.59	5/16/2006	15.28	14.75	0.53	17.84	973.80	0.327
GMA1-15	988.59	6/20/2006	15.25	14.85	0.40	17.84	973.71	0.247
GMA1-15	988.59	7/13/06	15.84	15.08	0.76	17.89	973.46	0.469
GMA1-15	988.59	8/21/06	15.98	15.61	0.37	17.84	972.95	0.228
GMA1-15	988.59	9/13/06	16.40	15.95	0.45	17.84	972.61	0.278
GMA1-15	988.59	9/20/06	16.45	15.90	0.55	17.84	972.65	0.339
GMA1-15	988.59	9/25/06	16.50	15.80	0.70	17.84	972.74	0.432

TABLE 2

ROUTINE GROUNDWATER ELEVATION AND NAPL MONITORING DATA FOR WELL GMA1-16

GROUNDWATER MANAGEMENT AREA 1

GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS

Well Name	Measuring Point Elev (Ft.)	Date	Depth to Water (feet BMP)	Depth to LNAPL (feet BMP)	LNAPL Thickness (feet)	Total Depth (feet BMP)	Corrected Water Elev. (feet)	LNAPL Removed (Liters)
GMA1-16	986.82	5/23/2003	12.80	---	0.00	18.00	974.02	0.000
GMA1-16	986.82	7/9/2003	13.86	13.78	0.08	20.01	973.03	0.000
GMA1-16	986.82	7/18/2003	13.90	13.86	0.04	20.03	972.96	0.025
GMA1-16	986.82	7/24/2003	13.89	13.88	0.01	20.01	972.94	0.006
GMA1-16	986.82	7/31/2003	14.12	14.10	0.02	20.01	972.72	0.012
GMA1-16	986.82	8/8/2003	13.45	---	0.00	20.02	973.37	0.000
GMA1-16	986.82	8/14/2003	12.12	12.11	0.01	20.02	974.71	0.006
GMA1-16	986.82	8/21/2003	12.53	12.50	0.03	20.02	974.32	0.019
GMA1-16	986.82	8/28/2003	13.30	13.23	0.07	20.01	973.59	0.043
GMA1-16	986.82	9/2/2003	12.92	12.91	0.01	20.02	973.91	0.006
GMA1-16	986.82	9/11/2003	12.87	12.81	0.06	20.02	974.01	0.037
GMA1-16	986.82	9/18/2003	12.94	12.93	0.01	20.02	973.89	0.006
GMA1-16	986.82	9/25/2003	11.96	11.92	0.04	20.02	974.90	0.025
GMA1-16	986.82	10/2/2003	11.03	---	0.00	20.02	975.79	0.000
GMA1-16	986.82	10/9/2003	11.93	11.80	0.13	20.02	975.01	0.080
GMA1-16	986.82	10/16/2003	11.65	---	0.00	20.02	975.17	0.000
GMA1-16	986.82	10/23/2003	11.99	11.93	0.06	20.02	974.89	0.037
GMA1-16	986.82	10/30/2003	11.19	---	0.00	20.02	975.63	0.000
GMA1-16	986.82	11/7/2003	11.33	---	0.00	20.02	975.49	0.000
GMA1-16	986.82	11/11/2003	11.40	---	0.00	20.02	975.42	0.000
GMA1-16	986.82	11/20/2003	11.34	---	0.00	20.02	975.48	0.000
GMA1-16	986.82	12/17/2003	10.07	---	0.00	20.00	976.75	0.000
GMA1-16	986.82	1/20/2004	12.30	11.98	0.32	20.00	974.82	0.197
GMA1-16	986.82	2/25/2004	13.54	12.85	0.69	20.00	973.92	0.426
GMA1-16	986.82	3/26/2004	12.39	12.15	0.24	20.00	974.65	0.000
GMA1-16	986.82	3/31/2004	11.19	11.13	0.06	20.00	975.69	0.038
GMA1-16	986.82	4/12/2004	12.38	11.97	0.41	20.01	974.82	0.000
GMA1-16	986.82	5/26/2004	11.19	11.02	0.17	19.99	975.79	0.000
GMA1-16	986.82	6/23/2004	13.30	12.75	0.55	20.01	974.03	0.339
GMA1-16	986.82	7/23/2004	13.80	13.11	0.69	20.01	973.66	0.426
GMA1-16	986.82	8/26/2004	12.92	12.50	0.42	20.02	974.29	0.259
GMA1-16	986.82	9/22/2004	11.09	11.01	0.08	20.01	975.80	0.049
GMA1-16	986.82	10/11/2004	12.23	11.77	0.46	20.04	975.02	0.000
GMA1-16	986.82	11/17/2004	12.50	12.03	0.47	20.01	974.76	0.290
GMA1-16	986.82	12/16/2004	12.04	11.58	0.46	20.00	975.21	0.284
GMA1-16	986.82	1/17/2005	11.92	11.42	0.50	20.01	975.37	0.308
GMA1-16	986.82	2/16/2005	12.15	11.95	0.20	20.02	974.86	0.000
GMA1-16	986.82	3/28/2005	12.90	12.48	0.42	20.01	974.31	0.259
GMA1-16	986.82	4/18/2005	12.36	11.91	0.45	20.01	974.88	0.000
GMA1-16	986.82	5/20/2005	13.10	12.60	0.50	20.03	974.19	0.308
GMA1-16	986.82	6/15/2005	13.48	13.02	0.46	20.00	973.77	0.284
GMA1-16	986.82	7/26/2005	13.38	13.22	0.16	20.00	973.59	0.000
GMA1-16	986.82	8/23/2005	13.90	13.72	0.18	20.02	973.09	0.000

TABLE 2

ROUTINE GROUNDWATER ELEVATION AND NAPL MONITORING DATA FOR WELL GMA1-16

GROUNDWATER MANAGEMENT AREA 1
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS

Well Name	Measuring Point Elev (Ft.)	Date	Depth to Water (feet BMP)	Depth to LNAPL (feet BMP)	LNAPL Thickness (feet)	Total Depth (feet BMP)	Corrected Water Elev. (feet)	LNAPL Removed (Liters)
GMA1-16	986.82	9/26/2005	14.97	14.34	0.63	20.00	972.44	0.389
GMA1-16	986.82	10/24/2005	12.10	11.70	0.40	20.00	975.09	0.000
GMA1-16	986.82	11/21/2005	12.35	12.15	0.20	20.01	974.66	0.000
GMA1-16	986.82	12/20/2005	12.55	12.43	0.12	20.00	974.38	0.000
GMA1-16	986.82	1/17/2006	12.00	11.55	0.45	20.00	975.24	0.278
GMA1-16	986.82	2/10/2006	12.00	11.50	0.50	20.00	975.29	0.308
GMA1-16	986.82	3/27/2006	13.86	13.22	0.64	20.00	973.56	0.395
GMA1-16	986.82	4/10/2006	13.67	13.05	0.62	20.50	973.73	0.000
GMA1-16	986.82	5/16/2006	12.80	12.65	0.15	20.00	974.16	0.000
GMA1-16	986.82	6/20/2006	13.00	12.75	0.25	20.01	974.05	0.154
GMA1-16	986.82	7/13/06	13.68	13.03	0.65	20.02	973.74	0.401
GMA1-16	986.82	8/21/06	14.10	13.66	0.44	20.00	973.13	0.271
GMA1-16	986.82	9/13/06	14.28	14.00	0.28	20.01	972.80	0.173
GMA1-16	986.82	9/20/06	14.30	13.93	0.37	20.00	972.86	0.228
GMA1-16	986.82	9/25/06	14.26	13.92	0.34	20.00	972.88	0.210

TABLE 3

ROUTINE GROUNDWATER ELEVATION AND NAPL MONITORING DATA FOR WELL GMA1-19

GROUNDWATER MANAGEMENT AREA 1

GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS

Well Name	Measuring Point Elev (Ft.)	Date	Depth to Water (feet BMP)	Depth to LNAPL (feet BMP)	LNAPL Thickness (feet)	Total Depth (feet BMP)	Corrected Water Elev. (feet)	LNAPL Removed (Liters)
GMA1-19	984.28	3/30/2005	9.65	---	0.00	17.59	974.63	0.000
GMA1-19	984.28	3/31/2005	9.86	---	0.00	17.59	974.42	0.000
GMA1-19	984.28	4/18/2005	10.86	9.56	1.30	17.13	974.63	0.800
GMA1-19	984.28	4/19/2005	10.86	9.56	1.30	17.13	974.63	0.802
GMA1-19	984.28	4/29/2005	11.48	9.95	1.53	17.12	974.22	0.944
GMA1-19	984.28	5/6/2005	10.95	9.89	1.06	17.14	974.32	0.654
GMA1-19	984.28	5/13/2005	11.40	10.13	1.27	17.14	974.06	0.784
GMA1-19	984.28	5/20/2005	11.82	10.38	1.44	17.14	973.80	0.888
GMA1-19	984.28	5/27/2005	11.33	10.19	1.14	17.15	974.01	0.703
GMA1-19	984.28	5/31/2005	10.80	10.09	0.71	17.20	974.14	0.840
GMA1-19	984.28	6/1/2005	11.03	10.36	0.67	17.20	973.87	0.710
GMA1-19	984.28	6/2/2005	10.79	10.32	0.47	17.20	973.93	0.655
GMA1-19	984.28	6/3/2005	10.90	10.48	0.42	17.20	973.77	0.469
GMA1-19	984.28	6/10/2005	11.18	10.61	0.57	17.14	973.63	0.352
GMA1-19	984.28	6/15/2005	11.55	10.80	0.75	17.13	973.43	0.463
GMA1-19	984.28	6/23/2005	11.53	10.46	1.07	17.13	973.75	0.660
GMA1-19	984.28	7/1/2005	11.18	10.44	0.74	17.14	973.79	0.457
GMA1-19	984.28	7/7/2005	11.60	10.85	0.75	17.14	973.38	0.463
GMA1-19	984.28	7/12/2005	11.70	11.05	0.65	17.13	973.18	0.401
GMA1-19	984.28	7/21/2005	11.62	11.00	0.62	17.14	973.24	0.383
GMA1-19	984.28	7/26/2005	11.50	10.75	0.75	17.13	973.48	0.463
GMA1-19	984.28	8/4/2005	11.95	11.15	0.80	17.13	973.07	0.494
GMA1-19	984.28	8/11/2005	12.30	11.58	0.72	17.13	972.65	0.444
GMA1-19	984.28	8/18/2005	12.60	11.68	0.92	17.13	972.54	0.568
GMA1-19	984.28	8/23/2005	11.43	11.25	0.18	17.14	973.02	0.111
GMA1-19	984.28	9/1/2005	11.35	11.15	0.20	17.13	973.12	0.123
GMA1-19	984.28	9/8/2005	12.15	11.65	0.50	17.13	972.60	0.308
GMA1-19	984.28	9/16/2005	12.30	11.98	0.32	17.13	972.28	0.197
GMA1-19	984.28	9/21/2005	12.30	11.95	0.35	17.13	972.31	0.216
GMA1-19	984.28	9/26/2005	12.30	12.10	0.20	17.14	972.17	0.123
GMA1-19	984.28	10/5/2005	12.32	12.06	0.26	17.13	972.20	0.160
GMA1-19	984.28	10/12/2005	8.63	---	0.00	17.13	975.65	0.000
GMA1-19	984.28	10/19/2005	9.32	9.30	0.02	17.14	974.98	0.012
GMA1-19	984.28	10/24/2005	9.66	9.60	0.06	17.13	974.68	0.037
GMA1-19	984.28	11/2/2005	10.06	9.65	0.41	17.14	974.60	0.253
GMA1-19	984.28	11/9/2005	10.80	10.28	0.52	17.13	973.96	0.321
GMA1-19	984.28	11/16/2005	10.81	10.44	0.37	17.14	973.81	0.228
GMA1-19	984.28	11/21/2005	10.54	10.12	0.42	17.15	974.13	0.259
GMA1-19	984.28	11/29/2005	10.38	10.05	0.33	17.13	974.21	0.204
GMA1-19	984.28	12/7/2005	10.24	9.63	0.61	17.14	974.61	0.376
GMA1-19	984.28	12/14/2005	11.10	10.14	0.96	17.15	974.07	0.592
GMA1-19	984.28	12/20/2005	10.93	10.40	0.53	17.15	973.84	0.327
GMA1-19	984.28	12/28/2005	10.60	10.06	0.54	17.15	974.18	0.333

TABLE 3

ROUTINE GROUNDWATER ELEVATION AND NAPL MONITORING DATA FOR WELL GMA1-19

GROUNDWATER MANAGEMENT AREA 1

GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS

Well Name	Measuring Point Elev (Ft.)	Date	Depth to Water (feet BMP)	Depth to LNAPL (feet BMP)	LNAPL Thickness (feet)	Total Depth (feet BMP)	Corrected Water Elev. (feet)	LNAPL Removed (Liters)
GMA1-19	984.28	1/4/2006	10.55	9.95	0.60	17.14	974.29	0.370
GMA1-19	984.28	1/11/2006	11.03	10.30	0.73	17.14	973.93	0.450
GMA1-19	984.28	1/17/2006	9.80	9.31	0.49	17.14	974.94	0.302
GMA1-19	984.28	1/24/2006	9.00	8.80	0.20	17.15	975.47	0.123
GMA1-19	984.28	2/1/2006	9.65	9.25	0.40	17.14	975.00	0.247
GMA1-19	984.28	2/8/2006	9.32	8.90	0.42	17.14	975.35	0.259
GMA1-19	984.28	2/10/2006	10.35	9.25	1.10	17.14	974.95	0.679
GMA1-19	984.28	2/15/2006	10.20	9.70	0.50	17.14	974.55	0.308
GMA1-19	984.28	2/22/2006	10.55	10.10	0.45	17.14	974.15	0.278
GMA1-19	984.28	3/1/2006	11.15	10.50	0.65	17.14	973.73	0.401
GMA1-19	984.28	3/8/2006	11.60	10.80	0.80	17.14	973.42	0.494
GMA1-19	984.28	3/15/2006	11.30	10.80	0.50	17.15	973.45	0.308
GMA1-19	984.28	3/22/2006	11.55	11.00	0.55	17.13	973.24	0.339
GMA1-19	984.28	3/27/2006	11.88	11.10	0.78	17.14	973.13	0.481
GMA1-19	984.28	4/5/2006	11.37	10.80	0.57	17.14	973.44	0.352
GMA1-19	984.28	4/10/2006	11.58	10.93	0.65	17.19	973.30	0.000
GMA1-19	984.28	4/18/2006	11.58	11.15	0.43	17.15	973.10	0.265
GMA1-19	984.28	4/25/2006	11.00	10.70	0.30	17.13	973.56	0.185
GMA1-19	984.28	5/2/2006	11.40	11.06	0.34	17.14	973.20	0.210
GMA1-19	984.28	5/9/2006	11.41	11.20	0.21	17.14	973.07	0.130
GMA1-19	984.28	5/16/2006	10.72	10.55	0.17	17.14	973.72	0.105
GMA1-19	984.28	5/24/2006	10.72	10.18	0.54	17.13	974.06	0.333
GMA1-19	984.28	5/31/2006	11.04	10.55	0.49	17.14	973.70	0.302
GMA1-19	984.28	6/7/2006	11.57	11.33	0.24	17.13	972.93	0.148
GMA1-19	984.28	6/13/2006	11.02	10.45	0.57	17.14	973.79	0.290
GMA1-19	984.28	6/20/2006	11.28	10.65	0.63	17.14	973.59	0.327
GMA1-19	984.28	6/28/2006	11.01	10.41	0.60	17.14	973.83	0.370
GMA1-19	984.28	7/5/06	11.14	10.70	0.44	17.14	973.55	0.271
GMA1-19	984.28	7/12/06	11.85	11.00	0.85	17.14	973.22	0.524
GMA1-19	984.28	7/19/06	12.05	11.40	0.65	17.14	972.83	0.401
GMA1-19	984.28	7/25/06	11.95	11.24	0.71	17.14	972.99	0.438
GMA1-19	984.28	8/2/06	12.10	11.35	0.75	17.13	972.88	0.463
GMA1-19	984.28	8/9/06	11.53	11.51	0.02	17.14	972.77	0.012
GMA1-19	984.28	8/16/06	11.90	11.65	0.25	17.13	972.61	0.154
GMA1-19	984.28	8/21/06	11.48	11.45	0.03	17.14	972.83	0.019
GMA1-19	984.28	8/29/06	11.72	11.51	0.21	17.14	972.76	0.019
GMA1-19	984.28	9/6/06	12.00	11.64	0.36	17.13	972.61	0.222
GMA1-19	984.28	9/13/06	12.14	11.82	0.32	17.13	972.44	0.197
GMA1-19	984.28	9/20/06	11.73	11.69	0.04	17.14	972.59	0.025
GMA1-19	984.28	9/25/06	11.63	11.60	0.03	17.14	972.68	0.019

Figure

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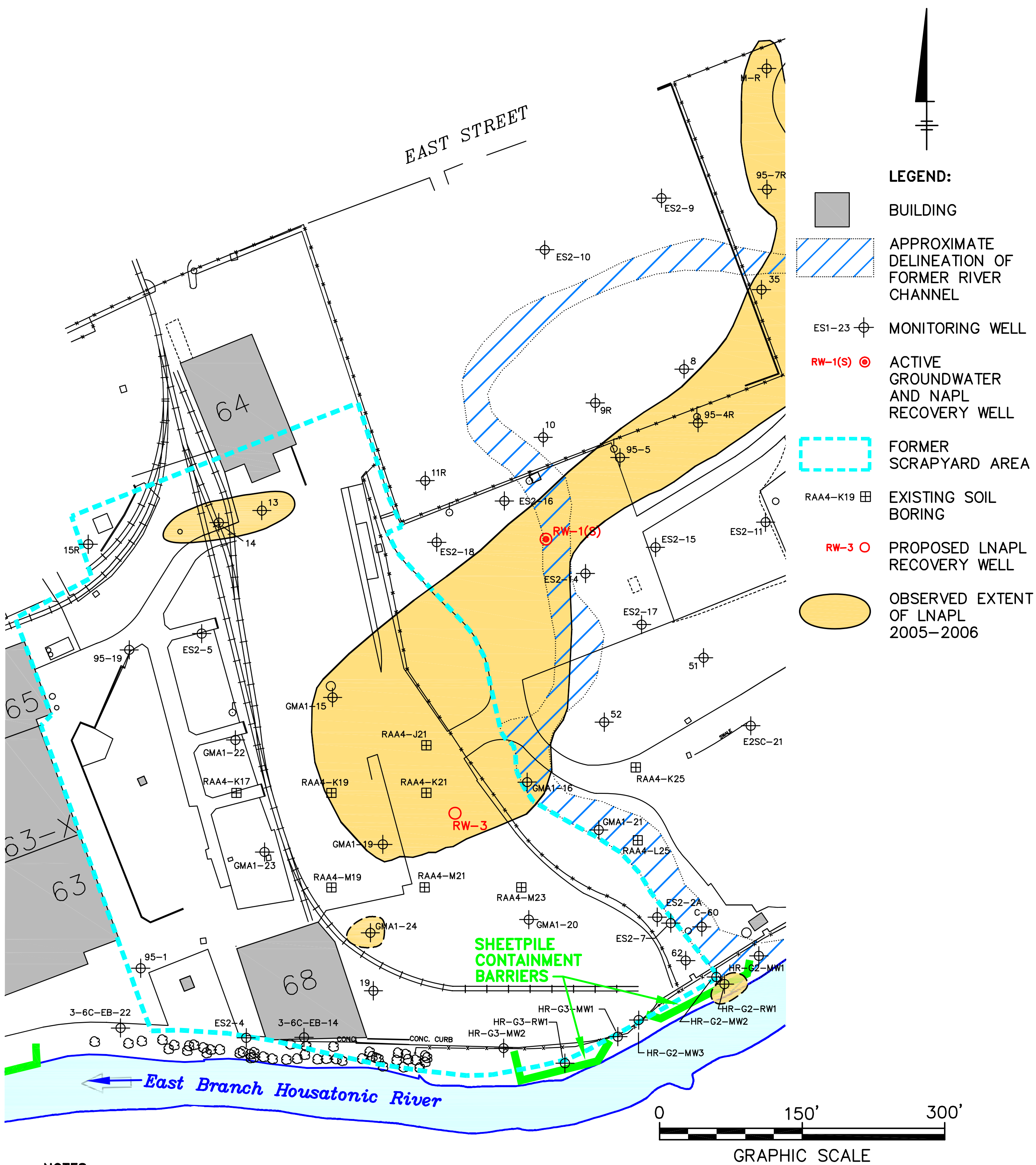

NOTES:

1. MAPPING IS BASED ON AERIAL PHOTOGRAPHS AND PHOTOGRAMMETRIC MAPPING BY LOCKWOOD MAPPING, INC. – FLOWN IN APRIL 1990; DATA PROVIDED BY GENERAL ELECTRIC COMPANY, AND BLASLAND AND BOUCK ENGINEERS, P.C. CONSTRUCTION PLANS.
2. NOT ALL PHYSICAL FEATURES SHOWN.
3. SITE BOUNDARY IS APPROXIMATE.
4. ALL MONITORING WELL LOCATIONS ARE APPROXIMATE.

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS
GMA 1 NAPL MONITORING PROGRAM

SITE PLAN

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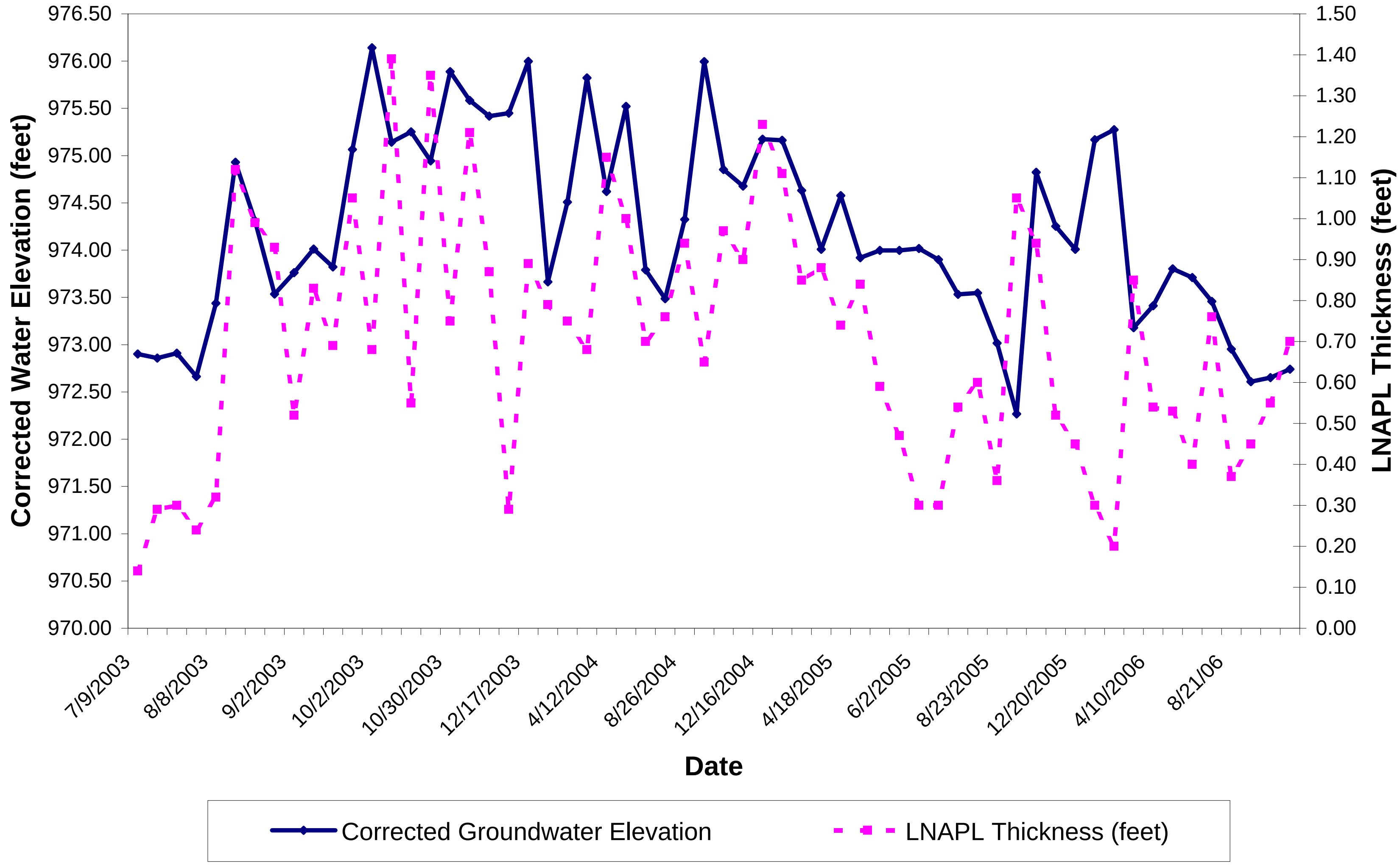
FIGURE
1

SYR-85-NJR RCB BGP L: ON=*, OFF=REF
G:\GE_ACTIVE\N\20136020\20136B01.DWG SAVED:10/30/2006 2:19 PM LAYOUT:Layout1 PAGESETUP:---- PENTABLE:PLTFULL.CTB PRINTED:10/30/2006 2:30 PM BY:BPITTSLEY
PROJECTNAME:----
XREFS: IMAGES:

Graphs

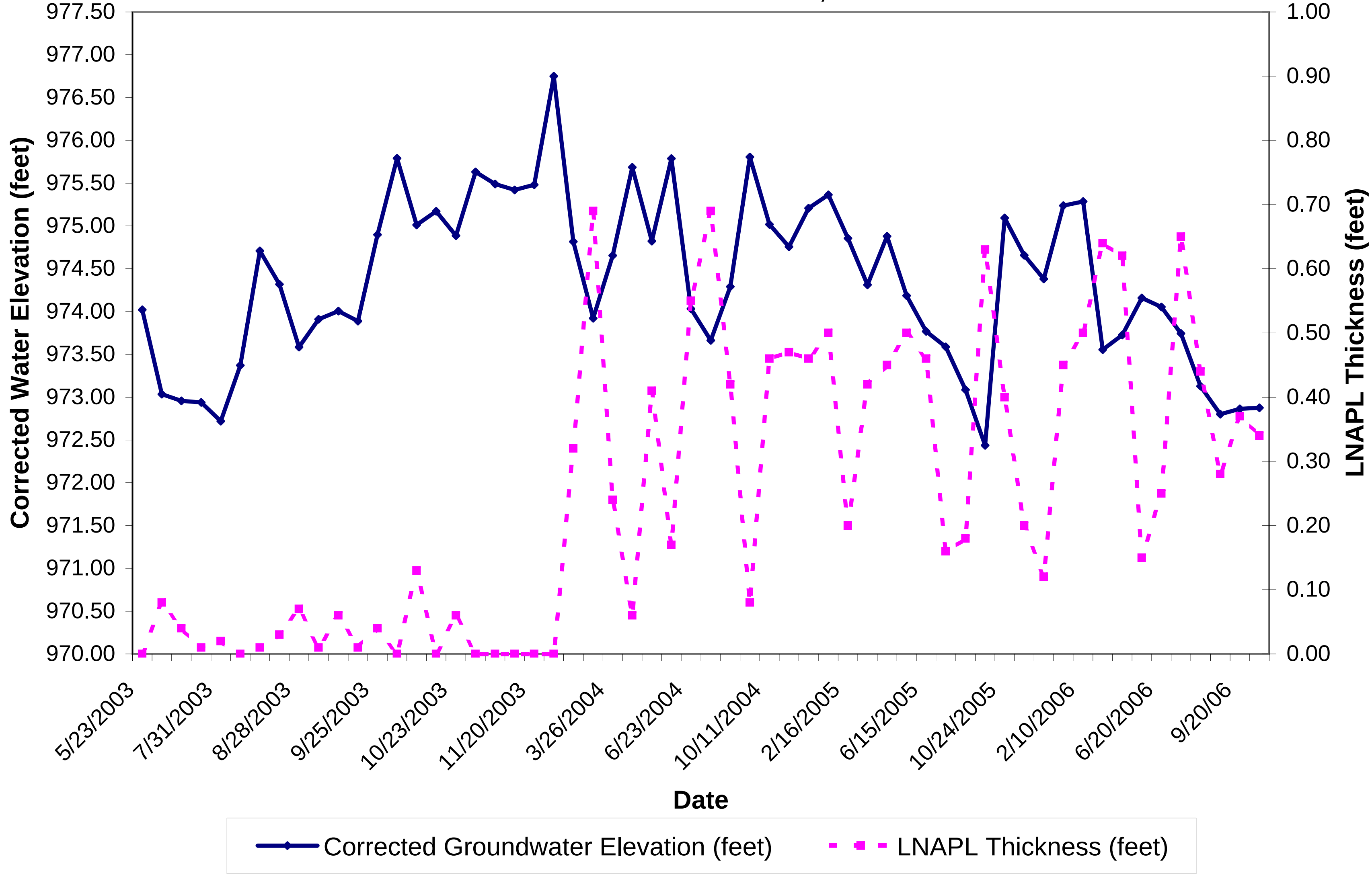
GROUNDWATER ELEVATION AND LNAPL THICKNESS DATA FOR MONITORING WELL GMA 1-15

GROUNDWATER MANAGEMENT AREA 1
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS



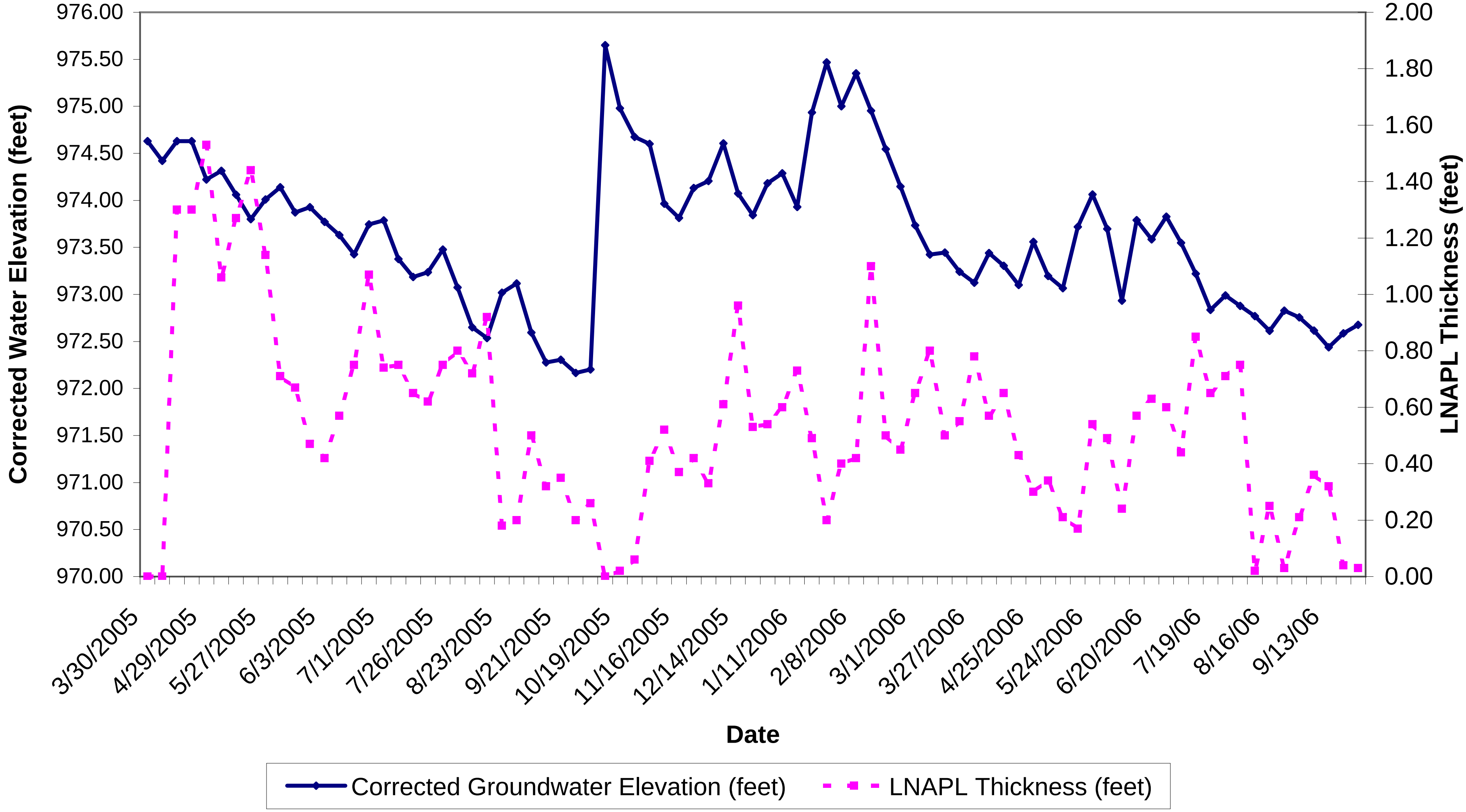
GROUNDWATER ELEVATION AND LNAPL THICKNESS DATA FOR MONITORING WELL GMA 1-16

GROUNDWATER MANAGEMENT AREA 1
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS



GROUNDWATER ELEVATION AND LNAPL THICKNESS DATA FOR
MONITORING WELL GMA 1-19

GROUNDWATER MANAGEMENT AREA 1
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS



Appendix A

Groundwater Flow Model
East Street Area 2-South

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Golder Associates Inc.

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APPENDIX A
DRAFT REPORT
GROUNDWATER FLOW MODEL
EAST STREET AREA 2-SOUTH
PLANT SITE 1 GROUNDWATER MANAGEMENT AREA
PITTSFIELD, MASSACHUSETTS

Prepared for:

General Electric Company

Prepared by:

Golder Associates Inc.
200 Century Parkway, Suite C
Mt. Laurel, NJ 08054

October 2006 Project No.: 063-6424

TABLE OF CONTENTS

1.0 INTRODUCTION

Golder Associates Inc. (Golder Associates) has prepared on behalf of General Electric Company, Inc. (GE) an update to the existing numerical groundwater flow model for the East Street Area 2-South portion (Site) of the Plant Site 1 Groundwater Management Area (GMA 1) of the Pittsfield facility. The objective of this study was to evaluate groundwater and oil recovery measures for the scrapyard section of the Site.

The numerical modeling study is based on previous studies conducted by Golder Associates ("Pumping Test Analyses and Evaluation of Recovery Measures, East Street Area 2, Pittsfield, Massachusetts", April 1992; "Additional Oil Recovery Measures Groundwater Flow Model, East Street Area 2/USEPA Area 4, Pittsfield, Massachusetts", July 1997; and "Groundwater Flow Model, East Street Area 2 – South Plant Site 1 Groundwater Management Area, Pittsfield Massachusetts," June 2002), and RUST Environmental and Infrastructure ("Evaluation of Recovery Measures and Groundwater Flow Modeling", August 1994).

The 1992 modeling study completed by Golder Associates focused on the area of the 64(X) recovery caisson (approximately 550 by 250 feet modeling grid area), while the 1997 modeling study focused on the area around caisson 64(S), using a model area of 600 feet by 1,000 feet. The RUST modeling (1994) included a larger portion of the Site, approximately 2,300 feet by 1,200 feet. The 2002 Golder Associates model was based on the RUST 1994 model and included an update of the model with additional field data collected at the Site since 1994. The 2002 model also included simulations of additional riverbank protective measures (i.e., sheet pile walls and oil recovery measures). The current study is largely based on the 2002 model and was completed to aid the hydrogeologic design of additional groundwater and oil recovery measures in the scrapyard area of the Site.

2.0 DESCRIPTION OF EXISTING RECOVERY MEASURES

GE has implemented extensive light non-aqueous phase liquid (LNAPL) recovery systems to control and remove the LNAPL present at the Site. These systems consist of the following:

- Recovery caisson 64S equipped with lateral collection trenches, and deepened with a 1-foot diameter extraction sump to a depth of 28.5 feet below ground surface (bgs);
- Recovery well RW-1(S);
- Recovery well 64V and associated “V-shaped” slurry wall;
- Riverbank recovery wells RW-1(X) and RW-2(X)[1];
- Caisson 64R;
- Recovery system 64X consisting of 3 caissons;
- Passive LNPL recovery from selected wells; and,
- Multiple sheetpile walls in the riverbank area.

A partially penetrating “V-Shaped” slurry wall is located downgradient of recovery well 64V. The slurry wall is completed to an average depth of 28 feet below ground surface. The wall extends approximately 200 feet to the east, and 150 feet to the west of well 64V. This barrier wall, in combination with the hydraulic influence of the adjacent recharge pond, enhance the oil recovery at the 64V caisson. The water in the recharge pond is kept at a constant elevation of approximately 983 ft mean sea level (MSL).

Caisson 64S, located in the western portion of the Site, originally consisted of an 8-foot diameter caisson with five sets of collection laterals. The limited depth of the caisson (approximately 15 feet) led to the installation of a 1-foot diameter well extending to a depth of 28.5 feet bgs within the caisson.

Recovery system RW-1(S) is a 1-foot diameter well that is located to the west of 64S and was put into operation in March of 1998. It is equipped with a groundwater extraction pump and an oil recovery pump. LNAPL collection for this well occurs in conjunction with the nearby 64S recovery well.

64R recovery system is an 8-foot deep caisson with laterals extending to the southwest and northeast. This caisson has groundwater depression and LNAPL collection pumps. Nearby, well 40R is a monitoring well that was previously equipped with an automated LNAPL recovery system. Because LNAPL recovery from this well became negligible, the automated skimmer system was removed.

The river bank area includes two 6-inch recovery wells, RW-1(X) and RW-2(X), and an oil recovery system which consists of three caissons, 64X(N), 64X(S), and 64X(W). These wells are hydraulically separated from the nearby Housatonic River by a sheetpile wall. Wells RW-1(X) and RW-2(X) are pumped such that they produce overlapping cones of depression which locally reverse the natural groundwater gradient (towards the recovery wells instead of the Housatonic River). Caisson 64X(W) is also pumped to facilitate increased oil recovery in the riverbank area.

[1] Well RW-3(X) is also located adjacent to the riverbank, but is used as a DNAPL recovery well, and consequently was not included in this modeling exercise.

3.0 SITE SETTING

3.1 Geology

The Site lies within the Taconic section of the New England Physiographic Province of the eastern United States and is located in the lowlands between surrounding mountain ranges. The main water bodies in the area are the Housatonic River, which borders the Site to the south, and Silver Lake, which is located to the west of the Site.

In general, the geology at the Site is represented by crystalline carbonate bedrock of Ordovician-Cambrian age, overlain by glacial sediments of Pleistocene age, recent alluvial deposits and man-made fill. The bedrock beneath the Site is tightly folded and generally steeply dipping as a result of tectonic activity and metamorphism. The bedrock consists of quartzose calcite and dolomite marble.

During the Pleistocene Epoch, most of the New England Province was covered by continental glaciers. These glacial ice masses moved from north to south covering the underlying topography with a variably-thick, dense, glacial till mantle. During glacial retreat, outwash sediments and meltout tills were deposited on top of the dense basal till. Many present day streams occupy the courses of the glacial outwash streams. The course of the Housatonic River occupies the course of one such outwash glacial channel.

Recent alluvial deposits primarily consist of gravel and sandy material which are generally within the former meander channel of the Housatonic River. Finer overbank deposits (fine sands, silts and clays) are generally present in the floodplain areas. Above the natural sediments in portions of the Site are man-made fill materials. The fill materials are heterogeneous and exhibit variable thickness. A greater fill thickness is generally present in the vicinity of the former Housatonic River oxbow that is present at the Site.

3.2 Hydrogeology

From a hydrogeologic standpoint, the stratified drift and man-made fill form the surficial aquifer at the Site. The saturated thickness of this aquifer ranges from approximately 10 feet to 30 feet. This material overlies a dense till mantle, which is considered to be the base of the surficial aquifer. The primary groundwater flow direction at the Site is southward toward the Housatonic

River, which is the main discharge zone of the aquifer. A portion of the groundwater (from the area northwest of East Street) flows to the southwest and discharges to Silver Lake.

The hydrogeologic properties within the surficial aquifer are directly related to the subsurface geology. High hydraulic conductivity values are characteristic of the coarser outwash sediments and of the recent alluvial deposits along the former oxbow. Lower hydraulic conductivity is characteristic of finer overbank sediments.

Regionally, the glacial till and the outwash deposits are not considered productive aquifers (Norvitch, et. al., 1968). The till mantle restricts direct hydraulic connection between the surficial aquifer and deeper bedrock aquifers. Figure 2 of the report titled *Plant Site 1 Groundwater Management Area NAPL Monitoring Report for Fall 2001* (Fall 2001 NAPL Monitoring Report, Blasland, Bouck & Lee, Inc. (BBL), June 2002) depicts the current interpretation of the top of the till layer underlying GMA-1.

4.0 NUMERICAL GROUNDWATER FLOW MODELING

4.1 General

The computer code MODFLOW^{win32}, based on the widely used United States Geologic Survey computer code MODFLOW and further developed by Environmental Simulations, Inc. (1996), was used to complete the modeling exercise. The goal of the groundwater flow model was to evaluate groundwater and oil recovery measures in the scrapyard area of the Site.

MODFLOW^{win32} is a three-dimensional numerical, finite-difference groundwater flow model that considers partial penetration and steady state hydraulic head distributions. In addition, flow due to external stress such as flow to wells, area recharge, evapotranspiration and surface water bodies, can also be simulated. Both pre- and post-processing of data was completed using Groundwater Vistas Software (Environmental Simulations, Inc., 1996). Particle tracking was developed using the computer code MODPATH (Pollack, 1994). With this code, it is possible to generate three-dimensional path lines of flowing groundwater based on steady state pumping simulations developed from MODFLOW. One of the main advantages of MODPATH is the ability to evaluate capture zones of pumping wells under different scenarios.

The completed numerical groundwater flow model assumes that the aquifer is a non-leaky, unconfined aquifer and that groundwater flow occurs under steady-state conditions. The base of the aquifer was considered to be the top of the till layer, as defined in numerous boreholes completed at the site and presented on Figure 2 of the Fall 2001 NAPL Monitoring Report (BBL, 2002).

4.2 Groundwater Flow Model Set-up

As stated previously, the site-wide flow model simulations were done using an updated version of the previous model completed by Golder Associates (2002). A brief summary of the model set-up follows.

- ***Finite Difference Grid and Boundary Conditions***
  The MODFLOW^{win32} model uses a node-centered grid. For the model area (Figure A-1), a finite difference grid of 120 rows and 234 columns with an equal grid spacing of 10 feet (1,200 feet x 2,340 feet) was selected for the groundwater flow simulation. To allow the simulation of partially penetrating pumping and observation wells, layer one of the modeling grid was defined as the thickness of the aquifer generally penetrated by the pumping well screens and layer two included that part of the aquifer below the well

screens. Constant head values were assigned to each cell around the edge of the model. The recovery wells are fitted with automatic level sensors designed to activate the pumps when the groundwater reaches a particular elevation. As such, the recovery wells were incorporated into the model as constant head nodes. The slurry wall downgradient of well 64V and the additional sheetpile walls installed along the Housatonic River were modeled as vertical flow barriers with a horizontal hydraulic conductivity of $1x10^{-7}$ cm/sec using MODFLOW's Wall package. The oil collection laterals located at caissons 64R and 64S, and the collection trench between caissons 64X(W) and 64X(S), were modeled as high hydraulic conductivity zones extending from the caissons and having a hydraulic conductivity of 300 ft/day.

- ***Hydraulic Conductivity***
  The zones of hydraulic conductivity in the modeling area were based on the results of slug testing as reported in the 1997 Golder Associates Inc. model and updated using the results of slug tests performed in conjunction with the GMA 1 Baseline Monitoring Program. The results of these tests are contained in Appendix C of the report titled *Plant Site 1 Groundwater Management Area Baseline Groundwater Quality Interim Report for Fall 2001* (BBL, January 2002).

  The area to the inside of the oxbow was assigned a hydraulic conductivity value of $1x10^{-4}$ cm/sec (0.28 feet/day), typical of low energy, fine grained deposits. The oxbow itself was assigned hydraulic conductivity values typical of high-energy, coarse-grained deposits ranging, from $2.82x10^{-2}$ cm/sec (80 ft/day) corresponding to the slug test results from ES2-15, to $7.4x10^{-2}$ cm/sec (211 ft/day) for that portion of the oxbow near ES2-14. The surficial aquifer area overlying the higher elevations of the till mantle were assigned a value of $1x10^{-3}$ cm/sec (2.8 feet/day). A transitional zone in the surficial aquifer of $1.9x10^{-3}$ cm/sec (5.6 feet/day) was assigned between the higher till elevations and the oxbow. Hydraulic conductivity zones for layers one and two are shown in Attachment A on Figures A-2 and A-3, respectively.

- ***Base of the Aquifer***
  As indicated above, the base of the unconfined aquifer is considered to be the top of the till layer. Within the finite difference grid, zones of equal elevation were defined for the base of the aquifer using the interpreted till elevations shown on Figure 2 of the Fall 2001 NAPL Monitoring Report (BBL, 2002). The bottom elevation zones for layers 1 and 2 are shown in Attachment A on Figures A-4 and A-5, respectively.

- ***Precipitation Recharge***
  The net precipitation recharge assigned to the model ranged from 0 to 18 inches/year. Areas occupied by buildings or foundations were assigned a recharge rate of 0 inches/year, non-paved areas were assigned recharge rates of 18 inches/year and mixed covered areas (e.g., pavement, vegetation, etc.) were assigned recharge rates of 15 inches/year. Precipitation recharge zonation is shown in Attachment A on Figure A-6.

4.3 Groundwater Flow Model Calibration and Verification

The goal of the model calibration was to obtain values for simulated hydraulic heads and gradients that are similar to the observed data. The 2002 model was calibrated using data collected on March 21-23, 2001, to simulate higher hydraulic heads, and October 2-5, 2001, to simulate lower hydraulic heads. This model was found to closely approximate the spring and fall conditions for subsequent years. This model setting was then used to carry out the simulations for the scrapyard area pumping well scenario. Additional model verification was also carried out to demonstrate the capability of the model to simulate the Site hydrogeologic conditions.

The model verification included simulation of the 2004 conditions that correspond to significant hydrogeologic changes as a result of the Housatonic River damming implemented during the river sediment remediation activities. To simulate the 2004 higher river and groundwater elevation conditions, the following changes were made based on surface water and groundwater measurements:

- ***Fall Model Changes*** - River elevation was increased by 2.3 feet and constant head boundary elevations were increased by 2.04 feet.
- ***Spring Model Changes*** - River elevation was increased by 0.25 feet and constant head boundary elevations were increased by 1.25 feet.

The statistics for model calibration and model verification, along with the observed and simulated head values are shown in Tables B-1 through B-4 included in Attachment B of this report. The statistics for these simulations indicated residual mean values less than 1 foot and absolute residual mean less than 10% of the overall range in hydraulic head observed across the modeling area. These results indicate that the model calibration and verification are reasonably accurate.

Figure 1 presents the simulated hydraulic heads for the typical spring conditions and Figure 2 presents the simulated hydraulic heads for typical fall conditions.

4.4 Groundwater Flow Model Results

Based on the extent of LNAPL shown on Figure 5 of the Spring 2006 NAPL Monitoring Report (BBL, 2006), tracking particles were set in the model at the approximate limit of the main LNAPL plume and particle tracking simulations were completed. To capture the LNAPL identified in the scrapyard area one extraction well (RW-3) was simulated, which is located in the vicinity of the downgradient extent of the oil plume in the scrapyard area. The results of these spring and fall simulations (see Figures 3 and 4, respectively) show that full LNAPL capture is achieved by the new extraction well and by the existing active recovery systems.

The groundwater elevation in the new extraction well was set at 971.75 feet MSL for the spring simulation. This corresponds to a drawdown of about 2.5 feet. Assuming no hydraulic well losses, the simulated pumping rate for this well was 15 gallons per minute (gpm). For the fall simulation, the level in the extraction well was set to 971.0 feet MSL, corresponding to a drawdown of about 2.3 feet. The simulated pumping rate for the fall conditions was 13 gpm.

As noted in the previous groundwater flow modeling studies, during the fall groundwater conditions, several particles appear to migrate along the western side of the recharge pond and are captured by the riverbank recovery system. However, it is important to note that the particle tracking simulations depict the motion of simulated particles of water under the stresses imposed by pumping, including vertical movement. These particles are forced into layer 2 of the model as a result of the downward vertical gradients imposed by the recharge pond, and therefore, are not indicative of the actual direction of potential LNAPL movement. Furthermore, numerous monitoring wells are present along the western side of the recharge pond and LNAPL has not actually been observed in this area.

Two additional simulations were completed to evaluate a hypothetical larger extent of the oil plume in the scrapyard area. Particles were set in the immediate vicinity of wells GMA1-20, GMA1-21, GMA1-22, GMA1-23, and GMA1-24. These wells surround the LNAPL plume in the scrapyard area and have not detected free-phase LNAPL. The results of these additional simulations show complete hydraulic capture in the scrapyard area, even with the hypothetically larger LNAPL plume. Figures 5 and 6 show the simulation results for spring and fall conditions, respectively.

5.0 SUMMARY

A revised numerical groundwater flow model was constructed for the East Street Area 2-South portion of GMA 1. The model grid covers an area of 2,340 feet by 1,200 feet, and consists of 120 rows and 234 columns with an equal grid spacing of 10 feet. To allow the simulation of partially penetrating pumping and observation wells, layer one of the modeling grid was defined as the thickness of the aquifer penetrated by the groundwater pumping well screens and layer two included that part of the aquifer below the well screens. The 2002/2006 model includes updated settings based on additional field data collected since 1994, including drilling and installation of new monitoring and recovery wells, and incorporates a revised top of till surface depicted on Figure 2 of the Fall 2001 NAPL Monitoring Report (BBL, 2002). Additionally, along the riverbank, several areas have been further protected by the installation of sheetpile walls. These protective measures are also incorporated into the 2002/2006 model.

The 2002/2006 model was calibrated using data collected on March 21-23, 2001, to simulate higher hydraulic heads, and October 2-5, 2001, to simulate lower hydraulic heads. The model was found to closely approximate the spring and fall conditions for subsequent years. Additional model verification was also carried out to demonstrate the capability of the model to simulate the Site hydrogeologic conditions. The 2002/2006 model verification included simulation of the 2004 conditions that correspond to significant hydrogeologic changes as a result of the Housatonic River damming implemented during the river sediment remediation activities. The 2002/2006 model was then used to perform simulations for the additional scrapyard area recovery well design.

To capture the LNAPL recently identified in the scrapyard area, one additional extraction well is adequate. This well is located in the vicinity of the downgradient extent of the oil plume in the scrapyard area. Complete capture of LNAPL was simulated by setting 2.3 feet to 2.5 feet of drawdown in the new well (groundwater elevations of 971 to 971.75 feet MSL) for fall and spring conditions, respectively. The simulated pumping rates for this well ranged from 13 gpm to 15 gpm for fall and spring conditions, respectively. Additional simulations were also completed to evaluate a hypothetically larger extent of the oil plume in the scrapyard area. The results of these additional simulations also show complete hydraulic capture of a hypothetically larger LNAPL plume.

Since the model does not account for hydraulic losses in the pumping well, the actual groundwater level in the extraction well should be set lower than the simulated levels of 971 – 971.75 feet MSL. In addition, the actual field setting should be verified by hydraulically testing the proposed new extraction well and the resultant drawdown of nearby monitoring wells. A step-drawdown test and a constant rate pumping test should be conducted in the new extraction well following well installation and well development.

Should you have any questions or require additional information please do not hesitate to contact us.

Very truly yours,

GOLDER ASSOCIATES INC.

Jarrett Elsea
Project Hydrogeologist

Florin Gheorghiu, C.P.G.
Principal

g:\projects\063-6424 gw-model pittsfield\gw-model 2006\fg\draft report\rpt 2006 text draft.doc

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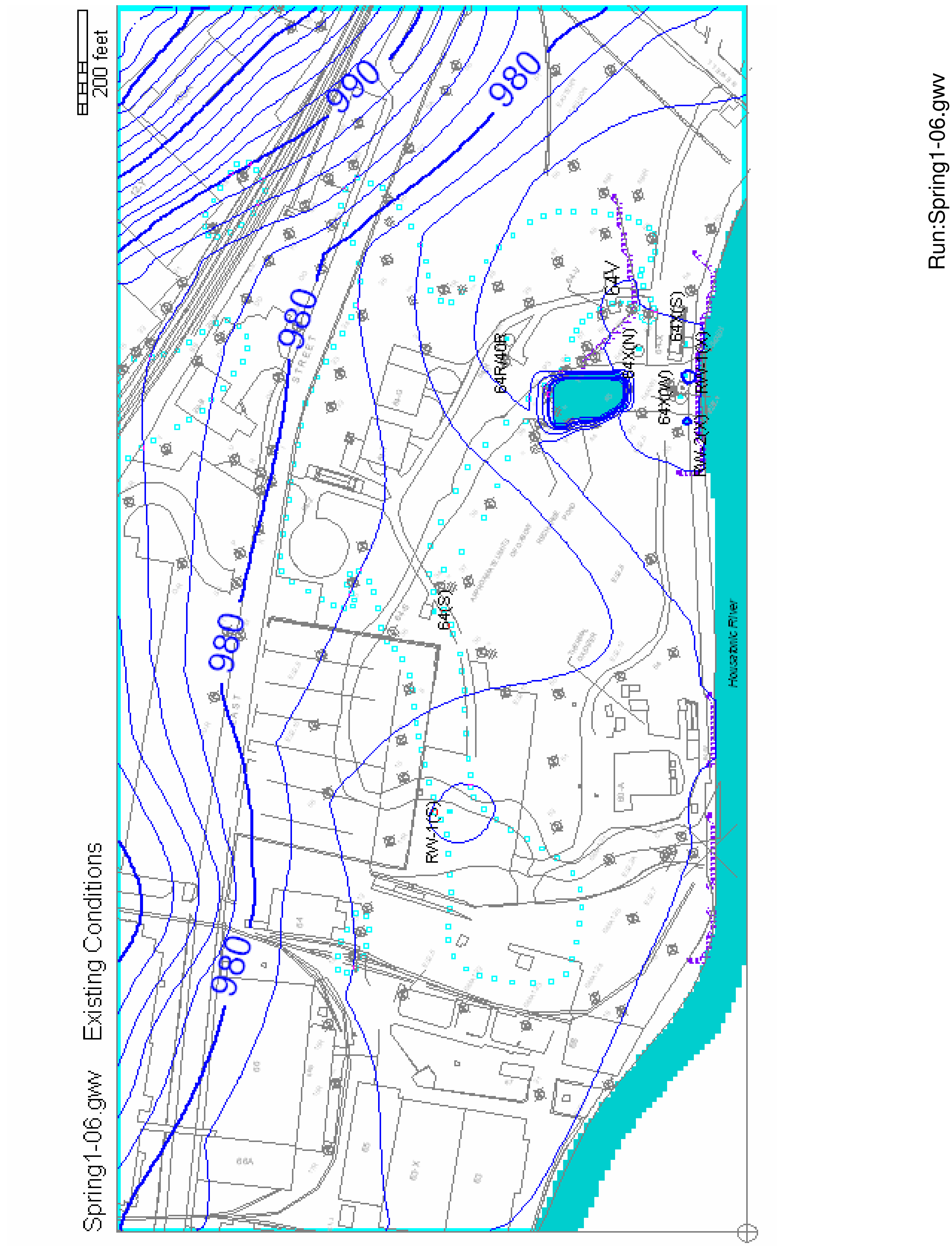
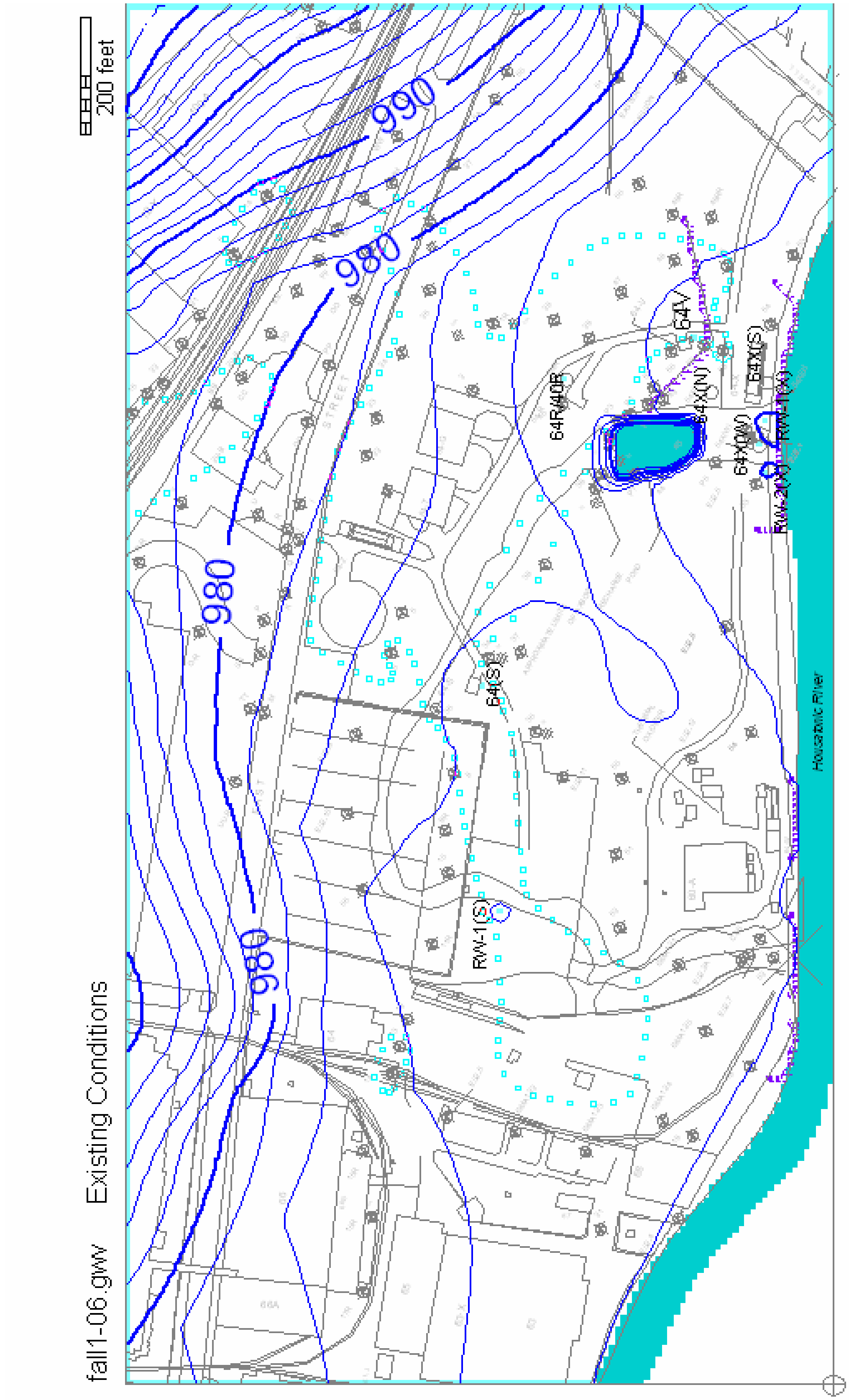


JOB No.: 063-6424	SCALE: AS SHOWN	**Simulated Hydraulic Heads and Particle Starting Locations - Spring**
DR BY: FG	DATE: 10/16/06	
CHK BY: JJE	FILE No.: Figures 1 to 6.doc	
REV BY: FG	DIRECTORY: 063-6424\2006 Model	

Golder Associates	**GENERAL ELECTRIC**	FIGURE: **1**



Run: fall 1-06.gwv

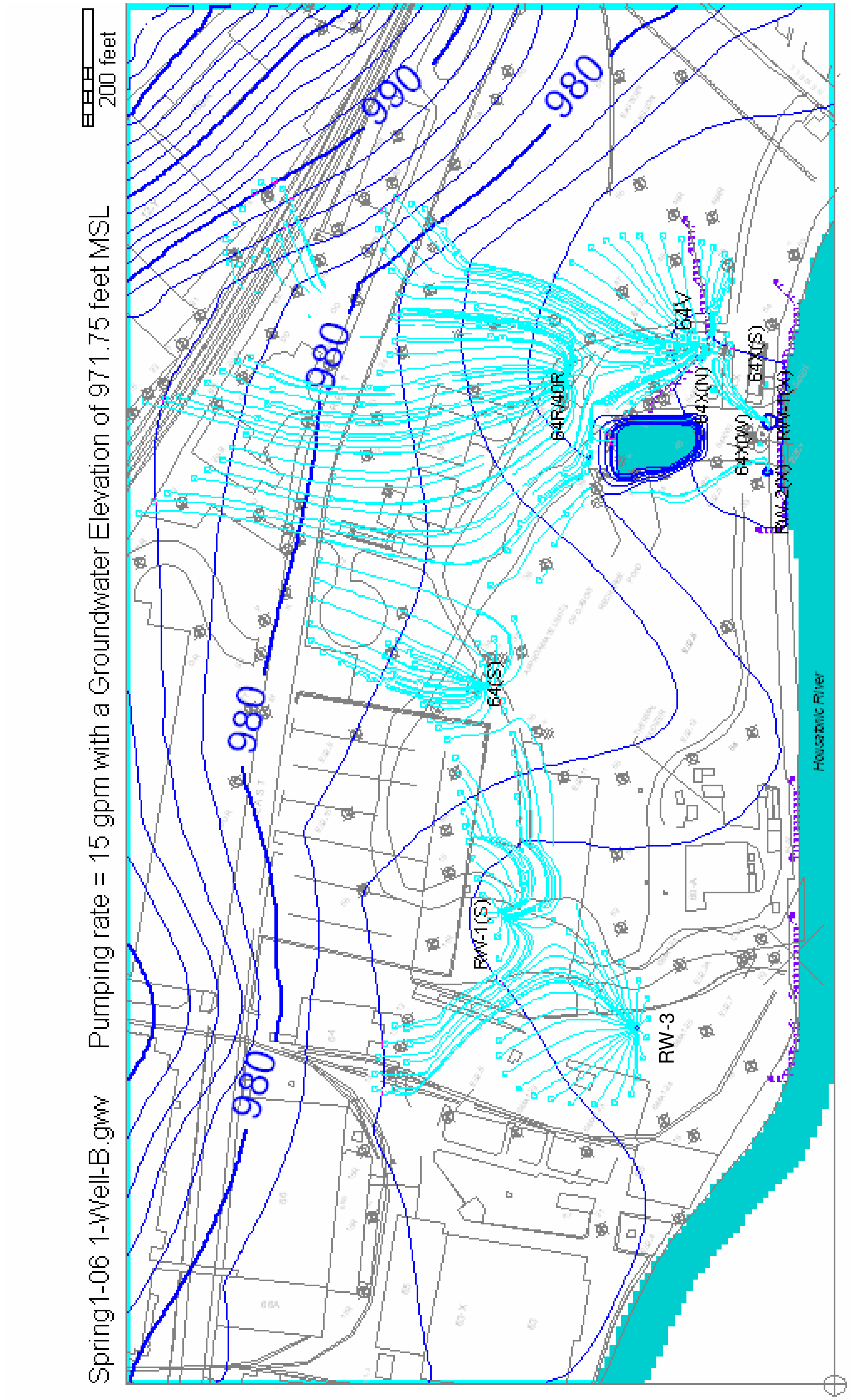
JOB No.:	063-6424	SCALE:	AS SHOWN
DR BY:	FG	DATE:	10/16/06
CHK BY:	JJE	FILE No.:	Figures 1 to 6.doc
REV BY:	FG	DIRECTORY:	063-6424\2006 Model

Simulated Hydraulic Heads and Particle Starting Locations - Fall

Golder Associates

GENERAL ELECTRIC

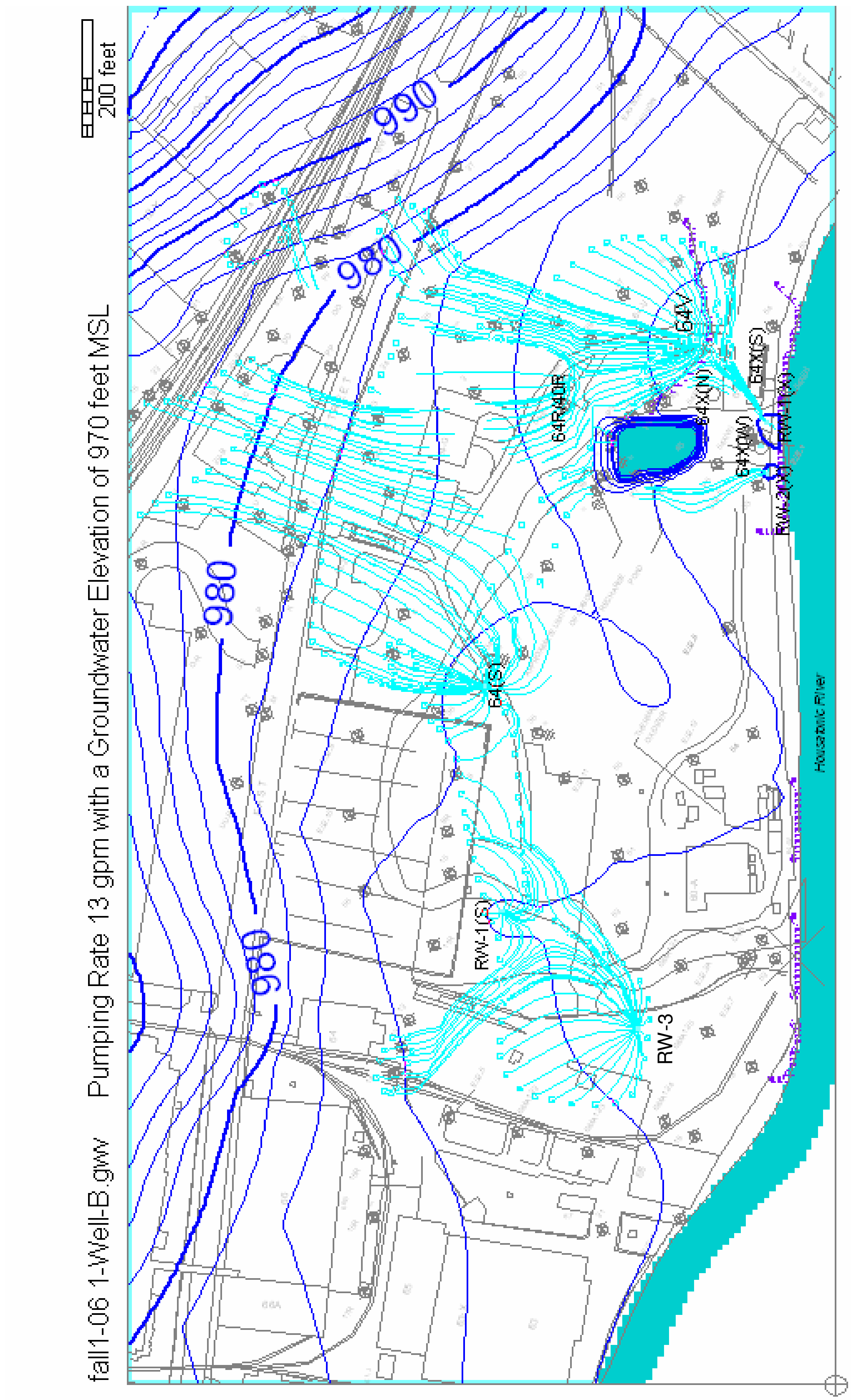
FIGURE: **2**



Run:Spring1-06 1Well B.gwv

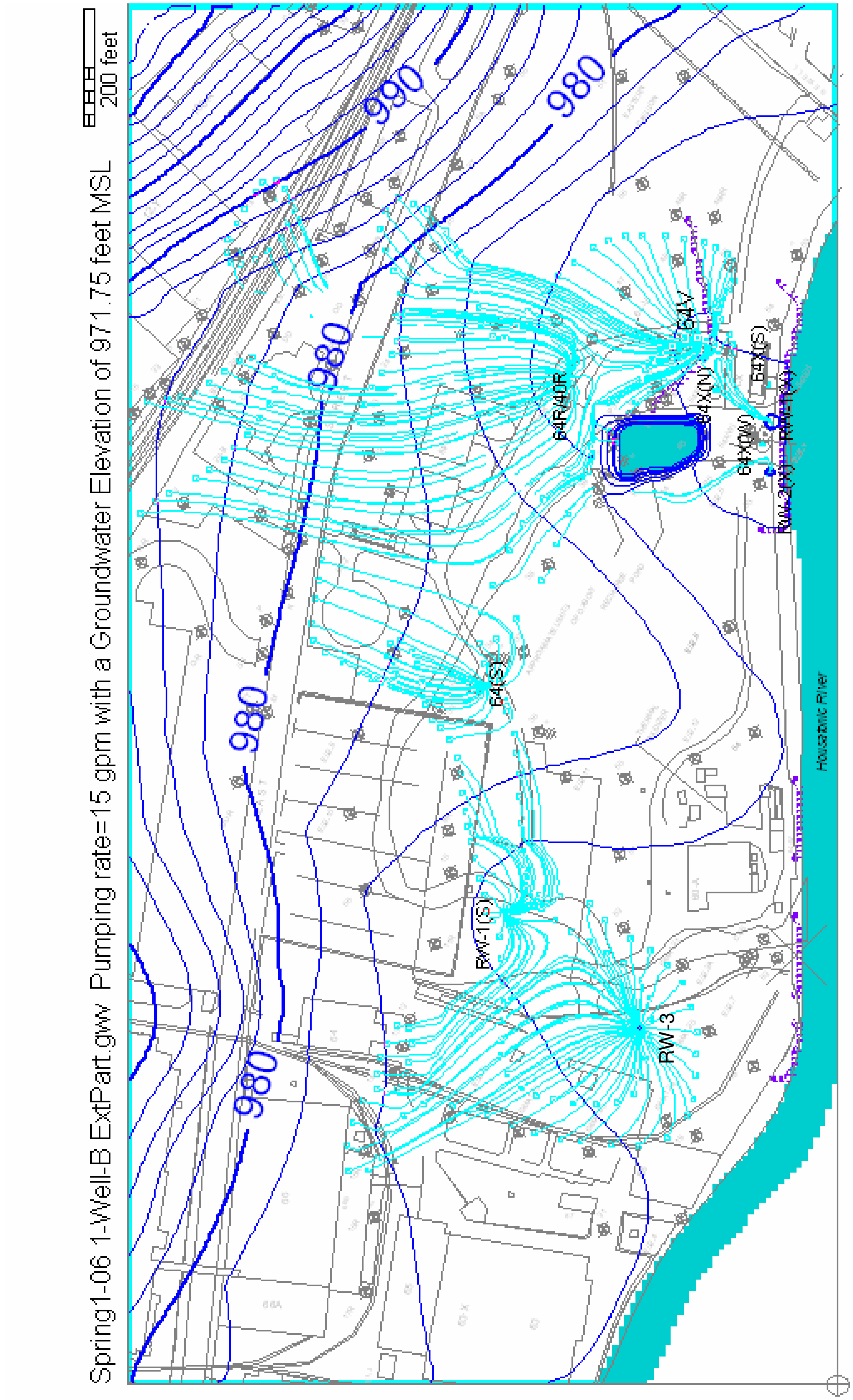
JOB No.:	063-6424	SCALE:	AS SHOWN	**Particle Tracking Results Spring**
DR BY:	FG	DATE:	10/16/06	
CHK BY:	JJE	FILE No.:	Figures 1 TO 6.doc	
REV BY:	FG	DIRECTORY:	063-6424\2006 Model	

Golder Associates	**GENERAL ELECTRIC**	FIGURE: **3**



Run: fall 1-06 1Well B.gwv

JOB No.: 063-6424	SCALE: AS SHOWN	**Particle Tracking Results Fall**	
DR BY: FG	DATE: 10/16/06		
CHK BY: JJE	FILE No.: Figures 1 to 6.doc		
REV BY: FG	DIRECTORY: 063-6424\2006 Model		
Golder Associates		**GENERAL ELECTRIC**	FIGURE: **4**



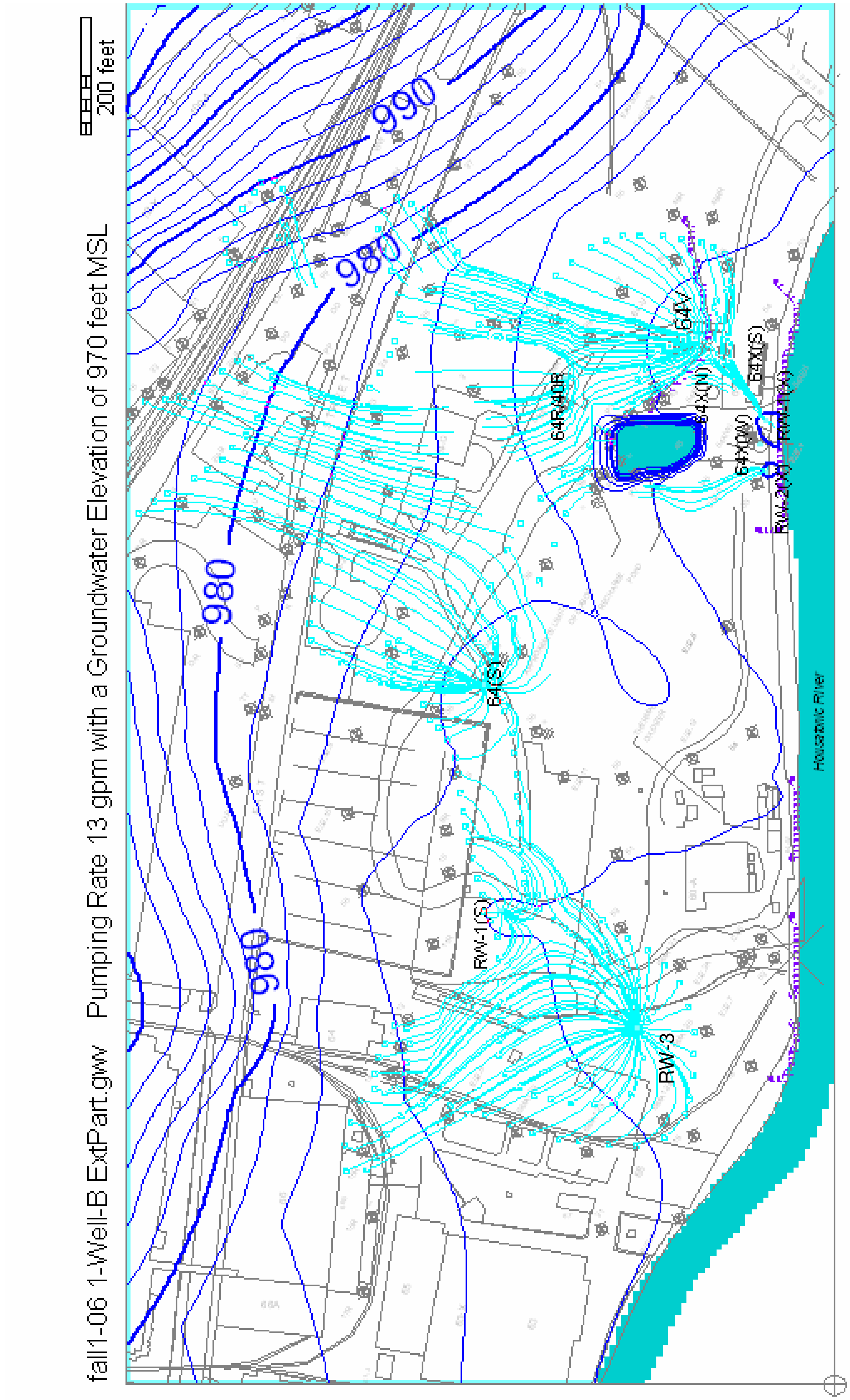
JOB No.: 063-6424	SCALE: AS SHOWN
DR BY: FG	DATE: 10/16/06
CHK BY: JJE	FILE No.: Figures 1 to6.doc
REV BY: FG	DIRECTORY: 063-6242\2006 Model

Particle Tracking Results - Spring Extended Particle Release Area

Golder Associates

GENERAL ELECTRIC

FIGURE: **5**



Run: fall 1-06 1Well B ExtPart.gwv

JOB No.:	063-6424	SCALE:	AS SHOWN
DR BY:	FG	DATE:	10/16/06
CHK BY:	JJE	FILE No.:	Figures 1 to 6.doc
REV BY:	FG	DIRECTORY:	063-6424\2006 Model

Particle Tracking Results - Fall Extended Particle Release Area

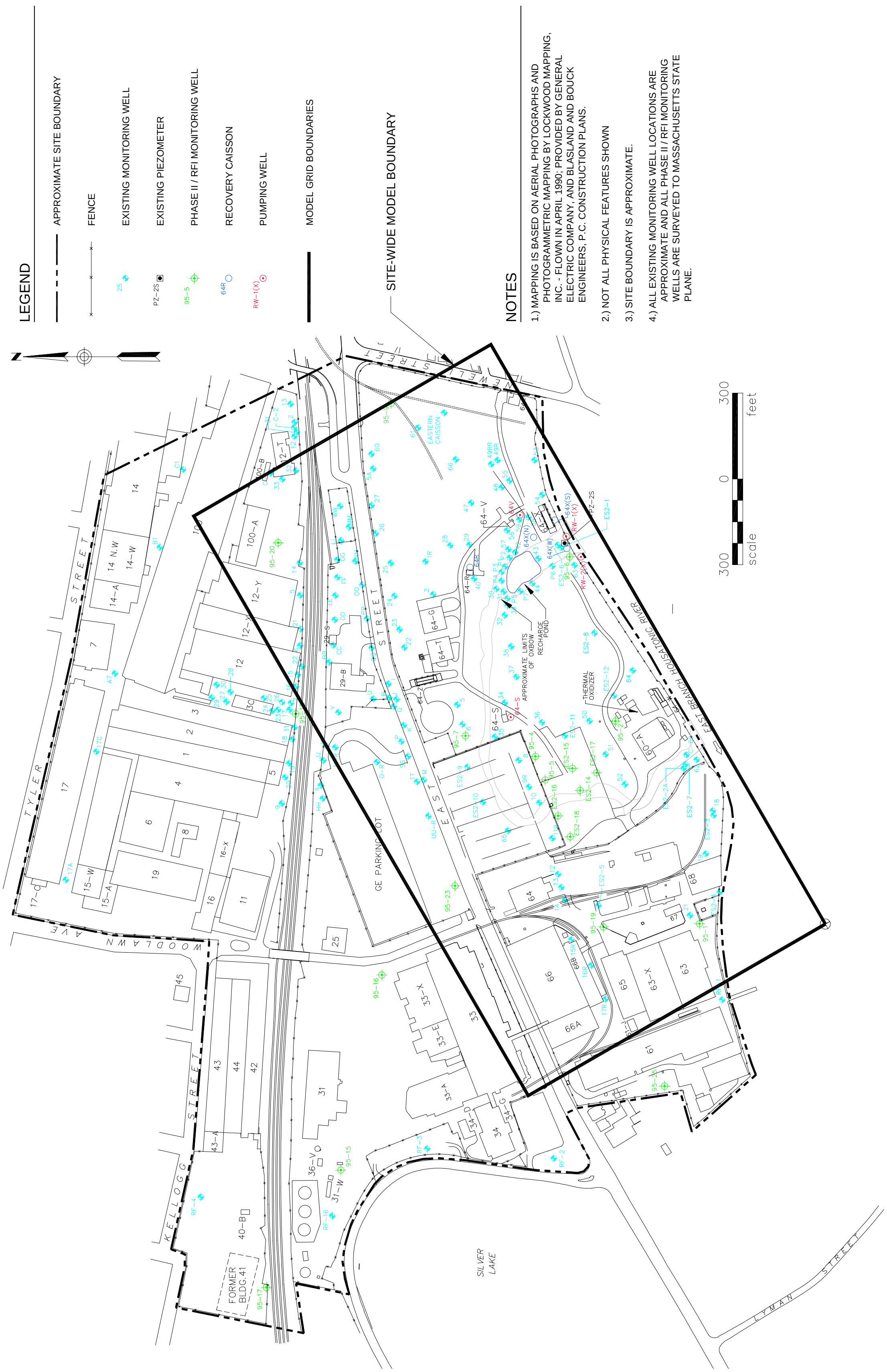
Golder Associates

GENERAL ELECTRIC

FIGURE: **6**

ATTACHMENT A

GROUNDWATER FLOW MODEL SET-UP



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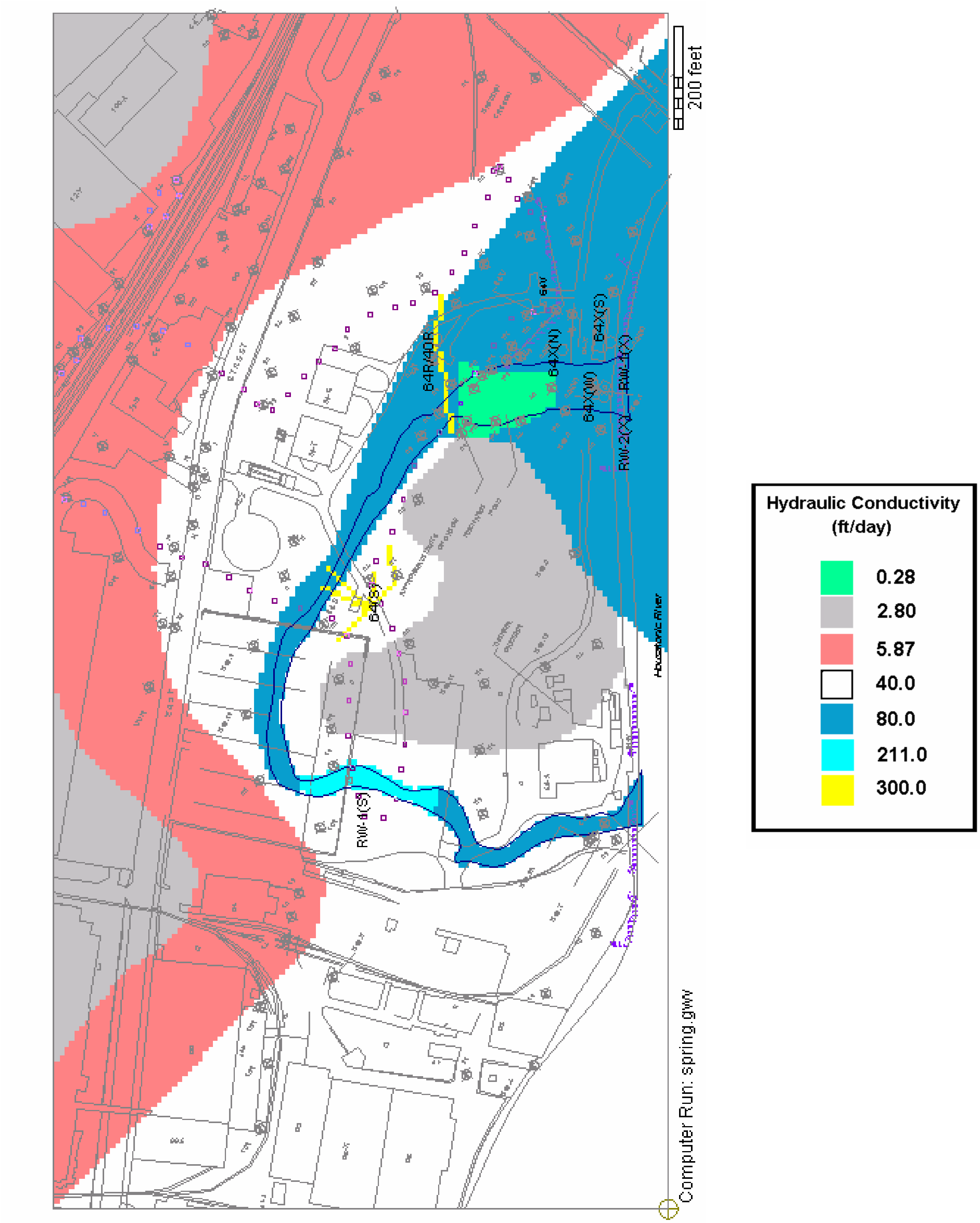
DR BY: FG	DATE: 10/16/06
CHK BY: JJE	FILE No.: Figure A1.doc
REV BY: FG	DIRECTORY: 063-6424\2006 Model

Site Layout and Model Grid Boundary

Golder Associates

GENERAL ELECTRIC

FIGURE: **A-1**



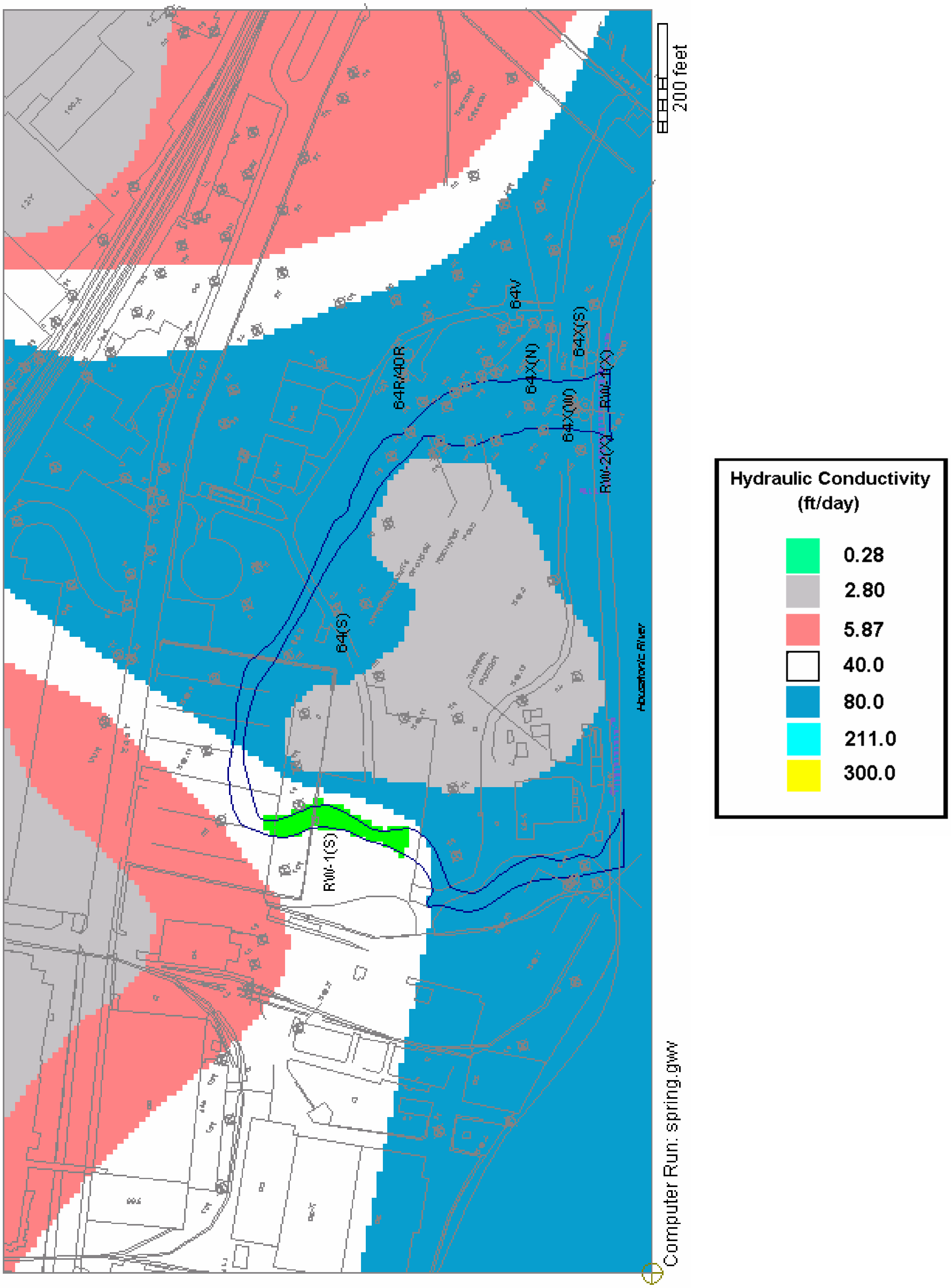
JOB No.: 063-6242	SCALE: AS SHOWN
DR BY: FG	DATE: 10/16/06
CHK BY: JJE	FILE No.: APPENDIX A.doc
REV BY: FG	DIRECTORY: 063-6424\2006 Model

SIMULATED HYDRAULIC CONDUCTIVITY ZONES – LAYER ONE

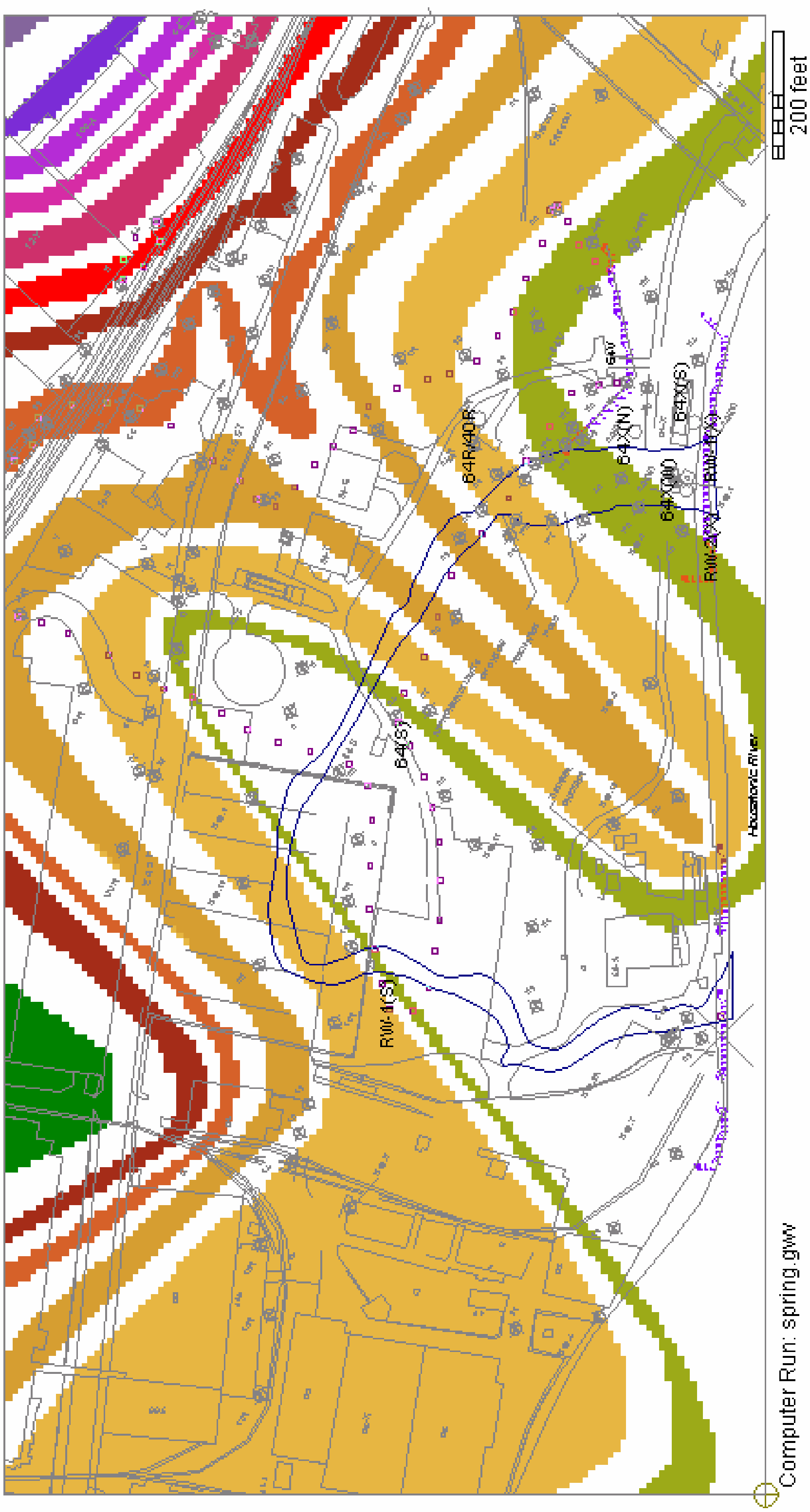
Golder Associates

GENERAL ELECTRIC

FIGURE: **A-2**



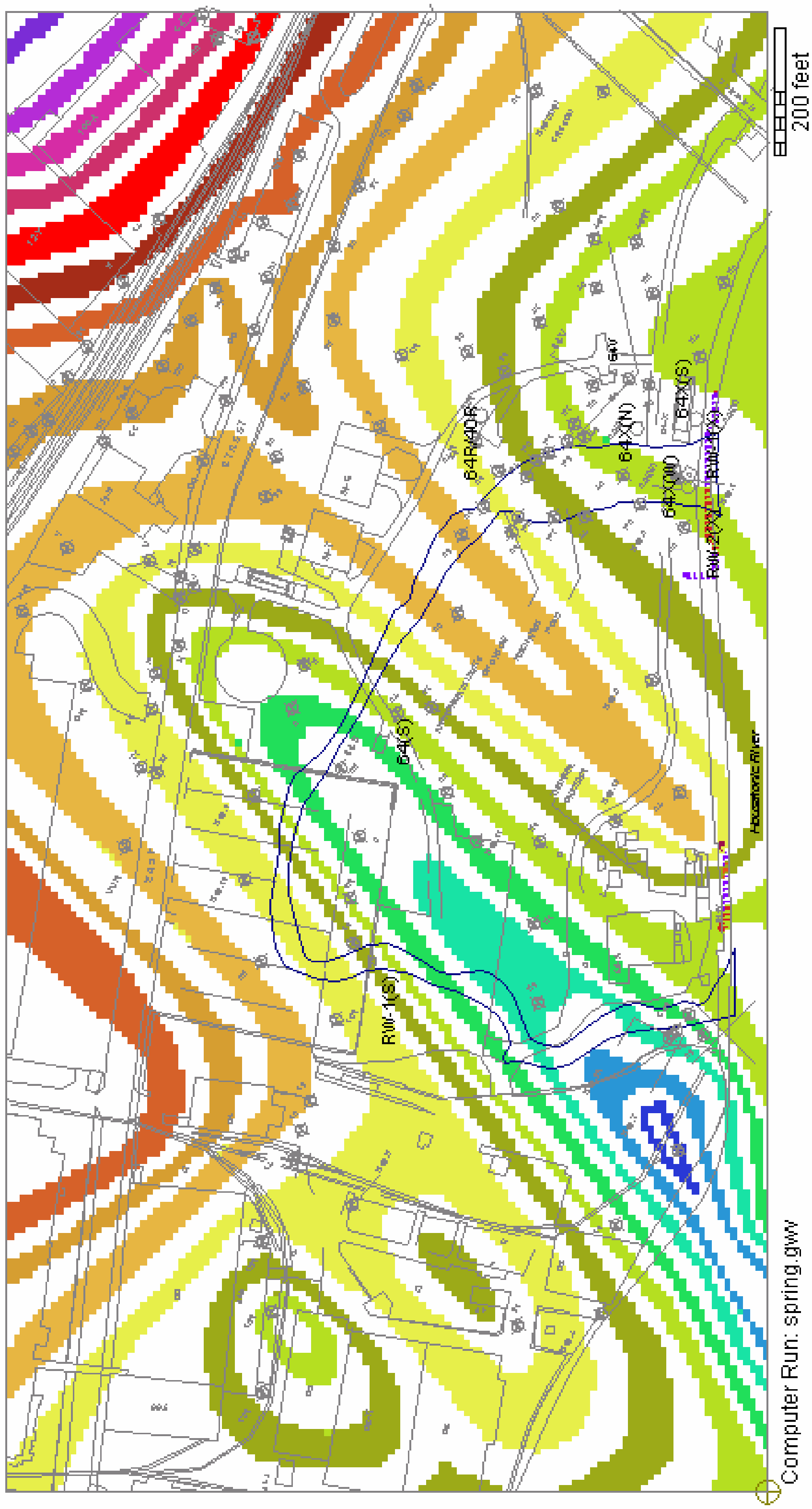
JOB No.: 063-6424	SCALE: AS SHOWN	SIMULATED HYDRAULIC CONDUCTIVITY ZONES – LAYER TWO	
DR BY: FG	DATE: 10/16/06		
CHK BY: JJE	FILE No.: APPENDIX A.doc		
REV BY: FG	DIRECTORY: 063-6424\2006 Model		
Golder Associates		GENERAL ELECTRIC	FIGURE: A-3



Elevation (ft AMSL)

932.5
937.5
942.5
947.5
952.5
957.5
962.5
967.5
972.5
977.5
982.5
987.5
992.5
997.5
1003
1008

JOB No.: 063-6424	SCALE: AS SHOWN	**BOTTOM ELEVATION – LAYER ONE**	
DR BY: FG	DATE: 10/16/06		
CHK BY: JJE	FILE No.: APPENDIX A.doc		
REV BY: FG	DIRECTORY: 063-6424\2006 Model		
Golder Associates		**GENERAL ELECTRIC**	FIGURE: A-4



Elevation (ft AMSL)

	932.5
	937.5
	942.5
	947.5
	952.5
	957.5
	962.5
	967.5
	972.5
	977.5
	982.5
	987.5
	992.5
	997.5
	1003
	1008

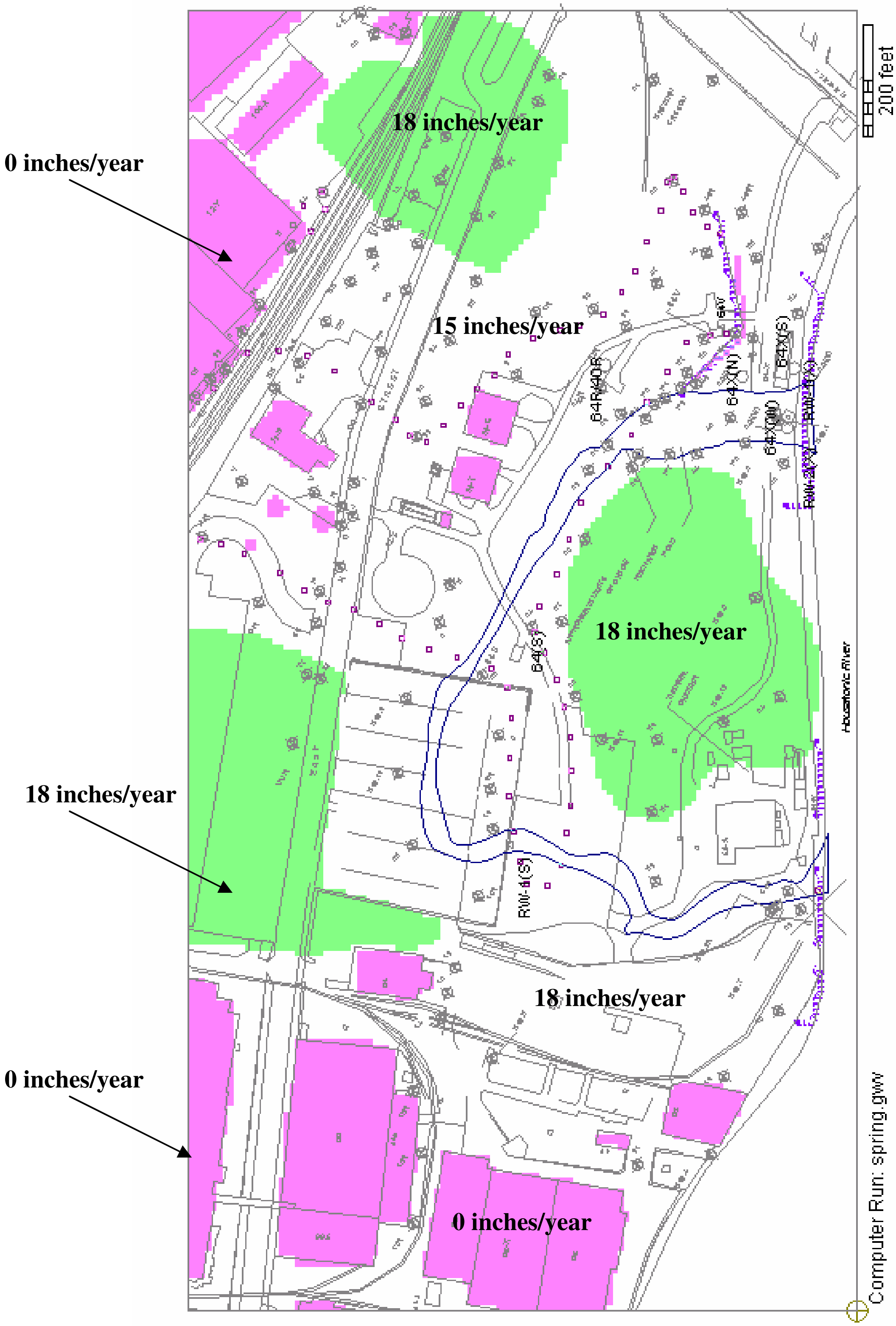
JOB No.:	063-6424	SCALE:	AS SHOWN
DR BY:	FG	DATE:	10/16/06
CHK BY:	JJE	FILE No.:	APPENDIX A.doc
REV BY:	FG	DIRECTORY:	063-6424\2006 Model

BOTTOM ELEVATION – LAYER TWO

Golder Associates

GENERAL ELECTRIC

FIGURE: A-5



JOB No.: 063-6424	SCALE: AS SHOWN
DR BY: FG	DATE: 10/16/06
CHK BY: JJE	FILE No.: APPENDIX A.doc
REV BY: FG	DIRECTORY: 063-6424\2006 Model

RECHARGE ZONES

Golder Associates

GENERAL ELECTRIC

FIGURE: **A-6**

ATTACHMENT B

GROUNDWATER FLOW CALIBRATION AND VERIFICATION RESULTS

Table B-1
Statistical Summary of Model Calibration
Spring 2001

Well ID	Hydraulic Head Observed (ft MSL)	Hydraulic Head Computed (ft MSL)	Residual (ft)
2	976.93	977.07	-0.14
5	977.62	978.32	-0.70
6	977.05	978.19	-1.14
13	973.24	975.86	-2.62
14	973.50	976.02	-2.52
29	973.24	974.61	-1.37
32	979.89	976.27	3.62
35	972.98	977.47	-4.49
36	974.36	976.78	-2.42
37	975.13	977.11	-1.98
38	977.01	977.37	-0.36
42	974.75	973.83	0.92
47	973.28	974.15	-0.87
48	972.60	973.84	-1.23
50	975.81	975.71	0.10
51	973.99	974.24	-0.25
55	972.74	973.60	-0.86
56	977.52	973.32	4.20
58	972.58	972.80	-0.22
59	971.35	972.66	-1.31
63	973.16	971.47	1.69
66	973.46	974.48	-1.02
05-N	984.65	986.11	-1.46
15R	975.63	976.28	-0.65
E2SC-17	973.56	973.12	0.44
E2SC-23	975.24	973.26	1.98
E2SC-24	973.91	973.68	0.23
ES2-01	974.68	972.18	2.50
HR-G1-MW-1	973.60	974.00	-0.40
HR-G1-MW-2	973.69	974.07	-0.38
HR-G1-MW-3	973.42	974.05	-0.63
HR-G2-MW-1	973.35	973.98	-0.63
HR-G2-MW-2	973.50	973.99	-0.49
HR-G2-RW-1	972.28	973.94	-1.66
HR-G3-RW-1	973.37	973.98	-0.61
PZ-1S	973.44	971.51	1.93
TMP-1	973.07	974.28	-1.21

Statistical Summary

Residual Mean	-0.38
Residual Standard Deviation	1.68
Sum of Squares	109.90
Absolute Residual Mean	1.33
Mimimum Residual	-4.49
Maximum Residual	4.20
Range	13.30
Head Range/Standard Deviation	0.13

Table B-2
Statistical Summary of Model Calibration
Fall 2001

Well ID	Hydraulic Head Observed (ft MSL)	Hydraulic Head Computed (ft MSL)	Residual (ft)
2.00	975.57	974.36	1.21
5.00	975.79	976.33	-0.54
6.00	973.83	976.19	-2.36
13.00	972.60	974.18	-1.58
14.00	973.01	974.40	-1.39
28.00	974.27	972.20	2.07
29.00	972.33	971.50	0.83
32.00	977.21	973.51	3.70
35.00	973.67	975.34	-1.67
36.00	972.99	974.53	-1.54
37.00	973.08	974.80	-1.72
38.00	973.99	972.50	1.49
42.00	973.75	971.13	2.62
44.00	974.08	976.47	-2.39
47.00	972.28	971.73	0.55
48.00	971.98	971.63	0.35
50.00	974.41	973.74	0.67
51.00	972.57	972.28	0.29
53.00	972.09	971.80	0.29
54.00	971.66	971.24	0.42
55.00	972.05	971.58	0.47
58.00	972.00	970.63	1.37
59.00	971.26	970.48	0.78
62.00	972.08	972.01	0.07
63.00	971.78	969.43	2.35
64.00	971.90	972.77	-0.87
66.00	972.50	972.57	-0.07
05-N	984.51	985.00	-0.49
09R	972.43	973.68	-1.25
15R	972.75	974.84	-2.09
3-6C-EB-14	973.14	971.93	1.21
49R	972.25	971.98	0.27
49RR	972.21	971.90	0.31
95-23	988.03	985.00	3.03
C60	973.47	972.03	1.44
ES2-01	972.22	970.07	2.15
ES2-02A	972.03	972.06	-0.03
ES2-04	972.72	971.91	0.81
ES2-05	972.96	973.81	-0.85

Table B-2
Statistical Summary of Model Calibration
Fall 2001

Well ID	Hydraulic Head Observed (ft MSL)	Hydraulic Head Computed (ft MSL)	Residual (ft)
ES2-06	972.21	969.41	2.80
ES2-07	972.42	972.05	0.37
ES2-08	972.33	971.77	0.56
ES2-17	972.61	972.14	0.47
ES2C-17	972.01	970.91	1.10
ES2C-23	972.97	971.19	1.78
ES2C-24	971.83	971.70	0.13
ES2C-25	975.55	974.96	0.59
HR-G1-MW-1	971.77	971.97	-0.20
HR-G1-MW-2	971.88	972.08	-0.20
HR-G1-MW-3	971.60	971.99	-0.39
HR-G2-MW-1	971.60	971.97	-0.37
HR-G2-MW-2	972.23	971.98	0.25
HR-G2-MW-3	972.04	971.95	0.09
HR-G2-RW-1	970.14	971.93	-1.79
HR-G3-MW-2	971.98	971.93	0.05
HR-G3-RW-1	972.06	972.01	0.05
PZ-1S	971.64	969.36	2.28
PZ-6S	971.48	969.08	2.40
RB-01	971.56	969.00	2.56
TMP-1	972.19	972.35	-0.16

Statistical Summary	
Residual Mean	0.37
Residual Standard Deviation	1.38
Sum of Squares	123.17
Absolute Residual Mean	1.10
Mimimum Residual	-2.39
Maximum Residual	3.70
Range	17.89
Head Range/Standard Deviation	0.08

Table B-3
Statistical Summary of Model Calibration/Varification
Spring 2004

WELL ID	X-Coordinate (Model)	Y-Coordinate (Model)	Observed Groundwater Fall 2004 [feet MSL]	Computed Groundwater Fall 2004 [feet MSL]	Residual (obs-comp) [feet]
2	1683.75	612.25	979.99	977.10	2.89
6	1240.40	749.96	978.80	977.35	1.45
10	867.48	652.66	975.35	974.54	0.81
13	573.38	735.88	975.87	976.35	-0.48
14	527.51	747.34	976.31	976.60	-0.29
19	422.99	238.51	974.57	973.87	0.70
28	1802.69	473.08	978.94	975.42	3.52
29	1771.72	414.59	974.95	974.80	0.15
34	1230.92	583.51	977.06	975.43	1.63
35	1145.22	674.27	976.77	976.27	0.50
36	1107.02	504.61	976.57	975.40	1.17
37	1238.23	531.41	976.03	975.87	0.16
38	1388.47	490.13	977.54	976.59	0.95
42	1675.04	308.01	977.78	974.13	3.65
44	1544.66	290.74	977.67	977.71	-0.04
47	1894.25	336.56	974.80	974.53	0.27
48	1904.89	271.00	974.52	974.34	0.18
50	1027.12	358.81	976.78	975.35	1.43
51	897.53	367.99	975.42	974.17	1.25
52	773.81	362.20	975.08	974.07	1.01
53	1912.78	71.72	976.60	973.95	2.65
54	1795.81	107.26	973.32	973.51	-0.19
55	1895.58	181.80	973.78	974.06	-0.28
57	1694.02	330.43	979.13	974.24	4.89
58	1751.08	187.23	974.15	973.23	0.92
59	1760.26	219.64	972.9	973.23	-0.33
64	1103.84	138.22	973.25	974.50	-1.25
09R	940.11	658.22	975.07	975.31	-0.24
15R	395.63	795.51	975.84	977.08	-1.24
16R	285.07	781.29	977.29	977.25	0.04
3-6C-EB-14	345.71	230.11	974.83	973.74	1.09
3-6C-EB-22	167.86	347.62	974.14	973.89	0.25
49R	1982.70	274.69	974.72	974.60	0.12
49RR	1978.55	207.61	974.76	974.46	0.30
64X(N)	1681.02	208.87	974.52	973.03	1.49
95-1	222.31	384.84	973.91	974.38	-0.47
95-4	1027.26	591.53	975.41	975.53	-0.12
95-5	926.92	600.42	974.99	974.47	0.52
95-7	1193.99	766.50	976.68	977.29	-0.61
E2SC-03I	1734.18	95.91	973.75	973.05	0.70

Table B-3
Statistical Summary of Model Calibration/Varification
Spring 2004

WELL ID	X-Coordinate (Model)	Y-Coordinate (Model)	Observed Groundwater Fall 2004 [feet MSL]	Computed Groundwater Fall 2004 [feet MSL]	Residual (obs-comp) [feet]
E2SC-17	1751.28	98.30	973.81	973.23	0.58
E2SC-21	921.99	282.73	973.87	974.30	-0.43
E2SC-23	1429.14	128.28	976.45	973.25	3.20
E2SC-24	1883.82	93.07	973.72	973.90	-0.18
ES2-01	1561.86	199.00	974.00	972.53	1.47
ES2-02A	718.63	156.98	974.12	973.89	0.23
ES2-05	451.91	654.74	975.28	975.95	-0.67
ES2-06	1614.61	147.39	973.85	971.93	1.92
ES2-08	1283.88	180.62	975.07	973.67	1.40
ES2-09	1101.20	808.99	979.23	977.42	1.81
ES2-11	1029.00	458.97	975.75	975.27	0.48
ES2-16	792.74	625.66	976.58	974.29	2.29
ES2-18	710.44	611.58	974.59	974.50	0.09
GMA1-14	1641.12	741.48	980.19	979.13	1.06
GMA1-15	535.71	534.09	974.62	974.95	-0.33
GMA1-16	673.17	344.29	974.82	974.08	0.74
GMA1-17E	1525.74	574.05	978.88	976.87	2.01
GMA1-17W	1512.68	580.36	978.83	976.97	1.86
HR-G1-MW-1	801.59	80.26	973.11	973.76	-0.65
HR-G1-MW-2	977.92	81.18	973.33	973.89	-0.56
HR-G1-MW-3	881.89	76.57	972.87	973.78	-0.91
HR-G2-MW-1	659.38	85.80	972.78	973.77	-0.99
HR-G2-MW-2	709.24	76.57	974.12	973.79	0.33
HR-G2-MW-3	586.43	83.95	973.52	973.75	-0.23
HR-G2-RW-1	510.71	119.04	973.12	973.73	-0.61
HR-G3-MW-2	538.41	86.72	973.53	973.73	-0.20
HR-G3-RW-1	1041.17	86.01	973.96	973.79	0.17
PZ-1S	1518.09	110.73	973.74	971.82	1.92
PZ-6S	1608.20	124.24	973.23	971.52	1.71
TMP-1	2027.59	300.04	974.1	974.92	-0.82

Statistical Summary	
Residual Mean	0.65
Residual Standard Deviation	1.23
Sum of Squares	135.23
Absolut Residual Mean	1.00
Minimum Residual	-1.25
Maximum Residual	4.89
Range	7.41
Standard Deviation / Head Range	0.17

Table B-4
Statistical Summary of Model Calibration/Varification
Fall 2004

WELL ID	X-Coordinate (Model)	Y-Coordinate (Model)	Observed Groundwater Fall 2004 [feet MSL]	Computed Groundwater Fall 2004 [feet MSL]	Residual (obs-comp) [feet]
2	1683.75	612.25	979.29	977.71	1.58
6	1240.40	749.96	978.74	977.87	0.87
10	867.48	652.66	975.07	975.14	-0.07
13	573.38	735.88	975.00	976.58	-1.58
14	527.51	747.34	975.50	976.75	-1.25
19	422.99	238.51	974.03	974.36	-0.33
28	1802.69	473.08	978.67	976.08	2.59
29	1771.72	414.59	974.87	975.44	-0.57
34	1230.92	583.51	975.29	976.09	-0.80
35	1145.22	674.27	976.52	976.86	-0.34
36	1107.02	504.61	975.67	976.04	-0.37
37	1238.23	531.41	975.45	976.50	-1.05
38	1388.47	490.13	976.78	977.11	-0.33
42	1675.04	308.01	976.89	974.75	2.14
44	1544.66	290.74	976.76	978.02	-1.26
47	1894.25	336.56	974.68	975.03	-0.35
48	1904.89	271.00	977.79	974.77	3.02
50	1027.12	358.81	976.26	975.90	0.36
51	897.53	367.99	974.96	974.72	0.24
52	773.81	362.20	974.63	974.60	0.03
53	1912.78	71.72	974.42	974.22	0.20
54	1795.81	107.26	973.98	973.99	-0.01
55	1895.58	181.80	974.12	974.35	-0.23
57	1694.02	330.43	978.66	974.87	3.79
58	1751.08	187.23	974.10	973.79	0.31
59	1760.26	219.64	972.81	973.89	-1.08
64	1103.84	138.22	973.31	975.01	-1.70
09R	940.11	658.22	974.89	975.90	-1.01
15R	395.63	795.51	975.24	977.02	-1.78
16R	285.07	781.29	976.85	977.10	-0.25
3-6C-EB-14	345.71	230.11	974.32	974.24	0.08
3-6C-EB-22	167.86	347.62	974.52	974.30	0.22
49R	1982.70	274.69	974.58	974.88	-0.30
49RR	1978.55	207.61	974.61	974.58	0.03
64X(N)	1681.02	208.87	974.17	973.64	0.53
95-1	222.31	384.84	975.16	974.65	0.51
95-4	1027.26	591.53	975.22	976.14	-0.92
95-5	926.92	600.42	975.02	975.06	-0.04
95-7	1193.99	766.50	976.40	977.82	-1.42
E2SC-03I	1734.18	95.91	974.28	973.61	0.67

Table B-4
Statistical Summary of Model Calibration/Varification
Fall 2004

WELL ID	X-Coordinate (Model)	Y-Coordinate (Model)	Observed Groundwater Fall 2004 [feet MSL]	Computed Groundwater Fall 2004 [feet MSL]	Residual (obs-comp) [feet]
E2SC-17	1751.28	98.30	975.23	973.76	1.47
E2SC-21	921.99	282.73	974.31	974.84	-0.53
E2SC-23	1429.14	128.28	975.88	973.81	2.07
E2SC-24	1883.82	93.07	974.03	974.22	-0.19
ES2-01	1561.86	199.00	974.76	973.17	1.59
ES2-02A	718.63	156.98	974.45	974.41	0.04
ES2-05	451.91	654.74	975.36	976.07	-0.71
ES2-06	1614.61	147.39	974.57	972.62	1.95
ES2-08	1283.88	180.62	974.08	974.21	-0.13
ES2-09	1101.20	808.99	978.41	977.96	0.45
ES2-11	1029.00	458.97	974.46	975.86	-1.40
ES2-16	792.74	625.66	976.73	974.88	1.85
ES2-18	710.44	611.58	974.54	975.01	-0.47
GMA1-15	535.71	534.09	974.85	975.28	-0.43
GMA1-16	673.17	344.29	975.02	974.59	0.43
GMA1-17E	1525.74	574.05	978.48	977.44	1.04
GMA1-17W	1512.68	580.36	978.32	977.53	0.79
HR-G1-MW-1	801.59	80.26	974.54	974.29	0.25
HR-G1-MW-2	977.92	81.18	974.14	974.42	-0.28
HR-G1-MW-3	881.89	76.57	974.58	974.31	0.27
HR-G2-MW-1	659.38	85.80	974.70	974.30	0.40
HR-G2-MW-2	709.24	76.57	974.48	974.32	0.16
HR-G2-MW-3	586.43	83.95	974.87	974.27	0.60
HR-G2-RW-1	510.71	119.04	975.19	974.25	0.94
HR-G3-MW-2	538.41	86.72	974.58	974.25	0.33
HR-G3-RW-1	1041.17	86.01	974.63	974.32	0.31
PZ-1S	1518.09	110.73	973.19	972.50	0.69
PZ-6S	1608.20	124.24	973.82	972.24	1.58
TMP-1	2027.59	300.04	974.49	975.20	-0.71

Statistical Summary	
Residual Mean	0.18
Residual Standard Deviation	1.11
Sum of Squares	85.89
Absolut Residual Mean	0.82
Minimum Residual	-1.78
Maximum Residual	3.79
Range	6.48
Standard Deviation / Head Range	0.17