TOBSWMF's Leachate Monitoring Program December 2019

Town of Babylon Department of Environmental Control

Victoria Russell, Commissioner
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631-422-7640

February 2020

Laboratory data and summary report from December 2019 sampling for Babylon's Leachate Monitoring Program.

TOBSWMF's Leachate Monitoring Program

December 2019

As part of its solid waste infrastructure the Town of Babylon maintains four ashfills, the Southern Ashfill (SA), the Old Northern U Ashfill (ONU), the New Northern U Ashfill (NNU) and the lateral expansion of the Southern Ashfill, also known as Cell 7 (NYSDEC Permit No. 1-4720-00778/00014). These ash facilities are located on the northern and southern face of the former Babylon Landfill located on Gleam Street in West Babylon, NY.

Babylon's leachate monitoring program (LMP) samples leachate from each of Babylon's ash facilities pursuant to the requirements of 6NYCRR part 363 (formerly part 360) and/or special condition attached to their NYSDEC solid waste management operating permits. Sampling procedures are described in detail within the 2018 Update Site Analytical Plan for the Town of Babylon Solid Waste Management Facilities (SAP) (TOBDEC, 2018).

Historically for the TOBSWMF's LMP, sampling at the SA, ONU and NNU ash facilities was limited to baseline parameters. In 2018 the NYSDEC required Babylon also sample for 1,4 dioxane when sampling these facilities for the LMP. Sampling in December 2019 also included PFOS/PFOA's. Leachate at Cell 7 continues to be sampled for expanded parameters (the expanded parameters list was modified as part of the updated NYSDEC Solid Waste Management Facility regulations (appendix 2)). Sampling of the SA, ONU, NNU and Cell 7 were performed on December 26, 2019. The sampling protocol for the LMP is detailed in the Updated SAP for the Town of Babylon Solid Waste Management Facilities (TOBDEC, 2018). Sampling at the SA and ONU is limited to the Secondary Leachate Collection and Recovery System (SLCRS). Sampling at the NNU is performed for both the Primary Leachate Collection and Recovery System (PLCRS) and SLCRS. Sampling at Cell 7 was for the PLCRS. The complete laboratory report, case narrative and QA/QC package from Pace Analytical Services Inc has been attached as an appendix to this report. Included within the Pace Labs report is analysis for PFAS/PFOA's performed by Eurofins Test America. In addition to internal laboratory QA/QC, a trip blank for VOC's and equipment blank sample were obtained as part of the operational QA/QC requirements. The trip blank and equipment blank were clean. The equipment blank provided as part of the PFAS/PFOA's analysis included PFHxS (.28 ng/l) and the method blank included PFBA (.464 ng/l) and PFHxS (.262 ng/l). A field duplicate sample was obtained with the GMP at well GM 27I. The results of the duplicate were not notable.

Project narratives prepared by the laboratory for each category were reviewed. Notations and flagging qualifiers discussed in the narratives were noted. Each data package was certified by the laboratory as being in compliance with the laboratories quality assurance manual both technically and for completeness.

This section of the LMP report provides a brief summary of the December 2019 leachate sampling at the TOBSWMF's. The sections that follow provide a more detailed discussion of the results from each ash facility.

The following are notable observations from the December 2019 LMP sampling results:

- Manganese exceeded it MCL at the ONU (14.5 mg/l). Manganese has exceeded its MCL at the ONU in 22 of the past 33 sampling events.
- pH of leachate at the ONU was 7.59, 7.24 at the SA, 8.49 at the NNU PLCRS, 7.74 at the NNU SLCRS and 7.48 at Cell 7. All continue to be observed within an acceptable range.
- Baseline organics observed at each facility for the December 2019 LMP:
  - Baseline organics were not observed at the ONU or SA facilities.
  - Total baseline organics observed at the NNU facility; 0.0842 mg/l at the NNU P and 0.3905 mg/l at the NNU S.
  - No individual organic compound from the baseline parameters list (SA, ONU and NNU), or summation of those compounds (TTO)[1] were observed at or above their MCL or TTO limits at any of these Babylon ash facilities during the December 2019 LMP.
- Total organics from the expanded parameters list (above mdl) observed at the Cell 7 facility was .542 mg/l. Total Toxic Organics (TTO) (>.01 mg/l) at the Cell 7 facility was .07 mg/l. This is below the overall TTO limit (10 mg/l) and 1.5 mg/l limit for acid extractable compounds within the Town of Babylon discharge Certificate issued by SCDPW.
- Barium did not exceed its MCL at the ONU, SA, NNU or Cell 7 for December 2019.
- Mercury was not detected at the ONU, SA or NNU SLCRS for December 2019. Mercury was detected at the NNUP (.00022 mg/l) and Cell 7 (.00015 mg/l (below reporting limit)) for December 2019.
- Piper diagrams for the SA, ONU, NNU and Cell 7 were updated with leachate sampled during the December 2019 LMP and conform to historical data.
- Chloride values reported for the NNU and Cell 7 were correctly flagged in the prior report (June 2019) as erroneous and the lab corrected provided revised chloride results for these facilities. The June 2019 report did not include Piper plots for the June 2019 data. Piper plots for these facilities using the revised chloride data from June 2019 are included in the Piper plots attached to this report.
- Project narratives were prepared by Pace Analytical Services Inc. for the December 2019 LMP laboratory results. Any issues, deficiencies or flagging of results were summarized in these narratives, and can be found in the appendix of this report. Each data package

[1] Suffolk County Department of Public Works Total Toxic Organics (TTO) limited to: VOC's 2.5 mg/l, Base Neutral Extractable Compounds 1.5 mg/l, Acid Extractable Compounds 1.5 mg/l and Pesticides and PCB's 1 mg/l.

was certified by the laboratory as being in compliance with its contract for Babylon's LMP both technically and for completeness.

TOBSWMF's Leachate Monitoring Program

Old Northern U

December 2019

Pursuant to NYSDEC 6NYCRR Part 363 requirements for the operation of the Town of Babylon's Old Northern U (ONU) Ashfill, leachate from that facility's secondary leachate collection and recovery system (SLCRS) was sampled in accordance with the procedures detailed in the TOBSWMF's SAP (TOBDEC, 2018). The ONU SLCRS is sampled semi-annually for baseline parameters. In 2018 the NYSDEC required sampling to be expanded to include 1,4 dioxane. For December 2019 Babylon expanded sampling to include PFAS/PFOA's for this facility.

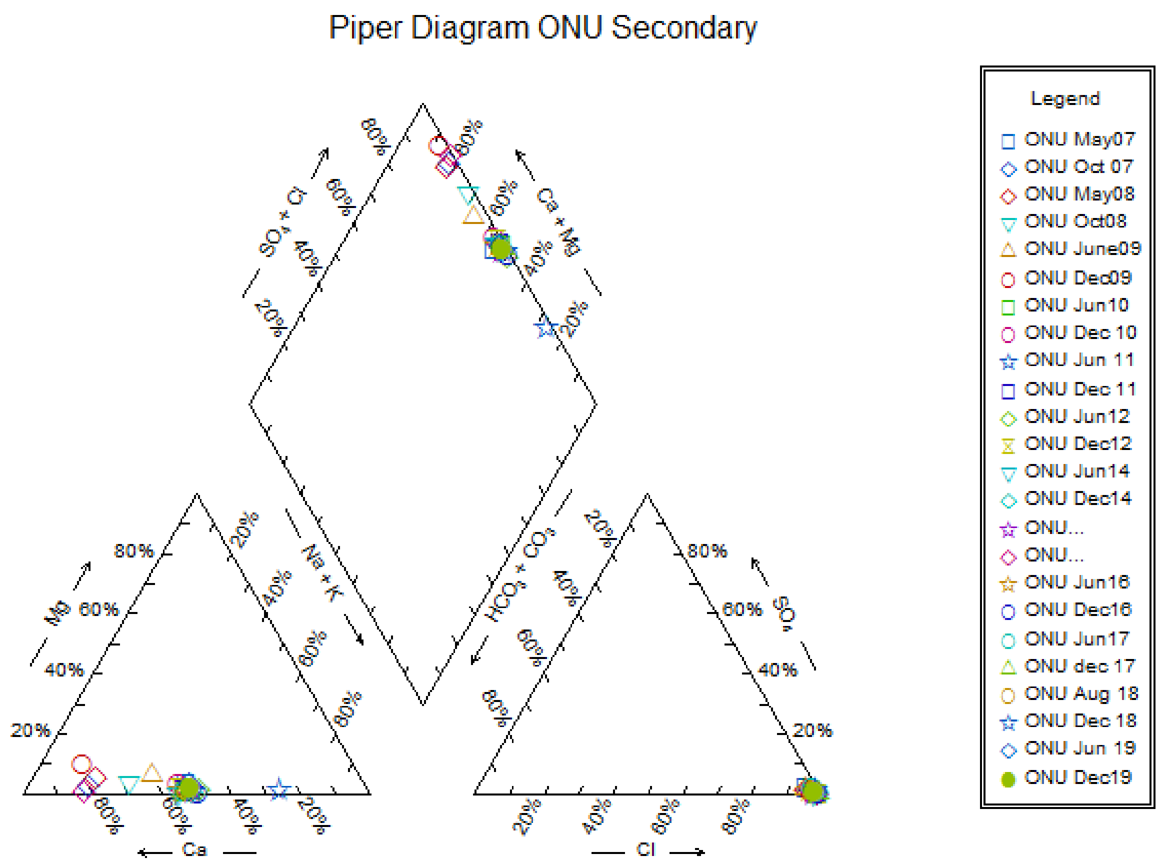
Ash has not been deposited in the ONU since it was capped in 2002 when the New Northern U (NNU) was constructed atop the facility. Leachate continues to be generated at the ONU despite the facility being capped and numerous attempts to locate the source. The LMP will continue at the ONU until there is a cessation of leachate generation. Included in this report is the December 2019 laboratory report from Pace Analytical Services, a spreadsheet summarizing parameters of concern dating back to 1995, a Piper diagram and a discussion of the laboratory results.

The attached spreadsheet provides a historical overview of leachate composition and any exceedance of MCL's at the ONU. The bullets below highlight notable observations from this round of sampling at the ONU and/or provide follow-up discussion/analysis of previous reports when appropriate.

- The chemical composition of leachate from the ONU for December 2019 generally conforms to historical data from the facility.
- pH measured in the field at the ONU SLCRS for December 2019 was 7.59.
- Manganese (14.5 mg/l) was observed above its MCL for December 2019. Manganese has been observed exceeding its MCL in 22 of the past 33 monitoring events at the ONU.
- Barium (2.07 mg/l) was not observed above its MCL at the ONU for December 2019.
- Arsenic and lead were not detected above their mdl at the ONU for December 2019. Low values of arsenic and lead have been intermittently observed at this facility.
- Other metals observed at the ONU at values above their reporting limit and below their MCL (where one has been established) for December 2019 include boron (.585 mg/l), calcium (3550 mg/l), iron (13.3 mg/l), magnesium (71 mg/l), potassium (1140 mg/l), selenium (.0135 mg/l) and sodium (3140 mg/l).
- No organics on the baseline list were observed at the ONU for December 2019.
- 1,4 dioxane was observed at 18.6 ug/l for December 2019 at the ONU.

- Sulfide was not detected above its mdl at the ONU facility for December 2019.
- The Piper diagram from the ONU facility was updated with December 2019 data. The geochemical fingerprint for this facility remains unchanged.
- PFAS/PFOA's results are attached in appendix A.

The next round of sampling at the ONU is scheduled for June 2020.



Note: Solid circle = data point for December 2019.

TOBSWMF's Leachate Monitoring Program

Southern Ashfill

December 2019

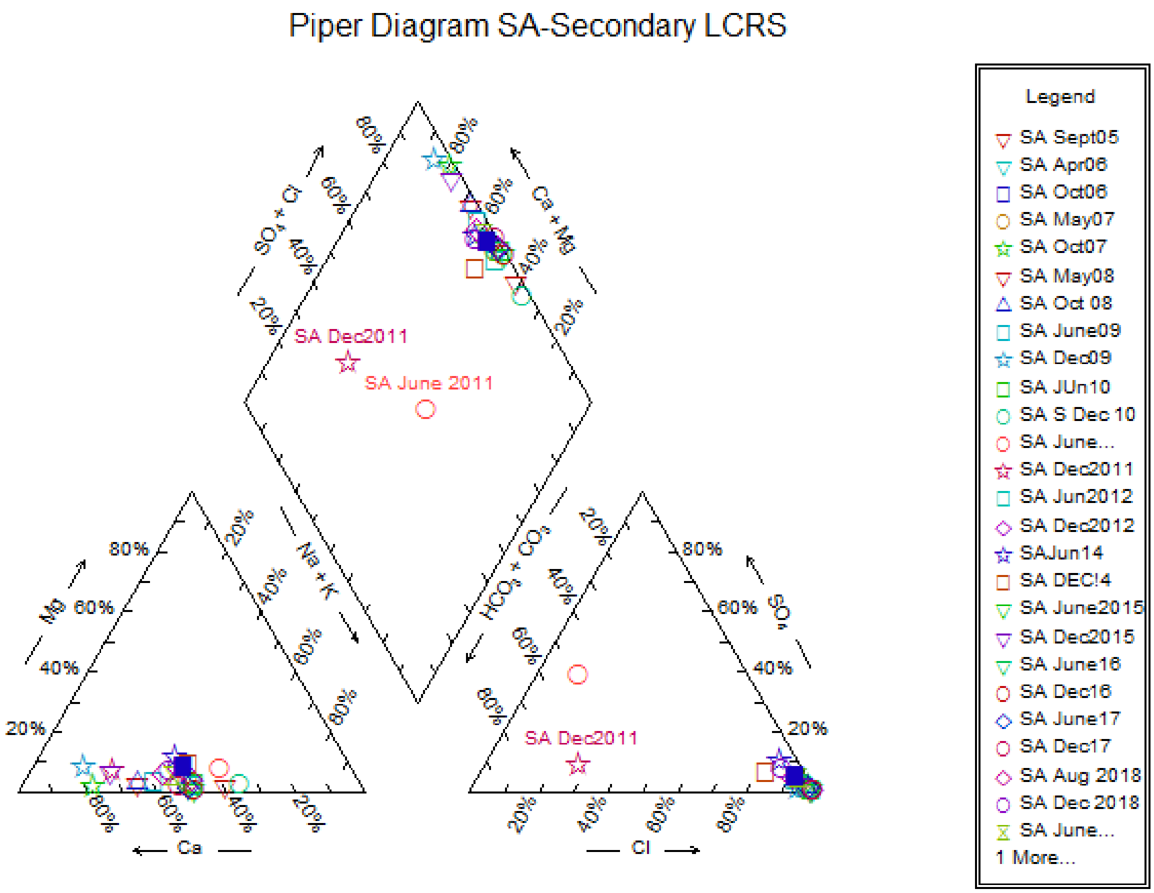
Pursuant to NYSDEC 6NYCRR Part 363 (formerly part 360) requirements for the operation of the Town of Babylon's Southern Ashfill (SA), leachate from that facility's Secondary Leachate Collection and Recovery System (SLCRS) was sampled in accordance with the procedures detailed in the TOBSWMF's SAP (TOBDEC, 2018). The SA facility requires semiannual sampling of leachate for baseline parameters from the facility's SLCRS. For 2018 NYSDEC required sampling at Babylon's leachate facilities to be expanded to include 1,4 dioxane. For December 2019 Babylon expanded sampling to include PFAS/PFOA's at the SA facility. This report includes the laboratory report from Pace Analytical Services, a Piper diagram, a spreadsheet summarizing parameters of concern dating back to 1994, and a discussion of the results.

The attached spreadsheet provides a historical overview of leachate composition at the SA and any exeedance of the MCL's. The following bullets summarize any findings from this round of sampling at the SA and provide follow-up analysis or discussion when recommended from previous reports.

- Leachate indicators at the SA have been observed to be highly variable. Data from the December 2019 LMP at the SA generally fall within the range of historical data.
- A Piper diagram that includes SA data from December 2019 conforms to its established pattern.
- Lead was not observed at the SA for December 2019. Low values of lead have been observed intermittently at the SA.
- Manganese was observed at 5.31 mg/l for December 2019. Manganese exceeded its MCL (8 mg/l) for June 2019. The only other sampling event where manganese exceeded its MCL at the SA facility was December 2013.
- Barium was observed at 0.158 mg/l at the SA for December 2019.
- Other metals observed at the SA at values above their reporting limit and below their MCL (where one has been established) for December 2019 include boron (.289 mg/l), chromium (.0156 mg/l), calcium (991 mg/l), iron (2.85 mg/l), magnesium (105 mg/l), potassium (324 mg/l), sodium (843 mg/l), and thallium (.012 mg/l).
- No organics from the baseline parameters list was detected at the SA facility for December 2019.
- 1,4 dioxane was not detected at the SA for December 2019.
- Mercury was not detected at the SA for December 2019.

- pH measured in the field was 7.24 at the SA facility.
- Sulfide was not detected at the SA facility for December 2019.
- PFAS/PFOA's results are attached in appendix A.

The next round of sampling is scheduled for June 2020.



Note: Solid square indicates December 2019 data.

TOBSWMF's Leachate Monitoring Program

New Northern U Ashfill

December 2019

Pursuant to NYSDEC 6NYCRR Part 363 (formerly part 360) requirements for the operation of the Town of Babylon's New Northern U Ashfill (NNU), leachate from the NNU Primary and Secondary Leachate Collection and Recovery System (PLCRS and SLCRS) were sampled in accordance with the procedures detailed in the TOBSWMF's SAP (TOBDEC, 2018). These facilities are sampled semi-annually for baseline parameters as part of Babylon's Leachate Monitoring Program (LMP). For 2018 the NYSDEC required that sampling of the Babylon leachate facilities be expanded to include 1,4 dioxane. For December 2019 Babylon also sampled for PFAS/PFOA's at the NNU facilities. This document includes the laboratory report from Pace Analytical Services, Inc., a spreadsheet summarizing parameters of concern at the facility, a Piper diagram of leachate from each liner system, and a discussion of the results.

The NNU which began accepting ash in 2003 sits atop the ONU, separated by a double liner system, with each layer consisting of a bentonite blanket, liner and geocomposite. The NNU SLCRS is also separated from the ONU by the ONU cap. Both systems serve as near impermeable barriers. The elevation of the NNU system (approximately 25-30 feet above the water table) prevents groundwater infiltration from being considered a source of leachate to the system.

The attached spreadsheet provides a historical overview of leachate composition at the NNU, highlighting any exceedance of an MCL from the facility's PLCRS and SLCRS. The following discussion summarizes any noteworthy findings from the December 2019 sampling and provides follow-up analysis or discussion wherever necessary or recommended in previous reports.

- For the December 2019 LMP pH was 7.74 at the NNU SLCRS and 8.49 at the NNU PLCRS.
- The overall leachate characteristics of the NNU PLCRS and SLCRS largely conform to the historical dataset for this facility.
  - The initial lab report for June 2019 reported chloride at 0.2 mg/l at both the NNUP and NNUS facilities. TOBDEC maintained that these values were erroneous. In response to TOBDEC's inquiry, the lab responded stating " The instrument was over calibration for the chloride in the anion run and the software only integrated a small portion of the peak causing the software to flag the sample as a non-detect or a lower value that is actually present. The analyst did not catch that the software missed the peak in her review of the data". A revised chloride value for was

provided for June 2019 at the NNUP was 44,200 mg/l and 41,700 at the NNUS. For December 2019 chloride at the NUP was reported at 31,900 mg/l and 51,900 mg/l at the NNUS. These values are within the historical range for these facilities.

- Arsenic and lead were not observed above their reporting limit at the NNU SLCRS and NNU PLCRS for December 2019. Low values of arsenic and lead have been intermittently observed at this facility.
- Mercury was observed at the NNU PLCRS (.00022 mg/l) and below its mdl at the NNU SLCRS (<.0002 mg/l) for December 2019.
- Organics from the baseline parameters list observed at the NNU for December 2019 were limited to low concentrations of acetone, MEK and 4 methyl 2 pentanone. Acetone was observed at .081 mg/l at the NNU PLCRS and .331 mg/l at the NNU SLCRS. Low concentrations of acetone have been observed at this facility since June 2010.

  MEK was detected at the NNU PLCRS at .0036 mg/l and .0523 mg/l at NNU-SLCRS during December 2019 sampling. Trace values of MEK have been intermittently observed at this facility.

  4 methyl 2pentanone was not observed at the NNUP facility and .0072 mg/l at the NNUS. Trace values of 4 methyl 2 pentanone have been observed intermittently at the NNU facility.

  TTO (>.01 mg/l) as defined on the Town of Babylon discharge certificate issued by Suffolk County Department of Public Works is <.01 mg/l at the NNU facility.

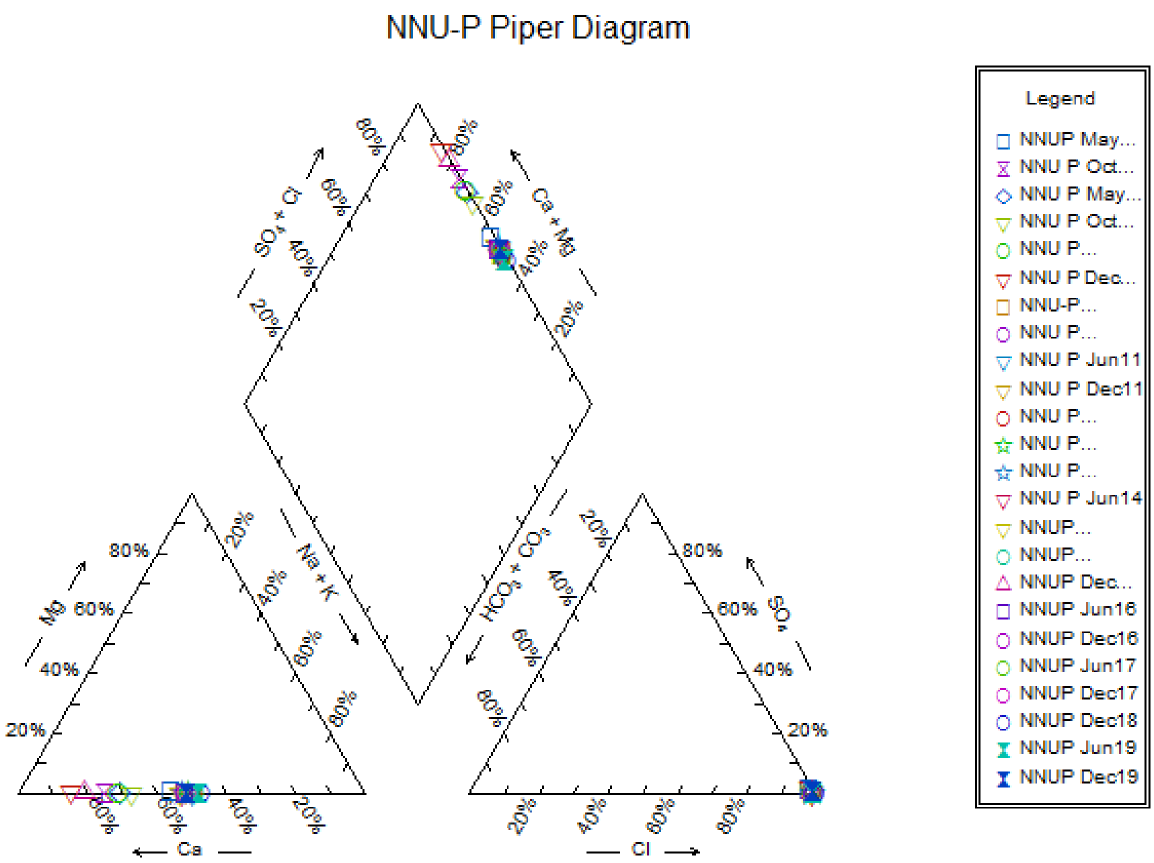
  Total baseline organics for the NNU PLCRS was .0842 mg/l and .3905 mg/l at the NNU SLCRS.

- 1,4 dioxane was observed at 3.8 ug/l at the NNU PLCRS and 3.9 ug/l at the NNU SLCRS.
- Barium was reported below its MCL at the NNU PLCRS (1.75 mg/l) and NNU SLCRS (2.1 mg/l) for December 2019. Barium has been observed exceeding its MCL at the NNU PLCRS 5 times over 33 sampling events through the life of the facility. Barium has exceeded its MCL at the NNU SLCRS 3 times over 33 sampling events through the life of the facility. The last exceedance for barium at each of the facilities was December 2012.
- Other metals observed above its mdl and below their MCL at the NNU PLCRS for December 2019 include boron (3.52 mg/l), chromium (.0132 mg/l), calcium (8200 mg/l), iron (.19 mg/l), magnesium (4.11 mg/l), manganese (.203 mg/l), potassium (2980 mg/l), sodium (7250 mg/l) and selenium (.0154 mg/l)).
- Other metals observed above their mdl and below their MCL at the NNU SLCRS for December 2019 include boron (4.38 mg/l), calcium (10400 mg/l), iron (.098 mg/l),

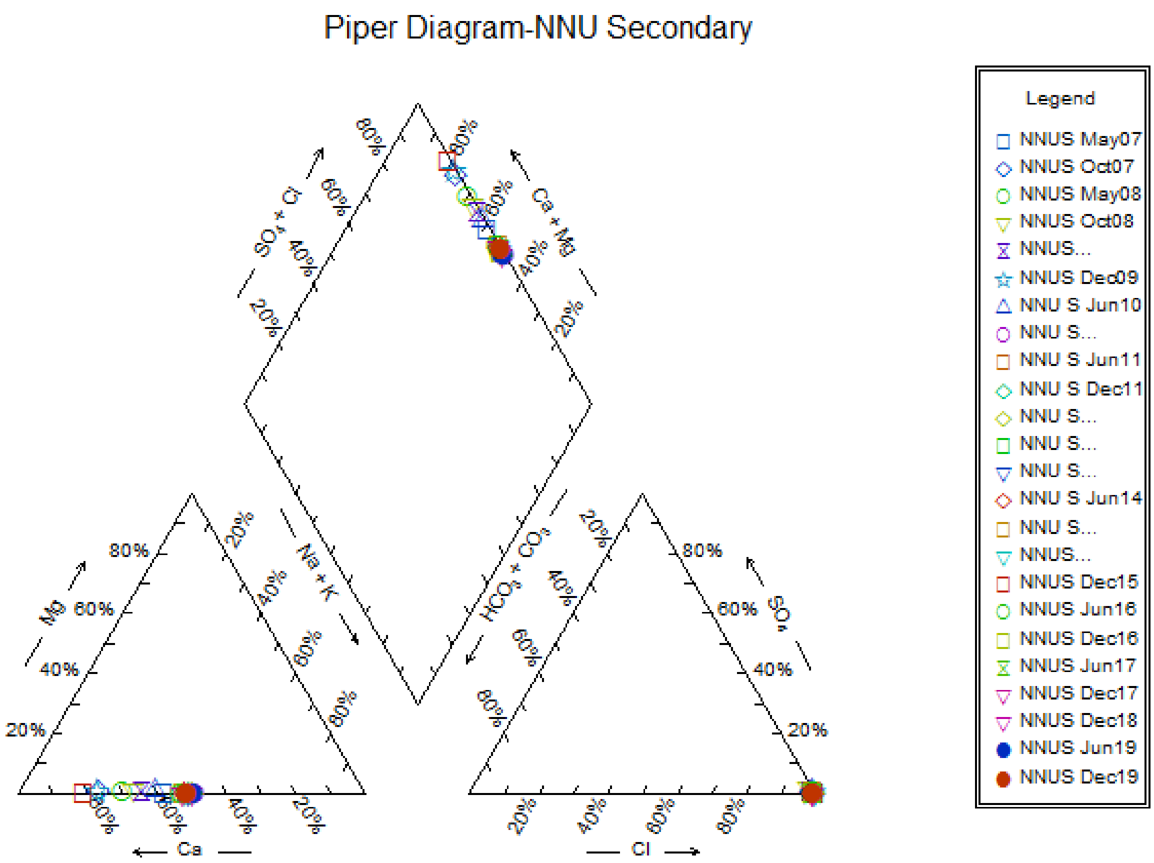
magnesium (2.92 mg/l), manganese (.414 mg/l), potassium (3880 mg/l), sodium (9050 mg/l) and selenium (.024).

- Sulfide exceeded its MCL at the NNUS (24 mg/l) and NNUP (25.6 mg/l). Sulfide has exceeded its MCL at the NNUP for December 2017, August 2018 and June 2019 and at the NNUS since June 2017.
- BOD was observed below its MCL (300 mg/l) at the NNUP and NNUS. BOD has intermittently exceeded its MCL at these facilities.
- A Piper diagram was not be prepared for June 2019 due to the questionable value for chloride in provided in the lab report. A corrected value for chloride was provided after submittal of the June 2019 report. For December 2019 a Piper diagram including the corrected June 2019 data and December 2019 data is provided. The geochemical fingerprint for the NNU facilities is unchanged.
- PFAS/PFOA's results are attached in appendix A.

The next round of sampling is scheduled for June 2020.



Note: solid hourglasses June 2019 and December 2019.



Note: solid circles June 2019 and December 2019.

TOBSWMF's Leachate Monitoring Program

Cell 7

December 2019

Pursuant to the NYSDEC operating permit for the operation of the Cell 7 Ashfill (Cell 7), leachate from that facility's PLCRS was sampled in accordance with the procedures detailed in the TOBSWMF's SAP (TOBDEC, 2018). The Cell 7 operating permit requires semiannual sampling of leachate for expanded parameters plus a scan for dioxins and furans from the facility's PLCRS. The expanded parameters list is found within 6NYCRR part 363-4.6(h) and includes 1,4 dioxane, fluorinated alkyl substances (PFOA's) and various other additional parameters (appendix 2) not found previously in NYCRR part 360. This report includes the laboratory report from Pace Analytical Services Inc., a spreadsheet summarizing the results, a Piper diagram and brief discussion.

- The overall leachate characteristics of the Cell 7 facility largely conform to the historical dataset for this facility.
- TOBDEC's flagging of and inquiry to the lab regarding the value of chloride reported with the June 2019 analysis (<2 mg/l) was substantiated after submittal of the leachate report. The lab responded stating "The revised level 2 is attached for chloride that was mis integrated by the software and the improper run was selected for reporting. We are working on solutions for this issue." The revised June 2019 and December 2019 analysis for chloride was within the historical range.
- A Piper diagram was not prepared for June 2019 leachate report due to the lack of an accurate value for chloride. A Piper diagram that includes the revised June 2019 and December 2019 chloride value is attached to this section. The geochemical fingerprint for Cell 7 is unchanged.
- For December 2019 pH at Cell 7 was measured at 7.48.
- Analysis for 2378 TCDD in December 2019 was ND (Reporting limit 10 pg/l).
- Analysis for 1,4 dioxane for December 2019 was reported at 4.2 ug/l.
- Analysis for fluorinated alkyl substances (PFAS) was performed for December 2019 pursuant to the modified expanded parameters list. This analysis was not performed in June 2019. After inquiry to Pace labs as to the cause this error they have indicated that this procedural error has been addressed which should avoid this from occurring in the future.
- Mercury was detected below its report limit (.00015 ug/l) at Cell 7 for December 2019.
- Organics from the expanded parameters list observed during December 2019 included acetone (.179 mg/l), MEK (.013 mg/l), phenol (.07 mg/l), dinoseb (.00043), 2,4 D (.001 mg/l),

Acetonitrile (.193 mg/l), 3-4 methylphenol (.076 mg/l) bis(2-ethylhexyl)phthalate (.0089 mg/l), Aroclor 1254 (.068 mg/l) and 2,4,5 TP (.016 mg/l). Total expanded organics observed for December 2019 was .542 mg/l.

- TTO (>.01 mg/l) observed at the Cell 7 facility for December 2019 is .07 mg/l (phenol). This is below the overall TTO limit of 10 mg/l, and below the limit for acid extractable organic compounds of 1.5 mg/l set forth in the Town of Babylon Discharge Certification issued by SCDPW.
- No metals were observed above their MCL. Metals observed above their RL include arsenic (.028 mg/l), barium (5.84 mg/l), boron (1.04 mg/l), calcium (9300 mg/l), iron (.388 mg/l), magnesium (11.1 mg/l), manganese (.75 mg/l), potassium (5700 mg/l) and sodium (7950 mg/l).
- PFAS/PFOA results are included in appendix A.

The next round of sampling for leachate at the Cell 7 facility is scheduled for June 2020.

Appendix 1

December 2019 Pace Analytical Laboratory Report and QA/QC

(see attached CD)

BABYLON LANDFILL - FIELD DATA - DECEMBER 26, 2019

Leachate Sampling Data

WELL #	Date	Start Purge	Stop Purge	Gallons Purged	Well Notes For Sampling
NNU-PLCRS	12/26/2019	834	839	~ 40	Clear, strong odors
NNU-SLCRS	12/26/2019	823	828	~ 40	Cloudy, white tint, strong odors
ONU-SLCRS	12/26/2019	854	859	~ 60	Clear, yellow tint, strong odors
SA-SLCRS	12/26/2019	Direct Sample	Direct Sample	0	Slightly cloudy, no odors, slight yellow tint
CELL - 7	12/26/2019	Direct Sample	Direct Sample	0	Clear, slight green tint, strong odors

Leachate Parameters

WELL #	Sampling Time	pH (SU)	ORP (mv)	Conductivity (umhos/cm2)	Temp. (oC)	Turbidity (NTU)	Dissolved Oxygen (DO) mg/L
NNU-PLCRS	840	8.49	-131.4	2250	14.8	5.18	3.03
NNU-SLCRS	830	7.74	-92.5	2235	13.0	80.20	2.17
ONU-SLCRS	900	7.59	-84.9	2248	13.1	52.80	5.76
SA-SLCRS	1325	7.24	-65.5	2145	13.4	37.20	2.29
CELL - 7	948	7.48	-79.2	2194	9.8	7.58	1.70

NNU-PLCRS: **New Northern U Primary * One Tap Location for Primary/Secondary (Top Road)**

NNU-SLCRS: **New Northern U Secondary * One Tap Location for Primary/Secondary (Top Road)**

ONU-SLCRS: **Old Northern U Secondary *One Tap Location for Primary/Secondary (Lower Road)**

SA-SLCRS: **Southern Ash Secondary *Use Bailer / Square Metal Door**

CELL 7: **Primary System * Use Bailer / First Round Black Cover (Left Cover)**

Joseph Guarino

From: Jennifer Aracri <Jennifer.Aracri@pacelabs.com>
Sent: Friday, October 18, 2019 12:35 PM
To: Joseph Guarino
Cc: Violeta Genna; Victoria Russell
Subject: RE: June data-Babylon
Attachments: DOC.pdf; Sampling frequency_2018.xlsx; 7093111_frc.pdf

Joe,

I have looked into the below and we did not do the PFAS for the expanded sample on the Cell 7. This was my oversight as I was looking at the attached when I did the bottles. I know that the expanded changed and I will include this going forward for Cell 7. The revised level 2 is attached for the chloride that was mis integrated by the software an the improper run was selected for reporting. We are working on solutions for this issue. The data package and the EDDs will be posted later today on Paceport and I will follow up with a revised CD of the data package. I apologize for the severe delay.

Jen

Jennifer Aracri
Project Manager
Pace Analytical Services
575 Broad Hollow Rd, Melville, NY 11747
Direct Dial: 516.370.6016 | Main Line: 631.694.3040 | Fax: 631.420.8436
www.pacelabs.com

>>> Joseph Guarino <jguarino@townofbabylon.com> 9/16/2019 7:30 AM >>>
Jennifer

I have not heard anything with regard to the below inquiries for the June sampling data and this is delaying my submittals to NYSDEC. Please note that I cannot process the invoices for payment until these matters are addressed.
Thank you,
Joe

Joseph Guarino, CFM
Principal Environmental Analyst
Town of Babylon Department of Environmental Control
631.422.7640

From: Joseph Guarino
Sent: Thursday, August 15, 2019 2:20 PM
To: 'Jennifer Aracri' <Jennifer.Aracri@pacelabs.com>
Subject: RE: June data-Babylon

Jennifer

I am following up on the items I noted missing or in error with regard to our leachate analysis for June 2019. I require the lab to re examine chloride in leachate at NNUP, NNUS and cell 7 and please provide explanation as to the cause of the low chloride results reported. Second, PFAS analysis was not performed (nor was it billed) for the Cell 7 leachate. PFAS is part of the expanded parameters and should have been done. Can you please look into this and provide explanation.

Its been 3 weeks since I initially brought this forward. Please note I cannot forward for payment until all has been completed. If you are in the process of addressing this matter please disregard.
Thanks,
Joe

Joseph Guarino, CFM
Principal Environmental Analyst
Town of Babylon Department of Environmental Control
631.422.7640

From: Joseph Guarino
Sent: Wednesday, August 7, 2019 8:25 AM
To: Jennifer Aracri <Jennifer.Aracri@pacelabs.com>
Subject: RE: June data-Babylon

I am going through the baseline leachate data (7092926) and noted the same issue is present for chloride at the NNUP and NNUS facilities (Cl result <2) as noted below at Cell 7. Can you please address these as per the below as well.
Thank you,
Joe

From: Joseph Guarino
Sent: Tuesday, August 6, 2019 11:27 AM
To: Jennifer Aracri <Jennifer.Aracri@pacelabs.com>
Subject: RE: June data-Babylon

Jennifer

Can you have the lab please reanalyze and explain the low chloride result?
Thanks,
Joe

From: Joseph Guarino
Sent: Thursday, July 25, 2019 3:39 PM
To: Jennifer Aracri <Jennifer.Aracri@pacelabs.com>
Subject: June data-Babylon

Jennifer

Going through the june 19 data and found a bad chloride reading for leachate at Cell 7:

		Client Sample ID:	CELL 7 PLCRS
			7093111001 Water 06/11/19 6/11/2019 9:15:00 AM
Analyte	CAS	Units	
Total Uranium	7440-61-1	ug/L	0.281 ± 0.014 (0.262) C:NA T:NA
Bromide	24959-67-9	mg/L	516 D
Chloride	16887-00-6	mg/L	<2.0

That's not possible ... we have had issues with that in the past re dilution.

Second, I don't see the excel sheet for the other leachate results.
Thanks,
Joe

Joseph Guarino, CFM
Principal Environmental Analyst
Town of Babylon Department of Environmental Control
631.422.7640

Appendix 2

Baseline and Expanded Parameters List (6NYCRR Part 363-4.6(h))

(5) Data quality assessment. At the conclusion of each sampling event and analysis of the samples collected, data quality assessment must occur. A data quality assessment report must be submitted with the results from each sampling event. Data quality assessment must occur in two phases – data validation and data usability analysis.

(i) Data validation.

(a) For those sampling events for which only routine parameters are analyzed, the required data validation may be performed by the laboratory that performed the sample analyses.

(b) For those sampling events in which groundwater samples are analyzed for baseline or expanded parameters, the data validation must be performed by a person with experience with similar validation projects and who is not affiliated with the laboratory that performed the analyses and who is acceptable to the department.

(c) The data validation must be performed on all analytical data for the facility at a rate acceptable to the department, but not less than five percent of the data generated, and must consist, at a minimum, of the following:

(1) field records and analytical data are reviewed to determine whether the data are accurate and defensible. All AQA/AQC information must be reviewed along with any corrective actions taken during that sampling event; and

(2) all data summaries must be clearly marked to identify any data that are not representative of environmental conditions at the site, or that were not generated in accordance with the site analytical plan.

(ii) Data usability analysis.

(a) The data usability analysis must be performed on all analytical data generated by the requirements for this Part for the facility and must consist of the following:

(1) an assessment to determine if the data quality objectives were met;

(2) for consistency, comparison of the analytical data with the results from previous sampling events;

(3) evaluation of field duplicate results to indicate the samples are representative;

(4) comparison of the results of all field blanks, trip blanks, equipment rinstate blanks, and method blanks with full data sets to provide information concerning contaminants that may have been introduced during sampling, shipping, or analysis;

(5) evaluation of matrix effects to assess the performance of the analytical method with respect to the sample matrix, and determine whether the data have been biased high or low due to matrix effects;

(6) integration of the field and laboratory data with geological, hydrogeological, and meteorological data to provide information about the extent of contamination, if it occurs; and

(7) comparison of precision, accuracy, representativeness, comparability, completeness, and defensibility of the data generated with that required to meet the data quality objectives established in the site analytical plan.

(h) Water quality analysis tables.

The water quality analysis tables in this section list the routine, baseline, and expanded parameters for analysis of all monitoring samples. The department may modify the parameters for analysis based on the location of the landfill or site-specific characteristics of waste disposed at the landfill.

TABLE 1: ROUTINE PARAMETERS [1]

Common Name (and CAS number, as appropriate) [2]		
Field Parameters:	Leachate Indicators:	Inorganic Parameters (total):
Static water level (in wells and sumps)	Total Kjeldahl Nitrogen	Arsenic
Specific Conductance	Ammonia (7664-41-7)	Cadmium
Temperature	Nitrate	Calcium
Floaters or Sinkers [3]	Chemical Oxygen Demand	Iron
Temperature	Biochemical Oxygen Demand (BOD_5)	Lead
pH	Total Organic Carbon	Magnesium
Eh	Total Dissolved Solids	Manganese
Dissolved Oxygen [4]	Sulfate	Potassium
Field Observations [5]	Alkalinity	Sodium
Turbidity	Phenols (108-95-2)	
	Chloride	
	Bromide (24959-67-9)	
	Total hardness as $CaCO_3$	

TABLE 2A: BASELINE PARAMETERS: Field Parameters, Leachate Indicators, and Inorganic Patameters [6]

Common Name (and CAS number, as appropriate)[7]		
Field Parameters:	Leachate Indicators:	Inorganic Parameters (total unless otherwise noted):
Static water level (in wells and sumps)	Total Kjeldahl Nitrogen	Aluminum
Specific Conductance	Ammonia (7664-41-7)	Antimony
Temperature	Nitrate	Arsenic
Floaters or Sinkers[8]	Chemical Oxygen Demand	Barium
Temperature	Biochemical Oxygen Demand (BOD_5)	Beryllium
pH	Total Organic Carbon	Cadmium
Eh	Total Dissolved Solids	Calcium
Dissolved Oxygen[9]	Sulfate	Chromium
Field Observations[10]	Alkalinity	Chromium (Hexavalent)[11]
Turbidity	Phenols (108-95-2)	Cobalt
	Chloride	Copper
	Bromide (24959-67-9)	Cyanide
	Total hardness as $CaCO_3$	Iron
	Color	Lead
	Boron (7440-42-8)	Magnesium
		Manganese
		Mercury
		Nickel
		Potassium
		Selenium
		Silver
		Sodium
		Thallium
		Vanadium
		Zinc

TABLE 2B: BASELINE PARAMETERS: Organic Parameters[12]

Common Name (and CAS number, as appropriate)[13]		
Organic Parameters:		
Acetone (67-64-1)	1,1-Dichloroethane; Ethylidene chloride (75-34-3)	Styrene (100-42-5)
Acrylonitrile (107-13-1)	1,2-Dichloroethane; Ethylene dichloride (107-06-02)	1,1,1,2-Tetrachloroethane (630-20-6)
Benzene (71-43-2)	1,1-Dichloroethylene; 1,1-Dichloroethene; Vinylidene chloride (75-35-4)	1,1,2,2-Tetrachloroethane (79-34-5)
Bromochloromethane (74-97-5)	cis-1,2-Dichloroethylene; cis-1,2-Dichloroethene (156-59-2)	Tetrachloroethylene; Tetrachloroethene; Perchloroethylene (127-18-4)
Bromodichloromethane (75-27-4)	trans-1,2-Dichloroethylene; trans-1,2-Dichloroethene (156-60-2)	Toluene (108-88-3)
Bromoform; Tribromomethane (75-25-2)	1,2-Dichloropropane; Propylene dichloride (78-87-5)	1,1,1-Trichloroethane; Methylchloroform (71-55-6)
Carbon disulfide (75-15-0)	cis-1,3-Dichloropropene (10061-01-5)	1,1,2-Trichloroethane (79-00-5)
Carbon tetrachloride (56-23-5)	trans-1,3-Dichloropropene (10061-02-6)	Trichloroethylene; Trichloroethene (79-01-6)
Chlorobenzene (108-90-7)	Ethylbenzene (100-41-4)	Trichlorofluoromethane; CFC-11 (75-69-4)
Chloroethane; Ethyl chloride (75-00-3)	2-Hexanone; Methyl butyl ketone (591-78-6)	1,2,3-Trichloropropane (96-18-4)
Chloroform; Trichloromethane (67-66-3)	Methyl bromide; Bromomethane (74-83-9)	Vinyl acetate (108-05-4)
Dibromochloromethane; Chlorodibromomethane (124-48-1)	Methyl chloride; Chloromethane (74-87-3)	Vinyl chloride; Chloroethene (75-01-4)
1,2-Dibromo-3-chloropropane; DBCP (96-12-8)	Methylene bromide; Dibro- momethane (74-95-3)	Xylenes (1330-20-7)
1,2-Dibromoethane; Ethylene dibromide; EDB (106-93-4)	Methylene chloride; Dichloromethane (75-09-2)	
o-Dichlorobenzene; 1,2-Dichlorobenzene (95-50-1)	Methyl ethyl ketone; MEK; 2-Butanone (78-93-3)	
p-Dichlorobenzene; 1,4-Dichlorobenzene (106-46-7)	Methyl iodide; Iodomethane (74-88-4)	
trans-1,4-Dichloro-2-butene (110-57-6)	4-Methyl-2-pentanone; Methyl isobutyl ketone (108-10-1)	

TABLE 3A: EXPANDED PARAMETERS: Field Parameters, Leachate Indicators, Radionuclides, and Inorganic Parameters[14]

Common Name (and CAS number, as appropriate)[15]			

Field Parameters:	Leachate Indicators:	Inorganic Parameters: (total unless otherwise noted)	Radionuclides [16]
Static water level (in wells and sumps)	Total Kjeldahl Nitrogen	Aluminum	Radium-226 per EPA 903.1
Specific Conductance	Ammonia (7664-41-7)	Antimony	Radium-228 per EPA 904.0
Temperature	Nitrate	Arsenic	Total Uranium per EPA 908.0
Floaters or Sinkers [17]	Chemical Oxygen Demand	Barium	
Temperature	Biochemical Oxygen Demand (BOD_5)	Beryllium	
pH	Total Organic Carbon	Cadmium	
Eh	Total Dissolved Solids	Calcium	
Dissolved Oxygen [18]	Sulfate	Chromium	
Field Observations [19]	Alkalinity	Chromium (Hexavalent) [20]	
Turbidity	Phenols (108-95-2)	Cobalt	
	Chloride	Copper	
	Bromide (24959-67-9)	Cyanide	
	Total hardness as $CaCO_3$	Iron	
	Color	Lead	
	Boron (7440-42-8)	Magnesium	
		Manganese	
		Mercury	
		Nickel	
		Potassium	
		Selenium	
		Silver	
		Sodium	
		Thallium	
		Tin	
		Vanadium	
		Zinc	

TABLE 3B: EXPANDED PARAMETERS: Organic Parameters [21]

Common Name (and CAS number, as appropriate) [22]		
Organic Parameters:		
Acenaphthene (83-32-9)	2,4-Dichlorophenol (120-83-2)	Naphthalene (91-20-3)
Acenaphthylene (208-96-8)	2,6-Dichlorophenol (87-65-0)	1,4-Naphthoquinone (130-15-4)
Acetone (67-64-1)	1,2-Dichloropropane; Propylene dichloride (78-87-5)	1-Naphthylamine (134-32-7)
Acetonitrile; Methyl cyanide (75-05-8)	1,3-Dichloropropane; Trimethylene dichloride (142-28-9)	2-Naphthylamine (91-59-8)
Acetophenone (98-86-2)	2,2-Dichloropropane; Isopropylidene chloride (594-20-7)	o-Nitroaniline; 2-Nitroaniline (88-74-4)
2-Acetylaminofluorene; 2-AAF (53-96-3)	1,1-Dichloropropene (563-58-6)	m-Nitroaniline; 3-Nitroaniline (99-09-2)
Acrolein (107-02-8)	cis-1,3-Dichloropropene (10061-01-5)	p-Nitroaniline, 4-Nitroaniline (100-01-6)
Acrylonitrile (107-13-1)	trans-1,3-Dichloropropene (10061-02-6)	Nitrobenzene (98-95-3)
Aldrin (309-00-2)	Dieldrin (60-57-1)	o-Nitrophenol 2-Nitrophenol (88-75-5)
Allyl chloride (107-05-1)	Diethyl phthalate (84-66-2)	p-Nitrophenol; 4-Nitrophenol (100-02-7)
4- aminobiphenyl (92-67-1)	0,0-Diethyl 0-2-pyrazinyl	N-Nitrosodi-n-butylamine (924-16-3)
Anthracene (120-12-7)	cis-1,2-Dichloroethylene; cis-1,2-Dichloroethene (156-59-2)	
N-Nitrosodiethylamine (55-18-5)		
Benzene (71-43-2)	trans-1,2-Dichloroethylene (156-60-2)	N-Nitrosodimethylamine (62-75-9)
Benzo[a]anthracene; Benzanthracene (56-55-3)	Phosphorothioate; Thionazin (297-97-2)	N-Nitrosodiphenylamine (86-30-6)
Benzo[b]fluoranthene (205-99-2)	Dimethoate (60-51-5)	N-Nitrosodipropylamine; N-Nitroso-N-dipropyl-amine; Di-n-propylni-trosamine (621-64-7)
Benzo[k]fluoranthene (207-08-9)	p-(Dimethylamino)azobenzene (60-11-7)	N-Nitrosomethylethalamine (10595-95-6)
Benzo[ghi]perylene (191-24-2)	7,12-Dimethylbenz[a]anthracene (57-97-6)	N-Nitrosopiperidine (100-75-4)
Benzo[a]pyrene (50-32-8)	3,3 [21] -Dimethylbenzidine (119-93-7)	N-Nitrosopyrrolidine (930-55-2)
Benzyl alcohol (100-51-6)	2,4-Dimethylphenol, m-Xylenol (105-67-9)	5-Nitro-o-toluidine (99-55-8)
alpha-BHC (319-84-6)	Dimethyl phthalate (131-11-3)	Parathion (56-38-2)
beta-BHC (319-85-7)	m-Dinitrobenzene (99-65-0)	Pentachlorobenzene (608-93-5)
delta-BHC (319-86-8)	4,6-Dinitro-o-cresol 4,6- Dinitro-2-methylphenol (534-52-1)	Pentachloronitrobenzene (82-68-8)

gamma-BHC, Lindane (58-89-9)	2,4-Dinitrophenol (51-28-5)	Pentachlorophenol (87-86-5)
Bis(2-chloroethoxy)methane (111-91-1)	2,4-Dinitrotoluene (121-14-2)	Phenacetin (62-44-2)
Bis(2-chloroethyl) ether; Dichloroethyl ether (111-44-4)	2,6-Dinitrotoluene (606-20-2)	Phenanthrene (85-01-8)
Bis-(2-chloro-1-methyl-ethyl)ether; 2,2[21]-Dichlorodiisopropyl ether; DCIP[23]	Dinoseb; DNBP; 2-sec-Butyl-4,6-dinitrophenol (88-85-7)	Phenol (108-95-2)
Bis(2-ethylhexyl)phthalate (117-81-7)	Di-n-octyl phthalate (117-84-0)	p-Phenylenediamine (106-50-9)
Bromochloromethane (74-97-5)	Diphenylamine (122-39-4)	Phorate (298-02-2)
Bromodichloromethane (75-27-4)	Disulfoton (298-04-4)	Polychlorinated biphenyls; PCBs; Aroclors[24]
Bromoform (75-25-2)	Endosulfan I (959-98-8)	Polychlorinated dibenzo-p- dioxins; PCDDs[25]
4-Bromophenyl phenyl ether (101-55-3)	Endosulfan II (33213-65-9)	Polychlorinated dibenzo- furans; PCDFs[26]
Butyl benzyl phthalate; Benzyl butyl phthalate (117-81-7)	Endosulfan sulfate (1031-07-8)	Pronamide (23950-58-5)
Carbon disulfide (75-15-0)	Endrin (72-20-8)	Propionitrile; Ethyl cyanide (107-12-0)
Carbon tetrachloride (56-23-5)	Endrin aldehyde (7421-93-4)	Pyrene (129-00-0)
Chlordane[27]	Ethylbenzene (100-41-4)	Safrole (94-59-7)
p-Chloroaniline (106-47-8)	Ethyl methacrylate (97-63-2)	Silvex, 2,4,5-TP (93-72-1)
Chlorobenzene (108-90-7)	Ethyl methanesulfonate (62-50-0)	Styrene (100-42-5)
Chlorobenzilate (510-15-6)	Famphur (52-85-7)	2,4,5-T, 2,4,5-trichloro- phenoxyacetic acid (93-76-5)
p-Chloro-m-cresol; 4-Chloro-3-methylphenol (59-50-7)	Fluoranthene (206-44-0)	1,2,4,5-Tetrachlorobenzene (95-94-3)
Chloroethane; Ethyl chloride (75-00-3)	Fluorene (86-73-7)	2,3,7,8-Tetrachlorodi- benzo-p-dioxin; 2,3,7,8-TCDD (1746-01-6)
Chloroform; Trichloromethane (67-66-3)	Heptachlor (76-44-8)	1,1,1,2-Tetrachloroethane (630-20-6)
2-Chloronaphthalene (91-58-7)	Heptachlor epoxide (1024-57-3)	1,1,2,2-Tetrachloroethane (79-34-5)
2-Chlorophenol (95-57-8)	Hexachlorobenzene (118-74-1)	Tetrachloroethylene; Tetrachloroethene; Perchloroethylene (127-18-4)
4-Chlorophenyl phenyl ether (7005-72-3)	Hexachlorobutadiene (87-68-3)	2,3,4,6-Tetrachlorophenol (58-90-2)
Chloroprene (126-99-8)	Hexachlorocyclopentadiene (77-47-4)	Toluene (108-88-3)
Chrysene (218-01-9)	Hexachloroethane (67-72-1)	o-Toluidine (95-53-4)
m-Cresol; 3-methylphenol (108-39-4)	Hexachloropropene (1888-71-7)	Toxaphene[28]
o-Cresol; 2-methylphenol (95-48-7)	2-Hexanone; Methyl butyl ketone (591-78-6)	1,2,4-Trichlorobenzene (120-82-1)
p-Cresol; 4-methylphenol (106-44-5)	Indeno(1,2,3-cd)pyrene (193-39-5)	1,1,1-Trichloroethane; Methylchloroform (71-55-6)
2,4-D; 2,4-Dichlorophen- oxyacetic acid (94-75-7)	Isobutyl alcohol (78-83-1)	1,1,2-Trichloroethane (79-00-5)
4,4[21]-DDD (72-54-8)	Isodrin (465-73-6)	Trichloroethylene; Trichloroethene (79-01-6)
4,4[21]-DDE (72-55-9)	Isophorone (78-59-1)	Trichlorofluoromethane; R-11 (75-69-4)
4,4[21]-DDT (50-29-3)	Isosafrole (120-58-1)	2,4,5-Trichlorophenol (95-95-4)
Diallate (2303-16-4)	Kepone (143-50-0)	2,4,6-Trichlorophenol (88-06-2)
Dibenz[a,h]anthracene (53-70-3)	Methacrylonitrile (126-98-7)	1,2,3-Trichloropropane (96-18-4)
Dibenzofuran (132-64-9)	Methapyrilene (91-80-5)	0,0,0-Triethyl phosphorothioate (126-68-1)
Dibromochloromethane; Chlorodibromomethane (124-48-1)	Methoxychlor (72-43-5)	sym-Trinitrobenzene (99-35-4)
1,2-Dibromo-3-chloro- propane; DBCP (96-12-8)	Methyl bromide; Bromomethane (74-83-9)	Vinyl acetate (108-05-4)
1,2-Dibromoethane; Ethylene dibromide; EDB (106-93-4)	Methyl chloride; Chloromethane (74-87-3)	Vinyl chloride; Chloroethene (75-01-4)
Di-n-butyl phthalate (84-74-2)	3-Methylcholanthrene (56-49-5)	Xylene (total)
o-Dichlorobenzene; 1,2-Dichlorobenzene (95-50-1)	Methyl ethyl ketone; MEK; 2-Butanone (78-93-3)	Per- and polyfluoroalkyl substances[29]
m-Dichlorobenzene; 1,3-Dichlorobenzene (541-73-1)	Methyl iodide; Iodomethane (74-88-4)	1,4-Dioxane (123-91-1)
p-Dichlorobenzene; 1,4-dichlorobenzene (106-46-7)	Methyl methacrylate (80-62-6)	
3,3[21]-Dichlorobenzidine (91-94-1)	Methyl methanesulfonate (66-27-3)	
trans-1,4-Dichloro- 2-butene (110-57-6)	2-Methylnaphthalene (91-57-6)	

Dichlorodifluoromethane, CFC 12 (75-71-8)	Methyl parathion; Parathion methyl (298-00-0)	
1,1-Dichloroethane; Ethyldidene chloride (75-34-3)	4-Methyl-2-pentanone; Methyl isobutyl ketone (108-10-1)	
1,2-Dichloroethane; Ethylene dichloride (107-06-2)	Methylene bromide; Dibromomethane (74-95-3)	
1,1-Dichloroethylene; 1,1-Dichloroethene; Vinylidene chloride (75-35-4)	Methylene chloride; Dichloromethane (75-09-2)	

(i) Leachate management plan.

The leachate management plan must include:

(1) a description of how the landfill will be constructed, operated, and closed in a manner that minimizes the generation of leachate, except in those cases where the department has approved the recirculation of leachate for waste mass stabilization enhancement, and how the migration of leachate into surface water or groundwater will be prevented;

(2) a description of operational methods to minimize the occurrence of perched leachate trapped above the leachate collection and removal system and surface seeps of leachate from above-grade landfill operations;

(3) a schedule for biennial video inspection and annual maintenance of the primary and secondary leachate collection and removal system;

(4) a schedule for the monitoring and recording of the secondary leachate collection and removal system flow data to determine the presence, quantity, nature and significance of any liquid detected;

(5) a discussion of the specific design and operational features related to the system, including leachate monitoring and sampling, locations of all leachate sampling points, alarm systems and maintenance, and any required back up equipment; and

(6) if leachate recirculation is proposed, the leachate management plan must include

(i) a supporting geotechnical analysis evaluating the effect of leachate recirculation on the structural integrity and stability of the landfill's liner system, leachate collection and removal system, and waste mass;

(ii) a description of how increased landfill gas emissions and associated odors will be controlled;

(iii) a description of the methods and rate of leachate recirculation and addition;

(iv) procedures for recording the date and volume of recirculated leachate;

(v) a description of the operation, which addresses:

(a) the use of permeable operating cover or alternative operating cover to facilitate leachate distribution throughout the waste mass; and

(b) operational controls such as monitoring of surface seeps, liner system performance and excessive leachate head buildup, prevention of subsurface fires, odor control, and instruction for cessation of leachate recirculation and remediation of these conditions.

(j) Odor control plan.

The odor control plan must include:

(1) identification of all potential sources for odors and a description of the operational procedures and strategies to be followed to effectively control odors at the facility;

(2) procedures to be taken in the event of proposed waste volume increases or changes in waste characterization that may increase landfill gas emissions or odors;

(3) identification of the landfill personnel who would be responsible for implementation of the odor control plan; and

(4) operational and design-related recommendations that can be implemented upon detection of odor control problems, including impervious membranes and interim covers in conjunction with other landfill gas control methods. The odor control plan may include but not be limited to, gas control systems that are appropriately connected to the landfill liner system's primary leachate collection and removal system (including the drainage area on the landfill's side slopes), use of a horizontal gas collection lines, which may include rejection or mitigation of odiferous wastes that are determined to be contributing to off-site odors.

(k) Gas monitoring and emission control plan.

The gas monitoring and emission control plan must include:

(1) a description of the day-to-day operation of the landfill gas management system with respect to operation of odor and emission controls;

(2) a description of any air quality monitoring, including monitoring for fugitive landfill odor and air emissions; and

(3) for a landfill with an appurtenant landfill gas-to-energy facility or other landfill gas recovery facility, a discussion of how the landfill's odor and air emission controls are integrated with a recovery facility.

(l) Winter and inclement weather operation plan.

A description of how winter and inclement weather operations will be conducted, including identification of the specific actions to be taken to prevent frost action on the liner system in places where waste will not be placed within one year of construction certification approval.

(m) Residential drop-off operation plan.

A description of the operation of a residential drop-off area, if applicable, for non-commercial vehicles to unload waste and recyclables at an area other than the landfill working face.

(n) A radioactive waste detection plan.

The radioactive waste detection plan must include procedures for detecting radioactive material; operation and maintenance documents for radiation detectors which address proper equipment placement for effective operation and include setting of investigation alarm setpoint settings and calibration methods; and response procedures to be implemented if radioactive waste is detected.

(o) Emergency response plan.

An emergency response plan must include a description of, at a minimum, the actions to be taken in response to:

(1) uncontrolled explosive landfill gases detected on-site or beyond the property boundary;

(2) unexpected events during the construction and operation of the landfill gas management system, including the equipment to be utilized to maintain proper landfill gas venting and control when normal operations cease; and

(3) unexpected events during the subsequent construction and/or daily operation of the landfill's leachate collection and removal system.

(p) Conceptual closure, post-closure care, custodial care, and end use plan.

The conceptual closure, post-closure care, custodial care, and end use plan must include:

(1) a site plan that shows proposed final contours, property lines, storm water drainage system, streams and water courses, roads, structures and, if applicable, the groundwater and leachate treatment system, air pollution control system and any active landfill gas collection system;

(2) typical details of final cover system components and facility structures;

(3) a description of how the sequential closure of areas of the landfill is expected to progress in concert with the fill progression schedule, including effects of landfill reclamation activities if proposed;

(4) an estimate of the greatest number of landfill cells which, at any given point during the lifetime of the facility, will have received waste but not undergone final closure;

(5) an estimate of the maximum volume of waste and alternative operating cover that will be contained within the landfill;

(6) sufficient information upon which to estimate closure costs and post-closure and custodial care monitoring and maintenance costs. This information must be based upon the requirements of Subpart 363-9 of this Part, including a rolling 30-year post-closure care period, and must include estimates of:

(i) quantities and costs for each component of the final cover system, including related construction costs;

(ii) the anticipated length of the post-closure care period based on the types of wastes disposed and the criteria provided in section 363-9.6(a) of this Part;

(iii) post-closure operational, monitoring and maintenance costs including costs to replace system components based on predicted service life; and

(iv) custodial care monitoring and maintenance costs including costs to replace system components based on predicted service life; and

(7) a conceptual end use for the site, if proposed.

Footnotes

1 This list contains parameters for which possible analytical procedures are provided in: *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*, EPA Publication SW-846 (Third Edition, (November 1986), as amended by Updates I

(July 1992), II (September 1994), IIA (August 1993), IIB (January 1995), III (December 1996), IIIA (April 1998), document number 955-001-00000-1), incorporated by reference in section 360.3 of this Title. *Methods for Chemical Analysis of Water and Wastes*, USEPA-600/4-79-020, March, 1983, incorporated by reference in section 360.3 of this Title.

2 Common names are those widely used in government regulations, scientific publications, and commerce; synonyms exist for many chemicals. "Total" indicates all species in the groundwater that contain this element.

3 Any floaters or sinkers found must be analyzed separately for baseline parameters.

4 Surface water only.

5 Any unusual conditions (colors, odors, surface sheens, etc.) noticed during well development, purging, or sampling must be reported.

6 This list contains parameters for which possible analytical procedures are provided in: *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*, EPA Publication SW-846 (Third Edition, (November 1986), as amended by Updates I (July 1992), II (September 1994), IIA (August 1993), IIB (January 1995), III (December 1996), IIIA (April 1998), document number 955-001-00000-1), incorporated by reference in section 360.3 of this Title. *Methods for Chemical Analysis of Water and Wastes*, USEPA-600/4-79-020, March, 1983, incorporated by reference in section 360.3 of this Title.

7 Common names are those widely used in government regulations, scientific publications, and commerce; synonyms exist for many chemicals. "Total" indicates all species in the groundwater that contain this element.

8 Any floaters or sinkers found must be analyzed separately for baseline parameters.

9 Surface water only.

10 Any unusual conditions (colors, odors, surface sheens, etc.) noticed during well development, purging, or sampling must be reported.

11 The department may waive the requirement to analyze hexavalent chromium provided that total and hexavalent and trivalent chromium values do not exceed 0.05 mg/l.

12 This list contains parameters for which possible analytical procedures are provided in: *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*, EPA Publication SW-846 (Third Edition, (November 1986), as amended by Updates I (July 1992), II (September 1994), IIA (August 1993), IIB (January 1995), III (December 1996), and IIIA (April 1998) document number 955-001-00000-1), incorporated by reference in section 360.3 of this Title. *Methods for Chemical Analysis of Water and Wastes*, USEPA-600/4-79-020, March, 1983, incorporated by reference in 360.3 of this Title.

13 Common names are those widely used in government regulations, scientific publications, and commerce; synonyms exist for many chemicals.

14 This list contains parameters for which possible analytical procedures are provided in: *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*, EPA Publication SW-846 (Third Edition, (November 1986), as amended by Updates I (July 1992), II (September 1994), IIA (August 1993), IIB (January 1995), III (December 1996), and IIIA (April 1998) document number 955-001-00000-1), incorporated by reference in section 360.3 of this Title. *Methods for Chemical Analysis of Water and Wastes*, USEPA-600/4-79-020, March 1983, incorporated by reference in 360.3 of this Title. *Prescribed Procedures for Measurement of Radioactivity in Drinking Water*, USEPA-600/4-80-032, August 1980, incorporated by reference in section 360.3 of this Title.

15 Common names are those widely used in government regulations, scientific publications, and commerce; synonyms exist for many chemicals. "Total" indicates all species in the groundwater that contain this element.

16 Two sets of samples must be collected: one filtered and one unfiltered. Filtered samples must be filtered using a 0.45 micron filter via standard techniques.

17 Any floaters or sinkers found must be analyzed separately for baseline parameters.

18 Surface water only.

19 Any unusual conditions (colors, odors, surface sheens, etc.) noticed during well development, purging, or sampling must be reported.

20 The department may waive the requirement to analyze hexavalent chromium provided that total and hexavalent and trivalent chromium values do not exceed 0.05 mg/l.

21 This list contains parameters for which possible analytical procedures are provided in: *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*, EPA Publication SW-846 (Third Edition, (November 1986), as amended by Updates I (July 1992), II (September 1994), IIA (August 1993), IIB (January 1995), III (December 1996), and IIIA (April 1998) document number 955-001-00000-1), incorporated by reference in section 360.3 of this Title. *Methods for Chemical Analysis of Water and Wastes*, USEPA-600/4-79-020, March 1983, incorporated by reference in section 360.3 of this Title.

22

Common names are those widely used in government regulations, scientific publications, and commerce; synonyms exist for many chemicals.

23 This substance is often called Bis(2-chloroisopropyl) ether, the name Chemical Abstracts Service applies to its noncommercial isomer, Propane, 2,2"-oxybis[2]-chloro- (CAS RN 39638-32-9).

24 Polychlorinated biphenyls (1336-36-3): This category contains congener chemicals, including constituents of Aroclor 1016 (12674-11-2), Aroclor 1221 (11104-28-2), Aroclor 1232 (11097-69-1), and Aroclor 1260 (11096-82-5).

25 Polychlorinated dibenzo-p-dioxins: This category contains congener chemicals, including tetrachlorodibenzo-p-dioxins, pentachlorodibenzo-p-dioxins, and hexachlorodibenzo-p-dioxins.

26 Polychlorinated dibenzofurans: This category includes congener chemicals, including tetrachlorodibenzofurans, pentachlorodibenzofurans, and hexachlorodibenzofurans.

27 Chlordane: This entry includes alpha-chlordane (5103-71-9), beta-chlordane (5103-74-2), gamma-chlordane (5566-34-7), and constituents of chlordane (57-74-9; 12789-03-6).

28 Toxaphene: This entry includes congener chemicals contained in technical toxaphene (CAS RN 8001-35-2), *i.e.*, chlorinated camphene.

29 Per- and polyfluoroalkyl substances (PFAS): This category contains congener chemicals, including but not limited to perfluorooctanoic acid, perfluorooctanesulfonic acid, perfluorononanoic acid, perfluorohexanesulfonic acid, perfluoroheptanoic acid, perfluorobutanesulfonic acid.

6 CRR-NY 363-4.6
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