# *FIRST QUARTER 2016 RAP REPORT*

Old Bethpage
Solid Waste Disposal Complex
Groundwater Treatment Facility

## TOWN OF OYSTER BAY

DEPARTMENT OF PUBLIC WORKS
SYOSSET, NEW YORK 11791

June 2016

LOCKWOOD
KESSLER &
BARTLETT, INC.
SYOSSET, NEW YORK 11791

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## 1.0 INTRODUCTION

This document is the Old Bethpage Landfill (Landfill) Remedial Action Plan (RAP) Report for the first calendar quarter of 2016. This RAP Report was prepared on behalf of the Town of Oyster Bay (Town) by Lockwood, Kessler & Bartlett, Inc. (LKB). It is submitted to the New York State Department of Environmental Conservation (NYSDEC) pursuant to Consent Decree 83 Civ. 5357, Appendix A (OBSWDC Remedial Action Plan), Section D (Reporting), Subsection b (Operating Period), which requires the Town to submit the following information quarterly:

- Pumpage records.
- Treatment system air and water discharge data.
- Treatment system performance records.
- Data analysis (trends, position of plume, etc.).
- Modifications to system, including method and dates of approval.
- Ground water-quality monitoring data.
- Water-level data.
- Potentiometric surface maps, as revised.
- Records of all system downtime.

This information is summarized and evaluated in Sections 2.0 and 3.0 below, supported by figures and/or tables as appropriate. Conclusions and recommendations based on this quarter's findings are provided in Section 4.0. Operating records, self-monitoring data and monitoring reports are archived by the Town per Consent Decree requirements. Copies of selected figures and/or tables from the ground water- and air-monitoring consultants' quarterly reports are provided in Appendices A and B, respectively, and referenced below where appropriate.

## 2.0 STATUS OF GROUND-WATER REMEDIATION

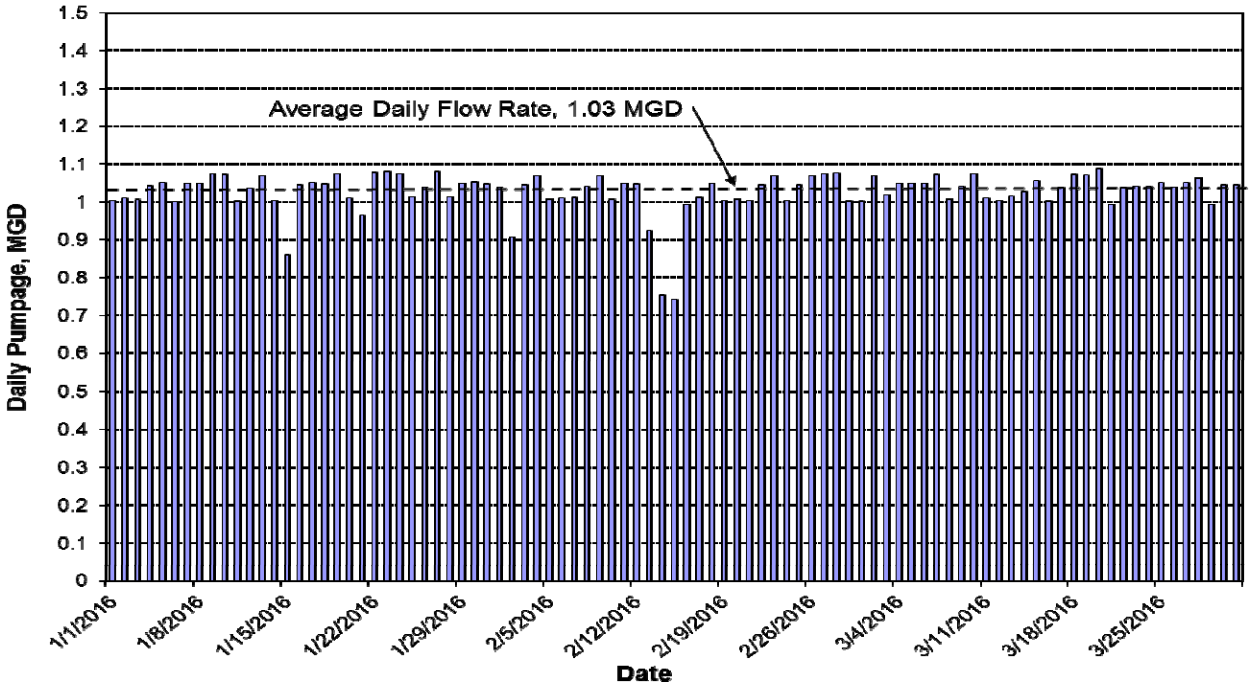
### 2.1 Ground Water-Treatment Facility Operation

The ground water-treatment facility (GTF) was on-line 99.9% of the time this quarter, based on 2,181 hours of operation out of a possible 2,184 hours (i.e., 24 hours per day for 91 days), although two recovery wells were typically off-line each day that the facility operated. The facility pumpage records for this quarter are summarized in Figure 1 on the following page. As shown in Figure 1, the average pumping rate was 1.03 Million Gallons per Day (MGD). The other key information regarding facility operation this quarter is summarized below:

- Recovery Well RW-3 was on-line 29 of 91 days this quarter, and continued to be operated on an approximately alternating basis with Recovery Wells RW-1 and RW-2.
- Recovery Well RW-4 was on-line the entire quarter. Recovery Well RW-5 was on-line 88 of 91 days this quarter. It was also on-line for 18 hours on February 16th.
- Only three recovery wells were operated at a time to prevent "high water" alarms from occurring and triggering a shut-down of the facility. This was necessary because the air stripper pumps appear to no longer be able to keep up with the influent flow when more than three recovery wells are in continuous operation. The Town's on-call contractor is in the process of investigating the cause(s) of and addressing this issue.

- The pressure drop across the air stripper media was acceptably low, and averaged 5.70 inches of water this quarter.

**Figure 1. Treatment Facility Pumpage Summary, First Quarter 2016**



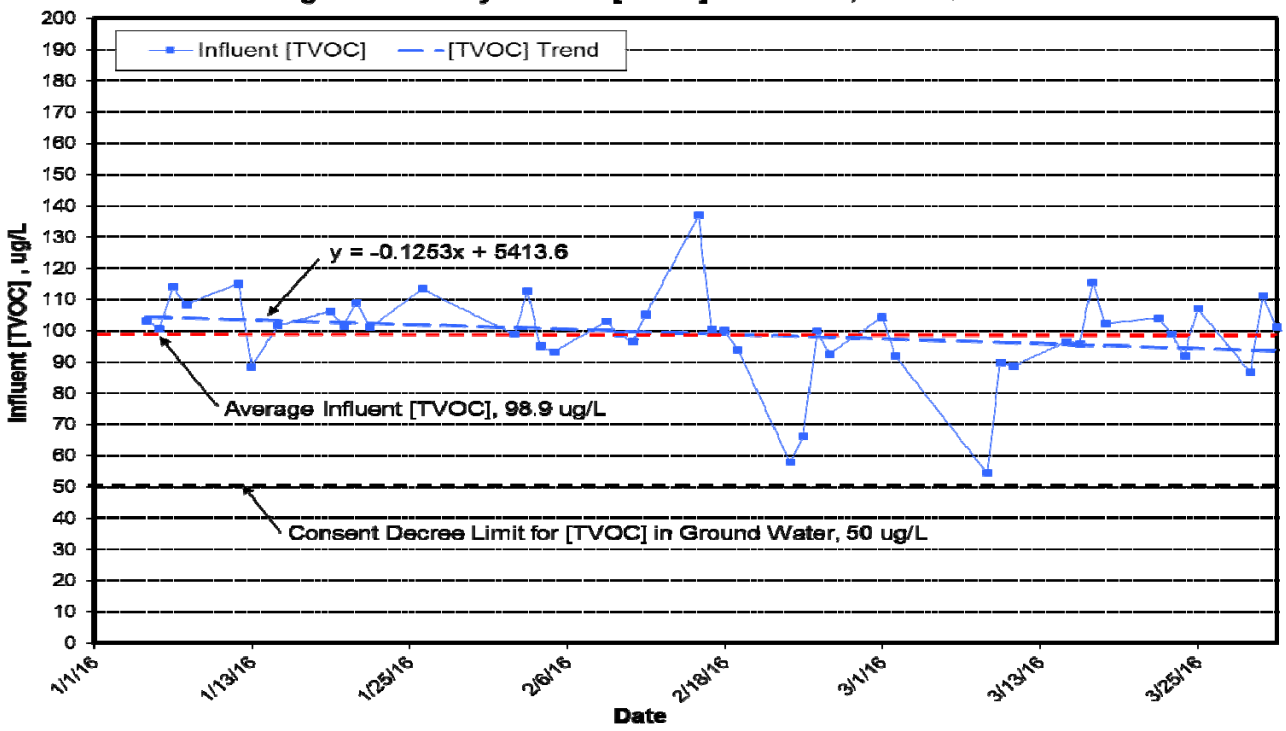

## 2.2 Ground Water-Treatment Facility Monitoring

The O&M Manual (Operation and Maintenance Manual) for the facility specifies that during normal operation, samples of the facility influent and effluent are to be collected three times per week and analyzed for VOCs at the on-site laboratory. This quarter, monitoring continued to be performed three to four times per week. The facility influent and effluent were also tested approximately weekly on-site for pH, iron, manganese, dissolved oxygen, ammonia and chloride. A total of 13 influent/effluent samples were collected and analyzed for these parameters this quarter.

Monthly samples of influent and effluent were also sent to an outside laboratory for VOC (influent and effluent) and inorganic/leachate (effluent only) parameter analyses, per SPDES-permit equivalency requirements. These three samples are sent to an outside laboratory because the permit equivalency-required analytes include parameters that the Town's laboratory is not certified for and does not perform.

The [TVOC] results for the influent samples collected this quarter are plotted in Figure 2 below:

**Figure 2. Facility Influent [TVOC] and Trend, First Quarter 2016**




The key information indicated by Figure 2 is summarized below:

- Influent [TVOC] were higher than the 50-micrograms per Liter (ug/L) Consent Decree limit for ground water this quarter.
- Influent [TVOC] ranged from 54.4 to 137 ug/L, and averaged 98.9 ug/L.
- Overall, influent [TVOC] exhibited a decreasing trend this quarter, based on the available data.

This quarter, 44 effluent samples were analyzed for VOCs at the on-site laboratory and all of them were non-detectable for VOCs. Effluent [TVOC] were therefore below the 100-ug/L Consent Decree limit for discharge. The laboratory's method detection limit for individual VOCs is 1.0 ug/L (0.5 ug/L for 1,2-dichloroethane, which has a standard/discharge limit of 0.6 ug/L), which is the same or lower than the Class GA standard and/or the SPDES permit equivalency discharge limit for each VOC. Therefore, the concentrations of individual VOCs in the effluent also met discharge requirements this quarter.

The effluent inorganic/leachate indicator parameter results for the 13 self-monitoring samples collected this quarter are summarized and compared to the TOGS 1.1.1 ground-water discharge limits in Table 1, which follows this page. The key information indicated on Table 1 is summarized below:

- The pH of the effluent was within the range-based limit of 6.5 - 8.5 Standard Units (SU) and averaged 7.29 SU.
- Effluent [iron] remained very low this quarter, and were much lower than the 0.6-milligrams per Liter (mg/L) discharge limit. The average effluent [iron] was 0.02 mg/L.
- Effluent [manganese] were also lower than the 0.6-mg/L discharge limit this quarter. The average effluent [manganese] was 0.13 mg/L.
- Effluent [iron and manganese] were lower than the 1.0-mg/L discharge limit, and averaged 0.15 mg/L.
- The [dissolved oxygen] of the effluent averaged 12.3 mg/L, indicating full aeration of the effluent.
- The effluent [ammonia] ranged from 4.08 to 26.4 mg/L, and averaged 6.56 mg/L.
- Effluent [chloride] ranged from 95.2 to 146 mg/L, and averaged 123 mg/L. These results are lower than the 500-mg/L discharge limit, which is based on the Federal SMCL.

The results of the three monthly SPDES Permit Equivalency samples analyzed by an independent certified laboratory this quarter are compared to the permit equivalency limits in Table 2, which also follows this page. Review of Table 2 indicates that the concentrations of every equivalency-required parameter were lower than its respective discharge limit in all three monthly samples. Based on these results, the effluent complied with these discharge requirements this quarter.

Also in accordance with the O&M Plan for the facility, samples from each recovery well were collected on an approximately weekly basis and analyzed for VOCs at the on-site laboratory. VOCs were not detected in Recovery Wells RW-1 and RW-2 this quarter. VOCs continued to be detected on a regular basis in Recovery Wells RW-3, RW-4 and RW-5. The [TVOC] results, and trends based on the available data, for these three recovery wells are plotted in Figure 3 on the following page.

# TABLE 1
# FIRST QUARTER 2016
# EFFLUENT INORGANIC PARAMETER SELF-MONITORING RESULTS

| Parameter | Limit | Avg. Conc. | 1/6/16 | 1/13/16 | 1/20/16 | 1/27/16 | 2/3/16 | 2/10/16 |
|---|---|---|---|---|---|---|---|---|
| pH | 6.5 - 8.5 | 7.29 | 7.38 | 7.28 | 7.30 | 7.42 | 7.23 | 7.24 |
| Iron | 0.6 | 0.02 | 0.03 | 0.03 | 0 | 0.03 | 0.02 | 0.05 |
| Manganese | 0.6 | 0.13 | 0 | 0.2 | 0 | 0.3 | 0.1 | 0.1 |
| Iron and Manganese | 1.0 | 0.15 | 0.03 | 0.23 | 0 | 0.33 | 0.12 | 0 |
| Dissolved Oxygen | No Std. | 12.3 | 11.9 | 13.6 | 12.3 | 12.3 | 12.3 | 12.1 |
| Ammonia | No Std. | 6.56 | 4.08 | 5.44 | 4.08 | 5.20 | 5.20 | 4.56 |
| Chloride | 500 | 123 | 95.2 | 119 | 99.2 | 122 | 146 | 119 |

| Parameter | Limit | 2/17/16 | 2/24/16 | 3/2/16 | 3/9/16 | 3/16/16 | 3/23/16 | 3/31/16 |
|---|---|---|---|---|---|---|---|---|
| pH | 6.5 - 8.5 | 7.22 | 7.15 | 7.21 | 7.22 | 7.22 | 7.80 | 7.16 |
| Iron | 0.6 | 0 | 0.01 | 0 | 0 | 0 | 0.02 | 0.02 |
| Manganese | 0.6 | 0 | 0.2 | 0.2 | 0 | 0.1 | 0.3 | 0.2 |
| Iron and Manganese | 1.0 | 0 | 0.21 | 0.20 | 0 | 0.10 | 0 | 0.22 |
| Dissolved Oxygen | No Std. | 12.3 | 11.3 | 12.5 | 12.4 | 11.8 | 13.0 | 12.1 |
| Ammonia | No Std. | 4.64 | 4.64 | 5.92 | 26.4 | 4.48 | 5.92 | 4.72 |
| Chloride | 500 | 108 | 131 | 135 | 145 | 123 | 124 | 130 |

Notes: Limits are ground water discharge limits in NYSDEC TOGS 1.1.1.
pH data are in standard units, other data are in mg/L.

# TABLE 2
# FIRST QUARTER 2016
# SPDES EQUVIALENCY PERMIT SELF-MONITORING RESULTS

| Parameter | Units | Limit | Effluent Result | | | |
|---|---|---|---|---|---|---|
| | | | Average | 1/5/16 | 2/2/16 | 3/1/16 |
| Flow | MGD | 1.5 | 1.09* | -- | -- | -- |
| pH (range)** | SU | 6.5 to 8.5 | 7.27 | 7.38 | 7.23 | 7.21 |
| Nitrogen, Total (as N) | mg/L | 10 | 9.02 | 9.96 | 8.19 | 8.91 |
| Phenolics, Total Recoverable | µg/L | 8 | <5.0 | <5.0 | <5.0 | <5.0 |
| cis-1,2-Dichloroethene | µg/L | 5 | <0.5 | <0.50 | <0.50 | <0.50 |
| Trichloroethene | µg/L | 5 | <0.5 | <0.50 | <0.50 | <0.50 |
| Tetrachloroethene | µg/L | 5 | <0.5 | <0.50 | <0.50 | <0.50 |
| Chloride | mg/L | 500 | 113 | 115 | 105 | 118 |
| Sulfate | mg/L | 500 | 20.4 | 18.9 | 17.8 | 24.4 |
| Magnesium | mg/L | 35 | 6.7 | 7.1 | 6.4 | 6.6 |
| Iron | mg/L | 0.6 | <0.020 | <0.020 | <0.10 | <0.020 |
| Manganese | mg/L | 0.6 | 0.20 | 0.32 | 0.15 | 0.14 |
| Iron and Manganese | mg/L | 1 | 0.203 | 0.320 | 0.150 | 0.140 |
| Zinc | mg/L | 5 | <0.020 | <0.020 | <0.020 | <0.020 |
| MTBE | µg/L | 10 | <0.5 | <0.50 | <0.50 | <0.50 |
| Total Dissolved Solids | mg/L | 1,000 | 250 | 264 | 235 | 252 |

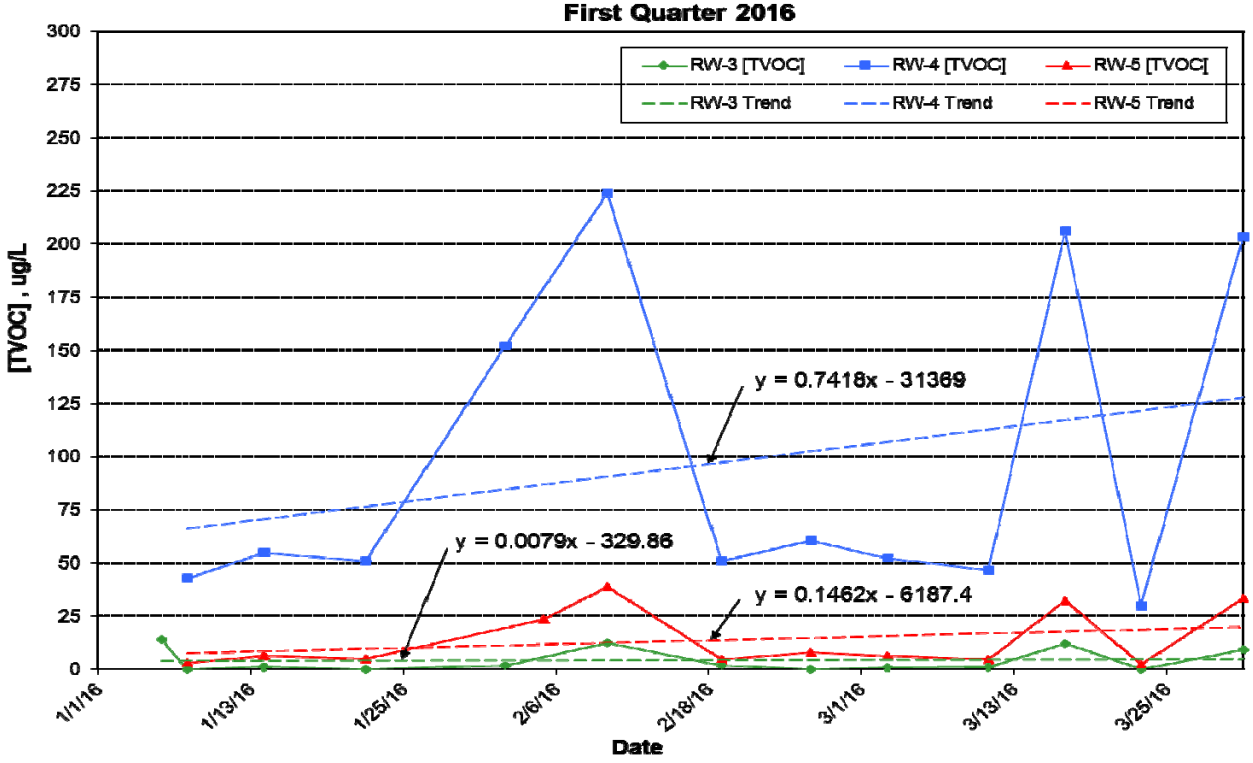
Notes:

MGD = Million Gallons per Day.

SU = Standard Units.

* - Maximum daily flow recorded during first quarter 2016, average flow was 1.03 MGD.

**Figure 3. [TVOC] and Trends in Recovery Wells RW-3, RW-4 and RW-5**
**First Quarter 2016**

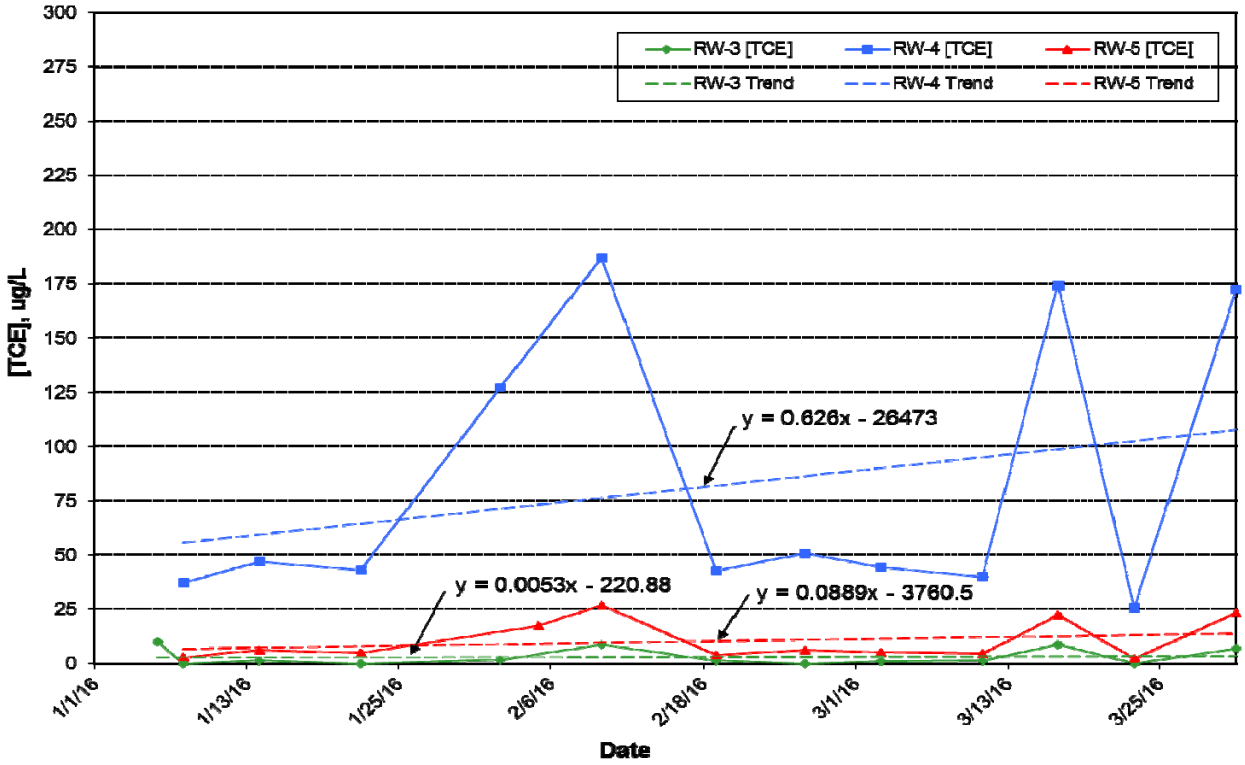



As shown in Figure 3 above, [TVOC] continued to be highest in Recovery Well RW-4. [TVOC] in Recovery Wells RW-3 and RW-5 were much lower. [TVOC] in Recovery Wells RW-4 and RW-5 continued to exhibit significant fluctuation this quarter. The fluctuation is attributed to temporal variation in ground-water quality as these wells were nearly fully operational this quarter. The other key information regarding [TVOC] in Recovery Wells RW-3, RW-4 and RW-5 this quarter is summarized below:

- [TVOC] in Recovery Well RW-3 ranged from ND (Not Detected) to 14.0 ug/L, and averaged 4.1 ug/L.
- [TVOC] in Recovery Well RW-4 ranged from 30.0 to 224 ug/L, and averaged 97.8 ug/L.
- [TVOC] in Recovery Well RW-5 ranged from 2.2 to 39.8 ug/L, and averaged 14.0 ug/L.
- [TVOC] in Recovery Well RW-3 exhibited basically a flat trend this quarter, based on the available data.
- [TVOC] in Recovery Wells RW-4 and RW-5 exhibited overall upward trends this quarter, based on the available data.

Three individual VOCs were detected at concentrations exceeding their 5-ug/L Class GA ground-water standard in at least one of these three recovery wells. Specifically, exceedances occurred for trichloroethene (TCE) in Recovery Wells RW-3, RW-4 and RW-5; tetrachloroethene (PCE) in Recovery Wells RW-4 and RW-5; and cis-1,2-dichloroethene (cis-1,2-DCE) in Recovery Well RW-4. The results for these three VOCs in these three recovery wells are plotted in Figures 4 through 6 on the following pages.

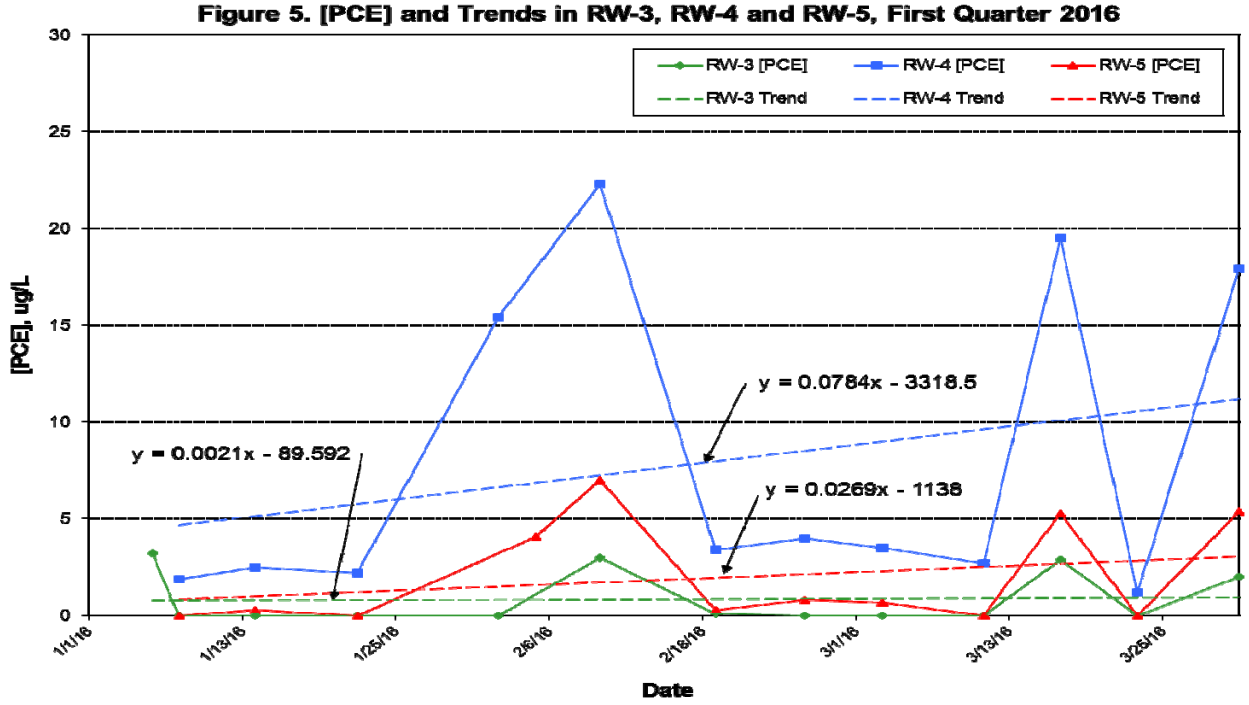
**Figure 4. [TCE] and Trends in RW-3, RW-4 and RW-5, First Quarter 2016**




As shown in Figure 4 above, [TCE] were highest in Recovery Well RW-4. [TCE] in Recovery Wells RW-3 and RW-5 were much lower. [TCE] in Recovery Well RW-4 exhibited the most fluctuation. The fluctuation is attributed to temporal variation in ground-water quality as this well was fully operational this quarter. Overall, these TCE results are similar to the TVOC results for the recovery wells, reflecting the fact that TCE accounts for most of the [TVOC] in these recovery wells. The other key information regarding [TCE] in these three recovery wells this quarter is summarized below:

- [TCE] in Recovery Well RW-3 ranged from ND to 10.0 ug/L, and averaged 3.0 ug/L.
- [TCE] in Recovery Well RW-4 ranged from 25.6 to 187 ug/L, and averaged 82.5 ug/L.
- [TCE] in Recovery Well RW-5 ranged from 2.2 to 26.8 ug/L, and averaged 10.4 ug/L.
- [TCE] in Recovery Well RW-3 exhibited a basically flat trend this quarter, based on the available data.
- [TCE] in Recovery Wells RW-4 and RW-5 exhibited overall upward trends this quarter, based on the available data.

**Figure 5. [PCE] and Trends in RW-3, RW-4 and RW-5, First Quarter 2016**




As shown in Figure 5 above, [PCE] in Recovery Well RW-4 were highest and exhibited the most fluctuation. The other key information regarding [PCE] in these three recovery wells this quarter is summarized below:

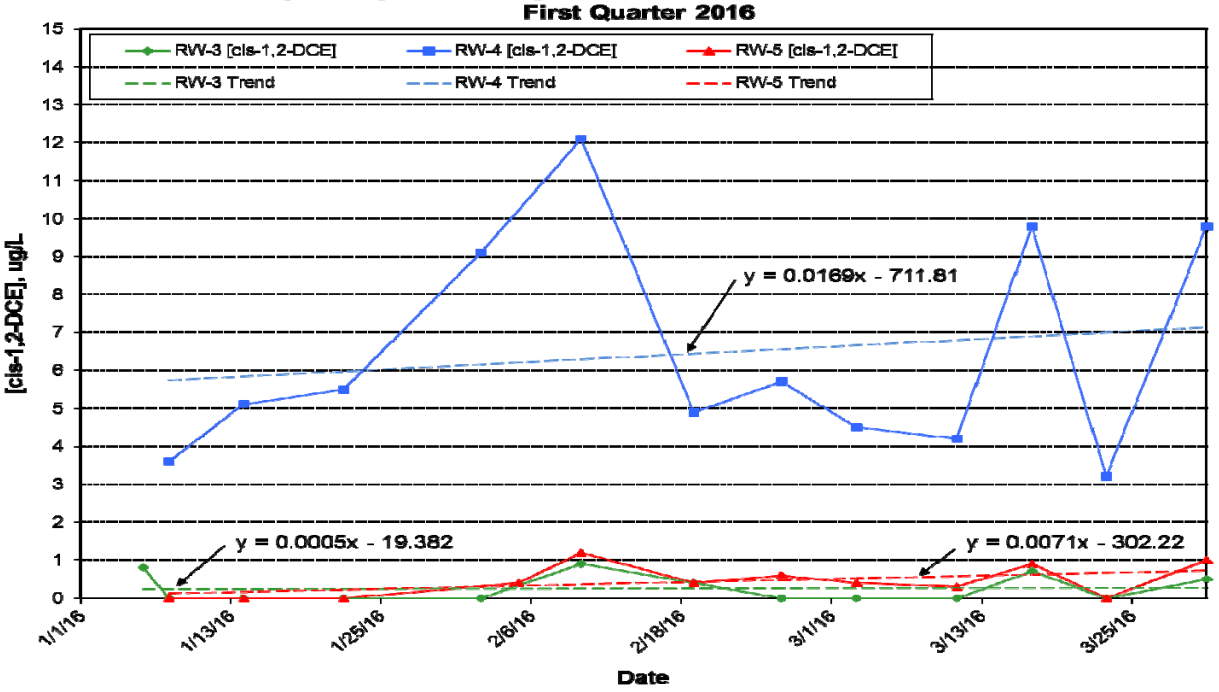
- [PCE] in Recovery Well RW-3 ranged from ND to 3.2 ug/L, and averaged 0.9 ug/L.
- [PCE] in Recovery Well RW-4 ranged from 1.5 to 22.3 ug/L, and averaged 8.0 ug/L.
- [PCE] in Recovery Well RW-5 ranged from ND to 7.0 ug/L, and averaged 2.0 ug/L.
- [PCE] in Recovery Well RW-3 exhibited a basically flat trend this quarter, based on the available data.
- [PCE] in Recovery Wells RW-4 and RW-5 exhibited upward trends this quarter, based on the available data.

As shown in Figure 6 on the following page, [cis-1,2-DCE] were highest in Recovery Well RW-4 and were often higher than the 5-ug/L Class GA ground-water standard in this recovery well. [cis-1,2-DCE] in Recovery Wells RW-3 and RW-5 were very low and much less than 5 ug/L. The other key information regarding [cis-1,2-DCE] in these recovery wells is summarized below:

- [cis-1,2-DCE] in Recovery Well RW-3 ranged from ND to 0.9 ug/L and averaged 0.3 ug/L.
- [cis-1,2-DCE] in Recovery Well RW-4 ranged from ND to 12.1 ug/L and averaged 5.3 ug/L.
- [cis-1,2-DCE] in Recovery Well RW-5 ranged from ND to 1.2 ug/L and averaged 0.4 ug/L.

- [cis-1,2-DCE] in Recovery Wells RW-3 and RW-5 exhibited basically flat trends this quarter, based on the available data.
- [cis-1,2-DCE] in Recovery Well RW-4 exhibited a slight upward trend this quarter, based in the available data.

**Figure 6. [cis-1,2-DCE] and Trends in RW-3, RW-4 and RW-5**
**First Quarter 2016**




Two other VOCs, specifically 1,1-dichloroethene (1,1-DCE) and 1,1,1-trichloroethane (1,1,1-TCA), were also detected in Recovery Wells RW-4 and RW-5 this quarter, but only sporadically and at concentrations lower than their 5-ug/L Class GA ground-water standards. Therefore, a figure for these results is not provided in this RAP Report.

To assess emissions from the air stripper stack, the average stack emission concentration of each VOC detected on a regular basis in the facility influent was calculated utilizing the data from the on-site laboratory and the pumpage data maintained by the Town. In Table 3, which follows this page, the results are compared to the stack emissions limits in Appendix A, Table 1 of the Consent Decree. As shown in Table 3, the average concentration of each VOC was lower than its stack discharge limit this quarter.

# TABLE 3
# FIRST QUARTER 2016
# COMPARISON OF AVERAGE STACK CONCENTRATIONS TO STACK DISCHARGE REQUIREMENTS

| Parameter | Average Stack Concentration* ($ug/m^3$) | Stack Discharge Requirements** ($ug/m^3$) |
|---|---|---|
| Benzene | ND | 100 |
| Bromodichloromethane | ND | 0.03 |
| Bromoform | ND | 16.7 |
| Carbon Tetrachloride | ND | 100 |
| Chlorobenzene | ND | 1,170 |
| Chloroethane | ND | 52,000 |
| Chloroform | ND | 167 |
| Dibromochloromethane | ND | 0.03 |
| 1,2-Dichlorobenzene (o) | ND | 1,000 |
| 1,3-Dichlorobenzene (m) | ND | 0.03 |
| 1,4-Dichlorobenzene (p) | ND | 1,500 |
| 1,1-Dichloroethane | ND | 2,700 |
| 1,2-Dichloroethane | ND | 20 |
| 1,1-Dichloroethene | 1.3 | 66.7 |
| 1,2-Dichloroethene | 44.2 | 2,630*** |
| 1,2-Dichloropropane | ND | 1,170 |
| Ethylbenzene | ND | 1,450 |
| Methylene Chloride | ND | 1,170 |
| Tetrachloroethene | 98.5 | 1,120 |
| Toluene | ND | 7,500 |
| 1,1,1-Trichloroethane | 0.3 | 38,000 |
| Trichloroethene | 835 | 900 |
| Vinyl Chloride | ND | 0.4 |
| Xylenes (Total) | ND | 1,450 |

FOOTNOTES:

* based on average influent concentrations and flow rates.

** per Table 1 of Consent Decree.

*** total for cis- and trans- isomers.

ND = not detectable.

$ug/m^3$ = micrograms per cubic meter.

Shaded values are higher than their respective stack discharge limit.

### 2.3 Ground Water-Quality Monitoring

The 2016 first quarter monitoring round was performed February 29th, March 1st and March 2nd and entailed collecting samples from the 16 of the Town monitoring wells required to be monitored. The samples were analyzed for VOCs and the required Part 360 leachate indicator and inorganic parameters. In addition, split-samples from 14 selected Claremont Site monitoring wells (which include some Town wells that the Town is not required to monitor), collected on March 17th and provided to the Town, were analyzed for VOCs.

The VOC results for the Town's samples are summarized by well and parameter group below:

| Well Number | [TVOC] | [Total VHO]* | [Total Aromatics] | [PCE] / [TCE] |
|---|---|---|---|---|
| Limits: | 50 | N/A | N/A | 5 / 5 |
| LF-1 | ND | ND | ND | ND / ND |
| M-30B-R | ND | ND | ND | ND / ND |
| MW-5B | ND | ND | ND | ND / ND |
| MW-6A | ND | ND | ND | ND / ND |
| MW-6B | 3.3 J | ND | 3.3 J | ND / ND |
| MW-6C | ND | ND | ND | ND / ND |
| MW-6E | ND | ND | ND | ND / ND |
| MW-6F | ND | ND | ND | ND / ND |
| MW-7B-R | **161** | 16.6 | ND | 4.3 / **140** |
| MW-8A | 0.3 J | ND | ND | 0.3 J / ND |
| MW-8B | ND | ND | ND | ND / ND |
| MW-9B | ND | ND | ND | ND / ND |
| MW-9C | ND | ND | ND | ND / ND |
| MW-11A | 28.9 J | 27.5 | ND | 0.8 J / 0.6 J |
| MW-11B | 0.4 J | 0.4 J | ND | ND / ND |
| OBS-1 | 2.2 J | ND | 1.3 J | ND / 0.9 J |

Notes: Results are in micrograms per Liter (ug/L); bold font indicates exceedance of Limit.
VHO = Volatile Halogenated Organics.
*Excluding PCE and TCE.
[PCE] / [TCE] = Tetrachloroethene concentration / Trichloroethene concentration.
N/A = Not Applicable, these standards are compound-specific.
ND = Not Detected.
J = Estimated Concentration.

Review of the above table indicates that VOCs are currently at non-detectable levels in 10 of the 16 wells monitored, and that [TVOC] in five of the six other wells are lower than the 50-ug/L Consent Decree Limit for ground water. The [TVOC] in Well MW-7B-R is approximately three times higher than this limit, primarily due to TCE. In contrast, the [TVOC] in Well MW-11A is primarily due to cis-1,2-DCE; and the [TVOC] in Well MW-6B is due to aromatic hydrocarbons.

In addition to the exceedances noted in the table above, the concentrations of cis-1,2-DCE in Wells MW-7B-R and MW-11A exceeded the 5-ug/L Class GA standard this quarter.

The VOC results for the Claremont Site split-samples are summarized below:

| Well Number | [TVOC] | [Total VHO]* | [Total Aromatics] | [PCE] / [TCE] |
|---|---|---|---|---|
| Limits: | 50 | N/A | N/A | 5 / 5 |
| EW-1A | 4.4 | 1.4 | ND | 3.0 / ND |
| EW-1B | ND | ND | ND | ND / ND |
| EW-1C | ND | ND | ND | ND / ND |
| EW-2A | ND | ND | ND | ND / ND |
| EW-2B | ND | ND | ND | ND / ND |
| EW-2C | ND | ND | ND | ND / ND |
| EW-2D | ND | ND | ND | ND / ND |
| BP-3A | ND | ND | ND | ND / ND |
| BP-3B | **62.8 J** | 46.5 | ND | **15.0** / 1.3 |
| BP-3C | 29.7 J | 20.7 J | ND | **8.7** / 0.3 J |
| MW-8A | ND | ND | ND | ND / ND |
| MW-8B | ND | ND | ND | ND / ND |
| MW-8C | ND | ND | ND | ND / ND |
| MW-10D | ND | ND | ND | ND / ND |

Notes: Results are in micrograms per Liter (ug/L); bold font indicates exceedance of Limit.
VHO = Volatile Halogenated Organics.
*Excluding PCE and TCE.
[PCE] / [TCE] = Tetrachloroethene concentration / Trichloroethene concentration.
N/A = Not Applicable, these standards are compound-specific.
ND = Not Detected.
J = Estimated Concentration.

Review of the above table indicates that [TVOC] in 11 of these 14 wells are currently at non-detectable levels, and that [TVOC] in two of the other three wells are lower than the 50-ug/L Consent Decree limit for ground water. The [TVOC] in Well BP-3B was higher than the 50-ug/L limit this quarter. The [TVOC] in Well EW-1A was primarily due to PCE. The [TVOC] in Wells BP-3B and BP-3C were primarily due to cis-1,2-DCE. The [cis-1,2-DCE] in Wells BP-3B and BP-3C, and the [1,1,-Dichloroethane] in Well BP-3B exceeded these VOC's 5-ug/L Class GA ground-water standard.

Since a relatively high [TVOC] was detected in Well BP-3C, it appears that the vertical extent of VOCs at this location has not been fully delineated. The VOCs at this location are also not Landfill-related, but appear to be exhibiting a decreasing trend.

Review of the total (unfiltered) leachate indicator and inorganic parameter result summary tables in Appendix A indicates that most of these parameters were either not detected, or only detected sporadically at low concentrations below their respective Class GA standard or guidance value. The highest concentration(s) of each detected parameter, as well as most of the exceedances, occurred in the wells located directly downgradient of the Landfill and within the capture zone of the Town's recovery wellfield (e.g., Wells MW-6B through MW-6E). The specific inorganic parameter exceedances that occurred this quarter are listed by well and parameter on the following page. Exceedances for total dissolved solids (TDS) are based on the 500-mg/L Federal SMCL, which is more stringent than the <1,000-mg/L State fresh ground water limit.

Listing of First Quarter 2016 Inorganic Parameter Exceedances in Ground Water:

- Well LF-1* – Phenols
- Well MW-5B – Manganese, phenols and sodium
- Well MW-6A – Iron
- Well MW-6B – Ammonia, chloride, iron, phenols, sodium and TDS
- Well MW-6C – Ammonia, chloride, iron, phenols, sodium and TDS
- Well MW-6E – Ammonia, chloride, iron, manganese, sodium and TDS
- Well MW-6F – Chloride, sodium and TDS
- Well MW-8A – Iron, phenols and sodium
- Well MW-8B – Iron, manganese, phenols, sodium and TDS
- Well MW-9B – Manganese, phenols and sodium
- Well MW-9C – Iron, phenols and sodium
- Well OBS-1 – Ammonia, manganese, phenols and sodium

* Well LF-1 is analyzed for leachate indicator parameters only, not metals.

Comparison of the total (unfiltered) metals results to the dissolved (filtered) metals results for these wells indicates that with the exception of Well MW-6E, the exceedances for iron were primarily due to particulate matter in the samples.

No exceedances of the Class GA inorganic/leachate indicator parameter standards occurred in Wells MW-11A or MW-11B this quarter. These wells are located downgradient of the Town's recovery wellfield. Well MW-11A is screened just above the deep potentiometric zone of the aquifer, and Well MW-11B is screened in the deep potentiometric zone of the aquifer. The fact that elevated levels of inorganic/leachate parameters are not detected in these wells indicates that the inorganic portion of the Landfill plume is also being captured by the recovery wellfield.

Figures 1 through 6 in Appendix A depict the ground water-flow patterns and plume boundaries within each of the three aquifer zones based on the Town's first quarter 2016 monitoring results, the corresponding water-level data for selected County monitoring wells for the adjacent Fireman's Training Center Site, and the first quarter VOC results for the Claremont Site split-samples. Review of these figures indicates the following key findings:

1. Ground water-flow directions in the water-table zone of the aquifer continue to be from northwest to southeast, consistent with the regional ground water-flow direction reported by the U.S. Geological Survey in Scientific Investigations Map 3066 (Water-Table and Potentiometric-Surface Altitudes of the Upper Glacial, Magothy, and Lloyd Aquifers beneath Long Island, New York, March-April 2006, Water-Table – SHEET 1 of 4).
2. Ground water-flow directions in the shallow and deep potentiometric zones of the aquifer also continue to be generally from northwest to southeast, except in the vicinity of the capture zone of the Town's recovery wellfield, where radial flow occurs. The capture zone contours shown in Figures 2 and 3 reflect the fact that Recovery Wells RW-1 and RW-3 were off-line on February 26th when the water-level round was performed.
3. In the water-table zone of the aquifer, the areal extent of VOC detections in ground water is limited to the area immediately downgradient of the Claremont Site (Based on Wells MW-8A and EW-1A).

4. In the shallow and deep potentiometric zones of the aquifer, VOC detections are the most widespread and occur in the areas downgradient of the Landfill and the Claremont Site that are within the capture zone of the Town's recovery wellfield. As noted in previous RAP Reports, based on available data, a portion of the off-site VOC plume from the Claremont Site is too far to the northeast to be captured by the Town's recovery wellfield. Moreover, the USEPA has indicated that there appears to be at least one other VOC source area in the vicinity of the Landfill. Accordingly, the eastern portion of the VOC plume, which is shown in Appendix A, Figures 2, 3, 4 and 6 as extending downgradient to Well Cluster MW-11, is not associated with the Landfill.

## 3.0 RESULTS OF AMBIENT-AIR, SOIL-GAS AND LANDFILL-GAS MONITORING

### 3.1 Ambient Air-Monitoring Results

The scope of this monitoring, which was developed based on the general requirements in the Consent Decree and accepted by the NYSDEC, entails sorbent-tube sampling for VOCs at one upwind and two downwind locations over a 24-hour period during a low/falling barometer, laboratory analysis of the samples, and comparison of the results to the NYSDEC DAR-1 short-term (8-hour) and long-term (annual) guideline concentrations (SGCs and AGCs, respectively). Sample locations are pre-selected based on the National Weather Service forecast. Meteorological conditions are monitored during the monitoring period for comparison to forecasted conditions. In a letter dated March 24, 2016, the NYSDEC approved the Town's request to reduce the frequency of this monitoring from quarterly to annually. The Town intends to implement this reduction during the second quarter of 2016.

The 2016 first quarter monitoring round was performed on March 22nd and 23rd. Based on the forecast southwesterly wind direction at light to moderate speeds, the upwind sample was collected south of the Landfill on the Bethpage State Park golf course, and the downwind samples were collected along the northeast boundary of the Landfill. The actual wind directions ranged from southerly to westerly during the test period, and speeds were higher than forecast. The downwind samplers were downwind of the Landfill for most or all of the test period. The barometric pressure decreased steadily during the first 18 hours of the test period, rose slightly during the last 8 hours of the test period, but dropped by a total of 0.16 inches of mercury.

A number of target VOCs were detected in both the upwind and downwind samples. All VOC concentrations were much lower than the DAR-1 SGCs. The concentrations of four target VOCs (benzaldehyde, benzene, carbon tetrachloride and 1,2-dichloroethane) were higher than the DAR-1 AGCs in all or most of the samples. However, the concentrations in the upwind and downwind samples were basically identical. These results indicate that the Landfill did not have a significant impact on ambient air quality.

Copies of Figure 2.1 and Table 4.1 from the air-monitoring consultant's report, which depict the sample locations and summarize the ambient air-monitoring results, respectively, are provided in Appendix B.

### 3.2 Soil-Gas Quality Monitoring Results

The scope of this monitoring entails sorbent-tube grab-sampling (approximately 10-minute sampling interval) for VOCs at 15 perimeter gas monitoring well locations, including multiple-depth sampling at one location (Well M9), and comparison of the results to the NYSDEC DAR-1 SGCs and AGCs. (Note: This comparison is made for informational purposes only. There are no New York State standards for VOCs in soil gas.)

The 2016 first quarter soil-gas monitoring round was also performed on March 22nd and 23rd. All wells were sampled. A relatively small number of VOCs were detected, generally at low concentrations, in most of the soil-gas samples. However, all VOC detections were much lower than the DAR-1 SGCs and only three target VOCs were detected at concentrations higher than their DAR-1 AGCs. These "exceedances" were sporadic and relatively low in magnitude.

Based on the results, overall, [VOC] in soil gas are low and consistent with an old MSW landfill with a perimeter gas collection system, and are not a concern for construction-related excavation should it be required. A copy of Table 4.2 from the air-monitoring consultant's report, which summarizes the soil gas-monitoring results, is provided in Appendix B.

### 3.3 Soil-Gas Pressure Monitoring Results

The scope of this monitoring entailed duplicate field measurements of pressure in a total of six gas monitoring wells at three locations (one 10 feet deep and one 20 feet deep at each location) around the Landfill utilizing an inclined manometer to verify zero or negative (vacuum) pressure readings in the vicinity of the perimeter landfill gas collection system. The 2016 first quarter monitoring round was performed on March 23rd.

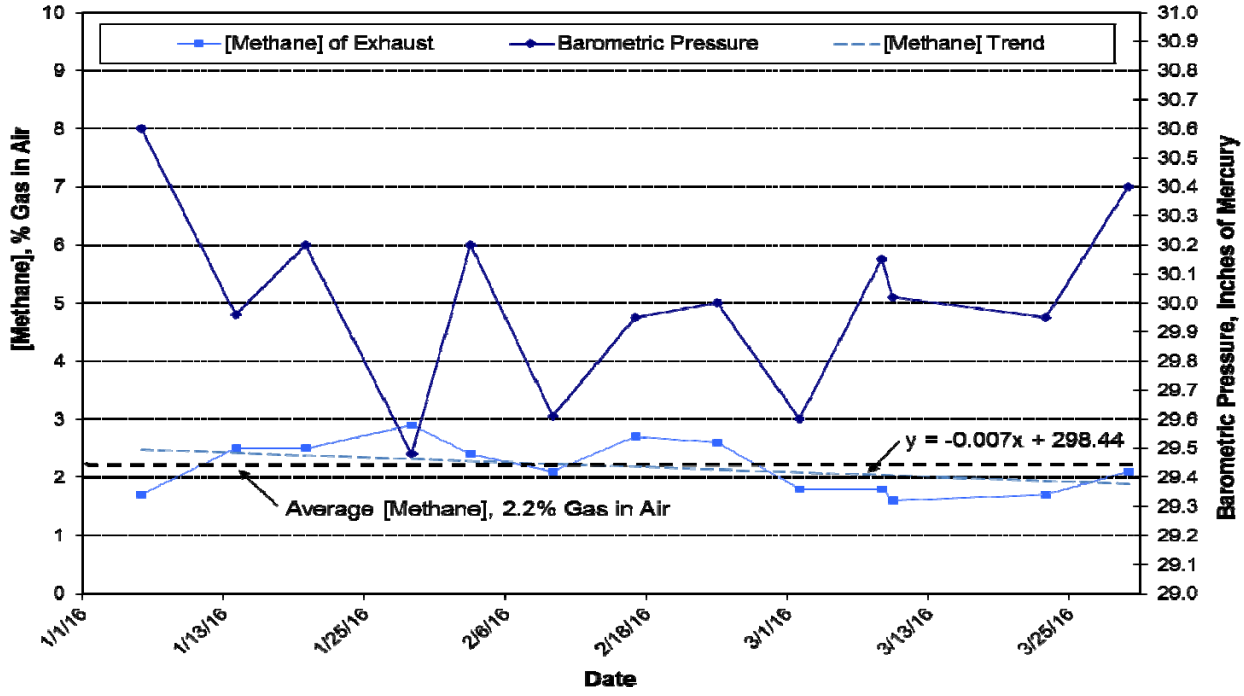
Zero or negative pressure readings were measured at both depth zones at all three locations. Based on these results, the perimeter landfill gas collection system is functioning properly and is preventing off-site migration. A copy of Table 5.1 from the air-monitoring consultant's report, which summarizes the soil gas pressure-monitoring results, is provided in Appendix B.

### 3.4 Landfill Gas-Monitoring Results

In a letter dated October 17, 2012, the NYSDEC approved the Town's request to discontinue operation of the landfill gas thermal oxidizer on a permanent basis, but requested that the Town monitor the perimeter gas collection system exhaust for methane on a weekly basis and include the results and a statement of inferred compliance in this section of each RAP report and in the annual zero gas migration reports.

This monitoring was performed by Town personnel utilizing a calibrated RAE Systems MultiRAE Lite meter equipped with LEL and percent-gas-in-air sensors. The monitoring results for this quarter, as percent gas in air, and the local barometric pressures when the monitoring was performed, are summarized in Figure 7 on the following page.

**Figure 7. [Methane] of Landfill Gas Collection System Exhaust, First Quarter 2016**




Review of Figure 7 indicates that this quarter the [methane] (methane concentration(s)) of the perimeter collection system exhaust were typically in the range of 1% to 3% gas in air and averaged 2.2% gas in air, which is 0.6% higher than last quarter's average. The [methane] did not appear to be significantly influenced by variations in barometric pressure, and exhibited a very slight downward trend. As requested by the NYSDEC in a letter dated March 27, 2015, the Town will continue to evaluate the weekly landfill gas-monitoring results to determine if shutting down the perimeter collection system is feasible.

The 2.2% gas in air average [methane] this quarter is approximately 2.3% to 3.3% gas in air lower than the two readings of 4.5% and 5.5% gas in air measured during the fourth quarter of 2011 and reported in the 2011 Annual Summary Report of landfill gas monitoring results. Moreover, it is consistent with the fact that the Landfill closed more than 25 years ago and continues to age. Previous analysis of the exhaust from the perimeter gas collection system indicated that it did not exceed permitting or regulatory thresholds, and did not significantly impact ambient air quality. Since current [methane] are even lower, and the blower flow rate is the same or lower. LKB concludes that this assessment is still valid.

## 4.0 CONCLUSIONS AND RECOMMENDATIONS

The conclusions of this RAP Report, based on the above information, are:

1. The facility was on-line 99.9% of the time this quarter, and maintained an average pumping rate of 1.03 MGD, although only three of the five recovery wells typically operated each day.
2. Recovery Well RW-3 was operated 29 of 91 days. Recovery Well RW-4 was on-line the entire quarter. Recovery Well RW-5 operated 88.75 of 91 days. Recovery Wells RW-1 and/or RW-2 were operated on approximately alternate days when Recovery Well RW-3 was off-line to prevent “high water” alarms form occurring and triggering a shut-down of the facility. The Town’s on-call contractor is in the process of investigating the cause(s) of and addressing this issue.
3. The [TVOC] of the facility influent was higher than the 50-ug/L limit for ground water listed in Appendix A, Table 2 of the Consent Decree this quarter, and averaged 98.9 ug/L. The influent [TVOC] exhibited an overall downward trend this quarter, based on the available data. TCE continued to be the main VOC detected in the facility influent.
4. VOCs were not detected in the 44 facility effluent samples collected this quarter. The effluent quality complied with Consent Decree and SPDES permit equivalency discharge limits this quarter.
5. VOCs were not detected in Recovery Wells RW-1 and RW-2 this quarter. However, certain Consent Decree inorganic parameters in these two recovery wells (e.g., iron or manganese) continue to exceed ground-water standards.
6. VOCs continued to be detected on a regular basis at significant concentrations in Recovery Wells RW-3, RW-4 and RW-5 this quarter. [TVOC] in Recovery Well RW-4 exhibited significant fluctuation, which is attributed to temporal variation in ground-water quality as this recovery well was fully operational this quarter. [TVOC] in Recovery Well RW-3 exhibited a basically flat trend this quarter, based on the available data. [TVOC] in Recovery Wells RW-4 and RW-5 exhibited overall upward trends this quarter, based on the available data.
7. [TCE] in Recovery Wells RW-3, RW-4 and RW-5 typically exceeded the 5-ug/L Class GA standards for this VOC. [PCE] in Recovery Wells RW-4 and RW-5, and [cis-1,2-DCE] in Recovery Well RW-4 also exceeded the 5-ug/L Class GA standard for these VOCs. Therefore, continued operation of these three recovery wells is warranted. [TCE] in Recovery Well RW-3 exhibited a basically flat trend this quarter, based on the available data. [TCE] in Recovery Wells RW-4 and RW-5 exhibited overall increasing trends this quarter, based on the available data. [PCE] in all three recovery wells, and [cis-1,2-DCE] in Recovery Well RW-4, exhibited overall downward trends this quarter, based on the available data. [cis-1,2-DCE] trends in Recovery Wells RW-3 and RW-5 exhibited basically flat trends this quarter, based on the available data.
8. The average concentration of each VOC in the air stripper exhaust was lower than its stack discharge limit this quarter.
9. [VOC] are currently at non-detectable or very low levels in 14 of the 16 monitoring wells sampled by the Town per the Consent Decree. The [TVOC] in Well MW-7B-R (161 ug/L) is approximately three times higher than the 50-yg/L Consent Decree limit for ground water, primarily due to TCE. The [TVOC] in Well MW-11A (28.9 J ug/L) is primarily due to cis-1,2-DCE. The [TCE] in Well MW-7B-R, and the [cis-1,2-DCE] in Wells MW-7B-R and MW-11A, exceeded the 5-ug/L Class GA standard for these VOCs this quarter.

10. [TVOC] in 12 of the 14 Claremont Site split-samples were also at non-detectable or very low levels this quarter. The relatively high [TVOC] detected in Wells BP-3B and BP-3C continue to indicate that the vertical extent of VOCs at this location has not been fully delineated. These VOCs are not associated with the Landfill. Therefore, their delineation is not the responsibility of the Town under the Consent Decree. The [cis-1,2-DCE] and [PCE] in Wells BP-3B and BP-3C, and the [1,1-dichloroethane] in Well BP-3B, exceeded the 5-ug/L Class GA standard for these VOCs this quarter.
11. The results of the perimeter landfill gas collection system exhaust [methane] monitoring performed this quarter verify that the average [methane] of the vented gas continues to be very low and appears to be stable or gradually decreasing over time, as expected for an aging closed and capped landfill, and is lower than previous monitoring results that were determined to be acceptable.

Accordingly, this RAP Report recommends the following for the second quarter of 2016:

1. Continue to operate and monitor the facility in accordance with the RAP in Appendix A of the Consent Decree and subsequent related protocols, including the exhaust from the perimeter landfill gas collection system, and the ambient air near the exhaust if warranted.
2. Implement the reduction in frequency of ambient air and soil gas monitoring from quarterly to annually as approved by the NYSDEC.
3. Complete the requirements contract as soon as possible, including diagnosis and repair of the pumping limitations at the treatment facility limiting the number of recovery wells that can be operated simultaneously.
4. Continue to track VOC concentrations in Monitoring Well MW-11A to determine of the recent increase in [TVOC] represents an actual trend for this well.
5. Continue to periodically inspect the air stripper media via a hatch, and monitor the pressure differential across the air stripper media regularly using the installed pressure-monitoring ports to detect the buildup of fouling, and perform an acid-rinse if warranted.
6. Continue to evaluate the [methane] of the exhaust from the perimeter landfill gas collection system to determine if shutting down this system is feasible.
7. Continue to analyze split-samples from selected Claremont Site monitoring wells for VOCs to provide current ground-water VOC data for these locations.
8. Continue to incorporate water-level data from selected County monitoring wells for the Fireman's Training Center Site to augment the Town's water-level data for the area.

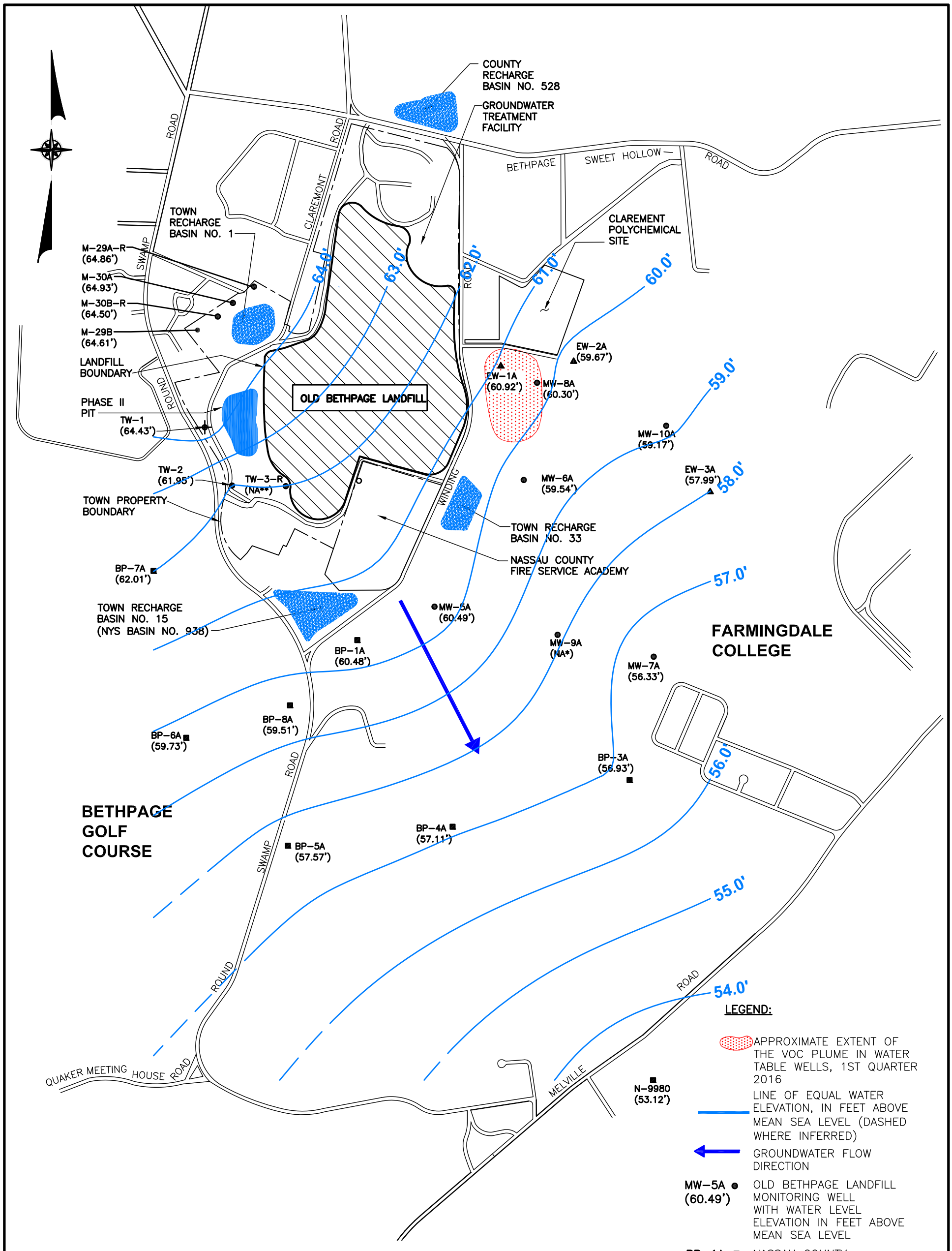
Additionally, it is recommended that the NYSDEC delineate the vertical extent of VOCs at Well Cluster BP-3, and evaluate the results with respect to the existing recovery wellfields to determine if additional recovery wells are required to capture these VOCs.

# APPENDIX A

**Figures 1 Through 6**
**Showing First Quarter 2016 Water-Level Contours and Plume Boundaries**

**Tables 1 and 3 Through 8**
**Summarizing First Quarter 2016 Water-Level and Water-Chemistry Results**

**Provided by D&B Engineers and Architects, PC**




LEGEND:

- APPROXIMATE EXTENT OF THE VOC PLUME IN WATER TABLE WELLS, 1ST QUARTER 2016
- LINE OF EQUAL WATER ELEVATION, IN FEET ABOVE MEAN SEA LEVEL (DASHED WHERE INFERRED)
- GROUNDWATER FLOW DIRECTION
- MW-5A (60.49') OLD BETHPAGE LANDFILL MONITORING WELL WITH WATER LEVEL ELEVATION IN FEET ABOVE MEAN SEA LEVEL
- BP-1A NASSAU COUNTY MONITORING WELL
- EW-3A CLAREMONT POLYCHEMICAL SITE MONITORING WELL
- (NA*) WELL MW-9A WAS DRY, AND NOT USED TO DEVELOP CONTOURS
- (NA**) WATER LEVEL WAS UNUSUALLY LOW IN TW-3-R, SUSPECTED TO BE ANOMALOUS READING AND NOT USED TO DEVELOP CONTOURS

NOTE:

BASE MAP WITH WELL LOCATIONS PROVIDED BY LKB IN DRAWING 101, DATED AUGUST 2005

D&B ENGINEERS AND ARCHITECTS, P.C.

OLD BETHPAGE LANDFILL
TOWN OF OYSTER BAY, NEW YORK

# WATER TABLE FLOW MAP
# FIRST QUARTER 2016

SCALE: 1"=800'

FIGURE 1

F:\3617\3617-C-PL01A_WATER TABLE CONTOUR 1Q 2016.dwg, 4/20/2016 1:43:43 PM, Adobe PDF.pc3

COUNTY RECHARGE BASIN NO. 528

GROUNDWATER TREATMENT FACILITY

ROAD

CLAREMONT ROAD

BETHPAGE SWEET HOLLOW ROAD

SWAMP

LF-4 (66.38')

LF-3 (63.12')

ROAD

CLAREMENT POLYCHEMICAL SITE

TOWN RECHARGE BASIN NO. 1

LANDFILL BOUNDARY

LF-2 (61.20')

EW-1C (60.72')

MW-8B (60.11')

EW-2C (60.18')

OLD BETHPAGE LANDFILL

PHASE II PIT

ROUND

MW-10B (59.16')

MW-6B (59.56')

EW-3C (58.04')

LF-1 (61.63')

WINDING

TOWN PROPERTY BOUNDARY

RW-5 (42.82'*)

RW-3 (51.17')

RW-4 (44.67'*)

NASSAU COUNTY FIRE SERVICE ACADEMY

MW-5B (60.46')

MW-9B (56.89')

BP-1B (60.28')

TOWN RECHARGE BASIN NO. 33

RW-2 (36.62')

RW-1 (51.14')

TOWN RECHARGE BASIN NO. 15 (NYS BASIN NO. 938)

FARMINGDALE COLLEGE

ROAD

BETHPAGE GOLF COURSE

BP-5B (57.40')

BP-4I (57.10')

SWAMP

BP-11 (NM)

BP-9I (NM)

ROUND

BP-12A (54.73')

ROAD

MW-11A (49.17')

QUAKER MEETING HOUSE ROAD

MELVILLE

66.0'
62.0'
64.0'
60.0'
58.0'
56.0'
54.0'
52.0'
50.0'
48.0'
46.0'
44.0'
42.0'

## LEGEND:

- APPROXIMATE EXTENT OF THE VOC PLUME IN SHALLOW POTENTIOMETRIC ZONE WELLS, 1ST QUARTER 2016
- LINE OF EQUAL WATER ELEVATION, IN FEET ABOVE MEAN SEA LEVEL (DASHED WHERE INFERRED)
- GROUNDWATER FLOW DIRECTION
- MW-5B (60.46') — OLD BETHPAGE LANDFILL MONITORING WELL WITH WATER LEVEL ELEVATION IN FEET ABOVE MEAN SEA LEVEL
- RW-1 — RECOVERY WELL
- BP-12A — NASSAU COUNTY MONITORING WELL
- EW-1C — CLAREMONT POLYCHEMICAL SITE MONITORING WELL
- (NM) — NOT MEASURED
- (44.67'*) — RECOVERY WELLS RW-4 AND RW-5 WERE DRY. DRY MEASUREMENT UTILIZED TO DEVELOP WATER ELEVATION CONTOURS.

NOTE:

BASE MAP WITH WELL LOCATIONS PROVIDED BY LKB IN DRAWING 101, DATED AUGUST 2005

D&B ENGINEERS AND ARCHITECTS, P.C.

OLD BETHPAGE LANDFILL
TOWN OF OYSTER BAY, NEW YORK

# SHALLOW POTENTIOMETRIC FLOW MAP
# FIRST QUARTER 2016

SCALE: 1"=800'

FIGURE 2

F:\3617\3617-C-PL01A_SHALLOW CONTOUR 1Q 2016.dwg, 4/20/2016 1:43:02 PM, Adobe PDF.pc3

COUNTY RECHARGE BASIN NO. 528

GROUNDWATER TREATMENT FACILITY

TOWN RECHARGE BASIN NO. 1

CLAREMENT POLYCHEMICAL SITE

OLD BETHPAGE LANDFILL

LANDFILL BOUNDARY

PHASE II PIT

TOWN PROPERTY BOUNDARY

NASSAU COUNTY FIRE SERVICE ACADEMY

TOWN RECHARGE BASIN NO. 15 (NYS BASIN NO. 938)

TOWN RECHARGE BASIN NO. 33

BETHPAGE GOLF COURSE

FARMINGDALE COLLEGE

ROAD

SWEET HOLLOW ROAD

CLAREMONT ROAD

SWAMP ROAD

ROUND SWAMP ROAD

WINDING ROAD

QUAKER MEETING HOUSE ROAD

MELVILLE ROAD

62.0'

60.0'

58.0'

56.0'

54.0'

52.0'

50.0'

48.0'

46.0'

44.0'

MW-8C (60.44')

MW-10D (59.14')

MW-6C (59.62')

RW-5 (42.82'*)

RW-3 (51.17')

RW-4 (44.67'*)

RW-1 (51.14')

MW-9C (56.07')

RW-2 (56.62')

MW-7B-R (55.79')

BP-7B (61.90')

BP-6B (59.32')

OBS-1 (56.69')

BP-3B (55.55')

BP-5B (57.40')

BP-4B (57.08')

BP-15B (55.96')

BP-14B (55.70')

BP-9B (55.57')

BP-12B (55.09')

MW-11B (52.76')

## LEGEND:

- APPROXIMATE EXTENT OF THE VOC PLUME IN DEEP POTENTIOMETRIC ZONE WELLS, 1ST QUARTER 2016
- LINE OF EQUAL WATER ELEVATION, IN FEET ABOVE MEAN SEA LEVEL (DASHED WHERE INFERRED)
- GROUNDWATER FLOW DIRECTION
- MW-8C (60.44') — OLD BETHPAGE LANDFILL MONITORING WELL WITH WATER LEVEL ELEVATION IN FEET ABOVE MEAN SEA LEVEL.
- RW-1 — RECOVERY WELL
- BP-14B — NASSAU COUNTY MONITORING WELL
- (44.67'*) — RECOVERY WELLS RW-4 AND RW-5 WERE DRY. DRY MEASUREMENT UTILIZED TO DEVELOP WATER ELEVATION CONTOURS.

NOTE:

BASE MAP WITH WELL LOCATIONS PROVIDED BY LKB IN DRAWING 101, DATED AUGUST 2005

D&B ENGINEERS AND ARCHITECTS, P.C.

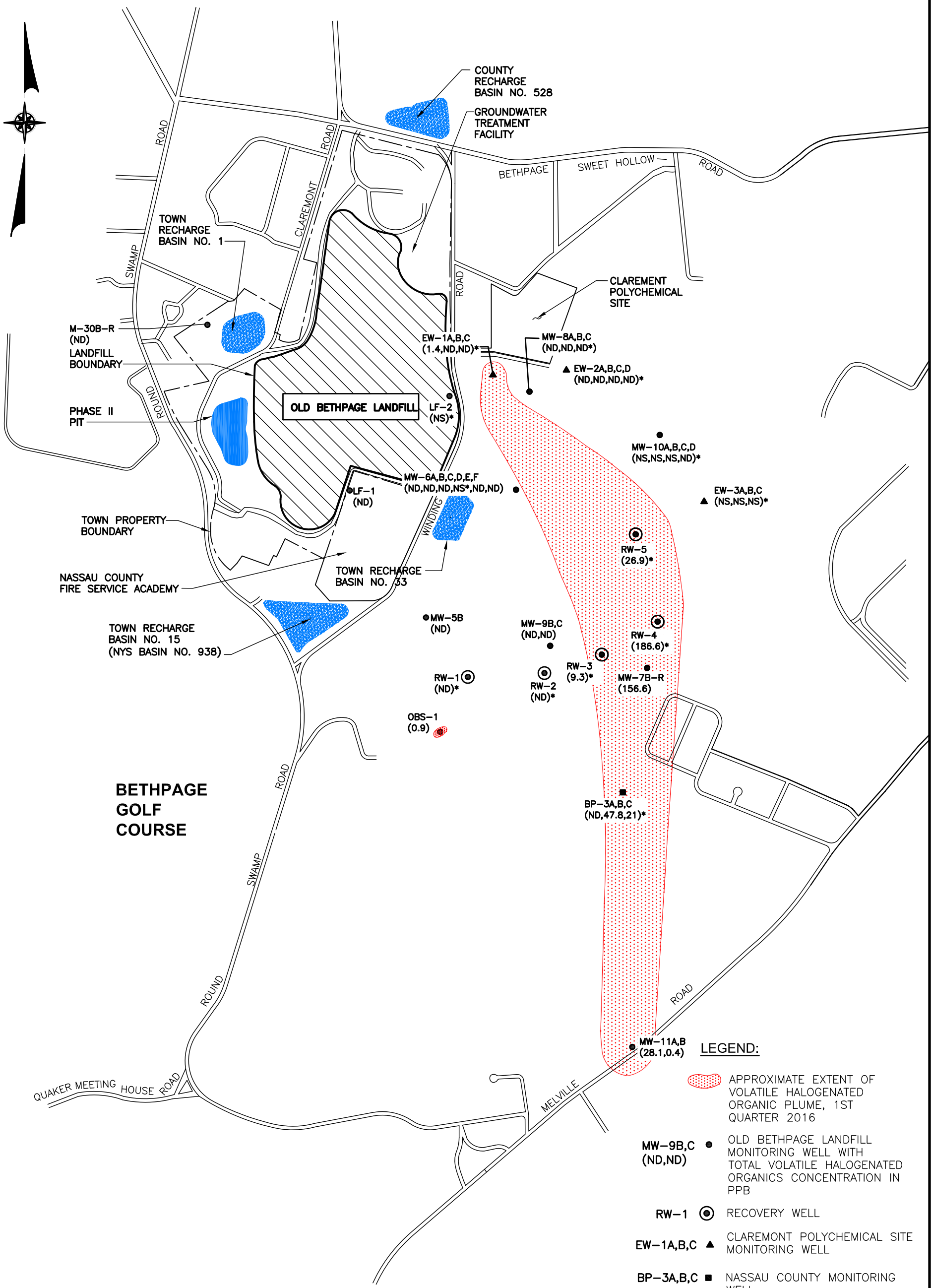
OLD BETHPAGE LANDFILL
TOWN OF OYSTER BAY, NEW YORK

# DEEP POTENTIOMETRIC FLOW MAP
# FIRST QUARTER 2016

SCALE: 1"=800'

FIGURE 3

F:\3617\3617-C-PL01A_DEEP CONTOUR 1Q 2016.dwg, 4/20/2016 1:41:55 PM, Adobe PDF.pc3




LEGEND:

- APPROXIMATE EXTENT OF VOLATILE HALOGENATED ORGANIC PLUME, 1ST QUARTER 2016
- MW-9B,C (ND,ND) — OLD BETHPAGE LANDFILL MONITORING WELL WITH TOTAL VOLATILE HALOGENATED ORGANICS CONCENTRATION IN PPB
- RW-1 — RECOVERY WELL
- EW-1A,B,C — CLAREMONT POLYCHEMICAL SITE MONITORING WELL
- BP-3A,B,C — NASSAU COUNTY MONITORING WELL
- * — DATA PROVIDED BY TOWN OF OYSTER BAY
- (NS) — NOT SAMPLED
- (ND) — NOT DETECTED

NOTE:

BASE MAP WITH WELL LOCATIONS PROVIDED BY LKB IN DRAWING 101, DATED AUGUST 2005

PLUME LIMIT IS BASED ON TOTAL VOLATILE HALOGENATED ORGANICS CONCENTRATIONS IN THE MONITORING AND RECOVERY WELLS.

D&B ENGINEERS AND ARCHITECTS, P.C.

OLD BETHPAGE LANDFILL
TOWN OF OYSTER BAY, NEW YORK

# APPROXIMATE EXTENT AND DISTRIBUTION OF TOTAL VOLATILE HALOGENATED ORGANICS, FIRST QUARTER 2016

SCALE: 1"=800'

FIGURE 4

COUNTY RECHARGE BASIN NO. 528

GROUNDWATER TREATMENT FACILITY

TOWN RECHARGE BASIN NO. 1

M-30B-R (ND)

LANDFILL BOUNDARY

PHASE II PIT

OLD BETHPAGE LANDFILL

LF-2 (NS)*

LF-1 (ND)

TOWN PROPERTY BOUNDARY

NASSAU COUNTY FIRE SERVICE ACADEMY

TOWN RECHARGE BASIN NO. 33

TOWN RECHARGE BASIN NO. 15 (NYS BASIN NO. 938)

CLAREMENT POLYCHEMICAL SITE

EW-1A,B,C (ND,ND,ND)*

EW-2A,B,C,D (ND,ND,ND,ND)*

MW-8A,B,C (ND,ND,ND*)

MW-10A,B,C,D (NS,NS,NS,ND)*

MW-6A,B,C,D,E,F (ND,3.3,ND,NS*,ND,ND)

EW-3A,B,C (NS,NS,NS)*

RW-5 (ND)*

MW-5B (ND)

MW-9B,C (ND,ND)

RW-4 (ND)*

RW-3 (ND)*

MW-7B-R (ND)

RW-1 (ND)*

RW-2 (ND)*

OBS-1 (1.3)

BP-3A,B,C (ND,ND,ND)*

MW-11A,B (ND,ND)

FARMINGDALE COLLEGE

BETHPAGE GOLF COURSE

BETHPAGE ROAD

SWEET HOLLOW ROAD

CLAREMONT ROAD

SWAMP ROAD

ROUND SWAMP ROAD

WINDING ROAD

QUAKER MEETING HOUSE ROAD

MELVILLE ROAD

## LEGEND:

- APPROXIMATE EXTENT OF AROMATIC HYDROCARBON PLUME, 1ST QUARTER 2016
- MW-9B,C (ND,ND) — OLD BETHPAGE LANDFILL MONITORING WELL WITH TOTAL AROMATIC HYDROCARBON CONCENTRATION IN PPB
- RW-1 — RECOVERY WELL
- EW-1A,B,C — CLAREMONT POLYCHEMICAL SITE MONITORING WELL
- BP-3A,B,C — NASSAU COUNTY MONITORING WELL
- * — DATA PROVIDED BY TOWN OF OYSTER BAY
- (NS) — NOT SAMPLED
- (ND) — NOT DETECTED

NOTE:

BASE MAP WITH WELL LOCATIONS PROVIDED BY LKB IN DRAWING 101, DATED AUGUST 2005.

PLUME LIMIT IS BASED ON TOTAL AROMATIC HYDROCARBON CONCENTRATIONS IN THE MONITORING AND RECOVERY WELLS.

D&B ENGINEERS AND ARCHITECTS, P.C.

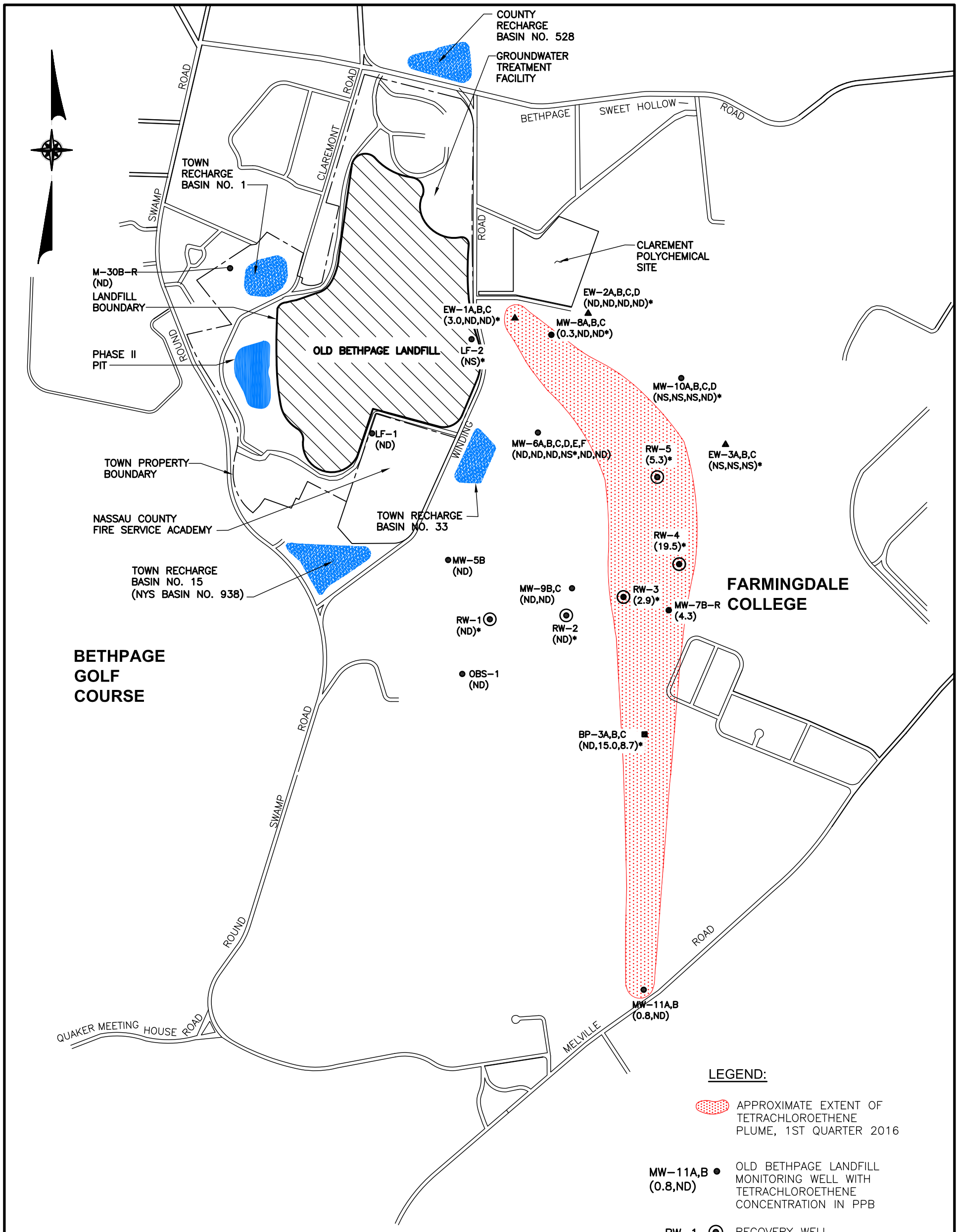
OLD BETHPAGE LANDFILL
TOWN OF OYSTER BAY, NEW YORK

# APPROXIMATE EXTENT AND DISTRIBUTION OF TOTAL AROMATIC HYDROCARBONS, FIRST QUARTER 2016

SCALE: 1"=800'

FIGURE 5

F:\3617\3617-C-PL02-AROMATIC HYDRO CARBONS_1Q 2016.dwg, 4/20/2016 1:44:23 PM, Adobe PDF




NOTE:

BASE MAP WITH WELL LOCATIONS PROVIDED BY LKB IN DRAWING 101, DATED AUGUST 2005

PLUME LIMIT IS BASED ON TETRACHLOROETHENE CONCENTRATIONS IN THE MONITORING AND RECOVERY WELLS.

LEGEND:

- APPROXIMATE EXTENT OF TETRACHLOROETHENE PLUME, 1ST QUARTER 2016
- MW-11A,B (0.8,ND) — OLD BETHPAGE LANDFILL MONITORING WELL WITH TETRACHLOROETHENE CONCENTRATION IN PPB
- RW-1 — RECOVERY WELL
- EW-1A,B,C — CLAREMONT POLYCHEMICAL SITE MONITORING WELL
- BP-3A,B,C — NASSAU COUNTY MONITORING WELL
- * — DATA PROVIDED BY TOWN OF OYSTER BAY
- (NS) — NOT SAMPLED
- (ND) — NOT DETECTED

D&B ENGINEERS AND ARCHITECTS, P.C.

OLD BETHPAGE LANDFILL
TOWN OF OYSTER BAY, NEW YORK

# APPROXIMATE EXTENT AND DISTRIBUTION OF TETRACHLOROETHENE, FIRST QUARTER 2016

SCALE: 1"=800'

FIGURE 6

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# TABLE 1
# TOWN OF OYSTER BAY
# OLD BETHPAGE LANDFILL

## WATER LEVEL MEASUREMENTS - FIRST QUARTER 2016

| Well Identification | Date | Measuring Point Elevation (feet) | Depth to Water (feet) | Water Elevation (feet) | Change in Water Elevation (feet) |
|---|---|---|---|---|---|
| EW-01A | 10/22/2015 | 128.59 | 67.45 | 61.14 | |
| EW-01A | 2/26/2016 | 128.59 | 67.67 | 60.92 | -0.22 |
| EW-01B | 10/22/2015 | 129.11 | 68.00 | 61.11 | |
| EW-01B | 2/26/2016 | 129.11 | 68.21 | 60.90 | -0.21 |
| EW-01C | 10/22/2015 | 129.02 | 68.11 | 60.91 | |
| EW-01C | 2/26/2016 | 129.02 | 68.30 | 60.72 | -0.19 |
| EW-02A | 10/22/2015 | 155.94 | 95.83 | 60.11 | |
| EW-02A | 2/26/2016 | 155.94 | 96.27 | 59.67 | -0.44 |
| EW-02B | 10/22/2015 | 156.33 | 95.97 | 60.36 | |
| EW-02B | 2/26/2016 | 156.33 | 96.25 | 60.08 | -0.28 |
| EW-02C | 10/22/2015 | 156.27 | 96.19 | 60.08 | |
| EW-02C | 2/26/2016 | 156.27 | 96.09 | 60.18 | 0.10 |
| EW-03A | 10/22/2015 | 157.71 | 99.45 | 58.26 | |
| EW-03A | 2/26/2016 | 157.71 | 99.72 | 57.99 | -0.27 |
| EW-03B | 10/22/2015 | 157.84 | 99.65 | 58.19 | |
| EW-03B | 2/26/2016 | 157.84 | 99.83 | 58.01 | -0.18 |
| EW-03C | 10/22/2015 | 157.72 | 99.32 | 58.40 | |
| EW-03C | 2/26/2016 | 157.72 | 99.68 | 58.04 | -0.36 |
| M-29A-R | 10/22/2015 | 157.83 | 93.08 | 64.75 | |
| M-29A-R | 2/26/2016 | 157.83 | 92.97 | 64.86 | 0.11 |
| M-29B | 10/22/2015 | 149.67 | 84.97 | 64.70 | |
| M-29B | 2/26/2016 | 149.67 | 85.06 | 64.61 | -0.09 |
| MW-30A | 10/22/2015 | 155.95 | 91.15 | 64.80 | |
| MW-30A | 2/26/2016 | 155.95 | 91.02 | 64.93 | 0.13 |
| M-30B-R | 10/22/2015 | 153.15 | 88.75 | 64.40 | |
| M-30B-R | 2/26/2016 | 153.15 | 88.65 | 64.50 | 0.10 |
| MW-05A | 10/22/2015 | 135.83 | 75.18 | 60.65 | |
| MW-05A | 2/26/2016 | 135.83 | 75.34 | 60.49 | -0.16 |
| MW-05B | 10/22/2015 | 137.05 | 76.41 | 60.64 | |
| MW-05B | 2/26/2016 | 137.05 | 76.59 | 60.46 | -0.18 |
| MW-06A | 10/22/2015 | 158.74 | 98.97 | 59.77 | |
| MW-06A | 2/26/2016 | 158.74 | 99.20 | 59.54 | -0.23 |
| MW-06B | 10/22/2015 | 159.02 | 99.21 | 59.81 | |
| MW-06B | 2/26/2016 | 159.02 | 99.46 | 59.56 | -0.25 |
| MW-06C | 10/22/2015 | 158.59 | 98.74 | 59.85 | |
| MW-06C | 2/26/2016 | 158.59 | 98.97 | 59.62 | -0.23 |

**TABLE 1**
**TOWN OF OYSTER BAY**
**OLD BETHPAGE LANDFILL**

**WATER LEVEL MEASUREMENTS - FIRST QUARTER 2016**

| Well Identification | Date | Measuring Point Elevation (feet) | Depth to Water (feet) | Water Elevation (feet) | Change in Water Elevation (feet) |
|---|---|---|---|---|---|
| MW-06D | 10/22/2015 | 158.90 | 99.14 | 59.76 | |
| MW-06D | 2/26/2016 | 158.90 | 99.36 | 59.54 | -0.22 |
| MW-06E | 10/22/2015 | 159.69 | 99.80 | 59.89 | |
| MW-06E | 2/26/2016 | 159.69 | 99.98 | 59.71 | -0.18 |
| MW-06F | 10/22/2015 | 158.66 | 99.13 | 59.53 | |
| MW-06F | 2/26/2016 | 158.66 | 99.21 | 59.45 | -0.08 |
| MW-07A | 10/22/2015 | 147.09 | 90.22 | 56.87 | |
| MW-07A | 2/26/2016 | 147.09 | 90.76 | 56.33 | -0.54 |
| MW-07B-R | 10/22/2015 | 146.42 | 90.39 | 56.03 | |
| MW-07B-R | 2/26/2016 | 146.42 | 90.63 | 55.79 | -0.24 |
| MW-08A | 10/22/2015 | 133.55 | 72.93 | 60.62 | |
| MW-08A | 2/26/2016 | 133.55 | 73.25 | 60.30 | -0.32 |
| MW-08B | 10/22/2015 | 132.85 | 72.54 | 60.31 | |
| MW-08B | 2/26/2016 | 132.85 | 72.74 | 60.11 | -0.20 |
| MW-08C | 10/22/2015 | 134.34 | 73.76 | 60.58 | |
| MW-08C | 2/26/2016 | 134.34 | 73.90 | 60.44 | -0.14 |
| MW-09A | 10/22/2015 | 151.98 | 91.60* | <60.38 | |
| MW-09A | 2/26/2016 | 151.98 | 95.00* | <56.98 | NA |
| MW-09B | 10/22/2015 | 152.07 | 94.89 | 57.18 | |
| MW-09B | 2/26/2016 | 152.07 | 95.18 | 56.89 | -0.29 |
| MW-09C | 10/22/2015 | 152.23 | 95.93 | 56.30 | |
| MW-09C | 2/26/2016 | 152.23 | 96.16 | 56.07 | -0.23 |
| MW-09D | 10/22/2015 | 151.68 | 94.82 | 56.86 | |
| MW-09D | 2/26/2016 | 151.68 | 94.88 | 56.80 | -0.06 |
| MW-10A | 10/22/2015 | 159.82 | 100.24 | 59.58 | |
| MW-10A | 2/26/2016 | 159.82 | 100.65 | 59.17 | -0.41 |
| MW-10B | 10/22/2015 | 160.01 | 100.53 | 59.48 | |
| MW-10B | 2/26/2016 | 160.01 | 100.85 | 59.16 | -0.32 |
| MW-10C | 10/22/2015 | 159.00 | 99.65 | 59.35 | |
| MW-10C | 2/26/2016 | 159.00 | 99.91 | 59.09 | -0.26 |
| MW-10D | 10/22/2015 | 159.81 | 100.59 | 59.22 | |
| MW-10D | 2/26/2016 | 159.81 | 100.67 | 59.14 | -0.08 |
| MW-11A | 10/22/2015 | 78.71 | 26.14 | 52.57 | |
| MW-11A | 2/26/2016 | 78.71 | 29.54 | 49.17 | -3.40 |
| MW-11B | 10/22/2015 | 78.51 | 25.94 | 52.57 | |
| MW-11B | 2/26/2016 | 78.51 | 25.75 | 52.76 | 0.19 |

**TABLE 1**
**TOWN OF OYSTER BAY**
**OLD BETHPAGE LANDFILL**

**WATER LEVEL MEASUREMENTS - FIRST QUARTER 2016**

| Well Identification | Date | Measuring Point Elevation (feet) | Depth to Water (feet) | Water Elevation (feet) | Change in Water Elevation (feet) |
|---|---|---|---|---|---|
| N-9980 | 10/22/2015 | 80.14 | 27.24 | 52.90 | |
| N-9980 | 2/26/2016 | 80.14 | 27.02 | 53.12 | 0.22 |
| OBS-1 | 10/22/2015 | 108.59 | 51.82 | 56.77 | |
| OBS-1 | 2/26/2016 | 108.59 | 51.90 | 56.69 | -0.08 |
| RW-01 | 10/22/2015 | 110.94 | 59.71 | 51.23 | |
| RW-01 | 2/26/2016 | 110.94 | 59.80 | 51.14 | -0.09 |
| RW-02 | 10/22/2015 | 145.31 | 109.05 | 36.26 | |
| RW-02 | 2/26/2016 | 145.31 | 108.69 | 36.62 | 0.36 |
| RW-03 | 10/22/2015 | 120.92 | 70.15 | 50.77 | |
| RW-03 | 2/26/2016 | 120.92 | 69.75 | 51.17 | 0.40 |
| RW-04 | 10/22/2015 | 144.82 | 104.3* | <40.52 | |
| RW-04 | 2/26/2016 | 144.82 | 100.15* | <44.67 | NA |
| RW-05 | 10/22/2015 | 149.74 | 106.55 | 43.19 | |
| RW-05 | 2/26/2016 | 149.74 | 106.92* | <42.82 | NA |
| TW-1 | 10/22/2015 | 119.56 | 54.76 | 64.80 | |
| TW-1 | 2/26/2016 | 119.56 | 55.13 | 64.43 | -0.37 |
| TW-2 | 10/22/2015 | 116.02 | 54.19 | 61.83 | |
| TW-2 | 2/26/2016 | 116.02 | 54.07 | 61.95 | 0.12 |
| TW-3-R | 10/22/2015 | 132.82 | 71.07 | 61.75 | |
| TW-3-R | 2/26/2016 | 132.82 | 76.96** | 55.86 | -5.89 |
| LF-1 | 10/22/2015 | 109.92 | 48.34 | 61.58 | |
| LF-1 | 2/26/2016 | 109.92 | 48.29 | 61.63 | 0.05 |
| LF-2 | 10/22/2015 | 117.26 | 64.94** | 52.32 | |
| LF-2 | 2/26/2016 | 117.26 | 56.06 | 61.20 | 8.88 |
| LF-3 | 10/22/2015 | 124.95 | 61.76 | 63.19 | |
| LF-3 | 2/26/2016 | 124.95 | 61.83 | 63.12 | -0.07 |
| LF-4 | 10/22/2015 | 149.93 | 83.63 | 66.30 | |
| LF-4 | 2/26/2016 | 149.93 | 83.55 | 66.38 | 0.08 |

Measuring Point Elevation and Water Elevation are in feet above mean sea level.
Measuring Point is typically top of casing.
NM: Not Measured
N/A: Not Applicable
*: Monitoring Well/ Recovery Well Dry
**: Water level reading suspected to be anomalous.

# TABLE 3
## TOWN OF OYSTER BAY
## OLD BETHPAGE LANDFILL
## GROUNDWATER ANALYTICAL RESULTS - FIRST QUARTER 2016
## VOLATILE HALOGENATED ORGANIC COMPOUNDS

| Sample ID | MW-05B | MW-06A | MW-06B | MW-06C | MW-06E | MW-06F | MW-07B-R | MW-07B-R (DUP) | MW-08A | MW-08B | MW-09B | NYSDEC Class GA |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sampling Date | 2/29/2016 | 3/1/2016 | 3/1/2016 | 3/2/2016 | 3/2/2016 | 3/2/2016 | 2/29/2016 | 2/29/2016 | 2/29/2016 | 2/29/2016 | 2/29/2016 | Standard or Guidance Value |
| Units | ug/l | ug/l | ug/l | ug/l | ug/l | ug/l | ug/l | ug/l | ug/l | ug/l | ug/l | ug/l |
| Bromodichloromethane | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 50 |
| Bromoform | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 50 |
| Carbon tetrachloride | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 5 |
| Chlorodibromomethane | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 50 |
| Chloroethane | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 5 |
| Chloroform | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 0.6 J | 1 U | 1 U | 1 U | 7 |
| Dichlorodifluoromethane | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 5 |
| 1,1-Dichloroethane | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 5 |
| 1,1-Dichloroethene | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1.0 | 1.2 | 1 U | 1 U | 1 U | 5 |
| 1,2-Dichloroethane | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.6 |
| trans-1,2-Dichloroethene | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 5 |
| cis-1,2-Dichloroethene | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | ***13.9*** | ***15.7*** | 1 U | 1 U | 1 U | 5 |
| 1,2-Dichloropropane | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 |
| Methylene chloride | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 5 |
| 1,1,1-Trichloroethane | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1.7 | 1.8 | 1 U | 1 U | 1 U | 5 |
| Trichloroethylene | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | ***140*** | ***169*** | 1 U | 1 U | 1 U | 5 |
| Vinyl chloride | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 2 |
| Total Volatile Compounds | ND | ND | ND | ND | ND | ND | 156.6 | 188.3 | ND | ND | ND | -- |

Footnotes/Qualifiers:

ug/l: Micrograms per liter
U: Analyzed for but not detected
J: Estimated value
--: No standard
ND: Not detected
***Exceeds NYSDEC Class GA Standard or Guidance Value***

D&B ENGINEERS AND ARCHITECTS, P.C.

# TABLE 3
## TOWN OF OYSTER BAY
## OLD BETHPAGE LANDFILL
## GROUNDWATER ANALYTICAL RESULTS - FIRST QUARTER 2016
## VOLATILE HALOGENATED ORGANIC COMPOUNDS

| Sample ID | MW-09C | MW-11A | MW-11B | MW-30B-R | LF-1 | OBS-1 | Field Blank | Trip Blank | Trip Blank | Trip Blank | NYSDEC Class GA |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Sampling Date | 2/29/2016 | 3/1/2016 | 3/1/2016 | 3/1/2016 | 2/29/2016 | 2/29/2016 | 3/1/2016 | 2/29/2016 | 3/1/2016 | 3/2/2016 | Standard or Guidance Value |
| Units | ug/l | ug/l | ug/l | ug/l | ug/l | ug/l | ug/l | ug/l | ug/l | ug/l | ug/l |
| **Bromodichloromethane** | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 50 |
| **Bromoform** | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 50 |
| **Carbon tetrachloride** | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 5 |
| **Chlorodibromomethane** | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 50 |
| **Chloroethane** | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 5 |
| **Chloroform** | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 7 |
| **Dichlorodifluoromethane** | 1 U | 2.0 | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 5 |
| **1,1-Dichloroethane** | 1 U | 2.5 J | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 5 |
| **1,1-Dichloroethene** | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 5 |
| **1,2-Dichloroethane** | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.6 |
| **trans-1,2-Dichloroethene** | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 5 |
| **cis-1,2-Dichloroethene** | 1 U | ***23.0*** | 0.4 J | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 5 |
| **1,2-Dichloropropane** | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 |
| **Methylene chloride** | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 5 |
| **1,1,1-Trichloroethane** | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 5 |
| **Trichloroethylene** | 1 U | 0.6 J | 1 U | 1 U | 1 U | 0.9 J | 1 U | 1 U | 1 U | 1 U | 5 |
| **Vinyl chloride** | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 2 |
| **Total Volatile Compounds** | ND | 28.1 | 0.4 | ND | ND | 0.9 | ND | ND | ND | ND | -- |

Footnotes/Qualifiers:

ug/l: Micrograms per liter

U: Analyzed for but not detected

J: Estimated value

--: No standard

ND: Not detected

***Exceeds NYSDEC Class GA Standard or Guidance Value***

D&B ENGINEERS AND ARCHITECTS, P.C.

# TABLE 4
## TOWN OF OYSTER BAY
## OLD BETHPAGE LANDFILL
## GROUNDWATER ANALYTICAL RESULTS - FIRST QUARTER 2016
## AROMATIC HYDROCARBONS

| Sample ID | MW-05B | MW-06A | MW-06B | MW-06C | MW-06E | MW-06F | MW-07B-R | MW-07B-R (DUP) | MW-08A | MW-08B | MW-09B | NYSDEC Class GA |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sampling Date | 2/29/2016 | 3/1/2016 | 3/1/2016 | 3/2/2016 | 3/2/2016 | 3/2/2016 | 2/29/2016 | 2/29/2016 | 2/29/2016 | 2/29/2016 | 2/29/2016 | Standard or Guidance Value |
| Units | ug/l | ug/l | ug/l | ug/l | ug/l | ug/l | ug/l | ug/l | ug/l | ug/l | ug/l | ug/l |
| **Benzene** | 1 U | 1 U | 0.6 J | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 |
| **n-Butylbenzene** | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 5 |
| **tert-Butylbenzene** | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 5 |
| **Chlorobenzene** | 1 U | 1 U | 1.7 | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 5 |
| **Dichlorobenzene,o&p** | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 3** |
| **Dichlorobenzene,o,m&p** | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 3** |
| **Ethylbenzene** | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 5 |
| **Isopropylbenzene** | 1 U | 1 U | 0.8 J | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 5 |
| **Toluene** | 6 U | 1 U | 0.2 J | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 6 U | 1 U | 5 |
| **m/p-Xylene** | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 5 |
| **o-Xylene** | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 5 |
| **Total Volatile Compounds** | ND | ND | 3.3 | ND | ND | ND | ND | ND | ND | ND | ND | -- |

Footnotes/Qualifiers:

ug/l: Micrograms per liter
U: Analyzed for but not detected
J: Estimated value
--: No standard
**: Applies to each isomer individually
ND: Not detected

***Exceeds NYSDEC Class GA Standard or Guidance Value***

# TABLE 4
## TOWN OF OYSTER BAY
## OLD BETHPAGE LANDFILL
## GROUNDWATER ANALYTICAL RESULTS - FIRST QUARTER 2016
## AROMATIC HYDROCARBONS

| Sample ID<br>Sampling Date<br>Units | MW-09C<br>2/29/2016<br>ug/l | MW-11A<br>3/1/2016<br>ug/l | MW-11B<br>3/1/2016<br>ug/l | MW-30B-R<br>3/1/2016<br>ug/l | LF-1<br>2/29/2016<br>ug/l | OBS-1<br>2/29/2016<br>ug/l | Field Blank<br>3/1/2016<br>ug/l | Trip Blank<br>2/29/2016<br>ug/l | Trip Blank<br>3/1/2016<br>ug/l | Trip Blank<br>3/2/2016<br>ug/l | NYSDEC Class GA<br>Standard<br>or Guidance Value<br>ug/l |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Benzene** | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 |
| **n-Butylbenzene** | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 5 |
| **tert-Butylbenzene** | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 5 |
| **Chlorobenzene** | 1 U | 1 U | 1 U | 1 U | 1 U | 0.3 J | 1 U | 1 U | 1 U | 1 U | 5 |
| **Dichlorobenzene,o&p** | 1 U | 1 U | 1 U | 1 U | 1 U | 1.0 | 1 U | 1 U | 1 U | 1 U | 3** |
| **Dichlorobenzene,o,m&p** | 1 U | 1 U | 1 U | 1 U | 1 U | 1.0 | 1 U | 1 U | 1 U | 1 U | 3** |
| **Ethylbenzene** | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 5 |
| **Isopropylbenzene** | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 5 |
| **Toluene** | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 5 |
| **m/p-Xylene** | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 5 |
| **o-Xylene** | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 5 |
| **Total Volatile Compounds** | ND | ND | ND | ND | ND | 1.3 | ND | ND | ND | ND | -- |

Footnotes/Qualifiers:

ug/l: Micrograms per liter
U: Analyzed for but not detected
J: Estimated value
--: No standard
**: Applies to each isomer individually
ND: Not detected

***Exceeds NYSDEC Class GA Standard or Guidance Value***

# TABLE 5
## TOWN OF OYSTER BAY
## OLD BETHPAGE LANDFILL
## GROUNDWATER ANALYTICAL RESULTS - FIRST QUARTER 2016
## TETRACHLOROETHENE

| Sample ID / Sampling Date / Units | MW-05B 2/29/2016 ug/l | MW-06A 3/1/2016 ug/l | MW-06B 3/1/2016 ug/l | MW-06C 3/2/2016 ug/l | MW-06E 3/2/2016 ug/l | MW-06F 3/2/2016 ug/l | MW-07B-R 2/29/2016 ug/l | MW-07B-R (DUP) 2/29/2016 ug/l | MW-08A 2/29/2016 ug/l | MW-08B 2/29/2016 ug/l | MW-09B 2/29/2016 ug/l | NYSDEC Class GA Standard or Guidance Value ug/l |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Tetrachloroethene | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 4.3 | 5.0 | 0.3 J | 1 U | 1 U | 5 |

| Sample ID / Sampling Date / Units | MW-09C 2/29/2016 ug/l | MW-11A 3/1/2016 ug/l | MW-11B 3/1/2016 ug/l | M-30B-R 3/1/2016 ug/l | LF-1 2/29/2016 ug/l | OBS-1 2/29/2016 ug/l | Field Blank 3/1/2016 ug/l | Trip Blank 2/29/2016 ug/l | Trip Blank 3/1/2016 ug/l | Trip Blank 3/2/2016 ug/l | | NYSDEC Class GA Standard or Guidance Value ug/l |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Tetrachloroethene | 1 U | 0.8 J | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | | 5 |

Footnotes/Qualifiers:
- ug/l: Micrograms per liter
- U: Analyzed for but not detected
- J: Estimated value

***Exceeds NYSDEC Class GA Standard or Guidance Value***

**TABLE 6**
**TOWN OF OYSTER BAY**
**OLD BETHPAGE LANDFILL**
**RECOVERY WELL SAMPLING RESULTS - FIRST QUARTER 2016**
**VOLATILE ORGANIC COMPOUNDS**

| Sample ID / Sampling Date / Units | RW-01 3/17/2016 ug/l | RW-02 3/17/2016 ug/l | RW-03 3/17/2016 ug/l | RW-04 3/17/2016 ug/l | RW-05 3/17/2016 ug/l | NYSDEC Class GA Standard or Guidance Value ug/l |
|---|---|---|---|---|---|---|
| Volatile Halogenated Organic Compounds | | | | | | |
| **Bromodichloromethane** | 1 U | 1 U | 1 U | 1 U | 1 U | 50 |
| **Bromoform** | 1 U | 1 U | 1 U | 1 U | 1 U | 50 |
| **Carbon tetrachloride** | 1 U | 1 U | 1 U | 1 U | 1 U | 5 |
| **Chlorodibromomethane** | 1 U | 1 U | 1 U | 1 U | 1 U | 50 |
| **Chloroethane** | 1 U | 1 U | 1 U | 1 U | 1 U | 5 |
| **Chloroform** | 1 U | 1 U | 1 U | 1 U | 1 U | 7 |
| **Dichlorodifluoromethane** | 1 U | 1 U | 1 U | 1 U | 1 U | 5 |
| **1,1-Dichloroethane** | 1 U | 1 U | 1 U | 1 U | 1 U | 5 |
| **1,1-Dichloroethene** | 1 U | 1 U | 1 U | 1.2 | 2.2 | 5 |
| **1,2-Dichloroethane** | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.6 |
| **trans-1,2-Dichloroethene** | 1 U | 1 U | 1 U | 1 U | 1 U | 5 |
| **cis-1,2-Dichloroethene** | 1 U | 1 U | 0.7 J | ***9.8*** | 0.9 J | 5 |
| **1,2-Dichloropropane** | 1 U | 1 U | 1 U | 1 U | 1 U | 1 |
| **Methylene chloride** | 1 U | 1 U | 1 U | 1 U | 1 U | 5 |
| **Tetrachloroethene** | 1 U | 1 U | 2.9 | ***19.5*** | ***5.3*** | 5 |
| **1,1,1-Trichloroethane** | 1 U | 1 U | 1 U | 1.6 | 1.5 | 5 |
| **Trichloroethylene** | 1 U | 1 U | ***8.6*** | ***174*** | ***22.3*** | 5 |
| **Vinyl chloride** | 1 U | 1 U | 1 U | 1 U | 1 U | 2 |
| **Total Volatile Halogenated Organic Compounds** | ND | ND | 12.2 | 206.1 | 32.2 | -- |
| Aromatic Hydrocarbons | | | | | | |
| **Benzene** | 1 U | 1 U | 1 U | 1 U | 1 U | 1 |
| **n-Butylbenzene** | 1 U | 1 U | 1 U | 1 U | 1 U | 5 |
| **tert-Butylbenzene** | 1 U | 1 U | 1 U | 1 U | 1 U | 5 |
| **Chlorobenzene** | 1 U | 1 U | 1 U | 1 U | 1 U | 5 |
| **Dichlorobenzene,o&p** | 1 U | 1 U | 1 U | 1 U | 1 U | 3** |
| **Dichlorobenzene,o,m&p** | 1 U | 1 U | 1 U | 1 U | 1 U | 3** |
| **Ethylbenzene** | 1 U | 1 U | 1 U | 1 U | 1 U | 5 |
| **Isopropylbenzene** | 1 U | 1 U | 1 U | 1 U | 1 U | 5 |
| **Toluene** | 1 U | 1 U | 1 U | 1 U | 1 U | 5 |
| **m/p-Xylene** | 1 U | 1 U | 1 U | 1 U | 1 U | 5 |
| **o-Xylene** | 1 U | 1 U | 1 U | 1 U | 1 U | 5 |
| **Total Aromatic Hydrocarbons** | ND | ND | ND | ND | ND | -- |

Footnotes/Qualifiers:
ug/l: Micrograms per liter
U: Analyzed for but not detected
J: Estimated value or limit
--: No standard
ND: Not detected
***Exceeds NYSDEC Class GA Standard or Guidance Value***

D&B ENGINEERS AND ARCHITECTS, P.C.

# TABLE 7
## TOWN OF OYSTER BAY
## OLD BETHPAGE LANDFILL
## GROUNDWATER ANALYTICAL RESULTS - FIRST QUARTER 2016
## TOTAL (UNFILTERED) METALS AND LEACHATE INDICATORS

| Sample ID / Sampling Date / Units | MW-05B 2/29/2016 mg/l | MW-06A 3/1/2016 mg/l | MW-06B 3/1/2016 mg/l | MW-06C 3/2/2016 mg/l | MW-06E 3/2/2016 mg/l | MW-06F 3/2/2016 mg/l | MW-07B-R 2/29/2016 mg/l | MW-07B-R (DUP) 2/29/2016 mg/l | MW-08A 2/29/2016 mg/l | NYSDEC Class GA Standard or Guidance Value mg/l |
|---|---|---|---|---|---|---|---|---|---|---|
| Total (Unfiltered) Metals | | | | | | | | | | |
| **Aluminum** | 0.2 U | 0.28 | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 0.2 U | -- |
| **Barium** | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 1 |
| **Calcium** | 15 | 1.4 | 18 | 12 | 27 | 33 | 5.6 | 5.5 | 33 | -- |
| **Chromium** | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.05 |
| **Chromium, Hexavalent** | 0.02 UH | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.02 UH | 0.02 UH | 0.02 UH | 0.05 |
| **Copper** | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.2 |
| **Iron** | 0.26 | **0.86** | **8.9** | **5.9** | **3.5** | 0.24 | **0.37** | **0.42** | **0.36** | 0.3 |
| **Lead** | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.025 |
| **Magnesium** | 7 | 1.4 | 16 | 9.9 | 11 | 12 | 2.7 | 2.7 | 11 | 35 |
| **Manganese** | **6.8** | 0.031 | 0.057 | 0.021 | **0.5** | 0.12 | 0.093 | 0.1 | 0.087 | 0.3 |
| **Mercury** | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0007 |
| **Nickel** | 0.04 U | 0.04 U | 0.04 U | 0.04 U | 0.04 U | 0.04 U | 0.04 U | 0.04 U | 0.04 U | 0.1 |
| **Potassium** | 8 | 5 U | 130 | 86 | 20 | 7.1 | 5 U | 5 U | 12 | -- |
| **Sodium** | **56** | 7.1 | **300** | **230** | **140** | **100** | 12 | 11 | **67** | 20 |
| **Zinc** | 0.02 U | 0.02 U | 0.02 U | 0.023 | 0.026 | 0.027 | 0.024 | 0.027 | 0.085 | 2 |
| Leachate Indicators | | | | | | | | | | |
| **Alkalinity, Total (as CaCO3)** | 30.2 | 3.1 | 861 D | 601 D | 81.1 | 1 U | 3.1 | 2.55 | 64.5 | -- |
| **Bicarbonate** | 30.2 | 3.1 | 858 | 598 | 81 | 1 U | 3.1 | 2.5 | 64.5 | -- |
| **Carbonate** | 1 U | 1 U | 2.7 | 3.3 | 1 U | 1 U | 1 U | 1 U | 1 U | -- |
| **Chloride** | 94.7 D | 9.27 | **366 D** | **281 D** | **353 D** | **306 D** | 21.2 | 24.3 | 114 D | 250 |
| **Cyanide** | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.2 |
| **Hardness (as CaCO3)** | 83 | 14 | 106 | 67 | 114 | 122 | 23 | 22 | 104 D | -- |
| **Nitrate as N** | 4.82 D | 0.15 | 0.1 U | 0.17 | 1.95 D | 1.93 D | 1.6 | 2.18 D | 5.05 D | 10 |
| **Nitrite as N** | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 1 |
| **Nitrogen, Ammonia (as N)** | 0.23 | 0.1 U | **173 D** | **110 D** | **16.1 D** | 0.1 U | 0.1 U | 0.1 U | 0.16 | 2 |
| **Nitrogen, Kjeldahl, Total** | 0.1 U | 0.2 | 143 D | 92.4 D | 13.6 D | 0.1 U | 0.1 U | 0.1 U | 0.1 U | -- |
| **Phenolics, Total Recoverable** | **0.007** | 0.005 U | **0.0115** | **0.0275** | 0.005 U | 0.005 U | **0.01** | **0.006** | **0.0061** | 0.001 |
| **Sulfate** | 17.2 | 5.04 | 5 U | 14.6 | 28.4 | 5 U | 9.75 | 7.33 | 29.5 | 250 |
| **Total Dissolved Solids** | 251 | 32 | 521 | 772 | 572 | 518 | 50 | 57 | 282 | -- |

Footnotes/Qualifiers:

mg/l: Milligrams per liter

U: Analyzed for but not detected

D: Analyzed at a secondary dilution

H: Analyzed outside holding time

--: No standard or not analyzed

**Exceeds NYSDEC Class GA Standard or Guidance Value**

D&B ENGINEERS AND ARCHITECTS, P.C.

# TABLE 7
## TOWN OF OYSTER BAY
## OLD BETHPAGE LANDFILL
## GROUNDWATER ANALYTICAL RESULTS - FIRST QUARTER 2016
## TOTAL (UNFILTERED) METALS AND LEACHATE INDICATORS

| Sample ID | MW-08B | MW-09B | MW-09C | MW-11A | MW-11B | MW-30B-R | LF-1 | OBS-1 | Field Blank | NYSDEC Class GA Standard or Guidance Value |
|---|---|---|---|---|---|---|---|---|---|---|
| Sampling Date | 2/29/2016 | 2/29/2016 | 2/29/2016 | 3/1/2016 | 3/1/2016 | 3/1/2016 | 2/29/2016 | 2/29/2016 | 3/1/2016 | |
| Units | mg/l | mg/l | mg/l | mg/l | mg/l | mg/l | mg/l | mg/l | mg/l | mg/l |
| Total (Unfiltered) Metals | | | | | | | | | | |
| **Aluminum** | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 0.2 U | -- | 0.2 U | 0.2 U | -- |
| **Barium** | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 0.2 U | -- | 0.2 U | 0.2 U | 1 |
| **Calcium** | 41 | 17 | 8.4 | 3.9 | 3.3 | 12 | -- | 21 | 1 U | -- |
| **Chromium** | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | -- | 0.01 U | 0.01 U | 0.05 |
| **Chromium, Hexavalent** | 0.02 UH | 0.02 UH | 0.02 UH | 0.02 U | 0.02 U | 0.02 U | -- | 0.02 UH | 0.02 U | 0.05 |
| **Copper** | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | -- | 0.025 U | 0.025 U | 0.2 |
| **Iron** | **0.63** | 0.19 | **0.57** | 0.068 | 0.14 | **0.48** | -- | 0.03 | 0.024 | 0.3 |
| **Lead** | 0.005 U | 0.005 U | 0.0098 | 0.005 U | 0.005 U | 0.005 U | -- | 0.005 U | 0.005 U | 0.025 |
| **Magnesium** | 11 | 6.4 | 6.7 | 2 | 1.6 | 3.7 | -- | 15 | 1 U | 35 |
| **Manganese** | **1** | **3.8** | 0.27 | 0.015 U | 0.015 U | 0.058 | -- | **2.3** | 0.015 U | 0.3 |
| **Mercury** | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | -- | 0.0002 U | 0.0002 U | 0.0007 |
| **Nickel** | 0.04 U | 0.04 U | 0.04 U | 0.04 U | 0.04 U | 0.04 U | -- | 0.04 U | 0.04 U | 0.1 |
| **Potassium** | 11 | 7.2 | 7.5 | 5 U | 5 U | 5 U | -- | 19 | 5 U | -- |
| **Sodium** | **150** | **61** | **48** | 5 U | 6.4 | **59** | -- | **58** | 5 U | 20 |
| **Zinc** | 0.051 | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U | -- | 0.02 U | 0.02 U | 2 |
| Leachate Indicators | | | | | | | | | | |
| **Alkalinity, Total (as CaCO3)** | 60.4 | 27 | 17.1 | 1.55 | 1 U | 5 | 80.2 | 107 | 1 U | -- |
| **Bicarbonate** | 60.3 | 27 | 17.1 | 1.5 | 1 U | 5 | 80.1 | 107 | 1 U | -- |
| **Carbonate** | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | -- |
| **Chloride** | 10.7 | 106 D | 83.3 D | 11.9 | 17.1 | 89.5 D | 137 D | 102 D | 2 U | 250 |
| **Cyanide** | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.2 |
| **Hardness (as CaCO3)** | 116 D | 64 D | 46 | 20 | 17 | 46 | 126 | 108 D | 5 U | -- |
| **Nitrate as N** | 1.81 D | 3.77 D | 2.69 D | 2.68 D | 1.39 D | 5.29 D | 0.1 U | 1.01 | 0.1 U | 10 |
| **Nitrite as N** | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 1 |
| **Nitrogen, Ammonia (as N)** | 0.31 | 0.14 | 1.79 | 0.1 U | 0.1 U | 0.1 U | 0.8 | **15 D** | 0.1 U | 2 |
| **Nitrogen, Kjeldahl, Total** | 0.34 | 0.1 U | 1.51 | 0.1 U | 0.1 U | 0.1 U | 0.93 | 12.6 D | 2.98 | -- |
| **Phenolics, Total Recoverable** | **0.0110** | **0.0053** | **0.0067** | 0.005 U | 0.005 U | **0.0101** | **0.0152** | **0.0083** | 0.005 U | 0.001 |
| **Sulfate** | 28.4 | 20.1 | 21 | 5 U | 5 U | 37 | 28.5 | 71.2 D | 5 U | 250 |
| **Total Dissolved Solids** | 513 | 226 | 186 | 50 | 41 | 227 | 349 | 280 | 10 U | -- |

Footnotes/Qualifiers:

mg/l: Milligrams per liter

U: Analyzed for but not detected

D: Analyzed at a secondary dilution

H: Analyzed outside holding time

--: No standard or not analyzed

**Exceeds NYSDEC Class GA Standard or Guidance Value**

D&B ENGINEERS AND ARCHITECTS, P.C.

# TABLE 8
## TOWN OF OYSTER BAY
## OLD BETHPAGE LANDFILL
## GROUNDWATER ANALYTICAL RESULTS - FIRST QUARTER 2016
## DISSOLVED (FILTERED) METALS

| Sample ID / Sampling Date / Units | MW-05B 2/29/2016 mg/l | MW-06A 3/1/2016 mg/l | MW-06B 3/1/2016 mg/l | MW-06C 3/2/2016 mg/l | MW-06E 3/2/2016 mg/l | MW-06F 3/2/2016 mg/l | MW-07B-R 2/29/2016 mg/l | MW-07B-R (DUP) 2/29/2016 mg/l | MW-08A 2/29/2016 mg/l | NYSDEC Class GA Standard or Guidance Value mg/l |
|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved (Filtered) Metals | | | | | | | | | | |
| **Aluminum** | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 0.2 U | -- |
| **Barium** | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 1 |
| **Calcium** | 14 | 1.3 | 16 | 10 | 25 | 31 | 5.4 | 5.5 | 31 | -- |
| **Chromium** | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.05 |
| **Chromium, Hexavalent** | 0.020 UH | 0.020 U | 0.020 U | 0.020 U | 0.020 U | 0.020 U | 0.02 UH | 0.020 UH | 0.02 UH | 0.05 |
| **Copper** | 0.073 | 0.03 | 0.057 | 0.048 | 0.069 | 0.086 | 0.063 | 0.058 | 0.036 | 0.2 |
| **Iron** | 0.02 U | 0.10 U | 0.13 | 0.13 | **3.1** | 0.100 U | 0.02 U | 0.02 U | 0.02 U | 0.3 |
| **Lead** | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.025 |
| **Magnesium** | 6.4 | 1.2 | 15 | 8.9 | 11 | 12 | 2.5 | 2.6 | 9.7 | 35 |
| **Manganese** | **5.7** | 0.015 U | 0.047 | 0.015 | **0.47** | 0.11 | 0.083 | 0.048 | 0.088 | 0.3 |
| **Mercury** | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0007 |
| **Nickel** | 0.04 U | 0.04 U | 0.04 U | 0.04 U | 0.04 U | 0.04 U | 0.04 U | 0.04 U | 0.04 U | 0.1 |
| **Potassium** | 6 | 1.2 | 110 | 76 | 18 | 6.6 | 5 U | 5 U | 11 | -- |
| **Sodium** | **50** | 7.1 | **270** | **210** | **130** | **96** | 12 | 12 | **62** | 20 |
| **Zinc** | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.028 | 0.044 | 0.026 | 0.032 | 0.10 | 2 |

Footnotes/Qualifiers:

mg/l: Milligrams per liter

U: Analyzed for but not detected

--: No standard

H: Analyzed outside holding time

**Exceeds NYSDEC Class GA Standard or Guidance Value**

D&B ENGINEERS AND ARCHITECTS, P.C.

# TABLE 8
## TOWN OF OYSTER BAY
## OLD BETHPAGE LANDFILL
## GROUNDWATER ANALYTICAL RESULTS - FIRST QUARTER 2016
## DISSOLVED (FILTERED) METALS

| Sample ID / Sampling Date / Units | MW-08B 2/29/2016 mg/l | MW-09B 2/29/2016 mg/l | MW-09C 2/29/2016 mg/l | MW-11A 3/1/2016 mg/l | MW-11B 3/1/2016 mg/l | MW-30B-R 3/1/2016 mg/l | OBS-1 2/29/2016 mg/l | Field Blank 3/1/2016 mg/l | NYSDEC Class GA Standard or Guidance Value mg/l |
|---|---|---|---|---|---|---|---|---|---|
| Dissolved (Filtered) Metals | | | | | | | | | |
| **Aluminum** | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 0.2 U | -- |
| **Barium** | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 1 |
| **Calcium** | 40 | 15 | 8 | 3.7 | 3.1 | 12 | 21 | 0.2 U | -- |
| **Chromium** | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.05 |
| **Chromium, Hexavalent** | 0.02 UH | 0.02 UH | 0.02 UH | 0.02 U | 0.02 U | 0.02 U | 0.02 UH | 0.02 U | 0.05 |
| **Copper** | 0.032 | 0.039 | 0.038 | 0.072 | 0.073 | 0.06 | 0.025 U | 0.02 U | 0.2 |
| **Iron** | 0.02 U | 0.02 U | 0.02 U | 0.1 U | 0.1 U | 0.1 U | 0.02 U | 0.02 U | 0.3 |
| **Lead** | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.025 |
| **Magnesium** | 10 | 5.7 | 6.1 | 1.8 | 1.5 | 3.5 | 15 | 0.2 U | 35 |
| **Manganese** | **0.94** | **3.2** | 0.24 | 0.015 U | 0.015 U | 0.048 | **2.2** | 0.02 U | 0.3 |
| **Mercury** | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0007 |
| **Nickel** | 0.04 U | 0.04 U | 0.04 U | 0.04 U | 0.04 U | 0.04 U | 0.04 U | 0.04 U | 0.1 |
| **Potassium** | 10 | 5.8 | 6.4 | 1 U | 1 U | 2.4 | 16 | 0.26 | -- |
| **Sodium** | **140** | **55** | **45** | 5.9 | 7.8 | **56** | **57** | 1.1 | 20 |
| **Zinc** | 0.043 | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.028 | 0.02 U | 0.02 U | 2 |

Footnotes/Qualifiers:

mg/l: Milligrams per liter

U: Analyzed for but not detected

--: No standard

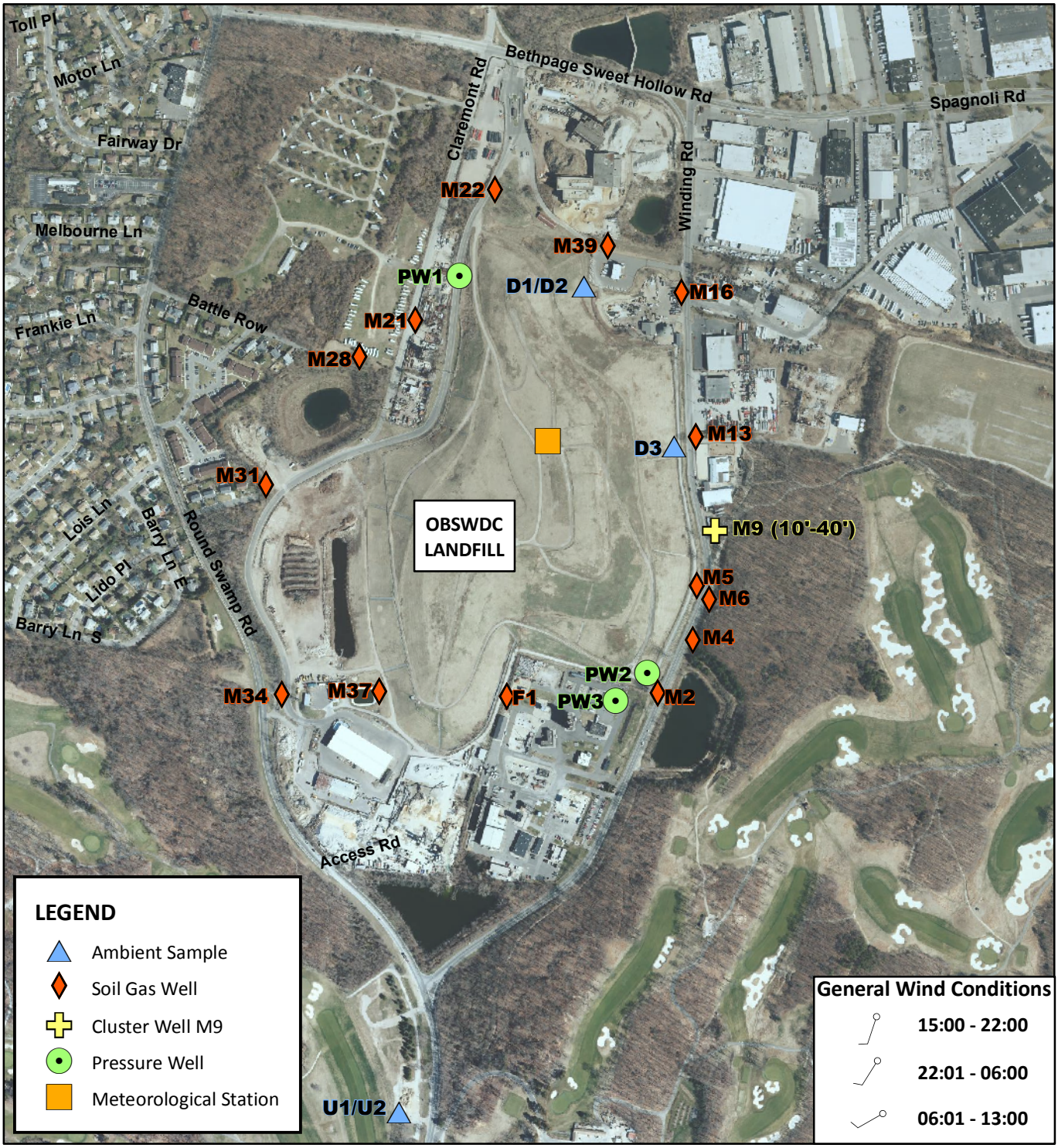
H: Analyzed outside holding time

**Exceeds NYSDEC Class GA Standard or Guidance Value**

# APPENDIX B

**Figure 2.1 and Tables 4.1, 4.2 and 5.1**
**from**
**"Town of Oyster Bay, Old Bethpage Solid Waste Disposal Complex**
**Ambient Air Quality Survey and Soil Gas Quality Survey**
**2016 First Quarter Report"**

**RTP Environmental Associates, Inc.**
**May 2016**




N

0 375 750 1,500 Feet

*RTP Environmental Associates, Inc.*
*Westbury, New York*

**NOTES:**

**ORTHOIMAGERY SOURCE:**
**NYSGIS 2013**

**TESTING DATES:**
**MARCH 22-23, 2016**

**FIGURE 2.1**

**FIRST QUARTER 2016**
**AMBIENT AIR AND SOIL GAS**
**MONITORING LOCATIONS**

**TOWN OF OYSTER BAY LANDFILL**
**BETHPAGE, NEW YORK**

**TABLE 4.1**

TOWN OF OYSTER BAY

OLD BETHPAGE SOLID WASTE DISPOSAL COMPLEX

**AMBIENT AIR VOST SAMPLE RESULTS**

**FIRST QUARTER 2016**

| | 24 HOUR AMBIENT AIR SAMPLE | | | | | BLANK | | CURRENT | 24 HOUR |
|---|---|---|---|---|---|---|---|---|---|
| SAMPLE IDENTIFICATION[1] | U1 | U2 | D1 | D2 | D3 | FB3 | TB1 | AGC | SGC[4] |
| LOWER QUANTITATION LIMIT (LQL) | 0.0174 | 0.0287 | 0.0162 | 0.0260 | 0.0260 | 5 | 5 | | |
| PRACTICAL QUANTITATION LIMIT (PQL) | 0.0278 | 0.0460 | 0.0260 | 0.0416 | 0.0416 | 8 | 8 | | |
| TARGETED TIC LQL | 0.0868 | 0.1437 | 0.0812 | 0.1299 | 0.130 | 25 | 25 | | |
| VOC COMPOUND NAME | (µg/std-$m^3$) | (µg/std-$m^3$) | (µg/std-$m^3$) | (µg/std-$m^3$) | (µg/std-$m^3$) | (ng) | (ng) | (µg/$m^3$) | (µg/$m^3$) |
| Acetone[2] | 1.15 | 1.12 | 1.07 | 0.70 | 0.68 | 27 | 31 | 30,000 | 180,000 |
| **Benzaldehyde[3]** | **0.45** | **< 2.64** | **0.58** | | **< 0.64** | **90** | **29** | 0.10 | ---- |
| **Benzene** | **0.49** | **0.43** | **0.49** | **< 0.32** | **0.36** | | | 0.13 | 1,300 |
| Bromodichloromethane | | | | | | | | 70.0 | --- |
| Bromoform[2] | | | 0.02 | | | | | 0.91 | --- |
| Bromomethane | | | | | | | | 5.00 | 3,900 |
| 2-Butanone[2] | 0.30 | 0.31 | 0.29 | 0.14 | 0.19 | | | 5,000 | 13,000 |
| Carbon Disulfide | | | | | | | | 700.0 | 6,200 |
| **Carbon Tetrachloride** | **0.56** | **0.50** | **0.58** | **0.36** | **0.39** | | | 0.17 | 1,900 |
| Chlorobenzene | | | | | | | | 60.0 | --- |
| Chloroethane | | | | | | | | 10,000 | --- |
| 2-Chloroethyl Vinyl Ether[3] | | | | | | | | 0.10 | ---- |
| Chloroform | 0.09 | 0.09 | 0.09 | 0.06 | 0.07 | | | 14.7 | 150 |
| Chloromethane | 0.07 | < 0.05 | 0.05 | | < 0.04 | | | 90.0 | 22,000 |
| Dibromochloromethane | | | | | | | | 0.10 | --- |
| 1,2-Dichlorobenzene (o) | | | | | | | | 200.0 | 30,000 |
| 1,3-Dichlorobenzene (m) | | | | | | | | 10.0 | --- |
| 1,4-Dichlorobenzene (p) | | | 0.02 | | | | | 0.09 | --- |
| 1,1-Dichloroethane | | | | | | | | 0.63 | --- |
| **1,2-Dichloroethane** | **0.069** | **< 0.060** | **0.068** | **< 0.047** | **< 0.049** | | | 0.038 | --- |
| 1,1-Dichloroethene | | | | | | | | 200.0 | --- |
| cis-1,2-Dichloroethene | | | | | | | | 63.0 | --- |
| trans-1,2-Dichloroethene | | | | | | | | 63.0 | ---- |
| 1,2-Dichloropropane | 0.03 | < 0.04 | 0.03 | < 0.03 | < 0.03 | | | 4.00 | ---- |
| 1,3-Dichloropropene, cis & trans isomers | | | | | | | | 0.25 | --- |
| Ethylbenzene | 0.06 | < 0.08 | 0.06 | < 0.07 | < 0.07 | | | 1,000 | --- |
| 2/4-Ethyltoluene (total) | 0.04 | < 0.05 | 0.05 | < 0.04 | < 0.05 | | | 0.10 | ---- |
| Freon 13[3] | | | | | | | | 5,000 | 9,000 |
| 2-Hexanone[2] | | | | | | | | 30.0 | 4,000 |
| Methylene Chloride | 0.24 | 0.26 | 0.25 | 0.15 | 0.18 | | | 60.0 | 14,000 |
| 4-Methyl-2-Pentanone[2] | | | | | | | | 3,000 | 31,000 |
| Styrene | | | | | | | | 1,000 | 17,000 |
| 1,1,2,2-Tetrachloroethane | | | | | | | | 16.0 | --- |
| Tetrachloroethene | 0.11 | < 0.12 | 0.11 | < 0.10 | < 0.09 | | | 4.00 | 300 |
| Toluene | 0.38 | < 0.42 | 0.39 | < 0.32 | < 0.32 | | | 5,000 | 37,000 |
| 1,1,1-Trichloroethane | 0.02 | | 0.02 | | | | | 5,000 | 9,000 |
| 1,1,2-Trichloroethane | | | | | | | | 1.40 | --- |
| Trichloroethene | | | | | | | | 0.20 | 14,000 |
| Trichlorofluoromethane | 1.25 | 1.45 | 1.23 | 0.92 | 1.04 | | | 5,000 | 9,000 |
| Vinyl Chloride | | | | | | | | 0.068 | 180,000 |
| Xylenes (Total) | 0.33 | < 0.33 | 0.36 | < 0.30 | < 0.32 | | | 100.0 | 22,000 |
| Decane[3] | | | 0.10 | | < 0.14 | | | 700.0 | --- |

**TABLE 4.1**
**Continued**

TOWN OF OYSTER BAY

OLD BETHPAGE SOLID WASTE DISPOSAL COMPLEX

**AMBIENT AIR VOST SAMPLE RESULTS**

**FIRST QUARTER 2016**

| SAMPLE TYPE | 24 HOUR AMBIENT AIR SAMPLE | | | | | BLANK | | CURRENT | 24 HOUR |
|---|---|---|---|---|---|---|---|---|---|
| SAMPLE IDENTIFICATION[1] | U1 | U2 | D1 | D2 | D3 | FB3 | TB1 | AGC | SGC[4] |
| ADDITIONAL TIC LQL | 0.087 | 0.144 | 0.081 | 0.130 | 0.130 | 25 | 25 | | |
| VOC COMPOUND NAME | (µg/std-m$^3$) | (µg/std-m$^3$) | (µg/std-m$^3$) | (µg/std-m$^3$) | (µg/std-m$^3$) | (ng) | (ng) | (µg/m$^3$) | (µg/m$^3$) |
| Nonanal | | | 1.62 | | | | | --- | --- |
| Pentane | 1.46 | 1.78 | 1.36 | 1.12 | 1.12 | | | 42,000 | --- |
| Decanal | | | 0.81 | | | | | --- | --- |
| 2-Methyl-butane | 1.94 | 2.41 | 1.82 | 1.61 | 1.48 | | | 42,000 | --- |
| Unknown Alkene (RT: 1.16) | | < 0.53 | | | < 0.35 | | | --- | --- |
| Hexane | | < 1.02 | 0.78 | < 0.56 | < 0.74 | | | 700.0 | --- |
| 2-Methyl-pentane | | < 0.76 | | < 0.48 | < 0.48 | | | --- | --- |
| 3-Methyl-pentane | | < 0.45 | | | | | | 4,200 | 350,000 |
| Isobutane | 1.91 | | 2.31 | < 1.60 | < 1.83 | | | --- | 238,000 |
| Dichlorodifluoromethane | 2.43 | < 1.51 | 1.36 | < 0.61 | < 0.90 | | | 12,000 | --- |
| 1,1-Dichloro-1-fluoroethane | | < 0.28 | | < 0.22 | < 0.22 | | | --- | --- |
| Ethane, 1,1,2-trichloro-1,2,2-triflu | 0.76 | < 0.82 | | < 0.58 | < 0.51 | | | 180,000 | 960,000 |
| 2-Methyl-Hexane | | < 0.59 | | < 0.45 | < 0.43 | | | --- | --- |
| Butane | | 4.20 | 3.57 | 2.74 | 3.12 | | | --- | 238,000 |
| Cyclopentane, methyl- | | | | < 0.29 | | | | --- | --- |
| Octane | | | | | < 0.32 | | | 3,300 | --- |
| Unknown (RT: 1.16) | 0.76 | | | < 0.30 | | | | --- | --- |

NOTES:

[1] See Figure 2.1 for ambient air sampling locations.

[2] An 8 (splitless) nanogram practical quantitation limit has been assigned to these compounds due to their poor responses during laboratory analysis.

[3] Targeted Tentatively Identified Compound (TIC). As reported by the laboratory, Targeted TICs have a Lower Quantitation Limit that is five (5) times the targeted compound Lower Quantitation Limit.

[4] This 24 hour guideline concentration was calculated by multiplying the current SGC value (last revised February 2014 and still current as of May 2016) by 0.4 (EPA averaging time adjustment factor).

U1/U2: Adjoining the east fence of the 15th hole fairway of the Bethpage State Park Black Golf Course, approximately 200 feet west of Round Swamp Road.

D1/D2: Approximately 75 feet southwest of the southwest corner of the Groundwater Treatment Building.

D3: At the fifth footbridge along Landfill Haul Road, approximately 75 feet west of Winding Road.

- All values are reported in micrograms per standard cubic meter (µg/std-m$^3$) except for the field blank and trip blank mass loading results which are reported in nanograms (ng).
- Blank values:

  Targeted Compounds and Targeted TICs- All blank values are below the Lower Quantitation Limit, Practical Quantitation Limit (applies to Acetone, Bromoform, 2-Butanone, 4-Methyl-2-Pentanone and 2-Hexanone), or the Targeted TIC Lower Quantitation Limit (applies to Chloroethyl vinyl ether, Freon 13 and Decane). Benzaldehyde has a LQL two (2) times the targeted TIC LQL.

  Additional Tentatively Identified Compounds- All blank values are either below the Targeted TIC Lower Quantitation Limit where fewer than six (6) additional TICs are reported for a particular sample or below the lowest reported additional TIC value, where six (6) or more additional TICs are reported for a particular sample.
- Values in shaded areas are at or exceed the level of the current (last revised February 2014 and still current as of December 2015) and/or previous ambient air Annual Guideline Concentration (AGC) values.
- Less than values (<) are used where the Lower Quantitation Limit, the Target TIC Lower Quantitation Limit, or the Practical Quantitation Limit is averaged with the reported values.
- Freon 13 is listed as Chlorotrifluoromethane in the analytical results, Appendix C.
- (µg/std-m$^3$): micrograms per standard cubic meter
- (ng): nanograms

**TABLE 4.2**

TOWN OF OYSTER BAY
OLD BETHPAGE SOLID WASTE DISPOSAL COMPLEX

**SOIL GAS VOST SAMPLE RESULTS**
**FIRST QUARTER 2016**

| SOIL GAS WELL ID | F1 | M2 | M4 | M5 | M6 | M9(10) | M9(20) | M9(30) | M9(40) | FB1 | Current | Current |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LOWER QUANTITATION LIMIT (LQL) | 0.463 | 0.488 | 0.474 | 0.482 | 0.474 | 0.479 | 0.481 | 0.968 | 0.487 | 5 | AGC | SGC |
| PRACTICAL QUANTITATION LIMIT (PQL) | 0.740 | 0.781 | 0.759 | 0.771 | 0.758 | 0.766 | 0.769 | 1.549 | 0.780 | 8 | --- | --- |
| TARGETED TIC LQL | 2.31 | 2.44 | 2.37 | 2.41 | 2.37 | 2.39 | 2.40 | 4.84 | 2.44 | 25 | --- | --- |
| VOC COMPOUND NAME | (µg/std-$m^3$) | (µg/std-$m^3$) | (µg/std-$m^3$) | (µg/std-$m^3$) | (µg/std-$m^3$) | (µg/std-$m^3$) | (µg/std-$m^3$) | (µg/std-$m^3$) | (µg/std-$m^3$) | (ng) | (µg/std-$m^3$) | (µg/std-$m^3$) |
| Acetone* | 3.98 | 5.57 | 3.80 | 5.30 | 3.60 | 3.07 | 5.10 | 10.94 | 3.61 | 25 | 30,000 | 180,000 |
| **Benzaldehyde**** | | **2.93** | | | | | | < **3.00** | | **42** | 0.10 | ---- |
| Benzene | | | | | | | | | | | 0.13 | 1,300 |
| Bromodichloromethane | | | | | | | | | | | 70.0 | --- |
| Bromoform* | | | | | | | | | | | 0.91 | --- |
| Bromomethane | | | | | | | | | | | 5.00 | 3,900 |
| 2-Butanone* | 0.85 | | 0.77 | | | | | 2.33 | | | 5,000 | 13,000 |
| Carbon Disulfide | | | | | | | | < 1.12 | | | 700 | 6,200 |
| **Carbon Tetrachloride** | | | | | | | | | | | 0.17 | 1,900 |
| Chlorobenzene | | | | | | | | | | | 60.0 | --- |
| Chloroethane | | | | | | | | | | | 10,000 | --- |
| 2-Chloroethyl Vinyl Ether** | | | | | | | | | | | 0.10 | ---- |
| Chloroform | | | | | | | | < 1.10 | 0.93 | | 14.7 | 150 |
| Chloromethane | | | | | | | | | | | 90.0 | 22,000 |
| Dibromochloromethane | | | | | | | | | | | 0.10 | --- |
| 1,2-Dichlorobenzene (o) | | | | | | | | | | | 200 | 30,000 |
| 1,3-Dichlorobenzene (m) | | | | | | | | | | | 10.0 | --- |
| 1,4-Dichlorobenzene (p) | | | | | | | | | | | 0.09 | --- |
| 1,1-Dichloroethane | | | | | | | | | | | 0.63 | --- |
| 1,2-Dichloroethane | | | | | | | | | | | 0.038 | --- |
| 1,1-Dichloroethene | | | | | | | | | | | 200 | --- |
| cis-1,2-Dichloroethene | | | | | | | | | | | 63.0 | --- |
| trans-1,2-Dichloroethene | | | | | | | | | 0.93 | | 63.0 | ---- |
| 1,2-Dichloropropane | | | | | | | | | | | 4.00 | ---- |
| 1,3-Dichloropropene, cis & trans isomers | | | | | | | | | | | 0.25 | --- |
| Ethylbenzene | | | | | | | | | | | 1,000 | --- |
| 2/4-Ethyltoluene (total) | | | | | | | | | | | 0.10 | ---- |
| Freon 13** | | | | | | | | | | | 5,000 | 9,000 |
| 2-Hexanone* | | | | | | | | | | | 30.0 | 4,000 |
| Methylene Chloride | | | | | | | | | | | 60.0 | 14,000 |
| 4-Methyl-2-Pentanone* | | | | | | | | | | | 3,000 | 31,000 |
| Styrene | | | | | | | | | | | 1,000 | 17,000 |
| 1,1,2,2-Tetrachloroethane | | | | | | | | | | | 16.0 | --- |
| **Tetrachloroethene** | 2.68 | | | 0.53 | | 2.20 | 2.69 | < **9.87** | 2.34 | | 4.00 | 300 |
| Toluene | | | | | | | | | | | 5,000 | 37,000 |
| 1,1,1-Trichloroethane | | | | | | | | | 0.57 | | 5,000 | 9,000 |
| 1,1,2-Trichloroethane | | | | | | | | | | | 1.40 | --- |
| Trichloroethene | | | | | | | | | | | 0.20 | 14,000 |
| Trichlorofluoromethane | 1.39 | 1.17 | 1.14 | 1.16 | 1.14 | 1.92 | 1.35 | < 1.65 | 1.66 | | 5,000 | 9,000 |
| Vinyl Chloride | | | | | | | | | | | 0.068 | 180,000 |
| Xylenes (Total) | | | | | | | | | | | 100 | 22,000 |
| Decane** | | | | | | | | | | | 700 | --- |

**TABLE 4.2**
**(Continued)**

TOWN OF OYSTER BAY
OLD BETHPAGE SOLID WASTE DISPOSAL COMPLEX

**SOIL GAS VOST SAMPLE RESULTS**
**ADDITIONAL TENTATIVELY IDENTIFIED COMPOUNDS**
**FIRST QUARTER 2016**

| SOIL GAS WELL ID | F1 | M2 | M4 | M5 | M6 | M9(10) | M9(20) | M9(30) | M9(40) | FB1 | Current | Current |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ADDITIONAL TIC LQL | 2.31 | 2.44 | 2.37 | 2.41 | 2.37 | 2.39 | 2.40 | 4.84 | 2.44 | 25 | AGC | SGC |
| VOC COMPOUND NAME | ($\mu g/std\text{-}m^3$) | ($\mu g/std\text{-}m^3$) | ($\mu g/std\text{-}m^3$) | ($\mu g/std\text{-}m^3$) | ($\mu g/std\text{-}m^3$) | ($\mu g/std\text{-}m^3$) | ($\mu g/std\text{-}m^3$) | ($\mu g/std\text{-}m^3$) | ($\mu g/std\text{-}m^3$) | (ng) | ($\mu g/std\text{-}m^3$) | ($\mu g/std\text{-}m^3$) |
| Pentane | | | | | | | | | | | 42,000 | --- |
| Norflurane | | | | | | | | | | | 80,000 | --- |
| 2-Methyl-butane | | | | 2.51 | | | | | | | 42,000 | --- |
| Isobutane | | | | | | | | | | | --- | 238,000 |
| Dichlorodifluoromethane | 4.16 | | 4.55 | | 4.93 | 5.94 | 5.38 | < 8.13 | 8.28 | | 12,000 | --- |
| 1,1-Dichloro-1-fluoroethane | | | 2.94 | | | | | | | | --- | --- |
| Butane | | | | 4.44 | | | | | | | --- | 238,000 |
| Cyclotrisiloxane, hexamethyl- | 3.24 | 7.13 | | 3.86 | | | | < 4.94 | | | --- | --- |
| Ethane, 1,2-dichloro-1,1,2,2-tetrafluoro | | | | | | | | | 2.73 | | 17,000 | --- |
| Ethane, 1,1-difluoro- | | | | | | | | | | | 40,000 | --- |
| Unknown (RT: 1.16) | | 5.18 | | | | | | | | | --- | --- |

**TABLE 4.2**
**(Continued)**

TOWN OF OYSTER BAY
OLD BETHPAGE SOLID WASTE DISPOSAL COMPLEX

**SOIL GAS VOST SAMPLE RESULTS**
**FIRST QUARTER 2016**

| SOIL GAS WELL ID | M13 | M16 | M21 | M22 | M28 | M31 | M34 | M37 | M39 | FB2 | Current | Current |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LOWER QUANTITATION LIMIT (LQL) | 0.487 | 0.483 | 0.497 | 0.485 | 0.483 | 0.480 | 0.474 | 0.480 | 0.982 | 5 | AGC | SGC |
| PRACTICAL QUANTITATION LIMIT (PQL) | 0.779 | 0.773 | 0.794 | 0.776 | 0.772 | 0.77 | 0.759 | 0.768 | 1.572 | 8 | | |
| TARGETED TIC LQL | 2.43 | 2.42 | 2.48 | 2.42 | 2.41 | 2.40 | 2.37 | 2.40 | 4.91 | 25 | | |
| VOC COMPOUND NAME | (µg/std-$m^3$) | (µg/std-$m^3$) | (µg/std-$m^3$) | (µg/std-$m^3$) | (µg/std-$m^3$) | (µg/std-$m^3$) | (µg/std-$m^3$) | (µg/std-$m^3$) | (µg/std-$m^3$) | (ng) | (µg/std-$m^3$) | (µg/std-$m^3$) |
| Acetone* | 3.60 | 3.29 | 4.37 | 4.75 | 7.14 | 3.94 | 3.61 | 7.10 | 4.91 | 26 | 30,000 | 180,000 |
| **Benzaldehyde**** | | | **3.08** | | **4.73** | | | **4.03** | | **39** | 0.10 | ---- |
| Benzene | | | | | | | | | | | 0.13 | 1300 |
| Bromodichloromethane | | | | | | | | | | | 70.0 | --- |
| Bromoform* | | | | | | | | | | | 0.91 | --- |
| Bromomethane | | | | | | | | | | | 5.00 | 3900 |
| 2-Butanone* | | | | 0.82 | 1.45 | | | 0.94 | < 1.59 | | 5000 | 13,000 |
| Carbon Disulfide | | | | | | | | | | | 700 | 6200 |
| **Carbon Tetrachloride** | | | | | **0.56** | | | | | | 0.17 | 1,900 |
| Chlorobenzene | | | | | | | | | | | 60 | --- |
| Chloroethane | | | | | | | | | | | 10,000 | --- |
| 2-Chloroethyl Vinyl Ether** | | | | | | | | | | | 0.10 | ---- |
| Chloroform | 0.56 | | | 1.26 | | 0.57 | | 0.62 | | | 14.7 | 150 |
| Chloromethane | | | | | | | | | | | 90.0 | 22,000 |
| Dibromochloromethane | | | | | | | | | | | 0.10 | --- |
| 1,2-Dichlorobenzene (o) | | | | | | | | | | | 200 | 30,000 |
| 1,3-Dichlorobenzene (m) | | | | | | | | | | | 10.0 | --- |
| 1,4-Dichlorobenzene (p) | | | | | | | | | | | 0.09 | --- |
| 1,1-Dichloroethane | | | | | | | | | | | 0.63 | --- |
| 1,2-Dichloroethane | | | | | | | | | | | 0.038 | --- |
| 1,1-Dichloroethene | | | | | | | | | | | 200.0 | --- |
| cis-1,2-Dichloroethene | | | | | | | | | | | 63.0 | --- |
| trans-1,2-Dichloroethene | | | | | | | | | | | 63.0 | ---- |
| 1,2-Dichloropropane | | | | | | | | | | | 4.00 | ---- |
| 1,3-Dichloropropene, cis & trans isomers | | | | | | | | | | | 0.25 | --- |
| Ethylbenzene | | | | | | | | | | | 1,000 | --- |
| 2/4-Ethyltoluene (total) | | | | | | | | | | | 0.10 | ---- |
| Freon 13** | | | | | | | | | | | 5,000 | 9,000 |
| 2-Hexanone* | | | | | | | | | | | 30.0 | 4000 |
| Methylene Chloride | | | | | | | | | | | 60.00 | 14,000 |
| 4-Methyl-2-Pentanone* | | | | | | | | | | | 3,000 | 31,000 |
| Styrene | | | | | | | | | | | 1,000 | 17,000 |
| 1,1,2,2-Tetrachloroethane | | | | | | | | | | | 16.0 | --- |
| **Tetrachloroethene** | 2.53 | 1.26 | 0.54 | | | | | | **< 5.70** | | 4.00 | 300 |
| Toluene | | | | | | | | | | | 5,000 | 37,000 |
| 1,1,1-Trichloroethane | | | | | | | | | | | 5,000 | 9,000 |
| 1,1,2-Trichloroethane | | | | | | | | | | | 1.40 | --- |
| Trichloroethene | | | | | | | | | | | 0.20 | 14,000 |
| Trichlorofluoromethane | 0.97 | 1.26 | 1.19 | 1.36 | 1.35 | 1.34 | 1.23 | 1.82 | < 1.29 | | 5,000 | 9,000 |
| Vinyl Chloride | | | | | | | | | | | 0.068 | 180,000 |
| Xylenes (Total) | | | | | | | | | | | 100 | 22,000 |
| Decane** | | | | | | | | | | | 700 | --- |

**TABLE 4.2**
**(Concluded)**

TOWN OF OYSTER BAY
OLD BETHPAGE SOLID WASTE DISPOSAL COMPLEX

**SOIL GAS VOST SAMPLE RESULTS**
**ADDITIONAL TENTATIVELY IDENTIFIED COMPOUNDS**
**FIRST QUARTER 2016**

| SOIL GAS WELL ID | M13 | M16 | M21 | M22 | M28 | M31 | M34 | M37 | M39 | FB2 | Current | Current |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ADDITIONAL TIC LQL | 2.43 | 2.42 | 2.48 | 2.42 | 2.41 | 2.40 | 2.37 | 2.40 | 4.91 | 25 | AGC | SGC |
| VOC COMPOUND NAME | ($\mu g/std\text{-}m^3$) | ($\mu g/std\text{-}m^3$) | ($\mu g/std\text{-}m^3$) | ($\mu g/std\text{-}m^3$) | ($\mu g/std\text{-}m^3$) | ($\mu g/std\text{-}m^3$) | ($\mu g/std\text{-}m^3$) | ($\mu g/std\text{-}m^3$) | ($\mu g/std\text{-}m^3$) | (ng) | ($mg/m^3$) | ($mg/m^3$) |
| Pentane | | 3.00 | 2.98 | | 2.70 | | | 5.28 | | | 42,000 | --- |
| Norflurane | | | | | | | | 4.32 | | | 80,000 | --- |
| 2-Methyl-butane | | 4.15 | 3.67 | | 3.09 | | | 11.52 | | | 42,000 | --- |
| Isobutane | | | 2.88 | | | | | 18.23 | | | --- | 238,000 |
| Dichlorodifluoromethane | 3.99 | 3.77 | 4.87 | 4.66 | 5.60 | 4.80 | 4.36 | 19.19 | < 6.68 | | 12,000 | --- |
| 1,1-Dichloro-1-fluoroethane | | | | | | | | | | | --- | --- |
| Butane | 3.89 | 5.80 | 5.66 | | 4.73 | | | 23.99 | | | --- | 238,000 |
| Cyclotrisiloxane, hexamethyl- | 3.21 | 3.09 | | | | | 2.94 | | | | --- | --- |
| Ethane, 1,2-dichloro-1,1,2,2-tetrafluoro | | | | | | | | | | | 17,000 | --- |
| Ethane, 1,1-difluoro- | | | | | | | | 15.36 | | | 40,000 | --- |
| Unknown (RT: 1.16) | | | | | | | | | | | --- | --- |

Notes:

* An 8 nanogram practical quantitation limit has been assigned to these compounds due to their poor responses during laboratory analysis.

** Targeted Tentatively Identified Compound (TIC). As reported by the laboratory, Targeted TICs have a Lower Quantitation Limit that is five (5) times the targeted compound Lower Quantitation Limit.

- All values are reported in micrograms per standard cubic meter ($mg/std\text{-}m^3$).
- Blank values:
  Targeted Compounds and Targeted TICs- All blank values are below the Lower Quantitation Limit, Practical Quantitation Limit (applies to Acetone, Bromoform, 2-Butanone, 4-Methyl-2-Pentanone and 2-Hexanone), or the Targeted TIC Lower Quantitation Limit (applies to Chloroethyl vinyl ether, Freon 13 and Decane). Benzaldehyde has a LQL 2 times the targeted TIC LQL.
  Additional Tentatively Identified Compounds- All blank values are either below the Targeted TIC Lower Quantitation Limit where fewer than six (6) additional TICs are reported for a particular sample or below the lowest reported additional TIC value, where six (6) or more additional TICs are reported for a particular sample.
- Values in shaded areas are at or exceed the level of the current (last revised February 2014 and still current as of December 2015) and/or previous ambient air Annual Guideline Concentration (AGC) values.
- Less than values (<) are used where the Lower Quantitation Limit, the Target TIC Lower Quantitation Limit, or the Practical Quantitation Limit is averaged with the reported values.
- Freon 13 is listed as Chlorotrifluoromethane in the Analytical Results, Appendix C.
- ($\mu g/std\text{-}m^3$): micrograms per standard cubic meter
- (ng): nanograms

**TABLE 5.1**

TOWN OF OYSTER BAY
OLD BETHPAGE SOLID WASTE DISPOSAL COMPLEX

**SUMMARY OF SOIL GAS PRESSURE TESTS**

**FIRST QUARTER 2016**

| SAMPLE ID | DATE (mm/dd/yy) | TIME (EST) | WELL ID | WELL LOCATION | WELL DEPTH (feet) | PRESSURE* (inches water) |
|---|---|---|---|---|---|---|
| P1 | 03/23/16 | 7:38 AM | PW1 | NW corner of the landfill on Haul Road | 10 | -0.02 |
| P2 | 03/23/16 | 7:38 AM | PW1 | NW corner of the landfill on Haul Road | 20 | -0.03 |
| P3 | 03/23/16 | 7:39 AM | PW1 | NW corner of the landfill on Haul Road | 10 | -0.01 |
| P4 | 03/23/16 | 7:39 AM | PW1 | NW corner of the landfill on Haul Road | 20 | -0.03 |
| P5 | 03/23/16 | 7:27 AM | PW2 | SE corner of the landfill NW of Well M2 | 10 | 0.00 |
| P6 | 03/23/16 | 7:27 AM | PW2 | SE corner of the landfill NW of Well M2 | 20 | -0.04 |
| P7 | 03/23/16 | 7:29 AM | PW2 | SE corner of the landfill NW of Well M2 | 10 | 0.00 |
| P8 | 03/23/16 | 7:29 AM | PW2 | SE corner of the landfill NW of Well M2 | 20 | -0.04 |
| P9 | 03/23/16 | 7:13 AM | PW3 | Nassau County Fire Service Academy | 10 | 0.00 |
| P10 | 03/23/16 | 7:13 AM | PW3 | Nassau County Fire Service Academy | 20 | 0.00 |
| P11 | 03/23/16 | 7:14 AM | PW3 | Nassau County Fire Service Academy | 10 | 0.00 |
| P12 | 03/23/16 | 7:14 AM | PW3 | Nassau County Fire Service Academy | 20 | 0.00 |

NOTES:

- Measurements taken using a ten inch Dwyer inclined manometer.
- Leak checks were performed on the manometer before testing each well.

* The differential pressure of a well is relative to ambient pressure.