January 25, 2018

Ms. Penelope Reddy
U.S. Army Corps of Engineers, New England District
696 Virginia Road
Concord, MA 01742-2751

RE: Addendum to the Long-Term Monitoring and Maintenance Plan
Shepley's Hill Landfill
Former Fort Devens Army Installation, Devens, MA
Contract No. W912WJ-15-C-0002

Dear Ms. Reddy,

KOMAN Government Solutions, LLC (KGS) is pleased to provide this Addendum to the *September 2015 Revised Final Long-Term Monitoring and Maintenance Plan (LTMMP) Update for Shepley's Hill Landfill* (SHL) (Sovereign, 2015). This Addendum documents the expanded monitoring program that was implemented during the spring and fall of 2017 at SHL and which will continue to be used during the 2018 groundwater monitoring events. As enclosed, this Addendum presents the following updates to the LTMMP:

- Section 3.2.2, Table 1 – Sampling Monitoring Program
- Section 3.2.2, Table 2 – Hydraulic Monitoring Program
- Section 3.2.2, Figure 5 – Long-Term Monitoring Well Network – General
- Section 3.2.2, Figure 6 – Long-Term Monitoring Well Network – Field

If you have any questions or require additional information, please contact me at (508) 219-6771 or jropp@komangs.com.

Sincerely,
KOMAN Government Solutions, LLC

James Ropp, P.E.
Project Manager

cc: Robert Simeone, BRAC Devens, MA
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TABLES

TABLE 1
SAMPLING MONITORING PROGRAM
Shepley's Hill Landfill, Devens, Massachusetts

Monitoring Frequency	Well ID (1)	TOC Elevation (ft msl)	Screen Interval (ft bgs)	Screen Elevation (ft msl)	Formation Type at Screen Interval	DQO for Inclusion into the LTMMP Addendum
UPGRADIENT AREA						
Annual	SHL-12	248.62	15.0 - 30.0	233.62 - 218.62	Overburden	Wells upgradient of source are necessary for determining groundwater parameters of what is entering the source zone
	SHL-15	259.92	14.5 - 24.5	245.42 - 235.42	Overburden	Wells upgradient of source are necessary for determining groundwater parameters of what is entering the source zone
	SHL-24	238.75	110.0 - 120.0*	128.75 - 118.75	Overburden/Till/Bedrock	Wells upgradient of source are necessary for determining groundwater parameters of what is entering the source zone
	SHL-7	236.33	11.0 - 21.0	225.33 - 215.33	Overburden	Wells upgradient of source are necessary for determining groundwater parameters of what is entering the source zone
	SHM-93-10D	248.01	46.0 - 56.0	202.01 - 192.01	Bedrock	Wells upgradient of source are necessary for determining groundwater parameters of what is entering the source zone
	SHM-93-18B	237.31	78.5 - 88.5	158.81 - 148.81	Overburden	Wells upgradient of source are necessary for determining groundwater parameters of what is entering the source zone
	SHM-93-24A	238.42	13.2 - 23.2	225.22 - 215.22	Overburden	Wells upgradient of source are necessary for determining groundwater parameters of what is entering the source zone
LANDFILL AREA						
Annual	N5-P1	242.65	95.5 - 97.5*	147.15 - 145.15	Bedrock	Well provides the bedrock monitoring within the landfill source area. Sampled historically, use to chart trends in source zone chemistry.
	SHM-10-07	246.82	40.0 - 50.0	206.82 - 196.82	Mid-depth Overburden	Provides and additional sampling point within the landfill, east of historically sampled wells.
	SHM-10-11	263.76	50.0 - 60.0	213.76 - 203.76	Deep Overburden	Wells upgradient of source are necessary for determining groundwater parameters of what is entering the source zone
	SHM-10-12	255.17	45.0 - 55.0	210.17 - 200.17	Mid-depth Overburden	Provides and additional sampling point within the landfill, south of historically sampled wells.
	SHM-10-13	244.77	60.0 - 70.0	184.77 - 174.77	Deep Overburden	Provides and additional sampling point within the landfill, east of historically sampled wells.
	SHM-10-14	237.62	60.0 - 80.0	177.62 - 157.62	Deep Overburden	Provides and additional sampling point within the landfill, north of historically sampled wells.
	SHM-10-15	243.68	45.0 - 55.0	198.68 - 188.68	Mid-depth Overburden	Provides and additional sampling point within the landfill, south and east of historically sampled wells.
	SHP-99-29X	243.34	19.0 - 29.0	254.16 - 244.16	Shallow Overburden	Similar screen interval/close proximity to N5-P2 but much higher As conc. Sampled historically, use to chart trends in source zone chem.
Semi-Annual	SHP-2016-07A	265.30	22.0 - 32.0	243.30 - 233.30	Bedrock	New well provides the bedrock monitoring adjacent the landfill source area and Shepley's Hill
	SHP-2016-07B	265.33	70.0 - 80.0	195.33 - 185.33	Bedrock	New well provides the bedrock monitoring adjacent the landfill source area and Shepley's Hill
BARRIER WALL AREA						
Annual	SHL-3	246.95	24.0 - 34.0	222.95 - 212.95	Mid-Overburden	Added to annual sampling to monitor As concentrations as groundwater upgradient of the barrier wall.
Semi-Annual	PZ-12-01	237.55	24.0 - 34.0	213.55 - 203.55	Shallow Overburden	Supplemental barrier wall performance monitoring of As concentrations on downgradient side of barrier wall.
	PZ-12-02	237.79	24.0 - 34.0	213.79 - 203.79	Shallow Overburden	Supplemental barrier wall performance monitoring of As concentrations on upgradient side of barrier wall.
	PZ-12-03	236.40	22.0 - 32.0	214.4 - 204.40	Shallow Overburden	Supplemental barrier wall performance monitoring of As concentrations on downgradient side of barrier wall.
	PZ-12-04	238.20	22.0 - 32.0	216.2 - 206.20	Shallow Overburden	Supplemental barrier wall performance monitoring of As concentrations on upgradient side of barrier wall.
	PZ-12-05	238.73	26.0 - 36.0	212.73 - 202.73	Mid-Overburden	Supplemental barrier wall performance monitoring of As concentrations on downgradient side of barrier wall.
	PZ-12-06	242.18	26.0 - 36.0	216.18 - 206.18	Mid-Overburden	Supplemental barrier wall performance monitoring of As concentrations on upgradient side of barrier wall.
	PZ-12-07	244.59	18.0 - 28.0	226.59 - 216.59	Mid-Overburden	Supplemental barrier wall performance monitoring of As concentrations on downgradient side of barrier wall.
	PZ-12-08	244.83	18.0 - 28.0	226.83 - 216.83	Mid-Overburden	Supplemental barrier wall performance monitoring of As concentrations on upgradient side of barrier wall.
	PZ-12-09	241.93	22.0 - 32.0	219.93 - 209.93	Shallow Overburden	Supplemental barrier wall performance monitoring of As concentrations on downgradient side of barrier wall.
	PZ-12-10	242.28	22.0 - 32.0	220.28 - 210.28	Shallow Overburden	Supplemental barrier wall performance monitoring of As concentrations on upgradient side of barrier wall.
	SHL-10	248.02	24.0 - 39.0	224.02 - 216.02	Shallow Overburden	Historically sampled bi-annually; remains part of LTM plan to monitor As concentrations on the downgradient/southern side of barrier wall.
	SHL-11	235.47	12.0 - 27.0	223.47 - 208.47	Shallow Overburden	Evaluates barrier wall contaminant removal performance. Sampled historically, used to chart trends in source zone chemistry.
	SHL-19	240.50	20.0 - 30.0	220.5 - 210.50	Shallow Overburden	Historically sampled annually, continued annual sampling to monitor As concentrations on downgradient side of barrier wall.
	SHL-20	235.95	39.0 - 49.0	196.95 - 186.95	Deep Overburden	Evaluates barrier wall contaminant removal performance. Sampled historically, used to chart trends in source zone chemistry.
	SHL-4	227.48	3.0 - 13.0	224.48 - 214.48	Shallow Overburden	Historically sampled annually, continued annual sampling to monitor As concentrations on downgradient side of barrier wall.
	SHM-11-02	240.73	39.0 - 49.0	201.73 - 191.73	Bedrock	Monitors potential As migration through bedrock beneath the barrier wall.
	SHM-11-06	236.17	25.0 - 35.0	211.17 - 201.17	Shallow Overburden	Added to annual sampling to monitor As concentrations in groundwater
	SHP-01-36X	223.95	3.0 - 8.0	220.95 - 215.95	Shallow Overburden	Historically sampled annually, continue annual sampling to monitor As concentrations along Plow Shop Pond boundary.
	SHP-01-37X	222.79	1.0 - 6.0	221.79 - 216.79	Shallow Overburden	Historically sampled annually, continue annual sampling to monitor As concentrations along Plow Shop Pond boundary.
	SHP-01-38A	220.86	1.5 - 6.5	219.36 - 214.36	Shallow Overburden	Historically sampled annually, continue annual sampling to monitor As concentrations along Plow Shop Pond and downgradient of wall.
NEARFIELD AREA						
Annual	SHL-5	217.60	3.0 - 13.0	214.60 - 204.60	Shallow Overburden	Historically sampled to evaluate ATP effectiveness and trends; relatively low detects therefore a reduction to annual sampling.
	SHL-8D	220.78	68.0 - 70.0	152.78 - 150.78	Deep Overburden	Historically sampled to evaluate ATP effectiveness and trends; relatively low detects therefore a reduction to annual sampling.
	SHL-8S	220.97	52.0 - 54.0	168.97 - 166.97	Shallow Overburden	Historically sampled to evaluate ATP effectiveness and trends; relatively low detects therefore a reduction to annual sampling.
	SHL-9	221.95	15.0 - 25.0	206.95 - 196.95	Shallow Overburden	Historically sampled to evaluate ATP effectiveness and trends; relatively low detects therefore a reduction to annual sampling.
	SHL-22	219.58	105.0 - 115.0	114.58 - 104.58	Deep Overburden/Till	Historically sampled to evaluate ATP effectiveness and trends; relatively low detects therefore a reduction to annual sampling.
	SHL-23	241.29	23.0 - 33.0	218.29 - 208.29	Overburden	Historically sampled biannually to monitor potential western migration route downgradient of source area.
	SHM-05-41A	222.48	42.0 - 44.0	180.48 - 178.48	Shallow Overburden	Sampled historically, to evaluate ATP effectiveness and trends.
	SHM-05-42A	216.81	40.0 - 42.0	176.81 - 174.81	Shallow Overburden	Historically sampled to evaluate ATP effectiveness and trends; relatively low detects therefore a reduction to annual sampling.
	SHM-05-42B	216.80	70.0 - 72.0	146.8 - 144.80	Mid-depth Overburden	Historically sampled to evaluate ATP effectiveness and trends; relatively low detects therefore a reduction to annual sampling.
	SHM-10-06	232.91	69.5 - 79.5	163.41 - 153.41	Deep Overburden	Added to annual sampling to provide an additional monitoring point along the eastern perimeter of landfill.
	SHM-10-06A	248.54	77.0 - 87.0	171.54 - 161.54	Deep Overburden	Added to annual sampling to replace SHL-21. SHM-10-06A has a deeper screen interval and higher As concentrations than SHL-21.
	SHM-10-16	219.23	75.0 - 85.0	144.23 - 134.23	Deep Overburden	Added to annual sampling to provide an additional monitoring point northwest of the ATP.
	SHM-93-22C	220.69	124.3 - 134.3	96.39 - 86.39	Deep Bedrock	Historically sampled to evaluate ATP effectiveness and trends; relatively low detects therefore a reduction to annual sampling.
	SHM-96-5C	218.39	50.0 - 60.0	168.39 - 158.39	Mid-Depth Overburden	Historically sampled historically to evaluate ATP effectiveness and trends; relatively low detects therefore a reduction to annual sampling.
Semi-Annual	EW-01 @ ATP Port	226.80	60.0 - 85.0	166.8 - 141.80	Overburden	Provides monitoring of As concentrations at the extraction wells and provide ATP effectiveness and trends.
	EW-04 @ ATP Port	227.03	70.0 - 95.0	157.03 - 132.03	Overburden	Provides monitoring of As concentrations at the extraction wells and provide ATP effectiveness and trends.
	EPA-PZ-2012-1A	223.79	20.0 - 25.0	203.79 - 198.79	Shallow Overburden	Provides an additional shallow/deep overburden sampling point east of the ATP.
	EPA-PZ-2012-1B	223.53	70.0 - 75.0	153.53 - 148.53	Deep Overburden	Provides an additional shallow/deep overburden sampling point east of the ATP.
	EPA-PZ-2012-2A	223.38	20.0 - 25.0	203.38 - 198.38	Shallow Overburden	Provides an additional shallow/deep sampling point in the nearfield area, northeast of the ATP.
	EPA-PZ-2012-2B	223.37	75.0 - 80.0	148.37 - 143.47	Deep Overburden	Provides an additional shallow/deep sampling point in the nearfield area, northeast of the ATP.
	EPA-PZ-2012-3A	222.65	20.0 - 25.0	202.65 - 197.65	Shallow Overburden	Provides an additional shallow/deep sampling point in the nearfield area, north of the ATP.
	EPA-PZ-2012-3B	222.57	70.0 - 75.0	152.57 - 147.57	Deep Overburden	Provides an additional shallow/deep sampling point in the nearfield area, north of the ATP.
	EPA-PZ-2012-4A	226.60	20.0 - 25.0	206.6 - 201.60	Shallow Overburden	Provides an additional shallow/deep sampling point in the nearfield area, north of the ATP.
	EPA-PZ-2012-4B	226.39	70.0 - 75.0	156.39 - 151.39	Deep Overburden	Provides an additional shallow/deep sampling point in the nearfield area, north of the ATP.

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Monitoring Frequency	Well ID (1)	TOC Elevation (ft msl)	Screen Interval (ft bgs)	Screen Elevation (ft msl)	Formation Type at Screen Interval	DQO for Inclusion into the LTMMP Addendum
NEARFIELD AREA (continued)						
Semi-Annual	EPA-PZ-2012-5A	220.01	20.0 - 25.0	200.01 - 195.01	Shallow Overburden	Provides an additional shallow/deep sampling point in the nearfield area, west of the ATP.
	EPA-PZ-2012-5B	219.38	80.0 - 85.0	139.38 - 134.38	Deep Overburden	Provides an additional shallow/deep sampling point in the nearfield area, west of the ATP.
	EPA-PZ-2012-6A	234.25	25.0 - 30.0	209.25 - 204.25	Shallow Overburden	Provides an additional shallow/deep sampling point in the nearfield area, west of the ATP.
	EPA-PZ-2012-6B	234.08	75.0 - 80.0	159.08 - 154.08	Deep Overburden	Provides an additional shallow/deep sampling point in the nearfield area, west of the ATP.
	EPA-PZ-2012-7A	234.16	25.0 - 30.0	209.16 - 204.16	Shallow Overburden	Provides an additional shallow/deep sampling point in the nearfield area, west of the ATP.
	EPA-PZ-2012-7B	234.03	60.0 - 65.0	174.03 - 169.03	Deep Overburden	Provides an additional shallow/deep sampling point in the nearfield area, west of the ATP.
	SHP-2016-1A	227.27	13.9 - 23.0	213.37 - 204.27	Shallow Overburden	Provides an additional shallow/deep sampling point in the nearfield area, west of the ATP.
	SHP-2016-1B	227.24	75.0 - 85.0	152.24 -142.24	Deep Overburden	Provides an additional shallow/deep sampling point in the nearfield area, west of the ATP.
	SHP-2016-2A	225.93	20.0 - 25.0	205.93 - 200.93	Shallow Overburden	Provides an additional shallow/deep sampling point in the nearfield area, west of the ATP.
	SHP-2016-2B	225.95	80.0 - 85.0	145.95 - 140.95	Deep Overburden	Provides an additional shallow/deep sampling point in the nearfield area, west of the ATP.
	SHP-2016-3A	223.18	20.0 - 25.0	203.18 - 198.18	Shallow Overburden	Provides an additional shallow/deep sampling point in the nearfield area, west of the ATP.
	SHP-2016-3B	223.18	80.0 - 85.0	143.18 - 138.18	Deep Overburden	Provides an additional shallow/deep sampling point in the nearfield area, west of the ATP.
	SHP-2016-4A	229.97	25.0 - 30.0	204.97 - 199.97	Shallow Overburden	Provides an additional shallow/deep sampling point in the nearfield area, west of the ATP.
	SHP-2016-4B	229.75	85.0 - 90.0	144.75 - 139.75	Deep Overburden	Provides an additional shallow/deep sampling point in the nearfield area, west of the ATP.
	SHP-2016-5A	227.01	25.0 - 30.0	202.01 - 197.01	Shallow Overburden	Provides an additional shallow/deep sampling point in the nearfield area, west of the ATP.
	SHP-2016-5B	226.95	85.0 - 90.0	141.95 - 136.95	Deep Overburden	Provides an additional shallow/deep sampling point in the nearfield area, west of the ATP.
	SHP-2016-06A	241.90	81.0 - 86.0	160.90 - 155.90	Bedrock	New bedrock well cluster to monitor potential western migration route of Arsenic within the bedrock.
	SHP-2016-06B	241.89	102.0 -112.0	139.89 - 129.89	Bedrock	New bedrock well cluster to monitor potential western migration route of Arsenic within the bedrock.
	SHP-2016-06C	241.92	123.0 - 133.0	118.92 - 108.92	Bedrock	New bedrock well cluster to monitor potential western migration route of Arsenic within the bedrock.
	SHM-05-41B	222.33	62.0 - 64.0	160.33 - 158.33	Mid-depth Overburden	Sampled historically, to evaluate ATP effectiveness and trends.
	SHM-05-41C	222.57	88.0 - 93.0	134.57 - 129.57	Deep Overburden/Till	Sampled historically, to evaluate ATP effectiveness and trends.
	SHM-93-22B	219.39	82.3 - 92.3	137.09 - 127.09	Mid-depth Overburden	Sampled historically, to evaluate ATP effectiveness and trends.
	SHM-96-5B	218.92	80.0 - 90.0	138.92 - 128.92	Sand/Till	Sampled historically, to evaluate ATP effectiveness and trends.
NORTHERN IMPACT AREA						
Annual	SHM-10-02	223.03	53.0 - 63.0	170.03 - 160.03	Mid-depth Overburden	Added sample location to monitor/evaluate possible western migration route.
	SHM-10-03	232.05	58.5 - 68.5	173.55 - 163.55	Mid-depth Overburden	Added sample location to monitor/evaluate possible western migration route.
	SHM-10-04	212.61	55.0 - 65.0	157.61 - 147.61	Mid-depth Overburden	Added sample location to monitor/evaluate possible western migration route.
	SHM-10-05A	235.09	50.0 - 60.0	185.09 - 175.09	Mid-depth Overburden	Added sample location to monitor/evaluate possible western migration route.
	SHM-10-08	214.36	46.0 - 56.0	168.36 - 158.36	Deep Overburden /Till	Added sample location to monitor/evaluate possible western migration route.
	SHM-10-10	217.11	56.0 - 66.0	161.11 - 151.11	Deep Overburden /Till	Monitors the northern edge of the As impacted groundwater.
	SHM-13-01	208.08	39.0 - 49.0	169.08 - 159.08	Mid-depth Overburden	Added sample location to monitor/evaluate possible western migration route.
	SHM-13-02	218.72	60.0 - 70.0	158.72 - 148.72	Deep Overburden	Monitors the northern edge of the As impacted groundwater.
	SHM-13-05	225.14	75.0 - 85.0	150.14 - 140.14	Deep Overburden	Monitors As concentrations within the core of the As impacted groundwater
	SHM-13-14D	210.68	45.0 - 55.0	165.68 - 155.68	Deep Overburden	Monitors As concentrations within 10 to 20 feet of Nonacoicus Brook at depth.
	SHM-13-14S	211.03	5.0 - 15.0	206.03 - 196.03	Shallow Overburden	Monitors As concentrations within 10 to 20 feet of Nonacoicus Brook
	SHM-13-15	210.58	50.0 - 60.0	160.58 - 150.58	Deep Overburden	Monitors the northern edge of the As impacted groundwater.
	SHM-99-32X	221.28	72.0 - 82.0	149.28 - 139.28	Deep Overburden	Sampled historically annually. Monitors As concentrations within the core of As impacted groundwater.
	SHM-99-31C	214.60	68.0 - 78.0	146.6 - 136.60	Deep Overburden	Sampled historically annually. Monitors As concentrations within the core of As impacted groundwater at depth.
Semi-Annual	SHM-05-40X	223.34	32.0 - 34.0	191.34 - 189.34	Mid-Overburden/Till	Sampled historically annually, Monitors As concentrations within the core of the As impacted groundwater.
	SHM-07-03	227.90	25.0 - 35.0	202.9 - 192.90	Shallow Overburden	Added sample location to monitor/evaluate possible western migration route.
	SHM-07-05X	223.40	56.0 - 66.0	167.4 - 157.40	Mid-Depth Overburden	Monitors As concentrations within the core of the As impacted groundwater
	SHM-13-03	212.05	42.0 - 52.0	170.05 - 160.05	Deep Overburden /Till	Monitors the leading/northern edge of the As impacted groundwater
	SHM-13-04	227.02	20.0 - 30.0	207.02 - 197.02	Shallow Overburden	Monitors As concentrations within the core of the As impacted groundwater
	SHM-13-06	223.89	36.0 - 46.0	187.89 - 177.89	Deep Overburden/Till	Monitors As concentrations within the core of the As impacted groundwater
	SHM-13-07	225.64	27.0 - 37.0	198.64 - 188.64	Unknown	Monitors As concentrations within the core of the As impacted groundwater
	SHM-13-08	227.90	55.0 - 65.0	172.9 - 162.90	Mid Overburden/Till	Monitors As concentrations within the core of the As impacted groundwater

Annual Sampling (Fall)
Semi-Annual Sampling (Spring/Fall)

Notes:

(1) Analyses: dissolved As, Fe, Mn, DOC, alkalinity, chloride, and sulfate (per 2015 LTMMP Update, Table 3)

Destroyed wells removed from program: N4-P1, N4-P2, N4-P3, and SHP-99-34A. SHP-13-03 in Nonacoicus Brook not found.

* - estimated value derived from Supplemental Groundwater Investigation (Harding ESE, 2003). Adapted from SHL Long-Term Monitoring and Maintenance Plan Update (Sovereign, Revised Septemer 2015).

ft bgs = feet below ground surface

ft msl = feet mean sea level

TABLE 2
HYDRAULIC MONITORING PROGRAM
Shepley's Hill Landfill, Devens, Massachusetts

Monitoring Frequency	Well ID	TOC Elevation (ft msl)	Screen Interval (ft bgs)	Screen Elevation (ft msl)	Formation Type at Screen Interval	DQO for Inclusion within the LTMMP Addendum
UPGRADIENT AREA						
Annual	SHL-12	248.62	15.0 - 30.0	233.62 - 218.62	Overburden	Hydraulic monitoring point upgradient of the landfill
	SHL-15	259.92	14.5 - 24.5	245.42 - 235.42	Overburden	Hydraulic monitoring point upgradient of the landfill
	SHL-17	233.79	6.0 - 16.0	227.79 - 217.79	Overburden	Hydraulic monitoring point upgradient of the landfill
	SHL-24	238.75	110.0 - 120.0*	128.75 - 118.75	OB/Till/BR	Hydraulic monitoring point upgradient of the landfill
	SHM-93-24A	238.42	13.2 - 23.2	225.22 - 215.22	Overburden	Hydraulic monitoring point upgradient of the landfill
	SHL-7	236.33	11.0 - 21.0	225.33 - 215.33	Overburden	Hydraulic monitoring point upgradient of the landfill
LANDFILL AREA						
Annual	N5-P1	242.65	95.5 - 97.5	147.15 - 145.15	Bedrock	Provides hydraulic monitoring point within the landfill area
	N5-P2	242.69	23.0 - 28.0*	219.69 - 214.69	Bedrock	Provides hydraulic monitoring point within the landfill area
	N6-P1	259.02	85.5 - 87.5*	173.52 - 171.52	Bedrock	Provides hydraulic monitoring point within the landfill area
	N7-P1	255.59	66.0 - 68.0*	189.59 - 187.59	Bedrock	Provides hydraulic monitoring point within the landfill area
	N7-P2	256.04	29.0 - 34.0*	227.04 - 222.04	Overburden	Provides hydraulic monitoring point within the landfill area
	SHL-18	237.56	16.0 - 26.0	221.56 - 211.56	Overburden	Provides hydraulic monitoring point within the landfill area
	SHM-93-18B	237.31	78.5 - 88.5	158.81 - 148.81	Overburden	Provides hydraulic monitoring point within the landfill area
	SHM-10-07	246.82	40.0 - 50.0	206.82 - 196.82	Mid Overburden	Provides hydraulic monitoring point within the landfill area
	SHM-10-11	263.76	50.0 - 60.0	213.76 - 203.76	Deep Overburden	Provides hydraulic monitoring point within the landfill area
	SHM-10-12	255.17	45.0 - 55.0	210.17 - 200.17	Mid Overburden	Provides hydraulic monitoring point within the landfill area
	SHM-10-13	244.77	60.0 - 70.0	184.77 - 174.77	Deep Overburden	Provides hydraulic monitoring point within the landfill area
	SHM-10-14	237.62	60.0 - 80.0	177.62 - 157.62	Deep Overburden	Provides hydraulic monitoring point within the landfill area
	SHM-10-15	243.68	45.0 - 55.0	198.68 - 188.68	Mid Overburden	Provides hydraulic monitoring point within the landfill area
	SHP-95-27X	237.45	30.5 - 40.5	206.95 - 196.95	Overburden	Provides hydraulic monitoring point within the landfill area
	SHP-99-01C	274.15	19.7 - 29.7	254.45 - 244.45	Bedrock	Provides hydraulic monitoring point within the landfill area
	SHP-99-29X	243.34	19.0 - 29.0	254.16 - 244.16	Shallow Overburden	Provides hydraulic monitoring point within the landfill area
	SHP-99-35X	258.49	30.2 - 40.2	228.29 - 218.29	Shallow Overburden	Provides hydraulic monitoring point within the landfill area
Semi-Annual	SHP-2016-07A	265.30	22.0 - 32.0	243.30 - 233.30	Bedrock	Hydraulic monitoring point on western edge of the landfill
	SHP-2016-07B	265.33	70.0 - 80.0	195.33 - 185.33	Bedrock	Hydraulic monitoring point on western edge of the landfill
BARRIER WALL AREA						
Annual	N1-P1	229.92	65.0 - 70.0	164.92 - 159.92	Deep Overburden	Historically used for hydraulic monitoring purposes
	N1-P2	229.93	40.0 - 45.0	189.93 - 184.93	Mid Overburden	Historically used for hydraulic monitoring purposes
	N1-P3	230.08	12.0 - 17.0	218.08 - 213.08	Shallow Overburden	Historically used for hydraulic monitoring purposes
	N2-P1	222.01	35.0 - 40.0	187.01 - 182.01	Bedrock	Historically used for hydraulic monitoring purposes
	N2-P2	222.16	4.0 - 9.0	218.16 - 213.16	Shallow Water Table	Historically used for hydraulic monitoring purposes
	N3-P1	220.83	33.0 - 35.0*	187.83 - 185.83	Bedrock	Historically used for hydraulic monitoring purposes
	N3-P2	220.84	4.0 - 9.0*	216.84 - 211.84	Shallow Water Table	Historically used for hydraulic monitoring purposes
	SHL-10	248.02	24.0 - 39.0	224.02 - 216.02	Shallow Overburden	Hydraulic monitoring point further east of barrier wall
	SHM-93-10D	248.01	46.0 - 56.0	202.01 - 192.01	Bedrock	Hydraulic monitoring point upgradient of the landfill
	SHL-11	235.47	12.0 - 27.0	223.47 - 208.47	Shallow Overburden	Hydraulic monitoring point east of barrier wall
	SHL-19	240.50	20.0 - 30.0	220.5 - 210.50	Shallow Overburden	Hydraulic monitoring point east of barrier wall
	SHL-20	235.95	39.0 - 49.0	196.95 - 186.95	Deep Overburden	Hydraulic monitoring point west of barrier wall
	SHL-3	246.95	24.0 - 34.0	222.95 - 212.95	Mid-Overburden	Hydraulic monitoring point east/upgradient of barrier wall
	SHL-4	227.48	3.0 - 13.0	224.48 - 214.48	Shallow Overburden	Hydraulic monitoring point east of barrier wall
	SHM-11-02	240.73	39.0 - 49.0	201.73 - 191.73	Bedrock	Hydraulic monitoring point west of barrier wall
	SHM-11-06	236.17	25.0 - 35.0	211.17 - 201.17	Shallow Overburden	Hydraulic monitoring point north of barrier wall
	SHM-11-07	240.83	41.0 - 46.0	199.83 - 194.83	Bedrock	Hydraulic monitoring point west of barrier wall
	SHP-01-36X	223.95	3.0 - 8.0	220.95 - 215.95	Shallow Overburden	Hydraulic monitoring point north of barrier wall
	SHP-01-37X	222.79	1.0 - 6.0	221.79 - 216.79	Shallow Overburden	Hydraulic monitoring point west of barrier wall
	SHP-01-38A	220.86	1.5 - 6.5	219.36 - 214.36	Shallow Overburden	Hydraulic monitoring point west of barrier wall
	SHP-01-38B	221.03	18.0 - 23.0	203.03 - 198.03	Deep Overburden	Hydraulic monitoring point west of barrier wall
	SHP-05-43	260.17	50.5 - 60.5	209.67 - 199.67	Shallow Overburden	Hydraulic monitoring point north of barrier wall
	SHP-05-44	258.55	51.0 - 61.0	207.55 - 197.55	Mid Overburden	Hydraulic monitoring point north of barrier wall
Semi-Annual	PZ-12-01	237.55	24.0 - 34.0	213.55 - 203.55	Shallow Overburden	Hydraulic monitoring point east of barrier wall
	PZ-12-02	237.79	24.0 - 34.0	213.79 - 203.79	Shallow Overburden	Hydraulic monitoring point west of barrier wall
	PZ-12-03	236.40	22.0 - 32.0	214.4 - 204.40	Shallow Overburden	Hydraulic monitoring point east of barrier wall
	PZ-12-04	238.20	22.0 - 32.0	216.2 - 206.20	Shallow Overburden	Hydraulic monitoring point west of barrier wall
	PZ-12-05	238.73	26.0 - 36.0	212.73 - 202.73	Mid-Overburden	Hydraulic monitoring point east of barrier wall
	PZ-12-06	242.18	26.0 - 36.0	216.18 - 206.18	Mid-Overburden	Hydraulic monitoring point west of barrier wall
	PZ-12-07	244.59	18.0 - 28.0	226.59 - 216.59	Mid-Overburden	Hydraulic monitoring point east of barrier wall
	PZ-12-08	244.83	18.0 - 28.0	226.83 - 216.83	Mid-Overburden	Hydraulic monitoring point west of barrier wall
	PZ-12-09	241.93	22.0 - 32.0	219.93 - 209.93	Shallow Overburden	Hydraulic monitoring point east of barrier wall
	PZ-12-10	242.28	22.0 - 32.0	220.28 - 210.28	Shallow Overburden	Hydraulic monitoring point west of barrier wall
NEARFIELD AREA						
Annual	SHL-13	220.71	5.0 - 20.0	215.71 - 200.71	Shallow Overburden	Historically used for hydraulic monitoring purposes
	SHL-22	219.58	105.0 - 115.0	114.58 - 104.58	Deep Overburden/Till	Additional hydraulic monitoring point in nearfield
	SHL-23	241.29	23.0 - 33.0	218.29 - 208.29	Overburden	Additional hydraulic monitoring point in nearfield
	SHL-5	217.60	3.0 - 13.0	214.60 - 204.60	Shallow Overburden	Additional hydraulic monitoring point in nearfield
	SHL-8D	220.78	68.0 - 70.0	152.78 - 150.78	Deep Overburden	Additional hydraulic monitoring point in nearfield
	SHL-8S	220.97	52.0 - 54.0	168.97 - 166.97	Shallow Overburden	Additional hydraulic monitoring point in nearfield
	SHL-9	221.95	15.0 - 25.0	206.95 - 196.95	Shallow Overburden	Additional hydraulic monitoring point in nearfield
	SHM-05-41A	222.48	42.0 - 44.0	180.48 - 178.48	Shallow Overburden	Additional hydraulic monitoring point in nearfield
	SHM-05-41B	222.33	62.0 - 64.0	160.33 - 158.33	Mid Overburden	Additional hydraulic monitoring point in nearfield
	SHM-05-41C	222.57	88.0 - 93.0	134.57 - 129.57	Deep Overburden/Till	Additional hydraulic monitoring point in nearfield
	SHM-05-42A	216.81	40.0 - 42.0	176.81 - 174.81	Shallow Overburden	Additional hydraulic monitoring point in nearfield
	SHM-05-42B	216.80	70.0 - 72.0	146.8 - 144.80	Mid Overburden	Additional hydraulic monitoring point in nearfield
	SHM-10-06	232.91	69.5 - 79.5	163.41 - 153.41	Deep Overburden	Additional hydraulic monitoring point in nearfield

TABLE 2
HYDRAULIC MONITORING PROGRAM
Shepley's Hill Landfill, Devens, Massachusetts

Monitoring Frequency	Well ID	TOC Elevation (ft msl)	Screen Interval (ft bgs)	Screen Elevation (ft msl)	Formation Type at Screen Interval	DQO for Inclusion within the LTMMP Addendum
NEARFIELD AREA (continued)						
Annual	SHM-10-06A	248.54	77.0 - 87.0	171.54 - 161.54	Deep Overburden	Additional hydraulic monitoring point in nearfield
	SHM-10-16	219.23	75.0 - 85.0	144.23 - 134.23	Deep Overburden	Additional hydraulic monitoring point in nearfield
	SHM-93-22B	219.39	82.3 - 92.3	137.09 - 127.09	Mid-depth Overburden	Additional hydraulic monitoring point in nearfield
	SHM-93-22C	220.69	124.3 - 134.3	96.39 - 86.39	Deep Bedrock	Historically used for hydraulic monitoring purposes
	SHM-96-5B	218.92	80.0 - 90.0	138.92 - 128.92	Sand/Till	Additional hydraulic monitoring point in nearfield
	SHM-96-5C	218.39	50.0 - 60.0	168.39 - 158.39	Mid Overburden	Additional hydraulic monitoring point in nearfield
	SHP-05-45A	228.48	20.0 - 25.0	208.48 - 203.48	Shallow Overburden	Historically used for hydraulic monitoring purposes
	SHP-05-45B	229.11	65.0 - 75.0	164.11 - 154.11	Mid Overburden	Historically used for hydraulic monitoring purposes
	SHP-05-46A	228.18	20.0 - 25.0	208.18 - 203.18	Mid Overburden	Historically used for hydraulic monitoring purposes
	SHP-05-46B	227.60	65.0 - 75.0	162.60 - 152.60	Shallow Overburden	Historically used for hydraulic monitoring purposes
	SHP-05-47A	217.39	1.0 - 2.0	216.39 - 215.39	Shallow Water Table	Historically used for hydraulic monitoring purposes
	SHP-05-47B	215.40	3.0 - 4.0	212.4 - 211.40	Shallow Water Table	Historically used for hydraulic monitoring purposes
Semi-Annual	SHP-2017-01	--	70.0 - 75.0	--	Overburden	New hydraulic monitoring point near extraction wells
	SHP-2017-02	--	85.0 - 90.0	--	Overburden	New hydraulic monitoring point near extraction wells
	EPA-PZ-2012-1A	223.79	20.0 - 25.0	203.79 - 198.79	Shallow Overburden	Additional hydraulic monitoring point in nearfield
	EPA-PZ-2012-1B	223.53	70.0 - 75.0	153.53 - 148.53	Deep Overburden	Additional hydraulic monitoring point in nearfield
	EPA-PZ-2012-2A	223.38	20.0 - 25.0	203.38 - 198.38	Shallow Overburden	Additional hydraulic monitoring point in nearfield
	EPA-PZ-2012-2B	223.37	75.0 - 80.0	148.37 - 143.47	Deep Overburden	Additional hydraulic monitoring point in nearfield
	EPA-PZ-2012-3A	222.65	20.0 - 25.0	202.65 - 197.65	Shallow Overburden	Additional hydraulic monitoring point in nearfield
	EPA-PZ-2012-3B	222.57	70.0 - 75.0	152.57 - 147.57	Deep Overburden	Additional hydraulic monitoring point in nearfield
	EPA-PZ-2012-4A	226.60	20.0 - 25.0	206.6 - 201.60	Shallow Overburden	Additional hydraulic monitoring point in nearfield
	EPA-PZ-2012-4B	226.39	70.0 - 75.0	156.39 - 151.39	Deep Overburden	Additional hydraulic monitoring point in nearfield
	EPA-PZ-2012-5A	220.01	20.0 - 25.0	200.01 - 195.01	Shallow Overburden	Additional hydraulic monitoring point in nearfield
	EPA-PZ-2012-5B	219.38	80.0 - 85.0	139.38 - 134.38	Deep Overburden	Additional hydraulic monitoring point in nearfield
	EPA-PZ-2012-6A	234.25	25.0 - 30.0	209.25 - 204.25	Shallow Overburden	Additional hydraulic monitoring point in nearfield
	EPA-PZ-2012-6B	234.08	75.0 - 80.0	159.08 - 154.08	Deep Overburden	Additional hydraulic monitoring point in nearfield
	EPA-PZ-2012-7A	234.16	25.0 - 30.0	209.16 - 204.16	Shallow Overburden	Additional hydraulic monitoring point in nearfield
	EPA-PZ-2012-7B	234.03	60.0 - 65.0	174.03 - 169.03	Deep Overburden	Additional hydraulic monitoring point in nearfield
	SHP-2016-1A	227.27	13.9 - 23.0	213.37 - 204.27	Shallow Overburden	Additional hydraulic monitoring point in nearfield
	SHP-2016-1B	227.24	75.0 - 85.0	152.24 -142.24	Deep Overburden	Additional hydraulic monitoring point in nearfield
	SHP-2016-2A	225.93	20.0 - 25.0	205.93 - 200.93	Shallow Overburden	Additional hydraulic monitoring point in nearfield
	SHP-2016-2B	225.95	80.0 - 85.0	145.95 - 140.95	Deep Overburden	Additional hydraulic monitoring point in nearfield
	SHP-2016-3A	223.18	20.0 - 25.0	203.18 - 198.18	Shallow Overburden	Additional hydraulic monitoring point in nearfield
	SHP-2016-3B	223.18	80.0 - 85.0	143.18 - 138.18	Deep Overburden	Additional hydraulic monitoring point in nearfield
	SHP-2016-4A	229.97	25.0 - 30.0	204.97 - 199.97	Shallow Overburden	Additional hydraulic monitoring point in nearfield
	SHP-2016-4B	229.75	85.0 - 90.0	144.75 - 139.75	Deep Overburden	Additional hydraulic monitoring point in nearfield
	SHP-2016-5A	227.01	25.0 - 30.0	202.01 - 197.01	Shallow Overburden	Additional hydraulic monitoring point in nearfield
	SHP-2016-5B	226.95	85.0 - 90.0	141.95 - 136.95	Deep Overburden	Additional hydraulic monitoring point in nearfield
	SHP-2016-06A	241.90	81.0 - 86.0	160.90 - 155.90	Bedrock	Additional hydraulic monitoring point in nearfield
	SHP-2016-06B	241.89	102.0 -112.0	139.89 - 129.89	Bedrock	Additional hydraulic monitoring point in nearfield
	SHP-2016-06C	241.92	123.0 - 133.0	118.92 - 108.92	Bedrock	Additional hydraulic monitoring point in nearfield
NORTHERN IMPACT AREA						
Annual	SHM-10-01	209.65	60.5 - 70.5	149.15 - 139.15	Deep Overburden/Till	Hydraulic monitoring point along western portion of NIA
	SHM-10-02	223.03	53.0 - 63.0	170.03 - 160.03	Mid Overburden	Hydraulic monitoring point along western portion of NIA
	SHM-10-03	232.05	58.5 - 68.5	173.55 - 163.55	Mid Overburden	Hydraulic monitoring point along western portion of NIA
	SHM-10-04	212.61	55.0 - 65.0	157.61 - 147.61	Mid Overburden	Hydraulic monitoring point along western portion of NIA
	SHM-10-05A	235.09	50.0 - 60.0	185.09 - 175.09	Mid Overburden	Additional hydraulic monitoring point in north impact area
	SHM-10-08	214.36	46.0 - 56.0	168.36 - 158.36	Deep OB / Till	Additional hydraulic monitoring point in north impact area
	SHM-10-10	217.11	56.0 - 66.0	161.11 - 151.11	Deep OB / Till	Additional hydraulic monitoring point in north impact area
	SHM-05-39A	221.53	37.0 - 39.0	184.53 - 182.53	Mid Overburden	Additional hydraulic monitoring point in north impact area
	SHM-05-39B	221.51	66.0 - 68.0	155.51 - 153.51	Deep Overburden	Additional hydraulic monitoring point in north impact area
	SHM-13-01	208.08	39.0 - 49.0	169.08 - 159.08	Mid Overburden	Additional hydraulic monitoring point in north impact area
	SHM-13-02	218.72	60.0 - 70.0	158.72 - 148.72	Deep Overburden	Additional hydraulic monitoring point in north impact area
	SHM-13-05	225.14	75.0 - 85.0	150.14 - 140.14	Deep Overburden	Additional hydraulic monitoring point in north impact area
	SHM-13-14D	210.68	45.0 - 55.0	165.68 - 155.68	Deep Overburden	Additional hydraulic monitoring point in north impact area
	SHM-13-14S	211.03	5.0 - 15.0	206.03 - 196.03	Shallow Overburden	Additional hydraulic monitoring point in north impact area
	SHM-13-15	210.58	50.0 - 60.0	160.58 - 150.58	Deep Overburden	Additional hydraulic monitoring point in north impact area
	SHM-99-32X	221.28	72.0 - 82.0	149.28 - 139.28	Deep Overburden	Additional hydraulic monitoring point in north impact area
	SHM-99-31A	214.34	4.0 - 14.0	210.34 - 200.34	Shallow OB / WT	Historically used for hydraulic monitoring purposes
	SHM-99-31B	214.39	50.0 - 60.0	164.39 - 154.39	Mid Overburden	Historically used for hydraulic monitoring purposes
	SHM-99-31C	214.60	68.0 - 78.0	146.6 - 136.60	Deep Overburden	Historically used for hydraulic monitoring purposes
	SHM-99-34B	224.91	74.5-79.5	150.4 - 145.4	Deep Overburden	Historically used for hydraulic monitoring purposes
	SHP-05-48A	217.31	1.0 - 2.0	216.31 - 215.31	Shallow Water Table	Historically used for hydraulic monitoring purposes
	SHP-05-48B	215.96	2.0 - 3.0	213.96 - 212.96	Shallow Water Table	Historically used for hydraulic monitoring purposes
	SHP-05-49A	216.67	1.0 - 2.0	215.67 - 214.67	Shallow Water Table	Historically used for hydraulic monitoring purposes
	SHP-05-49B	215.14	2.5 - 3.5	212.64 - 211.64	Shallow Water Table	Historically used for hydraulic monitoring purposes
Semi-Annual	SHM-05-40X	223.34	32.0 - 34.0	191.34 - 189.34	Mid Overburden/Till	Additional hydraulic monitoring point in north impact area
	SHM-07-03	227.90	25.0 - 35.0	202.9 - 192.90	Shallow Overburden	Additional hydraulic monitoring point in north impact area
	SHM-07-05X	223.40	56.0 - 66.0	167.4 - 157.40	Mid Overburden	Additional hydraulic monitoring point in north impact area
	SHM-13-03	212.05	42.0 - 52.0	170.05 - 160.05	Deep OB / Till	Additional hydraulic monitoring point in north impact area
	SHM-13-04	227.02	20.0 - 30.0	207.02 - 197.02	Shallow Overburden	Additional hydraulic monitoring point in north impact area
	SHM-13-06	223.89	36.0 - 46.0	187.89 - 177.89	Deep Overburden/Till	Additional hydraulic monitoring point in north impact area
	SHM-13-07	225.64	27.0 - 37.0	198.64 - 188.64	Unknown	Additional hydraulic monitoring point in north impact area
	SHM-13-08	227.90	55.0 - 65.0	172.9 - 162.90	Mid Overburden/Till	Additional hydraulic monitoring point in north impact area

TABLE 2
HYDRAULIC MONITORING PROGRAM
Shepley's Hill Landfill, Devens, Massachusetts

Monitoring Frequency	Well ID	TOC Elevation (ft msl)	Screen Interval (ft bgs)	Screen Elevation (ft msl)	Formation Type at Screen Interval	DQO for Inclusion within the LTMMP Addendum
SURFACE WATER						
Annual	PSP-01	218.14	--	--	Staff Gauge	Used for monitoring surface water elevations within PSP
	SHSG-13-01G	205.53	--	--	Staff Gauge	Monitor water levels in Nonacoicus Brook
	SHSG-13-02G	208.25	--	--	Staff Gauge	Monitor water levels in Nonacoicus Brook
	SHSG-13-03G	209.99	--	--	Staff Gauge	Monitor water levels in Nonacoicus Brook
	SHSG-14-01G	213.71	--	--	Staff Gauge	Monitoring water level elevations northwest outlet of PSP

Notes:

All wells included in the SHL LTM sampling program (Table 1) are to be gauged at minimum annually in addition to those wells listed above.

Adapted from SHL Long Term Monitoring and Maintenance Plan Update (Sovereign, Revised September 2015).

(*) estimated value derived from Supplemental Groundwater Investigation (Harding ESE, 2003).

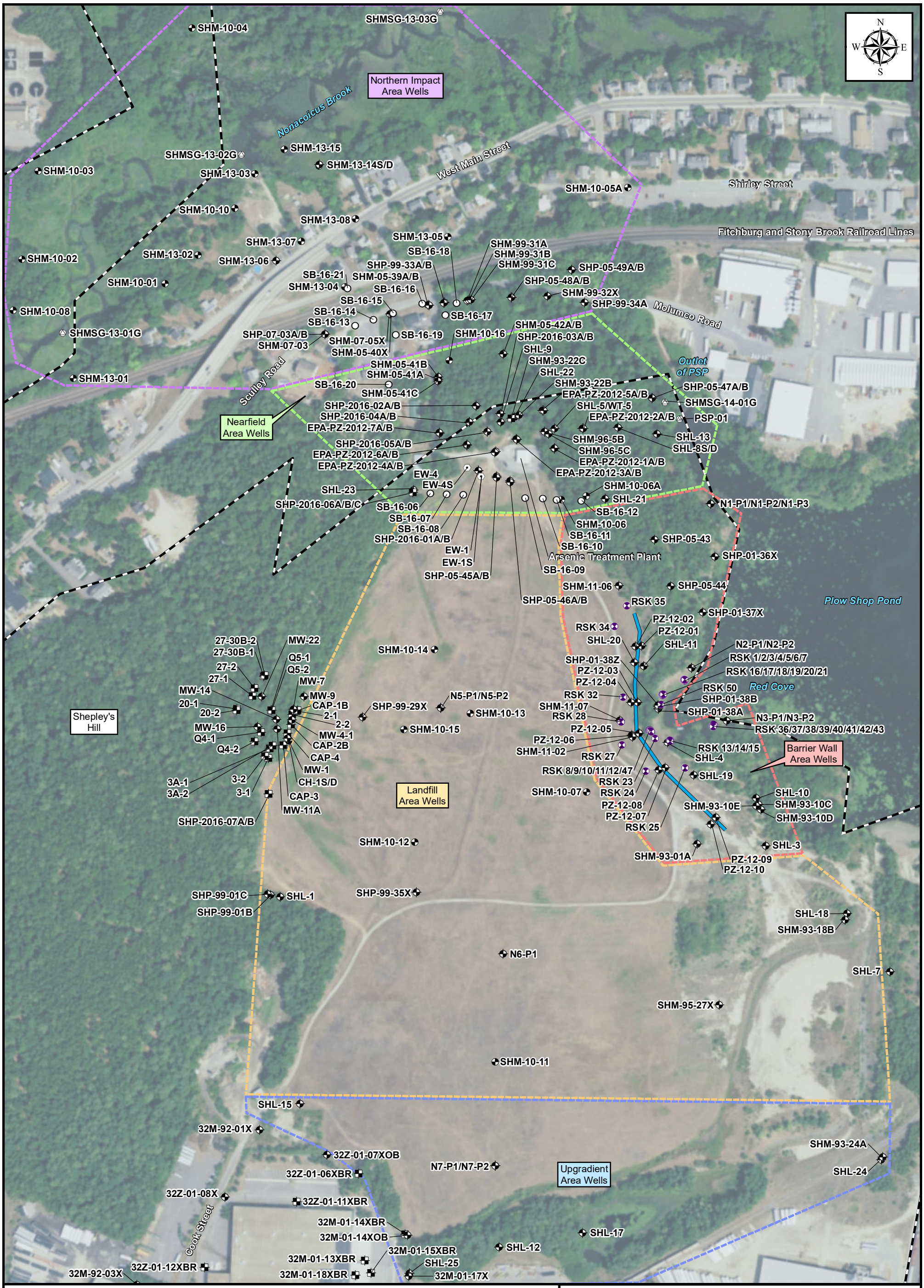
ft bgs = feet below ground surface

ft msl = feet mean sea level

Destroyed wells removed from program (2017): N4-P1, N4-P2, N4-P3, and SHP-99-34A.

Annual Hydraulic Only (Fall)
Semi-Annual Hydraulic Only (Spring/Fall)

FIGURES



Legend

- Overburden Monitoring Well/Piezometer
- Groundwater Profiling Location/Monitoring Well
- Monitoring Well
- Bedrock Monitoring Well
- Bedrock Study Core
- Extraction Well
- Soil Boring
- Stream Gauge
- Barrier Wall
- Former Fort Devens Boundary

Aerial Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Long-Term Monitoring Network - General
Shepley's Hill Landfill

Former Fort Devens Army Installation and Sudbury Annex
Devens, Massachusetts

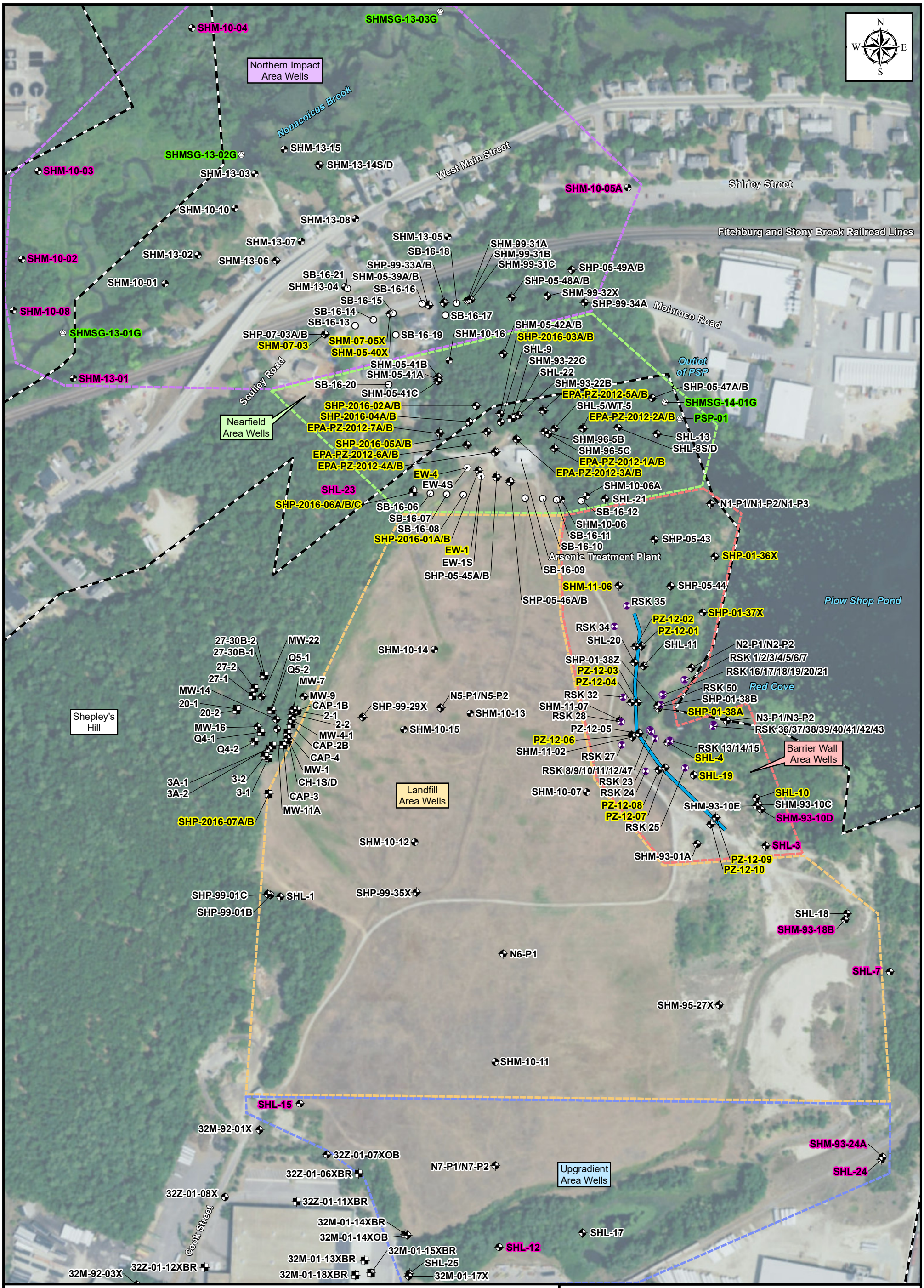
KOMAN Government Solutions, LLC
293 Boston Post Road West, Suite 100, Marlborough, MA 01752

0 150 300
Feet

Date: 10/16/2017

Figure 5

File: SHL_2017LTMMP_FIELD_General.mxd



Legend

Overburden Monitoring Well/Piezometer		Barrier Wall	
Groundwater Profiling Location/Monitoring Well		Former Fort Devens Boundary	
Monitoring Well	PZ-12-07	Well/Boring/Gauge Identification	
Bedrock Monitoring Well	SHM-13-01	LTM Well/Piezometer Annual Sampling (Fall)	
Bedrock Study Core	SHL-10	LTM Well/PiezometerSemi-Annual Sampling (Spring/Fall)	
Extraction Well			
Soil Boring	PSP-01	LTM Well/Piezometer Hydraulic Monitoring Only	
Stream Gauge			

Long-Term Monitoring Network
Shepley's Hill Landfill

Former Fort Devens Army Installation and Sudbury Annex
Devens, Massachusetts

KOMAN Government Solutions, LLC
293 Boston Post Road West, Suite 100, Marlborough, MA 01752

0 150 300
Feet

Date: 10/16/2017

Figure 6

File: SHL_2017LTMMP_FIELD.mxd Aerial Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community