

Round 7
Groundwater Monitoring Report
for
Area A Landfill

Naval Submarine Base
New London
Groton, Connecticut



Engineering Field Activity Northeast
Naval Facilities Engineering Command

Contract Number N62467-94-D-0888

Contract Task Order 0816

November 2001



TETRA TECH NUS, INC.



TETRA TECH NUS, INC.

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PITT-01-2-012

January 11, 2002

Project Number 2863

Ms. Kymberlee Keckler
Remedial Project Manager
U.S. Environmental Protection Agency – Region 1
1 Congress St.
Suite 1100 (HBT)
Boston, Massachusetts 02114-2023

Mr. Mark Lewis
Connecticut Department of Environmental Protection
Bureau of Water Management
Permitting, Enforcement, & Remediation Division
79 Elm Street
Hartford, Connecticut 06106-5127

Subject: Final Round 7 Groundwater Monitoring Report for Area A Landfill
Naval Submarine Base-New London, Groton, Connecticut

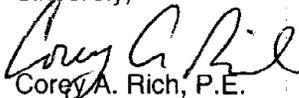
Reference: CLEAN Contract Number N62467-94-D-0888
Contract Task Order Number 0816

Dear Ms. Keckler / Mr. Lewis:

On behalf of the U.S. Navy, Tetra Tech NUS, Inc. (TtNUS) is pleased to submit to the U.S. Environmental Protection Agency, Region 1 (EPA), 2 copies and to the Connecticut Department of Environmental Protection (CTDEP), 1 copy of the enclosed page changes for the subject report. These new pages reflect the changes made to address the comments received from the EPA on December 17, 2001. The Navy's responses to EPA's comments are provided in Attachment A to this letter.

If you have any questions regarding the page changes, please contact Mr. Mark Evans of Engineering Field Activity Northeast at (610) 595-0567 (ext. 162).

Sincerely,


Corey A. Rich, P.E.
Project Manager

Attachment(s)

c: Mr. Mark Evans, EFANE (2 copies)
Mr. Richard Conant, NSB-NLON (2 copies)
Mr. Roger Boucher, EFANE (w/o enclosure)
Ms. Jennifer Hayes Stump, Gannett Fleming (1 copy)
Mr. John Trepanowski, TtNUS-KOP (1 copy)
CTO 816 – File Copy

ATTACHMENT A

**Responses to USEPA's December 17, 2001 Comments
Final Round 7 Groundwater Monitoring Report for Area A Landfill
NSB-NLON, Groton, Connecticut**

**RESPONSES TO USEPA'S DECEMBER 17, 2001 COMMENTS
FINAL ROUND 7 GROUNDWATER MONITORING REPORT
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SPECIFIC COMMENTS

Comment 1: p. 3-2, §3.0, ¶2

This text in this bulleted paragraph indicates that benzo(a)pyrene was detected at 1.0 ug/L in monitoring well 2WMW43DS. The September 2001 version of the report, however, does not reveal this detection even though the reporting limit was 0.5 ug/L. Please clarify.

Response

Clarification. The 0.5 U $\mu\text{g/L}$ quantitation limit provided for benzo(a)pyrene in the September 2001 report was incorrect. There was a discrepancy between the electronic data deliverable and the hard copy Form I provided by the laboratory. The laboratory was contacted and they indicated that the result reported on the hard copy Form I (1 $\mu\text{g/L}$) was correct. This value was subsequently provided in the November 2001 report.

Comment 2: p. 3-2, §3.0, ¶4

The discussion of chromium results implies that chromium was only detected in two wells. Based on Table 3-1, chromium was detected in 7 wells during the seventh round of sampling. In addition, the third sentence of this paragraph states: "All of the detected concentrations, with the exception of the concentration (9 J $\mu\text{g/L}$) detected in the unfiltered sample from 2WMW21S, exceeded the secondary monitoring criterion of 11 $\mu\text{g/L}$..." This statement appears to conflict with the data presented in Table 3-1 that presents a number of positive detections in both filtered and unfiltered samples below the secondary monitoring criterion. Please review and correct this paragraph.

Response

Agree. The paragraph only discusses the chromium results from sample locations which had exceedences of criteria. This approach was not clear in the paragraph. The paragraph will be revised as follows:

"Chromium was detected in samples collected from seven monitoring wells and one surface water sampling location. The concentrations of chromium detected in samples from three locations exceeded monitoring criteria. Chromium was detected in the unfiltered samples (9 J $\mu\text{g/L}$ and 23.2 J $\mu\text{g/L}$) and filtered samples (12.8 $\mu\text{g/L}$ and 13.9 J $\mu\text{g/L}$) from monitoring wells 2WMW21S and 2WMW46DS. Chromium was also detected in the filtered sample (27.5 $\mu\text{g/L}$) collected from surface water location SG-23. All of the detected concentrations from these three locations, with the exception of the concentration (9 J $\mu\text{g/L}$) detected in the unfiltered sample from 2WMW21S, exceeded the secondary monitoring criterion of 11 $\mu\text{g/L}$, which is the Federal AWQC for protection of aquatic life (chronic, freshwater), but none exceeded the primary criterion of 110 $\mu\text{g/L}$."

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Comment 3: p. 3.3, §3.0, ¶1

The first sentence in this paragraph begins with: "Zinc was detected in 10 of 14 groundwater samples ..."
Based on the data in Table 3-1, zinc was only detected in nine of the wells during the seventh round. Please review and correct as necessary.

Response

Agree. Zinc was detected in nine of 14 groundwater samples. The sentence will be corrected as follows:

"Zinc was detected in 9 of 14 groundwater samples and all eight seep and surface water samples."

Comment 4: Appendix F

Within the November 20, 2001 letter, there is a discussion of reporting limits used by the laboratory. The letter indicates that the laboratory "...reported to generic Method Detection Limits (MDLs) for Polynuclear Aromatic Hydrocarbons (PAHs)" Please identify the reporting limits that were used for other parameters (*i.e.* metals, volatile organics, semivolatile organics other than PAHs, pesticides and PCBs).

The letter also mentions that the laboratory provided instrument detection limits. Instrument detection limits represent a lower bound on actual sample specific detection limits. They are established by running standards in DI water and do not take into account effects from sample preparation or the sample matrix. Thus, although the IDLs may have been at or below the primary and secondary criteria, it does not follow that the sample detection limits were. The letter also states that "the laboratory corrected the data set by providing the Instrument Detection Limits (IDLs)." Please elaborate on what the laboratory did to "correct" the data.

The response to EPA's October 11, 2001 comments seems to indicate that the laboratory, at the Navy's request, re-reported the data for PAHs to lower reporting limits. The organic data validation letters provided in Appendix F indicate that, in addition to the PAH data, the semivolatile and PCB data were not reported to the correct reporting limits. Please clarify this apparent discrepancy.

Response

The quantitation limits, as defined in the TtNUS laboratory scope of work, are presented in the tables provided at the end of this response.

The referenced letter, dated November 20, 2001, did not accurately describe the corrections that were made to the data. The laboratory did not provide IDLs. The primary issue was that the laboratory did not provide quantitation limits according to the specifications outlined in the TtNUS laboratory scope of work for PAHs, PCBs, or semivolatile organic compounds (SVOCs). The laboratory reported results to laboratory derived reporting limits, which were not as low as the quantitation limits defined in the TtNUS laboratory scope of work. This error was not noticed until after the Round 7

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Groundwater Monitoring Report for Area A Landfill was issued. When the error was discovered, the laboratory was notified and asked to re-evaluate and resubmit the data.

The field samples from Round 7 were analyzed for PAHs, PCBs, and SVOCs by SW-846 methods. According to SW-846, the estimated quantitation limit shall be equal to the lowest calibration standard, which is what TtNUS required in the laboratory scope of work. However, what the laboratory actually reported was a reporting limit which is the method detection limit multiplied by some matrix specific factor and rounded up. This is a reporting convention that is used by most environmental testing laboratories. In order to correct this reporting discrepancy, the laboratory took the sample raw data and compared it to the respective method detection limit and as long the raw data values were greater than the method detection limit, a positive result was reported. If the raw data result was at or below the method detection limit, a nondetect was reported. In this revised data, nondetects were reported as the quantitation limit required by the TtNUS scope of work followed by a "U" data qualifier. The lowest calibration standards analyzed by the laboratory for the SVOCs, PAHs, and PCBs were consistent with the revised quantitation limits. Therefore, the laboratory reported revised results in the same manner as was done initially, with the exception of providing lower reporting limits. Therefore, the revised limits were derived in a technically defensible manner.

It should also be noted that the project laboratory that completed the subject sample analyses is no longer being used by TtNUS. Therefore, it is anticipated that these types of problems will not re-occur.

For informational purposes the following list of definitions is provided to try to clarify an industry-wide misunderstanding regarding the use of the terms: detection limit, reporting limit, quantitation limit, method detection limit, contract required quantitation limit, contract required detection limit, practical quantitation limit, instrument detection limit, and estimated quantitation limit.

DL - Detection limit – Generic term. Ideally, a limit that is specific to each analyte that is analyzed under a well-defined set of experimental conditions. Answers the question: "Can we say the analyte in question has been *detected* with a stated level of statistical confidence (usually 99%)?". Detection limits are adjusted for variables such as:

1. The amount taken for analysis relative to the nominal amount that is specified in the analytical method.
2. The amount of moisture in soil or sediment samples.
3. Dilutions that were incurred during sample preparation or analysis.

When DLs are adjusted for sample-specific variables, they are frequently referred to as sample-specific detection limits (SDLs).

QL - Quantitation Limit – Generic term. Ideally, a limit that is specific to each analyte. Answers a question different than the question answered by detection limits. The question it answers is: "What is the concentration above which a reported result falls within some stated percentage of the true value?". Theoretically, the stated percentage is usually about 20% or 30% but very few laboratories ever measure the percentage. Instead, the QL is usually set to be some multiple of the detection limit. Quantitation limits are adjusted for variables such as:

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1. The amount taken for analysis relative to the nominal amount that is specified in the analytical method.
2. The amount of moisture in soil or sediment samples.
3. Dilutions that were incurred during sample preparation or analysis.

When QLs are adjusted for sample-specific variables, they are frequently referred to as sample-specific quantitation limits (SQLs).

Note: Briefly stated, the QL focuses on the *accuracy of the quantified value*. The detection limit makes a statement about whether an analyte has been *detected* and is not a statement about the accuracy or precision of the reported result. Unfortunately, many people, including scientists, often confuse the purpose and use of DLs and QLs. Below are some of the specific industry terms that are most related to these generic terms.

CRDL – Contract Required Detection Limit. This is the detection limit that must be achieved by a laboratory performing work under the Contract Laboratory Program. It does not necessary reflect the actual laboratory detection limit, but the actual laboratory detection limit must be no greater than this value.

MDL – Method Detection Limit. A detection limit, as defined under “DL,” that is ideally specific to a particular sample matrix, analyte, laboratory and experimental conditions. MDLs are most frequently determined statistically and are actually measured periodically. Matters of practicality often require that compromises be made concerning the number of sample matrices for which the detection limit can be established. So, for example, a detection limit determined for a soil matrix might also be applied to sediment samples even though a sediment detection limit was not established. The MDL does not account for sample-specific variables associated with individual samples.

IDL – Instrument Detection Limit. A detection limit that is specific to a particular analytical instrument under a given set of analytical conditions, in a pure and interference free matrix. This value reflects the best achievable analytical performance under conditions of virtually no analytical interferences. This limit is often not realistic for actual analytical performance in common environmental matrices, other than groundwater or “clean” surface water. IDLs are most frequently determined statistically and are actually measured.

CRQL-Contract required quantitation limit. This is the quantitation limit that must be achieved by a laboratory performing work under the Contract Laboratory Program. It does not necessary reflect the *actual* laboratory quantitation limit, but the actual laboratory quantitation limit *must be no greater than* this value.

EQL – Estimated Quantitation Limit. This is the quantitation limit that has been computed as a multiple of the detection limit. The chosen multiple usually falls in the range of 2 to 5, but not always. Thus, the $EQL = xMDL$, where ($2 \leq x \leq 5$, usually). The EQL does not account for sample-specific variables associated with individual samples.

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PQL – Practical Quantitation Limit. The laboratory quantitation limit as described under “QL” or “EQL”— with a twist. It is difficult if not impossible for laboratory analysts and data reviewers to remember hundreds of analyte-specific limits. To make the reporting of results easier for laboratory personnel, the established quantitation limits are rounded (usually to greater concentrations) so that most PQL values are the same for each analyte, or group of analytes that are measured by a single analytical method. So, for example, a QL that is 3 times the MDL and has a value of 3.2 ppm might be rounded upwards to 4 ppm. The PQL might also be an upwards rounded version of the QL because the laboratory anticipates analytical interferences in environmental samples that were not accounted for when establishing the QL. The laboratory might also round the QL upwards so that all or most of the analytes in a given fraction (e.g., VOC or SVOC) have the same PQL, regardless of the instrument used for the analysis.

RL – Reporting Limit. This is usually the lowest analyte-specific concentration that a laboratory reports as a detected value. It is sometimes closest to the laboratory QL and sometimes closest to the laboratory DL, so it is important to understand which limit the RL represents. RLs probably represent QLs most frequently. Similar to PQLs, the RLs frequently reflect laboratory DLs or QLs that have been rounded upwards to account for unanticipated analytical interferences, etc.

The quantitation limits specified in the TtNUS laboratory scope of work are provided in the following tables:

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Low Concentration TCL Volatile Organic CLP OLC02.1	Quantitation Limits (µg/L)
Chloromethane	1
Bromomethane	1
Vinyl chloride	1
Chloroethane	1
Methylene Chloride	2
Acetone	5
Carbon Disulfide	1
1,1-Dichloroethene	1
1,1-Dichloroethane	1
cis-1,2-Dichloroethene	1
trans-1,2-Dichloroethene	1
Chloroform	1
1,2-Dichloroethane	1
2-Butanone	5
Bromochloromethane	1
1,1,1-Trichloroethane	1
Carbon Tetrachloride	1
Bromodichloromethane	1
1,2-Dichloropropane	1
cis-1,3-Dichloropropene	1
Trichloroethene	1
Dibromochloromethane	1
1,1,2-Trichloroethane	1
Benzene	1
Trans-1,3-Dichloropropene	1
Bromoform	1
4-Methyl-2-pentanone	5
2-Hexanone	5
Tetrachloroethene	1
1,1,2,2-Tetrachloroethane	1
1,2-Dibromoethane	1
Toluene	1
Chlorobenzene	1
Ethylbenzene	1
Styrene	1
Xylenes	1
1,3-Dichlorobenzene	1
1,4-Dichlorobenzene	1
1,2-Dichlorobenzene	1
1,2-Dibromo-3-chloropropane	1

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TCL Semivolatile Organics (minus PAHs) SW 846 8270C	Quantitation Limit (µg/L)
Phenol	5
Bis(2-chloroethyl)ether	5
2-Chlorophenol	5
1,3-Dichlorobenzene	5
1,4-Dichlorobenzene	5
1,2-Dichlorobenzene	5
2-Methylphenol	5
2,2'-oxybis(1-chloropropane)	5
4-Methylphenol	5
N-Nitroso-di-n-propylamine	5
Hexachloroethane	5
Nitrobenzene	5
Isophorone	5
2-Nitrophenol	5
2,4-Dimethylphenol	5
Bis(2-chloroethoxy)methane	5
2,2-Dichlorophenol	5
1,2,4-Trichlorobenzene	5
4-Chloroaniline	5
Hexachlorobutadiene	5
4-Chloro-3-methylphenol	5
Hexachlorocyclopentadiene	5
2,4,6-Trichlorophenol	20
2,4,5-Trichlorophenol	5
2-Chloronaphthalene	5
2-Nitroaniline	20
Dimethylphthalate	5
2,6-Dinitrotoluene	5
3-Nitroaniline	20
2,4-Dinitrophenol	20
4-Nitrophenol	20
2,4-Dinitrotoluene	5
Diethylphthalate	5
4-Chlorophenyl-phenyl ether	5
4-Nitroaniline	20
4,6-Dinitro-2-methylphenol	20
N-Nitroso-diphenylamine	5
4-Bromophenyl-phenyl ether	5

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TCL Semivolatile Organics (minus PAHs)

SW 846 8270C (Continued)	Quantitation Limit (µg/L)
Hexachlorobenzene	5
Pentachlorophenol	20
Di-n-butylphthalate	5
Butylbenzylphthalate	5
3,3'-Dichlorobenzidine	5
Bis(2-Ethylhexyl)phthalate	5
Di-n-octylphthalate	5
Benzoic Acid	5
Dibenzofuran	5
Carbazole	5

TCL Pesticide Organics CLP OLC02.1

	Quantitation Limits (µg/L)
Alpha-BHC	0.01
Beta-BHC	0.01
Delta-BHC	0.01
Gamma-BHC (lindane)	0.01
Heptachlor	0.01
Aldrin	0.01
Heptachlor epoxide	0.01
Endosulfan I	0.01
Dieldrin	0.02
4,4'-DDE	0.02
Endrin	0.02
Endosulfan II	0.02
4,4'-DDD	0.02
Endosulfan Sulfate	0.02
4,4'-DDT	0.02
Methoxychlor	0.10
Endrin Ketone	0.02
Endrin Aldehyde	0.02
Alpha-Chlordane	0.01
Gamma-Chlordane	0.01
Toxaphene	1.0
Hexachlorobiphenyl	

TCL PCBs SW 846 8082

	Quantitation Limits (µg/L)
Arochlor-1016	0.20
Arochlor-1221	0.40
Arochlor-1232	0.20
Arochlor-1242	0.20
Arochlor-1248	0.20
Arochlor-1254	0.20
Arochlor-1260	0.20

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TCL PAHs SW 846 8310	Quantitation Limits (µg/L)
Naphthalene	2
1-Methylnaphthalene	2
2-Methylnaphthalene	2
Acenaphthylene	2.5
Acenaphthene	2
Fluorene	0.3
Phenanthrene	0.7
Anthracene	0.7
Fluoranthene	0.3
Pyrene	0.27
Benzo(a)anthracene	0.02
Chrysene	0.2
Benzo(b)fluoranthene	0.02
Benzo(k)fluoranthene	0.02
Benzo(a)pyrene	0.025
Indeno(1,2,3-cd)pyrene	0.05
Dibenzo(a,h)anthracene	0.03
Benzo(g,h,i)perylene	0.08

TAL Metals	Instrument Detection Limit (µg/L)
Aluminum	30
Antimony	5
Arsenic	4
Barium	1
Beryllium	1
Cadmium	0.3
Calcium	40
Chromium	1
Cobalt	5
Copper	3
Iron	12
Lead	3
Magnesium	40
Manganese	3
Mercury	0.08
Nickel	10
Potassium	600
Selenium	5
Silver	1
Sodium	200
Thallium	2
Vanadium	7.4
Zinc	4

3.0 MONITORING RESULTS

The groundwater samples collected from 13 monitoring wells, five surface water locations, and one seep location were analyzed for TCL organic compounds, TAL inorganic (total and dissolved) analytes, and water chemistry parameters. As discussed in Section 2.0, one groundwater sample and two surface water samples were also analyzed, but only for TAL inorganic (total and dissolved) analytes. Monitoring focused on the following organic and inorganic chemicals of potential concern, as identified in the GMP (TtNUS, January 1999).

- Ethylbenzene
- 1,1,2,2-Tetrachloroethane
- Xylenes
- Benzo(a)anthracene
- Benzo(a)pyrene
- Benzo(b)fluoranthene
- Benzo(k)fluoranthene
- Bis(2-ethylhexyl)phthalate
- Phenanthrene
- Aroclor 1016
- Aroclor 1254
- Aroclor 1260
- Dieldrin
- Heptachlor
- Arsenic
- Beryllium
- Cadmium
- Chromium
- Copper
- Lead
- Zinc

The contaminants listed above have been detected either in groundwater at concentrations exceeding the Connecticut Department of Environmental Protection (CTDEP) Surface Water Protection Criteria (SWPCs) or in soil and landfill material at concentrations above their respective CTDEP Pollutant Mobility Criteria for GB groundwater.

The Round 7 analytical results are summarized on Tables 3-1 and 3-2. Within each table, the analytical results are compared to the primary and secondary monitoring criteria, as established in the GMP (TtNUS, January 1999). Chemicals exceeding either primary or secondary monitoring criteria are noted by shading. Figure 3-1 shows the chemicals detected in groundwater samples that exceed criteria and Figure 3-2 shows the chemicals detected in surface water samples that exceed criteria. Data validation letters and laboratory data sheets are attached to this report as Appendix F.

The results of this comparison can be summarized as follows:

- There were no detections of volatile organic compounds, pesticides, or PCBs in groundwater or surface water.
- There were no detections of semivolatile organic compounds in surface water.
- The semivolatile organic compound, phenanthrene, was detected in six of 13 groundwater samples at concentrations in excess of the primary monitoring criteria (0.077 µg/L), which is the Connecticut

SWPC for substances in groundwater. The concentrations ranged from 0.10 J $\mu\text{g/L}$ to 22.0 $\mu\text{g/L}$, with the highest concentration detected in the sample from monitoring well 2WMW42DS.

- One additional semivolatile organic compound, benzo(a)pyrene, was detected in two samples collected from monitoring wells 2WMW38DS and 2WMW43DS at concentrations of 0.38 $\mu\text{g/L}$ and 1.0 $\mu\text{g/L}$, respectively. These are slightly above the primary monitoring criterion of 0.3 $\mu\text{g/L}$, which is the Connecticut SWPC for substances in groundwater.
- Arsenic was detected in nine unfiltered groundwater samples at concentrations ranging from 6.6 J $\mu\text{g/L}$ to 29.5 $\mu\text{g/L}$. Arsenic was also detected in filtered samples from two wells (2WMW46DS and 2WMW47DS). The concentrations in the unfiltered samples from these two wells were 12.9 $\mu\text{g/L}$ and 29.5 $\mu\text{g/L}$, while the concentrations in the filtered samples were 6.8 J $\mu\text{g/L}$ and 31.3 $\mu\text{g/L}$. All of the detections of arsenic exceeded the primary criterion of 4 $\mu\text{g/L}$, which is the Connecticut SWPC for substances in groundwater. No detections exceeded the secondary criterion of 150 $\mu\text{g/L}$, which is the Federal Ambient Water Quality Criterion (AWQC) for protection of aquatic life (chronic, freshwater). Arsenic was detected in four unfiltered surface water samples collected from SG-20, SG-22, SG-23 and SG-24 and two filtered surface water samples collected from SG-22 and SG-24. The concentrations in the unfiltered samples ranged from 5.3 J $\mu\text{g/L}$ to 7.5 J $\mu\text{g/L}$, while the concentrations in the filtered samples ranged from 5.6 J $\mu\text{g/L}$ to 5.9 J $\mu\text{g/L}$.
- Chromium was detected in samples collected from seven monitoring wells and one surface water sampling location. The concentrations of chromium detected in samples from three locations exceeded monitoring criteria. Chromium was detected in the unfiltered samples (9 J $\mu\text{g/L}$ and 23.2 J $\mu\text{g/L}$) and filtered samples (12.8 $\mu\text{g/L}$ and 13.9 J $\mu\text{g/L}$) from monitoring wells 2WMW21S and 2WMW46DS. Chromium was also detected in the filtered samples (27.5 $\mu\text{g/L}$) collected from surface water location SG-23. All of the detected concentrations from these three locations, with the exception of the concentration (9 J $\mu\text{g/L}$) detected in the unfiltered sample from 2WMW21S, exceeded the secondary monitoring criterion of 11 $\mu\text{g/L}$, which is the Federal AWQC for protection of aquatic life (chronic, freshwater), but none exceeded the primary criterion of 110 $\mu\text{g/L}$.
- Lead was detected in four of 14 groundwater samples and four of eight seep and surface water samples. The concentrations in the unfiltered groundwater samples ranged from 3.7 J $\mu\text{g/L}$ to 5.5 J $\mu\text{g/L}$, while the concentrations in the filtered samples ranged from 3.3 J $\mu\text{g/L}$ to 6.6 J $\mu\text{g/L}$. The concentrations in the unfiltered surface water samples ranged from 3.2 J $\mu\text{g/L}$ to 9.5 $\mu\text{g/L}$. Lead was not detected in any filtered surface water sample. All of the positive detections of lead in the filtered and unfiltered samples exceeded the secondary criterion of 1.2 $\mu\text{g/L}$, which is the Connecticut Water

Quality Criteria CWQC for protection of human health from consumption of organisms. None of the detections exceeded the primary criterion of 13 µg/L.

- Zinc was detected in nine of 14 groundwater samples and all eight seep and surface water samples. The concentrations in the unfiltered groundwater samples ranged from 10.8 J µg/L to 123 µg/L, while the concentrations in the filtered samples ranged from 11.8 J µg/L to 58.4 µg/L. The concentrations in the unfiltered surface water samples ranged from 30.2 µg/L to 109 µg/L and the concentrations in the filtered samples ranged from 29.1 µg/L to 60 µg/L. Many of the concentrations of zinc detected in the filtered and unfiltered samples exceeded the secondary criterion of 58.2 µg/L, which is the Connecticut Water Quality Criteria CWQC for protection of human health from consumption of organisms. None of the detections exceeded the primary criterion of 123 µg/L.

As discussed in Section 1.2, because this is only an interim report, the evaluation of the analytical results is limited to the above comparison. No conclusions or recommendations are drawn from this comparison. Initial conclusions and recommendations were addressed in the Year 1 Summary Report based on the first four quarterly rounds of results. Further conclusions and recommendations will be provided in the Year 2 Summary Report based on the first eight quarterly rounds of results.

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**ROUND 7 GROUNDWATER MONITORING REPORT
FOR
AREA A LANDFILL**

**NAVAL SUBMARINE BASE - NEW LONDON
GROTON, CONNECTICUT**

**COMPREHENSIVE LONG-TERM
ENVIRONMENTAL ACTION NAVY (CLEAN) CONTRACT**

**Submitted to:
Engineering Field Activity Northeast
Environmental Branch Code EV
Naval Facilities Engineering Command
10 Industrial Highway, Mail Stop #82
Lester, Pennsylvania 19113-2090**

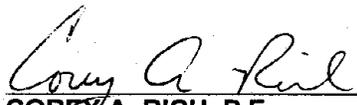
**Submitted by:
Tetra Tech NUS, Inc.
600 Clark Avenue, Suite 3
King of Prussia, Pennsylvania 19406-1433**

**CONTRACT NUMBER N62467-94-D-0888
CONTRACT TASK ORDER 0816**

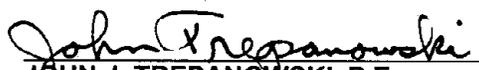
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1.0 INTRODUCTION

This Round 7 Groundwater Monitoring Report for the Area A Landfill at the Naval Submarine Base New London (NSB-NLON) in Groton, Connecticut was prepared for the U.S. Department of the Navy (Navy) by Tetra Tech NUS, Inc. (TtNUS) under the Comprehensive Long-Term Environmental Action Navy (CLEAN), Contract Number N62467-94-D-0888, Contract Task Order (CTO) 0816.

This document has been prepared in accordance with the Navy Installation Restoration Laboratory Quality Assurance Guide (Interim Guidance) of the Naval Facilities Engineering Service Center, (NFESC, February 1996).

1.1 SCOPE AND OBJECTIVE

An Interim Remedial Action (IRA) was completed in 1997 at the Area A Landfill site to address the risk from direct exposure to landfill material and to minimize the risk of migration of chemicals of concern (COCs) from the landfill to the surrounding areas via groundwater. The IRA consisted of capping the site with a multi-layer low-permeability cover system and installing a surface water and shallow groundwater interception and diversion system upgradient from the cover system. The groundwater monitoring is being conducted to evaluate the effectiveness of the IRA.

The objective of this Round 7 Groundwater Monitoring Report is to present the results of the seventh round of long-term groundwater monitoring at the Area A Landfill site. Three Phase I and Phase II Remedial Investigation (RI) monitoring wells and 11 monitoring wells installed in May 1999 were sampled and analyzed for a suite of analytes based on an evaluation of site history and previous analytical results. One seep sample and seven surface water samples, from locations adjacent to monitoring wells, were also obtained. Three additional surface water locations were to be sampled; however, due to a lack of surface water at these locations, samples were not obtained. Sampling and analyses were performed in accordance to the Groundwater Monitoring Plan (GMP) prepared for the Area A Landfill (TtNUS, January 1999). Because this is an interim report for the seventh round of groundwater monitoring, evaluation of monitoring results is limited to a comparison of these results to the criteria identified in the GMP for the Area A Landfill (TtNUS, January 1999).

1.2 BACKGROUND INFORMATION

1.2.1 Base Description

NSB-NLON is located in southeastern Connecticut in the Towns of Ledyard and Groton. It encompasses approximately 576 acres and lies on the east bank of the Thames River, approximately 6 miles north of

Long Island Sound. NSB-NLON is bounded to the east by Connecticut Route 12, to the south by Crystal Lake Road, and to the west by the Thames River (Figure 1-1). The northern border is a low, east-southeast trending ridge extending from the Thames River to Baldwin Hill.

NSB-NLON currently provides base command for naval submarine activities in the Atlantic Ocean. It also provides housing for Navy personnel and their families and supports submarine training facilities, military offices, medical facilities, and facilities for the submarine maintenance, repair, and overhaul.

1.2.2 Site Description and History

The Area A Landfill is located in the northeastern and north central part of NSB-NLON and encompasses approximately 13 acres (Figure 1-2). The Area A Landfill is relatively flat and is bordered by a steep, wooded hillside that rises to the south, a steep wooded ravine to the west, and the Area A Wetland to the north. Access to the west end of the landfill is via a gate off Wahoo Avenue and access to the east end of the landfill is via a paved road and gate adjacent to a parking lot and the Area A recreational facilities.

Before the Area A Landfill was opened, dredge spoil from the Thames River was deposited continuously along a major portion of the hillside and within the former valley, which is currently the Area A Wetland. The Area A Landfill reportedly opened sometime before 1957. However, a 1957 aerial photograph (USEPA, EPIC, 1957) shows no apparent landfilling activities, indicating a somewhat later start-up date. After the NSB-NLON incinerator closed in 1963, most of the wastes generated by submarine and base operations were disposed of in the landfill, including all non-salvageable materials.

The area fill method was reportedly used in landfill operations at the Area A Landfill. The area fill method consists of filling an area in a sequence of cells and lifts. Each lift is a specified thickness and consists of several cells. Each cell can be viewed as a rectangular area that is filled from back to front. The front area is the "working face" and is the location where new refuse is placed and is the area that is covered on a daily basis. The cover material used on the landfill was gravel obtained from the Groton water supply reservoir. The Area A Landfill closed in 1973.

After closure, a bituminous concrete pad approximately 160 x 100 feet in size was constructed in the southwest portion of the landfill for above-ground storage of industrial wastes. Steel drums, transformers, and electrical switches were stored on this pad. All of these materials have been properly disposed of off-site. This pad was also used for crane testing and test weights were stored there. The remainder of the Area A Landfill was unpaved and included a gravel covered parking lot (deployed parking) that was located in the central part of the landfill.

Site investigations were conducted at the Area A Landfill as part of a base-wide Phase I RI (Atlantic, August 1992) and a base-wide Phase II RI (B&R Environmental, March 1997). A site-specific Area A Landfill Focused Feasibility Study (FFS) (Atlantic, May 1995), and a Proposed Remedial Action Plan (PRAP), (Atlantic, June 1995) were also prepared. A Record of Decision (ROD) was prepared and signed by the Navy and United States Environmental Protection Agency (USEPA) Region I on September 26, 1995. The major components of the selected alternative as described in the ROD were as follows:

- Restricting access to the contaminated areas of the site using perimeter fencing and institutional controls.
- Capping the site with a low-permeability multi-layer cover system to prevent water infiltration into the landfill.
- Constructing an interception system to collect shallow groundwater and storm water and re-route these around the landfill
- Establishing landfill gas controls to manage landfill gas migration.
- Developing a groundwater monitoring plan to monitor the quality of groundwater after the landfill closure is completed.

A remedial design for the proposed landfill cover system was first prepared by Atlantic Environmental Services, Inc. (Atlantic) (Atlantic, July 1994) and subsequently amended and finalized by Brown & Root Environmental, Inc. (B&R Environmental) (B&R Environmental, December 1996b). As part of the re-design effort, a Geotechnical Field Investigation (HNUS, May 1995), an Area A East End Investigation (B&R Environmental, December 1996a), and a Groundwater/Leachate Modeling Study (B&R Environmental, October 1996) were also conducted.

Construction of the landfill cover system (including gas control and storm water and shallow groundwater interception systems) was completed as part of an Interim Remedial Action (IRA) in September 1997 by Foster Wheeler Environmental Corporation. Prior to commencement of construction, a large quantity of metal, concrete and wood debris, several thousand sandbags, the Deployed Parking lot, the electrical storage building (Building 496), the Master at Arms Building (Building 373), salt storage shed, and various other items that had been located on the surface of the landfill were removed or relocated. The majority of the surficial debris was disposed of off-site as scrap metal or at an off-site landfill. The debris that was salvageable by NSB-NLON was removed and relocated to other areas of NSB-NLON.

The preparation of the subgrade to the cover required excavation from the northern slope of the landfill and placement of the excavated material on the southern slope. Also, approximately 4,000 cubic yards of soil from the Rubble Fill Area at Bunker A 86 (Site 4) and 1,000 cubic yards of common fill were placed over the eastern portion of the landfill, beneath the area of the relocated Deployed Parking. The soils were then compacted. During the subgrade preparation activities, two storm water drainage structures located within the limits of the site were decommissioned. These structures consisted of open catch basins on the southern edge of the landfill that discharged into a reinforced concrete culvert running through the landfill and ultimately into the Area A Wetland. Both culverts were entirely filled with flowable concrete to eliminate potential voids in the subgrade due to pipe collapse. The catch basins were filled with materials unsuitable for placement in the landfill subgrade (e.g., tires, large metal and wood debris, large concrete debris, etc.) followed by encapsulation with flowable concrete fill.

1.2.3 Previous Site Investigations

Six field investigations have been conducted at the Area A Landfill. These include the following:

- Field investigation performed for the base-wide Phase I RI (Atlantic, August 1992)
- Supplemental field investigation performed for the Area A Landfill FFS (Atlantic, May 1995)
- Field investigation performed for the base-wide Phase II RI (B&R Environmental, March 1997)
- Geotechnical Field Investigation (HNUS, May 1995) and Area A East End Investigation (B&R Environmental, December 1996a) performed in support of the Area A Landfill Remedial Design (B&R Environmental, December 1996b)
- Field investigation performed for the Groundwater/Leachate Modeling Study, which supported the Area A Landfill Remedial Design (B&R Environmental, October 1996).

1.2.3.1 Base-Wide Phase I RI

Atlantic conducted a field investigation at the Area A Landfill in 1990 as part of the base-wide Phase I RI (Atlantic, August 1992). A total of 13 monitoring wells (2LMW7S, 2LMW7D, 2LMW8S, 2LMW8D, 2LMW9S, 2LMW9D, 2LMW13S, 2LMW13D, 2LMW14D, 2LMW17S, 2LMW17D, 2LMW18S, 2LMW18D) and 7 test borings (2LTB1 through 2LTB7) were installed. A total of 12 soil and 12 groundwater samples were collected from these monitoring wells and test borings. Soil samples were analyzed for Target Compound List (TCL) organics, Target Analyte List (TAL) inorganics, polychlorinated biphenyls (PCBs),

pesticides, and Toxicity Characteristics Leaching Procedure (TCLP) pesticides and metals. Groundwater samples were analyzed for the same parameters, except TCLP, plus radiological elements.

1.2.3.2 Area A Landfill FFS

Atlantic conducted a supplemental field investigation at the Area A Landfill in October and November 1993 to support the Area A Landfill FFS (Atlantic, May 1995). The main purpose of these field activities was to characterize the subsurface soil in the vicinity of the bituminous concrete pad located at the southwestern end of the landfill.

Twenty-four soil borings (2LTB8 through 2LTB31) were drilled to a depth of 16 feet or auger refusal. Based on field screening for volatile organic compounds (VOCs), with an HNu organic vapor analyzer and for PCBs with a field gas chromatograph, 13 subsurface soil sample were selected for analysis of TCL organics, PCBs, pesticides and TAL inorganics. Selected samples were also analyzed for organic content, cation exchange capacity, total organic carbon (TOC), dioxin and geotechnical parameters, including grain-size distribution, moisture content, and specific gravity. Two samples were also analyzed by the TCLP for all toxicity constituents.

1.2.3.3 Base-Wide Phase II RI

B&R Environmental conducted a field investigation at the Area A Landfill in 1994 as part of the base-wide Phase II RI (B&R Environmental, March 1997). A total of 10 monitoring wells (2LPW1S, 2LOW1S, 2LOW1D, 2LOW2S, 2LOW3S, 2LOW4S, 2LMW19S, 2LMW19D, 2LMW20S, 2LMW20D) were installed. Eleven soil samples were collected from two soil borings (2LTB13, 2LTB23). Two rounds of groundwater level measurements and groundwater sampling were conducted, including one in March 1994 and one in August 1994. Groundwater samples were analyzed for TCL organics, TAL inorganics, PCBs, and radiological elements.

1.2.3.4 Geotechnical Field Investigation

B&R Environmental conducted field activities at the Area A Landfill in February and March 1995 as part of the Geotechnical Field Investigation (HNUS, March 1995) performed in support of the remedial design for a landfill cover system. The purpose of the Geotechnical Field Investigation was to confirm the areal extent of the fill material and obtain additional geotechnical field data.

Twenty test pits (LF-TP01 to LF-TP13 and LF-TP15 to LF-TP21) were excavated along the edges of the Area A Landfill to allow for visual observation of subsurface conditions. The purpose of excavating these

test pits was primarily to determine the lateral extent of the fill material and, wherever practical (especially along the southern edge of the landfill), establish the depth and competence of bedrock.

Eight soil borings were drilled at strategic locations on the landfill plateau to establish the depth of bedrock and thickness of the fill and dredge spoil material. The soil borings were also used to collect six soil samples to be tested for geotechnical parameters (particle size, moisture content, classification, Atterberg limits, and triaxial compression) and three soil samples to be tested for analytical parameters (TCL organics, PCBs, and pesticides, and TAL inorganics). Four borings (LF-SB01 and LF-SB03 through LF-SB05) were advanced through the overburden to auger refusal at the bedrock. Two borings (LF-SB02, LF-SB06) were advanced through the overburden and approximately 5 feet into competent bedrock. Two borings (LF-TP01 and LF-TP07) were drilled through approximately 5 feet of bedrock at the bottom of previously excavated test pits.

1.2.3.5 Area A East End Investigation

B&R Environmental conducted field activities at the Area A Landfill in September 1995 as part of the Area A East End Investigation (B&R Environmental, December 1996a), performed in support of the remedial design for the landfill cover system. The purpose of the Area A East End Investigation was to verify that the fill used for the construction of the recreational facilities (Racquetball Building, tennis courts, and ball field) located at the extreme east end of Area A is of a different nature from that placed in the rest of the Area A Landfill, i.e., does not contain contaminated waste material, and therefore, does not need to be capped.

Six test trenches (LF-TP22 through LF-TP27) were excavated along the eastern boundary of the Area A Landfill cover system as designed to verify the eastern limit of contaminated fill material. The test trenches were field-screened for the presence of VOCs, and four soil samples were collected and analyzed TCL organics, PCBs, and pesticides; TAL inorganics and cyanide; and, total petroleum hydrocarbon (TPH).

Three soil borings (SB06 through SB08) were drilled in the vicinity of the Area A East End recreational facilities. These soil borings were advanced through the overburden to the bedrock to auger refusal. A total of six soil samples were collected from the fill and dredge spoil material and analyzed for TCL organics, PCBs, and pesticides; TAL inorganics and cyanide; and, TPH.

1.2.3.6 Groundwater/Leachate Modeling Study

B&R Environmental conducted field activities at the Area A Landfill in November/December 1995 as part of the Groundwater/Leachate Modeling Study (B&R Environmental, October 1996) performed in support

of the remedial design for the landfill cover system. The purpose of the Groundwater/Leachate Modeling Study was to evaluate the impact of the proposed landfill cover system on the saturated thickness of landfill material and on the flow and composition of the groundwater/leachate discharge from the landfill.

The modeling field investigation activities included the performance of the following activities:

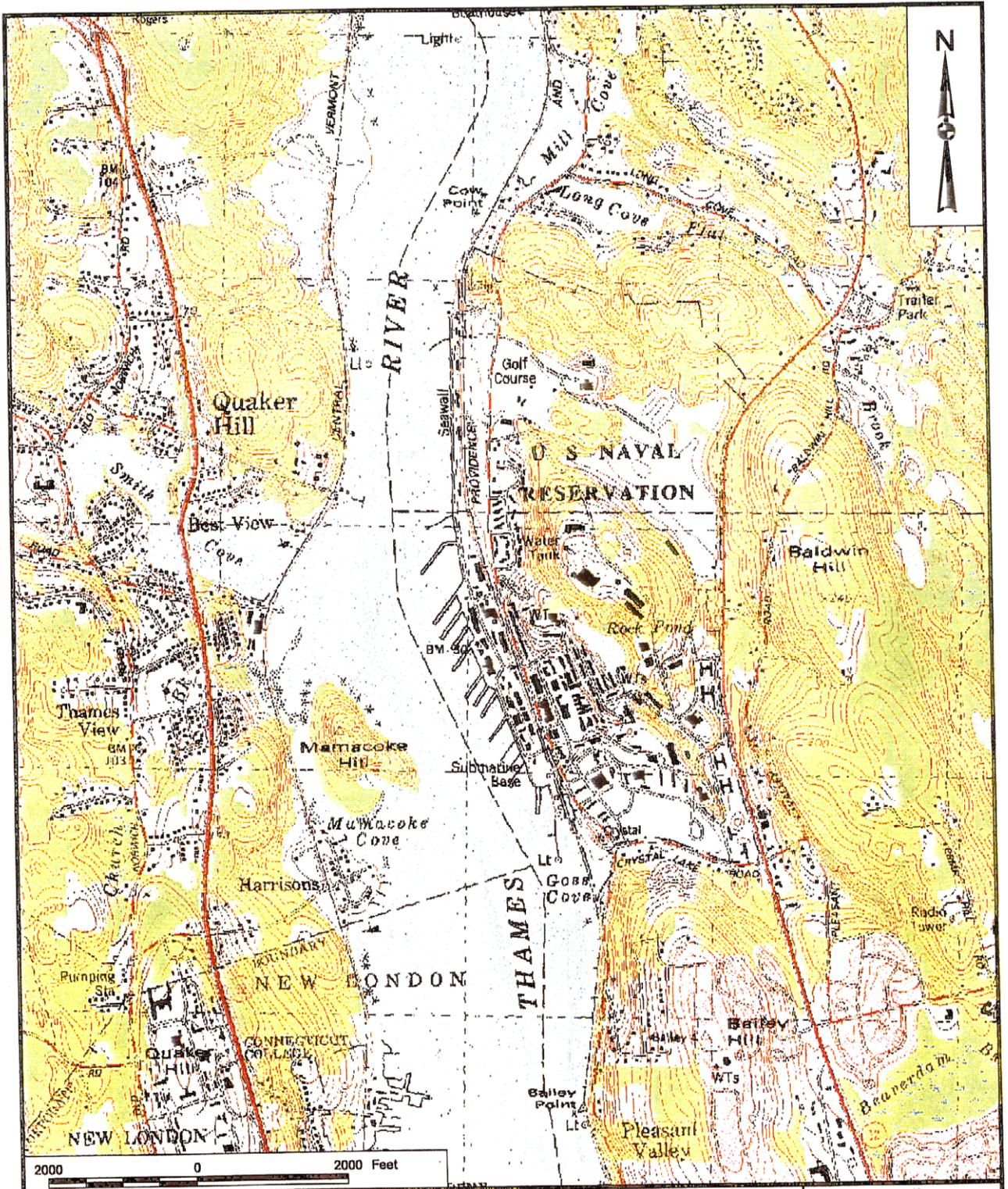
- Surface infiltration tests at 10 locations (2LT1 thru 2LT10) throughout the surface of the landfill
- Installation of 13 overburden monitoring wells, including 6 in the landfill material (2LMW28F through 2LMW33F) and 7 in the underlying dredge spoil or alluvium (2LMW28DS, 2LMW29A, 2LMW30DS through 2LMW34DS).
- Installation of three bedrock wells, including two located upgradient from the Area A Landfill (2LMW35B and 2LMW36B) and one at the northeast end of the landfill (2LMW32B).
- Installation of 10 piezometers, including 7 (2LPZ1DS thru 2LPZ7DS) along the boundary between the Area A Landfill and Area A Wetland and 3 (2LPZ1F, 2LPZ2F, and 2LMW32PZ) at the northeast end of the landfill.
- Installation of eight staff gauges (SG07 thru SG14) along the boundary between the Area A Landfill and Area A Wetland.
- Slug testing of the newly installed wells and one piezometer (2LMW32PZ).
- Water level measurement for all newly installed monitoring wells, piezometers, and staff gauges as well as for all previously existing monitoring wells.
- Flow measurement and sampling of the groundwater seep (3MSP01) from the western face of the Area A Landfill into the Overbank Disposal Area (OBDA) (Site 3) of the adjoining Area A Downstream site. This sample was analyzed for TCL organics and TAL inorganics.

The Groundwater/Leachate Modeling Study provided a comprehensive analysis of the site geology and hydrogeology. The report provided surface contour maps of the four units (landfill material, dredge spoil, alluvium and bedrock) underlying the site; thickness maps for the landfill material and dredge spoil; surface contour maps for the water table and bedrock groundwater; geologic cross-sections; conceptual flow nets; and an analysis of vertical flow gradients.

Additionally, the Groundwater/Leachate Modeling Study concluded that the Area A Landfill cover system would reduce the thickness of the saturated landfill material by approximately 0.1 foot along the Area A Wetland boundary, by approximately 0.5 foot at the eastern end of the landfill, by approximately 0.2 foot in the center of the landfill, and by over one foot at the western end of the landfill. The study concluded that the cover system would reduce the flux of groundwater COCs from the Area A Landfill to the Area A Wetland by 16 to 55 percent and that none of these COCs would exceed either the Federal AWQCs or the Connecticut's SWPCs.

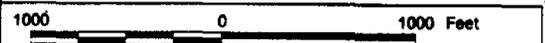
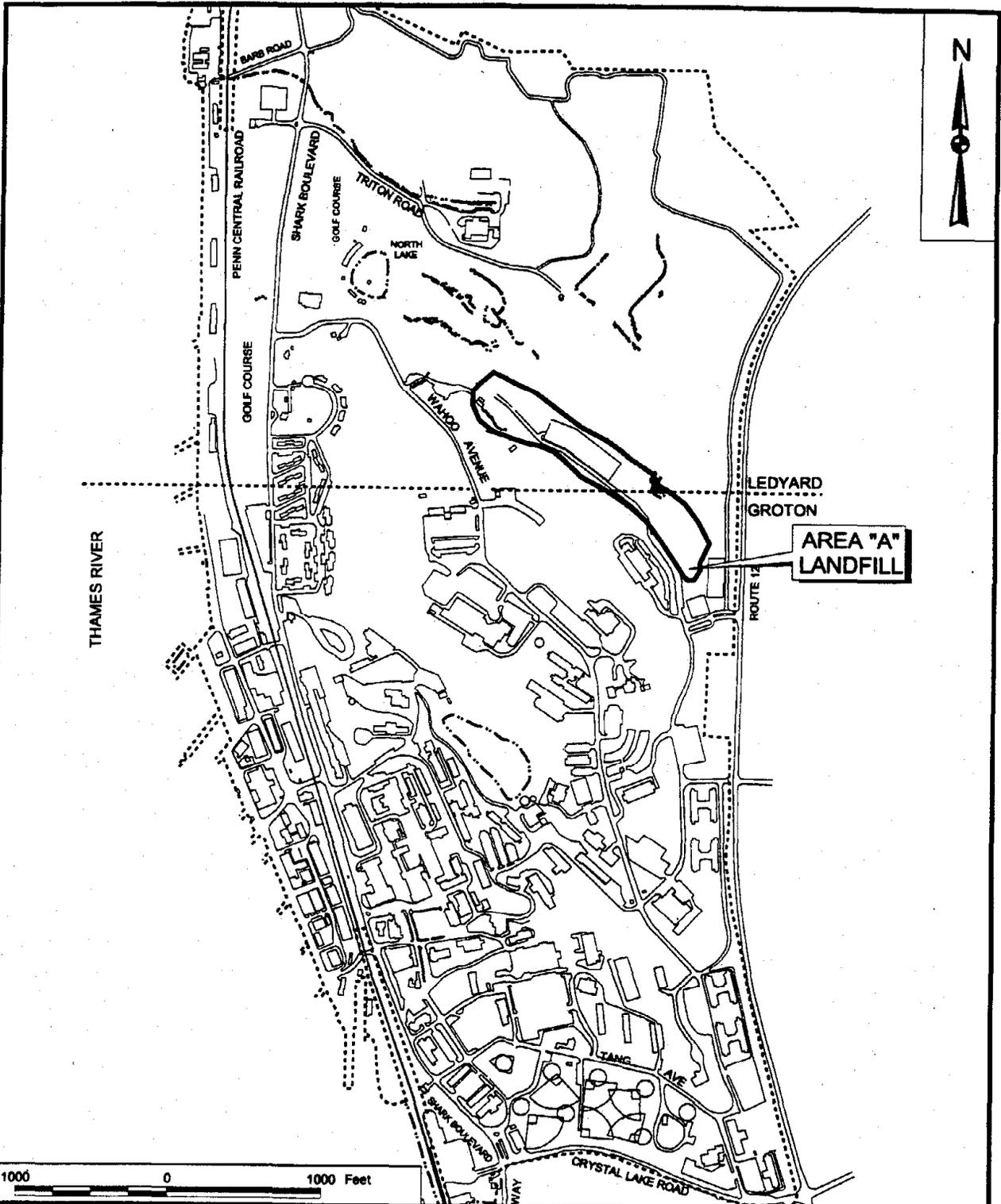
1.3 REPORT ORGANIZATION

This report has been prepared in the following format to address the requirements for long-term groundwater monitoring at the Area A Landfill. Section 1.0 is this brief introduction including the project scope and objective and a discussion of previous investigations. Section 2.0 describes Round 7 field activities. Section 3.0 presents and evaluates the analytical results from the Round 7 sampling effort.



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2.0 FIELD INVESTIGATION ACTIVITIES

Field investigation activities performed as part of the seventh round of the groundwater monitoring at Area A Landfill included the following:

- One round of water level measurements at 13 monitoring wells and six staff gauges
- Collection of groundwater samples from 14 monitoring wells.
- Collection of surface water samples from seven surface water locations.
- Collection of one seep sample.

Monitoring wells 3MW12S and 3MW12D have been destroyed and have not been sampled since Round 5. Three surface water locations (SG15, SG16, and SG17) were to be sampled; however, due to a lack of water, samples were not able to be obtained from these locations. Round 7 field activities occurred in June 2001. Figure 2-1 illustrates the sampling locations. Copies of the field logbook, sample logsheets, calibration logs, field measurements, and sample chain-of custody records for Round 7 are provided in Appendices A through E.

2.1 WATER LEVEL MEASUREMENT

Prior to groundwater purging and sampling and surface water sampling, one round of water levels was measured from 13 monitoring wells (monitoring well 2WMW44DS was inaccessible). Water levels were also measured at 6 staff gauge locations. Water levels were not measured at four staff gauges (SG-21 through SG-24) because of accessibility problems or the gauges were damaged or missing. The survey data for the staff gauges is considered suspect due to some of the staff gauges being moved after installation; therefore, the surface water elevation data were not used in preparing the potentiometric surface map. Historical staff gauges SG-06 and SG-25 (formerly SG-12) were not considered during this sampling event. Table 2-1 summarizes the water level measurements. Figure 2-2 illustrates the potentiometric surface map for the shallow groundwater at the Area A Landfill. Groundwater level measurement sheets are provided in Appendix B.

2.2 GROUNDWATER SAMPLING

A total of 14 monitoring wells, comprised of 2LMW20S, 2WMW21S, 4MW1S, 2WMW38DS through 2WMW47DS, and 3MW37S, were sampled during the seventh round of groundwater monitoring. Low-flow purging and sampling techniques, as described in Sections 4.1.6 and 4.1.7 of the GMP (TtNUS, January 1999), were used during sampling.

The wells were purged using a peristaltic pump with disposable Teflon[®] tubing. Prior to purging, the initial static water level was measured in the well using a water-level indicator. During purging, the water level was measured every 5 to 10 minutes. The pumping rate was initially set at less than 0.3 liters per minute and reduced to 0.1 to 0.2 liters per minute. The pumping rate was adjusted to not allow drawdown to exceed 0.3 foot during the purging (except for wells with low recharge rates). Copies of the low-flow purge data sheets are provided in Appendix D.

During purging, water quality parameters of pH, turbidity, specific conductance, temperature, Eh, salinity, and dissolved oxygen were measured and recorded every 5 to 10 minutes using a water quality meter and flow-through cell until all of the parameters stabilized and the minimum purge volume (equal to the stabilized drawdown volume plus the tubing volume) was removed. Stabilization of the above parameters is defined as follows:

- pH \pm 0.2 standard units
- turbidity \pm 10 % for values greater than 1 NTU
- specific conductance \pm 10 %
- temperature \pm 10 %
- Eh \pm 10 mV
- dissolved oxygen \pm 10 %.

Monitoring wells 2WMW38DS, 2WMW40DS, 2WMW41DS, 2WMW43DS, and 2WMW46DS were dewatered during purging due to the low recharge rate of the screened formation. These wells were sampled over multiple days to provide sufficient sample volume.

Following purging, samples were collected directly from the discharge end of the tubing. All sample containers were filled by allowing the discharge to flow gently down the inside of the container with minimal turbulence. Samples analyzed for VOCs were collected by drawing a column of water into the tubing with the pump; crimping the discharge end of the tubing; disconnecting the tubing from the well; releasing the tubing; and decanting the sample into the sample vials from an intake end of the tubing via gravity flow. For filtered inorganic samples, an in-line 0.45-micron filter was used, pre-rinsed with approximately 400 ml of deionized water and attached to the discharge end of the pump tubing. Copies of the groundwater sample logsheets and Chain of Custody Records are provided in Appendix D and E, respectively.

Groundwater samples were sent to the project laboratory (Chemtech) for analysis for select TCL VOCs, SVOCs, PAHs, pesticides and PCBs; TAL metals (total and dissolved); TOC; chemical oxygen demand; and water chemistry parameters of (total dissolved solids, alkalinity, chloride, sulfate, and hardness). Due

to a problem with sample shipment, the sample from monitoring well 4MW1S was not shipped on time and the holding times for the organic parameters and some of the miscellaneous parameters were exceeded. Subsequently, this sample was only analyzed for TAL metals (total and dissolved). Analytical results for the samples are discussed in Section 3.0.

2.3 SURFACE WATER SAMPLING

As detailed in Section 4.0 of the GMP for the Area A Landfill (TtNUS, January 1999), ten staff gauge locations and one seep sampling location were to be sampled as part of the sampling program. Due to the limited amount of surface water present within the wetland, only seven of the surface water locations and the one seep location were sampled. Surface water samples were collected by directly filling sample containers in accordance with Section 4.1.3 of the GMP (TtNUS, January 1999). Surface water sample logsheets and chain of custody are provided in Appendices D and E, respectively.

The surface water samples were sent to the project laboratory for analysis for the same parameters as the groundwater samples. The sample shipment problem also impacted two surface water samples from SG-22 and SG-24, respectively. The samples from these staff gauges were subsequently analyzed for only TAL metals (total and dissolved). Analytical results for surface water samples are discussed in Section 3.0.

2.4 DECONTAMINATION AND INVESTIGATION-DERIVED WASTE

All water quality and water level meters were decontaminated by rinsing with deionized water prior to and after use.

Liquid IDW derived from the monitoring of groundwater at the Area A Landfill was extensively tested for COCs during the first four rounds of quarterly monitoring. The liquid IDW generated has been determined to be non-hazardous and therefore it is disposed directly to the OT-10 wastewater processing facility in compliance with the SUBASE NLON Pre-Treatment Permit from the Connecticut DEP.

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TABLE 2-1

**WATER LEVEL ELEVATIONS (June, 2001)
ROUND 7 GROUNDWATER WATER MONITORING REPORT
AREA A LANDFILL, NSB-NLON, GROTON, CONNECTICUT**

Well/ Staff Gauge Number	Ground Surface Elevation ⁽¹⁾ (feet msl)	Reference Elevation ⁽¹⁾ (feet msl)	Depth to Water (feet)	Water Elevation (feet msl)	Screened Unit ⁽³⁾
2LMW20S	87.19	86.83	15.17	71.66	F/A
2WMW21S	74.59	76.31	4.14 ⁽²⁾	72.17	DS
2WMW38DS	72.29	74.06	5.20 ⁽²⁾	68.86	DS
2WMW39DS	71.59	73.53	2.28 ⁽²⁾	71.25	SS/DS
2WMW40DS	71.49	73.21	3.02 ⁽²⁾	70.19	DS
2WMW41DS	70.99	73.39	2.07 ⁽²⁾	71.32	DS
2WMW42DS	71.19	73.65	1.92 ⁽²⁾	71.73	DS
2WMW43DS	71.39	74.36	2.08 ⁽²⁾	72.28	DS
2WMW44DS	70.99	73.72	⁽⁵⁾	--	DS
2WMW45DS	72.19	74.24	1.73 ⁽²⁾	72.51	DS
2WMW46DS	71.69	73.53	1.02 ⁽²⁾	72.51	DS
2WMW47DS	71.99	73.39	1.00 ⁽²⁾	72.39	SS/DS
3MW12D	41.09	43.54	Destroyed	--	BR
3MW12S	40.79	42.25	Destroyed	--	A
3MW37S	44.09	47.39	3.55 ⁽²⁾	43.84	A
4MW1S	127.99	129.55	3.95 ⁽²⁾	125.6	BR
2LOW1S	⁽⁴⁾	88.57	--	--	F/DS
2LMW28DS	⁽⁴⁾	87.61	--	--	DS
SG-15	71.29	74.03	Dry	--	--
SG-16	71.19	73.50	Dry	--	--
SG-17	71.19	73.57	Dry	--	--
SG-18	70.99	75.92	1.30	74.62	--
SG-19	70.99	75.83	1.47	74.36	--
SG-20	71.09	75.19	2.00	73.19	--
SG-21	70.39	75.32	⁽⁵⁾	--	--
SG-22	71.79	76.13	⁽⁶⁾	--	--
SG-23	71.09	75.83	⁽⁶⁾	--	--
SG-24	71.59	76.68	⁽⁶⁾	--	--

NOTES:

msl: mean sea level (1982 Base Traverse System)

-- Data not available

1 Reference elevation is top of well casing (1982 Base Traverse System)

2 Depth to water is from top of well casing. Measured June 18 and 19, 2001.

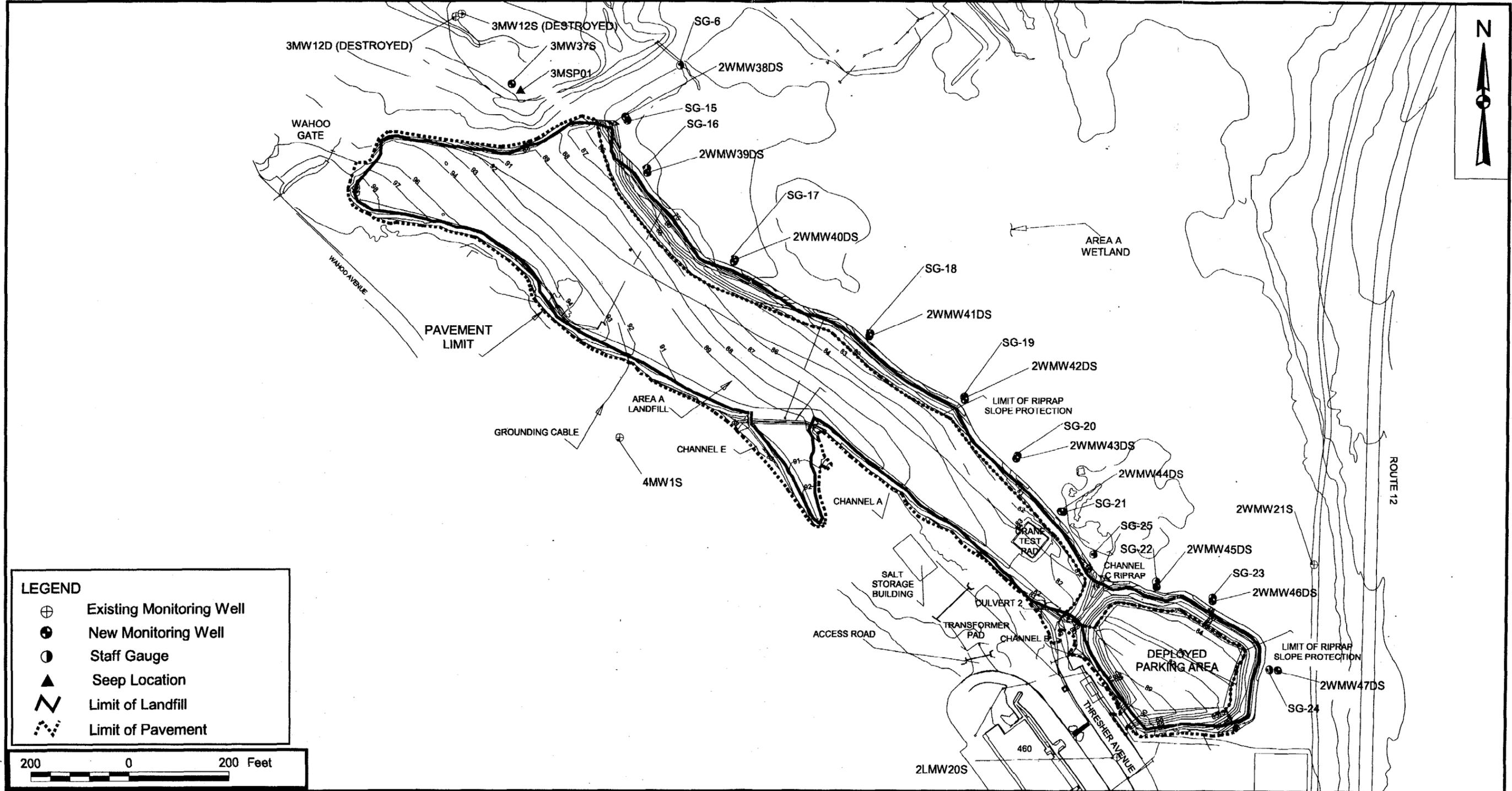
3 F = fill; DS = dredge spoil; A = alluvium; BR = bedrock; SS = surficial sand

4 No survey data available. Ground surface not resurveyed after landfill cap installed.

5 Inaccessible at the time water levels were taken.

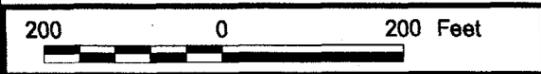
6 Staff Gauge was damaged or missing.

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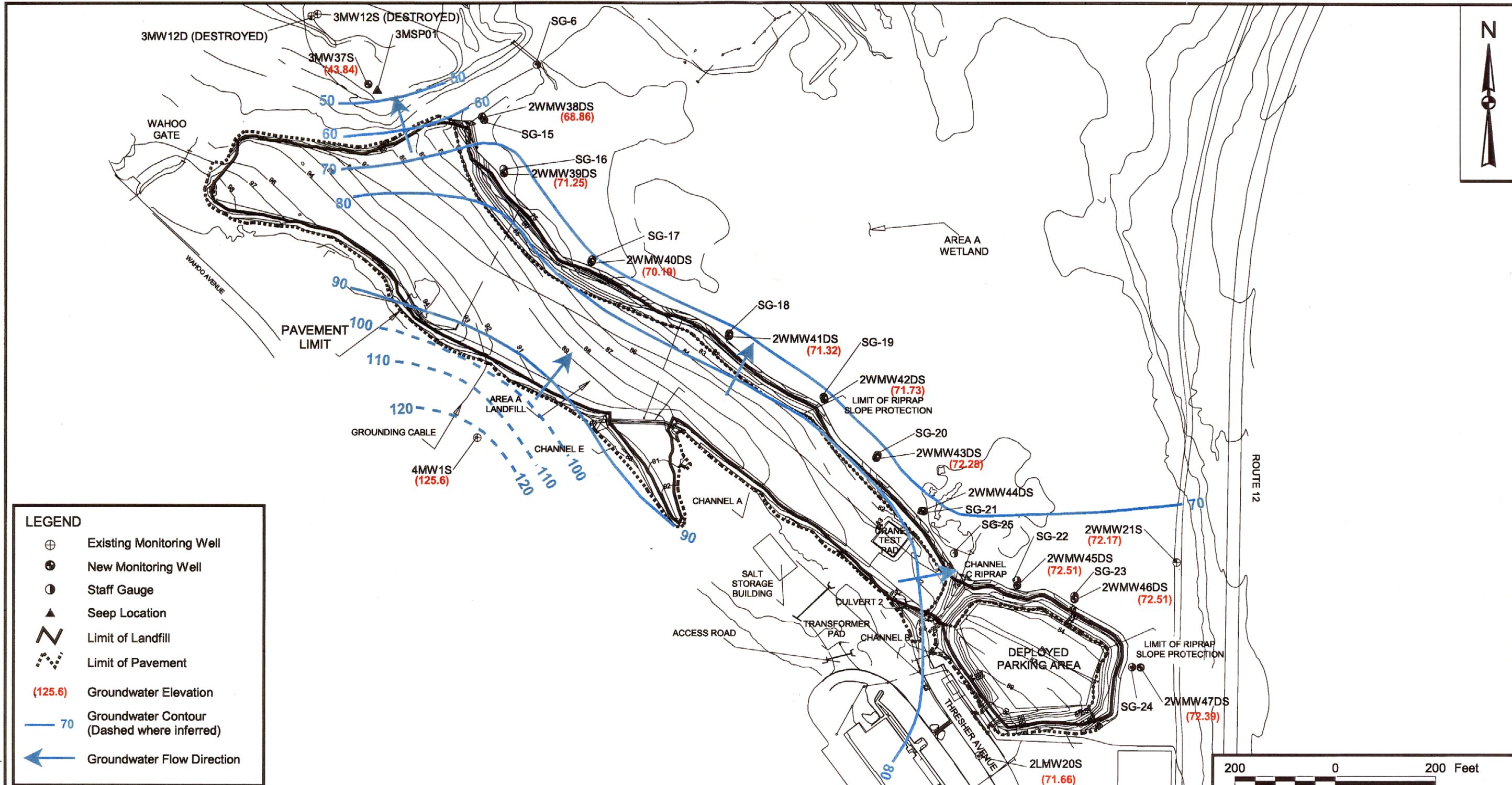


LEGEND

- ⊕ Existing Monitoring Well
- New Monitoring Well
- Staff Gauge
- ▲ Seep Location
- ⌞ Limit of Landfill
- ⋯ Limit of Pavement



NO.	DATE	REVISIONS	BY	CHKD	APPD	REFERENCES	DRAWN BY J. BELLONE	DATE 1/12/00	Tetra Tech NUS, Inc. SAMPLING LOCATIONS FOR ROUND 7 GROUNDWATER MONITORING AREA A LANDFILL NSB-NEW LONDON, GROTON, CONNECTICUT	CONTRACT NUMBER 7091	OWNER NUMBER CTO 816	
							CHECKED BY MLM	DATE 9/19/01		APPROVED BY C. Rich	DATE 9/19/01	
							COST/SCHEDULE-AREA			APPROVED BY	DATE	
							SCALE AS NOTED			DRAWING NO. FIGURE 2-1	REV 0	



LEGEND

- ⊕ Existing Monitoring Well
- ⊙ New Monitoring Well
- Staff Gauge
- ▲ Seep Location
- ⌚ Limit of Landfill
- ⌚ Limit of Pavement
- (125.6) Groundwater Elevation
- 70 Groundwater Contour (Dashed where inferred)
- ← Groundwater Flow Direction



NO.	DATE	REVISIONS	BY	CHKD	APPD	REFERENCES	DRAWN BY	DATE	Tetra Tech NUS, Inc.		CONTRACT NUMBER	OWNER NUMBER
							J. LAMEY	8/15/01	7091		CTO 816	
							CHECKED BY	DATE	APPROVED BY		DATE	
							<i>mcm</i>	9/19/01	<i>C. RICH</i>		9/19/01	
							COST/SCHEDULE-AREA		APPROVED BY		DATE	
							SCALE		DRAWING NO.		FIGURE 2-2	REV
							AS NOTED					0

3.0 MONITORING RESULTS

The groundwater samples collected from 13 monitoring wells, five surface water locations, and one seep location were analyzed for TCL organic compounds, TAL inorganic (total and dissolved) analytes, and water chemistry parameters. As discussed in Section 2.0, one groundwater sample and two surface water samples were also analyzed, but only for TAL inorganic (total and dissolved) analytes. Monitoring focused on the following organic and inorganic chemicals of potential concern, as identified in the GMP (TtNUS, January 1999).

- Ethylbenzene
- 1,1,2,2-Tetrachloroethane
- Xylenes
- Benzo(a)anthracene
- Benzo(a)pyrene
- Benzo(b)fluoranthene
- Benzo(k)fluoranthene
- Bis(2-ethylhexyl)phthalate
- Phenanthrene
- Aroclor 1016
- Aroclor 1254
- Aroclor 1260
- Dieldrin
- Heptachlor
- Arsenic
- Beryllium
- Cadmium
- Chromium
- Copper
- Lead
- Zinc

The contaminants listed above have been detected either in groundwater at concentrations exceeding the Connecticut Department of Environmental Protection (CTDEP) Surface Water Protection Criteria (SWPCs) or in soil and landfill material at concentrations above their respective CTDEP Pollutant Mobility Criteria for GB groundwater.

The Round 7 analytical results are summarized on Tables 3-1 and 3-2. Within each table, the analytical results are compared to the primary and secondary monitoring criteria, as established in the GMP (TtNUS, January 1999). Chemicals exceeding either primary or secondary monitoring criteria are noted by shading. Figure 3-1 shows the chemicals detected in groundwater samples that exceed criteria and Figure 3-2 shows the chemicals detected in surface water samples that exceed criteria. Data validation letters and laboratory data sheets are attached to this report as Appendix F.

The results of this comparison can be summarized as follows:

- There were no detections of volatile organic compounds, pesticides, or PCBs in groundwater or surface water.
- There were no detections of semivolatile organic compounds in surface water.
- The semivolatile organic compound, phenanthrene, was detected in six of 13 groundwater samples at concentrations in excess of the primary monitoring criteria (0.077 µg/L), which is the Connecticut

SWPC for substances in groundwater. The concentrations ranged from 0.10 J $\mu\text{g/L}$ to 22.0 $\mu\text{g/L}$, with the highest concentration detected in the sample from monitoring well 2WMW42DS.

- One additional semivolatile organic compound, benzo(a)pyrene, was detected in two samples collected from monitoring wells 2WMW38DS and 2WMW43DS at concentrations of 0.38 $\mu\text{g/L}$ and 1.0 $\mu\text{g/L}$, respectively. These are slightly above the primary monitoring criterion of 0.3 $\mu\text{g/L}$, which is the Connecticut SWPC for substances in groundwater.
- Arsenic was detected in nine unfiltered groundwater samples at concentrations ranging from 6.6 J $\mu\text{g/L}$ to 29.5 $\mu\text{g/L}$. Arsenic was also detected in filtered samples from two wells (2WMW46DS and 2WMW47DS). The concentrations in the unfiltered samples from these two wells were 12.9 $\mu\text{g/L}$ and 29.5 $\mu\text{g/L}$, while the concentrations in the filtered samples were 6.8 J $\mu\text{g/L}$ and 31.3 $\mu\text{g/L}$. All of the detections of arsenic exceeded the primary criterion of 4 $\mu\text{g/L}$, which is the Connecticut SWPC for substances in groundwater. No detections exceeded the secondary criterion of 150 $\mu\text{g/L}$, which is the Federal Ambient Water Quality Criterion (AWQC) for protection of aquatic life (chronic, freshwater). Arsenic was detected in four unfiltered surface water samples collected from SG-20, SG-22, SG-23 and SG-24 and two filtered surface water samples collected from SG-22 and SG-24. The concentrations in the unfiltered samples ranged from 5.3 J $\mu\text{g/L}$ to 7.5 J $\mu\text{g/L}$, while the concentrations in the filtered samples ranged from 5.6 J $\mu\text{g/L}$ to 5.9 J $\mu\text{g/L}$.
- Chromium was detected in the unfiltered samples (9 J $\mu\text{g/L}$ and 23.2 J $\mu\text{g/L}$) and filtered samples (12.8 $\mu\text{g/L}$ and 13.9 J $\mu\text{g/L}$) from monitoring wells 2WMW21S and 2WMW46DS. Chromium was also detected in the filtered sample (27.5 $\mu\text{g/L}$) collected from surface water location SG-23. All of the detected concentrations, with the exception of the concentration (9 J $\mu\text{g/L}$) detected in the unfiltered sample from 2WMW21S, exceeded the secondary monitoring criterion of 11 $\mu\text{g/L}$, which is the Federal AWQC for protection of aquatic life (chronic, freshwater), but none exceeded the primary criterion of 110 $\mu\text{g/L}$.
- Lead was detected in four of 14 groundwater samples and four of eight seep and surface water samples. The concentrations in the unfiltered groundwater samples ranged from 3.7 J $\mu\text{g/L}$ to 5.5 J $\mu\text{g/L}$, while the concentrations in the filtered samples ranged from 3.3 J $\mu\text{g/L}$ to 6.6 J $\mu\text{g/L}$. The concentrations in the unfiltered surface water samples ranged from 3.2 J $\mu\text{g/L}$ to 9.5 $\mu\text{g/L}$. Lead was not detected in any filtered surface water sample. All of the positive detections of lead in the filtered and unfiltered samples exceeded the secondary criterion of 1.2 $\mu\text{g/L}$, which is the Connecticut Water Quality Criteria CWQC for protection of human health from consumption of organisms. None of the detections exceeded the primary criterion of 13 $\mu\text{g/L}$.

- Zinc was detected in 10 of 14 groundwater samples and all eight seep and surface water samples. The concentrations in the unfiltered groundwater samples ranged from 10.8 J $\mu\text{g/L}$ to 123 $\mu\text{g/L}$, while the concentrations in the filtered samples ranged form 11.8 J $\mu\text{g/L}$ to 58.4 $\mu\text{g/L}$. The concentrations in the unfiltered surface water samples ranged from 30.2 $\mu\text{g/L}$ to 109 $\mu\text{g/L}$ and the concentrations in the filtered samples ranged from 29.1 $\mu\text{g/L}$ to 60 $\mu\text{g/L}$. Many of the concentrations of zinc detected in the filtered and unfiltered samples exceeded the secondary criterion of 58.2 $\mu\text{g/L}$, which is the Connecticut Water Quality Criteria CWQC for protection of human heath from consumption of organisms. None of the detections exceeded the primary criterion of 123 $\mu\text{g/L}$.

As discussed in Section 1.2, because this is only an interim report, the evaluation of the analytical results is limited to the above comparison. No conclusions or recommendations are drawn from this comparison. Initial conclusions and recommendations were addressed in the Year 1 Summary Report based on the first four quarterly rounds of results. Further conclusions and recommendations will be provided in the Year 2 Summary Report based on the first eight quarterly rounds of results.

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TABLE 3-1

ROUND 7 GROUNDWATER ANALYTICAL RESULTS SUMMARY
 INTERIM GROUNDWATER MONITORING REPORT
 AREA A, NSB-NLON, GRANTON, CONNECTICUT
 PAGE 1 OF 4

Chemical	Primary Monitoring Criterion ⁽¹⁾	Secondary Monitoring Criterion	2LMW20S 2L-GW20S-07 6/24/01	2WMW21S 2W-GW21S-07 6/23/01	2WMW21S 2W-GW21S-07-D 6/23/01	2WMW38DS 2W-GW38DS-07 6/21/01
VOCs (ug/L)						
1,1,2,2-TETRACHLOROETHANE	110	NA	1 U	1 U	1 U	1 U
ETHYLBENZENE	580,000	NA	1 U	1 U	1 U	1 U
XYLENES, TOTAL	NA	NA	1 U	1 U	1 U	1 U
SVOCs (ug/L)						
BENZO(A)ANTHRACENE	0.3	NA	0.012 U	0.012 U	0.012 U	0.012 U
BENZO(A)PYRENE	0.3	NA	0.21 U	0.021 U	0.021 U	0.38
BENZO(B)FLUORANTHENE	0.3	NA	0.02 U	0.02 U	0.02 U	0.02 U
BENZO(K)FLUORANTHENE	0.3	NA	0.02 U	0.02 U	0.02 U	0.02 U
BIS(2-ETHYLHEXYL)PHTHALATE	59	NA	1.3 J	1.4 J	1.4 J	1.9 J
PHENANTHRENE	0.077	NA	0.004 U	0.1 J	0.71 J	0.004 U
Pesticides/PCBs (ug/L)						
AROCLOR-1016	0.5	0.014 ⁽²⁾	0.20 U	0.20 U	0.20 U	0.20 U
AROCLOR-1254	0.5	0.014 ⁽²⁾	0.20 U	0.20 U	0.20 U	0.20 U
AROCLOR-1260	0.5	0.014 ⁽²⁾	0.20 U	0.20 U	0.20 U	0.20 U
DIELDRIN	0.1	0.0019 ⁽³⁾	0.02 U	0.8 U	0.02 U	0.02 U
HEPTACHLOR	0.05	0.0038 ⁽²⁾	0.01 U	0.4 U	0.01 U	0.01 U
Inorganics (total/dissolved) (ug/L)						
ARSENIC	4	150 ⁽²⁾	5 U/5 U	5 U/5 U	5 U/5 U	6.6 J/5 U
BERYLLIUM	4	NA	0.1 U/0.1 UJ	0.1 UJ/0.1 UJ	0.1 UJ/0.1 UJ	0.1 U/0.1 UJ
CADMIUM	6	0.62 ⁽³⁾	3 U/3 U	3 U/3 U	3 U/3 U	3 U/3 U
CHROMIUM ⁽⁴⁾	110	11 ⁽²⁾	5 U/5 U	9.3 J/8.9 J	9 J/12.8	5 U/5 U
COPPER	48	4.8 ⁽³⁾	2.3 U/2.2 U	4.3 U/3.5 J	12.2 U/2.2 U	10.8 U/4.6
LEAD	13	1.2 ⁽³⁾	3 U/3 U	3 U/3 UJ	3 UJ/3 U	3 U/3 U
ZINC	123	58.2 ⁽³⁾	36.9/30.4	20.4/8.5 U	12.2 J/37.4	25.1/12.6 J
Miscellaneous Parameters (mg/L)						
ALKALINITY	NA	NA				
CHEMICAL OXYGEN DEMAND	NA	NA	5 U	590	670	30
CHLORIDE	NA	NA	120	12040	10060	290
HARDNESS	NA	NA	120	4000	3300	230
SULFATE	NA	NA	5	67	62	32
TOTAL DISSOLVED SOLIDS	NA	NA	230 J	3300 J	14000 J	640 J
TOTAL ORGANIC CARBON	NA	NA	3.1 J	30 J	22 J	11 J

TABLE 3-1

ROUND 7 GROUNDWATER ANALYTICAL RESULTS SUMMARY
 INTERIM GROUNDWATER MONITORING REPORT
 AREA A, NSB-NLON, GRANTON, CONNECTICUT
 PAGE 2 OF 4

Chemical	Primary Monitoring Criterion ⁽¹⁾	Secondary Monitoring Criterion	2WMW39DS 2W-GW39DS-07 6/19/01	2WMW40DS 2W-GW40DS-07 6/19/01	2WMW41DS 2W-GW41DS-07 6/21/01	2WMW42DS 2W-GW42DS-07 6/20/01
VOCs (ug/L)						
1,1,2,2-TETRACHLOROETHANE	110	NA	1 U	1 U	1 U	1 U
ETHYLBENZENE	580,000	NA	1 U	1 U	1 U	1 U
XYLENES, TOTAL	NA	NA	1 U	1 U	1 U	1 U
SVOCs (ug/L)						
BENZO(A)ANTHRACENE	0.3	NA	0.012 U	0.012 U	0.012 U	0.012 U
BENZO(A)PYRENE	0.3	NA	0.021 U	0.021 U	0.021 U	0.021 U
BENZO(B)FLUORANTHENE	0.3	NA	0.02 U	0.02 U	0.02 U	0.02 U
BENZO(K)FLUORANTHENE	0.3	NA	0.02 U	0.02 U	0.02 U	0.02 U
BIS(2-ETHYLHEXYL)PHTHALATE	59	NA	3 J	4.1 J	2.9 J	3.1 J
PHENANTHRENE	0.077	NA	0.004 U	0.1	0.004 U	22
Pesticides/PCBs (ug/L)						
AROCLOR-1016	0.5	0.014 ⁽²⁾	0.20 U	0.20 U	0.20 U	0.20 U
AROCLOR-1254	0.5	0.014 ⁽²⁾	0.20 U	0.20 U	0.20 U	0.20 U
AROCLOR-1260	0.5	0.014 ⁽²⁾	0.20 U	0.20 U	0.20 U	0.20 U
DIELDRIN	0.1	0.0019 ⁽³⁾	0.020 U	0.020 U	0.020 U	0.020 U
HEPTACHLOR	0.05	0.0038 ⁽²⁾	0.010 U	0.010 U	0.010 U	0.010 U
Inorganics (total/dissolved) (ug/L)						
ARSENIC	4	150 ⁽²⁾	13.5/12.8 U	8.1 J/6.2 U	5.0 U/5.0 U	9.7 J/6.2 U
BERYLLIUM	4	NA	0.10 U/0.10 U	0.10 U/0.29 U	0.10 UJ/0.10 UJ	0.10 U/0.18 J
CADMIUM	6	0.62 ⁽³⁾	3.0 U/0.60 U	3.0 U/0.60 U	3.0 U/3.0 U	0.70 U/0.60 U
CHROMIUM ⁽⁴⁾	110	11 ⁽²⁾	5.0 U/0.60 U	5.0 U/1.6 J	5.0 U/8.9 J	4.0 J/6.4 J
COPPER	48	4.8 ⁽³⁾	2.2 U/1.5 U	2.2 UJ/1.5 U	2.2 U/7.0 U	2.2 UJ/1.5 U
LEAD	13	1.2 ⁽³⁾	3.0 U/3.0 U	3.0 U/3.0 U	3.0 UJ/3.0 UJ	3.0 U/3.0 U
ZINC	123	58.2 ⁽³⁾	123/16.0 U	8.5 U/17.0 U	8.5 U/8.5 U	8.5 U/13.0 U
Miscellaneous Parameters (mg/L)						
ALKALINITY	NA	NA	180	1400	1700	900
CHEMICAL OXYGEN DEMAND	NA	NA	33.0	460	560	590
CHLORIDE	NA	NA	370	13000	9800	7330
HARDNESS	NA	NA	140	2900	2600	1600
SULFATE	NA	NA	4.0	782	580	167
TOTAL DISSOLVED SOLIDS	NA	NA	870	20000	17380	11000
TOTAL ORGANIC CARBON	NA	NA	6.1	24.0	89	24.0

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TABLE 3-1

ROUND 7 GROUNDWATER ANALYTICAL RESULTS SUMMARY
 INTERIM GROUNDWATER MONITORING REPORT
 AREA A, NSB-NLON, GRANTON, CONNECTICUT
 PAGE 3 OF 4

Chemical	Primary Monitoring Criterion ⁽¹⁾	Secondary Monitoring Criterion	2WMW43DS 2W-GW43DS-07 6/20/01	2WMW44DS 2W-GW44DS-07 6/22/01	2WMW45DS 2W-GW45DS-07 6/20/01	2WMW46DS 2W-GW46DS-07 6/21/01
VOCs (ug/L)						
1,1,2,2-TETRACHLOROETHANE	110	NA	1 U	1 U	1 U	1 U
ETHYLBENZENE	580,000	NA	1 U	1 U	1 U	1 U
XYLENES, TOTAL	NA	NA	1 U	1 U	1 U	1 U
SVOCs (ug/L)						
BENZO(A)ANTHRACENE	0.3	NA	0.012 U	0.5 U	0.012 U	0.012 U
BENZO(A)PYRENE	0.3	NA	1.0	0.5 U	0.021 U	0.021 U
BENZO(B)FLUORANTHENE	0.3	NA	0.02 U	0.5 U	0.02 U	0.02 U
BENZO(K)FLUORANTHENE	0.3	NA	0.02 U	0.5 U	0.02 U	0.02 U
BIS(2-ETHYLHEXYL)PHTHALATE	59	NA	4.2 J	1.4 J	1.3 J	1.3 J
PHENANTHRENE	0.077	NA	0.4	0.004 U	4.5	2.9
Pesticides/PCBs (ug/L)						
AROCLOR-1016	0.5	0.014 ⁽²⁾	0.20 U	0.20 U	0.20 U	0.2 U
AROCLOR-1254	0.5	0.014 ⁽²⁾	0.20 U	0.20 U	0.20 U	0.2 U
AROCLOR-1260	0.5	0.014 ⁽²⁾	0.20 U	0.20 U	0.20 U	0.2 U
DIELDRIN	0.1	0.0019 ⁽³⁾	0.020 U	0.020 U	0.020 U	0.020 U
HEPTACHLOR	0.05	0.0038 ⁽²⁾	0.010 U	0.010 U	0.010 U	0.010 U
Inorganics (total/dissolved) (ug/L)						
ARSENIC	4	150 ⁽²⁾	9.3 J/6.2 U	8.2 J/5.0 U	10.4/11.4 U	12.9/6.8 J
BERYLLIUM	4	NA	0.10 U/0.22	0.10 UJ/0.10 UJ	0.10 U/0.15 J	0.10 UJ/0.10 UJ
CADMIUM	6	0.62 ⁽³⁾	0.70 U/0.60 U	3.0 U/3.0 U	3.0 U/0.60 U	3.0 U/3.0 U
CHROMIUM ⁽⁴⁾	110	11 ⁽²⁾	7.7 J/5.3 J	5.0 U/5.0 U	5.0 U/0.60 UJ	23.2 J/13.9 J
COPPER	48	4.8 ⁽³⁾	2.2 UJ/1.5 U	2.2 UJ/7.1 U	2.2 UJ/1.5 U	11.6 U/13.6 U
LEAD	13	1.2 ⁽³⁾	3.0 U/3.0 U	3.0 UJ/3.0 UJ	3.0 U/3.0 U	3.7 J/6.6 J
ZINC	123	58.2 ⁽³⁾	8.5 U/15.3 U	11.2 J/11.8 J	8.5 U/11.4 U	43.7 J/8.5 U
Miscellaneous Parameters (mg/L)						
ALKALINITY	NA	NA	2300	750	1800	2400
CHEMICAL OXYGEN DEMAND	NA	NA	530	650	750	1280
CHLORIDE	NA	NA	13000	3410	15000	16650
HARDNESS	NA	NA	3400	960	3300	6100
SULFATE	NA	NA	154	87	30.0	321
TOTAL DISSOLVED SOLIDS	NA	NA	25000	7400	22000	34400
TOTAL ORGANIC CARBON	NA	NA	29.0	28	22.0	140

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CTO 0816

TABLE 3-1

ROUND 7 GROUNDWATER ANALYTICAL RESULTS SUMMARY
 INTERIM GROUNDWATER MONITORING REPORT
 AREA A, NSB-NLON, GRANTON, CONNECTICUT
 PAGE 4 OF 4

Chemical	Primary Monitoring Criterion ⁽¹⁾	Secondary Monitoring Criterion	2WMM47DS 2W-GW47DS-07 6/23/01	3MW37S 3-GW37S-07 6/19/01	4MW1S 4-GW01S-07 6/25/01	4MW1S 4-GW01S-07-D 6/25/01
VOCs (ug/L)						
1,1,2,2-TETRACHLOROETHANE	110	NA	1 U	1 U		
ETHYLBENZENE	580,000	NA	1 U	1 U		
XYLENES, TOTAL	NA	NA	1 U	1 U		
SVOCs (ug/L)						
BENZO(A)ANTHRACENE	0.3	NA	0.012 U	0.012 U		
BENZO(A)PYRENE	0.3	NA	0.021 U	0.021 U		
BENZO(B)FLUORANTHENE	0.3	NA	0.02 U	0.02 U		
BENZO(K)FLUORANTHENE	0.3	NA	0.02 U	0.02 U		
BIS(2-ETHYLHEXYL)PHTHALATE	59	NA	1.6 J	1.7 J		
PHENANTHRENE	0.077	NA	0.004 U	0.004 U		
Pesticides/PCBs (ug/L)						
AROCLOR-1016	0.5	0.014 ⁽²⁾	0.20 U	0.20 U		
AROCLOR-1254	0.5	0.014 ⁽²⁾	0.20 U	0.20 U		
AROCLOR-1260	0.5	0.014 ⁽²⁾	0.20 U	0.20 U		
DIELDRIN	0.1	0.0019 ⁽³⁾	0.02 U	0.02 U		
HEPTACHLOR	0.05	0.0038 ⁽²⁾	0.01 U	0.01 U		
Inorganics (total/dissolved) (ug/L)						
ARSENIC	4	150 ⁽²⁾	29.5/31.3	5.0 U/5.0 U	5.0 U/5.0 U	5.0 U/5.0 U
BERYLLIUM	4	NA	0.1 U/0.1 UJ	0.1 U/0.10 U	0.10 U/0.10 U	0.10 U/0.10 U
CADMIUM	6	0.62 ⁽³⁾	3 U/3 U	3.0 U/3.0 U	3.0 U/3.0 U	3.0 U/3.0 U
CHROMIUM ⁽⁴⁾	110	11 ⁽²⁾	9.1 J/5 U	5.0 U/5.0 U	5.0 U/5.0 U	5.0 U/5.0 U
COPPER	48	4.8 ⁽³⁾	11.6 U/2.2 U	3.3 U/4.2 U	6.1 U/4.6 U	4.8 U/3.1 U
LEAD	13	1.2 ⁽³⁾	4.8 J/5.9 J	3.0 UJ/3.3 J	5.5 J/3.0 UJ	3.0 UJ/3.0 UJ
ZINC	123	58.2 ⁽³⁾	33.6/28.6	10.8 J/14.4 J	82 J/58.4	69.5/49.3
Miscellaneous Parameters (mg/L)						
ALKALINITY	NA	NA				
CHEMICAL OXYGEN DEMAND	NA	NA	69	5.0		
CHLORIDE	NA	NA	4800	470		
HARDNESS	NA	NA	540	270		
SULFATE	NA	NA	33	25.0		
TOTAL DISSOLVED SOLIDS	NA	NA	4700 J	925		
TOTAL ORGANIC CARBON	NA	NA	7.9 J	4.7		

NOTES:

Bold numbers denote exceedance of secondary monitoring criterion. There are no exceedances of primary monitoring criteria.

- (1) Surface Water Protection Criteria for substances in groundwater. (CTDEP, January 1996)
 - (2) Federal Ambient Water Quality Criteria for protection of aquatic life (chronic, freshwater). (USEPA, 1999)
 - (3) Connecticut Water Quality Criteria for protection of human health from consumption of organisms. (CTDEP, 1997)
 - (4) Hexavalent Chromium
- J Estimated Value
 R Rejected Value
 U Undetected
 NA Not Available

TABLE 3-2

ROUND 7 SURFACE WATER ANALYTICAL RESULTS SUMMARY
 INTERIM GROUNDWATER MONITORING REPORT
 AREA A, NSB-NLON, GROTON, CONNECTICUT
 PAGE 1 OF 2

Chemical	Primary Monitoring Criterion ⁽¹⁾	Secondary Monitoring Criterion	3MSP01 3MSP01-07 6/19/01	SG-18 SWSG18-07 6/20/01	SG-19 SWSG19-07 6/22/01	SG-20 SWSG20-07 6/22/01	SG-21 SWSG21-07 6/24/01
VOCs (ug/L)							
1,1,2,2-TETRACHLOROETHANE	110	NA	1 U	1 U	1 U	1 U	1 U
ETHYLBENZENE	580,000	NA	1 U	1 U	1 U	1 U	1 U
XYLENES, TOTAL	NA	NA	1 U	1 U	1 U	1 U	1 U
SVOCs (ug/L)							
BENZO(A)ANTHRACENE	0.3	NA	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U
BENZO(A)PYRENE	0.3	NA	0.021 U	0.021 U	0.021 U	0.021 U	0.021 U
BENZO(B)FLUORANTHENE	0.3	NA	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
BENZO(K)FLUORANTHENE	0.3	NA	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
BIS(2-ETHYLHEXYL)PHTHALATE	59	NA	2.1 J	2.1 J	1.5 J	1.1 J	1.9 J
PHENANTHRENE	0.077	NA	0.004 U	0.004 U	0.004 UJ	0.004 U	0.004 U
Pesticides/PCBs (ug/L)							
AROCLOR-1016	0.5	0.014 ⁽²⁾	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
AROCLOR-1254	0.5	0.014 ⁽²⁾	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
AROCLOR-1260	0.5	0.014 ⁽²⁾	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
DIELDRIN	0.1	0.0019 ⁽³⁾	0.02 U	0.020 U	0.020 U	0.020 U	0.02 U
HEPTACHLOR	0.05	0.0038 ⁽²⁾	0.01 U	0.010 U	0.010 U	0.010 U	0.01 U
Inorganics (total/dissolved) (ug/L)							
ARSENIC	4	150 ⁽²⁾	5.0 U/5.0 U	5.0 U/6.2 U	5.0 U/5.0 U	5.3 J/5.0 U	5 U/5 U
BERYLLIUM	4	NA	0.10 U/0.10 U	0.10 U/0.10 U	0.10 UJ/0.10 UJ	0.21 U/0.13 U	0.1 U/0.1 UJ
CADMIUM	6	0.62 ⁽³⁾	3.0 U/3.0 U	3.0 U/0.60 U	3.0 U/3.0 U	3.0 U/3.0 U	3 U/3 U
CHROMIUM ⁽⁴⁾	110	11 ⁽²⁾	5.0 U/5.0 U	5.0 U/0.60 U	5.0 U/5.0 U	5.0 U/5.0 U	5 U/5 U
COPPER	48	4.8 ⁽³⁾	7.0 U/8.1 U	2.2 U/1.5 U	2.2 U/6.4 U	7.6 U/5.6 U	15.5 U/2.2 U
LEAD	13	1.2 ⁽³⁾	5.8 J/3.0 UJ	3.0 U/3.0 U	3.0 UJ/3.0 UJ	9.5/3.0 UJ	5 J/3 U
ZINC	123	58.2 ⁽³⁾	68.5/56.6	55.9/47.0 J	30.2/43.7	109/41.0	107/29.1
Miscellaneous Parameters (mg/L)							
ALKALINITY	NA	NA		31	27	28	
CHEMICAL OXYGEN DEMAND	NA	NA	14.0	20.0	5 U	17	37
CHLORIDE	NA	NA	20.0	70.0	60	80	90
HARDNESS	NA	NA	160	49	45	37	1 U
SULFATE	NA	NA	13.0	6.0	7	9	13
TOTAL DISSOLVED SOLIDS	NA	NA	173	220	230	180	400 J
TOTAL ORGANIC CARBON	NA	NA	11.0	7.3	4.4	7.6	12 J

TABLE 3-2

ROUND 7 SURFACE WATER ANALYTICAL RESULTS SUMMARY
 INTERIM GROUNDWATER MONITORING REPORT
 AREA A, NSB-NLON, GROTON, CONNECTICUT
 PAGE 2 OF 2

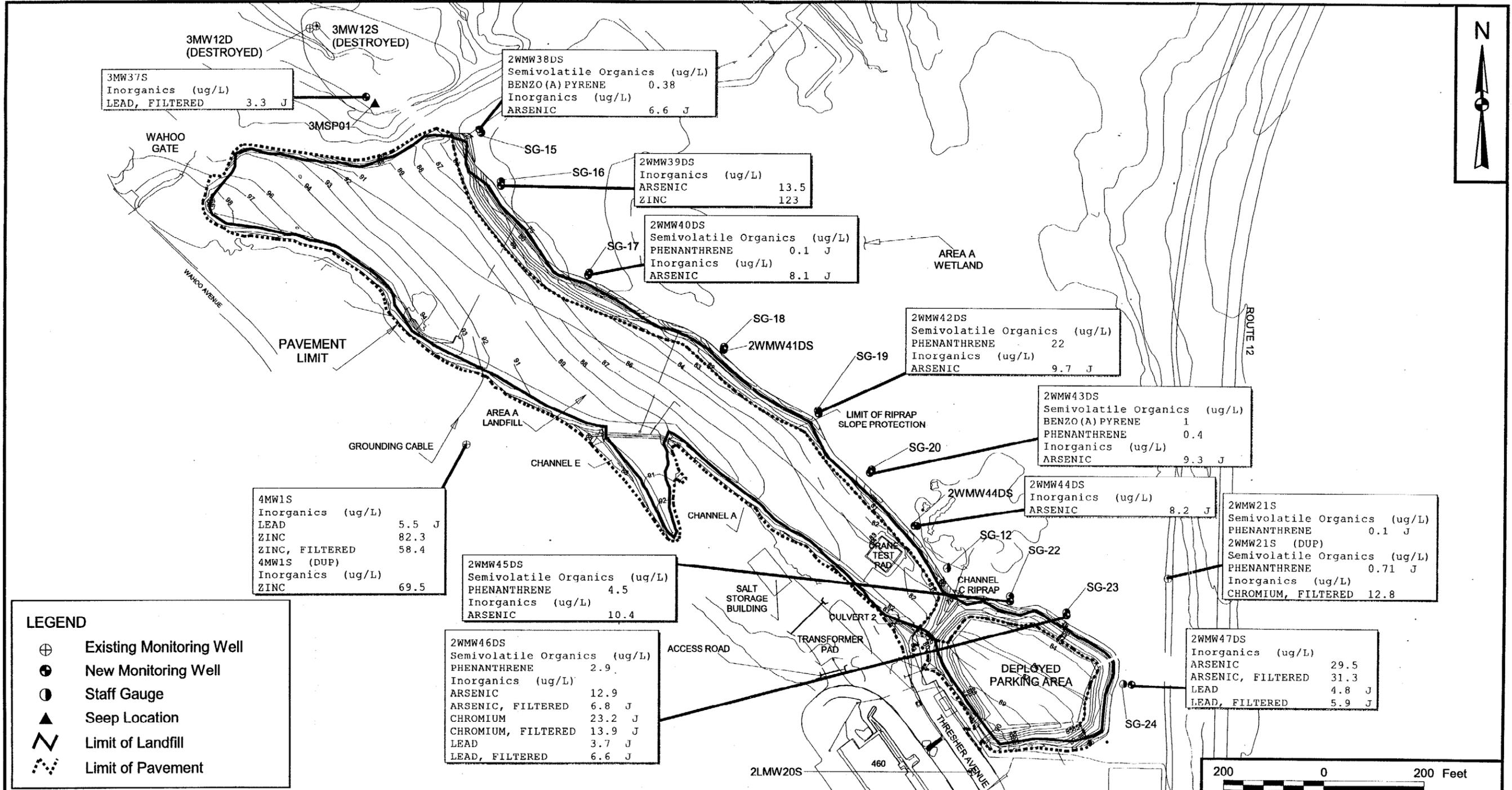
Chemical	Primary Monitoring Criterion ⁽¹⁾	Secondary Monitoring Criterion	SG-22 SWSG22-07 6/25/01	SG-22 SWSG22-07-D 6/25/01	SG-23 SWSG23-07 6/21/01	SG-24 SWSG24-07 6/25/01
VOCs (ug/L)						
1,1,2,2-TETRACHLOROETHANE	110	NA			1 U	
ETHYLBENZENE	580,000	NA			1 U	
XYLENES, TOTAL	NA	NA			1 U	
SVOCs (ug/L)						
BENZO(A)ANTHRACENE	0.3	NA			0.012 U	
BENZO(A)PYRENE	0.3	NA			0.021 U	
BENZO(B)FLUORANTHENE	0.3	NA			0.02 U	
BENZO(K)FLUORANTHENE	0.3	NA			0.02 U	
BIS(2-ETHYLHEXYL)PHTHALATE	59	NA			2.1 J	
PHENANTHRENE	0.077	NA			0.004 U	
Pesticides/PCBs (ug/L)						
AROCLOR-1016	0.5	0.014 ⁽²⁾			0.20 U	
AROCLOR-1254	0.5	0.014 ⁽²⁾			0.20 U	
AROCLOR-1260	0.5	0.014 ⁽²⁾			0.20 U	
DIELDRIN	0.1	0.0019 ⁽³⁾			0.020 U	
HEPTACHLOR	0.05	0.0038 ⁽²⁾			0.010 U	
Inorganics (total/dissolved) (ug/L)						
ARSENIC	4	150 ⁽²⁾	6.8 J/5.9 J	7.3 J/5.7 J	7.5 J/5.0 U	6.6 J/5.6 J
BERYLLIUM	4	NA	0.10 U/0.10 U	0.10 U/0.10 U	0.58 U/0.10 UJ	0.10 U/0.10 U
CADMIUM	6	0.62 ⁽³⁾	3.0 U/3.0 U	3.0 U/3.0 U	3.0 U/3.0 U	3.0 U/3.0 U
CHROMIUM ⁽⁴⁾	110	11 ⁽²⁾	5.0 U/5.0 U	5.0 U/5.0 U	5.0 U/27.5	5.0 U/5.0 U
COPPER	48	4.8 ⁽³⁾	7.4 U/6.3 U	7.8 U/4.5 U	5.3 U/5.1 U	10.2 U/3.3 U
LEAD	13	1.2 ⁽³⁾	3.0 UJ/3.0 UJ	3.2 J/3.0 UJ	3.0 UJ/3.0 UJ	3.0 UJ/3.0 UJ
ZINC	123	58.2 ⁽³⁾	81.6/60.0	84.9/56.2	103/41.5	95.4/57.6
Miscellaneous Parameters (mg/L)						
ALKALINITY	NA	NA			35	
CHEMICAL OXYGEN DEMAND	NA	NA			14	
CHLORIDE	NA	NA			80	
HARDNESS	NA	NA			41	
SULFATE	NA	NA			5	
TOTAL DISSOLVED SOLIDS	NA	NA			210	
TOTAL ORGANIC CARBON	NA	NA			6.8	

NOTES:

Bold numbers denote exceedance of secondary monitoring criterion. There are no exceedances of primary monitoring criteria.

- (1) Surface Water Protection Criteria for substances in groundwater. (CTDEP, January 1996)
 - (2) Federal Ambient Water Quality Criteria for protection of aquatic life (chronic, freshwater). (USEPA, 1999)
 - (3) Connecticut Water Quality Criteria for protection of human health from consumption of organisms. (CTDEP, 1997)
 - (4) Hexavalent Chromium
- J Estimated Value
 R Rejected Value
 U Undetected
 NA Not Available

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LEGEND

- ⊕ Existing Monitoring Well
- ⊙ New Monitoring Well
- Staff Gauge
- ▲ Seep Location
- ~ Limit of Landfill
- - - Limit of Pavement

4MW1S
Inorganics (ug/L)
LEAD 5.5 J
ZINC 82.3
ZINC, FILTERED 58.4
4MW1S (DUP)
Inorganics (ug/L)
ZINC 69.5

2WMW45DS
Semivolatile Organics (ug/L)
PHENANTHRENE 4.5
Inorganics (ug/L)
ARSENIC 10.4

2WMW46DS
Semivolatile Organics (ug/L)
PHENANTHRENE 2.9
Inorganics (ug/L)
ARSENIC 12.9
ARSENIC, FILTERED 6.8 J
CHROMIUM 23.2 J
CHROMIUM, FILTERED 13.9 J
LEAD 3.7 J
LEAD, FILTERED 6.6 J

3MW37S
Inorganics (ug/L)
LEAD, FILTERED 3.3 J

2WMW38DS
Semivolatile Organics (ug/L)
BENZO(A) PYRENE 0.38
Inorganics (ug/L)
ARSENIC 6.6 J

2WMW39DS
Inorganics (ug/L)
ARSENIC 13.5
ZINC 123

2WMW40DS
Semivolatile Organics (ug/L)
PHENANTHRENE 0.1 J
Inorganics (ug/L)
ARSENIC 8.1 J

2WMW42DS
Semivolatile Organics (ug/L)
PHENANTHRENE 22
Inorganics (ug/L)
ARSENIC 9.7 J

2WMW43DS
Semivolatile Organics (ug/L)
BENZO(A) PYRENE 1
PHENANTHRENE 0.4
Inorganics (ug/L)
ARSENIC 9.3 J

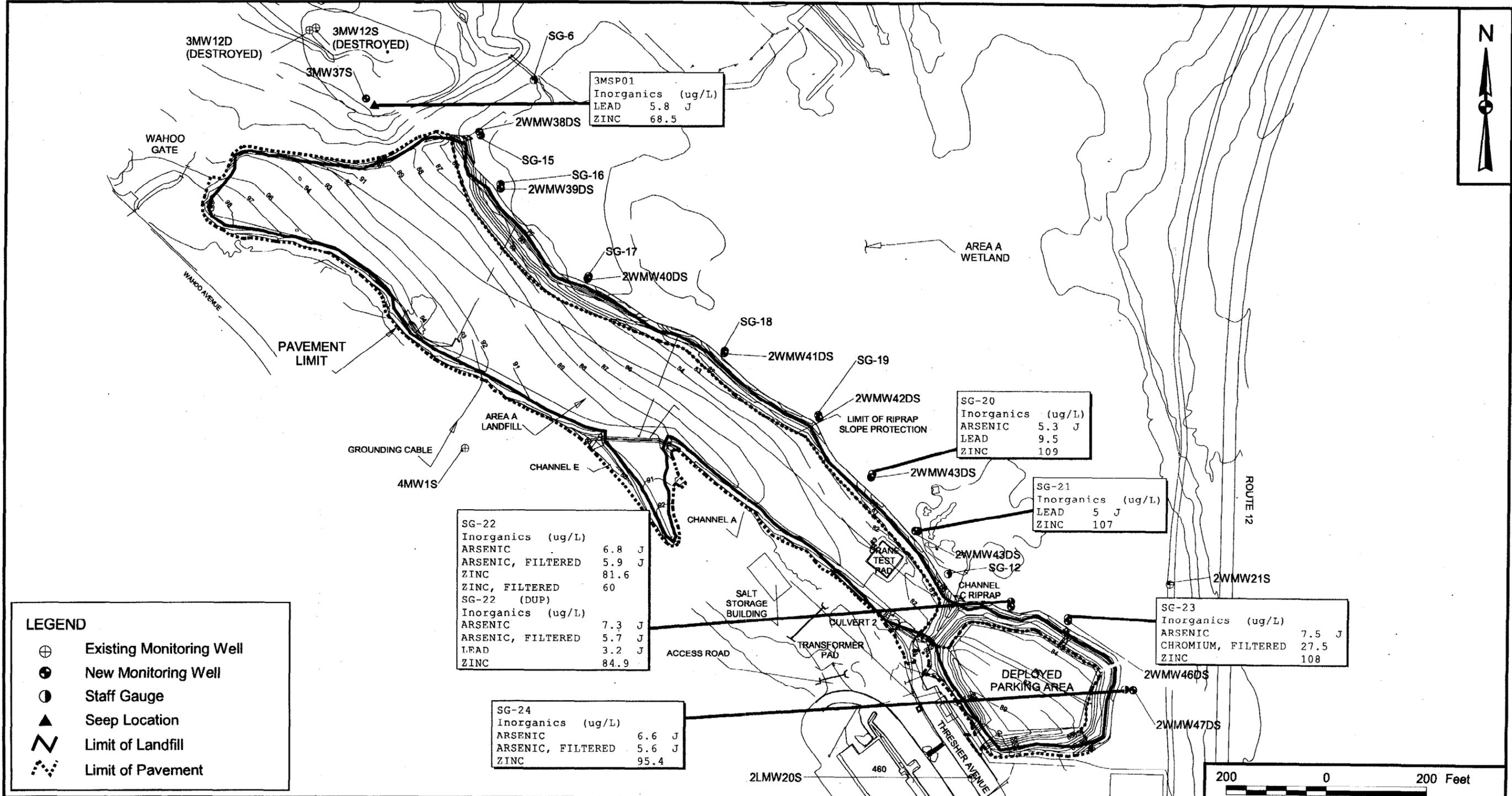
2WMW44DS
Inorganics (ug/L)
ARSENIC 8.2 J

2WMW21S
Semivolatile Organics (ug/L)
PHENANTHRENE 0.1 J
2WMW21S (DUP)
Semivolatile Organics (ug/L)
PHENANTHRENE 0.71 J
Inorganics (ug/L)
CHROMIUM, FILTERED 12.8

2WMW47DS
Inorganics (ug/L)
ARSENIC 29.5
ARSENIC, FILTERED 31.3
LEAD 4.8 J
LEAD, FILTERED 5.9 J

NO.	DATE	REVISIONS	BY	CHKD	APPD	REFERENCES

DRAWN BY J. LAMEY DATE 9-14-01 CHECKED BY DATE COST/SCHEDULE-AREA SCALE AS NOTED	Tetra Tech NUS, Inc. COC EXCEEDANCES OF MONITORING CRITERIA ROUND 7 GROUNDWATER SAMPLING AREA A LANDFILL NSB-NLON, GROTON, CONNECTICUT	CONTRACT NUMBER 7091 OWNER NUMBER CTO 816 APPROVED BY C. RICH DATE 11/19/01 APPROVED BY DATE DRAWING NO. FIGURE 3-1 REV 0
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LEGEND

- ⊕ Existing Monitoring Well
- New Monitoring Well
- ⊙ Staff Gauge
- ▲ Seep Location
- ~ Limit of Landfill
- - - Limit of Pavement



NO.	DATE	REVISIONS	BY	CHKD	APPD	REFERENCES	DRAWN BY	DATE	Tetra Tech NUS, Inc.	CONTRACT NUMBER	OWNER NUMBER
							J. LAMEY	9-14-01		COC EXCEEDANCES OF MONITORING CRITERIA ROUND 7 SURFACE WATER SAMPLING AREA A LANDFILL NSB-NLON, GROTON, CONNECTICUT	7091
							CHECKED BY MLM	DATE 9/19/01	APPROVED BY C. Rich		DATE 9/19/01
							COST/SCHEDULE-AREA			APPROVED BY	DATE
							SCALE AS NOTED			DRAWING NO.	REV
										FIGURE 3-2	0

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APPENDIX A

FIELD ACTIVITIES LOG BOOK

AREA A 7th QTR SAMPLING

TITLE

SUNNY 86-903

PROJECT NO

155

BOOK NO

MOON 6-18-01

0700-1200 MOB TO SITE, JCW + FUR

1200 UN GET PASS

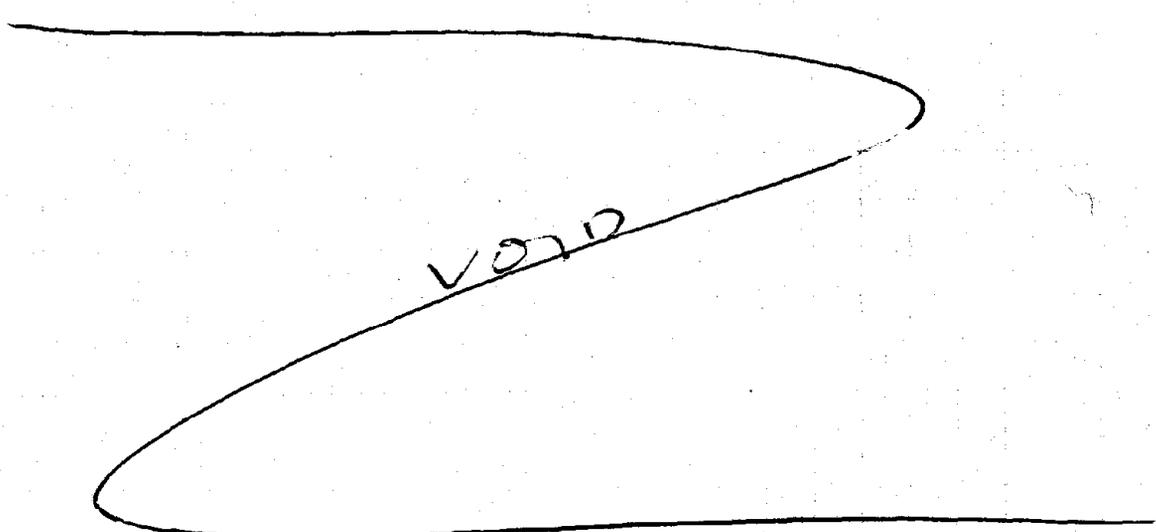
1230 UN PACK EQUIPMENT

1300-1330 PREP TO DO WATER LEVELS @ AREA A

1700 CANNOT FIND ALL WELLS WILL TAKE W/ DICK CONNKT TOMORROW.

RETURN TO BLOC 166 CHECK WATER QUALITY METERS, DO SAMPLE SETS (LABELS ON TO BOTTLES ETC. SEE PG 156

2100 HRS LV SITE.



Fred Rauer

Date submitted to Page

DATE 6-18-01

DATE

WELLS

DATE

AREA A

14 WELL

2 DUPS

1 ms/ms

17

1 EQUIPMENT
BLANKS

19

31 TOTAL

10 SW

1 DUP

1 ms/ms

12

12

SUMMARY AREA A ROUND 7, JUNE 2001

SAMPLE LOCATION	DATE SAMPLED	QA	COMMENTS
3MW37S	6-19-01	—	
2WMW38DS	6-21,23,24-01	—	
2WMW39DS	6-20-01	—	
2WMW40DS	6-20-01	—	
2WMW41DS	6-22-01		PURGED DRY 3-20-01
2WMW42DS	6-20-01		
2WMW43DS	6-20/21-01		
2WMW44DS	6-22-01		
2WMW45DS	6-20-01		
2WMW46DS	6-22-01		
2WMW47DS	6-23-01		
2LMW20S	6-23-01		MS/MSD INTEGRITY QUESTIONABLE NEEDS NEW FLUSH MT PAD, BOLT DOWN IS SUNKED
2WMW21S	6-23-01		
4MW1S			
3MSP01	6-19-01		
SG15			
SG16			
SG17			
SG18	6-20-01		
SG19	6-22-01	MS/MSD	
SG20	6/22-01		
SG21			
SG22			
SG23	6-21-01		
SG24			

Work continued to Page

DATE

DATE

DATE

DATE

DATE

DATE

SUMMER 2003-905

BOON NO

TUESDAY 19, 2001

0700 JENNIFER WELLMAN (JCW) SSH+SO } TENUS
 FRED WRAUSER (FWR) POL }
 ARR AT BLDG 166 TALK W/ DICK CONRAT, HE
 TAKES US ON A TOUR, + MEET PEOPLE WHO HAVE
 KEYS TO BUNKER A-86 (PURPLE) (ED)
 (KE)

0855 + SHOW US 2Wmw21S, 2Wmw20S, 3mw37
 + GENERATE TRIP BLANK FROM LAB (LABEL) 6WTB061901

0900 JCW + FWR GOTO 3mw37 SETUP TO SAMPLE
 FWR GOES TO COLLECT WLS MISSED YESTERDAY

- MEET w/ Kathy McReynolds @ DRMO DISCUSS
 Schedule she will talk w/ CONTRACTOR IN CHARGE
 OF DRMO

1200 FWR MEETS JCW @ 3mw37 HELP PACK OUT
 EQUIPMENT

FWR ~~GOTO~~ GOES TO 2Wmw38DS

JCW BEGAN @ 2Wmw39DS

FWR

1900 FWR + JCW RETURN TO BLDG 166 PREP 9PLS FOR
 TOMORROW PICK-UP.

2000 JCW + FWR LV BLDG 166

Fred Wrauser

6-19-01

[TITLE

[WED. 20, 2001

PARTLY SUNNY
+ CLOUDS

[0700

JCW - SSHSO ON SITE @ BUDG 166
PUR - FOL

- CALIBRATE EQUIPMENT
- LOAD VEHICLES w/ CONTAINERS
- CALLED FEDEX FOR AM PICK UP (~1000AM)

[0730

DEPART FOR AREA A. PROCEED TO PURGE
AND SAMPLE WELLS IN THE ~~FF~~ BOG/SWAMP
GENERATED TRIP BLANK GWTBOG2001

[1300

PUR GOES TO BOC GASES ON RT 183 PAST
WALMART. GET 3 X 60CFR TANK NITROGEN

[1500

PUR + JCW GO TO DRMO -

- TALK w/ LINDA SHE DOES NOT HAVE THE AUTHORITY
TO GIVE ME THE KEYS, THEIR LOCKING THE GATE
AT 1530, AND WILL NOT ALLOW ME TO LOCK
THE GATE WHEN I'M DONE. NO WL'S TODAY
LO TIDE @ 1520

[1530

PUR + JCW RETURN TO AREA AND PROCEED TO
SAMPLE WELLS IN BOG?, SWAMP?

PREP SAMPLES TO SHIP TO-MORROW

- DO BOTTLE INVENTORY
- WILL NEED FILTERS SURGICAL GLOVES
FOR TOM PATTON
- CALL LABS ABOUT VOL REQ

[2100

JCW + PUR LV SITE

Fred Wanser

6-20-01

AREA A 7th QTR

2863

163

THURSDAY 21, 2001

OVERCAST
70s

0700

JCW + PUR ARR AT BLDG 166 PREP TO
SAMPLE @ AREA A.

GENERATE TRIP BLANK USING NERI
LOT 0605050
EXP 06-2001

1100

- PREP 3-COOLERS FOR FED EX PICK UP

- TALK w/ KURT@CHEMTECHLAB.COM

REQ * 1 liter for S-VOL
* 1 liter for PAH
* PEST/PCBS 2-liter

- CALLED FED EX

1934

PUR + JCW LV SITE

NO LV PUR

Gred Raman

6-21-01

FRIDAY 22, 2001

OVERCAST 20s

0700

FUR + JCW ARR AT BLDG 166, CALIBRATE
YSL + TURBIDITY METERS

GENERATED TB FOR → GW TBO62201

JCW ^{+ FUR} COLLECTED THE FOLLOW SW SPLS

SAMPLE#	TIME	COMMENTS
SWSG14-07	0734	ms/msd
SWSG20-07	0825	
ZW-GW4605-07	0900	COMPLETED
ZW-GW4105-07	0930	COMPLETED
ZW-GW4405-07	1000	COMPLETED

PREP SAMPLES FOR SHIPMENT

1500

FED EX AB # 8216 5043 9697

PREP FOR DRMC SAMPLING SEE
BOOK 2497 CTO 257

SHIPPED SAMPLES FED EX AB# 8216 5043 9697

Scott Panzer

6-22-01

AREA A.

2863

167

SAT 23, 2001

OVERCAST
70's

0700 FUR+SFC JCLW ARR @ BLDG 166 PREP
TO SAMPLE @ 2W-GW215-GW-07
2W-GW47DS-07

0730 TRIP BLANK GWTB062301 FROM LAB.

WELL ID	2WGW215GW07	2WGW47DS07
START PURGED	925	0935 HR
END PURGED	1115	1115 HR
VOL PURGED	14.4 L	11 L

DUPLICATE GWFDD6230101 COLLECTED @ 2WGW215-07

1500

PREP SAMPLES FOR SFC SHIPMENT, MAKE
BOTTLE SETS FOR REMAINING SAMPLES
PREP FOR DRMO → SEE BOOK # 2497 CTOZET
267

Fred W. House

6-23-01

SUNDAY 24, 2007

0700 FUR + JCW ARR AT BLDG 166 PREP TO
SAMPLE 36's + CALIBRATE YSI + TURBIDITY
METERS

0900 JCW SET UP ON 2LMW20S

1040 FUR COMPLETED SAMPLING 2LMW38DS

FUR PREP SAMPLES COLLECTED THRU WEEKEND
FOR SHIPMENT ON MONDAY 25TH, CONCERNED
ABOUT HOLDING TIME. I HAVE E-MAIL a message
TO THE LAB ABOUT THE SHORT FUSE ASSOC.
WITH SAMPLES COLLECTED FRIDAY (PM). IF
LAB RECEIVES SAMPLES TUESDAY, THIS WILL LEAVE
3 DAYS FOR A 7-DAY HOLDING TIME FOR S-VOA
EXTRACTION

1300 PREP TO GO TO DRMO SEE NOTE BOOK #

Sred Warner

DATE
6-24-07

SUNNY 80°

MONDAY 25, 2001

0700 FUR + JCW ARR @ BLDG 166 PREP TO SAMPLE @
DRMW SEE NOTE BOOK # 2497 CTD 257

1200 FUR + JCW COMPLETED WORK @ DRMW, PREP
TO SAMPLE @ AREA "A" 4-GWOIS-07.
JCW SETS UPON GWOIS

- DO PAPER WORK
- BEGIN TO DEMOB EQUIPMENT USED FOR
DRMW

1500 FUR PREPS TO COLLECT SURFACE WATERS
@ SG 22 + SG 24

↑
WILL COLLECT FIELD DUP. SW FDOG25016
AT THIS LOCATION

1800 FUR RETURNS TO BLDG 166 PLACE SAMPLES
IN REF. CO

- CONT. TO DEMOB
- PAPER WORK

Sued Wanner

8-25-01

TUESDAY 26, 01

0700

FUR + JCW ARR AT BLDG 166, PACK

- PACK SAMPLES
- DEMO'S EQUIP (PACK FOR SHIPMENT)
- RETURN NITROGEN TANKS SIZE (60S) USED ~ 1/2 OF EACH (2) TANKS.
- CALLED PROEX FOR PICK-UP.
- JCW HAVING DIFFICULTIES GETTING A PLANE HOME EARLY

1200

FUR DEPARTS FOR PROVIDENCE AIRPORT

JCW WILL STAY AT BLDG W/ SAMPLES, AND WILL GO TO AIRPORT TO GO ON STANDBY.

~~LOUIS ME~~

Ered W. Ranson

6-26-01

APPENDIX B

GROUNDWATER LEVEL MEASUREMENT SHEET



WATER LEVEL MEASUREMENT SHEET

Project Name: NSB-NLON, [REDACTED] AREA A Project No.: CTO [REDACTED] 816
 Location: Groton, CT Personnel: [REDACTED] JENNIFER WELLMAN, F.W. RAMSER
 Weather Conditions: SUNNY Measuring Device: M-SCOPE
 Remarks: _____

Well ID	Date	Time	Water Level *	Thickness of Free Product	PID Reading ppm		Comments
					RP	BZ	
2WMW420S	6/18/01	1542	1.92	NA			
SG19	6/18/01	1544	1.47	NA			
2WMW410S	6/18/01	1533	2.07	NA			
SG18	6/18/01	1536	1.30	NA			
2WMW400S	6/18/01	1520	3.02	NA			
SG17	6/18/01	1634	DRY	NA			
4MW15	6/18/01	1655	3.95	NA			riser bent/ protective casing bent against riser
2WMW390S	6/18/01	1640	2.28	NA			
2WMW380S	6/18/01	1459	5.26	NA			
3MW375	6/18/01	0943	3.55	NA			
SG6	6/18/01			NA			
MINAD	6/18/01	1652	1 inch Above PVC	NA			Flowing

* All measurements to the nearest 0.01 foot

Signature(s): Jorel Whaner



WATER LEVEL MEASUREMENT SHEET

Project Name: NSB-NLON, [REDACTED] AREA
Location: Groton, CT
Weather Conditions: SUNNY
Project No.: CTO [REDACTED]
Personnel: [REDACTED] JENNIFER WELLMAN + F. W. RAMSEY
Measuring Device: M-SCOPE
Remarks: _____

Well ID	Date	Time	Water Level *	Thickness of Free Product	PID Reading ppm		Comments
					RP	BZ	
2MW43DS	6/18/01	1550	2.08	NA	NA	NA	
SG 20		1553	2.00	NA			
2MW44DS				NA			
SG 21		1606 ^{PM}		NA			
2MW45DS		1606	1.73	NA			
SG 22		1607	DRY	NA			
2MW46DS		1610	1.02	NA			
SG 24				NA			DAMAGED/BENT GALVANIZED ROD.
2mw47DS	6/18/01	1618	1.00	NA			
2LMMW21S	6/19/01	1000	4.14	NA			
2LMMW20S	1	1444	15.17	NA			flush mount + bolt needs replaced
				NA			

* All measurements to the nearest 0.01 foot

Signature(s): J. Ramsey

APPENDIX C

MONITORING INSTRUMENT CALIBRATION LOGS

APPENDIX D

**GROUNDWATER SAMPLE LOGSHEETS AND
LOW-FLOW PURGE DATA SHEETS**



Tetra Tech NUS, Inc

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSB-NLON / AREA A
Project No.: CTO

Sample ID No.: 4-GW015-07
Sample Location: 4 MW15
Sampled By: Wellman
C.O.C. No.: 41506

- Domestic Well Data
- Monitoring Well Data
- Other Well Type: _____
- QA Sample Type: _____

- Type of Sample:
- Low Concentration
 - High Concentration

SAMPLING DATA:

Date: <u>6/25/01</u>	Color	pH	S.C.	Temp.	Turbidity	DO	ORP	Salinity
Time: <u>1410</u>	Visual	Standard	mS/cm	Degrees C	NTU	mg/l	mV	ppt
Method: Peristaltic Pump	<u>clear</u>	<u>5.61</u>	<u>217</u>	<u>12.09</u>	<u>0.02</u>	<u>8.33</u>	<u>168.9</u>	

PURGE DATA:

Date: <u>6/25/01</u>	See Attached Low Flow Purge Data Sheet for Purge Data
Method: Peristaltic Pump	
Monitor Reading (ppm):	
Well Casing Diameter & Material	
Type: <u>2" PVC</u>	
Total Well Depth (TD): <u>20.30</u>	
Static Water Level (WL): <u>6.95</u>	
One Casing Volume (gal): <u>6 L</u>	
Start Purge (hrs): <u>1325</u>	
End Purge (hrs): <u>1410</u>	
Total Purge Time (min): <u>45</u>	
Total Vol. Purged (gal): <u>70 L</u>	

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TCL VOLATILES	HCL / 4° C	3 - 40 ml Vial	<u>6</u>
TCL SEMIVOLATILES	4° C	2 - Qt. Amber Glass	<u>2</u>
TCL PEST/PCBs	4° C	2 - Qt. Amber Glass	<u>4</u>
TCL PAH	4° C	2 - Qt. Amber Glass	<u>2</u>
TAL METALS (TOTAL) + Hardness	HNO ₃ / 4° C	1 - 500 ml PE	<u>2</u>
TAL METALS (DISSOLVED)	HNO ₃ / 4° C	1 - 500 ml PE	<u>2</u>
Total Organic Carbon (TOC)	HCL / 4° C	<u>1-500 ml PE</u> 40 ml Glass	<u>2</u>
Chemical Oxygen Demand (COD)	H ₂ SO ₄ / 4° C	<u>1-250 ml PE</u>	<u>2</u>
Alkalinity, Chloride, Sulfate, TDS	4° C	<u>1-1 L</u> 1-500 ml PE	<u>2</u>

OBSERVATIONS / NOTES:

Circle if Applicable:

<input checked="" type="checkbox"/> MS/MSD	Duplicate ID No.: <u>6WF106250102</u>
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Signature(s): Jennifer C. Wellman



Tetra Tech NUS, Inc

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSB-NLON / AREA A
Project No.: CTO

Sample ID No.: 2L-GW205⁰⁷
Sample Location: 2L-GW205
Sampled By: Wellman
C.O.C. No.: 41503

- Domestic Well Data
- Monitoring Well Data
- Other Well Type: _____
- QA Sample Type: _____

- Type of Sample:
- Low Concentration
 - High Concentration

SAMPLING DATA:

Date:	Color	pH	S.C.	Temp.	Turbidity	DO	Fe	Salinity
Time:	Visual	Standard	ms/cm	Degrees C	NTU	mg/l	ppm	ppt
6/24/01	clear	6.48	359	15.19	0.98	6.20	26.9	

PURGE DATA:

Date: 6/24/01
 Method: Peristaltic Pump
 Monitor Reading (ppm): ---
 Well Casing Diameter & Material
 Type: 2" PVC
 Total Well Depth (TD): 1890
 Static Water Level (WL): 16.32
 One Casing Volume (gal): 16.8L
 Start Purge (hrs): 1000
 End Purge (hrs): 1045
 Total Purge Time (min): 45
 Total Vol. Purged (gal): 6.2L

See Attached Low Flow Purge Data Sheet for Purge Data

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TCL VOLATILES	HCL / 4°C	3 - 40 ml Vial	9
TCL SEMIVOLATILES	4°C	1 - Qt. Amber Glass	3
TCL PEST/PCBs	4°C	2 - Qt. Amber Glass	6
TCL PAH	4°C	1 - Qt. Amber Glass	3
TAL METALS (TOTAL) + Hardness	HNO ₃ / 4°C	1 - 500 ml PE	3
TAL METALS (DISSOLVED)	HNO ₃ / 4°C	1 - 500 ml PE	3
Total Organic Carbon (TOC)	HCL / 4°C	1-500ml 2-40 ml Glass	3
Chemical Oxygen Demand (COD)	H ₂ SO ₄ / 4°C	1-250 ml PE	3
Alkalinity, Chloride, Sulfate, TDS	4°C	1-1L 1-500 ml PE	3

OBSERVATIONS / NOTES:

Circle if Applicable:

MS/MSD Duplicate ID No.: _____

Signature(s):

Jennifer C. Wellman



Tetra Tech NUS, Inc

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSB-NLON / AREA A
Project No.: CTO

Sample ID No.: 2W-GW215-GW-07
Sample Location: 2W MW 215
Sampled By: Wellman
C.O.C. No.: 41503
Type of Sample:
 Low Concentration
 High Concentration

- Domestic Well Data
- Monitoring Well Data
- Other Well Type: _____
- QA Sample Type: _____

SAMPLING DATA:

Date:	Color	pH	S.C.	Temp.	Turbidity	DO	ORP	Salinity
Time:	Visual	Standard	mS/cm	Degrees C	NTU	mg/l	mV	ppt
6/23/01	Clear/grey	6.69	25575	14.14	45	8.15	-302.9	

PURGE DATA:

Date:	6/23/01
Method:	Peristaltic Pump
Monitor Reading (ppm):	
Well Casing Diameter & Material	
Type:	2" PVC
Total Well Depth (TD):	17.4
Static Water Level (WL):	4.24
One Casing Volume (gal):	1.662
Start Purge (hrs):	0925
End Purge (hrs):	1115
Total Purge Time (min):	120
Total Vol. Purged (gal):	14.4L

See Attached Low Flow Purge Data Sheet for Purge Data

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TCL VOLATILES	HCL / 4°C	3 - 40 ml Vial	6
TCL SEMIVOLATILES	4°C	1 - 2 Qt. Amber Glass	2
TCL PEST/PCBs	4°C	2 - 1/2 Qt. Amber Glass	4
TCL PAH	4°C	1 - 2 Qt. Amber Glass	2
TAL METALS (TOTAL) + Hardness	HNO ₃ / 4°C	1 - 500 ml PE	2
TAL METALS (DISSOLVED)	HNO ₃ / 4°C	1 - 500 ml PE	2
Total Organic Carbon (TOC)	HCL / 4°C	1 - 500 ml PE / 2 - 40 mL Glass	2
Chemical Oxygen Demand (COD)	H ₂ SO ₄ / 4°C	1 - 250 mL PE	
Alkalinity, Chloride, Sulfate, TDS	4°C	1 - 1L / 1 - 500 ml PE	2

OBSERVATIONS / NOTES:

D.O. - values bounced around dramatically - value is questionable

Circle if Applicable:

MS/MSD

Duplicate ID No.:

GWFD06230101

Signature(s):

Jennifer C. Wellman



Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

Well No.: 2WMW215

PROJECT: NSB- NLon/Area A
 PROJECT NUMBER: _____
 SITE: Area A

DATE: 6/23/01
 WEATHER: Overcast, 70s, misty
 PERSONNEL: Wellman Ramser

Well Screen Depth: 7.4 / 17.4 ft. Pump Type/Material: peristaltic/lef on Tide Cycle: High @ _____
 Initial Water Level: 4.24 @ 0925 hrs. Pump Intake Depth: _____ Low @ _____
 Total Purge Volume= 14.4 (gal/L) Total Purge Time= 120 (min) Not Affected

Time	Water Level feet below TOC	Volume mL	Flow Rate mL/min	Pump Settings	Temp °C	pH	Sp Cond mS/cm	DO mg/L	Turbidity NTU	Salinity ppt	ORP mV	Comments
0925	4.24	—	180	—								Start purge
0935	5.20	1800	150	—	12.64	7.06	34130	7.48	19	—	-300.0	
0945	5.61	3300	150	—	13.17	6.90	34227	6.81	3.3	—	-316.2	
0955	5.62	4800	120	—	13.42	6.83	33652	7.77	3.1	—	-313.4	
1005	5.63	6000	120	—	13.57	6.77	32666	8.45	2.5	—	-310.2	
1015	5.63	7200	120	—	13.90	6.76	31627	9.50	3.7	—	-307.6	
1025	5.64	8400	120	—	14.02	6.75	30335	*0.02	7.3	—	-304.5	
1035	5.64	9600	120	—	13.65	6.74	28879	5.33	28	—	-299.7	
1045	5.69	10800	120	—	14.14	6.74	27272	6.28	45	—	-305.7	
1055	5.70	12000	120	—	14.15	6.73	26366	7.24	45	—	-303.6	
1105	5.69	13200	120	—	14.16	6.69	25958	8.15	45	—	-304.1	
1115	5.69	14400	120	—	14.14	6.69	25575	*	45	—	-302.7	

Water Quality Meter (S/N): 99B1377A
 Control Box Type (S/N): 01A0583 AB
 Turbidimeter (S/N): 1728-11600

Notes: * D.O. Questionable - Reading too high - checked probe + tie etc



Tetra Tech NUS, Inc

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSB-NLON / AREA A
 Project No.: CTO [REDACTED] 816

Domestic Well Data
 Monitoring Well Data
 Other Well Type: _____
 QA Sample Type: _____

Sample ID No.: 2W-6W38DS-07
 Sample Location: 2W MW 38DS
 Sampled By: FRED W. RAMSER
 C.O.C. No.: 41503
 Type of Sample:
 Low Concentration
 High Concentration

SAMPLING DATA:

Date: <u>6-19-01</u>	Color	pH	S.C.	Temp.	Turbidity	DO	Eh	Salinity
Time: <u>SEE BELOW</u>	Visual	Standard	ms/cm	Degrees C	NTU	mg/l	mV	ppt
Method: Peristaltic Pump								

SEE BELOW

PURGE DATA:

Date: 6-19-01
 Method: Peristaltic Pump
 Monitor Reading (ppm): _____
 Well Casing Diameter & Material
 Type: 2" PVC
 Total Well Depth (TD): 11.90
 Static Water Level (WL): 5.39
 One Casing Volume (gal): 3.52
 Start Purge (hrs): 1500 HR
 End Purge (hrs): 1550
 Total Purge Time (min): 50 min
 Total Vol. Purged (gal): 5.42

See Attached Low Flow Purge Data Sheet for Purge Data

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TCL VOLATILES	HCL / 4°C	1070 3 - 40 ml Vial	6-24-01
TCL SEMIVOLATILES	4°C	1430 1 - Qt. Amber Glass	6-23-01
TCL PEST/PCBs	4°C	1300 HR 2 - Qt. Amber Glass	6-21-01
TCL PAH	4°C	1430 1 - Qt. Amber Glass	6-23-01
TAL METALS (TOTAL) + Hardness	HNO ₃ / 4°C	1300 HR 1 - 500 ml PE	6-21-01
TAL METALS (DISSOLVED)	HNO ₃ / 4°C	1300 HR 1 - 500 ml PE	6-21-01
Total Organic Carbon (TOC)	HCL / 4°C	40 mL Glass	
Chemical Oxygen Demand (COD)	H ₂ SO ₄ / 4°C	1070 1 - 250 mL PE	6-24-01
Alkalinity, Chloride, Sulfate, TDS	4°C	1430 1 - 500 ml PE	6-23-01

OBSERVATIONS / NOTES:

11.90
 5.39
 (5.51 x 0.6) = 3.52

PURGED DRY 6-19-01
 6-21-01 WL = 8.91 PURGED DRY 1400 HRS

Circle if Applicable:

MS/MSD

Duplicate ID No.: _____

Signature(s):

Fred W. Ramses



Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

Well No.: 2UMW380S

PROJECT:	<u>AREA A QTR SPL (7TH)</u>		DATE:	<u>6-19-01</u>								
PROJECT NUMBER:	<u>CTD 816, JOB# 2863</u>		WEATHER:	<u>SUNNY 80-90's</u>								
SITE:	<u>AREA A</u>		PERSONNEL:	<u>FRED W. RAMSEY</u>								
Well Screen Depth:	<u>1</u> ft.		Pump Type/Material:	<u>PERISTALTIC</u>								
Initial Water Level:	<u>5.39</u> @ <u>1141</u> hrs.		Pump Intake Depth:	<u>SCREEN MIPT</u>								
Total Purge Volume=	_____ (gal / L)		Total Purge Time=	_____ (min)								
			Tide Cycle:	<input type="checkbox"/> High @ _____ <input type="checkbox"/> Low @ _____ <input checked="" type="checkbox"/> Not Affected								
Time	Water Level feet below TOC	Volume mL	Flow Rate mL/min	Pump Settings	Temp °C	pH	Sp Cond mS/cm	DO mg/L	Turbidity NTU	Salinity ppt	ORP Eff mV	Comments
<u>11411500</u>	<u>5.39</u>	<u>200</u>	<u>~100 mL/min</u>	<u>-</u>	<u>15.77</u>	<u>6.41</u>	<u>716</u>	<u>1.18</u>	<u>0.84</u>	<u>-</u>	<u>-10.8</u>	
<u>1510</u>	<u>6.65</u>	<u>1000</u> ⁽²⁰⁰⁾	<u>~100 mL/min</u>	<u>-</u>	<u>14.29</u>	<u>6.37</u>	<u>669</u>	<u>0.58</u>	<u>3.13</u>	<u>-</u>	<u>-18.8</u>	
<u>1520</u>	<u>8.45</u>	<u>2200</u> ⁽⁴⁰⁰⁾	<u>~120 mL/min</u>	<u>-</u>	<u>14.13</u>	<u>6.42</u>	<u>655</u>	<u>0.56</u>	<u>0.80</u>	<u>-</u>	<u>5.4</u>	
<u>1530</u>	<u>9.15</u>	<u>3400</u>	<u>~100 mL/min</u>	<u>-</u>	<u>14.50</u>	<u>6.54</u>	<u>684</u>	<u>0.86</u>	<u>0.77</u>	<u>-</u>	<u>4.6</u>	
<u>1540</u>	<u>10.19</u>	<u>4400</u>	<u>↓</u>	<u>-</u>	<u>14.11</u>	<u>6.66</u>	<u>723</u>	<u>0.85</u>	<u>2.50</u>	<u>-</u>	<u>-6.5</u>	
<u>1550</u>	<u>11.55</u>	<u>5400</u>	<u>~100 mL/min</u>	<u>-</u>	<u>13.65</u>	<u>6.75</u>	<u>748</u>	<u>1.24</u>	<u>0.89</u>	<u>-</u>	<u>-38.2</u>	<u>DRY WELL</u>
									<u>(END PURGE)</u>			

Water Quality Meter (S/N): 01D1391AA 451650MDS W/6820

Notes: _____

Control Box Type (S/N): NATurbidimeter (S/N): 1735-1600 LAMOTTE



Tetra Tech NUS, Inc

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSB-NLON / AREA A
Project No.: CTO

Sample ID No.: 2W-GW39DS-07

Sample Location: ZWMLW39DS

Sampled By: S. Wellman

C.O.C. No.: 41543

- Domestic Well Data
- Monitoring Well Data
- Other Well Type: _____
- QA Sample Type: _____

- Type of Sample:
- Low Concentration
- High Concentration

SAMPLING DATA:

Date: <u>6/19/01</u>	Color	pH	S.C.	Temp.	Turbidity	DO	ORP	Salinity
Time: <u>1651</u>	Visual	Standard	ms/cm	Degrees C	NTU	mg/l	mV	ppt
Method: Peristaltic Pump	<u>clear</u>	<u>6.67</u>	<u>1501</u>	<u>15.10</u>	<u>8.1</u>	<u>0.10</u>	<u>-61</u>	

PURGE DATA:

Date: <u>6/19/01</u>	See Attached Low Flow Purge Data Sheet for Purge Data
Method: Peristaltic Pump	
Monitor Reading (ppm):	
Well Casing Diameter & Material	
Type: <u>2" PVC</u>	
Total Well Depth (TD): <u>16.7</u>	
Static Water Level (WL): <u>2.50</u>	
One Casing Volume (gal): <u>6.61</u>	
Start Purge (hrs): <u>1441</u>	
End Purge (hrs): <u>1651</u>	
Total Purge Time (min): <u>130</u>	
Total Vol. Purged (gal): <u>1166.00</u>	

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TCL VOLATILES	HCL / 4°C	3 - 40 ml Vial	<input checked="" type="checkbox"/>
TCL SEMIVOLATILES	4°C	2 - Qt. Amber Glass	<input checked="" type="checkbox"/>
TCL PEST/PCBs	4°C	2 - Qt. Amber Glass	<input checked="" type="checkbox"/>
TCL PAH	4°C	1 - Qt. Amber Glass	<input checked="" type="checkbox"/>
TAL METALS (TOTAL) + Hardness	HNO ₃ / 4°C	1 - 500 ml PE	<input checked="" type="checkbox"/>
TAL METALS (DISSOLVED)	HNO ₃ / 4°C	1 - 500 ml PE	<input checked="" type="checkbox"/>
Total Organic Carbon (TOC)	H ₂ SO ₄ / 4°C	1 - 500ml PE 40 ml Glass	<input checked="" type="checkbox"/>
Chemical Oxygen Demand (COD)	H ₂ SO ₄ / 4°C	1 - 500ml 250 ml PE	<input checked="" type="checkbox"/>
Alkalinity, Chloride, Sulfate, TDS	4°C	1 - L 500 ml PE	<input checked="" type="checkbox"/>

OBSERVATIONS / NOTES:

Well went dry while filling bottles.
will have to fill sample bottles for TOC, COD,
and ALK, Cl, SO₄, TSD, and VOLATILES tomorrow
6/20/01 - complete sampling (TOC, COD, VOL, ALK, Cl, SO₄, TDS)

Circle if Applicable:

Signature(s):

MS/MSD	Duplicate ID No.:	<u>Jennifer C. Wellman</u>
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Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

Well No.: 2W-GW39AS-07

PROJECT: <u>NSB - NLON AREA A</u>					DATE: <u>06/19/01</u>							
PROJECT NUMBER: <u>2863</u>					WEATHER: <u>Sunny 80's</u>							
SITE: <u>AREA A</u>					PERSONNEL: <u>WELLMAN / RAMSER</u>							
Well Screen Depth: <u>06.7</u> / <u>11.7</u> ft.				Pump Type/Material: <u>PERISTALTIC</u>				Tide Cycle: <input type="checkbox"/> High @ _____				
Initial Water Level: <u>2.5</u> @ <u>1441</u> hrs.				Pump Intake Depth: <u>14.7</u>				<input type="checkbox"/> Low @ _____				
Total Purge Volume= <u>16600</u> (gal / L)				Total Purge Time= <u>130</u> (min)				<input checked="" type="checkbox"/> Not Affected				
Time	Water Level feet below TOC	Volume mL	Flow Rate mL/min	Pump Settings	Temp °C	pH	Sp Cond mS/cm	DO mg/L	Turbidity NTU	Salinity ppt	ORP En mV	Comments
1441	2.50	-	200	-	-	-	-	-	-	-	-	Start purge
1451	5.80	2000	200	-	15.92	6.89	2374	1.31	55	-	-99.4	
1501	5.07	4000	150	-	16.46	6.78	1739	0.61	2.5	-	-94.1	
1511	6.07	5500	100	-	16.55	6.79	1461	0.59	5.4	-	-97.5	
1521	7.52	7000	100	-	16.29	6.74	1091	0.56	14	-	-94.2	
1531	8.02	8000	100	-	16.49	6.74	1636	0.54	13	-	-82.8	
1541	8.37	9000	100	-	16.81	6.89	1915	0.60	17	-	-86.0	
1551	8.95	10000	100	-	16.82	6.78	1305	0.62	19	-	-73.3	
1601	9.65	11000	100	-	16.54	6.69	1140	0.64	12	-	-64.6	
1611	9.96	12000	100	-	17.42	6.86	1720	0.66	35	-	-76.2	
1621	10.35	13000	120	-	15.85	6.78	1255	0.67	16	-	-66.6	
1631	11.01	14200	120	-	15.90	6.81	1746	0.62	17	-	-71.6	
1641	11.65	15400	120	-	15.08	6.67	1438	0.62	16	-	-64.6	
1651	12.80	16600	120	-	15.10	6.67	1501	0.60	8.1	-	-67.0	SAMPLED

Water Quality Meter (S/N): 99B1377AA

Notes: _____

Control Box Type (S/N): 01B0583 ABTurbidimeter (S/N): 1728-1600



Tetra Tech NUS, Inc

GROUNDWATER SAMPLE LOG SHEET

Page of

Project Site Name: NSB-NLON / AREA A
Project No.: CTO [REDACTED] 816

Sample ID No.: 2W-6W40DS-07
Sample Location: 2Wmw40DS
Sampled By: Pure
C.O.C. No.: 41543

- Domestic Well Data
- Monitoring Well Data
- Other Well Type: _____
- QA Sample Type: _____

- Type of Sample:
- Low Concentration
 - High Concentration

SAMPLING DATA:

Date: <u>6-19-01, 6-20-01</u>	Color	pH	S.C.	Temp.	Turbidity	DO	Eh	Salinity
Time: <u>1745</u>	Visual	Standard	mS/cm	Degrees C	NTU	mg/l	mV	ppt
Method: Peristaltic Pump	<u>GRN120</u>	<u>6.89</u>	<u>12530</u>	<u>11.32</u>	<u>2.99</u>	<u>0.74</u>	<u>-333.6</u>	

PURGE DATA:

Date: 6-19-01

Method: Peristaltic Pump

Monitor Reading (ppm): _____

Well Casing Diameter & Material
Type: 2" PVC

Total Well Depth (TD): _____

Static Water Level (WL): 2.97

One Casing Volume (gal): _____

Start Purge (hrs): 1630

End Purge (hrs): 1735

Total Purge Time (min): 65

Total Vol. Purged (gal): 7.1 l

See Attached Low Flow Purge Data Sheet for Purge Data

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TCL VOLATILES	HCL / 4°C	3 - 40 ml Vial	<u>6-20-01</u>
TCL SEMIVOLATILES	4°C	2 - Qt. Amber Glass	<u>✓ 6/19/01</u>
TCL PEST/PCBs	4°C	<u>2</u> - Qt. Amber Glass	<u>✓ 6/19/01</u>
TCL PAH	4°C	2 - Qt. Amber Glass	<u>✓ 6/20/01</u>
TAL METALS (TOTAL) + Hardness	HNO ₃ / 4°C	1 - 500 ml PE	<u>6-20-01</u>
TAL METALS (DISSOLVED)	HNO ₃ / 4°C	1 - 500 ml PE	<u>6-20-01</u>
Total Organic Carbon (TOC)	HCL / 4°C	<u>2</u> - 40 mL Glass	<u>6-20-01</u>
Chemical Oxygen Demand (COD) <u>TOC</u>	H ₂ SO ₄ / 4°C	1 - 250 mL PE	<u>6-20-01</u>
Alkalinity, Chloride, Sulfate, TDS	4°C	1 - 500 ml PE <u>1 l</u>	<u>6-20-01</u>

OBSERVATIONS / NOTES:

WELL WENT DRY DURING CONTAINER FILL UP. 6-19-01
COLLECTED REMAINING CONTAINERS 6/20/01 @ 1130 HRS

Circle if Applicable:

MS/MSD

Duplicate ID No.: _____

Signature(s):

Fred Lawson



Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

Well No.: 2Wmw40DS

PROJECT:	<u>"AREA A" QTR SPL (7th)</u>				DATE:	<u>6-19-01</u>							
PROJECT NUMBER:	<u>2863</u>				WEATHER:	<u>SUNNY</u>							
SITE:	<u>AREA A</u>				PERSONNEL:	<u>FRED WRANSEP</u>							
Well Screen Depth:	<u>1</u> ft.			Pump Type/Material:	<u>PERISTALTIC</u>				Tide Cycle: <input type="checkbox"/> High @ _____				
Initial Water Level:	<u>2.97</u> @ <u>1630</u> hrs.			Pump Intake Depth:	<u>~1' OFF BOT.</u>				<input type="checkbox"/> Low @ _____				
Total Purge Volume= _____ (gal / L)				Total Purge Time= _____ (min)								<input checked="" type="checkbox"/> Not Affected	
Time	Water Level feet below TOC	Volume mL	Flow Rate mL/min	Pump Settings	Temp °C	pH	Sp Cond mS/cm	DO mg/L	Turbidity NTU	Salinity ppt	ORP Eh mV	Comments	
1630	2.97		~100 mL/min										
1635	5.18	600 mL	↓		11.77	6.91	25000	0.29	2.19	-	-321.1		
1645	6.29	1600	~120 mL/min		11.68	6.92	22000	0.45	3.01	-			
1655	7.48	2800	-120 mL/min		11.58	6.93	20500	-0.72	5.84	-	-337.1		
1705	8.47	4000 mL	-120 mL/min		11.77	6.92	17579	-0.11	2.20	-	-330.5		
1715	9.45	5100	~110 mL/min		11.87	6.91	19102	0.32	2.83	-	-330.5		
1725	10.55	6100	100 mL/min		11.86	6.86	12404	0.68	2.95	-	-342.2		
1735	11.45	7100	100 mL/min		11.32	6.89	12530	0.71	2.99		-333.6		
												(END PURGE)	

Water Quality Meter (S/N): 01D1391 AD YS1650 WDS w/68209 WQ Notes: _____Control Box Type (S/N): NA _____Turbidimeter (S/N): 1735-1600 LA MOTTE _____



Tetra Tech NUS, Inc

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSB-NLON / AREA A
 Project No.: CTO
 Sample ID No.: 2W-GW4105-07
 Sample Location: 2WMMW4105
 Sampled By: JCW
 C.O.C. No.: 41513
 Type of Sample:
 Low Concentration
 High Concentration

Domestic Well Data
 Monitoring Well Data
 Other Well Type:
 QA Sample Type:

SAMPLING DATA:

Date:	Color	pH	S.C.	Temp.	Turbidity	DO	Eh	Salinity
Time:	Visual	Standard	mS/cm	Degrees C	NTU	mg/l	mV	ppt
6/20/01	Clear	7.03	21403	19.72	34	777	-	-313.7
1545								
Method: Peristaltic Pump								

PURGE DATA:

Date: 6/20/01
 Method: Peristaltic Pump
 Monitor Reading (ppm):
 Well Casing Diameter & Material
 Type: 2" PVC
 Total Well Depth (TD): 16.5
 Static Water Level (WL): 2.12
 One Casing Volume (gal): 6.6 L
 Start Purge (hrs): 0800
 End Purge (hrs): 0934
 Total Purge Time (min): 94
 Total Vol. Purged (gal): 15100

See Attached Low Flow Purge Data Sheet for Purge Data

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TCL VOLATILES	HCL / 4°C	3 - 40 ml Vial	✓
TCL SEMIVOLATILES	4°C	2 - Qt. Amber Glass	6/20/01
TCL PEST/PCBs	4°C	2 - Qt. Amber Glass	6/20/01 + 6/21/01
TCL PAH	4°C	1 - Qt. Amber Glass	6/21/01
TAL METALS (TOTAL) + Hardness	HNO ₃ / 4°C	1 - 500 ml PE	6/21/01
TAL METALS (DISSOLVED)	HNO ₃ / 4°C	1 - 500 ml PE	✓
Total Organic Carbon (TOC)	HCL / 4°C	1 - 500 ml PE 2 - 40 mL Glass	6/21/01
Chemical Oxygen Demand (COD)	H ₂ SO ₄ / 4°C	2 - 1 - 250 mL PE	6/21/01
Alkalinity, Chloride, Sulfate, TDS	4°C	1 - 1L 4 - 500 ml PE	6/21/01

OBSERVATIONS / NOTES:

Collected both semivolatiles + 1 PEST/PCB at 1545 - before well went dry

Circle if Applicable: MSMSD Duplicate ID No.: _____ Signature(s): Jennifer C. Wellman



Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

Well No.: 2WMW420S

PROJECT:	<u>NSB-NLON Area A</u>				DATE:	<u>6/20/01</u>						
PROJECT NUMBER:	<u>2863</u>				WEATHER:	<u>Sunny 80s</u>						
SITE:	<u>Area A</u>				PERSONNEL:	<u>Wellman / Ramser</u>						
Well Screen Depth:	<u>6.5 / 16.5</u> ft.		Pump Type/Material:	<u>peristaltic</u>		Tide Cycle: <input type="checkbox"/> High @ _____						
Initial Water Level:	<u>2.12</u> @ <u>0753</u> hrs.		Pump Intake Depth:	<u>16 ft</u>		<input type="checkbox"/> Low @ _____						
Total Purge Volume= <u>15100</u> (gal / L)			Total Purge Time= <u>94</u> (min)			<input checked="" type="checkbox"/> Not Affected						
Time	Water Level feet below TOC	Volume mL	Flow Rate mL/min	Pump Settings	Temp °C	pH	Sp Cond mS/cm	DO mg/L	Turbidity NTU	Salinity ppt	<u>OP</u> EH mV	Comments
0800	2.12	—	250	—	—	—	—	—	—	—	→	Start purge
0810	5.49	2500	150	—	17.27	7.23	21836	4.27	13	—	-282.4	
0820	6.68	4000	150	—	17.60	7.18	19475	3.86	7.2	—	-289.2	
0830	8.37	5500	150	—	17.75	7.06	15401	5.13	4.3	—	-290.6	
0840	9.90	7000	150	—	17.80	6.94	11975	7.43	15.0	—	-289.1	
0850	11.48	8500	150	—	18.07	6.98	11915	12.84 6.85	25	—	-280.2	DO = 12.84
0900	13.29	10000	150	—	18.36	7.02	13929	13.75	19	—	-291.8	
0910	14.20	11500	150	—	18.59	7.04	15662	10.31	19	—	-302.8	
0920	15.02	13000	150	—	19.31	7.04	17544	7.49	14	—	-306.1	
0930	15.94	14800	150	—	19.72	7.03	21463	7.77	34	—	-313.7	
0934		15100	—								→	DRY

Water Quality Meter (S/N): 99 B1377AControl Box Type (S/N): 01 B0583 ABTurbidimeter (S/N): 1728-1600Notes: - Water has swampy smell.
(sulfur)

organic sheen on top of SW



Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

Well No.: 2UMW43DS

PROJECT:	<u>AREA A 7th QTR SPL</u>		DATE:	<u>6-20-01</u>								
PROJECT NUMBER:	_____		WEATHER:	<u>SUNNY</u>								
SITE:	<u>AREA A</u>		PERSONNEL:	<u>FRED W RAMBER</u>								
Well Screen Depth:	<u>15.65</u> ft.	Pump Type/Material:	<u>PERISTALTIC</u>									
Initial Water Level:	<u>2.95309</u> @ _____ hrs.	Pump Intake Depth:	<u>~14'</u>									
Total Purge Volume=	<u>7000</u> (gal/L)	Total Purge Time=	<u>70</u> (min)									
		Tide Cycle:		<input type="checkbox"/> High @ _____								
				<input type="checkbox"/> Low @ _____								
				<input checked="" type="checkbox"/> Not Affected								
Time	Water Level feet below TOC	Volume mL	Flow Rate mL/min	Pump Settings	Temp °C	pH	Sp Cond mS/cm	DO mg/L	Turbidity NTU	Salinity ppt	Eh mV	Comments
1617	3.51		~110%	-	15.26	6.60	32503	-1.11	19	-	-348.2	
1627	5.53	1100	1000 ^{ml} / _{9min}	-	15.65	6.65	31098	3.43	17	-	-363.7	
1637	6.45	2100	~100%	-	14.55	6.69	29023	5.78	6.7	-	-364.3	
1647	7.70	3100	100%	-	13.91	6.73	25222	4.63	4.8	-	-362.1	
1657	8.45	4100	100%	-	14.33	6.79	23153	3.53	5.5	-	-361.3	
1707	9.83	5000	85%	-	13.80	6.89	21387	5.14	5.9	-	-359.6	
1717	10.64	6000	100	-	12.98	6.92	20187	3.19	6.5		-357.8	
1727	11.22	7000	100	-	12.87	6.89	20215	2.88	5.5		-356.5	
							PURGING COMPLETE					

Water Quality Meter (S/N): 01D1391Notes: WELL PARAMETERS STABLE @ 1727

Control Box Type (S/N): _____

Turbidimeter (S/N): _____

Page ___ of ___



Tetra Tech NUS, Inc

GROUNDWATER SAMPLE LOG SHEET

Page of

Project Site Name: NSB-NLON / AREA A
 Project No.: CTO

Sample ID No.: 2W-6W44DS-07
 Sample Location: 2W44DS
 Sampled By: PUR
 C.O.C. No.: 41513
 Type of Sample:
 Low Concentration
 High Concentration

- Domestic Well Data
- Monitoring Well Data
- Other Well Type: _____
- QA Sample Type: _____

SAMPLING DATA:

Date: <u>SEE BELOW</u>	Color	pH	S.C.	Temp.	Turbidity	DO	CORR. μ V	Salinity
Time: <u>SEE BELOW</u>	Visual	Standard	μ S/cm	Degrees C	NTU	mg/l	(mV)	ppt
Method: Peristaltic Pump	<u>GREY/CLEAR</u>	<u>6.92</u>	<u>27880</u>	<u>15.74</u>	<u>4.3</u>	<u>5.87</u>	<u>-358.6</u>	<u>-</u>

PURGE DATA:

Date: <u>6-22-01</u>	See Attached Low Flow Purge Data Sheet for Purge Data
Method: Peristaltic Pump	
Monitor Reading (ppm):	
Well Casing Diameter & Material	
Type: <u>2" PVC</u>	
Total Well Depth (TD):	
Static Water Level (WL):	
One Casing Volume (gal):	
Start Purge (hrs): <u>0800</u>	
End Purge (hrs): <u>0840</u>	
Total Purge Time (min): <u>40</u>	
Total Vol. Purged (gal): <u>4.0</u>	

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TCL VOLATILES	HCL / 4°C	3 - 40 ml Vial	<u>6-22-01</u>
TCL SEMIVOLATILES	4°C	1 - Qt. Amber Glass	<u>6-22-01</u>
TCL PEST/PCBs	4°C	<u>1000 HR</u> 1 - Qt. Amber Glass	<u>6-22-01</u>
TCL PAH	4°C	1 - Qt. Amber Glass	<u>6-22-01</u>
TAL METALS (TOTAL) + Hardness	HNO ₃ / 4°C	1 - 500 ml PE	<u>6-22-01</u>
TAL METALS (DISSOLVED)	HNO ₃ / 4°C	1 - 500 ml PE	<u>6-22-01</u>
Total Organic Carbon (TOC)	HCL / 4°C	2 - 40 mL Glass	
Chemical Oxygen Demand (COD)	H ₂ SO ₄ / 4°C	<u>1000 HR</u> 1 - 250 mL PE	<u>6-22-01</u>
Alkalinity, Chloride, Sulfate, TDS	4°C	1 - 500 ml PE	<u>6-22-01</u>

OBSERVATIONS / NOTES:

Circle if Applicable:

MS/MSD Duplicate ID No.:

Signature(s):

Treed W. Houser



Tetra Tech NUS, Inc

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSB-NLON / AREA A
 Project No.: CTO

Sample ID No.: 2W-6W45DS⁰⁷
 Sample Location: 2W45 DS
 Sampled By: JW
 C.O.C. No.: 41543

Domestic Well Data
 Monitoring Well Data
 Other Well Type: _____
 QA Sample Type: _____

Type of Sample:
 Low Concentration
 High Concentration

SAMPLING DATA:								
Date:	Color	pH	S.C.	Temp.	Turbidity	DO	Eh	Salinity
Time:	Visual	Standard	mS/cm	Degrees C	NTU	mg/l	mV	ppt
6/20/01	Blackish	7.02	18011	18.33	35	5.68		-324.9
Method: Peristaltic Pump								

PURGE DATA:

Date: 6/20/01
 Method: Peristaltic Pump
 Monitor Reading (ppm): _____
 Well Casing Diameter & Material
 Type: 2" PVC
 Total Well Depth (TD): 16.82
 Static Water Level (WL): 2.92
 One Casing Volume (gal): 6.6 L
 Start Purge (hrs): 1050
 End Purge (hrs): 1150
 Total Purge Time (min): 60
 Total Vol. Purged (gal): 10100

See Attached Low Flow Purge Data Sheet
for Purge Data

SAMPLE COLLECTION INFORMATION:			
Analysis	Preservative	Container Requirements	Collected
TCL VOLATILES	HCL / 4° C	3 - 40 ml Vial	<input checked="" type="checkbox"/>
TCL SEMIVOLATILES	4° C	2 - Qt. Amber Glass	<input checked="" type="checkbox"/>
TCL PEST/PCBs	4° C	2 - Qt. Amber Glass	<input checked="" type="checkbox"/>
TCL PAH	4° C	1 - Qt. Amber Glass	<input checked="" type="checkbox"/>
TAL METALS (TOTAL) + Hardness	HNO ₃ / 4° C	1 - 500 ml PE	<input checked="" type="checkbox"/>
TAL METALS (DISSOLVED)	HNO ₃ / 4° C	1 - 500 ml PE	<input checked="" type="checkbox"/>
Total Organic Carbon (TOC)	HCL / 4° C	1 - 500 ml PE + 40 ml Glass	<input checked="" type="checkbox"/>
Chemical Oxygen Demand (COD)	H ₂ SO ₄ / 4° C	1 - 500 ml + 250 ml PE	<input checked="" type="checkbox"/>
Alkalinity, Chloride, Sulfate, TDS	4° C	1 - 500 ml PE	<input checked="" type="checkbox"/>

OBSERVATIONS / NOTES:

Strong Sulfur Smell

Circle if Applicable:

<input checked="" type="checkbox"/> MSMSD	Duplicate ID No.: _____	Signature(s): <u>Jennifer P. Wellman</u>
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Tetra Tech NUS, Inc

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSB-NLON / AREA A
Project No.: CTO

Sample ID No.: 21W-GW46DS-01

Sample Location: 21W-MW46DS

Sampled By: Wellman

C.O.C. No.: 41513

- Domestic Well Data
- Monitoring Well Data
- Other Well Type: _____
- QA Sample Type: _____

- Type of Sample:
- Low Concentration
 - High Concentration

SAMPLING DATA:

Date: <u>6/21/01</u>	Color	pH	S.C.	Temp.	Turbidity	DO	ORP/mV	Salinity
Time: <u>0917</u>	Visual	Standard	ms/cm	Degrees C	NTU	mg/l		ppt
Method: <u>Peristaltic Pump</u>	<u>clear</u>	<u>6.94</u>	<u>29678</u>	<u>14.38</u>	<u>4.7</u>	<u>2.94</u>	<u>-326.9</u>	

PURGE DATA:

Date: <u>6/21/01</u>	See Attached Low Flow Purge Data Sheet for Purge Data
Method: <u>Peristaltic Pump</u>	
Monitor Reading (ppm):	
Well Casing Diameter & Material Type: <u>2" PVC</u>	
Total Well Depth (TD): <u>16.68</u>	
Static Water Level (WL): <u>1.25</u>	
One Casing Volume (gal): <u>6.6 L</u>	
Start Purge (hrs): <u>0817</u>	
End Purge (hrs): <u>0917</u>	
Total Purge Time (min): <u>60</u>	
Total Vol. Purged (gal): <u>8.0 L</u>	

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TCL VOLATILES	HCL / 4°C	3 - 40 ml Vial	✓
TCL SEMIVOLATILES	4°C	2 - Qt. Amber Glass	✓
TCL PEST/PCBs	4°C	2 - Qt. Amber Glass	✓
TCL PAH	4°C	1 - Qt. Amber Glass	✓
TAL METALS (TOTAL) + Hardness	HNO ₃ / 4°C	1 - 500 ml PE	✓
TAL METALS (DISSOLVED)	HNO ₃ / 4°C	1 - 500 ml PE	1330
Total Organic Carbon (TOC)	HCL / 4°C	1 - 500ml PE 2 - 40 mL Glass	1330
Chemical Oxygen Demand (COD)	H ₂ SO ₄ / 4°C	2 - 250 mL PE	1330
Alkalinity, Chloride, Sulfate, TDS	4°C	1 - 1L 500 ml PE	✓

OBSERVATIONS / NOTES:

Strong sulfur smell

Circle if Applicable:

MS/MSD _____ Duplicate ID No.: _____

Signature(s):

Jennifer C. Wellman



Tetra Tech NUS, Inc

GROUNDWATER SAMPLE LOG SHEET

Page of Project Site Name: NSB-NLON / AREA A
Project No.: CTO 816Sample ID No.: 2W-GW4705-07
GW-00Sample Location: 2W-MW4705Sampled By: FURC.O.C. No.: 41503

- Domestic Well Data
 Monitoring Well Data
 Other Well Type: _____
 QA Sample Type: _____

- Type of Sample:
 Low Concentration
 High Concentration

SAMPLING DATA:

Date:	Color	pH	S.C.	Temp.	Turbidity	DO	EH	Salinity
Time:	Visual	Standard	$\mu\text{S/cm}$	Degrees C	NTU	mg/l	mV	ppt
<u>6-23-01</u>	<u>GREY</u>	<u>6.68</u>	<u>5429</u>	<u>14.95</u>	<u>29</u>	<u>2.89</u>	<u>0.63</u> <u>mV</u>	<u>—</u>

PURGE DATA:

Date: <u>6-23-01</u>	See Attached Low Flow Purge Data Sheet for Purge Data
Method: Peristaltic Pump	
Monitor Reading (ppm): <u>NA</u>	
Well Casing Diameter & Material Type: <u>2" PVC</u>	
Total Well Depth (TD):	
Static Water Level (WL): <u>1.95</u>	
One Casing Volume (gal): <u>NA</u>	
Start Purge (hrs): <u>04:35</u>	
End Purge (hrs): <u>11:15</u>	
Total Purge Time (min): <u>100</u>	
Total Vol. Purged (gal): <u>11.2</u>	

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TCL VOLATILES	HCL / 4°C	3 - 40 ml Vial	
TCL SEMIVOLATILES	4°C	1 - Qt. Amber Glass	
TCL PEST/PCBs	4°C	2 - Qt. Amber Glass	
TCL PAH	4°C	1 - Qt. Amber Glass	
TAL METALS (TOTAL) + Hardness	HNO ₃ / 4°C	1 - 500 ml PE	
TAL METALS (DISSOLVED)	HNO ₃ / 4°C	1 - 500 ml PE	
Total Organic Carbon (TOC)	HCL / 4°C	2 - 40 ml Glass	
Chemical Oxygen Demand (COD)	H ₂ SO ₄ / 4°C	1 - 250 mL PE	
Alkalinity, Chloride, Sulfate, TDS	4°C	1 - 500 ml PE	

OBSERVATIONS / NOTES:

NO OBVIOUS SHERN IS SEEN ON PURGE WATER

Circle if Applicable:

MS/MSD
 — Duplicate ID No.: —

Signature(s):

Fred Kanner



Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

Well No.: ZLWML47DS

PROJECT: AREA A QTR SPL (7th)
 PROJECT NUMBER:
 SITE: NSB-NLON GROTON, CT

DATE: 6-23-01
 WEATHER: OVERCAST
 PERSONNEL: FRED WRA... 5412

Well Screen Depth: 1 ft.
 Initial Water Level: 1.45 @ 0930 hrs.

Pump Type/Material: PERISTALTIC
 Pump Intake Depth:

Tide Cycle: High @ _____
 Low @ _____
 Not Affected

Total Purge Volume= 110 (gal) (L)

Total Purge Time= 100 (min)

Time	Water Level feet below TOC	Volume mL	Flow Rate mL/min	Pump Settings	Temp °C	pH	Sp Cond µS/cm	DO mg/L	Turbidity NTU	Salinity ppt	ORP Eh mV	Comments
0935	2.21	1000	100		14.43	7.04	24305	2.31	21	—	-301.9	
0945	3.15	2000			14.49	7.00	24346	0.43	5.1	—	-325.2	
0955	3.80	3000			14.48	6.89	20456	-0.14	2.9	—	-310.4	
1005	4.21	4000			14.43	6.79	17235	0.36	1.8	—	-314.4	
1015	4.57	5000			14.57	6.70	13,548	0.45	2.9	—	-313.4	
1025	4.80	6000			14.56	6.64	10912	1.43	34	—	-420.4	
1035	5.25	7000			14.64	6.66	6659	0.93	50	—	-368.5	
1045	5.50	8000			14.88	6.67	5832	2.78	40	—	-336.5	
1055	5.68	9000			14.66	6.67	5505	2.13	34	—	-296.9	
1105	5.85	10000			14.88	6.68	5305	2.95	28	—	-239.8	
1115	5.88	11000	100		14.95	6.68	5429	2.89	29	—	-236.9	
												(PURGING COMPLETED)

Water Quality Meter (S/N): YSI 0101391 AA

Notes: _____

Control Box Type (S/N): NA

Turbidimeter (S/N): LAMOTTE 1735 1600



SURFACE WATER SAMPLE LOG SHEET

Page ___ of ___

Project Site Name: NSB_NLON / Area A
Project No.: CTO [REDACTED]

Sample ID No.: 3MSP0107
Sample Location: SEEP
Sampled By: WELLMAN/RAMSER
C.O.C. No.: 41501

- Stream
- Spring
- Pond
- Lake
- Other: _____
- QA Sample Type: _____

Type of Sample:
 Low Concentration
 High Concentration

SAMPLING DATA:

Date: <u>06/19/01</u>	Color	pH	S.C.	Temp.	Turbidity	DO	Salinity	Eh
Time: <u>1125</u>	Visual	Standard	ms/cm	Degrees C	NTU	mg/l	ppt	mV
Depth: <u>2 FEET BELOW SUR</u>	<u>clear</u>	<u>6.50</u>	<u>491</u>	<u>16.16</u>	<u>11</u>	<u>7.00</u>	<u>—</u>	<u>50.5</u>
Method: <u>DIRECT FILL</u>	<u>clear</u>							

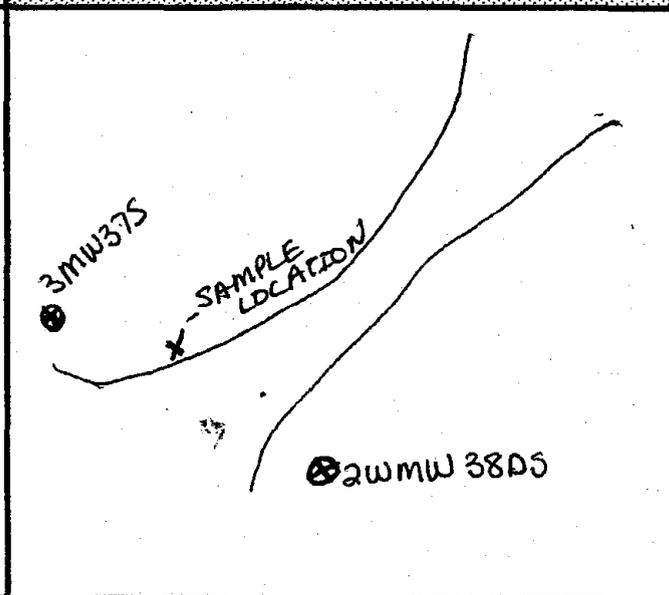
SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TCL VOLATILES	HCL / 4°C	3 - 40 ml Vial	<input checked="" type="checkbox"/>
TCL SEMIVOLATILES	4°C	2 - Qt. Amber Glass	<input checked="" type="checkbox"/>
TCL PEST/PCBs	4°C	2 - Qt. Amber Glass	<input checked="" type="checkbox"/>
TCL PAH	4°C	2 - Qt. Amber Glass	<input checked="" type="checkbox"/>
TAL METALS (TOTAL) + Hardness	HNO ₃ / 4°C	1 - 500 ml PE	<input checked="" type="checkbox"/>
TAL METALS (DISSOLVED)	HNO ₃ / 4°C	1 - 500 ml PE	<input checked="" type="checkbox"/>
Total Organic Carbon (TOC)	H ₂ SO ₄ / 4°C	1-500ml PE 2-40ml Glass	<input checked="" type="checkbox"/>
Chemical Oxygen Demand (COD)	H ₂ SO ₄ / 4°C	1-500ml PE 1-250ml PE	<input checked="" type="checkbox"/>
Alkalinity, Chloride, Sulfate, TDS	4°C	1 L 1-500ml PE	<input checked="" type="checkbox"/>

OBSERVATIONS / NOTES:

MAP:

Observations / Notes area is blank.



Circle if Applicable:

MS/MSD Duplicate ID No.: _____

Signature(s):

Jennifer C. Wellman



SURFACE WATER SAMPLE LOG SHEET

Project Site Name: NSB_NLON / Area A
Project No.: CTO [REDACTED]

Sample ID No.: SWSB18-07
Sample Location: 20MW41PS
Sampled By: JCW
C.O.C. No.: 41543

- Stream
- Spring
- Pond
- Lake
- Other: Wetland
- QA Sample Type: _____

Type of Sample:
 Low Concentration
 High Concentration

SAMPLING DATA:

Date:	Color	pH	S.C.	Temp.	Turbidity	DO	Salinity	Eh
Time:	Visual	Standard	mS/cm	Degrees C	NTU	mg/l	ppt	mV
<u>6/20/01</u>								
<u>1600</u>								
Depth:	<u>24.41</u>	<u>7.87</u>	<u>309</u>	<u>24.33</u>	<u>89</u>	<u>6.49</u>	<u>—</u>	<u>-79.8</u>
Method: <u>Grab</u>								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TCL VOLATILES	HCL / 4° C	3 - 40 ml Vial	<input checked="" type="checkbox"/>
TCL SEMIVOLATILES	4° C	2 - Qt. Amber Glass	<input checked="" type="checkbox"/>
TCL PEST/PCBs	4° C	1 - Qt. Amber Glass	<input checked="" type="checkbox"/>
TCL PAH	4° C	2 - Qt. Amber Glass	<input checked="" type="checkbox"/>
TAL METALS (TOTAL) + Hardness	HNO ₃ / 4° C	1 - 500 ml PE	<input checked="" type="checkbox"/>
TAL METALS (DISSOLVED)	HNO ₃ / 4° C	1 - 500 ml PE	<input checked="" type="checkbox"/>
Total Organic Carbon (TOC)	HCL / 4° C	<u>1 - 500ml PE</u> 5 - 40 mL Glass	<input checked="" type="checkbox"/>
Chemical Oxygen Demand (COD)	H ₂ SO ₄ / 4° C	1 - 250 ml PE	<input checked="" type="checkbox"/>
Alkalinity, Chloride, Sulfate, TDS	4° C	1 - 500 ml PE	<input checked="" type="checkbox"/>

OBSERVATIONS / NOTES:	MAP:
<u>Organic sheen on water surface</u>	

Circle if Applicable:

MSMSD	Duplicate ID No.:	Signature(s):
<u>—</u>	<u>_____</u>	<u>Jennifer C. Wellman</u>



SURFACE WATER SAMPLE LOG SHEET

Project Site Name: NSB_NLON / Area A
Project No.: CTO [redacted]

Sample ID No.: SWSG19-07
Sample Location: 2W MW 4205
Sampled By: Wellman
C.O.C. No.: 41513

- Stream
- Spring
- Pond
- Lake
- Other: Wetland
- QA Sample Type: _____

- Type of Sample:
- Low Concentration
 - High Concentration

SAMPLING DATA:

Date:	Color	pH	S.C.	Temp.	Turbidity	DO	Salinity	ThORP
Time:	Visual	Standard	mS/cm	Degrees C	NTU	mg/l	ppt	mV
<u>6/22/01</u>	<u>clean</u>	<u>6.51</u>	<u>236</u>	<u>20.07</u>	<u>5.8</u>	<u>4.56</u>	<u>/</u>	<u>31.6</u>
<u>0734</u>								
<u>Depth: 8 inches</u>								
<u>Method: Grab</u>								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TCL VOLATILES	HCL / 4°C	3 - 40 ml Vial	<u>9</u>
TCL SEMIVOLATILES	4°C	1 - Qt. Amber Glass	<u>3</u>
TCL PEST/PCBs	4°C	2 - Qt. Amber Glass	<u>36</u>
TCL PAH	4°C	1 - Qt. Amber Glass	<u>3</u>
TAL METALS (TOTAL) + Hardness	HNO ₃ / 4°C	1 - 500 ml PE	<u>3</u>
TAL METALS (DISSOLVED)	HNO ₃ / 4°C	1 - 500 ml PE	<u>3</u>
Total Organic Carbon (TOC)	HCL / 4°C	1-500 mL } 2-40 mL Glass	<u>3</u>
Chemical Oxygen Demand (COD)	H ₂ SO ₄ / 4°C	PE 1 - 250 mL PE	<u>3</u>
Alkalinity, Chloride, Sulfate, TDS	4°C	1-1 L 4-500 ml PE	<u>3</u>

OBSERVATIONS / NOTES:

MAP:

[Empty space for observations and map]

Circle if Applicable:
 MSMSD Duplicate ID No.:

Signature(s):
Jennifer C. Wellman



SURFACE WATER SAMPLE LOG SHEET

Project Site Name: NSB_NLON / Area A
Project No.: CTO

Sample ID No.: SW5626-07
Sample Location: 2WMW43DS
Sampled By: Wellman
C.O.C. No.: 41513

- Stream
- Spring
- Pond
- Lake
- Other: Wetland
- QA Sample Type: _____

- Type of Sample:
- Low Concentration
 - High Concentration

SAMPLING DATA:

Date:	Color	pH	S.C.	Temp.	Turbidity	DO	Salinity	Eh
Time:	Visual	Standard	ms/cm	Degrees C	NTU	mg/l	ppb	mV
<u>6/22/01</u>	<u>clear</u>	<u>6.55</u>	<u>231</u>	<u>20.23</u>	<u>7.2</u>	<u>6.21</u>		<u>13.6</u>
Depth: <u>4 inches</u>								
Method: <u>Grab</u>								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TCL VOLATILES	HCL / 4°C	3 - 40 ml Vial	3
TCL SEMIVOLATILES	4°C	4 - Qt. Amber Glass	1
TCL PEST/PCBs	4°C	2 - Qt. Amber Glass	2
TCL PAH	4°C	2 - Qt. Amber Glass	1
TAL METALS (TOTAL) + Hardness	HNO ₃ / 4°C	1 - 500 ml PE	1
TAL METALS (DISSOLVED)	HNO ₃ / 4°C	1 - 500 ml PE	1
Total Organic Carbon (TOC)	HCL / 4°C	1 - 500 ml PE { 2 - 40 ml Glass	{ 1
Chemical Oxygen Demand (COD)	H ₂ SO ₄ / 4°C	PE { 1 - 250 ml PE	{
Alkalinity, Chloride, Sulfate, TDS	4°C	1 - 1L 1 - 500 ml PE	1

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD

Duplicate ID No.: _____

Signature(s):

Jennifer C. Wellman



SURFACE WATER SAMPLE LOG SHEET

Page of

Project Site Name: NSB_NLON / Area A
Project No.: CTO

Sample ID No.: SWSG21-07
Sample Location: SWSG21
Sampled By: PUR
C.O.C. No.: 41504

- Stream
- Spring
- Pond
- Lake
- Other: _____
- QA Sample Type: _____

Type of Sample:
 Low Concentration
 High Concentration

SAMPLING DATA:

Date: <u>1610 6-24-01</u>	Color	pH	S.C.	Temp.	Turbidity	DO	Salinity	Eh
Time: <u>1610</u>	Visual	Standard	μ S/cm	Degrees C	NTU	mg/l	ppt	mV
Depth: <u>SURFACE</u>	<u>CLEAR</u>	<u>7.46</u>	<u>335</u>	<u>23.69</u>		<u>9.70</u>	<u>-</u>	<u>-9.5</u>
Method: <u>DIRECT FILL</u>								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TCL VOLATILES	HCL / 4° C	3 - 40 ml Vial	<input checked="" type="checkbox"/>
TCL SEMIVOLATILES	4° C	2 - Qt. Amber Glass	<input checked="" type="checkbox"/>
TCL PEST/PCBs	4° C	2 - Qt. Amber Glass	<input checked="" type="checkbox"/>
TCL PAH	4° C	2 - Qt. Amber Glass	<input checked="" type="checkbox"/>
TAL METALS (TOTAL) + Hardness	HNO ₃ / 4° C	1 - 500 ml PE	<input checked="" type="checkbox"/>
TAL METALS (DISSOLVED)	HNO ₃ / 4° C	1 - 500 ml PE	<input checked="" type="checkbox"/>
Total Organic Carbon (TOC)	HCL / 4° C	2 - 40 mL Glass	<input checked="" type="checkbox"/>
Chemical Oxygen Demand (COD)	H ₂ SO ₄ / 4° C	1 - 250 mL PE	<input checked="" type="checkbox"/>
Alkalinity, Chloride, Sulfate, TDS	4° C	1 - 500 ml PE	<input checked="" type="checkbox"/>

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MSMSD <u> </u>	Duplicate ID No.: <u> </u>
----------------------	----------------------------------

Signature(s):

Fred W. Kander



SURFACE WATER SAMPLE LOG SHEET

Project Site Name: NSB_NLON / Area A
Project No.: CTO

Sample ID No.: SWSG22-07
Sample Location: SWSG22
Sampled By: PVR
C.O.C. No.: 41506

- Stream
- Spring
- Pond
- Lake
- Other: _____
- QA Sample Type: _____

Type of Sample:
 Low Concentration
 High Concentration

SAMPLING DATA:

Date:	Color	pH	S.C.	Temp.	Turbidity	DO	Salinity	Eh
Time:	Visual	Standard	µmS/cm	Degrees C	NTU	mg/l	ppt	mV
<u>6-25-01</u>	<u>LT</u>	<u>6.80</u>	<u>430</u>	<u>14.83</u>	<u>—</u>	<u>3.16</u> <u>4.26</u>	<u>—</u>	<u>-102.7</u>
<u>1700</u>	<u>Drawn</u>							
Depth: <u>SURFACE</u>								
Method: <u>DIRECT FIL</u>								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TCL VOLATILES	HCL / 4°C	3 - 40 ml Vial	<input checked="" type="checkbox"/>
TCL SEMIVOLATILES	4°C	3 - Qt. Amber Glass	<input checked="" type="checkbox"/>
TCL PEST/PCBs	4°C	2 - Qt. Amber Glass	<input checked="" type="checkbox"/>
TCL PAH	4°C	3 - Qt. Amber Glass	<input checked="" type="checkbox"/>
TAL METALS (TOTAL) + Hardness	HNO ₃ / 4°C	1 - 500 ml PE	<input checked="" type="checkbox"/>
TAL METALS (DISSOLVED)	HNO ₃ / 4°C	1 - 500 ml PE	<input checked="" type="checkbox"/>
Total Organic Carbon (TOC)	HCL / 4°C	2 - 40 ml Glass	<input checked="" type="checkbox"/>
Chemical Oxygen Demand (COD) <u>TOC</u>	H ₂ SO ₄ / 4°C	1 x 0.5L + 250 ml PE	<input checked="" type="checkbox"/>
Alkalinity, Chloride, Sulfate, TDS	4°C	1 x 1L + 500 ml PE	<input checked="" type="checkbox"/>

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

Signature(s):

MS/MSD

Duplicate ID No.:

SWFD062501-01

Errol Ransen



SURFACE WATER SAMPLE LOG SHEET

Project Site Name: NSB_NLON / Area A
Project No.: CTO [REDACTED]

Sample ID No.: SLWS624-07
Sample Location: S624
Sampled By: PUR
C.O.C. No.: 41506

- Stream
- Spring
- Pond
- Lake
- Other: _____
- QA Sample Type: _____

- Type of Sample:
- Low Concentration
 - High Concentration

SAMPLING DATA:

Date:	Color	pH	S.C.	Temp.	Turbidity	DO	Salinity	Eh
Time:	Visual	Standard	uS/cm	Degrees C	NTU	mg/L	ppt	mV
<u>6-25-01</u>	<u>YEL BROWN</u>	<u>6.56</u>	<u>253</u>	<u>24.8</u>	<u>—</u>	<u>3.22</u>	<u>—</u>	<u>-11.8</u>
<u>1745</u>								
Depth: <u>SURFACE</u>								
Method: <u>DIRECT FILL</u>								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TCL VOLATILES	HCL / 4°C	3 - 40 ml Vial	<input checked="" type="checkbox"/>
TCL SEMIVOLATILES	4°C	2 - Qt. Amber Glass	<input checked="" type="checkbox"/>
TCL PEST/PCBs	4°C	2 - Qt. Amber Glass	<input checked="" type="checkbox"/>
TCL PAH	4°C	1 - Qt. Amber Glass	<input checked="" type="checkbox"/>
TAL METALS (TOTAL) + Hardness	HNO ₃ / 4°C	1 - 500 ml PE	<input checked="" type="checkbox"/>
TAL METALS (DISSOLVED)	HNO ₃ / 4°C	1 - 500 ml PE	<input checked="" type="checkbox"/>
Total Organic Carbon (TOC)	HCL / 4°C	2 - 40 ml Glass	<input checked="" type="checkbox"/>
Chemical Oxygen Demand (COD) <u>↓ TOC</u>	H ₂ SO ₄ / 4°C	1 x 500 ml <u>250 ml PE</u>	<input checked="" type="checkbox"/>
Alkalinity, Chloride, Sulfate, TDS	4°C	1 - 500 ml PE	<input checked="" type="checkbox"/>

OBSERVATIONS / NOTES: MAP:

Circle if Applicable: MSMSD Duplicate ID No.: _____

Signature(s): [Signature]

APPENDIX E

CHAIN OF CUSTODY RECORDS

Please chec.

CHEMTECH

CHAIN OF CUSTODY RECORD

110 Route 4
Englewood, NJ 07631
(201) 567-6868
Fax (201) 567-1333

205 Campus Plaza 1
Edison, NJ 08837
(732) 225-4111
Fax (732) 225-4110

CHEMTECH JOB NO.: N49394
CHEMTECH QUOTE NO.

Jul. 2. 2001 12:28PM

CLIENT INFORMATION		PROJECT INFORMATION		BILLING INFORMATION		
REPORT TO BE SENT TO		PROJECT NAME:	CTO 257		BILL TO:	PO #:
COMPANY: <u>Tetra Tech NUS, Inc.</u>		PROJECT NO.:	7091		ADDRESS:	
ADDRESS: <u>1401 Anderson Dr.</u>		PROJECT MANAGER:	Corey Rich		CITY:	STATE: ZIP:
CITY: <u>P. Hsburgh</u> STATE: <u>PA</u> ZIP: <u>15220</u>		LOCATION:			ATTENTION:	PHONE:
ATTENTION: <u>PCorey Rich</u>		PHONE:			ANALYSIS	
PHONE: <u>(412) 921-7090</u> FAX:		FAX:			<div style="border: 1px solid black; padding: 5px; transform: rotate(-45deg); display: inline-block;"> 1 TCL VOLBS 2 TCL SVOC 3 TCL PEST/PCB 4 TCL PAH 5 TAL Metals (Total) 6 TAL Metals (6) (Total) </div>	

DATA TURNAROUND INFORMATION		DATA DELIVERABLE INFORMATION	
FAX: _____ DAYS*	HARD COPY: _____ DAYS*	<input type="checkbox"/> RESULTS ONLY	<input type="checkbox"/> USEPA CLP
EDD: _____ DAYS*		<input type="checkbox"/> RESULTS + QC	<input type="checkbox"/> NYS ASP "B"
* TO BE APPROVED BY CHEMTECH		<input type="checkbox"/> NJ REDUCED	<input type="checkbox"/> NYS ASP "A"
** NORMAL TURNAROUND TIME - 14 DAYS		<input type="checkbox"/> NJ CLP	<input type="checkbox"/> EDD
STANDARD		<input type="checkbox"/> EDD FORMAT: _____	

CHEMTECH SAMPLE ID	PROJECT SAMPLE IDENTIFICATION	SAMPLE MATRIX	SAMPLE TYPE		SAMPLE COLLECTION		# OF BOTTLES	PRESERVATIVES									COMMENTS ← Specify Preservatives A - HCl B - HNO ₃ C - H ₂ SO ₄ D - NaOH E - XCE F - Other		
			COMP	GRAS	DATE	TIME		HCl				HNO ₃	HNO ₃						
			1	2	3	4		5	6	7	8	9							
1	DRMO-6MW25-GW-12	GW	X		6/21/01	11:27	9	3	1	2	1	1	1						
2	DRMO-6MW20-GW-12	GW	X		6/21/01	11:40	9	3	1	2	1	1	1						
3	DRMO-6WTB-062101	AQ	X		6/21/01	13:00	2	2											
4	04																		
5	05																		
6																			
7																			
8																			

SAMPLE CUSTODY MUST BE DOCUMENTED BELOW EACH TIME SAMPLES CHANGE POSSESSION INCLUDING COURIER DELIVERY

RELINQUISHED BY SAMPLER	DATE/TIME	RECEIVED BY	Conditions of bottles or coolers at receipt: <input checked="" type="checkbox"/> Compliant <input type="checkbox"/> Non-Compliant <input checked="" type="checkbox"/> Temp. of Cooler <u>Yes</u> Comments:
1. Jennifer Wellman	6/21/01 11:00	1. Fed Ex Archill	
RELINQUISHED BY:	DATE/TIME	RECEIVED BY	
2. Felk	6/27/01 10:00	2. [Signature]	
RELINQUISHED BY:	DATE/TIME	RECEIVED FOR LAB BY	
3.		3.	

Page 1 of 1 Shipment Complete: Yes No

CHEMTECH

CHAIN OF CUSTODY RECORD

110 Route 4
Englewood, NJ 07631
(201) 567-6868
Fax (201) 567-1333

205 Campus Plaza 1
Edison, NJ 08837
(732) 225-4111
Fax (732) 225-4110

CHEMTECH JOB NO.

CHEMTECH QUOTE NO.

149624P

Jul. 2. 2001 12:26PM

CLIENT INFORMATION **PROJECT INFORMATION** **BILLING INFORMATION**

REPORT TO BE SENT TO:

COMPANY: **TETRA TECH NUS** PROJECT NAME: **DRMO** BILL TO: _____ PO #: _____

ADDRESS: **661 ANDERSEN DR** PROJECT NO.: **7091, CTO 257** ADDRESS: _____

CITY: **PITTSBURGH** STATE: **PA** ZIP: **15220** PROJECT MANAGER: **COREY RICH** CITY: _____ STATE: _____ ZIP: _____

ATTENTION: **COREY RICH** LOCATION: _____ ATTENTION: _____ PHONE: _____

PHONE: **(412) 221-7090** FAX: _____ PHONE: _____ FAX: _____

DATA TURNAROUND INFORMATION **DATA DELIVERABLE INFORMATION**

FAX: _____ DAYS: _____
HARD COPY: _____ DAYS: _____
EDD: _____ DAYS: _____

* TO BE APPROVED BY CHEMTECH STANDA(K)
** NORMAL TURNAROUND TIME - 14 DAYS

RESULTS ONLY USEPA CLP
 RESULTS + QC NYS ASP "B"
 NJ REDUCED NYS ASP "A"
 NJ CLP EDD
 EDD FORMAT: _____

1 TCL VOAB 2 TCL SVOC
3 TCL PEST/PCB 4 TCL PRAI
5 TAL METAL (10) 6 TAL MET (10) 7 TCL + COD
8 9

CHEMTECH SAMPLE ID	PROJECT SAMPLE IDENTIFICATION	SAMPLE MATRIX	SAMPLE TYPE		SAMPLE COLLECTION		# OF BOTTLES	PRESERVATIVES									COMMENTS		
			COMP	GRAB	DATE	TIME		HCl			HNO3			H2O2					
								1	2	3	4	5	6	7	8	9			
1.13 01	DRMO-GMW11D-GW-12	AQ	X		6/22/01	1630	9	3	1	2	1	1	1						
2.14 02	DRMO-GMW11S-GW-12	AQ	X		6/22/01	1640	9	3	1	2	1	1	1						
3. 03	DRMO-GWTB-062201	AQ	X		6/22/01	1200	2	2											FROM LAB
4.15 04	DRMO-GMW01S-GW-12	AQ	X		6/23/01	1819	9	3	1	2	1	1	1						
5.16 05	DRMO-GMW9S-GW-12	AQ	X		6/23/01	1845	9	3	1	2	1	1	1						
6.17 06	DRMO-GMW10S-GW-12	AQ	X		6/24/01	1920	9	3	1	2	1	1	1						
7.18 07	DRMO-GMW10D-GW-12	AQ	X		6/24/01	1927	9	3	1	2	1	1	1						
8.																			

SAMPLE CUSTODY MUST BE DOCUMENTED BELOW EACH TIME SAMPLES CHANGE POSSESSION INCLUDING COURIER DELIVERY

RELINQUISHED BY SAMPLER 1. SURAMOR	DATE/TIME 6/25/01 1700H	RECEIVED BY 1. FED Ex	Conditions of bottles or coolers at receipt: <input type="checkbox"/> Compliant <input type="checkbox"/> Non-Compliant <input type="checkbox"/> Temp. of Cooler 4.0 Comments: FED Ex AB# 9169 3433 6780
RELINQUISHED BY 2. FedEx	DATE/TIME 6/26/01 12:00	RECEIVED BY 2. Sunnyfield	
RELINQUISHED BY	DATE/TIME	RECEIVED FOR LAB BY	

Page **2** Shipments Complete Yes No

YELLOW - CHEMTECH COPY PINK - SAMPLER COPY

11502

CHEMTECH

CHAIN OF CUSTODY RECORD

110 Route 4
Englewood, NJ 07631
(201) 567-6868
Fax (201) 567-1333

205 Campus Plaza I
Edison, NJ 08837
(732) 225-4111
Fax (732) 225-4110

CHEMTECH JOB NO. N4960LP
CHEMTECH QUOTE NO.

CLIENT INFORMATION

PROJECT INFORMATION

BILLING INFORMATION

REPORT TO BE SENT TO:
COMPANY: TETRA TECH NUS
ADDRESS: 661 ANDERSEN DR
CITY: PITTSBURGH STATE: PA ZIP: 15220
ATTENTION: COREY RICH

PROJECT NAME: NSB-NLON AREA A
PROJECT NO.: 2863 CTD 816
PROJECT MANAGER: COREY RICH
LOCATION: NSB-NLON

BILL TO: _____ PO # _____
ADDRESS: _____
CITY: _____ STATE: _____ ZIP: _____
ATTENTION: _____ PHONE: _____

PHONE: (412) 421-7090 FAX: _____
DATA TURNAROUND INFORMATION
FAX: _____ DAYS *
HARD COPY: _____ DAYS *
EDD: _____ DAYS *
* TO BE APPROVED BY CHEMTECH
** NORMAL TURNAROUND TIME - 14 DAYS STANDARD

PHONE: _____ FAX: _____
DATA DELIVERABLE INFORMATION
 RESULTS ONLY USEPA CLP
 RESULTS + QC NYS ASP "B"
 NJ REDUCED NYS ASP "A"
 NJ CLP EDD
 EDD FORMAT

ANALYSIS:
1 TCL VOA
2 TCL SVDA
3 TCL PEST/PCB
4 TCL PAH
5 TAL MET (TOX) + HMOX
6 TAL MET (TOX) + HMOX
7 TAL MET (TOX) + HMOX
8 TCL + COD
9 ALK, CHLORIDE, SULFATE, TDS

CHEMTECH SAMPLE ID	PROJECT SAMPLE IDENTIFICATION	SAMPLE MATRIX	SAMPLE TYPE		SAMPLE COLLECTION		BTL #	PRESERVATIVES									COMMENTS			
			COMP	GRAB	DATE	TIME														
								1	2	3	4	5	6	7	8	9				
1	01	GWTB062301	AQ		6/23/01	0750	2	2												FROM LARS
2	02	GWFD06230101	AQ	X	6/23/01	0000	11	3	1	2	1	1	1	1	1					
3	03	2W-GW215-07	AQ	X	6/23/01	1115	11	3	1	2	1	1	1	1	1					
4	04	2W-GW47DS-07	AQ	X	6/23/01	1115	11	3	1	2	1	1	1	1	1					
5	05	2W-GW38DS-07	AQ	X	6/21/01	1350	4			2	1	1								
6	06	2W-GW38DS-07	AQ	X	6/23/01	1430	3		1		1									
7	07	2W-GW38DS-07	AQ	X	6/24/01	1040	4	3								1				
8, 08, 09, 10		2L-GW205-07	AQ	X	6/24/01	1045	33	9	3	6	3	3	3	3	3	3				MS/MSD

SAMPLE CUSTODY MUST BE DOCUMENTED BELOW EACH TIME SAMPLES CHANGE POSSESSION INCLUDING COURIER DELIVERY

RELINQUISHED BY: <u>SURANAR</u>	DATE/TIME: <u>6/25/01 1700H</u>	RECEIVED BY: <u>1 FedEx</u>
RELINQUISHED BY: <u>2 FedEx</u>	DATE/TIME: <u>6/26/01 1200</u>	RECEIVED BY: <u>2 Sunny Patel</u>
RELINQUISHED BY: <u>3</u>	DATE/TIME: _____	RECEIVED FOR LAB BY: <u>3</u>

Conditions of bottles or coolers at receipt: Compliant Non-Compliant Temp. of Cooler 4°C
Comments: FED EX A1311 816 9 3433 6779
Page 1 of _____ Shipment Complete: Yes _____ No _____

JUL 2 2001 12:25 PM NO. 4094

CHEMTECH

CHAIN OF CUSTODY RECORD

110 Route 4
Englewood, NJ 07631
(201) 567-6068
Fax (201) 567-1333

205 Campus Plaza 1
Edison, NJ 08837
(732) 225-4111
Fax (732) 225-4110

CHEMTECH JOB NO.

NY9602P

CHEMTECH QUOTE NO.

Jul 2, 2001 12:25 PM

CLIENT INFORMATION **PROJECT INFORMATION** **BILLING INFORMATION**

REPORT TO BE SENT TO:

COMPANY **TETRA TECH NUS**

ADDRESS **661 ANDERSEN DR**

CITY **PITTSBURGH** STATE **PA** ZIP **15220**

ATTENTION **COREY RICH**

PHONE **(412) 921-7090** FAX

PROJECT NAME: **NSB-NLON AREA**

PROJECT NO. **2863 CTD 816**

PROJECT MANAGER **COREY RICH**

LOCATION **NSB-NLON**

PHONE _____ FAX _____

BILL TO: _____ PO # _____

ADDRESS _____

CITY _____ STATE _____ ZIP _____

ATTENTION _____ PHONE _____

DATA TURNAROUND INFORMATION

FAX _____ DAYS * _____

HARD COPY _____ DAYS * _____

EDD _____ DAYS * _____

* TO BE APPROVED BY CHEMTECH

** NORMAL TURNAROUND TIME - 14 DAYS **STANDARD**

DATA DELIVERABLE INFORMATION

RESULTS ONLY USEPA CLP

RESULTS + QC NYS ASP "B"

NJ REDUCED NYS ASP "A"

NJ CLP EDD

EDD FORMAT _____

ANALYSIS

1 **TCL VOA**

2 **TCL SVOA**

3 **TCL PEST/PCB**

4 **TCL PAH**

5 **TAL MET (TOX) + HAD (TOX)**

6 **TAL MET (DIS) + HAD (DIS)**

7 **TOX + COD**

8 **ALK, CHLORIDE, SULFATE**

9 **PTDS**

CHEMTECH SAMPLE ID	PROJECT SAMPLE IDENTIFICATION	SAMPLE MATRIX	SAMPLE TYPE		SAMPLE COLLECTION		# OF BOTTLES	PRESERVATIVES									COMMENTS ← Specify Preservatives A - HCl B - HNO ₃ C - H ₂ SO ₄ D - NaOH E - ICE F - Other				
			COMP	GRAB	DATE	TIME		HCL			HNO ₃			H ₂ SO ₄							
								1	2	3	4	5	6	7	8	9					
1	11 SWSG21-07	AQ	X		6/24-01	1610	11	3	1	2	1	1	1	1	1						
2	12																				
3	13																				
4	14																				
5	15																				
6	16																				
7	17																				
8	18																				

SAMPLE CUSTODY MUST BE DOCUMENTED BELOW EACH TIME SAMPLES CHANGE POSSESSION INCLUDING COURIER DELIVERY

RELINQUISHED BY SAMPLER 1. Blanco	DATE/TIME 6/25/00 12:00	RECEIVED BY 1. FED Ex
RELINQUISHED BY 2. FedEx	DATE/TIME 6/26/00 12:00	RECEIVED BY 2. Sunnyfield
RELINQUISHED BY	DATE/TIME	RECEIVED FOR LAB BY

Conditions of bottles or coolers at receipt: Compliant Non-Compliant Temp. of Cooler **4C**

Comments: **FED Ex ABF 8169 3433 6779**

Page **2** of _____

Shipment Complete: Yes _____ No _____

CHEMTECH

CHAIN OF CUSTODY RECORD

110 Route 4
Englewood, NJ 07631
(201) 567-6868
Fax (201) 567-1333

205 Campus Plaza 1
Edison, NJ 08837
(732) 225-4111
Fax (732) 225-4110

CHEMTECH JOB NO. N4962LP
CHEMTECH QUOTE NO.

Jul 12 2001 12:26 PM

CLIENT INFORMATION		PROJECT INFORMATION		BILLING INFORMATION	
REPORT TO BE SENT TO: COMPANY: <u>TENUS</u>		PROJECT NAME: <u>DRMO</u>		BILL TO: _____ PO #: _____	
ADDRESS: <u>661 ANDERSEN DR</u>		PROJECT NO: <u>7091 CTO 257</u>		ADDRESS: _____	
CITY: <u>PITTSBURGH</u> STATE: <u>PA</u> ZIP: <u>15220</u>		PROJECT MANAGER: <u>COREY RICH</u>		CITY: _____ STATE: _____ ZIP: _____	
ATTENTION: <u>COREY RICH</u>		LOCATION: _____		ATTENTION: _____ PHONE: _____	
PHONE: <u>(412) 921-7090</u> FAX: _____		PHONE: _____ FAX: _____		ANALYSIS: _____	

DATA TURNAROUND INFORMATION		DATA DELIVERABLE INFORMATION	
FAX _____ DAYS *	HARD COPY _____ DAYS *	EDD _____ DAYS *	<input type="checkbox"/> RESULTS ONLY <input type="checkbox"/> USEPA CLP <input type="checkbox"/> RESULTS + QC <input type="checkbox"/> NYS ASP "B" <input type="checkbox"/> NJ REDUCED <input type="checkbox"/> NYS ASP "A" <input type="checkbox"/> NJ CLP <input type="checkbox"/> EDD <input type="checkbox"/> EDD FORMAT: _____
* TO BE APPROVED BY CHEMTECH		** NORMAL TURNAROUND TIME - 14 DAYS	

1 TCL VOAS
 2 TCL SVOC
 3 TCL PEST/PCB
 4 TCL PAH
 5 TAL METALS (TCL)
 6 TAL METALS (TCL)
 7
 8
 9

CHEMTECH SAMPLE ID	PROJECT SAMPLE IDENTIFICATION	SAMPLE MATRIX	SAMPLE TYPE		SAMPLE COLLECTION		# OF BOTTLES	PRESERVATIVES									COMMENTS			
			COMP	GRAB	DATE	TIME		1	2	3	4	5	6	7	8	9				
1. 19 08	DRMO-GMW65-GW-12	AQ	X		6/25/01	9:30	9	3	1	2	1	1	1							
2. ^{20, 21, 22} 09, 10, 11	DRMO-GMW6D-GW-12	AQ	X		6/25/01	9:05	27	9	3	6	3	3	3							MS/MSD
3 23 12	GWFD06250101	AQ	X		6/25/01	0000	9	3	1	2	1	1	1							
4																				
5																				
6																				
7																				
8																				

SAMPLE CUSTODY MUST BE DOCUMENTED BELOW EACH TIME SAMPLES CHANGE POSSESSION INCLUDING COURIER DELIVERY

RELINQUISHED BY SAMPLER: 1. <u>Drew Warner</u>	DATE/TIME: <u>6/25/01 1700</u>	RECEIVED BY: <u>449. FedEx</u>	Conditions of bottles or coolers at receipt: <input type="checkbox"/> Compliant <input type="checkbox"/> Non-Compliant <input checked="" type="checkbox"/> Temp. of Cooler <u>4-8</u> Comments: <u>Fed Ex A/B# 8169 3433 6780</u> Page <u>2</u> of <u>2</u>
RELINQUISHED BY: 2. <u>FedEx</u>	DATE/TIME: <u>6/26/01 12:00</u>	RECEIVED BY: <u>2 Sunny Patel</u>	
RELINQUISHED BY: 3.	DATE/TIME:	RECEIVED FOR LAB BY: 3.	

NO. 40347

CHEMTECH

CHAIN OF CUSTODY RECORD

110 Route 4
Englewood, NJ 07631
(201) 567-6868
Fax (201) 567-1333

205 Campus Plaza 1
Edison, NJ 08837
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Fax (732) 225-4110

CHEMTECH JOB NO.

N49342P

CHEMTECH QUOTE NO.

JUL 2 2001 12:26PM NO. 40947 0/10

CLIENT INFORMATION		PROJECT INFORMATION		BILLING INFORMATION	
REPORT TO BE SENT TO:		PROJECT NAME		BILL TO	
COMPANY: Tetra Tech NUS Inc		PROJECT NO: CTO-816		PO #	
ADDRESS: 661 Anderson Dr		PROJECT MANAGER: Corey Rich		ADDRESS	
CITY: Pittsburgh STATE: TN ZIP: 15220		LOCATION		CITY	
ATTENTION: Corey Rich		PHONE		STATE	
PHONE: (412) 921-7090 FAX		FAX		ZIP	
DATA TURNAROUND INFORMATION		DATA DELIVERABLE INFORMATION		ANALYSIS	
FAX _____ DAYS HARD COPY _____ DAYS EDD _____ DAYS * TO BE APPROVED BY CHEMTECH STANDARD ** NORMAL TURNAROUND TIME - 14 DAYS		<input type="checkbox"/> RESULTS ONLY <input type="checkbox"/> USEPA CLP <input type="checkbox"/> RESULTS + QC <input type="checkbox"/> NYS ASP "B" <input type="checkbox"/> NJ REDUCED <input type="checkbox"/> NYS ASP "A" <input type="checkbox"/> NJ CLP <input type="checkbox"/> EDD <input type="checkbox"/> EDD FORMAT: _____		1. TCL Volatiles 2. TCL SVOC 3. TCL PEST/PCB 4. TCL PAH 5. TAL Metals (Cd)+Mn 6. TAL Metals (Cr)+Ni 7. TOC-COD 8. AIX, Chloride, Sulfate	

CHEMTECH SAMPLE ID	PROJECT SAMPLE IDENTIFICATION	SAMPLE MATRIX	SAMPLE TYPE		SAMPLE COLLECTION		# OF BOTTLES	PRESERVATIVES									COMMENTS
			COMP	GRAB	DATE	TIME		HCL	1	2	3	4	5	6	7	8	
1. 01, 02, 03	SWSG19-07	SW	X		6/20/01	0734	33		9	3	6	3	3	3	3	3	MS/MSD
2. 04	SWSG20-07	SW	X		6/22/01	0825	11		3	1	2	1	1	1	1		
3. 05	SWSG23-07	SW	X		6/21/01	1340	11		3	1	2	1	1	1	1		
4. 06	2W-GW440S-07	GW	X		6/22/01	1000	11		3	1	2	1	1	1	1		
5. 07	2W-GW410S-07	GW	X		6/22/01	0930	4		3				1				
6. 08	2W-GW460S-07	GW	X		6/21/01	1330	4		2				1	1			
7. 09	2W-GW460S-07	GW	X		6/21/01	0917	7			2	2	1	1			1	
8. 10	2W-GW460S-07	GW	X		6/22/01	10900	1		1								

SAMPLE CUSTODY MUST BE DOCUMENTED BELOW EACH TIME SAMPLES CHANGE POSSESSION INCLUDING COURIER DELIVERY

RELINQUISHED BY SAMPLER: 1. Jennifer Wellman	DATE/TIME 6/22/01 2:40	RECEIVED BY: 1. Fed Ex Airbill #
RELINQUISHED BY: 2. FedEx	DATE/TIME 6/23/01 9:45	RECEIVED BY: 2. Sunny Patel
RELINQUISHED BY:	DATE/TIME:	RECEIVED FOR LAB BY:

Conditions of bottles or coolers at receipt: Compliant Non-Compliant Temp. of Cooler _____

Comments:

Page 1 of 2

Shipment Complete: Yes _____ No _____

CHEMTECH

CHAIN OF CUSTODY RECORD

110 Route 4
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Edison, NJ 08837
(732) 225-4111
Fax (732) 225-4110

CHEMTECH JOB NO.

N49344P

CHEMTECH QUOTE NO.

Jul. 2. 2001 = 12:27 PM

CLIENT INFORMATION		PROJECT INFORMATION		BILLING INFORMATION	
REPORT TO BE SENT TO:		PROJECT NAME		BILL TO	
COMPANY: Tetra Tech NUS, Inc		PROJECT NO. CTO 816		PO #	
ADDRESS: 661 Anderson Dr.		PROJECT MANAGER: Corey Rich		ADDRESS	
CITY: Pittsburgh STATE: PA ZIP: 15220		LOCATION		CITY	
ATTENTION: Corey Rich		PHONE		STATE	
PHONE: (412) 921-7090 FAX		FAX		ZIP	
				ATTENTION	
				PHONE	

DATA TURNAROUND INFORMATION		DATA DELIVERABLE INFORMATION	
FAX _____	DAYS * _____	<input type="checkbox"/> RESULTS ONLY	<input type="checkbox"/> USEPA CLP
HARD COPY _____	DAYS * _____	<input type="checkbox"/> RESULTS + QC	<input type="checkbox"/> NYS ASP "B"
EDD _____	DAYS * _____	<input type="checkbox"/> NJ REDUCED	<input type="checkbox"/> NYS ASP "A"
* TO BE APPROVED BY CHEMTECH		<input type="checkbox"/> NJ CLP	<input type="checkbox"/> EDD
** NORMAL TURNAROUND TIME - 14 DAYS		<input type="checkbox"/> EDD FORMAT _____	

1 TCL VOC
 2 TCL SVOC
 3 TCL PEST/PCB
 4 TCL PAH
 5 TAL Metals (As, Cd, Cr, Hg, Ni, Pb, Se, V)
 6 IAL Metals (As, Cd, Cr, Hg, Ni, Pb, Se, V)
 7 TOC, COD
 8 Alk. Chloride, Sulfate, Nitrate

CHEMTECH SAMPLE ID	PROJECT SAMPLE IDENTIFICATION	SAMPLE MATRIX	SAMPLE TYPE		SAMPLE COLLECTION		# OF BOTTLES	PRESERVATIVES									COMMENTS ← Specify Preservatives A - HCl B - HNO ₃ C - H ₂ SO ₄ D - NaOH E - ICE F - Other			
			COMP	GRAB	DATE	TIME		1	2	3	4	5	6	7	8	9				
1. 11	2W-GW41DS-07	GW	X		6/20/01	1545	3		2	1										
2. 12	2W-GW41DS-07	GW	X		6/21/01	1430	5			1	1	1	1	1	1					
3. 13	GW TBO 62201	AQ	X		6/22/01	0700	2	2												
4. 14	GW TBO 62101	AQ	X			0730	2	2												
5. 15																				
6. 16																				
7. 17																				
8. 18, 19, 20																				

SAMPLE CUSTODY MUST BE DOCUMENTED BELOW EACH TIME SAMPLES CHANGE POSSESSION INCLUDING COURIER DELIVERY

RELINQUISHED BY SAMPLER: 1. Jennifer Wellman	DATE/TIME: 6/22/01 2:40	RECEIVED BY: 1. Fed Ex Airbill #	Conditions of bottles or coolers at receipt: <input type="checkbox"/> Compliant <input type="checkbox"/> Non-Compliant <input type="checkbox"/> Temp. of Cooler _____ Comments:
RELINQUISHED BY: 2. Fed Ex	DATE/TIME: 6/23/01 9:45	RECEIVED BY: 2. [Signature]	
RELINQUISHED BY: 3.	DATE/TIME:	RECEIVED FOR LAB BY: 3.	

Page _____ of _____ Shipment Complete Yes _____ No _____

CHEMTECH

CHAIN OF CUSTODY RECORD

110 Route 4
Englewood, NJ 07631
(201) 567-6868
Fax (201) 567-1333

205 Campus Plaza 1
Edison, NJ 08837
(732) 225-4111
Fax (732) 225-4110

CHEMTECH JOB NO. N4936LP
CHEMTECH QUOTE NO.

Jul. 2. 2001 - 12:27 PM

CLIENT INFORMATION		PROJECT INFORMATION		BILLING INFORMATION	
REPORT TO BE SENT TO:		PROJECT NAME		BILL TO	
COMPANY: <u>Tetra Tech NUS, Inc.</u>		PROJECT NO. <u>CTO 816</u>		ADDRESS	
ADDRESS: <u>6661 Anderson Dr.</u>		PROJECT MANAGER: <u>Corey Rich</u>		CITY STATE ZIP	
CITY: <u>Pittsburgh</u> STATE: <u>PA</u> ZIP: <u>15220</u>		LOCATION		ATTENTION PHONE	
ATTENTION: <u>Corey Rich</u>		PHONE FAX		PHONE	
PHONE: <u>412-921-7090</u> FAX:					

DATA TURNAROUND INFORMATION	DATA DELIVERABLE INFORMATION
FAX _____ DAYS * HARD COPY _____ DAYS * EDD _____ DAYS * * TO BE APPROVED BY CHEMTECH STANDARD ** NORMAL TURNAROUND TIME - 14 DAYS	<input type="checkbox"/> RESULTS ONLY <input type="checkbox"/> USEPA CLP <input type="checkbox"/> RESULTS + QC <input type="checkbox"/> NYS ASP "B" <input type="checkbox"/> NJ REDUCED <input type="checkbox"/> NYS ASP "A" <input type="checkbox"/> NJ CLP <input type="checkbox"/> EDD <input type="checkbox"/> EDD FORMAT _____

1 TCL VOCs
 2 TCL SVOCs
 3 TCL PEST
 4 TCL PCB
 5 TAL Metals + Hardw
 6 TAL DIS. Metals
 7 TOX COP
 8 ALK. Chlorid. SO₄ TDS
 9 TCL PAHS

CHEMTECH SAMPLE ID	PROJECT SAMPLE IDENTIFICATION	SAMPLE MATRIX	SAMPLE TYPE		SAMPLE COLLECTION		BOTTLES	PRESERVATIVES									COMMENTS ← Specify Preservatives A - HCl B - HNO ₃ C - H ₂ SO ₄ D - NaOH E - ICE F - Other
			COMP	GRAB	DATE	TIME		HCl				HNO ₃	HNO ₃	H ₂ SO ₄			
								1	2	3	4	5	6	7	8	9	
1	01 SWSG18-07	SW	X		6/20/01	1600	12	3	2	1	1	1	1	1	1	1	
2	02 2W-GW45DS-07	GW	X		6/20/01	1150	12	3	2	1	1	1	1	1	1	1	
3	03 2W-GW39DS-07	GW	X		6/19/01	1651	7A		2	1	1	1	1	1	1	1	
4	04 2W-GW39DS-07	GW	X		6/20/01	0955	5	3				1			1		
5	05 2W-GW40DS-07	GW	X		6/19/01	1745	4		2	1	1						
6	06 2W-GW40DS-07	GW	X		6/20/01	1130	8	3				1	1	1	1	1	
7	07 2W-GW42DS-07	GW	X		6/20/01	0930	11	3	2	1	1	1	1	1	1	1	
8	08 2W-GW42DS-07	GW	X		6/20/01	1530	1										1

SAMPLE CUSTODY MUST BE DOCUMENTED BELOW EACH TIME SAMPLES CHANGE POSSESSION INCLUDING COURIER DELIVERY

RELINQUISHED BY SAMPLER: 1. Jennifer Wellman	DATE/TIME: 6/22/01 10:00	RECEIVED BY: 1. Fed Ex Archill #	DATE/TIME: 8/16 5043 966	Conditions of bottles or coolers at receipt: <input type="checkbox"/> Compliant <input type="checkbox"/> Non-Compliant <input type="checkbox"/> Temp. of Cooler _____
RELINQUISHED BY: 2. FedEx	DATE/TIME: 6/22/01 10:00	RECEIVED BY: 2. Jennifer Wellman	DATE/TIME: 8/16 5043 966	Comments:
RELINQUISHED BY:	DATE/TIME:	RECEIVED FOR LAB BY:	DATE/TIME:	

CHEMTECH

CHAIN OF CUSTODY RECORD

110 Route 4
Englewood, NJ 07631
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Fax (201) 567-1333

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Edison, NJ 08837
(732) 225-4111
Fax (732) 225-4110

CHEMTECH JOB NO. N4936LP

CHEMTECH QUOTE NO.

Jul. 2. 2001 12:27PM

CLIENT INFORMATION		PROJECT INFORMATION		BILLING INFORMATION	
REPORT TO BE SENT TO:		PROJECT NAME		BILL TO	
COMPANY: <u>Tetra Tech NUS, Inc</u>		PROJECT NO. <u>CTO-816</u>		PO #	
ADDRESS: <u>6661 Anderson Dr.</u>		PROJECT MANAGER <u>Corey Rich</u>		ADDRESS	
CITY: <u>Pittsburgh</u> STATE: <u>PA</u> ZIP: <u>15220</u>		LOCATION		CITY	
ATTENTION: <u>Corey Rich</u>		PHONE		STATE	
PHONE: <u>412-921-7090</u> FAX:		FAX:		ZIP	
				ATTENTION	
				PHONE	
				ANALYSIS	

DATA TURNAROUND INFORMATION		DATA DELIVERABLE INFORMATION	
FAX: _____	DAYS: _____	<input type="checkbox"/> RESULTS ONLY	<input type="checkbox"/> USEPA CLP
HARD COPY: _____	DAYS: _____	<input type="checkbox"/> RESULTS + QC	<input type="checkbox"/> NYS ASP "B"
EDD: _____	DAYS: _____	<input type="checkbox"/> NJ REDUCED	<input type="checkbox"/> NYS ASP "A"
* TO BE APPROVED BY CHEMTECH		<input type="checkbox"/> NJ CLP	<input type="checkbox"/> EDD
** NORMAL TURNAROUND TIME - 14 DAYS <u>Standard</u>		<input type="checkbox"/> EDD FORMAT	

1 TCL VOCs
 2 TCL SVOCs
 3 TCL PEST
 4 TCL PCB
 5 TAL Metals + Hardness
 6 TAL DIS. Metals
 7 TOC COO
 8 ALK. CL. SO₄ TDS
 9 TCL PAHs

CHEMTECH SAMPLE ID	PROJECT SAMPLE IDENTIFICATION	SAMPLE MATRIX	SAMPLE TYPE		SAMPLE COLLECTION		# OF BOTTLES	PRESERVATIVES									COMMENTS ← Specify Preservatives A - HCl B - HNO ₃ C - H ₂ SO ₄ D - NaOH E - ICE F - Other		
			COMP	GRAB	DATE	TIME		HCl	HNO ₃	HNO ₂	H ₂ SO ₄								
								1	2	3	4	5	6	7	8	9			
1	09 BWTB D62001	W	X		6/20/01	0730	2												
2	10 2W-GW43DS-07	W	X		6/21/01	1800	8	3		1	1	1	1			1			
3	11 2W-GW43DS-07	W	X		6/21/01	800	4		2							1		1	
4	12																		
5	13																		
6	14																		
7	15																		
8	16, 17, 18																		

SAMPLE CUSTODY MUST BE DOCUMENTED BELOW EACH TIME SAMPLES CHANGE POSSESSION INCLUDING COURIER DELIVERY

RELINQUISHED BY SAMPLER: 1. <u>Jennifer Wellman</u>	DATE/TIME: <u>6/21/01 10:00</u>	RECEIVED BY: <u>82Kg 5043</u> 1. <u>FedEx Archill # 9686</u>	Conditions of bottles or coolers at receipt: <input type="checkbox"/> Compliant <input type="checkbox"/> Non-Compliant <input type="checkbox"/> Temp. of Cooler _____
RELINQUISHED BY: 2. <u>FedEx</u>	DATE/TIME: <u>6/22/01 10:20</u>	RECEIVED BY: 2. <u>Sina Jafar</u>	Comments:
RELINQUISHED BY: 3.	DATE/TIME:	RECEIVED FOR LAB BY: 3.	

Page 2 of 2 Shipment Complete Yes No

NW-403232

APPENDIX F

DATA VALIDATION LETTERS AND LABORATORY DATA SHEETS



Tetra Tech NUS

INTERNAL CORRESPONDENCE

TO: C. RICH DATE: OCTOBER 29, 2001
FROM: LINDA KARSONOVICH COPIES: DV FILE
REV. 1
SUBJECT: ORGANIC DATA VALIDATION: VOA/SVOA/PEST/PCB/PAH
CTO 816, NSB NEW LONDON
SDG 4922
SAMPLES: 3/Aqueous/
3-GW37S-07 3MSP01-07 GWTB061901

Overview

The sample set for the CTO 816, NSB New London, SDG 4922 consists of two (2) aqueous environmental samples and one (1) aqueous field quality control sample. All samples were analyzed for volatile organic compounds (VOCs). All of the environmental samples, except GWTB061901, were also analyzed for semivolatile organic compounds (SVOCs), pesticides, polychlorinated biphenyls (PCBs), and polynuclear aromatic hydrocarbons (PAHs). No field duplicate pairs were included in the SDG.

The samples were collected by TetraTech NUS on June 19, 2001 and were analyzed by Chemtech. Analyses were conducted using the Contract Laboratory Program (CLP) Statement of Work (SOW) OLC02.1, and SW-846 Method 8310 analytical and reporting protocols.

The data were evaluated based on the following parameters:

- * • Data Completeness
- * • Holding Times
- * • GC/MS Tuning
- Calibration
- Blanks
- * • Surrogate Spike Recoveries
- * • Blank Spike Recoveries
- * • Matrix Spike/Matrix Spike Duplicate Recoveries
- * • Internal Standards Performance
- * • Instrument Performance
- * • Compound Identification
- * • Compound Quantitation
- * • Tentatively Identified Compounds (TICs)

The asterisk (*) indicates that all quality control criteria were met for this parameter. Qualified (if applicable) analytical results are summarized in Appendix A. Results as reported by the laboratory are presented in Appendix B. Appendix C contains Region I Worksheets, and Appendix D contains the documentation to support the findings as discussed in this data validation report. The attached Table I summarizes the validation qualifications which were based on the following information:

CALIBRATIONS

The following tables summarize calibration non-compliances and corresponding actions:

<u>Compound</u>	<u>IC</u> <u>06/29/01</u>	<u>CC</u> <u>06/30/01</u>
Acetone	RD	R
2-Butanone	R	R
2-Hexanone	R	R
1,2-Dibromo-3-chloropropane	R	R
Chloroform		X
Carbon tetrachloride		X

Associated Samples: 3-GW37S-07
3MSP01-07
GWTB061901

<u>Compound</u>	<u>IC</u> <u>06/24/01</u>	<u>CC</u> <u>06/30/01</u>
2,4-Dinitrophenol	D	
2,2'oxybis(1-chloropropane)		X
N-Nitroso-di-n-propylamine		X
2-Nitroaniline		X

Associated Samples: 3-GW37S-07
3MSP01-07

Calibration Actions:

- D - Percent Relative Standard Deviation > 30%; Estimate (UJ) nondetected results.
- X - Percent Difference > 25%; Estimate (J) positive and (UJ) nondetected results.
- R - Relative Response Factors < 0.05; Reject (UR) nondetected results and estimate, (J) positive.

BLANKS

The maximum concentration of contaminants found in associated laboratory method blank and/or field quality control blanks (designated *) are summarized below:

<u>Compound</u>	<u>Maximum</u> <u>Concentration</u>	<u>Aqueous Blank</u> <u>Action Level</u>
Methylene chloride*	3 µg/L	30 µg/L

Samples Affected: All

Blank Actions:

- Value < Contract Required Quantitation Limit (CRQL); report CRQL followed by a U.
- Value > CRQL and < action level; report value followed by a U.
- Value > CRQL and > action level; report value unqualified.

Dilution factors and sample aliquots used for analysis were taken into consideration prior to the application of all action levels. Positive results for methylene chloride were qualified in the manner indicated by the blank action table. Field quality control blanks were not qualified due to method blank contamination or contamination in other field quality control blanks.

ADDITIONAL COMMENTS

The laboratory did not report to the requested reporting limits in the Statement of Work for the semivolatile, PCB, and PAH fractions. The laboratory was contacted and resubmitted the Form Is for these results.

Positive results reported at concentrations below the CRQL were qualified as estimated, (J).

The text of this report has been formulated to address only those problem areas affecting data quality.

PAHs were reported using SE-846 Method 8310.

Several compounds (1,2-dichlorobenzene, 1,3-dichlorobezene, 1,4-dichlorobenzene, and 1,2,4-trichlorobenzene) were reported in both the volatile and semivolatile fractions. The results from the volatile fraction should be used.

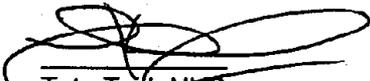
OVERALL ASSESSMENT

Laboratory Performance: The laboratory was unable to obtain acceptable percent differences between initial and continuing calibration response factors for several volatile and semivolatile compounds. The laboratory was unable to obtain acceptable relative response factors for several volatile compounds.

Other Factors Affecting Data Quality: None.

The data for these analyses were reviewed with reference to the Region I EPA "Volatile and Semivolatile Data Validation Functional Guidelines - Part II" (12/96).

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the NFESC Guidelines and the Quality Assurance Project Plan (QAPP)."



TetraTech NUS

Linda Karsonovich
Chemist/Data Validator



TetraTech NUS

Joseph A. Samchuck
Data Validation Quality Assurance Officer

Attachments:

- 1. Appendix A - Qualified Analytical Results**
- 2. Appendix B - Results as Reported by the Laboratory**
- 3. Appendix C - Regional Worksheets**
- 4. Appendix D - Support Documentation**

NSB NEW LONDON

SDG 4922

TABLE I. Summary of Tentatively Identified Volatile Compounds

TIC None Reported

NSB NEW LONDON

SDG 4922

TABLE II. Summary of Tentatively Identified Semivolatile Compounds

TIC None Reported

APPENDIX A

QUALIFIED LABORATORY RESULTS

CTO816-NSB NEW LONDON
WATER DATA
CHEMTECH CONSULTING GROUP
SDG: 4922

SAMPLE NUMBER:
 SAMPLE DATE:
 LABORATORY ID:
 QC_TYPE:
 % SOLIDS:
 UNITS:
 FIELD DUPLICATE OF:

3-GW37S-07
 06/19/01
 N4922-01
 NORMAL
 0.0 %
 UG/L

3MSP01-07
 06/19/01
 N4922-02
 NORMAL
 0.0 %
 UG/L

GWTB061901
 06/19/01
 N4922-03
 NORMAL
 0.0 %
 UG/L

//
 100.0 %

	RESULT	QUAL	CODE									
VOLATILES												
1,1,1-TRICHLOROETHANE	1	U		1	U		1	U				
1,1,2,2-TETRACHLOROETHANE	1	U		1	U		1	U				
1,1,2-TRICHLOROETHANE	1	U		1	U		1	U				
1,1-DICHLOROETHANE	1	U		1	U		1	U				
1,1-DICHLOROETHENE	1	U		1	U		1	U				
1,2,4-TRICHLOROENZENE	1	U		1	U		1	U				
1,2-DIBROMO-3-CHLOROPROPANE	1	UR	C	1	UR	C	1	UR	C			
1,2-DIBROMOETHANE	1	U		1	U		1	U				
1,2-DICHLOROENZENE	1	U		1	U		1	U				
1,2-DICHLOROETHANE	1	U		1	U		1	U				
1,2-DICHLOROPROPANE	1	U		1	U		1	U				
1,3-DICHLOROENZENE	1	U		1	U		1	U				
1,4-DICHLOROENZENE	1	U		1	U		1	U				
2-BUTANONE	5	UR	C	5	UR	C	5	UR	C			
2-HEXANONE	5	UR	C	5	UR	C	5	UR	C			
4-METHYL-2-PENTANONE	5	U		5	U		5	U				
ACETONE	5	UR	C	5	UR	C	5	UR	C			
BENZENE	1	U		1	U		1	U				
BROMOCHLOROMETHANE	1	U		1	U		1	U				
BROMODICHLOROMETHANE	1	U		1	U		1	U				
BROMOFORM	1	U		1	U		1	U				
BROMOMETHANE	1	U		1	U		1	U				
CARBON DISULFIDE	1	U		1	U		1	U				
CARBON TETRACHLORIDE	1	UJ	C	1	UJ	C	1	UJ	C			
CHLOROENZENE	1	U		1	U		1	U				
CHLORODIBROMOMETHANE	1	U		1	U		1	U				
CHLOROETHANE	1	U		1	U		1	U				
CHLOROFORM	1	UJ	C	1	UJ	C	1	UJ	C			
CHLOROMETHANE	1	U		1	U		1	U				
CIS-1,2-DICHLOROETHENE	1	U		1	U		1	U				
CIS-1,3-DICHLOROPROPENE	1	U		1	U		1	U				
ETHYLBENZENE	1	U		1	U		1	U				

**CT0816-NSB NEW LONDON
WATER DATA
CHEMTECH CONSULTING GROUP
SDG: 4922**

SAMPLE NUMBER:	3-GW37S-07	3MSP01-07	GWTB061901	
SAMPLE DATE:	06/19/01	06/19/01	06/19/01	//
LABORATORY ID:	N4922-01	N4922-02	N4922-03	
QC_TYPE:	NORMAL	NORMAL	NORMAL	
% SOLIDS:	0.0 %	0.0 %	0.0 %	100.0 %
UNITS:	UG/L	UG/L	UG/L	
FIELD DUPLICATE OF:				

	RESULT	QUAL	CODE									
VOLATILES												
METHYLENE CHLORIDE	2	U	B	2	U	B	3					
O-XYLENE	1	U		1	U		1	U				
STYRENE	1	U		1	U		1	U				
TETRACHLOROETHENE	1	U		1	U		1	U				
TOLUENE	1	U		1	U		1	U				
TOTAL XYLENES	1	U		1	U		1	U				
TRANS-1,2-DICHLOROETHENE	1	U		1	U		1	U				
TRANS-1,3-DICHLOROPROPENE	1	U		1	U		1	U				
TRICHLOROETHENE	1	J	P	1	U		1	U				
VINYL CHLORIDE	1	U		1	U		1	U				

**CTO816-NSB NEW LONDON
WATER DATA
CHEMTECH CONSULTING GROUP
SDG: 4922**

SAMPLE NUMBER:	3-GW37S-07	3MSP01-07		
SAMPLE DATE:	06/19/01	06/19/01	//	//
LABORATORY ID:	N4922-01	N4922-02		
QC_TYPE:	NORMAL	NORMAL		
% SOLIDS:	0.0 %	0.0 %	100.0 %	100.0 %
UNITS:	UG/L	UG/L		
FIELD DUPLICATE OF:				

	RESULT	QUAL	CODE									
SEMIVOLATILES												
1,2,4-TRICHLOROENZENE	5	U		5	U							
1,2-DICHLOROENZENE	5	U		5	U							
1,3-DICHLOROENZENE	5	U		5	U							
1,4-DICHLOROENZENE	5	U		5	U							
2,2'-OXYBIS(1-CHLOROPROPANE)	5	UJ	C	5	UJ	C						
2,4,5-TRICHLOROPHENOL	5	U		5	U							
2,4,6-TRICHLOROPHENOL	20	U		20	U							
2,4-DICHLOROPHENOL	5	U		5	U							
2,4-DIMETHYLPHENOL	5	U		5	U							
2,4-DINITROPHENOL	20	UJ	C	20	UJ	C						
2,4-DINITROTOLUENE *	5	U		5	U							
2,6-DINITROTOLUENE	5	U		5	U							
2-CHLORONAPHTHALENE	5	U		5	U							
2-CHLOROPHENOL	5	U		5	U							
2-METHYLNAPHTHALENE	5	U		5	U							
2-METHYLPHENOL	5	U		5	U							
2-NITROANILINE	20	UJ	C	20	UJ	C						
2-NITROPHENOL	5	U		5	U							
3&4-METHYLPHENOL	5	U		5	U							
3,3'-DICHLOROENZIDINE	5	U		5	U							
3-NITROANILINE	20	U		20	U							
4,6-DINITRO-2-METHYLPHENOL	20	U		20	U							
4-BROMOPHENYL PHENYL ETHER	5	U		5	U							
4-CHLORO-3-METHYLPHENOL	5	U		5	U							
4-CHLOROANILINE	5	U		5	U							
4-CHLOROPHENYL PHENYL ETHER	5	U		5	U							
4-NITROANILINE	20	U		20	U							
4-NITROPHENOL	20	U		20	U							
BENZOIC ACID	5	U		5	U							
BIS(2-CHLOROETHOXY)METHANE	5	U		5	U							
BIS(2-CHLOROETHYL)ETHER	5	U		5	U							
BIS(2-ETHYLHEXYL)PHTHALATE	1.7	J	P	2.1	J	P						

CTO816-NSB NEW LONDON
 WATER DATA
 CHEMTECH CONSULTING GROUP
 SDG: 4922

SAMPLE NUMBER:	3-GW37S-07	3MSP01-07		
SAMPLE DATE:	06/19/01	06/19/01	//	//
LABORATORY ID:	N4922-01	N4922-02		
QC_TYPE:	NORMAL	NORMAL		
% SOLIDS:	0.0 %	0.0 %	100.0 %	100.0 %
UNITS:	UG/L	UG/L		
FIELD DUPLICATE OF:				

	RESULT	QUAL	CODE									
SEMIVOLATILES												
BUTYL BENZYL PHTHALATE	5	U		5	U							
CARBAZOLE	5	U		5	U							
DI-N-BUTYL PHTHALATE	1.6	J	P	0.9	J	P						
DI-N-OCTYL PHTHALATE	5	U		5	U							
DIBENZOFURAN	5	U		5	U							
DIETHYL PHTHALATE	5	U		5	U							
DIMETHYL PHTHALATE	5	U		5	U							
HEXACHLORO BENZENE	5	U		5	U							
HEXACHLOROBUTADIENE	5	U		5	U							
HEXACHLOROCYCLOPENTADIENE	5	U		5	U							
HEXACHLOROETHANE	5	U		5	U							
ISOPHORONE	5	U		5	U							
N-NITROSO-DI-N-PROPYLAMINE	5	UJ	C	5	UJ	C						
N-NITROSODIPHENYLAMINE	5	U		5	U							
NITROBENZENE	5	U		5	U							
PENTACHLOROPHENOL	20	U		20	U							
PHENOL	5	U		5	U							

CT0816-NSB NEW LONDON
 WATER DATA
 CHEMTECH CONSULTING GROUP
 SDG: 4922

SAMPLE NUMBER:	3-GW37S-07	3MSP01-07		
SAMPLE DATE:	06/19/01	06/19/01	//	//
LABORATORY ID:	N4922-01	N4922-02		
QC_TYPE:	NORMAL	NORMAL		
% SOLIDS:	0.0 %	0.0 %	100.0 %	100.0 %
UNITS:	UG/L	UG/L		
FIELD DUPLICATE OF:				

	RESULT	QUAL	CODE									
PESTICIDES/PCBs												
AROCLOR-1016	0.20	U		0.20	U							
AROCLOR-1221	0.40	U		0.40	U							
AROCLOR-1232	0.20	U		0.20	U							
AROCLOR-1242	0.20	U		0.20	U							
AROCLOR-1248	0.20	U		0.20	U							
AROCLOR-1254	0.20	U		0.20	U							
AROCLOR-1260	0.20	U		0.20	U							

CTO816-NSB NEW LONDON
 WATER DATA
 CHEMTECH CONSULTING GROUP
 SDG: 4922

SAMPLE NUMBER:	3-GW37S-07	3MSP01-07		
SAMPLE DATE:	06/19/01	06/19/01	//	//
LABORATORY ID:	N4922-01	N4922-02		
QC_TYPE:	NORMAL	NORMAL		
% SOLIDS:	0.0 %	0.0 %	100.0 %	100.0 %
UNITS:	UG/L	UG/L		
FIELD DUPLICATE OF:				

	RESULT	QUAL	CODE									
POLYNUCLEAR AROMATIC HYDROCARBONS												
ACENAPHTHENE	0.016	U		0.016	U							
ACENAPHTHYLENE	0.013	U		0.013	U							
ANTHRACENE	0.52			0.28								
BENZO(A)ANTHRACENE	0.012	U		0.012	U							
BENZO(A)PYRENE	0.021	U		0.021	U							
BENZO(B)FLUORANTHENE	0.02	U		0.02	U							
BENZO(G,H,I)PERYLENE	0.009	U		0.009	U							
BENZO(K)FLUORANTHENE	0.02	U		0.02	U							
CHRYSENE	0.012	U		0.012	U							
DIBENZO(A,H)ANTHRACENE	0.014	U		0.014	U							
FLUORANTHENE	0.009	U		0.1								
FLUORENE	0.007	U		0.007	U							
INDENO(1,2,3-CD)PYRENE	0.008	U		0.008	U							
NAPHTHALENE	0.008	U		0.008	U							
PHENANTHRENE	0.004	U		0.004	U							
PYRENE	0.008	U		0.008	U							

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DATE: AUGUST 10, 2001

Calibration Recoveries

The contract required detection limit (CRDL) percent recoveries for lead and selenium were >120% quality control limit. Nondetected results reported for lead and selenium were qualified as estimated, "UJ". Positive results reported for lead were qualified as estimated, "J".

The CRDL percent recovery for thallium was < 80% quality control limit. Positive and nondetected results reported for thallium were qualified as estimated, "J" and "UJ", respectively.

Laboratory Blank Analyses

The following contaminants were detected in the laboratory method / preparation blanks at the following maximum concentrations:

<u>Analyte</u>	<u>Maximum Concentration</u>	<u>Action Level</u>
Aluminum	85.8 µg/L	429 µg/L
Antimony	4.5 µg/L	22.5 µg/L
Beryllium	0.20 µg/L	1.0 µg/L
Calcium	89.3 µg/L	446.5 µg/L
Copper	3.1 µg/L	15.5 µg/L
Iron	45.4 µg/L	227 µg/L
Magnesium	82.7 µg/L	413.5 µg/L
Potassium	177.8 µg/L	889 µg/L
Sodium	589.2 µg/L	2946 µg/L

An action level of 5X the maximum concentration was used to evaluate the sample data for blank contamination. Sample aliquot and dilution factors were taken into consideration when evaluating for blank contamination. Positive results less than the blank action levels for copper were qualified, "U", as a result of blank contamination.

Sample Quantitation

Due to uncertainty near the IDL, positive results less than two times the IDL reported for cobalt, lead, thallium and zinc were qualified as estimated, "J".

Notes

The chain-of-custody lists several other parameters to be performed on these samples, such as hardness, total organic carbon (TOC), chemical oxygen demand (COD), alkalinity, chloride, sulfate and total dissolved solids (TDS). Because the samples arrived at the laboratory one week after they were collected, the laboratory was instructed to analyze the total and dissolved metals only.

Executive Summary

Laboratory Performance: Several analytes were present in the laboratory method / preparation blanks. Lead, selenium and thallium were qualified due to calibration noncompliance.

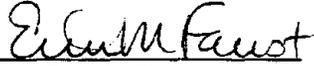
Other Factors Affecting Data Quality: Cobalt, lead, thallium and zinc were qualified due to uncertainty near the IDL.

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The data for these analyses were reviewed with reference to the "National Functional Guidelines for Inorganic Review", February 1989 and the NFESC document entitled "Navy IRCDQM" (September 1999).

The text of this report has been formulated to address only those problem areas affecting data quality.

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the NFESC Guidelines and the Quality Assurance Project Plan (QAPP)."



Tetra Tech NUS
Erin M. Faust
Environmental Scientist



TetraTech NUS
Joseph A. Samchuck
Quality Assurance Officer

Attachments:

1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as reported by the Laboratory
3. Appendix C - Regional Worksheets
4. Appendix D - Support Documentation

APPENDIX A
QUALIFIED ANALYTICAL RESULTS

Qualifier Codes:

- A = Lab Blank Contamination
- B = Field Blank Contamination
- C = Calibration (i.e., % RSDs, %Ds, ICVs, CCVs, RPDs, RRFs, etc.) Noncompliance
- D = MS/MSD Noncompliance
- E = LCS/LCSD Noncompliance
- F = Lab Duplicate Imprecision
- G = Field Duplicate Imprecision
- H = Holding Time Exceedance
- I = ICP Serial Dilution Noncompliance
- J = GFAA PDS - GFAA MSA's $r < 0.995$
- K = ICP Interference - include ICSAB % R's
- L = Instrument Calibration Range Exceedance
- M = Sample Preservation
- N = Internal Standard Noncompliance
- N01 = Internal Standard Noncompliance Dioxins
- N02 = Recovery Standard Noncompliance Dioxins
- N03 = Clean-up Standard Noncompliance Dioxins
- O = Poor Instrument Performance (i.e., base-time drifting)
- P = Uncertainty near detection limit ($< 2 \times$ IDL for inorganics and $<$ CRQL for organics)
- Q = Other problems (can encompass a number of issues)
- R = Surrogates Recovery Noncompliance
- S = Pesticide/PCB Resolution
- T = % Breakdown Noncompliance for DDT and Endrin
- U = Pest/PCD% between columns for positive results
- V = Non-linear calibrations, tuning $r < 0.995$ (correlation coefficient)
- W = EMPC result
- X = Signal to noise response drop
- Y = Percent solids $< 30\%$
- Z = Uncertainty at 2 sigma deviation is less than sample activity

**CT0816-NSB NEW LONDON
WATER DATA
CHEMTECH CONSULTING GROUP
SDG: 4922**

SAMPLE NUMBER:	3-GW37S-07	3-GW37S-07-F	3MSP01-07	3MSP01-07-F
SAMPLE DATE:	06/19/01	06/19/01	06/19/01	06/19/01
LABORATORY ID:	N4922-01	N4922-04	N4922-02	N4922-05
QC_TYPE:	NORMAL	NORMAL	NORMAL	NORMAL
% SOLIDS:	0.0 %	0.0 %	0.0 %	0.0 %
UNITS:	UG/L	UG/L	UG/L	UG/L
FIELD DUPLICATE OF:				

	RESULT	QUAL	CODE									
INORGANICS												
ALUMINUM	45.7	U		45.7	U		698			45.7	U	
ANTIMONY	3.7	U										
ARSENIC	5.0	U										
BARIUM	233			220			49.0			45.0		
BERYLLIUM	0.1	U		0.10	U		0.10	U		0.10	U	
CADMIUM	3.0	U										
CALCIUM	52700			43000			53300			45500		
CHROMIUM	5.0	U										
COBALT	10.1			6.7			2.1	J	P	1.8	U	
COPPER	3.3	U	A	4.2	U	A	7.0	U	A	8.1	U	A
IRON	395			310			1820			322		
LEAD	3.0	UJ	C	3.3	J	CP	5.8	J	CP	3.0	UJ	C
MAGNESIUM	33700			26700			5890			4830		
MANGANESE	4350			3860			125			106		
MERCURY	0.20	U										
NICKEL	4.0	U										
POTASSIUM	16200			10500			5220			5570		
SELENIUM	5.0	UJ	C									
SILVER	5.0	U										
SODIUM	446000			296000			22900			22000		
THALLIUM	8.5	J	CP	7.6	J	CP	5.7	UJ	C	5.7	UJ	C
VANADIUM	3.2	U										
ZINC	10.8	J	P	14.4	J	P	68.5			56.6		



Tetra Tech NUS

INTERNAL CORRESPONDENCE

TO: C. RICH **DATE:** OCTOBER 29, 2001

FROM: ANGELA SCHEETZ **COPIES:** DV FILE
REV. 1

SUBJECT: ORGANIC DATA VALIDATION: VOA / SVOA / PEST / PCB / PAH
CTO 816, NSB NEW LONDON
SDG 4934

SAMPLES: 6 / Aqueous / VOA / SVOA / PEST / PCB / PAH

2W-GW41DS-07	2W-GW44DS-07	2W-GW46DS-07
SWSG19-07	SWSG20-07	SWSG23-07

2 / Aqueous / VOA

GWTB062101	GWTB062201
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Overview

The sample set for CTO 816, NSB New London; SDG 4934 consists of six (6) aqueous environmental samples and two (2) aqueous trip blanks. The 6 aqueous environmental samples were analyzed for TCL volatile organics, TCL semivolatile organics, organochlorine pesticide, polychlorinated biphenyl organic compounds, and polynuclear aromatic hydrocarbons. The trip blanks were analyzed for TCL volatile organic compounds only. No field duplicate pairs were included in this SDG.

The samples were collected by TetraTech NUS on June 20, 21 and 22, 2001 and were analyzed by Chemtech Consulting Group. Analyses were conducted using the Contract Laboratory Program (CLP) Statement of Work (SOW) OLC02.1 and SW-846 Method 8310 analytical and reporting protocols.

The data were evaluated based on the following parameters:

- * • Data Completeness
- * • Holding Times
- * • GC/MS Tuning
- Initial and Continuing Calibration
- Laboratory Method and/or Field Quality Control Blanks
- Surrogate Spike Recoveries
- * • Blank Spike / Blank Spike Duplicate Recoveries
- * • Internal Standards Performance
- * • Instrument Performance
- * • Compound Identification
- * • Compound Quantitation
- * • Tentatively Identified Compounds (TICs)
- * • Detection Limits

The asterisk (*) indicates that all quality control criteria were met for this parameter. Qualified (if applicable)

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 Date: 10/29/01

analytical results are summarized in Appendix A. Results as reported by the laboratory are presented in Appendix B. Appendix C contains Region I worksheets, and Appendix D contains the documentation to support the findings as discussed in this data validation report. The attached Table summarizes the validation qualifications which are based on the following information:

CALIBRATIONS

The following tables summarize calibration noncompliance and corresponding actions for:

<u>Compound</u>	<u>ICV</u> <u>06/29/01</u>	<u>CCV</u> <u>06/30/01</u>	<u>CCV</u> <u>06/30/01</u>
Acetone	DR	R	R
1,2-dibromo-3-chloropropane	R	R	RX
2-hexanone	R	R	R
2-butanone	R	R	RX
Carbon tetrachloride		X	X
Chloroform		X	X
Chloroethane			X
1,1-dichloroethane			X
1,2-dichloropropane			X
cis-1,3-dichloropropene			X
1,1,1-trichloroethane			X

Associated Samples:	All	2W-GW41DS-07 2W-GW44DS-07 SWSG19-07 SWSG20-07 GWTB062101 GWTB062201	2W-GW46DS-07 2W-GW46DS-07 SWSG23-07
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<u>Compound</u>	<u>ICV</u> <u>06/24/01</u>	<u>CCV</u> <u>06/30/01</u>	<u>CCV</u> <u>07/02/01</u>
2,4-Dinitrophenol	D		X
2,2-oxybis (1-chloropropane)		X	X
2-Nitroaniline		X	X
N-nitroso-di-n-propylamine		X	

Associated Samples:	All	2W-GW41DS-07 2W-GW44DS-07 2W-GW46DS-07 SWSG19-07 SWSG20-07	SWSG23-07
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Calibration Actions:

D - Percent Relative Standard Deviation > 30%; estimate positive (J) and nondetected (UJ) results.
X - Percent Difference > 25%; estimate (J) positive and (UJ) nondetected results.
R - Relative Response Factors < 0.05; estimate positive (J) and reject nondetected (UR) results.

<u>Compound</u>	<u>CCV</u> <u>07/07/01</u>	<u>CCV</u> <u>07/07/01</u>
Aldrin		*
Alpha-BHC	*	
Delta-BHC		X
Gamma-BHC	*	
Endrin	X	
Heptachlor epoxide		*
4,4'-DDD	X	
4,4'-DDE		X

Associated Samples:	2W-GW41DS-07	2W-GW41DS-07
	2W-GW41DS-07	2W-GW41DS-07
	2W-GW44DS-07	2W-GW44DS-07
	2W-GW46DS-07	2W-GW46DS-07

Calibration Actions for pesticide/PCBs:

D - Percent Relative Standard Deviation > 20% on one analytical column; estimate positive (J) and no action required for nondetected results; on both analytical columns; estimate positive (J) and nondetected (UJ) results.
X - Percent Difference > 15% on both analytical columns; estimate (J) positive and (UJ) nondetected results.
* - Percent Difference > 15% on one analytical column; estimate positive (J) and no action required for nondetected results.

BLANKS

The following contaminants were detected in the trip blank:

<u>Compound</u>	<u>Maximum</u> <u>Concentration</u>	<u>Action Level</u>
Methylene chloride	2.2 µg/L	22.0 µg/L

Samples Affected: All
Blank Actions:

- Value < Contract Required Quantitation Limit (CRQL); report CRQL followed by a U.
- Value > CRQL and < action level; report value followed by a U.
- Value > CRQL and > action level; report value unqualified.

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Date: 10/29/01

Dilution factors and sample aliquots were taken into consideration when applying blank action levels. Positive results for methylene chloride were qualified in the manner indicated by the blank action table. Field quality control blanks were not qualified due to blank contamination.

SURROGATE RECOVERY

% Recoveries of the PCB surrogate Tetrachloro-m-xylene exceeded the quality control limits in sample 2W-GW46DS-07. The surrogate %R for Decachlorobiphenyl exceeded the quality control limits in samples 2W-GW41DS-07 and 2W-GW46DS-07. No qualifications were made on this basis since all the reported results are nondetected for these samples.

MATRIX SPIKE/MATRIX SPIKE DUPLICATE RESULTS

% Recovery in the matrix spike fell below the quality control limits for benzene in sample SWSG19-07. The nondetected result for benzene in the aforementioned sample was qualified as estimated, UJ.

% Recovery in the matrix spike/matrix spike duplicate exceeded the quality control limits for acenaphthene in the PAH fraction for sample SWSG19-07. No qualifications were made on this basis since the results were all nondetected.

% Recovery in the matrix spike/matrix spike duplicate exceeded the quality control limits for anthracene in the PAH fraction for sample SWSG19-07. The positive result was qualified as estimated, J for anthracene in the aforementioned compound.

Relative percent differences in the matrix spike/matrix spike duplicate in the PAH fraction exceeded the quality control limits for acenaphthylene, acenaphthene, anthracene, and phenanthrene in sample SWSG19-07. Positive and nondetected results were qualified as estimated, J and UJ respectively in the aforementioned sample.

ADDITIONAL COMMENTS

The laboratory did not report to the requested reporting limits in the Statement of Work for the semivolatile, PCB, and PAH fractions. The laboratory was contacted and resubmitted the Form Is for these results.

Positive results reported at concentrations below the CRQL were qualified as estimated (J).

1,2-dichlorobenzene, 1,3-dichlorobenzene, 1,4-dichlorobenzene, and 1,2,4-trichlorobenzene were reported in both the volatile and semivolatile fractions. Since the reporting limits for the referenced compounds is lower in the volatile fraction (1 ppb), the compounds were removed from the semivolatile fraction.

The chain of custody has two identical sample IDs that were sampled on different days but analyzed for the same fraction. Both sets of results were reported with the same ID but different sample dates. In the volatile fraction sample 2W-GW46DS-07, sampled on 6/22/01 was used for validation purposes. For the semivolatile and pesticide fractions sample 2W-GW41DS-07 that was sampled on 6/20/01 was used for validation. In the PAH fraction sample 2W-GW41DS-07 sampled on 6/21/01 was used for validation purposes.

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Date: 10/29/01

OVERALL ASSESSMENT

Laboratory Performance: Methylene chloride was detected in the laboratory blank and/or field quality control blank analyses. The laboratory was unable to obtain acceptable percent differences between initial and continuing calibration response factors for several volatile, semivolatile, and pesticide compounds. Surrogate recoveries exceeded the quality control limits in the PCB fraction.

Other Factors Affecting Data Quality: Matrix spike/matrix spike duplicate had recoveries and relative percent differences that were noncompliant in the volatile and PAH fractions.

The data for these analyses were reviewed with reference to the Region I EPA "Data Validation Functional Guidelines - Part II" (12/96).

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the NFESC Guidelines and the Quality Assurance Project Plan (QAPP)."


TetraTech NUS

Angela Scheetz
Chemist/Data Validator


TetraTech NUS

Joseph A. Samchuck
Data Validation Quality Assurance Officer

Attachments:

1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as Reported by the Laboratory
3. Appendix C - Regional Worksheets
4. Appendix D - Support Documentation

APPENDIX A

QUALIFIED LABORATORY RESULTS

**CT0816-NSB NEW LONDON
WATER DATA
CHEMTECH CONSULTING GROUP
SDG: 4934**

SAMPLE NUMBER:	2W-GW41DS-07	2W-GW44DS-07	2W-GW46DS-07	GWTB062101
SAMPLE DATE:	06/21/01	06/22/01	06/22/01	06/21/01
LABORATORY ID:	N4934-07	N4934-06	N4934-10	N4934-14
QC_TYPE:	NORMAL	NORMAL	NORMAL	NORMAL
% SOLIDS:	0.0 %	0.0 %	0.0 %	0.0 %
UNITS:	UG/L	UG/L	UG/L	UG/L
FIELD DUPLICATE OF:				

	RESULT	QUAL	CODE									
VOLATILES												
1,1,1-TRICHLOROETHANE	1	U		1	U		1	UJ	C	1	U	
1,1,2,2-TETRACHLOROETHANE	1	U		1	U		1	U		1	U	
1,1,2-TRICHLOROETHANE	1	U		1	U		1	U		1	U	
1,1-DICHLOROETHANE	1	U		1	U		1	UJ	C	1	U	
1,1-DICHLOROETHENE	1	U		1	U		1	U		1	U	
1,2,4-TRICHLOROBENZENE	1	U		1	U		1	U		1	U	
1,2-DIBROMO-3-CHLOROPROPANE	1	UR	C									
1,2-DIBROMOETHANE	1	U		1	U		1	U		1	U	
1,2-DICHLOROBENZENE	1	U		1	U		1	U		1	U	
1,2-DICHLOROETHANE	1	U		1	U		1	U		1	U	
1,2-DICHLOROPROPANE	1	U		1	U		1	UJ	C	1	UJ	C
1,3-DICHLOROBENZENE	1	U		1	U		1	U		1	U	
1,4-DICHLOROBENZENE	1	U		1	U		1	U		1	U	
2-BUTANONE	5	UR	C									
2-HEXANONE	5	UR	C									
4-METHYL-2-PENTANONE	5	U		5	U		5	U		5	U	
ACETONE	5	UR	C									
BENZENE	1	U		1	U		1	U		1	U	
BROMOCHLOROMETHANE	1	U		1	U		1	U		1	U	
BROMODICHLOROMETHANE	1	U		1	U		1	U		1	U	
BROMOFORM	1	U		1	U		1	U		1	U	
BROMOMETHANE	1	U		1	U		1	U		1	U	
CARBON DISULFIDE	1	U		1	U		2.2			1	U	
CARBON TETRACHLORIDE	1	UJ	C									
CHLOROBENZENE	1	U		1	U		1	U		1	U	
CHLORODIBROMOMETHANE	1	U		1	U		1	U		1	U	
CHLOROETHANE	1	U		1	U		1	U		1	U	
CHLOROFORM	1	UJ	C									
CHLOROMETHANE	1	U		1	U		1	UJ	C	1	U	
CIS-1,2-DICHLOROETHENE	1	U		1	U		1	U		1	U	
CIS-1,3-DICHLOROPROPENE	1	U		1	U		1	U		1	U	
ETHYLBENZENE	1	U		1	U		1	U		1	U	

CTO816-NSB NEW LONDON
WATER DATA
CHEMTECH CONSULTING GROUP
SDG: 4934

SAMPLE NUMBER:	2W-GW41DS-07	2W-GW44DS-07	2W-GW46DS-07	GWTB062101
SAMPLE DATE:	06/21/01	06/22/01	06/22/01	06/21/01
LABORATORY ID:	N4934-07	N4934-06	N4934-10	N4934-14
QC_TYPE:	NORMAL	NORMAL	NORMAL	NORMAL
% SOLIDS:	0.0 %	0.0 %	0.0 %	0.0 %
UNITS:	UG/L	UG/L	UG/L	UG/L
FIELD DUPLICATE OF:				

	RESULT	QUAL	CODE									
VOLATILES												
METHYLENE CHLORIDE	2	U		2	U		2	U	B	2.2		
O-XYLENE	1	U		1	U		1	U		1	U	
STYRENE	1	U		1	U		1	U		1	U	
TETRACHLOROETHENE	1	U		1	U		1.4			1	U	
TOLUENE	1	U		1	U		1	U		1	U	
TOTAL XYLENES	1	U		1	U		1	U		1	U	
TRANS-1,2-DICHLOROETHENE	1	U		1	U		1	U		1	U	
TRANS-1,3-DICHLOROPROPENE	1	U		1	U		1	U		1	U	
TRICHLOROETHENE	1	U		1	U		1.4			1	U	
VINYL CHLORIDE	1	U		1	U		1	U		1	U	

CTO816-NSB NEW LONDON
WATER DATA
CHEMTECH CONSULTING GROUP
SDG: 4934

SAMPLE NUMBER:
 SAMPLE DATE:
 LABORATORY ID:
 QC_TYPE:
 % SOLIDS:
 UNITS:
 FIELD DUPLICATE OF:

GWTB062201
 06/22/01
 N4934-13
 NORMAL
 0.0 %
 UG/L

SWSG19-07
 06/22/01
 N4934-01
 NORMAL
 0.0 %
 UG/L

SWSG20-07
 06/22/01
 N4934-04
 NORMAL
 0.0 %
 UG/L

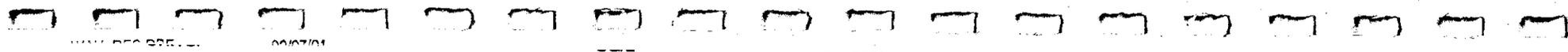
SWSG23-07
 06/21/01
 N4934-05
 NORMAL
 0.0 %
 UG/L

	RESULT	QUAL	CODE									
VOLATILES												
1,1,1-TRICHLOROETHANE	1	U		1	U		1	U		1	UJ	C
1,1,2,2-TETRACHLOROETHANE	1	U		1	U		1	U		1	U	
1,1,2-TRICHLOROETHANE	1	U		1	U		1	U		1	U	
1,1-DICHLOROETHANE	1	U		1	U		1	U		1	UJ	C
1,1-DICHLOROETHENE	1	U		1	U		1	U		1	U	
1,2,4-TRICHLOROBENZENE	1	U		1	U		1	U		1	U	
1,2-DIBROMO-3-CHLOROPROPANE	1	UR	C									
1,2-DIBROMOETHANE	1	U		1	U		1	U		1	U	
1,2-DICHLOROBENZENE	1	U		1	U		1	U		1	U	
1,2-DICHLOROETHANE	1	U		1	U		1	U		1	U	
1,2-DICHLOROPROPANE	1	U		1	U		1	U		1	UJ	C
1,3-DICHLOROBENZENE	1	U		1	U		1	U		1	U	
1,4-DICHLOROBENZENE	1	U		1	U		1	U		1	U	
2-BUTANONE	5	UR	C									
2-HEXANONE	5	UR	C									
4-METHYL-2-PENTANONE	5	U		5	U		5	U		5	U	
ACETONE	5	UR	C									
BENZENE	1	U		1	UJ	D	1	U		1	U	
BROMOCHLOROMETHANE	1	U		1	U		1	U		1	U	
BROMODICHLOROMETHANE	1	U		1	U		1	U		1	U	
BROMOFORM	1	U		1	U		1	U		1	U	
BROMOMETHANE	1	U		1	U		1	U		1	U	
CARBON DISULFIDE	1	U		1	U		1	U		1	U	
CARBON TETRACHLORIDE	1	UJ	C									
CHLOROBENZENE	1	U		1	UJ	C	1	U		1	U	
CHLORODIBROMOMETHANE	1	U		1	U		1	U		1	U	
CHLOROETHANE	1	U		1	U		1	U		1	UJ	C
CHLOROFORM	1	UJ	C									
CHLOROMETHANE	1	U		1	U		1	U		1	U	
CIS-1,2-DICHLOROETHENE	1	U		1	U		1	U		1	U	
CIS-1,3-DICHLOROPROPENE	1	U		1	U		1	U		1	UJ	C
ETHYLBENZENE	1	U		1	U		1	U		1	U	

CT08 ISB NEW LONDON
 WATER DATA
 CHEMTECH CONSULTING GROUP
 SDG: 4934

SAMPLE NUMBER:	GWTB062201	SWSG19-07	SWSG20-07	SWSG23-07
SAMPLE DATE:	06/22/01	06/22/01	06/22/01	06/21/01
LABORATORY ID:	N4934-13	N4934-01	N4934-04	N4934-05
QC_TYPE:	NORMAL	NORMAL	NORMAL	NORMAL
% SOLIDS:	0.0 %	0.0 %	0.0 %	0.0 %
UNITS:	UG/L	UG/L	UG/L	UG/L
FIELD DUPLICATE OF:				

	RESULT	QUAL	CODE									
VOLATILES												
METHYLENE CHLORIDE	1.7	J	P	2	U	B	2	U	B	2	U	
O-XYLENE	1	U		1	U		1	U		1	U	
STYRENE	1	U		1	U		1	U		1	U	
TETRACHLOROETHENE	1	U		1	U		1	U		1	U	
TOLUENE	1	U		1	U		2.6			1.9		
TOTAL XYLENES	1	U		1	U		1	U		1	U	
TRANS-1,2-DICHLOROETHENE	1	U		1	U		1	U		1	U	
TRANS-1,3-DICHLOROPROPENE	1	U		1	U		1	U		1	U	
TRICHLOROETHENE	1	U		1	U		1	U		1	U	
VINYL CHLORIDE	1	U		1	U		1	U		1	U	



CT08 USB NEW LONDON
 WATER DATA
 CHEMTECH CONSULTING GROUP
 SDG: 4934

SAMPLE NUMBER:	2W-GW41DS-07	2W-GW44DS-07	2W-GW46DS-07	SWSG19-07
SAMPLE DATE:	06/21/01	06/22/01	06/21/01	06/22/01
LABORATORY ID:	N4934-11	N4934-06	N4934-09	N4934-01
QC_TYPE:	NORMAL	NORMAL	NORMAL	NORMAL
% SOLIDS:	0.0 %	0.0 %	0.0 %	0.0 %
UNITS:	UG/L	UG/L	UG/L	UG/L
FIELD DUPLICATE OF:				

	RESULT	QUAL	CODE									
SEMIVOLATILES												
1,2,4-TRICHLOROENZENE	5	U		5	U		5	U		5	U	
1,2-DICHLOROENZENE	5	U		5	U		5	U		5	U	
1,3-DICHLOROENZENE	5	U		5	U		5	U		5	U	
1,4-DICHLOROENZENE	5	U		5	U		5	U		5	U	
2,2'-OXYBIS(1-CHLOROPROPANE)	5	UJ	C									
2,4,5-TRICHLOROPHENOL	5	U		5	U		5	U		5	U	
2,4,6-TRICHLOROPHENOL	20	U										
2,4-DICHLOROPHENOL	5	U		5	U		5	U		5	U	
2,4-DIMETHYLPHENOL	5	U		5	U		5	U		5	U	
2,4-DINITROPHENOL	20	UJ	C									
2,4-DINITROTOLUENE	5	U		5	U		5	U		5	U	
2,6-DINITROTOLUENE	5	U		5	U		5	U		5	U	
2-CHLORONAPHTHALENE	5	U		5	U		5	U		5	U	
2-CHLOROPHENOL	5	U		5	U		5	U		5	U	
2-METHYLNAPHTHALENE	5	U		5	U		5	U		5	U	
2-METHYLPHENOL	5	U		5	U		5	U		5	U	
2-NITROANILINE	20	UJ	C									
2-NITROPHENOL	5	U		5	U		5	U		5	U	
3&4-METHYLPHENOL	5	U		5	U		5	U		5	U	
3,3'-DICHLOROENZIDINE	5	U		5	U		5	U		5	U	
3-NITROANILINE	20	U										
4,6-DINITRO-2-METHYLPHENOL	20	U										
4-BROMOPHENYL PHENYL ETHER	5	U		5	U		5	U		5	U	
4-CHLORO-3-METHYLPHENOL	5	U		5	U		5	U		5	U	
4-CHLOROANILINE	5	U		5	U		5	U		5	U	
4-CHLOROPHENYL PHENYL ETHER	5	U		5	U		5	U		5	U	
4-NITROANILINE	20	U										
4-NITROPHENOL	20	U										
BENZOIC ACID	5	U		5	U		5	U		5	U	
BIS(2-CHLOROETHOXY)METHANE	5	U		5	U		5	U		5	U	
BIS(2-CHLOROETHYL)ETHER	5	U		5	U		5	U		5	U	
BIS(2-ETHYLHEXYL)PHTHALATE	2.9	J	P	1.4	J	P	1.3	J	P	1.5	J	P

**CT08 ISB NEW LONDON
WATER DATA
CHEMTECH CONSULTING GROUP
SDG: 4934**

SAMPLE NUMBER:	2W-GW41DS-07	2W-GW44DS-07	2W-GW46DS-07	SWSG19-07
SAMPLE DATE:	06/21/01	06/22/01	06/21/01	06/22/01
LABORATORY ID:	N4934-11	N4934-06	N4934-09	N4934-01
QC_TYPE:	NORMAL	NORMAL	NORMAL	NORMAL
% SOLIDS:	0.0 %	0.0 %	0.0 %	0.0 %
UNITS:	UG/L	UG/L	UG/L	UG/L
FIELD DUPLICATE OF:				

	RESULT	QUAL	CODE									
SEMIVOLATILES												
BUTYL BENZYL PHTHALATE	5	U		5	U		5	U		5	U	
CARBAZOLE	5	U		5	U		5	U		5	U	
DI-N-BUTYL PHTHALATE	0.8	J	P	5	U		5	U		1.2	J	P
DI-N-OCTYL PHTHALATE	5	U		5	U		5	U		5	U	
DIBENZOFURAN	5	U		5	U		5	U		5	U	
DIETHYL PHTHALATE	0.6	J	P	5	U		5	U		5	U	
DIMETHYL PHTHALATE	5	U		5	U		5	U		5	U	
HEXACHLOROENZENE	5	U		5	U		5	U		5	U	
HEXACHLOROBUTADIENE	5	U		5	U		5	U		5	U	
HEXACHLOROCYCLOPENTADIENE	5	U		5	U		5	U		5	U	
HEXACHLOROETHANE	5	U		5	U		5	U		5	U	
ISOPHORONE	5	U		5	U		5	U		5	U	
N-NITROSO-DI-N-PROPYLAMINE	5	UJ	C									
N-NITROSODIPHENYLAMINE	5	U		5	U		5	U		5	U	
NITROBENZENE	5	U		5	U		5	U		5	U	
PENTACHLOROPHENOL	20	U										
PHENOL	5	U		5	U		5	U		5	U	

CTO8 ISB NEW LONDON
 WATER DATA
 CHEMTECH CONSULTING GROUP
 SDG: 4934

SAMPLE NUMBER:	SWSG20-07	SWSG23-07		
SAMPLE DATE:	06/22/01	06/21/01	//	//
LABORATORY ID:	N4934-04	N4934-05		
QC_TYPE:	NORMAL	NORMAL		
% SOLIDS:	0.0 %	0.0 %	100.0 %	100.0 %
UNITS:	UG/L	UG/L		
FIELD DUPLICATE OF:				

	RESULT	QUAL	CODE									
SEMIVOLATILES												
1,2,4-TRICHLOROBENZENE	5	U		5	U							
1,2-DICHLOROBENZENE	5	U		5	U							
1,3-DICHLOROBENZENE	5	U		5	U							
1,4-DICHLOROBENZENE	5	U		5	U							
2,2'-OXYBIS(1-CHLOROPROPANE)	5	UJ	C	5	UJ	C						
2,4,5-TRICHLOROPHENOL	5	U		5	U							
2,4,6-TRICHLOROPHENOL	20	U		20	U							
2,4-DICHLOROPHENOL	5	U		5	U							
2,4-DIMETHYLPHENOL	5	U		5	U							
2,4-DINITROPHENOL	20	UJ	C	20	UJ	C						
2,4-DINITROTOLUENE	5	U		5	U							
2,6-DINITROTOLUENE	5	U		5	U							
2-CHLORONAPHTHALENE	5	U		5	U							
2-CHLOROPHENOL	5	U		5	U							
2-METHYLNAPHTHALENE	5	U		5	U							
2-METHYLPHENOL	5	U		5	U							
2-NITROANILINE	20	UJ	C	20	UJ	C						
2-NITROPHENOL	5	U		5	U							
3&4-METHYLPHENOL	5	U		5	U							
3,3'-DICHLOROENZIDINE	5	U		5	U							
3-NITROANILINE	20	U		20	U							
4,6-DINITRO-2-METHYLPHENOL	20	U		20	U							
4-BROMOPHENYL PHENYL ETHER	5	U		5	U							
4-CHLORO-3-METHYLPHENOL	5	U		5	U							
4-CHLOROANILINE	5	U		5	U							
4-CHLOROPHENYL PHENYL ETHER	5	U		5	U							
4-NITROANILINE	20	U		20	U							
4-NITROPHENOL	20	U		20	U							
BENZOIC ACID	5	U		5	U							
BIS(2-CHLOROETHOXY)METHANE	5	U		5	U							
BIS(2-CHLOROETHYL)ETHER	5	U		5	U							
BIS(2-ETHYLHEXYL)PHTHALATE	1.1	J	P	2.1	J	P						

CT08⁺ ISB NEW LONDON
 WATER DATA
 CHEMTECH CONSULTING GROUP
 SDG: 4934

SAMPLE NUMBER:	SWSG20-07	SWSG23-07		
SAMPLE DATE:	06/22/01	06/21/01	//	//
LABORATORY ID:	N4934-04	N4934-05		
QC_TYPE:	NORMAL	NORMAL		
% SOLIDS:	0.0 %	0.0 %	100.0 %	100.0 %
UNITS:	UG/L	UG/L		
FIELD DUPLICATE OF:				

	RESULT	QUAL	CODE									
SEMIVOLATILES												
BUTYL BENZYL PHTHALATE	5	U		5	U							
CARBAZOLE	5	U		5	U							
DI-N-BUTYL PHTHALATE	1.3	J	P	0.8	J	P						
DI-N-OCTYL PHTHALATE	5	U		5	U							
DIBENZOFURAN	5	U		5	U							
DIETHYL PHTHALATE	5	U		5	U							
DIMETHYL PHTHALATE	5	U		5	U							
HEXACHLOROBENZENE	5	U		5	U							
HEXACHLOROBUTADIENE	5	U		5	U							
HEXACHLOROCYCLOPENTADIENE	5	U		5	U							
HEXACHLOROETHANE	5	U		5	U							
ISOPHORONE	5	U		5	U							
N-NITROSO-DI-N-PROPYLAMINE	5	UJ	C	5	U							
N-NITROSODIPHENYLAMINE	5	U		5	U							
NITROBENZENE	5	U		5	U							
PENTACHLOROPHENOL	20	U		20	U							
PHENOL	5	U		5	U							

CT08 ISB NEW LONDON
 WATER DATA
 CHEMTECH CONSULTING GROUP
 SDG: 4934

SAMPLE NUMBER:	2W-GW41DS-07	2W-GW44DS-07	2W-GW46DS-07	SWSG19-07
SAMPLE DATE:	06/21/01	06/22/01	06/21/01	06/22/01
LABORATORY ID:	N4934-12	N4934-06	N4934-09	N4934-01
QC_TYPE:	NORMAL	NORMAL	NORMAL	NORMAL
% SOLIDS:	0.0 %	0.0 %	0.0 %	0.0 %
UNITS:	UG/L	UG/L	UG/L	UG/L
FIELD DUPLICATE OF:				

	RESULT	QUAL	CODE									
POLYNUCLEAR AROMATIC HYDROCARBONS												
ACENAPHTHENE	0.016	U		0.016	U		0.016	U		0.016	UJ	D
ACENAPHTHYLENE	0.013	U		0.013	U		0.013	U		0.013	UJ	D
ANTHRACENE	0.16			0.16			0.42			0.35	J	D
BENZO(A)ANTHRACENE	0.012	U		0.5	U		0.012	U		0.012	U	
BENZO(A)PYRENE	0.021	U		0.5	U		0.021	U		0.021	U	
BENZO(B)FLUORANTHENE	0.02	U		0.5	U		0.02	U		0.02	U	
BENZO(G,H,I)PERYLENE	0.009	U		0.5	U		0.009	U		0.009	U	
BENZO(K)FLUORANTHENE	0.02	U		0.5	U		0.02	U		0.02	U	
CHRYSENE	0.012	U		0.5	U		0.012	U		0.012	U	
DIBENZO(A,H)ANTHRACENE	0.014	U		0.5	U		0.014	U		0.014	U	
FLUORANTHENE	0.009	U		0.17			0.009	U		0.009	U	
FLUORENE	0.007	U										
INDENO(1,2,3-CD)PYRENE	0.008	U		0.5	U		0.008	U		0.008	U	
NAPHTHALENE	0.008	U										
PHENANTHRENE	0.004	U		0.004	U		2.9			0.004	UJ	D
PYRENE	0.008	U		0.5	U		0.008	U		0.008	U	

CT08 ISB NEW LONDON
 WATER DATA
 CHEMTECH CONSULTING GROUP
 SDG: 4934

SAMPLE NUMBER:	SWSG20-07	SWSG23-07		
SAMPLE DATE:	06/22/01	06/21/01	//	//
LABORATORY ID:	N4934-04	N4934-05		
QC_TYPE:	NORMAL	NORMAL		
% SOLIDS:	0.0 %	0.0 %	100.0 %	100.0 %
UNITS:	UG/L	UG/L		
FIELD DUPLICATE OF:				

	RESULT	QUAL	CODE									
POLYNUCLEAR AROMATIC HYDROCARBONS												
ACENAPHTHENE	0.016	U		0.016	U							
ACENAPHTHYLENE	0.013	U		0.013	U							
ANTHRACENE	0.23			0.03	U							
BENZO(A)ANTHRACENE	0.012	U		0.012	U							
BENZO(A)PYRENE	0.021	U		0.021	U							
BENZO(B)FLUORANTHENE	0.02	U		0.02	U							
BENZO(G,H,I)PERYLENE	0.009	U		0.009	U							
BENZO(K)FLUORANTHENE	0.02	U		0.02	U							
CHRYSENE	0.012	U		0.012	U							
DIBENZO(A,H)ANTHRACENE	0.014	U		0.014	U							
FLUORANTHENE	0.009	U		0.009	U							
FLUORENE	0.007	U		0.007	U							
INDENO(1,2,3-CD)PYRENE	0.008	U		0.008	U							
NAPHTHALENE	0.008	U		0.008	U							
PHENANTHRENE	0.004	U		0.004	U							
PYRENE	0.008	U		0.008	U							

CT08 USB NEW LONDON
 WATER DATA
 CHEMTECH CONSULTING GROUP
 SDG: 4934

SAMPLE NUMBER:	2W-GW41DS-07	2W-GW44DS-07	2W-GW46DS-07	SWSG19-07
SAMPLE DATE:	06/21/01	06/22/01	06/21/01	06/22/01
LABORATORY ID:	N4934-11	N4934-06	N4934-09	N4934-01
QC_TYPE:	NORMAL	NORMAL	NM	NORMAL
% SOLIDS:	0.0 %	0.0 %	0.0 %	0.0 %
UNITS:	UG/L	UG/L	UG/L	UG/L
FIELD DUPLICATE OF:				

	RESULT	QUAL	CODE									
PESTICIDES/PCBs												
4,4'-DDD	0.020	UJ	C	0.020	UJ	C	0.020	UJ	C	0.020	U	
4,4'-DDE	0.020	UJ	C	0.020	UJ	C	0.020	UJ	C	0.020	U	
4,4'-DDT	0.020	U										
ALDRIN	0.010	U										
ALPHA-BHC	0.010	U										
ALPHA-CHLORDANE	0.10	U										
AROCLOR-1016	0.20	U		0.20	U		0.2	U		0.20	U	
AROCLOR-1221	0.40	U		0.40	U		0.4	U		0.40	U	
AROCLOR-1232	0.20	U		0.20	U		0.2	U		0.20	U	
AROCLOR-1242	0.20	U		0.20	U		0.2	U		0.20	U	
AROCLOR-1248	0.20	U		0.20	U		0.2	U		0.20	U	
AROCLOR-1254	0.20	U		0.20	U		0.2	U		0.20	U	
AROCLOR-1260	0.20	U		0.20	U		0.2	U		0.20	U	
BETA-BHC	0.010	U										
DELTA-BHC	0.010	UJ	C									
DIELDRIN	0.020	U										
ENDOSULFAN I	0.010	U										
ENDOSULFAN II	0.020	U										
ENDOSULFAN SULFATE	0.020	U										
ENDRIN	0.020	UJ	C	0.020	UJ	C	0.020	UJ	C	0.020	U	
ENDRIN ALDEHYDE	0.020	U										
ENDRIN KETONE	0.020	U										
GAMMA-BHC (LINDANE)	0.010	U										
GAMMA-CHLORDANE	0.10	U										
HEPTACHLOR	0.010	U										
HEPTACHLOR EPOXIDE	0.010	U										
METHOXYCHLOR	0.10	U										
TOXAPHENE	1.0	U										

CT08 VSB NEW LONDON
 WATER DATA
 CHEMTECH CONSULTING GROUP
 SDG: 4934

SAMPLE NUMBER:	SWSG20-07	SWSG23-07		
SAMPLE DATE:	06/22/01	06/21/01	//	//
LABORATORY ID:	N4934-04	N4934-09		
QC_TYPE:	NORMAL	NORMAL		
% SOLIDS:	0.0 %	0.0 %	100.0 %	100.0 %
UNITS:	UG/L	UG/L		
FIELD DUPLICATE OF:				

	RESULT	QUAL	CODE									
PESTICIDES/PCBs												
4,4'-DDD	0.020	U		0.020	U							
4,4'-DDE	0.020	U		0.020	U							
4,4'-DDT	0.020	U		0.020	U							
ALDRIN	0.010	U		0.010	U							
ALPHA-BHC	0.010	U		0.010	U							
ALPHA-CHLORDANE	0.10	U		0.10	U							
AROCLOR-1016	0.20	U		0.20	U							
AROCLOR-1221	0.40	U		0.40	U							
AROCLOR-1232	0.20	U		0.20	U							
AROCLOR-1242	0.20	U		0.20	U							
AROCLOR-1248	0.20	U		0.20	U							
AROCLOR-1254	0.20	U		0.20	U							
AROCLOR-1260	0.20	U		0.20	U							
BETA-BHC	0.010	U		0.010	U							
DELTA-BHC	0.010	UJ	C	0.010	U							
DIELDRIN	0.020	U		0.020	U							
ENDOSULFAN I	0.010	U		0.010	U							
ENDOSULFAN II	0.020	U		0.020	U							
ENDOSULFAN SULFATE	0.020	U		0.020	U							
ENDRIN	0.020	U		0.020	U							
ENDRIN ALDEHYDE	0.020	U		0.020	U							
ENDRIN KETONE	0.020	U		0.020	U							
GAMMA-BHC (LINDANE)	0.010	U		0.010	U							
GAMMA-CHLORDANE	0.10	U		0.10	U							
HEPTACHLOR	0.010	U		0.010	U							
HEPTACHLOR EPOXIDE	0.010	U		0.010	U							
METHOXYCHLOR	0.10	U		0.10	U							
TOXAPHENE	1.0	U		1.0	U							

CT08 VSB NEW LONDON
 WATER DATA
 CHEMTECH CONSULTING GROUP
 SDG: 4922

SAMPLE NUMBER:	3-GW37S-07	3MSP01-07		
SAMPLE DATE:	06/19/01	06/19/01	//	//
LABORATORY ID:	N4922-01	N4922-02		
QC_TYPE:	NORMAL	NORMAL		
% SOLIDS:	0.0 %	0.0 %	100.0 %	100.0 %
UNITS:	UG/L	UG/L		
FIELD DUPLICATE OF:				

	RESULT	QUAL	CODE									
PESTICIDES/PCBs												
4,4'-DDD	0.02	U		0.0086	J	P						
4,4'-DDE	0.02	U		0.02	U							
4,4'-DDT	0.02	U		0.02	U							
ALDRIN	0.01	U		0.01	U							
ALPHA-BHC	0.01	U		0.01	U							
ALPHA-CHLORDANE	0.01	U		0.01	U							
AROCLOR-1016	0.20	U		0.20	U							
AROCLOR-1221	0.40	U		0.40	U							
AROCLOR-1232	0.20	U		0.20	U							
AROCLOR-1242	0.20	U		0.20	U							
AROCLOR-1248	0.20	U		0.20	U							
AROCLOR-1254	0.20	U		0.20	U							
AROCLOR-1260	0.20	U		0.20	U							
BETA-BHC	0.01	U		0.01	U							
DELTA-BHC	0.01	U		0.01	U							
DIELDRIN	0.02	U		0.02	U							
ENDOSULFAN I	0.01	U		0.01	U							
ENDOSULFAN II	0.02	U		0.02	U							
ENDOSULFAN SULFATE	0.02	U		0.02	U							
ENDRIN	0.02	U		0.02	U							
ENDRIN ALDEHYDE	0.02	U		0.02	U							
ENDRIN KETONE	0.02	U		0.02	U							
GAMMA-BHC (LINDANE)	0.01	U		0.01	U							
GAMMA-CHLORDANE	0.01	U		0.01	U							
HEPTACHLOR	0.01	U		0.01	U							
HEPTACHLOR EPOXIDE	0.01	U		0.01	U							
METHOXYCHLOR	0.1	U		0.1	U							
TOXAPHENE	1	U		1	U							



Tetra Tech NUS

INTERNAL CORRESPONDENCE

TO: C. RICH DATE: SEPTEMBER 7, 2001
FROM: ANGELA M. SCHEETZ COPIES: DV FILE
SUBJECT: INORGANIC DATA VALIDATION – TAL METALS & MISCELLANEOUS
PARAMETERS
CTO-816 NSB NEW LONDON
SAMPLE DELIVERY GROUP (SDG) – 4934
SAMPLES: 6/Aqueous/
2W-GW41DS-07 2W-GW44DS-07 2W-GW46DS-07
SWSG19-07 SWSG20-07 SWSG23-07

Overview

The sample set for CTO 816, NSB New London, SDG 4934, consists of six (6) aqueous environmental samples. No field duplicate pairs are included within this SDG.

All samples were analyzed for total and dissolved target analyte list (TAL) metals. All samples were analyzed for total target analyte list (TAL) metals, dissolved TAL metals, hardness, total organic carbon (TOC), chemical oxygen demand (COD), alkalinity, chloride, sulfate and total dissolved solids (TDS). Samples designated –F were analyzed for dissolved metals. The samples were collected by TetraTech NUS on June 21, and 22, 2001 and analyzed by Chemtech Consulting Group under Naval Facilities Engineering Service Center (NFESC) Quality Assurance/Quality Control (QA/QC) criteria. Metals analyses, with the exception of mercury, were conducted using Contract Laboratory Program (CLP) method ILM04.1. Mercury analyses were conducted using EPA method 245.1. Analyses for hardness were conducted using Standard Methods, 18th Edition, method 2340B. TOC analyses were conducted using EPA method 415.1. COD analyses were conducted using EPA method 410.4. Analyses for alkalinity were conducted using EPA method 310.1. Analyses for chloride and sulfate were conducted using EPA methods 325.3 and 375.4. TDS analyses were conducted using EPA method 160.1.

All metals analyses, with the exception of mercury, were conducted using Inductively Coupled Plasma (ICP) methodologies. Mercury analyses were conducted using Cold Vapor Atomic Absorption (CVAA). Sulfate and chloride analyses were conducted using Ion Chromatography (IC).

These data were evaluated based on the following parameters:

- * • Data Completeness
- * • Holding Times
- * • Calibration Recoveries
- * • Laboratory Blank Analyses
- * • Laboratory Control Sample Results
- * • ICP Interference Check Sample Results
- * • Matrix Spike Results
- * • Laboratory Duplicate Results
- * • ICP Serial Dilution Results

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DATE: SEPTEMBER 7, 2001

- Sample Quantitation
 - Detection Limits
- * - All quality control criteria were met for this parameter.

Calibration Recoveries

The contract required detection limit (CRDL) percent recoveries for barium, and thallium were < 80% quality control limit. Positive results <3X CRDL and nondetected results for barium and thallium were qualified as estimated, "J" and "UJ", respectively.

The CRDL percent recoveries for lead, selenium, and thallium were >120% quality control limit. Positive results <3X CRDL and nondetected results reported for lead, selenium, and thallium were qualified as estimated, "J" and "UJ", respectively.

Laboratory Blank Analyses

The following contaminants were detected in the laboratory method / preparation blanks at the following maximum concentrations:

<u>Analyte</u>	<u>Maximum Concentration</u>	<u>Action Level</u>
Aluminum	85.8 µg/L	429 µg/L
Antimony	4.5 µg/L	22.5 µg/L
Beryllium	0.20 µg/L	1.0 µg/L
Calcium	89.3 µg/L	446.5 µg/L
Copper	3.1 µg/L	15.5 µg/L
Iron	45.4 µg/L	227 µg/L
Magnesium	82.7 µg/L	413.5 µg/L
Potassium	177.8 µg/L	889 µg/L
Sodium	589.2 µg/L	2946 µg/L

An action level of 5X the maximum concentration was used to evaluate the sample data for blank contamination. Sample aliquot and dilution factors were taken into consideration when evaluating for blank contamination. Positive results less than the blank action levels for aluminum, antimony, beryllium, copper, and iron were qualified, "U", as a result of blank contamination.

Positive results for potassium were qualified as estimated, J due to the absolute value of the negative results of the laboratory blanks being >2X IDL. Nondetected results for iron and beryllium were qualified as estimated, UJ due to the absolute value of the negative results of the laboratory blanks being >2X IDL.

ICP Interference Check Sample Results

The interfering analytes magnesium and calcium were present in sample 2W-GW46DS-07 at concentrations, which were comparable to the levels of magnesium and calcium in the Interference Check Sample (ICS) solution. Several analytes namely chromium, cobalt, copper, manganese, potassium, vanadium and zinc were present in the ICS solution at concentrations which exceeded 2X the absolute value of the Instrument Detection Limit (IDL). Interference affects exist for chromium, cobalt, manganese, vanadium, and zinc in the affected sample. The positive results reported for chromium, cobalt, manganese, vanadium, and zinc were qualified as estimated "J".

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The interfering analyte magnesium was present in sample 2W-GW41DS-07 at a concentration, which was comparable to the level of magnesium in the Interference Check Sample (ICS) solution. Several analytes namely chromium, cobalt, copper, manganese, potassium, vanadium and zinc were present in the ICS solution at concentrations which exceeded 2X the absolute value of the Instrument Detection Limit (IDL). Interference affects exist for manganese, and vanadium in the affected sample. The positive result reported for manganese was qualified as estimated "J". The nondetected result reported for vanadium was qualified as estimated, "UJ".

The interfering analyte magnesium was present in sample 2W-GW41DS-07-F at a concentration, which was comparable to the level of magnesium in the Interference Check Sample (ICS) solution. Several analytes namely chromium, cobalt, copper, manganese, potassium, vanadium and zinc were present in the ICS solution at concentrations which exceeded 2X the absolute value of the Instrument Detection Limit (IDL). Interference affects exist for chromium, manganese and vanadium in the affected sample. The positive results reported for chromium, manganese and vanadium were qualified as estimated "J".

The interfering analyte magnesium was present in sample 2W-GW46DS-07-F at a concentration, which was comparable to the level of magnesium in the Interference Check Sample (ICS) solution. Several analytes namely chromium, cobalt, manganese, and vanadium were present in the ICS solution at concentrations which exceeded 2X the absolute value of the Instrument Detection Limit (IDL). Interference affects exist for chromium, cobalt, manganese and vanadium in the affected sample. The positive results reported for chromium, cobalt, manganese and vanadium were qualified as estimated "J".

Sample Quantitation

Due to uncertainty near the IDL, all positive results less than two times the IDL for arsenic, chromium, cobalt, lead, mercury, nickel, vanadium, and zinc were qualified as estimated, "J".

Notes

The dissolved samples 2W-GW44DS-07 and 2W-GW46DS-07 contain positive results for selenium. The total metals samples report selenium as nondetected. No qualifications were made on this basis.

Executive Summary

Laboratory Performance: Several analytes were present in the laboratory method blanks. Barium, lead, selenium, and thallium were qualified due to calibration noncompliance.

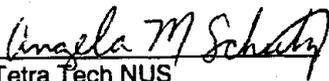
Other Factors Affecting Data Quality: Arsenic, chromium, cobalt, lead, mercury, nickel, vanadium, and zinc were qualified due to uncertainty near the IDL. Several samples had magnesium and calcium as an interfering analyte that was noncompliant.

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DATE: SEPTEMBER 7, 2001

The data for these analyses were reviewed with reference to the "National Functional Guidelines for Inorganic Review", February 1989 and the NFESC document entitled "Navy IRCDQM" (September 1999).

The text of this report has been formulated to address only those problem areas affecting data quality.

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the NFESC Guidelines and the Quality Assurance Project Plan (QAPP)."


Tetra Tech NUS
Angela M. Scheetz
Environmental Scientist


TetraTech NUS
Joseph A. Samchuck
Quality Assurance Officer

Attachments:

1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as reported by the Laboratory
3. Appendix C - Regional Worksheets
4. Appendix D - Support Documentation

APPENDIX A

QUALIFIED LABORATORY RESULTS

**CTO816-NSB NEW LONDON
WATER DATA
CHEMTECH CONSULTING GROUP
SDG: 4934**

SAMPLE NUMBER:	2W-GW41DS-07	2W-GW41DS-07-F	2W-GW44DS-07	2W-GW44DS-07-F
SAMPLE DATE:	06/21/01	06/22/01	06/22/01	06/22/01
LABORATORY ID:	N4934-07	N4934-12	N4934-06	N4934-20
QC_TYPE:	NORMAL	NORMAL	NORMAL	NORMAL
% SOLIDS:	0.0 %	0.0 %	0.0 %	0.0 %
UNITS:	UG/L	UG/L	UG/L	UG/L
FIELD DUPLICATE OF:				

	RESULT	QUAL	CODE									
INORGANICS												
ALUMINUM	45.7	U		45.7	U		79.7	U	A	45.7	U	
ANTIMONY	3.7	U		3.7	U		8.6	U	A	3.7	U	
ARSENIC	5.0	U		5.0	U		8.2	J	P	5.0	U	
BARIUM	15.9	J	C	55.4	J	C	45.4	J	C	42.7	J	C
BERYLLIUM	0.10	UJ	A									
CADMIUM	3.0	U										
CALCIUM	149000			199000			97600			101000		
CHROMIUM	5.0	U		8.9	J	KP	5.0	U		5.0	U	
COBALT	1.8	U										
COPPER	2.2	U		7.0	U	A	2.2	U		7.1	U	A
IRON	22900			35.9	U	A	10200			7.0	UJ	A
LEAD	3.0	UJ	C									
MAGNESIUM	534000			693000			217000			227000		
MANGANESE	396	J	K	308	J	K	376			395		
MERCURY	0.20	U		0.26	J	P	0.20	U		0.20	U	
NICKEL	4.0	U		5.2	J	P	4.0	U		4.0	U	
POTASSIUM	251000			305000			132000			67100		
SELENIUM	5.0	UJ	C	5.0	UJ	C	5.0	UJ	C	47.2		
SILVER	5.0	U										
SODIUM	5120000			5580000			2890000			1680000		
THALLIUM	5.7	UJ	C									
VANADIUM	3.2	UJ	K	10.1	J	K	3.2	U		3.2	U	
ZINC	8.5	U		8.5	U		11.2	J	P	11.8	J	P

**CT0816-NSB NEW LONDON
WATER DATA
CHEMTECH CONSULTING GROUP
SDG: 4934**

SAMPLE NUMBER:	2W-GW46DS-07	2W-GW46DS-07-F	SWSG19-07	SWSG19-07-F
SAMPLE DATE:	06/21/01	06/21/01	06/22/01	06/22/01
LABORATORY ID:	N4934-09	N4934-08	N4934-01	N4934-15
QC_TYPE:	NORMAL	NORMAL	NORMAL	NORMAL
% SOLIDS:	0.0 %	0.0 %	0.0 %	0.0 %
UNITS:	UG/L	UG/L	UG/L	UG/L
FIELD DUPLICATE OF:				

	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
INORGANICS												
ALUMINUM	1560			45.7	U		45.7	U		45.7	U	
ANTIMONY	3.7	U		3.7	U		3.7	U		3.7	U	
ARSENIC	12.9			6.8	J	P	5.0	U		5.0	U	
BARIUM	75.5	J	C	80.5	J	C	27.5	J	C	24.1	J	C
BERYLLIUM	0.10	UJ	A	0.10	UJ	A	0.10	UJ	A	0.10	UJ	A
CADMIUM	3.0	U		3.0	U		3.0	U		3.0	U	
CALCIUM	302000			231000			13600			12700		
CHROMIUM	23.2	J	K	13.9	J	K	5.0	U		5.0	U	
COBALT	12.8	J	K	9.7	J	K	1.8	U		1.8	U	
COPPER	11.6	U	A	13.6	U	A	2.2	U		6.4	U	A
IRON	3920			7.0	UJ	A	3890			941		
LEAD	3.7	J	CP	6.6	J	C	3.0	UJ	C	3.0	UJ	C
MAGNESIUM	1290000			886000			2700			2500		
MANGANESE	173	J	K	64.4	J	K	208			187		
MERCURY	0.20	U		0.20	U		0.20	U		0.20	U	
NICKEL	12.3			6.7	J	P	4.0	U		4.0	U	
POTASSIUM	537000			495000			1780	J	A	1210	J	A
SELENIUM	5.0	UJ	C	17.6			5.0	UJ	C	5.0	UJ	C
SILVER	5.0	U		5.0	U		5.0	U		5.0	U	
SODIUM	1770000			7110000			49200			40900		
THALLIUM	22.4	J	C	16.8	J	C	5.7	UJ	C	5.7	UJ	C
VANADIUM	23.2	J	K	19.1	J	K	3.2	U		3.2	U	
ZINC	43.7	J	K	8.5	U		30.2			43.7		

**CT0816-NSB NEW LONDON
WATER DATA
CHEMTECH CONSULTING GROUP
SDG: 4934**

SAMPLE NUMBER:	SWSG20-07	SWSG20-07-F	SWSG23-07	SWSG23-07-F
SAMPLE DATE:	06/22/01	06/22/01	06/21/01	06/21/01
LABORATORY ID:	N4934-04	N4934-18	N4934-05	N4934-19
QC_TYPE:	NORMAL	NORMAL	NORMAL	NORMAL
% SOLIDS:	0.0 %	0.0 %	0.0 %	0.0 %
UNITS:	UG/L	UG/L	UG/L	UG/L
FIELD DUPLICATE OF:				

	RESULT	QUAL	CODE									
INORGANICS												
ALUMINUM	1690			47.6	U	A	45.7	U		45.7	U	
ANTIMONY	3.7	U										
ARSENIC	5.3	J	P	5.0	U		7.5	J	P	5.0	U	
BARIUM	37.3	J	C	23.8	J	C	42.9	J	C	48.9	J	C
BERYLLIUM	0.21	U	A	0.13	U	A	0.58	U	A	0.10	UJ	A
CADMIUM	3.0	U										
CALCIUM	14300			14200			12200			17600		
CHROMIUM	5.0	U		5.0	U		5.0	U		27.5		
COBALT	1.9	J	P	1.8	U		1.8	U		1.9	J	P
COPPER	7.6	U	A	5.6	U	A	5.3	U	A	5.1	U	A
IRON	4110			612			4750			8160		
LEAD	9.5			3.0	UJ	C	3.0	UJ	C	3.0	UJ	C
MAGNESIUM	2810			2580			2550			3940		
MANGANESE	281			243			278			474		
MERCURY	0.20	U										
NICKEL	4.0	U		4.0	U		4.0	U		15.1		
POTASSIUM	2010	J	A	1170	J	A	1700	J	A	1710	J	A
SELENIUM	5.0	UJ	C									
SILVER	5.0	U										
SODIUM	47300			42000			21600			49100		
THALLIUM	5.7	UJ	C									
VANADIUM	5.6	J	P	3.2	U		3.2	U		3.2	U	
ZINC	109			41.0			108			41.5		

CT0816-NSB NEW LONDON
WATER DATA
CHEMTECH CONSULTING GROUP
SDG: 4934

SAMPLE NUMBER:	2W-GW41DS-07	2W-GW44DS-07	2W-GW46DS-07	SWSG19-07
SAMPLE DATE:	06/21/01	06/22/01	06/21/01	06/22/01
LABORATORY ID:	N4934-12	N4934-06	N4934-08	N4934-01
QC_TYPE:	NORMAL	NORMAL	NORMAL	NORMAL
% SOLIDS:	0.0 %	0.0 %	0.0 %	0.0 %
FIELD DUPLICATE OF:				

	RESULT	QUAL	CODE									
MISCELLANEOUS PARAMETERS												
ALKALINITY(MG/L)	1700			750			2100			27		
CHEMICAL OXYGEN DEMAND(MG/L)	560			650			1280			5	U	
CHLORIDE(MG/L)	9800			3410			16650			60		
HARDNESS(MG/L)	2600			960			6100			45		
SULFATE(MG/L)	580			87			321			7		
TOTAL DISSOLVED SOLIDS(MG/L)	17380			7400			34400			230		
TOTAL ORGANIC CARBON(MG/L)	89			28			140			4.4		



Tetra Tech NUS

INTERNAL CORRESPONDENCE

TO: C. RICH **DATE:** OCTOBER 29, 2001

FROM: ANGELA SCHEETZ **COPIES:** DV FILE
REV. 1

SUBJECT: ORGANIC DATA VALIDATION: VOA / SVOA / PEST / PCB / PAH
CTO 816, NSB NEW LONDON
SDG 4936

SAMPLES: 6 / Aqueous / VOA / SVOA / PEST / PCB / PAH

2W-GW39DS-07	2W-GW40DS-07	2W-GW42DS-07
2W-GW43DS-07	2W-GW45DS-07	SWSG18-07

1 / Aqueous / VOA

GWTB062001

Overview

The sample set for CTO 816, NSB New London; SDG 4936 consists of six (6) aqueous environmental samples and one (1) aqueous trip blank. The 6 aqueous environmental samples were analyzed for TCL volatile organics, TCL semivolatile organics, organochlorine pesticide, polychlorinated biphenyl organic compounds, and polynuclear aromatic hydrocarbons. The trip blank was analyzed for TCL volatile organic compounds only. No field duplicate pairs were included in this SDG.

The samples were collected by TetraTech NUS on June 19, 20 and 21, 2001 and were analyzed by Chemtech Consulting Group. Analyses were conducted using the Contract Laboratory Program (CLP) Statement of Work (SOW) OLC02.1 analytical and reporting protocols.

The data were evaluated based on the following parameters:

- * • Data Completeness
- * • Holding Times
- * • GC/MS Tuning
- • Initial and Continuing Calibration
- * • Laboratory Method and/or Field Quality Control Blanks
- * • Surrogate Spike Recoveries
- * • Blank Spike / Blank Spike Duplicate Recoveries
- * • Internal Standards Performance
- * • Instrument Performance
- * • Compound Identification
- * • Compound Quantitation
- * • Tentatively Identified Compounds (TICs)

The asterisk (*) indicates that all quality control criteria were met for this parameter. Qualified (if applicable) analytical results are summarized in Appendix A. Results as reported by the laboratory are presented in

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 Date: 10/29/01

Appendix B. Appendix C contains Region I worksheets, and Appendix D contains the documentation to support the findings as discussed in this data validation report. The attached Table summarizes the validation qualifications which are based on the following information:

CALIBRATIONS

The following tables summarize calibration noncompliance and corresponding actions for:

<u>Compound</u>	<u>ICV</u> <u>06/29/01</u>	<u>CCV</u> <u>06/30/01</u>
Acetone	DR	R
1,2-dibromo-3-chloropropane	R	RX
2-hexanone	R	R
2-butanone	R	RX
Carbon tetrachloride		X
Chloroform		X
Chloroethane		X
1,1-dichloroethane		X
1,1-dichloroethene		X
1,2-dichloropropane		X
cis-1,3-dichloropropene		X
1,1,1-trichloroethane		X

Associated Samples: All All

<u>Compound</u>	<u>ICV</u> <u>06/24/01</u>	<u>CCV</u> <u>06/30/01</u>	<u>CCV</u> <u>07/02/01</u>
2,4-Dinitrophenol	D		X
2,2-oxybis (1-chloropropane)		X	X
2-Nitroaniline			X
N-nitroso-di-n-propylamine		X	
Isophorone			X
Bis(2-chloroethyl)ether			X
Associated Samples:	All	2W-GW39DS-07 2W-GW40DS-07 2W-GW42DS-07 2W-GW43DS-07 SWSG18-07	2W-GW45DS-07

Calibration Actions:

- D - Percent Relative Standard Deviation > 30%; estimate positive (J) and nondetected (UJ) results.
- X - Percent Difference > 25%; estimate (J) positive and (UJ) nondetected results.
- R - Relative Response Factors < 0.05; estimate positive (J) and reject nondetected (UR) results.

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Date: 10/29/01

<u>Compound</u>	<u>CCV</u> <u>07/07/01</u>	<u>CCV</u> <u>07/07/01</u>
Aldrin		*
Alpha-BHC	*	
Delta-BHC		X
Gamma-BHC	*	
Endrin	X	
Heptachlor epoxide		*
4,4'-DDD	X	
4,4'-DDE		X

Associated Samples:	2W-GW39DS-07	2W-GW39DS-07
	2W-GW40DS-07	2W-GW40DS-07
	2W-GW42DS-07	2W-GW42DS-07
	2W-GW43DS-07	2W-GW43DS-07
	2W-GW45DS-07	2W-GW45DS-07

Calibration Actions for pesticide/PCBs:

D – Percent Relative Standard Deviation > 20% on one analytical column; estimate positive (J) and no action required for nondetected results; on both analytical columns; estimate positive (J) and nondetected (UJ) results.

X - Percent Difference > 15% on both analytical columns; estimate (J) positive and (UJ) nondetected results.

* - Percent Difference > 15% on one analytical column; estimate positive (J) and no action required for nondetected results.

MATRIX SPIKE/MATRIX SPIKE DUPLICATE RESULTS

% Recovery in the matrix spike/matrix spike duplicate exceeded the quality control limits for acenaphthene in the PAH fraction for a sample not included in this SDG. No qualifications were made on this basis since the sample is from another SDG.

% Recovery in the matrix spike/matrix spike duplicate fell below the quality control limits for anthracene in the PAH fraction for a sample included with another SDG. No qualifications were made on this basis since the sample is from another SDG.

Relative percent differences in the matrix spike/matrix spike duplicate in the PAH fraction exceeded the quality control limits for acenaphthylene, acenaphthene, anthracene, and phenanthrene in a sample included with another SDG. No qualifications were made on this basis since the sample was not included with this SDG.

ADDITIONAL COMMENTS

The laboratory did not report to the requested reporting limits in the Statement of Work for the semivolatile, PCB, and PAH fractions. The laboratory was contacted and resubmitted the Form Is for these results.

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Positive results reported at concentrations below the CRQL were qualified as estimated (J).

1,2-dichlorobenzene, 1,3-dichlorobenzene, 1,4-dichlorobenzene, and 1,2,4-trichlorobenzene were reported in both the volatile and semivolatile fractions. Since the reporting limits for the referenced compounds is lower in the volatile fraction (1 ppb), the compounds were removed from the semivolatile fraction.

OVERALL ASSESSMENT

Laboratory Performance: The laboratory was unable to obtain acceptable percent differences between initial and continuing calibration response factors for several volatile, semivolatile, and pesticide compounds.

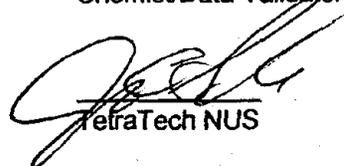
Other Factors Affecting Data Quality: Matrix spike/matrix spike duplicate had recoveries and relative percent differences that were noncompliant in the PAH fraction.

The data for these analyses were reviewed with reference to the Region I EPA "Data Validation Functional Guidelines - Part II" (12/96).

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the NFESC Guidelines and the Quality Assurance Project Plan (QAPP)."


TetraTech NUS

Angela Scheetz
Chemist/Data Validator


TetraTech NUS

Joseph A. Samchuck
Data Validation Quality Assurance Officer

Attachments:

1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as Reported by the Laboratory
3. Appendix C - Regional Worksheets
4. Appendix D - Support Documentation

APPENDIX A

QUALIFIED LABORATORY RESULTS

CTO816-NSB NEW LONDON
WATER DATA
CHEMTECH CONSULTING GROUP
SDG: 4936

SAMPLE NUMBER:	2W-GW39DS-07	2W-GW40DS-07	2W-GW42DS-07	2W-GW43DS-07
SAMPLE DATE:	06/20/01	06/20/01	06/20/01	06/20/01
LABORATORY ID:	N4936-04	N4936-06	N4936-07	N4936-10
QC_TYPE:	NORMAL	NORMAL	NORMAL	NORMAL
% SOLIDS:	0.0 %	0.0 %	0.0 %	0.0 %
UNITS:	UG/L	UG/L	UG/L	UG/L
FIELD DUPLICATE OF:				

	RESULT	QUAL	CODE									
VOLATILES												
1,1,1-TRICHLOROETHANE	1	UJ	C									
1,1,2,2-TETRACHLOROETHANE	1	U		1	U		1	U		1	U	
1,1,2-TRICHLOROETHANE	1	U		1	U		1	U		1	U	
1,1-DICHLOROETHANE	1	UJ	C									
1,1-DICHLOROETHENE	1	UJ	C									
1,2,4-TRICHLOROENZENE	1	U		1	U		1	U		1	U	
1,2-DIBROMO-3-CHLOROPROPANE	1	UR	C									
1,2-DIBROMOETHANE	1	U		1	U		1	U		1	U	
1,2-DICHLOROENZENE	1	U		1	U		1	U		1	U	
1,2-DICHLOROETHANE	1	U		1	U		1	U		1	U	
1,2-DICHLOROPROPANE	1	UJ	C									
1,3-DICHLOROENZENE	1	U		1	U		1	U		1	U	
1,4-DICHLOROENZENE	1	U		1	U		1	U		1	U	
2-BUTANONE	5	UR	C									
2-HEXANONE	5	UR	C									
4-METHYL-2-PENTANONE	5	U		5	U		5	U		5	U	
ACETONE	5	UR	C									
BENZENE	1	U		1	U		1	U		1	U	
BROMOCHLOROMETHANE	1	U		1	U		1	U		1	U	
BROMODICHLOROMETHANE	1	U		1	U		1	U		1	U	
BROMOFORM	1	U		1	U		1	U		1	U	
BROMOMETHANE	1	U		1	U		1	U		1	U	
CARBON DISULFIDE	1	U		2			1.2			7.6		
CARBON TETRACHLORIDE	1	UJ	C									
CHLOROENZENE	1	U		1	U		1	U		1	U	
CHLORODIBROMOMETHANE	1	U		1	U		1	U		1	U	
CHLOROETHANE	1	UJ	C									
CHLOROFORM	1	UJ	C									
CHLOROMETHANE	1	U		1	U		1	U		1	U	
CIS-1,2-DICHLOROETHENE	1	U		1	U		1	U		1	U	
CIS-1,3-DICHLOROPROPENE	1	UJ	C									
ETHYLBENZENE	1	U		1	U		1	U		1	U	

**CT0816-NSB NEW LONDON
WATER DATA
CHEMTECH CONSULTING GROUP
SDG: 4936**

SAMPLE NUMBER:	2W-GW39DS-07	2W-GW40DS-07	2W-GW42DS-07	2W-GW43DS-07
SAMPLE DATE:	06/20/01	06/20/01	06/20/01	06/20/01
LABORATORY ID:	N4936-04	N4936-06	N4936-07	N4936-10
QC_TYPE:	NORMAL	NORMAL	NORMAL	NORMAL
% SOLIDS:	0.0 %	0.0 %	0.0 %	0.0 %
UNITS:	UG/L	UG/L	UG/L	UG/L
FIELD DUPLICATE OF:				

	RESULT	QUAL	CODE									
VOLATILES												
METHYLENE CHLORIDE	1.2	J	P	0.6	J	P	0.5	J	P	0.8	J	P
O-XYLENE	1	U		1	U		1	U		1	U	
STYRENE	1	U		1	U		1	U		1	U	
TETRACHLOROETHENE	1	U		1	U		1	U		1	U	
TOLUENE	0.6	J	P	1	U		1	U		1	U	
TOTAL XYLENES	1	U		1	U		1	U		1	U	
TRANS-1,2-DICHLOROETHENE	1	U		1	U		1	U		1	U	
TRANS-1,3-DICHLOROPROPENE	1	U		1	U		1	U		1	U	
TRICHLOROETHENE	1	U		1	U		1	U		1	U	
VINYL CHLORIDE	1	U		1	U		1	U		1	U	

CT0816-NSB NEW LONDON
WATER DATA
CHEMTECH CONSULTING GROUP
SDG: 4936

SAMPLE NUMBER:
 SAMPLE DATE:
 LABORATORY ID:
 QC_TYPE:
 % SOLIDS:
 UNITS:
 FIELD DUPLICATE OF:

2W-GW45DS-07
 06/20/01
 N4936-02
 NORMAL
 0.0 %
 UG/L

GWTB062001
 06/20/01
 N4936-09
 NORMAL
 0.0 %
 UG/L

SWSG18-07
 06/20/01
 N4936-01
 NORMAL
 0.0 %
 UG/L

//
 100.0 %

	RESULT	QUAL	CODE									
VOLATILES												
1,1,1-TRICHLOROETHANE	1	UJ	C	1	UJ	C	1	UJ	C			
1,1,2,2-TETRACHLOROETHANE	1	U		1	U		1	U				
1,1,2-TRICHLOROETHANE	1	U		1	U		1	U				
1,1-DICHLOROETHANE	1	UJ	C	1	UJ	C	1	UJ	C			
1,1-DICHLOROETHENE	1	UJ	C	1	UJ	C	1	UJ	C			
1,2,4-TRICHLOROENZENE	1	U		1	U		1	U				
1,2-DIBROMO-3-CHLOROPROPANE	1	UR	C	1	UR	C	1	UR	C			
1,2-DIBROMOETHANE	1	U		1	U		1	U				
1,2-DICHLOROENZENE	1	U		1	U		1	U				
1,2-DICHLOROETHANE	1	U		1	U		1	U				
1,2-DICHLOROPROPANE	1	UJ	C	1	UJ	C	1	UJ	C			
1,3-DICHLOROENZENE	1	U		1	U		1	U				
1,4-DICHLOROENZENE	1	U		1	U		1	U				
2-BUTANONE	5	UR	C	5	UR	C	5	UR	C			
2-HEXANONE	5	UR	C	5	UR	C	5	UR	C			
4-METHYL-2-PENTANONE	5	U		5	U		5	U				
ACETONE	5	UR	C	5	UR	C	5	UR	C			
BENZENE	1	U		1	U		1	U				
BROMOCHLOROMETHANE	1	U		1	U		1	U				
BROMODICHLOROMETHANE	1	U		1	U		1	U				
BROMOFORM	1	U		1	U		1	U				
BROMOMETHANE	1	U		1	U		1	U				
CARBON DISULFIDE	2.2			1	U		1	U				
CARBON TETRACHLORIDE	1	UJ	C	1	UJ	C	1	UJ	C			
CHLOROENZENE	1	U		1	U		1	U				
CHLORODIBROMOMETHANE	1	U		1	U		1	U				
CHLOROETHANE	1	UJ	C	1	UJ	C	1	UJ	C			
CHLOROFORM	1	UJ	C	1	UJ	C	1	UJ	C			
CHLOROMETHANE	1	U		1	U		1	U				
CIS-1,2-DICHLOROETHENE	1	U		1	U		1	U				
CIS-1,3-DICHLOROPROPENE	1	UJ	C	1	UJ	C	1	UJ	C			
ETHYLBENZENE	1	U		1	U		1	U				

CT0816-NSB NEW LONDON
 WATER DATA
 CHEMTECH CONSULTING GROUP
 SDG: 4936

SAMPLE NUMBER:	2W-GW45DS-07	GWTB062001	SWSG18-07	
SAMPLE DATE:	06/20/01	06/20/01	06/20/01	//
LABORATORY ID:	N4936-02	N4936-09	N4936-01	
QC_TYPE:	NORMAL	NORMAL	NORMAL	
% SOLIDS:	0.0 %	0.0 %	0.0 %	100.0 %
UNITS:	UG/L	UG/L	UG/L	
FIELD DUPLICATE OF:				

	RESULT	QUAL	CODE									
VOLATILES												
METHYLENE CHLORIDE	1	J	P	2	U		0.7	J	P			
O-XYLENE	1	U		1	U		1	U				
STYRENE	1	U		1	U		1	U				
TETRACHLOROETHENE	1	U		1	U		1	U				
TOLUENE	1	U		1	U		1	U				
TOTAL XYLENES	1	U		1	U		1	U				
TRANS-1,2-DICHLOROETHENE	1	U		1	U		1	U				
TRANS-1,3-DICHLOROPROPENE	1	U		1	U		1	U				
TRICHLOROETHENE	1	U		1	U		1	U				
VINYL CHLORIDE	1	U		1	U		1	U				

**CTO816-NSB NEW LONDON
WATER DATA
CHEMTECH CONSULTING GROUP
SDG: 4936**

SAMPLE NUMBER:	2W-GW39DS-07	2W-GW40DS-07	2W-GW42DS-07	2W-GW43DS-07
SAMPLE DATE:	06/19/01	06/19/01	06/20/01	06/21/01
LABORATORY ID:	N4936-03	N4936-05	N4936-07	N4936-11
QC_TYPE:	NORMAL	NORMAL	NORMAL	NORMAL
% SOLIDS:	0.0 %	0.0 %	0.0 %	0.0 %
UNITS:	UG/L	UG/L	UG/L	UG/L
FIELD DUPLICATE OF:				

	RESULT	QUAL	CODE									
SEMIVOLATILES												
1,2,4-TRICHLOROENZENE	5	U		5	U		5	U		5	U	
1,2-DICHLOROENZENE	5	U		5	U		5	U		5	U	
1,3-DICHLOROENZENE	5	U		5	U		5	U		5	U	
1,4-DICHLOROENZENE	5	U		5	U		5	U		5	U	
2,2'-OXYBIS(1-CHLOROPROPANE)	5	UJ	C									
2,4,5-TRICHLOROPHENOL	5	U		5	U		5	U		5	U	
2,4,6-TRICHLOROPHENOL	20	U										
2,4-DICHLOROPHENOL	5	U		5	U		5	U		5	U	
2,4-DIMETHYLPHENOL	5	U		5	U		5	U		5	U	
2,4-DINITROPHENOL	20	UJ	C									
2,4-DINITROTOLUENE	5	U		5	U		5	U		5	U	
2,6-DINITROTOLUENE	5	U		5	U		5	U		5	U	
2-CHLORONAPHTHALENE	5	U		5	U		5	U		5	U	
2-CHLOROPHENOL	5	U		5	U		5	U		5	U	
2-METHYLNAPHTHALENE	5	U		5	U		5	U		5	U	
2-METHYLPHENOL	5	U		5	U		5	U		5	U	
2-NITROANILINE	20	U										
2-NITROPHENOL	5	U		5	U		5	U		5	U	
3&4-METHYLPHENOL	5	U		5	U		5	U		5	U	
3,3'-DICHLOROENZIDINE	5	U		5	U		5	U		5	U	
3-NITROANILINE	20	U										
4,6-DINITRO-2-METHYLPHENOL	20	U										
4-BROMOPHENYL PHENYL ETHER	5	U		5	U		5	U		5	U	
4-CHLORO-3-METHYLPHENOL	5	U		5	U		5	U		5	U	
4-CHLOROANILINE	5	U		5	U		5	U		5	U	
4-CHLOROPHENYL PHENYL ETHER	5	U		5	U		5	U		5	U	
4-NITROANILINE	20	U										
4-NITROPHENOL	20	U										
BENZOIC ACID	5	U		5	U		5	U		5	U	
BIS(2-CHLOROETHOXY)METHANE	5	U		5	U		5	U		5	U	
BIS(2-CHLOROETHYL)ETHER	5	U		5	U		5	U		5	U	
BIS(2-ETHYLHEXYL)PHTHALATE	3	J	P	4.1	J	P	3.1	J	P	4.2	J	P

**CT0816-NSB NEW LONDON
WATER DATA
CHEMTECH CONSULTING GROUP
SDG: 4936**

SAMPLE NUMBER:
SAMPLE DATE:
LABORATORY ID:
QC_TYPE:
% SOLIDS:
UNITS:
FIELD DUPLICATE OF:

2W-GW39DS-07
06/19/01
N4936-03
NORMAL
0.0 %
UG/L

2W-GW40DS-07
06/19/01
N4936-05
NORMAL
0.0 %
UG/L

2W-GW42DS-07
06/20/01
N4936-07
NORMAL
0.0 %
UG/L

2W-GW43DS-07
06/21/01
N4936-11
NORMAL
0.0 %
UG/L

	RESULT	QUAL	CODE									
SEMIVOLATILES												
BUTYL BENZYL PHTHALATE	5	U		0.6	J	P	5	U		5	U	
CARBAZOLE	5	U		5	U		5	U		5	U	
DI-N-BUTYL PHTHALATE	1.2	J	P	1.5	J	P	2	J	P	1.6	J	P
DI-N-OCTYL PHTHALATE	5	U		5	U		5	U		5	U	
DIBENZOFURAN	5	U		5	U		5	U		5	U	
DIETHYL PHTHALATE	5	U		5	U		5	U		5	U	
DIMETHYL PHTHALATE	5	U		5	U		5	U		5	U	
HEXACHLOROBENZENE	5	U		5	U		5	U		5	U	
HEXACHLOROBUTADIENE	5	U		5	U		5	U		5	U	
HEXACHLOROCYCLOPENTADIENE	5	U		5	U		5	U		5	U	
HEXACHLOROETHANE	5	U		5	U		5	U		5	U	
ISOPHORONE	5	U		5	U		5	U		5	U	
N-NITROSO-DI-N-PROPYLAMINE	5	UJ	C									
N-NITROSODIPHENYLAMINE	5	U		5	U		5	U		5	U	
NITROBENZENE	5	U		5	U		5	U		5	U	
PENTACHLOROPHENOL	20	U										
PHENOL	5	U		5	U		5	U		5	U	

CT0816-NSB NEW LONDON
WATER DATA
CHEMTECH CONSULTING GROUP
SDG: 4936

SAMPLE NUMBER:	2W-GW45DS-07	SWSG18-07		
SAMPLE DATE:	06/20/01	06/20/01	//	//
LABORATORY ID:	N4936-02	N4936-01		
QC_TYPE:	NORMAL	NORMAL		
% SOLIDS:	0.0 %	0.0 %	100.0 %	100.0 %
UNITS:	UG/L	UG/L		
FIELD DUPLICATE OF:				

	RESULT	QUAL	CODE									
SEMIVOLATILES												
1,2,4-TRICHLOROENZENE	5	U		5	U							
1,2-DICHLOROENZENE	5	U		5	U							
1,3-DICHLOROENZENE	5	U		5	U							
1,4-DICHLOROENZENE	5	U		5	U							
2,2'-OXYBIS(1-CHLOROPROPANE)	5	UJ	C	5	UJ	C						
2,4,5-TRICHLOROPHENOL	5	U		5	U							
2,4,6-TRICHLOROPHENOL	20	U		20	U							
2,4-DICHLOROPHENOL	5	U		5	U							
2,4-DIMETHYLPHENOL	5	U		5	U							
2,4-DINITROPHENOL	20	UJ	C	20	UJ	C						
2,4-DINITROTOLUENE	5	U		5	U							
2,6-DINITROTOLUENE	5	U		5	U							
2-CHLORONAPHTHALENE	5	U		5	U							
2-CHLOROPHENOL	5	U		5	U							
2-METHYLNAPHTHALENE	5	U		5	U							
2-METHYLPHENOL	5	U		5	U							
2-NITROANILINE	20	UJ	C	20	U							
2-NITROPHENOL	5	U		5	U							
3&4-METHYLPHENOL	5	UJ	C	5	U							
3,3'-DICHLOROBENZIDINE	5	U		5	U							
3-NITROANILINE	20	U		20	U							
4,6-DINITRO-2-METHYLPHENOL	20	U		20	U							
4-BROMOPHENYL PHENYL ETHER	5	U		5	U							
4-CHLORO-3-METHYLPHENOL	5	U		5	U							
4-CHLOROANILINE	5	U		5	U							
4-CHLOROPHENYL PHENYL ETHER	5	U		5	U							
4-NITROANILINE	20	U		20	U							
4-NITROPHENOL	20	U		20	U							
BENZOIC ACID	5	U		5	U							
BIS(2-CHLOROETHOXY)METHANE	5	U		5	U							
BIS(2-CHLOROETHYL)ETHER	5	UJ	C	5	U							
BIS(2-ETHYLHEXYL)PHTHALATE	1.3	J	P	2.1	J	P						

CT0816-NSB NEW LONDON
WATER DATA
CHEMTECH CONSULTING GROUP
SDG: 4936

SAMPLE NUMBER:	2W-GW45DS-07	SWSG18-07		
SAMPLE DATE:	06/20/01	06/20/01	//	//
LABORATORY ID:	N4936-02	N4936-01		
QC_TYPE:	NORMAL	NORMAL		
% SOLIDS:	0.0 %	0.0 %	100.0 %	100.0 %
UNITS:	UG/L	UG/L		
FIELD DUPLICATE OF:				

	RESULT	QUAL	CODE									
SEMIVOLATILES												
BUTYL BENZYL PHTHALATE	5	U		5	U							
CARBAZOLE	5	U		5	U							
DI-N-BUTYL PHTHALATE	0.6	J	P	0.8	J	P						
DI-N-OCTYL PHTHALATE	5	U		5	U							
DIBENZOFURAN	5	U		5	U							
DIETHYL PHTHALATE	5	U		5	U							
DIMETHYL PHTHALATE	5	U		5	U							
HEXACHLOROENZENE	5	U		5	U							
HEXACHLOROBUTADIENE	5	U		5	U							
HEXACHLOROCYCLOPENTADIENE	5	U		5	U							
HEXACHLOROETHANE	5	U		5	U							
ISOPHORONE	5	UJ	C	5	U							
N-NITROSO-DI-N-PROPYLAMINE	5	UJ	C	5	UJ	C						
N-NITROSODIPHENYLAMINE	5	U		5	U							
NITROBENZENE	5	U		5	U							
PENTACHLOROPHENOL	20	U		20	U							
PHENOL	5	U		5	U							

CT0816-NSB NEW LONDON
WATER DATA
CHEMTECH CONSULTING GROUP
SDG: 4936

SAMPLE NUMBER:	2W-GW39DS-07	2W-GW40DS-07	2W-GW42DS-07	2W-GW43DS-07
SAMPLE DATE:	06/19/01	06/20/01	06/20/01	06/21/01
LABORATORY ID:	N4936-03	N4936-06	N4936-08	N4936-11
QC_TYPE:	NORMAL	NORMAL	NORMAL	NORMAL
% SOLIDS:	0.0 %	0.0 %	0.0 %	0.0 %
UNITS:	UG/L	UG/L	UG/L	UG/L
FIELD DUPLICATE OF:				

	RESULT	QUAL	CODE									
POLYNUCLEAR AROMATIC HYDROCARBONS												
ACENAPHTHENE	0.016	U										
ACENAPHTHYLENE	0.013	U		0.013	U		1.0			0.013	U	
ANTHRACENE	0.35			0.03	U		0.03	U		0.34		
BENZO(A)ANTHRACENE	0.012	U										
BENZO(A)PYRENE	0.021	U		0.021	U		0.021	U		1.0		
BENZO(B)FLUORANTHENE	0.02	U										
BENZO(G,H,I)PERYLENE	0.009	U										
BENZO(K)FLUORANTHENE	0.02	U										
CHRYSENE	0.012	U										
DIBENZO(A,H)ANTHRACENE	0.014	U										
FLUORANTHENE	0.009	U										
FLUORENE	0.007	U										
INDENO(1,2,3-CD)PYRENE	0.008	U										
NAPHTHALENE	0.008	U										
PHENANTHRENE	0.004	U		0.1			22			0.4		
PYRENE	0.008	U										

CT0816-NSB NEW LONDON
 WATER DATA
 CHEMTECH CONSULTING GROUP
 SDG: 4936

SAMPLE NUMBER:	2W-GW45DS-07	SWSG18-07		
SAMPLE DATE:	06/20/01	06/20/01	//	//
LABORATORY ID:	N4936-02	N4936-01		
QC_TYPE:	NORMAL	NORMAL		
% SOLIDS:	0.0 %	0.0 %	100.0 %	100.0 %
UNITS:	UG/L	UG/L		
FIELD DUPLICATE OF:				

	RESULT	QUAL	CODE									
POLYNUCLEAR AROMATIC HYDROCARBONS												
ACENAPHTHENE	0.016	U		0.016	U							
ACENAPHTHYLENE	0.3			0.013	U							
ANTHRACENE	0.03	U		0.13								
BENZO(A)ANTHRACENE	0.012	U		0.012	U							
BENZO(A)PYRENE	0.021	U		0.021	U							
BENZO(B)FLUORANTHENE	0.02	U		0.02	U							
BENZO(G,H,I)PERYLENE	0.009	U		0.009	U							
BENZO(K)FLUORANTHENE	0.02	U		0.02	U							
CHRYSENE	0.012	U		0.012	U							
DIBENZO(A,H)ANTHRACENE	0.014	U		0.014	U							
FLUORANTHENE	0.009	U		0.009	U							
FLUORENE	0.007	U		0.007	U							
INDENO(1,2,3-CD)PYRENE	110			0.008	U							
NAPHTHALENE	0.008	U		0.008	U							
PHENANTHRENE	4.5			0.004	U							
PYRENE	0.008	U		0.008	U							

CTO816-NSB NEW LONDON
WATER DATA
CHEMTECH CONSULTING GROUP
SDG: 4936

SAMPLE NUMBER:
 SAMPLE DATE:
 LABORATORY ID:
 QC_TYPE:
 % SOLIDS:
 UNITS:
 FIELD DUPLICATE OF:

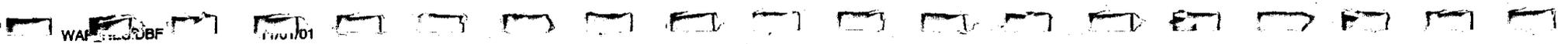
2W-GW39DS-07
 06/19/01
 N4936-03
 NORMAL
 0.0 %
 UG/L

2W-GW40DS-07
 06/19/01
 N4936-05
 NORMAL
 0.0 %
 UG/L

2W-GW42DS-07
 06/20/01
 N4936-07
 NORMAL
 0.0 %
 UG/L

2W-GW43DS-07
 06/20/01
 N4936-10
 NORMAL
 0.0 %
 UG/L

	RESULT	QUAL	CODE									
PESTICIDES/PCBs												
4,4'-DDD	0.020	UJ	C									
4,4'-DDE	0.020	UJ	C									
4,4'-DDT	0.020	U										
ALDRIN	0.010	U										
ALPHA-BHC	0.010	U										
ALPHA-CHLORDANE	0.010	U										
AROCLOR-1016	0.20	U										
AROCLOR-1221	0.40	U										
AROCLOR-1232	0.20	U										
AROCLOR-1242	0.20	U										
AROCLOR-1248	0.20	U										
AROCLOR-1254	0.20	U										
AROCLOR-1260	0.20	U										
BETA-BHC	0.010	U										
DELTA-BHC	0.010	U		0.010	U		0.010	UJ	C	0.010	UJ	C
DIELDRIN	0.020	U										
ENDOSULFAN I	0.010	U										
ENDOSULFAN II	0.020	U										
ENDOSULFAN SULFATE	0.020	U										
ENDRIN	0.020	UJ	C									
ENDRIN ALDEHYDE	0.020	U										
ENDRIN KETONE	0.020	U										
GAMMA-BHC (LINDANE)	0.010	U										
GAMMA-CHLORDANE	0.010	U										
HEPTACHLOR	0.010	U										
HEPTACHLOR EPOXIDE	0.010	U										
METHOXYCHLOR	0.10	U										
TOXAPHENE	1.0	U										



**CTO816-NSB NEW LONDON
WATER DATA
CHEMTECH CONSULTING GROUP
SDG: 4936**

SAMPLE NUMBER:	2W-GW45DS-07	SWSG18-07		
SAMPLE DATE:	06/20/01	06/20/01	//	//
LABORATORY ID:	N4936-02	N4936-01		
QC TYPE:	NORMAL	NORMAL		
% SOLIDS:	0.0 %	0.0 %	100.0 %	100.0 %
UNITS:	UG/L	UG/L		
FIELD DUPLICATE OF:				

	RESULT	QUAL	CODE									
PESTICIDES/PCBs												
4,4'-DDD	0.020	UJ	C	0.020	U							
4,4'-DDE	0.020	UJ	C	0.020	U							
4,4'-DDT	0.020	U		0.020	U							
ALDRIN	0.010	U		0.010	U							
ALPHA-BHC	0.010	U		0.010	U							
ALPHA-CHLORDANE	0.010	U		0.010	U							
AROCLOR-1016	0.20	U		0.20	U							
AROCLOR-1221	0.40	U		0.40	U							
AROCLOR-1232	0.20	U		0.20	U							
AROCLOR-1242	0.20	U		0.20	U							
AROCLOR-1248	0.20	U		0.20	U							
AROCLOR-1254	0.20	U		0.20	U							
AROCLOR-1260	0.20	U		0.20	U							
BETA-BHC	0.010	U		0.010	U							
DELTA-BHC	0.010	UJ	C	0.010	U							
DIELDRIN	0.020	U		0.020	U							
ENDOSULFAN I	0.010	U		0.010	U							
ENDOSULFAN II	0.020	U		0.020	U							
ENDOSULFAN SULFATE	0.020	U		0.020	U							
ENDRIN	0.020	UJ	C	0.020	U							
ENDRIN ALDEHYDE	0.020	U		0.020	U							
ENDRIN KETONE	0.020	U		0.020	U							
GAMMA-BHC (LINDANE)	0.010	U		0.010	U							
GAMMA-CHLORDANE	0.010	U		0.010	U							
HEPTACHLOR	0.010	U		0.010	U							
HEPTACHLOR EPOXIDE	0.010	U		0.010	U							
METHOXYCHLOR	0.10	U		0.10	U							
TOXAPHENE	1.0	U		1.0	U							

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DATE: AUGUST 13, 2001

Calibration Recoveries

The contract required detection limit (CRDL) percent recovery for selenium on 7/16/01 at 12:20 was < 80% quality control limit, affecting the total metals matrix. Positive and nondetected results reported for selenium in the affected samples were qualified as estimated, "J" and "UJ", respectively.

The CRDL percent recovery for mercury on 7/6/01 was < 80% quality control limit, affecting the total metals matrix. Positive and nondetected results reported for mercury in the affected samples were qualified as estimated, "J" and "UJ", respectively.

The CRDL percent recoveries for lead and zinc on 7/18/01 at 14:14 were >120% quality control limit, affecting the dissolved metals matrix. The positive result reported for zinc was qualified as estimated, "J". No validation action was taken for lead because the results for lead were reported as nondetected by the laboratory.

The CRDL percent recovery for selenium on 7/18/01 at 14:14 was < 80% quality control limit, affecting the dissolved metals matrix. Nondetected results reported for selenium in the affected samples were qualified as estimated, "UJ".

Laboratory Blank Analyses

The following contaminants were detected in the laboratory method blanks at the following maximum concentrations:

Samples affected: Total Metals

<u>Analyte</u>	<u>Maximum Concentration</u>	<u>Action Level</u>
Beryllium	0.10 µg/L	0.50 µg/L
Calcium	103.6 µg/L	518 µg/L
Iron	51.0 µg/L	255 µg/L
Magnesium	99.3 µg/L	496.5 µg/L

An action level of 5X the maximum concentration was used to evaluate the sample data for blank contamination. Sample aliquot and dilution factors were taken into consideration when evaluating for blank contamination. No validation action was necessary because the results were either reported as nondetected by the laboratory or were greater than the action levels.

Samples affected: Dissolved Metals

<u>Analyte</u>	<u>Maximum Concentration</u>	<u>Action Level</u>
Aluminum	36.1 µg/L	180.5 µg/L
Arsenic	6.8 µg/L	34.0 µg/L
Calcium	31.5 µg/L	157.5 µg/L
Iron	32.5 µg/L	162.5 µg/L
Magnesium	28.9 µg/L	144.5 µg/L
Manganese	0.60 µg/L	3.0 µg/L
Selenium	3.7 µg/L	18.5 µg/L
Zinc	4.0 µg/L	20.0 µg/L

An action level of 5X the maximum concentration was used to evaluate the sample data for blank contamination. Sample aliquot and dilution factors were taken into consideration when evaluating for blank contamination. Positive results less than the action level reported for

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DATE: AUGUST 13, 2001

aluminum, antimony, iron, selenium and zinc were qualified "U" as a result of blank contamination.

ICP Interference Check Sample Results

The interfering analyte magnesium was present in samples 2W-GW40DS-07, 2W-GW42DS-07, 2W-GW43DS-07 and 2W-GW45DS-07 at concentrations that were comparable to the level of magnesium in the Interference Check Sample (ICS) solution. Several analytes namely cobalt, copper, manganese and potassium were present in the ICS solution at concentrations that exceeded 2X the absolute value of the Instrument Detection Limit (IDL). Interference effects exist for copper in the affected samples. The nondetected results reported for copper were qualified as estimated, "UJ".

The interfering analyte magnesium was present in samples 2W-GW42DS-07-F and 2W-GW43DS-07-F at concentrations that were comparable to the level of magnesium in the Interference Check Sample (ICS) solution. Several analytes namely antimony, barium, cadmium, chromium, cobalt, manganese, nickel, potassium and zinc were present in the ICS solution at concentrations that exceeded 2X the absolute value of the Instrument Detection Limit (IDL). Interference effects exist for antimony, chromium and cobalt in the affected samples. The positive results reported for antimony, chromium and cobalt were qualified as estimated, "J".

The interfering analyte magnesium was present in sample 2W-GW40DS-07-F at a concentration that was comparable to the level of magnesium in the Interference Check Sample (ICS) solution. Several analytes namely antimony, barium, cadmium, chromium, cobalt, manganese, nickel, potassium and zinc were present in the ICS solution at concentrations that exceeded 2X the absolute value of the Instrument Detection Limit (IDL). Interference effects exist for antimony and chromium in the affected sample. The positive results reported for antimony and chromium were qualified as estimated, "J".

The interfering analyte magnesium was present in sample 2W-GW45DS-07-F at a concentration that was comparable to the level of magnesium in the Interference Check Sample (ICS) solution. Several analytes namely antimony, barium, cadmium, chromium, cobalt, manganese, nickel, potassium and zinc were present in the ICS solution at concentrations that exceeded 2X the absolute value of the Instrument Detection Limit (IDL). Interference effects exist for chromium, cobalt and manganese in the affected sample. The positive results reported for cobalt and manganese were qualified as estimated, "J". The nondetected result reported for chromium was qualified as estimated, "UJ".

Sample Quantitation

Due to uncertainty near the IDL, positive results less than two times the IDL reported for antimony, arsenic, beryllium, chromium, cobalt, mercury, nickel, selenium and vanadium were qualified as estimated, "J".

Notes

The Matrix Spike (MS) percent recovery for chloride was >125% quality control limit; however, no validation action was taken because the sample that was used for the MS was not one of the samples of interest.

The ICP serial dilution percent differences for potassium and sodium were >15% quality control limit, affecting the total metals matrix. The sample that was used for the serial dilution was not one of the samples of interest; therefore, no validation action was taken.

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DATE: AUGUST 13, 2001

The ICP serial dilution percent difference for potassium was >15% quality control limit, affecting the dissolved metals matrix. The sample that was used for the serial dilution was not one of the samples of interest; therefore, no validation action was taken.

Two different ICP instruments were used to analyze the samples in this SDG. The total metals samples were analyzed on ICP P1 and the dissolved metals samples were analyzed on ICP P2. Each instrument has a different set of IDLs; therefore, some positive and nondetected results in the total and dissolved metals matrices are not comparable.

Executive Summary

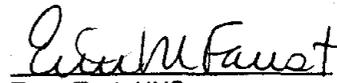
Laboratory Performance: Several analytes were present in the laboratory method blanks. Mercury, selenium and zinc were qualified due to calibration noncompliance.

Other Factors Affecting Data Quality: Antimony, arsenic, beryllium, chromium, cobalt, mercury, nickel, selenium and vanadium were qualified due to uncertainty near the IDL. The interfering analyte magnesium was present in several samples.

The data for these analyses were reviewed with reference to the "National Functional Guidelines for Inorganic Review", February 1989 and the NFESC document entitled "Navy IRCDQM" (September 1999).

The text of this report has been formulated to address only those problem areas affecting data quality.

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the NFESC Guidelines and the Quality Assurance Project Plan (QAPP)."


Tetra Tech NUS
Erin M. Faust
Environmental Scientist


Tetra Tech NUS
Joseph A. Samchuck
Quality Assurance Officer

Attachments:

1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as reported by the Laboratory
3. Appendix C - Regional Worksheets
4. Appendix D - Support Documentation

APPENDIX A
QUALIFIED ANALYTICAL RESULTS

Qualifier Codes:

- A = Lab Blank Contamination
- B = Field Blank Contamination
- C = Calibration (i.e., % RSDs, %Ds, ICVs, CCVs, RPDs, RRFs, etc.) Noncompliance
- D = MS/MSD Noncompliance
- E = LCS/LCSD Noncompliance
- F = Lab Duplicate Imprecision
- G = Field Duplicate Imprecision
- H = Holding Time Exceedance
- I = ICP Serial Dilution Noncompliance
- J = GFAA PDS - GFAA MSA's $r < 0.995$
- K = ICP Interference - include ICSAB % R's
- L = Instrument Calibration Range Exceedance
- M = Sample Preservation
- N = Internal Standard Noncompliance
- N01 = Internal Standard Noncompliance Dioxins
- N02 = Recovery Standard Noncompliance Dioxins
- N03 = Clean-up Standard Noncompliance Dioxins
- O = Poor Instrument Performance (i.e., base-time drifting)
- P = Uncertainty near detection limit ($< 2 \times$ IDL for inorganics and $<$ CRQL for organics)
- Q = Other problems (can encompass a number of issues)
- R = Surrogates Recovery Noncompliance
- S = Pesticide/PCB Resolution
- T = % Breakdown Noncompliance for DDT and Endrin
- U = Pest/PCD% between columns for positive results
- V = Non-linear calibrations, tuning $r < 0.995$ (correlation coefficient)
- W = EMPC result
- X = Signal to noise response drop
- Y = Percent solids $< 30\%$
- Z = Uncertainty at 2 sigma deviation is less than sample activity

**CTO816-NSB NEW LONDON
WATER DATA
CHEMTECH CONSULTING GROUP
SDG: 4936**

SAMPLE NUMBER:
SAMPLE DATE:
LABORATORY ID:
QC_TYPE:
% SOLIDS:
UNITS:
FIELD DUPLICATE OF:

2W-GW39DS-07
06/19/01
N4936-03
NORMAL
0.0 %
UG/L

2W-GW39DS-07-F
06/19/01
N4936-03
NORMAL
0.0 %
UG/L

2W-GW40DS-07
06/20/01
N4936-06
NORMAL
0.0 %
UG/L

2W-GW40DS-07-F
06/20/01
N4936-14
NORMAL
0.0 %
UG/L

	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
INORGANICS												
ALUMINUM	1440			16.9	U		1410			16.9	U	
ANTIMONY	3.7	U		8.9	U		3.7	U		23.6	J	K
ARSENIC	13.5			12.8	U	A	8.1	J	P	6.2	U	
BARIUM	22.5			17.5			52.2			61.6		
BERYLLIUM	0.10	U		0.10	U		0.10	U		0.29		
CADMIUM	3.0	U		0.60	U		3.0	U		0.60	U	
CALCIUM	25700			35400			167000			213000		
CHROMIUM	5.0	U		0.60	U		5.0	U		1.6	J	K
COBALT	1.8	U		0.90	U		1.8	U		6.1		
COPPER	2.2	U		1.5	U		2.2	UJ	K	1.5	U	
IRON	13500			9230			5330			1180		
LEAD	3.0	U		3.0	U		3.0	U		3.0	U	
MAGNESIUM	18400			28200			592000			749000		
MANGANESE	311			413			228			234		
MERCURY	0.20	UJ	C	0.20	U		0.20	UJ	C	0.20	U	
NICKEL	4.0	U		1.6	UJ	C	4.0	U		1.8	UJ	C
POTASSIUM	41300			57100			391000			397000		
SELENIUM	5.0	UJ	C	1.6	UJ	C	5.0	UJ	C	1.6	UJ	C
SILVER	5.0	U		1.7	U		5.0	U		1.7	U	
SODIUM	563000			716000			8930000			7690000		
THALLIUM	5.7	U		4.3	U		5.7	U		4.3	U	
VANADIUM	8.8			1.2	U		10.6			4.5		
ZINC	123			16.0	U	A	8.5	U		17.0	U	A

**CTO816-NSB NEW LONDON
WATER DATA
CHEMTECH CONSULTING GROUP
SDG: 4936**

SAMPLE NUMBER:	2W-GW42DS-07	2W-GW42DS-07-F	2W-GW43DS-07	2W-GW43DS-07-F
SAMPLE DATE:	06/20/01	06/20/01	06/20/01	06/20/01
LABORATORY ID:	N4936-07	N4936-15	N4936-10	N4936-16
QC_TYPE:	NORMAL	NORMAL	NORMAL	NORMAL
% SOLIDS:	0.0 %	0.0 %	0.0 %	0.0 %
UNITS:	UG/L	UG/L	UG/L	UG/L
FIELD DUPLICATE OF:				

	RESULT	QUAL	CODE									
INORGANICS												
ALUMINUM	45.7	U		16.9	U		171			16.9	U	
ANTIMONY	3.7	U		13.0	J	KP	3.7	U		18.1	J	K
ARSENIC	9.7	J	P	6.2	U		9.3	J	P	6.2	U	
BARIUM	59.8			56.4			111			106		
BERYLLIUM	0.10	U		0.18	J	P	0.10	U		0.22		
CADMIUM	0.70	U		0.60	U		0.70	U		0.60	U	
CALCIUM	14300			160000			211000			235000		
CHROMIUM	4.0	J	P	6.4	J	K	7.7	J	P	5.3	J	K
COBALT	1.8	U		3.7	J	K	1.8	U		4.5	J	K
COPPER	2.2	UJ	K	1.5	U		2.2	UJ	K	1.5	U	
IRON	5740			15.8	U		2270			57.6	U	A
LEAD	3.0	U										
MAGNESIUM	382000			459000			679000			939000		
MANGANESE	317			304			239			192		
MERCURY	0.20	UJ	C	0.20	U		0.20	UJ	C	0.20	U	
NICKEL	4.0	U		1.6	U		4.0	U		1.6	U	
POTASSIUM	237000			227000			360000			400000		
SELENIUM	3.5	J	CP	1.6	UJ	C	5.4	J	CP	1.6	UJ	C
SILVER	5.0	U		1.7	U		5.0	U		1.7	U	
SODIUM	5350000			4750000			9230000			8390000		
THALLIUM	5.7	U		4.3	U		5.7	U		4.3	U	
VANADIUM	4.0	J	P	1.6	J	P	6.2	J	P	1.7	J	P
ZINC	8.5	U		13.0	U	A	8.5	U		15.3	U	A

**CT0816-NSB NEW LONDON
WATER DATA
CHEMTECH CONSULTING GROUP
SDG: 4936**

SAMPLE NUMBER:	2W-GW45DS-07	2W-GW45DS-07-F	SWSG18-07	SWSG18-07-F
SAMPLE DATE:	06/20/01	06/20/01	06/20/01	06/20/01
LABORATORY ID:	N4936-02	N4936-13	N4936-01	N4936-12
QC_TYPE:	NORMAL	NORMAL	NORMAL	NORMAL
% SOLIDS:	0.0 %	0.0 %	0.0 %	0.0 %
UNITS:	UG/L	UG/L	UG/L	UG/L
FIELD DUPLICATE OF:				

	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
INORGANICS												
ALUMINUM	552			16.9	U		45.7	U		32.5	U	A
ANTIMONY	3.7	U		8.9	U		3.7	U		8.9	U	
ARSENIC	10.4			11.4	U	A	5.0	U		6.2	U	
BARIUM	65.1			61.7			32.6			31.0		
BERYLLIUM	0.10	U		0.15	J	P	0.10	U		0.10	U	
CADMIUM	3.0	U		0.60	U		3.0	U		0.60	U	
CALCIUM	179000			190000			15000			14800		
CHROMIUM	5.0	U		0.60	UJ	K	5.0	U		0.60	U	
COBALT	1.8	U		2.3	J	K	1.8	U		1.4	J	P
COPPER	2.2	UJ	K	1.5	U		2.2	U		1.5	U	
IRON	1650			198			10600			3000		
LEAD	3.0	U		3.0	U		3.0	U		3.0	U	
MAGNESIUM	697000			842000			2700			2670		
MANGANESE	130			78.5	J	K	498			465		
MERCURY	0.35	J	CP	0.20	U		0.20	UJ	C	0.20	U	
NICKEL	4.0	U		1.6	U		4.0	U		1.9	J	P
POTASSIUM	355000			411000			1070			2060		
SELENIUM	5.0	UJ	C	3.5	U	A	5.0	UJ	C	3.2	U	A
SILVER	5.0	U		1.7	U		5.0	U		1.7	U	
SODIUM	8530000			8210000			40300			39800		
THALLIUM	5.7	U		4.3	U		5.7	U		4.3	U	
VANADIUM	9.9			8.4			3.2	U		1.2	U	
ZINC	8.5	U		11.4	U	A	55.9			47.0	J	C

**CTO816-NSB NEW LONDON
WATER DATA
CHEMTECH CONSULTING GROUP
SDG: 4936**

SAMPLE NUMBER:	2W-GW39DS-07	2W-GW40DS-07	2W-GW42DS-07	2W-GW43DS-07
SAMPLE DATE:	06/20/01	06/20/01	06/20/01	06/21/01
LABORATORY ID:	N4936-03	N4936-06	N4936-07	N4936-11
QC_TYPE:	NORMAL	NORMAL	NORMAL	NORMAL
% SOLIDS:	0.0 %	0.0 %	0.0 %	0.0 %
FIELD DUPLICATE OF:				

	RESULT	QUAL	CODE									
MISCELLANEOUS PARAMETERS												
ALKALINITY(MG/L)	180			1400			900			2300		
CHEMICAL OXYGEN DEMAND(MG/L)	33.0			460			590			530		
CHLORIDE(MG/L)	370			13000			7330			13000		
HARDNESS(MG/L)	140			2900			1600			3400		
SULFATE(MG/L)	4.0			782			167			154		
TOTAL DISSOLVED SOLIDS(MG/L)	870			20000			11000			25000		
TOTAL ORGANIC CARBON(MG/L)	6.1			24.0			24.0			29.0		

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The asterisk (*) indicates that all quality control criteria were met for this parameter. Qualified (if applicable) analytical results are summarized in Appendix A. Results as reported by the laboratory are presented in Appendix B. Appendix C contains Region I worksheets, and Appendix D contains the documentation to support the findings as discussed in this data validation report. The attached Table summarizes the validation qualifications which are based on the following information:

CALIBRATIONS

The following tables summarize calibration noncompliance and corresponding actions for:

<u>Compound</u>	<u>ICV</u> <u>07/05/01</u>	<u>CCV</u> <u>07/05/01</u>
Acetone	DR	R
1,2-dibromo-3-chloropropane	DR	RX
2-hexanone	DR	R
2-butanone	R	R
4-methyl-2-pentanone	D	
1,2,4-trichlorobenzene	D	
Carbon Disulfide		X
Chloroethane		X
1,1-dichloroethane		X
1,1-dichloroethene		X
trans-1,2-dichloroethene		X
Associated Samples:	All	All

<u>Compound</u>	<u>ICV</u> <u>06/29/01</u>	<u>CCV</u> <u>07/06/01</u>
4-Chlorophenyl phenyl ether	D	
2-Methylnaphthalene		X
3,3'-Dichlorobenzidine		X
4-Nitroaniline		X
Associated Samples:	All	All

Calibration Actions:

D - Percent Relative Standard Deviation > 30%; estimate positive (J) and nondetected (UJ) results.
X - Percent Difference > 25%; estimate (J) positive and (UJ) nondetected results.
R - Relative Response Factors < 0.05; estimate positive (J) and reject nondetected (UR) results.

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BLANKS

The following contaminants were detected in the trip blank:

<u>Compound</u>	<u>Maximum Concentration</u>	<u>Action Level</u>
Methylene chloride	1.0 µg/L	10.0 µg/L

Samples Affected: All
Blank Actions:

- Value < Contract Required Quantitation Limit (CRQL); report CRQL followed by a U.
- Value > CRQL and < action level; report value followed by a U.
- Value > CRQL and > action level; report value unqualified.

Dilution factors and sample aliquots were taken into consideration when applying blank action levels. Positive results for methylene chloride were qualified in the manner indicated by the blank action table. Field quality control blanks were not qualified due to blank contamination.

SURROGATE RECOVERY

% Recoveries of the semivolatile surrogates Nitrobenzene-d5, 2-Fluorobiphenyl, and Terphenyl-d14 fell below the quality control limits in several samples. Because at least two of the neutral/base surrogates were out for each sample, the positive and nondetected results were qualified as estimated, J and UJ, respectively in all samples.

MATRIX SPIKE/MATRIX SPIKE DUPLICATE RESULTS

% Recovery in the matrix spike/matrix spike duplicate exceeded the quality control limits for gamma-BHC, endrin, and gamma-chlordane in sample 2L-GW20S-07. No qualifications were made on this basis since the results were all nondetected.

A relative percent difference in the matrix spike/matrix spike duplicate in the PAH fraction exceeded the quality control limits for anthracene. No qualifications were made on this basis since the %Rs were compliant.

FIELD DUPLICATE RESULTS

Phenathrene results were qualified as estimated, J in both 2W-GW21S-07 and GWFD06230101 due to field duplicate noncompliance. The duplicate summary is included in Appendix D.

ADDITIONAL COMMENTS

The laboratory did not report to the requested reporting limits in the Statement of Work for the semivolatile, PCB, and PAH fractions. The laboratory was contacted and resubmitted the Form Is for these results.

Positive results reported at concentrations below the CRQL were qualified as estimated (J).

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In the pesticide fraction in samples 2W-GW21S-07 and GWFD06230101, 4,4-DDD had results that exceeded the linear range. The samples were diluted by 40X and reanalyzed. The reanalyzed results were used for 4,4-DDD.

1,2-Dichlorobenzene, 1,3-dichlorobenzene, 1,4-dichlorobenzene, and 1,2,4-trichlorobenzene were reported in both the volatile and semivolatile fractions. Since the reporting limits for the referenced compounds is lower in the volatile fraction (1 ppb), the compounds were removed from the semivolatile fraction.

OVERALL ASSESSMENT

Laboratory Performance: Methylene chloride was detected in the laboratory blank and/or field quality control blank analyses. The laboratory was unable to obtain acceptable percent differences between initial and continuing calibration response factors for several volatile and semivolatile compounds. Surrogate recoveries were below the quality control limits in the semivolatile fraction.

Other Factors Affecting Data Quality: Matrix spike/matrix spike duplicate had recoveries and relative percent differences that were noncompliant. Dilution factors were used in the pesticide fraction.

The data for these analyses were reviewed with reference to the Region I EPA "Data Validation Functional Guidelines - Part II" (12/96).

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the NFESC Guidelines and the Quality Assurance Project Plan (QAPP)."


TetraTech NUS

Angela Scheetz
Chemist/Data Validator


TetraTech NUS

Joseph A. Samchuck
Data Validation Quality Assurance Officer

Attachments:

1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as Reported by the Laboratory
3. Appendix C - Regional Worksheets
4. Appendix D - Support Documentation

APPENDIX A

QUALIFIED LABORATORY RESULTS

CTO816-NSB NEW LONDON
 WATER DATA
 CHEMTECH CONSULTING GROUP
 SDG: 4960

SAMPLE NUMBER:
 SAMPLE DATE:
 LABORATORY ID:
 QC_TYPE:
 % SOLIDS:
 UNITS:
 FIELD DUPLICATE OF:

2L-GW20S-07
 06/24/01
 N4960-08
 NORMAL
 0.0 %
 UG/L

2W-GW21S-07
 06/23/01
 N4960-03
 NORMAL
 0.0 %
 UG/L

2W-GW38DS-07
 06/24/01
 N4960-07
 NORMAL
 0.0 %
 UG/L

2W-GW47DS-07
 06/23/01
 N4960-04
 NORMAL
 0.0 %
 UG/L

	RESULT	QUAL	CODE									
VOLATILES												
1,1,1-TRICHLOROETHANE	1	U		1	U		1	U		1	U	
1,1,2,2-TETRACHLOROETHANE	1	U		1	U		1	U		1	U	
1,1,2-TRICHLOROETHANE	1	U		1	U		1	U		1	U	
1,1-DICHLOROETHANE	1	UJ	C									
1,1-DICHLOROETHENE	1	UJ	C									
1,2,4-TRICHLOROBENZENE	1	UJ	C									
1,2-DIBROMO-3-CHLOROPROPANE	1	UR	C									
1,2-DIBROMOETHANE	1	U		1	U		1	U		1	U	
1,2-DICHLOROBENZENE	1	U		1	U		1	U		1	U	
1,2-DICHLOROETHANE	1	U		1	U		1	U		1	U	
1,2-DICHLOROPROPANE	1	U		1	U		1	U		1	U	
1,3-DICHLOROBENZENE	1	U		1	U		1	U		1	U	
1,4-DICHLOROBENZENE	1	U		1	U		1	U		1	U	
2-BUTANONE	5	UR	C									
2-HEXANONE	5	UR	C									
4-METHYL-2-PENTANONE	5	UJ	C									
ACETONE	5	UR	C									
BENZENE	1	U		1	U		1	U		1	U	
BROMOCHLOROMETHANE	1	U		1	U		1	U		1	U	
BROMODICHLOROMETHANE	1	U		1	U		1	U		1	U	
BROMOFORM	1	U		1	U		1	U		1	U	
BROMOMETHANE	1	U		1	U		1	U		1	U	
CARBON DISULFIDE	1	UJ	C	1.5	J	C	1	UJ	C	1	UJ	C
CARBON TETRACHLORIDE	1	U		1	U		1	U		1	U	
CHLOROENZENE	1	U		1	U		1	U		1	U	
CHLORODIBROMOMETHANE	1	U		1	U		1	U		1	U	
CHLOROETHANE	1	UJ	C									
CHLOROFORM	1	U		1	U		1	U		1	U	
CHLOROMETHANE	1	U		1	U		1	U		1	U	
CIS-1,2-DICHLOROETHENE	1	U		1	U		1	U		1	U	
CIS-1,3-DICHLOROPROPENE	1	U		1	U		1	U		1	U	
ETHYL BENZENE	1	U		1	U		1	U		1	U	

CT0816-NSB NEW LONDON
WATER DATA
CHEMTECH CONSULTING GROUP
SDG: 4960

SAMPLE NUMBER:	2L-GW20S-07	2W-GW21S-07	2W-GW38DS-07	2W-GW47DS-07
SAMPLE DATE:	06/24/01	06/23/01	06/24/01	06/23/01
LABORATORY ID:	N4960-08	N4960-03	N4960-07	N4960-04
QC_TYPE:	NORMAL	NORMAL	NORMAL	NORMAL
% SOLIDS:	0.0 %	0.0 %	0.0 %	0.0 %
UNITS:	UG/L	UG/L	UG/L	UG/L
FIELD DUPLICATE OF:				

	RESULT	QUAL	CODE									
VOLATILES												
METHYLENE CHLORIDE	2	U	A	2	U		2	U	A	2	U	
O-XYLENE	1	U		1	U		1	U		1	U	
STYRENE	1	U		1	U		1	U		1	U	
TETRACHLOROETHENE	1	U		1	U		1	U		1	U	
TOLUENE	1	U		1	U		1	U		1	U	
TOTAL XYLENES	1	U		1	U		1	U		1	U	
TRANS-1,2-DICHLOROETHENE	1	UJ	C									
TRANS-1,3-DICHLOROPROPENE	1	U		1	U		1	U		1	U	
TRICHLOROETHENE	1	U		1	U		1	U		1	U	
VINYL CHLORIDE	1	U		1	U		1	U		1	U	

CTO816-NSB NEW LONDON
 WATER DATA
 CHEMTECH CONSULTING GROUP
 SDG: 4960

SAMPLE NUMBER:	GWFD06230101	GWTB062301	SWSG21-07	
SAMPLE DATE:	06/23/01	06/23/01	06/24/01	//
LABORATORY ID:	N4960-02	N4960-01	N4960-11	
QC_TYPE:	NORMAL	NORMAL	NORMAL	
% SOLIDS:	0.0 %	0.0 %	0.0 %	100.0 %
UNITS:	UG/L	UG/L	UG/L	
FIELD DUPLICATE OF:	2W-GW21S-07			

	RESULT	QUAL	CODE									
VOLATILES												
1,1,1-TRICHLOROETHANE	1	U		1	U		1	U				
1,1,2,2-TETRACHLOROETHANE	1	U		1	U		1	U				
1,1,2-TRICHLOROETHANE	1	U		1	U		1	U				
1,1-DICHLOROETHANE	1	UJ	C	1	UJ	C	1	UJ	C			
1,1-DICHLOROETHENE	1	UJ	C	1	UJ	C	1	UJ	C			
1,2,4-TRICHLOROENZENE	1	UJ	C	1	UJ	C	1	UJ	C			
1,2-DIBROMO-3-CHLOROPROPANE	1	UR	C	1	UR	C	1	UR	C			
1,2-DIBROMOETHANE	1	U		1	U		1	U				
1,2-DICHLOROENZENE	1	U		1	U		1	U				
1,2-DICHLOROETHANE	1	U		1	U		1	U				
1,2-DICHLOROPROPANE	1	U		1	U		1	U				
1,3-DICHLOROENZENE	1	U		1	U		1	U				
1,4-DICHLOROENZENE	1	U		1	U		1	U				
2-BUTANONE	5	UR	C	5	UR	C	5	UR	C			
2-HEXANONE	5	UR	C	5	UR	C	5	UR	C			
4-METHYL-2-PENTANONE	5	UJ	C	5	UJ	C	5	UJ	C			
ACETONE	5	UR	C	5	UR	C	5	UR	C			
BENZENE	1	U		1	U		1	U				
BROMOCHLOROMETHANE	1	U		1	U		1	U				
BROMODICHLOROMETHANE	1	U		1	U		1	U				
BROMOFORM	1	U		1	U		1	U				
BROMOMETHANE	1	U		1	U		1	U				
CARBON DISULFIDE	2.5	J	C	1	UJ	C	1	UJ	C			
CARBON TETRACHLORIDE	1	U		1	U		1	U				
CHLOROENZENE	1	U		1	U		1	U				
CHLORODIBROMOMETHANE	1	U		1	U		1	U				
CHLOROETHANE	1	UJ	C	1	UJ	C	1	UJ	C			
CHLOROFORM	1	U		1	U		1	U				
CHLOROMETHANE	1	U		1	U		1	U				
CIS-1,2-DICHLOROETHENE	1	U		1	U		1	U				
CIS-1,3-DICHLOROPROPENE	1	U		1	U		1	U				
ETHYL BENZENE	1	U		1	U		1	U				

**CTO816-NSB NEW LONDON
WATER DATA
CHEMTECH CONSULTING GROUP
SDG: 4960**

SAMPLE NUMBER:	GWFD06230101	GWTB062301	SWSG21-07	
SAMPLE DATE:	06/23/01	06/23/01	06/24/01	//
LABORATORY ID:	N4960-02	N4960-01	N4960-11	
QC_TYPE:	NORMAL	NORMAL	NORMAL	
% SOLIDS:	0.0 %	0.0 %	0.0 %	100.0 %
UNITS:	UG/L	UG/L	UG/L	
FIELD DUPLICATE OF:	2W-GW21S-07			

	RESULT	QUAL	CODE									
VOLATILES												
METHYLENE CHLORIDE	2	U		1	J	P	2	U				
O-XYLENE	1	U		1	U		1	U				
STYRENE	1	U		1	U		1	U				
TETRACHLOROETHENE	1	U		1	U		1	U				
TOLUENE	1	U		1	U		1	U				
TOTAL XYLENES	1	U		1	U		1	U				
TRANS-1,2-DICHLOROETHENE	1	UJ	C	1	UJ	C	1	UJ	C			
TRANS-1,3-DICHLOROPROPENE	1	U		1	U		1	U				
TRICHLOROETHENE	1	U		1	U		1	U				
VINYL CHLORIDE	1	U		1	U		1	U				

**CT0816-NSB NEW LONDON
WATER DATA
CHEMTECH CONSULTING GROUP
SDG: 4960**

SAMPLE NUMBER:
SAMPLE DATE:
LABORATORY ID:
QC_TYPE:
% SOLIDS:
UNITS:
FIELD DUPLICATE OF:

2L-GW20S-07
06/24/01
N4960-08
NORMAL
0.0 %
UG/L

2W-GW21S-07
06/23/01
N4960-03
NORMAL
0.0 %
UG/L

2W-GW38DS-07
06/23/01
N4960-06
NORMAL
0.0 %
UG/L

2W-GW47DS-07
06/23/01
N4960-04
NORMAL
0.0 %
UG/L

	RESULT	QUAL	CODE									
SEMIVOLATILES												
1,2,4-TRICHLOROENZENE	5	U		5	U		5	U		5	U	
1,2-DICHLOROENZENE	5	U		5	U		5	U		5	U	
1,3-DICHLOROENZENE	5	U		5	U		5	U		5	U	
1,4-DICHLOROENZENE	5	U		5	U		5	U		5	U	
2,2'-OXYBIS(1-CHLOROPROPANE)	5	UJ	R									
2,4,5-TRICHLOROPHENOL	5	U		5	U		5	U		5	U	
2,4,6-TRICHLOROPHENOL	20	U										
2,4-DICHLOROPHENOL	5	U		5	U		5	U		5	U	
2,4-DIMETHYLPHENOL	5	U		5	U		5	U		5	U	
2,4-DINITROPHENOL	20	U										
2,4-DINITROTOLUENE	5	UJ	R									
2,6-DINITROTOLUENE	5	UJ	R									
2-CHLORONAPHTHALENE	5	UJ	R									
2-CHLOROPHENOL	5	U		5	U		5	U		5	U	
2-METHYLNAPHTHALENE	5	UJ	CR									
2-METHYLPHENOL	5	U		5	U		5	U		5	U	
2-NITROANILINE	20	UJ	R									
2-NITROPHENOL	5	U		5	U		5	U		5	U	
3&4-METHYLPHENOL	5	U		5	U		5	U		5	U	
3,3'-DICHLOROENZIDINE	5	UJ	CR									
3-NITROANILINE	20	UJ	R									
4,6-DINITRO-2-METHYLPHENOL	20	U										
4-BROMOPHENYL PHENYL ETHER	5	UJ	R									
4-CHLORO-3-METHYLPHENOL	5	U		5	U		5	U		5	U	
4-CHLOROANILINE	5	UJ	R									
4-CHLOROPHENYL PHENYL ETHER	5	UJ	R									
4-NITROANILINE	20	UJ	CR									
4-NITROPHENOL	20	U										
BENZOIC ACID	5	U		5	U		5	U		5	U	
BIS(2-CHLOROETHOXY)METHANE	5	UJ	R									
BIS(2-CHLOROETHYL)ETHER	5	UJ	R									
BIS(2-ETHYLHEXYL)PHTHALATE	1.3	J	PR	1.4	J	PR	1.9	J	PR	1.6	J	PR

**CT0816-NSB NEW LONDON
WATER DATA
CHEMTECH CONSULTING GROUP
SDG: 4960**

SAMPLE NUMBER:	2L-GW20S-07	2W-GW21S-07	2W-GW38DS-07	2W-GW47DS-07
SAMPLE DATE:	06/24/01	06/23/01	06/23/01	06/23/01
LABORATORY ID:	N4960-08	N4960-03	N4960-06	N4960-04
QC_TYPE:	NORMAL	NORMAL	NORMAL	NORMAL
% SOLIDS:	0.0 %	0.0 %	0.0 %	0.0 %
UNITS:	UG/L	UG/L	UG/L	UG/L
FIELD DUPLICATE OF:				

	RESULT	QUAL	CODE									
SEMIVOLATILES												
BUTYL BENZYL PHTHALATE	5	UJ	R									
CARBAZOLE	5	UJ	R									
DI-N-BUTYL PHTHALATE	1.5	J	PR	0.7	J	PR	1.5	J	PR	1.7	J	PR
DI-N-OCTYL PHTHALATE	5	UJ	R									
DIBENZOFURAN	5	UJ	R									
DIETHYL PHTHALATE	5	UJ	R									
DIMETHYL PHTHALATE	5	UJ	R									
HEXACHLOROENZENE	5	UJ	R									
HEXACHLOROBUTADIENE	5	UJ	R									
HEXACHLOROCYCLOPENTADIENE	5	UJ	R									
HEXACHLOROETHANE	5	UJ	R									
ISOPHORONE	5	UJ	R									
N-NITROSO-DI-N-PROPYLAMINE	5	UJ	R									
N-NITROSODIPHENYLAMINE	5	UJ	R									
NITROBENZENE	5	UJ	R									
PENTACHLOROPHENOL	20	U										
PHENOL	5	U		5	U		5	U		5	U	

CTO816-NSB NEW LONDON
WATER DATA
CHEMTECH CONSULTING GROUP
SDG: 4960

SAMPLE NUMBER:	GWFD06230101	SWSG21-07		
SAMPLE DATE:	06/23/01	06/24/01	//	//
LABORATORY ID:	N4960-02	N4960-11		
QC_TYPE:	NORMAL	NORMAL		
% SOLIDS:	0.0 %	0.0 %	100.0 %	100.0 %
UNITS:	UG/L	UG/L		
FIELD DUPLICATE OF:	2W-GW21S-07			

	RESULT	QUAL	CODE									
SEMIVOLATILES												
1,2,4-TRICHLOROENZENE	5	U		5	U							
1,2-DICHLOROENZENE	5	U		5	U							
1,3-DICHLOROENZENE	5	U		5	U							
1,4-DICHLOROENZENE	5	U		5	U							
2,2-OXYBIS(1-CHLOROPROPANE)	5	UJ	R	5	UJ	R						
2,4,5-TRICHLOROPHENOL	5	U		5	U							
2,4,6-TRICHLOROPHENOL	20	U		20	U							
2,4-DICHLOROPHENOL	5	U		5	U							
2,4-DIMETHYLPHENOL	5	U		5	U							
2,4-DINITROPHENOL	20	U		20	U							
2,4-DINITROTOLUENE	5	UJ	R	5	UJ	R						
2,6-DINITROTOLUENE	5	UJ	R	5	UJ	R						
2-CHLORONAPHTHALENE	5	UJ	R	5	UJ	R						
2-CHLOROPHENOL	5	U		5	U							
2-METHYLNAPHTHALENE	5	UJ	CR	5	UJ	CR						
2-METHYLPHENOL	5	U		5	U							
2-NITROANILINE	20	UJ	R	20	UJ	R						
2-NITROPHENOL	5	U		5	U							
3&4-METHYLPHENOL	5	U		5	U							
3,3'-DICHLOROENZIDINE	5	UJ	CR	5	UJ	CR						
3-NITROANILINE	20	UJ	R	20	UJ	R						
4,6-DINITRO-2-METHYLPHENOL	20	U		20	U							
4-BROMOPHENYL PHENYL ETHER	5	UJ	R	5	UJ	R						
4-CHLORO-3-METHYLPHENOL	5	U		5	U							
4-CHLOROANILINE	5	UJ	R	5	UJ	R						
4-CHLOROPHENYL PHENYL ETHER	5	UJ	R	5	UJ	R						
4-NITROANILINE	20	UJ	CR	20	UJ	CR						
4-NITROPHENOL	20	U		20	U							
BENZOIC ACID	5	U		5	U							
BIS(2-CHLOROETHOXY)METHANE	5	UJ	R	5	UJ	R						
BIS(2-CHLOROETHYL)ETHER	5	UJ	R	5	UJ	R						
BIS(2-ETHYLHEXYL)PHTHALATE	1.4	J	PR	1.9	J	PR						

CTO816-NSB NEW LONDON
WATER DATA
CHEMTECH CONSULTING GROUP
SDG: 4960

SAMPLE NUMBER:	GWFD06230101	SWSG21-07		
SAMPLE DATE:	06/23/01	06/24/01	//	//
LABORATORY ID:	N4960-02	N4960-11		
QC_TYPE:	NORMAL	NORMAL		
% SOLIDS:	0.0 %	0.0 %	100.0 %	100.0 %
UNITS:	UG/L	UG/L		
FIELD DUPLICATE OF:	2W-GW21S-07			

	RESULT	QUAL	CODE									
SEMIVOLATILES												
BUTYL BENZYL PHTHALATE	5	UJ	R	5	UJ	R						
CARBAZOLE	5	UJ	R	5	UJ	R						
DI-N-BUTYL PHTHALATE	5	UJ	R	1.5	J	PR						
DI-N-OCTYL PHTHALATE	5	UJ	R	5	UJ	R						
DIBENZOFURAN	5	UJ	R	5	UJ	R						
DIETHYL PHTHALATE	5	UJ	R	0.5	J	R						
DIMETHYL PHTHALATE	5	UJ	R	5	UJ	R						
HEXACHLOROBENZENE	5	UJ	R	5	UJ	R						
HEXACHLOROBUTADIENE	5	UJ	R	5	UJ	R						
HEXACHLOROCYCLOPENTADIENE	5	UJ	R	5	UJ	R						
HEXACHLOROETHANE	5	UJ	R	5	UJ	R						
ISOPHORONE	5	UJ	R	5	UJ	R						
N-NITROSO-DI-N-PROPYLAMINE	5	UJ	R	5	UJ	R						
N-NITROSODIPHENYLAMINE	5	UJ	R	5	UJ	R						
NITROBENZENE	5	UJ	R	5	UJ	R						
PENTACHLOROPHENOL	20	U		20	U							
PHENOL	5	U		5	U							

CTO816-NSB NEW LONDON
WATER DATA
CHEMTECH CONSULTING GROUP
SDG: 4960

SAMPLE NUMBER:	2L-GW20S-07	2W-GW21S-07	2W-GW38DS-07	2W-GW47DS-07
SAMPLE DATE:	06/24/01	06/23/01	06/21/01	06/23/01
LABORATORY ID:	N4960-08	N4960-03	N4960-05	N4960-04
QC_TYPE:	NORMAL	NORMAL	NORMAL	NORMAL
% SOLIDS:	0.0 %	0.0 %	0.0 %	0.0 %
UNITS:	UG/L	UG/L	UG/L	UG/L
FIELD DUPLICATE OF:				

	RESULT	QUAL	CODE									
PESTICIDES/PCBs												
4,4'-DDD	0.02	U		5.2			0.02	U		0.021		
4,4'-DDE	0.02	U										
4,4'-DDT	0.02	U										
ALDRIN	0.01	U										
ALPHA-BHC	0.01	U										
ALPHA-CHLORDANE	0.1	U										
AROCLOR-1016	0.20	U										
AROCLOR-1221	0.40	U										
AROCLOR-1232	0.20	U										
AROCLOR-1242	0.20	U										
AROCLOR-1248	0.20	U										
AROCLOR-1254	0.20	U										
AROCLOR-1260	0.20	U										
BETA-BHC	0.01	U		0.4	U		0.01	U		0.01	U	
DELTA-BHC	0.01	U		0.4	U		0.01	U		0.01	U	
DIELDRIN	0.02	U		0.8	U		0.02	U		0.02	U	
ENDOSULFAN I	0.01	U		0.4	U		0.01	U		0.01	U	
ENDOSULFAN II	0.02	U		0.8	U		0.02	U		0.02	U	
ENDOSULFAN SULFATE	0.02	U		0.8	U		0.02	U		0.02	U	
ENDRIN	0.02	U		0.8	U		0.02	U		0.02	U	
ENDRIN ALDEHYDE	0.02	U		0.8	U		0.02	U		0.02	U	
ENDRIN KETONE	0.02	U		0.8	U		0.02	U		0.02	U	
GAMMA-BHC (LINDANE)	0.01	U		0.4	U		0.01	U		0.01	U	
GAMMA-CHLORDANE	0.1	U		0.4	U		0.1	U		0.1	U	
HEPTACHLOR	0.01	U		0.4	U		0.01	U		0.01	U	
HEPTACHLOR EPOXIDE	0.01	U		0.4	U		0.01	U		0.01	U	
METHOXYCHLOR	0.1	U		4	U		0.1	U		0.1	U	
TOXAPHENE	1	U		40	U		1	U		1	U	

CTO816-NSB NEW LONDON
 WATER DATA
 CHEMTECH CONSULTING GROUP
 SDG: 4960

SAMPLE NUMBER:	GWFD06230101	SWSG21-07		
SAMPLE DATE:	06/23/01	06/24/01	//	//
LABORATORY ID:	N4960-02	N4960-11		
QC_TYPE:	NORMAL	NORMAL		
% SOLIDS:	0.0 %	0.0 %	100.0 %	100.0 %
UNITS:	UG/L	UG/L		
FIELD DUPLICATE OF:	2W-GW21S-07			

	RESULT	QUAL	CODE									
PESTICIDES/PCBs												
4,4'-DDD	5.7			0.02	U							
4,4'-DDE	0.02	U		0.02	U							
4,4'-DDT	0.02	U		0.02	U							
ALDRIN	0.01	U		0.01	U							
ALPHA-BHC	0.01	U		0.01	U							
ALPHA-CHLORDANE	0.1	U		0.1	U							
AROCLOR-1016	0.20	U		0.20	U							
AROCLOR-1221	0.40	U		0.40	U							
AROCLOR-1232	0.20	U		0.20	U							
AROCLOR-1242	0.20	U		0.20	U							
AROCLOR-1248	0.20	U		0.20	U							
AROCLOR-1254	0.20	U		0.20	U							
AROCLOR-1260	0.20	U		0.20	U							
BETA-BHC	0.01	U		0.01	U							
DELTA-BHC	0.01	U		0.01	U							
DIELDRIN	0.02	U		0.02	U							
ENDOSULFAN I	0.01	U		0.01	U							
ENDOSULFAN II	0.02	U		0.02	U							
ENDOSULFAN SULFATE	0.02	U		0.02	U							
ENDRIN	0.02	U		0.02	U							
ENDRIN ALDEHYDE	0.02	U		0.02	U							
ENDRIN KETONE	0.02	U		0.02	U							
GAMMA-BHC (LINDANE)	0.01	U		0.01	U							
GAMMA-CHLORDANE	0.1	U		0.1	U							
HEPTACHLOR	0.01	U		0.01	U							
HEPTACHLOR EPOXIDE	0.01	U		0.01	U							
METHOXYCHLOR	0.1	U		0.1	U							
TOXAPHENE	1	U		1	U							

**CTO816-NSB NEW LONDON
WATER DATA
CHEMTECH CONSULTING GROUP
SDG: 4960**

SAMPLE NUMBER:	2L-GW20S-07	2W-GW21S-07	2W-GW38DS-07	2W-GW47DS-07
SAMPLE DATE:	06/24/01	06/23/01	06/23/01	06/23/01
LABORATORY ID:	N4960-08	N4960-03	N4960-06	N4960-04
QC_TYPE:	NORMAL	NORMAL	NORMAL	NORMAL
% SOLIDS:	0.0 %	0.0 %	0.0 %	0.0 %
UNITS:	UG/L	UG/L	UG/L	UG/L
FIELD DUPLICATE OF:				

	RESULT	QUAL	CODE									
POLYNUCLEAR AROMATIC HYDROCARBONS												
ACENAPHTHENE	0.016	U										
ACENAPHTHYLENE	0.013	U										
ANTHRACENE	0.2			0.21			0.14			0.22		
BENZO(A)ANTHRACENE	0.012	U										
BENZO(A)PYRENE	0.21	U		0.021	U		0.38			0.021	U	
BENZO(B)FLUORANTHENE	0.02	U										
BENZO(G,H,I)PERYLENE	0.009	U										
BENZO(K)FLUORANTHENE	0.02	U										
CHRYSENE	0.012	U										
DIBENZO(A,H)ANTHRACENE	0.014	U										
FLUORANTHENE	0.009	U										
FLUORENE	0.007	U										
INDENO(1,2,3-CD)PYRENE	0.008	U										
NAPHTHALENE	0.008	U										
PHENANTHRENE	0.004	U		0.1	J	G	0.004	U		0.004	U	
PYRENE	0.008	U										

**CT0816-NSB NEW LONDON
WATER DATA
CHEMTECH CONSULTING GROUP
SDG: 4960**

SAMPLE NUMBER:	GWFD06230101	SWSG21-07		
SAMPLE DATE:	06/23/01	06/19/01	//	//
LABORATORY ID:	N4960-02	N4960-11		
QC_TYPE:	NORMAL	NORMAL		
% SOLIDS:	0.0 %	0.0 %	100.0 %	100.0 %
UNITS:	UG/L	UG/L		
FIELD DUPLICATE OF:	2W-GW21S-07			

	RESULT	QUAL	CODE									
POLYNUCLEAR AROMATIC HYDROCARBONS												
ACENAPHTHENE	0.016	U		0.016	U							
ACENAPHTHYLENE	0.013	U		0.013	U							
ANTHRACENE	0.71	U		0.03	U							
BENZO(A)ANTHRACENE	0.012	U		0.012	U							
BENZO(A)PYRENE	0.021	U		0.021	U							
BENZO(B)FLUORANTHENE	0.02	U		0.02	U							
BENZO(G,H,I)PERYLENE	0.009	U		0.009	U							
BENZO(K)FLUORANTHENE	0.02	U		0.02	U							
CHRYSENE	0.012	U		0.012	U							
DIBENZO(A,H)ANTHRACENE	0.014	U		0.014	U							
FLUORANTHENE	0.009	U		0.009	U							
FLUORENE	0.007			0.007	U							
INDENO(1,2,3-CD)PYRENE	0.008	U		0.008	U							
NAPHTHALENE	0.008	U		0.008	U							
PHENANTHRENE	0.71	J	G	0.004	U							
PYRENE	0.008	U		0.008	U							

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- Sample Quantitation
- * • Detection Limits

- * - All quality control criteria were met for this parameter.

Calibration Recoveries

The Contract Required Detection Limit (CRDL) percent recovery for lead on 7/7/01 at 03:21 was >120% quality control limit, affecting sample 2WGW21S-07-F. The nondetected result reported for lead in this sample was qualified as estimated, "UJ".

The CRDL percent recovery for selenium on 7/7/01 at 03:21 was < 80% quality control limit, affecting sample 2WGW21S-07-F. The nondetected result reported for selenium in this sample was qualified as estimated, "UJ".

The CRDL percent recovery for beryllium on 7/7/01 at 06:28 was < 80% quality control limit, affecting samples 2W-GW47DS-07-F, 2W-GW38DS-07-F, 2L-GW20S-07-F and SWSG21-07-F. The nondetected results reported for beryllium in these samples were qualified as estimated, "UJ".

The CRDL percent recovery for mercury on 7/6/01 was < 80% quality control limit, affecting the total metals matrix. Nondetected results reported for mercury in the affected samples were qualified as estimated, "UJ".

The CRDL percent recovery for lead on 7/10/01 at 21:05 was >120% quality control limit, affecting sample GWFD06230101. The nondetected result reported for lead in this sample was qualified as estimated, "UJ".

The CRDL percent recovery for thallium on 7/10/01 at 21:05 was < 80% quality control limit, affecting sample GWFD06230101. The positive result less than 3X CRDL reported for thallium in this sample was qualified as estimated, "J".

The CRDL percent recovery for selenium on 7/11/01 at 00:59 was >120% quality control limit, affecting samples 2W-GW21S-07, 2W-GW47DS-07, 2W-GW38DS-07, 2L-GW20S-07 and SWSG21-07. The nondetected results reported for selenium in these samples were qualified as estimated, "UJ".

Laboratory Blank Analyses

The following contaminants were detected in the laboratory method / preparation blanks at the following maximum concentrations:

Samples affected: Total Metals

<u>Analyte</u>	<u>Maximum Concentration</u>	<u>Action Level</u>
Aluminum	85.8 µg/L	429 µg/L
Antimony	4.5 µg/L	22.5 µg/L
Beryllium	0.20 µg/L	1.0 µg/L
Calcium	89.3 µg/L	446.5 µg/L
Copper	3.1 µg/L	15.5 µg/L
Iron	45.4 µg/L	227 µg/L
Magnesium	82.7 µg/L	413.5 µg/L
Potassium	177.8 µg/L	889 µg/L
Sodium	589.2 µg/L	2946 µg/L

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An action level of 5X the maximum concentration was used to evaluate the sample data for blank contamination. Sample aliquot and dilution factors were taken into consideration when evaluating for blank contamination. Positive results less than the blank action levels for aluminum and copper were qualified, "U", as a result of blank contamination.

Samples affected: Dissolved Metals

<u>Analyte</u>	<u>Maximum Concentration</u>	<u>Action Level</u>
Beryllium	0.20 µg/L	1.0 µg/L
Calcium	89.3 µg/L	446.5 µg/L
Iron	38.8 µg/L	194 µg/L

An action level of 5X the maximum concentration was used to evaluate the sample data for blank contamination. Sample aliquot and dilution factors were taken into consideration when evaluating for blank contamination. No validation action was necessary because the results were either reported as nondetected by the laboratory or were greater than the action levels.

ICP Interference Check Sample Results

The interfering analyte magnesium was present in samples 2W-GW21S-07, 2W-GW21S-07-F, and GWFD06230101 at concentrations, which were comparable to the level of magnesium in the Interference Check Sample (ICS) solution. Several analytes namely antimony, beryllium, cobalt, manganese, potassium, and vanadium were present in the ICS solution at concentrations which exceeded 2X the absolute value of the Instrument Detection Limit (IDL). Interference affects exist for antimony, beryllium, cobalt, and vanadium in the affected samples. The positive results reported for cobalt, and vanadium were qualified as estimated "J". The nondetected results reported for antimony and beryllium were qualified as estimated, "UJ".

The interfering analyte magnesium was present in sample GWFD06230101-F at a concentration, which was comparable to the level of magnesium in the Interference Check Sample (ICS) solution. Several analytes namely antimony, beryllium, cobalt, manganese, potassium, and vanadium were present in the ICS solution at concentrations which exceeded 2X the absolute value of the Instrument Detection Limit (IDL). Interference affects exist for antimony, beryllium, and vanadium in the affected sample. The positive result reported for vanadium was qualified as estimated "J". The nondetected results reported for antimony and beryllium were qualified as estimated, "UJ".

ICP Serial Dilution Results

The ICP serial dilution percent difference for potassium was >15% quality control limit, affecting the total metals matrix. Positive results reported for potassium in the affected samples were qualified as estimated, "J". A direction of bias could not be determined.

The ICP serial dilution percent differences for barium, potassium, and sodium were >15% quality control limit, affecting the dissolved metals matrix. Positive results reported for barium, potassium and sodium in the affected samples were qualified as estimated, "J". A direction of bias could not be determined.

Field Duplicate Results

Field duplicate imprecision (RPD > 30%) was noted for iron in the 2W-GW21S-07-F / GWFD06230101-F sample pair. The positive results reported for iron in the dissolved metals matrix were qualified as estimated, "J".

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Field duplicate imprecision (RPD > 30%) was noted for TOC and TDS in the 2W-GW21S-07 / GWFD06230101 sample pair. The positive results reported for TOS and TDS in the total metals matrix were qualified as estimated, "J".

Sample Quantitation

Due to uncertainty near the IDL, all positive results less than two times the IDL for arsenic, chromium, cobalt, copper, lead, nickel, thallium, vanadium, and zinc were qualified as estimated, "J".

Notes

The matrix spike percent recovery for iron was >125% quality control limit, affecting the dissolved metals matrix. No validation action was necessary because the amount of iron in the unspiked sample was >4X the spike added.

The laboratory reported a thallium result of 3.2U for sample 2W-GW38DS-07 on both the Form I and on the EDD. The IDL for thallium is 5.7 µg/L. The data reviewer changed the result in the database to be 5.7U.

The laboratory forms reference the analysis for hardness as being EPA Method 130.2. The laboratory actually did the analysis using Standard Methods, 18th Edition, Method 2340B. No qualifications were made on this basis.

Executive Summary

Laboratory Performance: Several analytes were present in the laboratory method blanks. Beryllium, lead, mercury, selenium, and thallium were qualified due to calibration noncompliance.

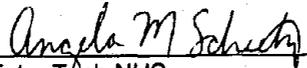
Other Factors Affecting Data Quality: Arsenic, chromium, cobalt, copper, lead, nickel, thallium, vanadium, and zinc were qualified due to uncertainty near the IDL. Several samples had magnesium as an interfering analyte that was noncompliant. Potassium was qualified due to ICP serial dilution noncompliance, affecting the total metals matrix. Potassium and sodium were qualified due to ICP serial dilution noncompliance, affecting the dissolved metals matrix. Field duplicate imprecision was noted for iron in the 2W-GW21S-07-F / GWFD06230101-F sample pair and TOC, TDS in 2W-GW21S-07 / GWFD06230101.

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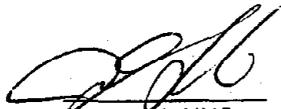
The data for these analyses were reviewed with reference to the "National Functional Guidelines for Inorganic Review", February 1989 and the NFESC document entitled "Navy IRCDQM" (September 1999).

The text of this report has been formulated to address only those problem areas affecting data quality.

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the NFESC Guidelines and the Quality Assurance Project Plan (QAPP)."



Tetra Tech NUS
Angela M. Scheetz
Environmental Scientist



TetraTech NUS
Joseph A. Samchuck
Quality Assurance Officer

Attachments:

1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as reported by the Laboratory
3. Appendix C - Regional Worksheets
4. Appendix D - Support Documentation

APPENDIX A

QUALIFIED LABORATORY RESULTS

**CT0816-NSB NEW LONDON
WATER DATA
CHEMTECH CONSULTING GROUP
SDG: 4960**

SAMPLE NUMBER:	2L-GW20S-07	2L-GW20S-07-F	2W-GW21S-07	2W-GW21S-07-F
SAMPLE DATE:	06/24/01	06/24/01	06/23/01	06/23/01
LABORATORY ID:	N4960-08	N4960-16	N4960-03	N4960-13
QC_TYPE:	NORMAL	NORMAL	NORMAL	NORMAL
% SOLIDS:	0.0 %	0.0 %	0.0 %	0.0 %
UNITS:	UG/L	UG/L	UG/L	UG/L
FIELD DUPLICATE OF:				

	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
INORGANICS												
ALUMINUM	45.7	U		45.7	U		45.7	U		45.7	U	
ANTIMONY	3.7	U		3.7	U		3.7	UJ	K	3.7	UJ	K
ARSENIC	5	U		5	U		5	U		5	U	
BARIUM	65.6			61.3			65.3			58.8		
BERYLLIUM	0.1	U		0.1	UJ	C	0.1	UJ	K	0.1	UJ	K
CADMIUM	3	U		3	U		3	U		3	U	
CALCIUM	36200			33600			201000			172000		
CHROMIUM	5	U		5	U		9.3	J	P	8.9	J	P
COBALT	1.8	U		1.8	U		2.4	J	KP	2.1	J	KP
COPPER	2.3	U	A	2.2	U		4.3	U	A	3.5	J	P
IRON	4580			4650	J	G	21000			1010	J	G
LEAD	3	U		3	U		3	U		3	UJ	C
MAGNESIUM	7350			6830			850000			572000		
MANGANESE	731			703			219			214		
MERCURY	0.2	UJ	C	0.2	U		0.2	UJ	C	0.2	U	
NICKEL	8	J	P	8.7			4	U		4	U	
POTASSIUM	6330	J	I	6210	J	I	351000	J	I	275000	J	I
SELENIUM	5	UJ	C	5	U		5	UJ	C	5	UJ	C
SILVER	5	U		5	U		5	U		5	U	
SODIUM	77600			80400	J	I	9750000			7500000	J	I
THALLIUM	7	J	P	7.3	J	P	9.2	J	P	9.8	J	P
VANADIUM	3.2	U		3.2	U		9.8	J	K	11.2	J	K
ZINC	36.9			30.4			20.4			8.5	U	

**CTO816-NSB NEW LONDON
WATER DATA
CHEMTECH CONSULTING GROUP
SDG: 4960**

SAMPLE NUMBER:	2W-GW38DS-07	2W-GW38DS-07-F	2W-GW47DS-07	2W-GW47DS-07-F
SAMPLE DATE:	06/24/01	06/24/01	06/23/01	06/23/01
LABORATORY ID:	N4960-05	N4960-15	N4960-04	N4960-14
QC_TYPE:	NORMAL	NORMAL	NORMAL	NORMAL
% SOLIDS:	0.0 %	0.0 %	0.0 %	0.0 %
UNITS:	UG/L	UG/L	UG/L	UG/L
FIELD DUPLICATE OF:				

	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
INORGANICS												
ALUMINUM	51.4	U	A	45.7	U		45.7	U		45.7	U	
ANTIMONY	3.7	U		3.7	U		3.7	U		3.7	U	
ARSENIC	6.6	J	P	5	U		29.5			31.3		
BARIUM	13.9			11.8			325			332		
BERYLLIUM	0.1	U		0.1	UJ	C	0.1	U		0.1	UJ	C
CADMIUM	3	U		3	U		3	U		3	U	
CALCIUM	57000			53500			55800			50200		
CHROMIUM	5	U		5	U		9.1	J	P	5	U	
COBALT	2.2	J	P	1.8	U		14.5			6.7		
COPPER	10.8	U	A	4.6			11.6	U	A	2.2	U	
IRON	687			612	J	G	99900			89600	J	G
LEAD	3	U		3	U		4.8	J	P	5.9	J	P
MAGNESIUM	21900			18400			98300			81100		
MANGANESE	138			164			4310			4160		
MERCURY	0.2	UJ	C	0.2	U		0.2	UJ	C	0.2	U	
NICKEL	7.2	J	P	4.4	J	P	4	U		4	U	
POTASSIUM	24800	J	I	21000	J	I	110000	J	I	104000	J	I
SELENIUM	5	UJ	C	5	U		5	UJ	C	5	U	
SILVER	5	U		5	U		5	U		5	U	
SODIUM	291000			250000	J	I	1970000			1760000	J	I
THALLIUM	5.7	U		5.7	U		5.7	U		9.4	J	P
VANADIUM	9.1			4.3	J	P	6.5			3.2	U	
ZINC	25.1			12.6	J	P	33.6			28.6		

**CTO816-NSB NEW LONDON
WATER DATA
CHEMTECH CONSULTING GROUP
SDG: 4960**

SAMPLE NUMBER:	GWFD06230101	GWFD06230101-F	SWSG21-07	SWSG21-07-F
SAMPLE DATE:	06/23/01	06/23/01	06/24/01	06/24/01
LABORATORY ID:	N4960-02	N4960-12	N4960-11	N4960-19
QC_TYPE:	NORMAL	NORMAL	NORMAL	NORMAL
% SOLIDS:	0.0 %	0.0 %	0.0 %	0.0 %
UNITS:	UG/L	UG/L	UG/L	UG/L
FIELD DUPLICATE OF:	2W-GW21S-07	2W-GW21S-07-F		

	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
INORGANICS												
ALUMINUM	45.7	U		45.7	U		505			45.7	U	
ANTIMONY	3.7	UJ	K	3.7	UJ	K	3.7	U		3.7	U	
ARSENIC	5	U		5	U		5	U		5	U	
BARIUM	68.7			67.2			47.9			21.7		
BERYLLIUM	0.1	UJ	K	0.1	UJ	K	0.1	U		0.1	UJ	C
CADMIUM	3	U		3	U		3	U		3	U	
CALCIUM	186000			172000			20600			17100		
CHROMIUM	9	J	P	12.8			5	U		5	U	
COBALT	2	J	KP	1.8	U		2.5	J	P	1.8	U	
COPPER	12.2	U	A	2.2	U		15.5	U	A	2.2	U	
IRON	16800			1420	J	G	1830			265	J	G
LEAD	3	UJ	C	3	U		5	J	P	3	U	
MAGNESIUM	685000			563000			4350			2860		
MANGANESE	208	J	K	206			764			38.2		
MERCURY	0.2	UJ	C	0.2	U		0.2	UJ	C	0.2	U	
NICKEL	4	U		9.2			5.3	J	P	4	U	
POTASSIUM	269000	J	I	265000	J	I	21700	J	I	1190	J	I
SELENIUM	5	U		5	U		5	UJ	C	5	U	
SILVER	5	U		5	U		5	U		5	U	
SODIUM	7330000			7190000	J	I	63700			67400	J	I
THALLIUM	6	J	CP	10	J	P	6.4	J	P	5.7	U	
VANADIUM	10	J	K	7.5	J	K	3.2	U		3.2	U	
ZINC	12.2	J	P	37.4			107			29.1		

**CT0816-NSB NEW LONDON
 WATER DATA
 CHEMTECH CONSULTING GROUP
 SDG: 4960**

SAMPLE NUMBER:	2L-GW20S-07	2W-GW21S-07	2W-GW38DS-07	2W-GW47DS-07
SAMPLE DATE:	06/24/01	06/23/01	06/23/01	06/23/01
LABORATORY ID:	N4960-08	N4960-03	N4960-05	N4960-04
QC_TYPE:	NORMAL	NORMAL	NORMAL	NORMAL
% SOLIDS:	0.0 %	0.0 %	0.0 %	0.0 %
UNITS:				
FIELD DUPLICATE OF:				

	RESULT	QUAL	CODE									
CARBONATE ALKALINITY	80			1300			270			340		
CHEMICAL OXYGEN DEMAND	5	U		590			30			69		
CHLORIDE	120			12040			290			4800		
HARDNESS	120			4000			230			540		
SULFATE	5			67			32			33		
TOTAL DISSOLVED SOLIDS	230	J	G	3300	J	G	640	J	G	4700	J	G
TOTAL ORGANIC CARBON	3.1	J	G	30	J	G	11	J	G	7.9	J	G

**CT0816-NSB NEW LONDON
WATER DATA
CHEMTECH CONSULTING GROUP
SDG: 4960**

SAMPLE NUMBER:	GWFD06230101	SWSG21-07		
SAMPLE DATE:	06/23/01	06/24/01	//	//
LABORATORY ID:	N4960-02	N4960-11		
QC_TYPE:	NORMAL	NORMAL		
% SOLIDS:	0.0 %	0.0 %	100.0 %	100.0 %
UNITS:				
FIELD DUPLICATE OF:	2W-GW21S-07			

	RESULT	QUAL	CODE									
CARBONATE ALKALINITY	1300			29								
CHEMICAL OXYGEN DEMAND	670			37								
CHLORIDE	10060			90								
HARDNESS	3300			1	U							
SULFATE	62			13								
TOTAL DISSOLVED SOLIDS	14000	J	G	400	J	G						
TOTAL ORGANIC CARBON	22	J	G	12	J	G						

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DATE: AUGUST 2, 2001

Calibration Recoveries

The contract required detection limit (CRDL) percent recoveries for mercury and thallium were < 80% quality control limit. Nondetected results reported for thallium were qualified as estimated, "UJ". Positive and nondetected results reported for mercury were qualified as estimated, "J" and "UJ", respectively.

The CRDL percent recovery for lead was >120% quality control limit. Positive and nondetected results reported for lead were qualified as estimated, "J" and "UJ", respectively.

Laboratory Blank Analyses

The following contaminants were detected in the laboratory method / preparation blanks at the following maximum concentrations:

<u>Analyte</u>	<u>Maximum Concentration</u>	<u>Action Level</u>
Aluminum	85.8 µg/L	429 µg/L
Antimony	4.5 µg/L	22.5 µg/L
Barium ⁽¹⁾	2.335 µg/L	11.675 µg/L
Beryllium	0.20 µg/L	1.0 µg/L
Calcium	89.3 µg/L	446.5 µg/L
Copper	3.1 µg/L	15.5 µg/L
Iron	45.4 µg/L	227 µg/L
Magnesium	82.7 µg/L	413.5 µg/L
Potassium	177.8 µg/L	889 µg/L
Sodium	589.2 µg/L	2946 µg/L

⁽¹⁾ Maximum concentration present in a laboratory preparation blank, affecting the total metals matrix only.

An action level of 5X the maximum concentration was used to evaluate the sample data for blank contamination. Sample aliquot and dilution factors were taken into consideration when evaluating for blank contamination. Positive results less than the blank action levels reported for aluminum, antimony, copper and iron were qualified, "U", as a result of blank contamination.

ICP Serial Dilution Results

The ICP serial dilution percent difference for potassium was >15% quality control limit, affecting the total metals matrix. Positive results reported for potassium in the affected samples were qualified as estimated, "J". A direction of bias could not be determined.

The ICP serial dilution percent differences for potassium and sodium were >15% quality control limit, affecting the dissolved metals matrix. Positive results reported for potassium and sodium in the affected samples were qualified as estimated, "J". A direction of bias could not be determined.

Field Duplicate Results

Field duplicate imprecision (difference > 2X CRDL) was noted for mercury in the 4-GW01S-07 / GWFD06250102 sample pair. The positive result reported for mercury in sample GWFD06250102 was qualified as estimated, "J". The nondetected result reported for mercury in sample 4-GW01S-07 was qualified as estimated, "UJ".

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Field duplicate imprecision (difference > 2X CRDL) was noted for aluminum in the SWFD06250101 / SWSG22-07 sample pair. The positive reported for aluminum in sample SWFD06250101 was qualified as estimated, "J".

Sample Quantitation

Due to uncertainty near the IDL, all positive results less than two times the IDL reported for arsenic, cobalt, lead and mercury were qualified as estimated, "J".

Notes

The chain-of-custody lists several other parameters to be performed on these samples, such as hardness, total organic carbon (TOC), chemical oxygen demand (COD), alkalinity, chloride, sulfate and total dissolved solids (TDS). Because the samples arrived at the laboratory one week after they were collected, the laboratory was instructed to analyze the total and dissolved metals only.

Executive Summary

Laboratory Performance: Several analytes were present in the laboratory method / preparation blanks. Lead, mercury and thallium were qualified due to calibration noncompliance.

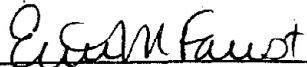
Other Factors Affecting Data Quality: Antimony, cobalt, lead and mercury were qualified due to uncertainty near the IDL. Sodium was qualified due to ICP serial dilution noncompliance, affecting the total metals matrix. Potassium and sodium were qualified due to ICP serial dilution noncompliance, affecting the dissolved metals matrix. Field duplicate imprecision was noted for mercury in the 4-GW01S-07 / GWFD06250102 sample pair. Field duplicate imprecision was noted for aluminum in the SWFD06250101 / SWSG22-07 sample pair.

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DATE: AUGUST 2, 2001

The data for these analyses were reviewed with reference to the "National Functional Guidelines for Inorganic Review", February 1989 and the NFESC document entitled "Navy IRCDQM" (September 1999).

The text of this report has been formulated to address only those problem areas affecting data quality.

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the NFESC Guidelines and the Quality Assurance Project Plan (QAPP)."


Tetra Tech NUS
Erin M. Faust
Environmental Scientist


TetraTech NUS
Joseph A. Samchuck
Quality Assurance Officer

Attachments:

1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as reported by the Laboratory
3. Appendix C - Regional Worksheets
4. Appendix D - Support Documentation

APPENDIX A
QUALIFIED ANALYTICAL RESULTS

Qualifier Codes:

- A = Lab Blank Contamination
- B = Field Blank Contamination
- C = Calibration (i.e., % RSDs, %Ds, ICVs, CCVs, RPDs, RRFs, etc.) Noncompliance
- D = MS/MSD Noncompliance
- E = LCS/LCSD Noncompliance
- F = Lab Duplicate Imprecision
- G = Field Duplicate Imprecision
- H = Holding Time Exceedance
- I = ICP Serial Dilution Noncompliance
- J = GFAA PDS - GFAA MSA's $r < 0.995$
- K = ICP Interference - include ICSAB % R's
- L = Instrument Calibration Range Exceedance
- M = Sample Preservation
- N = Internal Standard Noncompliance
- N01 = Internal Standard Noncompliance Dioxins
- N02 = Recovery Standard Noncompliance Dioxins
- N03 = Clean-up Standard Noncompliance Dioxins
- O = Poor Instrument Performance (i.e., base-time drifting)
- P = Uncertainty near detection limit ($< 2 \times \text{IDL}$ for inorganics and $< \text{CRQL}$ for organics)
- Q = Other problems (can encompass a number of issues)
- R = Surrogates Recovery Noncompliance
- S = Pesticide/PCB Resolution
- T = % Breakdown Noncompliance for DDT and Endrin
- U = Pest/PCD% between columns for positive results
- V = Non-linear calibrations, tuning $r < 0.995$ (correlation coefficient)
- W = EMPC result
- X = Signal to noise response drop
- Y = Percent solids $< 30\%$
- Z = Uncertainty at 2 sigma deviation is less than sample activity

**CTO816-NSB NEW LONDON
WATER DATA
CHEMTECH CONSULTING GROUP
SDG: 5059**

SAMPLE NUMBER:	4-GW01S-07	4-GW01S-07-F	GWFD06250102	GWFD06250102-F
SAMPLE DATE:	06/25/01	06/25/01	06/25/01	06/25/01
LABORATORY ID:	N5059-01	N5059-07	N5059-02	N5059-08
QC_TYPE:	NORMAL	NORMAL	NORMAL	NORMAL
% SOLIDS:	0.0 %	0.0 %	0.0 %	0.0 %
UNITS:	UG/L	UG/L	UG/L	UG/L
FIELD DUPLICATE OF:			4-GW01S-07	4-GW01S-07-F

	RESULT	QUAL	CODE									
INORGANICS												
ALUMINUM	65.9	U	A	73.9	U	A	71.9	U	A	58.4	U	A
ANTIMONY	3.9	U	A	3.7	U		3.7	U		3.7	U	
ARSENIC	5.0	U										
BARIUM	41.4			43			42.2			42.8		
BERYLLIUM	0.10	U										
CADMIUM	3.0	U										
CALCIUM	17300			18300			17900			18400		
CHROMIUM	5.0	U										
COBALT	1.8	U										
COPPER	6.1	U	A	4.6	U	A	4.8	U	A	3.1	U	A
IRON	103	U	A	7.6	U	A	35.0	U	A	20.8	U	A
LEAD	5.5	J	PC	3.0	UJ	C	3.0	UJ	C	3.0	UJ	C
MAGNESIUM	2480			2630			2560			2670		
MANGANESE	8.8			9.5			9.3			9.6		
MERCURY	0.20	UJ	CG	0.20	UJ	C	0.21	J	CGP	0.2	UJ	C
NICKEL	4.0	U										
POTASSIUM	2600	J	I	2940	J	I	2750	J	I	2910	J	I
SELENIUM	5.0	U										
SILVER	5.0	U										
SODIUM	28300			31800	J	I	28900			31200	J	I
THALLIUM	5.7	UJ	C									
VANADIUM	3.2	U										
ZINC	82.3			58.4			69.5			49.3		

**CTO816-NSB NEW LONDON
WATER DATA
CHEMTECH CONSULTING GROUP
SDG: 5059**

SAMPLE NUMBER:	SWFD06250101	SWFD06250101-F	SWSG22-07	SWSG22-07-F
SAMPLE DATE:	06/25/01	06/25/01	06/25/01	06/25/01
LABORATORY ID:	N5059-05	N5059-10	N5059-04	N5059-09
QC_TYPE:	NORMAL	NORMAL	NORMAL	NORMAL
% SOLIDS:	0.0 %	0.0 %	0.0 %	0.0 %
UNITS:	UG/L	UG/L	UG/L	UG/L
FIELD DUPLICATE OF:	SWSG-22-07	SWSG-22-07-F		

	RESULT	QUAL	CODE									
INORGANICS												
ALUMINIUM	431	J	G	71.9	U	A	204	U	A	89.0	U	A
ANTIMONY	3.7	U										
ARSENIC	7.3	J	P	5.7	J	P	6.8	J	P	5.9	J	P
BARIUM	53.8			48.6			54.8			48.7		
BERYLLIUM	0.10	U										
CADMIUM	3.0	U										
CALCIUM	20300			20700			21600			21000		
CHROMIUM	5.0	U										
COBALT	1.9	J	P	1.8	U		1.8	U		1.8	U	
COPPER	7.8	U	A	4.5	U	A	7.4	U	A	6.3	U	A
IRON	25900			18500			25700			18100		
LEAD	3.2	J	CP	3.0	UJ	C	3.0	UJ	C	3.0	UJ	C
MAGNESIUM	3870			3830			4020			3890		
MANGANESE	372			359			392			362		
MERCURY	0.20	UJ	C									
NICKEL	4.0	U										
POTASSIUM	1890	J	I	2040	J	I	2030	J	I	2080	J	I
SELENIUM	5.0	U										
SILVER	5.0	U										
SODIUM	54300			58800	J	I	58400			60500	J	I
THALLIUM	5.7	UJ	C									
VANADIUM	3.2	U										
ZINC	84.9			56.2			81.6			60.0		

**CT0816-NSB NEW LONDON
 WATER DATA
 CHEMTECH CONSULTING GROUP
 SDG: 5059**

SAMPLE NUMBER:	SWSG24-07	SWSG24-07-F		
SAMPLE DATE:	06/25/01	06/25/01	//	//
LABORATORY ID:	N5059-06	N5059-11		
QC_TYPE:	NORMAL	NORMAL		
% SOLIDS:	0.0 %	0.0 %	100.0 %	100.0 %
UNITS:	UGL	UGL		
FIELD DUPLICATE OF:				

	RESULT	QUAL	CODE									
INORGANICS												
ALUMINIUM	402	U	A	56.4	U	A						
ANTIMONY	3.7	U		3.7	U							
ARSENIC	6.6	J	P	5.6	J	P						
BARIUM	95.6			75.4								
BERYLLIUM	0.10	U		0.10	U							
CADMIUM	3.0	U		3.0	U							
CALCIUM	11800			11500								
CHROMIUM	5.0	U		5.0	U							
COBALT	9.9			7.8								
COPPER	10.2	U	A	3.3	U	A						
IRON	32000			8980								
LEAD	3.0	UJ	C	3.0	UJ	C						
MAGNESIUM	4310			4140								
MANGANESE	1790			1650								
MERCURY	0.20	UJ	C	0.20	UJ	C						
NICKEL	4.0	U		4.0	U							
POTASSIUM	2310	J	I	2320	J	I						
SELENIUM	5.0	U		5.0	U							
SILVER	5.0	U		5.0	U							
SODIUM	30300			30500	J	I						
THALLIUM	5.7	UJ	C	5.7	UJ	C						
VANADIUM	3.2	U		3.2	U							
ZINC	95.4			57.6								