City of Newburgh Landfill

NYSDEC Site No. 336063
Contract No. D-004437-6

Pierces Road, Newburgh, NY

Prepared by
Camp Dresser & McKee

Woodbury, NY

March 2008
Revised March 2009

Final

Site Characterization Report

Contents

Appendix A : Tables

Appendix B: Figures

Appendix C: Drum Investigation Photographs

Section 1
Introduction

This Site Characterization Report (SC) for the Newburgh Landfill site was prepared by Camp Dresser & McKee (CDM) for the New York State Department of Environmental Conservation (NYSDEC) under the Engineering Services for Investigation and Design, Standby Contract No. D004437. The SC was developed with information provided by NYSDEC including historical reports conducted by investigators on this and on adjacent sites, and from recently conducted on-site environmental investigations conducted in compliance with the NYSDEC-approved Site Characterization Work Plan, December 2006 and the Supplemental Site Characterization Work Plan dated September 2007. All work was performed in compliance with guidelines outline in the "*Division of Environmental Remediation (DER)-10 Draft Technical Guidance for Site Investigation and Remediation, December 2002*".

The major objectives of this Work Assignment included:

- Review all previous investigations conducted at the Newburgh Landfill by the City of Newburgh and the EPA as well as the results of the RI/FS of the adjacent DuPont-Stauffer Landfill, NYSDEC registry Code #336009.
- Determine if potential sources of solvent, metal, polynuclear aromatic hydrocarbon (PAH) and other contaminants are present in the landfill.
- Identify whether sources of solvent, PAH, and other contamination in the landfill are impacting surface water and sediments in Gidneytown Creek.
- Identify whether there are sources of groundwater contamination in the landfill and establish baseline water quality information. Prior to this SC, no groundwater quality information was available for this property.
- Determine the nature, disposition and extent of drums located along the western perimeter of the site.
- Determine the nature of the drum contents and any impacts to the surrounding soil. If deemed necessary by the Department, design a conceptual work plan for an IRM.
- Assist the Department in implementation of the Department prepared Citizen Participation Plan for the site.

The results of the Site Characterization Report were complimented with information derived from the following sources:

- State Superfund Standby Contract Work Assignment site characterization for the Newburgh Landfill; Site No. 336063

- Aerial Photographs dated 1919, 1953, 1965, 1990 and 1999.
- A site reconnaissance visit conducted with NYSDEC on September 7, 2006.
- Final Draft Inspection Report, Newburgh Landfill by NUS Corporation, dated April 15, 1988*
- Report for Characterization of Drums:
  First Environment dated August 5, 2002*
- Preliminary Site Assessment Report for DuPont-Stauffer Landfill by Dvirka & Bartilucci dated March 1994
- Supplemental Remedial Investigation Report DuPont-Stauffer Landfill by DuPont Corporate Remediation Group, June 2004

*Note: Only these reports provide information directly related to the Newburgh Landfill site.

1.1 Site Background and History

The following subsections describe the Newburgh Landfill site and provide a brief overview of the operational history of the site.

1.1.1 Location

The City of Newburgh Landfill is located on Pierces Road, in the City of Newburgh, Orange County (Tax Map Section 5, Block 1, Lot 16). Refer to Figure 1-1 under Appendix B. The roughly 30-acre site is bordered on the west by the DuPont-Stauffer Landfill (Site No. 336009), to the southeast by the Department of Public Works building, which includes the municipal garage and salt shed, to the south by Pierces Road, to the north by Interstate 84, and to the east by residential, commercial, and light industrial buildings.

The terrain of the former landfill is generally uneven and vegetated. A terrace is present around the site's wooded western, northern, and eastern perimeters. An exit off Interstate 84 was proposed then subsequently abandoned for the northeastern portion of the site. The Gidneytown Creek runs through the site from the southeast and along the northern perimeter, eventually emptying into a beaver-dammed wetland which appears to also receive stormwater runoff from Interstate 84. The landfill is currently inactive, but City of Newburgh activities such as vehicle repair, vehicle impounding, gravel, salt, and sand storage, and acceptance of public yard refuse occur on the site. The site location is shown on Figure 1-1.

1.1.2 Operational History

Though unlicensed, the site accepted municipal waste from the late 1940s until 1976 when the landfill was closed without the implementation of NYCRR Part 360 landfill

closure procedures. Historical documentation indicates that waste sludge from the nearby Former Creek Industrial Park was also disposed at the site. From presently unsubstantiated anecdotal information, there are also reports that incinerator ash from a nearby facility was deposited on the landfill. Similarly, waste-containing drums were also reported to have been disposed improperly on the landfill. Although by casual observation dozens of corroding drums are evident along the western perimeter of the site, no obvious evidence of ash disposal is apparent.

An employee of the City of the Newburgh Department of Public Works indicated that during landfill operations, numerous deep trenches running approximately southwest to northeast were dug at the site. These trenches received household refuse from local residents who hauled their wastes to the site. It's been reported that for a nominal fee, a resident could dispose of 'just about anything' into these trenches. As each trench was filled with debris, local soils and fill material were reportedly used to cover the trench. As one trench was filled, another was opened in sequence.

A March 1994 Preliminary Site Assessment Report (PSA) for the DuPont-Stauffer Landfill, completed by Dvirka and Bartillucci Consulting Engineers, indicated that the nearby manufacturing plant located on South Street in the City of Newburgh owned and operated by both DuPont and Stauffer is believed to have contributed to the hazardous waste disposal at the Newburgh City Landfill. It is reported that DuPont used nitrocellulose to coat fabrics from the late 1950's until the early 1960's, when vinyl replaced nitrocellulose as the coating agent. Coated fabric was used primarily in the manufacturing of automobile car seats and interiors. Stauffer Chemical purchased the plant from DuPont in 1967. Stauffer continued production of coated fabrics and also produced PVC sheeting until January 1979, when operations at the plant were shut down.

The 1994 PSA Report indicated that DuPont and Stauffer Chemical buried sludge at the Newburgh City Landfill and in the northern portion of the DuPont-Stauffer Landfill from 1965-1970. Solids such as fabric, metal cans, cotton synthetics, polyvinyl chloride (PVC) film, PVC resin, atomite, and silica were reportedly disposed at both the Newburgh City Landfill and the DuPont-Stauffer Landfill.

Stauffer Chemical reportedly generated a waste known as "bomb slops," which consisted of bags of nitrocellulose jelly. The "bomb slops" were reportedly buried at the DuPont-Stauffer Landfill and burned at the city incinerator from 1965 to 1970. Once the city incinerator was shut down, the "bomb slops" were then reportedly disposed at the Newburgh City Landfill from 1970 to 1979. Additionally, Stauffer Chemical delivered dry wastes to the Newburgh City Landfill and the County landfill starting in 1970 and continued to do so until the plant shut down in January 1979. Stauffer Chemical also generated slurries containing caustics, pigments, PVC resin, solvents, calcium carbonate, silica, and oils. It is reported that prior to burial the solvents in the slurry which reportedly contained methyl ethyl ketone and methyl isobutyl ketone, were allowed to evaporate. Evidence of these wastes were found at

the DuPont-Stauffer Landfill but it is unknown if these wastes were disposed at the Newburgh City Landfill.

During the supplemental Remedial Investigation at the DuPont-Stauffer Landfill in 2001, abandoned drums were observed at the surface of the adjoining Newburgh City Landfill on the western edge of the property. A request from the Department to the City of Newburgh resulted in the preparation of a work plan to investigate the nature and extent of the abandoned drums. The investigation performed by the city's consultant was summarized in First Environment's Report for Characterization of Drums, dated August 5, 2002. The report quantified the presence of 456 containers located on the surface along the western edge of the site. Approximately 159 containers were sealed and were not inspected as part of this investigation. The majority of the drums were found to contain plastic coated fabric, plastic resins, and black sludge. Drum contents failed TCLP testing for ignitability, lead, and chromium. Most of the drums are located on the slope of the landfill and it is evident that the drums have degraded and the contents have been released to the surface soil. Partially buried drums which were also observed, remain at the site.

1.1.3 Previous Investigations

A Site Investigation Report of the City of Newburgh Landfill was submitted by a consultant for the United States Environmental Protection Agency (EPA) on April 15, 1988. Two surface water and two sediment samples collected from a drainage culvert, and four soil samples from the landfill surface were collected on July 8, 1987. All samples were analyzed for Hazardous Substance List (HSL) organic and inorganic parameters. Solvents and polynuclear aromatic hydrocarbons (PAHs) were found in surface water/sediment samples. Solvents, metals, PAHs, and pesticides were found in soil samples.

As stated above, a 1994 PSA for the adjacent DuPont-Stauffer Landfill reported that DuPont Company and Stauffer Chemical disposed solid waste, slurries, and sludges at the City of Newburgh Landfill. During the implementation of the 2001 Remedial Investigation at the DuPont-Stauffer site, abandoned drums were observed at the western boundary of the adjoining Newburgh City Landfill. That observation provided the impetus for the Newburgh City landfill investigation.

A consultant for the City of Newburgh prepared a Drum Characterization Report in August 2002. Based on that report, 456 containers, primarily 55-gallon open top drums, were identified around the western perimeter of the City of Newburgh Landfill. Some of these drums were partially exposed along the side slopes of the landfill and most were observed to be degraded and rusted. Eight samples were collected, with chromium and lead reaching hazardous levels in two of the samples, and three samples failed the RCRA characteristic testing for ignitability.

The site is currently identified by the Department as a "P" site. "P" sites are those sites identified for further evaluation to determine if they should be considered for

inclusion on the Registry of Inactive Hazardous Disposal Sites. In addition to the presence of drums on the landfill, two spills were reported at the City's highway garage. The first was a tank test failure on an underground fuel storage tank conducted in July 1987; the second, a petroleum spill into sewer in December 1990. Both spills were reported to the Department and subsequently closed. The US EPA cited the City of Newburgh Department of Public Works with Field Citation II-UST-FC-600: failure to maintain records at a UST site, and failure to monitor tanks monthly. The final order and penalty were issued in September 2005, and the enforcement action was subsequently closed. No other enforcement actions for the site are pending.

1.1.3.1 Soil Quality

Little is known about the quality of surface and subsurface soils at this site. Much of the surface of the landfill has been transformed over the past years as grading, regarding, trenching and filling actions have reworked much of the landfill surface. At present, the site is used to maintain and house the City of Newburgh's DPW equipment. The property contains office buildings, a road salt storage shed, composting facility, a storage location for white goods, scrap metal, woodchip/tree debris and a fenced storage area for impounded and abandoned vehicles.

Where drums have been identified along the western portion of the site, there are documented occurrences of local contamination of surrounding soils by metals, PCB's and volatile and semi-volatile organic contaminants.

The work tasks conducted under CDM's Site Characterization Work Plan and the Supplemental Site Characterization Work Plan are reported in Section 3 herein. These results represent the first characterization efforts to quantify soil, surface water and groundwater quality on the landfill proper.

1.1.3.2 Groundwater Quality

Prior to the Site Characterization, no onsite groundwater data has been collected at this site. The reader is advised however that during CDM's on-site work, two, one-inch diameter peizometers were discovered near the wetland corridor on the eastern side of the site. The origins, records and purpose of these piezometers are presently a matter of speculation. Through the implementation of this investigation, a series of monitoring wells has been installed to better assess the nature and disposition of local groundwater.

1.1.4 Site Geology and Hydrogeology

Site geology and hydrogeology has been developed from information complied on adjacent and surrounding properties. The site is underlain by two main geologic units: glacial till and carbonate bedrock of the Cambro-Ordovician Age Wappinger Group. Boring logs from the DuPont-Stauffer Landfill indicate that the till is up to 20 feet thick and consists of sand, silt, gravel, cobbles, and boulders. Bedrock is encountered at depths ranging from exposed at the surface to 20 feet below grade.

The bedrock is highly fractured gray dolomitic limestone with some calcite deposits and shaly bands that generally dips towards the south.

Based on data obtained from nearby sites, the fractured bedrock aquifer into which the site wells are installed does produce water, however due to their lack of penetration into the higher-yielding strata the Site wells have limited production. It is likely that the small volume of water found inside site wells originates from percolating rainwater that migrates over the surface of the bedrock and eventually finds its way into the wells.

Bedrock surface elevations were determined from test-pits, geoprobe borings, and monitor wells. Several bedrock highs are located in the interior and eastern areas of the site. These highs (some exposed at the surface) generally slope toward the west. The water-bearing unit beneath the site exists mostly within the bedrock with a saturated overburden layer along the western area of the site adjacent to Gidneytown Creek.

In general, stormwater runoff from the site drains toward Gidneytown Creek. Gidneytown Creek is a Class D water body. Designated uses of the creek include recreational use and fishing. The creek receives stormwater drainage from I-84 and from other upstream sources. The creek, which forms the northern and western boundaries of the site, flows across the northern portion of the site in an east to west direction before turning southward.

Previous groundwater elevation data from wells on the DuPont-Stauffer Landfill indicate the groundwater generally flows towards the south. (Depth to water level measurements collected as part of the present investigation indicates a flow path in a northerly direction toward Gidneytown Creek. See Figure 1-2 Groundwater Contours under Appendix B).

On the DuPont-Stauffer Landfill, groundwater is found mostly in the bedrock. Overburden groundwater fluctuates across the site based upon seasonal precipitation. Overburden and bedrock groundwater flows predominantly toward the west and to the south.

Section 2
Scope of Work

2.1 Introduction

In general, field activities conducted for this Site Characterization followed those outlined in the NYSDEC approved Work Plans. Several procedural modifications were made during work implementation. These modifications were made necessary due to field conditions, severe weather, site access and logistical concerns and employee interviews. All modifications were communicated to NYSDEC in advance and were approved prior to implementation. Details can be reviewed in the descriptions for each task.

2.2 Task 1 – Site Characterization Investigation

In order to meet the stated objectives of this Work Assignment, a comprehensive scope of work was implemented. This scope of work was divided into five main work elements which included the following:

- Drum investigation (Test Pits)
- Soil Investigation
- Sediment and surface water investigation
- Groundwater investigation
- Trench investigation

Each investigation is described in detail below. Samples locations are presented on Figure 2-1 provided under Appendix B at the end of this report. All tables referenced can be found under Appendix A and all figures can be found under Appendix B. It is noted, however, that these investigations were conducted under one single mobilization with multiple sampling events, unless otherwise noted.

2.2.1 Background Soil Samples

The collection of representative surface soil samples was a necessary component of this scope of work, in that it allowed us to establish baseline data from which to compare the results of on-site samples. CDM collected three (3) background soil samples at locations shown in Figure 2-1 and Figure 3-1. Background surface soils samples were designated with the prefix "BKGR". Each location was pre-approved by the on-site NYSDEC representative. BKGR-1 was collected near the southwest corner of the intersection of Pierces and William Mott Road; BKGR-2 in the wooded area west of the Truck Parking Area (across the street from the DPW Garage); and BKGR-3 north of Gidneytown Creek between the creek bed and Friehoffer's Distribution Center west of Scobie Drive.

Each background surface sample was collected from a depth of 0-2 inches below grade. A vegetative cover and/or leaf debris was found at each background sample location. In accordance with the Work Plan, the vegetative cover was removed prior to sampling. All locations selected for the collection of background surface soil samples, were from areas believed to be un-impacted by historical landfill operations though it was acknowledged by all parties present that each location may have been impacted by fall-out from incinerator plumes formerly operated at nearby facilities.

Analytical Program

All three (3) background surface soil samples were analyzed for

- Full TCL
- TAL
- TIC's
- QA/QC

Results appear in Table 3-1.

2.2.2 Drum Investigation

Previous on-site investigators (First Environment, 2002) documented the presence of 456 drums on-site. Each drum was catalogued based on visual inspection and drums were found to be in various stages of disintegration. First Environment estimated that the drums were disposed on-site 25 to 30 years ago, if not longer. Drums contained a variety of waste types ranging from paint sludges, plastics, resins, rubber, white and gray powdery substances and plastic coated fabrics. Analysis of select drum contents confirmed the presence of metals, pesticides, volatile organic compounds, PCB's and RCRA characteristics.

The primary drum disposal area was located at the bottom of the slope bordering the DuPont/Stauffer property. During September 2006 site reconnaissance, damage to a large number of drums was observed. The drums may have been offloaded at the crest of the slope and allowed to tumble down the slope to the present location. It is also possible that the drums were buried at the toe of the landfill slope. A series of test pits were performed to test this second possibility.

Five (5) test pits or test pit transects were advanced from a point on the crest/slope of the landfill and worked back into the landfill proper. Using a backhoe, the 5 test pits averaged approximately five (5) feet deep. Lengths varied depending upon terrain, material encountered, safety concerns and practicality though attempts were made to extend most trenches to twenty (20) feet in length. Test Pit locations are shown in Figure 2-1 and Figure 3-2 and are denoted by prefixes of "TP". The reader is advised that the cancellation of the trench program (mentioned in Section 2.2.6) provided the ability to investigation other areas of the site, including the Burn Pit along the site southeastern side.

Test pit contents were photographed, catalogued, and documented. Details and photographs appear in Appendix C. All drums encountered within the test pits were identified to the extent practical and within the guidelines of CDM's Health and Safety Plan. No drums were punctured or otherwise opened in the course of the investigation. The integrity of most of the drums observed had already been compromised by deterioration.

At the conclusion of a test pit or test pit transect, all excavations were properly filled, compacted and staked. The test pits and test pit transect were later surveyed so that they can be located and accessed, if necessary, in the future.

Analytical Program

Wastes were categorized based on their waste types and analyzed accordingly. A total of seven (7) waste and/or sediment samples were collected under this investigation. Sample collection was biased towards materials that were believed to have been released from drums, drum contents and/or stained or discolored soils. Samples were analyzed at an ELAP certified environmental laboratory for the following parameters:

- TCLP Metals
- TCLP Volatile Organic Compounds
- PCB's
- RCRA Characteristics
- QA/QC

Results appear in Table 3.2A (Drum Investigation Analytical Results) provided under Appendix A.

2.2.3 Soil Investigation

To determine whether any negative environmental impacts to surface and subsurface soils exist at this site, a surface soil sampling program and a direct-push (geoprobe) subsurface investigation were conducted. Sample locations are shown on Figure 2-1, Figure 3-1, and Figure 3-3 provided under Appendix B.

Surface Soils:

At five (5) locations approved by the NYSDEC on-site representative, surface soils samples were collected. Sampling procedures followed those outlined in the approved QAPP. All on-site surface soil samples were designated with the prefix "SS". Locations and rationale for each surface soil sample are listed below:

- SS-1: adjacent to the DPW Burn Pit
- SS-2: west side of the Vehicle Impoundment Lot
- SS-3: adjacent to the scrap metals pile

- SS-4: adjacent to the woodchip/tree trunk disposal area.
- SS-5: in the vegetated, central portion of the site.

Analytical Program

All five (5) surface soil samples were analyzed by an ELAP certified laboratory for VOC's, SVOC's, Metals, Pesticides and PCB's. Results appear in Table 3-3 (Surface Soil Samples Analytical Results).

Subsurface Soils:

Forty-one (41) direct-push geoprobe subsurface soils borings (GP-1 through GP-41) were advanced on the landfill site during the performance of the initiate site investigation conducted in February 2007. In September 2007, an additional sixteen (16) geoprobe subsurface samples were collected (GP-42 through GP-57). All geoprobes were continuously sampled and field screened for volatile organic compounds. During the February 2007 geoprobe investigation, samples exhibiting evidence of contamination (visual or by PID) were immediately delivered to a mobile, on-site laboratory where they underwent analysis via GC/MS. The mobile laboratory was prepared with a list of targeted compounds including ketones, benzene, actetone, methyl ethyl ketone, methyl isobutyl ketone, methyl chloride toluene, trichloroethene and xylenes. Positive contaminant 'hits' identified by the mobile lab, provided the field team with information that was useful in locating areas of concern and guiding the future course of the geoprobe program. A mobile lab was not used during the installation of geoprobe borings in September 2007. In that phase of the investigation, samples were field screened visiually and with a PID. Samples with positive detections were submitted for chemical analysis in accordance with the Sampling & Analytical Plan.

Geoprobe locations are shown on Figure 2-1 and sample locations on Figure 3-3 and designated with the prefix "GP".

According to the approved Work Plan, Geoprobe soil borings were to be installed in transects that originated from groundwater seeps near Gidneytown Creek which had been identified before and during the Site Reconnaissance and Scoping meeting held on September 7, 2006. Modifications to this plan were necessitated by several factors, not the least of which was the damming of segments of Gidneytown Creek by beavers following the September 2006 site visit. At the time the geoprobe program was initiated in February 2007, all previously identified seeps had been submerged as a direct effect of the beaver dams. This factor combined with the lack of a perimeter roadway around the landfill created several logistical challenges. Many of these were met with the use of track-mounted all-terrain direct-push equipment.

The geoprobe unit was directed to areas that could be negotiated through the wooded and swampy terrain. Access to some sites was further complicated by severe winter weather and heavy snow/ice falls in February. Despite these factors, several areas off

the toe of the landfill were thoroughly examined. These included the area northeast of the scrap metals heap, the areas west of the wood chip and wood debris piles; as well as the area north of the drum disposal areas.

Analytical Program

To confirm the accuracy of the mobile laboratory equipment, approximately 10% of the subsurface samples collected, up to a maximum of ten (10) samples were submitted for analysis at a NYSDOH ELAP Certified Laboratory. Samples were analyzed for:

- Full Target Compound List
- Target Analyte List
- Tentatively Identified Compounds
- QA/QC

Results for the subsurface soils appear in Table 3-4 and 3-5 (Subsurface Geoprobe Samples Analytical Results and Supplemental Subsurface Soil Investigation).

2.2.4 Sediment and Surface Water Sampling

Gidneytown Creek and its associated wetlands form a natural barrier between the landfill site and U.S. Interstate I-84. The creek is also a potential receiver of landfill seeps and groundwater discharge. To assess to potential impacts of the landfill upon the creek, CDM conducted a creek sediment and surface water sampling program.

Originally anticipated to be collected at the site of now-submerged groundwater seeps, the co-located surface water and sediment samples were instead collected at points upstream and downstream of the landfill, as well as immediately adjacent to the landfill. A total of eight (8) locations were sampled with methodologies and procedures compliant with the QAPP. Each Gidneytown Creek sediment and surface water sample is designated with the prefix "GTC". Locations appear in Figure 2-1 and Figure 3-4.

The location and rationale for each Creek sample is provided below. The reader is advised that immediately preceding the collection of Gidneytown Creek samples, a significant rainfall event had occurred. However, in consultation with NYSDEC, the sampling program was promulgated with the observation that neither stream flow rates nor water turbidity showed any observable or measurable impacts from the precipitation event.

- GTC-1: upstream of the landfill. Sample location is North of I-84 off Creek Run Road
- GTC-2: East of MW-6 in the upper beaver pond.

- GTC-3: East of MW-6 immediately downstream of the beaver dam separating the upper and middle beaver ponds. Discolored sediment was observed here.
- GTC-4: Adjacent to MW-6 along the southern bank of the middle beaver pond. (A blind duplicate sample was collected at this location).
- GTC-5: east of MW-8, collected along the southern bank of middle beaver pond.
- GTC-6: west of MW-8, collected along the southern bank of middle beaver pond.
- GTC-7: collected downstream of the middle beaver pond dam in lower beaver pond. For unexplained reasons, this pond was observed not to freeze during the winter months as the other ponds had. Discolored sediment was also noted in this pond.
- GTC-8: collected independently of the other GTC samples the week after the first seven (7) GTC samples had been collected by request of NYSDEC. This sample location is downstream of the landfill and immediately downstream of South Street.

Analytical Program

All eight (8) surface water and all eight (8) sediment samples were analyzed at NYSDOH ELAP certified laboratory for:

- Full TCL
- TAL
- QA/QC

Results appear in Table 3-5 (Soils) and Table 3-6 (Surface Water).

2.2.5 Groundwater Investigation

At locations approved by NYSDEC, nine (9) groundwater monitoring wells were installed during the course of this site characterization. Due to site conditions, alternate drilling equipment had to be mobilized. All terrain track mounted auger drill rigs were used. Two (2) wells were installed on the landfill proper and one (1) well was installed along Pierces Road. The remaining six (6) wells were installed off the landfill's northeastern perimeter in a semi-circular configuration stretching from the eastern to the western sides of the site between Gidneytown Creek and the landfill. Specific locations were determined based upon the results of the direct-push (geoprobe) subsurface soils investigation, site access and field observations. Locations of each well appear on Figure 2-1 and Figure 3-5. Monitoring wells are defined with the prefix "MW".

Following well installation and development, each monitoring well was allowed to stand idle for two weeks so that the well screens could equilibrate. All wells were

purged prior to sampling via hand bailing. Groundwater quality parameters were recorded.

For the well installation and sampling program refer to Table 2-1under Appendix A for well construction details. Table 2-2 provides water level elevation data and pre-sampling water quality parameters. Table 3-8 provides the analytical data for each round of groundwater sampling event including the April 2007, September 2007, and April 2008 events.

Analytical Program

All groundwater samples collected in April 2007 were analyzed by a NYSDOH ELAP certified lab for:

- TCL VOC's
- TAL
- TIC's
- QA/QC

Samples collected in September 2007 were analyzed for VOC's only.

The reader is advised the existing monitoring wells located on the adjacent DuPont-Stauffer property were also accessed (with permission and oversight) and water level data was collected there. A decision was made not to collect samples from the Dupont-Stauffer wells on the adjacent site until the analyses of the on-site wells could be reviewed and evaluated.

Analytical data from each of the wells appears in Table 3-8.

2.2.6 Trench Investigation

Historical review of the available site information combined with interviews of City of Newburgh employees suggests that a series of disposal trenches had once existed on this site. Trenches were reported to have been dug parallel to Pierce Road and gradually filled with all types of municipal debris between the 1940's and 1970's.

Trenches were opened and closed in sequence as they become filled with trash. Trenches were reported to be thirty-five (35) feet center-on-center and at depths approaching twenty-five (25) feet deep. One city employee reported the existence of a photograph depicting a back-hoe so deep into the trench that only its exhaust stack was visible from grade level. The same employee reported that the present building structure currently used for DPW offices was constructed over one or more of these former disposal trenches. Both reports were confirmed by other city employees.

To determine the locations of these former trenches, CDM intended to conduct a series of test pits across this area of the site. Prior to the mobilization of heavy equipment for the trench investigation, CDM and NYSDEC representatives conducted follow-up interviewers with present employees of the Newburgh DPW. It

was during these follow-up interviews that the precise locations of all the former trenches were identified to be beneath the existing DPW Garage/Office Building. Some subsidence and compaction of the debris in these trenches seems to have taken place over time. This was evident in the uneven settling that can be seen in the floor of the office building. Under additional questioning, it became clear that all the former trenches are beneath the garage/office building, the asphalted driveway and/or the existing salt storage shed. As none of these structures could be disturbed for purposes of this site characterization, the trench investigation was cancelled.

As jointly proposed by CDM/DEC, the heavy equipment proposed for the trench investigation was re-mobilized to cut a series of access pathways along the perimeter toe of the landfill. Similarly, the opportunity to conduct trenching at other sites on the property became available with the cancellation of the trench investigation. In addition, the samples intended for analysis under the trench investigation were made available to other sampling and analytical programs in this site characterization.

2.2.7 Supplemental Investigation

At the request of the NYSDEC, CDM submitted Work Plan Amendment No. 1 for Additional Field Investigations to Support IRM Scoping and Planning on November 4, 2008. The major focus of the work was to further delineate the former drum disposal area on the western perimeter of the site and to collect a comprehensive round of groundwater samples in efforts to close select data gaps and to supplement the existing data base. Prior to mobilization, CDM developed a supplementary work plan outlining the new tasks to be performed and updated the site specific HASP as appropriate.

Field efforts in the former drum disposal area included:

- Installation of new test pits within the drum disposal area not previously investigated.
- Characterize the full surface expression of drums along the western perimeter of the site
- Determine the subsurface extent of the buried drums to the extent practical
- Collect waste samples of drum contents. Waste samples were submitted for RCRA hazardous waste characterization analysis and Toxic Characteristics Leaching Procedure (TCLP) analysis. Subsurface soil samples for volatile organic compounds (VOC), semi-volatile organic compound (SVOC), metals, pesticides and PCB analysis.

A total of four (4) test pits or test pit transects were excavated. Three test pits were excavated near TP-11 and TP-8 explored during the January 2007 investigations,

however no drums were uncovered. The fourth test pit was located near TP-7. Here a drum was exposed at approximately 3-feet bgs which contained a black plastic material and measured > 999 ppm on the PID. A sample of the drum materials was collected as "TP-15A Waste". This test pit was extended linearly and a second drum was uncovered. The drum was also reported at approximately 3-feet bgs and contained the same black plastic material. The waste material was sampled and identified as "TP-15B Waste". A soil sample was also collected from the area immediately adjacent to the drum and identified as "TP-15C Soil".

At the conclusion of a test pit or test pit transect, all excavations were properly back-filled, compacted and staked.

Analytical Program

Wastes were categorized based on their waste types and analyzed accordingly. A total of two (2) waste samples were collected. Only one soil sample was collected as part of this investigation, however at the request of the NYSDEC the waste samples were also analyzed for the soil parameters to the extent possible based on sample volume. The soil sample, TP-15C Soil, was analyzed for the soil parameters only. Samples were analyzed at an ELAP certified environmental laboratory for the following parameters:

Waste Parameters/ Method
- TCLP Volatile Organic Compounds
- TCLP Semi Volatile Organic Compounds
- TCLP Metals
- TCLP Pesticides/ Herbicides
- TCLP PCB's
- RCRA Characteristics
- QA/QC

Soil Parameters
- TCL VOC's
- TCL SVOC's
- TAL Metals
- Pesticides
- PCBs
- TIC's
- QA/QC

The analytical results are presented in Tables 3-2B and 3-2C provided under Appendix A.

Section 3
Results

Section 3 provides the results of the site characterization investigations conducted at City of Newburgh Landfill. For ease of review, the results have been organized as follows:

- Background Soil Samples, April 2007 (Table 3-1)
- Drum Investigation, January 2007 (Table 3-2A)
- Supplemental Drum Disposal Area Investigation, November 2008 (Table 3-2B and Table 3-2C)
- Surface, April 2007 and Subsurface Soil Investigation, January & February 2007 (Table 3-3 and Table 3-4)
- Supplemental Subsurface Investigation, September 2007 (Table 3-5)
- Sediment, April 2007 and Surface Water Sampling, April 2007 (Table 3-6 and Table 3-7)
- Groundwater Investigations, April 2007, September 2007, April 2008 (Table 3-8)

Results for soils were compared to the NYSDEC Recommended Soil Cleanup Objective (RSCO) found in TAGM 4046 and the standards set forth in 6 NYCRR Subpart 375-6 Restricted Commercial Use, Unrestricted Use, and Protection of Groundwater Criteria. As per NYSDEC request, Subpart 375-6 numerical criteria adopted December 14, 2006 were used as the basis for comparison over the older TAGM 4046 RSCO values. All tables and figures are provided under Appendix A and B, respectively.

Results for sediments were compared to the NYSDEC Division of Fish, Wildlife, and Marine Resources Technical Guidance for Screening Contaminated Sediments. Results were compared to the Human Health Bioaccumulation, Benthic Aquatic Life Acute and Chronic Toxicity criteria and Wildlife Bioaccumulation Criteria for non-polar organic contaminants and the Lowest and Severe Effect Levels for metals.

Analytical results for surface water and groundwater results were compared to 6 NYCRR Subpart 703.5 Standards for Surface waters and Groundwater that pertain to Class A fresh surface waters. NYSDEC Regulations Part 701.6 Classifications define Class A waters as "a source of water supply for drinking, culinary or food processing purposes; primary and secondary contact recreation; and fishing. The waters shall be suitable for fish propagation and survival." Class A standards are more stringent than those designated for Class D water bodies. The Gidneytown Creek is categorized as a Class D water body.

Quality Assurance/Quality Control (QA/QC) samples were collected to verify appropriate field and laboratory procedures. Duplicate samples, trip blanks and field blanks were collected and analyzed throughout the phases of investigation. Unless otherwise noted, QA/QC samples were generally non-detect or reported at concentrations within the accepted range.

In consultation with the NYSDEC on site representative it was not deemed necessary to collected QA/QC samples during the background and surface soil sampling. Also of note, a field blank was not collected during the April 2007 (first round) groundwater investigation. The QA/QC sample bottles were damaged in transit from the laboratory and unusable upon receipt. A trip blank and a field duplicate sample were collected during the investigation. During the September 2007 (second round) groundwater sampling event, all required QA/QC samples were collected and analyzed.

3.1 Background Soil Samples

Background surface soil samples were collected to determine baseline levels of surface soil quality. Three background samples were collected at locations biased toward areas believed to be un-impacted by historic landfill operations and representative of natural conditions. However the reader is advised that in the recent past, several waste incineration units were operated at nearby facilities. It is highly likely that the Newburgh Landfill and the surrounding environs have to some degree, been impacted/influenced by air emission plumes of these former facilities. Samples were analyzed for full TCL VOC's and SVOC's, TICs, and TAL metals.

TCL Volatile Organic Compounds

Trace concentrations of three VOCs were found in the background samples collected from the site. Methylene chloride (MeCl) and carbon tetrachloride (CCl_4) were detected in each of the background soil sample locations. Concentrations of MeCl ranged from 2.4 ppb to 3.5 pbb and concentrations of CCl_4 ranged from 13 ppb to 18 ppb. The other VOC, Styrene, was detected in BKG-2 at a concentration of 3.1 ppb. Concentrations of all the detected VOC's were below Department criteria and all results were qualified with "J", indicating that the concentration was less than the quantization limit and therefore is an approximate value.

No tentatively identified compounds (TICs) were reported.

TCL Semi-Volatile Organic Compounds

Seventeen (17) SVOCs were detected in the background soil samples. Of the 17 compounds detected, five compounds (benzo(a) anthracene, chrysene, benzo(b)fluoranthene, benzo(a)pyrene, and indeno(1,2,3-cd)pyrene) were reported with concentrations exceeding Department soil cleanup objectives. Elevated concentrations of all five compounds were reported in BKG-1, and all compounds with the exception of indeno(1,2,3-cd)pyrene were reported in BKG-2. Analytical results for all SVOCs were acceptable in BKG-3.

It is noteworthy to point-out that these five compounds are products of incomplete combustion and may represent a residual chemical fingerprint of the formerly-operated local incineration units.

TAGM RSCO standards for both benzo(a)anthracene and indeno(1,2,3-cd)pyrene were exceeded. Un-Restricted Use Criteria Standards were also exceeded for chrysene, benzo(b)fluoranthene and benzo(a)pyrene. Analytical results did not exceed the Restricted Commercial Use Criteria for any compounds in any background sample. See Table 3-1 for results.

Tentatively Identified Compounds or TICs were reported at each location; however concentrations did not exceed the Department standard of 500,000 ppb.

TAL Metals

Background soil samples were analyzed for target analyte list metals. All compounds were detected in at least one sample and nine compounds were detected at concentrations exceeding Department soil standards. Metals results are presented in parts per million (ppm).

Elevated levels of beryllium, calcium, chromium, iron, magnesium, nickel, silver, zinc and mercury were detected in background surface soil samples. Concentrations only marginally exceeded Department standards. See Table 3-1 and Figure 3-1 for analytical results.

Analytical results indicate that the concentrations of some heavy metals are fairly consistent across the site. It is likely that some of metals are naturally occurring and not the result of contamination. Metals concentrations collected in on-site characterization samples that far exceed the levels reported in background samples will be considered be indicative of contamination.

Pesticides/ PCBS

Two pesticides were detected in background soil samples. Gamma-BHC was detected in sample BKG-1 at a concentration of 8.8 ppb and dieldrin was detected in BKG-2 at a concentration of 5.8 ppb. Results are below Department standards.

3.2 Drum Investigation

Op-Tech Environmental Services of Albany, NY, was retained by CDM to assist in the drum/trench investigation. Fourteen (14) test pit/trench excavations were completed during the investigation. Test pits were extended to a maximum depth of 15-feet deep and a maximum length of 60-feet long. Test pit locations were biased toward the following areas:

- toe of the landfill slope, bordering the DuPont/Stauffer property; drums were reportedly offloaded and can be visually observed in this area
- other areas reported by long-time Newburgh DPW employees to have a history of activity

Drums were found in nearly every test pit and test pit transect with the exception of TC-1-TP-1, TP-13 and TP-14. At these locations garbage, decaying wood, construction debris, black sludge, colored vinyl strips and newspapers were revealed. In general drums appeared damaged beyond what would normally be caused by oxidation or exposure to the elements. Based on the condition of the drums and the observations that many are dented, crumbled and punctured it is believed that they may have been disposed of along the top of the slope and subsequently allowed to be tumbled or pushed down the slope.

A total of seven waste samples were collected and analyzed for TCLP VOCs, TCLP metals, PCBs, and RCRA Characteristics. Analytical results are provided in Table 3-2A and Figure 3-2. TCLP results are compared to the New York Code of Rules and Regulations (NYCRR) Chapter 6, Subpart 371.3 Characteristics of Hazardous Waste. The table below provides a description of the drum investigation excavations and the samples submitted for analysis.

TCLP Volatile Organic Compounds

Seven VOC's were detected during the drum investigation. All were below the maximum concentration of contaminants for toxicity characteristics. No VOC TICs were reported in any of the waste samples analyzed during the drum investigation.

Drum Investigation Samples

Test Pit ID	Size (ft) (LxWxD)	Description	OVM mg/kg	Sample Y/N?	Sample ID	Sample Description
TC-1 TP-1	10x3x7	Garbage		N		
TC-1 TP-2		Drums w/ strong chemical/organic odor and asbestos roofing material		Y	TC-1-TP-2[1]	Drum contents
					TC-1-TP-2[2]	Soil matrix
TC-1 TP-3	20x3x4	Drums w/ bomb slop and orange material	2700	Y	TC-1-TP-3[1]	Drum contents from white container in the drum, a rubbery, sticky, glue like material
TC-2 TP-1	20x3x7	Drum, wood timbers and tan asbestos roofing material	0	N		
TP-4	25x3x5	Drums	0	N		
TP-5	15x3x10	Drums	0	N		
TP-6	40x3x12	Drums	997	Y	TP-6	Soil
			9999		TP-6[3]	Orange waste
TP-7	60x3x12	Drums w/ blue tarp material and orange material	897 – 9999	N		
TP-8	40x3x10	Drums, concrete debris, white material and an ash layer above the drums	200	Y	TP-8[1]	White drum content

Test Pit ID	Size (ft) (LxWxD)	Description	OVM mg/kg	Sample Y/N?	Sample ID	Sample Description
TP-9	45x4x15	Drums with blue, red, green material. Drum with ropelike material and orange, blue and green vinyl material	22	N		
TP-10	45x4x10	Drums with green plastic material and dried paint sludge		N		
TP-11	40x3x12	Drums with yellow material, loose yellow and blue material, bomb slop, soft black material in a drum and a drum with polymer material	0-3	Y	TP-11[1]	Black drum content
TP-12	25x4x10	Drum w/ colored paint, drum w/ paint can, plastic material w/ white and orange color	0	N		
TP-13	15x3x15	Mass of different colored vinyl strips and a mass of newspapers w/a strong chemical odor	162	N		
TP-14	15x3x15'	Decayed wood covered in black sludge and construction debris		N		

1-Sample material – drum contents, 2- Sample material – soil matrix, 3- Sample material – orange waste

TAL Metals

The TCLP analysis performed on soil and drum material samples collected during the drum investigation indicates that high concentrations of metals exceeding the State maximum concentrations of contaminants for toxicity characteristics are present on site. Arsenic, barium, cadmium, chromium, lead, mercury and selenium were reported at concentrations exceeding 6 NYCRR Subpart 371.3 hazardous waste characteristic criteria. Exceedances of at least one metal were reported in all samples, with the exception of TP-11.

Arsenic concentrations ranged from non-detect to 5.61mg/L. The maximum concentration of arsenic for toxicity as defined by NYSDEC regulations is 5.0 mg/L. Arsenic concentrations reported in TC-1-TP-2 (soil matrix) and TP-6 (orange waste) marginally exceeded this value with detectable concentrations of 5.5 mg/L and 5.61 mg/L, respectively.

The drum content sample from TP-8 was reported as having a concentration of 421 mg/L of barium, which is four times greater than the maximum contaminant concentration of 100 mg/L. All other samples were below this maximum concentration.

Three samples were reported with concentrations of cadmium higher than the maximum contaminant concentrations for toxicity. The cadmium concentration at

sample locations TC-1-TP-2 (1.92 mg/L) and TP-6 (1.05 mg/L) marginally exceeded the acceptable value of 1.0 mg/L. However, the drum content material samples from TP-8 (348 mg/L) greatly exceeded this applicable value.

Chromium concentrations in samples TC-1-TP-2[1], TC-1-TP-2[2], TP-6[2], and TP-8[1] exceeded the maximum allowable contaminant concentration. Chromium in these samples ranged from 9.21 mg/L to 42.30 mg/L, exceeding the applicable value of 5.0 mg/L. Detected concentrations were qualified with "E" indicating that the values reported are estimated due to the presence of interference in the QA/QC samples. Note the superscript in the sample ID identifies the materials sampled; *1* denotes drum contents and *2* denotes soil, *3* denotes orange waste.

High levels of lead (range 17.5 mg/L to 19, 800 mg/L) were reported in all samples, except TP-11. All results, except sample TP-6[3] (17.5 mg/L), were qualified with "E." The highest reported level of lead (19,800 mg/L) was in the soil matrix of sample TC-1-TP-2[2], which reported a concentration approximately four times greater than the maximum lead concentration acceptable by the State (5.0 mg/L).

Four samples reported high levels of mercury. The maximum mercury concentration for toxicity acceptable by the Department is 0.2 mg/L. Elevated concentration reported in TC-1-TP-2[1], TP-6[2,3], and TP-8[1] ranged between 0.36 mg/L and 1.8 mg/L.

Samples, TC-1-TP-2[2], TC-1-TP-3[1], and TP-6[2] exceeded the Department maximum toxicity concentration of 1.0 mg/L for selenium with concentrations of 2.14 mg/L, 2.08 mg/L, and 2.4 mg/L respectively.

The concentrations of other metals detected in these samples were below the maximum contaminant level accepted for toxicity.

PCBs

Samples collected during the drum investigation were analyzed for PCBs. Analysis was not performed via toxic characteristics leaching procedure and are therefore compared to Subpart 375-6 Soil Cleanup Objectives and TAGM 4046. Only one PCB, Aroclor-1242, was detected in one sample, TP-6[3]. Aroclor was reported at a concentration of 10,000 ppb as compared to the standards of Unrestricted Use and Restricted Commercial Use criteria of 100 ppb and 1,000 ppb. The result was qualified with an "E", indicating that the analyte's concentration exceeds the calibrated range of the instrument for that specific analysis.

RCRA Characteristics

A RCRA Characteristics analysis was performed on each sample. Samples were non-detect for reactive cyanide and reactive sulfide. Sample pH values were reported as non-corrosive. TP-6[3] was identified as ignitable. Ignitable wastes can create fires under certain conditions, are spontaneously combustible, or have flash points less than 60°C (140°F). Ignitable wastes are typically waste oils and used solvents. Results are compared to the Hazardous Waste Identification Regulations defined by EPA 40 CFR Part 261.

Drum Investigation
RCRA Characteristics

	TC-1-TP-2[1]	TC-1-TP-2[2]	TC-1-TP-3[1]	TP-6	TP-6[3]	TP-8[1]	TP-11[1]
Corrosivity pH ≤ 2 or ≥ 12.5	6.9	7.5	3.8	7.7	6.8	6.8	5.4
Ignitability <60°	No	No	No	No	**Yes**	No	No
Reactive Cyanide	ND	ND	ND	ND	ND	ND	ND
Reactive Sulfide	ND	ND	ND	ND	ND	ND	ND

ND – Non-detect

3.2.1 Drum Disposal Area Supplemental Investigation

The supplemental investigation of the drum disposal area was conducted on November 12, 2008. Conklin Services & Construction Inc., of Newburgh, NY was retained by CDM to excavate the test pits during the investigation. The exploratory test pits were biased towards areas not previously investigated or uncovered. Soils and waste materials were screened for volatile organics using a MiniRae 2000 photo ionization detector (PID).

Two waste samples, TP-15A WASTE and TP-15B WASTE, representative of the content of the disposed drums, were collected and submitted to ChemTech for analysis. The waste samples were analyzed for RCRA hazardous material characteristics and VOCs, SVOCs, pesticides, herbicides and metals by the TCLP method. The waste samples and a soil sample, TP-15C SOIL, collected adjacent to TP-15B WASTE, were also analyzed for VOCs, SVOCs, metals including mercury (Hg) and cyanide (Cn), pesticides and PCBs by methods US EPA Methods SW-8260, SW-8270, SW-6010, SW-7471 (Hg), SW-9012 (Cn), SW-8081 and SW-8082, respectively.

Table 3-2B and Table 3-2C show the results of the supplemental subsurface investigation completed in the drum disposal area. Analytical results were compared to the NYSDEC Recommended Soil Cleanup Objective (RSCO) found in TAGM 4046 and the standards set forth in 6 NYCRR Subpart 375-6 Restricted Commercial Use, Unrestricted Use, and Protection of Groundwater Criteria. As per NYSDEC request, Subpart 375-6 numerical criteria adopted December 14, 2006 were used as the basis for comparison over the older TAGM 4046 RSCO values.

Waste Classification

The black material found inside the uncovered drums was submitted to ChemTech for analysis. Waste samples were submitted for RCRA hazardous waste characterization analysis and Toxic Characteristics Leaching Procedure (TCLP) analysis. RCRA Characteristics analysis did not indicate the presence of hazardous materials. Samples were non-detect for reactive sulfide and cyanide and both samples were reported with flashpoints greater than 140°F and pH values between 2 standard units (s.u.) and 12.5 s.u. indicting that neither sample exhibited characteristics of ignitability or corrosivity. Furthermore, the TCLP analysis did not indicate that the black material found inside the drums was toxic. Two VOCs, 2-butanone (also known as methyl-ethyl-ketone or MEK) and chlorobenzene, two SVOCs; 2-methylphenol and 3+4-methylphenol, and two metals, barium and lead, were detected in the waste

samples. Concentrations of all compounds were well below the Maximum Concentrations of Contaminants for Toxicity Characteristics as defined by 40 CFR §261.24. No pesticides or herbicides were detected.

Subsurface Soils

Volatile Organic Compounds

A total of six VOCs were detected in subsurface soils collected from the drums samples. Of the six; toluene, tetrachloroethene, chlorobenzene, ethyl benzene, and m/p-xylenes and were detected at concentrations far exceeding all applicable criteria. Samples for VOC were analyzed after a methanol extraction, elevating the detection limits. However, even after the methanol extraction, the samples had to be diluted further due to the high concentration of target compounds. In general results exceeded Subpart 375-6 numerical criteria by a factor of 10 or greater. Each waste sample analyzed for the soil parameters sample reported an exceedance of Department criteria with the exception of TP15C SOIL, which was comprised of soils adjacent to the recovered drums. No elevated levels were reported at TP15C SOIL. A summary of the VOC exceedances are provided below;

Toluene was detected in the most diluted samples of TP15A WASTE and TP15B WASTE at concentrations of 1,090,000,000ug/kg and 15,000,000 ug/kg far exceeding the applicable standard of 100,000 ug/kg.

Tetrachlorobenzene was detected in sample in the undiluted TP15 WASTE samples at a concentration of 11,000 ug/kg double the applicable standard of 5,500ug/kg. No other exceedance was reported.

Chlorobenzene was detected in both TP15A WASTE and TP15 WASTE. Both samples were diluted; TP15A WASTE by a factor of 500 and TP15B by a factor of 20. The concentrations of chlorobenzene reported by these samples are 31,000,000ug/kg and 610,000ug/kg respectively.

Methylbenzene was detected in TP15A WASTE at a concentration of 260,000ug/kg after being diluted by a factor of 50. This result exceeds the Restricted Commercial Use Soil Cleanup Objective of 30,000ug/kg.

An exceedance of m/p-xylenes was reported at sample TP15A WASTE. A concentration of 240,000ug/kg was reported in the sample after being diluted by a factor of 50. This exceeds the applicable standard of 100,000ug/kg.

Semivolatile Organic Compounds

Subsurface soils were analyzed for SVOCs. A total of eighteen SVOCs were detected in site soils and five; dielthylphthalate, di-n-butylphthtalate, chrysene, bis(2-ethylhexyl)phthalate, and di-n-octyl phthahate were reported at concentrations exceeding standards used for comparison. As with the VOCs, no SVOCs were reported in TP15C at concentrations exceeding applicable standards. A summary of the exceedances are provide below:

Dielthylphthalate was detected in both; sample TP-15A WASTE and TP-15B WASTE, at concentrations of 30,000ug/kg and 37,000 ug/kg exceeding the TAGM 4046 RSCO of 7,100 ug/kg. The Department has not established standards for comparison under 6 NMYCRR Subpart 375-6 and so analytical results for dielthylphthalate are compared to the TAGM RSCO.

Di-n-butylphthtalate was detected in samples TP-15A WASTE and TP-15B WASTE, at concentrations of 30,000ug/kg and 36,000 ug/kg exceeding the TAGM 4046 RSCO of 8,100 ug/kg. Similar to dielthylphthalate the Department has not established standards for comparison under 6 NMYCRR Subpart 375-6 and so analytical results for di-n-butylphthtalate are compared to the TAGM RSCO.

Chrysene was detected in sample TP-15B WASTE at a concentration of 2,200 ug/kg. The reported concentration exceeds the Restricted Commercial Use Soil Cleanup Objective of 1,000ug/kg. The result however is qualified with a "J" indicating that the compound meets the identification criteria and is less than the quantitation limit but greater than the method detection limit. Therefore, the value provided is approximate.

Bis(2-ethylhexyl)phthalate was detected in both; sample TP-15A WASTE and TP-15B WASTE, at concentrations of 370,000 ug/kg and 600,000 ug/kg exceeding the TAGM 4046 RSCO of 50,000 ug/kg. These values are reflective of the concentrations present after diluting sample TP-15A WASTE by a factor of 500 and TP-15B WASTE by a factor of 20.

Di-n-octyl phthahate was detected in both; sample TP-15A WASTE and TP-15B WASTE, at concentrations of 20,000 ug/kg and 36,000 ug/kg exceeding the TAGM 4046 RSCO of 8,1000ug/kg.

The SVOCs reported in TP-15A WASTE and TP-15B WASTE that exceed Department standards are phthalates, which are mainly used as plasticizers. Plasticizers increase the flexibility of plastics and are commonly used to soften polyvinyl chloride used in making vinyl upholstery.

Pesticides and PCBs

Subsurface soil samples were also analyzed for pesticides and PCBS. However due to the limited sample volume available for TP-15A WASTE and TP-15B WASTE analyses could not be preformed. Three pesticides and one PCB were detected in sample TP-15C. These include 4,4-DDE, 4,4-DDD, 4,4-DDT and arolclor-1260. The reported concentrations were well below applicable standards.

Metals

Metals were reported in each subsurface soil sample. In most cases, metals exceeded both the Restricted Commercial Use Soil Cleanup Objectives and TAGM RSCO values, and in some instances TAGM 4046 Eastern USA Background Concentrations. Of the twenty-two metals analyzed under the target analyte list (TAL) six metals; cadmium, copper, lead, mercury, silver, and zinc.

Cadmium was reported in each soil sample. Concentrations ranged from 8.15 mg/kg in TP-15C SOIL to 10.9 mg/kg in TP-15B WASTE. These results are reflective of the results from the un-diluted samples. Metals were generally reported at higher concentrations in the diluted samples. Concentrations at these levels exceed the Restricted Commercial Use Soil Cleanup Objective of 9.3mg/kg the Un-restricted Use Soil Cleanup Objective of 1.5 mg/kg, TAGM RSCO of 1 mg/kg and the TAGM background upper limit of 1 mg/kg.

Copper was detected in site soils at concentrations ranging from 40.8 mg/kg to 150 mg/kg. The highest reported concentration did not exceed the Restricted Commercial Use Soil Cleanup Objective of 270 mg/kg, but did exceed all other applicable standards of comparison.

Lead was detected in the undiluted soil samples at concentrations ranging from 643 mg/kg to 1,060 mg/kg. The Restricted Commercial Use Soil Cleanup Objective of 1000 mg/kg was exceeded at samples TP-15B WASTE and TP-15C SOIL.

Mercury was detected in each subsurface soil sample. Mercury was reported in TP-15A at 0.129 mg/k, in TP-15B at 0.723 mg/kg, and TP-15C SOIL at 0.202 mg/kg. None of the reported concentrations exceeded the Restricted Commercial Use Soil Cleanup Objective of 2.8 mg/kg, however both TP-15B WSATE and TP-15C SOIL exceed the Un-restricted Use Soil Cleanup Objective of 0.18 mg/kg, TAGM RSCO of 0.1 mg/kg and the TAGM background upper limit of 0.2 mg/kg.

Silver was detected in all subsurface soil samples at concentration above the Un-restricted Use Soil Cleanup Objective of 2 mg/kg. Concentrations ranged from 8.37 mg/kg to 11.7 mg/kg.

Zinc was reported in each soil sample. Concentrations ranged from 1,150 mg/k to 12,777.64 mg/kg. At these levels, zinc exceeds the Restricted Commercial Use Soil Cleanup Objective of 10,000 mg/kg and the Un-restricted Use Soil Cleanup Objective of 109 mg/kg.

Elevated levels of metals were reported in site soils during the supplemental investigation. The presence of metals is however not unexpected since metals exceeding applicable standards were reported across the site during the site characterization activities in 2007. Concentrations reported during this supplemental investigation are consistent with previous results.

3.3 Soil Investigation

CDM conducted a two phase soil investigation to determine whether any negative environmental impacts to surface or subsurface soils exist at the City of Newburgh landfill. During the initial phase five surface samples and ten subsurface samples were submitted for analysis. A total of 41direct-push geoprobe subsurface soil borings were advanced across the site. Surface sample locations were approved by the NYSDEC on-site representative and biased towards areas susceptible to surface contamination. The NYSDEC on-site representative also provided guidance when

choosing geoprobe sample locations. Modifications to the geoprobe sampling plan were necessary as a result of varying site conditions:

- Gidneytown Creek beaver dam, which submerged previously identified seeps
- Inclement weather
- Woody, swampy terrain

During the second phase of the soils investigation an additional 18 geoprobe borings were drilled and 16 subsurface soil samples submitted for analysis. Sample locations were approved by the NYSDEC project manager prior to mobilizing in the field. Sample locations were biased towards areas identified as having some level of contamination during the first round of sampling.

3.3.1 Surface Soil Investigation

Five surface soil samples were collected and submitted to NYSDOH-ELAP certified, Chemtech Laboratories of Mountainside, New Jersey for analysis. As stated above samples were biased towards areas vulnerable to contamination. Sample locations are described below.

SS-1: adjacent to the DPW Burn Pit

SS-2: west side of the vehicle impound lot

SS-3: adjacent to the scrap metals pile

SS-4: adjacent to the wood chip/tree trunk disposal area

SS-5: in the vegetated, central portion of the site

Surface samples were analyzed for TCL VOCs and SVOCs, TAL Metals, Pesticides, and PCBs. The results are provided in Table 3-3 and Figure 3-1.

TCL Volatile Organic Compounds

Five TCL VOC's were detected in surface soils. Methylene chloride was detected in all surface soil samples, with the exception of SS-4. Carbon tetrachloride was detected in all samples, with the exception of SS-1. Methylene chloride, carbon tetrachloride, ethylbenzene, m/p-xylenes, and o-xylenes were each detected in SS-5. Concentrations of all compounds were below Department standards. All results were qualified with "J", indicating that values are approximate.

TCL Semi-Volatile Organic Compounds

Eighteen (18) SVOCs were detected during the TCL SVOC analysis of the surface soil samples. Six (6) compounds; benzo(a) anthracene, chrysene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, and indeno(1,2,3-cd)pyrene, were detected at concentrations greater than Department standards.

High levels of benzo(a)anthracene, chrysene, and benzo(a)pyrene exceeding Department criteria was reported in all five surface soil samples. Benzo(k)fluoranthene and indeno(1,2,3-cd)pyrene exceeded Department standards in three of the five samples. The concentrations in SS-1 are acceptable. Concentrations exceeded Un-Restricted and Restricted Use Criteria Soil Cleanup objectives.

TICs were detected at each sample location. Concentrations (range 5,860 ppb to 17,040 ppb) were below the Department standard of 500,000 ppb. See Table 3-3 for a list of all detected SVOCs and respective sample concentrations.

SVOC contamination in surface soils is minor and limited to polycyclic aromatic hydrocarbons (PAHs). PAHs are typically produced through the incomplete combustion of carbon-containing fuels such as wood, coal, diesel, fat, or tobacco. The five compounds listed above were detected in surface samples are classified as probable human carcinogens. These same compounds were found in background surface samples although at slightly lower concentrations.

TAL Metals

Target analyte metals were detected in surface soils samples. Beryllium, chromium, cobalt, copper, iron, lead, magnesium, potassium, silver, zinc and mercury were present at concentrations exceeding Department soil cleanup criterion. Beryllium, chromium, iron, magnesium, nickel, and zinc were detected in all surface soil samples.

Beryllium concentrations ranged from 0.507 ppm to 0.531 ppm. These levels exceed the TAGM Soil Cleanup Objective of 0.16 ppm but are within the Eastern USA background range.

Chromium was detected in surface soil samples at concentrations ranging from 18.3 ppm to 35 ppm. These levels exceeded the TAGM Soil Cleanup Objective of 10 ppm, but were less than the Eastern USA background upper limit of 40 ppm.

Copper was detected at elevated levels in all surface soil samples. Concentrations ranged from 29.4 ppm to 73.5 ppm. SS-2 detected at 29.4 ppm, is below Department standards. Copper concentrations in samples SS-4 and SS-5 exceed the TAGM soil cleanup objective of 25 ppm but are within the Eastern USA background range, and SS-1 and SS-3 exceed Subpart 375-6 Un-restricted use criteria of 50 ppm.

Iron concentrations in all surface samples exceed the TAGM Soil Cleanup Objective of 2,000 ppm. Concentrations ranged from 22,600 ppm to 25,500 ppm. Concentrations are within the Eastern USA Background range. New criteria was not established under 6 NYCRR Subpart 375-6.

Lead was detected in all surface samples however only samples SS-3 and SS-5 were reported at levels exceeding State cleanup objectives. Concentrations in SS-3 and SS-5 were 90.7 ppm and 118 ppm, respectively exceeding the Un-Restricted Use Cleanup objective of 63 ppm.

Reportable concentrations of magnesium were found at all surface sample locations. Concentrations ranged from 6,670 ppm to 11,900 ppm. These levels exceed the TAGM Eastern USA background upper limit of 5,000 ppm. No other criterion is established for magnesium.

Mercury was reported at all surface soil sample locations. Mercury concentrations in SS-1, SS-3, SS-4, and SS-5 exceeded Department Un-Restricted Use Cleanup objective of 0.18 ppm. Elevated concentrations were reportedly 0.19 ppm in SS-1, 0.45 ppm in SS-4, and 0.48 in SS-5. Mercury was reported in SS-3 at a concentration of 0.16 ppm which although below Subpart 375-6 criteria exceeds the TAGM cleanup objective of 0.1 ppm. Results were reported with a "J" qualifier indicating that the results are approximate values.

Nickel was reported in each surface soil sample. Nickel in SS-3 exceeds the Department's Un-Restricted Use Cleanup objective of 30 ppm. Concentrations at all locations exceeded the TAGM Soil Cleanup Objective of 13 ppm and only marginally exceeded the Eastern USA Background upper limit of 25 ppm. Concentrations were reported as 26 ppm (SS-1), 26.6 ppm (SS-2), 30.8 ppm (SS-3), 26.7 ppm (SS-4), and 26.7 ppm (SS-5).

Silver concentrations at all surface soil locations exceed the Department Un-Restricted Use criteria objective of 2 ppm. Concentrations range from 4.49 ppm to 6.48 ppm. The highest concentration was reported in SS-4. Concentrations were below the Department Restricted Commercial Use standard of 1,500 ppm.

Surface soil zinc concentrations ranged from 87.5 ppm to 223 ppm. These levels exceeded Subpart 375-6 Un-Restricted Use Cleanup objective (109 ppm), the TAGM soil cleanup objective (20 ppm or SB), and the TAGM Eastern USA background upper limit (50 ppm).

Analytical results indicate that heavy metals have not significantly impacted surface soils. Metal concentrations found in site surface samples were compared to background surface samples. In general, concentrations are fairly consistent with only chromium and zinc showing significantly higher concentrations.

Pesticides/PCBs

Two pesticides were detected in surface soils samples; gamma-BHC and Aldrin. Results were well below the Subpart 375-6 Soil Cleanup Objectives. No other pesticides or PCBs were detected at any surface sample locations.

3.3.2 Subsurface Soil Samples

Newburgh Landfill subsurface soil samples were collected to determine the extent of negative impacts on subsurface soils at the site. Sampling began in the vicinity of groundwater seeps at the toe of the landfill toward Gidneytown Creek, north and east of the site. A photo ionization detector, field characteristics and a mobile laboratory equipped with a mobile gas chromatograph were used to confirm the presence of volatile organic compounds in surface and subsurface soils and to help in directing

the progress and direction of each geoprobe transect. Subsurface soil samples were analyzed for Toxic Characteristic Leaching Procedure Volatile Organic Compounds (TCLP VOCs) and Tentatively Identified Volatile Organic Compounds (TIC's) Target Analyte List (TAL) Metals, and PCBs. RCRA characteristics analysis was performed on four samples GP16 (3-3.5), GP17 (4-5), GP 18 (6-6.5) and GP 22 (9.5-10). Numbers in parentheses denotes the interval below grade in feet. Detected compounds are reported in Table 3-4 and on Figure 3-3.

Aztech Drilling of Ballston Spa, NY was retained by CDM to perform the direct push geoprobe subsurface sampling. Samples were advanced to a maximum depth of 25-feet, native materials, or refusal. A total of 41 geoprobe borings were installed and ten soil samples were containerized and submitted for offsite analysis. Probing began in the northeast corner of the site in the vicinity of Gidneytown Creek and the groundwater seeps. Probing continued west along Gidneytown Creek to the western bounds of the property in the vicinity of the DuPont/Stauffer site and drum deposition area. Some probing was completed a top the landfill.

Mobile Laboratory

AccuScience Environmental, a Philadelphia, PA, based mobile laboratory that can perform in-field gas chromatography analysis, was retained by CDM to support the efforts of the subsurface soil investigation. During the subsurface soil investigation, soil samples suspected of contamination were analyzed on-site to determine the presence and concentrations of target compounds. The mobile laboratory operated a Shimadzu GC-17A, laboratory-grade gas chromatograph, equipped with a photoionization detector (PID), and electron capture (ECD) and flame ionization detector (FID). Results facilitated the field staff in their decision to collect samples for off-site analysis and in directing the path of the geoprobe transects.

The mobile lab identified the following target compounds:

Acetone	Methyl-ethyl-ketone (MEK)	Toluene
1,1-dichloroethylene	cis-1,2-dichloroethylene	2-hexanone
Methylene chloride (MeCl)	Benzene	Tetrachloroethylene (PCE)
Methyl-tert-butyl-ether (MTBE)	Trichloroethylene (TCE)	Ethylbenzene
Trans-1,2-dichloroethylene	Methyl-iso-butyl-ketone (MIBK)	m,p, and o-xylenes

The mobile laboratory analyzed 62 samples on site. Thirty-four (34) of those samples showed concentrations of acetone, methyl-ethyl-ketone (MEK), cis- 1,2-dichloroethylene, or benzene concentrations exceeding applicable criteria. All other compounds were either non-detect or below applicable concentrations for all samples.

Acetone was detected in 33 samples with concentrations exceeding the Un-Restricted Use Cleanup criteria and/or TAGM RSCO (range 51 ppb to 2000 ppb).

Methyl Ethyl Ketone was identified in four samples at elevated concentrations. Concentrations ranged from 130 ppb to 380 ppb exceeding the Unrestricted Use cleanup objective of 120 ppb. Elevated detections were found in samples GP13 (9), GP16 (3-3.5), GP17 (4-5) and GP37 (11-12).

The compound cis-1,2-dichloroethylene was reported in 2 samples, GP1 (8-9) and GP1 (12-13). Both samples were collected from geoprobe (GP) boring GP1 located in the northeast corner of the Newburgh Landfill site adjacent to the Gidneytown Creek seeps. Concentrations were measured as 980 ppb and 3500 ppb exceeding both the Un-Restricted Use Soil Cleanup criteria of 250 ppb and the TAGM RSCO value of 300 ppb. Both samples were qualified with "E" which indicates that the concentrations are estimates extrapolated beyond the upper calibration unit.

Benzene was detected at a concentration of 85 ppb in sample GP1 (8-9). This concentration exceeds the Unrestricted Use cleanup objective and the TAGM RSCO value both of which are 60 ppb. Benzene was also detected in other samples, but at much lower concentrations.

Based on these results, field observations, and PID readings 10 subsurface soil samples were containerized and submitted to ChemTech for off-site analysis. Subsurface samples were analyzed for Toxic Characteristic Leaching Procedure Volatile Organic Compounds (TCLP VOCs), Target Analyte List (TAL) Metals, and PCBs. No SVOC analysis or pesticide analysis was performed. Samples were collected from geoprobe borings GP1, GP9, GP9A, GP16, GP17, GP18, GP22, GP36, GP37, and GP38. The results are discussed below.

TCL Volatile Organic Compounds

Subsurface soil samples were analyzed for Toxic Characteristic Leaching Procedure Volatile Organic Compounds (TCLP VOC's) and Tentatively Identified Volatile Organic Compounds (TIC's). Results were compared to 6 NYCRR 371.3 Characteristics of Hazardous Waste. Three volatile organic compounds; vinyl chloride, 2-butanone (MEK), and chlorobenzene, were detected in subsurface soils sent off-site for analysis. Vinyl chloride was detected in sample GP1 (9-9.5) at a concentration of 0.61 mg/L, exceeding the Hazardous Waste Characteristic maximum value of 0.2 mg/L. This result was qualified with an "E" indicating that the concentration exceeds the calibrated range of the instrument for the specific analysis.

2-Butanone was detected in GP16 (3-3.5) and GP22 (9.5-10) and chlorobenzene was detected in GP9 (6.5-7) and GP36 (12); results were below the maximum Hazardous Waste Characteristic values for those respective compounds.

Vinyl chloride, also known as chloroethane, is an industrial chemical primarily used to produce polyvinyl chloride (PVC). Vinyl chloride can also be used in the manufacture of automobile upholstery. Rolls of upholstery were uncovered during the test pit and trench excavations as well as during the subsurface sampling. On more than one occasion during the geoprobe investigation, soil cores were opened to reveal layers of poly vinyl material.

TAL Metals

Target analytle list metals were detected at locations all across the site. A total of 15 compounds were detected in subsurface samples at concentrations exceeding either Department Protection of Groundwater Cleanup objectives or TAGM 4046 Un-

Restricted Use Cleanup objectives. Compounds detected at elevated levels included the following:

Arsenic	Iron
Barium	Lead
Beryllium	Magnesium
Cadmium	Mercury
Calcium	Nickel
Chromium	Selenium
Copper	Silver
Zinc	

All samples showed an exceedance of at least one TAL metal, with the exception of GP-1 (9-9.5). All metals detected in the soils at this sample location were below Department criteria.

Arsenic was detected in GP9 (6.5-7), GP9A (9.5-10.), GP-16 (30-3.5), GP17(4-5), and GP37 (11-12). Concentrations ranged from 8.09 ppm and 11.3 ppm in GP9A and GP9 to more elevated concentrations of 17.2 ppm, 20.3 ppm, and 22.2 ppm in GP16, GP17, and GP37, respectively. These levels exceed the TAGM 4046 recommended soil cleanup objective of 7.5 ppm. Samples GP16, GP17, and GP37 also exceeded the State protection of groundwater cleanup objective of 16 ppm as well as the Un-Restricted Use Soil Cleanup objective of 13 ppm.

Four exceedances of barium were detected during the subsurface investigation. GP16 was reported with a concentration of 361 ppm, which exceeds the Department Un-Restricted Use cleanup objective of 350 ppm. GP-18 was reported with a concentration of 409 ppm, GP-22 with a concentration of 1970 ppm and GP-37 with a concentration of 532 ppm, all of which exceed the State Protection of groundwater standard of 820ppm. 400 ppm.

Beryllium was reported at concentrations ranging from 0.167 ppm to 0.498 ppm. These levels exceed the TAGM 4046 recommended soil cleanup objective of 0.16 ppm but are well below the Eastern USA standard background upper limit of 1.75 ppm and the standard for the protection of groundwater and unrestricted use of 47 ppm and 7.2 ppm.

High levels of cadmium were reported in eight subsurface soil samples. GP-9A was reported at a concentration of 1.79 ppm exceeding the TAGM Cleanup objective of 1 ppm. Samples GP-9, GP-16, GP-18, and GP-22 were reported as having concentrations ranging from 3.57 ppm to 7.35 ppm, all of which exceed the Department Un-Restricted Use criteria of 2.5 ppm. GP-36, GP-37 and GP-38 exceeded the Department Protection of Groundwater cleanup objective of 7.5 ppm with concentrations of 8.79 ppm, 18.4 ppm and 11.5 ppm, respectively.

Two samples showed elevated levels of calcium exceeding the Eastern USA background upper limit of 35,000 ppm. Calcium was detected at concentrations of

41,400 ppm in GP-22 and 54,900 ppm in GP-38. No other cleanup objectives are established for comparison.

Elevated concentrations of chromium were reported in all samples (range 12.6 ppm to 86.5 ppm), with the exception of GP-1. Samples GP-17 (12.6 ppm), GP-36 (18.5 ppm), and GP-38 (15.7 ppm) exceeded the TAGM recommended soil cleanup objective number of 10 ppm, but were less than the background upper limit of 40 ppm. Samples GP-9A (21.2 ppm), GP-9 (60.1 ppm), GP-16 (80 ppm), GP-18 (86.5 ppm), GP-22 (42.3 ppm) and GP-37 (38.3 ppm) exceeded the Protection of Groundwater standard of 19 ppm (hexavalent chromium). GP-9, GP-16, GP-18, GP-22, and GP-37 also exceed the Un-Restricted Use standards of 1 ppm (hexavalent chromium) and 30 ppm (trivalent chromium). Chromium speciation was not performed as part of the analysis.

Eight subsurface soil samples were reported with elevated levels copper. Copper concentrations in GP-9A (36.3 ppm), GP-22 (44 ppm) and GP-36 (35.9 ppm) exceeded the TAGM recommended soil cleanup objective of 25 ppm but did not exceed the eastern USA background upper limit of 50 ppm. Samples GP-9 (140 ppm), GP-18 (204 ppm) and GP-38 (68.2 ppm) exceeded TAGM criterion as well as the State Un-Restricted Use cleanup objective which is also 50 ppm. Two samples GP-16 and GP-37, met or exceeded the Department restricted commercial use soil cleanup value of 270 ppm with respective concentrations of 270 ppm and 498 ppm.

Iron was detected in all subsurface soil samples with the exception of GP-1 at concentrations (range 36,000 ppm to 121,000 ppm) exceeding the TAGM 4046 recommended soil cleanup objective of 2,000 ppm. This sample was below the state standard. The highest concentration of iron was reported in sample GP-16.

High levels of lead were detected in seven subsurface soils samples. Samples GP-9, GP-9A, GP-16, GP-18, GP-22, GP-37 and GP-38 were reported as having concentrations ranging from 256 ppm to 2,520 ppm. These concentrations exceed the Department Un-Restricted Use criteria value of 63 ppm. Additionally, samples GP-16 and GP-18 exceeded the Protection of Groundwater objective of 450 ppm.

Magnesium was detected in six samples at concentrations exceeding the eastern USA background upper limit of 5,000 ppm. Samples GP-9A, GP-16, GP-18, GP-22, GP-36, and GP-38 were reported as having magnesium concentrations ranging from 5,710 ppm to 26,700 ppm. The highest concentration of magnesium was reported in sample GP-38. No other cleanup objectives have been established for comparison.

High concentrations of mercury were detected in seven subsurface soil samples. Mercury was detected in GP-9 and GP-9A at concentrations of 1.7 ppm and 0.18 ppm, in GP-18 at 1.5 ppm, in GP-22 at 1.7 ppm, in GP-37 at 0.22 ppm, and GP-38 at 0.74 ppm. These levels meet or exceed the Department Un-Restricted Use criteria value of 0.18 ppm. These concentrations are fairly consistent with concentrations found at other sample locations including background samples. Samples GP-9A, GP-16, GP-18, GP-22, and GP-38 also exceed the Protection of Groundwater limit of 0.73 ppm.

Elevated concentrations of nickel were reported in all subsurface soil samples with the exception of GP-1. Nickel concentrations in GP-9A, GP-17, GP-22, GP-36, and GP-38 (range 15.9 ppm to 22.8 ppm) exceeded the TAGM 4046 recommended cleanup value of 13 ppm. These samples did not exceed the Eastern USA background upper limit of 25 ppm. Nickel concentrations in GP-9, GP-16, GP-18 and GP-37 ranged from 37.1 ppm to 76 ppm, which exceeds the Un-Restricted Use soil cleanup objective of 30 ppm.

Six samples were detected with selenium concentrations slightly greater than TAGM 4046 recommended soil cleanup objective of 2 ppm, Department Un-Restricted Use Soil Cleanup Objective of 3.9 ppm or Department Protection of Groundwater criteria of 4 ppm. Concentrations ranged from 2.05 ppm to 6.13 ppm.

Silver was detected in two samples; GP-9 at a concentrations of 2.79 ppm and GP-16 at a concentration of 267 ppm. GP-9 exceeds the Un-Restricted use soil cleanup objective of 2 ppm and GP-16 exceeds the Protection of Groundwater standard of 8 ppm.

High levels of zinc were reported at all locations with the exception of GP-1. Concentrations ranged from 33.2 ppm, which exceeds the TAGM 4046 recommended soil cleanup objective of 20 ppm, to 9,870 ppm, which exceeds the Un-Restricted Use soil cleanup objective of 109 ppm and the Protection of groundwater value of 2,480 ppm.

Analytical results indicate that portions of the site's subsurface soils have been impacted by historical activities and contain high levels of metals. Samples collected adjacent to Gidneytown Creek appear to exhibit the highest concentrations of heavy metals. Geopropbe samples GP16 (3-3.5), GP17 (4-5), GP18 (6-6.5), and GP36 (12-13) and GP38 (12-13) were collected along the Creek and exhibit metals concentrations exceeding Department Restricted Commercial Use criteria. Soil appears to be primarily impacted by arsenic, barium, cadmium, chromium, copper, magnesium, and zinc.

TCL Pesticides/PCBs

Two PCBs were detected in the subsurface samples. Aroclor-1248 was reported at a concentration of 2.3 ppb in GP18 (6-6.5). This concentration is well below the Subpart 375-6 Soil Cleanup Objectives of 100 ppb and 1,000 ppb. Aroclor-1260 was reported in sample GP9 (6.5-7) at 290 ppb and in sample GP16 (3-3.5) at 230 ppb. The concentrations reported at both locations exceed the Unrestricted Use Cleanup criteria of 100 ppb. The result at GP9 was qualified with "J" indicating that the concentration is an estimated value.

RCRA Characteristics

Four geoprobe samples; GP16 (3-3.5), GP17 (4-5), GP18 (6-6.5), and GP22 (9.5-10), were submitted for RCRA characteristics analysis. Samples were non-detect for reactive cyanide and reactive sulfide. Sample pH values were reported as non-corrosive and did not possess characteristics for combustion.

RCRA Characteristics of Four Geoprobe Samples

	GP16(3-3.5)	GP17(4-5)	GP18(6-6.5)	GP22(9.5-10)
Corrosivity pH ≤ 2 or ≥ 12.5	6.9	7.5	3.8	7.7
Ignitability <60°	No	No	No	No
Reactive Cyanide	ND	ND	ND	ND
Reactive Sulfide	ND	ND	ND	ND

3.3.3 Supplemental Subsurface Soil Samples

Following receipt and interpretation of the January-February 2007 (phase 1) subsurface soil results, a supplemental subsurface soil investigation (phase 2) was conducted. The supplemental investigation was performed on September 24, 25, and 26, 2007. Sample locations were approved by the NYSDEC project manager prior field mobilization. Sample locations were biased towards areas identified during the first round of sampling as having some level contamination. As previously stated in section 3.3.2, the Newburgh Landfill subsurface soil samples were collected to determine the extent to which historical activities have negatively impacted this site. The use of a photo ionization detector and field characteristics were used to confirm the presence of volatile organic compounds in the subsurface soils. All subsurface soil samples were analyzed for VOCs and TICs and TAL metals. Select samples were also analyzed for SVOCs and TICs, pesticides and PCBs. Detected compounds are reported in Table 3-5 and Figure 3-3.

Aztech Drilling of Ballston Spa, NY was retained by CDM to perform the direct push Geoprobe subsurface sampling. Samples were advanced to a maximum depth of 25-feet, native materials, or refusal. A total of 18 Geoprobe borings (GP-42 through GP-58) were installed and 16 soil samples were containerized and submitted for offsite analysis.

The supplemental investigation began with the installation of borings GP-42 and GP-43 at the south end of the property north of the DPW garage. Geoprobes GP-44 through GP-52 formed a south to north transect, parallel to the western property line and corresponding to the general eastern extent of the former drum disposal area. Geoprobes GP-53 through GP-58 were scattered across the north-central portion of the site.

TCL Volatile Organic Compounds

Subsurface soil samples were analyzed for TCL VOC's and TIC's by EPA Method SW 846 8260B. Analytical results were compared to 6 NYCRR Subpart 375-6 Protection of Groundwater and Un-Restricted Use soil cleanup objectives as well as TAGM 4046 RSCOs and Eastern USA background standards. Twenty (20) volatile organic compounds, acetone and m/p xylenes, were detected in subsurface site soils. However only 2 compounds were reported with concentrations exceeding State criteria.

Acetone was detected in samples GP-42 (15-20), GP-44 (14-15), GP-45(5-10), GP-46(7-9), GP-47(10-15), GP-48A (10-15), GP-50 (8.5-10), and GP-54 (15-20). Concentrations ranged from 60 ppb to 500 ppb, exceeding the Protection of Groundwater and Un-Restricted Use soil cleanup objectives of 50 ppb. A concentration of 300 ppb for m/p xylenes was reported in sample GP-47 (10-15) exceeding the Un-Restricted Use objective of 260 ppb. The m/p-xylene objective of 260 ppb is the standard for the combined total of xylenes and therefore also includes o-xylenes. O-xylenes were detected in sample GP-47 (10-15) at a concentration of 55 ppb. Xylenes were not detected ion subsurface samples during the initial investigation. They were however detected in surface soil and Gidneytown Creek samples. Acetone was detected in Gidneytown Creek samples only.

TCL Semi-Volatile Organic Compounds

Five of the 16 subsurface soil samples collected during the supplemental investigation (September 2007) were analyzed for semi-volatile organic compounds. SVOC analysis was performed on samples GP-42(15-20), GP-46(7-9), GP-48A(10-15), GP-54, and GP-56(5-10). Eleven (11) SVOCs were reported at concentrations exceeding State Protection of Groundwater, State Un-Restricted Use, or TAGM 4046 RSCO numbers.

Phenol was detected in GP-48 (10-15) at a concentration of 270 ppb exceeding the TAGM 4046 RSCO number of 30 ppb. The analytical result was reported with a "J" qualifier indicating that the concentration reported is an approximate value. Naphthalene was detected at a concentration of 35,000 ppb in GP-46 (7-9) exceeding the Un-Restricted Use Value of 12,000 ppb. This result was reported with an "E" qualifier indicating that the analyte's concentration exceeds the calibrated range of the instrument for that specific analysis.

Benzo(a)anthracene and chrysene were reported in four of the five samples at concentrations exceeding the Protection of Groundwater standard and Un-Restricted Use Cleanup Objective of 1,000 ppb. Concentrations of benzo(a)anthracene and chrysene ranged from 1,100 ppb to 5,300 ppb and 1,300 ppb to 6,500 ppb, respectively in GP-42 (15-20), GP-46 (7-9), GP-48A (10-15), and GP-56 (5-10).

Bis(2-ethylhexyl)phthalate was detected in GP-42(15-20), GP-46(7-9), GP-48A(10-15), and GP-54 (15-20) at concentrations ranging from 120,000 ppb to 920,000 ppb, exceeding the TAGM 4046 RSCO of 50,000 ppb. Di-n-octyl phthalate was also detected in GP-42 (15-20), GP-46 (7-9), and GP-48A (10-15) at concentrations of 500,000 ppb, 600,000 ppb, and 240,000 ppb exceeding the TAGM RSCO of 50,000 ppb. Results for both compounds were reported with "E" qualifiers.

Benzo(b)fluoranthene and benzo(k)fluoranthene were detected in subsurface samples. Benzo(b)- was detected in samples GP-42 (15-20), GP-46 (7-9), GP-48A (10-15), and GP-56 (5-10) at concentrations ranging from 1,600 ppb to 7,800 ppb. Each exceeded the Protection of Groundwater standard of 1,700 ppb except for GP-56 which was reported with a concentration of 1,600 ppb. Benzo(k)- was detected at elevated concentrations in the same samples. GP-42 (15-20) and GP-56 (5-10) were reported with values exceeding the Un-Restricted Use Criteria Objective of 1,000 ppb. GP-46 (7-

9) and GP-48A (10-15) were reported with values exceeding the Protection of Groundwater standard of 1,700 ppb.

Benzo(a)pyrene was detected at all sample locations analyzed for SVOCs. Concentrations ranged from 75 ppb to 5,400 ppb exceeding Un-Restricted Use Criteria value of 1,000 ppb and/or the TAGM 4046 RSCO value of 61 ppb. GP-54(15-20) was reported with a "J" qualifier, which indicates that the reported value is estimated.

Indeno(1,2,3-cd)pyrene was detected in all samples except GP-54(15-20). Concentrations ranged from 560 ppb to 2,400 ppb exceeding the Un-Restricted Use Criteria value of 500 ppb. GP-42(15-20) and GP-48A (10-15) were reported with "J"qualifiers.

Dibenz(a,h)anthracene was reported at three sample locations at concentrations exceeding the Un-Restricted Use Criteria Objective of 330 ppb and the TAGM 4046 RSCO value of 14.1 ppb. Concentrations in GP-46 (7-9), GP-48A (10-15), and GP-56 (5-10) were reported as 350 ppb, 300 ppb, and 560 ppb respectively. Results at GP-46 (7-9) GP-48A (10-15) were both reported with "J" qualifiers.

SVOC analysis was not performed during the initial (April 2007) site investigation/ characterization. Based on results of the supplemental investigation (September 2007) semi-volatile organic compounds are present in the subsurface soils at relatively low concentrations.

Pesticides and PCBs

Pesticide and PCB analyses were performed at the same five sample locations where SVOC analysis was completed. Five pesticides were detected in the samples, two were reported at concentrations exceeding State soil cleanup objectives. Dieldrin was detected at GP-48A (10-15) at a concentration of 7.7 ppb and endrin was detected at GP-42 (15-20) at a concentration of 30 ppb exceeding the Un-Restricted Use objectives of 5 ppb. No PCBs were detected in any of the samples.

TAL Metals

The supplemental subsurface soil sampling included the analysis of TAL Metals at all sixteen sample locations. Barium, cadmium, calcium, chromium, copper, lead, magnesium, nickel, silver, zinc, and mercury were detected in site soils at concentrations exceeding State applicable soil cleanup objectives.

Barium was reported at GP-45 (5-10), GP-48A (10-15), GP-49 (0-5), and GP-50 (8.5-10) at concentrations ranging from 361 ppm to 881 ppm. Barium at these levels exceeds the Un-Restricted Use Soil Cleanup Objective of 350 ppm. GP-48A was reported with a barium concentration of 880 ppm which also exceeds the Protection of Groundwater standard of 820 ppm.

Cadmium was detected in eight samples at levels exceeding Department criteria. Samples GP-46 (7-9), GP-51 (15-20), GP-55 (5-7.5), and GP-57 (14-15) were reported with concentrations ranging from 1.49 ppm to 2.31 ppm, exceeding the TAGM RSCO

value of 1 ppm. Samples GP-48A (10-15) and GP-56 (5-10) were reported with concentrations of 4.95 ppm and 4.06 ppm exceeding the Un-Restricted Use Objective of 2.5 ppm. Sample GP-42 (15-20) and GP-45 (5-10) exceeded the Protection of Groundwater standard of 47 ppm with concentrations of 67.9 ppm and 48.5 ppm.

Calcium was detected in two samples with concentrations exceeding the TAGM Eastern USA Background upper limit of 35,000 ppm. Calcium was detected in sample GP-51 (15-20) at a concentration of 54,400 ppm and in sample GP-57 (18.5-19.5) at a concentration of 52,200 ppm. No other soil objective criteria are established for calcium.

Chromium was detected in all site subsurface samples and exceeded the Protection to Groundwater standard of 19 ppm (hexavalent) at all locations except GP-52 and GP-57. Chromium concentrations ranged from 19.3 ppm to 141 ppm. Subpart 375-6 does not provide a total chromium limit, but does present values for hexavalent chromium and trivalent chromium. The Un-Restricted Use standard of 30 ppm (trivalent) and 1 ppm (hexavalent) was also exceeded in samples GP-45, GP-46, GP-48A, GP-49, GP-51, GP-54, and GP-55Chromium speciation was not performed on the samples to identify the type of chromium found.

Copper was detected at elevated levels in 11 samples at elevated levels. Nine samples, GP-42 (15-20), GP-44 (14-15), GP-45 (5-10), GP-46 (7-9), GP-47 (10-15), GP-45A (10-15), GP-49 (0-5), GP-50 (8.5-10), GP-55 (5-7.5), and GP-56 (5-10) were reported with concentrations ranging from 53.7 ppm to 597 ppm and exceeding the Un-Restricted Use Objective of 50 ppm. One sample, GP-51 (15-20) was reported with a copper concentration of 1,970ppm exceeding the Protection of Groundwater standard of 1,720 ppm.

Lead was detected in 12 samples with concentrations exceeding the Un-Restricted Use Objective of 63 ppm and Protection of Groundwater standard of 450 ppm. Lead concentrations exceeding State criteria ranged from 104 ppm to 1,110 ppm. The highest concentration of lead was reported in sample GP-47 (10-15) at 1,110 ppm.

Magnesium was detected in nine samples at concentrations (range 5,200 ppm to 37,000 ppm) exceeding the Eastern USA Background upper limit of 5,000 ppm. Samples with elevated magnesium levels included GP-45 (5-10), GP-47 (10-15), GP-48A (10-15), GP-49 (0-5), GP-51 (15-20), GP-53 (9-10), GP-55 (5-7.5), GP-56 (5-10), and GP-57 (18.5-19.5).

Exceedances of mercury were detected in 12 samples. Sample concentrations ranged from 0.14 ppm to 15.6 ppm. These levels exceeded the TAGM RSCO values as well as the Protection of Groundwater and Un-Restricted Use Soil Cleanup Objectives. Six of the 12 samples with elevated mercury levels exceeded the Protection of Groundwater value of 0.73 ppm. Concentrations reported at these samples locations ranged from 1.8 ppm to 15.6 ppm.

Nickel was detected in 9 samples at concentrations exceeding cleanup objectives. Sample GP-44 (14-15) and GP-55 (5-7.5) were reported with nickel concentrations of

27.1 ppm and 29 ppm, exceeding the TAGM Eastern USA Background upper limit of 25 ppm. Concentrations detected in GP-45 (5-10), GP-46 (7-9), GP-48A (10-15), GP-49 (0-5), GP-51 (15-20), GP-53 (9-10), and GP-56 (5-10) ranged from 38 ppm to 337 ppm, exceeding the Un-Restricted Use Soil Objective of 30 ppm as well as the Protection of Groundwater Objective of 130 ppm at GP-56 (5-10).

Silver was detected in one sample, GP-55 (5-7.5) at 5.33 ppm. This concentration exceeds the Un-Restricted Use Cleanup Objective of 2 ppm.

Samples exceeding the Eastern USA Background upper limit of 50 ppm for zinc included GP-52 (0-5) and GP-57 (14-15) with concentrations of 51ppm and 101 ppm, respectively. Samples exceeding the Un-Restricted Use Criteria Soil Objective of 109 ppm for zinc included GP-42 (15-20), GP-44 (14-15), GP-45 (5-10), GP-46 (7-9), GP-47 (10-15), GP-48A (10-15), GP-49 (0-5), GP-50 (8.5-10), GP-51 (15-20), GP-53 (9-10), GP-54 (15-20), GP-55 (5-7.5), and GP-56 (5-10), with concentrations ranging from 218 ppm to 1,590 ppm.

As indicated during the subsurface investigation completed in January/February 2007, analytical results suggest that portions of the site have been impacted and contain high levels of metals. The presence of metals is consistent across the site and at varying depths below the ground surface. Metals of highest concern include arsenic, chromium, lead, mercury, and zinc. In general these heavy metals were found at levels exceeding the Un-Restricted Use criteria values, Protection of groundwater standards or both, in addition to exceeding the upper range of Eastern USA background levels. It is not uncommon for higher concentrations of heavy metals to be found in the subsurface soils of municipal landfill soils as metals can enter the waste stream of municipal solid waste landfills from a variety of sources. However these metals and at these concentration pose concern to animal and human health. The metals are not typically taken up by plant life and so will remain in soils or leach into ground and surface water.

3.4 Gidneytown Creek Sediment and Surface Waters Investigation

Gidneytown Creek and its associated wetlands form a natural barrier between the landfill site and U.S. Interstate I-84. Due to the creeks proximity and location in reference to the landfill it is a potential receiver of landfill seeps and groundwater discharge. To investigate the potential and/or degree of contamination a total of eight surface water and sediment samples were collected. Samples GTC-1 through GTC -7 were collected on April 5, 2007; sample GTC-8 was collected from an off-site downstream location on April 19, 2007. (The reader is advised that sample location GTC-8 is several hundred yards downstream of the closest upstream sample location GTC-7.) Samples were collected first from upstream locations and then downstream locations. Surface water and sediment samples were analyzed for the full TCL Volatile Organic Compounds and Semi Volatile Organic Compounds, and TAL Metals plus cyanide and mercury.

Results for sediments were compared to the NYSDEC Division of Fish, Wildlife, and Marine Resources Technical Guidance for Screening Contaminated Sediments. Results were compared to the Human Health Bioaccumulation, Benthic Aquatic Life Acute and Chronic Toxicity criteria for non-polar organic contaminants and the Lowest and Severe Effect Levels for metals. The table below identifies the sample, sample date, time, and relative location. The results of the sediment analysis are presented in Table 3-6, and the results of the surface water analysis are presented in Table 3-7. Figure 3-4 presents the results of both sediment and water. Results are discussed by media; sediment first followed by surface water.

Gidneytown Creek Sediment and Surface Water Samples

Sample ID	Sample Date	Sample Time	Sample Location
GTC-1	4-5-2007	09:20	North of I-84, off of Creek Run Rod. North bank of Gidneytown Road
GTC-2	4-5-2007	10:10	East of MW-6. Upper beaver pond
GTC-3	4-5-2007	10:20	East of MW-6. Immediately downstream of the upper beaver dam in middle beaver pond
GTC-4	4-5-2007	11:00	Near MW-6. Middle beaver pond
GTC-5	4-5-2007	11:15	Near MW-8. Middle beaver pond.
GTC-6	4-5-2007	11:45	Near MW-8. Middle beaver pond
GTC-7	4-5-2007	12:00	Near MW-8. Lower beaver pond
GTC-D*	4-5-2007	13:00	Near MW-6. Field duplicate of sample GTC-4.
GTC-8	4-19-2007	11:10	Downstream, off site on South Street. East of Old Pierces Road.

* Field duplicate of sample GTC-4.
Samples GTC-1 through GTC-7 were collected from the bank on the landfill side of the creek.
Sample GTC-8 was collected following a heavy storm event (April 2007 Nor-Easter).

3.4.1 Sediment

TCL Volatile Organic Compounds

Six (6) volatile organic compounds, acetone, methylene chloride, 2-butanone, tetrachloroethene, chlorobenzene, and ethyl benzene were detected in sediments collected from the Gidneytown Creek. All results were below NYSDEC Division of Fish, Wildlife, and Marine Resources Technical Guidance for Screening Contaminated Sediments.

No detections of TICs were reported.

TCL Semi-Volatile Organic Compounds

Fifteen (15) SVOCs were detected in sediment samples collected from Gidneytown Creek and all were below the standards for comparison. The detected compounds include:

Benzaldehyde	Fluoranthene	Bis(2)-ethylhexyl-phthalate
Hexachloroethane	Pyrene	Benzo(b)fluoranthene
Phenanthrene	Butylbenzylphthalate	Benzo(k)fluoranthene
Anthracene	Benzo(a)anthracene	Ideno(1,2,3-cd)pyrene
di-n-butylphthalate	Chrysene	Benzo(a)antracene

TICs were detected in each of the eight samples collected. Total TIC concentrations ranged from 5,040 ppb to 52,900 ppb.

TAL Metals

Seven (7) target analyte list metals were detected at elevated concentrations in the Gidneytown Creek sediment samples. Results were compared the Lowest Effect Level (LEL) and Severe Effect Level (SEL) guidance values. According to the Technical Guidance for Screening Contaminated Sediments document sediment is considered contaminated if criterion, the lowest effect or severe effect level, is exceeded. If both are exceeded the impact is considered severe, if only the lowest level effect criterion is exceeded the impact is moderate.

Arsenic was detected in sediment sample GTC-5 at a concentration of 7.11 ppm. Arsenic at this level exceeds the LEL of 6 ppm. Concentrations were well below the SEL of 33 ppm thus indicating that the sediments in the area of GTC-5 have only been moderately impacted.

Cadmium was detected in four sample locations, GTC-3, GTC-4, GTC-5, And GTC-D (blink duplicate of GTC-4) at concentrations ranging from 0.829 pp to 1.47 ppm. These levels exceed the LEL of 0.6 ppm but again are well below the SEL of 9ppm. GTC 3 and GTC-5 are also qualified with "J" indicating that the concentrations are estimated.

Copper was detected in all sediment samples and exceeded the Department's Technical Guidance for Screening Contaminated Sediments LEL of 16 ppm at all locations with the exception of GTC-1. Copper concentrations ranged from 20.9ppm to 92.3ppm.

Manganese was detected at all sediment sample locations; four locations exceeded LEL or SEL values. GTC-3 and GTC-5 were reported with manganese concentrations of 543 ppm and 475 ppm respectively exceeding the LEL of460 ppm. . GTC-1 and GTC-8 each exceeded the LEL of 460 ppm and also exceeded the SEL of 1,100 ppm with reported concentrations of 1,420 ppm and 1,630 ppm.

Mercury concentrations in six of the eight sediment samples met or exceeded the Department standards. Mercury in samples GTC-2, GTC-3, GTC-4, GTC-5, GTC-6, and GCTD were reported at concentrations ranging from 0.15 ppm to 2.2ppm. The guidance values are 0.15 ppm and 1.3 ppm for the LEL and SEL. The highest concentration of mercury was reported downstream in sample GTC-7. All results except GTC-2 and GTC-7 were qualified with a "J" indicating that the values are approximated.

Nickel was detected in all sediment samples and exceeded the LEL of 16 ppm at six locations. Nickel concentrations across the site ranged from 15.4 ppm to 33.2 ppm. The most upstream and most downstream locations were below guidance values.

Elevated concentrations of silver were found at all sediment samples collected from the creek. Results exceeded the SEL of 2.2 ppm at all locations indicating that the

creek is severely impacted by silver. Concentrations ranged form 3.03 ppm to 7.2 ppm.

Zinc was detected in all sediment samples, and reported at elevated concentrations in six samples. Concentrations ranged from 66.7 ppm to 193 ppm. Samples GTC-2, GTC-3, GTC-4, GTC-5, GTC-d, and GTC-8 were reported with zinc concentrations exceeding 120 ppm, the LEL. Concentrations were well below the SEL of 270 ppm indicating that sediments are only moderately impacted.

Based on the results of the metals analysis, Gidneytown Creek sediments are moderately impacted by metals. Sediments within the limits of the Beaver Pond, GTC-3, GTC-4 and GTC-5, appear to have been impacted the most by historic activities. Silver was detected at concentrations exceeding the SEL at all sample locations indicating it has had the greatest level of impact. Mercury was also reported at all locations with the highest concentration at GTC-7.

Pesticides/ PCBs

Two pesticides, gamma-chlordane and endolsulfan II, were detected in the sediment samples. Guidance values have not been established for either compound. No PCBs were detected in any sediment samples collected from the Gidneytown Creek.

3.4.2 Surface Water

TCL Volatile Organic Compounds

Three volatile organic compounds, methyl-tert-buytl-ether (MTBE), methylene chloride, and toluene were detected in Gidneytown Creek surface water samples. Concentrations did not exceed NYSDEC Division of Technical and Operational Guidance Series (TOGS) 1.1.1. Criteria. No VOCs were detected in the most upstream (GTC-1) or the furthest downstream (GTC-8) samples.

TCL Semi-Volatile Organic Compounds

Two SVOCs, hexachlorocyclopentadiene and bis(2-ethylhexyl)phthalate, were detected in GTC samples. Hexachloropentadiene was detected in all samples, except for GTC-8, and bis(2-thylhexyl)phthalate was only detected in GTC-8. Hexachloropentadiene was reported at a concentration of 10 ug/L at all locations and all results were qualified with "J." Bis(2-ethylhexyl)phthalate was reported in GRC-8 at a concentration of 3.2 ug/L. The NYSDEC TOGS standard values are 5 ug/L for both compounds. TICs were reported in each sample and ranged from 110 ug/L to 133.2 ug/L.

TAL Metals

Gidneytown Creek surface water samples reportedly contained low level concentrations of aluminum, barium, calcium, cobalt, copper, cyanide, iron, lead, magnesium, manganese, mercury potassium, sodium, vanadium, and zinc. Concentrations were below state standards for all compounds, with the exception of aluminum, iron and manganese.

Aluminum concentrations in GTC-2 (189 ug/L), GTC-3 (251 ug/L) and GTC-8 (667 ug/L) exceeded the NYSDEC TOGS standard of 100 ppm. Sample GTC-2 was reported with a "J" qualifier.

Iron concentrations (range 185 ug/L to 3,360 ug/L) exceeded the state surface water standard (300 ug/L) at all locations except GTC-1. The highest concentrations were reported at samples locations GTC-3 (3,360 ug/L) and GTC-8 (1,210 ug/L).

Manganese was detected at all surface water locations but reportedly exceeded the state established TOGS standard of 300 ug/L in only samples GTC-3 (480 ug/L), GTC-6 (321 ug/L) and in the duplicate sample GTC-D (344 ug/L). The duplicate sample was a field duplicate sample of GTC-4, which reported a concentration of 206 ug/L.

Aluminum, iron and manganese were reported in sediment samples however a guidance standard for aluminum has not been established and iron is evaluated as a percent. Manganese exceeded the LEL and/or SEL in four of the with sediment samples analyzed.

Pesticides/PCBs

Gamma-chlordane, an organochlorine pesticide, was detected in GTC-1, GTC-3, GTC-4, GTC-6, and GTC-7, at concentrations ranging from 0.047 ug/L to 0.051 ug/L. State criteria is not established for gamma-chlordane, however the standard for chlordance is 0.5 ug/L. These, with the exception of GTC-3, marginally exceeded the accepted value for chlordane.

3.4.3 Gidneytown Creek Results

The results of the Gidenytown Creek surface water and sediment sampling indicates that contaminants do not appear to be traveling in the direction of creek flow. However the results do indicate that the highest levels of contaminants are located between GTC-3 and GTC-7. This area is fairly level and includes the area designated as the beaver pond (GTC-3 to GTC-5). Water in this area is stagnant at times allowing compounds to settle within the creek bed.

3.5 Groundwater Investigation

A groundwater investigation was conducted in three phases. The first phase included the installation of nine geoprobes borings to determine the depth to groundwater across the site. Phase 2 consisted of installation and development of groundwater monitoring wells at each boring location. Phase 3 was completed through well purging and groundwater sampling and analysis.

Phase 1 and Phase 2 were completed simultaneously. With the guidance of the NYSDEC Project Manager, monitoring well locations were staked out across the site prior to installation. Geoprobe borings, preformed by Aztech drilling, were advanced to the depth of groundwater and/or refusal. Well depths range from 14-feet to 26-feet bgs. Monitoring wells were installed upon completion of each bore hole and constructed of 2-inch PVC with minimum 10-feet of screen and protected by a 4-inch

stainless steel casing with locking cap. Wells were provided a minimum of one day (24 hours) to settle at which time CDM and Aztech returned to the site for well development. Well development was completed on March 30, 2007.

The analytical program, Phase 3, began two weeks after well development and included two rounds of groundwater sampling and analysis. Round 1 was conducted on April 16 and 17, 2007 and included the full suite of analytical parameters. Round 2 was completed on September 25, 2007 during the Supplemental Investigation. During the latter round, only VOCs and SVOCs were analyzed. Prior to sampling each monitoring well was purged using a new disposable bailer. Field parameters including temperature, pH, conductivity, turbidity, and dissolved oxygen were recorded at the start and end of purging. Samples were submitted to ChemTech Laboratories Inc, of Mountainside, NJ for analysis. Field parameter results are presented in Section 2.2.5 in Table 2-2. Table 3-8 compares the detected compounds of all three groundwater sampling events including the April 2008 event discussed in the next section.

TCL Volatile Organic Compounds

Forty-one (41) volatile organic compounds were detected in groundwater samples collected from the Newburgh landfill site during the April 2007 sampling event. Only 11 were detected during the September sampling event. Of the VOC's detected during both events, only three compounds were detected at concentrations exceeding NYSDEC Ambient Water Quality Standards or Guidance Values as defined in NYSDEC Division of Water Technical and Operating Guidance Series 1.1.1 (June 1998). Compounds reported with elevated concentrations include benzene, chlorobenzene, and 1,4-dichlorobenzene. See Table 3-8 for a list of all VOCs detected in site groundwater per event.

Benzene was detected in sample MW-6 during both the April 2007 and September 2007 sampling events. In April benzene was detected at a concentration of 1.9 ug/L and in September it was detected at a concentration of 2.7 ug/L. Also in April, benzene was reported in MW-5 at a concentration of 5.7 ug/L, and in MW-5DL (10.0 dilution factor) at a concentration of 5.1 ug/L, but was non-detect in September. These concentrations exceeded the NYSDEC ambient water quality standard of 1 ug/L for benzene.

Chlorobenzene was detected in MW-2, MW-4, MW-5, MW-5DL, MW-6, and MW-D, (the duplicate sample) at concentrations (range 5.8 ug/L to 120 ug/L) exceeding the Department standard of 5 ug/L. The highest concentrations were reported in MW-5 and MW-5DL. Results from MW-5 and MW-5DL were reported with qualifiers, "E" and "D" respectively. The qualifier "E" indicates the analyte's concentration exceeds the calibrated range of the instrument for that specific analysis, and "D" indicates that the compound was detected at a secondary dilution factor. Exceedances of chlorobenzene were reported in MW-5 and MW-6 during both sampling events. Chlorobenzene was non-detect at MW-4 during the April event and MW-2 was not sampled during the September event due to a lack of water in the well.

1,4-Dichlorobenzene was detected in MW-5 and MW-5DL. Concentrations reported were 6.4 ug/L and 5.5 ug/L only slightly exceeding the Department standard of 5 ug/L.

Monitoring well MW-5 and MW-6 were located on opposing ends of the access path that passes through the eastern portion of the site in a north south direction. MW-5 (23 feet deep) was located at the south end of the path amidst an area of moderate brush, while MW-6 (15 feet deep) was located at the north end of the path adjacent to Gidneytown Creek. Volatile organic compounds were not reported in the soils in the vicinity of MW-6. Soil samples were not collected in the vicinity of MW-5.

Tentatively identified compounds were detected in samples MW-1, MW-3, MW-4, MW-5, and MW-6 during April 2007 and in MW-4, MW-5, MW-6, and MW-9 during September 2007. The highest concentration reported was 17.29 ug/Lat MW-4 during September 2007.

TCL Semi Volatile Organic Compounds

Four SVOCs were detected at concentrations exceeding NYSDEC water quality standards. Benzo(a)anthracene, chrysene, bis(2-ethylhexyl)phthalate, and benzo(b)fluoranthene were detected in MW-3 during the April sampling event. Bis(2-ethylhexyl)phthalate was also reported at an elevated concentration in MW-6 during both, the April and September events. No other samples were detected with compounds above Department criteria.

In MW-3 benzo(a)anthracene was reported at a concentration of 1.5 ug/L, chrysene was reported at a concentration of 1.7 ug/L and benzo(b)fluoranthene was reported at a concentration of 1.5 ug/L, all exceeding the Department standard of 0.002 ug/L. Bis(2-ethylhexyl)phthalate was detected at concentrations of 22 ug/L in MW-3 and 9.0 ug/L and 8.7 ug/L in MW-6 exceeding the standard of 5 ug/L. Results were reported with "J" qualifiers indicating the reported concentrations are estimated. See Table 3-8 for a list of all SVOCs detected in site groundwater.

Monitoring well MW-3 is located centrally along the access path that runs along the eastern portion of the site in the north–south direction. MW-6 is located at the north end of the path. MW-3 is 19 feet deep. Analysis of SVOCs was not performed on the soil samples collected in the vicinity of MW-6 or MW-3.

TICs were reported in all groundwater samples collected from the site however concentrations were low and did not exceed 266.4 ug/L.

TAL Metals

Groundwater was analyzed for target analyte metals during the April sampling event. Five metals, antimony, iron, magnesium, manganese, and sodium were detected at concentrations exceeding TOGS 1.1.1 Ambient Water Quality Standards or Guidance Values. Other metals were detected; however concentrations were well below Department criteria.

Antimony was detected at sample MW-3 at a concentration of 395 ug/L well above the accepted standard of 3 ug/L. Antimony was not detected in any other groundwater sample.

Elevated concentrations of iron were detected in all samples with the exception of MW-8. Concentrations ranged from 409 ug/L to 48,900 ug/L exceeding the Department standard of 300 ug/L. The highest levels of iron were reported in samples MW-6, MW-5 and MW-4. Iron in the highest wells exceeded 15,000 ug/L.

Magnesium was detected in groundwater across the site. Magnesium concentrations in MW-1, MW-2, MW-3, MW-6M MW-7, and MW-8 exceeded the standards value of 35,000 ug/L. Concentrations ranged from 36,900 ug/L to 116,000 ug/L.

Manganese was detected in groundwater across the site. Concentrations ranged from 125 ug/L to 4,570 ug/L. MW-1, MW-3, MW-4, MW-5, MW-6, MW-7, and MW-8 and exceeded the standard value of 300 ug/L.

Elevated levels of sodium were detected in monitoring wells MW-2, MW-3, MW-5, MW-8 and MW-9. Concentrations ranged from 23, 800 ug/L to 84,100 ug/L. The highest concentration was reported in MW-2.

Other compounds detected in site groundwater but at concentrations less then the standard criterion include aluminum, arsenic, barium, beryllium, cadmium, calcium, chromium cobalt, copper, cyanide, lead, mercury, nickel, potassium, selenium, silver, thallium, vanadium, and zinc. See Tables 3-8 for a list of all detected metals and concentrations.

Based on the presence of heavy metals in surface and subsurface soils it is expected that metals would also be found in groundwater. However, the metals reported at elevated levels in soils were generally non-detect or well below Department standards in groundwater.

Pesticides/PCBs

Groundwater samples were analyzed for pesticides and PCBS during the April sampling event. Five pesticides were detected in MW-3 and three were reported with slightly elevated concentrations exceeding NYSDEC Ambient Water Quality Standards. 4,4-DDE, 4,4-DDD, and 4,4-DDT were reported at concentrations of 0.11 ug/L, 0.69 ug/L, and 1.1 ug/L. Individual standards have not been determined for these compounds however TOGS 1.1.1 states the sum of 4,4-DDE, 4,4-DDD, and 4,4-DDT should not exceed 0.2 ug/L. Endrin and dieldrin were also detected in MW-3, however no standards have been established. Monitoring well MW-3 is located at the toe of the landfill in areas of trees and dense brush where insecticides and pesticides have likely been used for pest control. See Table 3-8 for results.

3.5.1 Supplemental Groundwater Investigation

As a follow up to the sampling completed in 2007 and at the request of the NYSDEC, CDM conducted the third groundwater sampling event on April 30, 2008. This third

round of sampling was completed with the intent of determining if contaminant concentrations exhibited seasonality. . Prior to sampling each monitoring well was purged using a new dedicated disposable bailer. Consistent with previous sample events, field parameters including temperature, pH, conductivity, turbidity, and dissolved oxygen were recorded at the beginning and end of purging. See the Table 2-2 for water quality parameters. To mimic the first round of groundwater sampling collected in April 2007, groundwater samples were analyzed for TCL VOCs, TCL SVOC, TAL metals, pesticides and PCBs.

Similar to the second round of groundwater sampling conducted in September 2007 several wells contained insufficient volumes of water for sample collection. Monitoring well MW-1 was dry upon opening and therefore not sampled. Monitoring well MW-3 was purged dry and did not recover sufficiently for sample collection. Monitoring well MW-2 was also purged dry. Recovery in MW-2 was slow but allowed CDM to collect the required sample volumes for VOC and SVOC analysis and approximately one-third of the required sample volume for metals. A complete set of samples were collected from monitoring wells MW-4, MW-5, MW-6, MW-7, MW_8, and MW-9. One field blank, one trip blank, and one field duplicate, MW-D, collected from MW-9, were also submitted to the lab for analysis. The field blank and duplicate samples were submitted for the same analysis as the groundwater samples. The trip blank was analyzed for VOCs only.

Results

Analytical results from the April 30, 2008 groundwater sampling event are similar to that which was reported during the first two events(but do not exhibit significant differences with the September 2007 results to make a conclusion for seasonality). Four (4) VOCs were detected, nine (9) SVOCs, and nineteen (19) metals were detected in site groundwater. No pesticides or PCBs were reported. Analytical results were compared to the NYSDEC TOGS 1.1.1 (June 1998) Ambient Water Quality Standards and Guidance Values. See Table 3-8 for a comparison of the April 2008 results with the results of the 2007 sampling events.

Volatile Organic Compounds

Four VOCs, benzene, chlorobenzene, isopropylbenzene, and 1,4-dichlorobenzene, were detected in site groundwater. Of the VOCs detected all but isopropylbenzene were reported at concentrations exceeding NYSDEC Ambient Water Quality Standards or Guidance Values. Detections and exceedances were reported at monitoring wells MW-2, MW-4, MW-5, and MW-6. Samples collected from MW-7, MW-8, and MW-9 were non-detect for all VOCs.

Benzene was detected in MW-5 and MW-6 at concentrations of 5.3 ug/l and 2.6 (J) ug/l exceeding the Department standard of 1 ug/l. Chlorbenzene was detected in samples MW-2, MW-4, MW-5, and MW-6 at concentrations ranging from 8.5 ug/l to 82 ug/l also exceeding the applicable Department standard of 5 ug/l. Concentrations of 1,4-dichlorobenzene in MW-4, MW-5, and MW-6 exceeded the Department Standard of 3 ug/l with concentrations of 3.1 (J) ug/l, 7.7 ug/l and 4.9 (J) ug/. Several results were reported with "J" qualifier which suggests the data indicates the

presence of a compound that meets the identification criteria. The result is less than the quantitation limit but greater than zero and so the result provided is approximated.

Semi-Volatile Organic Compounds

SVOCs were detected at all sample locations except MW-2. Analytical results reported detections of benzaldehyde, naphthalene, caprolatam, 2-methylnapthalene, acenaphthene, fluorene, diethylphthalate, phenanthrene, and bis (2-ethyhexyl) phthalate in site groundwater. Concentrations were well below Department for all compounds at all locations with the exception of the bis (2-ethyhexyl) phthalate concentration reported in MW-6. Bis (2-ethyhexyl) phthalate was detected in MW-6 at a concentration of 6.4 ug/l exceeding the Ambient Water Quality Standard of 5 ug/l.

Metals

Groundwater was analyzed for target analyte metals during the April 2008 sampling event. Six (6) metals; aluminum, iron, lead, magnesium, manganese, and sodium were detected at concentrations exceeding TOGS 1.1.1 Ambient Water Quality Standards or Guidance Values. Other metals were detected; however concentrations were well below Department criteria. Due to insufficient water approximately one-third of the required water volume for TAL metals analysis was collected from MW-2. As such, the lab was only to run the analysis for mercury, cyanide, and aluminum at MW-2.

Aluminum was detected in samples MW-2, MW-4, MW-6, MW-7, MW-8, and MW-9 at concentrations ranging from 353ug/l to 11,000 ug/l well above the accepted standard of 100 ug/L.

Elevated concentrations of iron were detected in all samples. Concentrations 10,100 ug/l to 60,900 ug/L exceeding the Department standard of 300ug/L. The highest levels of iron were reported in samples MW-4, MW-5, and MW-6. Concentrations at these locations exceeded 40,000ug/l

Exceedances of lead were reported in samples collected from MW-6 and MW-8. Concentrations reported were 71.7ug/l and 27.5 ug/l exceeding the Department standard of 25 ug/l.

Magnesium was detected in groundwater across the site. Magnesium concentrations in MW-4, MW-5, MW-6, and MW-8 exceeded the standard value of 35,000 ug/L. Concentrations ranged from 35,400ug/L to 47,000 ug/L.

Manganese was detected in groundwater across the site at concentrations exceeding the Department standard of 300ug/l. Concentrations ranged from 348ug/l to 2,450 ug/l. The highest concentrations were reported in MW-8 and MW-7.

Sodium was detected across the site at all sample locations. Elevated levels that exceeded the standard of 20,000ug/l were reported in MW-4, MW-5, MW-6, and MW-9. Concentrations ranged from 37,900ug/l to 203,000ug/l.

Other compounds detected in site groundwater but at concentrations less than the standard criterion include arsenic, barium, beryllium, calcium, chromium, cobalt, copper, cyanide, mercury, nickel, potassium, vanadium, and zinc. Based on the presence of heavy metals in surface and subsurface soils it is expected that metals would also be found in groundwater.

3.6 Quality Assurance/Quality Control

In order to maintain QA/QC in both the field and the laboratory, additional samples such as trip blanks, duplicates, field blanks, performance evaluation samples and background samples were collected. Duplicate samples were collected during the Gidneytown Creek soil and surface water investigations and during the groundwater investigation. Duplicate samples were analyzed to ensure laboratory "blind" analysis. Duplicate samples are designed to be identical to the original environmental samples. They are submitted to gain information on homogeneity, handling, shipping, storage, sample preparation, and analysis. The duplicate sample is collected at the same time and from the same location of the environmental sample and is used to identify possible filed variations. The sample is considered “blind” because the sample environmental sample that is being duplicated was not identified to the laboratory. The results are presented with the investigative sample results.

Field blank and trip blank samples were collected during the Newburgh Landfill investigation to ensure proper lab handling of samples and proper field collection. Trip blanks were collected during the Gidneytown Creek investigation, drum investigation and subsurface soil investigation. Trip blanks are provided by the laboratory with each cooler packed and shipped for aqueous VOC analysis should also contain a trip blank. Trip blanks are VOA vials filled with distilled water. These vials are to be carried with the sample bottles and samples and remain sealed until ready for analysis. Results are included with the investigative sample results.

Field blanks were collected during the drum and subsurface soil investigations. Samples were collected by pouring distilled water over decontaminated sampling equipment. The poured/distilled water is collected in sample jars for the same analysis as the investigative samples.

3.6.1 Nonconformance Summaries

The laboratory Nonconformance Summaries for ChemTech Project # Y1309, #Y1359, #Y1438, #Y1501, #Y2238, #Y2240, #Y2408, #4618, and #4655 meets all requirements of NELAC both technically and for completeness except as follows:

Project # Y1309:

RCRA Characteristics and Corrosivity, Ignitability, Reactive Cyanide, Reactive Sulfide – Analysis was in complete compliance.

TAL Metals and Mercury – The Serial Dilution met the acceptable requirements except for Aluminum, Calcium, Chromium, Cobalt, Iron, lead, Magnesium, Manganese Nickel, and Zinc.

PCBs – The Calibration File ID CCALC02 met the requirements except for Aroclor-1016 and -1260. The Calibration File ID CCALC met the requirements except for Aroclor-1016.

Project # Y1359:

TCLP Volatiles – The Blank Spike met requirements for all samples except for 1,1-Dichloroethene. The Calibration File ID VD008816.D met the requirements except for 1,1-Dichloroethene.

TAL Metals and Mercury – The Matrix Spike analysis met criteria for all samples except Antimony and Thallium. The Matrix Spike Duplicate analysis met criteria for all samples except Antimony and Thallium.

PCBs - Analysis was in complete compliance.

Project # Y1438:

TCLP Volatiles – The Blank Spike met requirements for all samples except for 1,1-Dichloroethene and Vinyl Chloride. The Calibration File ID VD008816.D met the requirements except for 1,1-Dichloroethene.

TAL Metals and Mercury – The Matrix Spike analysis met criteria for all samples except Antimony and Silver. The Matrix Spike Duplicate analysis met criteria for all samples except Antimony and Silver.

PCBs – The Surrogate Recoveries met the acceptable criteria except for Y1462-01MS, GP16(3-3.5), GP18(6-6.5) and GP18(6-6.5)DL. The MS recoveries met the requirements for all compounds except for Aroclor-1016. The MSD recoveries met the acceptable requirements except for Aroclor-1016.

Project # Y1501:

TCLP Volatiles – Analysis was in complete compliance.

VOCMS Group2 – The MS recoveries met the requirements for all compounds except for Carbon Tetrachloride. The MSD recoveries met the acceptable requirements except for Carbon Tetrachloride. The Blank Spike met requirements for all samples except for Carbon Tetrachloride, Vinyl Chloride, 1,1-Dichloroethene and 2-Butanone.

TAL Metals and Mercury – The Matrix Spike analysis met criteria for all samples except Antimony, Copper and Thallium. The Serial dilution met the acceptable requirements except for Calcium, Potassium, and Zinc.

PCBs – The Surrogate Recoveries met the acceptable criteria except for GP36(12-13).

Project # Y2238:

TCLVolatiles+10 – The Surrogate Recoveries met the acceptable criteria except for Y2261-12MS. The Internal Standards Areas met the acceptable requirements except for Y2261-12MS and Y2261-12MSD. The Calibration File ID VE002798.D and VE002854.D met the requirements except for Carbon Tetrachloride and Bromoform.

TAL Metals and Mercury – The Matrix Spike analysis met criteria for all samples except for Mercury. The Matrix Spike Duplicate analysis met criteria for all samples except for Mercury. The Serial Dilution met the acceptable requirements except for Sodium and Manganese.

TCL Pesticides/PCBs – Analysis was in complete compliance.

Project # Y2240:

TCLVolatiles+10 – The Surrogate Recoveries met the acceptable criteria except for Y2261-12MS. The Internal Standards Areas met the acceptable requirements except for Y2261-12MS and Y2261-12MSD.

SVOC-TCL BNA-20 – The Surrogate recoveries met the acceptable criteria except for GTC-1 and Y2238-12MSD. The Internal Standards Areas met the acceptable requirements except for GTC-4, GTC-4RE and GTC-D. The MS recoveries met the requirements for all compounds except for 4-Nitrophenol. The MSD recoveries met the acceptable requirements except for 2-Chlorophenol, 4-Chloro-3-methylphenol, 4-Nitrophenol, 2,4-Dinitrotoluene and Pentachlorophenol. Samples GTC-were diluted due to bad matrices.

TAL Metals and Mercury – The Matrix Spike analysis met criteria for all samples except for Mercury. The Matrix Spike Duplicate analysis met criteria for all samples except for Mercury. The Serial Dilution met the acceptable requirements except for Sodium and Manganese.

TCL Pesticides/PCBs – The Surrogate recoveries met the acceptable criteria except for Y2238-10MSD, GTC-3 and GTC-DDL. Samples GTC-4 and GTC-D were diluted due to high concentrations.

Project # Y2408:

TCLVolatiles+10 – The Blank analysis indicated presence of Acetone (25 ug/L) due to possible lab contamination. The Initial Calibration met the requirements except for Bromomethane.

TAL Metals and Mercury – The Matrix Spike analysis met criteria for all samples except for Mercury and Silver. The Serial Dilution met the acceptable requirements except for Potassium, Sodium, Barium, Cadmium, Calcium, Chromium, Iron, Lead, Magnesium, Manganese, Nickel, Zinc, and Arsenic.

TCL Pesticides/PCBs – The Surrogate recoveries met the acceptable criteria except for GTC-8, GTC-8MS, and GTC-8MSD.

Project # Y4618:

TCLVolatiles+10- SOIL– The Surrogate recoveries met the acceptable criteria except for GP-47(10-156), Go-54(15-20) and GP-47(10-15)DL. The MS recoveries met the requirements for all compounds except for toluene. Holding times were met for all analysis except for Y4618-14DL, Y4618-15DL & 21DL.

TCLVolatiles+10 –Water- The Matrix Spike (MS)/ Matrix Spike Duplicate (MSD) Recoveries analysis were met for all compounds except for bromomethane .

SVOC-TCL BNA-20 – The Surrogate recoveries met the acceptable criteria except for GP-48A(10-15)DL, GP-46(7-9)DL2, GP-54(15-20)DL2 and GP-42(15-20)DL. Internal Standard Areas met the acceptable requirements except for GP-46(7-9), GP-42(15-20) and GP-54(15-20)MS.

TAL Metals and Mercury –The Serial Dilution met the acceptable requirements except for Cobalt and Potassium.

Project # Y4655:

TCLVolatiles+10 –SOIL- The Matrix Spike (MS)/ Matrix Spike Duplicate (MSD) Recoveries analysis were met for all compounds except for toluene.

TCLVolatiles+10 –Water- GC/MS Calibration Check Compounds (CCC) for 8260 and CLP were not met for 1,1-dichloroethene, chloroform, 1,2-dochloropropane, toluene, and ethylbenzene. CCC compounds initial calibration criteria were reported as RSD leas than or equal to 30 %. System Performance Check Compounds (SPCC) for 8260 and CLP were not met for chloromethane, 1,1-dichloroethane, bromoform, chlorobenzene, 1,1,2,2-tetrachloroethane, and vinyl chloride. SPCC compounds initial calibration criteria were reported as %D less than or equal to 20%.

TCLVolatiles+10 –Water- The Matrix Spike (MS)/ Matrix Spike Duplicate (MSD) Recoveries analysis were met for all compounds except for bromomethane.

SVOC-TCL BNA-20 – The GC/MS Calibration Requirements for 8270 and CLP were not met.

TAL Metals and Mercury – The Matrix Spike analysis met criteria for all samples except for Mercury. The Serial Dilution met the acceptable requirements for all compounds except lead, potassium, and vanadium.

TCL **Pesticides/PCBs –** The Surrogate recoveries met the acceptable criteria except for GTC-8, GTC-8MS, and GTC-8MSD.

Section 4
Conclusions

The following conclusions are based upon environmental data collected at the City of Newburgh Landfill during site investigations conducted between January and April 2008.

- Background Surface Soils: background surface soils collected off-site as well as surface soils collected on-site exhibit signs of SVOC contamination. Many of the compounds detected (and those that exceeded NYSDEC action levels) are identified as incomplete products of combustion. Sources of this material could include emissions from trash burning which reportedly takes place at the landfill Burn Pit on a weekly basis. Other historical sources may include the reported operations of incinerators from local industries, including the former DuPont facility and the Stauffer Companies. Elevated concentrations of metals are also found to be associated with background surface soils.

- Drum Disposal Areas: the drum disposal areas along the western perimeter of the site contain material that is visually contaminated and therefore should be addressed by Immediate Remedial Measures (IRM). Surface and subsurface soils in the immediate vicinity of these drums, are also contaminated. Drums were found to be crushed and partially buried at many locations suggesting the they may have been disposed of at the top of the slope and were either tumbled down or were pushed down slope. In general the integrity of most if not all of the drums have been compromised by thirty or forty years of exposure to the elements. Yet wastes from these drum can still be classified as hazardous under the present day waste characterization criterion. Compounds found to exceed NYSDEC standards include metals, semi-volatile organic compounds, volatile organic compounds, and some PCB's. The contents of some of the drummed wastes are still ignitable even after reported decades on the landfill site.

- The semi-volatile organic concentrations reported during the April 2008 soil analysis were extremely high when compared to Department Standards. The SVOCs reported consisted of phthalates, which are mainly used as plasticizers. Plasticizers increase the flexibility of plastics and are commonly used to soften polyvinyl chloride used in making vinyl upholstery. This would be consistent with a theory that former local manufacturers (DuPont Company and Stauffer Chemical) may have used the landfill as a waste disposal site. On-Site Surface Soils: surface soils on site were found to be impacted by volatile organic compounds, semi-volatile organic compounds and various metals. SVOC's and many metals species were found to exceed NYSDEC Standards.

- On-Site Subsurface Soils: subsurface soils collected by geoprobe were found to be similarly impacted with VOC's, SVOC's and metals. In additional both pesticides and PCB's were detected in some subsurface soils at levels exceeding NYSDEC clean-up values.

- Surface Water Samples: the nearest surface water body to the Newburgh Landfill is Gidneytown Creek. Topographic expression and groundwater flow patterns indicate that Gidneytown Creek could potentially be a receptor of contamination emanating from the landfill. Volatile organic compounds including MTBE were identified in surface water samples collected at the creek. Many of the metals species identified on the landfill proper were also identified in surface water, but generally at lower concentrations.

- Sediment Sample: Sediment samples from Gidneytown Creek also exhibited landfill-related contamination. Sediment contained several VOC's, SVOC's and pesticides at level below State guidance values. Metals are present at levels that exceeded State guidance values.

- Groundwater: Select groundwater monitoring wells indicated levels of VOC, SVOC, Metals and pesticide/ PCB concentrations that exceeded State groundwater standards. Contaminant concentrations identified during the April 2007 sampling event were in general, higher than those collected during the drier sampling event of September 2007. The results of the April 2008 groundwater sampling event confirmed the presence of VOCs, SVOCs, and metals at elevated levels in groundwater beneath the Newburgh Landfill. Concentrations fluctuated slightly but overall remained consistent since the first sampling event in April 2007. This could indicate a seasonal dilution of contaminant concentrations; however additional semi-annual sampling would be required to support this conclusion.

APPENDIX A
Tables

City of Newburgh Landfill
NYSDEC Contract No. D004437
Site Characterization Report

Table 2-1
Well Construction Details

Monitoring Well ID	Depth of Well (feet)	Groundwater Elevation at Installation (feet)	Top of Casing (feet)	Top of Screen (EL bgs)	Bottom of Screen (EL bgs)	Well Diameter (inches)
MW-1	20	17	+2	10	20	2
MW-2	26	21	+2	16	26	2
MW-3	19	17	+2.8	4	19	2
MW-4	19	6	+3	4	19	2
MW-5	23.5	7	+2.2	8	23	2
MW-6	16	6	+2.6	5	15	2
MW-7	14	5	+2.8	4	14	2
MW-8	14	5	+3.0	4	14	2
MW-9	16		+2.7	6	16	2

EL bgs – Elevation below ground surface

City of Newburgh Landfill
NYSDEC Contract No. D004437
Site Characterization Report

Table 2-2
Groundwater Sampling
Monitoring Well Field Parameters
April 2007, September 2007, April 2008

	MW-1			***MW-2***			***MW-3***			***MW-4***			***MW-5***			***Water Quality***
Sampling Date	4/17/2007	9/25/2007	4/30/2008	4/17/2007	9/25/2007	4/30/2008	4/17/2007	9/25/2007	4/30/2008	4/17/2007	9/25/2007	4/30/2008	4/17/2007	9/25/2007	4/30/2008	-
Depth to Water* (ft)	14.55	22.12	DRY	17.51	26.48	DRY	16.05	21.32	DRY	7.88	11.85	10.52	10.08	15.92	12.77	-
Temperature (°C)	11.64	NA	NA	13.95	NA	NA	13.56	NA	NA	8.27	16.10	11.82	10.57	19.70	12.00	
pH (su)	6.77	NA	NA	6.76	NA	NA	6.76	NA	NA	6.68	6.71	6.90	6.71	7.03	6.94	6.5-8.5
Conductivity (umhos/cm)	1.270	NA	NA	2.010	NA	NA	2.010	NA	NA	1.270	2.090	2.120	1.660	1.790	2.430	-
Dissolved Oxygen (ppm)	4.84	NA	NA	2.00	NA	NA	2.00	NA	NA	1.81	12.73	12.73	2.20	9.75	15.57	-
Turbidity (NTU)	**>1000**	NA	NA	**920**	NA	NA	**920**	NA	NA	**>1000**	**608**	**370**	**>1000**	**787**	**13**	5.00

	MW-6			***MW-7***			***MW-8***			***MW-9***			***Water Quality***
Sampling Date	4/17/2007	9/25/2007	4/30/2008	4/17/2007	9/25/2007	4/30/2008	4/17/2007	9/25/2007	4/30/2008	4/17/2007	9/25/2007	4/30/2008	-
Depth to Water* (ft)	7.15	9.32	7.76	6.75	9.97	8.86	8.07	12.70	DRY	6.50	13.66	9.49	-
Temperature (°C)	8.96	21.70	10.78	6.15	17.20	9.42	6.18	16.30	NA	4.45	16.7	8.61	
pH (su)	6.52	6.61	6.77	6.90	7.14	7.24	7.03	7.24	NA	6.84	7.3	7.06	6.5-8.5
Conductivity (umhos/cm)	1.550	1.760	1.890	0.761	1.430	0.680	0.857	1.250	NA	0.623	1.660	1.210	-
Dissolved Oxygen (ppm)	3.14	9.75	11.44	6.56	11.58	14.29	6.63	12.72	NA	8.98	12.98	12.73	-
Turbidity (NTU)	**>1000**	**795.00**	**-5.00**	**>1000**	**>1000**	**718.00**	**>1000**	**>1000**	NA	**>1000**	**952**	**-5**	5.00

Notes:
* Depth to water from top of casing before purge. Physical and chemical characteristices recorded at time of sample.
1. NYSDEC Surface Water and Groundwater Quality Standards - 6 NYCRR Part 703
2. Results in bold exceed applicable standard.
3. Where wells are marked DRY and with NA indicates that the well was either purged or sampled until DRY.

City of Newburgh Landfill
NYSDEC Contract No. D004437
Site Characterization Report

Table 3-1
Background Soil Samples Analytical Results
April 2007

Sample ID Lab Sample Number Sampling Date Matrix Dilution Factor Units	6 NYCRR Subpart 375-6 Restricted Commercial Use Soil Cleanup Objective (ppb)	6 NYCRR Subpart 375-6 Un-Restricted Use Cleanup Objective (ppb)	TAGM 4046 Rec. Soil Cleanup Objective (ppb)	TAGM 4046 Eastern USA Background (ppm)	**BKG-1** Y2238-10 04/05/07 SOIL 1.0 ppb	**BKG-2** Y2238-11 04/05/07 SOIL 1.0 ppb	**BKG-3** Y2238-12 04/05/07 SOIL 1.0 ppb
Volatile Organic Compounds							
Methylene Chloride	500,000	50	100	N/A	3.0 J	3.5 J	2.4 J
Carbon Tetrachloride	22,000	760	600	N/A	17 J	18 J	13 J
Styrene	N/A	N/A	N/A	N/A	17 U	3.1 J	13 U
Total TICs	10,000	10,000	10000	N/A	0	0	0
Semi Volatile Organic Compounds							
Hexachlorocyclopentadiene	N/A	N/A	N/A	N/A	570 J	580 J	410 J
Acenaphthylene	500,000	100,000	41,000	N/A	170 J	59 J	410 U
2,4-Dinitrophenol	N/A	N/A	2 or MDL	N/A	1400 U	1400 U	1000 J
Fluorene	500,000	30,000	50,000	N/A	92 J	580 U	410 U
Phenanthrene	500,000	100,000	50,000	N/A	1,500	560 J	410 U
Anthracene	500,000	100,000	50,000	N/A	120 J	100 J	410 U
Carbazole	N/A	N/A	N/A	N/A	86 J	580 U	410 U
Fluoranthene	500,000	100,000	50,000	N/A	2,200	1,300	42 J
Pyrene	500,000	100,000	50,000	N/A	2,900	1,400	44 J
Benzo(a)anthracene	5,600	1,000	224 or MDL	N/A	**870**	**640**	410 U
Chrysene	56,000	1,000	400	N/A	1,100	**630**	410 U
bis(2-Ethylhexyl)phthalate	N/A	N/A	50,000	N/A	260 J	99 J	410 U
Benzo(b)fluoranthene	5,600	1,000	1,100	N/A	1,400	1,100	51 J
Benzo(k)fluoranthene	56,000	800	1,100	N/A	380 J	310 J	410 U
Benzo(a)pyrene	1,000	1,000	61 or MDL	N/A	**840**	**630**	410 U
Indeno(1,2,3-cd)pyrene	5,600	500	3,200	N/A	560 J	350 J	410 U
Benzo(g,h,i)perylene	500,000	100,000	50,000	N/A	120 J	80 J	410 U
Total Confident Conc. SVOC	500,000	500,000	500,000	N/A	12,598	7,718	137
Total TICs	500,000	500,000	500,000	N/A	11,400	16,990	6,210
Metals (ppm)							
Aluminum	N/A	N/A	SB	33,000	13,900	7,730	12,900
Arsenic	16	13	7.5 or SB	3-12	5.42 U	4.18 U	3.45 U
Barium	400	350	300 or SB	15-600	106	58.6	48.1
Beryllium	590	7.2	0.16 or SB	0-1.75	**0.669 J**	**0.469 J**	**0.499 J**
Cadmium	9.3	2.5	1 or SB	0.1-1	0.504 J	0.783 J	0.226 J
Calcium	N/A	N/A	SB	130-35,000	2,680	***39,400***	1,930
Chromium	400 (Hexavelent) 1,500 (Trivalent)	1 (Hexavelent) 30 (Trivalent)	10 or SB	1.5-40	**15.2**	**12.2**	**15.8**
Cobalt	N/A	N/A	30 or SB	2.5-60	7.62 J	8.61 J	10.6
Copper	270	50	25 or SB	1-50	16.8	25.2	23.3
Cyanide	N/A	27	N/A	N/A	0.41	0.26	0.06 U
Iron	N/A	N/A	2,000 or SB	2,000-550,000	**16,700**	**14,200**	**22,200**
Lead	1,000	63	SB	4-500	60.2	40.4	13.2
Magnesium	N/A	N/A	SB	100-5,000	2,950	***21,300***	4,390
Manganese	10,000	1,600	SB	50-5,000	730	426	686
Mercury	2.8	0.18	0.1	N/A	0.47 J	0.19 J	**0.11 J**
Nickel	310	30	13 or SB	0.5-25	**20.5**	***30***	**22.3**
Potassium	N/A	N/A	SB	8,500-43,000	693 J	1,570	1,290
Silver	1,500	2	SB	N/A	10.5	7.87	4.84
Sodium	N/A	N/A	SB	6,000-8,000	858 U	257 J	170 J
Thallium	N/A	N/A	SB	N/A	4.29 U	4.41 U	3.89
Vanadium	N/A	N/A	150 or SB	1-300	43.2	23	21.4
Zinc	10,000	109	20 or SB	9-50	***94.4***	***111***	***92.5***
Pesticides/PCBs							
gamma-BHC	9,200	100	60	N/A	8.8 J	3.0 U	2.1 U
Dieldrin	1,400	5	44	N/A	5.6 U	5.8 J	4.2 U

Notes
NYSDEC guidance states that Restricted/Un-Restricted Use numerical criteria (Subpart 375) should govern over older TAGM #4046 RSCO values.
Results in red exceed the Restricted Commercial Use Soil Cleanup Objectives
Results in blue exceed Unrestricted Commercial Use Soil Cleanup Objectives
Results in bold exceed the TAGM Recommended Soil Cleanup Objective
Metals are reported in ppm.

Qualifiers
U - The compound was not detected at the indicated concentration.
J - Data indicates the presence of a compound that meets the identification criteria. The result is less than the quantitation limit but greater than zero. The concentration given is an approximate value.
E - For In-Organics (Metals) - indicates that the value reported is estimated due to the presence of interference in the QA/QC sample.
For Organics (VOCs, SVOCs, Pesticides, PCBS) - indicates the anlayte's concentration exceeds the calibrated range of the instrument for that specific analysis.
B - The analyte was found in the laboratory blank as well as the sample. This indicates possible laboratory contamination of the environmental sample.
D - The reported value is from a secondary analysis with a dilution factor. The original analysis exceeded the calibration range.
P - For dual column analysis, the percent difference between the quantitated concentrations on the two columns is greater than 40%.
* - For dual column analysis, the lowest quantitated concentration is being reported due to coeluting interference.
NR - Not analyzed

City of Newburgh Landfill
NYSDEC Contract No. D004437

Table 3-2A
Test Pit/Drum Investigation Analytical Results
January 2007

Sample ID Lab Sample Number Sampling Date Matrix Dilution Factor Units	6 NYCRR Subpart 375-6 Restricted Commercial Use Soil Cleanup Objective (ppb)	6 NYCRR Subpart 375-6 Un-Restricted Use Cleanup Objective (ppb)	TAGM 4046 Rec. Soil Cleanup Objective (ppb)	TAGM 4046 Eastern USA Background (ppm)	6 NYCRR Subpart 371.3 Characteristics of Hazardous Waste (mg/L)	**TC-1-TP-2[1]** Y1309-01 1/22/2007 TCLP/SOIL 5.0 mg/L / ppm	**TC-1-TP-2[2]** Y1309-02 1/22/2007 TCLP/SOIL 20.0 mg/L / ppm	**TC-1-TP-3[1]** Y1309-03 1/23/2007 TCLP/SOIL 5.0 mg/L / ppm	**TP-6[2]** 1309-04 1/23/2007 TCLP/SOIL 5.0 mg/L / ppm	**TP-6[3]** 1309-07 1/23/2007 TCLP/SOIL 5.0 mg/L / ppm	**TP-8[1]** Y1309-10 1/24/2007 TCLP/SOIL 5.0 mg/L / ppm	**TP-11[1]** Y1309-11 1/25/2007 TCLP/SOIL 5.0 mg/L / ppm	**TB** Y1309-08 1/22/2007 TCLP/SOIL 5.0 mg/L / ppm	**FB** 1309-09 1/22/2007 TCLP/SOIL 5.0 mg/L / ppm
Volatile Organic Compound														
Vinyl Chloride	13,000	20	200	N/A	0.2	0.0016 U	0.0016 U	0.0016 U	0.0016 U	0.0087 J	0.0016 U	0.0016 U	0.0016 U	0.0016 U
1,1-Dichloroethene	500,000	330	400	N/A	0.7	0.0021 U	0.0021 U	0.0021 U	0.0021 U	0.0021 U	0.0021 U	0.0021 U	0.0021 U	0.0021 U
2-Butanone (methyl ethyl ketone)	500,000	120	300	N/A	200.0	0.0057 U	0.0057 U	0.0057 U	0.0057 U	0.24	0.16	0.31	0.0057 U	0.0057 U
Carbon Tetrachloride	22,000	760	600	N/A	0.5	0.0057 U	0.0057 U	0.0057 U	0.0057 U	0.0057 U	0.0057 U	0.0057 U	0.0057 U	0.0057 U
Chloroform	350,000	370	300	N/A	6.0	0.0017 U	0.0017 U	0.0017 U	0.0017 U	0.0017 U	0.0017 U	0.0017 U	0.0017 U	0.0017 U
Benzene	44,000	60	60	N/A	0.5	0.13	0.0019 U	0.0019 U	0.0019 U	0.1	0.0072 J	0.0052 J	0.0019 U	0.0019 U
1,2-Dichloroethane	30,000	20	100	N/A	0.5	0.0017 U	0.0017 U	0.84 E	0.0017 U	0.0017 U	0.0017 U	0.0017 U	0.0017 U	0.0017 U
Trichloroethene	200,000	470	700	N/A	0.5	0.0023 U	0.0023 U	0.0023 U	0.0023 U	0.0088 J	0.0023 U	0.028	0.0023 U	0.0023 U
Tetrachloroethene	150000	1,300	1400	N/A	0.7	0.0024 U	0.0024 U	0.0024 U	0.000	0.015 J	0.0024 U	0.0024 U	0.0024 U	0.0024 U
Chlorobenzene	500000	1,100	700	N/A	100.0	0.0023 U	0.0023 U	3.8 E	0.000	7.9 E	0.0023 U	0.0023 U	0.0023 U	0.0023 U
Total Confident Conc. VOC	10000	10000	10000	N/A	N/A	0.13		4.6		8.2725	1.672	0.3432		
Total TICs	10000	10000	10000	N/A	N/A	0	0	0	0	0	0	0	0	0
Metals (ppm)														
Aluminum	N/A	N/A	SB	33,000	N/A	7540 E	20,600 E	88.2 E	1350 E	571 E	1360 E	20.6 E	N/A	200 U
Antimony	N/A	N/A	SB	N/A	N/A	1.21 U	0.764 U	21.9 U	0.691 U	1.2 U	1190	0.664 U	N/A	60 U
Arsenic	16	13	7.5 or SB	3-12	5.0	0.202 U	**5.5**	0.736	**5.61**	0.2 U	1.4	3.71	N/A	10 U
Barium	400	350	300 or SB	15-600	100.0	12	70.8	2.52	56.1	3.86 J	**421**	0.965 J	N/A	200 U
Beryllium	590	7.2	0.16 or SB	0-1.75	N/A	0.042 J	0.257	0.062 U	0.361	0.1 U	0.058 J	0.055 U	N/A	5 U
Cadmium	9.3	2.5	1 or SB	0.1-1	1.0	0.432	**1.92**	0.202	**1.05**	0.226	**348**	0.055 U	N/A	5 U
Calcium	N/A	N/A	SB	130-35,000	N/A	4580 E	19,800 E	203 E	10,000 E	181 E	70,000 E	147 E	N/A	53 J
Chromium	400 (Hexavelent) 1,500 (Trivalent)	1 (Hexavelent) 30 (Trivalent)	10 or SB	1.5-40	5.0	**16.4 E**	**42.30 E**	1.05 E	**23.60 E**	2.56 E	**9.21 E**	0.357 E	N/A	10 U
Cobalt	N/A	N/A	30 or SB	2.5-60	N/A	1.5 E	8.62 E	1.46 E	32.80 E	0.501 J	1.31 E	0.554 UE	N/A	50 U
Copper	270	50	25 or SB	1-50	N/A	368	784	2.24	144	6.22	14.8	2.02	N/A	25 U
Iron	N/A	N/A	2,000 or SB	2,000-550,000	N/A	11,100 E	42300 E	4930 E	37600 E	6400	2500 E	43.1 E	N/A	100 U
Lead	1000	63	SB	4-500	5.0	**19,800 E**	**849 E**	**26.2 E**	**340 E**	**17.5**	**181 E**	1.67 E	N/A	10 U
Magnesium	N/A	N/A	SB	100-5,000	N/A	670 E	4110 E	512 E	4770 E	1570	1170 E	13.1 JE	N/A	5,000 U
Manganese	10000	1,600	SB	50-5,000	N/A	152 E	877 E	29.4 E	905 E	34.2	161 E	0.641 E	N/A	15 U
Mercury	2.80	0.18	0.1	N/A	0.2	**0.53**	0.19	0.05 J	**1.8**	**1.4**	**0.36**	0.06 U	N/A	0.2 U
Nickel	310	30	13 or SB	0.5-25	N/A	11.9 E	64.9 E	1.2 E	57.1 E	3.49	2.04 E	0.96 E	N/A	40 U
Potassium	N/A	N/A	SB	8,500-43,000	N/A	695	3930.00	30.6	2030	45.7 J	162	55.4 U	N/A	5,000 U
Selenium	1500	3.9	2 or SB	0.1-3.9	1.0	0.707 U	**2.14**	**2.08**	**2.4**	0.699 U	0.538 U	0.388 U	N/A	35 U
Silver	1500	2	SB	N/A	5.0	0.766	0.127 U	0.125 U	0.115 U	0.2 U	0.154 U	0.111 U	N/A	10 U
Sodium	N/A	N/A	SB	6,000-8,000	N/A	415	2600.00	217	493	1300	142	66.9	N/A	5,000 U
Thallium	N/A	N/A	SB	N/A	N/A	0.505 U	0.318 U	0.311 U	0.288 U	0.499 U	0.384 U	0.277 U	N/A	25 U
Vanadium	N/A	N/A	150 or SB	1-300	N/A	3.83	20.80	0.763	17.8	2.57	2.42	12.8	N/A	50 U
Zinc	10000	109	20 or SB	9-50	N/A	299 E	1310.00 E	403 E	554 E	2490	103 E	6.56 E	N/A	39.3 J
PCBs														
Aroclor-1242	1,000	100	N/A	N/A	N/A	11 U	6.6 U	6.5 U	6 U	**10,000 E**	8.1 U	170 U	N/A	0.085 U
Aroclor-1260	1,000	100	N/A	N/A	N/A	8.6 U	3.3 U	5.2 U	54	8.4 U	6.5 U	140 U	N/A	0.16 U

Notes
TCLP VOA analysis was performed on the samples, therefore results must be compared to 6 NYCRR Subpart 371.3 Characteristics of Hazardous Waste. Metals and PCBs are compared to 6 NYCRR Subpart
[1] - Sample collected of drum contents; [2] - Sample collected of soil matrix; [3] - Orange Waste
"TC" - Transect
Metals are reported in ppm.
N/A - No criteria established.

Qualifiers
U - The compound was not detected at the indicated concentration.
J - Data indicates the presence of a compound that meets the identification criteria. The result is less than the quantitation limit but greater than zero. The concentration given is an approximate value.
E - For In-Organics (Metals) - indicates that the value reported is estimated due to the presence of interference in the QA/QC sample. For Organics (VOCs, SVOCs, Pesticides, PCBS) - indicates the anlayte's concentration exceeds the calibrated range of the instrument for that specific analysis.
B - The analyte was found in the laboratory blank as well as the sample. This indicates possible laboratory contamination of the environmental sample.
D - The reported value is from a secondary analysis with a dilution factor. The original analysis exceeded the calibration range.
P - For dual column analysis, the percent difference between the quantitated concentrations on the two columns is greater than 40%.
* - For dual column analysis, the lowest quantitated concentration is being reported due to coeluting interference.
NR - Not analyzed

City of Newburgh Landfill
NYSDEC Contract No. D004437

Table 3-2B
Supplemental Drum Investigation
Analytical Results - Soil
November 2008

Sample ID	6 NYCRR Subpart 375-6 Restricted Commercial Use Soil Cleanup Objective ug/kg	6 NYCRR Subpart 375-6 Un-Restricted Use Soil Cleanup Objective ug/kg	TAGM 4046 Recommended Soil Cleanup Objective ug/kg	TAGM 4046 Eastern USA Background mg/kg	TP15A WASTE	TP15A WASTEDL	TP15A WASTEDL2	TP15B WASTE	TP15B WASTEDL	TP15B WASTEDL2	TP15C SOIL	TRIP BLANK
Lab Sample Number					Z5415-05	Z5415-05DL	Z5415-05DL2	Z5415-06	Z5415-06DL	Z5415-06DL2	Z5415-03	Z5415-01
Sampling Date					11/12/2008	11/12/2008	11/12/2008	11/12/2008	11/12/2008	11/12/2008	11/12/2008	11/12/2008
Matrix					SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	WATER
Dilution Factor					50	500	50000	1	20	400	1	1
Units					ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/l
VOLATILE ORGANICS												
Toluene	100,000	700	1,500	NA	**51,000,000 E**	**770,000,000 ED**	**1,090,000,000 D**	**710,000 E**	**7,000,000 ED**	**15,000,000 D**	16 J	5 U
Tetrachloroethene	5,500	1,300	1,400	NA	62,000 U	1,200,000 U	120,000,000 U	**11,000**	**20,000 JD**	1,000,000 U	33	5 U
Chlorobenzene	100,000	1,100	1,700	NA	**10,000,000 E**	**31,000,000 D**	120,000,000 U	**320,000 E**	**610,000 D**	**1,200,000 D**	29 U	5 U
Ethyl Benzene	30,000	1,000	5,500	NA	**260,000**	1,200,000 U	120,000,000 U	16,000	26,000 D	1,000,000 U	29 U	5 U
m/p-Xylenes	100,000	260	1,200	NA	**240,000**	2,500,000 U	250,000,000 U	26,000	43,000 JD	2,100,000 U	58 U	10 U
o-Xylene	100,000	260	1,200	NA	26,000 J	1,200,000 U	120,000,000 U	7,000	12,000 JD	1,000,000 U	29 U	5 U
Total Confident Conc.				NA	**61,526,000**	**801,000,000**	**1,090,000,000**	**1,090,000**	**7,711,000**	**16,200,000**	49	
Total TICs				NA				110,000				
SEMIVOLATILE ORGANICS												
Benzaldehyde	NA	NA	NA	NA	37,000	82,000 UD	NR	17,000 U	170,000 UD	NR	4,000 U	NR
Phenol	100,000	330	30 or MDL	NA	1,800 J	82,000 UD	NR	17,000 U	170,000 UD	NR	4,000 U	NR
2-Methylphenol	100,000	330	1 or MDL	NA	18,000	17,000 JD	NR	10,000 J	170,000 UD	NR	4,000 U	NR
3+4-Methylphenols	100,000	330	NA	NA	26,000	26,000 JD	NR	3,300 J	170,000 UD	NR	4,000 U	NR
Naphthalene	100,000	12,000	13,000	NA	16,000 U	82,000 UD	NR	7,600 J	170,000 UD	NR	4,000 U	NR
2-Methylnaphthalene	NA	NA	36,400	NA	16,000 U	82,000 UD	**NR**	6,200 J	170,000 UD	NR	4,000 U	NR
1,1-Biphenyl	NA	NA	NA	NA	16,000 U	82,000 UD	NR	21,000	23,000 JD	NR	4,000 U	NR
Diethylphthalate	NA	NA	7,100	NA	**30,000**	**34,000 JD**	NR	**37,000**	**41,000 JD**	NR	4,000 U	NR
N-Nitrosodiphenylamine	NA	NA	NA	NA	25,000	27,000 JD	NR	5,200 J	170,000 UD	NR	4,000 U	NR
Phenanthrene	100,000	100,000	50,000	NA	2,100 J	82,000 UD	NR	8,100 J	170,000 UD	NR	4,000 U	NR
Di-n-butylphthalate	NA	NA	8,100	NA	**30,000**	**34,000 JD**	NR	**36,000**	**42,000 JD**	NR	4,000 U	NR
Fluoranthene	100,000	100,000	50,000	NA	2,800 J	82,000 UD	NR	4,900 J	170,000 UD	NR	420 J	NR
Pyrene	100,000	100,000	50,000	NA	4,000 J	82,000 UD	NR	6,700 J	170,000 UD	NR	4,000 U	NR
Butylbenzylphthalate	NA	NA	50,000	NA	16,000 U	82,000 UD	NR	46,000	49,000 JD	NR	4,000 U	NR
Chrysene	1,000	1,000	400	NA	16,000 U	82,000 UD	NR	**2,200 J**	170,000 UD	NR	4,000 U	NR
bis(2-Ethylhexyl)phthalate	NA	NA	50,000	NA	**280,000 E**	**370,000 D**	NR	**470,000 E**	**600,000 D**	NR	15,000	NR
Di-n-octyl phthalate	NA	NA	8,100	NA	**20,000**	**95,000 D**	NR	**36,000**	**110,000 JD**	NR	470 J	NR
Benzo(g,h,i)perylene	100,000	100,000	50,000	NA	4,700 J	82,000 UD	NR	17,000 U	170,000 UD	NR	4,000 U	NR
Total Confident Conc.				NA	481,400	603,000	NR	700,200	865,000	NR	15,890	NR
Total TICs				NA	895,000			5,819,000			17,030	
PESTICIDES												
4,4-DDE	1,800	3	2,100	NA	NR	NR	NR	NR	NR	NR	5.7	NR
4,4-DDD	2,600	3	2,900	NA	NR	NR	NR	NR	NR	NR	31 P	NR
4,4-DDT	1,700	3	2,100	NA	NR	NR	NR	NR	NR	NR	7.2 P	NR
Total Confident Conc.				NA	NR	NR	NR	NR	NR	NR	43.9	NR
Total TICs				NA								
PCBs												
Aroclor-1260	1,000	100	1,000	NA	NR	NR	NR	NR	NR	NR	32	NR
Total Confident Conc.				NA	NR	NR	NR	NR	NR	NR	32	NR
METALS (mg/kg)												
Aluminum	N/A	N/A	SB	33,000	630	1,070	NR	4,130	4,630	NR	10,900	NR
Antimony	N/A	N/A	SB	N/A	8.65	66.9 U	NR	229	271	NR	54.5	NR
Arsenic	16	13	7.5 or SB	3 - 12	1.46	26.8 U	NR	4.55	28 U	NR	6.56	NR
Barium	400	350	300 or SB	15 - 600	59.3	68.5 J	NR	153	162	NR	162	NR
Beryllium	590	7.2	0.16 or SB	0 - 1.75	0.402 U	8.03 U	NR	0.42 U	8.4 U	NR	0.152 J	NR
Cadmium	9.3	2.5	1 or SB	0.1 - 1	**8.95**	**10.6**	NR	**10.9**	**13.1**	NR	8.15	NR
Calcium	N/A	N/A	SB	130 - 35,000	8490	11,000	NR	12,200	13,200	NR	8,300	NR
Chromium	400 (Hexavelent) 1,500 (Trivalent)	1 (Hexavelent) 30 (Trivalent)	10 or SB	1.5 - 40	18.9	23.8	NR	19.9	22.7	NR	32	NR
Cobalt	N/A	N/A	30 or SB	2.5 - 60	2.98	40.2 U	NR	3.85	42 U	NR	6.96	NR
Copper	270	50	25 or SB	1 - 50	40.8	**53.7**	NR	43.3	**53.4**	NR	150	NR
Iron	N/A	N/A	2,000 or SB	2,000 - 550,000	57,300	70,400	NR	40,800	45,900	NR	52,300	NR
Lead	1,000	63	SB	200 - 500	**643**	**885**	NR	**1,010**	**1,310**	NR	**1,060**	NR
Magnesium	N/A	N/A	SB	100 - 5,000	2,150	2,810	NR	3,630	3,960	NR	2,330	NR
Manganese	10,000	1,600	SB	50 - 5,000	485	589	NR	372	414	NR	564	NR
Mercury	2.8	0.18	0.1	0.001 - 0.2	0.129	NR	NR	**0.723**	NR	NR	0.202	NR
Nickel	310	30	13 or SB	0.5 - 25	17.2	23.2 J	NR	21.1	24.8 J	NR	34.2	NR
Potassium	N/A	N/A	SB	8,500 - 43,000	462	2,680 U	NR	502	2,800 U	NR	554	NR
Silver	1,500	2	SB	N/A	**11.2**	**14.6**	NR	**8.37**	**8.12 J**	NR	11.7	NR
Sodium	N/A	N/A	SB	6,000 - 8,000	435	2,680 U	NR	891	2,800 U	NR	737	NR
Vanadium	N/A	N/A	150 or SB	1 - 300	1.29 J	53.5 U	NR	9.8	56 U	NR	9.02	NR
Zinc	10,000	109	20 or SB	9 - 50	**12,777.64 D**	**21,100**	NR	**11,118.49 D**	**16,900**	NR	1,150	NR
Cyanide	27	27	N/A	N/A	1 U		NR	1.05 U		NR	0.826	NR
Total Confident Conc.					NA	NA	NR	NA	NA	NR	NA	NR
Total TICs												

Notes:
U -The compound was not detected at the indicated concentration.
J -Data indicates the presence of a compound that meets the identification criteria.
The result is less than the quantition limit but greater than MDL. The concentration given is an approximate value.
B - The analyte was found in the laboratory blank as well as the sample. This indicates possible laboratory contamination of the environmental sampl
P - For dual column analysis, the percent difference between the quantitated concentrations on the two columns is greater than 40%.
* - For dual column analysis, the lowest quantitated concentration is being reported due to coeluting interference.

E (Organics) - Indicates the analyte 's concentration exceeds the calibrated range of the instrument for that specific analysis.
E (Inorganics) - The reported value is estimated because of the presence of interference.
D - The reported value is from a secondary analysis with a dilution factor. The original analysis exceeded the calibration range.
* - For dual column analysis, the lowest quantitated concentration is being reported due to coeluting interference.
NR - Not analyzed

City of Newburgh Landfill
NYSDEC Contract No. D004437

Table 3-2C
Supplemental Drum Investigation
Analytical Results
Toxic Characaterisitics Leaching Procedure and RCRA Characteristics
November 2008

Sample ID	40 CFR §261.24 Maximum Concentrations of Contaminants for Toxicity Characteristics mg/l	**TP15A WASTE**	**TP15A WASTEDL**	**TP15B WASTE**
Lab Sample Number		Z5415-02	Z5415-02DL	Z5415-04
Sampling Date		11/12/2008	11/12/2008	11/12/2008
Matrix		TCLP	TCLP	TCLP
Dilution Factor		1	100	1
Units		mg/l	mg/l	mg/l
TCLP VOLATILE ORGANICS				
Vinyl Chloride	0.2	0.025 U	0.5 U	0.025 U
1,1-Dichloroethene	0.7	0.025 U	0.5 U	0.025 U
2-Butanone	200	0.43	2.5 U	0.12 U
Carbon Tetrachloride	0.5	0.025 U	0.5 U	0.025 U
Chloroform	6	0.025 U	0.5 U	0.025 U
Benzene	0.5	0.025 U	0.5 U	0.025 U
1,2-Dichloroethane	0.5	0.025 U	0.5 U	0.025 U
Trichloroethene	0.5	0.025 U	0.5 U	0.025 U
Tetrachloroethene	0.7	0.025 U	0.5 U	0.025 U
Chlorobenzene	100	3.1 E	4.1 D	0.47
TCLP SEMIVOLATILES				
Pyridine	5	0.1 U	0.5 JD	0.1 U
1,4-Dichlorobenzene	7.5	0.1 U	0.5 JD	0.1 U
2-Methylphenol	200	0.71	1 D	2.7
3+4-Methylphenols	200	1.3 E	1.9 D	0.065 J
Hexachloroethane	3	0.1 U	0.5 JD	0.1 U
Nitrobenzene	2	0.1 U	0.5 JD	0.1 U
Hexachlorobutadiene	0.5	0.1 U	0.5 JD	0.1 U
2,4,5-Trichlorophenol	400	0.1 U	0.5 JD	0.1 U
2,4,6-Trichlorophenol	2	0.1 U	0.5 JD	0.1 U
2,4-Dinitrotoluene	0.13	0.1 U	0.5 JD	0.1 U
Hexachlorobenzene	0.13	0.1 U	0.5 JD	0.1 U
Pentachlorophenol	100	0.1 U	0.5 JD	0.1 U
TCLP PESTICIDES				
None Detected				
TCLP HERBICIDE				
None Detected				
TCLP METALS				
Barium	100	0.5 U	NR	0.302 J
Lead	5	0.0869	NR	1.52
RCRA CHARACTERISTICS				
Reactive Sulfide [(a)]		40 U	NR	40 U
Reactive Cyanide [(a)]		10 U	NR	10 U
Ignitability	Flashpoint <140 º F	NO	NR	NO
Corrosivity (as pH)	aqueous pH < 2 or > 12.5	5.7	NR	6.9

Notes:
U - The compound was not detected at the indicated concentration.
E (Organics) - Indicates the analyte ‘s concentration exceeds the calibrated range of the instrument for that specific analysis.
D - The reported value is from a secondary analysis with a dilution factor. The original analysis exceeded the calibration range.
NR - Not analyzed
(a) - Reactive (normally unstable, undergoes violent changes without detonating, water reactive)

City of Newburgh Landfill
NYSDEC Contract No. D004437
Site Characterization Report

Table 3-3
Surface Soil Samples Analytical Results
April 2007

Sample ID Lab Sample Number Sampling Date Matrix Dilution Factor Units	6 NYCRR Subpart 375-6 Restricted Commercial Use Soil Cleanup Objective (ppb)	6 NYCRR Subpart 375-6 Un-Restricted Use Cleanup Objective (ppb)	TAGM 4046 Rec. Soil Cleanup Objective (ppb)	TAGM 4046 Eastern USA Background (ppm)	**SS-1** Y2238-13 04/05/07 SOIL 1.0 ppb	**SS-2** Y2238-14 04/05/07 SOIL 1.0 ppb	**SS-3** Y2238-15 04/05/07 SOIL 1.0 ppb	**SS-4** Y2238-16 04/05/07 SOIL 1.0 ppb	**SS-5** Y2238-17 04/05/07 SOIL 1.0 ppb
Volatile Organic Compounds									
Methylene Chloride	500,000	50	100	N/A	4.0 J	1.7 J	4.0 J	14 U	5.3 J
Carbon Tetrachloride	22,000	760	600	N/A	14 U	13 J	11 J	14 J	16 J
Ethyl Benzene	390,000	1,000	5,500	N/A	14 U	13 U	11 U	14 U	1.0 J
m/p-Xylenes	500,000	260	1,200	N/A	14 U	13 U	11 U	14 U	1.8 J
o-Xylene	500,000	260	1,200	N/A	14 U	13 U	11 U	14 U	1.2 J
Total TICs	10,000	10,000	10000	N/A	0	0	0	0	0
Semi-Volatile Organic Compounds									
Hexachlorocyclopentadiene	N/A	N/A	N/A		2200 J	4100 J	3700 J	4600 J	5300 J
Acenaphthylene	500,000	100,000	41,000	N/A	2,200 U	840 J	480 J	4,600 U	5,300 U
2,4-Dinitrophenol	N/A	N/A	2 or MDL	N/A	5600 U	10000 J	9400 U	12000 U	13000 U
Fluorene	500,000	30,000	50,000	N/A	2,200 U	460 J	3,700 U	4,600 U	5,300 U
Phenanthrene	500,000	100,000	50,000	N/A	750 J	5,000	3,300 J	1,900 J	4,400 J
Anthracene	500,000	100,000	50,000	N/A	2,200 U	750 J	770 J	4,600 U	1,100 J
Di-n-butylphthalate	N/A	N/A	8,100	N/A	2,200 U	4,100 U	710 J	4,600 U	5,300 U
Fluoranthene	500,000	100,000	50,000	N/A	1,700 J	6,900	6,100	4,000 J	7,300
Pyrene	500,000	100,000	50,000	N/A	2,000 **J**	7,600	7,600	4,400 J	8,700
Benzo(a)anthracene	5,600	1,000	224 or MDL	N/A	**820** J	4,200	3,700 J	2,100 J	3,900 J
Chrysene	56,000	1,000	400	N/A	900 J	3,700 J	3,300 J	2,100 J	3,600 J
Di-n-octyl phthalate	N/A	N/A	50,000	N/A	2200 U	4100 J	3700 U	4600 U	5300 U
Benzo(b)fluoranthene	5,600	1,000	1,100	N/A	1,600 J	6,800 J	6,500	2,800 J	6,300
Benzo(k)fluoranthene	56,000	800	1,100	N/A	480 J	2,000 J	1,600 J	1,100 J	1,600 J
Benzo(a)pyrene	1,000	1,000	61 or MDL	N/A	**900 J**	3,700 J	3,800	2,100 J	3,600 J
Indeno(1,2,3-cd)pyrene	5,600	500	3,200	N/A	470 J	1,700 J	1,700 J	1,200 J	1,800 J
Dibenz(a,h)anthracene	560	330	14 or MDL	N/A	2200 U	4100 J	3700 U	4600 U	5300 U
Benzo(g,h,i)perylene	500,000	100,000	50,000	N/A	2,200 U	470 J	390 J	4,600 U	5,300 U
Total TICs	500,000	500,000	500,000	N/A	660	10,940	5,500	7,800	10,000
Metals (ppm)									
Aluminum	N/A	N/A	SB	33,000	12,200	13,900	12,100	13,800	12,000
Antimony	N/A	N/A	SB	N/A	8.22 U	7.55 U	6.79 U	8.27 U	9.72 U
Arsenic	16	13	7.5 or SB	3-12	5.09 U	3.02 U	13.2 U	4.69 U	5.94 U
Barium	400	350	300 or SB	15-600	84.1	63	86.9	77.4	85.5
Beryllium	590	7.2	0.16 or SB	0-1.75	**0.56 J**	**0.526 J**	**0.507 J**	**0.531 J**	**0.517 J**
Cadmium	9.3	2.5	1 or SB	0.1-1	0.593 J	0.17 J	0.923	0.612 J	0.546 J
Calcium	N/A	N/A	SB	130-35,000	20,700	3,600	11,300	10,500	21,200
Chromium	400 (Hexavelent) 1,500 (Trivalent)	1 (Hexavelent) 30 (Trivalent)	10 or SB	1.5-40	**20.4**	**35**	**19**	**24.9**	**18.3**
Cobalt	N/A	N/A	30 or SB	2.5-60	11.7	10.6	10.9	10.3	8.94
Copper	270	50	25 or SB	1-50	***73.5***	29.4	51.3	**47.6**	**40.9**
Cyanide	N/A	27	N/A	N/A	0.21	0.51	0.53	0.07 U	0.28
Iron	N/A	N/A	2,000 or SB	2,000-550,000	**25,200**	**25,500**	**24,500**	**24,100**	**22,600**
Lead	1,000	63	SB	4-500	83.9	38.9	90.7	56.8	118
Magnesium	N/A	N/A	SB	100-5,000	***11,900***	***6,670***	***8,450***	***7,210***	***10,800***
Manganese	10,000	1,600	SB	50-5,000	714	624	614	550	721
Mercury	2.8	0.18	0.1	N/A	0.19 J	0.04 J	**0.16 J**	0.45 J	0.48 J
Nickel	310	30	13 or SB	0.5-25	***26***	***26.6***	30.8	***26.7***	***26.7***
Potassium	N/A	N/A	SB	8,500-43,000	2,070	1,360	1,560	1,770	1,490
Selenium	1,500	3.9	2 or SB	0.1-3.9	4.79 U	4.4 U	3.96 U	4.83 U	5.67 U
Silver	1,500	2	SB	N/A	5.57	5.56	4.49	6.48	4.69
Sodium	N/A	N/A	SB	6,000-8,000	221 J	120 J	186 J	126 J	164 J
Thallium	N/A	N/A	SB	N/A	3.94	3.77	2.83 U	3.45 U	4.05 U
Vanadium	N/A	N/A	150 or SB	1-300	22.9	22.2	24.9	24.9	23.6
Zinc	10,000	109	20 or SB	9-50	***183***	***87.5***	223	132	177
Pesticides/PCBs									
gamma-BHC	9,200	100	60	N/A	2.3 U	18	21	2.4 U	7.4
Aldrin	680	5	41	N/A	2.3 U	2.1 U	1.9 U	2.4 U	2.7 J

Notes
NYSDEC guidance states that Restricted/Un-Restricted Use numerical criteria (Subpart 375) should govern over older TAGM #4046 RSCO values.
Results in red exceed the Restricted Commercial Use Soil Cleanup Objectives
Results in blue exceed Unrestricted Commercial Use Soil Cleanup Objectives
Results in bold exceed the TAGM Recommended Soil Cleanup Objective
Results in ***bold italics*** exceed both the TAGM Recommended Soil Cleanup Objective and Eastern USA Background
Metals are reported in ppm.
N/A - No criteria established.

Qualifiers
U - The compound was not detected at the indicated concentration.
J - Data indicates the presence of a compound that meets the identification criteria. The result is less than the quantitation limit but greater than zero. The concentration given is an approximate value.
E - For In-Organics (Metals) - indicates that the value reported is estimated due to the presence of interference in the QA/QC sample. For Organics (VOCs, SVOCs, Pesticides, PCBS) - indicates the anlayte's concentration exceeds the calibrated range of the instrument for that specific analysis.
B - The analyte was found in the laboratory blank as well as the sample. This indicates possible laboratory contamination of the environmental sample.
D - The reported value is from a secondary analysis with a dilution factor. The original analysis exceeded the calibration range.
P - For dual column analysis, the percent difference between the quantitated concentrations on the two columns is greater than 40%.
* - For dual column analysis, the lowest quantitated concentration is being reported due to coeluting interference.
NR - Not analyzed

City of Newburgh Landfill
NYSDEC Contract No. D004437

Table 3-4
Subsurface Samples Analytical Results
January - February 2007

Sample ID Lab Sample Number Sampling Date Matrix Dilution Factor Units	6 NYCRR Subpart 375-6 Protection of Groundwater (ppb)	6 NYCRR Subpart 375-6 Un-Restricted Use Cleanup Objective (ppb)	TAGM 4046 Rec. Soil Cleanup Objective (ppb)	TAGM 4046 Eastern USA Background (ppm)	6 NYCRR Subpart 371.3 Characteristics of Hazardous Waste (mg/L)	**GP-1-9.0-9.5** Y1359-03 01/29/07 TCLP/ SOIL 5.0 mg/L / ppm	**GP-9-6.5-7.0** Y1359-02 01/30/07 TCLP/ SOIL 5.0 mg/L / ppm	**GP-9A-9.5-10.0** Y1359-01 01/30/07 TCLP/ SOIL 5.0 mg/L / ppm	**GP16(3-3.5)** Y1438-01 02/05/07 TCLP/ SOIL 5.0 mg/L / ppm	**GP17(4-5)** Y1438-02 02/05/07 TCLP/ SOIL 5.0 mg/L / ppm	**GP18(6-6.5)** Y1438-03 02/05/07 TCLP/ SOIL 5.0 mg/L / ppm	**GP22(9.5-10)** Y1438-04 02/05/07 TCLP/ SOIL 5.0 mg/L / ppm	**GP-36(12-13)** Y1501-01 02/08/07 TCLP/ SOIL 5.0 mg/L / ppm	**GP-37(11-12)** Y1501-02 02/08/07 TCLP/ SOIL 5.0 mg/L / ppm	**GP-38(12-13)** Y1501-03 02/08/07 TCLP/ SOIL 5.0 mg/L / ppm	**FB020807** Y1501-04 02/08/07 WATER 1.0 mg/L	**TB** Y1501-05 02/08/07 WATER 1.0 mg/L
Volatile Organic Compound (TCLP)																	
Vinyl Chloride	20	20	200	N/A	0.2	**0.61 E**	0.0016 U	0.0016 U	0.0016 U	0.0016 U	0.0016 U	0.0016 U	0.0016 U	0.0016 U	0.0016 U	0.00033 U	0.00033 U
2-Butanone (MEK)	120	120	300	N/A	200	0.0057 U	0.0057 U	0.0057 U	0.02 J	0.0057 U	0.0057 U	0.0072 J	0.0057 U	0.0057 U	0.0057 U	0.0011 U	0.0011 U
Chlorobenzene	1,100	1,100	1700	N/A	100	0.0023 U	0.0088 J	0.0023 U	0.0023 U	0.0023 U	0.0023 U	0.0023 U	0.007 J	0.0023 U	0.0023 U	0.00047 U	0.00047 U
Total TICs	10000	10000	10000	N/A	N/A	0	0	0	0	0	0	0	0	0	0	0	0
Metals (ppm)																	
Aluminum	N/A	N/A	SB	33,000	N/A	67.2	4470	9030	7170	8670	6000	6280	13,700	6,290	5,660	14 U	N/A
Antimony	N/A	N/A	SB	N/A	N/A	0.831 J	2.79 U	1.67 U	3.75 U	3.91 U	2.96 U	61.1	0.537 U	3.4	0.691 U	7 U	N/A
Arsenic	16	13	7.5 or SB	3-12	5.0	0.298 U	**11.3**	**8.09**	17.2	20.3	0.652 U	5.72	6.170	22.2	5.98	3.5 U	N/A
Barium	820	350	300 or SB	15-600	100.0	2.5 J	144	86.5	361	**35.4**	409	1970	88	532	54.7	7.4 U	N/A
Beryllium	47	7.2	0.16 or SB	0-1.75	N/A	0.149 U	**0.167 J**	**0.437**	**0.375**	**0.244**	**0.247**	0.262	0.498	0.228 J	0.296	0.49 U	N/A
Cadmium	7.5	2.5	1 or SB	0.1-1	1.0	0.155	4.4	**1.79**	3.97	0.138 U	3.57	7.35	8.79	18.4	11.5	0.57 U	N/A
Calcium	-	-	SB	130-35,000	N/A	876	16,400	22,900	22,600	1,250	28,700	***41,400***	2,240	15,800	***54,900***	6.1 U	N/A
Chromium	19 (Hexavelent) NS (Trivalent)	1 (Hexavelent) 30 (Trivalent)	10 or SB	1.5-40	5.0	2.65	60.1	21.2	80	**12.6**	86.5	42.3	**18.5**	38.3	**15.7**	1.1 U	N/A
Cobalt	N/A	N/A	30 or SB	2.5-60	N/A	0.344 J	10.4	7.98	18.4	6.93	8.07	8.97	8.52	11.3	7.08	2.1 U	N/A
Copper	1,720	50	25 or SB	1-50	N/A	7.23	140	**36.3**	270	17	204	**44**	**35.9**	498	68.2	2.5 U	N/A
Iron	N/A	N/A	2,000 or SB	2,000-550,000	N/A	163	96,500	67,900	121,000	39,400	78,300	38,800	39,600	104,000	36,000	15.4 U	N/A
Lead	450	63	SB	4-500	5.0	1.72	430	256	2520	9.17	478	444	45.3	365	311	3.7 U	N/A
Magnesium	N/A	N/A	SB	100-5,000	N/A	753	4,140	***13,100***	***5,710***	2,650	***5,940***	***18,800***	***5,250***	2,530	***26,700***	13.9 U	N/A
Manganese	2,000	1,600	SB	50-5,000	N/A	32.9	692	519	1,490	78.7	615	872	658	1,100	1,710	0.46 U	N/A
Mercury	0.73	0.18	0.1	N/A	0.2	0.14	1.7	0.18	4.9	0.04 U	1.5	1.7	0.15	0.22	0.74	0.04 J	N/A
Nickel	130	30	13 or SB	0.5-25	N/A	4.68	43.8	**21.4**	75.6	**15.9**	76	**16.2**	**22.8**	37.1	**19.8**	2.9 U	N/A
Potassium	N/A	N/A	SB	8,500-43,000	N/A	29.8 J	601	1,220	671	653	452	704	741	504	746	52.2 U	N/A
Selenium	4	3.9	2 or SB	0.1-3.9	1.0	1.04 U	5.46	**3.49**	**3.71**	**2.05**	1.22 U	1.03 U	**2.06**	6.13	1.62	4.2 U	N/A
Silver	8	2	SB	N/A	5.0	0.298 U	2.79	1.87	267	0.736 U	0.556 U	0.469 U	0.312	0.929	0.798	1.4 U	N/A
Sodium	N/A	N/A	SB	6,000-8,000	N/A	123 J	254	286	117 U	293	241	241	196	701	399	706 U	N/A
Thallium	N/A	N/A	SB	N/A	N/A	0.746 U	1.16 U	0.695 U	2.1 U	2.18 U	1.65 U	1.39 U	0.895 U	1.61 U	1.15 U	11.2 U	N/A
Vanadium	N/A	N/A	150 or SB	1-300	N/A	0.422 J	11.3	17.8	16.4	17.5	12	11.1	17.8	12	10.8	0.85 U	N/A
Zinc	2,480	109	20 or SB	9-50	N/A	9.38	700	212	1,290	**33.2**	1,270	684	300	2,720	9,870	20.9 J	N/A
PCBs																	
Aroclor-1248	1,000	100	N/A	N/A	N/A	3.8 U	6 U	3.5 U	5.6 U	5.7 U	2.3 E	3.7 U	3.3 U	5.7 U	4.1 U	0.042 U	N/A
Aroclor-1260	1,000	100	N/A	N/A	N/A	6.3 U	**290 J**	5.8 U	**230**	9.4 U	7.5 U	6.1 U	5.4 U	9.4 U	6.8 U	0.16 U	N/A

Notes
VOCs were analyzed using the Toxic Characteristics Leaching Procedure (TCLP) therefore results are compared to 6 NYCRR Subpart 371.3 Characteristics of Hazardous Waste.
SVOC analysis was not performed on geoprobe samples.
NYSDEC guidance states that Protection of Groundwater and Un-Restricted Use numerical criteria (Subpart 375) govern over older TAGM #4046 RSCO values.
Results in red exceed the Protection of Groundwater Standards
Results in blue exceed Un-Restricted Commercial Use Soil Cleanup Objectives
Results in bold exceed the TAGM Recommended Soil Cleanup Objective
Results in ***bold italics*** exceed both the TAGM Recommended Soil Cleanup Objective and Eastern USA Background
N/A - No criteria established.
Qualifiers
U - The compound was not detected at the indicated concentration.
J - Data indicates the presence of a compound that meets the identification criteria. The result is less than the quantitation limit but greater than zero.
The concentration given is an approximate value.
E - For In-Organics (Metals) - indicates that the value reported is estimated due to the presence of interference in the QA/QC sample.
For Organics (VOCs, SVOCs, Pesticides, PCBS) - indicates the anlayte's concentration exceeds the calibrated range of the instrument for that specific analysis.
B - The analyte was found in the laboratory blank as well as the sample. This indicates possible laboratory contamination of the environmental sample.
D - The reported value is from a secondary analysis with a dilution factor. The original analysis exceeded the calibration range.
P - For dual column analysis, the percent difference between the quantitated concentrations on the two columns is greater than 40%.
* - For dual column analysis, the lowest quantitated concentration is being reported due to coeluting interference.
NR - Not analyzed

City of Newburgh Landfill
NYSDEC Contract No. D004437
Site Characterization Report

Table 3-5
Supplemental Subsurface Soil Investigation
September 2007

Sample ID Lab Sample Number Sampling Date Matrix Dilution Factor Units	6 NYCRR Subpart 375-6 Protection of Groundwater (ppb)	6 NYCRR Subpart 375-6 Un-Restricted Use Soil Cleanup Objective (ppb)	TAGM 4046 Recommended Soil Cleanup Objective (ppb)	TAGM 4046 Eastern USA Background (ppm)	**GP-42(15-20)** Y4618-20 09/24/07 SOIL 1.0 ppb	**GP-44(14-15)** Y4618-12 09/24/07 SOIL 1.0 ppb	**GP-45(5-10)** Y4618-13 09/24/07 SOIL 1.0 ppb	**GP-46(7-9)** Y4618-21 09/25/07 SOIL 1.0 ppb	**GP-47(10-15)** Y4618-14 09/25/07 SOIL 1.0 ppb	**GP-48A(10-15)** Y4618-22 09/25/07 SOIL 1.0 ppb	**GP-49(0-5)** Y4618-15 09/25/07 SOIL 1.0 ppb	**GP-50(8.5-10)** Y4618-16 09/25/07 SOIL 1.0 ppb	**GP-51(15-20)** Y4618-17 09/25/07 SOIL 1.0 ppb	**GP-52(0-5)** Y4618-18 09/25/07 SOIL 1.0 ppb	**GP-53(9-10)** Y4618-19 09/25/07 SOIL 1.0 ppb	**GP-54(15-20)** Y4618-23 09/25/07 SOIL 1.0 ppb	**GP-55(5-7.5)** Y4665-02 09/26/07 SOIL 1.0 ppb	**GP-56(5-10)** Y4665-05 09/26/07 SOIL 1.0 ppb	**GP-57(14-15)** Y4665-03 09/26/07 SOIL 1.0 ppb	**GP-57(18.5-19.5)** Y4665-04 09/26/07 SOIL 1.0 ppb
Volatile Organic Compounds																				
Chloroethane	N/A	N/A	1,900	N/A	12 U	22 U	41	7.1 J	15 U	14 U	12 U	12 U	11 U	11 U	12 U	12 U	12 U	12 U	14 U	11 U
Acetone	50	50	200	N/A	150	500	150	300	470	60 J	61 U	310	16 J	54 U	47 J	190	58 U	61 U	70 U	57 U
Carbon Disulfide	N/A	N/A	2,700	N/A	5.4 J	19 J	17	8.0 J	7.5 J	9.0 J	12 U	12 U	11 U	11 U	12 U	8.6 J	12 U	12 U	14 U	11 U
Methylene Chloride	50	50	100	N/A	12 U	22 U	12 U	2.8 J	15 U	2.4 J	12 U	12 U	11 U	11 U	12 U	1.7 J	12 U	12 U	14 U	11 U
Cyclohexane	N/A	N/A	N/A	N/A	2.4 J	22 U	12 U	12 U	15 U	14 U	12 U	12 U	11 U	11 U	12 U	12 U	12 U	12 U	14 U	11 U
2-Butanone (MEK)	120	120	300	N/A	34 J	110 J	25 J	34 J	59 J	11 J	61 U	80	55 U	54 U	59 U	27 J	58 U	61 U	70 U	57 U
cis-1,2-Dichloroethene	250	250	N/A	N/A	12 U	22 U	12 U	12 U	15 U	2.1 J	12 U	12 U	11 U	11 U	12 U	12 U	12 U	12 U	14 U	11 U
Methylcyclohexane	N/A	N/A	N/A	N/A	16	8.7 J	16	11 J	28	14 U	12 U	12 U	11 U	11 U	12 U	11 J	12 U	12 U	14 U	11 U
Benzene	60	60	60	N/A	3.9 J	22 J	12 U	5.7 J	2.4 J	14 U	12 U	12 U	11 U	11 U	12 U	2.9 J	12 U	12 U	14 U	11 U
4-Methyl-2-Pentanone	N/A	N/A	1,000	N/A	60 U	110 U	61 U	58 U	77 U	70 U	61 U	67	55 U	54 U	59 U	61 U	58 U	61 U	70 U	57 U
Toluene	700	700	1,500	N/A	2.8 J	8.3 J	12 U	99	18	7.2 J	250 E	29	11 U	11 U	12 U	2.1 J	12 U	12 U	14 U	11 U
Tetrachloroethene	1,300	1,300	1,400	N/A	12 U	22 U	12 U	12 U	15 U	2.8 J	4.6 J	12 U	3.8 J	11 U	12 U	12 U	1.2 J	9.7 J	14 U	11 U
Chlorobenzene	1,100	1,100	1,700	N/A	18	4.1 J	3.1 J	440 E	11 J	5.5 J	6.0 J	2.9 J	11 U	11 U	3.8 J	52	12 U	12 U	4.7 J	11 U
Ethyl Benzene	1,000	1,000	5,500	N/A	4.1 J	22 U	12 U	11 J	84	14 U	12 U	12 U	11 U	11 U	12 U	1.3 J	12 U	12 U	14 U	11 U
m/p-Xylenes	1600*	260*	1,200*	N/A	21	4.7 J	4.4 J	44	300	6.5 J	3.6 J	12 U	11 U	11 U	18	6.3 J	12 U	12 U	14 U	11 U
o-Xylene	1600*	260*	1,200*	N/A	10 J	22 U	3.2 J	34	55	2.9 J	1.8 J	12 U	11 U	11 U	21	10 J	12 U	12 U	14 U	11 U
Isopropylbenzene	N/A	N/A	N/A	N/A	19	14 J	45	33	360 E	1.6 J	12 U	11 J	11 U	11 U	3.8 J	37	12 U	12 U	7.3 J	11 U
1,3-Dichlorobenzene	2,400	2,400	1,600	N/A	1.4 J	22 U	12 U	12 U	15 U	14 U	12 U	12 U	11 U	11 U	57	12 U	12 U	12 U	14 U	11 U
1,4-Dichlorobenzene	1,800	1,800	8,500	N/A	12	3.6 J	5.1 J	13	15 U	3.2 J	12 U	12 U	11 U	11 U	53	26	12 U	1.8 J	4.0 J	11 U
1,2-Dichlorobenzene	1,100	1,100	7,900	N/A	12	22 U	4.7 J	2.9 J	26	14 U	12 U	12 U	11 U	11 U	1.8 J	3.4 J	12 U	12 U	1.5 J	11 U
Total TICs				N/A	357	454	371	364	566	681	0	555	0	0	500	990	0	61	390	0
Semi-Volatile Organic Compounds																				
Phenol	330	330	30 or MDL	N/A	2,000 U	NR	NR	1,900 U	NR	**270 J**	NR	NR	NR	NR	NR	400 U	NR	400 U	NR	NR
3+4-Methylphenols	N/A	N/A	N/A	N/A	2,000 U	NR	NR	230 J	NR	2,300 U	NR	NR	NR	NR	NR	400 U	NR	400 U	NR	NR
Naphthalene	12,000	12,000	13,000	N/A	480 J	NR	NR	35,000 E	NR	2,300 U	NR	NR	NR	NR	NR	140 J	NR	400 U	NR	NR
2-Methylnaphthalene	N/A	N/A	36,400	N/A	380 J	NR	NR	14,000	NR	2,300 U	NR	NR	NR	NR	NR	120 J	NR	400 U	NR	NR
1,1-Biphenyl	N/A	N/A	N/A	N/A	2,000 U	NR	NR	1,900 J	NR	2,300 U	NR	NR	NR	NR	NR	400 U	NR	400 U	NR	NR
Acenaphthylene	107,000	100,000	41,000	N/A	410 J	NR	NR	1,000 J	NR	670 J	NR	NR	NR	NR	NR	400 U	NR	280 J	NR	NR
Acenaphthene	98,000	20,000	50,000	N/A	430 J	NR	NR	5,200	NR	2,300 U	NR	NR	NR	NR	NR	400 U	NR	400 U	NR	NR
Dibenzofuran	N/A	N/A	6,200	N/A	420 J	NR	NR	3,100	NR	2,300 U	NR	NR	NR	NR	NR	400 U	NR	400 U	NR	NR
Fluorene	386,000	30,000	50,000	N/A	770 J	NR	NR	2,600	NR	460 J	NR	NR	NR	NR	NR	47 J	NR	60 J	NR	NR
Phenanthrene	1,000,000	100,000	50,000	N/A	9,600	NR	NR	12,000	NR	5,400	NR	NR	NR	NR	NR	280 J	NR	630	NR	NR
Anthracene	1,000,000	100,000	50,000	N/A	910 J	NR	NR	1,900	NR	1,200 J	NR	NR	NR	NR	NR	51 J	NR	170 J	NR	NR
Carbazole	N/A	N/A	N/A	N/A	560 J	NR	NR	690 J	NR	380 J	NR	NR	NR	NR	NR	400 U	NR	400 U	NR	NR
Di-n-butylphthalate	N/A	N/A	8,100	N/A	870 J	NR	NR	220 J	NR	2,300 U	NR	NR	NR	NR	NR	1,200	NR	42 J	NR	NR
Fluoranthene	1,000,000	100,000	50,000	N/A	9,300	NR	NR	11,000	NR	9,500	NR	NR	NR	NR	NR	230 J	NR	1,500	NR	NR
Pyrene	1,000,000	100,000	50,000	N/A	8,000	NR	NR	11,000	NR	11,000	NR	NR	NR	NR	NR	200 J	NR	1,900	NR	NR
Benzo(a)anthracene	1,000	1,000	224 or MDL	N/A	3,800	NR	NR	5,300	NR	5,000	NR	NR	NR	NR	NR	89 J	NR	1,100	NR	NR
Chrysene	1,000	1,000	400	N/A	4,100	NR	NR	6,500	NR	5,800	NR	NR	NR	NR	NR	110 J	NR	1,300	NR	NR
bis(2-Ethylhexyl)phthalate	N/A	N/A	50,000	N/A	**330,000 E**	NR	NR	**920,000 E**	NR	**280,000 E**	NR	NR	NR	NR	NR	**120,000 E**	NR	2,500	NR	NR
Di-n-octyl phthalate	N/A	N/A	50,000	N/A	**500,000 E**	NR	NR	**600,000 E**	NR	**240,000 E**	NR	NR	NR	NR	NR	5,600 E	NR	400 U	NR	NR
Benzo(b)fluoranthene	1,700	800	1,100	N/A	5,000	NR	NR	7,800	NR	7,400	NR	NR	NR	NR	NR	94 J	NR	1,600	NR	NR
Benzo(k)fluoranthene	1,700	1,000	1,100	N/A	1,400 J	NR	NR	2,400	NR	2,700	NR	NR	NR	NR	NR	41 J	NR	460	NR	NR
Benzo(a)pyrene	22,000	1,000	61 or MLD	N/A	2,100	NR	NR	5,300	NR	5,400	NR	NR	NR	NR	NR	**75 J**	NR	**930**	NR	NR
Indeno(1,2,3-cd)pyrene	8,200	500	3200	N/A	1,000 J	NR	NR	2,400	NR	2,200 J	NR	NR	NR	NR	NR	400 U	NR	560	NR	NR
Dibenz(a,h)anthracene	1,000,000	330	14.1 or MDL	N/A	2,000 U	NR	NR	350 J	NR	**300 J**	NR	NR	NR	NR	NR	400 U	NR	**80 J**	NR	NR
Benzo(g,h,i)perylene	1,000,000	100,000	50,000	N/A	210 J	NR	NR	470 J	NR	370 J	NR	NR	NR	NR	NR	400 U	NR	92 J	NR	NR
Total TICs				N/A	180,600	NR	NR	11,500	NR	24,200	NR	NR	NR	NR	NR	44,510	NR	9,250	NR	NR

Notes
NYSDEC guidance states that Protection of Groundwater and Un-Restricted Use numerical criteria (Subpart 375) govern over older TAGM #4046 RSCO values.
Results in red exceed the Protection of Groundwater Standards
Results in blue exceed Un-Restricted Commercial Use Soil Cleanup Objectives
Results in bold exceed the TAGM Recommended Soil Cleanup Objective
Results in ***bold italics*** exceed both the TAGM Recommended Soil Cleanup Objective and Eastern USA Background
N/A - No criteria established.
Qualifiers
U - The compound was not detected at the indicated concentration.
J - Data indicates the presence of a compound that meets the identification criteria. The result is less than the quantitation limit but greater than zero. The concentration given is an approximate value.
E - For In-Organics (Metals) - indicates that the value reported is estimated due to the presence of interference in the QA/QC sample.
For Organics (VOCs, SVOCs, Pesticides, PCBS) - indicates the anlayte's concentration exceeds the calibrated range of the instrument for that specific analysis.
B - The analyte was found in the laboratory blank as well as the sample. This indicates possible laboratory contamination of the environmental sample.
P - For dual column analysis, the percent difference between the quantitated concentrations on the two columns is greater than 40%.
*- 6 NYCRR Subpart 375-6 and TAM 4046 criteria for m/p xylenes and o-xylenes represent total mixed xylenes.
NR - Not analyzed

City of Newburgh Landfill
NYSDEC Contract No. D004437
Site Characterization Report

Table 3-5
Supplemental Subsurface Soil Investigation
September 2007

Sample ID Lab Sample Number Sampling Date Matrix Dilution Factor Units	6 NYCRR Subpart 375-6 Protection of Groundwater (ppb)	6 NYCRR Subpart 375-6 Un-Restricted Use Soil Cleanup Objective (ppb)	TAGM 4046 Recommended Soil Cleanup Objective (ppb)	TAGM 4046 Eastern USA Background (ppm)	**GP-42(15-20)** Y4618-20 09/24/07 SOIL 1.0 ppb	**GP-44(14-15)** Y4618-12 09/24/07 SOIL 1.0 ppb	**GP-45(5-10)** Y4618-13 09/24/07 SOIL 1.0 ppb	**GP-46(7-9)** Y4618-21 09/25/07 SOIL 1.0 ppb	**GP-47(10-15)** Y4618-14 09/25/07 SOIL 1.0 ppb	**GP-48A(10-15)** Y4618-22 09/25/07 SOIL 1.0 ppb	**GP-49(0-5)** Y4618-15 09/25/07 SOIL 1.0 ppb	**GP-50(8.5-10)** Y4618-16 09/25/07 SOIL 1.0 ppb	**GP-51(15-20)** Y4618-17 09/25/07 SOIL 1.0 ppb	**GP-52(0-5)** Y4618-18 09/25/07 SOIL 1.0 ppb	**GP-53(9-10)** Y4618-19 09/25/07 SOIL 1.0 ppb	**GP-54(15-20)** Y4618-23 09/25/07 SOIL 1.0 ppb	**GP-55(5-7.5)** Y4665-02 09/26/07 SOIL 1.0 ppb	**GP-56(5-10)** Y4665-05 09/26/07 SOIL 1.0 ppb	**GP-57(14-15)** Y4665-03 09/26/07 SOIL 1.0 ppb	**GP-57(18.5-19.5)** Y4665-04 09/26/07 SOIL 1.0 ppb
Metals (mg/Kg)																				
Aluminum	N/A	N/A	SB	33,000	9,020	3,880	10,600	14,200	7,220	9,590	11,600	4,610	8,590	12,300	10,700	6,960	11,700	8,350	12,200	8,770
Antimony	N/A	N/A	SB	N/A	81.2	1.83 U	288	0.976 U	1.26 U	136	1.03 U	22.6	113	0.905 U	0.999 U	1.03 U	4.33	6.81	1.53 J	0.95 U
Arsenic	16	13	7.5 or SB	3 - 12	5.9	9.14	7.15	6.64	5.9	6.18	10	3.81	8.59	9.86	4.44	5.41	6.37	11.2	4.5	3.47
Barium	820	350	300 or SB	15 - 600	108	236	493	223	249	881	457	361	154	39.7	60	73.4	277	217	70.1	27.2
Beryllium	47	7.2	0.16 or SB	0 - 1.75	0.384	0.308	0.274	0.292	0.350	0.356	0.24	0.103 J	0.372	0.692	0.339	0.275	0.414	0.39	0.466	0.279
Cadmium	7.5	2.5	1 or SB	0.1 - 1	67.9	0.197 U	48.5	**1.49**	0.135 U	4.95	0.11 U	0.104 U	**1.84**	0.097 U	0.107 U	0.11 U	**2.03**	4.06	**2.31**	0.595
Calcium	N/A	N/A	SB	130 - 35,000	6,600	6,750	25,400	14,400	28,800	32,300	25,400	9,000	**54,400**	2,120	1,700	9,310	10,900	17,800	3,040	**52,200**
Chromium	19 (Hexavalent) NS (Trivalent)	1 (Hexavalent) 30 (Trivalent)	10 or SB	1.5 - 40	27.4	26.8	43.8	67.8	22.9	45.4	41.1	29.5	31.6	18.5	29.4	39.5	141	28.2	19.3	11.2
Cobalt	N/A	N/A	30 or SB	2.5 - 60	7.47	6.95	7.98	11.9	4.17	8.92	8.84	4.27	7.36	11.6	9.7	6.68	9.38	16.2	10.1	8.46
Copper	1,720	50	25 or SB	1 - 50	56.7	152	314	287	53.7	110	228	119	1,970	28.3	31.1	46.9	169	597	29.1	18.1
Cyanide	40	27	N/A	N/A	1.4	0.2	0.14	0.25	0.19	0.53	0.26	0.44	0.49	0.12	0.01	0.03	2.4	0.57	0.16	0.07
Iron	N/A	N/A	2,000 or SB	2,000 - 550,000	29,500	48,200	62,100	65,700	44,900	45,100	105,000	31,500	37,500	29,700	25,700	51,800	37,800	95,596.6	25,300	18,000
Lead	450	63	SB	200 - 500	217	891	499	373	1,110	455	904	158	431	22.3	104	178	404	303	61.1	13
Magnesium	N/A	N/A	SB	100 - 5,000	4,660	1,020	**8,510**	3,910	**12,700**	**9,770**	**5,900**	1,930	**20,900**	4,240	**14,500**	4,640	**5,200**	**5,970**	3,450	**37,000**
Manganese	2,000	1,600	SB	50 - 5,000	483	512	904	969	420	893	928	370	607	785	246	763	473	843	248	515
Mercury	0.73	0.18	0.1	0.001 - 0.2	11	2	15.6	**0.14**	0.98	4.2	0.21	**0.1**	0.28	0.03 U	0.03 U	0.44	1.8	0.36	0.47	0.03 U
Nickel	130	30	13 or SB	0.5 - 25	23	**27.1**	38	30.7	15	195	55	19	48	20.3	66	22	**29**	337	20.4	15.6
Potassium	N/A	N/A	SB	8,500 - 43,000	705	403	835	1,200	518	1030	797	292	810	706	771	481	686	802	708	865
Selenium	4	3.9	2 or SB	0.1 - 3.9	0.935 U	1.7 U	0.952 U	0.906 U	1.17 U	1.1 U	0.957 U	0.899 U	0.853 U	0.841 U	0.927 U	0.956 U	1.06	2	1.1 U	0.883 U
Silver	8	2	SB	N/A	0.204 U	0.371 U	0.208 U	0.197 U	0.256 U	0.24 U	0.209 U	0.196 U	0.186 U	0.183 U	0.202 U	0.208 U	5.33	0.646	0.24 U	0.192 U
Sodium	N/A	N/A	SB	6,000 - 8,000	1,130	784	1,280	3,210	401	269	660	450	389	159	149	257	222	312	505	408
Thallium	N/A	N/A	SB	N/A	1.68 U	3.06 U	1.71 U	1.630 U	2.11 U	1.98 U	2.760	1.61 U	1.53 U	1.51 U	1.66 U	1.72 U	1.62 U	1.71 U	1.98 U	1.58 U
Vanadium	N/A	N/A	150 or SB	1 - 300	21.2	17.5	13	12.9	13.6	24.9	16.4	4.83	14.6	30	14.8	9.97	17.7	13.2	19.7	13.7
Zinc	2,480	109	20 or SB	9 - 50	240	457	772	905	384	933	1,590	804	934	**51**	218	177	473	549	**101**	47.3
Pesticides/ PCBs																				
Heptachlor	380	N/A	100	N/A	2 U	NR	NR	2 U	NR	2.4 U	NR	NR	NR	NR	NR	4.3 P	NR	2.1 U	NR	NR
Aldrin	190	5	41	N/A	2 U	NR	NR	2 U	NR	4.1	NR	NR	NR	NR	NR	2.1 U	NR	2.1 U	NR	NR
Dieldrin	100	5	44	N/A	4 U	NR	NR	3.8 U	NR	7.7	NR	NR	NR	NR	NR	4 U	NR	4 U	NR	NR
Endrin	60	14	1,000	N/A	30	NR	NR	3.8 U	NR	4.6 U	NR	NR	NR	NR	NR	4 U	NR	4 U	NR	NR
Endosulfan II	102,000	2,400	900	N/A	6.6	NR	NR	68 E	NR	180 E	NR	NR	NR	NR	NR	4.7	NR	4 U	NR	NR

Notes
NYSDEC guidance states that Protection of Groundwater and Un-Restricted Use numerical criteria (Subpart 375) govern over older TAGM #4046 RSCO values.
Results in red exceed the Protection of Groundwater Standards
Results in blue exceed Un-Restricted Commercial Use Soil Cleanup Objectives
Results in bold exceed the TAGM Recommended Soil Cleanup Objective
Results in ***bold italics*** exceed both the TAGM Recommended Soil Cleanup Objective and Eastern USA Background
N/A - No criteria established.
Qualifiers
U - The compound was not detected at the indicated concentration.
J - Data indicates the presence of a compound that meets the identification criteria. The result is less than the quantitation limit but greater than zero. The concentration given is an approximate value.
E - For In-Organics (Metals) - indicates that the value reported is estimated due to the presence of interference in the QA/QC sample. For Organics (VOCs, SVOCs, Pesticides, PCBS) - indicates the anlayte's concentration exceeds the calibrated range of the instrument for that specific analysis.
B - The analyte was found in the laboratory blank as well as the sample. This indicates possible laboratory contamination of the environmental sample.
P - For dual column analysis, the percent difference between the quantitated concentrations on the two columns is greater than 40%.
NR - Not analyzed

City of Newburgh Landfill
NYSDEC Contract No. D004437
Site Characterization Report

Table 3-6
Gidneytown Creek Samples Analytical Results - Sediment
April 2007

Sample ID Lab Sample Number Sampling Date Matrix Dilution Factor Units	Human Health Bioaccumulation (ppb*)	Benthic Aquatic Life Acute Toxicity (ppb*)	Benthic Aquatic Life Chronic Toxicity (ppb*)	Wildlife Bioaccumulation (ppb*)	**GTC-1** Y2240-01 04/05/07 SEDIMENT 1.0 ppb	**GTC-2** Y2240-02 04/05/07 SEDIMENT 1.0 ppb	**GTC-3** Y2240-03 04/05/07 SEDIMENT 1.0 ppb	**GTC-4** Y2240-04 04/05/07 SEDIMENT 1.0 ppb	**GTC-5** Y2240-05 04/05/07 SEDIMENT 1.0 ppb	**GTC-6** Y2240-06 04/05/07 SEDIMENT 1.0 ppb	**GTC-7** Y2240-07 04/05/07 SEDIMENT 1.0 ppb	**GTC-D** Y2240-08 04/05/07 SEDIMENT 5.0 ppb	**GTC-8** Y2408-15 04/19/07 SEDIMENT 1.0 ppb
Volatile Organic Compound													
Acetone	N/A	N/A	N/A	N/A	74 U	87 U	110 U	85 U	86 U	80 U	53 J	86 U	81 U
Methylene Chloride	N/A	N/A	N/A	N/A	15 U	5.0 J	23 U	3.2 J	3.0 J	3.6 J	6.5 J	1.5 J	2.5 J
2-Butanone	N/A	N/A	N/A	N/A	74 U	87 U	110 U	85 U	86 U	80 U	21 J	86 U	81 U
Tetrachloroethene	800	N/A	N/A	N/A	15 U	17 U	23 U	2.0 J	17 U	16 U	20 U	1.6 J	16 U
Chlorobenzene	N/A	34,600	3,500.0	N/A	15 U	17 U	23 U	17 U	17 U	16 U	20 U	17 U	4.4 J
Ethyl Benzene	N/A	212,000 (FW) 58,000 (SW)	24,000 (FW) 6,400 (SW)	N/A	15 U	17 U	23 U	17 U	17 U	16 U	1.0 J	17 U	16 U
Total TICs	N/A	N/A	N/A	N/A	0	0	0	0	0	0	0	0	0
Semi-Volatile Organic Compound													
Benzaldehyde	N/A	N/A	N/A	N/A	54 U	63 U	81 U	64 J	62 U	58 U	70 U	310 U	540 U
Hexachloroethane	N/A	N/A	N/A	N/A	54 U	63 U	81 U	65 J	62 U	58 U	70 U	310 U	540 U
Phenanthrene	N/A	N/A	120,000 (FW) 160,000 (SW)	N/A	28 U	33 U	43 U	160 J	33 U	30 U	37 U	160 U	420 J
Anthracene	N/A	986,000	107,000	N/A	28 U	33 U	43 U	32 U	33 U	30 U	37 U	160 U	67 J
Di-n-butylphthalate	N/A	N/A	N/A	N/A	43 U	51 U	66 U	1,500	50 U	46 U	57 U	590 J	540 U
Fluoranthene	N/A	N/A	1,020,000 (FW) 1,340,000 (SW)	N/A	86 U	100 U	130 U	240 J	99 U	93 U	110 U	500 U	840
Pyrene	N/A	8,775,000	961,000	N/A	130 U	150 U	190 U	340 J	150 U	140 U	170 U	520 J	700
Butylbenzylphthalate	N/A	N/A	N/A	N/A	95 U	110 U	140 U	4,500	110 U	100 U	120 U	24,000 E	540 U
Benzo(a)anthracene	N/A	94,000	12,000	N/A	37 U	44 U	57 U	160 J	43 U	40 U	49 U	210 U	420 J
Chrysene	1,300 (FW) 700 (SW)	N/A	N/A	N/A	46 U	54 U	70 U	180 J	53 U	50 U	61 U	270 U	450 J
bis(2-Ethylhexyl)phthalate	N/A	N/A	199,500	N/A	24 U	28 U	36 U	1,300	27 U	26 U	31 U	7,800	140 J
Benzo(b)fluoranthene	1,300 (FW) 700 (SW)	N/A	N/A	N/A	77 U	91 U	120 U	300 J	89 U	83 U	100 U	450 U	450 J
Benzo(k)fluoranthene	1,300 (FW) 700 (SW)	N/A	N/A	N/A	120 U	140 U	190 U	100 J	140 U	130 U	160 U	700 U	190 J
Benzo(a)pyrene	1,300 (FW) 700 (SW)	N/A	N/A	N/A	27 U	31 U	41 U	190 J	31 U	29 U	35 U	150 U	190 J
Indeno(1,2,3-cd)pyrene	1,300 (FW) 700 (SW)	N/A	N/A	N/A	94 U	110 U	140 U	110 U	110 U	100 U	120 U	540 U	130 J
Total TICs	N/A	N/A	N/A	N/A	6,810	7,400	10,440	21,950	7,420	21,670	9,620	36,470	5040
Pesticides/PCBs													
gamma-BHC	N/A	N/A	N/A	N/A	2.5 U	3.0 U	77 U	2.9 U	2.9 U	2.7 U	3.3 U	58 U	2.8 J
Endosulfan II	N/A	N/A	N/A	N/A	4.9 U	5.8 U	150 U	230 EP	5.7 U	5.3 U	6.4 U	7500 E	5.4 U

Notes
*NYSDEC Technical Guidance for Screening Contaminated Sediments converted to ppb from µg/gOC, where 1 µg/gOC = 1000ppb.
NYSDEC Technical Guidance for Screening Contaminated Sediments present iron as a percentage
N/A - No criteria established.
FW - Fresh Water
SW - Salt Water
Qualifiers
U - The compound was not detected at the indicated concentration.
J - Data indicates the presence of a compound that meets the identification criteria. The result is less than the quantitation limit but greater than zero. The concentration given is an approximate value.
E - For In-Organics (Metals) - indicates that the value reported is estimated due to the presence of interference in the QA/QC sample.
For Organics (VOCs, SVOCs, Pesticides, PCBS) - indicates the anlayte's concentration exceeds the calibrated range of the instrument for that specific analysis.

City of Newburgh Landfill
NYSDEC Contract No. D004437
Site Characterization Report

Table 3-6
Gidneytown Creek Samples Analytical Results - Sediment
April 2007

Sample ID Lab Sample Number Sampling Date Matrix Dilution Factor Units	Technical Guidance for Screening Contaminated Sediments Severe Effect Level (ppm)	Technical Guidance for Screening Contaminated Sediments Lowest Effect Level (ppm)	**GTC-1** Y2240-01 04/05/07 SEDIMENT 1.0 ppm	**GTC-2** Y2240-02 04/05/07 SEDIMENT 1.0 ppm	**GTC-3** Y2240-03 04/05/07 SEDIMENT 1.0 ppm	**GTC-4** Y2240-04 04/05/07 SEDIMENT 1.0 ppm	**GTC-5** Y2240-05 04/05/07 SEDIMENT 1.0 ppm	**GTC-6** Y2240-06 04/05/07 SEDIMENT 1.0 ppm	**GTC-7** Y2240-07 04/05/07 SEDIMENT 1.0 ppm	**GTC-D** Y2240-08 04/05/07 SEDIMENT 5.0 ppm	**GTC-8** Y2408-15 04/19/07 SEDIMENT 1.0 ppm
Metals (ppm)											
Aluminum	N/A	N/A	12,700	15,900	9,960	9,170	11,600	11,400	9,360	8,100	6,180
Arsenic	33	6	1.7	1.26 J	3.47	3.85	7.11	4.11	2.03	4.58	3.34
Barium	N/A	N/A	95.6	152	178	119	82.1	68.8	64.3	93.5	74.9
Beryllium	N/A	N/A	0.566 J	0.609 J	0.603 J	0.442 J	0.483 J	0.514 J	0.424 J	0.402 J	0.319
Cadmium	9	0.6	0.126 J	0.592 J	1 J	1.33	0.829 J	0.379 J	0.291 J	1.47	0.464
Calcium	N/A	N/A	2,600	3,370	8,370	7,430	6,310	4,680	5,440	8,290	5,900
Chromium	N/A	N/A	15.6	18.3	15.2	24	19.9	16.3	14.4	20.7	11.5
Cobalt	N/A	N/A	6.82 J	7.4 J	8.5 J	8.87	11.9	8.49	9.49 J	8.29 J	5.78
Copper	110	16	13	22.8	35.2	92.3	63.4	29.4	28.4	86.1	20.9
Cyanide	N/A	N/A	NA	NA	NA	NA	NA	NA	NA	NA	0.36 J
Iron	4%	2%	17,100	35,200	32,600	20,600	25,400	19,400	19,900	18,900	13,600
Lead	N/A	N/A	15.9	32.2	21.3	255	125	41.7	36.9	236	30.7
Magnesium	N/A	N/A	3,160	4,370	43,500	4,320	5,590	4,590	4,480	4,480	3,320
Manganese	1100	460	1,420	342	543	422	475	408	413	377	1,630
Mercury	1.3	0.15	0.11 J	0.2	0.16 J	0.15 J	0.17 J	0.16 J	2.2	0.18 J	0.04 J
Nickel	50	16	15.4	20.9	22	33.1	31.3	22	25.2	33.2	12.7
Potassium	N/A	N/A	694 J	1,150	1,520	1,390	987	1,250	692 J	1,000	743
Silver	2.2	1	3.03	7.2	5.93	4.31	5	3.6	4.3	4.15	5.24
Sodium	N/A	N/A	196 J	350 J	681 J	284 J	368 J	402 J	378 J	219 J	212
Vanadium	N/A	N/A	17.5	29.8	20.4	28.4	27.7	23.1	23.2	26.2	13.9
Zinc	270	120	66.7	155	130	188	193	106	104	181	120

Notes
NYSDEC Technical Guidance for Screening Contaminated Sediments expressed in (µg/gOC).
NYSDEC Technical Guidance for Screening Contaminated Sediments present iron as a percentage
Results in blue exceed Lowest Effect Level.
Results in red exceed the Severe Effect Level
N/A - No criteria established.

Qualifiers
U - The compound was not detected at the indicated concentration.
J - Data indicates the presence of a compound that meets the identification criteria. The result is less than the quantitation limit but greater than zero. The concentration given is an approximate value.
E - For In-Organics (Metals) - indicates that the value reported is estimated due to the presence of interference in the QA/QC sample. For Organics (VOCs, SVOCs, Pesticides, PCBS) - indicates the anlayte's concentration exceeds the calibrated range of the instrument for that specific analysis.

City of Newburgh Landfill
NYSDEC Contract No. D004437
Site Characterization Report

Table 3-7
Gidneytown Creek Samples Analytical Results - Surface Water
April 2007

Sample ID Lab Sample Number Sampling Date Matrix Dilution Factor Units	NYSDEC Division of Water TOGS 1.1.1. (ug/L)	NYS Groundwater Effluent Limitations (Class GA)[1] (ug/L)	**GTC-1** Y2238-01 04/05/07 SURFACE WATER 1.0 ug/L	**GTC-2** Y2238-02 04/05/07 SURFACE WATER 1.0 ug/L	**GTC-3** Y2238-03 04/05/07 SURFACE WATER 1.0 ug/L	**GTC-4** Y2238-04 04/05/07 SURFACE WATER 1.0 ug/L	**GTC-5** Y2238-05 04/05/07 SURFACE WATER 1.0 ug/L	**GTC-6** Y2238-06 4/5/2007 SURFACE WATER 1.0 ug/L	**GTC-7** Y2238-07 04/05/07 SURFACE WATER 1.0 ug/L	**GTC-D** Y2238-08 04/05/07 SURFACE WATER 1.0 ug/L	**GTC-8** Y2408-14 04/19/07 SURFACE WATER 1.0 ug/L	**TB** Y2238-09 04/05/07 BLANK 1.0 ug/L
Volatile Organic Compounds												
Methyl Tert-Butyl Ether	N/A	10	0.50 U	0.50 U	0.87	0.50 U	0.50 U	0.50 U	0.50 U	0.29 J	0.50 U	0.50 U
Methylene Chloride	5	5	0.50 U	0.73 B	0.50 U	1.1 B	0.41 JB	0.94 B	0.81	0.50 U	0.50 U	0.30 JB
Toluene	5	N/A	0.50 U	0.32 J	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Total TICs	N/A	N/A	0	0	0	0	0	0	0	0	0	0
Semi-Volatile Organic Compounds												
Hexachlorocyclopentadiene	5	N/A	10 J	10 J	10 J	10 J	10 J	10 J	10 J	10 J	10 U	NR
bis(2-Ethylhexyl)phthalate	5	5	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	3.2 J	NR
Total TICs	N/A	N/A	3.1	0	6.1	4.7	4.7	3.2	0	0	120	NR
Metals												
Aluminum	100	2,000	69.6 J	**189 J**	**251**	63.4 J	78.6 J	48.6 U	200 U	67.5 J	**667**	NR
Barium	1,000	2,000	200 U	43 J	148 J	76.9 J	94.8 J	91.7 J	76.4 J	98.2 J	21.5 J	NR
Calcium	N/A	N/A	22,500	31,100	69,500	107,000	101,000	98,100	103,000	103,000	20,200	NR
Cobalt	5	N/A	50 U	50 U	1.39 J	50 U	50 U	1.57 J	50 U	50 U	50 U	NR
Copper	200	1,000	12.5 J	16 J	11.3 J	8.77 J	8.18 J	8.23 J	8.15 J	11.4 J	15.2 J	NR
Cyanide	200	400	2.2 J	3 J	10 U	3.1 J	2.8 J	1.9 J	3.5 J	5 J	2 J	NR
Iron	300	600**	185	**774**	**3,360**	**423**	**966**	**815**	**558**	**808**	**1,210**	NR
Lead	50	50	10.000 U	10 U	10.000 U	10.000 U	10.000 U	10.000 U	10.000 U	10.000 U	6.35 J	NR
Magnesium	35,000	N/A	3050 J	7,150	18,300	25,300	24,400	23,700	24,200	25,000	3,470 J	NR
Manganese	300	600	61.4 J	243 J	**480 J**	206 J	290 J	**321 J**	261 J	**344 J**	250	NR
Mercury	0.7	1.4	0.2 U	0.02 J	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	NR
Potassium	N/A	N/A	780 J	2,420 J	9,220	6,640	7,440	7,610	6,280	7,930	851 J	NR
Sodium	N/A	N/A	24,100 J	51,600 J	119,000 J	241,000 J	212,000	190,000 J	227,000 J	202,000 J	19500	NR
Vanadium	14	N/A	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	1.63 J	NR
Zinc	2,000	5,000	105	114	68.8	55.4 J	68.2	75.9	63.9	64.2	64.6	NR
Pesticides/PCBs												
gamma-Chlordane	0.05*•	N/A	**0.051 J**	0.051 U	0.047 J	**0.051 J**	0.051 U	**0.051 J**	**0.051 J**	**0.051 J**	0.052 U	NR

Notes

[1] NYSDEC TOGS 1.1.1 (June 1998): Ambient Water Quality Standards and Guidance Values and Effluent Standards (Class GA Groundwater Standards)

[1] NYSDEC TOGS 1.1.1 (June 1998): Ambient Water Quality Standards and Guidance Values and Effluent Standards (Class Water Class A,A-S,AA, AA-S Source of Drinking Water - Surface Water)

Results in **bold** exceed Class A,AS,AA,AA-S Surface water criteria.

Results is ***bold italics*** exceed Groundwater Water Effluent Limitations

**TOGS criteria for Chlrodane.

N/A - No criteria established.

Qualifiers

U - The compound was not detected at the indicated concentration.

J - Data indicates the presence of a compound that meets the identification criteria. The result is less than the quantitation limit but greater than zero. The concentration given is an approximate value.

E - For In-Organics (Metals) - indicates that the value reported is estimated due to the presence of interference in the QA/QC sample. For Organics (VOCs, SVOCs, Pesticides, PCBS) - indicates the anlayte's concentration exceeds the calibrated range of the instrument for that specific analysis.

B - The analyte was found in the laboratory blank as well as the sample. This indicates possible laboratory contamination of the environmental sample.

D - The reported value is from a secondary analysis with a dilution factor. The original analysis exceeded the calibration range.

P - For dual column analysis, the percent difference between the quantitated concentrations on the two columns is greater than 40%.

* - For dual column analysis, the lowest quantitated concentration is being reported due to coeluting interference.

NR - Not analyzed

City of Newburgh Landfill
NYSDEC Contract No. D004437
Site Characterization Report

Table 3-8
Groundwater Analytical Results
April 2007, September 2007, April 2008

Sample ID	NYS Groundwater Effluent Limitations[1]	NYSDEC Ambient Water Quality Standards or Guidance	MW-1			MW-2			MW-3			MW-4			MW-5				MW-6		
Sampling Date			04/19/07	09/25/07	4/30/08	04/19/07	09/25/07	4/30/08	04/19/07	09/25/07	4/30/08	04/19/07	09/25/07	4/30/08	04/19/07	04/19/07	09/25/07	4/30/08	04/19/07	09/25/07	4/30/08
Matrix			WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
Dilution Factor			1.0	1.0	1.0	1.0	1	1	1.0	1.0	1.0	1.0	1.0	1	2.0	10 DL	1.0	1	1.0	1.0	1
Units	(ug/)		ug/L	ug/L	ug/L	ug/L	ug/l	ug/l	ug/L	ug/L	ug/L	ug/L	ug/L	ug/l	ug/L	ug/L	ug/L	ug/l	ug/L	ug/L	ug/l
VOC																					
Benzene	1	1	0.50 U	NR	NR	0.50 U	NR	0.29 U	0.50 U	NR	NR	0.50 J	0.50 U	0.29 U	**5.7**	**5.1 D**	0.54	**5.30**	**1.9**	**2.7**	**2.6 J**
trans-1,3-Dichloropropene	0.4	0.4	0.50 U	NR	NR	0.50 U	NR	0.12 U	0.50 U	NR	NR	**0.50 J**	0.50 U	0.12 U	1.0 U	5.0 U	0.50 U	0.12 U	0.50 U	0.50 U	0.12 U
cis-1,3-Dichloropropene	0.4	0.4	0.50 U	NR	NR	0.50 U	NR	0.26 U	0.50 U	NR	NR	**0.50 J**	0.50 U	0.26 U	1.0 U	5.0 U	0.50 U	0.26 U	0.50 U	0.50 U	0.26 U
Chlorobenzene	5	5	3.7 J	NR	NR	**12 J**	NR	**8.5**	0.50 U	NR	NR	2.4 J	**5.8**	**20.00**	**120 E**	**120 D**	**6.6**	**82.00**	**17 J**	**21**	**23**
1,4-Dichlorobenzene	5	3	**4.0**	NR	NR	1.3	NR	0.24 U	0.50 U	NR	NR	1.8 J	1.1	**3.10 J**	**6.4**	**5.5 D**	0.63	**7.70**	**4.1**	**4.0**	**4.9 J**
SVOC																					
Chrysene	0.002	0.002	10 U	NR	NR	10 U	NR	0.61 U	**1.7 J**	NR	NR	11 U	10 U	0.61 U	10 U	10 U	10 U	0.61 U	10 U	10 U	0.63 U
bis(2-Ethylhexyl)phthalate	5	5	4.3 J	NR	NR	3.6 J	NR	0.55 U	**22**	NR	NR	**5.7 J**	4.6 J	3.2	10 U	1.1 J	1.3 J	0.55 U	**9.0 J**	**8.7 J**	**6.4**
Benzo(b)fluoranthene	0.002	0.002	10 U	NR	NR	10 U	NR	0.6 U	**1.5 J**	NR	NR	11 U	10 U	0.6 U	10 U	10 U	10 U	0.6 U	10 U	10 U	0.62 U
Benzo(a)pyrene	0.002	0.002	10 U	NR	NR	10 U	NR	0.47 U	1.1 J	NR	NR	11 U	10 U	0.47 U	10 U	10 U	10 U	0.47 U	10 U	10 U	0.48 U
Metals																					
Aluminum	2000	100	66.8 J	NR	NR	**796**	NR	**807**	49.2 J	NR	NR	67.1 J	NR	**353**	**148 J**	NR	NR	45.8 U	**2,800**	NR	**2,470**
Antimony	6	3	60 U	NR	NR	60 U	NR	NR	**395**	NR	NR	60 U	NR	6.8 U	60 U	NR	NR	6.8 U	60 U	NR	6.8 U
Iron	600	300	**6,170**	NR	NR	**6,830**	NR	NR	**2,180**	NR	NR	**17,000**	NR	**59,200**	**36,100**	NR	NR	**60,900**	**48,900**	NR	**44,400**
Lead	50	25	10 U	NR	NR	10 U	NR	NR	24.6	NR	NR	10 U	NR	4.6 U	3.98 J	NR	NR	4.6 U	**81.3**	NR	**71.7**
Magnesium	35,000	35,000	**81,400**	NR	NR	**70,100**	NR	NR	**116,000**	NR	NR	11,900	NR	**43,400**	26,000	NR	NR	**36,500**	**45,700**	NR	**47,000**
Manganese	600	300	**951**	NR	NR	179	NR	NR	**378**	NR	NR	**1,120**	NR	**652**	**480**	NR	NR	**719**	**764**	NR	**513**
Nickel	200	100	10 J	NR	NR	14.4 J	NR	NR	**225**	NR	NR	40 U	NR	4.7 U	40 U	NR	NR	4.7 U	9.05 J	NR	9.64 J
Selenium	20	10	35 U	NR	NR	35 U	NR	NR	35 U	NR	NR	35 U	NR	5 U	35 U	NR	NR	5 U	35 U	NR	5 U
Silver	100	50	10 U	NR	NR	10 U	NR	NR	10 U	NR	NR	10 U	NR	0.7 U	10 U	NR	NR	0.7 U	10 U	NR	0.7 U
Sodium	NA	20,000	17,900	NR	NR	**84,100**	NR	NR	**49,000**	NR	NR	17,100	NR	**130,000**	**77,100**	NR	NR	**203,000**	16,200	NR	**37,900**
Pesticides/PCBs																					
gamma-BHC	NA	NA	0.054 U	NR	NR	0.052 U	NR	NR	0.062	NR	NR	0.052 U	NR	0.0031 U	0.052 U	NR	NR	0.0031 U	0.052 U	NR	0.0031 U
4,4-DDE	0.2	0.2	0.11 U	NR	NR	0.10 U	NR	NR	**0.11**	NR	NR	0.10 U	NR	0.0034 U	0.10 U	NR	NR	0.0034 U	0.10 U	NR	0.0034 U
4,4-DDD	0.3	0.3	0.11 U	NR	NR	0.10 U	NR	NR	**0.69**	NR	NR	0.10 U	NR	0.0033 U	0.10 U	NR	NR	0.0033 U	0.10 U	NR	0.0033 U
4,4-DDT	0.2	0.2	0.11 U	NR	NR	0.10 U	NR	NR	**1.1**	NR	NR	0.10 U	NR	0.0033 U	0.10 U	NR	NR	0.0033 U	0.10 U	NR	0.0033 U
Endrin	NA	NA	0.11 U	NR	NR	0.10 U	NR	NR	0.17	NR	NR	0.10 U	NR	0.0038 U	0.10 U	NR	NR	0.0038 U	0.10 U	NR	0.0038 U
gamma-Chlordane	NA	NA	0.054 J	NR	NR	0.052 U	NR	NR	0.052 U	NR	NR	0.052 U	NR	0.0033 U	0.052 U	NR	NR	0.0033 U	0.052 U	NR	0.0033 U

Qualifiers

U- The compound was not detected at the indicated concentration.
J - Data indicates the presence of a compound that meets the identification criteria.
The result is less than the quantitation limit but greater than zero. The concentration given is an approximate value.
B - The analyte was found in the laboratory blank as well as the sample. This indicates possible sample.
laboratory contamination of the environmental
NR- Not analyzed
NA- Not available

[1] *- NYSDEC TOGS 1.1.1 (June 1998): Ambient Water Quality Standards and Guidance Values. Table 1*
Results in bold indicate an exceedance of Department criteria.
This summary table lists only those compounds detected in at least one sample.

City of Newburgh Landfill
NYSDEC Contract No. D004437
Site Characterization Report

Table 3-8
Groundwater Analytical Results
April 2007, September 2007, April 2008

Sample ID	NYS Groundwater Effluent Limitations[1] (ug/)	NYSDEC Ambient Water Quality Standards or Guidance	MW-7			MW-8			MW-9			MW-D			FB		TB	
Sampling Date			04/19/07	09/25/07	4/30/08	04/19/07	09/25/07	4/30/08	04/19/07	09/25/07	4/30/08	04/19/07	09/25/07	4/30/08	09/25/07	4/30/08	09/25/07	04/19/07
Matrix			WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
Dilution Factor			1.0	1.0	1	1.0	1.0	1	1.0	1.0	1	1.0	1.0	1	1.0	1	1.0	1.0
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	ug/L	ug/l	ug/L	ug/L
VOC																		
Benzene	1	1	0.50 U	0.50 U	0.29 U	0.50 U	0.50 U	0.29 U	0.50 U	0.50 U	0.29 U	0.50 J	0.50 U	0.29 U	0.50 U	0.29 U	0.50 U	0.50 U
trans-1,3-Dichloropropene	0.4	0.4	0.50 U	0.50 U	0.12 U	0.50 U	0.50 U	0.12 U	0.50 U	0.50 U	0.12 U	**0.50 J**	0.50 U	0.12 U	0.50 U	0.12 U	0.50 U	0.50 U
cis-1,3-Dichloropropene	0.4	0.4	0.50 U	0.50 U	0.26 U	0.50 U	0.50 U	0.26 U	0.50 U	0.50 U	0.26 U	**0.50 J**	0.50 U	0.26 U	0.50 U	0.26 U	0.50 U	0.50 U
Chlorobenzene	5	5	0.50 U	0.50 U	0.32 U	0.50 U	0.50 U	0.32 U	0.50 U	1.0	0.32 U	**8.1 J**	0.95	0.32 U	0.50 U	0.32 U	0.98	0.50 U
1,4-Dichlorobenzene	5	3	0.50 U	0.50 U	0.24 U	0.50 U	0.50 U	0.24 U	0.50 U	0.50 U	0.24 U	1.1 J	0.50 U	0.24 U	0.50 U	0.24 U	0.50 U	0.50 U
SVOC																		
Chrysene	0.002	0.002	10 U	10 U	0.61 U	10 U	NR	0.61 U	10 U	10 U	0.61 U	10 U	10 U	0.61 U	10 U	0.61 U	NR	NR
bis(2-Ethylhexyl)phthalate	5	5	2.0 J	10 U	0.55 U	3.1 J	NR	0.55 U	2.6 J	10 U	0.55 U	3.6 J	10 U	0.55 U	10 U	0.55 U	NR	NR
Benzo(b)fluoranthene	0.002	0.002	10 U	10 U	0.6 U	10 U	NR	0.6 U	10 U	10 U	0.6 U	10 U	10 U	0.60 U	10 U	0.6 U	NR	NR
Benzo(a)pyrene	0.002	0.002	10 U	10 U	0.47 U	10 U	NR	0.47 U	10 U	10 U	0.47 U	10 U	10 U	0.47 U	10 U	0.47 U	NR	NR
Metals																		
Aluminum	2000	100	**2,900**	NR	**11,000**	**242**	NR	**9,670**	**202**	NR	**9,180**	69.9	NR	**4,650**	NR	45.8 U	NR	NR
Antimony	6	3	60 U	NR	6.8 U	60 U	NR	6.8 U	60 U	NR	6.8 U	**60**	NR	6.8 U	NR	6.8 U	NR	NR
Iron	600	300	**5,640**	NR	**26,200**	277	NR	**23,200**	**409**	NR	**20,100**	**6,000**	NR	**10,100**	NR	37 U	NR	NR
Lead	50	25	3.11 J	NR	20.4	10 U	NR	**27.5**	10 U	NR	20.1	10	NR	9.39 J	NR	4.6 U	NR	NR
Magnesium	35,000	35,000	**39,400**	NR	26,600	**36,900**	NR	**35,400**	7570	NR	11,800	**60,100**	NR	10,700	NR	60.5 U	NR	NR
Manganese	600	300	**607**	NR	**1,170**	**4,570**	NR	**2,450**	132	NR	**522**	125	NR	**348**	NR	1.4 U	NR	NR
Nickel	200	100	9.37 J	NR	24.6 J	6.75 J	NR	26.8 J	40 U	NR	18.5 J	11.7	NR	11.3 J	NR	4.7 U	NR	NR
Selenium	20	10	35 U	NR	5 U	35 U	NR	5 U	35 U	NR	5 U	**35**	NR	5 U	NR	5 U	NR	NR
Silver	100	50	10 U	NR	0.7 U	10 U	NR	0.7 U	10 U	NR	0.7 U	10	NR	0.7 U	NR	0.7 U	NR	NR
Sodium	NA	20,000	14,300	NR	8,190	**23,800**	NR	16,700	**61,900**	NR	**177,000**	**92,900**	NR	**177,000**	NR	463 U	NR	NR
Pesticides/PCBs																		
gamma-BHC	NA	NA	0.052 U	NR	0.0031 U	0.050 U	NR	0.0031 U	0.052 U	NR	0.0031 U	0.053 U	NR	0.0031 U	NR	0.0031 U	NR	NR
4,4-DDE	0.2	0.2	0.10 U	NR	0.0034 U	0.10 U	NR	0.0034 U	0.10 U	NR	0.0034 U	0.11 U	NR	0.0034 U	NR	0.0034 U	NR	NR
4,4-DDD	0.3	0.3	0.10 U	NR	0.0033 U	0.10 U	NR	0.0033 U	0.10 U	NR	0.0033 U	0.11 U	NR	0.0033 U	NR	0.0033 U	NR	NR
4,4-DDT	0.2	0.2	0.10 U	NR	0.0033 U	0.10 U	NR	0.0033 U	0.10 U	NR	0.0033 U	0.11 U	NR	0.0033 U	NR	0.0033 U	NR	NR
Endrin	NA	NA	0.10 U	NR	0.0038 U	0.10 U	NR	0.0038 U	0.10 U	NR	0.0038 U	0.11 U	NR	0.0038 U	NR	0.0038 U	NR	NR
gamma-Chlordane	NA	NA	0.052 U	NR	0.0033 U	0.050 U	NR	0.0033 U	0.052 U	NR	0.0033 U	0.053 U	NR	0.0033 U	NR	0.0033 U	NR	NR

Qualifiers
U- The compound was not detected at the indicated concentration.
J - Data indicates the presence of a compound that meets the identification criteria.
The result is less than the quantitation limit but greater than zero. The concentration given is an approximate value.
B - The analyte was found in the laboratory blank as well as the sample. This indicates possible sample.
laboratory contamination of the environmental
NR- Not analyzed
NA- Not available

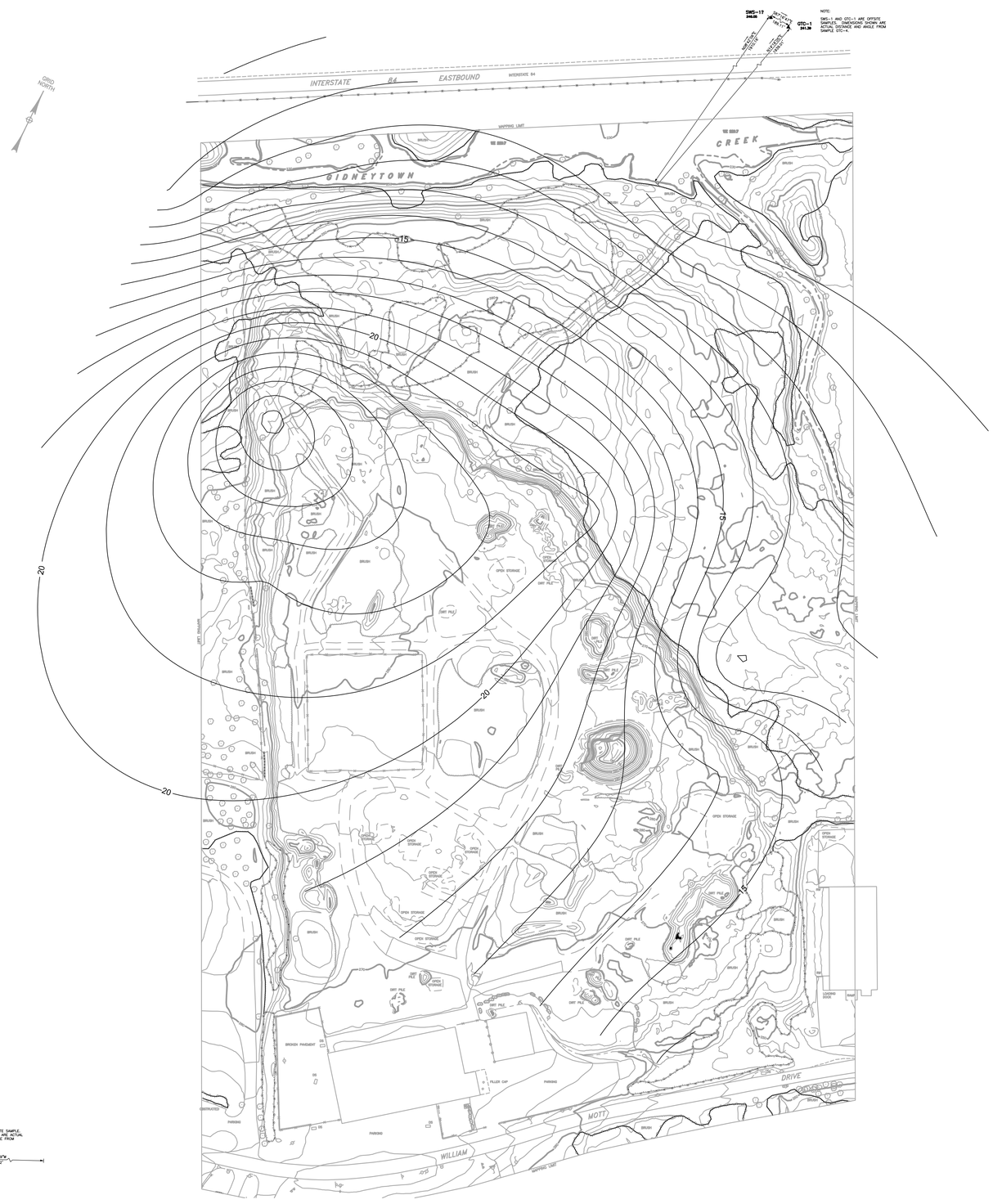
[1] *- NYSDEC TOGS 1.1.1 (June 1998): Ambient Water Quality Standards and Guidance Values. Table 1*
Results in bold indicate an exceedance of Department criteria.
This summary table lists only those compounds detected in at least one sample.

APPENDIX B
Figures

Aerial Source: Google Earth, Image © 2007 New York GIS

Figure 1-1
Site Location Map
City of Newburgh Landfill
88 Pierces Road, Newburgh, NJ

CDM



REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY:
DRAWN BY:
SHEET CHK'D BY:
CROSS CHK'D BY:
APPROVED BY:
DATE: JANUARY 2008

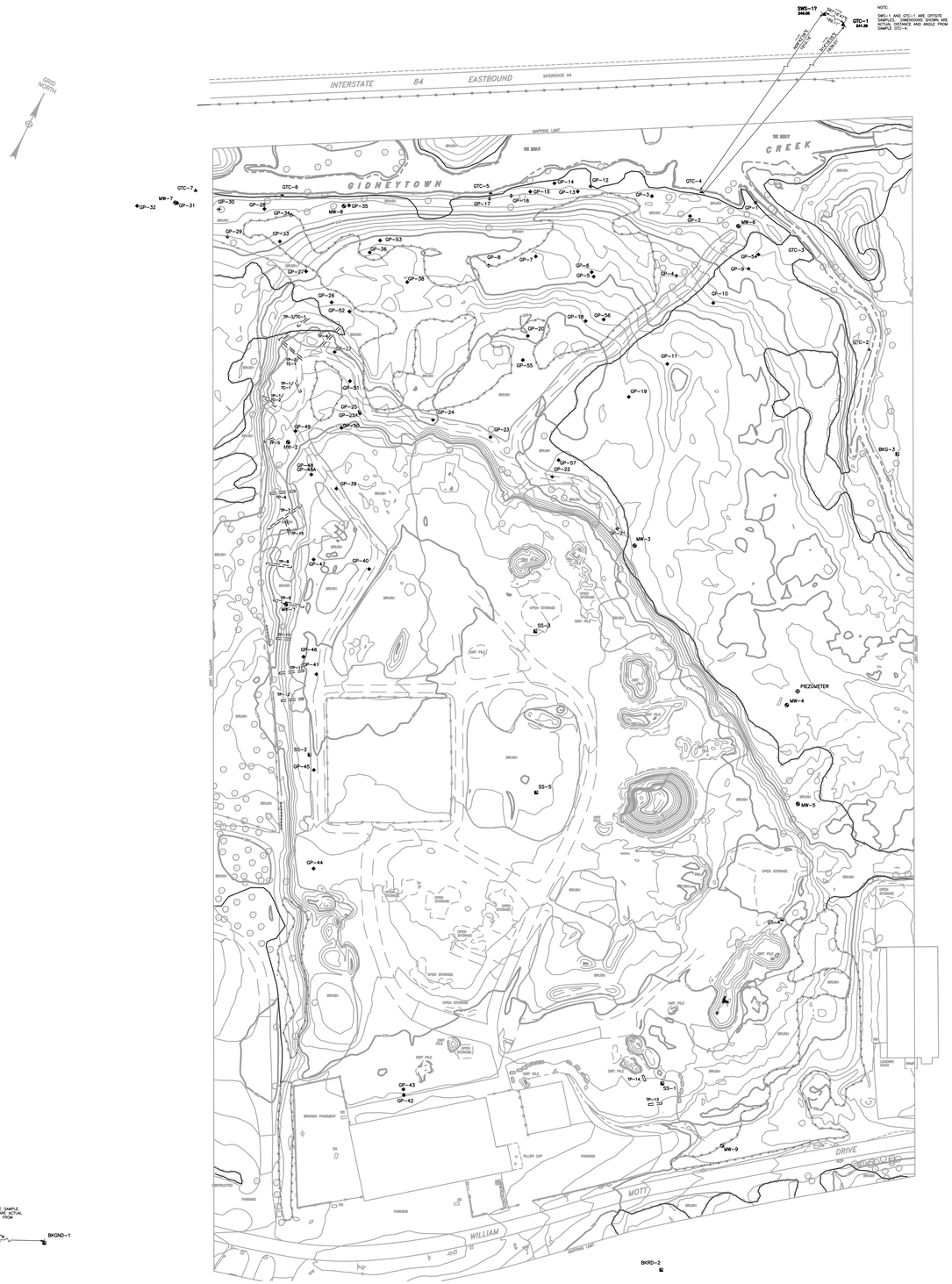
CDM
Camp Dresser & McKee Inc.
Raritan Plaza I, Raritan Center
Edison, NJ 08818
Tel: (732) 225-7000
consulting • engineering • construction • operations

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

NYSDEC SITE No. 336063
CONTRACT No. D-004437
CITY OF NEWBURGH LANDFILL SITE CHARACTERIZATION

FIGURE 1-2
GROUNDWATER CONTOURS

PROJECT NO.
FILE NAME:
SHEET NO.



NOTE:
GTC-9 IS AN OFFSITE SAMPLE. DIMENSIONS SHOWN ARE ACTUAL DISTANCE AND ANGLE FROM SAMPLE BKGND-1.

S65°18'35"W
1190.02'

GTC-9
318.19

BKGND-1

REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY:
DRAWN BY:
SHEET CHK'D BY:
CROSS CHK'D BY:
APPROVED BY:
DATE: JANUARY 2008

CDM
Camp Dresser & McKee Inc.
Raritan Plaza I, Raritan Center
Edison, NJ 08818
Tel: (732) 225-7000
consulting • engineering • construction • operations

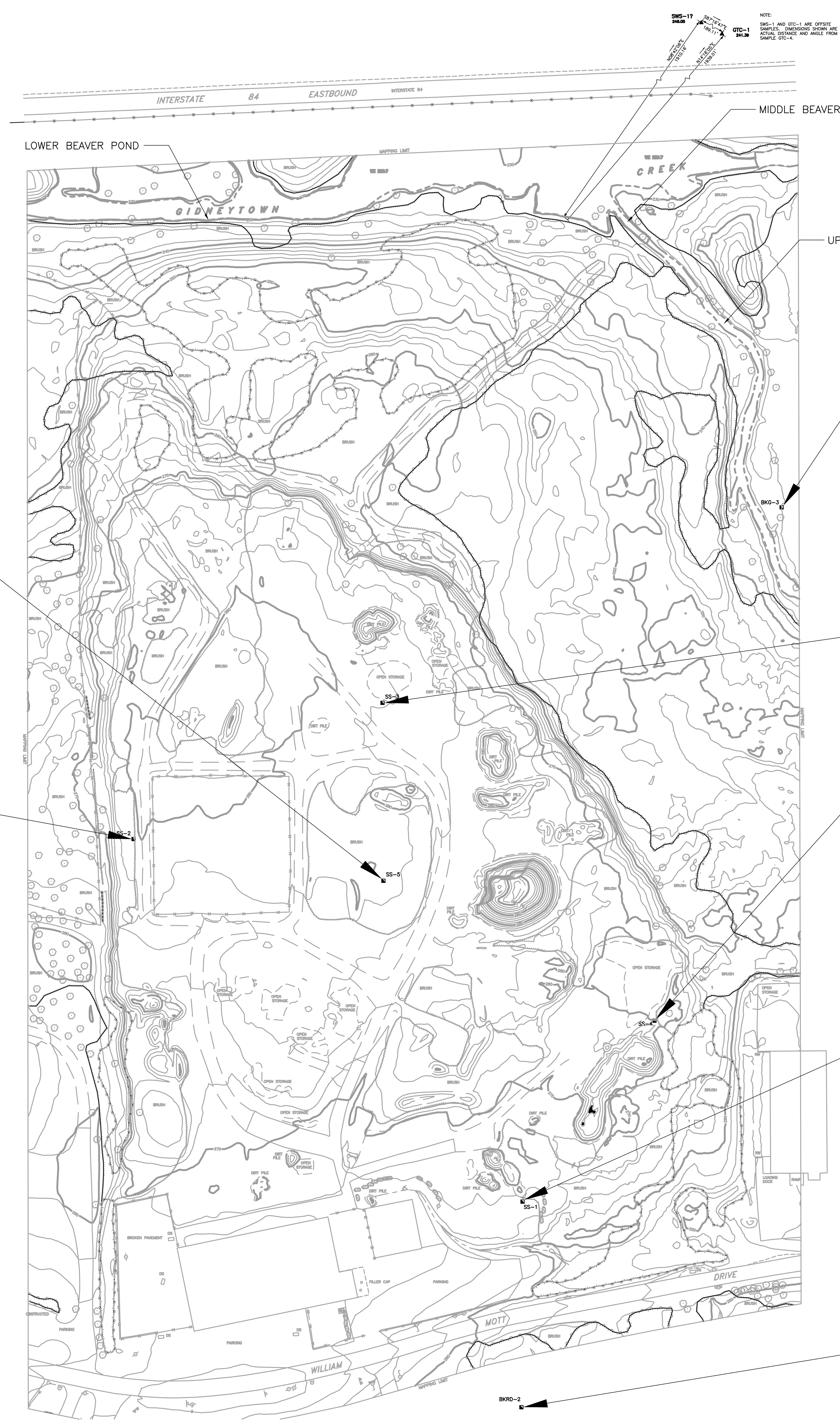
NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

NYSDEC SITE No. 336063
CONTRACT No. D-004437
CITY OF NEWBURGH LANDFILL SITE CHARACTERIZATION

FIGURE 2-1
SAMPLE LOCATIONS

PROJECT NO.
FILE NAME:
SHEET NO.

Filename: \\Wbysvr01\cad2\0897\54580\FIGS\FIG_3-1.dwg   Xref's: [NBLFBDR, XWPPL001,]   Plotted by: LARSONEJ   Time: 3/19/2008 3:16:05 PM



SS-5	
SVOC	
Benzo(a)anthracene	3900 J
Chrysene	3600 J
Benzo(b)fluoranthene	6,300
Benzo(k)fluoranthene	1600 J
Benzo(a)pyrene	3600 J
Indeno(1,2,3-cd)pyrene	1800 J
Metals	
Beryllium	0.517 J
Chromium	18.3
Copper	40.9
Iron	22,600
Lead	118
Magnesium	*10,800*
Mercury	0.48 J
Nickel	*26.7*
Silver	4.69
Zinc	177

SS-2	
SVOC	
Benzo(a)anthracene	4,200
Chrysene	3700 J
Benzo(b)fluoranthene	6800 J
Benzo(k)fluoranthene	2000 J
Benzo(a)pyrene	3700 J
Indeno(1,2,3-cd)pyrene	1700 J
Metals	
Beryllium	0.526 J
Chromium	35
Iron	25,500
Magnesium	*6,670*
Nickel	*26.6*
Silver	5.56
Zinc	*87.5*

BKG-1	
SVOC	
Benzo(a)anthracene	870
Chrysene	1,100
Benzo(b)fluoranthene	1,400
Benzo(a)pyrene	840
Indeno(1,2,3-cd)pyrene	560 J
Metals	
Beryllium	0.669 J
Chromium	15.2
Iron	16,700
Mercury	0.47 J
Nickel	20.5
Silver	10.5
Zinc	*94.4*

BKG-3	
Metals	
Beryllium	0.499 J
Chromium	15.8
Iron	22,200
Mercury	0.11 J
Nickel	22.3
Silver	4.84
Zinc	*92.5*

SS-3	
SVOC	
Benzo(a)anthracene	3700 J
Chrysene	3300 J
Benzo(b)fluoranthene	6,500
Benzo(k)fluoranthene	1,600 J
Benzo(a)pyrene	3,800
Indeno(1,2,3-cd)pyrene	1700 J
Metals	
Beryllium	0.507 J
Chromium	19
Copper	51.3
Iron	24,500
Lead	90.7
Magnesium	*8,450*
Mercury	0.16 J
Nickel	30.8
Silver	4.49
Zinc	223

SS-4	
SVOC	
Benzo(a)anthracene	2100 J
Chrysene	2100 J
Benzo(b)fluoranthene	2800 J
Benzo(k)fluoranthene	1100 J
Benzo(a)pyrene	2100 J
Indeno(1,2,3-cd)pyrene	1200 J
Metals	
Beryllium	0.531 J
Chromium	24.9
Copper	47.6
Iron	24,100
Magnesium	*7,210*
Mercury	0.45 J
Nickel	*26.7*
Silver	6.48
Zinc	132

SS-1	
SVOC	
Benzo(a)anthracene	820 J
Benzo(b)fluoranthene	1600 J
Benzo(a)pyrene	900 J
Metals	
Beryllium	0.56 J
Chromium	20.4
Copper	*73.5*
Iron	25,200
Magnesium	*11,900*
Mercury	0.19 J
Nickel	*26*
Silver	5.57
Zinc	*183*

BKG-2	
SVOC	
Benzo(a)anthracene	640
Chrysene	630
Benzo(b)fluoranthene	1,100
Benzo(a)pyrene	630
Metals	
Beryllium	0.469 J
Calcium	*39,400*
Chromium	12.2
Iron	14,200
Magnesium	*21,300*
Mercury	0.19 J
Nickel	*30*
Silver	7.87
Zinc	*111*

	6 NYCRR Subpart 375-6 Restricted Commercial Use Soil Cleanup Objective (ppb)	6 NYCRR Subpart 375-6 Un-Restricted Use Cleanup Objective (ppb)	TAGM 4046 Recommended Soil Cleanup Objective (ppb)	TAGM 4046 Eastern USA Background (ppm)
SVOC				
Benzo(a)anthracene	5,600	1,000	224 or MDL	N/A
Chrysene	56,000	1,000	400	N/A
Benzo(b)fluoranthene	5,600	1,000	1,100	N/A
Benzo(k)fluoranthene	56,000	800	1,100	N/A
Benzo(a)pyrene	1,000	1,000	61 or MDL	N/A
Indeno(1,2,3-cd)pyrene	5,600	500	3,200	N/A
Metals				
Beryllium	590	7.2	0.16 or SB	0-1.75
Calcium	–	–	SB	130-35,000
Chromium	400 (IV) 1,500 (III)	1 (IV) 30 (III)	10 or SB	1.5-40
Copper	270	50	25 or SB	1-50
Lead	1,000	63	SB	4-500
Iron	N/A	N/A	2,000 or SB	2,000-550,000
Magnesium	N/A	N/A	SB	100-5,000
Manganese	10,000	1,600	SB	50-5,000
Mercury	2.8	0.18	0.1	N/A
Nickel	310	30	13 or SB	0.5-25
Silver	1,500	2	SB	N/A
Zinc	10,000	109	20 or SB	9-50

Notes:
Results in red exceed the Restricted Commercial Use Soil Cleanup Objectives
Results in blue exceed Un-Restricted Use Soil Cleanup Objectives
Results in bold exceed the TAGM Recommended Soil Cleanup Objective
Results in italics exceed the TAGM Recommended Soil Cleanup Objective and Eastern USA Background
Metals are reported in ppm; VOCs, SVOCs, Pesticides/PCBs are reported in ppb.

REV. NO.	DATE	DRWN	CHKD	REMARKS

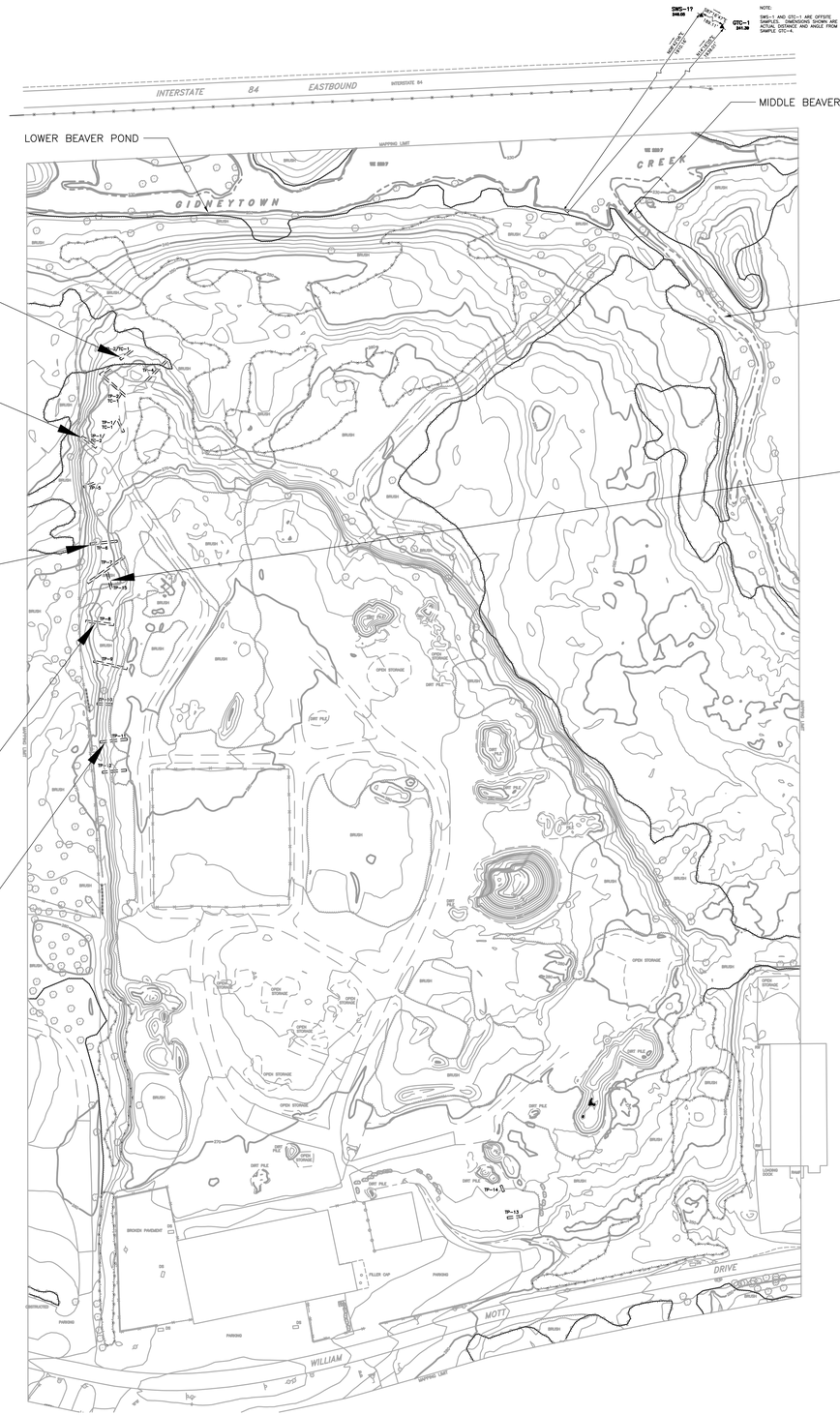
DESIGNED BY:
DRAWN BY:
SHEET CHK'D BY:
CROSS CHK'D BY:
APPROVED BY:
DATE: JANUARY 2008

CDM
Camp Dresser & McKee Inc.
Raritan Plaza I, Raritan Center
Edison, NJ 08818
Tel: (732) 225-7000
consulting • engineering • construction • operations

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
NYSDEC SITE No. 336063
CONTRACT No. D-004437
CITY OF NEWBURGH LANDFILL SITE CHARACTERIZATION

FIGURE 3-1
BACKGROUND SAMPLE & SURFACE SOIL RESULTS

PROJECT NO.
FILE NAME:
SHEET NO.



TC–1–TP–3 DRUM CONTENTS	
1/23/2007	
Metals	
Lead	26.2 E
Selenium	2.08

TC–1–TP–2 DRUM CONTENTS	
1/22/2007	
Metals	
Chromium	16.4 E
Lead	19,800 E
Mercury	0.53

TC–1–TP–2 SOIL MATRIX	
Metals	
Arsenic	5.5
Cadmium	1.92
Chromium	42.3 E
Lead	849 E
Selenium	2.14

TP–6 SOIL MATRIX	
1/23/2007	
Metals	
Arsenic	5.61
Cadmium	1.05
Chromium	23.6 E
Lead	340 E
Mercury	1.8
Selenium	2.4

TP–6 ORANGE WASTE	
Metals	
Lead	17.5
Mercury	1.4
Pesticides/ PCBs	
Aroclor–1242	10,000 E

TP–8 DRUM CONTENTS	
1/24/2007	
Metals	
Barium	421
Cadmium	348
Chromium	9.21 E
Lead	181 E
Mercury	0.36

TP–11 DRUM CONTENTS	
No Exceedances	

NOTE:
GTC–9 IS AN OFFSITE SAMPLE. BEARINGS AND DISTANCES ARE ACTUAL DISTANCE AND ANGLE FROM SAMPLE BKGND–1.

S65°18'36"W
1729.02'
GTC–9
318.19

TP15A SOIL MATRIX	
11/12/08	
VOC	
Toluene	51,000,000 E
Chlorobenzene	10,000,000 E
Ethyl Benzene	260,000
m/p–Xylenes	240,000
SVOC	
Diethylphthalate	30,000
Di–n–butylphthalate	30,000
bis(2–Ethylhexyl)phthalate	280,000 E
Di–n–octyl phthalate	20,000
Metals	
Cadmium	8.95
Lead	643
Silver	11.2
Zinc	12,777.64 D

TP15A WASTE	
No Exceedances	

TP15B SOIL MATRIX	
11/12/08	
VOC	
Toluene	710,000 E
Tetrachloroethene	11,000
Chlorobenzene	320,000 E
SVOC	
Diethylphthalate	37,000
Di–n–butylphthalate	36,000
Chrysene	2,200 J
bis(2–Ethylhexyl)phthalate	470,000 E
Di–n–octyl phthalate	36,000
Metals	
Cadmium	10.9
Lead	1,010
Mercury	0.723
Silver	8.37
Zinc	11,118.49 D

TP15B WASTE	
No Exceedances	

TP15C SOIL MATRIX	
11/12/08	
Metals	
Lead	1,060

	6 NYCRR Subpart 371.3 Characteristics of Hazardous Waste (mg/L)	6 NYCRR Subpart 375–6 Restricted Commercial Use Soil Cleanup Objective (ppb)	6 NYCRR Subpart 375–6 Un–Restricted Use Cleanup Objective (ppb)	TAGM 4046 Recommended Soil Cleanup Objectives (ppb)	TAGM 4046 Eastern USA Background (ppm)
Metals					
Arsenic	5	16	13	7.5 or SB	3–12
Barium	100	400	350	300 or SB	15–600
Cadmium	1	9.3	2.5	1 or SB	0.1–1
Chromium	5	400 (IV) 1,500 (III)	1 (IV) 30 (III)	10 or SB	1.5–40
Copper	N/A	270	50	25 or SB	1–50
Lead	5	1,000	63	SB	4–500
Mercury	0.2	2.80	0.18	0.1	
Selenium	1	1,500	3.9	2 or SB	0.1–3.9
Silver	5	1,500	2	SB	9–50
Zinc	N/A	10,000	109	20 or SB	9–50
Pesticides/ PCBs					
Aroclor–1242	N/A	1,000	100	N/A	N/A
Volatile Organics					
Chlorobenzene	100	100,000	700	1,500	N/A
Ethyl Benzene	N/A	30,000	1,000	5,500	N/A
m/p–Xylenes	N/A	100,000	700	1500	N/A
Toluene	N/A	100,000	700	1,500	NA
Tetrachloroethene	0.7	5,500	1,300	1,400	NA
Semivolatile Organics					
Diethylphthalate	N/A	NA	NA	7,100	NA
Di–n–butylphthalate	N/A	NA	NA	8,100	NA
Chrysene	N/A	1,000	1,000	400	NA
bis(2–Ethylhexyl)phthalate	N/A	NA	NA	50,000	NA
Di–n–octyl phthalate	N/A	NA	NA	8,100	NA

Notes:
Metals are reported in ppm.
Only TCLP VOA and metals analysis was only run on drum samples collected during the January 2007 investigation.
Metals results should be compared to 6 NYCRR Subpart 371.3 Characteristics of Hazardous Waste.
Other paramters should be comparec to NYCRR Subpart 375–6 and TAGM 4046 RSCO.
Only results of the initial sample analysis are provided for the 2008 supplement investigation, refer to Table 3–2B for the results of diluted samples.

REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY:
DRAWN BY:
SHEET CHK'D BY:
CROSS CHK'D BY:
APPROVED BY:
DATE: JANUARY 2008

CDM
Camp Dresser & McKee Inc.
Raritan Plaza I, Raritan Center
Edison, NJ 08818
Tel: (732) 225-7000
consulting • engineering • construction • operations

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
NYSDEC SITE No. 336063
CONTRACT No. D-004437
CITY OF NEWBURGH LANDFILL SITE CHARACTERIZATION

FIGURE 3-2
TEST PIT & DRUM INVESTIGATION RESULTS

PROJECT NO.
FILE NAME:
SHEET NO.

I:\08971.54580\FIGS\ FIG_3-2 03/31/09 09:26 larsonej XREFS: NBLFBDR, XWPPL001

GP16(3–3.5)	
Metals	
Arsenic	17.2
Barium	361
Beryllium	0.375
Cadmium	3.97
Chromium	80
Copper	270
Iron	121,000
Lead	2520
Magnesium	*5,710*
Mercury	4.9
Nickel	75.6
Selenium	3.71
Silver	267
Zinc	1,290
PCBs	
Aroclor–1260	230

GP17(4–5)	
Metals	
Arsenic	20.3
Barium	35.4
Cadmium	0.244
Chromium	12.6
Iron	39,400
Nickel	15.9
Selenium	2.05
Zinc	33.2

GP–53(9–10)	
Metals	
Chromium	29.4
Lead	104
Magnesium	14,500
Nickel	66
Zinc	218

GP–36(12–13)	
Metals	
Cadmium	8.79
Chromium	18.5
Copper	35.9
Iron	39,600
Magnesium	*5,250*
Nickel	22.8
Selenium	2.06
Zinc	300

GP–52(0–5)	
Metals	
Zinc	51

GP–37(11–12)	
Metals	
Arsenic	22.2
Barium	532
Cadmium	18.4
Chromium	38.3
Copper	498
Iron	104,000
Lead	365
Mercury	0.22
Nickel	37.1
Selenium	6.13
Zinc	2,720

GP–38(12–13)	
Metals	
Cadmium	11.5
Calcium	*54,900*
Chromium	15.7
Copper	68.2
Iron	36,000
Lead	311
Magnesium	*26,700*
Manganese	1,710
Mercury	0.74
Nickel	19.8
Zinc	9,870

GP–50(8.5–10)	
VOC	
Acetone	310
Metals	
Barium	361
Chromium	29.5
Copper	119
Lead	158
Mercury	0.1
Zinc	804

GP–49(0–5)	
Metals	
Barium	457
Chromium	41.1
Copper	228
Lead	904
Magnesium	5,900
Mercury	0.21
Nickel	55
Zinc	1,590

GP–48A(10–15)	
VOC	
Acetone	60 J
SVOC	
Phenol	270 J
Benzo(a)anthracene	5,000
Chrysene	5,800
bis(2–Ethylhexyl)phthalate	280000 E
Di–n–octyl phthalate	240000 E
Benzo(b)fluoranthene	7,400
Benzo(k)fluoranthene	2,700
Benzo(a)pyrene	5,400
Indeno(1,2,3–cd)pyrene	2200 J
Dibenz(a,h)anthracene	300 J
Pesticides/ PCBs	
Dieldrin	7.7
Metals	
Barium	881
Cadmium	4.95
Chromium	45.4
Copper	110
Lead	455
Magnesium	9,770
Mercury	4.2
Nickel	195
Zinc	933

GP–47(10–15)	
VOC	
Acetone	470
m/p–Xylenes	300
Metals	
Chromium	22.9
Copper	53.7
Lead	1,110
Magnesium	12,700
Mercury	0.98
Zinc	384

GP–46(7–9)	
VOC	
Acetone	300
SVOC	
Naphthalene	35000 E
Benzo(a)anthracene	5,300
Chrysene	6,500
bis(2–Ethylhexyl)phthalate	920000 E
Di–n–octyl phthalate	600000 E
Benzo(b)fluoranthene	7,800
Benzo(k)fluoranthene	2,400
Benzo(a)pyrene	5,300
Indeno(1,2,3–cd)pyrene	2,400
Dibenz(a,h)anthracene	350 J
Metals	
Cadmium	1.49
Chromium	67.8
Copper	287
Lead	373
Mercury	0.14
Nickel	30.7
Zinc	905

GP–44(14–15)	
VOC	
Acetone	500
Metals	
Chromium	26.8
Copper	152
Lead	891
Mercury	2
Nickel	27.1
Zinc	457

GP–45(5–10)	
VOC	
Acetone	150
Metals	
Barium	493
Cadmium	48.5
Chromium	43.8
Copper	314
Lead	499
Magnesium	8,510
Mercury	15.6
Nickel	38
Zinc	772

GP–1–(9.0–9.5)	
VOC (TCLP)	
Vinyl Chloride	*0.61 E*

GP18(6–6.5)	
METALS	
Barium	409
Beryllium	0.247
Cadmium	3.57
Chromium	86.5
Copper	204
Iron	78,300
Lead	478
Magnesium	*5,940*
Mercury	1.5
Nickel	76
Zinc	1,270

GP–9–(6.5–7.0)	
Metals	
Arsenic	11.3
Beryllium	0.167 J
Cadmium	4.4
Chromium	60.1
Copper	140
Iron	96,500
Lead	430
Mercury	1.7
Nickel	43.8
Selenium	5.46
Silver	2.79
Zinc	700
PCBs	
Aroclor–1260	290J

GP–9A–(9.5–10.0)	
Metals	
Arsenic	8.09
Beryllium	0.437
Cadmium	1.79
Chromium	21.2
Copper	36.3
Iron	67,900
Lead	256
Magnesium	*13,100*
Mercury	0.18
Nickel	21.4
Selenium	3.49
Zinc	212

GP–54(15–20)	
VOC	
Acetone	190
SVOC	
bis(2–Ethylhexyl)phthalate	120000 E
Benzo(a)pyrene	75 J
Metals	
Chromium	39.5
Lead	178
Mercury	0.44
Zinc	177

GP–56(5–10)	
SVOC	
Benzo(a)anthracene	1,100
Chrysene	1,300
Benzo(b)fluoranthene	1,600
Benzo(a)pyrene	930
Indeno(1,2,3–cd)pyrene	560
Dibenz(a,h)anthracene	80 J
Metals	
Cadmium	4.06
Chromium	28.2
Copper	597
Lead	303
Magnesium	5,970
Mercury	0.36
Nickel	337
Zinc	549

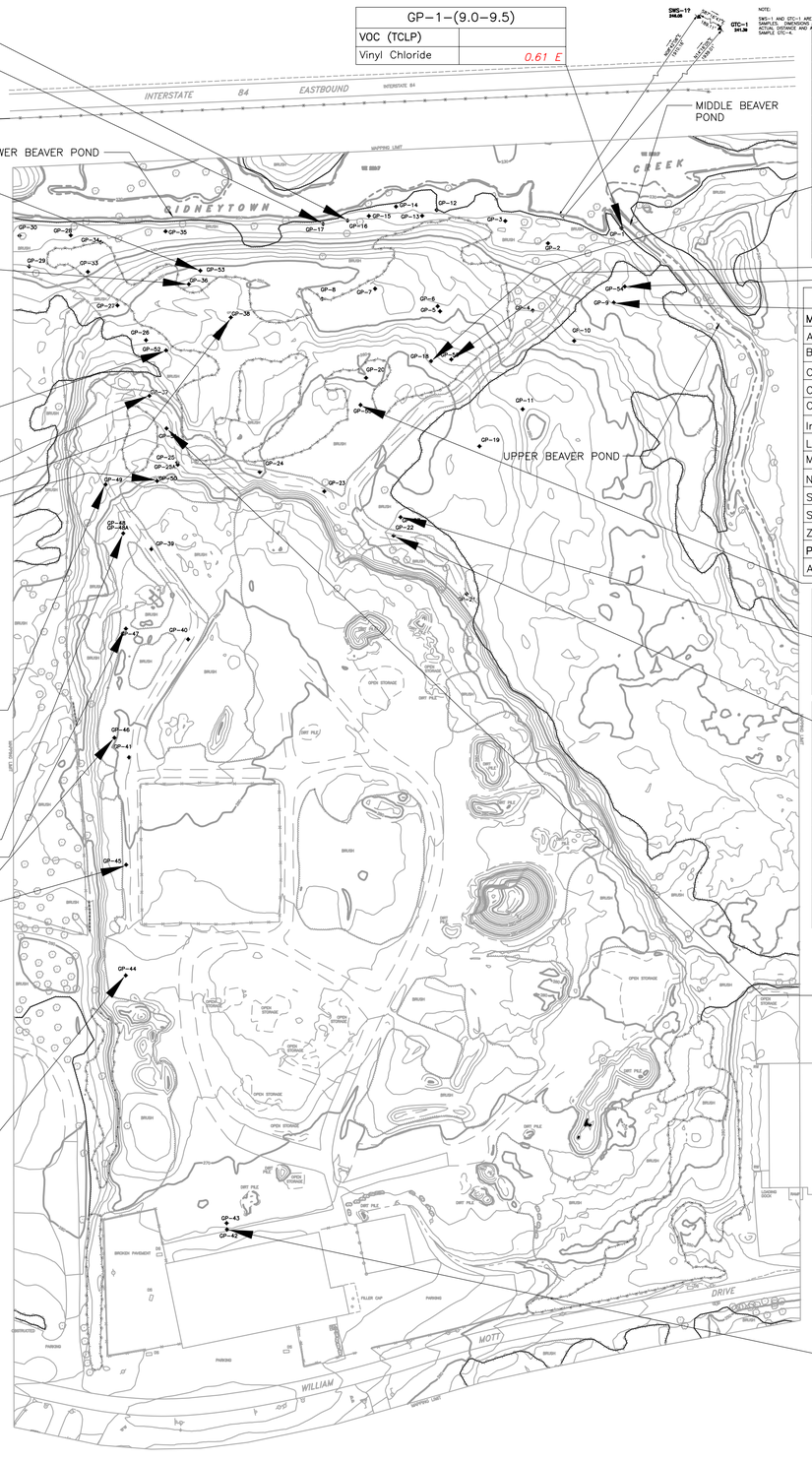
GP–55(5–7.5)	
Metals	
Cadmium	2.03
Chromium	141
Copper	169
Lead	404
Magnesium	5,200
Mercury	1.8
Nickel	29
Silver	5.33
Zinc	473

GP–57(14–15)		GP–57(18.5–19.5)	
Metals		**Metals**	
Cadmium	2.31	Calcium	52,200
Chromium	19.3	Magnesium	37,000
Mercury	0.47		
Zinc	101		

GP22(9.5–10)	
METALS	
Barium	1970
Cadmium	7.35
Calcium	*41,400*
Chromium	42.3
Copper	44
Iron	38,800
Lead	444
Magnesium	*18,800*
Mercury	1.7
Nickel	16.2
Zinc	684

GP–51(15–20)	
Metals	
Cadmium	1.84
Calcium	54,400
Chromium	31.6
Copper	1,970
Lead	431
Magnesium	20,900
Mercury	0.28
Nickel	48
Zinc	934

GP–42(15–20)	
VOC	
Acetone	150
SVOC	
Benzo(a)anthracene	3,800
Chrysene	4,100
bis(2–Ethylhexyl)phthalate	330000 E
Di–n–octyl phthalate	500000 E
Benzo(b)fluoranthene	5,000
Benzo(k)fluoranthene	1400 J
Benzo(a)pyrene	2,100
Indeno(1,2,3–cd)pyrene	1000 J
Pesticides/ PCBs	
Endrin	30
Metals	
Cadmium	67.9
Chromium	27.4
Copper	56.7
Lead	217
Mercury	11
Zinc	240



NOTE: SWS-1 AND GTC-1 ARE OFFSITE SAMPLES. DIMENSIONS SHOWN ARE ACTUAL DISTANCE AND ANGLE FROM SAMPLE GTC-1.

NOTE: GTC-9 IS AN OFFSITE SAMPLE. DIMENSIONS SHOWN ARE ACTUAL DISTANCE AND ANGLE FROM SAMPLE SWMG-1.

S65°18'36"W
1190.02'
GTC-9
216.19

Notes:
Results in red exceed the Protection of Groundwater Criteria
Results in blue exceed Un–Restricted Use Soil Cleanup Objectives
Results in bold exceed the TAGM Recommended Soil Cleanup Objective
Results in italics exceed the TAGM Recommended Soil Cleanup Objective and Eastern USA Background
Result in red italics exceeds 6 NYCRR subpart 371.3 Characteristics of Hazardous Waste.
TCLP VOA analysis was only run on subsurface samples collected during the January–February 2007 characterization activities
Metals are reported in ppm; VOCs, SVOCs, Pesticides/PCBs are reported in ppb

	6 NYCRR Subpart 375–6 Protection of Groundwater (ppb)	6 NYCRR Subpart 375–6 Un–Restricted Use Soil Cleanup Objective (ppb)	TAGM 4046 Recommended Soil Cleanup Objective (ppb)	TAGM 4046 Eastern USA Background (ppm)	6 NYCRR Subpart 371.3 Characteristics of Hazardous Waste (mg/L)
VOCs					
Vinyl Chloride	20	20	200	N/A	0.2
Acetone	50	50	200	N/A	N/A
m/p–Xylenes	1600	260*	1200*	N/A	N/A
SVOCs					
Phenol	330	330	30 or MDL	N/A	N/A
Naphthalene	12,000	12,000	13,000	N/A	N/A
Benzo(a)anthracene	1,000	1000	224 or MDL	N/A	N/A
Chrysene	1,000	1000	400	N/A	N/A
bis(2–Ethylhexyl)phthalate	N/A	N/A	50000	N/A	N/A
Di–n–octyl phthalate	N/A	N/A	50000	N/A	N/A
Benzo(b)fluoranthene	1,700	800	1100	N/A	N/A
Benzo(k)fluoranthene	1,700	1000	1100	N/A	N/A
Benzo(a)pyrene	22,000	1000	61 or MDL	N/A	N/A
Indeno(1,2,3–cd)pyrene	8,200	500	3200	N/A	N/A
Dibenz(a,h)anthracene	1,000,000	330	14.1 or MDL	N/A	N/A
Pesticides/ PCBs					
Dieldrin	100	5	44	N/A	N/A
Endrin	60	14	1000	N/A	0.02
Aroclor–1248	1,000	1,000	100	N/A	N/A
Aroclor–1260	1,000	1,000	100	N/A	N/A
Metals					
Arsenic	16	13	7.5 or SB	3 – 12	5
Barium	820	350	300 or SB	15 – 600	100
Beryllium	47	7.2	0.16 or SB	0 – 1.75	N/A
Cadmium	7.5	2.5	1 or SB	0.1 – 1	1
Calcium	N/A	N/A	SB	130 – 35,000	1
Chromium	19 (IV) NS (III)	1 (IV) 30 (III)	10 or SB	1.5 – 40	5
Copper	1720	50	25 or SB	1 – 50	N/A
Iron	N/A	N/A	2,000 or SB	2,000 – 550,000	N/A
Lead	450	63	SB	200 – 500	5
Magnesium	N/A	N/A	SB	100 – 5,000	N/A
Manganese	2,000	1,600	SB	50 – 5,000	N/A
Mercury	0.73	0.18	0.1	0.001 – 0.2	0.2
Nickel	130	30	13 or SB	0.5 – 25	N/A
Selenium	4	3.9	2 or SB	0.1 – 3.9	1
Silver	8	2	SB	N/A	5
Zinc	2,480	109	20 or SB	9 – 50	N/A

REV. NO.	DATE	DRWN	CHKD	REMARKS

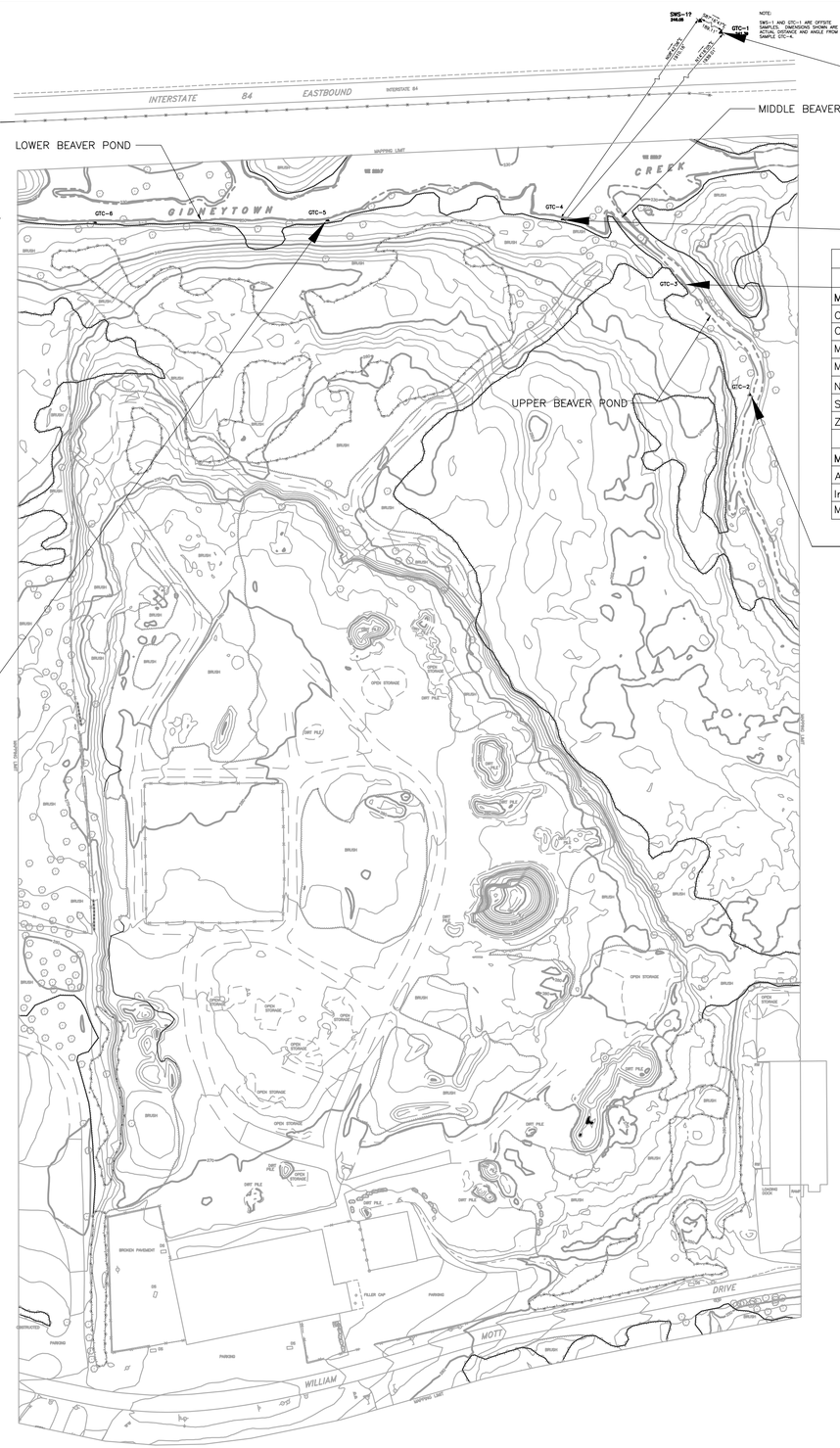
DESIGNED BY:
DRAWN BY:
SHEET CHK'D BY:
CROSS CHK'D BY:
APPROVED BY:
DATE: JANUARY 2008

CDM
Camp Dresser & McKee Inc.
Raritan Plaza I, Raritan Center
Edison, NJ 08818
Tel: (732) 225-7000
consulting • engineering • construction • operations

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
NYSDEC SITE No. 336063
CONTRACT No. D-004437
CITY OF NEWBURGH LANDFILL SITE CHARACTERIZATION

FIGURE 3-3
SUBSURFACE SOIL CHARACTERIZATION

PROJECT NO.
FILE NAME:
SHEET NO.



GTC-1	
Sediment	
Metals	
Manganese	1420
Silver	3.03
Surface Water	
Pesticides/PCBs	
gamma-Chlordane	0.051 J

GTC-3	
Sediment	
Metals	
Cadmium	1 J
Copper	35.2
Manganese	543
Mercury	0.16 J
Nickel	22
Silver	5.93
Zinc	130
Surface Water	
Metals	
Aluminum	251
Iron	*3,360*
Manganese	480 J

GTC-4	
Sediment	
Metals	
Cadmium	1.33
Copper	92.3
Mercury	0.15 J
Nickel	33.1
Silver	4.31
Zinc	188
Surface Water	
Metals	
Iron	423
Pesticides/PCBs	
gamma-Chlordane	0.051 J

GTC-D (GTC-4)	
Sediment	
Metals	
Cadmium	1.47
Copper	86.1
Mercury	0.18 J
Nickel	33.2
Silver	4.15
Zinc	181
Surface Water	
Metals	
Iron	*808*
Manganese	344 J
Pesticides/PCBs	
gamma-Chlordane	0.051 J

GTC-2	
Sediment	
Metals	
Copper	22.8
Mercury	0.2
Nickel	20.9
Silver	7.2
Zinc	155
Surface Water	
Metals	
Aluminum	189J
Iron	*774*

GTC-7	
Sediment	
Metals	
Copper	28.4
Mercury	2.2
Nickel	25.2
Silver	4.3
Surface Water	
Metals	
Iron	558
Pesticides/PCBs	
gamma-Chlordane	0.051 J

GTC-6	
Sediment	
Metals	
Copper	29.4
Mercury	0.16 J
Nickel	22
Silver	3.6
Surface Water	
Metals	
Iron	*815*
Manganese	321 J
Pesticides/PCBs	
gamma-Chlordane	0.051 J

GTC-5	
Sediment	
Metals	
Arsenic	7.11
Beryllium	0.829 J
Copper	63.4
Manganese	475
Mercury	0.17 J
Nickel	31.3
Silver	5
Zinc	193
Surface Water	
Metals	
Iron	*966*

GTC-8	
Sediment	
Metals	
Copper	20.9
Manganese	1630
Silver	5.24
Zinc	120
Surface Water	
Metals	
Aluminum	667
Iron	*1210*

	Technical Guidance for Screening Contaminated Sediments Severe Effect Level (ppm)	Technical Guidance for Screening Contaminated Sediments Lowest Effect Level (ppm)
Metals		
Arsenic	33	6
Cadmium	9	0.6
Copper	110	16
Manganese	1100	460
Mercury	1	0
Nickel	50	16
Zinc	270	120

	NYSDEC TOGS 1.1.1 Ambient Water Quality Standards (ug/l)	NYSDEC TOGS 1.1.1 Groundwater Effluent Limitations (Class GA) (ug/L)
Metals		
Aluminum	100	2000
Iron	300	600
Manganese	300	600
Pesticides/PCBs		
gamma-Chlordane	0.05	N/A

Notes:
Sediment results are compared to NYSDEC Technical Guidance for Screening Contaminated Sediments.
No exceedances of VOCs, SVOCs, Pesticides or PCBS were reported in sediment samples.
Surface Water samples were compared to NYSDEC TOGS 1.1.1 Ambient Water Quality Standards and Groundwater Effluent Limitations.
No exceedances of VOCs or SVOCs were reported in surface water samples.
Results in red exceed the Sever Effect Level.
Results is blue exceed the Lowest Effect Level.
Results in bold exceed NYSDEC TOGS 1.1.1 Ambient Water Quality Standards
Results in italics exceed NYSDEC TOGS 1.1.1 Ambient Water Quality Standards and Groundwater Effluent Limitations.

REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY:
DRAWN BY:
SHEET CHK'D BY:
CROSS CHK'D BY:
APPROVED BY:
DATE: JANUARY 2008

CDM
Camp Dresser & McKee Inc.
Raritan Plaza I, Raritan Center
Edison, NJ 08818
Tel: (732) 225-7000
consulting • engineering • construction • operations

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

NYSDEC SITE No. 336063
CONTRACT No. D-004437
CITY OF NEWBURGH LANDFILL SITE CHARACTERIZATION

FIGURE 3-4
GIDNEYTOWN CREEK RESULTS

PROJECT NO.
FILE NAME:
SHEET NO.

MW–7	
4/19/2007	
Metals	
Iron	5,640
Magnesium	39,400
Manganese	607
9/25/2007	
No Exceedances	
4/30/2008	
Metals	
Aluminum	11,000
Iron	26,200
Manganese	1,170

MW–8	
4/19/2007	
Metals	
Magnesium	36,900
Manganese	4,570
Sodium	23,800
9/25/2007	
No Exceedances	
4/30/2008	
Metals	
Aluminum	9,670
Iron	23,200
Lead	27.50
Magnesium	35,400
Manganese	2,450

MW–2	
4/19/2007	
Metals	
Iron	6,830
Magnesium	70,100
Sodium	84,100
9/25/2007	
Not Sampled	
4/30/2008	
VOC	
Chlorobenzene	8.5
Metal	
Aluminum	807

MW–1	
4/19/2007	
Metals	
Iron	6,170
Magnesium	81,400
Manganese	951
9/25/2007	
Not Sampled	
4/30/2008	
Not Sampled	

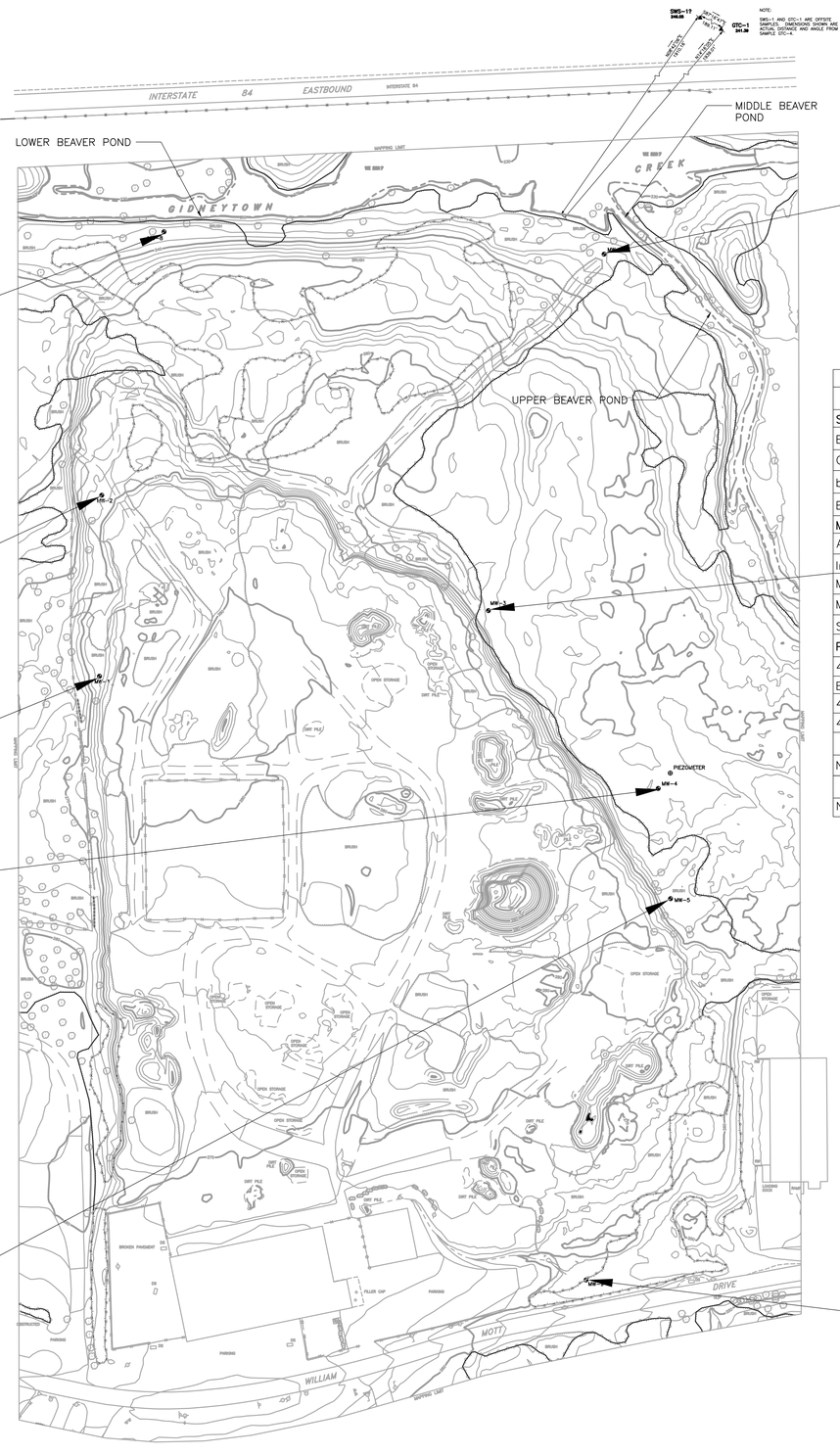
MW–4	
4/19/2007	
VOC	
Metals	
Iron	17,000
Manganese	1,120
9/25/2007	
Chlorobenzene	5.8
4/30/2008	
VOC	
Chlorobenzene	20
1,4–Dichlorobenzene	3.1 J
Metals	
Aluminum	353
Iron	59200
Magnesium	43400
Manganese	652
Sodium	130000

MW–5	
4/19/2007	
VOC	
Benzene	5.7
Chlorobenzene	120 E
1,4–Dichlorobenzene	6.4
Metals	
Iron	36,100
Manganese	480
Sodium	77,100
9/25/2007	
Chlorobenzene	6.6
4/30/2008	
VOC	
Benzene	5.3
Chlorobenzene	82
1,4–Dichlorobenzene	7.7
Metals	
Iron	60,900
Magnesium	65,500
Manganese	719
Sodium	203,000

NOTE:
GTC–9 IS AN OFFSITE SAMPLE. DIMENSIONS SHOWN ARE ACTUAL DISTANCE AND ANGLE FROM SAMPLE SWMG–11

S65°18'39"W
1190.02'

GTC–9
316.19



MW–6	
4/19/2007	
VOC	
Benzene	1.9
Chlorobenzene	17 J
SVOC	
bis(2–Ethylhexyl)phthalate	9.0 J
Metals	
Iron	48,900
Magnesium	45,700
Manganese	764
9/25/2007	
VOC	
Benzene	2.7
Chlorobenzene	21
SVOC	
bis(2–Ethylhexyl)phthalate	8.7 J

4/30/2008	
VOC	
Benzene	2.6 J
Chlorobenzene	23
1,4–Dichlorobenzene	4.9 J
SVOC	
bis(2–Ethylhexyl)phthalate	6.4
Metals	
Aluminum	2,470
Iron	44,400
Lead	71.7
Magnesium	47,000
Manganese	513
Sodium	37,900

MW–3	
4/19/2007	
SVOC	
Benzo(a)anthracene	1.5 J
Chrysene	1.7 J
bis(2–Ethylhexyl)phthalate	22
Benzo(b)fluoranthene	1.5 J
Metals	
Antimony	395
Iron	2,180
Magnesium	116,000
Manganese	378
Sodium	49,000
Pesticides/PCBs	
4,4–DDE	0.11
Endrin	0.17
4,4–DDD	0.69
4,4–DDT	1.1
9/25/2007	
Not Sampled	
4/30/2008	
Not Sampled	

MW–9	
4/19/2007	
Metals	
Iron	409
Sodium	61,900
9/25/2007	
No Exceedances	
4/30/2008	
Metals	
Aluminum	9,179
Iron	20,100
Manganese	522
Sodium	177,000

	NYSDEC TOGS 1.1.1 Ambient Water Quality Standards (ug/l)
VOCs	
Benzene	1
Chlorobenzene	5
1,4–Dichlorobenzene	5
trans–1,3–Dichloropropene	0.4
cis–1,3–Dichloropropene	0.4
SVOCs	
Benzo(a)anthracene	0.002
Chrysene	0.002
bis(2–Ethylhexyl)phthalate	5
Benzo(b)fluoranthene	0.002
Benzo(a)pyrene	0.002
Metals	
Aluminum	100
Antimony	3
Beryllium	3
Cadmium	5
Iron	300
Lead	25
Magnesium	35,000
Manganese	300
Nickel	100
Selenium	10
Silver	50
Sodium	20,000
Pesticides/PCBs	
4,4–DDE	0.3**
4,4–DDD	0.2**
4,4–DDT	0.2**

Notes:
Results exceed NYSDEC TOGS 1.1.1 (June 1998): Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations
Samples collected during the September groundwater sampling event were analyzed for VOCs and SVOCs only.
All results are reported in ug/L.
** Applies to the sum of 4,4–DDD, 4.4–DDE, and 4,4–DDT.

REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY:
DRAWN BY:
SHEET CHK'D BY:
CROSS CHK'D BY:
APPROVED BY:
DATE: JANUARY 2008

CDM
Camp Dresser & McKee Inc.
Raritan Plaza I, Raritan Center
Edison, NJ 08818
Tel: (732) 225-7000
consulting • engineering • construction • operations

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

NYSDEC SITE No. 336063
CONTRACT No. D-004437
CITY OF NEWBURGH LANDFILL SITE CHARACTERIZATION

FIGURE 3-5
GROUNDWATER RESULTS

PROJECT NO.
FILE NAME:
SHEET NO.

I:\0897\54580\FIGS\ FIG_3-5 03/30/09 15:48 larsonej XREFS: NBLFBDR, XWPPL001

APPENDIX C
Drum Investigation Photographs

Photo 1: Close up of drum where sample TP-15A was collected. Drum was found approximately 3 feet below grade in test pit. PID reading >9999 ppm.

Photo 2: Metal drum found in test pit TP-15. Found approximately 4 feet below grade in test pit.

Photo 3: Close up of photo #2.

Photo 4: Close up of drum where sample TP-15B was collected. Drum was approximately 3 feet below grade. Soil sample TP-15B Soil was collected near the silver object. PID reading of waste approximately 600 ppm and the soil approximately 100 ppm.