Versar INC

REPORT FOR THE INDEPENDENT THIRD PARTY DATA VALIDATION REPORT

SUPPLYSIDE AND FORRESTAL LANDFILL
2nd QUARTERLY MONITORING EVENT
NAVAL STATION GREAT LAKES
GREAT LAKES, ILLINOIS
U.S. NAVY PROJECT NUMBER: N40083-05-A-4217
BPA Call # 0025

Prepared for:

Department of the Navy
Naval Station Great Lakes
Naval Facilities Engineering Command, Midwest
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Versar Project Number: 111186.0001.025

March 23, 2007

Report Written by:

Donna A. Oswald

Donna A. Oswald, Ph.D

DATA VALIDATION REPORT FOR NAVSAC-MIDWEST,

Kemron Project Numbers L0701274, L0701358, L0701434

Project: Naval Station Great Lakes (NSGL), Great Lakes, Illinois.
Quarterly Groundwater Monitoring at Forrestal and Supply Side Landfills
2nd Quarterly Event

Laboratory: Kemron Environmental Services, Marietta, OH

Analyses:
Volatile Organic Compounds (VOC) by SW846 Method 8260B
Semivolatile Organic Compounds (SVOC) by SW846 Method 8270C
Pesticides (PEST) by SW846 Method 8081B
PCBs by SW846 Method 8082
Herbicides by SW846 Method 8150, and EPA Method 525.2
TAL Metals by USEPA/SW846 Methods 6010B/7000 Series: Aluminum, Antimony, Arsenic, Barium, Beryllium, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Mercury, Nickel, Potassium, Selenium, Silver, Sodium, Thallium, Vanadium, Zinc
Biological Oxygen Demand (BOD) by SM 5210B
Chloride by EPA Method 325.2
Chemical Oxygen Demand (COD) by EPA Method 421.4
Total Cyanide (CN) by SW846 Method9014B
Hexavalent Chromium (CR6) by SM 3500Cr
Fluoride (F) by SM 4500F
Phenols by EPA Method 420.1
Ammonia by EPA Method 350.1
Nitrates by EPA Method 353.2
Phosphorous by EPA Method 365.4
Sulphate by EPA Method 375.4
Total Dissolved Solids (TDS) by EPA Method 160.1
Total Organic Carbon (TOC) by EPA Method 415.1
Total Suspended Solids (TSS) by EPA Method 160.2

Matrices: 13 Aqueous Field Samples, 1 Aqueous Equipment Blank, 11 Aqueous Trip Blanks,
Reviewer: Donna Oswald, Ph. D.
Date: March 23, 2007

1.0 INTRODUCTION

Eleven aqueous monitoring well samples, two duplicate samples, one aqueous equipment blank and 11 aqueous trip blanks were collected at Naval Station Great Lakes (NSGL), Great Lakes, Illinois from newly installed monitoring wells at the Supplyside and Forrestal Landfills from Jan 10th through January 31st, 2007. Samples were sent to Kemron Environmental Services (Kemron), located in Marietta, Ohio, for analysis of IEPA L1 and L2 constituents (Appendix A) except for the trip blanks which were analyzed for VOCs only. Analyses were performed in accordance with the Department of Defense Quality Systems Manual, version 3 (DOD QSM3, May 2005). Several compounds not part of the QSM target analyte list were also included to satisfy IEPA reporting requirements. For any L1 or L2 parameters not included in the QSM the laboratory historical statistical limits method or laboratory

QC requirements were used to evaluate the analytical results. Ten percent of the field samples were submitted for validation along with any associated field QC samples. The samples chosen for validation were SL06 (which was also designated for matrix spike/matrix spike duplicate analysis) from Kemron Project Number L0608264 and FL-03 from Kemron project number L0701358 and FL-01 from Kemron project number L0701274. The field duplicate pair (FL-03, FL-DUP) results from Kemron project number L0701434 were also evaluated to determine field/analytical precision. The associated chain of custody documentation is found in Appendix B. A listing of qualified data is found in Appendix C.

The data were qualified in accordance with the validation protocols in the DOD QSM ver3 (May, 2005). A summary table of qualified results and the rationale behind the data qualification is presented in Appendix C.. The laboratory performed the initial review of the data package, and qualified the data in accordance with the DOD QSM requirements. Final qualification of the data was made by the Versar project chemist based on results of the data validation. The following items were reviewed during the data validation process: chain of custody, sample condition upon receipt, extraction/analysis holding times, method detection/reporting limits, internal standards, surrogates, matrix spike/matrix spike duplicate (MS/MSD) analysis results, laboratory control sample (LCS) recoveries, initial and continuing calibrations, second source calibration verification standards, laboratory method and field QC blank contamination, instrument tuning and field duplicates.

The hierarchy of QSM qualifiers applied by the laboratory and or the Versar project chemist from least to most severe are as follows;

U – Undetected at the limit of detection: The associated data value is the limit of detection, adjusted by any dilution factor used in the analysis.
UJ – Undetected at the limit of detection. The reporting limit is an estimation due to quality control deficiences.
J – Estimated: The analyte was positively identified; the quantitated value is an estimation (for example, matrix interference, below standard, outside the calibration range).
Q – One or more quality control criteria (for example, LCS recovery, surrogate spike recovery) failed. Data usability should be carefully assessed by the project team.
R – Data is rejected and not suitable for use for decision making purposes.

2.0 VALIDATION

All calibration requirements as summarized in Appendix D were performed for all samples. All QC criteria were met except as summarized below. Results associated with non-compliances were qualified in accordance with the DOD QSM. Results reported between the method detection limit (MDL) and the reporting limit (RL) or limit of quantitation (LOQ) are qualified "J". These results are considered to be qualitatively acceptable but quantitatively suspect due to poor analytical precision near the limit of detection.

Volatile Data (Method 8260B)

All project specific QC criteria were met, except as indicated below:

In the Volatile Alternate Source Calibration standards (ALT) associated with samples FL-01, SLF-06, SL-06MS, and SL-06MSD, %difference (%D) results for Iodomethane and Vinyl Acetate (non-QSM target analytes) exceeded the laboratory's QC limits (%D $\leq$ 30% and 40%, respectively). Neither of these compounds are target analytes specified in the DoD QSM. Excessive variations in the results for the second source standard may indicate problems with the initial calibration for that compound. These compounds were not detected in any of the associated samples. Both of these compounds were only recovered at 50% in the alternate source standard; positive results may be biased low and there is the possibility of false non-detects. **Reporting limits for iodomethane and vinyl acetate are qualified UJ.**

In the Laboratory Control Sample (LCS) associated with samples FL-01, SLF-06, SL-06MS, and SL-06MSD the percent recovery results for the compound iodomethane (also know as methyl iodide, 54.7%) was below the laboratory's lower control limits (60-200). This compound was not detected in the associated samples. The observed bias is consistent with the low bias observed in the alternate source standard analysis. As this data has already been qualified no addition action was taken.

Matrix spike recovery criteria were met for all target analytes except iodomethane which was biased low (47.5%, 50.9%) and acetone which was biased high (142%, 149%). Iodomethane was also biased low in the alternate source standard and laboratory control sample analyses, therefore the matrix spike results are indicative of a calibration issue and likely not due to a matrix effect. Acetone recovery was acceptable in the associated laboratory control sample. Non-recovery of Acetone is likely indicative of a matrix effect enhancing the recovery of this compound as opposed to analytical bias. **Acetone was not detected in this sample, therefore no qualification is required.**

Semivolatile Data (Method 8270)

All project specific QC criteria were met, except as indicated below.

QC acceptance criteria for the semi-volatile LCS were not met for bis(2-chloroethoxy)methane in the LCS associated with samples FL-01, SLF-06, SLF-06MS and SL-06MSD. Results were biased low. This compound was not detected in any of the associated samples. Low bias may impact a laboratory's ability to detect a compound. **The reporting limit is qualified UJ for use as an estimate.**

Sample SLF-06 was designated for matrix spike, matrix spike duplicate (MS/MSD) analysis. Recovery criteria were met for all target analytes except for bis(2-chloroethoxy)methane (recovery below the control limit). The associated LCS was also biased low, therefore the low bias in the matrix spike analysis is likely due to analytical bias rather

than a matrix effect. **The low bias for bis(2-chloroethoxy)methane is indicate of potential false non-detects. Reporting limits are already qualified UJ, no additional qualification is required.**

Polyaromatic Hydrocarbons(PAHs) (EPA Method 8270 – low level)

All project specific QC criteria were met, except as indicated below.

The Alternate Source Calibration (ALT) standard results for acenaphthene, and naphthalene (25.1 and 27.8, respectively%) did not meet criteria (%D $\leq$ 20%) in the initial calibration associated with the reanalysis of sample SL-06 on 1/26/2007. The results were indicative of possible low bias. These compounds were not detected in the associated sample. The ALT standard results associated with the original sample analysis on 1/19/2007 were acceptable. **Results for naphthalene and acenaphthene in the reanalysis of SL-06 are qualified UJ.**

LCS acceptance criteria were exceeded for Naphthalene, Phenanthrene, Anthracene, Fluoranthene, Benzo(a)anthracene and Chrysene in the original analysis of samples SL-06, SL-06MS, SL-06MSD. Results were biased high. As the samples were past extraction holding time, it was not possible to re-extract and re-analyze them. The sample was reanalyzed on a different date using a different instrument, with acceptable results. None of these compounds were detected in any the associated samples and the LCS results are indicative of high bias. High bias does not impact a laboratory's ability to detect a compound. **There is no impact on the laboratory's ability to detect any of these compounds, no qualification is required. The results from the original analysis should be used for regulatory reporting purposes.**

Acceptance criteria were exceeded for Phenanthrene, Anthracene, Fluoranthene, Pyrene, Benzo(a)anthracene, Chrysene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(a)pyrene, Indeno(1,2,3-cd)pyrene, Dibenzo(a,h)anthracene, Benzo(g,h,i)perylene in the LCS and/or LCSD associated with the analysis of FL-01. . As the samples were past extraction holding time, it was not possible to re-extract and re-analyze them. The problem was investigated by the laboratory and traced to a spiking standard that had become concentrated. **As none of these compounds were detected in the sample, no additional corrective action was taken, no qualification is required.**

Sample SL-06 was designated for matrix spike, matrix spike duplicate (MS/MSD) analysis. Recovery criteria were exceeded for Acenaphthylene, Fluorene, Phenanthrene, Anthracene, Fluoranthene, Benzo(a) anthracene, Chrysene, Benzo(b)fluoranthehe and Benzo(a)pyrene in the matrix spike and/or matrix spike duplicate analysis. For those compounds where the associated LCS was also biased high, the high bias in the matrix spike analysis is likely due to analytical bias rather than a matrix effect. For Acenaphthylene, Fluorene, Benzo(b)fluoranthehe and Benzo(a)pyrene the high bias is likely due to a matrix effect which is enhancing the recovery of these comounds. Reanalysis of these samples on a differenct instrument yielded acceptable recoveries. **There is no impact on the laboratory's ability to detect any of these compounds, no qualification is required.**

Pesticide Data (EPA Method SW8081)

All project specific QC criteria were met:

PCB Data (EPA Method SW8082)

All project specific QC criteria were met.

Herbicide Data (EPA Method SW8150)

All QC acceptance criteria were met for herbicide analysis by the above method for the required compounds for this project.

Herbicide Data (EPA Method 525.2

Alachlor, Aldicarb and Carbofuran were analyzed by Underwriters Laboratory Inc. by EPA Method 525.5. These compounds are not part of the DoD QSM, therefore the laboratory supplied QC limits were used. All results were acceptable.

Metals (EPA Methods 6010, 6020, 7470)

All calibration requirements as summarized in Appendix D were met for all samples. All other QC criteria were met except as summarized below. Results associated with non-compliances were qualified in accordance with the QSM.

Sample SLF-06 was designated for matrix spike, matrix spike duplicate (MS/MSD) analysis. Recovery and precision criteria were met for all metals except for Aluminum, Calcium, Iron and Magnesium. Due to the high levels of Calcium, Iron and Magnesium in the parent sample, the amount spiked in was insignificant relative to the native level, therefore spike recovery is not relevant. No qualification is required. High recovery was observed for Aluminum. The associated laboratory control sample recovery was acceptable. The high bias is likely indicative of a matrix effect enhancing the result. **The result for Aluminum is qualified with a J for use as an estimate.**

Samples FL-03 and FL-DUP were a field duplicate pair. No criteria for the evaluation of field duplicate results are provided in the DoD QSM, therefore guidance provided for review of laboratory duplicates in the USEPA CLP National Functional Guidelines for Inorganic Data Review (EPA-540/R-94-013) was used. LCS/LCSD relative percent difference (RPD) criteria were used to evaluate results greater than 5 times the reporting limit (RL). LCS RPD criteria serve as a lower estimate of precision as they do not include variability introduced by sample matrices. Results less than 5 times the RL were evaluated against criteria of $\pm$ the RL. Acceptable precision (RPD < 20%) was observed for all metals except for Selenium. As all associated QC criteria were met for this sample (Kemron project # L07-01434), the poor precision is likely reflective of a matrix effect. **The result for Selenium in these samples are qualified with a J for use as estimates due to poor precision.**

GENERAL CHEMISTRY METHODS

The QSM does not provide QC evaluation criteria/guidance for any of the general chemistry methods employed for this project. The laboratories statistically generated internal QC criteria were therefore employed for data evaluation purposes.

BOD Data (SM5210B)
All method specific QC criteria were met except for the following.

The LCS duplicate recovery associated with the analysis of sample FL-01 was marginally low (82.9%Recovery versus criteria 84.6%-115.4%). The LCS recovery was acceptable at 101%. The calculated RPD for the LCS/LCSD (19%) did not meet the laboratory's internal criteria (RPD $\leq$10%). **The associated sample result for FL-01 is qualified UJ for use as an estimate due to potential poor bias and prcecision.**

Chloride Data by EPA Method 325.2
All method specific QC criteria were met.

Chemical Oxygen Demand (COD) by EPA Method 421.4
All method specific QC criteria were met.

Total Cyanide (CN) by SW846 Method 9014B
All method specific QC criteria were met.

Hexavalent Chromium (CR6) by SM 3500Cr
All method specific QC criteria were met.

Fluoride Data by SM 4500F
All method specific QC criteria were met.

Phenols Data by EPA Method 420.1
All method specific QC criteria were met.

Ammonia Data by EPA Method 350.1
All method specific QC criteria were met.

Nitrates Data by EPA Method 353.2
Nitrate is analyzed by subtracting the nitrite result from the nitrate-nitrite result. The nitrite was analyzed within the 48 hour hold time. Nitrate-nitrite has a 28 day hold, so the analysis was performed within hold. All method specific QC criteria were met.

Phosphorous Data by EPA Method 365.4

All method specific QC criteria were met.

Sulfate Data by EPA Method 375.4

All method specific QC criteria were met.

Total Dissolved Solids Data by EPA Method 160.1

All method specific QC criteria were met.

Total Organic Carbon Data by EPA Method 415.1

All method specific QC criteria were met.

Total Suspended Solids Data by EPA Method 160.2

All method specific QC criteria were met.

APPENDIX A

L1/L2 ANALYTE LIST

LIST L1

Routine Leachate Monitoring Parameters	STORET
Temp. of Leachate Sample (°F)	00011
Specific Conductance	00094
pH	00400
Elevation Leachate Surface (ft. AMSL)	71993
BTM of Well Elevation (ft. AMSL)	72020
Leachate Level from Measuring Point ft.	72109
Arsenic (total)	01002
Barium (total)	01007
Cadmium (total) mg/l	01027
Chromium (hexavalent)	01032
Chromium (total)	01034
Copper (total)	01042
Cyanide	00720
Fluoride	00951
Iron (total)	01045
Lead (total)	01051
Manganese (total)	01055
Nickel (total)	01067
Oils (hexane soluble or equivalent)	00550
Phenols	32730
Silver (total)	01077
Zinc (total)	01092
Total Dissolved Solids (TDS) mg/l	70300
Total Suspended Solids	00530
Ammonia Nitrogen - N	00610
Bacteria (Fecal Coliform)	31616
Biochemical Oxygen Demand(BOD_5)	00310
Mercury (total)	71900
Phosphorous	00665
Chemical Oxygen Demand (COD)	00335

LIST L2

Annual Leachate Monitoring Parameters	STORET
Temp. of Leachate Sample (°F)	00011
Specific Conductance	00094
pH	00400
Elevation Leachate Surface	71993

BTM of Well Elevation	72020
Leachate Level from Measuring Point ft.	72109
1,1,1,2-Tetrachloroethane	77562
1,1,1-Trichloroethane	34506
1,1,2,2-Tetrachloroethane	34516
1,1,2-Trichloroethane	34511
1,1-Dichloroethane	34496
1,1-Dichloroethylene	34501
1,1-Dichloropropene	77168
1,2,3-Trichlorobenzene	77613
1,2,3-Trichloropropane	77443
1,2,4-Trichlorobenzene	34551
1,2,4-Trimethylbenzene	77222
1,2-Dibromo-3-Chloropropane	38760
1,2-Dichloroethane	34531
1,2-Dichloropropane	34541
1,3,5-Trimethylbenzene	77226
1,3-Dichloropropane	77173
1,3-Dichloropropene	34561
1,4-Dichloro-2-Butene	73547
1-Propanol	7018
2,2-Dichloropropane	77170
2,4,5-tp (Silvex)	39760
2,4,6-Trichlorophenol	34621
2,4-Dichlorophenol	34601
2,4-Dichlorophenoxyacetic Acid (2,4-D)	39730
2,4-Dimethylphenol	34606
2,4-Dinitrotoluene	34611
2,4-Dinitrophenol	34616
2,6-Dinitrotoluene	34626
2-Chloroethyl Vinyl Ether	34576
2-Chloronaphthalene	34581
2-Chlorophenol	34586
2-Hexanone	77103
2-Propanol (Isopropyl Alcohol)	81310
3,3-Dichlorobenzidine	34631
4,4-DDD	39310
4,4-DDE	39320
4,4-DDT	39300
4,6-Dinitro-O-Cresol	34657
4-Bromophenyl Phenyl Ether	34636
4-Chlorophenyl Phenyl Ether	34641
4-Methyl-2-Pentanone	78133
4-Nitrophenol	34646
Acenaphthene	34205

Acetone	81552
Alachlor	77825
Aldicarb	39053
Aldrin	39330
Alpha - BHC	39337
Aluminum	01105
Ammonia Nitrogen - N	00610
Anthracene	34220
Antimony	01097
Aroclor-1016	34671
Aroclor-1221	39488
Aroclor-1232	39492
Aroclor-1242	39496
Aroclor-1248	39500
Aroclor-1254	39504
Aroclor-1260	39508
Arsenic (total)	01002
Atrazine	39033
Bacteria (Fecal Coliform)	31616
Barium	01007
Benzene	34030
Benzo (a) Anthracene	34526
Benzo (a) Pyrene	34247
Benzo (b) Fluoranthene	34230
Benzo (ghi) Perylene	34521
Benzo (k) Fluoranthene	34242
Beryllium (total)	01012
Beta - BHC	39338
Bicarbonate	00425
Biochemical Oxygen Demand (BOD_5)	00310
Bis (2-Chloro-1-Methylethyl) Ether	73522
Bis (2-Chloroethoxy) Methane	34278
Bis (2-Chloroethyl) Ether	34273
Bis (2-Ethylhexyl) Phthalate	39100
Bis(Chloromethyl)Ether	34268
Boron	01022
Bromobenzene	81555
Bromochloromethane	77297
Bromodichloromethane	32101
Bromoform	32104
Bromomethane	34413
Butanol	45265
Butyl Benzyl Phthalate	34292
Cadmium (total)	01027
Calcium mg/l	00916

Carbofuran	81405
Carbon Disulfide	77041
Carbon Tetrachloride	32101
Chemical Oxygen Demand (COD)	00335
Chlordane	39350
Chloride mg/l	00940
Chlorobenzene	34301
Chloroethane	34311
Chloroform	32106
Chloromethane	34418
Chromium	01034
Chrysene	34320
Cis-1,2-Dichloroethylene	77093
Cobalt	01037
Copper (total)	01042
Cyanide	00720
DDT	39370
Delta - BHC	46323
Di-N-Butyl Phthalate	39110
Di-N-Octyl Phthalate	34596
Dibenzo (a,h) Anthracene	34556
Dibromochloromethane	32105
Dibromomethane	77596
Dichlorodifluormethane	34668
Dieldrin	39380
Diethyl Phthalate	34336
Dimethyl Phthalate	34341
Endosulfan I	34361
Endosulfan II	34356
Endosulfan Sulfate	34351
Endrin	39390
Endrin Aldehyde	34366
Ethyl Acetate	81585
Ethylbenzene	78113
Ethylene Dibromide (EDB)	77651
Fluoranthene	34376
Fluorene	34381
Fluoride	00951
Heptachlor Epoxide	39420
Heptachlor	39410
Hexachlorobenzene	39700
Hexachlorobutadiene	39702
Hexachlorocyclopentadiene	34386
Hexachloroethane	34396
Ideno (1,2,3-cd) Pyrene	34403

Iodomethane	77424
Iron	01045
Isopropylbenzene	77223
Lead	01051
Lindane	39782
Magnesium	00927
Manganese	01055
Mercury	71900
Methoxychlor	39480
Methyl Chloride	34418
Methyl Ethyl Ketone	81595
Methylene Bromide	77596
Methylene Chloride	34423
Naphthalene	34696
Nickel	01067
Nitrate-Nitrogen	00620
Nitrobenzene	34447
Oil, Hexane Soluble (or Equivalent)	00550
Parathion	39540
Pentachlorophenol	39032
Phenanthrene	34461
Phenols	32730
Phosphorous	00665
Polychlorinated Biphenyls	39516
Potassium	00937
Pyrene	34469
Selenium	01147
Silver	01077
Sodium	00929
Styrene	77128
Sulfate	00945
Tert-Butylbenzene	77353
Tetrachlorodibenzo-p-Dixoins	34675
Tetrachloroethylene	34475
Tetrahydrofuran	81607
Thallium	01059
Tin	01102
Toluene	34010
Total Dissolved Solids (TDS) mg/l	70300
Total Organic Carbon (TOC)	00680
Total Suspended Solids	00530
Toxaphene	39400
Trans-1,2-Dichloroethylene	34546
Trans-1,3-Dichlorpropene	34699
Trichloroethylene	39180

Trichlorofluoromethane	34488
Vinyl Acetate	77057
Vinyl Chloride	39175
Xylene	81551
Zinc	01092
m-Dichlorobenzene	34566
m-Xylene	77134
n-Butylbenzene	77342
n-Nitrosodimethylamine	34438
n-Nitrosodiphenylamine	34433
n-Nitrosodipropylamine	34428
n-Propylbenzene	77224
o-Chlorotoluene	77275
o-Dichlorobenzene	34536
o-Nitrophenol	34591
o-Xylene	77135
p-Chlorotoluene	77277
p-Cresol	77146
p-Dichlorobenzene	34571
p-Isopropyltoluene	77356
p-Nitrophenol	34646
p-Xylene	77133
sec-Butylbenzene	77350

LIST L3
RCRA Parameters for Leachate and Condensate

Ignitability	STORET
Flashpoint, Pensky-Martens Closed Cup (°F)	00497
Corrosivity	
pH	00400
Reactivity	
Reactive Cyanide	99040
Reactive Sulfide	99042
Toxicity (TCLP)	
Arsenic	99012
Barium	99014
Cadmium	99016
Chromium	99018
Chromium, Hexavalent	99019
Lead	99020

APPENDIX B

CHAIN OF CUSTODIES

COC No. A 71219

156 Starlite Drive
Marietta, OH 45750

KEMRON
ENVIRONMENTAL SERVICES
CHAIN-OF-CUSTODY RECORD

B552

Phone: 740-373-4071
Fax: 740-373-4835

Company Name: Tol Test, Inc.	
Project Contact: Tim Boos	Contact Phone #: 847 689-0697
Turn Around Requirements: Standard	Location: Naval Station Great Lakes
Project #: 73775.01	Project Name: Forrestal Landfill
Sampler (print): Tim Boos	Signature: T Boos

Program: ☐ NPDES ☐ AFCEE ☒ RCRA ☐ USAGE ☐ Other

Sample I.D. No.	Comp*	Grab	Date	Time	Protocol CWA	Protocol SW846	NUMBER OF CONTAINERS	Hold	VOC extended list	SVOC w/PNA SIM	Herb	Pest	PCB	Metals	NH3	COD	Phos	TOC	Cl	F	NO3	SO4	OG-HEM	Phenols	ADDITIONAL REQUIREMENTS
FL-01		X	01/11/07	11:20		8260	2	14	X																
		X				8270	3	7		X															
		X				8151	2	7			X														
		X				8081	1	7				X													
		X				8082	1	7					X												
		X				6010	1	6m						X											
		X				350.1	1	28							X										
		X				410	1	28								X									
		X				365	1	28									X								
		X		↓		415	1	-										X							
		X		14:47		325	1	6h											X						
		X		14:47		413A	1	28d												X					
		X		14:47		352	1	2													X				
		X		14:47		375.4	1	1														X			
		X		11:20		1664	1	7															X		
↓		X	↓	11:20		420.1	1	28																X	

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Relinquished by: (Signature)	Date	Time	Received by: (Signature)
T Boos	01/11/07	1700	FedEX				

Relinquished by: (Signature)	Date	Time	Received for Laboratory by: (Signature)	Date	Time	Cooler Temp in °C	Remarks:
			Brenda Gregory	1/12/07	1000	4	dc dated Sp intact bag

*Homogenize all composite samples prior to analysis

COC No. A 71220

156 Starlite Drive
Marietta, OH 45750

KEMRON
ENVIRONMENTAL SERVICES

CHAIN-OF-CUSTODY RECORD

Phone: 740-373-4071
Fax: 740-373-4835

Company Name: Tol Test, Inc.

Project Contact: Tim Boos | Contact Phone #: 847 689-0697

Turn Around Requirements: Standard | Location: NSGL

Project #: 73775.01 | Project Name: Forrestal Landfill

Sampler (print): Tim Boos | Signature: Tim Boos

Program: ☐ NPDES ☐ AFCEE ☒ RCRA ☐ USACE ☐ Other

Sample I.D. No.	Comp*	Grab	Date	Time	Protocol CWA	Protocol SW846	NUMBER OF CONTAINERS	Hold	TDS	TSS	BOD	CN	Cr (Hex) +6	Trip Blank (VOC)	ADDITIONAL REQUIREMENTS
FL-01		X	01/11/07	11:20		160.1	1	7	X						
		X		11:20		160.2	1	7		X					
		X		14:47		405.1	1	2			X				
		X		11:20		335.2	1	7				X			
		X		14:47		—	1	2H					X		
FL-TB-02		X	↓	11:20		8260	2	14						X	

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Relinquished by: (Signature)	Date	Time	Received by: (Signature)
Tim Boos	01/11/07	17000	FedEx				

Relinquished by: (Signature)	Date	Time	Received for Laboratory by: (Signature)	Date	Time	Cooler Temp in °C	Remarks:
			Brenda Gregory	1/12/07	1000	4	

*Homogenize all composite samples prior to analysis

COC No. A 71213

156 Starlite Drive
Marietta, OH 45750

KEMRON
ENVIRONMENTAL SERVICES

CHAIN-OF-CUSTODY RECORD

Phone: 740-373-4071
Fax: 740-373-4835

Company Name: ToITest, Inc	
Project Contact: Tim Boos	Contact Phone #: 847 689 0697
Turn Around Requirements: Standard	Location: Naval Station Great Lakes
Project #: 73775.01	Project Name: Supplyside Landfill
Sampler (print): Tim Boos	Signature: Tim Boos

Program: ☐ NPDES ☐ AFCEE ☒ RCRA ☐ USACE ☐ Other

Sample I.D. No.	Comp*	Grab	Date	Time	Protocol CWA	Protocol SW846	NUMBER OF CONTAINERS	Hold	VOC extended list	SVOC w/ PNA SIM	Herbs	Pests	PCB	Metals	NH3	COD	Phos	TOC	Cl	F	NO3	SO4	DG-ITEM	Phenols	ADDITIONAL REQUIREMENTS
SL-06		X	01/16/07	11:25		8260	2		X																
		X				8270	3			X															
		X				8151	2				X														
		X				8081	1					X													
		X				~~8082~~	1						X												
		X			1664	~~350.1~~	1							X											
		X			350.1	~~410~~	1								X										
		X			410	~~365~~	1									X									
		X			365	~~415~~	1										X								
		X			415	~~325~~	1											X							
		X		1355	325	~~413A~~	1												X						
		X		1355	413A	~~352~~	1													X					
		X		1355	352	~~375.4~~	1														X				
		X		1355	375.4		1															X			
		X		11:25	1664		1																X		
		X		11:25	420.1		1																	X	

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Relinquished by: (Signature)	Date	Time	Received by: (Signature)
Tim Boos	01/16/07	17:00	FedEx				

Relinquished by: (Signature)	Date	Time	Received for Laboratory by: (Signature)	Date	Time	Cooler Temp in °C	Remarks:
			Don Lightner	1-17-07	1030	2/2/3	C/C sealed & COC intact

*Homogenize all composite samples prior to analysis

COC No. A 71214

156 Starlite Drive
Marietta, OH 45750

KEMRON
ENVIRONMENTAL SERVICES
CHAIN-OF-CUSTODY RECORD

Phone: 740-373-4071
Fax: 740-373-4835

Company Name: TolTest, Inc	
Project Contact: Tim Boos	Contact Phone #: 847 689 0697
Turn Around Requirements: Standard	Location: NSGL
Project #: 73775.01	Project Name: Supply Side Landf'll
Sampler (print): Tim Boos	Signature: Tim Boos

Program: ☐ NPDES ☐ AFCEE ☒ RCRA ☐ USAGE ☐ Other

ADDITIONAL REQUIREMENTS

Sample I.D. No.	Comp*	Grab	Date	Time	Protocol CWA	Protocol SW846	NUMBER OF CONTAINERS	Hold	TDS	TSS	CN	BOD	Cr^{+6} (Hex)	Trip Blank (VOC)
SL-06		X	01/16/07	11:25		160.1	1		X					
		X				160.2	1			X				
		X				335.2	1				X			
		X		13:55		405.1	1					X		
		X		13:55			1						X	
SL-TB-02		X		11:25		8260	2							X

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Relinquished by: (Signature)	Date	Time	Received by: (Signature)
Tim Boos	01/16/07	1700	FedEx				

Relinquished by: (Signature)	Date	Time	Received for Laboratory by: (Signature)	Date	Time	Cooler Temp in °C	Remarks:
			Don Lightfoot	1-17-07	1030	2/2/3	c/c sealed ok/c intact ok

*Homogenize all composite samples prior to analysis

Page 2 of 4

Page 1588

COC No. A 71209

156 Starlite Drive
Marietta, OH 45750

KEMRON
ENVIRONMENTAL SERVICES
CHAIN-OF-CUSTODY RECORD

Phone: 740-373-4071
Fax: 740-373-4835

Company Name: Tol Test, Inc.

Project Contact: Tim Boos
Contact Phone #: 847 689 0697

Turn Around Requirements: Standard
Location: Naval Station Great Lakes

Project #: 73775.01
Project Name: Forrestal Landfill

Sampler (print): Tim Boos
Signature: Tim Boos

Program: ☐ NPDES ☐ AFCEE ☒ RCRA ☐ USAGE ☐ Other _____

Sample I.D. No.	Comp*	Grab	Date	Time	Protocol CWA	Protocol SW846	NUMBER OF CONTAINERS	Hold	VOC extended list	SVOC w/ PNA SIM	Herb	Pest	PCB	Metals	NH_3	COD	Phos	TOC	Cl	F	NO_3	SO_4	OG-Hem	Phenols	ADDITIONAL REQUIREMENTS
FL-03		X	01/18/07	1035		8260	2		X																
		X				8270	3			X															
		X				8151	2				X														
		X				8081	1					X													
		X				8082	1						X												
		X				6010	1							X											
		X				350.1	1								X										
		X				410	1									X									
		X				365	1										X								
		X		↓		415	1											X							
		X		1527		325	1												X						
		X				413A	1													X					
		X				352	1														X				
		X		↓		375.4	1															X			
		X		1035		1664	1																X		
↓		X	↓	↓		420.1	1																	X	

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Relinquished by: (Signature)	Date	Time	Received by: (Signature)
Tim Boos	01/18/07	1800	FedEx				

Relinquished by: (Signature)	Date	Time	Received for Laboratory by: (Signature)	Date	Time	Cooler Temp in °C	Remarks:
			Shawna Hyde	1-19-07	0938	3	SX's intact c/c sealed

*Homogenize all composite samples prior to analysis

Page 1 of 4

COC No. A 71210

156 Starlite Drive
Marietta, OH 45750

KEMRON
ENVIRONMENTAL SERVICES

CHAIN-OF-CUSTODY RECORD

Phone: 740-373-4071
Fax: 740-373-4835

Company Name: Tol Test, Inc.

Project Contact: Tim Boos | Contact Phone #: 847 689 0697

Turn Around Requirements: Standard | Location: NSGL

Project #: 73775.01 | Project Name: Forrestal Landfill

Sampler (print): Tim Boos | Signature: Tim Boos

Program: ☐ NPDES ☐ AFCEE ☒ RCRA ☐ USAGE ☐ Other

ADDITIONAL REQUIREMENTS

Sample I.D. No.	Comp*	Grab	Date	Time	Protocol CWA	Protocol SW846	NUMBER OF CONTAINERS	Hold	TDS	TSS	BOD	CN	Cr+6	Trip Blank (VOC)
FL-03		x	01/18/07	1035		160.1	1		x					
		x		1035		160.2	1			x				
		x		1527		405.1	1				x			
		x		1035		335.2	1					x		
		x		1527			1						x	
FL-TB-03		x		1035		8260	2							x

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Relinquished by: (Signature)	Date	Time	Received by: (Signature)
Tim Boos	01/18/07	1800	FedEx				

Relinquished by: (Signature)	Date	Time	Received for Laboratory by: (Signature)	Date	Time	Cooler Temp in °C	Remarks:
			Shawna Hyde	1/19/07	0938	3	SX's intact & sealed

*Homogenize all composite samples prior to analysis

APPENDIX C

SUMMARY OF QUALIFIED DATA

3/23/2007

Table 1
SUMMARY OF QUALIFIED RESULTS

Field Sample ID	Method	Target Analyte	Reported Conc. (mg/L)	Reason for Qualification(1)	Data Impact[2]	Qualifier(3)
FL-01	365.4	Phosphorus	0.095	Result < RL	Precision	J
FL-01	420.1	Phenolics	0.00467	Result < RL	Precision	J
SL-06	6010	Aluminum	4.8	MS>CL	High Bias	J
SL-06	6010	Iron	12.9	Result < RL	Precision	J
SL-06	6010	Beryllium	0.000571	Result < RL	Precision	J
SL-06	6010	Chromium	0.00824	Result < RL	Precision	J
SL-06	6010	Cobalt	0.00327	Result < RL	Precision	J
SL-06	6010	Copper	0.00992	Result < RL	Precision	J
SL-06	6010	Nickel	0.0101	Result < RL	Precision	J
FL-01	6020	Antimony	0.000627	Result < RL	Precision	J
FL-03	6020	Selenium	0.0053	FD RPD > CL	Precision	J
FL-DUP	6020	Selenium	0.0076	FD RPD > CL	Precision	J
SL-06	6020	Thallium	0.000129	Result < RL	Precision	J
FL-01	8260	Iodomethane	<5	ALT > CL	Precision	UJ
FL-01	8260	Vinyl Acetate	<5	ALT > CL	Precision	UJ
FL-01	8260	Iodomethane	<5	LCS<CL	Low Bias	UJ
SL-06	8260	Vinyl Acetate	<5	ALT > CL	Precision	UJ
SL-06	8260	Iodomethane	<5	ALT > CL	Precision	UJ
SL-06	8260	Iodomethane	<5	LCS<CL	Low Bias	UJ
FL-01	8270	bis(2-chloroethoxy)methane	<5.7	LCS<CL	Low Bias	UJ
SL-06	8270	bis(2-chloroethoxy)methane	<5.3	LCS<CL	Low Bias	UJ
SL-06	8270	Naphthalene	0.0859	Result < RL	Precision	J
SL-06	8270	Naphthalene	0.0663	Result < RL	Precision	J
SL-06 (RA)	8270-PAH	Naphthalene	<1	ALT > CL	Precision	UJ
SL-06 (RA)	8270-PAH	Acenaphthene	<1	ALT > CL	Precision	UJ
FL-01	SM5210B	Biochemical Oxygen Demand	1.4	Result < RL	Precision	J

(1) Reason for Qualification:
- continuing calibration verification %difference greater than the control limit
- MS > CL: Matrix spike %Recovery above upper control limit
- LCS < CL: Laboratory control recovery below lower control limit
- ALT > CL: Second source calibration standard %difference above control limit
- Result < RL: Result is above the MDL but below the RL and subject to poor precision

(2) Data Impact:
- High Bias: The associated reported result may overestimate the true value.
- Low Bias: The associated reported result may underestimate the true value or the possibility of a false non-detect exists.
- Precision: The associated reported result is subject to high variability.

(3) Qualifier
- **J -** Results are estimated and the data are valid for limited purposes. The results are qualitatively acceptable but quantitatively unreliable.
- **UJ -** The reported quantitation limit is estimated because associated quality control criteria were not met.

APPENDIX D

SUMMARY OF QUALITY CONTROL REQUIREMENTS

Initial Calibration quality control requirements for reportable analytes

QC requirement	multi-point calib.	Multi-point %RSD or r^2 OK	Low standard < RL	Alternate Source Standard (ALT)	Alt %D OK	Tune within 12 hours & tune OK	Column breakdown check ok	CCC RSD OK	SPCC RRFs OK
Analytical Method									
8260B	X	X	X	X	X	X		X	X
8270C	X	X	X	X	X	X		X	X
8081B/8082	X	X	X	X	X		X		
8015/525.2	X	X	X	X	X				
6010B/7000	X	X	X	X	X				
Chloride (325.5)		X	X	X	X				
COD (421.4)		X	X	X	X				
Cr6 (3500 Cr-)		X	X	X	X				
F (SM4500F)		X	X	X	X				
Phenols (420.1)		X	X	X	X				
Ammonia (350.1)		X	X	X	X				
Nitrate (353.2)		X	X	X	X				
Phosphorous (365.4)		X	X	X	X				
Sulfate (375.4)		X	X	X	X				
TDS (160.1)				X	X				
TOC (415.1)		X	X	X	X				
TSS (160.2)				X	X				
CN(9014)	X	X	X	X	X				

Continuing Calibration quality control requirements for reportable analytes

QC requirement	Acceptable tune within 12 hours	CCC %D OK	SPCC RF(50) OK	Column Breakdown Check ok	Continuing Calibration Verification Standard (CCV)	CCV %D OK
Analytical Method						
8260B	X	X	X			
8270C	X	X	X			
8081B/8082		X		X	X	X
8015/525.2	X	X			X	X
6010B					X	X
Chloride (325.5)					X	X
COD (421.4)					X	X
Cr6 (3500 Cr-)					X	X
F (SM4500F)					X	X
Phenols (420.1)					X	X
Ammonia (350.1)					X	X
Nitrate (353.2)					X	X
Phosphorous (365.4)					X	X
Sulfate (375.4)					X	X
TOC (415.1)					X	X
CN(9014)					X	X