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# Supplemental Site Inspection for Air Force Plant 59, Johnson City, New York

## Volume 2: Appendices A – E

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ANL/ESD/TM-90

# Supplemental Site Inspection for Air Force Plant 59, Johnson City, New York

# Volume 2: Appendices A – E

by B. Nashold,* D. Rosenblatt, J. Hau,* D. Tomasko,* L. Durham,* W. Harrison, L. Shepard, L. Reed, E. Schug, and T. Sydelko

Energy Systems Division,
Argonne National Laboratory, 9700 South Cass Avenue, Argonne, Illinois 60439

August 1995

Work sponsored by United States Department of Defense, U.S. Air Force, monitored by U.S. Army Corps of Engineers, Baltimore District

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*Nashold is affiliated with the Environmental Research Division; Tomasko and Durham, with the Environmental Assessment Division; and Hau, with Hydro-Terra, Inc., Columbia, Md.*

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# Appendix A:

## Data Validation and Usability

**Appendix A-1: Data Validation**

**Appendix A-2: Data Usability**

# DATA VALIDATION

**This appendix consists of a series of validation reports from ECHEM Inc. regarding Galson Laboratory data for AFP-59. These reports were used by Gradient Corporation during its data usability study (Appendix B-2). The reports are numbered for presentation here according to sample delivery group number (SDG) and analytical type as follows. The number of the report on a specific sample may be determined by first determining the samples SDG number using the cross-index provided in Appendix G-3.**

| Report | Date | SDG | Analysis* |
|---|---|---|---|
| 1 | 25 FEB 92 | 1 | VOC |
| 2 | 26 FEB 92 | 1 | SVOC |
| 3 | 25 FEB 92 | 1 | P/P |
| 4 | 26 FEB 92 | 1 | MET |
| 5 | 26 FEB 92 | 2 | VOC |
| 6 | 26 FEB 92 | 2 | SVOC |
| 7 | 26 FEB 92 | 2 | P/P |
| 8 | 26 FEB 92 | 2 | MET |
| 9 | 17 MAR 92 | 3 | VOC |
| 10 | 16 MAR 92 | 3 | SVOC |
| 11 | 17 MAR 92 | 3 | P/P |
| 12 | 17 MAR 92 | 3 | MET |
| 13 | 13 MAR 92 | 5 | VOC |
| 14 | 14 MAR 92 | 5 | SVOC |
| 15 | 13 MAR 92 | 5 | P/P |
| 16 | 16 MAR 92 | 5 | MET |
| 17 | 25 MAR 92 | 6 | VOC |
| 18 | 25 MAR 92 | 6 | SVOC |
| 19 | 25 MAR 92 | 6 | P/P |
| 20 | 25 MAR 92 | 6 | MET |
| 21 | 24 MAR 92 | 7 | VOC |
| 22 | 24 MAR 92 | 7 | SVOC |
| 23 | 25 MAR 92 | 7 | P/P |
| 24 | 25 MAR 92 | 7 | MET |

* MET=inorganics
P/P=PCB's and pesticides
SVOC=semi-volatile compounds
VOC=volatile organic compounds

**ECHEM INC.**
**ENGINEERING CHEMISTRY CONSULTANTS**

P.O. Box 1510
#32 Route 35
Sebago Common
Windham, Maine 04062
(207) 892-0002
FAX (207) 892-7499

25 February 1992

Dr. A. Dallas Wait
Senior Environmental Chemist
Gradient Corporation
44 Brattle Street
Cambridge, MA 02138

| | |
|---|---|
| Re: | Air Force Plant 59 |
| Laboratory: | Galson Laboratories |
| Case No: | NONE |
| SDG No: | 1-5554 |

| | | | | |
|---|---|---|---|---|
| Pesticides/PCB's: | JCCNSCS | JCDW1AS | JCDWICS | JCDW3AS |
| | JCDW3BS | JCQC2BW | JCQCITW | JCQC3XW |
| | JCSD1AS | JCSD2AS | JCSW4AS | JCSW4BS |
| | JCSW4CS | JCSW5AS | JCSW5BS | JCSW6AS |
| | JCSW6BS | JCSW8BS | JCSW8AS | |

Dear Dr. Wait:

Validation was performed on the organic analytical data from the samples referenced above. The data were evaluated based on the following parameters:

- * - data completeness
- * - holding times
- - surrogate recovery
- - matrix spike/matrix spike duplicate/matrix spike blank
- * - blanks
- * - calibration
- * - pesticide instrument performance
- * - field duplicates
- * - TCL compound identification
- * - compound guantitation and reported detection limits
- * - sample result verification

* All criteria were met for this parameter.

# Appendix A-1: Data Validation

## Report 1

# ECHEM INC.

## ENGINEERING CHEMISTRY CONSULTANTS

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25 February 1992

Dr. A. Dallas Wait
Senior Environmental Chemist
Gradient Corporation
44 Brattle Street
Cambridge, MA 02138

| | |
|---|---|
| Re: | Air Force Plant 59 |
| Laboratory: | Galson Laboratories |
| Case No: | NONE |
| SDG No: | 1-5554 |

| | | | | |
|---|---|---|---|---|
| Volatiles: | JCCNSCS | JCDW1AS | JCDW1BS | JCDW1CS |
| | JCDW3AS | JCDW3BS | JCSD1AS | JCSD2AS |
| | JCSW4AS | JCSW4BS | JCSW4CS | JCSW5AS |
| | JCSW5BS | JCSW6AS | JCSW6BS | JCSW8AS |
| | JCSW8BS | JCQC1TW | JCQC2BW | JCQC3XW |
| | TRIP BLANK1 | TRIP BLANK2 | | |
| | TRIP BLANK3 | TRIP BLANK6 | | |
| | TRIP BLANK8 | | | |

Dear Dr. Wait:

Validation was performed on the organic analytical data from the samples referenced above. The data were evaluated based on the following parameters:

* - data completeness
* - holding times
* - surrogate recovery
* - matrix spike/matrix spike duplicate/matrix spike blank
- blanks
- GC/MS tuning
* - calibration
* - internal standards performance
* - field duplicates
* - TCL compound identification
* - tentatively identified compounds

* - system performance
* - compound quantitation and reported detection limits
* - sample result verification

* All criteria were met for this parameter.

Table I summarizes the validation actions, which were in accordance with USEPA Region II CLP Organics Data Review and Preliminary Review, March 1990, SOP No. HW-6, Revision #7, and the NYSDEC ASP, September 1989, as detailed below.

Also attached are the:

- data validation log,
- telephone log,
- completeness log, and
- sample preparation and analysis summaries.

BLANKS:

Positive blank results and associated action levels calculated in accordance with the USEPA Functional Guidelines are tabulated below:

| BLANK ID. | COMPOUND | CONCENTRATION | ACTION LEVEL |
|---|---|---|---|
| JCQCITW | acetone | 11 | 110 |
| | 1,1,1-trichloroethane | 5 | 25 |
| JCQC2BW | acetone | 11 | 110 |
| | 1,1,1-trichloroethane | 2 | 10 |
| JCQC3XW | acetone | 12 | 120 |
| | 1,1,1-trichloroethane | 4 | 20 |

*Method blank levels below upper limit established by NYSDEC CLP (Vol. VIII, E-27).

Associated samples with positive values reported below the action level are:

| RINSATE BLANK ID. | ASSOCIATED SAMPLES |
|---|---|
| JCQCITW JCQC2BW | JCDW1CS |
| | JCSW4CS |
| | JCSW8AS |
| | JCSW8BS |

Action:

- o associated sample results ≥CRQL and <action level (flagged B) are flagged as not detected at the sample value (U)

NOTE: Blank action levels were corrected for associated sample dilution factors, where necessary, prior to validation qualifications.

GC/MS TUNING:

Form 5A for Instrument B(#2) tune performed on 11/13/91 at 08:02 has incorrect relative abundance data and calculation errors. A review of raw data indicates that the tune was compliant, therefore, no action was taken.

Sincerely,

ECHEM INC.

Bruce K. Wallin, Ph.D.
Vice President

enclosures

Air Force Plant 59
Case No. NONE

Table I. Validation Action Summary

| Sample No. | VOA |
|---|---|
| JCCNSCS | |
| JCDW1AS | |
| JCDW1BS | |
| JCDW1CS | A1 |
| JCDW3AS | |
| JCDW3BS | |
| JCSD1AS | |
| JCSD2AS | |
| JCSW4AS | |
| JCSW4BS | |
| JCSW4CS | A1 |
| JCSW5AS | |
| JCSW5BS | |
| JCSW6AS | |
| JCSW6BS | |
| JCSW8AS | A1 |
| JCSW8BS | A1 |

If the field is blank, no qualifiers were necessary.

A1 - change positive values for acetone or 1,1,1-trichloroethane to revised detection limit due to blank contamination

J1 - estimate positive values (J) and detection limit values (UJ) due to holding time violations

J2 - estimate positive values (J) and detection limit values (UJ) due to non-compliant volatile surrogate recoveries

J3 - estimate positive values (J) and detection limit values (UJ) due to non-compliant (acid) (base-neutral) fraction surrogate recoveries

J4 - estimate positive values (J) for ( ) due to non-compliant matrix spike recoveries

J5 - estimate positive values (J) for ( ) due to calibration not meeting minimum RF criteria

J6 - estimate positive values (J) and detection limit values (UJ) for ( ) due to non-compliant calibration stability

| | | |
|---|---|---|
| J7 | - | estimate positive values (J) for ( ) due to non-compliant internal standard stability |
| J8 | - | estimate positive values (J) due to non-compliant field duplicate precision |
| Rl | - | reject detection limit values (UR) due to holding time exceedences |
| R2 | - | reject detection limit values (UR) due to low surrogate recoveries |
| R3 | - | reject detection limit values (UR) for ( ) due to low matrix spike recoveries |
| R4 | - | reject detection limit values (UR) for ( ) due to calibration not meeting minimum RF criteria |
| R5 | - | reject detection limit values (UR) for ( ) due to extreme variations in the internal standard stability |

ECHEM INC.
SAMPLE PREPARATION AND ANALYSIS SUMMARY
FOR NYSDEC

CLIENT: Argonne Nat'l Labs
CASE NO.
SDG NO. 15554
SITE: Air Force Plant 59
ANALYTICAL FRACTION: Volatiles

| CLIENT SAMPLE ID | EPA SAMPLE NO. | LAB SAMPLE ID | MATRIX | DATE COLLECTED | DATE RECEIVED | DATE ANALYZED | HOLD TIME COLLECT | HOLD TIME RECEIPT |
|---|---|---|---|---|---|---|---|---|
| TCCNSCS | | 5832-007 | Soil | 11-20-91 | 11-21-91 | 11-28-91 | 8 | 7 |
| TCDW1AS | | 5832-008 | | 11-21-91 | 11-21-91 | 11-28-91 | 7 | 7 |
| TCDW1BS | | 5832-009 | | 11-21-91 | 11-21-91 | 11-28-91 | 7 | 7 |
| TCDW1CS | | 5832-010 | | 11-21-91 | 11-21-91 | 11-28-91 | 7 | 7 |
| TCDW3AS | | 5602-001 | | 11-05-91 | 11-05-91 | 11-08-91 | 3 | 3 |
| TCDW3BS | | 5602-002 | | 11-05-91 | 11-05-91 | 11-08-91 | 3 | 3 |
| TCSD1AS | | 5770-006 | | 11-17-91 | 11-18-91 | 11-22-91 | 5 | 4 |
| TCSD2AS | | 5770-004 | | 11-17-91 | 11-18-91 | 11-22-91 | 5 | 4 |
| TCSW4AS | | 5909-001 | | 11-26-91 | 11-26-91 | 11-30-91 | 4 | 4 |
| TCSW4BS | | 5909-002 | | 11-26-91 | 11-26-91 | 11-30-91 | 4 | 4 |
| TCSW4CS | | 5909-003 | | 11-26-91 | 11-26-91 | 11-28-91 | 2 | 2 |
| TCSW5AS | | 5832-001 | | 11-20-91 | 11-21-91 | 11-28-91 | 8 | 7 |
| TCSW5BS | | 5832-002 | | 11-20-91 | 11-21-91 | 11-28-91 | 8 | 7 |
| TCSW6AS | | 5770-001 | | 11-16-91 | 11-18-91 | 11-22-91 | 6 | 4 |
| TCSW6BS | | 5770-002 | | 11-16-91 | 11-18-91 | 11-22-91 | 6 | 4 |
| TCSW8AS | | 5554-001 | | 11-04-91 | 11-05-91 | 11-08-91 | 4 | 3 |
| TCSW8BS | | 5554-002 | | 11-04-91 | 11-05-91 | 11-09-91 | 5 | 4 |
| TCQC2TW | | 5602-003 | | 11-06-91 | 11-06-91 | 11-08-91 | 2 | 3 |
| TCQC2BW | | 5602-004 | | 11-06-91 | 11-07-91 | 11-09-91 | 3 | 2 |
| TCQC3XW | | 5680-001 | | 11-07-91 | 11-08-91 | 11-09-91 | 2 | 1 |
| TRIP BLANK 1 | | 5554-003 | | 11-04-91 | 11-05-91 | 11-08-91 | 4 | 3 |
| TRIP BLANK 2 | | 5602-005 | | 11-06-91 | 11-06-91 | 11-08-91 | 2 | 2 |
| TRIP BLANK 3 | | 5686-002 | | 11-07-91 | 11-08-91 | 11-09-91 | 2 | 1 |
| TRIP BLANK 6 | | 5832-011 | | 11-21-91 | 11-21-91 | 11-28-91 | 7 | 7 |
| TRIP BLANK 8 | | 5909-004 | | 11-26-91 | 11-26-91 | 11-28-91 | 2 | 2 |

COMMENTS:

HOLD TIME COLLECT = DATE COLLECTED MINUS DATE ANALYZED

HOLD TIME RECEIPT = DATE RECEIVED MINUS DATE ANALYZED

REV. 9/91

ECHEM INC.
ORGANICS
COMPLETENESS LOG

SITE: Air Force Plant 59 CLIENT: Argonne Nat'l Labs

CASE # SDG# 1-5554

| | SAMPLE # | TCCW5CS | TCDW1AS | TCDW1AS | TCDW1CS | TCDW3AS | TCDW3AS | TCSD1AS | TCSD2AS | TCSW4AS | TCSW4CS | TCSW5AS | TCSW5BS | TCSW6AS | TCSW6BS | TCSW8AS | TCSW8BS | TCOC1TW | TCOC2AW | TCOC3XW | TRIP BLANK 1 | TRIP BLANK 2 | TRIP BLANK 3 | TRIP BLANK 6 | TRIP BLANK 8 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1A | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| | 1B | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| | 2A | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| | 2B | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| | 3A | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| VOA | 3B | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| | 4A | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| | 5A | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| | 6A | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| | 7A | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| | 8A | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| | 1B | | | | | | | | | | | | | | | | | | | | | | | | |
| | 1C | | | | | | | | | | | | | | | | | | | | | | | | |
| | 1F | | | | | | | | | | | | | | | | | | | | | | | | |
| | 2C | | | | | | | | | | | | | | | | | | | | | | | | |
| | 2D | | | | | | | | | | | | | | | | | | | | | | | | |
| | 3C | | | | | | | | | | | | | | | | | | | | | | | | |
| | 3D | | | | | | | | | | | | | | | | | | | | | | | | |
| SVOA | 4B | | | | | | | | | | | | | | | | | | | | | | | | |
| | 5B | | | | | | | | | | | | | | | | | | | | | | | | |
| | 6B | | | | | | | | | | | | | | | | | | | | | | | | |
| | 6C | | | | | | | | | | | | | | | | | | | | | | | | |
| | 7B | | | | | | | | | | | | | | | | | | | | | | | | |
| | 7C | | | | | | | | | | | | | | | | | | | | | | | | |
| | 8B | | | | | | | | | | | | | | | | | | | | | | | | |
| | 8C | | | | | | | | | | | | | | | | | | | | | | | | |
| | 1D | | | | | | | | | | | | | | | | | | | | | | | | |
| | 2E | | | | | | | | | | | | | | | | | | | | | | | | |
| | 2F | | | | | | | | | | | | | | | | | | | | | | | | |
| | 3E | | | | | | | | | | | | | | | | | | | | | | | | |
| PEST | 3F | | | | | | | | | | | | | | | | | | | | | | | | |
| | 4C | | | | | | | | | | | | | | | | | | | | | | | | |
| | 8D | | | | | | | | | | | | | | | | | | | | | | | | |
| | 8E | | | | | | | | | | | | | | | | | | | | | | | | |
| | 9 | | | | | | | | | | | | | | | | | | | | | | | | |
| | 10 | | | | | | | | | | | | | | | | | | | | | | | | |

✓ Quant Reports
✓ MASS SPECS
✓ TIC Compounds
✓ Laboratory Blank (Form 1's)
✓ MS/MSD (Forms 1's)
Total Solids Log (if applicable)
Injection Log
✓ Chain of Custody
✓ Case Narrative

REV. 391

# Appendix A-1:

## Report 2

**ECHEM INC.**
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26 February 1992

Dr. A. Dallas Wait
Senior Environmental Chemist
Gradient Corporation
44 Brattle Street
Cambridge, MA 02138

| | |
|---|---|
| Re: | Air Force Plant 59 |
| Laboratory: | Galson Laboratories |
| Case No: | NONE |
| SDG No: | 1-5554 |

| | | | | |
|---|---|---|---|---|
| Semivolatiles: | JCCNSCS | JCDW1AS | JCDW1BS | JCDWICS |
| | JCDW3AS | JCDW3BS | JCQCITW | JCQC2BW |
| | JCQC3XW | JCSD1AS | JCSD2AS | JCSW4AS |
| | JCSW4BS | JCSW5AS | JCSW5BS | JCSW6AS |
| | JCSW4CS | JCSW8AS | JCSW8BS | JCSW6BS |

Dear Dr. Wait:

Validation was performed on the organic analytical data from the samples referenced above. The data were evaluated based on the following parameters:

* - data completeness
* - holding times
- surrogate recovery
* - matrix spike/matrix spike duplicate/matrix spike blank
- blanks
* - GC/NS tuning
- calibration
* - internal standards performance
* - field duplicates
* - TCL compound identification
* - tentatively identified compounds
* - system performance
* - compound quantitation and reported detection limits
* - sample result verification

* All criteria were met for this parameter.

Table I summarizes the validation actions, which were in accordance with USEPA Region II CLP Organics Data Review and Preliminary Review, March 1990, SOP No. HW-6, Revision # 7, and the NYSDEC ASP, September 1989, as detailed below.

Also attached are the:

- o data validation log,
- o telephone log,
- o completeness log, and
- o sample preparation and analysis summaries.

HOLDING TIMES:

Samples with extraction holding times exceeding the NYSDEC CLP 5 day requirement (Vol. VIII) are itemized below.

| SAMPLE | HOLDING TIME (DAYS) FROM SAMPLE COLLECTION | HOLDING TIME (DAYS) FROM RECEIPT BY LAB |
|---|---|---|
| JCCNSCSRE | 24 | 23 |

Action:

- o for holding time exceedences >14 days, detection limit values (CRQL U) are flagged as unusable (R)

SURROGATE RECOVERY:

Samples with two or more surrogate recoveries from either the base/neutral or acid fraction which were >10% but did not meet the criteria specified in NYSDEC CLP (Vol. VIII, E-54), and samples with one or more surrogate recoveries <10% as specified in the Functional Guidelines are summarized below:

| | PERCENT RECOVERIES | | | | | |
|---|---|---|---|---|---|---|
| | BASE-NEUTRAL FRACTION | | | ACID FRACTION | | |
| SAMPLE | NBZ | FBP | TPH | PHL | 2FP | TBP |
| JCSW4CS | | | | 21 | 11 | |
| JCCNSCS | 7 | 9 | 10 | 8 | 8 | 7 |

Action:

- o recoveries >10%; sample results for the associated fraction are flagged as estimated (J)

- o recoveries <10%; sample results for the associated fraction ≥CRQL are flagged as estimated (J), and detection limit values (CRQL U) are flagged as unusable (R)

Comments:

For sample JCSW4CS the reanalysis surrogate recoveries were compliant, however, it was extracted beyond the hold time resulting in more extensively qualified results. For sample JCCNSCS the reanalysis surrogate results were compliant, however, the hold time was substantially exceeded. As a result, both data sets are equally qualified.

BLANKS:

The method blanks as well as most associated samples contained a TIC (likely an aldol condensation product) eluting at approximately 10 minutes. The associated sample results for this TIC were flagged as unusable (R). Sample JCQC3XW and its associated method blank (0059) contained two TIC's eluting in the 30 minute range. The sample results for these TIC's were flagged as unusable (R).

CALIBRATION:

Calibration linearity, sensitivity and stability criteria specified in the NYSDEC CLP (Vol. VIII, E-48-51), or federal criteria (*), are tabulated below.

CONTINUING CALIBRATION CRITERIA

| COMPOUND | %D (max.) | RRF (min.) |
|---|---|---|
| SPCC | 20 | 0.05 |
| all other TCL compounds | 20 | 0.05* |

Deviations from the above calibration criteria are tabulated below.

CONTINUING CALIBRATION

| INSTR. | DATE/TIME | COMPOUND | %D | RRF |
|---|---|---|---|---|
| GCMSD(#4) | 11-15-91/16:28 | bis(2-chloroisopropyl) ether | 25 | |
| | | hexachlorocyclopentadiene | 21 | |
| | | 2-nitroaniline | 23 | |
| | | 3-nitroaniline | 24 | |

| INSTR. | DATE/TIME | COMPOUND | %D | RRF |
|---|---|---|---|---|
| GCMSD(#4) | 11-19-91/13 : 40 | bis(2-chloroisopropyl) ether | 23 | |
| | | bis (2-chloroethyl) ether | 23 | |
| | | hexachloroethane | 24 | |
| | | hexachlorocyclopentadiene | | 24 |
| | | hexachlorobenzene | 24 | |
| | | pentachlorophenol | 23 | |
| | | 3,3'-dichlorobenzidine | 22 | |
| | | bis (2-ethylhexyl) phthalate | 22 | |
| | | di-n-octylphthalate | 22 | |
| | 11-20-91/09:47 | 1, 2-dichlorobenzene | 23 | |
| | | hexachloroethane | 23 | |
| | | hexachlorobutadiene | 21 | |
| | | hexachlorocyclopentadiene | 24 | |
| | | 3-nitroaniline | 22 | |
| | | hexachlorobenzene | 24 | |
| | | pentachlorophenol | 23 | |
| | | butylbenzylphthalate | 25 | |
| | | bis (2-ethylhexyl) phthalate | 22 | |
| | 12-14-91/13:26 | bis(2-chloroethyl) ether | 21 | |
| | | 4-nitroaniline | 25 | |
| | | di-n-butylphthalate | 23 | |
| | 12-16-91/16:23 | di-n-butylphthalate | 22 | |

Associated samples:

| INSTRUMENT | DATE/TIME | SAMPLE NO. |
|---|---|---|
| GCMSD(#4) | 11-15-91/16:28 | JCSW8BS<br>JCDW3AS<br>JCDW3 BS |
| | 11-19-91/13 :40 | JCSW8AS |
| | 11-20-91/09:47 | JCQC1TW<br>JCQC2BW |
| | 12-14-91/13:26 | JCSW6AS<br>JCDW1AS<br>JCDWIBS<br>JCDW1CS |
| GCMSD(#4) | 12-16-91/16:23 | JCSW4AS<br>JCCNSCS<br>JCSW4BS<br>JCSW4CS |

Action:

o none, associated sample results reported as either <CRQL J or CRQL U

Sincerely,
ECHEM INC.

Bruce K. Wallin, Ph.D.
Vice President

enclosures

Air Force Plant 59

Case No. NONE

Table I. Validation Action Summary

| Sample No. | SVOA |
|---|---|
| JCDW1BS | |
| JCCNSCS(RE) | R2, (RI) |
| JCDW1CS | |
| JCDW3AS | |
| JCDW3BS | |
| JCQCITW | |
| JCQC2BW | |
| JCQC3XW | |
| JCSD1AS | |
| JCSD2AS | |
| JCSW4AS | J3 |
| JCSW4BS | |
| JCSW5AS | |
| JCSW5BS | |
| JCSW6AS | |
| JCSW4CS | |
| JCSW8AS | |
| JCSW8BS | |
| JCSW6BS | |

If the field is blank, no qualifiers were necessary.

Al - change positive values for ( ) to revised detection limit due to blank contamination

J1 - estimate positive values (J) and detection limit values (UJ) due to holding time violations

J2 - estimate positive values (J) and detection limit values (UJ) due to non-compliant volatile surrogate recoveries

J3 - estimate positive values (J) and detection limit values (UJ) due to non-compliant fraction surrogate recoveries

J4 - estimate positive values (J) for ( ) due to non-compliant matrix spike recoveries

J5 - estimate positive values (J) for ( ) due to calibration not meeting minimum RF criteria

J6 - estimate positive values (J) and detection limit values (UJ) for ( ) due to non-compliant calibration stability

J7 - estimate positive values (J) for ( ) due to non-compliant internal standard stability

J8 - estimate positive values (J) due to non-compliant field duplicate precision

R1 - reject detection limit values (UR) due to holding time exceedences

R3 - reject detection limit values (UR) for ( ) due to low matrix spike recoveries

R4 - reject detection limit values (UR) for ( ) due to calibration not meeting minimum RF criteria

R5 - reject detection limit values (UR) for ( ) due to extreme variations in the internal standard stability

R7 - reject detection limit value (UR) for ( ) due to continuing calibration %D >50%

ECHEM INC.
ORGANICS
COMPLETENESS LOG

SITE: Air Force Plant 59 CLIENT: Argonne Nat'l Labs
CASE # SDG# 1-5554

| | SAMPLE # | JCENSCS | JCDW1AS | JCDW1BS | JCDW1CS | JCDW3AS | JCDW3BS | JCQC1TW | JCQC2BW | JCQC2XW | JCSD1AS | JCSD2AS | JCSW4AS | JCSW4BS | JCSW4CS | JCSW5AS | JCSW5BS | JCSW6AS | JCSW6BS | JCSW8AS | JCSW8BS | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VOA | 1A | | | | | | | | | | | | | | | | | | | | | | | |
| | 1B | | | | | | | | | | | | | | | | | | | | | | | |
| | 2A | | | | | | | | | | | | | | | | | | | | | | | |
| | 2B | | | | | | | | | | | | | | | | | | | | | | | |
| | 3A | | | | | | | | | | | | | | | | | | | | | | | |
| | 3B | | | | | | | | | | | | | | | | | | | | | | | |
| | 4A | | | | | | | | | | | | | | | | | | | | | | | |
| | 5A | | | | | | | | | | | | | | | | | | | | | | | |
| | 6A | | | | | | | | | | | | | | | | | | | | | | | |
| | 7A | | | | | | | | | | | | | | | | | | | | | | | |
| | 8A | | | | | | | | | | | | | | | | | | | | | | | |
| SVOA | 1B | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | | |
| | 1C | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | | |
| | 1F | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | | |
| | 2C | | | | | | | | | | | | | | | | | | | | | | | |
| | 2D | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | | |
| | 3C | | | | | | | | | | | | | | | | | | | | | | | |
| | 3D | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | | |
| | 4B | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | | |
| | 5B | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | | |
| | 6B | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | | |
| | 6C | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | | |
| | 7B | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | | |
| | 7C | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | | |
| | 8B | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | | |
| | 8C | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | | |
| PEST | 1D | | | | | | | | | | | | | | | | | | | | | | | |
| | 2E | | | | | | | | | | | | | | | | | | | | | | | |
| | 2F | | | | | | | | | | | | | | | | | | | | | | | |
| | 3E | | | | | | | | | | | | | | | | | | | | | | | |
| | 3F | | | | | | | | | | | | | | | | | | | | | | | |
| | 4C | | | | | | | | | | | | | | | | | | | | | | | |
| | 8D | | | | | | | | | | | | | | | | | | | | | | | |
| | 8E | | | | | | | | | | | | | | | | | | | | | | | |
| | 9 | | | | | | | | | | | | | | | | | | | | | | | |
| | 10 | | | | | | | | | | | | | | | | | | | | | | | |

✓ Quant Reports
✓ MASS SPECS
✓ TIC Compounds
✓ Laboratory Blank (Form 1's)
✓ MS/MSD (Forms 1's)
Total Solids Log (if applicable)
Injection Log
✓ Chain of Custody
✓ Case Narrative

REV. 391

ECHEM INC.
SAMPLE PREPARATION AND ANALYSIS SUMMARY
FOR NYSDEC

CLIENT: Argonne Nat'l Labs
CASE NO.
SDG NO. 1-5554
SITE: Air Force Plant 59
ANALYTICAL FRACTION: Semivolatiles

| CLIENT SAMPLE ID | EPA SAMPLE NO. | LAB. SAMPLE ID | MATRIX | DATE COLLECTED | DATE RECEIVED | DATE EXTRACTED | HOLD TIME TO EXTRACTION COLLECT | HOLD TIME TO EXTRACTION RECEIPT |
|---|---|---|---|---|---|---|---|---|
| JCCN5CS | | 5832-007 | Soil | 11-20-91 | 11-21-91 | 11-26-91 | 6 | 5 |
| JCDW1AS | | 5832-008 | | 11-21-91 | 11-21-91 | 11-26-91 | 5 | 5 |
| JCDW1BS | | 5832-009 | | 11-21-91 | 11-21-91 | 11-26-91 | 5 | 5 |
| JCDW1CS | | 5832-010 | | 11-21-91 | 11-21-91 | 11-26-91 | 5 | 5 |
| JCDW3AS | | 5608-001 | | 11-05-91 | 11-07-91 | 11-08-91 | 3 | 1 |
| JCDW3BS | | 5608-002 | | 11-05-91 | 11-07-91 | 11-08-91 | 3 | 1 |
| JCQC1W | | 5602-003 | | 11-06-91 | 11-07-91 | 11-11-91 | 5 | 4 |
| JCQC2BW | | 5602-004 | | 11-06-91 | 11-07-91 | 11-11-91 | 5 | 4 |
| JCQC3XW | | 5630-001 | | 11-07-91 | 11-08-91 | 11-11-91 | 4 | 3 |
| JCSD1AS | | 5770-006 | | 11-17-91 | 11-18-91 | 11-21-91 | 4 | 3 |
| JCSD2AS | | 5770-004 | | 11-17-91 | 11-18-91 | 11-21-91 | 4 | 3 |
| JCSW4AS | | 5909-001 | | 11-26-91 | 11-26-91 | 11-30-91 | 4 | 4 |
| JCSW4BS | | 5909-002 | | 11-26-91 | 11-26-91 | 11-30-91 | 4 | 4 |
| JCSW4CS | | 5909-003 | | 11-26-91 | 11-26-91 | 11-30-91 | 4 | 4 |
| JCSW5AS | | 5832-001 | | 11-20-91 | 11-21-91 | 11-26-91 | 6 | 5 |
| JCSW5BS | | 5832-002 | | 11-20-91 | 11-21-91 | 11-26-91 | 6 | 5 |
| JCSW6AS | | 5770-001 | | 11-16-91 | 11-18-91 | 11-21-91 | 5 | 3 |
| JCSW6BS | | 5770-002 | | 11-16-91 | 11-18-91 | 11-21-91 | 5 | 3 |
| JCSW8AS | | 5554-001 | | 11-04-91 | 11-05-91 | 11-08-91 | 4 | 3 |
| JCSW8BS | | 5554-002 | | 11-04-91 | 11-05-91 | 11-08-91 | 4 | 3 |

COMMENTS:

HOLD TIME COLLECT = DATE COLLECTED MINUS DATE EXTRACTED

HOLD TIME RECEIPT = DATE RECEIVED MINUS DATE EXTRACTED

REV. 3/91

# Appendix A-1:

# Report 3

Table I summarizes the validation actions, which were in accordance with USEPA Region II CLP Organics Data Review and Preliminary Review, March 1990, SOP No. HW-6, Revision #7 and the NYSDEC ASP, September 1989 as detailed below.

Also attached are the:

- o data validation log,
- o telephone log,
- o completeness log, and
- o sample preparation and analysis summaries.

SURROGATE RECOVERY:

Samples with surrogate recoveries that were not diluted out and did not meet the criteria specified in NYSDEC CLP (Vol. VIII, E-69) are Summarized below:

| SAMPLE | DBC RECOVERY (%) |
|---|---|
| JCSW6AS | 163 |

Action:

- o for recovery not within criteria, sample results >CRQL are flagged as estimated (J)

MATRIX SPIKE/MATRIX SPIKE DUPLICATE/MATRIX SPIKE BLANK:

Matrix spike recoveries which did not meet the criteria specified in the NYSDEC CLP (Vol. VII, E-73) are Summarized below:

| | RECOVERY (%) | | | | | |
|---|---|---|---|---|---|---|
| SAMPLE | LIN | HEP | ALQ | DIEL | END | DDT |
| Q1-0058 (MSB) | | | | | 140/136 | |

Action:

- o none, sample results reported as CRQL U

Sincerely,

Bruce K. Wallin, Ph.D.
Vice President

enclosures

U.S. Steel Site
Case 1-5554

Table I. Validation Action Summary

| SAMPLE NO. | Pesticide/PCB |
|---|---|
| JCCNSCS | |
| JCDW1AS | |
| JCDW1CS | |
| JCDW3AS | |
| JCDW3BS | |
| JCQC2BW | |
| JCQC1TW | |
| JCQC3XW | |
| JCSD1AS | |
| JCSD2AS | |
| JCSW4AS | |
| JCSW4BS | |
| JCSW4CS | |
| JCSW5AS | |
| JCSW5BS | |
| JCSW6AS | J2 |
| JCSW6BS | |
| JCSW8BS | |
| JCSW8AS | |

If the field is blank, no qualifiers were necessary.

Al - change positive values for ( ) to revised detection limit due to blank contamination

J1 - estimate positive values (J) and detection limit values (UJ) due to holding time violations

J2 - estimate positive values (J) due to non-compliant surrogate recoveries

J3 - estimate positive values (J) and detection limit values (UJ) due to non-compliant (acid) (base-neutral) fraction surrogate recoveries

J4 - estimate positive values (J) for ( ) due to non-compliant matrix spike recoveries

J5 - estimate positive values (J) for ( ) due to calibration not meeting minimum RF criteria

J6 - estimate positive values (J) and detection limit values (UJ) for ( ) due to non-compliant calibration stability

J7 - estimate positive values (J) for ( ) due to non-compliant internal standard stability

J8 - estimate positive values (J) due to non-compliant field duplicate precision

R1 - reject detection limit values (UR) due to holding time exceedences

R2 - reject detection limit values (`JR) due to holding time exceedences reject detection limit values (UR) due to low surrogate recoveries

R3 - reject detection limit values (UR) for ( ) due to low matrix spike recoveries

R4 - reject detection limit values (UR) for ( ) due to calibration not meeting minimum RF criteria

R5 - reject detection limit values (UR) for ( ) due to extreme variations in the internal standard stability

R7 - reject detection limit value (UR) for ( ) due to continuing calibration %D >50*2

ECHEM INC.
SAMPLE PREPARATION AND ANALYSIS SUMMARY
FOR NYSDEC

CLIENT: Argonne Nat'l Labs
CASE NO.
SDG NO. 1-5554
SITE: Air Force Plant 59
ANALYTICAL FRACTION: Pesticide/PCBs

| CLIENT SAMPLE ID | EPA SAMPLE NO. | LAB SAMPLE ID | MATRIX | DATE COLLECTED | DATE RECEIVED | DATE EXTRACTED | HOLD TIME TO EXTRACTION COLLECT | HOLD TIME TO EXTRACTION RECEIPT |
|---|---|---|---|---|---|---|---|---|
| JCCNSCS | | 5832-007 | Soil | 11-20-91 | 11-21-91 | 11-25-91 | 5 | 4 |
| JCDW1AS | | 5832-008 | Soil | 11-21-91 | 11-21-91 | 11-25-91 | 4 | 4 |
| JCDW1CS | | 5832-010 | Soil | 11-21-91 | 11-21-91 | 11-25-91 | 4 | 4 |
| JCDW3AS | | 5602-001 | Soil | 11-05-91 | 11-07-91 | 11-08-91 | 3 | 1 |
| JCDW3BS | | 5602-002 | Soil | 11-05-91 | 11-07-91 | 11-08-91 | 3 | 1 |
| JCQC2BW | | 5602-004 | WATER | 11-06-91 | 11-07-91 | 11-11-91 | 5 | 4 |
| JCQC1TW | | 5602-003 | WATER | 11-06-91 | 11-07-91 | 11-11-91 | 5 | 4 |
| JCQC3XW | | 5630-001 | WATER | 11-07-91 | 11-08-91 | 11-11-91 | 4 | 3 |
| JCSD1AS | | 5770-006 | SOIL | 11-17-91 | 11-18-91 | 11-20-91 | 3 | 2 |
| JCSD2AS | | 5770-004 | SOIL | 11-17-91 | 11-18-91 | 11-20-91 | 3 | 2 |
| JCSW4AS | | 5909-001 | SOIL | 11-26-91 | 11-26-91 | 11-30-91 | 4 | 4 |
| JCSW4BS | | 5909-002 | SOIL | 11-26-91 | 11-26-91 | 11-30-91 | 4 | 4 |
| JCSW4CS | | 5909-003 | SOIL | 11-26-91 | 11-26-91 | 11-30-91 | 4 | 4 |
| JCSW5AS | | 5832-001 | SOIL | 11-20-91 | 11-21-91 | 11-25-91 | 5 | 4 |
| JCSW5BS | | 5832-002 | SOIL | 11-20-91 | 11-21-91 | 11-25-91 | 5 | 4 |
| JCSW6AS | | 5770-001 | SOIL | 11-16-91 | 11-18-91 | 11-20-91 | 4 | 2 |
| JCSW6BS | | 5770-002 | SOIL | 11-16-91 | 11-18-91 | 11-20-91 | 4 | 2 |
| JCSW8BS | | 5554-002 | SOIL | 11-04-91 | 11-05-91 | 11-08-91 | 4 | 3 |
| JCSW8AS | | 5554-001 | SOIL | 11-04-91 | 11-05-91 | 11-08-91 | 4 | 3 |

COMMENTS:

HOLD TIME COLLECT = DATE COLLECTED MINUS DATE EXTRACTED

HOLD TIME RECEIPT = DATE RECEIVED MINUS DATE EXTRACTED

REV. 301

# ECHEM INC.
## ORGANICS
## COMPLETENESS LOG

SITE: Air Force Plant 59 CLIENT: Argonne Nat'l Labs

CASE # SDG# 1-5554

| | SAMPLE # | JCENJC5 | JCDW1A5 | JCDW1C5 | JCDW3A5 | JCDW3B5 | JCQC2BW | JCQC1TW | JCQC3XW | JCSD1A5 | JCSD2A5 | JCSW4A5 | JCSW5A5 | JCSW4B5 | JCSW4C5 | JCSW5B5 | JCSW6A5 | JCSW6B5 | JCSW8A5 | JCSW8B5 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1A | | | | | | | | | | | | | | | | | | | | | | | |
| | 1E | | | | | | | | | | | | | | | | | | | | | | | |
| | 2A | | | | | | | | | | | | | | | | | | | | | | | |
| | 2B | | | | | | | | | | | | | | | | | | | | | | | |
| | 3A | | | | | | | | | | | | | | | | | | | | | | | |
| VOA | 3B | | | | | | | | | | | | | | | | | | | | | | | |
| | 4A | | | | | | | | | | | | | | | | | | | | | | | |
| | 5A | | | | | | | | | | | | | | | | | | | | | | | |
| | 6A | | | | | | | | | | | | | | | | | | | | | | | |
| | 7A | | | | | | | | | | | | | | | | | | | | | | | |
| | 8A | | | | | | | | | | | | | | | | | | | | | | | |
| | 1B | | | | | | | | | | | | | | | | | | | | | | | |
| | 1C | | | | | | | | | | | | | | | | | | | | | | | |
| | 1F | | | | | | | | | | | | | | | | | | | | | | | |
| | 2C | | | | | | | | | | | | | | | | | | | | | | | |
| | 2D | | | | | | | | | | | | | | | | | | | | | | | |
| | 3C | | | | | | | | | | | | | | | | | | | | | | | |
| | 3D | | | | | | | | | | | | | | | | | | | | | | | |
| SVOA | 4B | | | | | | | | | | | | | | | | | | | | | | | |
| | 5B | | | | | | | | | | | | | | | | | | | | | | | |
| | 6B | | | | | | | | | | | | | | | | | | | | | | | |
| | 6C | | | | | | | | | | | | | | | | | | | | | | | |
| | 7B | | | | | | | | | | | | | | | | | | | | | | | |
| | 7C | | | | | | | | | | | | | | | | | | | | | | | |
| | 8B | | | | | | | | | | | | | | | | | | | | | | | |
| | 8C | | | | | | | | | | | | | | | | | | | | | | | |
| | 1D | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | | | | |
| | 2E | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | | | | |
| | 2F | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | | | | |
| | 3E | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | | | | |
| PEST | 3F | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | | | | |
| | 4C | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | | | | |
| | 8D | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | | | | |
| | 8E | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | | | | |
| | 9 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | | | | |
| | 10 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | | | | |

____ Quant Reports
____ MASS SPECS
____ TIC Compounds
✓ Laboratory Blank (Form 1's)
✓ MS/MSD (Forms 1's)
____ Total Solids Log (if applicable)
____ Injection Log
✓ Chain of Custody
✓ Case Narrative

REV. 391

# Appendix A-1:

## Report 4

**ECHEM INC.**

**ENGINEERING CHEMISTRY CONSULTANTS**

P.O. Box 1510
#32 Route 35
Sebago Common
Windham, Maine 04062
(207) 892-0002
FAX (207) 892-7499

26 February 1992

Dr. A. Dallas Wait
Senior Environmental Chemist
Gradient Corporation
44 Brattle Street
Cambridge, MA 02138

| | |
|---|---|
| Re: | Air Force Plant 59 |
| Laboratory: | Galson Laboratories |
| Case No: | NONE |
| SDG No: | 1-5554 |

| | | | | |
|---|---|---|---|---|
| TAL Inorganics: | JCSW6AS | JCSW8BS | JCCNSCS | JCDW1AS |
| | JCDW1BS | JCDW1CS | JCDW3AS | JCDW3BS |
| | JCQC1TW | JCQC2BW | JCQC3XW | JCSD1AS |
| | JCSW4AS | JCSW4BS | JCSW4CS | JCSW5AS |
| | JCSW5BS | JCSW6BS | JCSW8AS | JCSD2AS |

Dear Dr. Wait:

Validation was performed on the inorganic analytical data from the samples referenced above. The data were evaluated, based on the following parameters:

* - data completeness
* - holding times
* - calibrations
- blanks
* - ICP interference check sample analysis
- matrix spike analysis
* - duplicate sample analysis
* - laboratory control sample analysis
- furnace atomic absorption results
- ICP serial dilution results
* - detection limits
* - sample result verification
* - sample result verification

* All criteria were met for this parameter.

Table I Summarizes the validation actions, which were in accordance with USEPA Region II Evaluation of Inorganic Data for the Contract Laboratory Program, February 1990, SOP No. HW-2, Revision X, and the NYSDEC ASP, September 1989 as detailed below.

Also attached are the:

- o data validation log,
- o telephone log,
- o completeness log, and
- o sample preparation and analysis Summaries.

1. Positive Blanks

Blanks providing results ≥IDL and their associated action levels are tabulated below:

| BLANK ID | PARAMETER | CONCENTRATION | ACTION LEVEL WATER | ACTION LEVEL SOIL |
|---|---|---|---|---|
| CCB2 | beryllium | 4 | | 4 |
| | sodium | 412 | | 412 |
| CCB3 | beryllium | 3 | | 3 |
| | sodium | 395 | | 395 |
| CCB4 | beryllium | 3 | | 3 |

Associated samples with positive values reported below the action level are tabulated below:

| CAL BLANK ID | PARAMETER | SAMPLE NO. |
|---|---|---|
| CCB2 | beryllium | JCSW8AS |
| | sodium | JCSW8AS |
| | | JC5W8BS |
| CCB3 | beryllium | JCSW5A5 |
| | | JCCNSCS |
| | | JCSW5BS |
| | | JCDW1AS |
| | | JCDW1BS |
| | | JCSW4AS |
| | | JCSW4BS |

| CAL BLANK ID | PARAMETER | SAMPLE NO. |
|---|---|---|
| CCB3 | sodium | JCCNSCS |
| | | JCSW5BS |
| | | JCDW1AS |
| | | JCDW1BS |
| | | JCSW4AS |
| | | JCSW4BS |
| CCB4 | beryllium | JCSW4CS |

Action:

- o associated sample results >IDL but <action level are flagged as not detected at the sample value (U)

2. Negative Blanks

Blanks that provided results <-2IDL are tabulated below:

| BLANK ID | PARAMETER | CONCENTRATION |
|---|---|---|
| CCB1 | calcium | -93 |
| | magnesium | -272 |
| CCB2 | antimony | -4.6 |
| | magnesium | -122 |
| CCB3 | calcium | -71 |
| | copper | -9 |
| | magnesium | -240 |
| CCB4 | calcium | -77 |
| | magnesium | -234 |
| | manganese | -4 |
| CCB5 | antimony | -4.5 |
| | calcium | -59 |
| | magnesium | -242 |

Associated samples with results reported <10IDL: NONE

MATRIX SPIKE ANALYSIS:

Samples providing matrix spike recoveries not within 75-125% that also contain native analyze reported at <4X the spiking level as specified in the NYSDEC CLP (Vol. VIII, E-111) are tabulated below:

| SAMPLE | ELEMENT | % RECOVERY |
|---|---|---|
| JCSW5BSMS | antimony | 26 |
| | arsenic | 66 |
| | thallium | 66 |

Action:

- o for recoveries <30%, results ≥IDL are flagged as estimated (J) detection limit values (IDL U) are flagged as unusable (R)

- o for recoveries from 30-74%, results are flagged as estimated (J)

Comments:

The above actions are applied to ALL samples of the same matrix associated with this SDG.

FURNACE ATOMIC ABSORPTION RESULTS:

1. Post-digestion spike

Samples with post-digestion spike recoveries ≥40% but not within 85-115%, and also having native analyze sample absorbance <50% of the spiked sample value, and samples with post-digestion spike recoveries reported at <40% that were diluted 5-10 fold and recoveries repeated at <40% or that were not within 85-115%, and also having native sample absorbance <50% of the spiked sample value, as specified in the NYSDEC CLP (Vol. VIII, E-118-119) are tabulated below:

| SAMPLE | ELEMENT | % RECOVERY |
|---|---|---|
| JCDW1CS | selenium | 76 |
| JCDW3AS | selenium | 81 |
| JCSW6AS | selenium | 65 |
| JCSW6BS | selenium | 82 |
| JCSD1AS | selenium | 75 |
| JCSD2AS | selenium | 80 |
| JCSW5AS | selenium | 77 |
| JCDW1BS | selenium | 83 |
| JCSW4AS | selenium | 73 |
| JCSW4BS | selenium | 81 |
| JCSW4CS | selenium | 75 |

Action:

- o for spike recoveries >10%, but not within 85-115%, sample results ≥IDL are flagged as estimated (J)

- o for spike recoveries >10% but <85%, sample detection limit values (IDL U) are flagged as estimated (J)

ICP SERIAL DILUTION RESULTS:

Serial dilution results for elements reported present in the undiluted sample at >50IDL that providing serial dilution reproducibility (%D) of >10% specified by the NYSDEC clap (Vol. VIII, E-116) are tabulated below:

| SAMPLE | ELEMENT | %D |
|---|---|---|
| JCSW5BS | zinc | 12.4 |

Action:

- o results are flagged as estimated (J)

Comments:

The above actions are applied to ALL samples of the same matrix associated with this SDG.

Sincerely,
ECHEM INC.

Bruce K. Wallin, Ph.D.
Vice President

enclosures

Air Force Plant 59

Case No. NONE

Table I. Validation Action Summary

| | | | |
|---|---|---|---|
| Aluminum | | Magnesium | |
| Antimony | J4 | Manganese | |
| Arsenic | J4 | Mercury | |
| Barium | | Nickel | |
| Beryllium | A1 | Potassium | |
| Cadmium | | Selenium | J7 |
| Calcium | | Silver | |
| Chromium | | Sodium | A1 |
| Cobalt | | Thallium | J4 |
| Copper | | Vanadium | |
| Iron | | Zinc | J9 |
| Lead | | Cyanide | |

If an element has no entry, no qualifications were necessary.

A1 - Accept data, raise the sample detection limit(s) due to blank contamination.

J1 - Estimate (J) positive values and (UJ) detection limit results due to hold time exceedences.

J2 - Estimate (J) positive values and (UJ) detection limit results due to non-compliant calibrations.

J3 - Estimate (J) positive values and (UJ) detection limit results due to non-compliant linearity near the CRDL.

J4 - Estimate (J) positive values and (UJ) detection limit results due to non-compliant matrix spike recoveries.

J5 - Estimate (J) positive values due to non-compliant duplicate precision.

J6 - Estimate (J) positive values and (UJ) detection limit results due non-compliant laboratory control sample results.

J7 - Estimate (J) positive values and (UJ) detection limit results due to non-compliant analytical precision and/or accuracy.

J8 - Estimate (J) positive values due to non-compliant method of standard additions linearity.

J9 - Estimate (J) positive values and (UJ) detection limit results due to non-compliant serial dilution reproduceability.

**ECHEM INC.**
**INORGANICS**
**COMPLETENESS LOG**

SITE: Air Force Plant 59 CLIENT: Argonne Nat'l Labs
CASE # SDG# 1-5554

| SAMPLE # | JCSW06AS | JCSW08BS | JCCN5CS | JCDW02AS | JCDW01BS | JCDW01CS | JCDW03AS | JCDW03BS | JCQC1TW | JCQC3XW | JCSD1AS | JCSD2AS | JCSW4AS | JCSW4BS | JCSW4CS | JCSW5AS | JCSW5BS | JCSW6BS | JCSW8AS | JCQC2BW | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | | | |
| 2A | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | | | |
| 2B | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | | | |
| 3 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | | | |
| 4 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | | | |
| 5A | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | | | |
| 5B | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | | | |
| 7 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | | | |
| 8 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | | | |
| 9 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | | | |
| 10 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | | | |
| 11A | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | | | |
| 11B | | | | | | | | | | | | | | | | | | | | | | | | |
| 12 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | | | |
| 13 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | | | |
| 14 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | | | |

____ Standardization Report for ICP
____ Analysis Report for each calibration, blank, sample
____ Copies of printer tapes for each AAS element
✓ Mercury Analysis Sheet
✓ Cyanide Analysis Sheet
✓ Total Solids Log (if applicable)
✓ Metals Digestion Log
✓ Mercury Digestion Log
✓ Cyanide Distillation Log
✓ Chain of Custody
✓ Case Narrative

REV. 391

ECHEM INC.
SAMPLE PREPARATION AND ANALYSIS SUMMARY
FOR NYSDEC

CLIENT: Argonne Nat'l Labs
CASE NO.
SDG NO. 1-5554
SITE: Air Force Plant 59
ANALYTICAL FRACTION: Mercury

| CLIENT SAMPLE ID | EPA SAMPLE NO. | LAB. SAMPLE ID | MATRIX | DATE COLLECTED | DATE RECEIVED | DATE ANALYZED | HOLD TIME COLLECT | HOLD TIME RECEIPT |
|---|---|---|---|---|---|---|---|---|
| JCSW6AS | | 5770-001 | Soil | 11-16-91 | 11-18-91 | 11-25-91 | 9 | 7 |
| JCSW8BS | | 5554-008 | | 11-04-91 | 11-05-91 | 11-13-91 | 9 | 8 |
| JCCNSCS | | 5832-007 | | 11-20-91 | 11-21-91 | 12-04-91 | 14 | 13 |
| JCDW1AS | | 5832-008 | | 11-21-91 | 11-21-91 | 12-04-91 | 13 | 13 |
| JCDW1BS | | 5832-009 | | 11-21-91 | 11-21-91 | 12-04-91 | 13 | 13 |
| JCDW1CS | | 5832-010 | | 11-21-91 | 11-21-91 | 12-04-91 | 13 | 13 |
| JCDW3AS | | 5608-001 | | 11-05-91 | 11-07-91 | 11-13-91 | 8 | 6 |
| JCDW3BS | | 5608-002 | Soil | 11-05-91 | 11-07-91 | 11-13-91 | 8 | 6 |
| JCQC1TW | | 5608-003 | Water | 11-06-91 | 11-07-91 | 11-13-91 | 7 | 6 |
| JCQC2BW | | 5602-004 | Water | 11-06-91 | 11-07-91 | 11-13-91 | 7 | 6 |
| JCQC3XW | | 5630-001 | Water | 11-07-91 | 11-09-91 | 11-13-91 | 6 | 6 |
| JCSD1AS | | 5770-006 | Soil | 11-17-91 | 11-18-91 | 11-25-91 | 8 | 7 |
| JCSD2AS | | 5770-004 | | 11-17-91 | 11-18-91 | 11-25-91 | 8 | 7 |
| JCSW4AS | | 5909-001 | | 11-26-91 | 11-26-91 | 12-04-91 | 8 | 8 |
| JCSW4BS | | 5909-002 | | 11-26-91 | 11-26-91 | 12-04-91 | 8 | 8 |
| JCSW4CS | | 5909-003 | | 11-26-91 | 11-26-91 | 12-04-91 | 8 | 8 |
| JCSW5AS | | 5832-001 | | 11-20-91 | 11-21-91 | 12-04-91 | 14 | 13 |
| JCSW5BS | | 5832-002 | | 11-20-91 | 11-21-91 | 12-04-91 | 14 | 13 |
| JCSW6BS | | 5770-002 | | 11-16-91 | 11-18-91 | 11-25-91 | 9 | 7 |
| JCSW8AS | | 5554-001 | | 11-04-91 | 11-05-91 | 11-13-91 | 9 | 8 |

COMMENTS:

HOLD TIME COLLECT = DATE COLLECTED MINUS DATE ANALYZED

HOLD TIME RECEIPT = DATE RECEIVED MINUS DATE ANALYZED

REV. 301

ECHEM INC.
SAMPLE PREPARATION AND ANALYSIS SUMMARY
FOR NYSDEC

CLIENT: Argonne Nat'l Labs
CASE NO.
SDG NO. 1-5554
SITE: Air Force Plant 59
ANALYTICAL FRACTION: Cyanide

| CLIENT SAMPLE ID | EPA SAMPLE NO. | LAB. SAMPLE ID | MATRIX | DATE COLLECTED | DATE RECEIVED | DATE ANALYZED | HOLD TIME COLLECT | HOLD TIME RECEIPT |
|---|---|---|---|---|---|---|---|---|
| JCSW6AS | | 5770-001 | Soil | 11-16-91 | 11-18-91 | 11-21-91 | 5 | 3 |
| JCSW8AS | | 5554-002 | | 11-04-91 | 11-05-91 | 11-18-91 | 9 | 8 |
| JCCNSCS | | 5832-007 | | 11-20-91 | 11-21-91 | 11-27-91 | 7 | 6 |
| JCDW1AS | | 5832-008 | | 11-21-91 | 11-21-91 | 11-27-91 | 6 | 6 |
| JCDW1BS | | 5832-009 | | 11-21-91 | 11-21-91 | 11-27-91 | 6 | 6 |
| JCDW1CS | | 5832-010 | | 11-21-91 | 11-21-91 | 11-27-91 | 6 | 6 |
| JCDW3AS | | 5602-001 | | 11-05-91 | 11-07-91 | 11-27-91 | 2 | 20 |
| JCDW3BS | | 5602-002 | Soil | 11-05-91 | 11-07-91 | 11-13-91 | 8 | 6 |
| JCAC1TW | | 5602-003 | WATER | 11-06-91 | 11-07-91 | 11-13-91 | 7 | 6 |
| JCAC2XW | | 5630-001 | WATER | 11-08-91 | 11-07-91 | 11-13-91 | 6 | 6 |
| JCSD1AS | | 5770-006 | Soil | 11-07-91 | 11-18-91 | 11-21-91 | 4 | 3 |
| JCSD2AS | | 5770-004 | | 11-17-91 | 11-18-91 | 11-21-91 | 4 | 3 |
| JCSW4AS | | 5909-001 | | 11-26-91 | 11-26-91 | 12-06-91 | 10 | 10 |
| JCSW4BS | | 5909-002 | | 11-26-91 | 11-26-91 | 12-06-91 | 10 | 10 |
| JCSW4CS | | 5909-003 | | 11-26-91 | 11-26-91 | 12-06-91 | 10 | 10 |
| JCSW5AS | | 5832-001 | | 11-20-91 | 11-21-91 | 11-27-91 | 7 | 6 |
| JCSW5BS | | 5832-002 | | 11-20-91 | 11-21-91 | 11-27-91 | 7 | 6 |
| JCSW6BS | | 5770-002 | | 11-16-91 | 11-18-91 | 11-21-91 | 5 | 3 |
| JCSW8AS | | 5554-001 | Soil | 11-04-91 | 11-05-91 | 11-13-91 | 9 | 8 |
| JCAC2AW | | 5602-004 | WATER | 11-08-91 | 11-07-91 | 11-13-91 | 7 | 6 |

COMMENTS:

HOLD TIME COLLECT = DATE COLLECTED MINUS DATE ANALYZED

HOLD TIME RECEIPT = DATE RECEIVED MINUS DATE ANALYZED

REV. 361

# Appendix A-1:

# Report 5

**ECHEM INC.**

**ENGINEERING CHEMISTRY CONSULTANTS**

P.O. Box 1510
#32 Route 33
Sebago Common
Windham, Maine 04062
(207) 892-0002
FAX (207) 892-7499

26 February 1992

Dr. A. Dallas Wait
Senior Environmental Chemist
Gradient Corporation
44 Brattle Street
Cambridge, MA 02138

| | |
|---|---|
| Re: | Air Force Plant 59 |
| Laboratory: | Galson Laboratories |
| Case No: | NONE |
| SDG No: | 2-5807 |

| | | | |
|---|---|---|---|
| Volatiles: | JCCNCAW | JCCW1AW | JCCW2AW |
| (USEPA 524.2) | JCOF1AW | JCOF2AW | TRIP BLANK4 |
| | TRIP BLANK5 | TRIP BLANK7 | |

Dear Dr. Wait:

Validation was performed on the organic analytical data from the samples referenced above. The data were evaluated based on the following parameters in accordance with the specifications set forth in USEPA Method No. 524.2, Revision 3 and the Quality Assurance Project Plan for Air Force Plant 59, Johnson City, New York, Revision 2, December 19, 1991.

* - data completeness
* - holding times
- surrogate recovery
- matrix spike/matrix spike duplicate
- laboratory fortified blank
- blanks
* - GC/MS tuning
- calibration
* - internal standards performance
- field duplicates
* - TCL compound identification
* - tentatively identified compounds

* - system performance
* - compound guantitation and reported detection limits
* - sample result verification

* All criteria were met for this parameter.

Table I summarizes the validation actions, which were in accordance with USEPA Region II CLP Organics Data Review and Preliminary Review, March 1990, SOP No. HW-6, Revision #7, and the NYSDEC ASP, September 1989, as detailed below.

Also attached are the:

- o data validation log,
- o telephone log,
- o completeness log, and
- o sample preparation and analysis summaries.

SURROGATE RECOVERY:

Samples with surrogate recoveries which did not meet the criteria specified-in the NYSDEC ASP are summarized below:

| | PERCENT RECOVERIES | | |
|---|---|---|---|
| SAMPLE | D4DCE | D8T | BFB |
| JCCW2AW | 121 | | |
| JCCW1AW | 126 | | |
| JCOF2AW | 123 | | |

Action:

- o for sample JCOF2AW recovery ≥10%; sample results ≥MDL are flagged as estimated (J)
- o for samples JCCW2AW and JCCW1AW none, results reported as MLD U

MATRIX SPIKE/MATRIX SPIKE DUPLICATE:

Samples with MS and/or MSD recoveries not within recovery range specified in the NYSDEC ASP are tabulated below:

| | RECOVERY (%) | | | | |
|---|---|---|---|---|---|
| SAMPLE | DCE | TCE | BENZ | TOL | CLB |
| JC0F2AW | | 30 | | | |

Action:

- o sample results >MDL for the compound are flagged as estimated (J)

Samples with MS/MSD relative percent differences (RPD) greater than the limits specified in the NYSDEC ASP are tabulated below:

| | | | RPD (%) | | |
|---|---|---|---|---|---|
| SAMPLE | DCE | TCE | BENZ | TOL | CLB |
| JCOF2AW | | 102 | | | |

Action:

- o sample results >MDL for the compound are flagged as estimated (J)

LABORATORY FORTIFIED BLANK:

Compounds not within the recovery limits specified in the NYSDEC ASP are tabulated below:

| COMPOUND | % RECOVERY |
|---|---|
| cis-1, 3-dichloropropene | 82 |
| dibromochloromethane | 84 |
| 1,1, 2-trichloroethane | 86 |

Action:

- o none, sample results are reported as MDL U

Positive blank results and associated action levels are tabulated below:

| BLANK ID. | COMPOUND | CONCENTRATION | ACTION LEVEL |
|---|---|---|---|
| TRIP BLANK4 | methylene chloride | 0.9 | 9.0 |
| | chloroform | 0.6 | 3.0 |
| TRIP BLANKS | methylene chloride | 1 | 10 |
| TRIP BLANK7 | methylene chloride | 1 | 10 |

* Method blank levels below the NYSDEC ASP requirements.

Associated samples with positive values reported below the action level are:

| TRIP BLANK ID. | ASSOCIATED SAMPLES |
|---|---|
| TRIP BLANK4 | JCCW1AW |
| | JCCW2AW |
| TRIP BLANK7 | JCOFIAW |
| | JCOF2AW |

Action:

- o associated sample results <EL (flagged J); changed to EL (U)
- o associated sample results >MDL and <action level (flagged B) Are flagged as not detected at the sample value (U)

NOTE: Blank action levels were corrected for associated sample dilution factors, where necessary, prior to validation qualifications.

CALIBRATION:

A. Initial calibration:

SPCC compounds with average relative response factors (AVG RRF) below the limits and all others £0.10 or percent relative standard deviations (%RSD) >30% for CCC compounds and >35% for all other compounds as specified in the NYSDEC ASP are tabulated below:

| INSTR. | CAL DATE | COMPOUND | AVG RRF | %RSD |
|---|---|---|---|---|
| C | 11-19-90 | 2-butanone | 0.031 | |
| | | 1,1,2,2-tetrachloroethane | 0. 241 | |
| | | 2-hexanone | 0.073 | |

Associated samples:

| INSTRUMENT | CAL DATE | SAMPLE NO. | |
|---|---|---|---|
| C | 11-19-90 | JCCNCAW | JCCW1AW |
| | | JCCW2AW | JCOF1AW |
| | | JCOF2AW | |
| | | TRIP BLANK4 | |
| | | TRIP BLANK5 | |
| | | TRIP BLANK7 | |

Action:

- o for AVG PULP, <0 a 10, results >MDL for the compound are flagged as estimated (J) and detection limit values (MDL U) are flagged a; unusable (R)
- o none, sample results reported as MDL U

Comments:

a. The lower specific response for the SPCC compound 1,1,2,2-tetrachloroethane is most likely due to the increased purge volume rather than methodology problems. All samples were reported MDL U, the validation concludes that the specific response was sufficient to achieve the MDL reported, therefore, no action was taken.

b. For 2-butanone, 2-hexanone and 4-methyl-2-pentanone the detection limits provided for this SDG are probably valid, even thought they have been flagged in accordance with the specifications for initial and/or continuing calibration. This conclusion is based on the following observations:

- o The specific response for the 2 µg/l initial calibration standard are consistent with the AVG. RRF's and the continuing calibration RRF's, and
- o the recoveries provided for the 5 µg/l QC check standard are reasonable.

B. Continuing calibration:

SPCC compounds with relative response factors (RRF) below the limits and all others ≤0.10 or percent difference between initial and continuing calibration (%D) >25% for CCC compounds and >35% for all other compounds as specified in the NYSDEC ASP are tabulated below:

| INSTR. | CAL DATE-TIME | COMPOUND | RRF | %D |
|---|---|---|---|---|
| C | 11-21-91/23:52 | 2-butanone | 0.035 | |
| | | 1,1,2,2-tetrachloroethane | 0.230 | |
| | | 4-methyl-2-pentanone | 0.089 | |
| | | 2-hexanone | 0.063 | |
| B | 11-22-91/16:28 | 2-butanone | 0.022 | |
| | | 1,1,2,2-tetrachloroethane | 0.226 | |
| | | 4-methyl-2-pentanone | 0.094 | |
| | | 2-hexanone | 0.070 | |
| C | 11-27-91/13:47 | 2-butanone | 0.033 | |
| | | 1,1,2,2-tetrachloroethane | 0.218 | |
| | | 4-methyl-2-pentanone | 0.078 | |
| | | 2-hexanone | 0.058 | |

| INSTR. | CAL DATE/TIME | COMPOUND | RRF | %D |
|---|---|---|---|---|
| C | 11-30-91/12:40 | 2-butanone | 0.029 | |
| | | 1,1,2,2-tetrachloroethane | 0 237 | |
| | | 2-hexanone | 0.077 | |

Associated samples:

| INSTRUMENT | CAL DATE/TIME | SAMPLE NO. |
|---|---|---|
| C | 11-21-91/23:52 | JCCW2AW<br>JCCWIAW |
| | 11-27-91/13:47 | JCOFIAW<br>JCOF2AW |
| | 11-30-90/12:40 | TRIP BLANK7 |
| B | 11-22-91/16:28 | JCCNCAW<br>TRIP BLANK5<br>TRIP BLANK4 |

Action:

- o for RRF, ≤0.10, results ≥MDL for the compound are flagged as estimated (J) and detection limit values (MDL U) are flagged as unusable (R)
- o none, sample results reported as MDL U

Comments:

See above comments for initial calibration.

FIELD DUPLICATES:

No field duplicates were identified for this SDG.

Sincerely,
ECHEM INC.

Bruce K. Wallin, Ph.D.
Vice President

enclosures

Air Force Plant 59

Case No NONE

Table I. Validation Action Summary

| Sample No. | VOA |
|---|---|
| JCCNCAW | R4 |
| JCCW1AW | A1,R4 |
| JCCW2AW | A1,R4 |
| JC0F1AW | A1,R4 |
| JCOF2AW | J2,J4,R4 |
| TRIP BLANK4 | R4 |
| TRIP BLANK5 | R4 |
| TRIP BIANK7 | R4 |

If the field is blank, no qualifiers were necessary.

A1 - change positive values for chloroform and methylene chloride to revised detection limit due to blank contamination

J1 - estimate positive values (J) and detection limit values (UJ) due to holding time violations

J2 - estimate positive values (J) due to non-compliant volatile surrogate recoveries

J3 - estimate positive values (J) and detection limit values (UJ) due to non-compliant (acid) (base-neutral) fraction surrogate recoveries

J4 - estimate positive values (J) for trichloroethene due to non-compliant matrix spike recoveries

J5 - estimate positive values (J) for ( ) due to calibration not meeting minimum RF criteria

J6 - estimate positive values (J) and detection limit values (UJ) for ( ) due to non-compliant calibration stability

J7 - estimate positive values (J) for ( ) due to non-compliant internal standard stability

J8 - estimate positive values (J) due to non-compliant field duplicate precision

R1 - reject detection limit values (UR) due to holding time exceedences

R2 - reject detection limit values (UR) due to low surrogate recoveries

R3 - reject detection limit values (UR) for ( ) due to low matrix spike recoveries

R4 - reject detection limit values (UR) for 2-butanone, 2-hexanone and 4-methyl-2-pentanone due to calibration not meeting minimum RF criteria

R5 - reject detection limit values (UR) for ( ) due to extreme variations in the internal standard stability

# ECHEM INC.
## ORGANICS
## COMPLETENESS LOG

SITE: Air Force Plant 59 CLIENT: Argonne Nat'l Labs

CASE # SDG# 2-5807

| | SAMPLE # | TCCNCAW | TCCW1AW | TCCW2AW | TCOF1AW | TCOF2AW | TRIP BLANK 4 | TRIP BLANK 5 | TRIP BLANK 7 |
|---|---|---|---|---|---|---|---|---|---|
| | 1A | X | X | X | X | X | X | X | X |
| | 1B | X | X | X | X | X | X | X | X |
| | 2A | X | X | X | X | X | X | X | X |
| | 2B | | | | | | | | |
| | 3A | X | X | X | X | X | X | X | X |
| VOA | 3B | | | | | | | | |
| | 4A | X | X | X | X | X | X | X | X |
| | 5A | X | X | X | X | X | X | X | X |
| | 6A | X | X | X | X | X | X | X | X |
| | 7A | X | X | X | X | X | X | X | X |
| | 8A | X | X | X | X | X | X | X | X |
| | 1B | | | | | | | | |
| | 1C | | | | | | | | |
| | 1F | | | | | | | | |
| | 2C | | | | | | | | |
| | 2D | | | | | | | | |
| | 3C | | | | | | | | |
| | 3D | | | | | | | | |
| SVOA | 4B | | | | | | | | |
| | 5B | | | | | | | | |
| | 6B | | | | | | | | |
| | 6C | | | | | | | | |
| | 7B | | | | | | | | |
| | 7C | | | | | | | | |
| | 8B | | | | | | | | |
| | 8C | | | | | | | | |
| | 1D | | | | | | | | |
| | 2E | | | | | | | | |
| | 2F | | | | | | | | |
| | 3E | | | | | | | | |
| PEST | 3F | | | | | | | | |
| | 4C | | | | | | | | |
| | 8D | | | | | | | | |
| | 8E | | | | | | | | |
| | 9 | | | | | | | | |
| | 10 | | | | | | | | |

✓ Quant Reports
✓ MASS SPECS
✓ TIC Compounds
✓ Laboratory Blank (Form 1's)
✓ MS/MSD (Forms 1's)
N.A. Total Solids Log (if applicable)
___ Injection Log
✓ Chain of Custody
✓ Case Narrative

REV. 391

# ECHEM INC.
## DATA VALIDATION LOG

CLIENT: Argonne Nat'l Labs

SITE: Air Force Plant 59

| CASE NO. | SDG NO. | DATE REC'D | VALIDATION UNITS | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | VOA | SVOA | PEST/PCB | INORG | SAS | DIOX |
| | 1-5554 | 1-8-92 | 0/24 | 0/20 | 2/16 | 3/17 | | |
| | 2-5807 | 1-8-92 | 8/0 | 0/5 | 0/5 | 0/5 | | |
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| | | | | | | | | |

NOTE: UNITS ARE DEFINED AS WATER/SOIL (E.G., 5/6) INCLUDING BLANKS

COMMENTS: SAS for this project include:

Turnaround time for these cases is: standard = 30 days / fast = 14 days

REV. 3/91

ECHEM INC.
SAMPLE PREPARATION AND ANALYSIS SUMMARY
FOR NYSDEC

CLIENT: Argonne Nat'l Labs
CASE NO.
SDG NO. 2-5807
SITE: Air Force Plant 59
ANALYTICAL FRACTION: Volatiles

| CLIENT SAMPLE ID | EPA SAMPLE NO. | LAB. SAMPLE ID | MATRIX | DATE COLLECTED | DATE RECEIVED | DATE ANALYZED | HOLD TIME COLLECT | HOLD TIME RECEIPT |
|---|---|---|---|---|---|---|---|---|
| JCCNCAW | | 5808-001 | WATER | 11-18-91 | 11-19-91 | 11-22-91 | 4 | 3 |
| JCCW1AW | | 5807-002 | WATER | 11-17-91 | 11-18-91 | 11-22-91 | 5 | 4 |
| JCCW2AW | | 5807-001 | WATER | 11-17-91 | 11-18-91 | 11-22-91 | 5 | 4 |
| JCOF1AW | | 5868-001 | WATER | 11-23-91 | 11-23-91 | 11-27-91 | 4 | 4 |
| JCOF2AW | | 5868-002 | WATER | 11-23-91 | 11-23-91 | 11-27-91 | 4 | 4 |
| TRIP BLANK 4 | | 5807-003 | WATER | 11-18-91 | 11-18-91 | 11-23-91 | 5 | 5 |
| TRIP BLANK 5 | | 5808-002 | WATER | 11-18-91 | 11-19-91 | 11-22-91 | 4 | 3 |
| TRIP BLANK 7 | | 5868-007 | WATER | 11-23-91 | 11-23-91 | 11-30-91 | 7 | 7 |

COMMENTS:

HOLD TIME COLLECT = DATE COLLECTED MINUS DATE ANALYZED

HOLD TIME RECEIPT = DATE RECEIVED MINUS DATE ANALYZED

REV. 301

# Appendix A-I:

# Report 6

**ECHEM INC.**
**ENGINEERING CHEMISTRY CONSULTANTS**

P.O. Box 1510
#32 Route 35
Sebago Common
Windham, Maine 04062
(207)892-0002
FAX (207) 892-7499

26 February 1992

Dr. A. Dallas Wait
Senior Environmental Chemist
Gradient Corporation
44 Brattle Street
Cambridge, MA 02138

| | |
|---|---|
| Re: | Air Force Plant 59 |
| Laboratory: | Galson Laboratories |
| Case No: | NONE |
| SDG No: | 2-5807 |

| | | | |
|---|---|---|---|
| Semivolatiles: | JCCNCAW | JCCW1AW | JC0F1AW |
| | JC0F2AW | JCCW2AW | |

Dear Dr. Wait:

Validation was performed on the organic analytical data from the samples referenced above. The data were evaluated based on the following parameters:

* - data completeness
* - holding times
* - surrogate recovery
- matrix spike/matrix spike duplicate/matrix spike blank
- blanks
* - GC/MS tuning
- calibration
* - internal standards performance
- field duplicates
* - TCL compound identification
* - tentatively identified compounds
* - system performance
* - compound quantitation and reported detection limits
* - sample result verification

* All criteria were met for this parameter.

Table I Summarizes the validation actions, which were in accordance with USEPA Region II CLP Organics Data Review and Preliminary Review, March 1990, SOP No. HW-E, Revision # 7, and the NYSDEC ASP, September 1989, as detailed below.

Also attached are the:

- o data validation log,
- o telephone log,
- o completeness log, and
- o sample preparation and analysis summaries.

MATRIX SPIKE/MATRIX SPIKE DUPLICATE/MATRIX SPIKE BLANK:

Matrix spike recoveries which did not meet The criteria specified in The NYSDEC CLP (Vol. VIII, E-41) are summarized below.

| | RECOVERY (%) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SAMPLE | PHE | CLPH | DCB | DNP | TCB | CRE | ACE | NPH | DNT | PCP | PYR |
| JC0F2AW | | | | | 110 | 110 | 130 | 99 | 130 | 130 | 149 |

Action:

- o none, sample results reported as <CRQL J or CRQL U

BLANKS:

For sample JC0F1AW a TIC was reported that was also present in the associated method blank, therefore, the sample results was flagged as unusable (R).

CALIBRATION:

Calibration linearity, sensitivity and stability criteria specified in the NYSDEC CLP (Vol. VIII, E-48-51), or federal criteria (*), are tabulated below.

CONTINUING CALIBRATION CRITERIA

| COMPOUND | %D (max.) | RRF (min.) |
|---|---|---|
| SPCC | 20 | 0.05 |
| all other TCL compounds | 20 | 0.05* |

Deviations from the above calibration criteria are tabulated below.

## CONTINUING CALIBRATION

| INSTRUMENT | DATE/TIME | COMPOUND | %D | RRF |
|---|---|---|---|---|
| GCMSD(#4) | 12-16-91/16:23 | di-n-butylphthalate | 22 | |
| | 12-17-91/08:07 | 2,4-dinitrophenol | 21 | |
| | | 4-nitroaniline | 24 | |
| GCMSD (#4) | 12-16-91/16:23 | di-n-butylphthalate | 24 | |
| | | fluoranthene | 21 | |
| | 12-18-91/07:25 | benzoic acid | 22 | |
| | | 4-nitroaniline | 21 | |
| | | di-n-butylphthalate | 23 | |
| | | fluoranthene | 24 | |

Associated samples:

| INSTRUMENT | DATE/TIME | SAMPLE NO. |
|---|---|---|
| GCMSD(#4) | 12-16-91/16:23 | NONE |
| | 12-17-91/08 : 07 | JCCW2AW |
| | | JCCWIAW |
| | | JCCNCAW |
| | 12-18-91/07:25 | JC0F1AW |
| | | JC0F2AW |

Action:

- o none, associated sample results reported as either <CRQL J or CRQL U

FIELD DUPLICATES:

No field duplicates were identified for this SDG.

Sincerely,
ECHEM INC.

Bruce K. Wallin, Ph.D.
Vice President

enclosures

Air Force Plant 59
Case No. NONE

Table I. Validation Action Summary

| Sample No. | SVOA |
|---|---|
| JCCNCAW | |
| JC0F1AW | J8 |
| JC0F2AW | |
| JCCW2AW | |

If the field is blank, no qualifiers were necessary.

A1 - change positive values for ( ) to revised detection limit due to blank contamination

J1 - estimate positive values (J) and detection limit values (UJ) due to holding time violations

J2 - estimate positive values (J) and detection limit values (UJ) due to non-compliant volatile surrogate recoveries

J3 - estimate positive values (J) and detection limit values (UJ) due to non-compliant (acid) (base-neutral) fraction surrogate recoveries

J4 - estimate positive values (J) for ( ) due to non-compliant matrix spike recoveries

J5 - estimate positive values (J) for ( ) due to calibration not meeting minimum RF criteria

J6 - estimate positive values (J) and detection limit values (UJ) for ( ) due to non-compliant calibration stability

J7 - estimate positive values (J) for ( ) due to non-compliant internal standard stability

J8 - estimate positive values (J) due to non-compliant field duplicate precision

RI - reject detection limit values (UR) due to holding time exceedences

R2 - reject detection limit values (UR) due to low surrogate recoveries

R3 - reject detection limit values (UR) for ( ) due to low matrix spike recoveries

R4 - reject detection limit values (UR) for ( ) due to calibration not meeting minimum RF criteria

R5 - reject detection limit values (UR) for ( ) due to extreme variations in The internal standard stability

R7 - reject detection limit value (UR) for ( ) due to continuing calibration %D >50%

R8 - TIC's identified in associated method blank, result flagged as unusable (R)

ECHEM INC.
SAMPLE PREPARATION AND ANALYSIS SUMMARY
FOR NYSDEC

CLIENT: Argonne Nat'l Labs
CASE NO.

SDG NO. 2-5807

SITE: Air Force Plant 59
ANALYTICAL FRACTION: Semivolatiles

| CLIENT SAMPLE ID | EPA SAMPLE NO. | LAB. SAMPLE ID | MATRIX | DATE COLLECTED | DATE RECEIVED | DATE EXTRACTED | HOLD TIME TO EXTRACTION COLLECT | HOLD TIME TO EXTRACTION RECEIPT |
|---|---|---|---|---|---|---|---|---|
| JCCNCAW | | 5808-001 | WATER | 11-18-91 | 11-18-91 | 11-21-91 | 3 | 3 |
| JCCWIAW | | 5807-002 | WATER | 11-17-91 | 11-18-91 | 11-21-91 | 4 | 3 |
| JCOFIAW | | 5868-001 | WATER | 11-23-91 | 11-24-91 | 11-26-91 | 3 | 2 |
| JCOF2AW | | 5868-002 | WATER | 11-23-91 | 11-24-91 | 11-26-91 | 3 | 2 |
| JCCW2AW | | 5807-001 | WATER | 11-17-91 | 11-18-91 | 11-21-91 | 4 | 3 |

COMMENTS:

HOLD TIME COLLECT = DATE COLLECTED MINUS DATE EXTRACTED

HOLD TIME RECEIPT = DATE RECEIVED MINUS DATE EXTRACTED

REV. 391

# ORGANICS COMPLETENESS LOG

SITE: Air Force Plant 59 CLIENT: Argonne Nat'l

CASE # SDG# 2-5807

| | SAMPLE # | JCCNCAW | JCCW1AW | JCOF1AW | JCOF2AW | JCW2AW |
|---|---|---|---|---|---|---|
| VOA | 1A | | | | | |
| | 1E | | | | | |
| | 2A | | | | | |
| | 2B | | | | | |
| | 3A | | | | | |
| | 3B | | | | | |
| | 4A | | | | | |
| | 5A | | | | | |
| | 6A | | | | | |
| | 7A | | | | | |
| | 8A | | | | | |
| SVOA | 1B | X | X | X | X | X |
| | 1C | X | X | X | X | X |
| | 1F | X | X | X | X | X |
| | 2C | X | X | X | X | X |
| | 2D | | | | | |
| | 3C | X | X | X | X | X |
| | 3D | | | | | |
| | 4B | X | X | X | X | X |
| | 5B | X | X | X | X | X |
| | 6B | X | X | X | X | X |
| | 6C | X | X | X | X | X |
| | 7B | X | X | X | X | X |
| | 7C | X | X | X | X | X |
| | 8B | X | X | X | X | X |
| | 8C | X | X | X | X | X |
| PEST | 1D | | | | | |
| | 2E | | | | | |
| | 2F | | | | | |
| | 3E | | | | | |
| | 3F | | | | | |
| | 4C | | | | | |
| | 8D | | | | | |
| | 8E | | | | | |
| | 9 | | | | | |
| | 10 | | | | | |

COC

NARRATIVE

# Appendix A-1:

# Report 7

**ECHEM INC.**
**ENGINEERING CHEMISTRY CONSULTANTS**

P.O. Box 1510
#32 Route 35
Sebago Common
Windham, Maine 04062
(207) 892-0002
FAX (207) 892-7499

26 February 1992

Dr. A. Dallas Wait
Senior Environmental Chemist
Gradient Corporation
44 Brattle Street
Cambridge, MA 02138

| | |
|---|---|
| Re: | Air Force Plant 59 |
| Laboratory: | Galson Laboratories |
| Case No: | NONE |
| SDG No: | 2-5807 |

Pesticides/PCB's: JCCNCAW JCCW1AW JCCW2AW JCOF1AW JCOF2AW

Dear Dr. Wait:

Validation was performed on the organic analytical data from the samples referenced above. The data were evaluated based on the following parameters:

* - data completeness
* - holding times
* - surrogate recovery
- matrix spike/matrix spike duplicate/matrix spike blank
* - blanks
* - calibration
* - pesticide instrument performance
- field duplicates
* - TCL compound identification
* - compound quantitation and reported detection limits
* - sample result verification

* All criteria were met for this parameter.

Table I summarizes the validation actions, which were in accordance with USEPA Region II CLP Organics Data Review and Preliminary Review, March 1990, SOP No. HW-6, Revision #7 and the NYSDEC ASP, September 1989 as detailed below.

Also attached are the:

- o data validation log,
- o telephone log,
- o completeness log, and
- o sample preparation and analysis summaries.

MATRIX SPIKE/MATRIX SPIKE DUPLICATE/MATRIX SPIKE BLANK:

Matrix spike recoveries which did not meet the criteria specified in the NYSDEC CLP (Vol. VII, E-73) are summarized below.

| | RECOVERY (%) | | | | | |
|---|---|---|---|---|---|---|
| SAMPLE | LIN | HEP | ALD | DIEL | END | DDT |
| MSB-0064 | | | | | 128 | |

Action:

- o none, sample results reported as CRQL U

FIELD DUPLICATES:

No field duplicates were identified for this SDG.

Sincerely,
ECHEM INC.

Bruce K. Wallin, PhD
Vice President

enclosures

Air Force Plant 59
Case No. NONE

Table I. Validation Action Summary

| Sample No. | Pesticide/PCB |
|---|---|
| JCCNCAW | |
| JCCW1AW | |
| JCCW2AW | |
| JCOF1AW | |
| JCOF2AW | |

If the field is blank, no qualifiers were necessary.

A1 - change positive values for ( ) to revised detection limit due to blank contamination

J1 - estimate positive values (J) and detection limit values (UJ) due to holding time violations

J2 - estimate positive values (J) and detection limit values (UJ) due to non-compliant volatile surrogate recoveries

J3 - estimate positive values (J) and detection limit values (UJ) due to non-compliant (acid) (base-neutral) fraction surrogate recoveries

J4 - estimate positive values (J) for ( ) due to non-compliant matrix spike recoveries

J5 - estimate positive values (J) for ( ) due to calibration not meeting minimum RF criteria

J6 - estimate positive values (J) and detection limit values (UJ) for ( ) due to non-compliant calibration stability

J7 - estimate positive values (J) for ( ) due to non-compliant internal standard stability

J8 - estimate positive values (J) due to non-compliant field duplicate precision

R1 - reject detection limit values (UR) due to holding time exceedences

R2 - reject detection limit values (UR) due to low surrogate recoveries

R3 - reject detection limit values (UR) for ( ) due to low matrix spike recoveries

R4 - reject detection limit values (UR) for ( ) due to calibration not meeting minimum RF criteria

R5 - reject detection limit values (UR) for ( ) due to extreme variations in the internal standard stability

R7 - reject detection limit value (UR) for ( ) due to continuing calibration %D >50%

ECHEM INC.
SAMPLE PREPARATION AND ANALYSIS SUMMARY
FOR NYSDEC

CLIENT: Argonne Nat'l Labs
CASE NO.
SDG NO. 2-5807
SITE: Air Force Plant 59
ANALYTICAL FRACTION: Pesticide/PCBs

| CLIENT SAMPLE ID | EPA SAMPLE NO. | LAB SAMPLE ID | MATRIX | DATE COLLECTED | DATE RECEIVED | DATE EXTRACTED | HOLD TIME TO EXTRACTION COLLECT | HOLD TIME TO EXTRACTION RECEIPT |
|---|---|---|---|---|---|---|---|---|
| JCCNCAW | | 5808-001 | WATER | 11-18-91 | 11-19-91 | 11-22-91 | 4 | 3 |
| JCCWIAW | | 5807-002 | WATER | 11-17-91 | 11-18-91 | 11-22-91 | 5 | 4 |
| JCCW2AW | | 5807-001 | WATER | 11-17-91 | 11-18-91 | 11-22-91 | 5 | 4 |
| JCOFIAW | | 5868-001 | WATER | 11-23-91 | 11-23-91 | 11-27-91 | 4 | 4 |
| JCOFRAW | | 5868-002 | WATER | 11-23-91 | 11-23-91 | 11-27-91 | 4 | 4 |

COMMENTS:

HOLD TIME COLLECT = DATE COLLECTED MINUS DATE EXTRACTED

HOLD TIME RECEIPT = DATE RECEIVED MINUS DATE EXTRACTED

REV. 301

ECHEM INC.
ORGANICS
COMPLETENESS LOG

SITE: Air Force Plant 59 CLIENT: Argonne Nat'l Labs
CASE # SDG# 2-5807

| | SAMPLE # | JEENCAW | JCW01AW | JCW02AW | JCOF1AW | JCOF2AW | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1A | | | | | | | | | | | | | | | | | | | | | | |
| | 1E | | | | | | | | | | | | | | | | | | | | | | |
| | 2A | | | | | | | | | | | | | | | | | | | | | | |
| | 2B | | | | | | | | | | | | | | | | | | | | | | |
| | 3A | | | | | | | | | | | | | | | | | | | | | | |
| VOA | 3B | | | | | | | | | | | | | | | | | | | | | | |
| | 4A | | | | | | | | | | | | | | | | | | | | | | |
| | 5A | | | | | | | | | | | | | | | | | | | | | | |
| | 6A | | | | | | | | | | | | | | | | | | | | | | |
| | 7A | | | | | | | | | | | | | | | | | | | | | | |
| | 8A | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | |
| | 1B | | | | | | | | | | | | | | | | | | | | | | |
| | 1C | | | | | | | | | | | | | | | | | | | | | | |
| | 1F | | | | | | | | | | | | | | | | | | | | | | |
| | 2C | | | | | | | | | | | | | | | | | | | | | | |
| | 2D | | | | | | | | | | | | | | | | | | | | | | |
| | 3C | | | | | | | | | | | | | | | | | | | | | | |
| | 3D | | | | | | | | | | | | | | | | | | | | | | |
| SVOA | 4B | | | | | | | | | | | | | | | | | | | | | | |
| | 5B | | | | | | | | | | | | | | | | | | | | | | |
| | 6B | | | | | | | | | | | | | | | | | | | | | | |
| | 6C | | | | | | | | | | | | | | | | | | | | | | |
| | 7B | | | | | | | | | | | | | | | | | | | | | | |
| | 7C | | | | | | | | | | | | | | | | | | | | | | |
| | 8B | | | | | | | | | | | | | | | | | | | | | | |
| | 8C | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | |
| | 1D | X | X | X | X | X | | | | | | | | | | | | | | | | | |
| | 2E | X | X | X | X | X | | | | | | | | | | | | | | | | | |
| | 2F | | | | | | | | | | | | | | | | | | | | | | |
| | 3E | X | X | X | X | X | | | | | | | | | | | | | | | | | |
| PEST | 3F | | | | | | | | | | | | | | | | | | | | | | |
| | 4C | X | X | X | X | X | | | | | | | | | | | | | | | | | |
| | 8D | X | X | X | X | X | | | | | | | | | | | | | | | | | |
| | 8E | X | X | X | X | X | | | | | | | | | | | | | | | | | |
| | 9 | X | X | X | X | X | | | | | | | | | | | | | | | | | |
| | 10 | X | X | X | X | X | | | | | | | | | | | | | | | | | |

____ Quant Reports
____ MASS SPECS
____ TIC Compounds
✓ Laboratory Blank (Form 1's)
✓ MS/MSD (Forms 1's)
N/A Total Solids Log (if applicable)
____ Injection Log
✓ Chain of Custody
✓ Case Narrative

REV. 391

# Appendix A-1:

# Report 8

**ECHEM INC.**
**ENGINEERING CHEMISTRY CONSULTANTS**

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Sebago Common
Windham, Maine 04062
(207) 892-0002
FAX (207) 892-7499

26 February 1992

Dr. A. Dallas Wait
Senior Environmental Chemist
Gradient Corporation
44 Brattle Street
Cambridge, MA 02138

| | |
|---|---|
| Re: | Air Force Plant 59 |
| Laboratory: | Galson Laboratories |
| Case No: | NONE |
| SDG No: | 2-5807 |

| | | |
|---|---|---|
| TAL Inorganics: | JCCNCAW | JCCW1AW |
| | JCCW2AW | JCOF1AW |
| | JCOF2AW | |

Dear Dr. Wait:

Validation was performed on the inorganic analytical data from the samples referenced above. The data were evaluated, based on the following parameters:

* - data completeness
- holding times
- calibrations
- blanks
- ICP interference check sample analysis
* - matrix spike analysis
- duplicate sample analysis
* - laboratory control sample analysis
- furnace atomic absorption results
* - ICP serial dilution results
* - detection limits
* - sample result verification

* All criteria were met for this parameter.

Table I summarizes the validation actions, which were in accordance with USEPA Region II Evaluation of Inorganic Data for the Contract Laboratory Program, February 1990, SOP No. HW-2, Revision X, and the NYSDEC ASP, September 1989 as detailed below.

Also attached are the:

- o data validation log,
- o telephone log,
- o completeness log, and
- o sample preparation and analysis summaries.

HOLDING TIMES:

Cyanide

Samples with holding times that exceeded the 12 days specified by the NYSDEC CLP (Vol. VIII) are tabulated below:

| SAMPLE | HOLDING TIME (DAYS) FROM COLLECTION | RECEIPT BY LABORATORY |
|---|---|---|
| JC0F2AW | 14 | 14 |

Action:

- o sample results are flagged as estimated (J)

CALIBRATIONS:

1. ICP and furnace AA Elements

   a. Initial and/or continuing calibration verifications that were not within 90-110% of the true value as specified by the NYSDEC CLP (Vol. VIII, E-l06) are tabulated below:

| CALIBRATION DATE-TIME | INSTRUMENT | ELEMENT | % OF TRUE |
|---|---|---|---|
| l2-17-91/08:30 | F1 | antimony | 111 |

Associated samples: NONE

BLANKS:

1. Positive Blanks

Blanks providing results ≥IDL and their associated action levels are tabulated below:

| BLANK ID | PARAMETER | CONCENTRATION | ACTION LEVEL WATER | SOIL |
|---|---|---|---|---|
| CCB6 | barium | 15 | 75 | |
| | calcium | 33 | 165 | |
| | copper | 8 | 40 | |
| | manganese | 1 | 5 | |
| | nickel | 7 | 35 | |
| | zinc | 7 | 35 | |
| | barium | 13 | 65 | |
| | calcium | 31 | 155 | |
| | copper | 10 | 50 | |
| | iron | 6 | 30 | |
| | manganese | 2 | 10 | |
| | nickel | 8 | 40 | |
| | vanadium | 5 | 25 | |
| | zinc | 15 | 75 | |
| CCB8 | barium | 17 | 85 | |
| | cadmium | 5 | 25 | |
| | calcium | 87 | 435 | |
| | copper | 7 | 35 | |
| | iron | 20 | 100 | |
| | magnesium | 62 | 310 | |
| | manganese | 3 | 15 | |
| | nickel | 6 | 30 | |
| | vanadium | 4 | 20 | |
| | zinc | 8 | 40 | |

Associated samples with positive values reported below the action level are tabulated below:

| CAL BLANK ID | PARAMETER | SAMPLE NO. |
|---|---|---|
| CCB6 | barium | JCCW1AW |
| | copper | JCCW2AW |
| | zinc | |
| | vanadium | JCCW2AW |
| CCB7 | barium | JCOF2AW |
| | copper | JCOF1AW |
| | nickel | JCOF2AW |
| | vanadium | |
| CCB7 | zinc | JCOF1AW |
| CCB8 | barium | JCCNCAW |

Action:

- o associated sample results >IDL but <action level are flagged as not detected at the sample value (U)

2. Negative Blanks

Blanks that provided results <-2IDL are tabulated below:

| BLANK ID | PARAMETER | CONCENTRATION |
|---|---|---|
| ICH1 | calcium | |
| | iron | -15 |
| CCH1 | calcium | -60 |
| CCH2 | antimony | -4.6 |
| | calcium | -93 |
| | iron | -24 |
| | vanadium | -10 |
| CCH3 | iron | -13 |
| CCB5 | antimony | -4.5 |
| | calcium | -48 |
| CCB7 | antimony | -4.1 |
| CCB11 | zinc | -19 |
| PB1 | calcium | -41 |

Associated samples with results reported <10IDL: NONE

DUPLICATE SAMPLE ANALYSIS:

Field duplicates:

No field duplicates were identified for this SDG.

FURNACE ATOMIC ABSORPTION RESULTS:

Post-digestion spike

Samples with post-digestion spike recoveries ≥40% but not within 85-115%, and also having native analyte sample absorbance <50% of the spiked sample value, and samples with post-digestion spike recoveries reported at <40% that were diluted 5-10 fold and recoveries repeated at <40% or that were not within 85-115%, and also having native sample absorbance <50% of the spiked sample value, as specified in the NYSDEC CLP (Vol. VIII, E-118-119) are tabulated below:

| SAMPLE | ELEMENT | % RECOVERY |
|---|---|---|
| JCCW1AW | arsenic | 117 |
| JCOF2AW | arsenic | 118 |

Action:

- none, sample results reported as IDL U

Sincerely,
ECHEM INC.

Bruce K. Wallin, Ph.D.
Vice President

enclosures

Air Force Plant 59
Case No. NONE

Table I. Validation Action Summary

| | | | |
|---|---|---|---|
| Aluminum | | Magnesium | |
| Antimony | | Manganese | |
| Arsenic | | Mercury | |
| Atrium | A1 | Nickel | A1 |
| Beryllium | | Potassium | |
| Cadmium | | Selenium | |
| Calcium | | Silver | |
| Chromium | | Sodium | |
| Cobalt | | Thallium | |
| Copper | A1 | Vanadium | A1 |
| Iron | | Zinc | A1 |
| Lead | | Cyanide | J1 |

If an element has no entry, no qualifications were necessary.

A1 - Accept data, raise the sample detection limit(s) due to & blank contamination.

J1 - Estimate (J) positive values and (UJ) detection limit results due to hold time exceedences.

J2 - Estimate (J) positive values and (UJ) detection limit results due to non-compliant calibrations.

J3 - Estimate (J) positive values and (UJ) detection limit results due to non-compliant linearity near the CRDL.

J4 - Estimate (J) positive values and (UJ) detection limit results due to non-compliant matrix spike recoveries.

J5 - Estimate (J) positive values due to non-compliant duplicate precision.

J6 - Estimate (J) positive values and (UJ) detection limit results due non-compliant laboratory control sample results.

J7 - Estimate (J) positive values and (UJ) detection limit results due to non-compliant analytical precision and/or accuracy.

J8 - Estimate (J) positive values due to non-compliant method of standard additions linearity.

J9 - Estimate (J) positive values and (UJ) detection limit results due to non-compliant serial dilution reproducibility.

ECHEM INC.
SAMPLE PREPARATION AND ANALYSIS SUMMARY
FOR NYSDEC

CLIENT: Argonne Nat'l Labs
CASE NO.

SDG NO. 2-5807

SITE: Air Force Plant 59
ANALYTICAL FRACTION: Cyanide

| CLIENT SAMPLE ID | EPA SAMPLE NO. | LAB. SAMPLE ID | MATRIX | DATE COLLECTED | DATE RECEIVED | DATE ANALYZED | HOLD TIME COLLECT | HOLD TIME RECEIPT |
|---|---|---|---|---|---|---|---|---|
| JCCNCAW | | 5808-001 | WATER | 11-18-91 | 11-19-91 | 11-20-91 | 2 | 1 |
| JCCW1AW | | 5807-002 | WATER | 11-17-91 | 11-18-91 | 11-20-91 | 3 | 2 |
| JCCW2AW | | 5807-001 | WATER | 11-17-91 | 11-18-91 | 11-20-91 | 3 | 2 |
| JCOF1AW | | 5868-001 | WATER | 11-23-91 | 11-23-91 | 11-26-91 | 3 | 3 |
| JCOF2AW | | 5868-002 | WATER | 11-23-91 | 11-23-91 | 12-7-91 | 14 | 14 |

COMMENTS:

HOLD TIME COLLECT = DATE COLLECTED MINUS DATE ANALYZED

HOLD TIME RECEIPT = DATE RECEIVED MINUS DATE ANALYZED

REV. 361

ECHEM INC.

SAMPLE PREPARATION AND ANALYSIS SUMMARY
FOR NYSDEC

CLIENT: Argonne Nat'l Labs
CASE NO.

SDG NO. 2-5807

SITE: Air Force Plant 59
ANALYTICAL FRACTION: Mercury

| CLIENT SAMPLE ID | EPA SAMPLE NO. | LAB. SAMPLE ID | MATRIX | DATE COLLECTED | DATE RECEIVED | DATE ANALYZED | HOLD TIME COLLECT | HOLD TIME RECEIPT |
|---|---|---|---|---|---|---|---|---|
| JCCNCAW | | 5808-001 | WATER | 11-18-91 | 11-19-91 | 12-7-91 | 19 | 18 |
| JCCIDIAW | | 5807-002 | WATER | 11-17-91 | 11-18-91 | 12-7-91 | 20 | 19 |
| JCCW2AW | | 5807-001 | WATER | 11-17-91 | 11-18-91 | 12-7-91 | 20 | 19 |
| JCOF1AW | | 5868-001 | WATER | 11-23-91 | 11-23-91 | 12-7-91 | 14 | 14 |
| JCOF2AW | | 5868-002 | WATER | 11-23-91 | 11-23-91 | 12-7-91 | 14 | 14 |

COMMENTS:

HOLD TIME COLLECT = DATE COLLECTED MINUS DATE ANALYZED

HOLD TIME RECEIPT = DATE RECEIVED MINUS DATE ANALYZED

REV. 301

**ECHEM INC.**
**INORGANICS**
**COMPLETENESS LOG**

SITE: Air Force Plant 59 CLIENT: Argonne Nat'l Labs
CASE # SDG# 0-5807

| SAMPLE # | JCCNCAW | JCCW1AW | JCCW2AW | JCOF1AW | JCOF2AW |
|---|---|---|---|---|---|
| 1 | X | X | X | X | X |
| 2A | X | X | X | X | X |
| 2B | X | X | X | X | X |
| 3 | X | X | X | X | X |
| 4 | X | X | X | X | X |
| 5A | X | X | X | X | X |
| 5B | | | | | |
| 6 | X | X | X | X | X |
| 7 | X | X | X | X | X |
| 8 | | | | | |
| 9 | X | X | X | X | X |
| 10 | X | X | X | X | X |
| 11A | X | X | X | X | X |
| 11B | | | | | |
| 12 | X | X | X | X | X |
| 13 | X | X | X | X | X |
| 14 | X | X | X | X | X |

____ Standardization Report for ICP
____ Analysis Report for each calibration, blank, sample
____ Copies of printer tapes for each AAS element
✓ Mercury Analysis Sheet
✓ Cyanide Analysis Sheet
N.A. Total Solids Log (if applicable)
✓ Metals Digestion Log
✓ Mercury Digestion Log
✓ Cyanide Distillation Log
✓ Chain of Custody
✓ Case Narrative

REV. 391

# Appendix A-1:

# Report 9

**ECHEM INC.**
**ENGINEERING CHEMISTRY CONSULTANTS**

P.O. Box 1510
#32 Route 35
Sebago Common
Windham, Maine 04062
(207) 892-0002
FAX (207) 892-7499

17 March 1992

Dr. A. Dallas Wait
Senior Environmental Chemist
Gradient Corporation
44 Brattle Street
Cambridge, MA 02138

| | |
|---|---|
| Re: | Air Force Plant 59 |
| Laboratory: | Galson Laboratories |
| Case No: | NONE |
| SDG No: | 3-5983 |

| | | | | |
|---|---|---|---|---|
| Volatiles: | JCBG1AS | JCSW7AS | JCSW7BS | JCSW9AS |
| | JCSW9BS | JC1H1AS | JC1H1CS | JC3H1AS |
| | JC4K1AS | JC4H2AS | JCGH1AS | |
| | TRIP BLANK9 | HOLD BLANK10 | | |
| | HOLD BLANK11 | TRIP BLANK9 | | |
| | TRIP BLANK10 | TRIP BLANK11 | | |

Dear Dr. Wait:

Validation was performed on the organic analytical data from the samples referenced above. The data were evaluated based on the following parameters:

* - data completeness
* - holding times
- surrogate recovery
- matrix spike/matrix spike duplicate/matrix spike blank
* - blanks
* - GC/MS tuning
* - calibration
* - internal standards performance
* - field duplicates
* - TCL compound identification
* - tentatively identified compounds
* - system performance

* - compound guantitation and reported detection limits
* - sample result verification

* All criteria were met for this parameter.

Table I summarizes the validation actions, which were in accordance with USEPA Region II CLP Organics Data Review and Preliminary Review, March 1990, SOP No. HW-6, Revision #7 and the NYSDEC ASP, September 1989 as detailed below.

Also attached are the:

- o data validation log,
- o telephone log,
- o completeness log, and
- o sample preparation and analysis summaries.

LABORATORY FORTIFIED BLANK:

Compounds not within the recovery limits specified in the NYSDEC ASP are tabulated below:

| COMPOUND | % RECOVERY |
|---|---|
| 1,1,2-trichloroethane | 95 |
| toluene | 95 |
| chlorobenzene | 95 |
| ethylbenzene | 95 |

Action:

- o none, sample results for the compounds reported as CRQL U

CALIBRATION:

Calibration linearity, sensitivity and stability criteria specified in the NYSDEC CLP (Vol. VIII, E-23-26), or federal criteria (*), are tabulated below.

INITIAL CALIBRATION CRITERIA

| COMPOUND | %RSD (max.) | AVG RRF (min.) |
|---|---|---|
| CCC | 30 | 0.05* |
| SPCC (except bromoform) | 35 | 0.300 |
| bromoform | 35 | 0.250 |
| all other TCL compounds | 35 | 0.05* |

Deviations from the above calibration criteria are tabulated below.

CONTINUING CALIBRATION

| INSTRUMENT | DATE | COMPOUND | %RSD | AVE. RRF |
|---|---|---|---|---|
| B#2 | 12-10-91 | 2-BUTANONE | | .069 |

Associated samples:

| INSTRUMENT | DATE | SAMPLE NO. |
|---|---|---|
| B#2 | 12-10-91 | JC1H1CS |

Action:

- o for AVG RRF <0.05; detection limit values (CRQL U) are flagged as unusable (R)

Sincerely,

Bruce K. Wallin, Ph.D.
Vice President

enclosures

Air Force Plant 59
SDG No. 3-5983

Table I. Validation Action Summary

| Sample No. | VOA |
|---|---|
| JCBG1AS | |
| JCSW7AS | |
| JC5W7BS | |
| JCSW9As | |
| JCSW9BS | |
| JC1H1AS | |
| JC1N1CS | R4 |
| JC3H1AS | |
| JC4H1AS | |
| JC4H2AS | |
| JC6E1AS | |
| HOLD BLANK10 | |
| HOLD BLANK11 | |
| TRIP BLANK10 | |
| TRIP BLANK11 | |

If the field is blank, no qualifiers were necessary.

A1 - change positive values for ( ) to revised detection limit due to blank contamination

J1 - estimate positive values (J) and detection limit values (UJ) due to holding time violations

J2 - estimate positive values (J) and detection limit values (UJ) due to non-compliant volatile surrogate recoveries

J3 - estimate positive values (J) and detection limit values (UJ) due to non-compliant (acid) (base-neutral) fraction surrogate recoveries

J4 - estimate positive values (J) for ( ) due to non-compliant matrix spike recoveries

J5 - estimate positive values (J) for ( ) due to calibration not meeting minimum RF criteria

J6 - estimate positive values (J) and detection limit values (UJ) for ( ) due to non-Compliant calibration stability

J7 - estimate positive values (UR) for ( ) due to non-compliant internal standard stability

| | | |
|---|---|---|
| J8 | - | estimate positive values (J) due to non-compliant field duplicate precision |
| R1 | - | reject detection limit values (UR) due to holding time exceedences |
| R2 | - | reject detection limit values (UR) due to low surrogate recoveries |
| R3 | - | reject detection limit values (UR) for ( ) due to low matrix spike recoveries |
| R4 | | reject detection limit values (UR) for 2-butanone due to calibration not meeting minimum RF criteria |
| R5 | - | reject detection limit values (UR) for ( ) due to extreme variations in the internal standard stability |
| R7 | - | TIC's identified in associated method blank, results flagged as unusable (R) |

ECHEM INC.
SAMPLE PREPARATION AND ANALYSIS SUMMARY
FOR NYSDEC

CLIENT: Argonne Nat'l Lab
CASE NO. TASK NO: 6044/6006A/6007/5983 SDG NO. 3-5983

SITE: IEP Supplemental S.I.
ANALYTICAL FRACTION: Volatiles

| CLIENT SAMPLE ID | EPA SAMPLE NO. | LAB SAMPLE ID | MATRIX | DATE COLLECTED | DATE RECEIVED | DATE ANALYZED | HOLD TIME COLLECT | HOLD TIME RECEIPT |
|---|---|---|---|---|---|---|---|---|
| JCBG1AS | | 6044-003 | SOIL | 12-06-91 | 12-09-91 | 12-11-91 | 5 | 2 |
| JCSW7AS | | 6044-001 | | 12-06-91 | 12-09-91 | 12-11-91 | 5 | 2 |
| JCSW7BS | | 6044-002 | | 12-06-91 | 12-09-91 | 12-11-91 | 5 | 2 |
| JCSW9AS | | 6069-001 | | 12-10-91 | 12-10-91 | 12-14-91 | 4 | 4 |
| JCSW9BS | | 6069-002 | | 12-10-91 | 12-10-91 | 12-11-91 | 1 | 1 |
| JC1H1AS | | 6007-001 | | 12-04-91 | 12-05-91 | 12-06-91 | 2 | 1 |
| JC1H1CS | | 6007-002 | | 12-04-91 | 12-05-91 | 12-10-91 | 6 | 5 |
| JC3H1AS | | 6007-003 | | 12-04-91 | 12-05-91 | 12-09-91 | 5 | 4 |
| JC4H1AS | | 5983-001 | | 12-03-91 | 12-04-91 | 12-05-91 | 2 | 1 |
| JC4H2AS | | 5983-002 | | 12-03-91 | 12-04-91 | 12-05-91 | 2 | 1 |
| JC6H1AS | | 6007-004 | | 12-04-91 | 12-05-91 | 12-09-91 | 5 | 4 |
| HOLD BLANK9 | | 5983-004 | | 12-03-91 | 12-04-91 | 12-05-91 | 2 | 1 |
| HOLD BLANK 10 | | 6007-006 | | 12-04-91 | 12-05-91 | 12-06-91 | 2 | 1 |
| HOLD BLANK 11 | | 6044-005 | | 12-06-91 | 12-09-91 | 12-09-91 | 3 | 0 |
| TRIP BLANK 9 | | 5983-003 | | 12-03-91 | 12-04-91 | 12-05-91 | 2 | 1 |
| TRIP BLANK 10 | | 6007-005 | | 12-04-91 | 12-05-91 | 12-06-91 | 2 | 1 |
| TRIP BLANK 11 | | 6044-004 | | 12-06-91 | 12-09-91 | 12-09-91 | 3 | 0 |

COMMENTS:

HOLD TIME COLLECT = DATE COLLECTED MINUS DATE ANALYZED

HOLD TIME RECEIPT = DATE RECEIVED MINUS DATE ANALYZED

REV. 3/91

# Appendix A-1:

# Report 10

**ECHEM INC.**

**ENGINEERING CHEMISTRY CONSULTANTS**

P.O. Box 1510
#32 Route 35
Sebago Common
Windham, Maine 04062
(207) 892-0002
FAX (207) 892-7499

16 March 1992

Dr. A. Dallas Wait
Senior Environmental Chemist
Gradient Corporation
44 Brattle Street
Cambridge, MA 02138

| | |
|---|---|
| Re: | Air Force Plant 59 |
| Laboratory: | Galson Laboratories |
| Case No: | NONE |
| SDG No: | 3-5983 |

| | | | | |
|---|---|---|---|---|
| Semivolatiles: | JC1H1AS | JC1H1CS | JC3H1AS | JC4H1AS |
| | JC4H2AS | JC6H1AS | JCBG1AS | JCSW7AS |
| | JCSW7BS | JCSW9AS | JCSW9BS | |

Dear Dr. Wait:

Validation was performed on the organic analytical data from the samples referenced above. The data were evaluated based on the following parameters:

* - data completeness
* - holding times
* - surrogate recovery
- matrix spike/matrix spike duplicate/matrix spike blank
- blanks
* - GC/MS tuning
- calibration
* - internal standards performance
* - field duplicates
* - TCL compound identification
* - tentatively identified compounds
* - system performance
* - compound quantitation and reported detection limits
* - sample result verification

* All criteria were met for this parameter.

Table I summarizes the validation actions, which were in accordance with USEPA Region II CLP Organics Data Review and Preliminary Review, March 1990, SOP No. HW-6, Revision # 7, and the NYSDEC ASP, September 1989, as detailed below.

Also attached are the:

- o data validation log,
- o telephone log,
- o completeness log, and
- o sample preparation and analysis summaries.

MATRIX SPIKE/MATRIX SPIKE DUPLICATE/MATRIX SPIKE BLANK:

Matrix spike recoveries which did not meet the criteria specified in the NYSDEC CLP (Vol. VIII, E-41) are summarized below.

| | RECOVERY (%) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SAMPLE | PHE | CLPH | DCB | DNP | TCB | CRE | ACE | NPH | DNT | PCP | PYR |
| JCSW9BS | | | | | 114 | | | | 105 | 125 | |
| Q1-0081 | | | | | | | | | | 114 | |

Action:

- o none, sample results reported as CRQL U

Samples with MS/MSD relative percent difference (RPD) not within the criteria specified in the USEPA Functional Guidelines are tabulated below:

| | RPD (%) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SAMPLE | PHE | CLPH | DCB | DNP | TCB | CRE | ACE | NPH | DNT | PCP | PYR |
| JCSW9BS | | | | | 31 | | | | | 58 | |

Action:

- o none, sample results reported as CRQL U

BLANKS:

Several TIC's were identified in some samples as well as their associated method blanks. These results were flagged as unusable (R).

CALIBRATION:

Calibration linearity, sensitivity and stability criteria specified in the NYSDEC CLP (Vol. VIII, E-48-51), or federal criteria (*), are tabulated below.

## CONTINUING CALIBRATION CRITERIA

| COMPOUND | %D (max.) | RRF (min.) |
|---|---|---|
| SPCC | 20 | 0.05 |
| all other TCL compounds | 20 | 0.05* |

Deviations from the above calibration criteria are tabulated below.

## CONTINUING CALIBRATION

| INSTR. | DATE/TIME | COMPOUND | %D | RRF |
|---|---|---|---|---|
| GCMSD#4 | 12-19-91/08:37 | N-nitroso-di-n-propylamine | 21 | |
| | 12-20-91/08:34 | bis(2-chloroisopropyl) ether | 25 | |
| | | 2,4-dinitrophenol | 22 | |
| | | fluoranthene | 22 | |
| | | indeno(1,2,3-cd)pyrene | 23 | |
| | | dibenz(a,h)anthracene | 23 | |
| | | benzo(g,h,i)perylene | 26 | |
| | 12-23-91/11:00 | 2, 4-dinitrophenol | 22 | |
| | | 4-nitroaniline | 21 | |
| | | di-n-butylphthalate | 25 | |
| | | fluoranthene | 24 | |
| | | bis(2-ethylhexyl) phthalate | 21 | |

Associated samples:

| INSTRUMENT | DATE/TIME | SAMPLE NO. |
|---|---|---|
| GCMSD#4 | 12-19-91/08:37 | JC4H1AS |
| | | JC4H2AS |
| | | JC1H1CS |
| | | JC1H1AS |

| INSTRUMENT | DATE/TIME | SAMPLE NO. |
|---|---|---|
| GCMSD#4 | 12-20-91/08:37 | JC6H1AS |
| | | JCSW7AS |
| | | JCSW7BS |
| | | JCBG1AS |
| | 12-23-91/11:00 | JC3H1AS |
| | | JCSW9AS |
| | | JCSW9BS |

Action:

- o for %D <50%; results ≥CRQL for the compound are flagged as estimated (J)

Sincerely,
ECHEM INC.

Bruce K. Wallin, PhD
Vice President

enclosures

Air Force Plant 59
SDG No. 3-5983

Table I. Validation Action Summary

| Sample No. | SVOA |
|---|---|
| JC1H1AS | |
| JC1H1CS | |
| JC3H1AS | J6 |
| JC4H1AS | R8 |
| JC4H2AS | R8 |
| JC6H1AS | J6, R8 |
| JCBG1AS | J6 |
| JCSW7AS | J6 |
| JCSW7BS | |
| JCSW9AS | J6, R8 |
| JCSW9BS | R8 |

If the field is blank, no qualifiers were necessary.

A1 - change positive values for ( ) to revised detection limit due to blank contamination

J1 - estimate positive values (J) and detection limit values (UJ) due to holding time violations

J2 - estimate positive values (J) and detection limit values (UJ) due to non-compliant volatile surrogate recoveries

J3 - estimate positive values (J) and detection limit values (UJ) due to non-compliant (acid) (base-neutral) fraction surrogate recoveries

J4 - estimate positive values (J) for ( ) due to non-compliant matrix spike recoveries

J5 - estimate positive values (J) for ( ) due to calibration not meeting minimum RF criteria

J6 - estimate positive values (J) and detection limit values (UJ) for di-n-butylphthalate, benzo(g,h,i)perylene, bis(2-ethylhexyl) phthalate, fluoranthene and dibenz(a,h)anthracene due to non-compliant calibration stability

J7 - estimate positive values (J) for ( ) due to non-compliant internal standard stability

J8 - estimate positive values (J) due to non-compliant field duplicate precision

| | | |
|---|---|---|
| R1 | - | reject detection limit values (UR) due to holding time exceedences |
| R2 | - | reject detection limit values (UR) due to low surrogate recoveries |
| R3 | - | reject detection limit values (UR) for ( ) due to low matrix spike recoveries |
| R4 | - | reject detection limit values (UR) for ( ) due to calibration not meeting minimum RF criteria |
| R5 | - | reject detection limit values (UR) for ( ) due to extreme variations in the internal standard stability |
| R7 | - | reject detection limit value (UR) for ( ) due to continuing calibration %D >50% |
| R8 | - | TIC's identified in associated method blank, results flagged as unusable (R) |

ECHEM INC.
SAMPLE PREPARATION AND ANALYSIS SUMMARY
FOR NYSDEC

CLIENT: Argonne Nat'l Lab
CASE NO.
SDG NO. 3-5983
SITE: IRP Supplemental S.I.
ANALYTICAL FRACTION: Semivolatiles

| CLIENT SAMPLE ID | EPA SAMPLE NO. | LAB SAMPLE ID | MATRIX | DATE COLLECTED | DATE RECEIVED | DATE EXTRACTED | HOLD TIME TO EXTRACTION COLLECT | HOLD TIME TO EXTRACTION RECEIPT |
|---|---|---|---|---|---|---|---|---|
| JC1H1AS | | 6007-001 | Soil | 12-04-91 | 12-05-91 | 12-06-91 | 2 | 1 |
| JC1H1CS | | 6007-002 | | 12-04-91 | 12-05-91 | 12-06-91 | 2 | 1 |
| JC3H1AS | | 6007-003 | | 12-04-91 | 12-05-91 | 12-06-91 | 2 | 1 |
| JC4H1AS | | 5983-001 | | 12-03-91 | 12-04-91 | 12-05-91 | 2 | 1 |
| JC4H2AS | | 5983-002 | | 12-03-91 | 12-04-91 | 12-05-91 | 2 | 1 |
| JC6H1AS | | 6007-004 | | 12-03-91 | 12-05-91 | 12-06-91 | 3 | 1 |
| JCBG1AS | | 6044-003 | | 12-06-91 | 12-09-91 | 12-10-91 | 4 | 1 |
| JCSW7AS | | 6044-001 | | 12-06-91 | 12-09-91 | 12-10-91 | 4 | 1 |
| JCSW7BS | | 6044-002 | | 12-06-91 | 12-09-91 | 12-10-91 | 4 | 1 |
| JCSW9AS | | 6069-001 | | 12-10-91 | 12-10-91 | 12-15-91 | 5 | 5 |
| JCSW9BS | | 6069-002 | | 12-10-91 | 12-10-91 | 12-15-91 | 5 | 5 |

COMMENTS:

HOLD TIME COLLECT = DATE COLLECTED MINUS DATE EXTRACTED

HOLD TIME RECEIPT = DATE RECEIVED MINUS DATE EXTRACTED

REV. 991

# Appendix A-1:

# Report 11

**ECHEM INC.**

**ENGINEERING CHEMISTRY CONSULTANTS**

P.O. Box 1310
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(207) 892-0002
FAX (207) 892-7499

16 March 1992

Dr. A. Dallas Wait
Senior Environmental Chemist
Gradient Corporation
44 Brattle Street
Cambridge, MA 02138

| | |
|---|---|
| Re: | Air Force Plant 59 |
| Laboratory: | Galson Laboratories |
| Case No: | NONE |
| SDG No: | 3-5983 |

| | | | | |
|---|---|---|---|---|
| Pesticides/PCB's: | JCBG1AS | JCSW7AS | JCSW7BS | JCSW9AS |
| | JCSW9BS | JC1H1AS | JC1H1CS | JC3H1AS |
| | JC4H1AS | JC6H1AS | JC4H2AS | |

Dear Dr. Wait:

Validation was performed on the organic analytical data from the samples referenced above. The data were evaluated based on the following parameters:

* - data completeness
* - holding times
* - surrogate recovery
- matrix spike/matrix spike duplicate/matrix spike blank
* - blanks
* - calibration
* - pesticide instrument performance
* - field duplicates
* - TCL compound identification
* - compound quantitation and reported detection limits
* - sample result verification

* All criteria were met for this parameter.

Table I summarizes the validation actions, which were in accordance with USEPA Region II CLP Organics Data Review and Preliminary Review, March 1990, SOP No. HW-6, Revision #7 and the NYSDEC ASP, September 1989 as detailed below.

Also attached are the:

- o data validation log,
- o telephone log,
- o completeness log, and
- o sample preparation and analysis summaries.

MATRIX SPIKE/MATRIX SPIKE DUPLICATE/MATRIX SPIKE BLANK:

Matrix spike recoveries which did not meet the criteria specified in the NYSDEC CLP (Vol. VII, E-73) are summarized below.

| | RECOVERY (%) | | | | | |
|---|---|---|---|---|---|---|
| SAMPLE | LIN | HEP | ALD | DIEL | END | DDT |
| JCSW9BS | | | | 138 | 142 | 164 |

Action:

- o none, sample results reported as CRQL U

Sincerely,
ECHEM INC.

Bruce K. Wallin, PhD
Vice President

enclosures

Air Force Plant 59
SDG No. 3-5983

Table I. Validation Action Summary

| Sample No. | Pesticide/PCB |
|---|---|
| JCSW7AS | |
| JCSW7BS | |
| JCSW9AS | |
| JC5W9BS | |
| JC1H1AS | |
| JC1H1C5 | |
| JC3H1AS | |
| JC4H1AS | |
| JC6H1AS | |
| JC4H2AS | |

If the field is blank, no qualifiers were necessary.

A1 - change positive values for ( ) to revised detection limit due to blank contamination

J1 - estimate positive values (J) and detection limit values (UJ) due to holding time violations

J2 - estimate positive values (J) and detection limit values (UJ) due to non-compliant volatile surrogate recoveries

J3 - estimate positive values (J) and detection limit values (UJ) due to non-compliant (acid) (base-neutral) fraction surrogate recoveries

J4 - estimate positive values (J) for ( ) due to non-compliant matrix spike recoveries

J5 - estimate positive values (J) for ( ) due to calibration not meeting minimum RF criteria

J6 - estimate positive values (J) and detection limit values (UJ) for ( ) due to non-compliant calibration stability

J7 - estimate positive values (J) for ( ) due to non-compliant internal standard stability

J8 - estimate positive values (J) due to non-compliant field duplicate precision

R1 - reject detection limit values (UR) due to holding time exceedences

R2 - reject detection limit values (UR) due to low surrogate recoveries

R3 - reject detection limit values (UR) for ( ) due to low matrix spike recoveries

R4 - reject detection limit values (UR) for ( ) due to calibration not meeting minimum RF criteria

R5 - reject detection limit values (UR) for ( ) due to extreme variations in the internal standard stability

R7 - reject detection limit value (UR) for ( ) due to continuing calibration %D >50%

ECHEM INC.
SAMPLE PREPARATION AND ANALYSIS SUMMARY
FOR NYSDEC

CLIENT: Argonne Nat'l Lab
TASK CASE NO.
SDG NO. 3-5983
SITE: IRP Supplemental S.I.
ANALYTICAL FRACTION: Pesticide/PCBs

| CLIENT SAMPLE ID | EPA SAMPLE NO. | LAB SAMPLE ID | MATRIX | DATE COLLECTED | DATE RECEIVED | DATE EXTRACTED | HOLD TIME TO EXTRACTION COLLECT | HOLD TIME TO EXTRACTION RECEIPT |
|---|---|---|---|---|---|---|---|---|
| JCBG1AS | | 6044-003 | SOIL | 12-06-91 | 12-09-91 | 12-10-91 | 4 | 1 |
| JCSW7AS | | 6044-001 | | 12-06-91 | 12-09-91 | 12-10-91 | 4 | 1 |
| JCSW7AS | | 6044-002 | | 12-06-91 | 12-09-91 | 12-10-91 | 4 | 1 |
| JCSW9AS | | 6069-001 | | 12-10-91 | 12-10-91 | 12-15-91 | 5 | 5 |
| JCSW9AS | | 6069-002 | | 12-10-91 | 12-10-91 | 12-15-91 | 5 | 5 |
| JC1HIAS | | 6007-001 | | 12-04-91 | 12-05-91 | 12-06-91 | 2 | 1 |
| JC1HICS | | 6007-002 | | 12-04-91 | 12-05-91 | 12-06-91 | 2 | 1 |
| JC3HIAS | | 6007-003 | | 12-04-91 | 12-05-91 | 12-06-91 | 2 | 1 |
| JC4HIAS | | 5983-001 | | 12-03-91 | 12-04-91 | 12-05-91 | 2 | 1 |
| JC4H2AS | | 5983-002 | | 12-03-91 | 12-04-91 | 12-05-91 | 2 | 1 |
| JC6HIAS | | 6007-004 | | 12-03-91 | 12-05-91 | 12-06-91 | 3 | 1 |

COMMENTS:

HOLD TIME COLLECT = DATE COLLECTED MINUS DATE EXTRACTED

HOLD TIME RECEIPT = DATE RECEIVED MINUS DATE EXTRACTED

REV. 361

# ECHEM INC.
## ORGANICS
## COMPLETENESS LOG

SITE: TRP Supplemental S.I. CLIENT: Argonne Nat'l Lab

TASK CASE # 6044/6069/6117/5983 SDG# 3-5983

| | SAMPLE # | IC8QIAS | IC5W7AS | IC5W7BS | IC5W9AS | IC5W9BS | IC1HIAS | IC1HICS | IC3HIAS | IC4HIAS | IC4H2AS | SC6IIAS | HOLD BLANK 9 | HOLD BLANK 10 | HOLD BLANK 11 | TRIP BLANK 9 | TRIP BLANK 10 | TRIP BLANK 11 | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1A | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | | | | | |
| | 1E | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | | | | | |
| | 2A | | | | | | | | | | | | | | | | | | | | | | | |
| | 2B | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | | | | | |
| | 3A | | | | | | | | | | | | | | | | | | | | | | | |
| VOA | 3B | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | | | | | |
| | 4A | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | | | | | |
| | 5A | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | | | | | |
| | 6A | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | | | | | |
| | 7A | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | | | | | |
| | 8A | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | |
| | 1B | X | X | X | X | X | X | X | X | X | X | X | | | | | | | | | | | | |
| | 1C | X | X | X | X | X | X | X | X | X | X | X | | | | | | | | | | | | |
| | 1F | X | X | X | X | X | X | X | X | X | X | X | | | | | | | | | | | | |
| | 2C | | | | | | | | | | | | | | | | | | | | | | | |
| | 2D | X | X | X | X | X | X | X | X | X | X | X | | | | | | | | | | | | |
| | 3C | | | | | | | | | | | | | | | | | | | | | | | |
| | 3D | X | X | X | X | X | X | X | X | X | X | X | | | | | | | | | | | | |
| SVOA | 4B | X | X | X | X | X | X | X | X | X | X | X | | | | | | | | | | | | |
| | 5B | X | X | X | X | X | X | X | X | X | X | X | | | | | | | | | | | | |
| | 6B | X | X | X | X | X | X | X | X | X | X | X | | | | | | | | | | | | |
| | 6C | X | X | X | X | X | X | X | X | X | X | X | | | | | | | | | | | | |
| | 7B | X | X | X | X | X | X | X | X | X | X | X | | | | | | | | | | | | |
| | 7C | X | X | X | X | X | X | X | X | X | X | X | | | | | | | | | | | | |
| | 8B | X | X | X | X | X | X | X | X | X | X | X | | | | | | | | | | | | |
| | 8C | X | X | X | X | X | X | X | X | X | X | X | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | |
| | 1D | X | X | X | X | X | X | X | X | X | X | X | | | | | | | | | | | | |
| | 2E | | | | | | | | | | | | | | | | | | | | | | | |
| | 2F | | | | | | | | | | | | | | | | | | | | | | | |
| | 3E | X | X | X | X | X | X | X | X | X | X | X | | | | | | | | | | | | |
| PEST | 3F | | | | | | | | | | | | | | | | | | | | | | | |
| | 4C | | | | | | | | | | | | | | | | | | | | | | | |
| | 8D | X | X | X | X | X | X | X | X | X | X | X | | | | | | | | | | | | |
| | 8E | X | X | X | X | X | X | X | X | X | X | X | | | | | | | | | | | | |
| | 9 | X | X | X | X | X | X | X | X | X | X | X | | | | | | | | | | | | |
| | 10 | | | | | | | | | | | | | | | | | | | | | | | |

✓ Quant Reports
✓ MASS SPECS
✓ TIC Compounds
___ Laboratory Blank (Form 1's)
___ MS/MSD (Forms 1's)
___ Total Solids Log (if applicable)
___ Injection Log
✓ Chain of Custody
✓ Case Narrative

REV. 391

# Appendix A-1:

# Report 12

**ECHEM INC.**

**ENGINEERING CHEMISTRY CONSULTANTS**

P.O. Box 1510
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FAX (207) 892-7499

17 March 1992

Dr. A. Dallas Wait
Senior Environmental Chemist
Gradient Corporation
44 Brattle Street
Cambridge, MA 02138

| | |
|---|---|
| Re: | Air Force Plant 59 |
| Laboratory: | Galson Laboratories |
| Case No: | NONE |
| SDG No: | 3-5983 |

| | | | | |
|---|---|---|---|---|
| TAL Inorganics: | JCBG1AS | JCSW7AS | JCSW7BS | JCSW9AS |
| | JCSW9BS | JC1H1CS | JC3H1AS | JC4H2AS |
| | JC4H1AS | JC6H1AS | | |

Dear Dr. Wait:

Validation was performed on the inorganic analytical data from the samples referenced above. The data were evaluated, based on the following parameters:

* - data completeness
* - holding times
* - calibrations
- blanks
* - ICP interference check sample analysis
- matrix spike analysis
- duplicate sample analysis
* - laboratory control sample analysis
- furnace atomic absorption results
* - ICP serial dilution results
* - detection limits
* - sample result verification

* All criteria were met for this parameter.

Table I summarizes the validation actions, which were in accordance with USEPA Region II Evaluation of Inorganic Data for the Contract Laboratory Program, February 1990, SOP No. HW-2, Revision X, and the NYSDEC ASP, September 1989 as detailed below.

Also attached are the:

- o data validation log,
- o telephone log,
- o completeness log, and
- o sample preparation and analysis summaries.

BLANKS

1. Positive Blanks

Blanks providing results ≥IDL and their associated action levels are tabulated below:

| BLANK ID | PARAMETER | CONCENTRATION | ACTION LEVEL WATER | ACTION LEVEL SOIL |
|---|---|---|---|---|
| CCB3 | barium | 12 | | 12 |
| | cadmium | 3 | | 3 |
| | calcium | 124 | | 124 |
| | cobalt | 7 | | 7 |
| | copper | 5 | | 5 |
| | iron | 47 | | 47 |
| | magnesium | 100 | | 100 |
| | manganese | 4 | | 4 |
| | nickel | 8 | | 8 |
| | vanadium | 16 | | 16 |
| | zinc | 9 | | 9 |
| CCB4 | barium | 19 | | 19 |
| | cadmium | 5 | | 5 |
| | calcium | 112 | | 112 |
| | chromium | 5 | | 5 |
| | copper | 4 | | 4 |
| | iron | 20 | | 20 |
| | magnesium | 54 | | 54 |
| | manganese | 2 | | 2 |
| | nickel | 10 | | 10 |
| | vanadium | 5 | | 5 |
| | zinc | 8 | | 8 |

| BLANK ID | PARAMETER | CONCENTRATION | ACTION LEVEL WATER | ACTION LEVEL SOIL |
|---|---|---|---|---|
| CCB7 | barium | 56 | | 56 |
| | beryllium | 1 | | 1 |
| | cadmium | 3 | | 3 |
| | calcium | 200 | | 200 |
| | chromium | 4 | | 4 |
| | cobalt | 9 | | 9 |
| | copper | 10 | | 10 |
| | iron | 80 | | 80 |
| | magnesium | 102 | | 102 |
| | manganese | 12 | | 12 |
| | nickel | 12 | | 12 |
| | potassium | 199 | | 199 |
| | zinc | 4 | | 4 |

Associated samples with positive values reported below the action level are tabulated below:

| CAL BLANK ID | PARAMETER | SAMPLE NO. |
|---|---|---|
| CCB3 | cadmium | JC4H1AS |
| | cobalt | |
| | vanadium | |
| | cadmium | JC4H2AS |
| | vanadium | |
| CCB4 | cadmium | JC3H1AS |
| | | JC1H1CS |
| | nickel | JCSW7BS |
| CCB7 | barium | JCSW9AS |
| | cadmium | JCSW9BS |
| | cobalt | |

Action:

- o associated sample results ≥IDL but <action level are flagged as not detected at the sample value (U)

MATRIX SPIKE ANALYSIS:

Samples providing matrix spike recoveries not within 75-125% that also contain native analyte reported at <4X the spiking level as specified in the NYSDEC CLP (Vol. VIII, E-111) are tabulated below:

| SAMPLE | ELEMENT | % RECOVERY |
|---|---|---|
| JCSW9BS | antimony | 69 |
| | lead | 1 |
| | selenium | 64 |

Action:

- o for recoveries <30%, results ≥IDL are flagged as estimated (J) and detection limit values (IDL U) are flagged as unusable (R)
- o for recoveries from 30-74%, results are flagged as estimated (J)

Comments:

The above actions are applied to all samples of the same matrix associated with this SDG.

DUPLICATE SAMPLE ANALYSIS:

1. Laboratory replicates:

Laboratory replicate results for samples containing >5 CRDL with RPD's that exceed 20% and for samples containing <5 CRDL that exceed the +CRDL specified in the NYSDEC CLP (Vol. VIII, E-114) are as follows:

| SAMPLE NO. | ELEMENT | RPD % | CRDL | S - D |
|---|---|---|---|---|
| JCSW9BS | lead | 37 | | |

Action:

- o results are flagged as estimated (J)

Comments:

The above actions are applied to all samples of the same matrix associated with this SDG.

FURNACE ATOMIC ABSORPTION RESULTS:

1. Duplicate injections:

Samples with concentrations reported >CRDL or post-digestion spikes providing duplicate injection coefficient of variation (CV) 20% as specified by the NYSDEC CLP (Vol. VIII, E-118) are tabulated below:

| SAMPLE ID | ELEMENT | CV |
|---|---|---|
| JCBG1AS | selenium | 35 |

Action:

- o sample results are flagged as estimated (J)

2. Method of Standard Additions:

Samples analyzed by MSA that provided replicated linearity coefficients (r) of <0.995 as specified in the NYSDEC CLP (Vol. VIII, E-120) are tabulated below:

| SAMPLE | ELEMENT | r |
|---|---|---|
| JCSW7BS | arsenic | 0.9936 |

Action:

- o sample results >IDL are flagged as estimated (J)

Sincerely,
ECHEM INC.

Bruce K. Wallin, PhD
Vice President

enclosures

Air Force Plant 59
SDG No. 3-5983

Table I. Validation Action Summary

| | | | |
|---|---|---|---|
| Aluminum | | Magnesium | |
| Antimony | J4 | Manganese | |
| Arsenic | J8 | Mercury | |
| Barium | A1 | Nickel | A1 |
| Beryllium | | Potassium | |
| Cadmium | A1 | Selenium | J4 |
| Calcium | | Silver | |
| Chromium | | Sodium | |
| Cobalt | A1 | Thallium | |
| Copper | | Vanadium | A1 |
| Iron | | Zinc | |
| Lead | J4, J5 | Cyanide | |

If an element has no entry, no qualifications were necessary.

Al - Accept data, raise the sample detection limit(s) due to blank contamination.

J1 - Estimate (J) positive values and (UJ) detection limit results due to hold time exceedences.

J2 - Estimate (J) positive values and (UJ) detection limit results due to non-compliant calibrations.

J3 - Estimate (J) positive values and (UJ) detection limit results due to non-compliant linearity near the CRDL.

J4 - Estimate (J) positive values and (UJ) detection limit results due to non-compliant matrix spike recoveries.

J5 - Estimate (J) positive values due to non-compliant duplicate precision.

J6 - Estimate (J) positive values and (UJ) detection limit results due non-compliant laboratory control sample results.

J7 - Estimate (J) positive values and (UJ) detection limit results due to non-compliant analytical precision and/or accuracy.

J8 - Estimate (J) positive values due to non-compliant method of standard additions linearity.

J9 - Estimate (J) positive values and (UJ) detection limit results due to non-compliant serial dilution reproducibility.

# ECHEM INC.
## DATA VALIDATION LOG

CLIENT: Argonne Nat'l

SITE: Air Force Plant 59

| CASE NO. | SDG NO. | DATE REC'D | VALIDATION UNITS | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | VOA | SVOA | PEST/PCB | INORG | SAS | DIOX |
| — | 56384 | 2-11-92 | 24/0 | 18/0 | 18/0 | 18/0 | | |
| — | 5-5993 | 1-24-92 | 17/0 | 0/11 | 0/11 | 0/10 | | |

NOTE: UNITS ARE DEFINED AS WATER/SOIL (E.G., 5/6) INCLUDING BLANKS

COMMENTS: SAS for this project include:

Turnaround time for these cases is: standard = 30 days
fast = 14 days

REV. 3/91

**ECHEM INC.**
**INORGANICS**
**COMPLETENESS LOG**

SITE: IRP Supplemental S.I. CLIENT: Armme Nat'l Lab
CASE # SDG# 3-5983

| SAMPLE # | IC8G1AS | IC5W7AS | IC5W7BS | IC5W9AS | IC5W9BS | IC1HICS | IC3H1AS | IC4H1AS | IC4H2AS | IC4H3AS | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | X | X | X | X | X | X | X | X | X | X | | | | | | | | | | | |
| 2A | X | X | X | X | X | X | X | X | X | X | | | | | | | | | | | |
| 2B | X | X | X | X | X | X | X | X | X | X | | | | | | | | | | | |
| 3 | X | X | X | X | X | X | X | X | X | X | | | | | | | | | | | |
| 4 | X | X | X | X | X | X | X | X | X | X | | | | | | | | | | | |
| 5A | X | X | X | X | X | X | X | X | X | X | | | | | | | | | | | |
| 5B | | | | | | | | | | | | | | | | | | | | | |
| 6 | X | X | X | X | X | X | X | X | X | X | | | | | | | | | | | |
| 7 | X | X | X | X | X | X | X | X | X | X | | | | | | | | | | | |
| 8 | X | X | X | X | X | X | X | X | X | X | | | | | | | | | | | |
| 9 | X | X | X | X | X | X | X | X | X | X | | | | | | | | | | | |
| 10 | X | X | X | X | X | X | X | X | X | X | | | | | | | | | | | |
| 11A | X | X | X | X | X | X | X | X | X | X | | | | | | | | | | | |
| 11B | | | | | | | | | | | | | | | | | | | | | |
| 12 | X | X | X | X | X | X | X | X | X | X | | | | | | | | | | | |
| 13 | X | X | X | X | X | X | X | X | X | X | | | | | | | | | | | |
| 14 | X | X | X | X | X | X | X | X | X | X | | | | | | | | | | | |

____ Standardization Report for ICP
____ Analysis Report for each calibration, blank, sample
____ Copies of printer tapes for each AAS element
✓ Mercury Analysis Sheet
✓ Cyanide Analysis Sheet
✓ Total Solids Log (if applicable)
✓ Metals Digestion Log
✓ Mercury Digestion Log
✓ Cyanide Distillation Log
✓ Chain of Custody
✓ Case Narrative

REV. 391

ECHEM INC.
SAMPLE PREPARATION AND ANALYSIS SUMMARY
FOR NYSDEC

CLIENT: Argonne Nat'l Lab
CASE NO.

SDG NO. 3-5983

SITE: IRP Supplemental S.I.
ANALYTICAL FRACTION: Mercury

| CLIENT SAMPLE ID | EPA SAMPLE NO. | LAB. SAMPLE ID | MATRIX | DATE COLLECTED | DATE RECEIVED | DATE ANALYZED | HOLD TIME COLLECT | HOLD TIME RECEIPT |
|---|---|---|---|---|---|---|---|---|
| JCBG1AS | | 6044-003 | SOIL | 12-06-91 | 12-09-91 | 12-16-91 | 10 | 7 |
| JCSW7AS | | 6044-001 | | 12-06-91 | 12-09-91 | | 10 | 7 |
| JCSW7BS | | 6044-002 | | 12-06-91 | 12-09-91 | | 10 | 7 |
| JCSW9AS | | 6069-001 | | 12-10-91 | 12-10-91 | | 6 | 6 |
| JCSW9BS | | 6069-002 | | 12-10-91 | 12-10-91 | | 6 | 6 |
| JC1H1CS | | 6007-002 | | 12-04-91 | 12-05-91 | | 12 | 11 |
| JC3H1AS | | 6007-003 | | 12-04-91 | 12-05-91 | | 12 | 11 |
| JC4H1AS | | 5983-001 | | 12-03-91 | 12-04-91 | | 13 | 12 |
| JC4H2AS | | 5983-002 | | 12-03-91 | 12-04-91 | | 13 | 12 |
| JC6H1AS | | 6007-004 | | 12-04-91 | 12-05-91 | | 12 | 11 |

COMMENTS:

HOLD TIME COLLECT = DATE COLLECTED MINUS DATE ANALYZED

HOLD TIME RECEIPT = DATE RECEIVED MINUS DATE ANALYZED

REV. 991

ECHEM INC.
SAMPLE PREPARATION AND ANALYSIS SUMMARY
FOR NYSDEC

CLIENT: Argonne Nat'l Lab
CASE NO. ——
SDG NO. 3-5983
SITE: IRP Supplemental S.I.
ANALYTICAL FRACTION: Cyanide

| CLIENT SAMPLE ID | EPA SAMPLE NO. | LAB. SAMPLE ID | MATRIX | DATE COLLECTED | DATE RECEIVED | DATE ANALYZED | HOLD TIME COLLECT | HOLD TIME RECEIPT |
|---|---|---|---|---|---|---|---|---|
| JCBG1AS | | 6044-003 | SOIL | 12-06-91 | 12-09-91 | 12-11-91 | 5 | 2 |
| JCSW7AS | | 6044-001 | | 12-06-91 | 12-09-91 | 12-11-91 | 5 | 2 |
| JCSW7BS | | 6044-002 | | 12-06-91 | 12-09-91 | 12-11-91 | 5 | 2 |
| JCSW9AS | | 6069-001 | | 12-10-91 | 12-10-91 | 12-18-91 | 8 | 8 |
| JCSW9BS | | 6069-002 | | 12-10-91 | 12-10-91 | 12-18-91 | 8 | 8 |
| JC1HICS | | 6007-002 | | 12-04-91 | 12-05-91 | 12-11-91 | 7 | 6 |
| JC3HIAS | | 6007-003 | | 12-04-91 | 12-05-91 | 12-11-91 | 7 | 6 |
| JC4HIAS | | 5983-001 | | 12-03-91 | 12-04-91 | 12-11-91 | 8 | 7 |
| JC4H2AS | | 5983-002 | | 12-03-91 | 12-04-91 | 12-11-91 | 8 | 7 |
| JC6HIAS | | 6004-004 | | 12-04-91 | 12-05-91 | 12-11-91 | 7 | 6 |

COMMENTS:

HOLD TIME COLLECT = DATE COLLECTED MINUS DATE ANALYZED

HOLD TIME RECEIPT = DATE RECEIVED MINUS DATE ANALYZED

REV. 301

# Appendix A-1:

# Report 13

# ECHEM INC.

## ENGINEERING CHEMISTRY CONSULTANTS

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FAX (207) 892-7499


13 March 1992

Dr. A. Dallas Wait
Senior Environmental Chemist
Gradient Corporation
44 Brattle Street
Cambridge, MA 02138

| | |
|---|---|
| Re: | Air Force Plant 59 |
| Laboratory: | Galson Laboratories |
| Case No: | NONE |
| SDG No: | 5-6384 |

| | | | | |
|---|---|---|---|---|
| Volatiles: | JCBG2BW | JCDPWAW | JCDW1AW | JCDW3AW |
| (USEPA 524.2) | JCDW4AW | JCDW5AW | JCDW6AW | JCDW8AW |
| | JCDW8RW | JCDW9AW | JCSW1AW | JCSW3AW |
| | JCSW4AW | JCSW5AW | JCSW6AW | JCSW7AW |
| | JCSW8AW | TRIP BLANK13 | TRIP BLANK14 | JCSW9AW |
| | | TRIP BLANK15 | HOLD BLANK13 | |
| | | HOLD BLANK14 | HOLD BLANK15 | |

Dear Dr. Wait:

Validation was performed on the organic analytical data from the samples referenced above. The data were evaluated based on the following parameters in accordance with the specifications set forth in USEPA Method No. 524.2, Revision 3 and the Quality Assurance Project Plan for Air Force Plant 59, Johnson City, New York, Revision 2, December 19, 1991.

- * - data completeness
- * - holding times
- - surrogate recovery
- * - matrix spike/matrix spike duplicate
- - laboratory fortified blank
- - blanks
- * GC/MS tuning
- - calibration

* - internal standards performance
* - field duplicates
* - TCL compound identification
* - tentatively identified compounds
* - system performance
* - compound quantitation and reported detection limits
* - sample result verification

* All criteria were met for this parameter.

Table I summarizes the validation actions, which were in accordance with USEPA Region II CLP Organics Data Review and Preliminary Review, March 1990, SOP No. HW-6, Revision #7, and the NYSDEC ASP, September 1989, as detailed below.
Also attached are the:

- o data validation log,
- o telephone log,
- o completeness log, and
- o sample preparation and analysis summaries.

SURROGATE RECOVERY:

Samples with surrogate recoveries which did not meet the criteria specified in the NYSDEC ASP are summarized below:

| SAMPLE | PERCENT RECOVERIES D4DCE | D8T | BFB |
|---|---|---|---|
| JCBG2BW | | | 86 |
| JCSW3AW | | | 86 |
| JCDW9AW | | | 86 |

Action:

- o recovery ≥10%; sample results >MDL are flagged as estimated (J)

LABORATORY FORTIFIED BLANK:

Compounds not within the recovery limits specified in the NYSDEC ASP are tabulated below:

| COMPOUND | % RECOVERY |
|---|---|
| 1, 2-dichloroethene (total) | 80 |
| cis-1, 3-dichloropropene | 84 |
| benzene | 86 |
| styrene | 86 |

Action:

- o for recovery >10% but below limit, detection limit values for the compound are flagged as estimated (J)

Comments:

The above actions are applied to all samples of the same matrix associated with this SDG.

BLANKS:

Positive blank results and associated action levels are tabulated below:

| BLANK ID. | COMPOUND | CONCENTRATION | ACTION LEVEL |
|---|---|---|---|
| TRIP BLANK14 | methylene chloride | 0.2 | 2.0 |
| TRIP BLANK15 | methylene chloride | 1.0 | 10.0 |

* Method blank levels below the NYSDEC ASP requirements.

Associated samples with positive values reported below the action level are: NONE

CALIBRATION:

A. Initial calibration:

SPCC compounds with average relative response factors (AVG RRF) below the limits and all others ≤0.10 or percent relative standard deviations (%RSD) >30% for CCC compounds and >35% for all other compounds as specified in the NYSDEC ASP are tabulated below:

| INSTRUMENT | CAL DATE | COMPOUND | AVG RRF | %RSD |
|---|---|---|---|---|
| C | 01-03-92 | 2-butanone | .030 | |
| | | vinyl acetate | .028 | |
| | | 2-hexanone | .075 | |
| C | 01-13-92 | 2-butanone | .041 | |
| | | vinyl acetate | .027 | |
| | | 2-hexanone | .098 | |

Associated samples:

| INSTRUMENT | CAL DATE | SAMPLE NO. | |
|---|---|---|---|
| C | 01-03-92 | HOLD BLANK13 | TRIP BLANK13 |
| | | JCDW1AW | JCSW1AW |
| | | JCDW5AW | JCDW3AW |
| | | JCDW6AW | JCSW3AW |

| INSTRUMENT | CAL DATE | SAMPLE NO. | |
|---|---|---|---|
| C | 01-03-92 | JCSW6AW | JCDW9AW |
| | | JCSW5AW | JCDW4AW |
| | | JCBG2BW | |
| | 01-13-92 | HOLD BLANK14 | TRIP BLANK14 |
| | | JCSW9AW | JCSW4AW |
| | | JCSW7AW | JCDW8RW |
| | | JCSW8AW | HOLD BLANK15 |
| | | TRIP BLANK15 | JCDPWAW |

Action:

- o for AVG RRF ≤0.10, results ≥MDL for the compound are flagged as estimated (J) and detection limit values (MDL U) are flagged as unusable (R)

B. Continuing calibration:

SPCC compounds with relative response factors (RRF) below the limits and all others ≤0.10 or percent difference between initial and continuing calibration (%D) >25% for CCC compounds and >35% for all other compounds as specified in the NYSDEC ASP are tabulated below:

| INSTRUMENT | CAL DATE/TIME | COMPOUND | RRF | %D |
|---|---|---|---|---|
| C | 01-07-92/08:42 | 2-butanone | .039 | |
| | | vinyl acetate | .025 | |
| | | 2-hexanone | .089 | |
| | 01-08-92/10:17 | 2-butanone | .032 | |
| | | vinyl acetate | .034 | |
| | | 2-hexanone | .082 | |
| | 01-09-92/09:58 | 2-butanone | .035 | |
| | | vinyl acetate | .035 | |
| | | 2-hexanone | .094 | |
| | 01-10-92/08:55 | 2-butanone | .030 | |
| | | vinyl acetate | .027 | |
| | | 2-hexanone | .081 | |
| | 01-14-92/05:43 | 2-butanone | .044 | |
| | | vinyl acetate | .030 | |
| | | 2-hexanone | .104 | |

| INSTRUMENT | CAL DATE/TIME | COMPOUND | RRF | %D |
|---|---|---|---|---|
| C | 01-15-92/05:46 | 2-butanone | .041 | |
| | | vinyl acetate | .031 | |
| | | 2-hexanone | .100 | |
| | 01-16-92/01:40 | 2-butanone | .041 | |
| | | vinyl acetate | .031 | |
| | | 2-hexanone | .103 | |

Associated samples:

| INSTRUMENT | CAL DATE | SAMPLE NO. | |
|---|---|---|---|
| C | 01-07-92/08:42 | HOLD BLANK13 | JCDW1AW |
| | | TRIP BLANK13 | JCSW1AW |
| | 01-08-92/10:17 | JCDW5AW | JCSW5AW |
| | | JCSW3AW | JCDW9AW |
| | 01-09-92/09:58 | JCBG2BW | JCDW3AW |
| | | JCSW3AW | JCDW9AW |
| | 01-10-92/08 : 55 | JCDW4AW | |
| | 01-14-92/05:43 | HOLD BLANK14 | JCSW9AW |
| | | TRIP BLANK14 | JCSW4AW |
| | | JCSW7AW | JCDW8RW |
| | 01-15-92/05:46 | HOLD BLANK15 | JCSW8AW |
| | 01-16-92/01:40 | JCSW8AW | JCDPWAW |
| | | TRIP BLANK15 | |

Action:

- o for RAE ≤0.10, results ≥MDL for the compound are flagged as estimated (J) and detection limit values (MDL U) are flagged as unusable (R)

Sincerely,
ECHEM INC.

Bruce K. Wallin, PhD
Vice President

enclosures

Air Force Plant 59
SDG No. 5-6384

Table I. Validation Action Summary

| Sample No. | VOA |
|---|---|
| JCBG2BW | J2, R4, J9 |
| JCDPWAW | R4, J9 |
| JCDW1AW | R4, J9 |
| JCDW3AW | R4, J9 |
| JCDW4AW | R4, J9 |
| JCDW5AW | R4, J9 |
| JCDW6AW | R4, J9 |
| JCDW8AW | R4, J9 |
| JCDW8RW | R4, J9 |
| JCDW9AW | J2, R4, J9 |
| JCSW1AW | R4, J9 |
| JCSW3AW | J2, R4, J9 |
| JCSW4AW | R4, J9 |
| JCSW5AW | R4, J9 |
| JCSW6AW | R4, J9 |
| JCSW7AW | R4, J9 |
| JCSW8AW | R4, J9 |
| JCSW9AW | R4, J9 |
| TRIP BLANK13 | R4, J9 |
| TRIP BLANK14 | R4, J9 |
| TRIP BLANK15 | R4, J9 |
| HOLD BLANK13 | R4, J9 |
| HOLD BLANK14 | R4, J9 |
| HOLD BLANK15 | R4, J9 |

If the field is blank, no qualifiers were necessary.

A1 - change positive values for ( ) to revised detection limit due to blank contamination

J1 - estimate positive values (J) and detection limit values (UJ) due to holding time violations

J2 - estimate positive values (J) and detection limit values (UJ) due to non-compliant volatile surrogate recoveries

J3 - estimate positive values (J) and detection limit values (UJ) due to non-compliant (acid) (base-neutral) fraction surrogate recoveries

J4 - estimate positive values (J) for ( ) due to non-compliant matrix spike recoveries

J5 - estimate positive values (J) for ( ) due to calibration not meeting minimum RF criteria

J6 - estimate positive values (J) and detection limit values (UJ) for ( ) due to non-compliant calibration stability

J7 - estimate positive values (J) for ( ) due to non-compliant internal standard stability

J8 - estimate positive values (J) due to non-compliant field duplicate precision

J9 - estimate detection limit value (UJ) for 1,2-dichloroethene, cis-1,3-dichloropropene, benzene and styrene due to non-compliant check standard results

RI - reject detection limit values (UR) due to holding time exceedences

R2 - reject detection limit values (UR) due to low surrogate recoveries

R3 - reject detection limit values (UR) for ( ) due to low matrix spike recoveries

R4 - reject detection limit values (UR) for 2-butanone, 2-hexanone and vinyl acetate due to calibration not meeting minimum RF criteria

R5 - reject detection limit values (UR) for ( ) due to extreme variations in the internal standard stability

ECHEM INC.
SAMPLE PREPARATION AND ANALYSIS SUMMARY
FOR NYSDEC

CLIENT: Argonne Nat'l Lab
CASE NO.
SDG NO. J-6384
SITE: IRP Supplemental S.I.
ANALYTICAL FRACTION: Volatiles

| CLIENT SAMPLE ID | EPA SAMPLE NO. | LAB. SAMPLE ID | MATRIX | DATE COLLECTED | DATE RECEIVED | DATE ANALYZED | HOLD TIME COLLECT | HOLD TIME RECEIPT |
|---|---|---|---|---|---|---|---|---|
| JCBG2AW | | 6415-001 | WATER | 1-7-92 | 1-8-92 | 1-9-92 | 2 | 1 |
| JCDPWAW | | 6446-004 | | 1-9-92 | 1-10-92 | 1-16-92 | 7 | 6 |
| JCDW1AW | | 6384-001 | | 1-5-92 | 1-6-92 | 1-7-92 | 2 | 1 |
| JCDW3AW | | 6415-002 | | 1-7-92 | 1-8-92 | 1-9-92 | 2 | 1 |
| JCDW4AW | | 6415-006 | | 1-8-92 | 1-8-92 | 1-10-92 | 2 | 2 |
| JCDW5AW | | 6384-003 | | 1-5-92 | 1-6-92 | 1-8-92 | 3 | 2 |
| JCDW6AW | | 6384-005 | | 1-6-92 | 1-6-92 | 1-8-92 | 2 | 2 |
| JCDW8AW | | 6446-001 | | 1-9-92 | *1-10-92 | 1-15-92 | 6 | 5 |
| JCDW8RW | | 6446-002 | | 1-9-92 | (1-8-92) | 1-14-92 | 5 | 6 |
| JCDW9AW | | 6415-004 | | 1-7-92 | 1-8-92 | 1-9-92 | 2 | 1 |
| JCSW1AW | | 6384-002 | | 1-5-92 | 1-6-92 | 1-7-92 | 2 | 1 |
| JCSW3AW | | 6415-003 | | 1-7-92 | 1-8-92 | 1-9-92 | 2 | 1 |
| JCSW4AW | | 6415-009 | | 1-8-92 | 1-8-92 | 1-14-92 | 6 | 6 |
| JCSW5AW | | 6384-004 | | 1-5-92 | 1-6-92 | 1-8-92 | 3 | 2 |
| JCSW6AW | | 6384-006 | | 1-6-92 | 1-6-92 | 1-8-92 | 2 | 2 |
| JCSW7AW | | 6415-010 | | 1-8-92 | 1-8-92 | 1-14-92 | 6 | 6 |
| JCSW8AW | | 6446-003 | | 1-8-92 | 1-10-92 | 1-16-92 | 8 | 6 |
| JCSW9AW | | 6415-005 | | 1-7-92 | 1-8-92 | 1-14-92 | 7 | 6 |
| TRIP BLANK 13 | | 6384-007 | | 1-6-92 | 1-6-92 | 1-7-92 | 1 | 1 |
| TRIP BLANK 14 | | 6415-011 | | 1-8-92 | 1-8-92 | 1-14-92 | 6 | 6 |
| TRIP BLANK 15 | | 6446-005 | | 1-10-92 | 1-10-92 | 1-16-92 | 6 | 6 |
| HOLD BLANK 13 | | 6384-008 | | N.A. | 1-6-92 | 1-7-92 | | |
| HOLD BLANK 14 | | 6415-012 | | N.A | 1-8-92 | 1-14-92 | | |
| HOLD BLANK 15 | | 6446-006 | | N.A | 1-10-92 | 1-15-92 | | |

COMMENTS:

HOLD TIME COLLECT = DATE COLLECTED MINUS DATE ANALYZED

HOLD TIME RECEIPT = DATE RECEIVED MINUS DATE ANALYZED

*Note: The correct date received is 1-10-92 according to Field records.
BWM (ANL) 15 JUL 92

REV. 3/91

# Appendix A-1:

# Report 14

**ECHEM INC.**

**ENGINEERING CHEMISTRY CONSULTANTS**

P.O. Box 1510
#32 Route 35
Sebago Common
Windham, Maine 04062
(207) 892-0002
FAX (207) 892-7499

16 March 1992

Dr. A. Dallas Wait
Senior Environmental Chemist
Gradient Corporation
44 Brattle Street
Cambridge, MA 02138

| | |
|---|---|
| Re: | Air Force Plant 59 |
| Laboratory: | Galson Laboratories |
| Case No: | NONE |
| SDG No: | 5-6384 |

| | | | | |
|---|---|---|---|---|
| Semivolatiles: | JCBG2BW | JCDPWAW | JCDW1AW | JCDW3AW |
| | JCDW4AW | JCDW5AW | JCDW6AW | JCDW8AW |
| | JCDW8RW | JCDW9AW | JCSW1AW | JCSW3AW |
| | JCSW4AW | JCSW5AW | JCSW6AW | JCSW7AW |
| | JCSW8AW | JCSW9AW | | |

Dear Dr. Wait:

Validation was performed on the organic analytical data from the samples referenced above. The data were evaluated based on the following parameters:

* - data completeness
* - holding times
* - surrogate recovery
- matrix spike/matrix spike duplicate/matrix spike blank
* - blanks
* - GC/MS tuning
- calibration
* - internal standards performance
* - field duplicates
* - TCL compound identification
* - tentatively identified compounds
* - system performance
* - compound quantitation and reported detection limits
* - sample result verification

* All criteria were met for this parameter.

Table I summarizes the validation actions, which were in accordance with USEPA Region II CLP Organics Data Review and Preliminary Review, March 1990, SOP No. HW-6, Revision # 7, and the NYSDEC ASP, September 1989, as detailed below.

Also attached are the:

- o data validation log,
- o telephone log,
- o completeness log, and
- o sample preparation and analysis summaries.

MATRIX SPIKE/MATRIX SPIKE DUPLICATE/MATRIX SPIKE BLANK:

Matrix spike recoveries which did not meet the criteria specified in the NYSDEC CLP (Vol. VIII, E-41) are summarized below.

| | RECOVERY (%) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SAMPLE | PHE | CLPH | DCB | DNP | TCB | CRE | ACE | NPH | DNT | PCP | PYR |
| QI-0086 | 73 | 74 | 71 | | 73 | 73 | | | | | |

Action:

- o none, sample results reported as CRQL U

CALIBRATION:

Calibration linearity, sensitivity and stability criteria specified in the NYSDEC clap (Vol. VIII, E-48-51), or federal criteria (*), are tabulated below.

CONTINUING CALIBRATION CRITERIA

| COMPOUND | %D (max.) | RRF (min.) |
|---|---|---|
| SPCC | 20 | 0.05 |
| all other TCL compounds | 20 | 0.05* |

Deviations from the above calibration criteria are tabulated below.

CONTINUING CALIBRATION

| INSTRUMENT | DATE/TIME | COMPOUND | %D | RRF |
|---|---|---|---|---|
| GCMSD#4 | 01-30-92/10:25 | naphthalene | 21 | |
| | | di-n-butylphthalate | 22 | |
| | 01-30-92/22:33 | di-n-butylphthalate | 22 | |

Associated samples:

| INSTRUMENT | DATE/TIME | SAMPLE NO. | |
|---|---|---|---|
| GCMSD#4 | 01-30-92/10:25 | JCSWSAW | JCSW6AW |
| | | JCSW3AW | JCDW6AW |
| | | JCDW3AW | JCDW9AW |
| | | JCBG2BW | |
| | 01-30-92/22:33 | JCDW4AW | JCDW8AW |
| | | JCDW8RW | JC5W4AW |
| | | JCSW7AW | JCSW8AW |
| | | JCSW9AW | JCDPWAW |

Action:

o none, sample results reported as CRQL U

Sincerely,
ECHEM INC.

Bruce K. Wallin, PhD
Vice President

enclosures

Air Force Plant 59
SDG No. 5-6384

Table I. Validation Action Summary

| Sample No. | SVOA |
|---|---|
| JCBG2BW | |
| JCDPWAW | |
| JCDW1AW | |
| JCDW3AW | |
| JCDW4AW | |
| JCDW5AW | |
| JCDW6AW | |
| JCDW8AW | |
| JCDW8RW | |
| JCDW9AW | |
| JCSW1AW | |
| JCSW3AW | |
| JCSW4AW | |
| JCSWSAW | |
| JCSW6AW | |
| JCSW7AW | |
| JCSW8AW | |
| JCSW9AW | |

If the field is blank, no qualifiers were necessary.

A1 - change positive values for ( ) to revised detection limit due to blank contamination

J1 - estimate positive values (J) and detection limit values (UJ) due to holding time violations

J2 - estimate positive values (J) and detection limit values (UJ) due to non-compliant volatile surrogate recoveries

J3 - estimate positive values (J) and detection limit values (UJ) due to non-compliant (acid) (base-neutral) fraction surrogate recoveries

J4 - estimate positive values (J) for ( ) due to non-compliant matrix spike recoveries

J5 - estimate positive values (J) for ( ) due to calibration not meeting minimum RF criteria

J6 - estimate positive values (J) and detection limit values (UJ) for ( ) due to non-compliant calibration stability

J7 - estimate positive values (J) for ( ) due to non-compliant internal standard stability

J8 - estimate positive values (J) due to non-compliant field duplicate precision

R1 - reject detection limit values (UR) due to holding time exceedences

R2 - reject detection limit values (UR) due to low surrogate recoveries

R3 - reject detection limit values (UR) for ( ) due to low matrix spike recoveries

R4 - reject detection limit values (UR) for ( ) due to calibration not meeting minimum RF criteria

R5 - reject detection limit values (UR) for ( ) due to extreme variations in the internal standard stability

R7 - reject detection limit value (UR) for ( ) due to continuing calibration %D >50%

R8 - TIC's identified in associated method blank, results flagged as unusable (R)

ECHEM INC.
SAMPLE PREPARATION AND ANALYSIS SUMMARY
FOR NYSDEC

CLIENT: Argonne Nat'l Lab
CASE NO.
SDG NO. 5-6384
SITE: IRP Supplemental S.I.
ANALYTICAL FRACTION: Semivolatiles

| CLIENT SAMPLE ID | EPA SAMPLE NO. | LAB SAMPLE ID | MATRIX | DATE COLLECTED | DATE RECEIVED | DATE EXTRACTED | HOLD TIME TO EXTRACTION COLLECT | HOLD TIME TO EXTRACTION RECEIPT |
|---|---|---|---|---|---|---|---|---|
| JCBG2BW | | 6415-001 | WATER | 1-7-92 | 1-09-92 | 1-09-92 | 2 | 0 |
| JCDPWAW | | 6446-004 | | 1-9-92 | 1-10-92 | 1-13-92 | 4 | 3 |
| JCDW1AW | | 6384-001 | | 1-5-92 | 1-06-92 | 1-09-92 | 4 | 3 |
| JCDW3AW | | 6415-002 | | 1-7-92 | 1-09-92 | 1-09-92 | 2 | 0 |
| JCDW4AW | | 6415-006 | | 1-8-92 | 1-09-92 | 1-09-92 | 1 | 0 |
| JCDW5AW | | 6384-003 | | 1-5-92 | 1-06-92 | 1-09-92 | 4 | 3 |
| JCDW6AW | | 6384-005 | | 1-6-92 | 1-06-92 | 1-09-92 | 3 | 3 |
| JCDW8AW | | 6446-001 | | 1-9-92 | 1-10-92 | 1-13-92 | 4 | 3 |
| JCDW8RW | | 6446-002 | | 1-9-92 | 1-10-92 | 1-13-92 | 4 | 3 |
| JCDW9AW | | 6415-004 | | 1-7-92 | 1-09-92 | 1-09-92 | 2 | 0 |
| JCSW1AW | | 6384-002 | | 1-5-92 | 1-06-92 | 1-09-92 | 4 | 3 |
| JCSW3AW | | 6415-008 | | 1-7-92 | 1-09-92 | 1-09-92 | 2 | 0 |
| JCSW4AW | | 6415-009 | | 1-8-92 | 1-09-92 | 1-09-92 | 1 | 0 |
| JCSW5AW | | 6384-004 | | 1-5-92 | 1-06-92 | 1-09-92 | 4 | 3 |
| JCSW6AW | | 6384-006 | | 1-6-92 | 1-06-92 | 1-09-92 | 3 | 3 |
| JCSW7AW | | 6415-010 | | 1-8-92 | 1-09-92 | 1-09-92 | 1 | 0 |
| JCSW8AW | | 6446-003 | | 1-9-92 | 1-10-92 | 1-13-92 | 4 | 3 |
| JCSW9AW | | 6415-005 | | 1-7-92 | 1-09-92 | 1-09-92 | 2 | 0 |

COMMENTS:

HOLD TIME COLLECT = DATE COLLECTED MINUS DATE EXTRACTED

HOLD TIME RECEIPT = DATE RECEIVED MINUS DATE EXTRACTED

REV. 3/91

# Appendix A-1:

# Report 15

**ECHEM INC.**

**ENGINEERING CHEMISTRY CONSULTANTS**

P.O. Box 1510
#32 Route 35
Sebago Common
Windham, Maine 04062
(207) 892-0002
FAX (207) 892-7499

13 March 1992

Dr. A. Dallas Wait
Senior Environmental Chemist
Gradient Corporation
44 Brattle Street
Cambridge, MA 02138

| | |
|---|---|
| Re: | Air Force Plant 59 |
| Laboratory: | Galson Laboratories |
| Case No: | NONE |
| SDG No: | 5-6384 |

| | | | | |
|---|---|---|---|---|
| Pesticides/PCB's: | JCBG2BW | JCDPWAW | JCDW1AW | JCDW3AW |
| | JCDW4AW | JCDW5AW | JCDW6AW | JCDW8AW |
| | JCDW8RW | JCDW9AW | JCSW1AW | JCSW3AW |
| | JCSW4AW | JCSW5AW | JCSW6AW | JCSW7AW |
| | JCSW8AW | JCSW9AW | | |

Dear Dr. Wait:

Validation was performed on the organic analytical data from the samples referenced above. The data were evaluated based on the following parameters:

* - data completeness
* - holding times
* - surrogate recovery
- matrix spike/matrix spike duplicate/matrix spike blank
* - blanks
* - calibration
* - pesticide instrument performance
* - field duplicates
* - TCL compound identification
* - compound quantitation and reported detection limits sample result verification

* All criteria were met for this parameter.

Table I summarizes the validation actions, which were in accordance with USEPA Region II CLP Organics Data Review and Preliminary Review, March 1990, SOP No. HW-6, Revision #7 and the NYSDEC ASP, September 1989 as detailed below.

Also attached are the:

- o data validation log,
- o telephone log,
- o completeness log, and
- o sample preparation and analysis summaries.

MATRIX SPIKE/MATRIX SPIKE DUPLICATE/MATRIX SPIKE BLANK:

Matrix spike recoveries which did not meet the criteria specified in the NYSDEC CLP (Vol. VII, 2-73) are summarized below.

| | RECOVERY (%) | | | | | |
|---|---|---|---|---|---|---|
| SAMPLE | LIN | HEP | ALD | DIEL | END | DDT |
| JCDW4AW | | | | | 128/126 | |

Action:

- o none, sample results reported as CRQL U

Sincerely,
ECHEM INC.

Bruce K. Wallin, PhD
Vice President

enclosures

Air Force Plant 59
SDG No. 5-6384

Table I. Validation Action Summary

| Sample No. | Pesticide/PCB |
|---|---|
| JCBG2BW | |
| JCDPWAW | |
| JCDW1AW | |
| JCDW3AW | |
| JCDW4AW | |
| JCDW5AW | |
| JCDW6AW | |
| JCDW8AW | |
| JCDW8RW | |
| JCDW9AW | |
| JCSW1AW | |
| JCSW3AW | |
| JCSW4AW | |
| JC5W5AW | |
| JCSW6AW | |
| JCSW7AW | |
| JCSW8AW | |
| JCSW9AW | |

If the field is blank, no qualifiers were necessary.

A1 - change positive values for ( ) to revised detection limit due to blank contamination

J1 - estimate positive values (J) and detection limit values (UJ) due to holding time violations

J2 - estimate positive values (J) and detection limit values (UJ) due to non-compliant volatile surrogate recoveries

J3 - estimate positive values (J) and detection limit values (UJ) due to non-compliant (acid) (base-neutral) fraction surrogate recoveries

J4 - estimate positive values (J) for ( ) due to non-compliant matrix spike recoveries

J5 - estimate positive values (J) for ( ) due to calibration not meeting minimum RF criteria

J6 - estimate positive values (J) and detection limit values (UJ) for ( ) due to non-compliant calibration stability

J7 - estimate positive values (J) for ( ) due to non-compliant internal standard stability

| | | |
|---|---|---|
| J8 | - | estimate positive values (J) due to non-compliant field duplicate precision |
| R1 | - | reject detection limit values (UR) due to holding time exceedences |
| R2 | | reject detection limit values (UR) due to low surrogate recoveries |
| R3 | - | reject detection limit values (UR) for ( ) due to low matrix spike recoveries |
| R4 | - | reject detection limit values (UR) for ( ) due to calibration not meeting minimum RF criteria |
| R5 | - | reject detection limit values (UR) for ( ) due to extreme variations in the internal standard stability |
| R7 | - | reject detection limit value (UR) for ( ) due to continuing calibration %D >50% |

ECHEM INC.
SAMPLE PREPARATION AND ANALYSIS SUMMARY
FOR NYSDEC

CLIENT: Argonne Nat'l Lab
CASE NO.
SDG NO. 5-6384
SITE: IRP Supplemental S.I.
ANALYTICAL FRACTION: Pesticide/PCBs

| CLIENT SAMPLE ID | EPA SAMPLE NO. | LAB. SAMPLE ID | MATRIX | DATE COLLECTED | DATE RECEIVED | DATE EXTRACTED | HOLD TIME TO EXTRACTION COLLECT | HOLD TIME TO EXTRACTION RECEIPT |
|---|---|---|---|---|---|---|---|---|
| JCBG2BW | | 6415-001 | WATER | 1-7-92 | 1-08-92 | 1-13-92 | 6 | 5 |
| JCDPWAW | | 6446-004 | | 1-9-92 | 1-10-92 | 1-13-92 | 4 | 3 |
| JCDW1AW | | 6384-001 | | 1-5-92 | 1-06-92 | 1-08-92 | 3 | 2 |
| JCDW3AW | | 6415-002 | | 1-7-92 | 1-08-92 | 1-13-92 | 6 | 5 |
| JCDW4AW | | 6415-006 | | 1-8-92 | 1-08-92 | 1-13-92 | 5 | 5 |
| JCDW5AW | | 6384-003 | | 1-5-92 | 1-06-92 | 1-08-92 | 3 | 2 |
| JCDW6AW | | 6384-005 | | 1-6-92 | 1-06-92 | 1-08-92 | 2 | 2 |
| JCDW8AW | | 6446-001 | | 1-9-92 | 1-10-92 | 1-13-92 | 4 | 3 |
| JCDW8RW | | 6446-002 | | 1-9-92 | 1-08-92 | 1-13-92 | 4 | 5 |
| JCDW9AW | | 6415-004 | | 1-7-92 | 1-06-92 | 1-08-92 | 1 | 2 |
| JCSW1AW | | 6384-002 | | 1-5-92 | 1-06-92 | 1-08-92 | 3 | 2 |
| JCSW3AW | | 6415-003 | | 1-7-92 | 1-08-92 | 1-13-92 | 6 | 5 |
| JCSW4AW | | 6415-009 | | 1-8-92 | 1-08-92 | 1-13-92 | 5 | 5 |
| JCSW5AW | | 6384-004 | | 1-5-92 | 1-06-92 | 1-08-92 | 3 | 2 |
| JCSW6AW | | 6384-006 | | 1-6-92 | 1-06-92 | 1-08-92 | 2 | 2 |
| JCSW7AW | | 6415-010 | | 1-8-92 | 1-08-92 | 1-13-92 | 5 | 5 |
| JCSW8AW | | 6446-003 | | 1-9-92 | 1-10-92 | 1-13-92 | 4 | 3 |
| JCSW9AW | | 6415-005 | | 1-7-92 | 1-08-92 | 1-13-92 | 6 | 5 |

COMMENTS:

HOLD TIME COLLECT = DATE COLLECTED MINUS DATE EXTRACTED

HOLD TIME RECEIPT = DATE RECEIVED MINUS DATE EXTRACTED

REV. 301

ECHEM INC.
ORGANICS
COMPLETENESS LOG

SITE: IRP Supplemental S.I. CLIENT: Argonne Nat'l Lab
TSK CASE #6384/6415/6444 SDG# S-6384

| | SAMPLE # | JCBGABW | JCDPWIAW | JCDW1AW | JCDW3AW | JCDW4AW | JCDW5AW | JCDW6AW | JCDW8AW | JCDW8RW | JCDW9AW | JCSW1AW | JCSW3AW | JCSW4AW | JCSW5AW | JCSW6AW | JCSW7AW | JCSW8AW | JCSW9AW | TRIP BLANK13 | TRIP BLANK14 | TRIP BLANK15 | HOLD BLANK13 | HOLD BLANK14 | HOLD BLANKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1A | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| | 1B | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| | 2A | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| | 2B | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| | 3A | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| VOA | 3B | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| | 4A | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| | 5A | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| | 6A | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| | 7A | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| | 8A | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| | 1B | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | | | | | |
| | 1C | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | | | | | |
| | 1F | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | | | | | |
| | 2C | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | | | | | |
| | 2D | | | | | | | | | | | | | | | | | | | | | | | | |
| | 3C | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | | | | | |
| | 3D | | | | | | | | | | | | | | | | | | | | | | | | |
| SVOA | 4B | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | | | | | |
| | 5B | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | | | | | |
| | 6B | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | | | | | |
| | 6C | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | | | | | |
| | 7B | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | | | | | |
| | 7C | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | | | | | |
| | 8B | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | | | | | |
| | 8C | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | | | | | |
| | 1D | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | | | | | |
| | 2E | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | | | | | |
| | 2F | | | | | | | | | | | | | | | | | | | | | | | | |
| | 3E | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | | | | | |
| PEST | 3F | | | | | | | | | | | | | | | | | | | | | | | | |
| | 4C | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | | | | | |
| | 8D | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | | | | | |
| | 8E | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | | | | | |
| | 9 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | | | | | |
| | 10 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | | | | | |

✓ Quant Reports
✓ MASS SPECS
✓ TIC Compounds
✓ Laboratory Blank (Form 1's)
✓ MS/MSD (Forms 1's)
N.A. Total Solids Log (if applicable)
___ Injection Log
✓ Chain of Custody
✓ Case Narrative

REV. 391

# Appendix A-1:

# Report 16

**ECHEM INC.**

**ENGINEERING CHEMISTRY CONSULTANTS**

P.O. Box 1510
#32 Route 35
Sebago Common
Windham, Maine 04062
(207) 892-0002
FAX (207) 892-7499

16 March 1992

Dr. A. Dallas Wait
Senior Environmental Chemist
Gradient Corporation
44 Brattle Street
Cambridge, MA 02138

| | |
|---|---|
| Re: | Air Force Plant 59 |
| Laboratory: | Galson Laboratories |
| Case No: | NONE |
| SDG No: | 5-6384 |

| | | | | |
|---|---|---|---|---|
| TAL Inorganics: | JCBG2BW | JCDPWAW | JCDW1AW | JCDW3AW |
| | JCDW4AW | JCDW5AW | JCDW6AW | JCDW8AW |
| | JCDW8RW | JCDW9AW | JCSW1AW | JCSW3AW |
| | JCSW4AW | JCSW5AW | JCSW6AW | JCSW7AW |
| | JCSW8AW | JCSW9AW | | |

Dear Dr. Wait:

Validation was performed on the inorganic analytical data from the samples referenced above. The data were evaluated, based on the following parameters:

* - data completeness
* - holding times
* - calibrations
- blanks
* - ICP interference check sample analysis
- matrix spike analysis
* - duplicate sample analysis
- laboratory control sample analysis furnace atomic absorption results
* - ICP serial dilution results
* - detection limits
* - sample result verification

* All criteria were met for this parameter.

Table I summarizes the validation actions, which were in accordance with USEPA Region II Evaluation of Inorganic Data for the Contract Laboratory Program, February 1990, SOP No. HW-2, Revision X, and the NYSDEC ASP, September 1989 as detailed below.

Also attached are the:

- o data validation log,
- o telephone log,
- o completeness log, and
- o sample preparation and analysis summaries.

BLANKS:

1. Positive Blanks

Blanks providing results ≥IDL and their associated action levels are tabulated below:

| BLANK ID | PARAMETER | CONCENTRATION | ACTION LEVEL WATER | SOIL |
|---|---|---|---|---|
| CCB2 | vanadium | 23 | 115 | |
| CCB3 | beryllium | 1 | 5 | |
| | cadmium | 4 | 20 | |
| | nickel | 7 | 35 | |
| | vanadium | 24 | 120 | |
| PB | calcium | 17 | 85 | |
| | iron | 9 | 45 | |
| | nickel | 6 | 30 | |
| | vanadium | 9 | 45 | |
| | zinc | 3 | 15 | |
| CCB4 | beryllium | 2 | 10 | |
| | calcium | 22 | 110 | |
| | vanadium | 4 | 20 | |
| CCB5 | copper | 8 | 40 | |
| CCB8 | zinc | 4 | 20 | |

sociated samples with positive values reported below the action level are tabulated below:

| CAL BLANK ID | PARAMETER | SAMPLE NO. |
|---|---|---|
| CCB2 | vanadium | JCDW1AW |
| | | JCDW5AW |
| | | JCDW6AW |
| CCB3 | beryllium | JCSW9AW |
| | vanadium | |
| | nickel | JCBG2BW |
| | vanadium | JCDW3AW |
| | | JCDW9AW |
| CCB4 | vanadium | JCDW4AW |
| | | JCSW4AW |
| | | JCSW7AW |
| CCB5 | copper | JCDW4AW |
| | | JCSW4AW |
| | | JCSW7AW |
| CCB8 | zinc | JCDPWAW |

| PREP BLANK ID | PARAMETER | SAMPLE NO. |
|---|---|---|
| PBW | iron | JCBG2BW |
| | nickel | JCSW7AW |
| | | JCDW8AW |
| | | JCSW1AW |
| | | JCSW4AW |
| | | JCDPWAW |
| | | JCDW1AW |
| | | JCDW4AW |
| | | JCDW5AW |
| | | JCDW6AW |
| PEW | nickel | JCSW1AW |
| | vanadium | JCSW3AW |
| | | JCSW6AW |
| | vanadium | JCSW5AW |
| | | JCSW8AW |

ction:

- o associated sample results ≥IDL but <action level are flagged as not detected at the sample value (U)

2. Negative Blanks

Blanks that provided results <-2IDL are tabulated below:

| BLANK ID | PARAMETER | CONCENTRATION |
|---|---|---|
| CCB2 | zinc | -12 |
| CCB3 | zinc | -11 |
| CCB4 | zinc | -7 |
| CCB6 | zinc | -9 |
| CCB8 | vanadium | -10 |

Associated samples with results reported <10IDL:

| BLANK ID | PARAMETER | ASSOCIATED SAMPLES |
|---|---|---|
| CCB2 | zinc | JCDW6AW |
| CCB3 | zinc | JCBG2BW<br>JCDW3AW |
| CCB4 | zinc | JCDW4AW |
| CCB8 | vanadium | JCSW8AW<br>JCDPWAW<br>JCDW8AW<br>JCDW8RW |

Action:

- o associated sample results ≥IDL are flagged as estimated (J)
- o associated sample detection limit values (IDL U) are flagged as unusable (R)

MATRIX SPIKE ANALYSIS:

Samples providing matrix spike recoveries not within 75-125% that also contain native analyte reported at <4X the spiking level as specified in the NYSDEC CLP (Vol. VIII, E-111) are tabulated below:

| SAMPLE ID | ELEMENT | % RECOVERY |
|---|---|---|
| JCDW4AW | antimony | 69 |

Action:

- o for recoveries from 30-74%, results are flagged as estimated (J)

Comments:

The above actions are applied to all samples of the same matrix associated with this SDG.

LABORATORY CONTROL SAMPLE ANALYSIS:

1. Aqueous.

Values that were not reported within 80-120% of the certified concentration as specified by the NYSDEC CLP (Vol. VIII, E-115) are tabulated below:

| ELEMENT | % RECOVERY |
|---|---|
| mercury | 123 |

Action:

- o for recoveries >120%, results ≥IDL are flagged as estimated (J)

Comments:

The above actions are applied to all samples of the same matrix associated with this SDG.

FURNACE ATOMIC ABSORPTION RESULTS:

1. Duplicate injections:

Samples with concentrations reported >CRDL or post-digestion spikes providing duplicate injection coefficient of variation (CV) 20% as specified by the NYSDEC CLP (Vol. VIII, E-118) are tabulated below:

| SAMPLE ID | ELEMENT | CV |
|---|---|---|
| JCDPWAW | selenium | 28 |

Action:

- o sample results are flagged as estimated (J)

2. Post-digestion spike

Samples with post-digestion spike recoveries ≥40% but not within 85-115%, and also having native analyte sample absorbance <50% of the spiked sample value, and samples with post-digestion spike recoveries reported at <40% that were diluted 5-10 fold and recoveries repeated at <40% or that were not within 85-115%, and also having native sample absorbance <50% of the spiked sample value, as specified in the NYSDEC CLP (Vol. VIII, E-118-119) are tabulated below:

| SAMPLE | ELEMENT | % RECOVERY |
|---|---|---|
| JCSW7AW | lead | 79 |
| JCDW8RW | lead | 83 |
| JCDW4AW | lead | 82 |
| JCDPWAW | lead | 84 |
| JCDPWAW | selenium | 77 |
| JCSW1AW | lead | 84 |
| JCDW8AW | lead | 76 |
| JCDW9AW | lead | 82 |
| JCBG2BW | thallium | 80 |
| JCDW1AW | thallium | 67 |
| JCDW9AW | thallium | 79 |
| JCSW1AW | thallium | 58 |
| JCSW3AW | thallium | 80 |
| JCSW5AW | thallium | 67 |
| JCSW6AW | thallium | 81 |
| JCSW8AW | thallium | 132 |
| JCSW9AW | thallium | 83 |

Action:

- for spike recoveries >10%, but not within 85-115%, sample results ≥IDL are flagged as estimated (J)
- for spike recoveries >10% but <85%, sample detection limit values (IDL U) are flagged as estimated (J)

Sincerely,
ECHEM INC.

Bruce K. Wallin, PhD
Vice President

enclosures

Air Force Plant 59
SDG No. 5-6384

Table I. Validation Action Summary

| | | | |
|---|---|---|---|
| uminum | | Magnesium | |
| ntimony | J4 | Manganese | |
| rsenic | | Mercury | J6 |
| rium | | Nickel | A1 |
| eryllium | A1 | Potassium | |
| admium | | Selenium | J7 |
| alcium | | Silver | |
| hromium | | Sodium | |
| obalt | | Thallium | J7 |
| opper | A1 | Vanadium | A1, J3 |
| on | A1 | Zinc | A1, J3 |
| ead | J7 | Cyanide | |

an element has no entry, no qualifications were necessary.

1 - Accept data, raise the sample detection limit(s) due to blank contamination.

- Estimate (J) positive values and (UJ) detection limit results due to hold time exceedences.

- Estimate (J) positive values and (UJ) detection limit results due to non-compliant calibrations.

- Estimate (J) positive results due to non-compliant linearity near the CRDL.

- Estimate (J) positive values and (UJ) detection limit results due to non-compliant matrix spike recoveries.

- Estimate (J) positive values due to non-compliant duplicate precision.

J6 - Estimate (J) positive values due non-compliant laboratory control sample results.

J7 - Estimate (J) positive values and (UJ) detection limit results due to non-compliant analytical precision and/or accuracy.

J8 - Estimate (J) positive values due to non-compliant method of standard additions linearity.

J9 - Estimate (J) positive values and (UJ) detection limit results due to non-compliant serial dilution reproducibility

RI - Reject detection limit values (UR) due to negative blank drift.

# ECHEM INC.
## DATA VALIDATION LOG

CLIENT: Argonne Nat'l

SITE: Air Force Plant 59

| CASE NO. | SDG NO. | DATE REC'D | VALIDATION UNITS | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | VOA | SVOA | PEST/PCB | INORG | SAS | DIOX |
| — | 56384 | 2-11-92 | 24/0 | 18/0 | 18/0 | 18/0 | | |
| — | 3-5983 | 1-24-92 | 17/0 | 0/11 | 0/11 | 0/10 | | |

NOTE: UNITS ARE DEFINED AS WATER/SOIL (E.G., 5/6) INCLUDING BLANKS

COMMENTS: SAS for this project include:

Turnaround time for these cases is: standard = 30 days
fast = 14 days

**ECHEM INC.**
**INORGANICS**
**COMPLETENESS LOG**

SITE: IRP Supplemental S.I. CLIENT: Argonne Nat'l Lab
CASE # SDG# 5-6384

| SAMPLE # | JCB68BW | JCDPWAW | JCDPW1AW | JCDW5AW | JCDW10AW | JCDW5AW | JCDW6AW | JCDW8AW | JCDW9AW | JCSW1AW | JCSW3AW | JCSW4AW | JCSW5AW | JCSW6AW | JCSW7AW | JCSW8AW | JCSW9AW | JCDW8RW |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| 2A | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| 2B | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| 3 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| 4 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| 5A | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| 5B | | | | | | | | | | | | | | | | | | |
| 6 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| 7 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| 8 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| 9 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| 10 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| 11A | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| 11B | | | | | | | | | | | | | | | | | | |
| 12 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| 13 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| 14 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |

____ Standardization Report for ICP
____ Analysis Report for each calibration, blank, sample
____ Copies of printer tapes for each AAS element
✓ Mercury Analysis Sheet
✓ Cyanide Analysis Sheet
N/A Total Solids Log (if applicable)
✓ Metals Digestion Log
✓ Mercury Digestion Log
✓ Cyanide Distillation Log
✓ Chain of Custody
✓ Case Narrative

REV. 391

# SAMPLE PREPARATION AND ANALYSIS SUMMARY FOR NYSDEC

CLIENT: Argonne Nat'l Lab
TAKE CASE NO. 6384/6415/6446
SDG NO. 5-6384
SITE: IRP Supplemental S.I.
ANALYTICAL FRACTION: Cyanide

| CLIENT SAMPLE ID | EPA SAMPLE NO. | LAB. SAMPLE ID | MATRIX | DATE COLLECTED | DATE RECEIVED | DATE ANALYZED | HOLD TIME COLLECT | HOLD TIME RECEIPT |
|---|---|---|---|---|---|---|---|---|
| JCBG2BW | | 6415-001 | WATER | 1-7-92 | 1-8-92 | 1-10-92 | 3 | 2 |
| JCDPWAW | | 6446-004 | | 1-9-92 | 1-10-92 | 1-16-92 | 7 | 6 |
| JCDW1AW | | 6384-001 | | 1-5-92 | 1-6-92 | 1-10-92 | 5 | 4 |
| JCDW3AW | | 6415-002 | | 1-7-92 | 1-8-92 | 1-10-92 | 3 | 2 |
| JCDW4AW | | 6415-006 | | 1-8-92 | 1-8-92 | 1-10-92 | 2 | 2 |
| JCDW5AW | | 6384-003 | | 1-5-92 | 1-6-92 | 1-10-92 | 5 | 4 |
| JCDW6AW | | 6384-005 | | 1-6-92 | 1-6-92 | 1-10-92 | 4 | 4 |
| JCDW8AW | | 6446-002 | | 1-9-92 | 1-10-92 | 1-10-92 | 1 | 1 |
| JCDW9AW | | 6415-004 | | 1-7-92 | 1-8-92 | 1-10-92 | 3 | 2 |
| JCSW1AW | | 6384-002 | | 1-5-92 | 1-6-92 | 1-10-92 | 5 | 4 |
| JCSW3AW | | 6415-003 | | 1-7-92 | 1-8-92 | 1-10-92 | 3 | 2 |
| JCSW4AW | | 6415-009 | | 1-8-92 | 1-8-92 | 1-10-92 | 2 | 2 |
| JCSW5AW | | 6384-004 | | 1-5-92 | 1-6-92 | 1-10-92 | 5 | 4 |
| JCSW6AW | | 6384-006 | | 1-6-92 | 1-6-92 | 1-10-92 | 4 | 4 |
| JCSW7AW | | 6415-010 | | 1-8-92 | 1-8-92 | 1-10-92 | 2 | 2 |
| JCSW8AW | | 6446-003 | | 1-9-92 | 1-10-92 | 1-16-92 | 7 | 6 |
| JCSW9AW | | 6415-005 | | 1-7-92 | 1-8-92 | 1-10-92 | 3 | 2 |
| JCDW8RW | | 6446-002 | | 1-9-92 | 1-10-92 | 1-16-92 | 7 | 6 |

COMMENTS:

HOLD TIME COLLECT = DATE COLLECTED MINUS DATE ANALYZED

HOLD TIME RECEIPT = DATE RECEIVED MINUS DATE ANALYZED

REV. 391

ECHEM INC.
SAMPLE PREPARATION AND ANALYSIS SUMMARY
FOR NYSDEC

CLIENT: Amanne Nat'l Lab
TASK CASE NO. 6384/6415/6446

SDG NO. 5-6384

SITE: IRP Supplemental S.I.
ANALYTICAL FRACTION: Mercury

| CLIENT SAMPLE ID | EPA SAMPLE NO. | LAB. SAMPLE ID | MATRIX | DATE COLLECTED | DATE RECEIVED | DATE ANALYZED | HOLD TIME COLLECT | HOLD TIME RECEIPT |
|---|---|---|---|---|---|---|---|---|
| JCBG2BW | | 6415-001 | WATER | 1-7-92 | 1-8-92 | 1-13-92 | 6 | 5 |
| JCDPWAW | | 6446-004 | | 1-9-92 | 1-10-92 | 1-13-92 | 4 | 3 |
| JCDW1AW | | 6384-001 | | 1-5-92 | 1-6-92 | 1-13-92 | 8 | 7 |
| JCDW3AW | | 6415-002 | | 1-7-92 | 1-8-92 | 1-13-92 | 6 | 5 |
| JCDW4AW | | 6415-006 | | 1-8-92 | 1-8-92 | 1-13-92 | 5 | 5 |
| JCDW5AW | | 6384-003 | | 1-5-92 | 1-6-92 | 1-13-92 | 8 | 7 |
| JCDW6AW | | 6384-005 | | 1-6-92 | 1-6-92 | 1-13-92 | 7 | 7 |
| JCDW8AW | | 6446-001 | | 1-9-92 | 1-10-92 | 1-13-92 | 4 | 3 |
| JCDW8RW | | 6446-002 | | 1-9-92 | 1-10-92 | 1-13-92 | 4 | 3 |
| JCDW9AW | | 6415-004 | | 1-7-92 | 1-8-92 | 1-13-92 | 6 | 5 |
| JCSW1AW | | 6384-002 | | 1-5-92 | 1-6-92 | 1-13-92 | 8 | 7 |
| JCSW3AW | | 6415-003 | | 1-7-92 | 1-8-92 | 1-13-92 | 6 | 5 |
| JCSW4AW | | 6415-009 | | 1-8-92 | 1-8-92 | 1-13-92 | 5 | 5 |
| JCSW5AW | | 6384-004 | | 1-5-92 | 1-6-92 | 1-13-92 | 8 | 7 |
| JCSW6AW | | 6384-006 | | 1-6-92 | 1-6-92 | 1-13-92 | 7 | 7 |
| JCSW7AW | | 6415-010 | | 1-8-92 | 1-8-92 | 1-13-92 | 5 | 5 |
| JCSW8AW | | 6446-003 | | 1-9-92 | 1-10-92 | 1-13-92 | 4 | 3 |
| JCSW9AW | | 6415-005 | | 1-7-92 | 1-8-92 | 1-13-92 | 6 | 5 |

COMMENTS:

HOLD TIME COLLECT = DATE COLLECTED MINUS DATE ANALYZED

HOLD TIME RECEIPT = DATE RECEIVED MINUS DATE ANALYZED

REV. 9/91

# Appendix A-1:

# Report 17

**ECHEM INC.**

**ENGINEERING CHEMISTRY CONSULTANTS**

P.O. Box 1510
#32 Route 35
Sebago Common
Windham, Maine 04062
(207) 892-0002
FAX (207) 892-7499

25 March 1992

Dr. A. Dallas Wait
Senior Environmental Chemist
Gradient Corporation
44 Brattle Street
Cambridge, MA 02138

| | |
|---|---|
| Re: | Air Force Plant 59 |
| Laboratory: | Galson Laboratories |
| Case No: | NONE |
| SDG No: | 6-6703 |

| | | | | | |
|---|---|---|---|---|---|
| Volatiles: | JCDPWBW | JCDW1BW | JCDW3BW | JCDW4BW | JCDW5BW |
| (USEPA 524.2) | JCDW6BW | JCDW8BW | JCDW9BW | JCDW3RW | JCSW1BW |
| | JC5W3BW | JCSW4BW | JCSW5BW | JCSW6BW | JCSW7BW |
| | JCSW8BW | JCSW9BW | JCQC4WW | JCQC5XW | |
| | TRIP BLANK16 | | TRIP BLANK17 | | |
| | TRIP BLANK18 | | HOLD BLANK16 | | |
| | HOLD BLANK17 | | HOLD BLANK18 | | |

Dear Dr. Wait:

Validation was performed on the organic analytical data from the samples referenced above. The data were evaluated based on the following parameters in accordance with the specifications set forth in USEPA Method No. 524.2, Revision 3 and the Quality Assurance Project Plan for Air Force Plant 59, Johnson City, New York, Revision 2, December 19, 1991.

- * - data completeness
- * - holding times
- * - surrogate recovery
- * - matrix spike/matrix spike duplicate
- - laboratory fortified blank
- - blanks
- * - GC/MS tuning
- - calibration

* - internal standards performance
* - field duplicates
* - TCL compound identification
* - tentatively identified compounds
* - system performance
* - compound quantitation and reported detection limits
* - sample result verification

* All criteria were met for this parameter.

Table I summarizes the validation actions, which were in accordance with USEPA Region II CLP Organics Data Review and Preliminary Review, March 1990, SOP No. HW-6, Revision #7, and the NYSDEC ASP, September 1989, as detailed below.

Also attached are the:

- o data validation log,
- o telephone log,
- o completeness log, and
- o sample preparation and analysis summaries.

LABORATORY FORTIFIED BLANK:

Compounds not within the recovery limits specified in the NYSDEC ASP are tabulated below:

| COMPOUND | % RECOVERY |
|---|---|
| bromomethane | 64 |
| vinyl chloride | 46 |

Action:

- o none, sample results for the compounds reported as CRQL U

BLANKS:

Positive blank results and associated action levels are tabulated below:

| BLANK ID. | COMPOUND | CONCENTRATION | ACTION LEVEL |
|---|---|---|---|
| TRIP BLANK16 | methylene chloride | 0.6 | 6 |
| TRIP BLANK17 | methylene chloride | 3 | 30 |
| | 1,1,1-trichloroethane | 3 | 15 |
| | benzene | 1 | 5 |
| | toluene | 0.2 | 2 |
| HOLD BLANK17 | methylene chloride | 0.3 | 3 |

| BLANK ID. | COMPOUND | CONCENTRATION | ACTION LEVEL |
|---|---|---|---|
| VBLK5 | methylene chloride | 0.6 | 6 |
| VBLK6 | methylene chloride | 0.4 | 4 |

* Method blank levels below the NYSDEC ASP minimum requirement.

Associated samples with positive values reported below the action level are:

| METHOD BLANK ID. | ASSOCIATED SAMPLES |
|---|---|
| VBLK5 | JCSW5BW<br>JCSW1BW<br>JCDW3BW<br>JCDW3RW |
| VBLK6 | JCSW3BW |

| TRIP BLANK ID. | ASSOCIATED SAMPLES |
|---|---|
| TRIP BLANK17 | JCSW3BW<br>JCDW9BW |

| FIELD BLANK ID. | ASSOCIATED SAMPLES |
|---|---|
| HOLD BLANK17 | JCSW3BW |

Action:

- o associated sample results <MDL (flagged J); changed to EL (U)
- o associated sample results ≥MDL and <action level (flagged B) are flagged as not detected at the sample value (U)

TIC's identified as freons eluting at approximately 10.6 and 12.7 minutes were identified in several samples as well as the trip blanks. The environmental sample results for these TIC's were flagged as unusable (R).

CALIBRATION:

A. Initial calibration:

SPCC compounds with average relative response factors (AVG RRF) below the limits and all others ≤0.10 or percent relative standard deviations (%RSD) >30% for CCC compounds and >35% for all other compounds as specified in the NYSDEC ASP are tabulated below:

| INSTR. | CAL DATE | COMPOUND | AVG RRF | %RSD |
|---|---|---|---|---|
| C(#3) | 01-13-92 | 2-butanone | .041 | |
| | | vinyl acetate | .027 | |
| | | 2-hexanone | .098 | |
| | | 1, 1, 2, 2-tetrachloroethane | .230 | |

Associated samples:

| INSTRUMENT | CAL DATE | SAMPLE NO. |
|---|---|---|
| C(#3) | 01-13-92 | ALL SAMPLES |

Action:

- o for AVG RRF ≤0.10, results ≥MDL for the compound are flagged as estimated (J) and detection limit values (MDL U) are flagged as unusable (R)

B. Continuing calibration:

SPCC compounds with relative response factors (RRF) below the limits and all others ≤0.10 or percent difference between initial and continuing calibration (%D) >25% for CCC compounds and >35% for all other compounds as specified in the NYSDEC ASP are tabulated below:

| INSTR. | CAL DATE/TIME | COMPOUND | RRF | %D |
|---|---|---|---|---|
| C(#3) | 02-03-92/08:37 | 2-butanone | .036 | |
| | | vinyl acetate | .031 | |
| | | 1,1,2, 2-tetrachloroethane | .233 | |
| | 02-04-92/15:46 | 2-butanone | .037 | |
| | | vinyl acetate | .030 | |
| | | 2-hexanone | .093 | |
| | | 1,1,2, 2-tetrachloroethane | .227 | |
| | 02-05-92/04:35 | 2-butanone | .034 | |
| | | vinyl acetate | .027 | |
| | | 2-hexanone | .082 | |
| | | 1,1,2, 2-tetrachloroethane | .223 | |
| | 02-05-92/19:25 | 2-butanone | .031 | |
| | | vinyl acetate | .024 | |
| | | 2-hexanone | .095 | |
| | | 1,1,2, 2-tetrachloroethane | .217 | |
| | 02-06-92/08:24 | 2-butanone | .040 | |
| | | vinyl acetate | .036 | |
| | | 1, 1,2, 2-tetrachloroethane | .253 | |

| INSTR. | CAL DATE/TIME | COMPOUND | RRF | %D |
|---|---|---|---|---|
| | 02-07-92/06:28 | 2-butanone | .038 | |
| | | vinyl acetate | .032 | |
| | | 1, 1, 2, 2-tetrachloroethane | .250 | |
| | 02-10-92/15:04 | 2-butanone | .042 | |
| | | vinyl acetate | .030 | |
| | | 1, 1, 2, 2-tetrachloroethane | .277 | |

Associated samples:

| INSTR. | CAL DATE/TIME | SAMPLE NO. | |
|---|---|---|---|
| C(#3) | 02-03-92/08:37 | JCQC4WW | JCQC5XW |
| | 02-04-92/15:46 | JCDW4BW | JCSW4BW |
| | | JCDW8BW | JCSW8BW |
| | | JCSW7BW | |
| | 02-05-92/04:35 | TRIP BLANK16 | HOLD BLANK16 |
| | 02-05-92/19:25 | JCDW5BW | |
| | 02-06-92/08:24 | JCSW5BW | JCDW6BW |
| | | JCSW6BW | JCDW1BW |
| | | JCSW1BW | JCDW3BW |
| | | JCDW3RW | |
| | 02-07-92/06:28 | TRIP BLANK17 | HOLD BLANK17 |
| | | JCSW3BW | JCDW9BW |
| | 02-10-92/15:04 | JCSW9BW | JCDPWBW |
| | | HOLD BLANK18 | TRIP BLANK18 |

Action:

- o for RRF ≤0.10, results ≥MDL for the compound are flagged as estimated (J) and detection limit values (MDL U) are flagged as unusable (R)

Comments:

a.) The lowered specific response for the SPCC compound l, l, 2, 2-tetrachloroethane is likely due to reduced purging efficiency at the higher sample volume used. No action was taken for this compound since: 1) the IC specific responses were stable, 2) the QC check sample recovery was 98% and 3) the compound was not reported present in any environmental sample.

b.) Although detection limits for 2-butanone, vinyl acetate and 2-hexanone were rejected in accordance with the validation guidelines, they are probably reasonable since; 1) the IC specific responses were stable at low levels, and 2) QC check standard recoveries at 5 ug/l were within established limits.

Sincerely,
ECHEM INC.

Bruce K. Wallin, PhD
Vice President

enclosures

Air Force Plant 59
SDG No. 6-6703

Table I. Validation Action Summary

| Sample No. | VOA |
|---|---|
| JCDW8BW | R4 |
| JCDW3BW | A1, R4 |
| JCDW3RW | A1, R4 |
| JCSW1BW | A1, R4 |
| JCSW3BW | A1, R4 |
| JCSW5BW | A1, R4 |
| JCDW9BW | A1, R4, R6 |
| JCDPWBW | R4, R6 |
| JCDW1BW | R4 |
| JCDW4BW | R4, R6 |
| JCDW5BW | R4 |
| JCDW6BW | R4 |
| JCSW4BW | R4, R6 |
| JCSW6BW | R4 |
| JCSW7BW | R4 |
| JCSW8BW | R4 |
| JCSW9BW | R4, R6 |
| JCQC4WW | R4 |
| JCQC5XW | R4 |
| TRIP BLANK16 | R4 |
| TRIP BLANK17 | R4 |
| TRIP BLANK18 | R4 |
| HOLD BLANK16 | R4 |
| HOLD BLANK17 | R4 |
| HOLD BLANK18 | R4 |

If the field is blank, no qualifiers were necessary.

A1 - change positive values as necessary, for toluene, methylene chloride, and 1,1,1-trichloroethane to revised detection limit due to blank contamination

J1 - estimate positive values (J) and detection limit values (UJ) due to holding time violations

J2 - estimate positive values (J) and detection limit values (UJ) due to non-compliant volatile surrogate recoveries

J3 - estimate positive values (J) for ( ) due to non-compliant matrix spike recoveries

J4 - estimate positive values (J) for ( ) due to calibration not meeting minimum RF criteria

J5 - estimate positive values (J) and detection limit values (UJ) for ( ) due to non-compliant calibration stability

J6 - estimate positive values (J) for ( ) due to non-compliant internal standard stability

J7 - estimate positive values (J) due to non-compliant field duplicate precision

R1 - reject detection limit values (UR) due to holding time exceedences

R2 - reject detection limit values (UR) due to low surrogate recoveries

R3 - reject detection limit values (UR) for ( ) due to low matrix spike recoveries

R4 - reject detection limit values (UR) for 2-hexanone, vinyl acetate, and 2-butanone due to calibration not meeting minimum RF criteria

R5 - reject detection limit values (UR) for ( ) due to extreme variations in the internal standard stability

R6 - TIC's identified in associated Trip blank, results flagged as unusable (R)

ECHEM INC.
DATA VALIDATION LOG

CLIENT: Argonne Nat'l Labs SITE: Air Force Plant 59

| CASE NO. | SDG NO. | DATE REC'D | VALIDATION UNITS | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | VOA | SVOA | PEST/PCB | INORG | SAS | DIOX |
| | 66TC3 | 03-05-92 | 25/0 | 17/0 | 17/0 | 17/0 | | |
| | 76779 | 03-05-92 | 0/1 | 0/1 | 0/1 | 0/1 | | |

NOTE: UNITS ARE DEFINED AS WATER/SOIL (E.G., 5/6) INCLUDING BLANKS

COMMENTS: SAS for this project include:

Turnaround time for these cases is: standard = 30 days
fast = 14 days

REV. 3/91

ECHEM INC.
ORGANICS
COMPLETENESS LOG

SITE: AFP 59 CLIENT: Argonne Nat'l Labs
CASE # SDG# 6-16-03

| | SAMPLE # | TCDPW8W | TCDW1BW | TCDW3BW | TCDW4BW | TCDW5BW | TCDW6BW | TCDW8BW | TCDW9BW | TCDW3BW | TCSW1BW | TCSW3BW | TCSW4BW | TCSW5WBW | TCSW6BW | TCSW7BW | TCSW8BW | TCSW9BW | TCAC4WW | TCAC5XW | TRIP BLK 16 | TRIP BLK 17 | TRIP BLK 18 | HOLD BLK 16 | HOLD BLK 17 | HOLD BLK 18 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1A | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | |
| | 1E | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | |
| | 2A | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | |
| | 2B | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 3A | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | |
| VOA | 3B | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 4A | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | |
| | 5A | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | |
| | 6A | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | |
| | 7A | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | |
| | 8A | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | |
| | 1B | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | | | | | | | |
| | 1C | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | | | | | | | |
| | 1F | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | | | | | | | |
| | 2C | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | | | | | | | |
| | 2D | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 3C | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | | | | | | | |
| | 3D | | | | | | | | | | | | | | | | | | | | | | | | | |
| SVOA | 4B | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | | | | | | | |
| | 5B | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | | | | | | | |
| | 6B | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | | | | | | | |
| | 6C | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | | | | | | | |
| | 7B | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | | | | | | | |
| | 7C | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | | | | | | | |
| | 8B | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | | | | | | | |
| | 8C | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | | | | | | | |
| | 1D | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | | | | | | | |
| | 2E | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | | | | | | | |
| | 2F | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 3E | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | | | | | | | |
| PEST | 3F | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 4C | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | | | | | | | |
| | 8D | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | | | | | | | |
| | 8E | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | | | | | | | |
| | 9 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | | | | | | | |
| | 10 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | | | | | | | |

✓ Quant Reports
✓ MASS SPECS
___ TIC Compounds
✓ Laboratory Blank (Form 1's)
✓ MS/MSD (Forms 1's)
___ Total Solids Log (if applicable)
✓ Injection Log
✓ Chain of Custody
✓ Case Narrative

REV. 391

ECHEM INC.
SAMPLE PREPARATION AND ANALYSIS SUMMARY
FOR NYSDEC

CLIENT: Argonne Nat'l Labs
CASE NO. J
SDG NO. 6-6703
SITE: AFP 59
ANALYTICAL FRACTION: Volatiles

| CLIENT SAMPLE ID | EPA SAMPLE NO. | LAB. SAMPLE ID | MATRIX | DATE COLLECTED | DATE RECEIVED | DATE ANALYZED | HOLD TIME COLLECT | HOLD TIME RECEIPT |
|---|---|---|---|---|---|---|---|---|
| JCDPWRW | | 6761-006 | WATER | 02-03-92 | 02-03-92 | 02-10-92 | 7 | 7 |
| JCDW1BW | | 6749-005 | | 02-01-92 | 02-01-92 | 02-06-92 | 5 | 5 |
| JCDW3BW | | 6761-001 | | 02-02-92 | 02-03-92 | 02-06-92 | 4 | 3 |
| JCDW4BW | | 6703-001 | | 01-29-92 | 01-30-92 | 02-04-92 | 6 | 5 |
| JCDW5BW | | 6749-001 | | 01-31-92 | 02-01-92 | 02-06-92 | 6 | 5 |
| JCDW6BW | | 6749-003 | | 02-01-92 | 02-01-92 | 02-06-92 | 5 | 5 |
| JCDW8BW | | 6703-006 | | 01-30-92 | 01-30-92 | 02-05-92 | 6 | 6 |
| JCDW9BW | | 6761-004 | | 02-03-92 | 02-03-92 | 02-07-92 | 4 | 4 |
| JCDW3RW | | 6761-002 | | 02-02-92 | 02-03-92 | 02-06-92 | 4 | 3 |
| JCSW1BW | | 6749-006 | | 02-01-92 | 02-01-92 | 02-06-92 | 5 | 5 |
| JCSW3BW | | 6761-003 | | 02-02-92 | 02-03-92 | 02-07-92 | 5 | 4 |
| JCSW4BW | | 6703-004 | | 01-29-92 | 01-30-92 | 02-04-92 | 6 | 5 |
| JCSW5BW | | 6749-002 | | 01-31-92 | 02-01-92 | 02-06-92 | 6 | 5 |
| JCSW6BW | | 6749-004 | | 02-01-92 | 02-01-92 | 02-06-92 | 5 | 5 |
| JCSW7BW | | 6703-005 | | 01-30-92 | 01-30-92 | 02-05-92 | 6 | 6 |
| JCSW8BW | | 6703-007 | | 01-30-92 | 01-30-92 | 02-05-92 | 6 | 6 |
| JCSW9BW | | 6761-005 | | 02-03-92 | 02-03-92 | 02-10-92 | 7 | 7 |
| JCQC4WW | | 6703-008 | | 01-30-92 | 01-30-92 | 02-03-92 | 4 | 4 |
| JCQC5XW | | 6703-009 | | 01-30-92 | 01-30-92 | 02-03-92 | 4 | 4 |
| TRIP BLANK 16 | | 6703-010 | | 01-30-92 | 01-30-92 | 02-05-92 | 6 | 6 |
| TRIP BLANK 17 | | 6749-007 | | 02-01-92 | 02-01-92 | 02-07-92 | 6 | 6 |
| TRIP BLANK 18 | | 6761-007 | | 02-03-92 | 02-03-92 | 02-10-92 | 7 | 7 |
| HOLD BLANK 16 | | 6703-001 | | | 01-30-92 | 02-05-92 | | |
| HOLD BLANK 17 | | 6749-008 | | | 02-01-92 | 02-07-92 | | |
| HOLD BLANK 18 | | 6761-008 | | | 02-03-92 | 02-10-92 | | |

COMMENTS:

HOLD TIME COLLECT = DATE COLLECTED MINUS DATE ANALYZED

HOLD TIME RECEIPT = DATE RECEIVED MINUS DATE ANALYZED

REV. 3/91

# Appendix A-1:

# Report 18

**ECHEM INC.**

**ENGINEERING CHEMISTRY CONSULTANTS**

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Sebago Common
Windham, Maine 04062
(207) 892-0002
FAX (207) 892-7499

25 March 1992

Dr. A. Dallas Wait
Senior Environmental Chemist
Gradient Corporation
44 Brattle Street
Cambridge, MA 02138

| | |
|---|---|
| Re: | Air Force Plant 59 |
| Laboratory: | Galson Laboratories |
| Case No: | NONE |
| SDG No: | 6-6703 |

| | | | | |
|---|---|---|---|---|
| Semivolatiles: | JCDPWBW | JCDW1BW | JCSW1BW | JCDW3BW |
| | JCDW3RW | JCSW3BW | JCDW4BW | JCSW4BW |
| | JCDW5BW | JCSW5BW | JCDW6BW | JCSW6BW |
| | JCSW7BW | JCDW8BW | JCSW8BW | JCDW9BW |
| | JCSW9BW | | | |

Dear Dr. Wait:

Validation was performed on the organic analytical data from the samples referenced above. The data were evaluated based on the following parameters:

* - data completeness
* - holding times
- surrogate recovery
- matrix spike/matrix spike duplicate/matrix spike blank
* - blanks
* - GC/MS tuning
- calibration
* - internal standards performance
* - field duplicates
* - TCL compound identification
* - tentatively identified compounds
* - system performance
* - compound quantitation and reported detection limits
* - sample result verification

* All criteria were met for this parameter.

Table I summarizes the validation actions, which were in accordance with USEPA Region II CLP Organics Data Review and Preliminary Review, March 1990, SOP No. HW-6, Revision # 7, and the NYSDEC ASP, September 1989, as detailed below.

Also attached are the:

- o data validation log,
- o telephone log,
- o completeness log, and
- o sample preparation and analysis summaries.

SURROGATE RECOVERY:

Samples with two or more surrogate recoveries from either the base/neutral or acid fraction which were >10% but did not meet the criteria specified in NYSDEC CLP (Vol. VIII, E-54), and samples with one or more surrogate recoveries <10% as specified in the Functional Guidelines are summarized below:

| | PERCENT RECOVERIES | | | | | |
|---|---|---|---|---|---|---|
| | BASE-NEUTRAL FRACTION | | | ACID FRACTION | | |
| SAMPLE | NBZ | FBP | TPH | PHL | 2FP | TBP |
| JCDW4BW | 0 | 7 | | | | |
| JCDW3BW | | | | 3 | 2 | 2 |

Action:

- o recoveries <10%; sample results for the associated fraction ≥CRQL are flagged as estimated (J), and detection limit values (CRQL U) are flagged as unusable

Comments:

Both samples were re-extracted, albeit beyond the hold time, with compliant surrogate recoveries. The rejected detection limits were, therefore, replaced with detection limits from the reanalysis flagged as estimated (J) due to hold time exceedences.

MATRIX SPIKE/MATRIX SPIKE DUPLICATE/MATRIX SPIKE BLANK:

Matrix spike recoveries which did not meet the criteria specified in the NYSDEC CLP (Vol. VIII, E-41) are summarized below.

| SAMPLE | PHE | CLPH | DCB | DNP | TCB | CRE | ACE | NPH | DNT | PCP | PYR |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | RECOVERY (%) | | | | | |
| JCDW4BW | | | | | | | | 81/84 | | | |
| Q1-0094 | 68 | | 55 | 55 | 57 | 72 | 63 | | | | 66 |

Action:.

- o none, sample results reported as CRQL U

CALIBRATION:

Calibration linearity, sensitivity and stability criteria specified in the NYSDEC CLP (Vol. VIII, E-48-51), or federal criteria (*), are tabulated below.

CONTINUING CALIBRATION CRITERIA:

| COMPOUND | %D (max.) | RRF (min.) |
|---|---|---|
| SPCC | 20 | 0.05 |
| all other TCL compounds | 20 | 0.05* |

Deviations from the above calibration criteria are tabulated below.

CONTINUING CALIBRATION

| INSTRUMENT | DATE/TIME | COMPOUND | %D | RRF |
|---|---|---|---|---|
| GCMSD(#4) | 02-21-92/09:14 | N-nitroso-di-n-propylamine | 22 | |
| | | hexachloroethane | 22 | |
| | | naphthalene | 24 | |
| | | 4-nitrophenol | 24 | |
| | | 4-nitroaniline | 24 | |
| | | butylbenzylphthalate | 21 | |
| | 02-24-92/10:28 | N-nitroso-di-n-propylamine | 23 | |
| | | hexachloroethane | 23 | |
| | | naphthalene | 22 | |
| | | 4-nitrophenol | 21 | |
| | | Di-n-butylbenzylphthalate | 23 | |
| | | butylbenzylphthalate | 21 | |
| | 02-26-92/15:24 | 2,4-dinitrophenol | 23 | |
| | | pentachlorophenol | 21 | |
| | 02-27-92/12:13 | pentachlorophenol | 23 | |
| | | 3, 3'-dichlorobenzidine | 24 | |
| | 02-28-92/13:51 | pentachlorophenol | 23 | |

| INSTRUMENT | DATE/TIME | COMPOUND | %D | RRF |
|---|---|---|---|---|
| GCMSD(#4) | 03-01-92/16:27 | bis(2-chloroisopropyl)ether | 21 | |
| | | N-nitroso-di-n-propylamine | 23 | |
| | | 4-chloroaniline | 22 | |
| | | hexachlorocyclopentadiene | 22 | |
| | | bis(2-ethylhexyl) phthalate | 21 | |

Associated samples:

| INSTRUMENT | DATE/TIME | SAMPLE NO. | |
|---|---|---|---|
| GCMSD(#4) | 02-21-92/09:14 | JCDW4BW | |
| | 02-24-92/10:28 | JCSW7BW | JCDW3BW |
| | | JCSW8BW | |
| | 02-26-92/15:24 | JCDW8BW | JCSW5BW |
| | | JCDW6BW | JCSW6BW |
| | 02-27-92/12:13 | JCSW9BW | JCSW1BW |
| | 02-28-92/13:51 | JCDW5BW | JCSW5BW |
| | | JCDW6BW | JCSW6BW |
| | | JCDW1BW | JCSW1BW |
| | | JCSW4BW | |

Action:

- o none, sample results reported as CRQL U

Sincerely,
ECHEM INC.

Bruce K. Wallin, PhD
Vice President

enclosures

Air Force Plant 59
SDG No. 6-6703

Table I. Validation Action Summary

| Sample No. | SVOA |
|---|---|
| JCDPWBW | |
| JCDW1BW | |
| JCSW1BW | |
| JCDW3BW | J1 |
| JCDW3RW | |
| JCSW3BW | |
| JCDW4BW | J1 |
| JCSW4BW | |
| JCDW5BW | |
| JCSW5BW | |
| JCDW6BW | |
| JCSW6BW | |
| JCSW7BW | |
| JCDW8BW | |
| JCSW8BW | |
| JCDW9BW | |
| JCSW9BW | |

If the field is blank, no qualifiers were necessary.

A1 - change positive values for ( ) to revised detection limit due to blank contamination

J1 - estimate positive values (J) and detection limit values (UJ) due to holding time violations

J2 - estimate positive values (J) and detection limit values (UJ) due to non-compliant (acid) (base-neutral) fraction surrogate recoveries

J3 - estimate positive values (J) for ( ) due to non-compliant matrix spike recoveries

J4 - estimate positive values (J) for ( ) due to calibration not meeting minimum RF criteria

J5 - estimate positive values (J) and detection limit values (UJ) for ( ) due to non-compliant calibration stability

J6 - estimate positive values (J) for ( ) due to non-compliant internal standard stability

J7 - estimate positive values (J) due to non-compliant field duplicate precision

R1 - reject detection limit values (UR) due to holding time exceedences

R2 - reject detection limit values (UR) due to low surrogate recoveries

R3 - reject detection limit values (UR) for ( ) due to low matrix spike recoveries

R4 - reject detection limit values (UR) for ( ) due to calibration not meeting minimum RF criteria

R5 - reject detection limit values (UR) for ( ) due to extreme variations in the internal standard stability

R7 - reject detection limit value (UR) for ( ) due to continuing calibration %D >50%

R8 - TIC's identified in associated method blank, results flagged as unusable (R)

ECHEM INC.
SAMPLE PREPARATION AND ANALYSIS SUMMARY
FOR NYSDEC

CLIENT: Argonne Nat'l Labs
CASE NO.
SDG NO. 6-6703
SITE: AFP 59
ANALYTICAL FRACTION: Semivolatiles

| CLIENT SAMPLE ID | EPA SAMPLE NO. | LAB. SAMPLE ID | MATRIX | DATE COLLECTED | DATE RECEIVED | DATE EXTRACTED | HOLD TIME TO EXTRACTION COLLECT | HOLD TIME TO EXTRACTION RECEIPT |
|---|---|---|---|---|---|---|---|---|
| JCDPW1BW | | 6761-006 | WATER | 02-03-92 | 02-03-92 | 02-04-92 | 1 | 1 |
| JCDW1BW | | 6749-005 | | 02-01-92 | 02-01-92 | 02-06-92 | 5 | 5 |
| JCSW1BW | | 6749-006 | | 02-01-92 | 02-01-92 | 02-06-92 | 5 | 5 |
| JCDW3BW | | 6761-001 | | 02-02-92 | 02-03-92 | 02-04-92 | 2 | 1 |
| JCDW3RW | | 6761-002 | | 02-02-92 | 02-03-92 | 02-04-92 | 2 | 1 |
| JCSW3BW | | 6761-003 | | 02-02-92 | 02-03-92 | 02-04-92 | 2 | 1 |
| JCDW4BW | | 6703-001 | | 01-29-92 | 01-30-92 | 02-04-92 | 6 | 5 |
| JCSW4BW | | 6703-004 | | 01-29-92 | 01-30-92 | 02-04-92 | 6 | 5 |
| JCDW5BW | | 6749-001 | | 01-31-92 | 02-01-92 | 02-06-92 | 6 | 5 |
| JCSW5BW | | 6749-002 | | 01-31-92 | 02-01-92 | 02-06-92 | 6 | 5 |
| JCDW6BW | | 6749-003 | | 02-01-92 | 02-01-92 | 02-06-92 | 5 | 5 |
| JCSW6BW | | 6749-004 | | 02-01-92 | 02-01-92 | 02-06-92 | 5 | 5 |
| JCSW7BW | | 6703-005 | | 01-30-92 | 01-30-92 | 02-04-92 | 5 | 5 |
| JCDW8BW | | 6703-006 | | 01-30-92 | 01-30-92 | 02-04-92 | 5 | 5 |
| JCSW8BW | | 6703-007 | | 01-30-92 | 01-30-92 | 02-04-92 | 5 | 5 |
| JCDW9BW | | 6761-004 | | 02-03-92 | 02-03-92 | 02-04-92 | 1 | 1 |
| JCSW9BW | | 6761-005 | | 02-03-92 | 02-03-92 | 02-04-92 | 1 | 1 |

COMMENTS:

HOLD TIME COLLECT = DATE COLLECTED MINUS DATE EXTRACTED

HOLD TIME RECEIPT = DATE RECEIVED MINUS DATE EXTRACTED

REV. 3/91

# Appendix A-1:

# Report 19

**ECHEM INC.**

**ENGINEERING CHEMISTRY CONSULTANTS**

P.O. Box 1510
#32 Route 35
Sebago Common
Windham, Maine 04062
(207) 892-0002
FAX (207) 892-7499

25 March 1992

Dr. A. Dallas Wait
Senior Environmental Chemist
Gradient Corporation
44 Brattle Street
Cambridge, MA 02138

| | |
|---|---|
| Re: | Air Force Plant 59 |
| Laboratory: | Galson Laboratories |
| Case No: | NONE |
| SDG No: | 6-6703 |

| | | | | |
|---|---|---|---|---|
| Pesticides/PCB's: | JCDPWBW | JCDW1BW | JCDW3BW | JCDW3RW |
| | JCDW4BW | JCDWSBW | JCDW6BW | JCDW8BW |
| | JCDW9BW | JCSW1BW | JCSW3BW | JCSW4BW |
| | JCSWSBW | JCSW6BW | JCSW7BW | JCSW8BW |
| | JCSW9BW | | | |

Dear Dr. Wait:

Validation was performed on the organic analytical data from the samples referenced above. The data were evaluated based on the following parameters:

* - data completeness
* - holding times
* - surrogate recovery
- matrix spike/matrix spike duplicate/matrix spike blank
* - blanks
* - calibration
* - pesticide instrument performance
* - field duplicates
* - TCL compound identification
* - compound quantitation and reported detection limits
* - sample result verification

* All criteria were met for this parameter.

Table I summarizes the validation actions, which were in accordance with USEPA Region II CLP Organics Data Review and Preliminary Review, March 1990, SOP No. HW-6, Revision #7 and the NYSDEC ASP, September 1989 as detailed below.

Also attached are the:

- o data validation log,
- o telephone log,
- o completeness log, and
- o sample preparation and analysis summaries.

MATRIX SPIKE/MATRIX SPIKE DUPLICATE/MATRIX SPIKE BLANK:

Matrix spike recoveries which did not meet the criteria specified in the NYSDEC CLP (Vol. VII, E-73) are summarized below.

| | RECOVERY (%) | | | | | |
|---|---|---|---|---|---|---|
| SAMPLE | LIN | HEP | ALD | DIEL | END | DDT |
| JCDW4BW | | | | | 133/133 | |
| MD | | | | | 140 | |

Action:

- o none, sample results reported as CRQL U

Sincerely,
Sincerely,
ECHEM INC.

Bruce K. Wallin, PhD
Vice President

enclosures

Air Force Plant 59
SDG No. 6-6703

Table I. Validation Action Summary

| Sample No. | Pesticide/PCB |
|---|---|
| JCDPWBW | |
| JCDW1BW | |
| JCDW3BW | |
| JCDW3RW | |
| JCDW4BW | |
| JCDW5BW | |
| JCDW6BW | |
| JCDW8BW | |
| JCDW9BW | |
| JCSW1BW | |
| JCSW3BW | |
| JCSW4BW | |
| JCSW5BW | |
| JCSW6BW | |
| JCSW7BW | |
| JCSW8BW | |
| JCSW9BW | |

If the field is blank, no qualifiers were necessary.

A1 - change positive values for ( ) to revised detection limit due to blank contamination

J1 - estimate positive values (J) and detection limit values (U3) due to holding time violations

J2 - estimate positive values (J) and detection limit values (UJ) due to non-compliant volatile surrogate recoveries

J3 - estimate positive values (J) and detection limit values (UJ) due to non-compliant (acid) (base-neutral) fraction surrogate recoveries

J4 - estimate positive values (J) for ( ) due to non-compliant matrix spike recoveries

J5 - estimate positive values (J) for ( ) due to calibration not meeting minimum RF criteria

J6 - estimate positive values (J) and detection limit values (UJ) for ( ) due to non-compliant calibration stability

J7 - estimate positive values (J) for ( ) due to non-compliant internal standard stability

| | | |
|---|---|---|
| J8 | - | estimate positive values (J) due to non-compliant field duplicate precision |
| R1 | - | reject detection limit values (UR) due to holding time exceedences |
| R2 | - | reject detection limit values (UR) due to low surrogate recoveries |
| R3 | - | reject detection limit values (UR) for ( ) due to low matrix spike recoveries |
| R4 | - | reject detection limit values (UR) for ( ) due to calibration not meeting minimum RF criteria |
| R5 | - | reject detection limit values (UR) for ( ) due to extreme variations in the internal standard stability |
| R7 | - | reject detection limit value (UR) for ( ) due to continuing calibration %D >50% |

ECHEM INC.
SAMPLE PREPARATION AND ANALYSIS SUMMARY
FOR NYSDEC

CLIENT: Argonne Natl Labs
CASE NO. NONE
SDG NO. 6-6703
SITE: AFP59
ANALYTICAL FRACTION: Pesticide/PCBs

| CLIENT SAMPLE ID | EPA SAMPLE NO. | LAB. SAMPLE ID | MATRIX | DATE COLLECTED | DATE RECEIVED | DATE EXTRACTED | HOLD TIME TO EXTRACTION COLLECT | HOLD TIME TO EXTRACTION RECEIPT |
|---|---|---|---|---|---|---|---|---|
| JCDPWBW | | 6761-006 | WATER | 02-03-92 | 02-03-92 | 02-04-92 | 1 | 1 |
| JCDW1BW | | 6749-005 | | 02-01-92 | 02-01-92 | 02-06-92 | 5 | 5 |
| JCDW3BW | | 6761-001 | | 02-02-92 | 02-03-92 | 02-04-92 | 2 | 1 |
| JCDW3RW | | 6761-002 | | 02-02-92 | 02-03-92 | 02-04-92 | 2 | 1 |
| JCDW4BW | | 6703-001 | | 01-29-92 | 01-30-92 | 02-04-92 | 6 | 5 |
| JCDW5BW | | 6749-001 | | 01-31-92 | 02-01-92 | 02-06-92 | 6 | 5 |
| JCDW6BW | | 6749-003 | | 02-01-92 | 02-01-92 | 02-06-92 | 5 | 5 |
| JCDW8BW | | 6703-006 | | 01-30-92 | 01-30-92 | 02-04-92 | 5 | 5 |
| JCDW9BW | | 6761-004 | | 02-03-92 | 02-03-92 | 02-04-92 | 1 | 1 |
| JCSW1BW | | 6749-006 | | 02-01-92 | 02-01-92 | 02-06-92 | 5 | 5 |
| JCSW3BW | | 6761-003 | | 02-02-92 | 02-03-92 | 02-04-92 | 2 | 1 |
| JCSW4BW | | 6703-004 | | 01-29-92 | 01-30-92 | 02-04-92 | 6 | 5 |
| JCSW5BW | | 6749-002 | | 01-31-92 | 02-01-92 | 02-06-92 | 6 | 5 |
| JCSW6BW | | 6749-004 | | 02-01-92 | 02-01-92 | 02-06-92 | 5 | 5 |
| JCSW7BW | | 6703-005 | | 01-30-92 | 01-30-92 | 02-04-92 | 5 | 5 |
| JCSW8BW | | 6703-007 | | 01-30-92 | 01-30-92 | 02-04-92 | 5 | 5 |
| JCSW9BW | | 6761-005 | | 02-03-92 | 02-03-92 | 02-04-92 | 1 | 1 |

COMMENTS:

HOLD TIME COLLECT = DATE COLLECTED MINUS DATE EXTRACTED

HOLD TIME RECEIPT = DATE RECEIVED MINUS DATE EXTRACTED

REV. 3/91

# Appendix A-1:

# Report 20

**ECHEM INC.**

**ENGINEERING CHEMISTRY CONSULTANTS**

P.O. Box 1510
#32 Route 35
Sebago Common
Windham, Maine 04062
(207) 892-0002
FAX (207) 892-7499

25 March 1992

Dr. A. Dallas Wait
Senior Environmental Chemist
Gradient Corporation
44 Brattle Street
Cambridge, MA 02138

| | |
|---|---|
| Re: | Air Force Plant 59 |
| Laboratory: | Galson Laboratories |
| Case No: | NONE |
| SDG No: | 6-6703 |

| | | | | |
|---|---|---|---|---|
| TAL Inorganics: | JCDPWBW | JCDW1BW | JCDW3RW | JCDW4BW |
| | JCDW5BW | JCDW6BW | JCDW8BW | JCDW9BW |
| | JCSW1BW | JCSW3BW | JCSW4BW | JCSW5BW |
| | JCSW6BW | JCSW7BW | JCSWSBW | JCSW9BW |
| | JCDW3BW | | | |

Dear Dr. Wait:

Validation was performed on the inorganic analytical data from the samples referenced above. The data were evaluated, based on the following parameters:

* - data completeness
* - holding times
* - calibrations
- blanks
* - ICP interference check sample analysis
- matrix spike analysis
- duplicate sample analysis
- laboratory control sample analysis
- furnace atomic absorption results
* - ICP serial dilution results
* - detection limits
* - sample result verification

* All criteria were met for this parameter.

Table I summarizes the validation actions, which were in accordance with USEPA Region II Evaluation of Inorganic Data for the Contract Laboratory Program, February 1990, SOP No. HW-2, Revision X, and the NYSDEC ASP, September 1989 as detailed below.

Also attached are the:

- o data validation log,
- o telephone log,
- o completeness log, and
- o sample preparation and analysis summaries.

BLANKS:

1. Positive Blanks

Blanks providing results ≥IDL and their associated action levels are tabulated below:

| BLANK ID | PARAMETER | CONCENTRATION | ACTION LEVEL WATER | ACTION LEVEL SOIL |
|---|---|---|---|---|
| CCB5 | calcium | 119 | 595 | |
| | iron | 36 | 180 | |
| | nickel | 7 | 35 | |
| | zinc | 5 | 25 | |
| | calcium | 75 | 375 | |
| | iron | 9 | 45 | |
| CCB7 | calcium | 111 | 555 | |
| | iron | 17 | 85 | |
| | zinc | 3 | 15 | |
| PB | cobalt | 5 | 25 | |
| | nickel | 7 | 35 | |
| | vanadium | 5 | 25 | |
| | zinc | 12 | 60 | |

Associated samples with positive values reported below the action level are tabulated below:

| CAL BLANK ID | PARAMETER | SAMPLE NO. | |
|---|---|---|---|
| CCB5 | nickel | JCDW4BW | JCSW8BW |

| PREP BLANK ID | PARAMETER | SAMPLE NO. | |
|---|---|---|---|
| PS | nickel | JCSW3BW | JCSW6BW |
| | | JCDPWBW | JCDW3RW |
| | | JCDW4BW | JCDW6BW |
| | | JCDW9BW | JCSW1BW |
| | | JCSW9BW | JCSW8BW |
| | vanadium | JCDW1BW | JCDPWBW |
| | | JCSW7BW | JCDW3BW |
| | | JCDW3RW | JCSW8BW |
| | | JCDW4BW | JCDW5BW |
| | | JCSW9BW | JCDW6BW |
| | | JCDW9BW | JCSW1BW |
| | | JCSW3BW | JCSW4BW |
| JCSW5BW | | | |
| | cobalt | JCDW3BW | JCDW3RW |
| | | JCSW4BW | JCSW6BW |
| JCSW8BW | | | |
| | zinc | JCSW3BW | JCSW1BW |
| | | JCSW7BW | JCSW5BW |
| | | JCDW5BW | JCSW3BW |
| | | JCDW6BW | JCDWSBW |
| JCDW4BW | | | |

Action:

- o associated sample results ≥IDL but <action level are flagged as not detected at the sample value (U)

MATRIX SPIKE ANALYSIS:

Samples providing matrix spike recoveries not within 75-125% that also contain native analyte reported at <4X the spiking level as specified in the NYSDEC CLP (Vol. VIII, E-111) are tabulated below:

| SAMPLE ID | ELEMENT | % RECOVERY |
|---|---|---|
| JCDW4BWMS | thallium | 63 |

Action:

- o for recoveries from 30-74%, results are flagged as estimated (J)

Comments:

The above actions are applied to all samples of the same matrix associated with this SDG.

DUPLICATE SAMPLE ANALYSIS:

1. Field duplicates:

Field duplicate precision results for samples both containing >5CRDL that exceed the aqueous RPD of 30% and solid RPD of 50% or when one or both contain <5CRDL with the difference between them exceeding the 2CRDL for water and 4CRDL for soils, as specified in the USEPA Functional Guidelines, are as follows:

| SAMPLE | ELEMENT | RPD% | CRDL | S - D |
|---|---|---|---|---|
| JCDW3DW | zinc | | 20 | 56 |
| | aluminum | 68 | | |
| | iron | 67 | | |
| | manganese | 37 | | |

Action:

o results ≥IDL are flagged as estimated (J)

Comments:

The above actions are applied to all samples of the same matrix associated with this SDG.

LABORATORY CONTROL SAMPLE ANALYSIS:

1. Aqueous.

Values that were not reported within 80-120% of the certified concentration as specified by the NYSDEC CLP (Vol. VIII, E-115) are tabulated below:

| ELEMENT | %RECOVERY |
|---|---|
| selenium | 79 |

Action:

o for recoveries from 50-79%, results are flagged as estimated (J)

Comments:

The above actions are applied to all samples of the same matrix associated with this SDG.

FURNACE ATOMIC ABSORPTION RESULTS:

1. Post-digestion spike

Samples with post-digestion spike recoveries ≥40% but not within 85-115%, and also having native analyte sample absorbance <50% of the spiked sample value, and samples with post-digestion spike recoveries reported at <40% that were diluted 5-10 fold and recoveries repeated at <40% or that were not within 85-115%, and also having native sample absorbance <50% of the spiked sample value, as specified in the NYSDEC CLP (Vol. VIII, E-118-119) are tabulated below:

| SAMPLE | ELEMENT | % RECOVERY |
|---|---|---|
| JCDW1BW | lead | 83 |
| JCDPWBW | lead | 78 |
| JCSW7BW | selenium | 73 |
| JCSW5BW | selenium | 77 |
| JCSW6BW | selenium | 71 |
| JCSW1BW | selenium | 81 |
| JCDW4BW | thallium | 54 |
| JCSW7BW | thallium | 45 |
| JCDW8BW | thallium | 53 |
| JCSW8BW | thallium | 41 |
| JCDW5BW | thallium | 83 |
| JCSW5BW | thallium | 49 |
| JCDW6BW | thallium | 82 |
| JCSW6BW | thallium | 61 |
| JCDW1BW | thallium | 66 |
| JCSW1BW | thallium | 49 |
| JCDW3BW | thallium | 77 |
| JCDW3RW | thallium | 81 |
| JCSW3BW | thallium | 70 |
| JCDW9DW | thallium | 63 |
| JCSW9BW | thallium | 81 |
| JCDPWBW | thallium | 62 |
| JCSW4BW(5x) | thallium | 124 |

Action:

- o for spike recoveries >10%, but not within 85-115%, sample results ≥IDL are flagged as estimated (J)

- o for spike recoveries >10% but <85%, sample detection limit values (IDL U) are flagged as estimated (J)

Sincerely,
ECHEM INC.

Bruce K. Wallin, PhD
Vice President

enclosures

Air Force Plant 59
SDG No. 6-6703

Table I. Validation Action Summary

| | | | |
|---|---|---|---|
| Aluminum | J5 | Magnesium | |
| Antimony | | Manganese | J5 |
| Arsenic | | Mercury | |
| Barium | | Nickel | A1 |
| Beryllium | | Potassium | |
| Cadmium | | Selenium | J6, J7 |
| Calcium | | Silver | |
| Chromium | | Sodium | |
| Cobalt | A1 | Thallium | J4, J7 |
| Copper | | Vanadium | A1 |
| Iron | J5 | Zinc | A1, J5 |
| Lead | J7 | Cyanide | |

If an element has no entry, no qualifications were necessary.

A1 - Accept data, raise the sample detection limit(s) due to blank contamination.

J1 - Estimate (J) positive values and (UJ) detection limit results due to hold time exceedences.

J2 - Estimate (J) positive values and (UJ) detection limit results due to non-compliant calibrations.

J3 - Estimate (J) positive values and (UJ) detection limit results due to non-compliant linearity near the CRDL.

J4 - Estimate (J) positive values and (UJ) detection limit results due to non-compliant matrix spike recoveries.

J5 - Estimate (J) positive values due to non-compliant duplicate precision.

J6 - Estimate (J) positive values and (UJ) detection limit results due non-compliant laboratory control sample results.

J7 - Estimate (J) positive values and (UJ) detection limit results due to non-compliant analytical precision and/or accuracy.

J8 - Estimate (J) positive values due to non-compliant method of standard additions linearity.

J9 - Estimate (J) positive values and (UJ) detection limit results due to non-compliant serial dilution reproducibility.

**ECHEM INC.**
**INORGANICS**
**COMPLETENESS LOG**

SITE: AFP 59 CLIENT: Argonne Nat'l Lab
CASE # SDG# 6-6703

| SAMPLE # | JCDPW1BW | JCDW1BW | JCDW2BW | JCDW3BW | JCDW4BW | JCDW5BW | JCDW6BW | JCDW8BW | JCDW9BW | JCSW1BW | JCSW3BW | JCSW4BW | JCSW5BW | JCSW6BW | JCSW7BW | JCSW8BW | JCSW9BW | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | | | | | | |
| 2A | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | | | | | | |
| 2B | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | | | | | | |
| 3 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | | | | | | |
| 4 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | | | | | | |
| 5A | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | | | | | | |
| 5B | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | | | | | | |
| 7 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | | | | | | |
| 8 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | | | | | | |
| 9 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | | | | | | |
| 10 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | | | | | | |
| 11A | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | | | | | | |
| 11B | | | | | | | | | | | | | | | | | | | | | | | | |
| 12 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | | | | | | |
| 13 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | | | | | | |
| 14 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | | | | | | |

____Standardization Report for ICP
____Analysis Report for each calibration, blank, sample
____Copies of printer tapes for each AAS element
✓ Mercury Analysis Sheet
✓ Cyanide Analysis Sheet
N.A. Total Solids Log (if applicable)
✓ Metals Digestion Log
✓ Mercury Digestion Log
✓ Cyanide Distillation Log
✓ Chain of Custody
✓ Case Narrative

REV. 391

ECHEM INC.
SAMPLE PREPARATION AND ANALYSIS SUMMARY
FOR NYSDEC

CLIENT: Argonne Nat'l Labs
CASE NO.

SDG NO. 6-6703

SITE: AFP 59
ANALYTICAL FRACTION: Mercury

| CLIENT SAMPLE ID | EPA SAMPLE NO. | LAB. SAMPLE ID | MATRIX | DATE COLLECTED | DATE RECEIVED | DATE ANALYZED | HOLD TIME COLLECT | HOLD TIME RECEIPT |
|---|---|---|---|---|---|---|---|---|
| JCDW0BW | | 6761-006 | WATER | 02-03-92 | 02-03-92 | 02-11-92 | 8 | 8 |
| JCDW1BW | | 6749-005 | | 02-01-92 | 02-01-92 | 02-11-92 | 10 | 10 |
| JCDW3BW | | 6761-001 | | 02-02-92 | 02-03-92 | | 9 | 8 |
| JCDW3RW | | 6761-002 | | 02-02-92 | 02-03-92 | | 9 | 8 |
| JCDW4BW | | 6703-001 | | 01-29-92 | 01-30-92 | | 13 | 12 |
| JCDW5BW | | 6749-001 | | 01-31-92 | 02-01-92 | | 10 | 10 |
| JCDW6BW | | 6749-003 | | 02-01-92 | 02-01-92 | | 10 | 10 |
| JCDW8BW | | 6703-006 | | 01-30-92 | 01-30-92 | | 12 | 12 |
| JCDW9BW | | 6761-004 | | 02-03-92 | 02-03-92 | | 8 | 8 |
| JCSW1BW | | 6749-006 | | 02-01-92 | 02-01-92 | | 10 | 10 |
| JCSW3BW | | 6761-003 | | 02-02-92 | 02-03-92 | | 9 | 8 |
| JCSW4BW | | 6703-004 | | 01-29-92 | 01-30-92 | | 13 | 12 |
| JCSW5BW | | 6749-002 | | 01-31-92 | 02-01-92 | | 11 | 10 |
| JCSW6BW | | 6749-004 | | 02-01-92 | 02-01-92 | | 10 | 10 |
| JCSW7BW | | 6703-005 | | 01-30-92 | 01-30-92 | | 12 | 12 |
| JCSW8BW | | 6703-007 | | 01-30-92 | 01-30-92 | | 12 | 12 |
| JCSW9BW | | 6761-005 | | 02-03-92 | 02-03-92 | | 8 | 8 |

COMMENTS:

HOLD TIME COLLECT = DATE COLLECTED MINUS DATE ANALYZED

HOLD TIME RECEIPT = DATE RECEIVED MINUS DATE ANALYZED

REV. 3/91

ECHEM INC.
SAMPLE PREPARATION AND ANALYSIS SUMMARY
FOR NYSDEC

CLIENT: Argonne Nat'l Labs
CASE NO.
SDG NO. 6-6703
SITE: AFP 59
ANALYTICAL FRACTION: Cyanide

| CLIENT SAMPLE ID | EPA SAMPLE NO. | LAB. SAMPLE ID | MATRIX | DATE COLLECTED | DATE RECEIVED | DATE ANALYZED | HOLD TIME COLLECT | HOLD TIME RECEIPT |
|---|---|---|---|---|---|---|---|---|
| JCDPWBW | | 6761-006 | WATER | 02-03-92 | 02-03-92 | 02-07-92 | 4 | 4 |
| JCDW1BW | | 6749-005 | | 02-01-92 | 02-01-92 | 02-07-92 | 6 | 6 |
| JCDW3BW | | 6761-001 | | 02-02-92 | 02-03-92 | 02-12-92 | 10 | 9 |
| JCDW3RW | | 6761-002 | | 02-02-92 | 02-03-92 | 02-12-92 | 10 | 9 |
| JCDW4BW | | 6703-001 | | 01-29-92 | 01-30-92 | 02-04-92 | 6 | 5 |
| JCDW5BW | | 6749-001 | | 01-31-92 | 02-01-92 | 02-07-92 | 7 | 6 |
| JCDW6BW | | 6749-003 | | 02-01-92 | 02-01-92 | 02-07-92 | 6 | 6 |
| JCDW8BW | | 6703-006 | | 01-30-92 | 01-30-92 | 02-04-92 | 5 | 5 |
| JCDW9BW | | 6761-004 | | 02-03-92 | 02-03-92 | 02-12-92 | 9 | 9 |
| JCSW1BW | | 6749-006 | | 02-01-92 | 02-01-92 | 02-07-92 | 6 | 6 |
| JCSW3BW | | 6761-003 | | 02-02-92 | 02-03-92 | 02-12-92 | 10 | 9 |
| JCSW4BW | | 6703-004 | | 01-29-92 | 01-30-92 | 02-04-92 | 6 | 5 |
| JCSW5BW | | 6749-002 | | 01-31-92 | 02-01-92 | 02-07-92 | 7 | 6 |
| JCSW6BW | | 6749-004 | | 02-01-92 | 02-01-92 | 02-07-92 | 6 | 6 |
| JCSW7BW | | 6703-005 | | 01-30-92 | 01-30-92 | 02-04-92 | 5 | 5 |
| JCSW8BW | | 6703-007 | | 01-30-92 | 01-30-92 | 02-04-92 | 5 | 5 |
| JCSW9BW | | 6761-005 | | 02-03-92 | 02-03-92 | 02-12-92 | 9 | 9 |

COMMENTS:

HOLD TIME COLLECT = DATE COLLECTED MINUS DATE ANALYZED

HOLD TIME RECEIPT = DATE RECEIVED MINUS DATE ANALYZED

REV. 201

# Appendix A-1:

# Report 21

**ECHEM INC.**

**ENGINEERING CHEMISTRY CONSULTANTS**

P.O. Box 1510
#32 Route 35
Sebago Common
Windham, Maine 04062
(207) 892-0002
FAX (207) 892-7499

24 March 1992

Dr. A. Dallas Wait
Senior Environmental Chemist
Gradient Corporation
44 Brattle Street
Cambridge, MA 02138

| | |
|---|---|
| Re: | Air Force Plant 59 |
| Laboratory: | Galson Laboratories |
| Case No: | NONE |
| SDG No: | 7-6779 |
| Volatiles: | JC2L1AS |

Dear Dr. Wait:

Validation was performed on the organic analytical data from the samples referenced above. The data were evaluated based on the following parameters:

- * - data completeness
- * - holding times
- * - surrogate recovery
- * - matrix spike/matrix spike duplicate/matrix spike blank
- * - blanks
- * - GC/NS tuning
- * - calibration
- * - internal standards performance
- - field duplicates
- * - TCL compound identification
- * - tentatively identified compounds
- * - system performance
- * - compound quantitation and reported detection limits
- * - sample result verification

* All criteria were met for this parameter.

Table I summarizes the validation actions, which were in accordance with USEPA Region II CLP Organics Data Review and Preliminary Review, March 1990, SOP No. HW-6, Revision #7, and the NYSDEC ASP, September 1989, as detailed below.

Also attached are the:

- o data validation log,
- o telephone log,
- o completeness log, and
- o sample preparation and analysis summary

FIELD DUPLICATES:

A field duplicate was not identified for this SDG.

Sincerely,
ECHEM INC.

Bruce K. Wallin, PhD
Vice President

enclosures

Air Force Plant 59
SDG No. 7-6779

Table I. Validation Action Summary

| Sample No. | VOA |
|---|---|
| JC2L1AS | |

If the field is blank, no qualifiers were necessary.

A1 - change positive values for ( ) to revised detection limit due to blank contamination

J1 - estimate positive values (J) and detection limit values (UJ) due to holding time violations

J2 - estimate positive values (J) and detection limit values (UJ) due to non-compliant volatile surrogate recoveries

J3 - estimate positive values (J) and detection limit values (UJ) due to non-compliant (acid) (base-neutral) fraction surrogate recoveries

J4 - estimate positive values (J) for ( ) due to non-compliant matrix spike recoveries

J5 - estimate positive values (J) for ( ) due to calibration not meeting minimum RF criteria

J6 - estimate positive values (J) and detection limit values (UJ) for ( ) due to non-compliant calibration stability

J7 - estimate positive values (J) for ( ) due to non-compliant internal standard stability

J8 - estimate positive values (J) due to non-compliant field duplicate precision

RI - reject detection limit values (UR) due to holding time exceedences

R2 - reject detection limit values (UR) due to low surrogate recoveries

R3 - reject detection limit values (UR) for ( ) due to low matrix spike recoveries

R4 - reject detection limit values (UR) for ( ) due to calibration not meeting minimum RF criteria

R5 - reject detection limit values (UR) for ( ) due to extreme variations in the internal standard stability

R7 - TIC's identified in associated method blank, results flagged as unusable (R)

ECHEM INC.
ORGANICS
COMPLETENESS LOG

SITE: AFP 59 CLIENT: Fragonne Nat'l
CASE # SDG# 7-1-779

| | SAMPLE # | JC.GLIAS |
|---|---|---|
| | 1A | X |
| | 1E | X |
| | 2A | |
| | 2B | X |
| | 3A | |
| VOA | 3B | X |
| | 4A | X |
| | 5A | X |
| | 6A | X |
| | 7A | X |
| | 8A | X |
| | | |
| | 1B | X |
| | 1C | X |
| | 1F | X |
| | 2C | |
| | 2D | X |
| | 3C | |
| | 3D | X |
| SVOA | 4B | X |
| | 5B | X |
| | 6B | X |
| | 6C | X |
| | 7B | X |
| | 7C | X |
| | 8B | X |
| | 8C | X |
| | | |
| | 1D | X |
| | 2E | |
| | 2F | |
| | 3E | |
| PEST | 3F | |
| | 4C | |
| | 8D | X |
| | 8E | X |
| | 9 | X |
| | 10 | |

✓ Quant Reports
✓ MASS SPECS
✓ TIC Compounds
✓ Laboratory Blank (Form 1's)
✓ MS/MSD (Forms 1's)
Total Solids Log (if applicable)
✓ Injection Log
✓ Chain of Custody
✓ Case Narrative

REV. 391

ECHEM INC.
SAMPLE PREPARATION AND ANALYSIS SUMMARY
FOR NYSDEC

CLIENT: Argonne Nat'l Labs
CASE NO.
SDG NO. 7-6779
SITE: AFP 59
ANALYTICAL FRACTION: Volatiles

| CLIENT SAMPLE ID | EPA SAMPLE NO. | LAB. SAMPLE ID | MATRIX | DATE COLLECTED | DATE RECEIVED | DATE ANALYZED | HOLD TIME COLLECT | HOLD TIME RECEIPT |
|---|---|---|---|---|---|---|---|---|
| JC2LIAS | | 6779-001 | SOIL | 01-31-92 | 01-31-92 | 02-06-92 | 6 | 6 |

COMMENTS:

HOLD TIME COLLECT = DATE COLLECTED MINUS DATE ANALYZED

HOLD TIME RECEIPT = DATE RECEIVED MINUS DATE ANALYZED

REV 301

# Appendix A-1:

## Report 22

**ECHEM INC.**

**ENGINEERING CHEMISTRY CONSULTANTS**

P.O. Box 1510
#32 Route 35
Sebago Common
Windham, Maine 04062
(207) 892-0002
FAX (207) 892-7499

24 March 1992

Dr. A. Dallas Wait
Senior Environmental Chemist
Gradient Corporation
44 Brattle Street
Cambridge, MA 02138

| | |
|---|---|
| Re: | Air Force Plant 59 |
| Laboratory: | Galson Laboratories |
| Case No: | NONE |
| SDG No: | 7-6779 |
| Semivolatiles: | JC2L1AS |

Dear Dr. Wait:

Validation was performed on the organic analytical data from the samples referenced above. The data were evaluated based on the following parameters:

- * - data completeness
- * - holding times
- * - surrogate recovery
- - matrix spike/matrix spike duplicate/matrix spike blank
- - blanks
- * - CC/MS tuning
- - calibration
- * - internal standards performance
- - field duplicates
- * - TCL compound identification
- * - tentatively identified compounds
- * - system performance
- * - compound quantitation and reported detection limits
- * - sample result verification

* All criteria were met for this parameter.

Table I summarizes the validation actions, which were in accordance with USEPA Region II CLP Organics Data Review and Preliminary Review, March 1990, SOP No. HW-6, Revision # 7, and the NYSDEC ASP, September 1989, as detailed below.

Also attached are the:

- o data validation log,
- o telephone log,
- o completeness log, and
- o sample preparation and analysis summaries.

MATRIX SPIKE/MATRIX SPIKE DUPLICATE/MATRIX SPIKE BLANK:

Matrix spike recoveries which did not meet the criteria specified in the NYSDEC CLP (Vol. VIII, E-41) are summarized below.

| | RECOVERY (%) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SAMPLE | PHE | CLPH | DCB | DNP | TCB | CRE | ACE | NPH | DNT | PCP | PYR |
| Q1-0098 | 66 | 68 | 70 | 65 | 74 | 70 | | | | | 69 |

Action:

- o none, sample results for the compounds reported as either <CRQL J or CRQL U

BLANKS:

A TIC eluting at approximately 7.4 minutes was identified in the sample as well as the method blank. This result was flagged as unusable (R).

CALIBRATION:

Calibration linearity, sensitivity and stability criteria specified in the NYSDEC CLP (Vol. VIII, E-48-51), or federal criteria (*), are tabulated below.

CONTINUING CALIBRATION CRITERIA

| COMPOUND | %D (max.) | RRF (min.) |
|---|---|---|
| SPCC | 20 | 0.05 |
| all other TCL compounds | 20 | 0.05* |

Deviations from the above calibration criteria are tabulated below.

## CONTINUING CALIBRATION

| INSTRUMENT | DATE/TIME | COMPOUND | %D | RRF |
|---|---|---|---|---|
| D (#4) | 02-18-92/09:49 | bis(chloroisopropyl)ether | 23 | |
| | | N-nitroso-di-n-propylamine | 21 | |
| | | hexachloroethane | 22 | |
| | | naphthalene | 22 | |
| | | fluoranthene | 24 | |

Associated samples:

| INSTRUMENT | DATE/TIME | SAMPLE NO. |
|---|---|---|
| D (#4) | 02-18-92/09:49 | JC2L1AS |

Action:

- o none, sample results for the compounds either reported as <CRQL J or CRQL U

FIELD DUPLICATES:

A field duplicate was not provided for this SDG.

Sincerely,
ECHEM INC.

Bruce K. Wallin, PhD
Vice President

enclosures

Air Force Plant 59
SDG No. 7-6779

Table I. Validation Action Summary

| Sample No. | SVOA |
|---|---|
| JC2L1AS | R8 |

If the field is blank, no qualifiers were necessary.

| | | |
|---|---|---|
| A1 | - | change positive values for ( ) to revised detection limit due to blank continuation |
| J1 | - | estimate positive values (J) and detection limit values (UJ) due to holding time violations |
| J2 | - | estimate positive values (J) and detection limit values (UJ) due to non-compliant volatile surrogate recoveries |
| J3 | - | estimate positive values (J) and detection limit values (UJ) due to non-compliant (acid) (base-neutral) fraction surrogate recoveries |
| J4 | - | estimate positive values (J) for pyrene due to non-compliant matrix spike recoveries |
| J5 | - | estimate positive values (J) for ( ) due to calibration not meeting minimum RF criteria |
| J6 | - | estimate positive values (J) and detection limit values (UJ) for fluoranthene due to non-compliant calibration stability |
| J7 | - | estimate positive values (J) for ( ) due to non-compliant internal standard stability |
| J8 | - | estimate positive values (J) due to non-compliant field duplicate precision |
| R1 | - | reject detection limit values (UR) due to holding time exceedences |
| R2 | - | reject detection limit values (UR) due to low surrogate recoveries |
| R3 | - | reject detection limit values (UR) for ( ) due to low matrix spike recoveries |
| R4 | - | reject detection limit values (UR) for ( ) due to calibration not meeting minimum RF criteria |

R5 - reject detection limit values (UR) for ( ) due to extreme variations in the internal standard stability

R7 - reject detection limit value (UR) for ( ) due to continuing calibration %D >50%

R8 - TIC's identified in associated method blank, results flagged as unusable (R)

ECHEM INC.
SAMPLE PREPARATION AND ANALYSIS SUMMARY
FOR NYSDEC

CLIENT: Argonne Nat'l Labs
CASE NO.
SDG NO. 7-6779
SITE: AFP 59
ANALYTICAL FRACTION: Semivolatiles

| CLIENT SAMPLE ID | EPA SAMPLE NO. | LAB. SAMPLE ID | MATRIX | DATE COLLECTED | DATE RECEIVED | DATE EXTRACTED | HOLD TIME TO EXTRACTION COLLECT | HOLD TIME TO EXTRACTION RECEIPT |
|---|---|---|---|---|---|---|---|---|
| JC 2 LIA-S | | 6779-001 | SOIL | 01-31-92 | 02-01-92 | 02-06-92 | 1 | 6 |

COMMENTS:

HOLD TIME COLLECT = DATE COLLECTED MINUS DATE EXTRACTED

HOLD TIME RECEIPT = DATE RECEIVED MINUS DATE EXTRACTED

REV. 391

# Appendix A-1:

# Report 23

# ECHEM INC.

## ENGINEERING CHEMISTRY CONSULTANTS

P.O. Box 1510
#32 Route 35
Sebago Common
Windham, Maine 04062
(207) 892-0002
FAX (207) 892-7499

25 March 1992

Dr. A. Dallas Wait
Senior Environmental Chemist
Gradient Corporation
44 Brattle Street
Cambridge, MA 02138

| | |
|---|---|
| Re: | Air Force Plant 59 |
| Laboratory: | Galson Laboratories |
| Case No: | NONE |
| SDG No: | 7-6779 |
| Pesticides/PCB's: | JC2L1AS |

Dear Dr. Wait:

Validation was performed on the organic analytical data from the samples referenced above. The data were evaluated based on the following parameters:

- * - data completeness
- * - holding times
- * - surrogate recovery
- * - matrix spike/matrix spike duplicate/matrix spike blank
- * - blanks
- * - calibration
- * - pesticide instrument performance
- - field duplicates
- * - TCL compound identification
- - compound quantitation and reported detection limits
- * - sample result verification

* All criteria were met for this parameter.

Table 1 summarizes the validation actions, which were in accordance with USEPA Region II CLP Organics Data Review and Preliminary Review, March 1990, SOP No. HW-6, Revision #7 and the NYSDEC ASP, September 1989 as detailed below.

Also attached are the:

- o data validation log,
- o telephone log,
- o completeness log, and
- o sample preparation and analysis summaries.

FIELD DUPLICATES:

A field duplicate was not provided for this SDG.

COMPOUND QUANTITATION AND REPORTED DETECTION LIMITS:

Arochlor 1260 was detected in the sample at 130 ug/kg which is slightly below the CRQL. It is the reviewer's opinion that this result should have been reported instead of CRQL U; the Form I has been corrected accordingly.

Sincerely,
ECHEM INC.

Bruce K. Wallin, PhD
Vice President

enclosures

Air Force Plant 59
SDG No. 7-6779

Table I. Validation Action Summary

| Sample No. | Pesticide/PCB |
|---|---|
| JC2L1AS | |

If the field is blank, no qualifiers were necessary.

| | | |
|---|---|---|
| A1 | - | change positive values for ( ) to revised detection limit due to blank contamination |
| J1 | - | estimate positive values (J) and detection limit values (UJ) due to holding time violations |
| J2 | - | estimate positive values (J) and detection limit values (UJ) due to non-compliant volatile surrogate recoveries |
| J3 | - | estimate positive values (J) and detection limit values (UJ) due to non-compliant (acid) (base-neutral) fraction surrogate recoveries |
| J4 | - | estimate positive values (J) for ( ) due to non- compliant matrix spike recoveries |
| J5 | - | estimate positive values (J) for ( ) due to calibration not meeting minimum RF criteria |
| J6 | - | estimate positive values (J) and detection limit values (UJ) for ( ) due to non-compliant calibration stability |
| J7 | - | estimate positive values (J) for ( ) due to non- compliant internal standard stability |
| J8 | - | estimate positive values (J) due to non-compliant field duplicate precision |
| R1 | - | reject detection limit values (UR) due to holding time exceedences |
| R2 | - | reject detection limit values (UR) due to low surrogate recoveries |
| R3 | - | reject detection limit values (UR) for ( ) due to low matrix spike recoveries |
| R4 | - | reject detection limit values (UR) for ( ) due to calibration not meeting minimum RF criteria |

R5 - reject detection limit values (UR) for ( ) due to extreme variations in the internal standard stability

R7 - reject detection limit value (UR) for ( ) due to continuing calibration %D >50%

ECHEM INC.
SAMPLE PREPARATION AND ANALYSIS SUMMARY
FOR NYSDEC

CLIENT: Argonne Nat'l Labs
CASE NO.

SDG NO. 7-6779

SITE: AFP 59
ANALYTICAL FRACTION: Pesticide/PCBs

| CLIENT SAMPLE ID | EPA SAMPLE NO. | LAB. SAMPLE ID | MATRIX | DATE COLLECTED | DATE RECEIVED | DATE EXTRACTED | HOLD TIME TO EXTRACTION COLLECT | HOLD TIME TO EXTRACTION RECEIPT |
|---|---|---|---|---|---|---|---|---|
| TC2 LIAS | | 6779-001 | SOIL | 01-31-92 | 02-01-92 | 02-11-92 | 1 | 6 |

COMMENTS:

HOLD TIME COLLECT = DATE COLLECTED MINUS DATE EXTRACTED

HOLD TIME RECEIPT = DATE RECEIVED MINUS DATE EXTRACTED

REV. 3/91

# Appendix A-2:

# Data Usability

# DATA USABILITY

This appendix consists of a letter report from Gradient Corporation on the usability of Galson Laboratory data for AFP-59 preceeded by a list showing the page number on which environmental samples from various site locations are discussed.


| Location/Analysis * | Report Page Number |
|---|---|
| Well Borehole Soil Samples | |
| MET | 1 |
| P/P | 3 |
| SVOC | 3 |
| VOC | 4 |
| Groundwater | |
| MET | 4 |
| P/P | 5 |
| SVOC | 6 |
| VOC | 6 |
| Named-site Bore & Hand Soil | |
| MET | 6 |
| P/P | 8 |
| SVOC | 8 |
| VOC | 8 |
| Creek Sediment | |
| MET | 8 |
| P/P | 10 |
| SVOC | 10 |
| VOC | 10 |
| Creek Water | |
| MET | 10 |
| P/P | 11 |
| SVOC | 11 |
| VOC | 11 |
| Outfalls | |
| MET | 12 |
| P/P | 13 |
| SVOC | 13 |
| VOC | 13 |


* MET=inorganics
P/P=PCB's and pesticides
SVC=semi-volatile organic compounds
VOC=volatile organic compounds

*Gradient* Corporation

April 28, 1992

Mr. Wyman Harrison
Argonne National Laboratory
9700 S. Cass Ave.
Argonne, IL 60439

Dear Wyman:

Gradient Corporation has completed a review of the laboratory data associated with the AFP 59, Johnson City site inspection. The sample analyses were performed by Galson Laboratories, and the data validation was conducted by ECHEM.

The sampling and analysis program was conducted in three phases. The first phase was conducted from November 4 through December 10, 1991, and consisted of well borehole soil samples, site test bore and hand soil samples, creek sediment and water samples, and outfall samples. The second and third phases of the program consisted of groundwater samples which were taken from January 5 through January 9, 1992, and again from January 29 through February 3, 1992.

This report serves as a critique of the analyses performed for this program and assesses data usability. A compilation of the resultant data, with appropriate qualifiers, is provided in attached tables.

Well Borehole Soil Samples

- Metals

Well Borehole Soil Sampling comprised 15 field samples, 3 field replicates, 1 background sample, and 2 field blanks for a total of 21 samples. The field samples were taken from 11/04/91 through 12/10/91 and were grouped into two Sample Delivery Groups (SDG #1 and #3). Each SDG contains associated matrix and laboratory QC which were reviewed as compared to requirements set forth in the site-specific QAPP, NYSDEC ASP (9/89), and applicable Region II Functional Guidelines for Data Validation (SOP No. HW-2, Revision X, 2/16/90). Table Q lists the validated metals data for the Well Borehole Soil Samples. These include the samples associated with SDG #1 (JCDW1AS, JCDW1BS, JCDW1CS, JCDW3AS, JCDW3BS, JCSW4AS, JCSW4BS, JCSW4CS, JCSW5AS, JCSW5BS, JCSW6AS, JCSW6BS, JCSW8AS, JCSW8BS, JCQC1TW, JCQC2BW) and SDG #3 (JCBG1AS, JCSW7AS, JCSW7BS, JCSW9AS, JCSW9BS).

The laboratory did not perform a solid LCS with these soil samples; rather, they substituted a water LCS (blank spike). This is non-compliant with the site-specific QAPP (Section 10, pg. 10-5) and NYSDEC ASP (9/89) and does not allow for an accurate evaluation of laboratory accuracy for the soil matrices. However, two sets of matrix spikes (on JCSW5BS and JCSW9BS) were performed with these soil samples, which suffices. The metals accuracy, therefore, has been based upon the percent recoveries of analytes in these matrix spikes. As no backup information is available due to lack of a solid LCS, it must be stressed that extrapolation of matrix spike data to all samples within this data set may be compromised by sample matrix heterogeneity. Indeed, the



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range of percent solids for these samples was 72.4 to 93.6%; indicating heterogeneity in this data set. Matrix suppression of certain analytes was evident in the matrix spike (MS) analytical results for antimony, arsenic, lead, selenium, and thallium. Though the validated results indicate estimated data (J) for specific sample analytes based upon the division of the sample delivery groups, it is prudent to extend this estimation to all of the borehole soil samples. Therefore, all data for antimony, arsenic, lead, selenium, and thallium should be considered estimated and may be biased low. The percent recovery of the antimony MS (JCSW5BS) for data analyzed with SDG #1 was less than 30%; therefore, the validator rejected the nondetected data associated with this MS. However, the MS for the data associated with SDG #2 recovered at 69% for antimony. Due to the fact that the two available MS % recoveries do not agree, and because no antimony was detected in any of the samples, all antimony data are considered usable as estimated results at the detection limit. The lead MS recovery for SDG #3 (JCSW9BS) was listed as 1%. There is reason to believe, however, that the laboratory may have confused the sample, sample duplicate, and spiked sample during analysis. The raw data indicate a correction to the sample ID# from the original designation of the analyst. Additionally, lead met recovery criteria in the other MS (JCSW5BS). The laboratory was contacted and reanalyzed the sample and MS. The reanalysis gave a lead value of 9.3 mg/kg (compared to 8.1 mg/kg reported previously). The MS recovery as 44%. Therefore, the lead data are considered usable but estimated (j) values and may be bias low. No evaluation of accuracy of manganese could be made because of the high manganese found in the field samples. For both MS performed, the level spiked was too low to quantitate accurately above the indigenous manganese in the sample. All manganese data, therefore, must be considered estimated due to the possibility of uncertainty in the quantitation in the soil matrix.

Overall precision of these samples was good. Laboratory duplicate precision met criteria for all analytes except for lead. Three field duplicate pairs were associated with the Well Borehole Soil Samples. All three pairs showed good precision; the relative percent difference (RPD) for all analytes except cyanide was less than 50% (criteria as defined in the QAPP, Section 4). For the field pair JCSW4BS and JCSW4CS, cyanide was not detected in the initial sample but was detected (7.9 mg/Kg) in the replicate. Due to this discrepancy, all cyanide data should be considered usable but estimated due to the uncertainty in the quantitation based upon poor field duplicate precision.

Two rinsate blanks (JCQC1TW and JCQC2BW) were associated with these soil samples. These blanks showed low level contamination of several analytes; however, associated soil data were sufficiently high so that the contamination level was considered negligible. Concurrently, no laboratory blanks showed contamination above the analyte CRDLs. However, the data validator followed Region I Functional Guidelines for the blank action levels. These guidelines are stricter than the Region II guidelines in that they require data to be considered not detected at the level found in the sample for values up to 5 times the level found in the laboratory blank. Therefore, low level laboratory contamination resulted in several sample analytes being considered nondetects (U), with the detection limit raised to the level found in the sample, for barium, beryllium, cadmium, cobalt, sodium, and vanadium. Following Region II guidelines, none of these analytes would have been qualified. Since the reported raised detection limits are still below commonly used ranges for NYSDEC soil cleanup criteria for all analytes, the low level contamination found is insignificant and the data are usable.

There may be a minor matrix suppression of zinc in these samples as evidenced by a slightly high percent difference (12.4% when criteria is 10%) of the serial dilution result performed with SDG #1. However, the serial dilution performed on another sample with SDG #3 met criteria for all analytes. Therefore, no definitive conclusion can be drawn as this discrepancy may be due to individual sample matrix effects.

In summary, overall precision and accuracy are good. All data are usable with the following qualifications: all antimony, arsenic, selenium, and thallium data may be biased low; lead should

be considered estimated due to the possibility of a low bias based upon inconclusive MS results; all manganese data are usable but estimated based on lack of data on accuracy; cyanide data should be considered estimated due to the uncertainty in the result based upon poor field duplicate precision.

- Pesticides/PCBs

The following pesticides were detected in the well borehole soil samples (Table D: Aldrin at 7.6 ppb in JCDW1AS, 4,4'-DDB at 6 ppb in JCSW6AS, and heptachlor epoxide at 84 ppb in JCSW8BS and 62 ppb in JCSW6AS. The identification of the pesticides meets all GC/ECD dual column confirmation criteria as required by NYSDEC ASP, but are at concentrations too low to confirm by GC/MS. All holding times were adhered to, and all analytical QC requirements were met. No problems were noted with the blanks, and although there were some minor exceedances of high surrogate recoveries for DBC and with some of the matrix spike compounds (resulting in J flags), this is of no consequence to data quality. All well borehole soil pesticide data are usable.

- Semivolatile Organics

Many of the well borehole soil samples contained a suite of polynuclear aromatic hydrocarbons (PAHs) typical of petroleum contamination (Table G). JCDW1AS, JCDW1BS, JCSW6BS, and JCSW7AS contained trace levels of some combination of phenanthrene, anthracene, fluoranthene, pyrene and chrysene. Additional PAHs at slightly higher concentrations were found in JCDW3AS. Sample JCSW8BS contained high-ppb/low-ppm concentration of most of the PAHs searched for, and JCSW6AS was heavily contaminated with PAHs at the low ppm levels. A high concentration of bis(2- ethylhexyl)phthalate was also found in JCSW6AS. For samples containing tentatively identified compounds, these compounds were typically hydrocarbons, which may also originate from petroleum contamination.

Field replicate results were quite good. Replicates JCSW4CS/JCSW4BS contained no compounds in significant quantities. A comparison of JCDW1AS and JCDW1BS data (in ppb) follows.

| | JCDW1AS | JCDW1BS |
|---|---|---|
| phenanthrene | 160J | 1100U |
| anthracene | 17J | 1100U |
| di-n-butyl phthalate | 220J | 260J |
| fluoranthene | 140J | 65J |
| pyrene | 110J | 52J |

The detection of phenanthrene and anthracene at trace levels (well below the CRQL) in only one of the two samples is not surprising. The reproducibility of di-n-butyl phthalate between each sample is good. The quantitative difference between fluoranthene and pyrene, which is at trace levels below the CRQL, is reasonable for soil samples.

All other QC criteria were met, including holding times, MS tuning, calibration, and internal standard requirements. All well borehole semivolatile organic soil data are usable.

- Volatile Organics

Most of well borehole soil samples did not contain any volatile organics (Table A). A few samples contained trace levels of methylene chloride and/or acetone. The only constituent of interest was trichloroethene, which was present at 14 ppb in JC5S9AS and 8 ppb in JC5W9BS.

With regard to trip and holding blanks, low levels of acetone (11 to 12 ppb) and 1,1,1-trichloroethane (2 to 7 ppb) were detected in a few rinsate blanks and one trip blank. An exhaustive examination of the laboratory and the field operations was conducted to explain the occurrence of these compounds, unfortunately without success. The presence of these compounds has required raising the detection limits slightly for a few samples; however, it does not jeopardize the integrity of the data.

All other QC results were acceptable. Holding times and MS tuning criteria were met for all samples. Calibration and internal standard performance was compliant. All surrogate and matrix spike recoveries were acceptable. All well borehole soil volatile organic data are usable.

**Groundwater Samples**

- Metals

Groundwater sampling comprised 32 field samples, 2 field replicates, 1 background sample, and 1 field blank for a total of 36 samples. The field samples were taken from 1/05/92 through 2/03/92 and therefore were grouped into two Sample Delivery Groups (SDG #5 and #6); the associated Bailer blank (JCQC3XW) was taken on 11107191 and grouped with SDG #1. Each SDG contains associated matrix and laboratory QC which were reviewed as compared to requirements set forth in the site-specific QAPP, NYSDEC ASP (9/89), and applicable Region II Functional Guidelines for Data Validation (SOP No. HW-2, Revision X, 2/16/90). Table R lists the metals validated data for the Groundwater Samples. These comprised SDG #5 (samples: JCDPWAW, JCDW1AW, JCDW3AW, JCDW4AW, JCDW5AW, JCDW6AW, JCDW8AW, JCDW8RW, JCDW9AW, JCSW1AW, JCSW3AW, JCSW4AW, JCSW5AW, JCSW6AW, JCSW7AW, JCSW8AW, JCSW9AW, and background sample JCBG2BW) and SDG #6 (samples: JCDPWBW, JCDW1BW, JCDW3BW, JCDW3RW, JCDW4BW, JCDW5BW, JCDW6BW, JCDW8BW, JCDW9BW, JCSW1BW, JCSW3BW, JCSW4BW, JCSW5BW, JCSW6BW, JCSW7BW, JCSW8BW, JCSWPBW).

All holding times were met and all laboratory and matrix QC criteria were in control for mercury and cyanide except for the mercury LCS recovery associated with SDG #5 which was slightly outside of the control limits. The associated mercury data were all nondetects, except for samples JCSW4AW and JCSW8AW. These mercury results may be false positives based upon the high recovery of the LCS associated with the sample analyses. All cyanide values were nondetects.

For the furnace metals (antimony, arsenic, lead, selenium, and thallium) all matrix and laboratory specific QC met criteria for accuracy and precision, with the following exceptions. The LCS for selenium recovered slightly outside of criteria for the samples associated with SDG #6. Additionally, the post-digestion spike for selenium recovered low for many of the samples associated with SDG #6. These two QC indicators are evidence of a low bias in the selenium groundwater data associated with SDG #6.

However, no evidence of matrix or laboratory effects on quantitation of selenium was found in the QC data associated with the rest of the groundwater samples (SDG #5). As all the selenium values are either nondetects or 10x lower than the NYSDEC Class GA Groundwater Standard value of 10 ug/L, these minor QC issues are not significant and all selenium data are therefore usable. Matrix effects are evident for antimony and thallium based upon low recoveries in the matrix spike sample. The associated data may therefore be biased low; however, all associated antimony and thallium groundwater values are either nondetects or less than half of the Groundwater Standard value (3 ug/L for antimony; 4 ug/L for thallium) and thus the low bias is insignificant at these levels.

For the ICP analytes (all other metals), all matrix and laboratory QC met criteria for accuracy (LCS and MS recoveries) and the laboratory QC for precision met criteria for all analytes. Two field duplicate pairs were associated with these samples. One pair showed excellent precision, all analytes met criteria (RPD <50%). The other pair, JCDW3BW and JCDW3RW, showed poor duplicate precision for aluminum (RPD 68%), copper (RPD 140%), iron (67%), and zinc (RPD 95%). Because all laboratory duplicates met precision criteria, it is likely that the poor precision found in the field duplicate pair is due to sampling effects or heterogeneity of the sample replicates. Therefore, because the extent of this effect cannot be evaluated, the conservative approach requires that all aluminum, copper, iron, and zinc data be considered usable but estimated due to the uncertainty in the results based upon poor field duplicate precision.

The single field blank applicable to the groundwater samples, the bailer field blank (JCQC3XW), had no significant levels of contamination compared to the values found in the field samples. Concurrently, no laboratory blanks showed contamination above analyte CRDLs. However, the data validator followed Region I Functional Guidelines for the blank action levels. These guidelines are stricter than the Region II sidelines in that they require data to be considered not detected at the level found in the sample for values up to 5 times the level found in the laboratory blank. Therefore, low level laboratory contamination resulted in several sample analytes being considered nondetects, with the detection limit raised to the level found in the sample, for beryllium, cobalt, copper, iron, nickel, vanadium, and zinc. Following Region II guidelines, none of these analytes would have been qualified. Since the reported data for beryllium, copper, iron, and zinc are all lower than the NYSDEC Class GA Groundwater Standards or Guidance values, the low level contamination found is insignificant. The remaining analytes (cobalt, nickel, and vanadium) do not have standards or guidance values set under NYSDEC and are considered usable at the higher detection limits indicated on the data summary table.

Several vanadium values were rejected (R) by the data validator due to a negative laboratory blank. Again, following Region II guidelines for data validation, these values would not have been rejected because the level found in the blank was less than the negative CRDL. Therefore, all vanadium data are usable.

In summary, all groundwater data are usable with the following qualifications. The mercury results reported for samples JCSW4AW and JCSW8AW are likely to be false positives. Aluminum, copper, iron, and zinc results are considered estimated due to the uncertainty in the quantitation based upon field replicate precision.

- Pesticides/PCBs

No pesticides were detected in any of the groundwater samples (Table M). All holding times were adhered to, and all analytical QC was very good. All groundwater pesticide data are usable.

- Semivolatile Organics

No semivolatile organic compounds were detected in any of the groundwater samples (Table H). All holding times were met. QC criteria were compliant for MS tuning, calibration and internal standards. Surrogate and matrix spike recoveries were good, and field replicate analyses were consistent. All groundwater semivolatile organic data are usable.

- Volatile Organics

Many of the groundwater samples were characterized by low ppb levels of 1,1,1-trichloroethane and trichloroethene, as well as extremely low levels (high part per trillion) levels of an occasional halogenated solvent, toluene, and/or xylene (Table B). Typically low level volatile organic analysis methods, such as what was used for the waters in this project (Method 524.2), produce results of extremely low concentrations for compounds which ultimately are of little concern. Of particular note was trichloroethane in JCSW4 (95 ppb in AW and 97 ppb in BW); and in JCSW9 both 1,1,1-trichloroethane (15.2 ppb in AW and 15 ppb in BW), and trichloroethane (9.5 ppb in AW and 10 ppb in BW) were detected.

The detection limits for 2-butanone, 2-hexanone, 4-methyl-2-pentanone, and/or vinyl acetate were rejected by ECHEM due to problems with the continuing calibration. However, the 2 ppb initial calibration standard responses were stable at low levels and the QC check standard recoveries at 5 ppb were within established limits. It is therefore appropriate to assume that none of these compounds are present in any of the groundwater samples at the CRDL, and thus the data is usable.

With regards to trip and holding blanks, low levels of methylene chloride were detected in 6 of the blanks and very low levels of benzene, toluene, and 1,1,1-trichloroethane were noted in 1 trip blank. This resulted in minor modifications to some sample detection limits, but does not compromise the integrity of the data. TICs were identified as freons in several of the samples, as well as the trip blanks, thus the TIC freon data is not usable.

All holding times were met. MS tuning was performed satisfactorily and internal standard performance was good. Surrogate and matrix spike results were acceptable. Comparison of data between similar well locations and depths from the first round to the second round is excellent. In addition, replicate data is excellent. With the exception of the freon TICs in a few samples, all groundwater volatile organic data are usable.

**Named-site Test Bore and Hand Soil Samples**

- Metals

Named-Site Test Bore and Hand Soil Sampling comprised 6 field samples; a 7th sample was collected for VOA only due to sample volume limitations (JC1H1AS). The field rinsate blanks associated with the soil bore-hole samples are also applicable to these soil samples. No field replicates were collected with these samples. The samples were taken from 12/03/91 through 1/31/92 and therefore were grouped into two Sample Delivery Groups (SDG #3 and #7). Each SDG contains associated matrix and laboratory QC which were reviewed as compared to requirements set forth in the site-specific QAPP, NYSDEC ASP (9/89), and applicable Region II Functional Guidelines for Data Validation (SOP No. HW-2, Revision X, 2/16/90). Table T2 lists the metals validated data for the Named-site Test Bore and Hand Soil Samples. These include the samples associated with SDG #3 (JC1H1CS, JC3H1AS, JC4H1AS, JC4H2AS, JC6H1AS) and SDG #7 (JC2L1AS).

The laboratory did not perform a solid LCS with these soil samples; rather, they substituted a water LCS (blank spike). This is non-compliant with the site-specific QAPP (Section 10, pg. 10-5) and NYSDEC ASP (9/89) and does not allow for an accurate evaluation of laboratory accuracy for the soil matrices. However, two sets of matrix spikes (on JCSW9BS, a Well Borehole sample and JC2LIAS) were performed with these soil samples. The metals accuracy, therefore, has been based upon the percent recoveries of analytes in these matrix spikes. As no backup information is available due to lack of a solid LCS, it must be stressed that extrapolation of matrix spike data to all samples within this data set may be compromised by sample matrix heterogeneity. This is especially important because one of the matrix spikes used to evaluate accuracy may not be indicative of the matrix of these Named-Site samples (JCSW9BS). Matrix suppression of certain analytes was evident in the matrix spike (MS) analytical results for antimony, lead, and selenium. Though the validated results indicate estimated data (J) for specific sample analytes based upon the division of the sample delivery groups, a conservative approach was taken to extend this estimation to all of the Named-Site soil samples. Therefore, all data for antimony, lead, and selenium should be considered estimated and may be biased low. The lead MS recovery for SDG #3 (JCSW9BS) was listed as 1 %. There is reason to believe, however, that the laboratory may have confiised the sample, sample duplicate, and spiked sample during analysis. The raw data indicate a correction to the sample ID# from the original designation of the analyst. The MS performed on JC2L1AS cannot be used to evaluate lead accuracy because the sample concentration exceeds the spike added concentration by more than a factor of 4. Given that this discrepancy cannot be resolved, the data are considered usable but estimated values. No evaluation of accuracy of manganese could be made because of the high manganese found in the field samples. For both MS performed, the level spiked was too low to quantitate accurately above the indigenous manganese in the sample. All manganese data, therefore, must be considered estimated due to the possibility of uncertainty in the quantitation in the soil matrix.

Overall precision of these samples was good. Laboratory duplicate precision met criteria for all analytes except for calcium and lead. No field replicates were included with this data set. Therefore, field duplicate precision could not be evaluated. Based upon the uncertainty in the quantitation due to laboratory duplicate precision results, all calcium and lead data are usable but estimated values.

Two rinsate blanks (JCQC1TW and JCQC2BW) were associated with all of the soil sampling events. These blanks showed low level contamination of several analytes; however, associated soil data were sufficiently high so that the contamination level was considered negligible. Concurrently, no laboratory blanks showed contamination above the analyte CRDLs. However, the data validator followed Region I Functional Guidelines for the blank action levels. These guidelines are stricter than the Region U guidelines in that they require data to be considered not detected at the level found in the sample for values up to 5 times the level found in the laboratory blank. Therefore, low level laboratory contamination resulted in several sample analytes being considered nondetects (U), with the detection limit raised to the level found in the sample, for barium, beryllium, cadmium, cobalt, sodium, and vanadium. Following Region II guidelines, none of these analytes would have been qualified. Since the reported raised detection limits are still below commonly used ranges for NYSDEC soil cleanup criteria for all analytes, the low level contamination found is insignificant and the data are usable.

In summary, overall precision and accuracy are good. All data are usable with the following qualifications: all antimony and selenium data may be biased low; lead should be considered

estimated due to the possibility of a low bias based upon inconclusive MS results; all manganese data are usable but estimated based on lack of data on accuracy; calcium and lead data are considered estimated results due to the uncertainty in the quantitation based upon poor laboratory duplicate precision.

- Pesticides/PCBs

Two of the test bore soil samples contained pesticides/PCBs (Table O2). Sample JC2LIAS contained 130 ppb of Aroclor 1260 and JC1H1AS contained 24 ppb of gamma-chlordane. The identification of the PCB and the pesticide meets all GC/ECD dual column confirmation criteria as required by NYSDEC ASP, but are at concentrations too low to confirm by GC/MS. All holding times were adhered to, and all analytical QC requirements were met. No problems were noted with the blanks, and spike recoveries were reasonable. All test bore soil pesticide data are usable.

- Semivolatile Organics

The same types of PAH contaminants found in the well borehole soil samples were also found in many of the test bore and hand soil samples (Table J2). Low levels of PAH's were detected in JC261AS and JC3H1AS. High ppb/low ppm PAH concentrations were noted in JC1H1CS and JC6H1AS, and ppm levels were found in JC1H1AS. Again, this suite of PAH's is typical of petroleum contamination.

All holding times and MS tuning criteria were met. Results for GC/MS calibration and internal standards were good. Matrix spike and surrogate spike recoveries were acceptable. Method blank results were good, except for one TIC which was found in sample JC2E1AS and the associated blank. All test bore and hand semivolatile organic soil data are usable.

- Volatile Organics

Other than a trace concentration of methylene chloride in JC1H1AS, there were no volatile organics detected in any of the test bore and hand soil samples (Table D2). Methylene chloride at this level may not be indigenous to the sample, but there is no viable reason for excluding it. All holding times were met and MS tuning criteria was adhered to. A calibration problem was noted for 2-butanone in sample JC1H1CS, thus requiring rejection of the detection limit value for that compound for that sample. Matrix spike and surrogate spike recoveries were acceptable. No blank problems were noted. **Except for 2-butanone in JC1H1CS, all test bore and hand soil volatile organic data are usable.**

**Creek Sediment Samples**

- Metals

Creek sediment sampling consisted of 2 field samples and 1 background sample for a total of 3 samples. The 2 field rinsate blanks associated with the Well Borehole soil samples are also applicable to these sediments. No field replicates were collected with these samples. The samples were taken on 11/17/91 and 11/20/91 and therefore were grouped into a single Sample Delivery Group (SDG #1). Each SDG contains associated matrix and laboratory QC which were reviewed as compared to requirements set forth in the site-specific QAPP, NYSDEC ASP (9/89), and applicable Region II Functional Guidelines for Data Validation (SOP No. HW-2, Revision X, 2/16/90). Table T1 lists the metals validated data for the Creek Sediment Samples. These include the samples associated with SDG #1 (JCSD1AS, JCSD2AS, JCCNSCS).

The laboratory did not perform a solid LCS with these soil samples; rather, they substituted a water LCS (blank spike). This is non-compliant with the site-specific QAPP (Section 10, pg. 10-5) and

NYSDEC ASP (9/89) and does not allow for an accurate evaluation of laboratory accuracy for the soil matrices. Additionally, no matrix spike (MS) was performed on these sediment samples. Therefore, accuracy was evaluated based upon the MS performed with SDG #1 on a Well Borehole sample (JCSW5BS). The metals accuracy, therefore, has been based upon the percent recoveries of analytes in these matrix spikes. As no backup information is available due to lack of a solid LCS, it must be stressed that extrapolation of matrix spike data to all samples within this data set may be compromised by sample matrix heterogeneity. This is especially important because the matrix spike used to evaluate accuracy may not be indicative of the matrix of these Creek Sediments. The percent recovery of the antimony MS (JCSWSBS) for data analyzed with SDG #1 was less than 30%; therefore, the validator rejected the nondetected data associated with this MS. However, the MS for the data associated with SDG #2 recovered at 69% for antimony. Due to the fact that the two available MS % recoveries do not agree, and because no antimony was detected in any of the samples, all antimony data are considered usable as estimated results at the detection limit. Matrix suppression of certain analytes was evident in the matrix spike (MS) analytical results for antimony, arsenic, and thallium. Also, the post-digestion spikes for selenlum indicated a matrix suppression of this analyte for the Creek Sediment samples JCSD1AS and JCSD2AS. Therefore, all data for antimony, arsenic, selenium, and thallium should be considered estimated and may be biased low. No evaluation of accuracy of manganese could be made because of the high manganese found in the field samples. The level spiked for the MS was too low to quantitate accurately above the indigenous manganese in the sample. All manganese data, Therefore, must be considered estimated due to the possibility of uncertainty in the quantitation in the soil matrix.

Overall precision of these samples was good. Laboratory duplicate precision met criteria for all analytes. Per agreement with NYSDEC, no field replicates were included with this data set. Therefore, field duplicate precision could not be evaluated.

Two rinsate blanks (JCQC1TW and JCQC2BW) were associated with all of the soil/sediment sampling events. These blanks showed low level contamination of several analytes; however, associated soil data were sufficiently high so that the contamination level was considered negligible. Concurrently, no laboratory blanks showed contamination above the analyte CRDLs. However, the data validator followed Region I Functional Guidelines for the blank action levels. These guidelines are stricter than the Region II guidelines in that they require data to be considered not detected at the level found in the sample for values up to 5 times the level found in the laboratory blank. Therefore, low level laboratory contamination resulted in several sample analytes begin considered nondetects (U), with the detection limit raised to the level found in the sample, for beryllium and sodium. Following Region II guidelines, none of these analytes would have been qualified. Since the reported raised detection limits are still below commonly used ranges for NYSDEC soil cleanup criteria for these analytes, the low level contamination found is insignificant and the data are usable.

There may be a minor matrix suppression of zinc in these samples as evidenced by a slightly high percent difference (12.4% when criteria is 10%) of the serial dilution result performed with SDG #1. However, this serial dilution was not performed on a Creek Sediment and therefore extrapolation of these results to the sediment matrices is technically questionable. Therefore, no definitive conclusion can be drawn as this discrepancy may be due to individual sample matrix effects.

In summary, overall laboratory precision is good; however, no field replicate was collected and therefore sampling precision and sample heterogeneity could not be evaluated. Accuracy was evaluated using matrix spike information from a Well Borehole sample. All data are usable with the following qualifications: all antimony, arsenic, selenium, and thallium data may be biased low; all manganese data are usabld but estimated based on lack of data on accuracy.

- Pesticides/PCBs

Two of the three creek sediment samples contained aldrin (Table O1). Aldrin was present at 8.8 ppb in JCSD1AS and 18 ppb in JCSD2AS. The identification of aldrin meets all GC/ECD dual column confirmation criteria as required by NYSDEC ASP, but are concentrations too low to confirm by GC/MS. All holding times and analytical QC criteria was met. Surrogate and matrix spike recoveries were good, and no contaminants were noted in the blanks. All creek sediment pesticide data is usable.

- Semivolatile Organics

One of the three creek sediment samples contained PAHs typical of the PAHs found in the well borehole soil samples and the test bore and hand soil samples (Table J1). This may indicate erosion of these materials from the site into the creek.

Holding times were met for all samples but one. Sample JCCNSCS was initially extracted within holding times. GC/MS analysis of the extract indicated poor recoveries for all surrogates. The sample was reextracted well outside of holding times, and thus the data was rejected by ECHEM. However, nothing was detected in either sample, and therefore the data should be considered usable.

All holding times and analytical QC criteria were met, including MS tuning, calibration, and internal standards. Matrix spike and surrogate recoveries were reasonable, as well as blank results. All creek sediment semivolatile organic data are usable.

- Volatile Organics

Except for a trace level of methylene chloride in JCSDS2AS, there were no volatile organic compounds detected in the creek sediments (Table D1). Methylene chloride at this level may not be indigenous to the sample, but there is no viable reason for excluding it. All holding times were met and MS tuning criteria was adhered to. Calibration and internal standard performance was compliant. Matrix spike and surrogate spike recoveries were acceptable. No blank problems were noted. All creek sediment volatile organic data are usable.

**Creek Water Samples**

- Metals

Creek Water sampling consisted of 2 field samples and 1 background sample collected on 11/17/91 and 11/18/91. These samples were grouped with SDG #2. The field blank for water sampling, Bailer blank JCQC3XW, was taken on 11/07/91 and grouped with SDG #1. Each SDG contains associated matrix and laboratory QC which were reviewed as compared to requirements set forth in the site-specific QAPP, NYSDEC ASP (9/89), and applicable Region II Functional Guidelines for Data Validation (SOP No. HW-2, Revision X, 2/16/90). Table S lists the metals validated data for the Creek Water Samples. These include JCCW1AW and JCCW2AW.

All holding times were met and all laboratory and matrix QC criteria were in control for mercury and cyanide. For the furnace metals (antimony, arsenic, lead, selenium, and thallium) all matrix and laboratory specific QC met criteria for accuracy (LCS and Matrix Spike) and precision (laboratory duplicate), with the following minor exception. The post-digestion spike for arsenic for sample JCCW1AW recovered slightly higher than the control limit. However, the sample value was a nondetect; therefore, the datum is usable without qualification. For the ICP analytes (all other metals), all matrix and laboratory QC met criteria for accuracy (LCS and MS recoveries) and precision (laboratory duplicate) for all analytes.

Per agreement with NYSDEC, no field replicates were associated with the Creek Water samples and therefore field precision and sample homogeneity could not be evaluated. This would have been valuable in assessing the validity of the high mercury value (4.9 ug/L) found for sample JCCW2AW.

The single field blank applicable to the groundwater samples, the bailer field blank (JCQC3XW) had no significant levels of contamination compared to the values found in the field samples. Concurrently, no laboratory blanks showed contamination above analyte CRDLs. However, tide data validator followed Region I Functional Guidelines for the blank action levels. These guidelines are stricter than the Region II guidelines in that they require data to be considered not detected at the level found in the sample for values up to 5 times the level found in the laboratory blank. Therefore, low level laboratory contamination resulted in several sample analytes being considered nondetects, with the detection limit raised to the level found in the sample, for barium, beryllium, copper, vanadium, and zinc. Following Region II guidelines, none of these analytes would have been qualified. Since the raised reporting limits for barium, copper, and zinc are all lower than the NYSDEC Class GA Groundwater Standards or Guidance values, the low level contamination found is insignificant. No standards or guidance values have been set for vanadium under NYSDEC.

In summary, all creek water sample data met QA/QC criteria, precision, and accuracy criteria as indicated by laboratory QC, duplicates, and matrix spikes. All data are therefore usable with the caution that no field replicate was collected per agreement with NYSDEC and therefore sampling precision and sample heterogeneity could not be evaluated.

- Pesticides

No pesticides were detected in the creek water samples (Table N). All holding times were met, and all analytical QC criteria were adhered to. No contaminants were noted in the blanks, and surrogate and matrix spike recoveries were acceptable. All creek water pesticide data are usable.

- Semivolatile Organics

No semivolatile organics were detected in the creek water samples. Surrogate and matrix spike results were good. All holding times were met and all analytical QC results were satisfactory. No problems were noted with the associated blanks. All creek water semivolatile organic data are usable.

- Volatile Organics

No volatile organics were detected in any of the creek water samples (Table C). All holding times were met and MS tuning criteria was compliant. The detection limits for 2-butanone, 2-hexanone, and 4-methyl-2-pentanone were rejected by ECHEM due to problems with the continuing calibration. However, the 2 ppb initial calibration standard responses were stable at low levels and the QC check standard recoveries at 5 ppb were within established limits. It is therefore

appropriate to assume that none of these compounds are present in any of the creek water samples at the CRDL, and thus the data is usable.

Some minor problems were noted with slightly high recoveries of the d4-dichloroethane surrogate, which is of no consequence. There were no significant blank contamination problems. All creek water volatile organic data are usable.

**Outfall Samples**

- Metals

Outfall water sampling consisted of 2 field samples collected on 11/23/91 and grouped with SDG #2. The field blank for water sampling, Bailer blank JCQC3XW, was taken on 11/07/91 and grouped with SDG #1. Bach SDG contains associated matrix and laboratory QC which were reviewed as compared to requirements set forth in the site-specific QAPP, NYSDEC ASP (9/89), and applicable Region II Functional Guidelines for Data Validation (SOP No. HW-2; Revision X, 2/16/90). Table S lists the metals validated data for the Creek Water Samples. These include JCOF1AW and JCOF2AW.

All holding times were met and, all laboratory and matrix QC criteria were in control for mercury and cyanide. Note that the validator qualified the cyanide value for JCOF2AW as estimated due to holding time violation. A review of the raw data indicated that the holding time was met for this sample and no qualification is necessary. For the furnace metals (antimony, arsenic, lead, selenium, and thallium) all matrix and laboratory specific QC met criteria for accuracy (LCS and Matrix Spike) and precision (laboratory duplicate), with the following minor exception. The post-digestion spike for arsenic for sample JCOF2AW recovered slightly higher than the control limit. However, the sample value was a nondetect; therefore, the datum is usable without qualification. For the ICP analytes (all other metals), all matrix and laboratory QC met criteria for accuracy (LCS and MS recoveries) and precision (laboratory duplicate) for all analytes.

Per agreement with NYSDEC, no field replicates were associated with the Outfall samples and therefore field precision and sample homogeneity could not be evaluated.

The single field blank applicable to the groundwater samples, the bailer field blank (JCQC3XW) had no significant levels of contamination compared to the values found in the field samples. Concurrently, no laboratory blanks showed contamination above analyte CRDLs. However, the data validator followed Region I Functional Guidelines for the blank action levels. These guidelines are stricter than the Region II guidelines in that they require data to be considered not detected at the level found in the sample for values up to 5 times the level found in the laboratory blank. Therefore, low level laboratory contamination resulted in several sample analytes being considered nondetects, with the detection limit raised to the level found in the sample, for barium, copper, nickel, and zinc. Following Region H guidelines, none of these analytes would have been qualified. Since the raised reporting limits for barium, copper, and zinc are all lower than the NYSDEC Class GA Groundwater Standards or Guidance values, the low level contamination found is insignificant. No standards or guidance values have been set for nlckel under NYSDEC.

In summary, all Outfall water sample data met QA/QC criteria, precision, and accuracy criteria as indicated by laboratory QC, duplicates, and matrix spikes. All data are therefore usable with the caution that no field replicate was collected per agreement with NYSDEC and therefore sampling precision and sample heterogeneity could not be evaluated,

- Pesticides

No pesticides were detected in the outfall water samples (Table N). All holding times were met, and all analytical QC criteria were adhered to. No containinants were noted in the blanks, and surrogate and matrix spike recoveries were acceptable. All outfall water pesticide data are usable.

- Semivolatile Organics

Very trace levels of fiuoranthene, pyrene, chrysene, and bis(2-ethyihexyl)phthalate were detected in one of the three outfall samples JCOF2AW (Table I). All holding times were met, as well as MS tuning, calibration, and internal standard criteria. Surrogate and matrix spike recoveries were good and no problems were noted with the blanks. All outfall water semivolatile organic data are usable.

- Volatile Organics

Trace levels of a few volatile organic compounds were detected in both outfall water samples (Table C). Sample JCOF1AW contained 1,1,1-trichloroethane (0.6 ppb), trichloroethene (0.3 ppb), and bromoform (0.4 ppb); while sample JCOF2AW contained acetone (17 ppb) and trichloroethene (4 ppb). The quantitation of the two compounds in JCOF2AW was estimated (J) due to noncompliant surrogate and matrix spike recoveries. All holding times were met and MS tuning criteria was compliant. The detection limits for 2-butanone, 2-hexanone, and 4-methyl-2-pentanone were rejected by ECHEM due to problems with the containing calibration; however, the 2 ppb initial calibration standard responses were stable at low levels and the QC check standard recoveries at 3 ppb were within established limits. It is therefore appropriate to assume that none of these compounds are present in any of the outfall water samples at the CRDL, and thus the data is usable. All outfall water volatile organic data are usable.

In summary, the analytical chemistry program conducted for the AFB 59, Johnson City site investigation is very solid. All data, with some qualifications, were found to be usable. If you have any questions about this report, please do not hesitate to contact me.

Sincerely,

GRADIENT CORPORATION

A. Dallas Wait, Ph.D.
Director, Chemistry Division

Enclosures

# Appendix B: Well Data and Lithological Logs

## Appendix B-1: Lithological Logs

## Appendix B-2: Well Completion Record

# Appendix B-1:

# Lithological Logs

# TEST BORING LOG — ARGONNE NATIONAL LABORATORY — PAGE 1

**BORING NO.:** DW1 **PROJECT:** AFP#59 IRP SI **DATE:** 11/22/91

| | | | | | |
|---|---|---|---|---|---|
| PROJECT NO: | 91230 | DRILLER: | MARCOR | DRILLING BIT: | 8 1/4" & 6 1/4" |
| LOCATION: | Johnson City, NY | RIG TYPE: | Centerra CT 350 | GROUND ELEVATION: | 631.83' |
| INSPECTOR: | Joseph Hau | METHOD: | HSA & Driven Steel Casing | SAMPLING METHOD: | 24" Split Spoon |
| WELL TYPE: | 4" PVC | SCREEN LENGTH: | 10.0' | PROTOP WIDTH/TYPE | 6" St-up Lock Steel |
| WELL DEPTH: | 61.5' | GROUT LENGTH/TYPE: | 43.5' / 10:90 Bent:Cemt Mix | PAD ELEVATION: | 631.83' |
| SCREEN: | 4" Cont. Wound PVC | SEAL LENGTH/TYPE: | 5' / Bentonite | TOC ELEVATION | 634.57' |
| SLOT SIZE: | 0.010 | FILTER LENGTH/TYPE: | 13' / No. 2 Sand | STICK UP/DOWN: | 2.74' |

| DEPTH | SAMPLE COLLECTION DATA: SAMPLE NUMBER | HNU (PPM) | STP TEST BLOWS / 6" | REC (in.) | DESCRIPTION | DEPTH |
|---|---|---|---|---|---|---|
| 4" | | 0 | | | Asphalt (Begin 11-21-91 at 0600 hour) | |
| 2 | | 0 | 8/8/32 | 6" | Brown and grey gravel, some fine to coarse sand, trace silt and clay | |
| 4 | | 0 | 10/4/5/7 | 24" | Brown fine sand and silt, trace clay | |
| 6 | 1 | 0 | 11/7/8/9 | 24" | SAB | 5 |
| 8 | | 0 | 3/4/6/7 | 24" | SAB | |
| 10 | 2/CHEM | 0 | 5/9/10/10 | 18" | 8 – 9' SAB (3" split spoon)<br>9'-10' Brown fine to coarse sand, trace silt and clay | 10 |
| 12 | | 0 | 2/5/5/7 | 6" | 10'-11.5' SAB<br>11.5'-12' Brown fine to coarse sand and gravel trace silt | |
| 14 | | 0 | 1/4/5/7 | 6" | SAB, trace clay | |
| 16 | | 0 | 5/4/10/9 | 12" | SAB | 15 |
| 18 | 3 | 0 | 1/2/1/5 | 18" | Brown fine to coarse sand, trace gravel | |
| 20 | CHEM | 0 | 12/15/19/17 | 12" | SAB, some gravel (3" split spoon) | 20 |
| 22 | SA-1 | 0 | 4/10/11/17 | 6" | Brown fine to coarse sand and gravel | |
| 24 | | 0 | 4/8/16/21 | 12" | SAB | |
| 28 | | | | | | 25 |
| 30 | | 0 | 9/13/15/36 | 12" | SAB | 30 |

PROPORTIONS USED: TRACE = 0-10%, LITTLE = 10-20%, SOME 20-35%, AND = 35-50%

| TEST BORING LOG | ARGONNE NATIONAL LABORATORY | PAGE 2 |
|---|---|---|

| BORING NO.: DW1 | PROJECT: AFP#59 IRP SI | DATE: 11/22/91 |
|---|---|---|

| DEPTH | SAMPLE COLLECTION DATA: SAMPLE NUMBER | HNU (PPM) | STP TEST BLOWS / 6" | REC (in.) | DESCRIPTION | DEPTH |
|---|---|---|---|---|---|---|
| 33 | | | | | | |
| 35 | | 0 | 4/5/23/26 | 6" | SAB | 35 |
| 38 | | | | 0" | 38' No sample, heaving sands in casing. Brown coarse sand and fine gravel cuttings. | |
| 43 | 4 | | | 0" | 43' Heaving sands in casing. SAB cuttings. | 40 |
| 48 | | | | 0" | 48' Heaving sands, SAB cuttings. (End 1700 hour) | 45 |
| 53 | 5 | | | 0" | 53' Heaving sands in casing. Brown, medium to coarse sand and fine gravel cuttings. (Begin 0600 hour, 11/22/91) | 50 |
| 58 | | | | | 58' Heaving sands in casing. Brown medium to coarse sand and fine gravel cuttings | 55 |
| 60 | | | | | | 60 |
| 62.5 | | | | | 62.5' Heaving sands in casing. SAB cuttings. cuttings<br>Roller bit refused at 62.5' – Boulder likely. | |
| 65 | | | | | Boring terminated at 62.5'.<br>Alternating layers of coarse sand and gravel from 38' to 62.5'.<br>(Water at 19.84 bgs) (End 1030 hour) | 65 |

PROPORTIONS USED: TRACE = 0–10%, LITTLE = 10–20%, SOME 20–35%, AND = 35–50%

# TEST BORING LOG — ARGONNE NATIONAL LABORATORY — PAGE 1

| | | | | | |
|---|---|---|---|---|---|
| BORING NO.: | DW3 | PROJECT: | AFP #59 IRP SI | | DATE: 11/8/91 |
| PROJECT NO: | 91230 | DRILLER: | MARCOR | DRILLING BIT: | 14 1/4" & 6 1/4" |
| LOCATION: | Johnson City, NY | RIG TYPE: | Centerra CT 350 | GROUND ELEVATION: | 829.42' |
| INSPECTOR: | Joseph Hau | METHOD: | HSA & Driven Steel Casing | SAMPLING METHOD: | 24" Split Spoon |
| WELL TYPE: | 4" PVC | SCREEN LENGTH: | 20' | PROTOP WIDTH/TYPE | 10" Flush Manhole |
| WELL DEPTH: | 68.0' | GROUT LENGTH/TYPE: | 59.5' / 10:90 Bent:Cemt Mix | PAD ELEVATION: | 829.41' |
| SCREEN: | 4" Cont. Wound PVC | SEAL LENGTH/TYPE: | 5' / Bentonite | TOC ELEVATION | 829.04' |
| SLOT SIZE: | 0.010 | FILTER LENGTH/TYPE: | 23.5' / No. 2 Sand | STICK UP/DOWN: | −0.38' |

| DEPTH | SAMPLE COLLECTION DATA: SAMPLE NUMBER | HNU (PPM) | STP TEST BLOWS / 6" | REC (in.) | DESCRIPTION | DEPTH |
|---|---|---|---|---|---|---|
| | | 0 | | | Asphalt (begin 11−5−91 at 1230 hour) | |
| 2 | | NSNO | 26/32/45 | 6" | Gravel cobble fill and brown sand, silt. (Note: HNu inoperable – screened by color and odor. No Stain, No odor "NSNO") | |
| 4 | | NSNO | 12/0/9/7 | 6" | SAB | |
| | | | | | SAB | 5 |
| 6 | 1 | NSNO | 9/4/3/10 | 12" | Moist, dark brown, fine sand and gravel, trace silt and clay. | |
| 8 | 2 | NSNO | 15/34/29/28 | 12" | Moist, dark brown, fine to coarse sand and gravel. | |
| 10 | 2 | NSNO | 14/32//30/38 | 12" | SAB | 10 |
| 12 | SA 1a | NSNO | 46/50/70/74 | 12" | SAB (3" spoon) | |
| 14 | SA 1b | NSNO | 15/28/14/18 | 24" | SAB | |
| 16 | SA 1c | NSNO | 7/23/34/43 | 12" | SAB | 15 |
| 18 | SA 1d | NSNO | 14/29/34/50 | 12" | SAB | |
| 20 | | NSNO | 50/Ref. | 0" | SAB wet spoon (First water at 18') | 20 |
| 22 | cutting | NSNO | 80/100/ref. | 0" | SAB, wet (3" split spoon) | |
| 24 | cutting | NSNO | 30/65/47/33 | 0" | SAB (3" spoon) | |
| 26 | cutting | NSNO | 12/13/13/23 | 6" | SAB (3" spoon) | 25 |
| 28 | cutting | NSNO | 18/12/14/43 | 6" | SAB (3" spoon) (End 1730 hour) | |
| | cutting | 0 | 18/12/14/43 | 6" | SAB (Begin 11−06−91 at 0600 hour) | 30 |

PROPORTIONS USED: TRACE = 0−10%, LITTLE = 10−20%, SOME 20−35%, AND = 35−50%

| TEST BORING LOG | ARGONNE NATIONAL LABORATORY | PAGE 2 |
|---|---|---|

| BORING NO.: DW3 | PROJECT: AFP#59 IRP SI | DATE: 11/8/91 |
|---|---|---|

| DEPTH | SAMPLE COLLECTION DATA: SAMPLE NUMBER | HNU (PPM) | STP TEST BLOWS / 6" | REC (in.) | DESCRIPTION | DEPTH |
|---|---|---|---|---|---|---|
| 33 | cutting | | | | | |
| 35 | 3<br>4 | 0 | 3/5/7/13 | 24" | 33' – 34.5' SAB<br>34.5' – 35' Wet, gray, fine sand, little silt, trace clay | 35 |
| 38 | | | | | | |
| 40 | 5 | 0 | 4/4/9/17 | 24" | Wet, gray, fine sand and silt, little clay (Grout 8" casing in at 40')<br>(End 1438 hour) | 40 |
| 43 | | | | | | |
| 45 | 5 | 0 | 4/5/9/13 | 24" | (Begin 11/7/91 at 0600 hour. Drive and wash 6" casing.)<br>SAB, trace clay | 45 |
| 48 | | | | | | |
| 50 | 6 | 0 | 27/17/16/16 | 12" | Wet, gray coarse sand, little gravel | 50 |
| 55 | 7 | 0 | 16/14/19/36 | 12" | 53'–54.75' Gray, fine sand and silt, little clay.<br>54.75'–55' Gray, fine to coarse sand, some silt, trace gravel. | 55 |
| 58 | | | | | | |
| 60 | | 0 | 15/28/26/30 | 12" | Gray, fine sand and silt, little clay | 60 |
| 63 | | | | | | |
| 65 | | 0 | 15/14/20/24 | 24" | SAB | 65 |

PROPORTIONS USED: TRACE = 0–10%, LITTLE = 10–20%, SOME 20–35%, AND = 35–50%

| TEST BORING LOG | ARGONNE NATIONAL LABORATORY | PAGE 3 |
|---|---|---|

| BORING NO.: DW3 | PROJECT: AFP #59 IRP SI | DATE: 11/8/91 |
|---|---|---|

| DEPTH | SAMPLE COLLECTION DATA: SAMPLE NUMBER | HNU (PPM) | STP TEST BLOWS / 6" | REC (in.) | DESCRIPTION | DEPTH |
|---|---|---|---|---|---|---|
| 68 | | | | | | |
| 70 | | 0 | 16/20/25/27 | 12" | Gray coarse sand and gravel trace silt (gravel are shale fragments) (Note; Hard to rollerbit) | 70 |
| 73 | | | | | | |
| 75 | 8 | 0 | 60/ref | 6" | SAB (End 17:00) | 75 |
| 78 | | | | | | |
| 80 | 9 | NSNO | 64/ref | 6" | Gray, angular gravel (Begin 11-08-91 at 0600) | 80 |
| 83 | | | | | | |
| 85 | | NSNO | ref/ | 0" | SAB | 85 |
| 86 | | | | | | |
| 88 | | NSNO | ref/ | 0" | SAB | |
| | | | | | Boring terminated at 88' (Water level in well after completion is 19.07' bgs) (End 1200 hour) | 90 |
| | | | | | | 95 |
| | | | | | | 100 |

PROPORTIONS USED: TRACE = 0-10%, LITTLE = 10-20%, SOME 20-35%, AND = 35-50%

# TEST BORING LOG — ARGONNE NATIONAL LABORATORY — PAGE 1

| | | | |
|---|---|---|---|
| BORING NO.: DW4 | PROJECT: AFP #59 IRP SI | | DATE: 11/25/91 |
| PROJECT NO.: 91230 | DRILLER: MARCOR | DRILLING BIT: 14 1/4" & 6 1/4" | |
| LOCATION: Johnson City, NY | RIG TYPE: Cantera CT 350 | GROUND ELEVATION: 829.05' | |
| INSPECTOR: Joseph Hau | METHOD: HSA & Driven Steel Casing | SAMPLING METHOD: 24" Split Spoon | |
| WELL TYPE: 4" PVC | SCREEN LENGTH: 20' | PROTOP WIDTH/TYPE: 10" Flush Manhole | |
| WELL LENGTH: 85.0' | GROUT LENGTH/TYPE: 57' / 10:90 Bent:Cemt Mix | PAD ELEVATION: 829.10' | |
| SCREEN: 4" Cont. Wound PVC | SEAL LENGTH/TYPE: 5' / Bentonite | TOC ELEVATION 828.78' | |
| SLOT SIZE: 0.010 | FILTER LENGTH/TYPE: 23' / No. 2 Sand | STICK UP/DOWN: −0.27 | |

| DEPTH | SAMPLE COLLECTION DATA: SAMPLE NUMBER | HNU (PPM) | STP TEST BLOWS / 6" | REC (in.) | DESCRIPTION | DEPTH |
|---|---|---|---|---|---|---|
| 4" | | | 12/9/9 | 8" | Asphalt (Begin 11−23−91 at 0845 hour) | |
| 2' | | 0 | 3/3/4/5 | 6" | Yellowish−brown, sandy gravel fill | |
| 4' | | 0 | 7/14/10/11 | 6" | Brown fine to coarse sand and gravel, trace silt | |
| 6' | | 0 | 7/14/10/11 | 6" | SAB | 5 |
| 8' | 1 | 0 | 7/8/11/9 | 8" | SAB | |
| 10 | | 0 | 3/11/21/24 | 6" | SAB | 10 |
| 12 | | 0 | 14/14/12/12 | 6" | SAB, moist | |
| 14 | | 0 | 5/7/9/11 | 6" | SAB, wet at ~ 13' | |
| 16 | 2 | 0 | 10/8/8/10 | 12" | 14' − 15' SAB<br>15' − 16' Brown fine sand and silt, little clay | 15 |
| 18 | 3 | 60 | 4/3/5/10 | 18" | SAB, trace clay | |
| 20 | | | 3/3/4/8 | 24" | SAB | 20 |
| 23 | | | | | | |
| 25 | 4 | 0 | 1/2/2/4 | 18" | Gray fine sand and silt, trace clay | 25 |
| 28 | | | | | | |
| 30 | | 0 | 1/1/2/3 | 18" | SAB, little clay | 30 |

PROPORTIONS USED: TRACE = 0−10%, LITTLE = 10−20%, SOME 20−35%, AND = 35−50%

| TEST BORING LOG | ARGONNE NATIONAL LABORATORY | PAGE 2 |
|---|---|---|

| BORING NO.: DW4 | PROJECT: AFP #59 IRP SI | DATE: 11/25/91 |
|---|---|---|

| DEPTH | SAMPLE COLLECTION DATA: SAMPLE NUMBER | HNU (PPM) | STP TEST BLOWS / 6" | REC (in.) | DESCRIPTION | DEPTH |
|---|---|---|---|---|---|---|
| 33 | | | | | | |
| 35 | | 0 | 1/3/3/6 | 18" | SAB (8" casing set at 35') (End 1130 hour) | 35 |
| 38 | | | | | | |
| 40 | 5 | 0 | 15/16/31/28 | 12" | (Begin 11–24–91 at 0600) (Water at 21.3)<br>Brown fine to coarse sand, little gravel, trace silt, 1–2 mm clay layers, up to 1" silt layers. (4" spoon) | 40 |
| 43 | | | | | | |
| 45 | 6 | 0 | 10/12/22/32 | 8" | SAB (4" spoon.) | 45 |
| 48 | | | | 0 | 48' Five feet of heaving sand and gravel. No recovery, large gravel felt by driller under rollerbit | |
| 53 | | | | 0 | 53' Six feet of heaving sand and gravel in casing. No recovery. Brown coarse sand and fine gravel cuttings. Large gravel felt by bit. | 50 |
| 58 | | | | 0 | 58' Twelve feet of heaving sand and gravel in casing. No recovery. Brown coarse sand and fine gravel cuttings, large gravel felt by bit. | 55 |
| 63 | | | | 0 | 63' Twelve feet of heaving sand and gravel in casing. No recovery. Brown coarse sand and fine gravel cuttings, large gravel felt by bit. | 60 |
| 65 | | | | | | 65 |

PROPORTIONS USED: TRACE = 0–10%, LITTLE = 10–20%, SOME 20–35%, AND = 35–50%

| TEST BORING LOG | ARGONNE NATIONAL LABORATORY | PAGE 3 |
|---|---|---|

BORING NO.: DW4 | PROJECT: AFP#59 IRP SI | DATE: 11/25/91

| DEPTH | SAMPLE COLLECTION DATA: SAMPLE NUMBER | HNU (PPM) | STP TEST BLOWS / 6" | REC (in.) | DESCRIPTION | DEPTH |
|---|---|---|---|---|---|---|
| 68 | 7 | | | 0 | 68' Nine and one-half feet of heaving sand in casing, gray coarse sand and fine gravel cuttings. No large gravel felt. | |
| 73 | 8 | | | 0 | 73' Nine feet of heaving sand in casing. Gray, slightly finer sands in cuttings. No large gravel felt. (End 1700 hour) | 70 |
| | | | | | (Begin 11-25-91 at 0600) (Water at 14.3') | 75 |
| 78 | | | | 0 | 78' Eight feet of heaving sand in casing. Gray coarse sand and fine gravel in cuttings. No large gravel felt. | |
| 83 | 9 | | | | 83' Seven feet of heaving sands in casing. Gray coarse sand and fine gravel cuttings. No large gravel felt. | 80 |
| 88 | | | | | 88' Eight feet of heaving sands in casing. Gray coarse sand and fine gravel cuttings. Large gravel felt at 87.5' | 85 |
| 92.5 | | | | Ref | 92.5' SAB, large gravel and likely shale bedrock (refusal of rollerbit) | 90 |
| | | | | | Boring terminated at 92.5' (End 1200 hour) (water level at 19.5 bgs) | 95 |
| | | | | | | 100 |

PROPORTIONS USED: TRACE = 0-10%, LITTLE = 10-20%, SOME 20-35%, AND = 35-50%

# TEST BORING LOG — ARGONNE NATIONAL LABORATORY — PAGE 1

| | | | | | |
|---|---|---|---|---|---|
| BORING NO.: | DW5 | PROJECT: AFP #59 IRP SI | | | DATE: 11/19/91 |
| PROJECT NO.: | 91230 | DRILLER: | MARCOR | DRILLING BIT: | 14 1/4" & 6 1/4" |
| LOCATION: | Johnson City, NY | RIG TYPE: | Centerra CT 350 | GROUND ELEVATION: | 836.24' |
| INSPECTOR: | Joseph Hau | METHOD: | HSA & Driven Steel Casing | SAMPLING METHOD: | 24" Split Spoon |
| WELL TYPE: | 4" PVC | SCREEN LENGTH: | 10' | PROTOP WIDTH/TYPE | 10" Flush Manhole |
| WELL LENGTH: | 83' | GROUT LENGTH/TYPE: | 65' / 10:90 Bent:Cemt Mix | PAD ELEVATION: | 836.24' |
| SCREEN: | 4" Cont. Wound PVC | SEAL LENGTH/TYPE: | 5' / Bentonite | TOC ELEVATION | 835.97 |
| SLOT SIZE: | 0.010 | FILTER LENGTH/TYPE: | 13' / No. 2 Sand | STICK UP/DOWN: | −0.27 |

| DEPTH | SAMPLE COLLECTION DATA: SAMPLE NUMBER | HNU (PPM) | STP TEST BLOWS / 6" | REC (in.) | DESCRIPTION | DEPTH |
|---|---|---|---|---|---|---|
| 4" | | 0 | | | Asphalt (Begin 11−17−91 at 1225 hour) | |
| 2 | | 0 | 7/6/5 | 8" | Brown fine to coarse sand, some gravel fill | |
| 4 | | | | | | |
| 6 | 1 | 0 | 3/2/2/1 | 16" | Brown fine to medium sand, some silt, trace clay and gravel | 5 |
| 8 | | | | | | |
| 10 | SA 1 | 0 | 10/6/6/10 | 0 | Brown fine to coarse sand and gravel, trace silt, moist. (Used four−3" spoons for 4 qt. recovery) | 10 |
| 12 | | | | | | |
| 14 | 2 | 0 | 12/20/20/25 | 18" | SAB | |
| 16 | | | | | | 15 |
| 18 | | 0 | 3/5/3/2 | 12" | SAB | |
| 22 | | 0 | 9/10/7/9 | 4" | SAB, wet at tip | 20 |
| 24 | | | | | | |
| 26 | 3 / 4 | 0 | 3/2/1/4 | | Wet, brown grading to gray, fine sand and silt, some clay | 25 |
| 28 | | | | | | |
| | | 0 | 3/1/2/3 | 18" | SAB | 30 |

PROPORTIONS USED: TRACE = 0−10%, LITTLE = 10−20%, SOME 20−35%, AND = 35−50%

| TEST BORING LOG | ARGONNE NATIONAL LABORATORY | PAGE 2 |
|---|---|---|

| BORING NO.: DW5 | PROJECT: AFP#59 IRP SI | DATE: 11/19/91 |
|---|---|---|

| DEPTH | SAMPLE COLLECTION DATA: SAMPLE NUMBER | HNU (PPM) | STP TEST BLOWS / 6" | REC (in.) | DESCRIPTION | DEPTH |
|---|---|---|---|---|---|---|
| 35 | | | | | | 35 |
| 37 | 5 | 0 | 2/1/2/4 | 24" | SAB (Set 8" casing at 35') (end 1535 hour) (Begin 11-18-91 at 0700 hour) (Drive 6" casing) | |
| 38 | | | | | | |
| 40 | 6 | 0 | 0.3828571 | 12' | 38' – 39.5' Wet, gray fine to coarse sand, trace gravel and silt. | 40 |
| | | | | | 39.5 – 40' Wet, gray fine sand and silt, little clay. | |
| 43 | | | | | | |
| 45 | 7 | 0 | 4/5/7/9 | 24" | SAB, some brown streaks | 45 |
| 48 | | | | | | |
| 50 | | | 13/11/15/15 | 0 | No recovery | 50 |
| 53 | | | | | | |
| | | | | | 53' – 53.5' Wet, coarse gray sand, trace silt and clay | |
| 55 | 8 | 0 | 10/12/16/18 | | 53.5' – 55' Wet, gray fine sand and silt, trace clay. | 55 |
| 58 | | | | | | |
| 60 | 9 | 0 | 16/19/17/17 | 18" | Wet, fine to coarse gray sand, little silt, trace clay. | 60 |
| 63 | | | | | | |
| 65 | 10 / 11 | 0 | 11/13/15/20 | 24" | Wet, brownish gray fine sand, some silt, little clay. | 65 |

PROPORTIONS USED: TRACE = 0–10%, LITTLE = 10–20%, SOME 20–35%, AND = 35–50%

| TEST BORING LOG | ARGONNE NATIONAL LABORATORY | PAGE 3 |
|---|---|---|

| BORING NO.: DW5 | PROJECT: AFP#59 IRP SI | DATE: 11/19/91 |
|---|---|---|

| DEPTH | SAMPLE COLLECTION DATA: SAMPLE NUMBER | HNU (PPM) | STP TEST BLOWS / 6" | REC (in.) | DESCRIPTION | DEPTH |
|---|---|---|---|---|---|---|
| 68 | | | | | | |
| 70 | | 0 | 12/16/20/25 | 24" | SAB (End 1730 hours) | 70 |
| 73 | | | | | | |
| 75 | --- 12 | 0 | 6/20/31/33 | 18" | (Begin 11-19-91 at 0600 hours) SAB Gray, fine to coarse sand, some gravel, trace silt and clay (shale fragments) | 75 |
| 78 | | | | | | |
| 80 | SA 2 | 0 | 35/39/43/39 | 18" | Gray, fine to coarse sand and angular gravel, trace silt and clay. | 80 |
| 83 | | | | | | |
| 83.5 | | | 100/R | 6" | Hard pan. Compact glacial till, gray, equal amounts of fine to coarse sand, gravel, silt and clay. Refusal of rollerbit (shale?) at 83.5' | |
| | | | | | (Boring terminated at 83.5') (Water level at 25.26 bgs) (End 1123 hour) | 85 |
| | | | | | | 90 |
| | | | | | | 95 |
| | | | | | | 100 |

PROPORTIONS USED: TRACE = 0-10%, LITTLE = 10-20%, SOME 20-35%, AND = 35-50%

# TEST BORING LOG — ARGONNE NATIONAL LABORATORY — PAGE 1

**BORING NO.:** DW6 **PROJECT:** AFP#59 IRP SI **DATE:** 11/16/91

| | | | | | |
|---|---|---|---|---|---|
| PROJECT NO: | 91230 | DRILLER: | MARCOR | DRILLING BIT: | 14 1/4" & 6 1/4" |
| LOCATION: | Johnson City, NY | RIG TYPE: | Centerra CT 350 | GROUND ELEVATION: | 828.95' |
| INSPECTOR: | Joseph Hau | METHOD: | HSA & Driven Steel Casing | SAMPLING METHOD: | 24" Split Spoon |
| WELL TYPE: | 4" PVC | SCREEN LENGTH: | 10' | PROTOP WIDTH/TYPE | 10" Flush Manhole |
| WELL LENGTH: | 66.5' | GROUT LENGTH/TYPE: | 46.5' / 10:90 Bent:Cemt Mix | PAD ELEVATION: | 828.97' |
| SCREEN: | 4" Cont. Wound PVC | SEAL LENGTH/TYPE: | 5' / Bentonite | TOC ELEVATION | 828.51' |
| SLOT SIZE: | 0.010 | FILTER LENGTH/TYPE: | 13 / No. 2 Sand | STICK UP/DOWN: | −0.44' |

| DEPTH | SAMPLE COLLECTION DATA: SAMPLE NUMBER | HNU (PPM) | STP TEST BLOWS / 6" | REC (in.) | DESCRIPTION | DEPTH |
|---|---|---|---|---|---|---|
| 4" | | | | | Asphalt (Begin 11−13−91 at 0600 hours) | |
| 2 | 1 | 0 | 13/11/10 | 6" | 4"−1.5' gravel fill<br>1.5'−2' Brown, fine to coarse sand and silt, trace clay | |
| 4 | | | 6/7/5/6 | 0 | Brown, fine to coarse sand and gravel, trace silt (noted from cuttings) | |
| 6 | | 0 | 5/8/26/28 | 6" | SAB | 5 |
| 8 | 2 | 0 | 5/12/15/19 | 12" | SAB | |
| 10 | | 0 | 5/7/7/30 | 12" | SAB, moist | 10 |
| 12 | | 0 | 13/15/19/16 | 12" | SAB, thin, wet layer at 13' | |
| 14 | | 0 | 9/5/5/5 | 12" | SAB | |
| 16 | | 0 | 15/45/21/22 | 0 | SAB | 15 |
| 18 | | 0 | 9/9/6/7 | 6" | SAB | |
| 20 | | 0 | 5/9/12/14 | 12" | SAB | 20 |
| 23 | | | | | | |
| 25 | 3 | 0 | 7/4/13/12 | 6" | Wet, brown, fine to coarse sand and gravel.<br>(Augers walking west, hard obstruction at 25') (End 1650 hour) | 25 |
| 27 | 4 | 0 | 25/14/12/8 | 24" | (Begin 11−14−91 at 0600 hours) (Water at 22')<br>Wet, brown fine sand and silt, little clay. | |
| 30 | 5 | 0 | cuttings | | Wet, gray very fine sand and silt, little clay (cuttings) | 30 |

PROPORTIONS USED: TRACE = 0−10%, LITTLE = 10−20%, SOME 20−35%, AND = 35−50%

| TEST BORING LOG | ARGONNE NATIONAL LABORATORY | PAGE 2 |
|---|---|---|

| BORING NO.: DW6 | PROJECT: AFP#59 IRP SI | DATE: 11/16/91 |
|---|---|---|

| DEPTH | SAMPLE COLLECTION DATA: SAMPLE NUMBER | HNU (PPM) | STP TEST BLOWS / 6" | REC (in.) | DESCRIPTION | DEPTH |
|---|---|---|---|---|---|---|
| 33 | | | | | | |
| 35 | 5 | 0 | cuttings | | SAB (6" casing set at 36') (End 1200 hours) | 35 |
| 38 | | | | | | |
| | | | | | (Begin 11-15-91 at 0600 hours) (Drive 6" casing) | |
| 40 | 6 | 0 | 5/6/11/14 | 24" | SAB, trace clay | 40 |
| 43 | | | | | | |
| 46 | ST 1 | 0 | | 20"/36" | SAB, little clay | 45 |
| 48 | | | | | | |
| 50 | | 0 | 6/8/14/21 | 24" | SAB | 50 |
| 53 | | | | | | |
| 55 | 7 | 0 | 9/11/15/22 | 12" | SAB | 55 |
| 58 | | | | | | |
| 60 | 8 | 0 | 35/30/12/12 | 18" | 58' - 59' Gray, fine to coarse sand and gravel, trace silt and clay<br>59' - 60' Gray, fine sand and silt, trace clay | 60 |
| 63 | | | | | | |
| 65 | | 0 | 11/12/14/25 | 18" | 63'-64' Gray, fine to coarse sand and gravel, trace silt and clay<br>64'-65' Gray, fine sand and silt, trace clay | 65 |

PROPORTIONS USED: TRACE = 0-10%, LITTLE = 10-20%, SOME 20-35%, AND = 35-50%

| TEST BORING LOG | ARGONNE NATIONAL LABORATORY | PAGE 3 |
|---|---|---|

| BORING NO.: DW6 | PROJECT: AFP#59 IRP SI | DATE: 11/16/91 |
|---|---|---|

| DEPTH | SAMPLE COLLECTION DATA: SAMPLE NUMBER | HNU (PPM) | STP TEST BLOWS / 6" | REC (in.) | DESCRIPTION | DEPTH |
|---|---|---|---|---|---|---|
| 68 | | | | | | |
| 70 | | 0 | 2/2/7/12 | 24" | SAB, small brown streaks | 70 |
| 73 | | | | | | |
| 75 | | 0 | 9/14/25/29 | 24" | SAB | 75 |
| 78' | | | | | | |
| 80 | 9 | 0 | 12/16/26/27 | 24" | Gray, fine sand and silt, little clay | 80 |
| 83 | | | | | | |
| 85 | | 0 | 12/16/22/32 | 24" | SAB (End 1700 hours) | 85 |
| | | | | | (Begin 11-16-91 at 0600 hour) (Water level at 17.5') | |
| 86.5 | | | | | Refusal of rollerbit | |
| | | | | | Boring terminated at 86.5', (Water level in well post completion is ~ 21') (End 0645 hours) | 90 |
| | | | | | | 95 |
| | | | | | | 100 |

PROPORTIONS USED: TRACE = 0-10%, LITTLE = 10-20%, SOME 20-35%, AND = 35-50%

| TEST BORING LOG | ARGONNE NATIONAL LABORATORY | PAGE 1 |
|---|---|---|

| BORING NO.: DW8 | PROJECT: AFP #59 IRP SI | DATE: 11/3/91 |
|---|---|---|

| | | | | | |
|---|---|---|---|---|---|
| PROJECT NO: | 91230 | DRILLER: | MARCOR | DRILLING BIT: | 14 1/4" & 6 1/4" |
| LOCATION: | Johnson City, NY | RIG TYPE: | Cantera CT 350 | GROUND ELEVATION: | 830.20' |
| INSPECTOR: | Joseph Hau | METHOD: | HSA & Driven Steel Casing | SAMPLING METHOD: | 24" Split Spoon |
| WELL TYPE: | 4" PVC | SCREEN LENGTH: | 20' | PROTOP WIDTH/TYPE: | 10" Flush Mount |
| WELL LENGTH: | 93' | GROUT LENGTH/TYPE: | 65' | PAD ELEVATION: | 830.20' |
| SCREEN: | 4" Cont. Wound PVC | SEAL LENGTH/TYPE: | 5.5' / Bentonite | TOC ELEVATION | 828.70' |
| SLOT SIZE: | 0.010 | FILTER LENGTH/TYPE: | 22.5' / No. 2 Sand | STICK UP/DOWN: | -0.50' |

| DEPTH | SAMPLE COLLECTION DATA: SAMPLE NUMBER | HNU (PPM) | STP TEST BLOWS / 6" | REC (in.) | DESCRIPTION | DEPTH |
|---|---|---|---|---|---|---|
| | | | | | Asphalt (Begin 10-31-91 at 1239 hour) | |
| 2 | 1 | 0 | 8/16/20 | 6" | Brownish black gravel and sand fill, unsaturated (2" cobbles) | |
| 4 | 1 | 0 | 17/20/25/15 | 12" | 2' - 3' Brown gravel and sand fill, unsaturated<br>3.5' - 4' Brown sand and silt, trace organics | |
| 6 | 2 | 0 | 11/8/3/9 | 24" | Gray, fine sand, some silt, trace gravel and clay | 5 |
| 8 | 3 | 0 | 6/3/4/5 | 24" | Gray, fine sand, some silt, some clay, trace gravel | |
| 10 | 4 | 0 | 0/1/2/2 | 24" | 8' - 9.5' Gray, fine sand, some silt and clay, trace gravel<br>9.5' - 10' Moist, brown, fine sand and silt, trace clay | 10 |
| 12 | 4 | 0 | 0/1/2/4 | 24" | Moist, mottled, brown/gray, fine sand and silt, little clay<br>12'-13' SAB | |
| 14 | 5 | 0 | 2/2/3/6 | 18" | 13'-14' Wet, brown, coarse sand and gravel | |
| 16 | 5 | 0 | 3/5/3/2 | 24" | SAB | 15 |
| 18 | 6 | 0 | 1/2/3/4 | 24" | SAB | |
| 20 | 6 | 0 | 7/7/6/5 | 6" | SAB | 20 |
| 22 | 6 | 0 | 3/4/6/8 | 6" | Wet, gray sand and gravel | |
| 24 | 7 | 0 | 8/2/4/6 | 24" | Wet, gray, fine sand and silt, trace clay | |
| 26 | 7 | 0 | 2/3/3/5 | 24" | SAB | 25 |
| 28 | 7 | 0 | 0/2/3/6 | 24" | SAB | |
| 30 | 7 | 0 | 0/3/4/7 | 24" | SAB | 30 |

PROPORTIONS USED: TRACE = 0-10%, LITTLE = 10-20%, SOME 20-35%, AND = 35-50%

| TEST BORING LOG | ARGONNE NATIONAL LABORATORY | PAGE 2 |
|---|---|---|

| BORING NO.: DW8 | PROJECT: AFP#59 IRP SI | DATE: 11/3/91 |
|---|---|---|

| DEPTH | SAMPLE COLLECTION DATA: SAMPLE NUMBER | HNU (PPM) | STP TEST BLOWS / 6" | REC. (in.) | DESCRIPTION | DEPTH |
|---|---|---|---|---|---|---|
| 32 | 7 | 0 | 4/2/5/4 | 24" | SAB | |
| 34 | 7 | 0 | 2/6/8/10 | 24" | SAB | |
| 36 | 7 | 0 | 7/9/9/10 | 24" | Wet, gray, fine sand and silt, little clay | 35 |
| 38 | 7 | 0 | 1/3/3/5 | 24" | SAB | |
| 40 | 7 | 0 | 11/9/7/5 | 24" | SAB (End 1730 hours) | 40 |
| 43 | DW8 ST 1 | 0 | -- | 0 | (Begin 11-01-91 at 0630 hours) (Set 6" casing at 40') (End 1730 hour) (Begin 11-02-91 at 0630 hour) (Water at 21') (drive and wash 8" casing) SAB, Shelby tube – fail due to gravel fall | |
| 47 | | | | | | 45 |
| 49 | SA -1 | 0 | 0.05 | 24" | SAB | |
| 52 | | | | | | 50 |
| 55 | ST 1 | 0 | -- | 0 | Shelby tube – no recovery, cohesionless | 55 |
| 57 | SA 1a | 0 | | 24" | SAB | |
| 62 | SA 1a | | | | | 60 |
| 64 | SA 1b | 0 | 12/18/18/18 | 24" | SAB | |
| | | | | | | 65 |

PROPORTIONS USED: TRACE = 0-10%, LITTLE = 10-20%, SOME 20-35%, AND = 35-50%

| TEST BORING LOG | ARGONNE NATIONAL LABORATORY | PAGE 3 |
|---|---|---|

| BORING NO.: DW8 | PROJECT: AFP#59 IRP SI | DATE: 11/3/91 |
|---|---|---|

| DEPTH | SAMPLE COLLECTION DATA: SAMPLE NUMBER | HNU (PPM) | STP TEST BLOWS / 6" | REC (in.) | DESCRIPTION | DEPTH |
|---|---|---|---|---|---|---|
| 67 | | | | | | |
| 69 | SA 1c | 0 | 16/17/25/22 | 18" | SAB (End 1700 hour) | |
| 72 | | | | | | 70 |
| 74 | 8 | 0 | 19/19/19/18 | F | (Begin 11-3-91 at 0600) (Water at 14.4') SAB | |
| 77 | | | | | | 75 |
| 79 | 9 | 0 | 13/14/12/12 | F | Wet, gray, fine to coarse sand, some silt, trace clay | |
| 82 | | | | | | 80 |
| 84 | SA-2a 10 | 0 | 11/11/15/15 | F | SAB | |
| 87 | 10 | | | | | 85 |
| 89 | 10 | 0 | 12/13/18/51 | F | SAB | |
| 90 | | | | | 90' Coarse gravel felt by driller under rollerbit, no recovery | 90 |
| 93 | | | | | 91.5' – 93' Rollerbit into bedrock, Refusal at 93' | |
| | | | | | Boring terminated at 93'. (End 1630 hour) (Begin 11-04-91 at 0642 hour) (Construct DW8 monitor well) (End 1450 hour) (Water in well post completion is ~ 18.37 bgs.) | 95 |
| | | | | | | 100 |

PROPORTIONS USED: TRACE = 0-10%, LITTLE = 10-20%, SOME 20-35%, AND = 35-50%

# TEST BORING LOG — ARGONNE NATIONAL LABORATORY — PAGE 1

| | | | | | |
|---|---|---|---|---|---|
| BORING NO.: | DW9 | PROJECT: AFP#59 IRP SI | | | DATE: 12/9/91 |
| PROJECT NO.: | 91230 | DRILLER: | MARCOR | DRILLING BIT: | 14 1/4" & 6 1/4" |
| LOCATION: | Johnson City, NY | RIG TYPE: | Centerra CT 350 | GROUND ELEVATION: | 828.80' |
| INSPECTOR: | Joseph Hau | METHOD: | HSA & Driven Steel Casing | SAMPLING METHOD: | 24" Split Spoon |
| WELL TYPE: | 4" PVC | SCREEN LENGTH: | 20' | PROTOF WIDTH/TYPE | 6" St-up Lock Steel |
| WELL LENGTH: | 88.0' | GROUT LENGTH/TYPE: | 59.5' / 10:90 Bent:Cemt Mix | PAD ELEVATION: | 828.80' |
| SCREEN: | 4" Cont. Wound PVC | SEAL LENGTH/TYPE: | 5' / Bentonite | TOC ELEVATION | 831.31' |
| SLOT SIZE: | 0.010 | FILTER LENGTH/TYPE: | 23' / No. 2 Sand | STICK UP/DOWN: | 2.51' |

| DEPTH | SAMPLE COLLECTION DATA: SAMPLE NUMBER | HNU (PPM) | STP TEST BLOWS / 6" | REC (in.) | DESCRIPTION | DEPTH |
|---|---|---|---|---|---|---|
| 4" | | | | | Turf (Begin 12-6-91 at 1400 hour) | |
| 2 | 1 | 0 | 4/12/11/19 | 16" | Brown, fine sand and silt, some clay, trace gravel | |
| 4 | 2 | 0 | 9/9/7/7 | 12" | 2'-3' Yellow, coarse sand<br>3'-4' Dark brown, coarse sand and silt, trace gravel,some clay | |
| 6 | 3 | 0 | 5/5/5/5 | 6" | Dark brown, fine to coarse sand, some gravel, little silt and clay | 5 |
| 8 | | 0 | 3/3/4/4 | 6" | SAB | |
| 10 | | 0 | 6/8/11/8 | 8" | SAB (3" spoon) | 10 |
| 12 | 4 | 0 | 2/6/15/17 | 6" | Brown, fine to coarse sand and gravel, trace silt and clay, moist | |
| 14 | SA 1 | 0 | 12/14/22/26 | 18" | SAB, moist | |
| 16 | SA 1 | 0 | 32/36/42/42 | 18" | SAB, wet (First water at ~ 15') | 15 |
| 18 | 5 | 0 | 3/9/5/5 | 16" | Brown, fine to coarse sand, little gravel, trace organic matter | |
| 20 | | 0 | 4/4/9/13 | 12" | SAB | 20 |
| 23 | | | | | | |
| 25 | | 0 | 3/6/8/13 | 12" | SAB, trace gravel | 25 |
| 28 | | | | | | |
| 30 | | 0 | | | SAB, No recovery, heaving sands (End 1700 hour) | 30 |

PROPORTIONS USED: TRACE = 0-10%, LITTLE = 10-20%, SOME 20-35%, AND = 35-50%

| TEST BORING LOG | ARGONNE NATIONAL LABORATORY | PAGE 2 |
|---|---|---|

| BORING NO.: DW9 | PROJECT: AFP#59 IRP SI | DATE: 12/9/91 |
|---|---|---|

| DEPTH | SAMPLE COLLECTION DATA: SAMPLE NUMBER | HNU (PPM) | STP TEST BLOWS / 6" | REC (in.) | DESCRIPTION | DEPTH |
|---|---|---|---|---|---|---|
| 33 | | | | | | |
| | | | | | 33'–34' Brown, coarse sand and trace gravel | |
| 35 | 6 | 0 | 3/5/7/11 | 10" | (Begin 12–7–91 at 0630 hour) (Water at 14.9') 34'–35' Brown, fine sand and silt, some clay | 35 |
| 38 | | | | | (8" casing set at 38') | |
| 40 | 7 | 0 | 2/4/6/13 | 4" | Gray, fine sand and silt, little clay | 40 |
| 42 | 8 | 0 | 1/4/5/7 | 8" | 40' – 41' SAB 41' – 42' Gray, fine to medium sand, little silt and clay | |
| 43 | | | | | | |
| 45 | 9 | 0 | 7/17/14/16 | 18" | (Begin 12–8–91 at 0630 hour) 43' – 44' Gray, fine sand and silt, some clay, trace gravel 44' – 45' Gray, fine sand and silt, little clay | 45 |
| 48 | | | | | | |
| 50 | 10 | 0 | 13/13/19/19 | 18" | SAB | 50 |
| 53 | ST 1 | 0 | | 27" / 36" | SAB | |
| 55 | 11 | 0 | 7/10/14/16 | 18" | Thin alternating layers of gray fine sand and silt, little clay; to fine to medium gray sand, little silt, trace gravel and clay | 55 |
| 58 | | | | | | |
| 60 | 12 / 13 | 0 | 32/28/22/22 | 18" | 58' – 59.5' Gray, fine to coarse sand and gravel, trace silt and clay 59.5 – 60' Gray, fine sand and silt, little clay | 60 |
| 63 | | | | | | |
| 65 | | 0 | 12/8/27/24 | 20" | Thin alternating layers of gray fine to coarse sand and gravel, trace silt and clay; to gray, fine sand and silt, little clay | 65 |

PROPORTIONS USED: TRACE = 0–10%, LITTLE = 10–20%, SOME 20–35%, AND = 35–50%

| TEST BORING LOG | ARGONNE NATIONAL LABORATORY | PAGE 3 |
|---|---|---|

| BORING NO.: DW9 | PROJECT: AFP#59 IRP SI | DATE: 12/9/91 |
|---|---|---|

| DEPTH | SAMPLE COLLECTION DATA: SAMPLE NUMBER | HNU (PPM) | STP TEST BLOWS / 6" | REC (in.) | DESCRIPTION | DEPTH |
|---|---|---|---|---|---|---|
| 68 | | | | | | |
| 70 | 14 | 0 | 14/18/27/47 | 20" | Gray, fine to coarse sand and shale gravel, little silt and clay | 70 |
| 72 | | | | | | |
| 73 | 15 | | CORE | 5" | Refusal at 72' cored 5" shale boulder | |
| 75 | 16 | 0 | 20/30/38/40 | 18" | Gray, fine to coarse sand and shale gravel, trace silt and clay (End 1636 hour) | 75 |
| 78 | | | | | | |
| 80 | | | | | (Begin 12–9–91 at 0600 hour) No recovery – 3' of heaving sands in casing | 80 |
| 83 | | | | | | |
| 85 | | | | | No recovery – 3' of heaving sands in casing | 85 |
| 88 | | | | | | |
| 90 | 17 | 0 | 70/72/94/110 | 18" | Compact gray till with equal mix of clay, silt, sand and gravel (End 1230 hour) | 90 |
| | | | | | (Boring terminated at 90') (Water at 14.9' bgs) | 95 |
| | | | | | | 100 |

PROPORTIONS USED: TRACE = 0–10%, LITTLE = 10–20%, SOME 20–35%, AND = 35–50%

| TEST BORING LOG | ARGONNE NATIONAL LABORATORY | PAGE 1 |
|---|---|---|

| BORING NO.: IW9 | PROJECT: AFP#59 IRP SI | DATE: 12/10/91 |
|---|---|---|

| | | | | | |
|---|---|---|---|---|---|
| PROJECT NO.: | 91230 | DRILLER: | MARCOR | DRILLING BIT: | 8 1/4" |
| LOCATION: | Johnson City, NY | RIG TYPE: | Centerra CT 350 | GROUND ELEVATION: | 828.62 |
| INSPECTOR: | Joseph Hau | METHOD: | HSA & Driven Steel Casing | SAMPLING METHOD: | 24" Split Spoon |
| WELL TYPE: | 2" PVC | SCREEN LENGTH: | 5' | PROTOP WIDTH/TYPE | 4" St-up Lock Steel |
| WELL LENGTH: | 51' | GROUT LENGTH/TYPE: | 38' / 10:90 Bent:Cemt Mix | PAD ELEVATION: | 828.83 |
| SCREEN: | 2" Cont. Wound PVC | SEAL LENGTH/TYPE: | 5' / Bentonite | TOC ELEVATION | 831.52 |
| SLOT SIZE: | 0.010 | FILTER LENGTH/TYPE: | 8' / No. 2 Sand | STICK UP/DOWN: | 2.90 |

| DEPTH | SAMPLE COLLECTION DATA: SAMPLE NUMBER | HNU (PPM) | STP TEST BLOWS / 6" | REC (in.) | DESCRIPTION | DEPTH |
|---|---|---|---|---|---|---|
| | | | | | Turf (Begin 12-10-91 at 1030) | |
| | | | | | Brown, fine sand and silt, some clay, trace gravel | |
| | | | | | 2' -3' Yellow, coarse sand | |
| | | | | | 3' - 4' Dark brown, coarse sand and silt, trace gravel,some clay | |
| 5 | | | | | Dark brown, fine to coarse sand, some gravel, little silt and clay | 5 |
| | | | | | SAB | |
| | | | | | (3" spoon) | |
| 10 | | | | | | 10 |
| | | | | | Brown, fine to coarse sand and gravel, trace silt and clay, moist | |
| | | | | | SAB, moist | |
| 15 | | | | | SAB, wet (First water at ~ 15') | 15 |
| | | | | | Brown, fine to coarse sand, little gravel trace organic matter | |
| 20 | | | | | SAB | 20 |
| 25 | | | | | SAB, trace gravel | 25 |
| 30 | | | | | SAB | 30 |

PROPORTIONS USED: TRACE = 0-10%, LITTLE = 10-20%, SOME 20-35%, AND = 35-50%

| TEST BORING LOG | ARGONNE NATIONAL LABORATORY | PAGE 2 |
|---|---|---|

BORING NO.: IW9 | PROJECT: AFP#59 IRP SI | DATE: 12/10/91

| DEPTH | SAMPLE COLLECTION DATA: SAMPLE NUMBER | HNU (PPM) | STP TEST BLOWS / 6" | REC (in.) | DESCRIPTION | DEPTH |
|---|---|---|---|---|---|---|
| | | | | | 33'–34' Brown, coarse sand and trace gravel | |
| 35 | | | | | 34'–35' Brown, fine sand and silt, some clay | 35 |
| | | | | | Gray, fine sand and silt, little clay | |
| 40 | | | | | 40'–41' SAB | 40 |
| | | | | | 41'–42' Gray, fine to medium sand, little silt and clay | |
| | | | | | 43'–44' Gray, fine sand and silt, some clay, trace gravel | |
| 45 | | | | | 44'–45' Gray, fine sand and silt, little clay | 45 |
| 50 | | | | | SAB | 50 |
| | | | | | SAB (End 1500 hour) | |
| | | | | | Boring terminated at 51.0' (Water at 14.9') | |
| 55 | | | | | | 55 |
| 60 | | | | | | 60 |
| 65 | | | | | | 65 |

PROPORTIONS USED: TRACE = 0–10%, LITTLE = 10–20%, SOME 20–35%, AND = 35–50%

# TEST BORING LOG — ARGONNE NATIONAL LABORATORY — PAGE 1

| | | | | | |
|---|---|---|---|---|---|
| BORING NO.: | IW7 | PROJECT: | AFP #59 IRP SI | DATE: | 12/5/91 |
| PROJECT NO: | 91230 | DRILLER: | MARCOR | DRILLING BIT: | 8 1/4" |
| LOCATION: | Johnson City, NY | RIG TYPE: | Cantera CT 350 | GROUND ELEVATION: | 828.88' |
| INSPECTOR: | Joseph Hau | METHOD: | Hollow Stem Auger | SAMPLING METHOD: | 24" Split Spoon |
| WELL TYPE: | None | SCREEN LENGTH: | --- | PROTOP WIDTH/TYPE: | --- |
| WELL LENGTH: | --- | GROUT LENGTH/TYPE: | --- | PAD ELEVATION: | --- |
| SCREEN: | --- | SEAL LENGTH/TYPE: | --- | TOC ELEVATION: | --- |
| SLOT SIZE: | --- | FILTER LENGTH/TYPE: | --- | STICK UP/DOWN: | --- |

| DEPTH | SAMPLE COLLECTION DATA: SAMPLE NUMBER | HNU (PPM) | STP TEST BLOWS / 6" | REC (in.) | DESCRIPTION | DEPTH |
|---|---|---|---|---|---|---|
| 2 | | | | | Grass and clayey topsoil w/ organics (Begin 12–5–91 at 0800 hour) | |
| 4 | | 0 | 3/3/4/6 | 6" | Brown, fine sand and silt, little clay, trace gravel with organics | |
| 6 | | | | | 6' – 7' SAB | 5 |
| 8 | | 0 | 9/8/6/12 | 6" | 7'–8' Brown, fine to coarse sand and gravel, trace silt | |
| 10 | | | | | | 10 |
| 12 | 1 | 0 | 3/4/6/10 | 6" | SAB | |
| 14 | | | | | | |
| 16 | 2 | 0 | 4/5/11/12 | 12" | 14' – 15' SAB (3" spoon)<br>15'–16' Brown, coarse sand, trace to little gravel, moist (First water at 15.8' bgs) | 15 |
| 18 | 3 | 0 | 7/8/15/18 | 8" | 16'–17' Brown, coarse gravel and coarse sand, wet<br>17'–18' Brown, coarse gravel and coarse sand, wet (3" spoon) | |
| 20 | SA 1 | 0 | 16/17/27/29 | 10" | SAB (3" spoon) | 20 |
| 22 | | | | | | |
| 24 | SA 1 | 0 | 23/14/10/10 | 18" | SAB (3" spoon) | |
| 26 | | | | | | 25 |
| 28 | 4 | | 11/11/11/14 | 20" | 26'–26.5' SAB<br>26.5'–28' Brown, fine sand and silt, little clay (3" spoon) | |
| 30 | | | | | | 30 |

PROPORTIONS USED: TRACE = 0–10%, LITTLE = 10–20%, SOME 20–35%, AND = 35–50%

| TEST BORING LOG | ARGONNE NATIONAL LABORATORY | PAGE 2 |
|---|---|---|

| BORING NO.: IW7 | PROJECT: AFP#59 IRP SI | DATE: 12/5/91 |
|---|---|---|

| DEPTH | SAMPLE COLLECTION DATA: SAMPLE NUMBER | HNU (PPM) | STP TEST BLOWS / 6" | REC (in.) | DESCRIPTION | DEPTH |
|---|---|---|---|---|---|---|
| 31 | ST-1 (Cont.) | | -- | 0" 36" | 26'-31' Attempt Shelby tube (No recovery) | |
| 32 | | | | | | |
| 34 | 5 | 0 | 33/38/43/45 | 8" | Brown, fine to coarse sand, little silt | |
| 35 | | | | | | 35 |
| 36 | | | | | | |
| 38 | | 0 | 1/6/13/13 | 24" | SAB, trace gravel | |
| 40 | | | | | | 40 |
| 42 | 6 | 0 | 7/11/18/22 | 24" | SAB, trace gravel | |
| 44 | | | | | (End 1200 hours) | |
| 45 | | | | | Boring terminated at 44'<br>IW7 not installed. Atempted to install SW7 – running sands interfered with bentonite plug. Boring backfilled with grout 0'-26', bentonite/formation sand mix 26'-28', sand 28'-32', formation collapse 32'-44' | 45 |
| 50 | | | | | | 50 |
| 55 | | | | | | 55 |
| 60 | | | | | | 60 |
| 65 | | | | | | 65 |

PROPORTIONS USED: TRACE = 0-10%, LITTLE = 10-20%, SOME 20-35%, AND = 35-50%

| TEST BORING LOG | ARGONNE NATIONAL LABORATORY | PAGE 1 |
|---|---|---|

| BORING NO.: SW4 | PROJECT: AFP #59 IRP SI | DATE: 12/2/91 |
|---|---|---|

| | | | | | |
|---|---|---|---|---|---|
| PROJECT NO: | 91230 | DRILLER: | MARCOR | DRILLING BIT: | 8 1/4" |
| LOCATION: | Johnson City, NY | RIG TYPE: | Canterra CT 350 | GROUND ELEVATION: | 829.05 |
| INSPECTOR: | Joseph Hau | METHOD: | Hollow Stem Auger | SAMPLING METHOD: | 24" Split Spoon |
| WELL TYPE: | 2" PVC | SCREEN LENGTH: | 15 | PROTOP WIDTH/TYPE: | 8" Flush Manhole |
| WELL LENGTH: | 29' | GROUT LENGTH/TYPE: | 9.5' / 10:90 Bent:Cemt Mix | PAD ELEVATION: | 829.28 |
| SCREEN: | 2" Cont. Wound PVC | SEAL LENGTH/TYPE: | 2' / Bentonite | TOC ELEVATION | 828.85 |
| SLOT SIZE: | 0.010 | FILTER LENGTH/TYPE: | 17.5' / No. 2 Sand | STICK UP/DOWN: | −0.43' |

| DEPTH | SAMPLE COLLECTION DATA: SAMPLE NUMBER | HNU (PPM) | STP TEST BLOWS / 6" | REC. (in.) | DESCRIPTION | DEPTH |
|---|---|---|---|---|---|---|
| 4" | | | | | Asphalt (Begin 0730 hour) | |
| 2 | | | | | Yellowish, brown sand and gravel fill | |
| 4 | | 0 | 5/5/5/9 | 6" | Brown, fine to coarse sand and gravel, trace silt | |
| 6 | | 0 | 5/9/10/12 | 8" | SAB | 5 |
| 8 | CHEM | 0 | 26/24/20/21 | 18" | SAB | |
| 10 | | 0 | 8/12/22/24 | 6" | SAB | 10 |
| 12 | | 0 | 16/10/6/7 | 6" | SAB, moist | |
| 14 | | 0 | 5/7/7/14 | 6" | SAB, wet at 13'<br>14'−15' SAB (3" spoon) | 15 |
| 16 | CHEM | 0 | 10/19/14/15 | 12" | 15'−16' Brown, fine sand and silt. little clay | |
| 18 | CHEM | 0 | 17/23/27/31 | F | SAB, trace clay (3" spoon) | |
| 21.5 | | | | | SAB, wet | 20 |
| | | | | | Gray, fine sand and silt, trace clay (End 1200 hour) | 25 |
| 30 | | | | | Boring terminated at 29' (Water at 18.38' bgs.) | 30 |

PROPORTIONS USED: TRACE = 0−10%, LITTLE = 10−20%, SOME 20−35%, AND = 35−50%

# TEST BORING LOG — ARGONNE NATIONAL LABORATORY — PAGE 1

| | | | | | |
|---|---|---|---|---|---|
| BORING NO.: | SW5 | PROJECT: | AFP #59 IRP SI | | DATE: 11/20/91 |
| PROJECT NO: | 91230 | DRILLER: | MARCOR | DRILLING BIT: | 8 1/4" |
| LOCATION: | Johnson City, NY | RIG TYPE: | Centerra CT 350 | GROUND ELEVATION: | 836.24' |
| INSPECTOR: | Joseph Hau | METHOD: | Hollow Stem Auger | SAMPLING METHOD: | 24" Split Spoon |
| WELL TYPE: | 2" PVC | SCREEN LENGTH: | 10' | PROTOP WIDTH/TYPE | 8" Flush Manhole |
| WELL DEPTH: | 30.5 | GROUT LENGTH/TYPE: | 14.5' / 10:90 Bent:Cemt Mix | PAD ELEVATION: | 836.32' |
| SCREEN: | 2" Cont. Wound PVC | SEAL LENGTH/TYPE: | 3' / Bentonite | TOC ELEVATION | 835.84' |
| SLOT SIZE: | 0.010 | FILTER LENGTH/TYPE: | 13' / No. 2 Sand | STICK UP/DOWN: | −0.40' |

| DEPTH | SAMPLE COLLECTION DATA: SAMPLE NUMBER | HNU (PPM) | STP TEST BLOWS / 6" | REC (in.) | DESCRIPTION | DEPTH |
|---|---|---|---|---|---|---|
| 4" | | | | | Asphalt (Begin 0600 hour) | |
| 3 | | | | | Brown fine to coarse sand, some gravel | |
| 5 | | 0 | 1/1/1/2 | 18" | Brown, fine to medium sand, some silt, trace clay and gravel | 5 |
| 8 | | | | | | |
| 10 | | 0 | 3/3/7/13 | 18" | Brown, fine to coarse sand and gravel, trace silt | 10 |
| 12 | CHEM | 0 | 36/35/41/55 | 12" | SAB (two, 3" spoons) | |
| 13 | | | | | | |
| 15 | | 0 | 13/26/28/26 | 18" | SAB | 15 |
| 18 | | | | | | |
| 20 | | 0 | 2/9/29/37 | 4" | SAB | 20 |
| 22 | CHEM | 0 | 24/19/16/12 | 12" | SAB (3" spoon) | |
| 23 | | | 36/100/R | 0 | | |
| 25 | CHEM | 0 | 17/12/12/12 | | Wet, brown grading to gray, fine sand and silt, some clay (3" spoon) | 25 |
| 27 | CHEM | 0.5−0.8 | 10/11/11/20 | | Gray SAB, some brown, streaks wet, (Note: 3" spoon, ovm hotspots, 0.5−0.8 ppp at 25.5 and 26 ft below grade) | |
| | SWS ST 1 | | --- | 25" 36" | SAB Shelby Tube Sample | |
| 30 | | | | | Boring Terminated at 30.5' (Water at 25.4') (End 0930 hour) | 30 |

PROPORTIONS USED: TRACE = 0−10%, LITTLE = 10−20%, SOME 20−35%, AND = 35−50%

# TEST BORING LOG | ARGONNE NATIONAL LABORATORY | PAGE 1

**BORING NO.:** SW6 **PROJECT:** AFP #59 IRP SI **DATE:** 11/17/91

| | | | | | |
|---|---|---|---|---|---|
| PROJECT NO.: | 91230 | DRILLER: | MARCOR | DRILLING BIT: | 8 1/4" |
| LOCATION: | Johnson City, NY | RIG TYPE: | Centerra CT 350 | GROUND ELEVATION: | 828.95' |
| INSPECTOR: | Joseph Hau | METHOD: | Hollow Stem Auger | SAMPLING METHOD: | 24" Split Spoon |
| WELL TYPE: | 2" PVC | SCREEN LENGTH: | 10' | PROTOP WIDTH/TYPE | 8" Flush Manhole |
| WELL LENGTH: | 29' | GROUT LENGTH/TYPE: | 13' / 10:90 Bent:Cement Mix | PAD ELEVATION: | 828.99' |
| SCREEN: | 2" Cont. Wound PVC | SEAL LENGTH/TYPE: | 3' / Bentonite | TOC ELEVATION | 828.49' |
| SLOT SIZE: | 0.010 | FILTER LENGTH/TYPE: | 13' / No. 2 Sand | STICK UP/DOWN: | -0.46 |

| DEPTH | SAMPLE COLLECTION DATA: SAMPLE NUMBER | HNU (PPM) | STP TEST BLOWS / 6" | REC (in.) | DESCRIPTION | DEPTH |
|---|---|---|---|---|---|---|
| 4" | | | | | Asphalt (Begin 11-16-91 at 1405 hours) | |
| | | | | | 4"-1.5' Gravel fill | |
| 3 | | | | | 1.5'-2' Brown, fine to coarse sand and gravel trace silt | |
| 5 | | 0 | 2/3/6/10 | 18" | Brown coarse sand and gravel, trace silt | 5 |
| 8 | | | | | | |
| 10 | | 0 | 3/4/8/20 | 12" | Brown fine to coarse sand and gravel, trace silt (Two, 3" spoons) | 10 |
| 13 | | | | | | |
| 15 | | 0 | 9/8/8/10 | 6" | SAB | 15 |
| 16 | | | | | | |
| 18 | | 0 | 5/8/7/16 | 6" | SAB (Two, 3" spoons) | |
| 20 | | 0 | 32/31/19/22 | 18" | SAB (3" spoon) | 20 |
| 25 | | | | | SAB (End 1600 hours) | 25 |
| 29 | | | | | (Begin 11-17-91 at 0600 hour)<br>Brown fine sand and silt, little clay | |
| 30 | | | | | Boring terminated at 29' (End 0635 hour)<br>(Water level in well after completion is at 21.7') | 30 |

PROPORTIONS USED: TRACE = 0-10%, LITTLE = 10-20%, SOME 20-35%, AND = 35-50%

| TEST BORING LOG | ARGONNE NATIONAL LABORATORY | PAGE 1 |
|---|---|---|

| BORING NO.: SW7 | PROJECT: AFP #59 IRP SI | DATE: 12/6/91 |
|---|---|---|

| | | | | | |
|---|---|---|---|---|---|
| PROJECT NO: | 91230 | DRILLER: | MARCOR | DRILLING BIT: | 8 1/4" |
| LOCATION: | Johnson City, NY | RIG TYPE: | Cantera CT 350 | GROUND ELEVATION: | 828.88' |
| INSPECTOR: | Joseph Hau | METHOD: | Hollow Stem Auger | SAMPLING METHOD: | 24" Split Spoon |
| WELL TYPE: | 2" PVC | SCREEN LENGTH: | 15' | PROTOP WIDTH/TYPE | 4" Sit-up Lock Steel |
| WELL LENGTH: | 26.5' | GROUT LENGTH/TYPE: | 6.5 / 10:90 Bent:Cemt Mix | PAD ELEVATION: | 829.12' |
| SCREEN: | 2" Cont. Wound PVC | SEAL LENGTH/TYPE: | 3' / Bentonite | TOC ELEVATION | 831.89' |
| SLOT SIZE: | 0.010 | FILTER LENGTH/TYPE: | 17' / No. 2 Sand | STICK UP/DOWN: | 3.01' |

| DEPTH | SAMPLE COLLECTION DATA: SAMPLE NUMBER | HNU (PPM) | STP TEST BLOWS / 6" | REC (in.) | DESCRIPTION | DEPTH |
|---|---|---|---|---|---|---|
| 2 | | | | | Grass and clayey topsoil w/ organics | |
| 7 | | | | | Brown, fine sand and silt, little clay, trace gravel w/ organics | 5 |
| 9 | CHEM | 0 | 10/11/10/11 | 5" | Brown, fine to coarse sand and gravel, trace silt (3" spoon) | |
| 11 | CHEM | 0 | 9/10/19/19 | 4" | SAB (3" spoon) | 10 |
| 14 | | | | | | |
| 16 | CHEM | 0 | 5/6/13/9 | 8" | 14'–15' SAB<br>15'–16' Brown, coarse sand, trace gravel, moist (3" spoon) | 15 |
| 18 | CHEM | 0 | 8/11/16/19 | 8" | 16'–17' SAB<br>17'–18' Brown, coarse gravel and coarse sand, wet (3" spoon) | |
| 26.5 | | | | | SAB<br>(End 0840 hours) | 20<br>25 |
| 30 | | | | | Boring terminated at 26.5' (Water at ~ 15.8') | 30 |

PROPORTIONS USED: TRACE = 0–10%, LITTLE = 10–20%, SOME 20–35%, AND = 35–50%

| TEST BORING LOG | ARGONNE NATIONAL LABORATORY | PAGE 1 |
|---|---|---|

| BORING NO.: SW7 | PROJECT: AFP #59 IRP SI | DATE: 12/6/91 |
|---|---|---|

| | | | | | |
|---|---|---|---|---|---|
| PROJECT NO: | 91230 | DRILLER: | MARCOR | DRILLING BIT: | 8 1/4" |
| LOCATION: | Johnson City, NY | RIG TYPE: | Canterra CT 350 | GROUND ELEVATION: | 828.88' |
| INSPECTOR: | Joseph Hau | METHOD: | Hollow Stem Auger | SAMPLING METHOD: | 24" Split Spoon |
| WELL TYPE: | 2" PVC | SCREEN LENGTH: | 15' | PROTOP WIDTH/TYPE | 4" St-up Lock Steel |
| WELL LENGTH: | 26.5' | GROUT LENGTH/TYPE: | 6.5 / 10:90 Bent:Cemt Mix | PAD ELEVATION: | 829.12' |
| SCREEN: | 2" Cont. Wound PVC | SEAL LENGTH/TYPE: | 3' / Bentonite | TOC ELEVATION | 831.89' |
| SLOT SIZE: | 0.010 | FILTER LENGTH/TYPE: | 17' / No. 2 Sand | STICK UP/DOWN: | 3.01' |

| DEPTH | SAMPLE COLLECTION DATA: SAMPLE NUMBER | HNU (PPM) | STP TEST BLOWS / 6" | REC. (in.) | DESCRIPTION | DEPTH |
|---|---|---|---|---|---|---|
| 2 | | | | | Grass and clayey topsoil w/ organics | |
| 7 | | | | | Brown, fine sand and silt, little clay, trace gravel w/ organics | 5 |
| 9 | CHEM | 0 | 10/11/10/11 | 5" | Brown, fine to coarse sand and gravel, trace silt (3" spoon) | |
| 11 | CHEM | 0 | 9/10/19/19 | 4" | SAB (3" spoon) | 10 |
| 14 | | | | | | |
| 16 | CHEM | 0 | 5/6/13/9 | 8" | 14'–15' SAB<br>15'–16' Brown, coarse sand, trace gravel, moist (3" spoon) | 15 |
| 18 | CHEM | 0 | 8/11/16/19 | 8" | 16'–17' SAB<br>17'–18' Brown, coarse gravel and coarse sand, wet (3" spoon) | |
| 26.5 | | | | | SAB<br>(End 0840 hours) | 20<br>25 |
| 30 | | | | | Boring terminated at 26.5' (Water at ~ 15.8') | 30 |

PROPORTIONS USED: TRACE = 0–10%, LITTLE = 10–20%, SOME 20–35%, AND = 35–50%

| TEST BORING LOG | ARGONNE NATIONAL LABORATORY | PAGE 1 |
|---|---|---|

| BORING NO.: SW9 | PROJECT: AFP #59 IRP SI | DATE: 12/10/91 |
|---|---|---|

| | | | | | |
|---|---|---|---|---|---|
| PROJECT NO: | 91230 | DRILLER: | MARCOR | DRILLING BIT: | 8 1/4" |
| LOCATION: | Johnson City, NY | RIG TYPE: | Canterra CT 350 | GROUND ELEVATION: | 828.80' |
| INSPECTOR: | Joseph Hau | METHOD: | Hollow Stem Auger | SAMPLING METHOD: | 24" Split Spoon |
| WELL TYPE: | 2" PVC | SCREEN LENGTH: | 15' | PROTOP WIDTH/TYPE | 4" St–up Lock Steel |
| WELL LENGTH: | 25' | GROUT LENGTH/TYPE: | 6' / 10:90 Bent:Cemt Mix | PAD ELEVATION: | 828.80' |
| SCREEN: | 2" Cont. Wound PVC | SEAL LENGTH/TYPE: | 2' / Bentonite | TOC ELEVATION | 831.38' |
| SLOT SIZE: | 0.010 | FILTER LENGTH/TYPE: | 17' / No. 2 Sand | STICK UP/DOWN: | 2.58' |

| DEPTH | SAMPLE COLLECTION DATA: SAMPLE NUMBER | HNU (PPM) | STP TEST BLOWS / 6" | REC (in.) | DESCRIPTION | DEPTH |
|---|---|---|---|---|---|---|
| 4" | | | | | Turf | |
| 6 | | | | | Brown, fine sand and silt, some clay, trace gravel (All 3" spoons)<br>2" – 3" Yellow, coarse sand<br>3" – 4" Dark brown, coarse sand and silt, trace gravel, some clay | 5 |
| 8 | CHEM | 0 | 12/15/17/20 | 10" | Dark brown, fine to coarse sand, some gravel, little silt and clay | |
| 10 | CHEM | 0 | 31/31/30/27 | 10" | SAB | 10 |
| 12 | | | | | | |
| 14 | CHEM | 0 | 44/49/47/64 | 12" | Brown, fine to coarse sand and some gravel, trace silt and clay, moist | |
| 16 | CHEM | 0 | 50/50/46/52 | 12" | SAB | 15 |
| 25 | | | | | SAB<br>(End 1000 hours) | 20<br>25 |
| 30 | | | | | Boring terminated at 25' (Water at 15.0') | 30 |

PROPORTIONS USED: TRACE = 0–10%, LITTLE = 10–20%, SOME 20–35%, AND = 35–50%

| TEST BORING LOG | ARGONNE NATIONAL LABORATORY | PAGE 1 |
|---|---|---|

| BORING NO.: 1H1 | PROJECT: AFP #59 IRP SI | DATE: 12/4/91 |
|---|---|---|

| | | | | | |
|---|---|---|---|---|---|
| PROJECT NO: | 91230 | DRILLER: | MARCOR | DRILLING BIT: | 8 1/4" |
| LOCATION: | Johnson City, NY | RIG TYPE: | Canterra CT 350 | GROUND ELEVATION: | 828.67' |
| INSPECTOR: | Joseph Hau | METHOD: | Hollow Stem Auger | SAMPLING METHOD: | 24" Split Spoon |

| | | | | | |
|---|---|---|---|---|---|
| WELL TYPE: | None | SCREEN LENGTH: | --- | PROTOP WIDTH/TYPE | --- |
| WELL LENGTH: | --- | GROUT LENGTH/TYPE: | --- | PAD ELEVATION: | --- |
| SCREEN: | --- | SEAL LENGTH/TYPE: | --- | TOC ELEVATION | --- |
| SLOT SIZE: | --- | FILTER LENGTH/TYPE: | --- | STICK UP/DOWN: | --- |

| DEPTH | SAMPLE COLLECTION DATA: SAMPLE NUMBER | HNU (PPM) | STP TEST BLOWS / 6" | REC (in.) | DESCRIPTION | DEPTH |
|---|---|---|---|---|---|---|
| 6" | | | | | Gravel – Crusher run (Begin 0840 hour) | |
| 3 | | | | | | |
| 5 | | 0.0 | 11/12/15/14 | 12" | Brown, fine to coarse sand and gravel fill | 5 |
| 8 | | | | | | |
| 10 | | (1) 2.1<br>(2) 0.0 | 3/2/1/5 | 2" | (1) Gray, coarse sand in spoon tip.<br>(2) 8" of gray, fine to coarse sand and gravel (Bruker = low ppm hydrocarbon detect, 3" spoon) | 10 |
| 12 | L CHEM | 3.4 | 13/19/20/10 | 6" | Gray, oily coarse sand and gravel – much stain and odor (3" spoon) | |
| 14 | L CHEM | 30 | 6/6/8/7 | 18" | SAB, heavy oil stain and odor (Bruker = low ppm, 3" spoon) | |
| | | | | | Boring terminated at 14'<br>(Bruker determined existance of alaphitic alkenes and napthalene)<br>(End 1000 HOUR) | 15<br>20<br>25<br>30 |

PROPORTIONS USED: TRACE = 0–10%, LITTLE = 10–20%, SOME 20–35%, AND = 35–50%

| TEST BORING LOG | ARGONNE NATIONAL LABORATORY | PAGE 1 |
|---|---|---|

| BORING NO.: 3H1 | PROJECT: AFP #59 IRP SI | DATE: 12/4/91 |
|---|---|---|

| | | | | | |
|---|---|---|---|---|---|
| PROJECT NO: | 91230 | DRILLER: | MARCOR | DRILLING BIT: | 8 1/4" |
| LOCATION: | Johnson City, NY | RIG TYPE: | Centerra CT 350 | GROUND ELEVATION: | 828.58' |
| INSPECTOR: | Joseph Hau | METHOD: | Hollow Stem Auger | SAMPLING METHOD: | 24" Split Spoon |
| WELL TYPE: | None | SCREEN LENGTH: | --- | PROTOP WIDTH/TYPE | --- |
| WELL LENGTH: | --- | GROUT LENGTH/TYPE: | --- | PAD ELEVATION: | --- |
| SCREEN: | --- | SEAL LENGTH/TYPE: | --- | TOC ELEVATION | --- |
| SLOT SIZE: | --- | FILTER LENGTH/TYPE: | --- | STICK UP/DOWN: | --- |

| DEPTH | SAMPLE COLLECTION DATA: SAMPLE NUMBER | HNU (PPM) | STP TEST BLOWS / 6" | REC (in.) | DESCRIPTION | DEPTH |
|---|---|---|---|---|---|---|
| 0" | | | | | 6" Turf (Begin 1145 hour) | |
| 2 | | 0 | 15/13/18/17 | 8" | Brown, sand and gravel fill, trace silt (All 3" spoons) | |
| 4 | | 0 | 3/3/4/4 | 20" | Brown, fine sand and silt, little clay | |
| 6 | | 0 | 1/2/3/5 | 20" | SAB | 5 |
| 8 | | 0 | 1/4/5/6 | 20" | SAB, some clay | |
| 10 | | 27 | 2/4/8/9 | 20" | 8'–9.7' SAB, little clay<br>9.7'–10' Gray, oily, fine to coarse sand and gravel | 10 |
| 12 | | 76.5 | 10/13/14/17 | 6" | Oily SAB | |
| 14 | | 63.8 | 11/12/7/17 | 6" | Oily SAB<br>Oily, gray coarse sand | |
| | | | | | Boring terminated at 14' (Bruker detect alaphitic alkenes and napthalene)<br>(End 1245 hours) | 15<br>20<br>25<br>30 |

PROPORTIONS USED: TRACE = 0–10%, LITTLE = 10–20%, SOME 20–35%, AND = 35–50%

| TEST BORING LOG | ARGONNE NATIONAL LABORATORY | PAGE 1 |
|---|---|---|

| BORING NO.: 4H1 | PROJECT: AFP #59 IRP SI | DATE: 12/3/91 |
|---|---|---|

| | | | | | |
|---|---|---|---|---|---|
| PROJECT NO: | 91230 | DRILLER: | MARCOR | DRILLING BIT: | 4 1/4" |
| LOCATION: | Johnson City, NY | RIG TYPE: | Cantera CT 150 | GROUND ELEVATION: | 829.19' |
| INSPECTOR: | Joseph Hau | METHOD: | Spun Steel Casing | SAMPLING METHOD: | 24" Split Spoon |
| WELL TYPE: | None | SCREEN LENGTH: | --- | PROTOP WIDTH/TYPE: | --- |
| WELL LENGTH: | --- | GROUT LENGTH/TYPE: | --- | PAD ELEVATION: | --- |
| SCREEN: | --- | SEAL LENGTH/TYPE: | --- | TOC ELEVATION | --- |
| SLOT SIZE: | --- | FILTER LENGTH/TYPE: | --- | STICK UP/DOWN: | --- |

| DEPTH | SAMPLE COLLECTION DATA: SAMPLE NUMBER | HNU (PPM) | STP TEST BLOWS / 6" | REC. (in.) | DESCRIPTION | DEPTH |
|---|---|---|---|---|---|---|
| 6" | | | | | 6" Asphalt (Begin 0845 hour) | |
| 3 | | | | | Sand and gravel fill | |
| 5 | F CHEM | 0 | 7/7/8/9 | 6" | Brown, fine to coarse sand and gravel, trace clay and silt (Bruker = ND) | 5 |
| 8 | | | | | | |
| 10 | F CHEM | 0 | 7/7/14/15 | 6" | SAB (Bruker = Low ppm hydrocarbon detect) | 10 |
| 13 | | | | | | |
| 15 | F CHEM | 0 | 13/12/14/14 | 8" | SAB (Bruker = ND, 3" spoon) | 15 |
| 17 | L CHEM | 0 | 11/12/14/15 | 14" | SAB (Bruker = ND, 3" spoon) | |
| 18 | | | | | | |
| | | | | | Boring terminated at 18'<br>Boring installed at 30° from verticle<br>(End 1210 hours) | 20 |
| | | | | | | 25 |
| | | | | | | 30 |

PROPORTIONS USED: TRACE = 0–10%, LITTLE = 10–20%, SOME 20–35%, AND = 35–50%

| TEST BORING LOG | ARGONNE NATIONAL LABORATORY | PAGE 1 |
|---|---|---|

| BORING NO.: 4H2 | PROJECT: AFP #59 IRP SI | DATE: 12/3/91 |
|---|---|---|

| | | | | | |
|---|---|---|---|---|---|
| PROJECT NO: | 91230 | DRILLER: | MARCOR | DRILLING BIT: | 4 1/4" |
| LOCATION: | Johnson City, NY | RIG TYPE: | Centerra CT 150 | GROUND ELEVATION: | 629.27' |
| INSPECTOR: | Joseph Hau | METHOD: | Spun Steel Casing | SAMPLING METHOD: | 24" Split Spoon |

| | | | | | |
|---|---|---|---|---|---|
| WELL TYPE: | None | SCREEN LENGTH: | --- | PROTOP WIDTH/TYPE | --- |
| WELL LENGTH: | --- | GROUT LENGTH/TYPE: | --- | PAD ELEVATION: | --- |
| SCREEN: | --- | SEAL LENGTH/TYPE: | --- | TOC ELEVATION | --- |
| SLOT SIZE: | --- | FILTER LENGTH/TYPE: | --- | STICK UP/DOWN: | --- |

| DEPTH | SAMPLE COLLECTION DATA: SAMPLE NUMBER | HNU (PPM) | STP TEST BLOWS / 6" | REC (in.) | DESCRIPTION | DEPTH |
|---|---|---|---|---|---|---|
| 6" | | | | | Asphalt (All 3" spoons, begin 1400 hour) | |
| 3 | | | | | Sand and gravel fill | |
| 5 | F CHEM | 0 | 15/15/16/15 | 12" | 3'–4.5' Brown, fine to coarse sand little silt, trace clay and gravel<br>4.5'–5' Brown, fine to coarse sand and gravel, trace silt (Bruker = ND) | 5 |
| 8 | | | | | | |
| 10 | F CHEM | 0 | 8/8/8/18 | 12" | SAB | 10 |
| 13 | | | | | | |
| 15 | F CHEM | 0 | 11/11/15/17 | 12" | SAB | 15 |
| 17 | L CHEM | 0 | 15/12/12/12 | 8" | SAB | |
| 19 | L CHEM | 0 | 18/16/17/26 | 8" | SAB | |
| | | | | | Boring terminated at 19'<br>Boring installed at 30° from verticle<br>(End 1700 hours) | 20<br>25<br>30 |

PROPORTIONS USED: TRACE = 0–10%, LITTLE = 10–20%, SOME 20–35%, AND = 35–50%

| TEST BORING LOG | ARGONNE NATIONAL LABORATORY | PAGE 1 |
|---|---|---|

| BORING NO.: 6H1 | PROJECT: AFP #59 IRP SI | DATE: 12/4/91 |
|---|---|---|

| | | | | | |
|---|---|---|---|---|---|
| PROJECT NO: | 91230 | DRILLER: | MARCOR | DRILLING BIT: | 8 1/4" |
| LOCATION: | Johnson City, NY | RIG TYPE: | Centerra CT 350 | GROUND ELEVATION: | 832.03' |
| INSPECTOR: | Joseph Hau | METHOD: | Hollow Stem Auger | SAMPLING METHOD: | 24" Split Spoon |

| | | | | | |
|---|---|---|---|---|---|
| WELL TYPE: | None | SCREEN LENGTH: | --- | PROTOP WIDTH/TYPE | --- |
| WELL LENGTH: | --- | GROUT LENGTH/TYPE: | --- | PAD ELEVATION: | --- |
| SCREEN: | --- | SEAL LENGTH/TYPE: | --- | TOC ELEVATION | --- |
| SLOT SIZE: | --- | FILTER LENGTH/TYPE: | --- | STICK UP/DOWN: | --- |

| DEPTH | SAMPLE COLLECTION DATA: SAMPLE NUMBER | HNU (PPM) | STP TEST BLOWS / 6" | REC (in.) | DESCRIPTION | DEPTH |
|---|---|---|---|---|---|---|
| 6" | | | | | Asphalt (Begin 1415 hour) | |
| 2 | | 0 | 25/9/11 | 6" | Brown, coarse sand and gravel fill with asphalt pieces (3" spoon) | |
| 4 | | 0 | 5/4/4/12 | 6" | Brown, fine sand and silt, little clay, trace gravel and asphalt pieces (3" spoon) | |
| 6 | | 0 | 1/3/6/4 | 6" | SAB (2" spoon) | 5 |
| 8 | | 0 | 1/3/1/3 | 6" | SAB (2" spoon) | |
| 10 | | 0 | 3/5/5/4 | 8" | 8'–9.7" SAB (2" spoon)<br>9.7' – 10' Brown, fine to coarse sand and gravel (3" spoon) | 10 |
| 12 | | 0 | 5/5/5/5 | 8" | SAB (3" spoon) | |
| 14 | | 0 | 6/4/5/25 | 8" | SAB (3" spoon) | |
| | | | | | Boring terminated at 14'<br>(End 1555 Hour) | 15 |
| | | | | | | 20 |
| | | | | | | 25 |
| | | | | | | 30 |

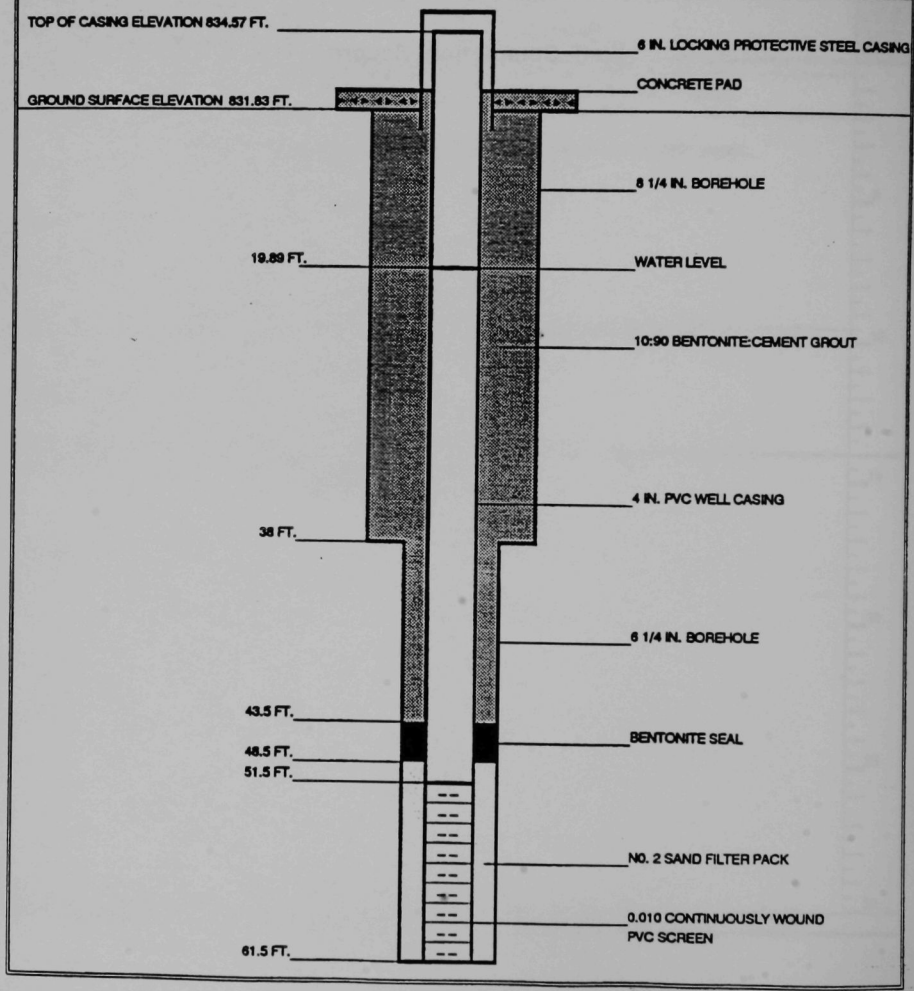
PROPORTIONS USED: TRACE = 0–10%, LITTLE = 10–20%, SOME 20–35%, AND = 35–50%

# Appendix B-2:

# Well Completion Record

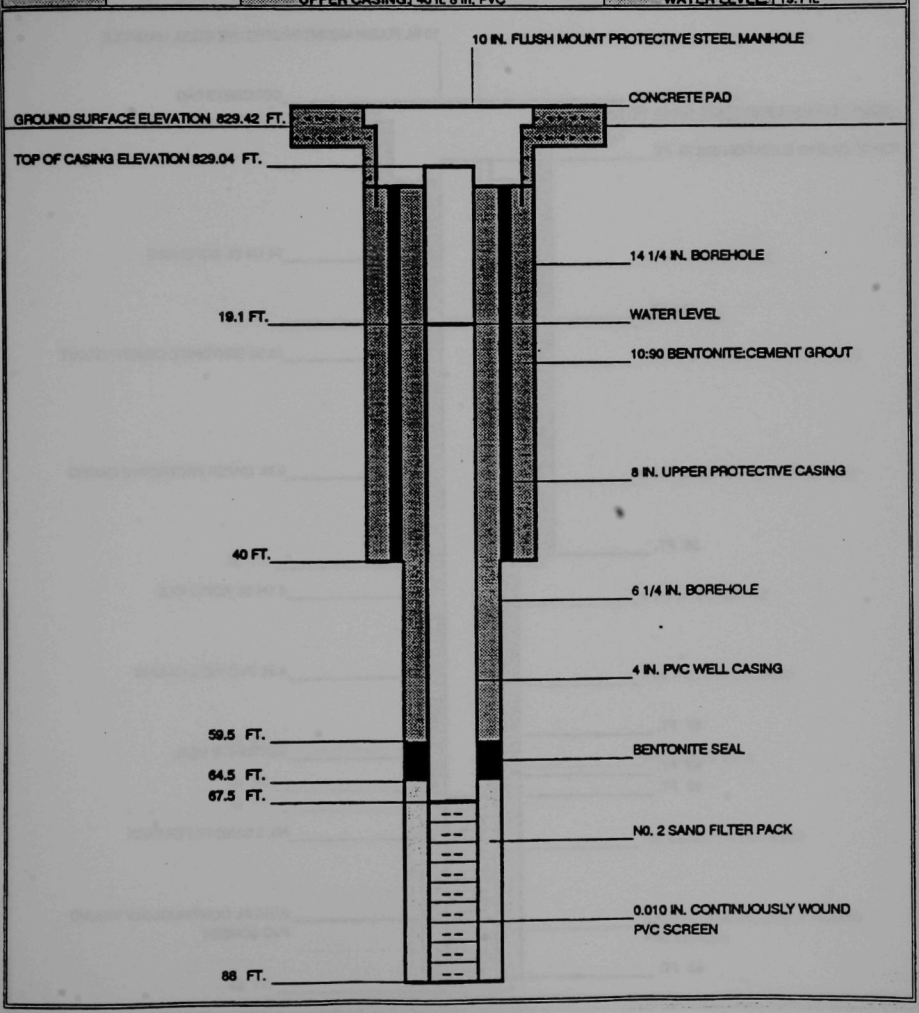
# DW1 WELL COMPLETION RECORD | ARGONNE NATIONAL LABORATORY

| | | | | | |
|---|---|---|---|---|---|
| PROJECT NO: | 91230 | DRILLER: | MARCOR | DRILLING BIT: | 8 1/4 in. & 6 1/4 in. |
| LOCATION: | Johnson City, NY | RIG TYPE: | Canterra CT 350 | GROUND ELEVATION: | 831.83ft. |
| INSPECTOR: | Joseph Hau | METHOD: | HSA & Driven Steel Casing | SAMPLING METHOD: | 24" Split Spoon |
| WELL TYPE: | 4 in. PVC | SCREEN LENGTH: | 10 ft. | PROTOP WIDTH/TYPE: | 6 in. SU Lock Steel |
| WELL DEPTH: | 61.5 ft. | GROUT LENTGH/TYPE: | 43.5 ft. / 10:90 Bent:Cemt. Mix | PAD ELEVATION: | 831.93ft. |
| SCREEN: | 4 in. Con. Wnd PVC | SEAL LENGTH/TYPE: | 5 ft. / bentonite | TOC ELEVATION: | 834.57ft. |
| SLOT SIZE: | 0.010 in. | FILTER LENGTH/TYPE: | 13 ft./ No. 2 Sand | STICK UP/DOWN: | 2.74 ft. |
| | | UPPER CASING: | None | WATER LEVEL: | 19.89 ft. |



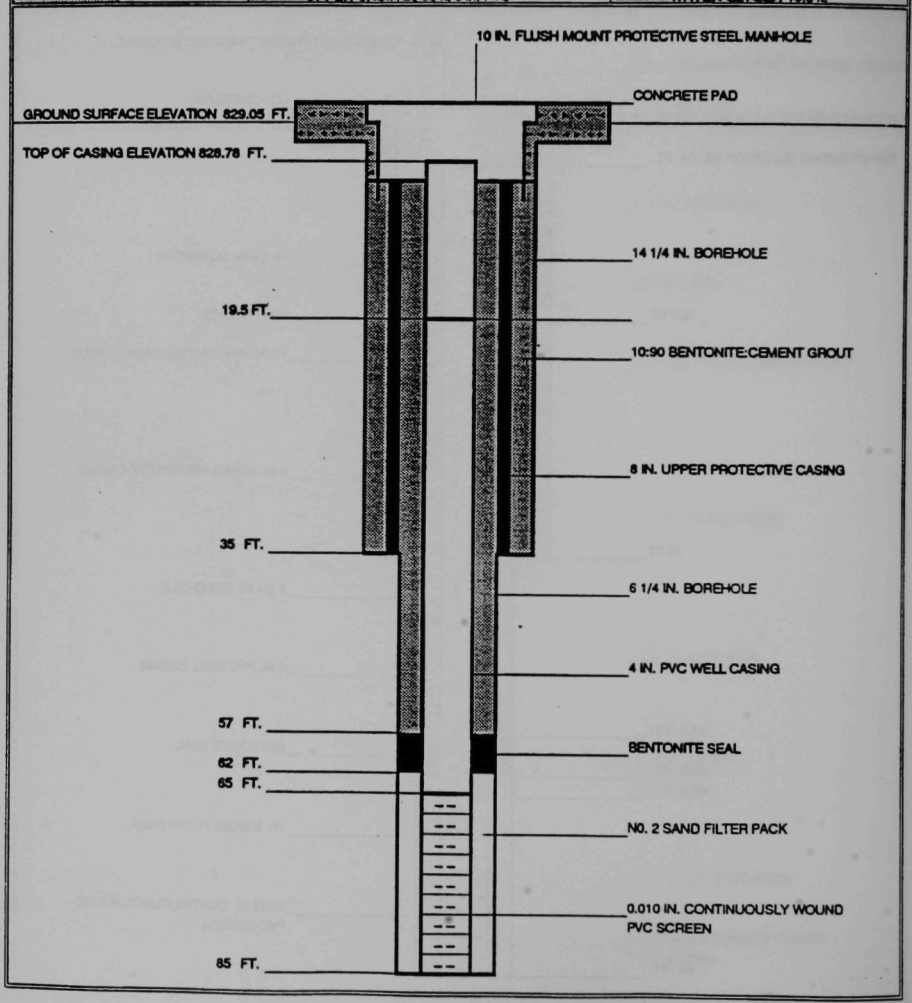
# DW3 WELL COMPLETION RECORD | ARGONNE NATIONAL LABORATORY

| | | | | | |
|---|---|---|---|---|---|
| PROJECT NO: | 91230 | DRILLER: | MARCOR | DRILLING BIT: | 14 1/4 in. & 6 1/4 in. |
| LOCATION: | Johnson City, NY | RIG TYPE: | Canterra CT 350 | GROUND ELEVATION: | 829.42 ft. |
| INSPECTOR: | Joseph Hau | METHOD: | HSA & Driven Steel Casing | SAMPLING METHOD: | 24" Split Spoon |
| WELL TYPE: | 4 in. PVC | SCREEN LENGTH: | 20 ft. | PROTOP WIDTH/TYPE: | 10 in. Flush Manhole |
| WELL DEPTH: | 88.0 ft. | GROUT LENTGH/TYPE: | 59.5 ft. / 10:90 Bent:Cemt. Mix | PAD ELEVATION: | 829.41 ft. |
| SCREEN: | 4 in. Con. Wnd PVC | SEAL LENGTH/TYPE: | 5 ft. / bentonite | TOC ELEVATION: | 829.04 ft. |
| SLOT SIZE: | 0.010 in. | FILTER LENGTH/TYPE: | 23.5 ft./ No. 2 Sand | STICK UP/DOWN: | −0.38 ft. |
| | | UPPER CASING: | 40 ft. 8 in. PVC | WATER LEVEL: | 19.1 ft. |



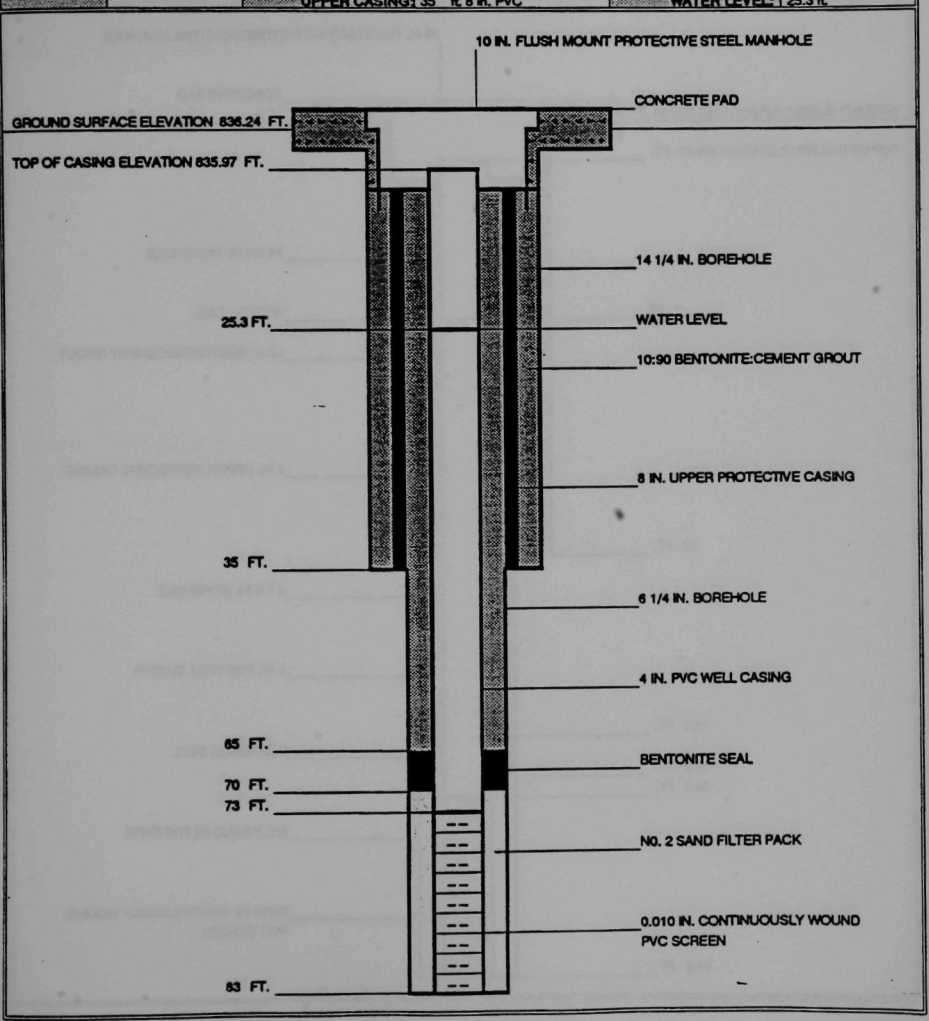
# DW4 WELL COMPLETION RECORD | ARGONNE NATIONAL LABORATORY

| | | | | | |
|---|---|---|---|---|---|
| PROJECT NO: | 91230 | DRILLER: | MARCOR | DRILLING BIT: | 14 1/4 in. & 6 1/4 in. |
| LOCATION: | Johnson City, NY | RIG TYPE: | Canterra CT 350 | GROUND ELEVATION: | 829.05 ft. |
| INSPECTOR: | Joseph Hau | METHOD: | HSA & Driven Steel Casing | SAMPLING METHOD: | 24" Split Spoon |
| WELL TYPE: | 4 in. PVC | SCREEN LENGTH: | 20 ft. | PROTOP WIDTH/TYPE: | 10 in. Flush Manhole |
| WELL DEPTH: | 85 ft. | GROUT LENTGH/TYPE: | 57 ft. / 10:90 Bent:Cemt. Mix | PAD ELEVATION: | 829.10 ft. |
| SCREEN: | 4 in. Con. Wnd PVC | SEAL LENGTH/TYPE: | 5 ft. / bentonite | TOC ELEVATION: | 828.78 ft. |
| SLOT SIZE: | 0.010 in. | FILTER LENGTH/TYPE: | 23 ft./ No. 2 Sand | STICK UP/DOWN: | −0.27 ft. |
| | | UPPER CASING: | 35 ft. 8 in. PVC | WATER LEVEL: | 19.5 ft. |



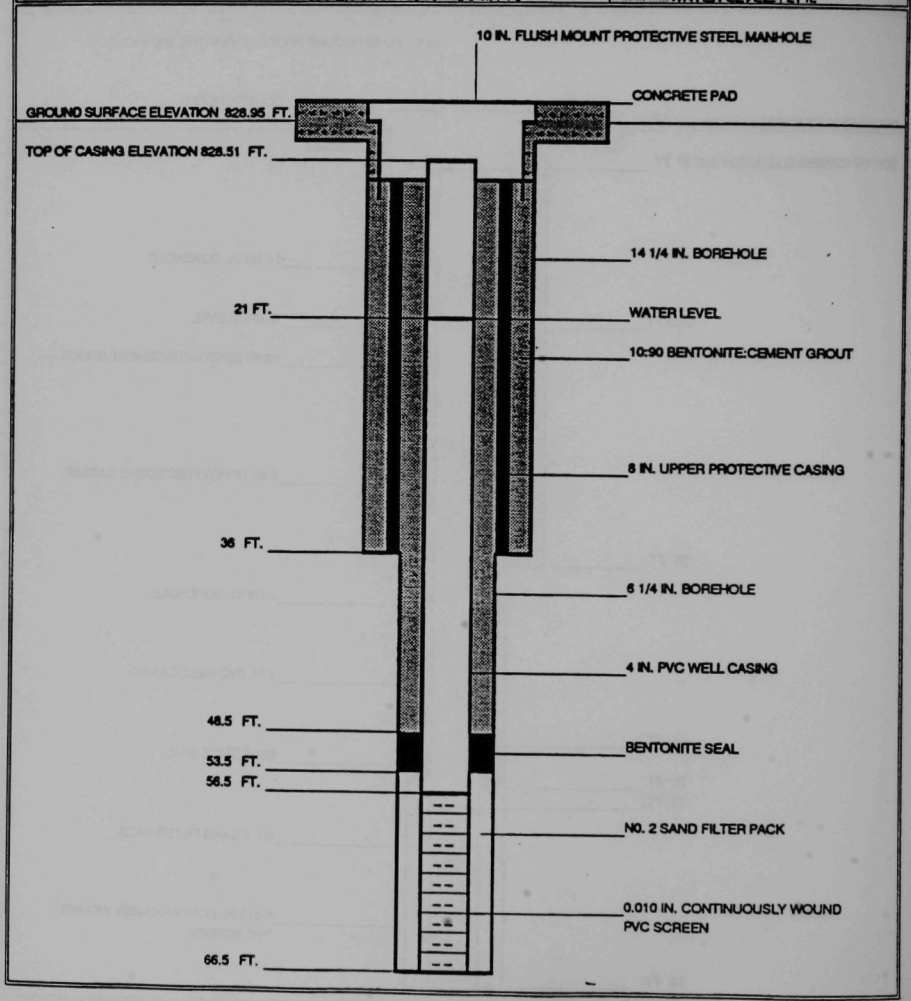
# DW5 WELL COMPLETION RECORD | ARGONNE NATIONAL LABORATORY

| | | | | | |
|---|---|---|---|---|---|
| PROJECT NO: | 91230 | DRILLER: | MARCOR | DRILLING BIT: | 14 1/4 in. & 6 1/4 in. |
| LOCATION: | Johnson City, NY | RIG TYPE: | Canterra CT 350 | GROUND ELEVATION: | 836.24 ft. |
| INSPECTOR: | Joseph Hau | METHOD: | HSA & Driven Steel Casing | SAMPLING METHOD: | 24" Split Spoon |
| WELL TYPE: | 4 in. PVC | SCREEN LENGTH: | 10 ft. | PROTOP WIDTH/TYPE: | 10 in. Flush Manhole |
| WELL DEPTH: | 83 ft. | GROUT LENTGH/TYPE: | 65 ft. / 10:90 Bent:Cemt. Mix | PAD ELEVATION: | 836.24 ft. |
| SCREEN: | 4 in. Con. Wnd PVC | SEAL LENGTH/TYPE: | 5 ft. / bentonite | TOC ELEVATION: | 835.97 ft. |
| SLOT SIZE: | 0.010 in. | FILTER LENGTH/TYPE: | 13 ft./ No. 2 Sand | STICK UP/DOWN: | −0.27 ft. |
| | | UPPER CASING: | 35 ft. 8 in. PVC | WATER LEVEL: | 25.3 ft. |



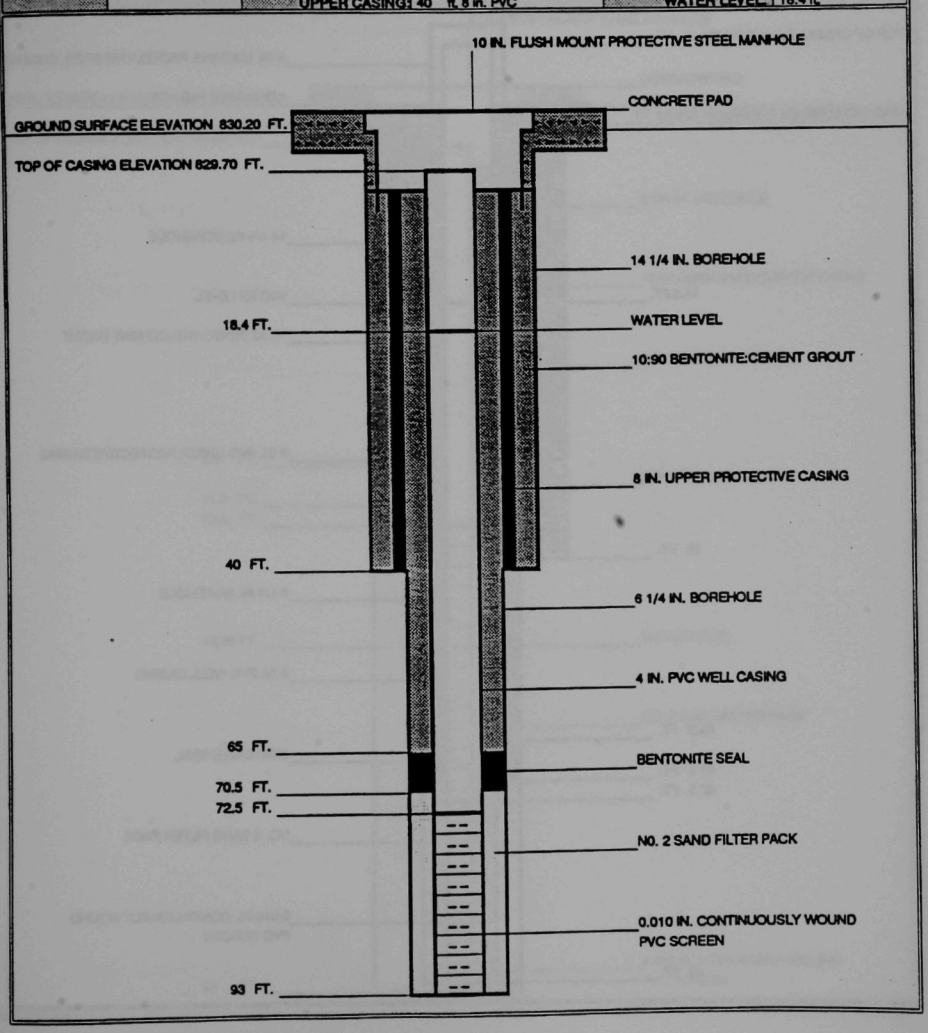
# DW6 WELL COMPLETION RECORD | ARGONNE NATIONAL LABORATORY

| | | | | | |
|---|---|---|---|---|---|
| PROJECT NO: | 91230 | DRILLER: | MARCOR | DRILLING BIT: | 14 1/4 in. & 6 1/4 in. |
| LOCATION: | Johnson City, NY | RIG TYPE: | Canterra CT 350 | GROUND ELEVATION: | 828.95 ft. |
| INSPECTOR: | Joseph Heu | METHOD: | HSA & Driven Steel Casing | SAMPLING METHOD: | 24" Split Spoon |
| WELL TYPE: | 4 in. PVC | SCREEN LENGTH: | 10 ft. | PROTOP WIDTH/TYPE: | 10 in. Flush Manhole |
| WELL DEPTH: | 66.5 ft. | GROUT LENTGH/TYPE: | 48.5 ft. / 10:90 Bent:Cemt. Mix | PAD ELEVATION: | 828.97 ft. |
| SCREEN: | 4 in. Con. Wnd PVC | SEAL LENGTH/TYPE: | 5 ft. / bentonite | TOC ELEVATION: | 828.51 ft. |
| SLOT SIZE: | 0.010 in. | FILTER LENGTH/TYPE: | 13 ft./ No. 2 Sand | STICK UP/DOWN: | −0.44 ft. |
| | | UPPER CASING: | 36 ft. 8 in. PVC | WATER LEVEL: | 21 ft. |



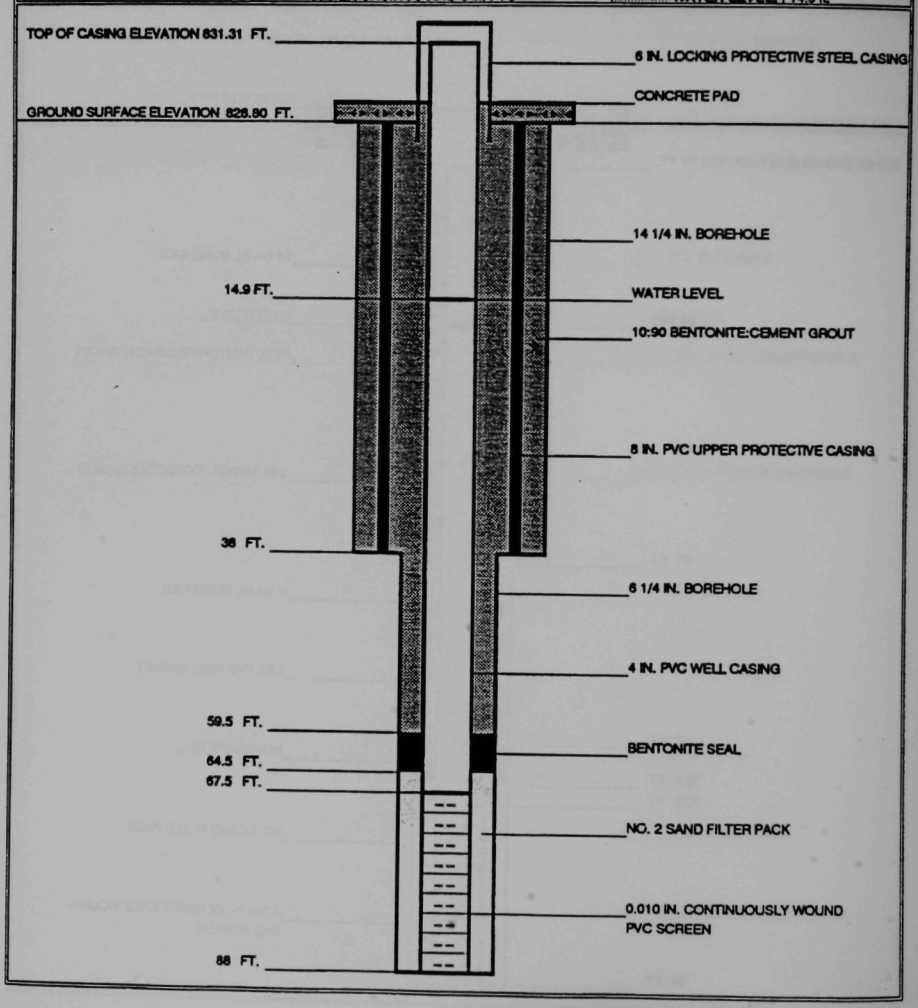
# DW8 WELL COMPLETION RECORD | ARGONNE NATIONAL LABORATORY

| | | | | | |
|---|---|---|---|---|---|
| PROJECT NO: | 91230 | DRILLER: | MARCOR | DRILLING BIT: | 14 1/4 in. & 6 1/4 in. |
| LOCATION: | Johnson City, NY | RIG TYPE: | Canterra CT 350 | GROUND ELEVATION: | 830.20ft. |
| INSPECTOR: | Joseph Hau | METHOD: | HSA & Driven Steel Casing | SAMPLING METHOD: | 24" Split Spoon |
| WELL TYPE: | 4 in. PVC | SCREEN LENGTH: | 20 ft. | PROTOP WIDTH/TYPE: | 10 in. Flush Manhole |
| WELL DEPTH: | 93 ft. | GROUT LENTGH/TYPE: | 65 ft. / 10:90 Bent:Cemt. Mix | PAD ELEVATION: | 830.20ft. |
| SCREEN: | 4 in. Con. Wnd PVC | SEAL LENGTH/TYPE: | 5.5 ft. / bentonite | TOC ELEVATION: | 829.70ft. |
| SLOT SIZE: | 0.010 in. | FILTER LENGTH/TYPE: | 22.5 ft./ No. 2 Sand | STICK UP/DOWN: | -0.50 ft. |
| | | UPPER CASING: | 40 ft. 8 in. PVC | WATER LEVEL: | 18.4 ft. |



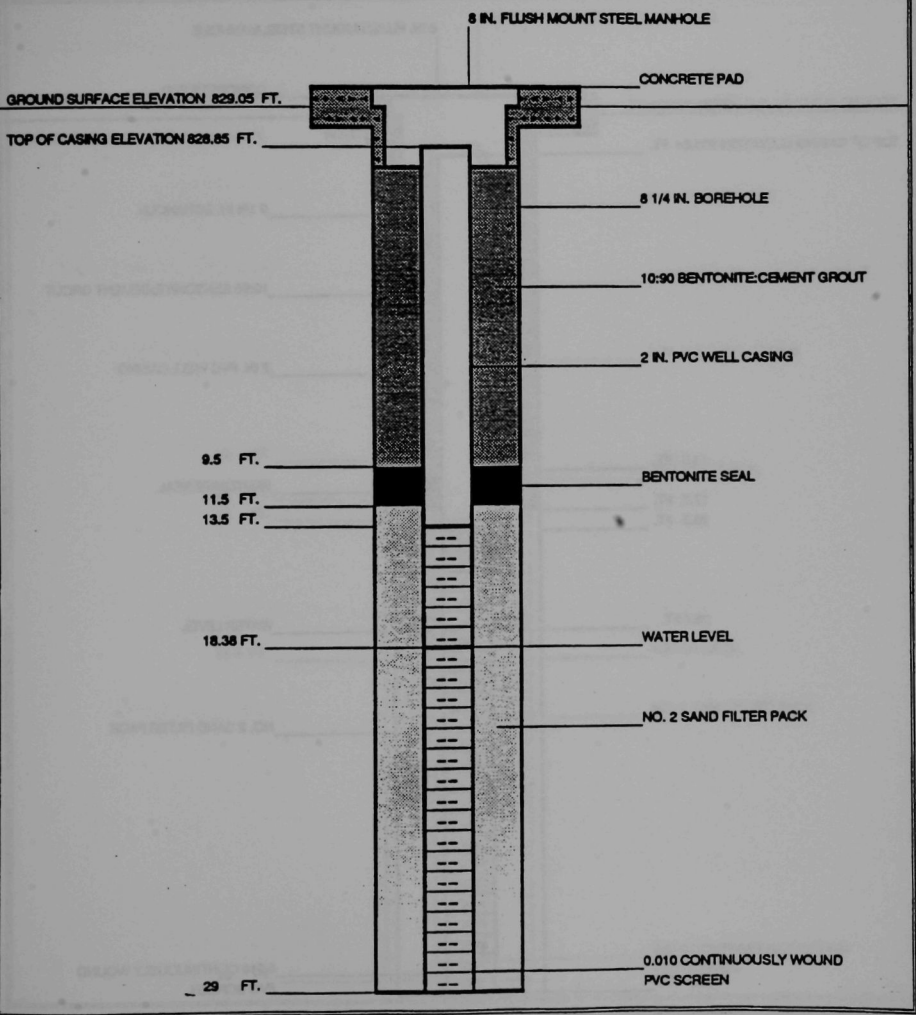
# DW9 WELL COMPLETION RECORD | ARGONNE NATIONAL LABORATORY

| | | | | | |
|---|---|---|---|---|---|
| PROJECT NO: | 91230 | DRILLER: | MARCOR | DRILLING BIT: | 14 1/4 in. & 6 1/4 in. |
| LOCATION: | Johnson City, NY | RIG TYPE: | Canterra CT 350 | GROUND ELEVATION: | 828.80 ft. |
| INSPECTOR: | Joseph Heu | METHOD: | HSA & Driven Steel Casing | SAMPLING METHOD: | 24" Split Spoon |
| WELL TYPE: | 4 in. PVC | SCREEN LENGTH: | 20 ft. | PROTOP WIDTH/TYPE: | 6 in. SU Lock Steel |
| WELL DEPTH: | 88 ft. | GROUT LENTGH/TYPE: | 59.5 ft. / 10:90 Bent:Cemt. Mix | PAD ELEVATION: | 828.80 ft. |
| SCREEN: | 4 in. Con. Wnd PVC | SEAL LENGTH/TYPE: | 5 ft. / Bentonite | TOC ELEVATION: | 831.31 ft. |
| SLOT SIZE: | 0.010 in. | FILTER LENGTH/TYPE: | 23 ft./ No. 2 Sand | STICK UP/DOWN: | 2.51 ft. |
| | | UPPER CASING: | 36 ft. 8 in. PVC | WATER LEVEL: | 14.9 ft. |



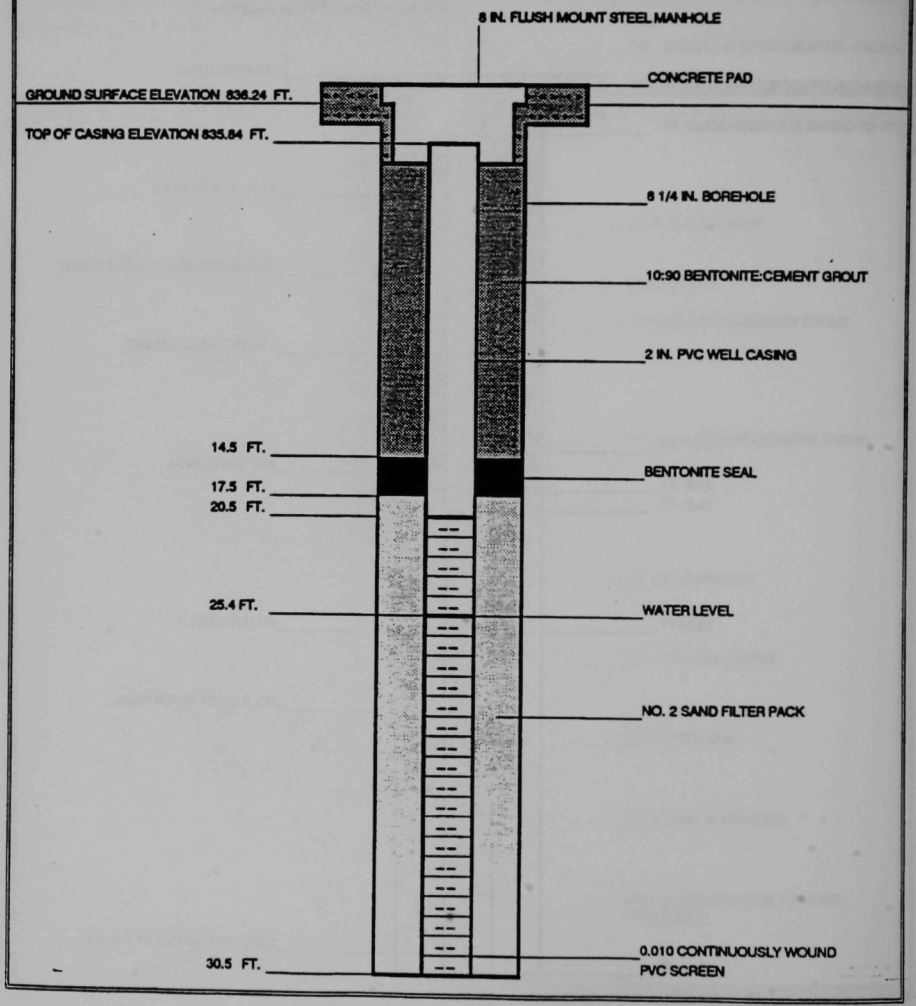
# SW4 WELL COMPLETION RECORD | ARGONNE NATIONAL LABORATORY

| | | | | | |
|---|---|---|---|---|---|
| PROJECT NO: | 91230 | DRILLER: | MARCOR | DRILLING BIT: | 8 1/4 in. |
| LOCATION: | Johnson City, NY | RIG TYPE: | Canterra CT 350 | GROUND ELEVATION: | 829.05 ft. |
| INSPECTOR: | Joseph Hau | METHOD: | HSA & Driven Steel Casing | SAMPLING METHOD: | 24" Split Spoon |
| WELL TYPE: | 2 in PVC | SCREEN LENGTH: | 15 ft | PROTOP WIDTH/TYPE: | 8 in. Flush Manhole |
| WELL DEPTH: | 29 ft. | GROUT LENTGH/TYPE: | 9.5 ft. / 10:90 Bent:Cemt. Mix | PAD ELEVATION: | 829.28 ft. |
| SCREEN: | 2 in. Con. Wnd PVC | SEAL LENGTH/TYPE: | 2 ft. / bentonite | TOC ELEVATION: | 828.85 ft. |
| SLOT SIZE: | 0.010 in. | FILTER LENGTH/TYPE: | 17.5 ft./ No. 2 Sand | STICK UP/DOWN: | −0.43 ft. |



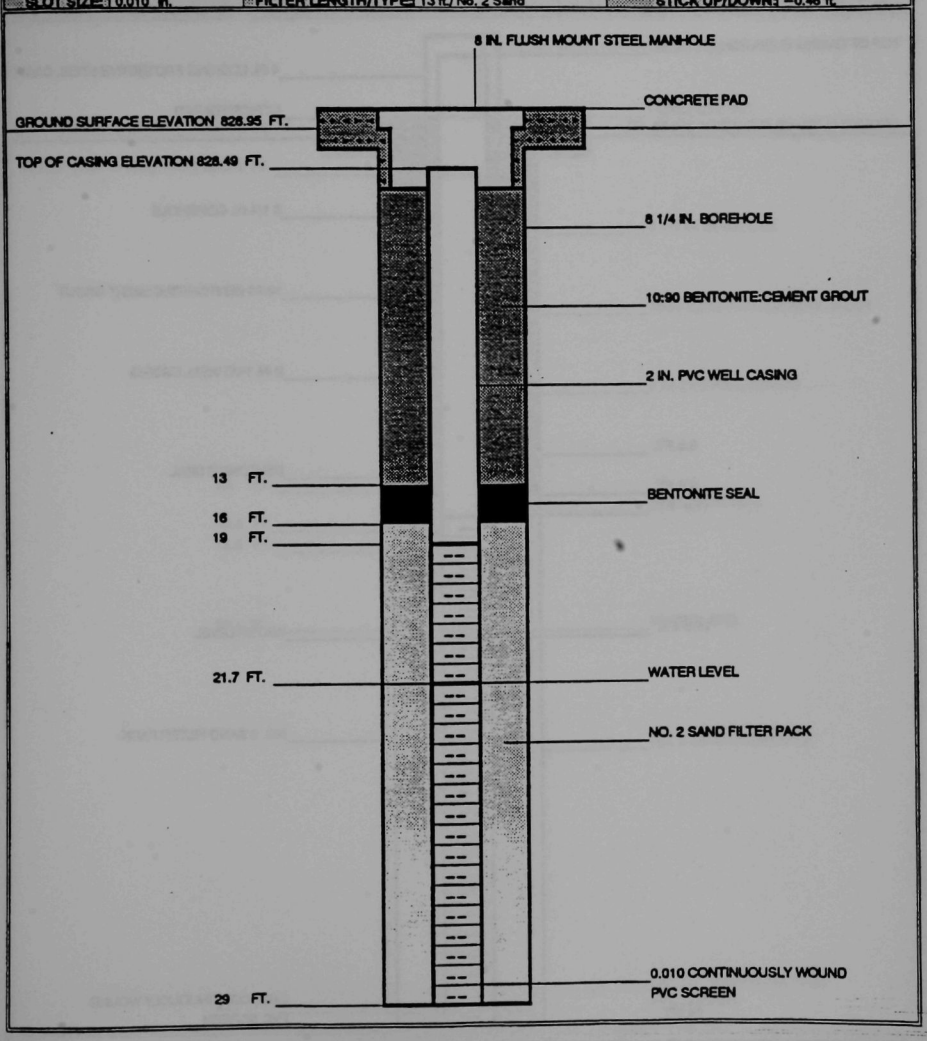
# SW5 WELL COMPLETION RECORD | ARGONNE NATIONAL LABORATORY

| | | | | | |
|---|---|---|---|---|---|
| PROJECT NO: | 91230 | DRILLER: | MARCOR | DRILLING BIT: | 8 1/4 in. |
| LOCATION: | Johnson City, NY | RIG TYPE: | Canterra CT 350 | GROUND ELEVATION: | 836.24ft. |
| INSPECTOR: | Joseph Hau | METHOD: | HSA & Driven Steel Casing | SAMPLING METHOD: | 24" Split Spoon |
| WELL TYPE: | 2 in. PVC | SCREEN LENGTH: | 10 ft | PROTOP WIDTH/TYPE: | 8 in. Flush Manhole |
| WELL DEPTH: | 30.5 ft. | GROUT LENTGH/TYPE: | 14.5 ft. / 10:90 Bent:Cemt. Mix | PAD ELEVATION: | 836.32ft. |
| SCREEN: | 2 in. Con. Wnd PVC | SEAL LENGTH/TYPE: | 3 ft. / bentonite | TOC ELEVATION: | 835.84ft. |
| SLOT SIZE: | 0.010 in. | FILTER LENGTH/TYPE: | 13 ft./ No. 2 Sand | STICK UP/DOWN: | -0.40 ft. |



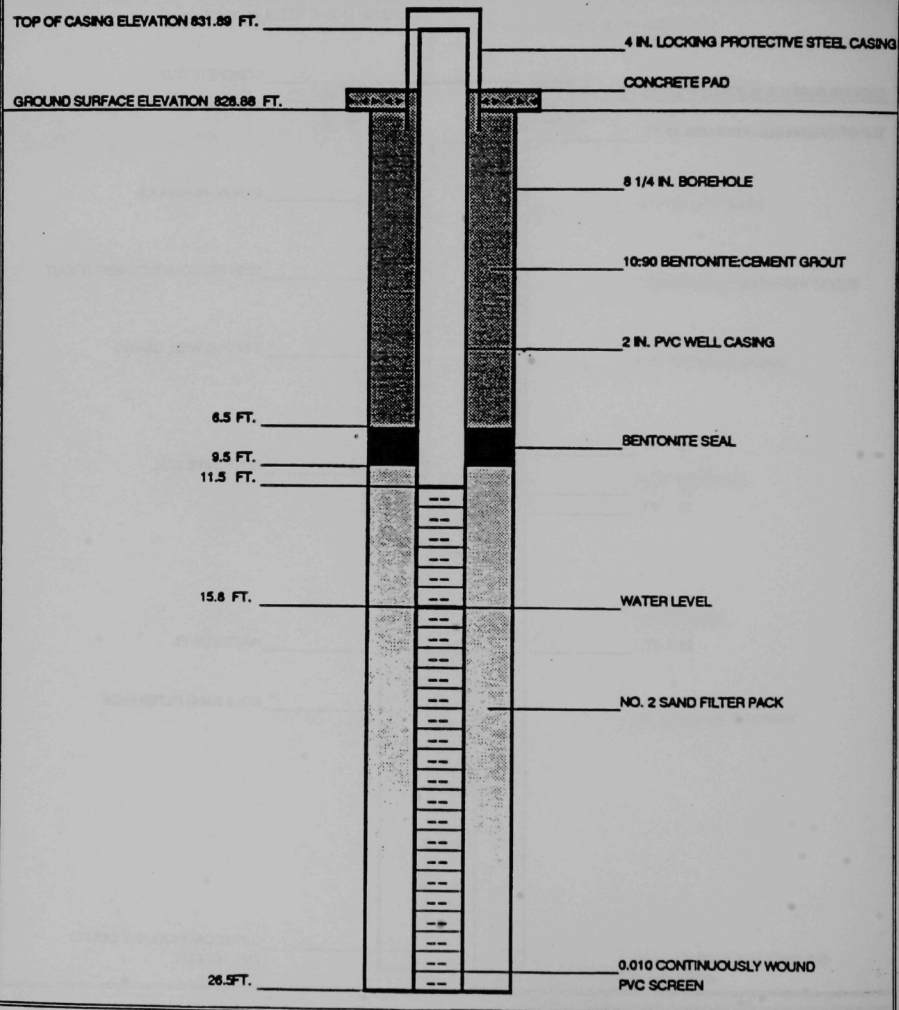
# SW6 WELL COMPLETION RECORD | ARGONNE NATIONAL LABORATORY

| | | | | | |
|---|---|---|---|---|---|
| PROJECT NO: | 91230 | DRILLER: | MARCOR | DRILLING BIT: | 8 1/4 in. |
| LOCATION: | Johnson City, NY | RIG TYPE: | Canterra CT 350 | GROUND ELEVATION: | 828.95 ft. |
| INSPECTOR: | Joseph Hau | METHOD: | HSA & Driven Steel Casing | SAMPLING METHOD: | 24" Split Spoon |
| WELL TYPE: | 2 in PVC | SCREEN LENGTH: | 10 ft | PROTOP WIDTH/TYPE: | 8 in. Flush Manhole |
| WELL DEPTH: | 29 ft. | GROUT LENTGH/TYPE: | 13 ft. / 10:90 Bent:Cemt. Mix | PAD ELEVATION: | 828.99 ft. |
| SCREEN: | 2 in. Con. Wnd PVC | SEAL LENGTH/TYPE: | 3 ft. / bentonite | TOC ELEVATION: | 828.49 ft. |
| SLOT SIZE: | 0.010 in. | FILTER LENGTH/TYPE: | 13 ft. / No. 2 Sand | STICK UP/DOWN: | −0.46 ft. |



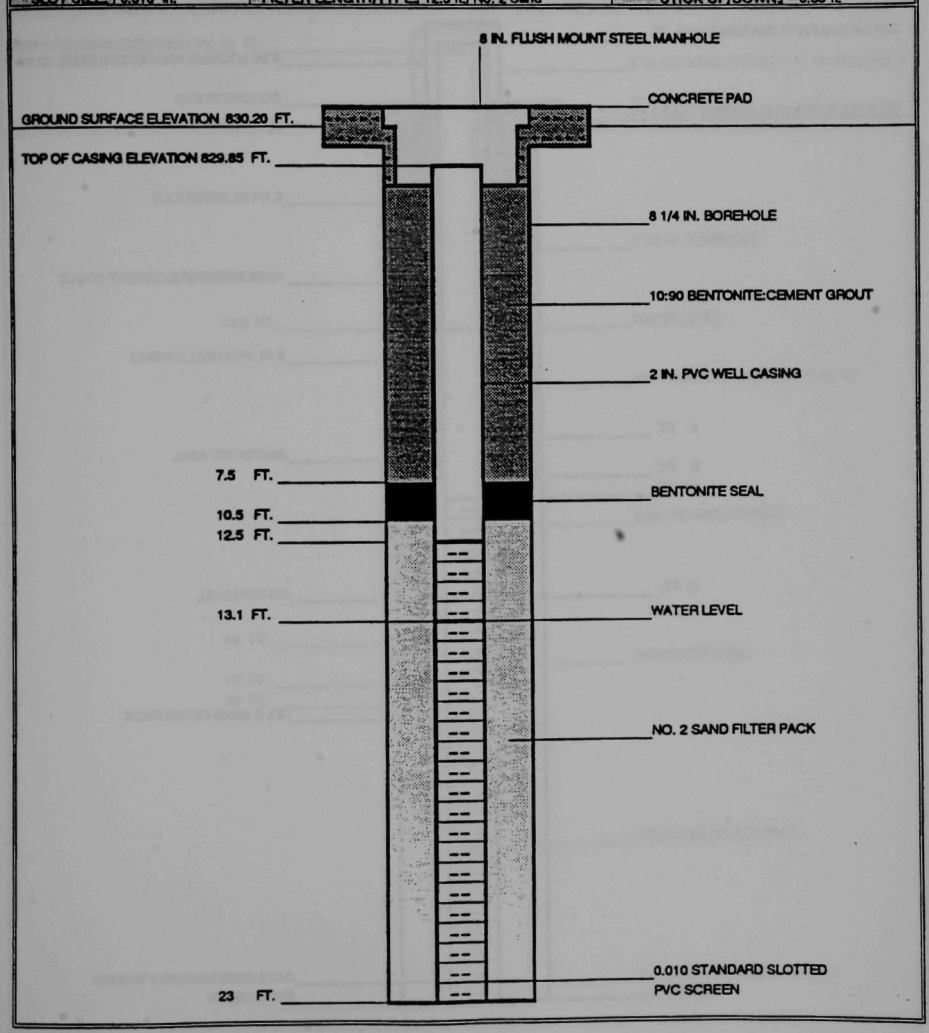
# SW7 WELL COMPLETION RECORD | ARGONNE NATIONAL LABORATORY

| | | | | | |
|---|---|---|---|---|---|
| PROJECT NO: | 91230 | DRILLER: | MARCOR | DRILLING BIT: | 8 1/4 in. |
| LOCATION: | Johnson City, NY | RIG TYPE: | Canterra CT 350 | GROUND ELEVATION: | 828.88 ft. |
| INSPECTOR: | Joseph Hau | METHOD: | HSA & Driven Steel Casing | SAMPLING METHOD: | 24" Split Spoon |
| WELL TYPE: | 2 in PVC | SCREEN LENGTH: | 15 ft | PROTOP WIDTH/TYPE: | 4 in. SU Lock Steel |
| WELL DEPTH: | 26.5 ft. | GROUT LENTGH/TYPE: | 6.5 ft. / 10:90 Bent:Cemt. Mix | PAD ELEVATION: | 829.12 ft. |
| SCREEN: | 2 in. Con. Wnd PVC | SEAL LENGTH/TYPE: | 3 ft. / bentonite | TOC ELEVATION: | 831.89 ft. |
| SLOT SIZE: | 0.010 in. | FILTER LENGTH/TYPE: | 17 ft./ No. 2 Sand | STICK UP/DOWN: | 3.01 ft. |



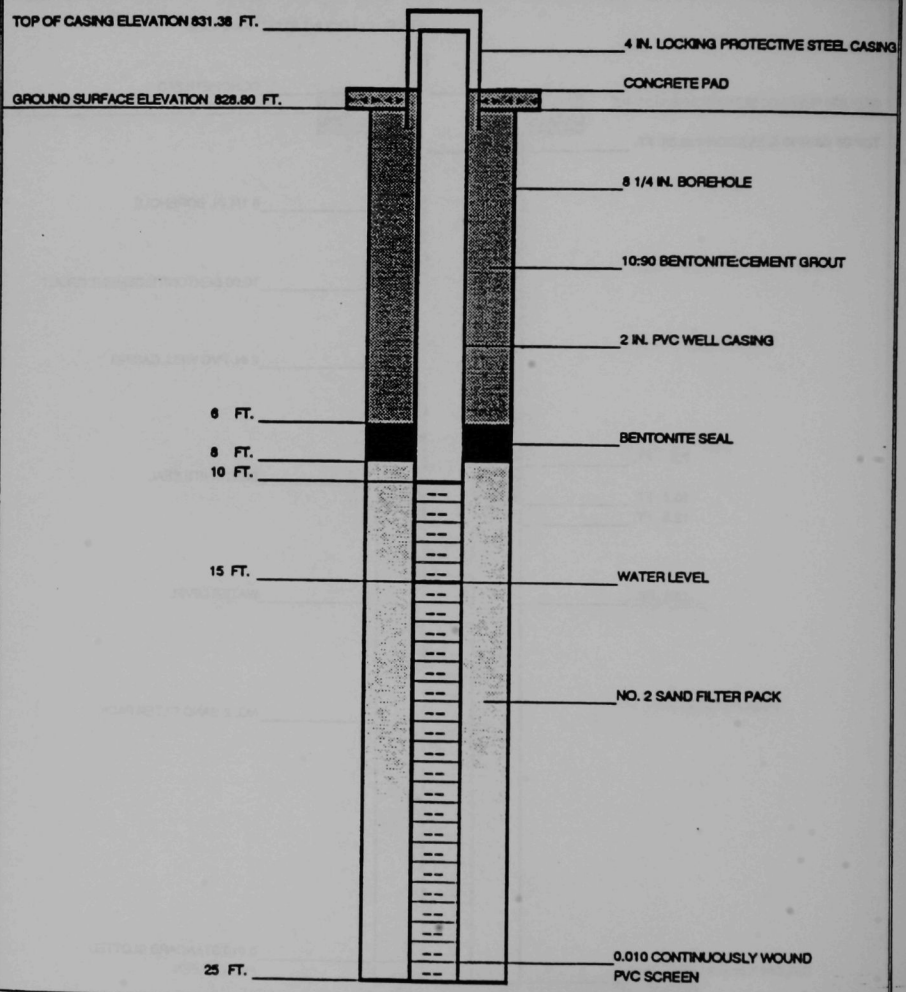
# SW8 WELL COMPLETION RECORD | ARGONNE NATIONAL LABORATORY

| | | | | | |
|---|---|---|---|---|---|
| PROJECT NO: | 91230 | DRILLER: | MARCOR | DRILLING BIT: | 8 1/4 in. |
| LOCATION: | Johnson City, NY | RIG TYPE: | Canterra CT 350 | GROUND ELEVATION: | 830.20ft. |
| INSPECTOR: | Joseph Hau | METHOD: | HSA & Driven Steel Casing | SAMPLING METHOD: | 24" Split Spoon |
| WELL TYPE: | 2 in PVC | SCREEN LENGTH: | 10 ft | PROTOP WIDTH/TYPE: | 8 in. Flush Manhole |
| WELL DEPTH: | 23 ft. | GROUT LENTGH/TYPE: | 7.5 ft. / 10:90 Bent:Cemt. Mix | PAD ELEVATION: | 830.26ft. |
| SCREEN: | 2 in. Strd. Slot PVC | SEAL LENGTH/TYPE: | 3 ft. / bentonite | TOC ELEVATION: | 829.85ft. |
| SLOT SIZE: | 0.010 in. | FILTER LENGTH/TYPE: | 12.5 ft./ No. 2 Sand | STICK UP/DOWN: | −0.35 ft. |



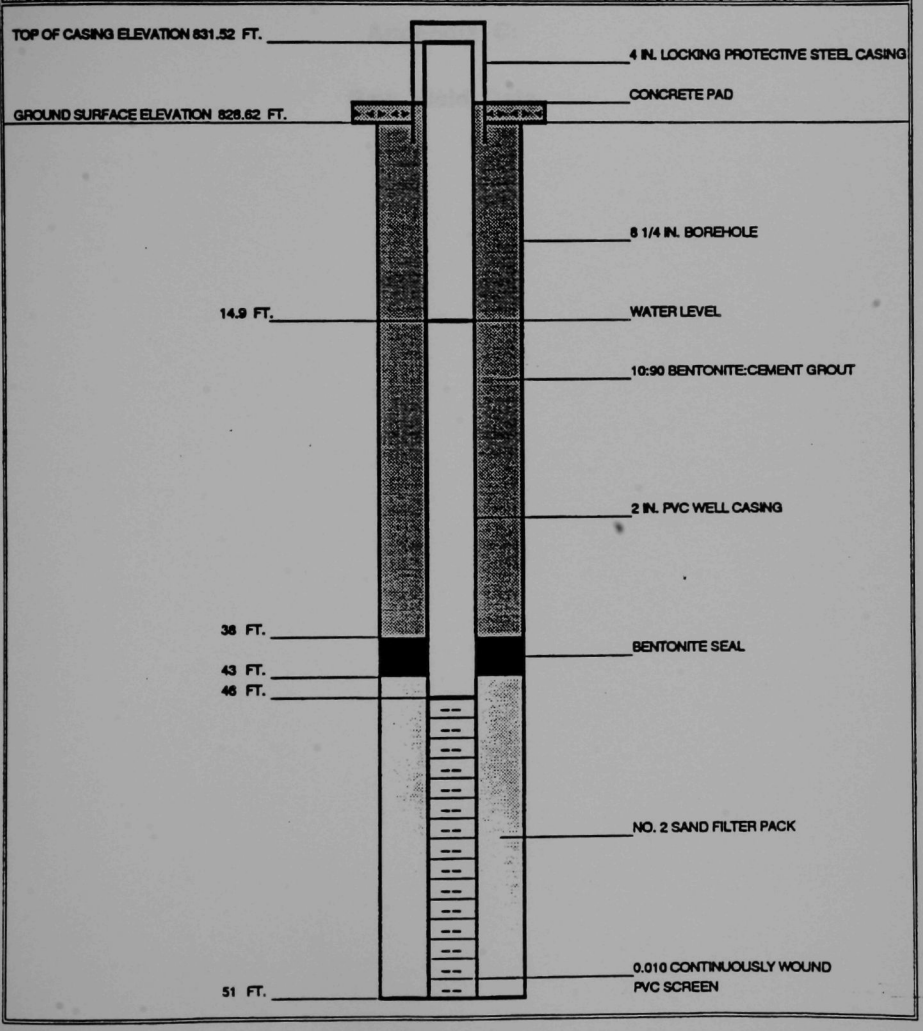
# SW9 WELL COMPLETION RECORD | ARGONNE NATIONAL LABORATORY

| | | | | | |
|---|---|---|---|---|---|
| PROJECT NO: | 91230 | DRILLER: | MARCOR | DRILLING BIT: | 8 1/4 in. |
| LOCATION: | Johnson City, NY | RIG TYPE: | Centerra CT 350 | GROUND ELEVATION: | 828.80 ft. |
| INSPECTOR: | Joseph Heu | METHOD: | HSA & Driven Steel Casing | SAMPLING METHOD: | 24" Split Spoon |
| WELL TYPE: | 2 in PVC | SCREEN LENGTH: | 15 ft | PROTOP WIDTH/TYPE: | 4 in. SU Lock Steel |
| WELL DEPTH: | 25 ft. | GROUT LENTGH/TYPE: | 6 ft. / 10:90 Bent:Cemt. Mix | PAD ELEVATION: | 828.80 ft. |
| SCREEN: | 2 in. Con. Wnd PVC | SEAL LENGTH/TYPE: | 2 ft. / bentonite | TOC ELEVATION: | 831.38 ft. |
| SLOT SIZE: | 0.010 in. | FILTER LENGTH/TYPE: | 17 ft./ No. 2 Sand | STICK UP/DOWN: | 2.58 ft. |



# IW9 WELL COMPLETION RECORD | ARGONNE NATIONAL LABORATORY

| | | | | | |
|---|---|---|---|---|---|
| PROJECT NO: | 91230 | DRILLER: | MARCOR | DRILLING BIT: | 8 1/4 in. |
| LOCATION: | Johnson City, NY | RIG TYPE: | Canterra CT 350 | GROUND ELEVATION: | 828.62ft. |
| INSPECTOR: | Joseph Hau | METHOD: | HSA & Driven Steel Casing | SAMPLING METHOD: | 24" Split Spoon |
| WELL TYPE: | 2 in PVC | SCREEN LENGTH: | 5 ft | PROTOP WIDTH/TYPE: | 4 in. SU Lock Steel |
| WELL DEPTH: | 51 ft. | GROUT LENTGH/TYPE: | 38 ft. / 10:90 Bent:Cemt. Mix | PAD ELEVATION: | 828.83ft. |
| SCREEN: | 2 in. Con. Wnd PVC | SEAL LENGTH/TYPE: | 5 ft. / bentonite | TOC ELEVATION: | 831.52ft. |
| SLOT SIZE: | 0.010 in. | FILTER LENGTH/TYPE: | 8 ft./ No. 2 Sand | STICK UP/DOWN: | 2.90 ft. |



# Appendix C:

# Raw Field Data

# Appendix C-1:

## Well Development Records

# DW1 WELL DEVELOPMENT RECORD | ARGONNE NATIONAL LABORATORY

| | | | | | |
|---|---|---|---|---|---|
| PROJECT NO: | 91230 | DRILLER: | MARCOR | DEPTH TO WATER: | 20.66 ft. |
| LOCATION: | Johnson City, NY | RIG TYPE: | Canterra CT 350 | HEIGHT OF WATER: | 41.34 ft. |
| INSPECTOR: | Joseph Hau | METHOD: | HSA & Driven Steel Casing | VOLUME IN WELL: | 27 gal. |
| WELL TYPE: | 4 in. PVC | SCREEN LENGTH: | 10 ft. | PROTOP WIDTH/TYPE: | 6 in. SU Lock Steel |
| WELL DEPTH: | 61.5 ft. | GROUT LENTGH/TYPE: | 43.5 ft. / 10:90 Bent:Cemt. Mix | GROUND ELEVATION: | 831.83 ft. |
| SCREEN: | 4 in. Con. Wnd PVC | SEAL LENGTH/TYPE: | 5 ft. / bentonite | PAD ELEVATION: | 831.93 ft. |
| SLOT SIZE: | 0.010 in. | FILTER LENGTH/TYPE: | 13 ft./ No. 2 Sand | TOC ELEVATION: | 834.57 ft. |
| | | | | STICK UP/DOWN: | 2.74 ft. |

| DATE | 12/12/91 | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| TIME | 0745 | 0800 | 0805 | 0810 | 0815 | 0820 | 0825 | 0830 | 0835 |
| RATE (GPM) | 6 | | | | | | | | |
| DEPTH TO WATER (FT) | 20.66 | 27.00 | 27.73 | 27.81 | 27.82 | 28.11 | 28.18 | 28.22 | 28.34 |
| VOLUME (GAL) | ---(1) | 40 | 50 | 70 | 100 | 130 | 150 | 175 | 225 |
| TEMPERATURE (°C) | --- | 11.0 | 11.5 | 11.5 | 11.6 | 11.4 | 11.4 | 11.4 | 11.2 |
| pH | --- | 6.87 | 8.33 | 7.61 | 7.48 | 7.26 | 7.26 | 7.24 | [7.23](2) |
| CONDUCTIVITY (mS) | --- | --- | --- | --- | --- | --- | --- | --- | 14.16 |
| TURBIDITY (NTUs) | --- | --- | --- | --- | --- | --- | --- | 85.1 | 56.4 |

| DATE | | | END | REC | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| TIME | 0840 | 0845 | 0850 | 0855 | | | | | |
| RATE (GPM) | | | | | | | | | |
| DEPTH TO WATER (FT) | 28.38 | 28.42 | 28.43 | 20.68 | | | | | |
| VOLUME (GAL) | 250 | 275 | 300 | --- | | | | | |
| TEMPERATURE (°C) | 11.5 | [11.5] | --- | --- | | | | | |
| pH | --- | --- | --- | --- | | | | | |
| CONDUCTIVITY (mS) | 14.01 | [14.03] | --- | --- | | | | | |
| TURBIDITY (NTUs) | --- | [36.2] | --- | --- | | | | | |

(1) --- means no reading
(2) [Number] means parameter has stabilized or is acceptable

# DW3 WELL DEVELOPMENT RECORD | ARGONNE NATIONAL LABORATORY

| | | | | | |
|---|---|---|---|---|---|
| PROJECT NO: | 91230 | DRILLER: | MARCOR | DEPTH TO WATER: | 14.81 ft. |
| LOCATION: | Johnson City, NY | RIG TYPE: | Canterra CT 350 | HEIGHT OF WATER: | 51.69 ft. |
| INSPECTOR: | Joseph Hau | METHOD: | HSA & Driven Steel Casing | VOLUME IN WELL: | 34 gal. |
| WELL TYPE: | 4 in. PVC | SCREEN LENGTH: | 20 ft. | PROTOP WIDTH/TYPE: | 10 in. SU Lock Steel |
| WELL DEPTH: | 88.0 ft. | GROUT LENTGH/TYPE: | 59.5 ft. / 10:90 Bent:Cemt. Mix | GROUND ELEVATION: | 829.42 ft. |
| SCREEN: | 4 in. Con. Wnd PVC | SEAL LENGTH/TYPE: | 5 ft. / bentonite | PAD ELEVATION: | 829.41 ft. |
| SLOT SIZE: | 0.010 in. | FILTER LENGTH/TYPE: | 23.5 ft./ No. 2 Sand | TOC ELEVATION: | 829.04 ft. |
| | | | | STICK UP/DOWN: | -0.38 ft. |

| DATE | START 12/11/91 | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| TIME | 1112 | 1117 | 1127 | | | | | | |
| RATE (GPM) | 7.89 | | | | | | | | |
| DEPTH TO WATER (FT) | 15.29 | 15.92 | 16.04 | 16.04 | 16.06 | 15.41 | --- | 15.95 | 16.00 |
| VOLUME (gal) | ---(1) | --- | --- | --- | --- | 175 | --- | --- | --- |
| TEMPERATURE (°C) | 12.7 | --- | --- | --- | --- | 13.3 | --- | --- | --- |
| pH | 6.08 | --- | --- | --- | --- | 6.38 | --- | --- | --- |
| CONDUCTIVITY (mS) | --- | --- | --- | --- | --- | 10.14 | --- | --- | --- |
| TURBIDITY (NTUs) | --- | --- | --- | --- | 66.5 | --- | --- | --- | --- |

| DATE | | | END | REC | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| TIME | 1157 | 1202 | 1207 | 1212 | | | | | |
| RATE (GPM) | | | | | | | | | |
| DEPTH TO WATER (FT) | 16.02 | 16.00 | 16.05 | 15.35 | | | | | |
| VOLUME (GAL) | 300 | 350 | 400 | --- | | | | | |
| TEMPERATURE (°C) | 13.3 | 13.3 | [13.3] | --- | | | | | |
| pH | 7.01 | 7.05 | [7.02] | --- | | | | | |
| CONDUCTIVITY (mS) | 10.23 | 10.32 | [10.24] | --- | | | | | |
| TURBIDITY (NTUs) | [3.65](2) | | | | | | | | |

(1) --- means no reading
(2) [Number] means parameter has stabilized or is acceptable

# DW4 WELL DEVELOPMENT RECORD | ARGONNE NATIONAL LABORATORY

| | | | | | |
|---|---|---|---|---|---|
| PROJECT NO: | 91230 | DRILLER: | MARCOR | DEPTH TO WATER: | 15.34 ft. |
| LOCATION: | Johnson City, NY | RIG TYPE: | Canterra CT 350 | HEIGHT OF WATER: | 76.67 ft. |
| INSPECTOR: | Joseph Hau | METHOD: | HSA & Driven Steel Casing | VOLUME IN WELL: | 50 gal. |
| WELL TYPE: | 4 in. PVC | SCREEN LENGTH: | 20 ft. | PROTOP WIDTH/TYPE: | 10 in. SU Lock Steel |
| WELL DEPTH: | 85 ft. | GROUT LENTGH/TYPE: | 57 ft. / 10:90 Bent:Cemt. Mix | GROUND ELEVATION: | 829.05 ft. |
| SCREEN: | 4 in. Con. Wnd PVC | SEAL LENGTH/TYPE: | 5 ft. / bentonite | PAD ELEVATION: | 829.10 ft. |
| SLOT SIZE: | 0.010 in. | FILTER LENGTH/TYPE: | 23 ft./ No. 2 Sand | TOC ELEVATION: | 828.78 ft. |
| | | | | STICK UP/DOWN: | 2.74 ft. |

| DATE | 12/12/91 | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| TIME | 0950 | 0955 | 1000 | 1005 | 1010 | 1015 | 1020 | 1025 | 1030 | 1035 |
| RATE (GPM) | 5 | 5 | 5 | 5 | 6 | 6 | 6 | 6 | 6 | 6 |
| DEPTH TO WATER (FT) | 15.34 | 23.96 | 27.14 | 27.62 | 28.79 | 29.39 | 30.43 | 30.74 | 30.60 | 30.84 |
| VOLUME (gal) | 0 | 15 | 40 | 75 | 90 | 120 | 150 | 175 | 200 | 225 |
| TEMPERATURE (°C) | 12.3 | 12.4 | 12.9 | 12.8 | 12.5 | 12.5 | 12.8 | 13.1 | 12.7 | 12.7 |
| pH | ---(1) | 7.22 | 7.38 | 7.36 | 7.35 | 7.33 | [7.35](2) | --- | --- | --- |
| CONDUCTIVITY (mS) | --- | --- | --- | --- | --- | --- | --- | 9.27 | 9.71 | 9.39 |
| TURBIDITY (NTUs) | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |

| DATE | | | | | | | | END | REC | |
|---|---|---|---|---|---|---|---|---|---|---|
| TIME | 1040 | 1045 | 1050 | 1055 | 1100 | 1105 | 1110 | 1115 | 1120 | |
| RATE (GPM) | | | | | | | | | | |
| DEPTH TO WATER (FT) | 31.04 | 31.58 | 31.72 | 31.71 | 31.93 | 32.03 | 31.99 | 32.04 | 16.07 | |
| VOLUME (GAL) | 265 | 280 | 315 | 325 | 360 | 400 | 420 | 440 | 450 | |
| TEMPERATURE (°C) | [13.0] | 13.0 | 13.0 | 13.0 | 13.0 | 13.1 | 13.0 | 13.0 | 13.0 | |
| pH | --- | --- | --- | --- | --- | --- | --- | --- | --- | |
| CONDUCTIVITY (mS) | 9.61 | 9.58 | 9.68 | 9.60 | 9.33 | 9.05 | 8.67 | 8.61 | [8.63] | |
| TURBIDITY (NTUs) | --- | --- | --- | 141 | 86 | 109 | 68 | [44] | --- | |

(1) --- means no reading
(2) [Number] means parameter has stabilized or is acceptable

# DW5 WELL DEVELOPMENT RECORD | ARGONNE NATIONAL LABORATORY

| | | | | | |
|---|---|---|---|---|---|
| ROJECT NO: | 91230 | DRILLER: | MARCOR | DEPTH TO WATER: | 22.33 ft. |
| LOCATION: | Johnson City, NY | RIG TYPE: | Canterra CT 350 | HEIGHT OF WATER: | 60.97 ft. |
| INSPECTOR: | Joseph Hau | METHOD: | HSA & Driven Steel Casing | VOLUME IN WELL: | 40 gal. |
| WELL TYPE: | 4 in. PVC | SCREEN LENGTH: | 10 ft. | PROTOP WIDTH/TYPE: | 10 in. SU Lock Steel |
| VELL DEPTH: | 63 ft. | GROUT LENTGH/TYPE: | 65 ft. / 10:90 Bent:Cemt. Mix | GROUND ELEVATION: | 836.24 ft. |
| SCREEN: | 4 in. Con. Wnd PVC | SEAL LENGTH/TYPE: | 5 ft. / bentonite | PAD ELEVATION: | 836.24 ft. |
| SLOT SIZE: | 0.010 in. | FILTER LENGTH/TYPE: | 13 ft./ No. 2 Sand | TOC ELEVATION: | 835.79 ft. |
| | | | | STICK UP/DOWN: | −0.27 ft. |

| DATE | 12/11/91 | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| TIME | 1610 | 1619 | 1625 | 1630 | 1635 | 1640 | 1645 | 1650 | 1655 |
| RATE (GPM) | 7.14 | | | | | | | | |
| DEPTH TO WATER (FT) | 22.33 | 24.05 | 24.12 | 24.17 | 24.23 | 24.30 | 24.38 | 24.46 | 24.51 |
| VOLUME (gal) | 0 | 50 | 100 | 150 | 175 | 210 | 250 | 275 | 325 |
| TEMPERATURE (°C) | 12.8 | 12.3 | 12.3 | 12.3 | 12.3 | 12.3 | 12.3 | 12.3 | 12.3 |
| pH | 8.40 | 7.50 | 7.47 | 7.36 | 7.37 | [7.35] | --- | --- | --- |
| CONDUCTIVITY (mS) | --- | --- | --- | --- | --- | --- | 8.47 | 8.32 | 8.46 |
| TURBIDITY (NTUs) | --- | --- | --- | --- | --- | --- | --- | --- | --- |

| DATE | | | | | | | END | REC | |
|---|---|---|---|---|---|---|---|---|---|
| TIME | 1700 | 1705 | 1710 | 1714 | 1720 | 1725 | 1730 | 1735 | |
| RATE (GPM) | | | | | | | | | |
| DEPTH TO WATER (FT) | 24.56 | 24.55 | 24.60 | 24.60 | 24.65 | 24.68 | 24.69 | 22.90 | |
| VOLUME (GAL) | 375 | 425 | 475 | 500 | 525 | 575 | 600 | --- | |
| TEMPERATURE (°C) | 12.3 | 12.3 | 12.3 | [12.3] | --- | --- | --- | --- | |
| pH | --- | --- | --- | --- | --- | --- | --- | --- | |
| CONDUCTIVITY (mS) | 8.53 | [8.58] | --- | --- | --- | --- | --- | --- | |
| TURBIDITY (NTUs) | 141 | --- | --- | 92.5 | 71.2 | --- | [48.3] | --- | |

(1) --- means no reading
(2) [Number] means parameter has stabilized or is acceptable

# DW6 WELL DEVELOPMENT RECORD | ARGONNE NATIONAL LABORATORY

| | | | | | |
|---|---|---|---|---|---|
| PROJECT NO: | 91230 | DRILLER: | MARCOR | DEPTH TO WATER: | 14.81 ft. |
| LOCATION: | Johnson City, NY | RIG TYPE: | Canterra CT 350 | HEIGHT OF WATER: | 51.69 ft. |
| INSPECTOR: | Joseph Hau | METHOD: | HSA & Driven Steel Casing | VOLUME IN WELL: | 34 gal. |
| WELL TYPE: | 4 in. PVC | SCREEN LENGTH: | 10 ft. | PROTOP WIDTH/TYPE: | 10 in. SU Lock Steel |
| WELL DEPTH: | 66.5 ft. | GROUT LENTGH/TYPE: | 48.5 ft. / 10:90 Bent:Cemt. Mix | GROUND ELEVATION: | 828.95 ft. |
| SCREEN: | 4 in. Con. Wnd PVC | SEAL LENGTH/TYPE | 5 ft. / bentonite | PAD ELEVATION: | 828.97 ft. |
| SLOT SIZE: | 0.010 in. | FILTER LENGTH/TYPE: | 13 ft./ No. 2 Sand | TOC ELEVATION: | 828.51 ft. |
| | | | | STICK UP/DOWN: | -0.44 ft. |

| DATE | 12/11/91 | | | END | 12/12/91 | | | | END | 12/13/91 |
|---|---|---|---|---|---|---|---|---|---|---|
| TIME | 1355 | 1400 | 1406 | 1424 | 1510 | 1525 | 1545 | 1556 | 1611 | 0705 |
| RATE (GPM) | 7.43 | | | | 1.5 | | | | | 1.4 |
| DEPTH TO WATER (FT) | 14.81 | TO PUMP | 55.0 | 38.0 | 14.92 | 39.37 | 53.0 | TO PUMP | 41.3 | 14.8 |
| VOLUME (gal) | --- | 34 | --- | --- | 0 | 25 | 35 | 50 | --- | --- |
| TEMPERATURE (°C) | 10.2 | --- | --- | --- | 12.3 | 12.6 | 12.6 | 12.6 | --- | --- |
| pH | -- | --- | --- | --- | 11.65 | 11.54 | 11.49 | 11.56 | --- | --- |
| CONDUCTIVITY (mS) | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| TURBIDITY (NTUs) | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |

| DATE | | | | | | | | | END | RECV |
|---|---|---|---|---|---|---|---|---|---|---|
| TIME | 0710 | 0715 | 0720 | 0725 | 0730 | 0735 | 0740 | 0745 | 0750 | 0755 |
| RATE (GPM) | 1.4 | | | | | | | | | |
| DEPTH TO WATER (FT) | 26.6 | 35.14 | 42.67 | 48.71 | 54.50 | TO PUMP | TO PUMP | TO PUMP | TO PUMP | 45.52 |
| VOLUME (GAL) | --- | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 | --- |
| TEMPERATURE (°C) | --- | 14.9 | 15.5 | 15.6 | 15.6 | 15.6 | 15.2 | 15.2 | [15.2] | --- |
| pH | --- | 11.0 | 11.22 | 11.29 | 11.14 | [11.18] | --- | --- | --- | --- |
| CONDUCTIVITY (mS) | --- | --- | --- | --- | --- | 6.03 | 5.83 | 5.65 | [5.58] | --- |
| TURBIDITY (NTUs) | --- | --- | --- | --- | --- | --- | --- | --- | [>200] | --- |

(1) --- means no reading
(2) [Number] means parameter has stabilized or is acceptable

# DW8 WELL DEVELOPMENT RECORD | ARGONNE NATIONAL LABORATORY

| | | | | | |
|---|---|---|---|---|---|
| PROJECT NO: | 91230 | DRILLER: | MARCOR | DEPTH TO WATER: | 15.6 ft. |
| LOCATION: | Johnson City, NY | RIG TYPE: | Canterra CT 350 | HEIGHT OF WATER: | 76.9 ft. |
| INSPECTOR: | Joseph Hau | METHOD: | HSA & Driven Steel Casing | VOLUME IN WELL: | 50 gal. |
| WELL TYPE: | 4 in. PVC | SCREEN LENGTH: | 20 ft. | PROTOP WIDTH/TYPE: | 10 in. SU Lock Steel |
| WELL DEPTH: | 93 ft. | GROUT LENTGH/TYPE: | 65 ft. / 10:90 Bent:Cemt. Mix | GROUND ELEVATION: | 830.20 ft. |
| SCREEN: | 4 in. Con. Wnd PVC | SEAL LENGTH/TYPE: | 5.5 ft. / bentonite | PAD ELEVATION: | 830.20 ft. |
| SLOT SIZE: | 0.010 in. | FILTER LENGTH/TYPE: | 22.5 ft./ No. 2 Sand | TOC ELEVATION: | 829.70 ft. |
| | | | | STICK UP/DOWN: | -0.50 ft. |

| DATE | 12/13/91 | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| TIME | 0844 | 0850 | 0855 | 0900 | 0905 | 0910 | 0915 | 0920 | 0925 |
| RATE (GPM) | 6 | | | | | | | | |
| DEPTH TO WATER (FT) | 15.6 | 25.46 | 25.60 | 25.80 | 25.87 | 24.81 | 25.89 | 26.64 | 26.77 |
| VOLUME (gal) | 0 | 40 | 60 | 75 | 120 | 150 | 175 | 205 | 225 |
| TEMPERATURE (°C) | 11.2 | [11.3] | 11.3 | 11.3 | 11.3 | 11.3 | 11.3 | 11.3 | 11.3 |
| pH | 8.33 | 7.50 | 7.38 | 7.23 | 7.18 | 7.72 | 7.51 | 7.22 | 7.14 |
| CONDUCTIVITY (mS) | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| TURBIDITY (NTUs) | --- | --- | --- | --- | --- | --- | --- | >200 | 109.4 |

| DATE | | | | END | RECV | | | | |
|---|---|---|---|---|---|---|---|---|---|
| TIME | 0930 | 0935 | 0940 | 0945 | 0945 | | | | |
| RATE (GPM) | 6 | | | | | | | | |
| DEPTH TO WATER (FT) | 26.77 | 26.84 | 27.03 | 27.14 | 15.67 | | | | |
| VOLUME (GAL) | 250 | 280 | 320 | 350 | --- | | | | |
| TEMPERATURE (°C) | 11.3 | 11.3 | 11.3 | 11.3 | --- | | | | |
| pH | [7.13] | --- | --- | --- | --- | | | | |
| CONDUCTIVITY (mS) | 15.94 | 15.74 | 15.83 | 15.82 | --- | | | | |
| TURBIDITY (NTUs) | --- | 55.6 | --- | 42.1 | --- | | | | |

(1) --- means no reading
(2) [Number] means parameter has stabilized or is acceptable

# DW9 WELL DEVELOPMENT RECORD | ARGONNE NATIONAL LABORATORY

| | | | | | |
|---|---|---|---|---|---|
| PROJECT NO: | 91230 | DRILLER: | MARCOR | DEPTH TO WATER: | 17.28 ft. |
| LOCATION: | Johnson City, NY | RIG TYPE: | Canterra CT 350 | HEIGHT OF WATER: | 70.22 ft. |
| INSPECTOR: | Joseph Hau | METHOD: | HSA & Driven Steel Casing | VOLUME IN WELL: | 46 gal. |
| WELL TYPE: | 4 in. PVC | SCREEN LENGTH: | 20 ft. | PROTOP WIDTH/TYPE: | 6 in. SU Lock Steel |
| WELL DEPTH: | 88 ft. | GROUT LENTGH/TYPE: | 59.5 ft. / 10:90 Bent:Cemt. Mix | GROUND ELEVATION: | 828.80 ft. |
| SCREEN: | 4 in. Con. Wnd PVC | SEAL LENGTH/TYPE: | 5 ft. / bentonite | PAD ELEVATION: | 828.80 ft. |
| SLOT SIZE: | 0.010 in. | FILTER LENGTH/TYPE: | 23 ft./ No. 2 Sand | TOC ELEVATION: | 831.31 ft. |
| | | | | STICK UP/DOWN: | 2.51 ft. |

| DATE | 12/12/91 | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| TIME | 1325 | 1330 | 1335 | 1340 | 1345 | 1350 | 1355 | 1400 | 1405 |
| RATE (GPM) | 7.5 | | | | | | | | |
| DEPTH TO WATER (FT) | 17.28 | 18.48 | 18.42 | 18.43 | 18.43 | 18.43 | 18.43 | 18.39 | 18.43 |
| VOLUME (gal) | 25 | 50 | 75 | 115 | 150 | 185 | 220 | 285 | 320 |
| TEMPERATURE (°C) | 13.0 | 13.1 | 13.1 | 13.1 | 13.1 | 13.2 | 13.2 | 13.2 | --- |
| pH | 7.85 | 6.95 | 6.94 | 6.93 | [6.95] | --- | --- | --- | --- |
| CONDUCTIVITY (mS) | --- | --- | --- | --- | 11.87 | 12.09 | 12.05 | [12.09] | --- |
| TURBIDITY (NTUs) | --- | --- | --- | >200 | 69.4 | [40.7] | --- | --- | --- |

| DATE | END | RECV | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| TIME | 1410 | 1415 | | | | | | | |
| RATE (GPM) | 7.5 | | | | | | | | |
| DEPTH TO WATER (FT) | 18.51 | 17.36 | | | | | | | |
| VOLUME (GAL) | 350 | --- | | | | | | | |
| TEMPERATURE (°C) | --- | --- | | | | | | | |
| pH | --- | --- | | | | | | | |
| CONDUCTIVITY (mS) | --- | --- | | | | | | | |
| TURBIDITY (NTUs) | --- | --- | | | | | | | |

(1) --- means no reading
(2) [Number] means parameter has stabilized or is acceptable

# SW4 WELL DEVELOPMENT RECORD | ARGONNE NATIONAL LABORATORY

| | | | | | |
|---|---|---|---|---|---|
| PROJECT NO.: | 91230 | DRILLER: | MARCOR | DEPTH TO WATER: | 15.31 ft. |
| LOCATION: | Johnson City, NY | RIG TYPE: | Canterra CT 350 | HEIGHT OF WATER: | 13.91 ft. |
| INSPECTOR: | Joseph Hau | METHOD: | HSA & Driven Steel Casing | VOLUME IN WELL: | 2.26 gal. |
| WELL TYPE: | 2 in. PVC | SCREEN LENGTH: | 15 ft. | PROTOP WIDTH/TYPE: | 8 in. SU Lock Steel |
| WELL DEPTH: | 29 ft. | GROUT LENTGH/TYPE: | 9.5 ft. / 10:90 Bent:Cemt. Mix | GROUND ELEVATION: | 829.05 ft. |
| SCREEN: | 4 in. Con. Wnd PVC | SEAL LENGTH/TYPE: | 2 ft. / bentonite | PAD ELEVATION: | 829.28 ft. |
| SLOT SIZE: | 0.010 in. | FILTER LENGTH/TYPE: | 17.5 ft./ No. 2 Sand | TOC ELEVATION: | 828.85 ft. |
| | | | | STICK UP/DOWN: | -0.43 ft. |

| DATE | 12/12/91 | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| TIME | 1134 | 1140 | 1145 | 1150 | 1155 | 1200 | 1205 | 1210 | 1215 |
| RATE (GPM) | 0.25 | | | | | | | | |
| DEPTH TO WATER (FT) | 15.31 | TO PUMP | TO PUMP | 23.35 | 23.95 | 23.37 | TO PUMP | TO PUMP | TO PUMP |
| VOLUME (gal) | 0 | 3 | 4 | 6 | 8 | 9 | 12 | 15 | 17 |
| TEMPERATURE (°C) | --- | 19.6 | 18.5 | 17.8 | 17.7 | 17.3 | 17.3 | 17.3 | 17.3 |
| pH | --- | --- | --- | 6.89 | 7.04 | [7.25] | --- | --- | --- |
| CONDUCTIVITY (mS) | --- | --- | --- | --- | 9.58 | --- | --- | --- | --- |
| TURBIDITY (NTUs) | | | | | | | | | |

| DATE | | END | RECV | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| TIME | 1220 | 1225 | 1230 | | | | | | |
| RATE (GPM) | 0.25 | | | | | | | | |
| DEPTH TO WATER (FT) | TO PUMP | TO PUMP | 19.78 | | | | | | |
| VOLUME (GAL) | 19 | 20 | --- | | | | | | |
| TEMPERATURE (°C) | 17.3 | [17.3] | --- | | | | | | |
| pH | --- | 7.28 | --- | | | | | | |
| CONDUCTIVITY (mS) | --- | [9.63] | --- | | | | | | |
| TURBIDITY (NTUs) | | >200 (3) | --- | | | | | | |

(1) --- means no reading
(2) [Number] means parameter has stabilized or is acceptable
(3) Well was slow yielding – unable to remove fies to < 200 NTUs
Well was developed to less than 50 NTUs during purging prior to sampling

# SW5 WELL DEVELOPMENT RECORD | ARGONNE NATIONAL LABORATORY

| | | | | | |
|---|---|---|---|---|---|
| PROJECT NO: | 91230 | DRILLER: | MARCOR | DEPTH TO WATER: | 25.22 ft. |
| LOCATION: | Johnson City, NY | RIG TYPE: | Canterra CT 350 | HEIGHT OF WATER: | 4.78 ft. |
| INSPECTOR: | Joseph Hau | METHOD: | HSA & Driven Steel Casing | VOLUME IN WELL: | 0.78 gal. |
| WELL TYPE: | 2 in. PVC | SCREEN LENGTH: | 10 ft. | PROTOP WIDTH/TYPE: | 8 in. SU Lock Steel |
| WELL DEPTH: | 30.5 ft. | GROUT LENTGH/TYPE: | 14.5 ft. / 10:90 Bent:Cemt. Mix | GROUND ELEVATION: | 836.24 ft. |
| SCREEN: | 4 in. Con. Wnd PVC | SEAL LENGTH/TYPE | 3 ft. / bentonite | PAD ELEVATION: | 836.32 ft. |
| SLOT SIZE: | 0.010 in. | FILTER LENGTH/TYPE: | 13 ft./ No. 2 Sand | TOC ELEVATION: | 835.84 ft. |
| | | | | STICK UP/DOWN: | -0.40 ft. |

| DATE | BAILED 11/24/91 | | END | PUMPED (3) 12/11/91 | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| TIME | 1100 | 1130 | 1200 | 1545 | | | | | |
| RATE (GPM) | | | | | | | | | |
| DEPTH TO WATER (FT) | 25.22 | 25.28 | 26.35 | 22.15 | | | | | |
| VOLUME (gal) | 0 | 3 | 5 | 1.36 | | | | | |
| TEMPERATURE (°C) | 11.4 | 11.0 | [11.0] (2) | --- | | | | | |
| pH | 7.85 | 7.41 | [7.48] | --- | | | | | |
| CONDUCTIVITY (mS) | 12.23 | 11.50 | [11.14] | --- | | | | | |
| TURBIDITY (NTUs) | --- | --- | >200 (3) | --- | | | | | |

| DATE | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| TIME | | | | | | | | | |
| RATE (GPM) | | | | | | | | | |
| DEPTH TO WATER (FT) | | | | | | | | | |
| VOLUME (GAL) | | | | | | | | | |
| TEMPERATURE (°C) | | | | | | | | | |
| pH | | | | | | | | | |
| CONDUCTIVITY (mS) | | | | | | | | | |
| TURBIDITY (NTUs) | | | | | | | | | |

(1) --- means no reading
(2) [Number] means parameter has stabilized or is acceptable
(3) Well was slow yielding – developed by bailing – attempted pumping but pumped dry immediately – unable to remove fines to < 200 NTUs – Well was developed to less than 50 NTUs during purging prior to sampling

# SW6 WELL DEVELOPMENT RECORD | ARGONNE NATIONAL LABORATORY

| | | | | | |
|---|---|---|---|---|---|
| PROJECT NO: | 91230 | DRILLER: | MARCOR | DEPTH TO WATER: | 20.6 ft. |
| LOCATION: | Johnson City, NY | RIG TYPE: | Canterra CT 350 | HEIGHT OF WATER: | 8.4 ft. |
| INSPECTOR: | Joseph Hau | METHOD: | HSA & Driven Steel Casing | VOLUME IN WELL: | 1.37 gal. |
| WELL TYPE: | 2 in. PVC | SCREEN LENGTH: | 10 ft. | PROTOP WIDTH/TYPE: | 8 in. SU Lock Steel |
| WELL DEPTH: | 29 ft. | GROUT LENTGH/TYPE: | 13 ft. / 10:90 Bent:Cemt. Mix | GROUND ELEVATION: | 828.95 ft. |
| SCREEN: | 2 in. Con. Wnd PVC | SEAL LENGTH/TYPE: | 3 ft. / bentonite | PAD ELEVATION: | 828.99 ft. |
| SLOT SIZE: | 0.010 in. | FILTER LENGTH/TYPE: | 13 ft./ No. 2 Sand | TOC ELEVATION: | 828.49 ft. |
| | | | | STICK UP/DOWN: | -0.46 ft. |

| DATE | BAILED 11/23/91 | | END | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| TIME | 1000 | 1020 | 1045 | | | | | | |
| RATE (GPM) | | | | | | | | | |
| DEPTH TO WATER (FT) | 20.6 | 20.68 | 20.65 | | | | | | |
| VOLUME (gal) | 0 | 5.0 | 9.5 | | | | | | |
| TEMPERATURE (°C) | 14.6 | 14.3 | [14.0] (2) | | | | | | |
| pH | 6.94 | 7.44 | [7.67] | | | | | | |
| CONDUCTIVITY (mS) | 9.48 | 9.12 | [8.66] | | | | | | |
| TURBIDITY (NTUs) | --- | --- | >200 (3) | | | | | | |

| DATE | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| TIME | | | | | | | | | |
| RATE (GPM) | | | | | | | | | |
| DEPTH TO WATER (FT) | | | | | | | | | |
| VOLUME (GAL) | | | | | | | | | |
| TEMPERATURE (°C) | | | | | | | | | |
| pH | | | | | | | | | |
| CONDUCTIVITY (mS) | | | | | | | | | |
| TURBIDITY (NTUs) | | | | | | | | | |

(1) --- means no reading
(2) [Number] means parameter has stabilized or is acceptable
(3) Well slow yielding – could not install pump due to joint obstruction – unable to remove fines below 200 NTUs
(4) Well slow yielding – Well was developed to less than 50 NTUs during purging prior to sampling;

# SW7 WELL DEVELOPMENT RECORD | ARGONNE NATIONAL LABORATORY

| | | | | | |
|---|---|---|---|---|---|
| PROJECT NO: | 91230 | DRILLER: | MARCOR | DEPTH TO WATER: | 15.68 ft. |
| LOCATION: | Johnson City, NY | RIG TYPE: | Canterra CT 350 | HEIGHT OF WATER: | 10.82 ft. |
| INSPECTOR: | Joseph Hau | METHOD: | HSA & Driven Steel Casing | VOLUME IN WELL: | 1.8 gal. |
| WELL TYPE: | 2 in. PVC | SCREEN LENGTH: | 15 ft. | PROTOP WIDTH/TYPE: | 4 in. SU Lock Steel |
| WELL DEPTH: | 26.5 ft. | GROUT LENTGH/TYPE: | 6.5 ft. / 10:90 Bent:Cemt. Mix | GROUND ELEVATION: | 828.88 ft. |
| SCREEN: | 2 in. Con. Wnd PVC | SEAL LENGTH/TYPE: | 3 ft. / bentonite | PAD ELEVATION: | 829.12 ft. |
| SLOT SIZE: | 0.010 in. | FILTER LENGTH/TYPE: | 17 ft./ No. 2 Sand | TOC ELEVATION: | 831.89 ft. |
| | | | | STICK UP/DOWN: | 3.01 ft. |

| DATE | BAILING 12/13/91 | | | END | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| TIME | 1545 | 1553 | 1605 | 1625 | | | | | |
| RATE (GPM) | | | | | | | | | |
| DEPTH TO WATER (FT) | 15.68 | 15.68 | 15.70 | 15.70 | | | | | |
| VOLUME (gal) | ---(1) | 1 | 5 | 10 | | | | | |
| TEMPERATURE (°C) | --- | 13.9 | 13.9 | [13.8](2) | | | | | |
| pH | --- | 6.37 | 6.51 | [6.94] | | | | | |
| CONDUCTIVITY (mS) | --- | 12.11 | 11.80 | [11.76] | | | | | |
| TURBIDITY (NTUs) | --- | --- | --- | >200(3) | | | | | |

| DATE | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| TIME | | | | | | | | | |
| RATE (GPM) | | | | | | | | | |
| DEPTH TO WATER (FT) | | | | | | | | | |
| VOLUME (GAL) | | | | | | | | | |
| TEMPERATURE (°C) | | | | | | | | | |
| pH | | | | | | | | | |
| CONDUCTIVITY (mS) | | | | | | | | | |
| TURBIDITY (NTUs) | | | | | | | | | |

(1) --- means no reading
(2) [Number] means parameter has stabilized or is acceptable
(3) Unable to install pump at time of well development – well was developed by bailing – unable to remove fines to <200 NTUs – well was developed to less than 50 NTUs during purging prior to sampling

# SW8 WELL DEVELOPMENT RECORD | ARGONNE NATIONAL LABORATORY

| | | | | | |
|---|---|---|---|---|---|
| PROJECT NO: | 91230 | DRILLER: | MARCOR | DEPTH TO WATER: | 12.52 ft. |
| LOCATION: | Johnson City, NY | RIG TYPE: | Canterra CT 350 | HEIGHT OF WATER: | 10.48 ft. |
| INSPECTOR: | Joseph Hau | METHOD: | HSA & Driven Steel Casing | VOLUME IN WELL: | 1.71 gal. |
| WELL TYPE: | 2 in. PVC | SCREEN LENGTH: | 10 ft. | PROTOP WIDTH/TYPE: | 8 in. SU Lock Steel |
| WELL DEPTH: | 23 ft. | GROUT LENTGH/TYPE: | 7.5 ft. / 10:90 Bent:Cemt. Mix | GROUND ELEVATION: | 830.20 ft. |
| SCREEN: | 2 in. Con. Wnd PVC | SEAL LENGTH/TYPE: | 3 ft. / bentonite | PAD ELEVATION: | 830.26 ft. |
| SLOT SIZE: | 0.010 in. | FILTER LENGTH/TYPE: | 12.5 ft./ No. 2 Sand | TOC ELEVATION: | 829.65 ft. |
| | | | | STICK UP/DOWN: | -0.35 ft. |

| DATE | BAILED 11/23/91 | | END | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| TIME | 1215 | 1245 | 1315 | | | | | | |
| RATE (GPM) | | | | | | | | | |
| DEPTH TO WATER (FT) | 12.52 | 12.6 | 12.6 | | | | | | |
| VOLUME (gal) | 0 | 5 | 10 | | | | | | |
| TEMPERATURE (°C) | 16.5 | 16.2 | [16.2] (2) | | | | | | |
| pH | 6.38 | 6.80 | [6.95] | | | | | | |
| CONDUCTIVITY (mS) | 10.20 | 10.48 | [10.71] | | | | | | |
| TURBIDITY (NTUs) | --- (1) | --- | >200 (3) | | | | | | |

| DATE | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| TIME | | | | | | | | | |
| RATE (GPM) | | | | | | | | | |
| DEPTH TO WATER (FT) | | | | | | | | | |
| VOLUME (GAL) | | | | | | | | | |
| TEMPERATURE (°C) | | | | | | | | | |
| pH | | | | | | | | | |
| CONDUCTIVITY (mS) | | | | | | | | | |
| TURBIDITY (NTUs) | | | | | | | | | |

(1) --- means no reading
(2) [Number] means parameter has stabilized or is acceptable
(3) Unable to install pump at time of well development – well was developed by bailing – unable to remove fines to <200 NTUs – well was developed to less than 50 NTUs during purging prior to sampling

# SW9 WELL DEVELOPMENT RECORD | ARGONNE NATIONAL LABORATORY

| | | | | | |
|---|---|---|---|---|---|
| PROJECT NO: | 91230 | DRILLER: | MARCOR | DEPTH TO WATER: | 15.2 ft. |
| LOCATION: | Johnson City, NY | RIG TYPE: | Canterra CT 350 | HEIGHT OF WATER: | 11.3 ft. |
| INSPECTOR: | Joseph Hau | METHOD: | HSA & Driven Steel Casing | VOLUME IN WELL: | 1.8 gal. |
| WELL TYPE: | 2 in. PVC | SCREEN LENGTH: | 15 ft. | PROTOP WIDTH/TYPE: | 4 in. SU Lock Steel |
| WELL DEPTH: | 25 ft. | GROUT LENTGH/TYPE: | 6 ft. / 10:90 Bent:Cemt. Mix | GROUND ELEVATION: | 828.80 ft. |
| SCREEN: | 2 in. Con. Wnd PVC | SEAL LENGTH/TYPE: | 2 ft. / bentonite | PAD ELEVATION: | 828.80 ft. |
| SLOT SIZE: | 0.010 in. | FILTER LENGTH/TYPE: | 17 ft./ No. 2 Sand | TOC ELEVATION: | 831.38 ft. |
| | | | | STICK UP/DOWN: | 2.58 ft. |

| DATE | BAILING 12/13/91 | | | END | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| TIME | 1320 | 1334 | 1351 | 1400 | | | | | |
| RATE (GPM) | | | | | | | | | |
| DEPTH TO WATER (FT) | 15.2 | 15.2 | 15.25 | 15.25 | | | | | |
| VOLUME (gal) | ---(1) | 2 | 6 | 10 | | | | | |
| TEMPERATURE (°C) | --- | 15.7 | 15.4 | [15.4](2) | | | | | |
| pH | --- | 6.32 | 7.33 | [7.32] | | | | | |
| CONDUCTIVITY (mS) | --- | 10.39 | 11.50 | [11.29] | | | | | |
| TURBIDITY (NTUs) | --- | --- | --- | >200(3) | | | | | |

| DATE | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| TIME | | | | | | | | | |
| RATE (GPM) | | | | | | | | | |
| DEPTH TO WATER (FT) | | | | | | | | | |
| VOLUME (GAL) | | | | | | | | | |
| TEMPERATURE (°C) | | | | | | | | | |
| pH | | | | | | | | | |
| CONDUCTIVITY (mS) | | | | | | | | | |
| TURBIDITY (NTUs) | | | | | | | | | |

(1) --- means no reading
(2) [Number] means parameter has stabilized or is acceptable
(3) Unable to install pump at time of well development – well was developed by bailing – unable to remove fines to <200 NTUs – well was developed to less than 50 NTUs during purging prior to sampling

# IW9 WELL DEVELOPMENT RECORD | ARGONNE NATIONAL LABORATORY

| | | | | | |
|---|---|---|---|---|---|
| PROJECT NO: | 91230 | DRILLER: | MARCOR | DEPTH TO WATER: | 16.72 ft. |
| LOCATION: | Johnson City, NY | RIG TYPE: | Canterra CT 350 | HEIGHT OF WATER: | 34.28 ft. |
| INSPECTOR: | Joseph Hau | METHOD: | HSA & Driven Steel Casing | VOLUME IN WELL: | 5.58 gal. |
| WELL TYPE: | 2 in. PVC | SCREEN LENGTH: | 5 ft. | PROTOP WIDTH/TYPE: | 4 in. SU Lock Steel |
| WELL DEPTH: | 51 ft. | GROUT LENTGH/TYPE: | 38 ft. / 10:90 Bent:Cemt. Mix | GROUND ELEVATION: | 828.62 ft. |
| SCREEN: | 2 in. Con. Wnd PVC | SEAL LENGTH/TYPE: | 5 ft. / bentonite | PAD ELEVATION: | 828.83 ft. |
| SLOT SIZE: | 0.010 in. | FILTER LENGTH/TYPE: | 8 ft./ No. 2 Sand | TOC ELEVATION: | 831.52 ft. |
| | | | | STICK UP/DOWN: | 2.90 ft. |

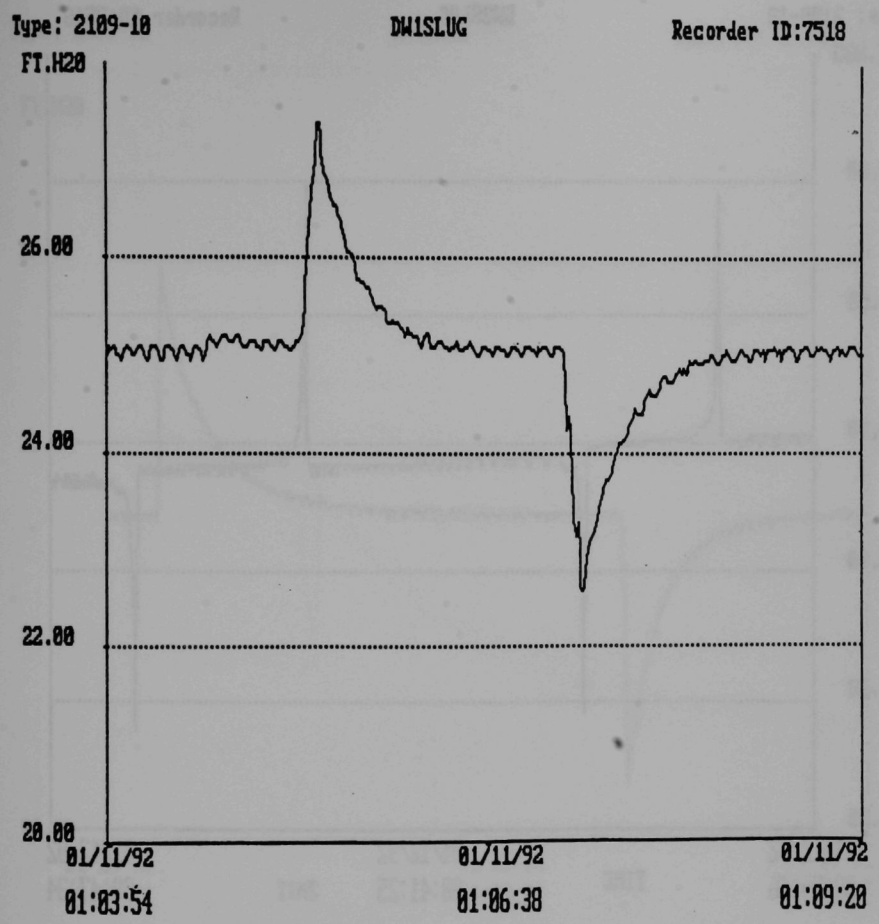
| DATE | 12/13/91 | | | | | END | | | |
|---|---|---|---|---|---|---|---|---|---|
| TIME | 1405 | 1419 | 1440 | 1510 | 1520 | 1530 | | | |
| RATE (GPM) | | | | | | | | | |
| DEPTH TO WATER (FT) | 16.72 | 30.6 | 30.78 | 31.04 | 31.3 | 31.7 | | | |
| VOLUME (gal) | 0 | 5 | 10 | 12 | 14 | 17 | | | |
| TEMPERATURE (°C) | ---(1) | 14.6 | 14.3 | 13.1 | 13.0 | [13.0](2) | | | |
| pH | --- | 6.67 | 6.41 | 6.44 | 6.42 | [6.43] | | | |
| CONDUCTIVITY (mS) | --- | 11.76 | 5.28 | 5.50 | 5.41 | [5.33] | | | |
| TURBIDITY (NTUs) | --- | --- | --- | --- | --- | >200(3) | | | |

| DATE | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| TIME | | | | | | | | | |
| RATE (GPM) | | | | | | | | | |
| DEPTH TO WATER (FT) | | | | | | | | | |
| VOLUME (GAL) | | | | | | | | | |
| TEMPERATURE (°C) | | | | | | | | | |
| pH | | | | | | | | | |
| CONDUCTIVITY (mS) | | | | | | | | | |
| TURBIDITY (NTUs) | | | | | | | | | |

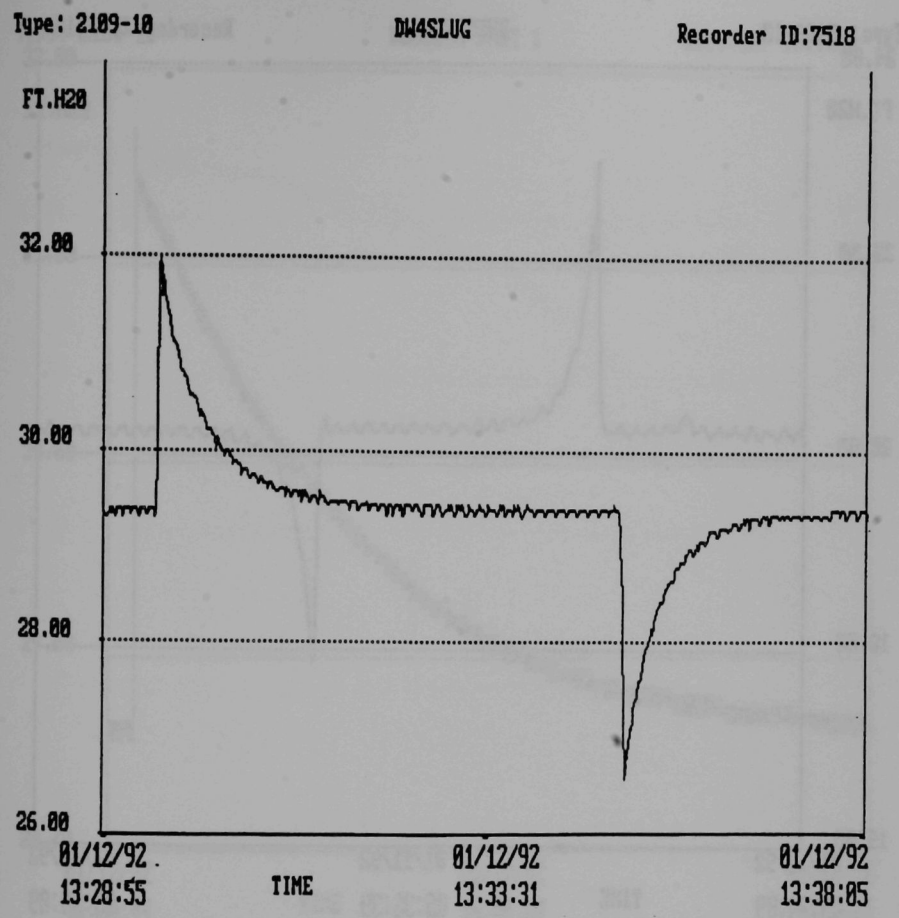
(1) --- means no reading
(2) [Number] means parameter has stabilized or is acceptable
(3) Unable to install pump at time of well development – well was developed by bailing – unable to remove fines to <200 NTUs

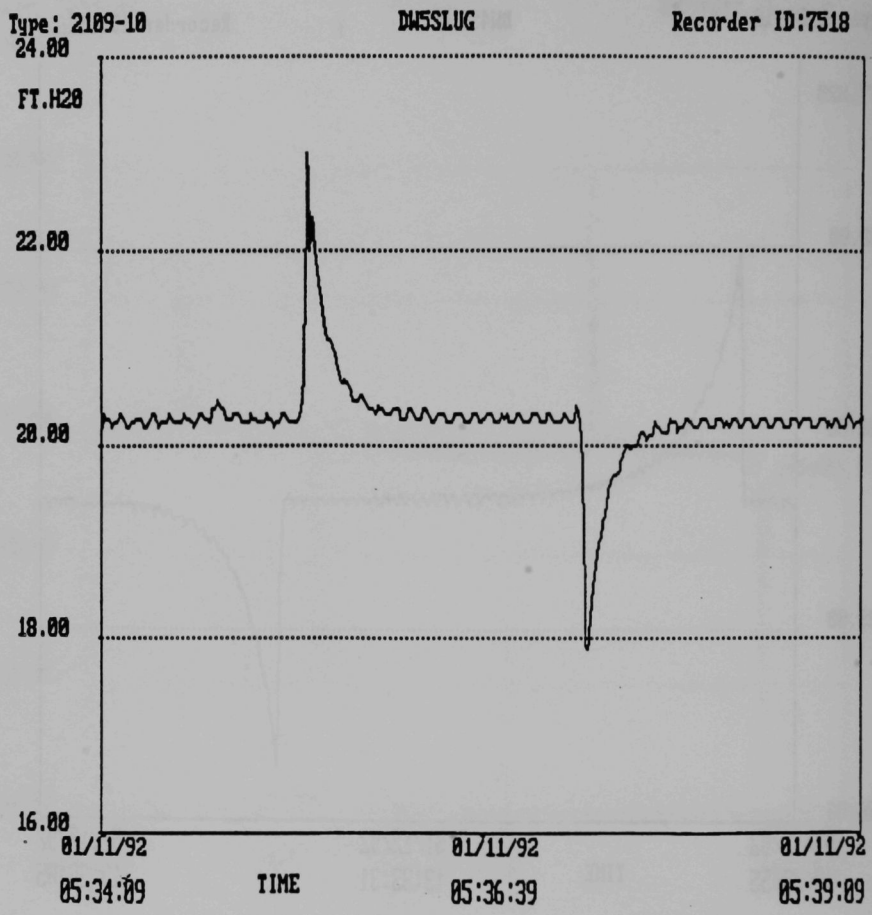
# Appendix C-2:

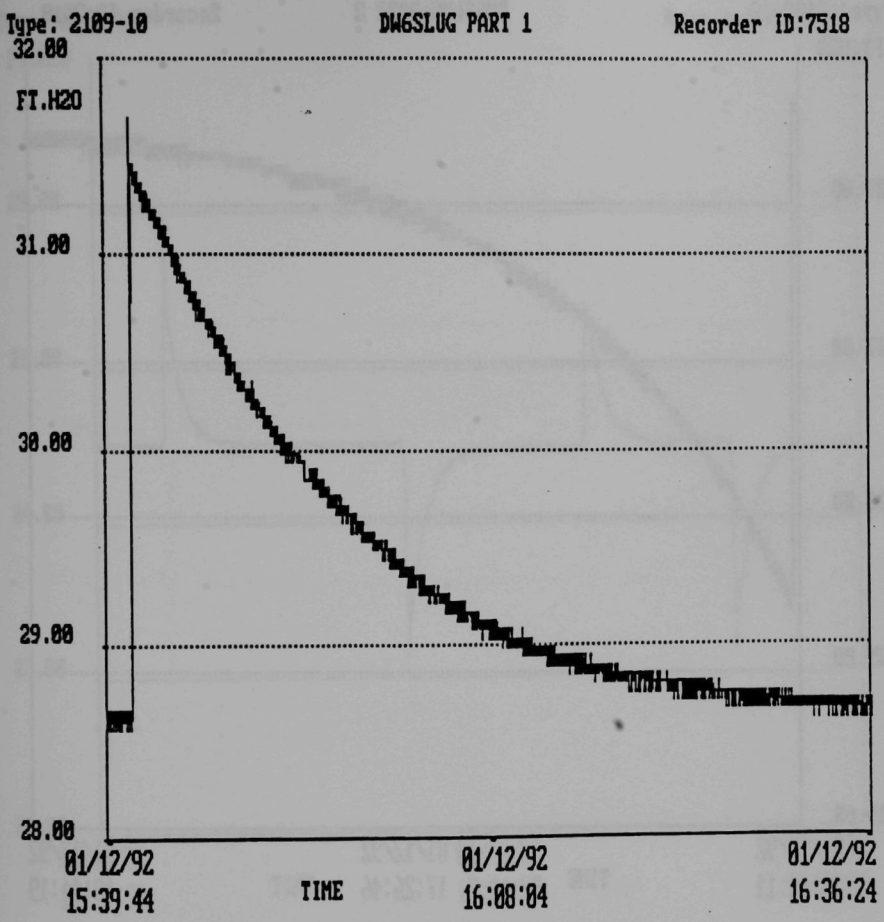
# Aquifer Slug Test Recovery Curves

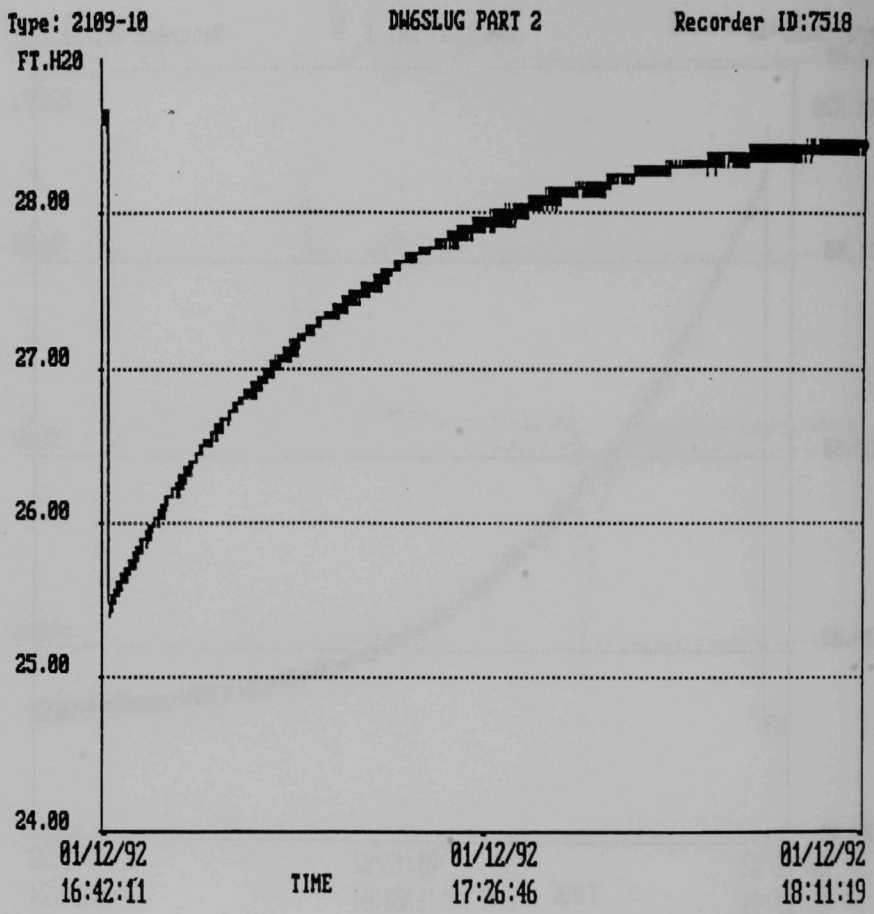

Type: 2109-10
DW1SLUG
Recorder ID:7518
FT.H20
26.00
24.00
22.00
20.00
01/11/92
01:03:54
01/11/92
01:06:38
01/11/92
01:09:20

Type: 2109-10
DW3SLUG
Recorder ID:7518
FT.H2O
31.00
30.00
29.00
28.00
27.00
26.00
01/12/92
08:35:16
TIME
01/12/92
08:41:25
01/12/92
08:47:34

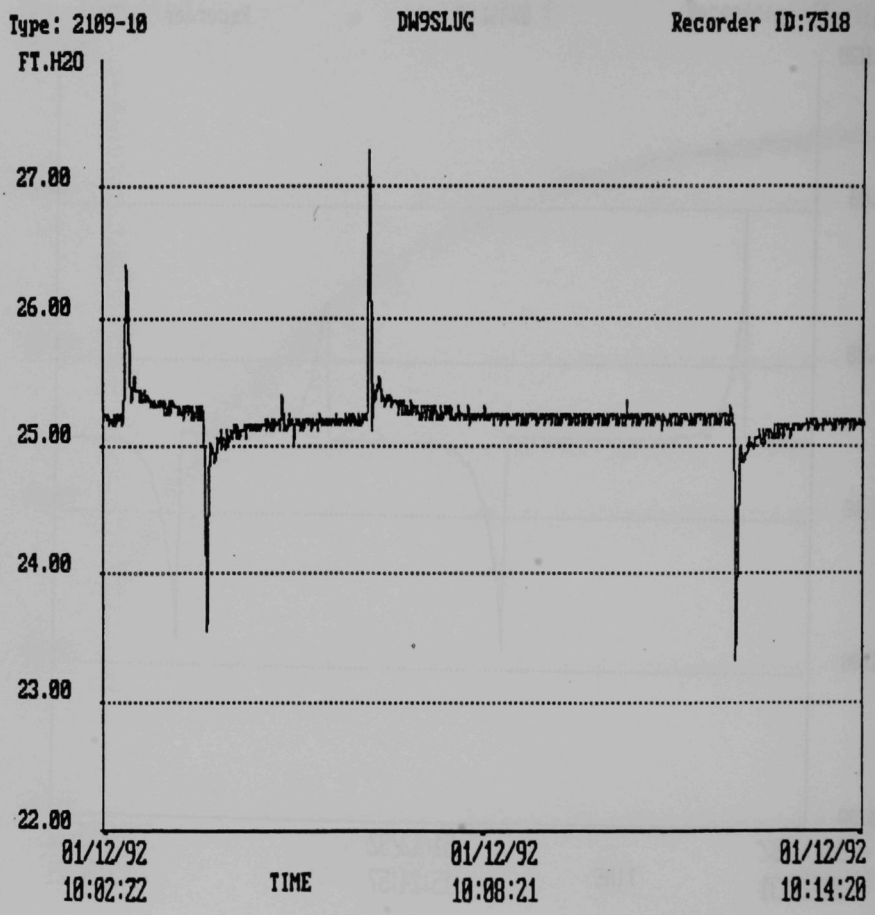

Type: 2109-10
DW4SLUG
Recorder ID:7518
FT.H20
32.00
30.00
28.00
26.00
01/12/92
13:28:55
TIME
01/12/92
13:33:31
01/12/92
13:38:05


Type: 2109-10
DW5SLUG
Recorder ID:7518
24.00
FT.H20
22.00
20.00
18.00
16.00
01/11/92
05:34:09
TIME
01/11/92
05:36:39
01/11/92
05:39:09


Type: 2109-10
DW6SLUG PART 1
Recorder ID:7518
32.00
FT.H2O
31.00
30.00
29.00
28.00
01/12/92
15:39:44
TIME
01/12/92
16:08:04
01/12/92
16:36:24


Type: 2109-10
DW6SLUG PART 2
Recorder ID:7518
FT.H20
28.00
27.00
26.00
25.00
24.00
01/12/92
16:42:11
TIME
01/12/92
17:26:46
01/12/92
18:11:19

Type: 2109-10
DW8SLUG
Recorder ID:7518
FT.H20
28.00
26.00
24.00
22.00
20.00
01/13/92
15:19:31
TIME
01/13/92
15:24:57
01/13/92
15:30:21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Recorder ID:7518
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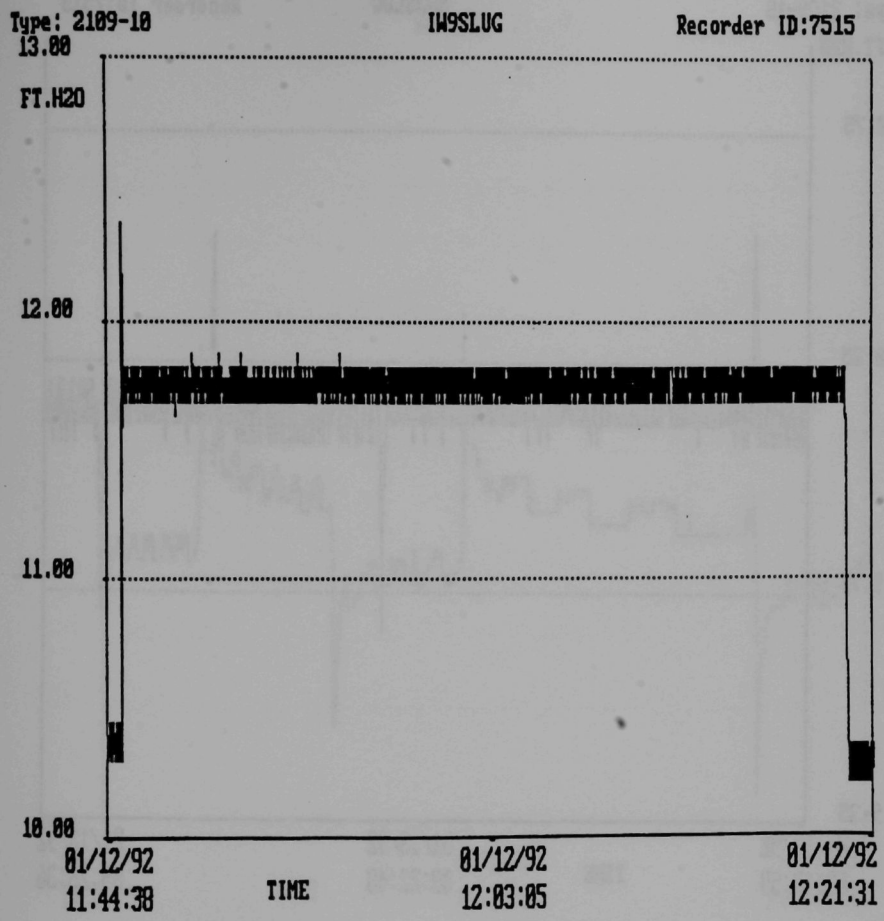
26.00
25.00
24.00
23.00
22.00
01/12/92
10:02:22
TIME
01/12/92
10:08:21
01/12/92
10:14:20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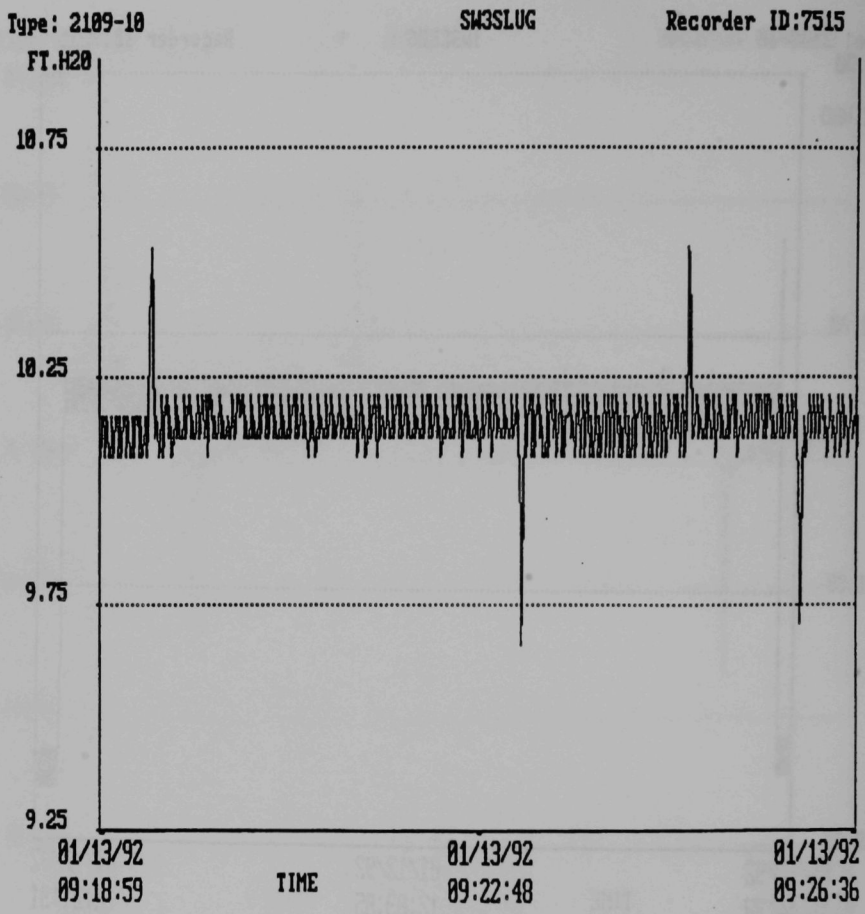
IW9SLUG
Recorder ID:7515
13.00
FT.H2O
12.00
11.00
10.00
01/12/92
11:44:38
TIME
01/12/92
12:03:05
01/12/92
12:21:31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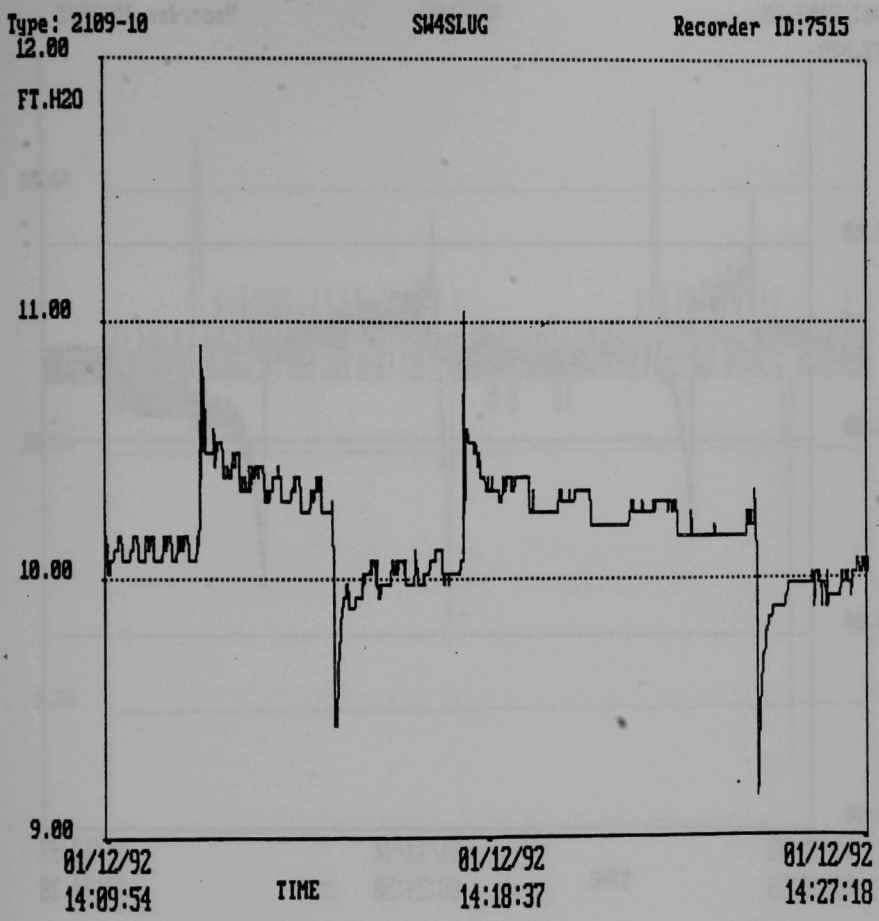
SW3SLUG
Recorder ID:7515
FT.H20
10.75
10.25
9.75
9.25
01/13/92
09:18:59
TIME
01/13/92
09:22:48
01/13/92
09:26:36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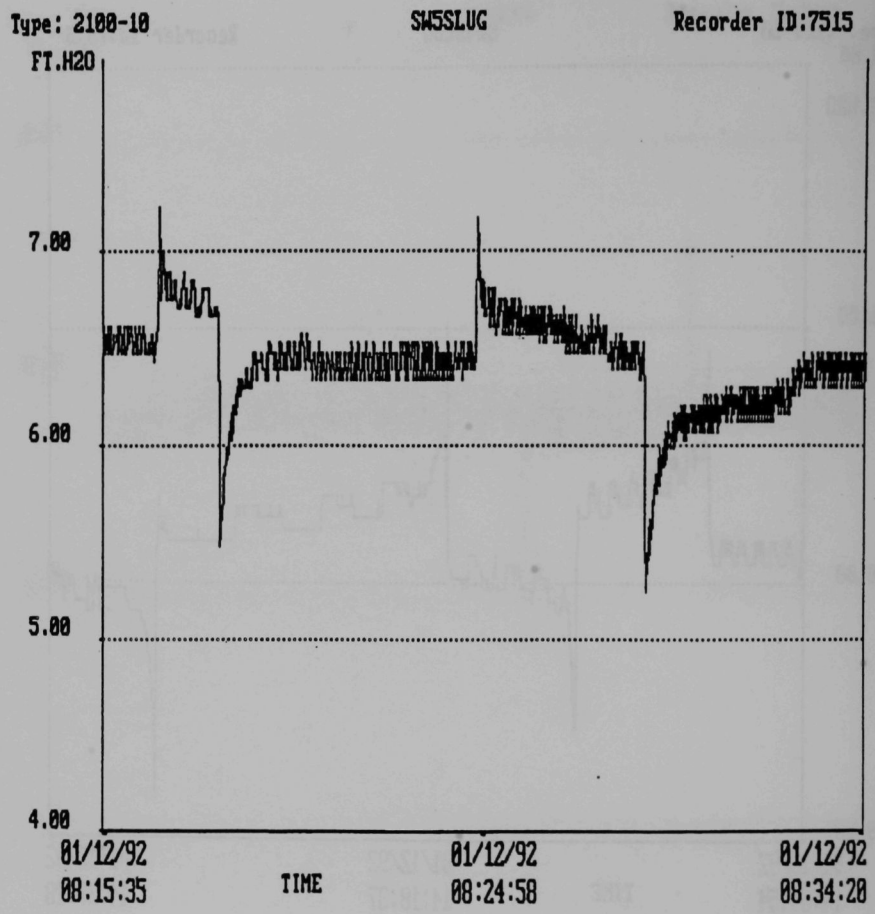
SW4SLUG
Recorder ID:7515
12.00
FT.H2O
11.00
10.00
9.00
01/12/92
14:09:54
TIME
01/12/92
14:18:37
01/12/92
14:27:18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Recorder ID:7515
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6.00
5.00
4.00
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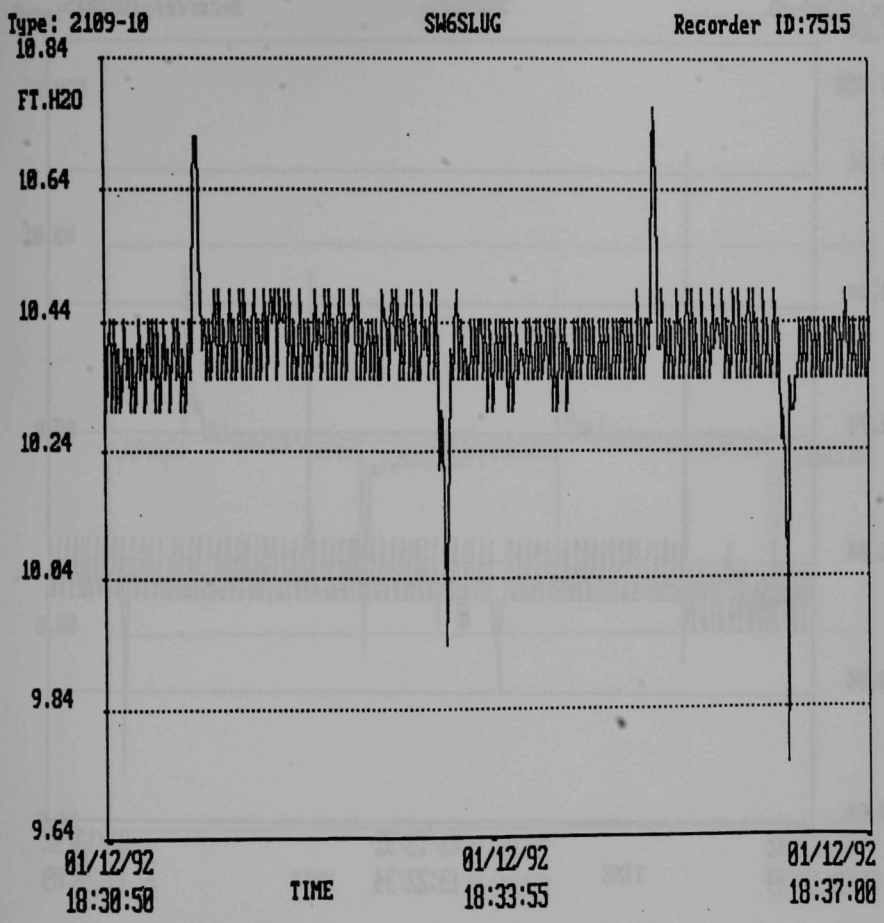
TIME
01/12/92
08:24:58
01/12/92
08:34:20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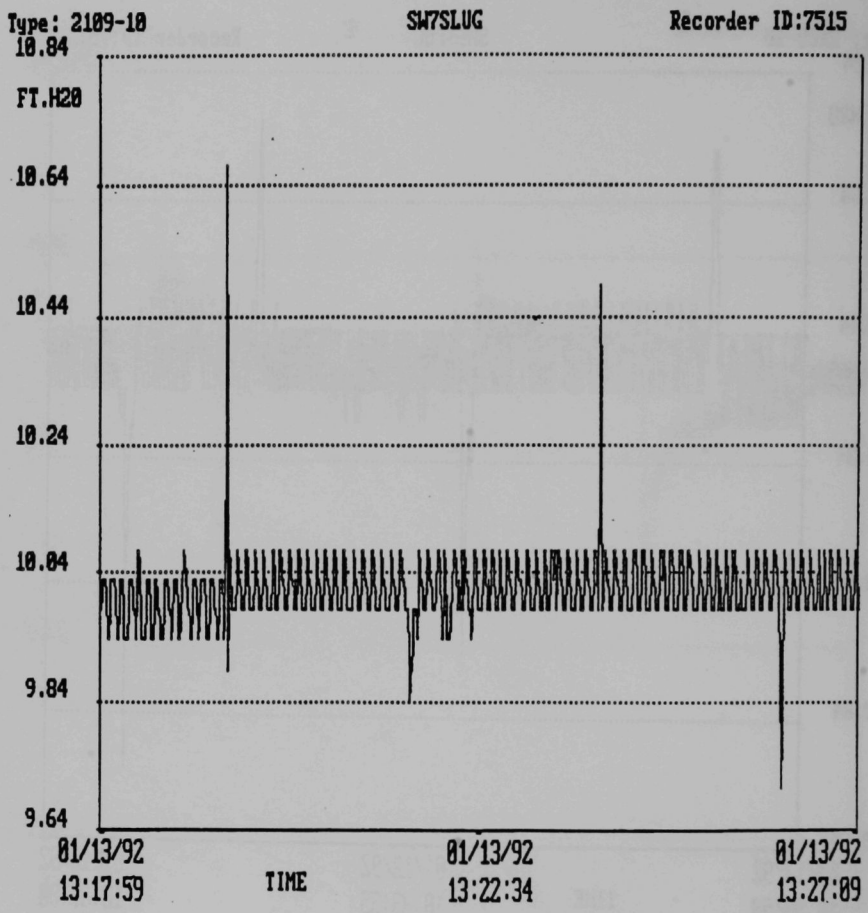
SW6SLUG
Recorder ID:7515
10.84
FT.H20
10.64
10.44
10.24
10.04
9.84
9.64
01/12/92
18:30:50
TIME
01/12/92
18:33:55
01/12/92
18:37:00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SW7SLUG
Recorder ID:7515
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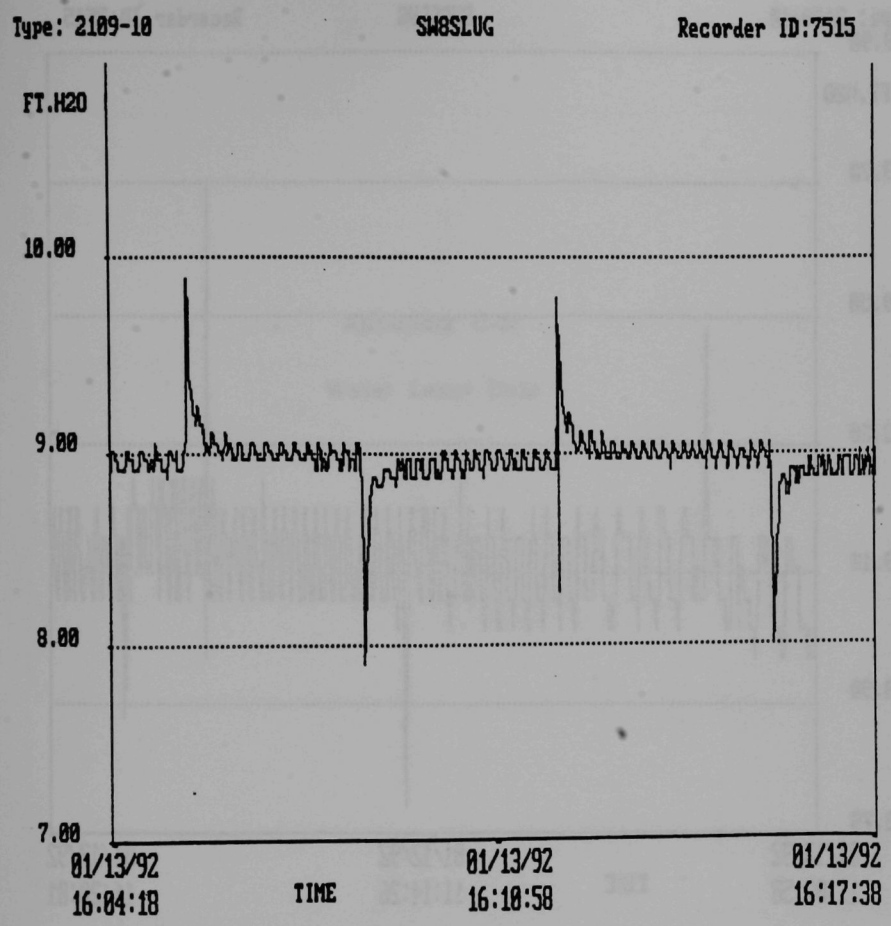
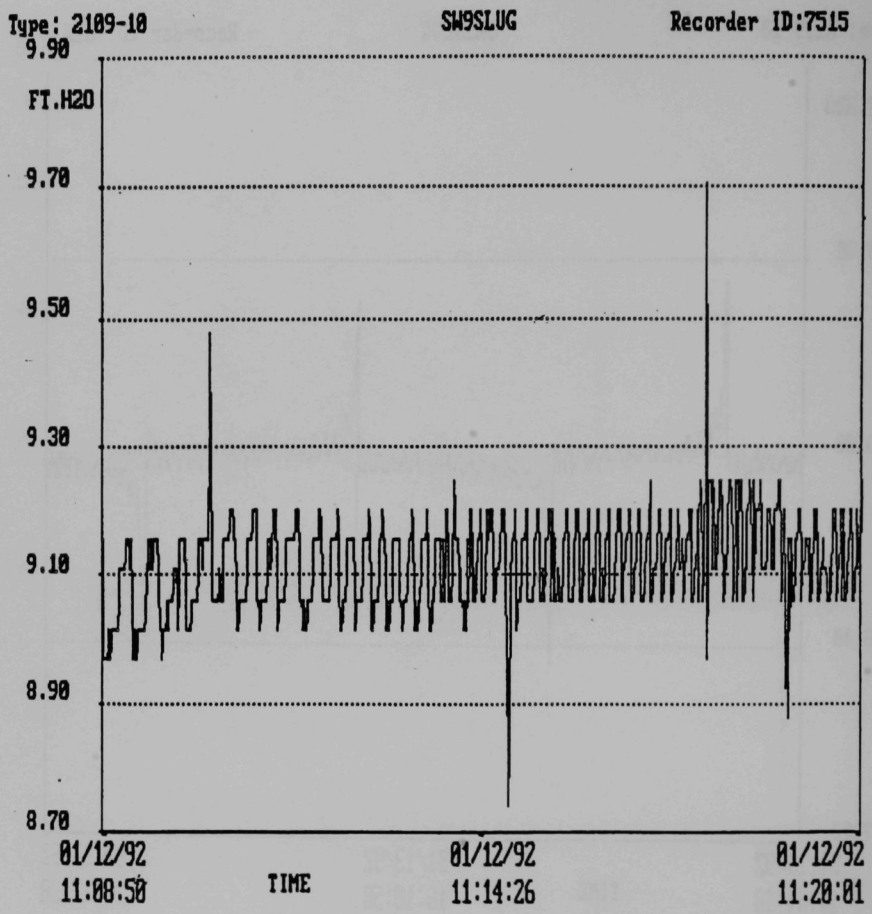
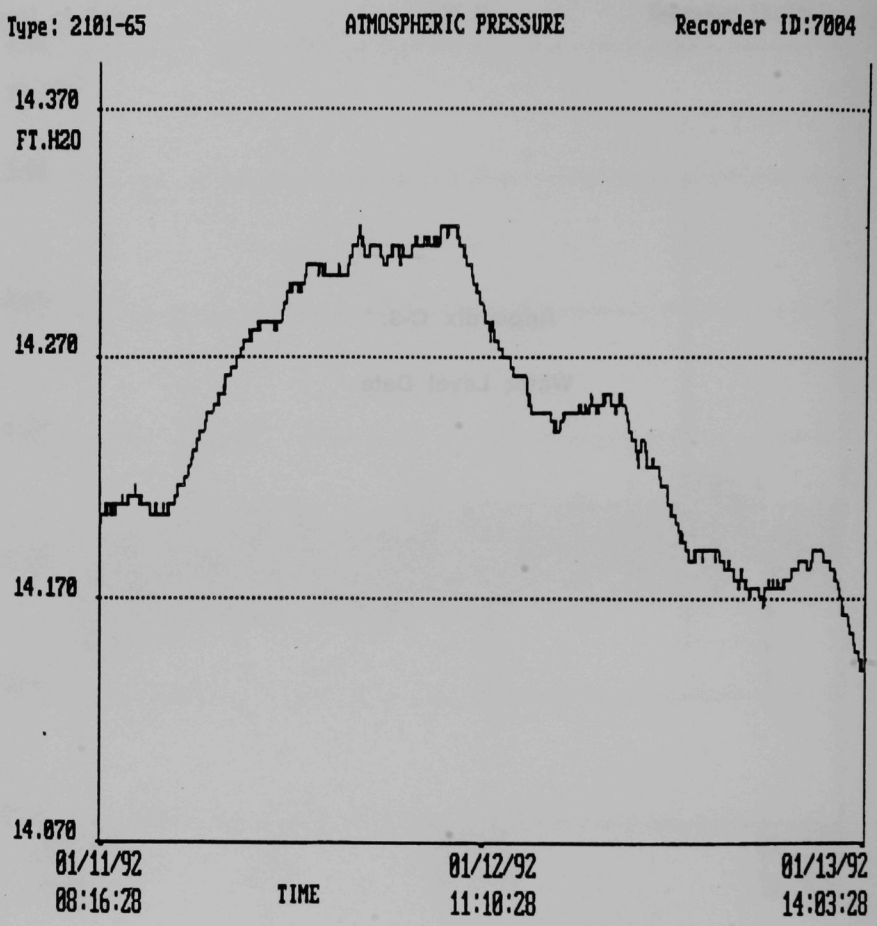
FT.H20
10.64
10.44
10.24
10.04
9.84
9.64
01/13/92
13:17:59
TIME
01/13/92
13:22:34
01/13/92
13:27:09


Type: 2109-10
SW8SLUG
Recorder ID:7515
FT.H2O
10.00
9.00
8.00
7.00
01/13/92
16:04:18
TIME
01/13/92
16:10:58
01/13/92
16:17:38


Type: 2109-10
SW9SLUG
Recorder ID:7515
9.90
FT.H2O
9.70
9.50
9.30
9.10
8.90
8.70
01/12/92
11:08:50
TIME
01/12/92
11:14:26
01/12/92
11:20:01

# Appendix C-3:

# Water Level Data


Type: 2101-65
ATMOSPHERIC PRESSURE
Recorder ID:7004
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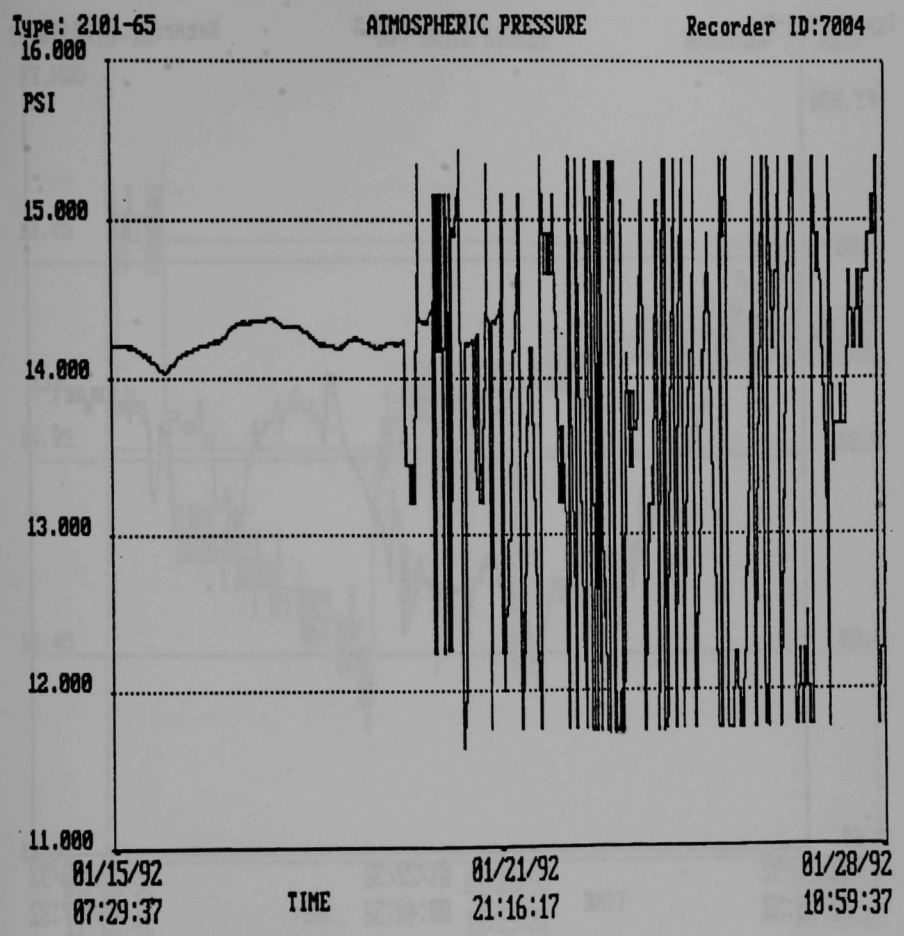
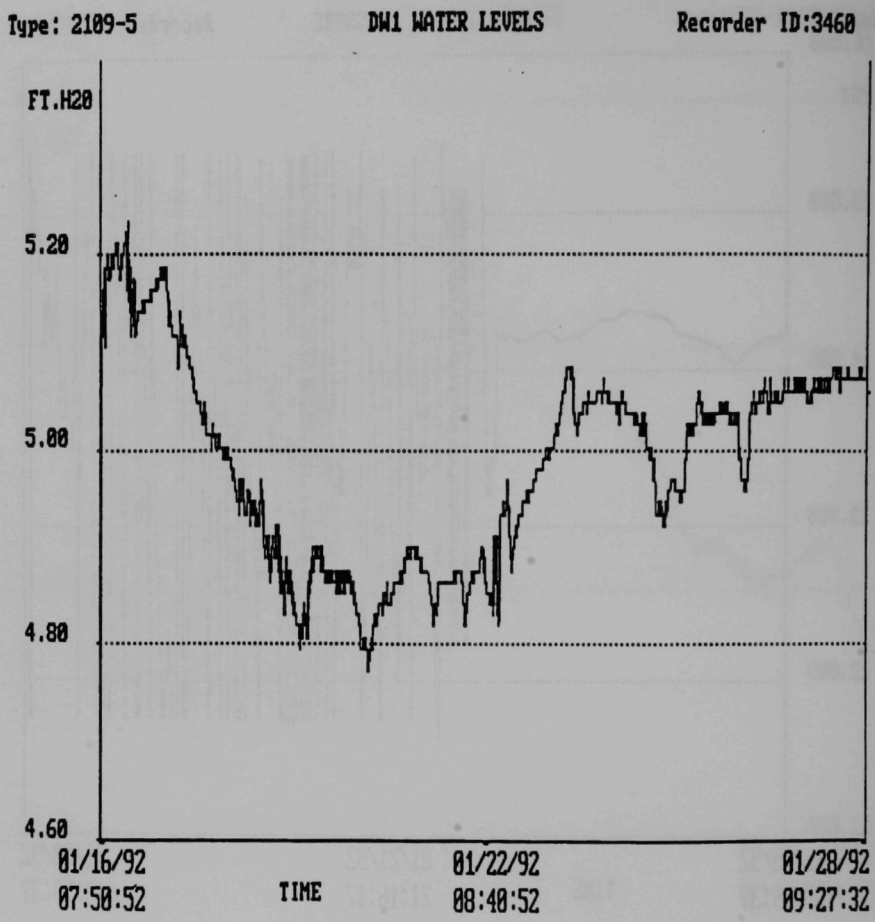
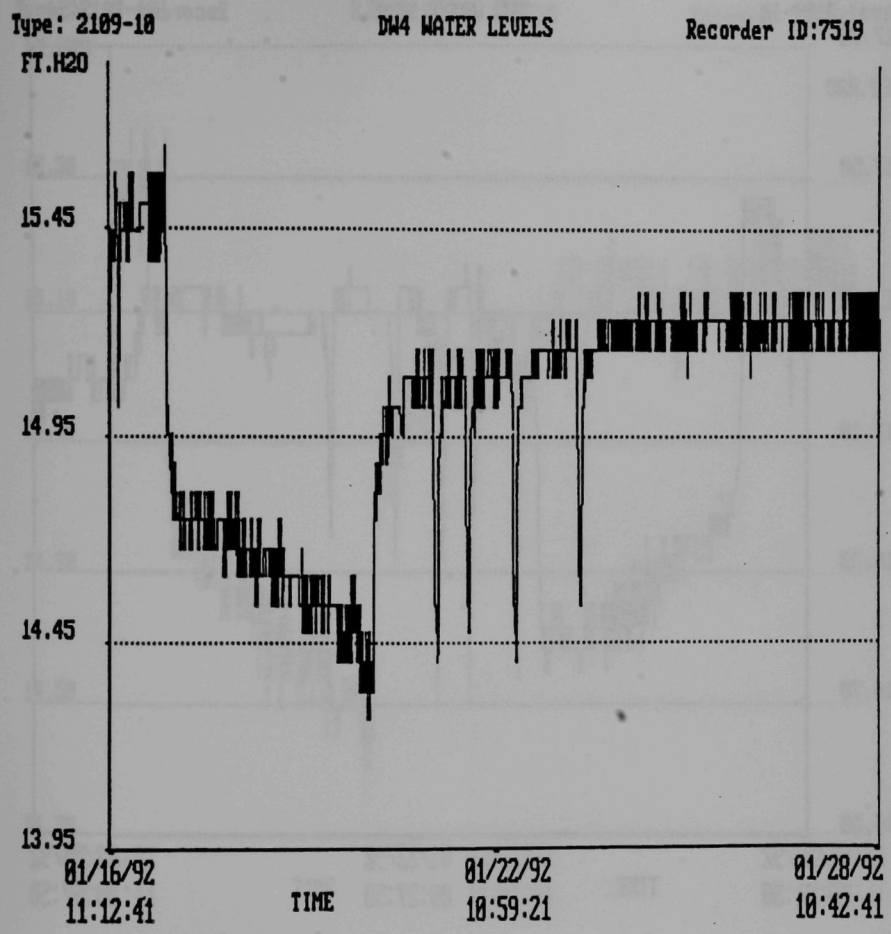
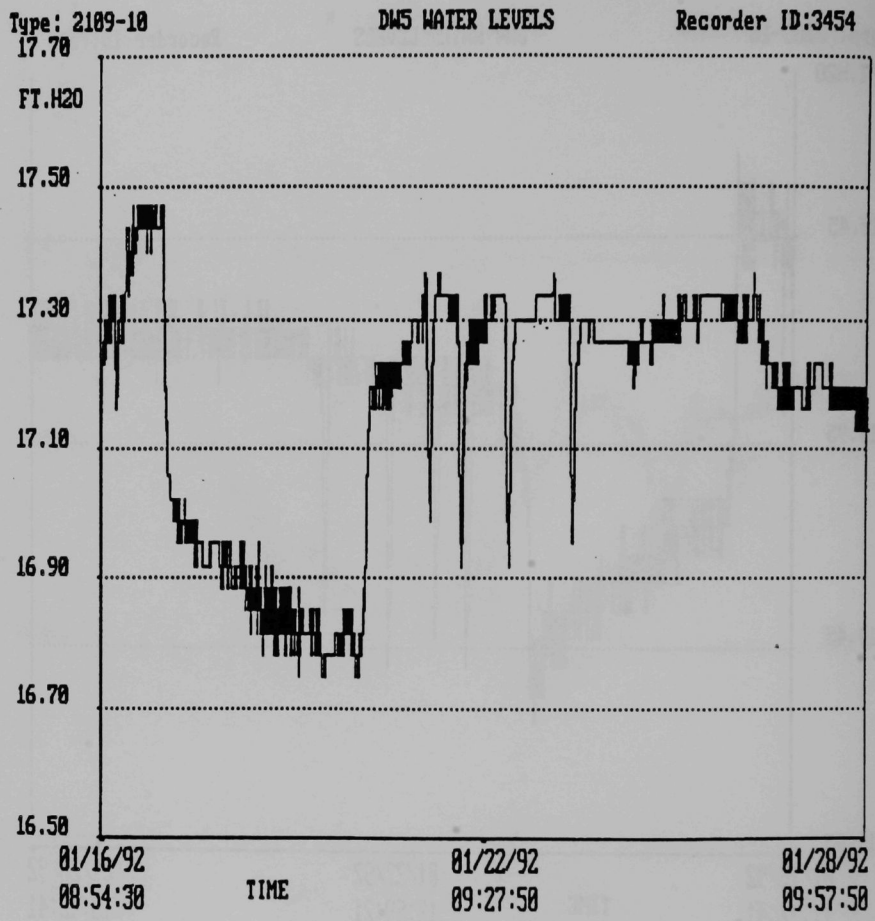
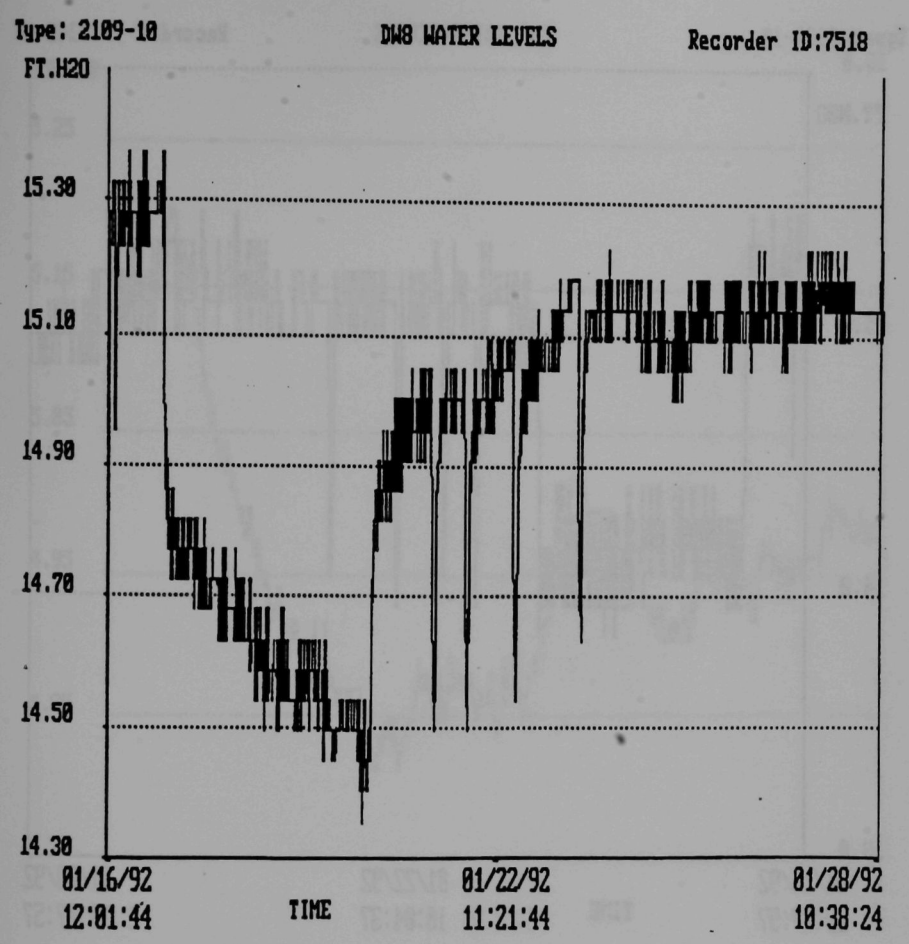
FT.H20
14.270
14.170
14.070
01/11/92
08:16:28
TIME
01/12/92
11:10:28
01/13/92
14:03:28

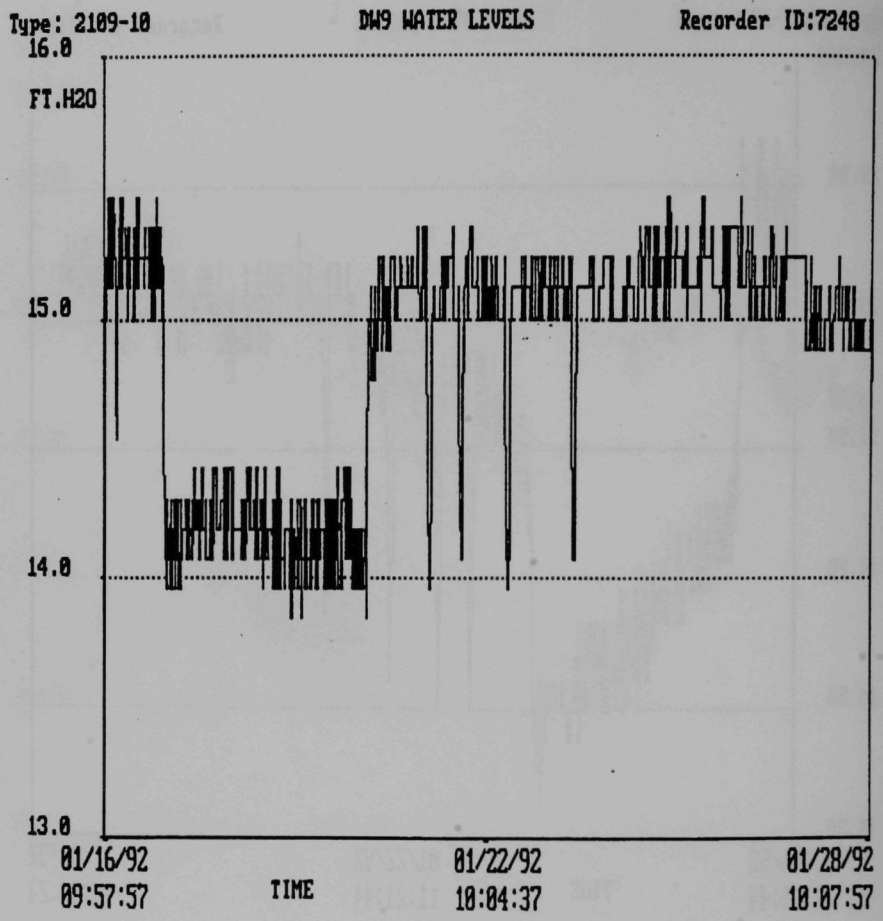

Type: 2101-65
ATMOSPHERIC PRESSURE
Recorder ID:7004
16.000
PSI
15.000
14.000
13.000
12.000
11.000
01/15/92
07:29:37
TIME
01/21/92
21:16:17
01/28/92
10:59:37

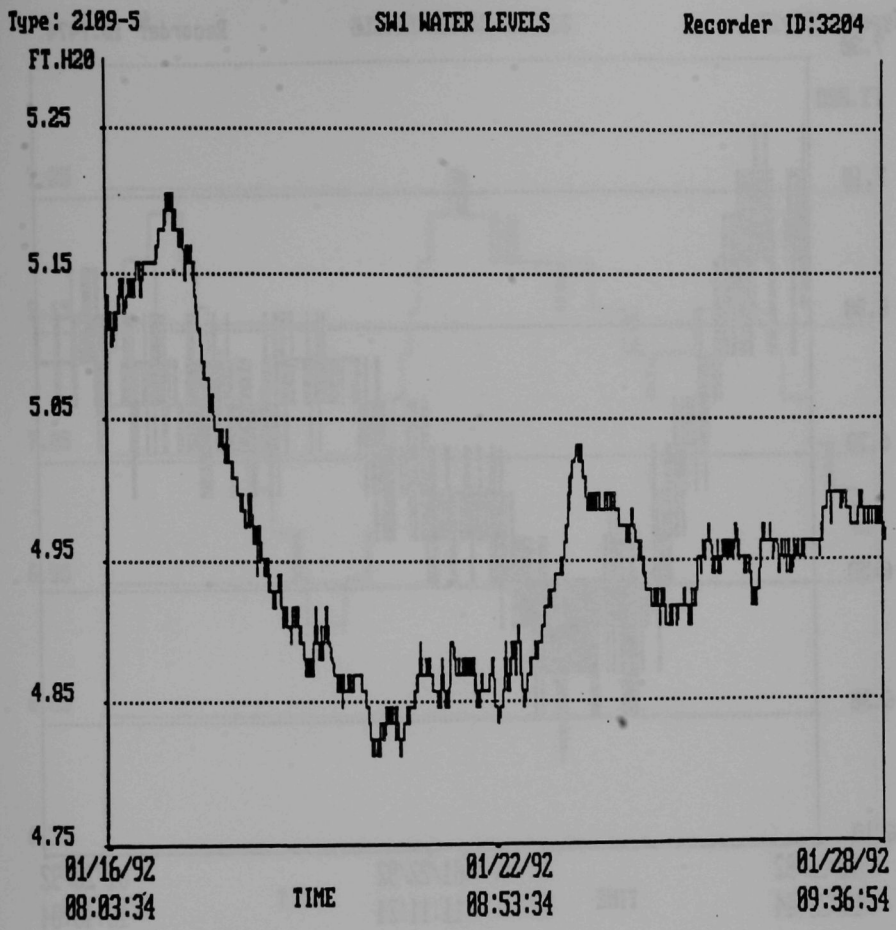

Type: 2109-5
DW1 WATER LEVELS
Recorder ID:3460
FT.H20
5.20
5.00
4.80
4.60
01/16/92
07:50:52
TIME
01/22/92
08:40:52
01/28/92
09:27:32

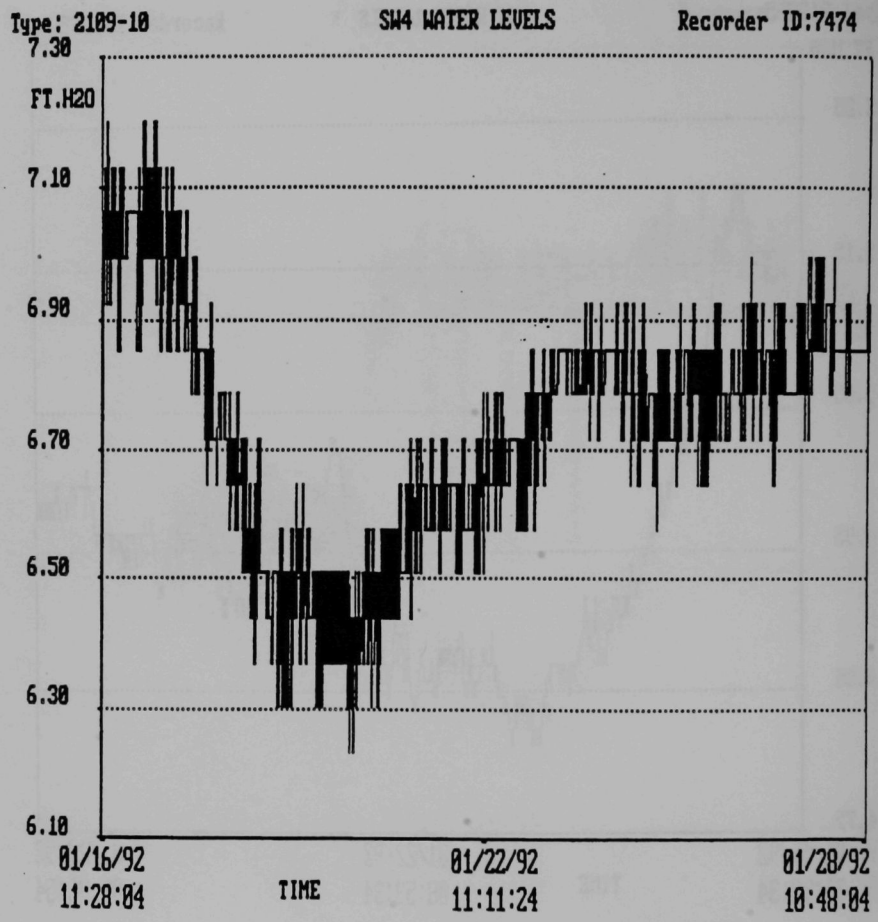

Type: 2109-10
DW4 WATER LEVELS
Recorder ID:7519
FT.H20
15.45
14.95
14.45
13.95
01/16/92
11:12:41
TIME
01/22/92
10:59:21
01/28/92
10:42:41

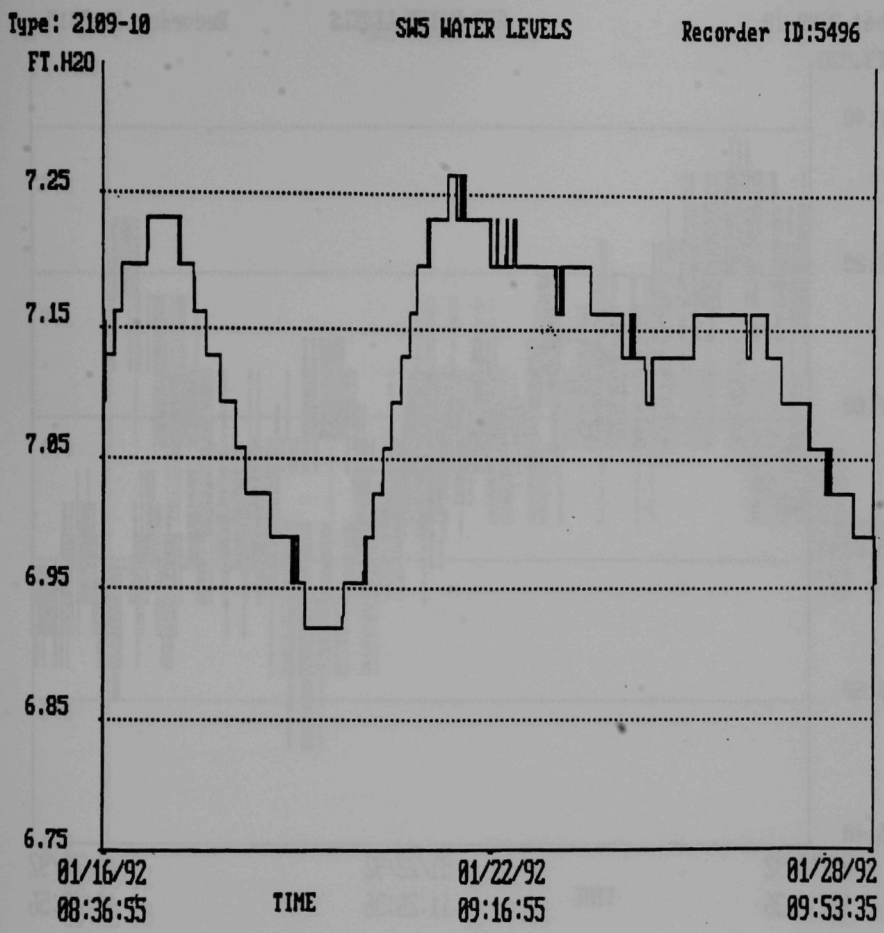

Type: 2109-10
DW5 WATER LEVELS
Recorder ID:3454
17.70
FT.H2O
17.50
17.30
17.10
16.90
16.70
16.50
01/16/92
08:54:30
TIME
01/22/92
09:27:50
01/28/92
09:57:50

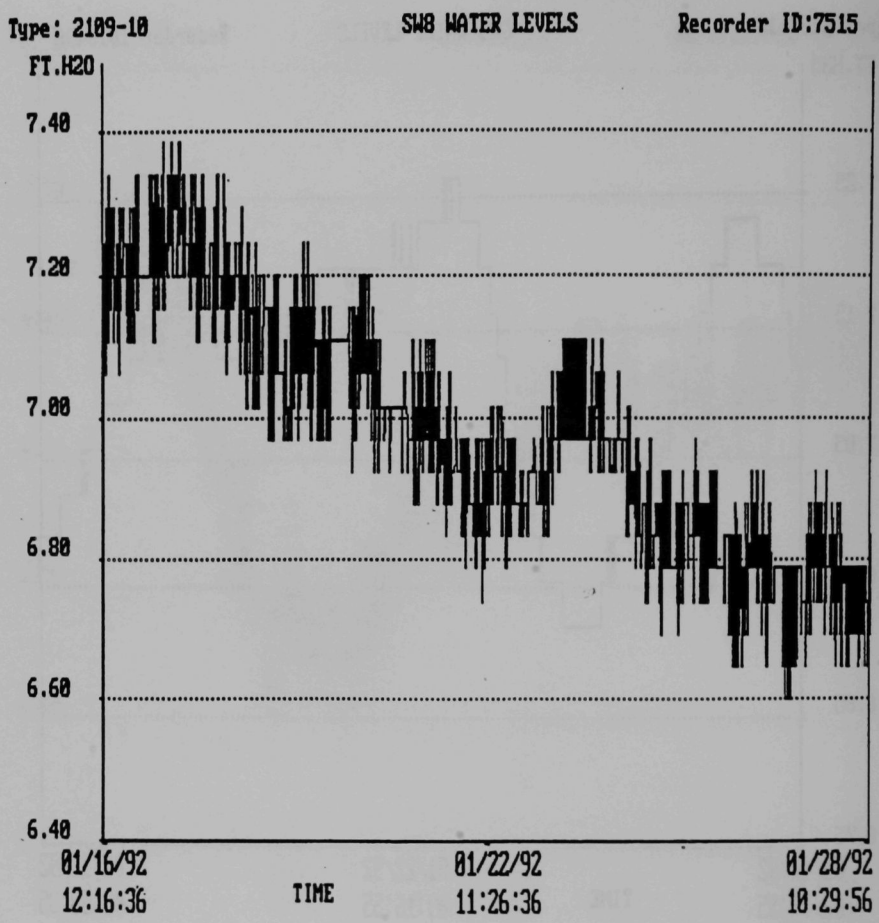

Type: 2109-10
DW8 WATER LEVELS
Recorder ID:7518
FT.H20
15.30
15.10
14.90
14.70
14.50
14.30
01/16/92
12:01:44
TIME
01/22/92
11:21:44
01/28/92
10:38:24

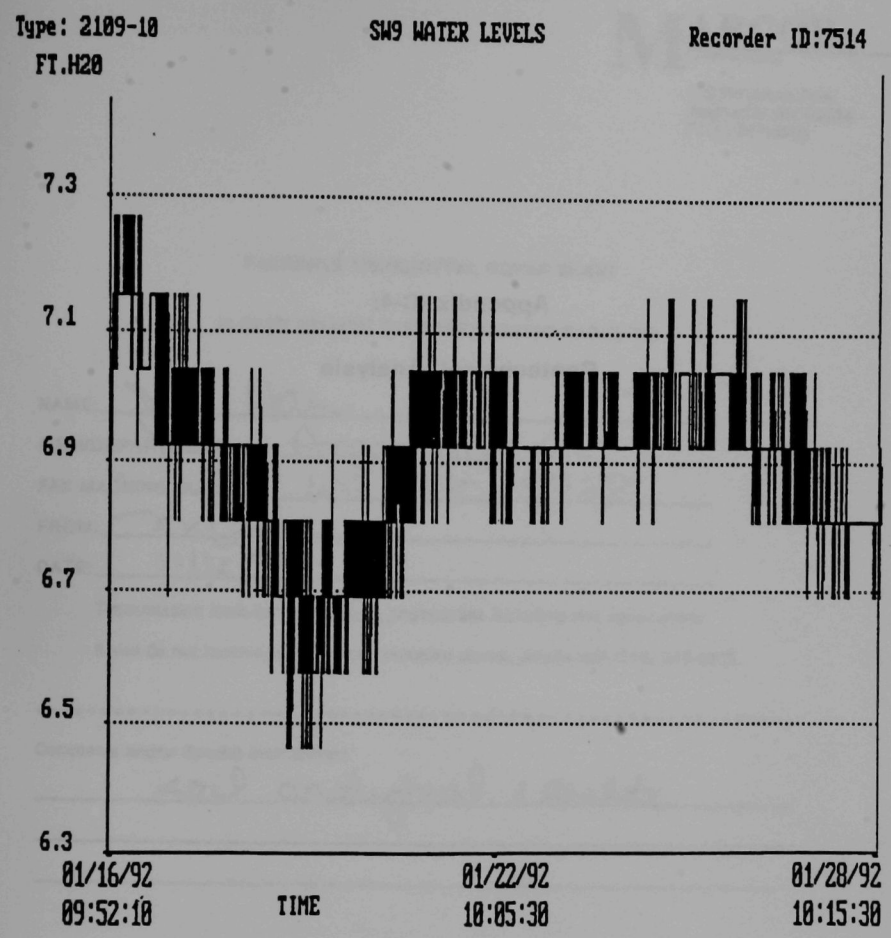

Type: 2109-10
DW9 WATER LEVELS
Recorder ID:7248
16.0
FT.H2O
15.0
14.0
13.0
01/16/92
09:57:57
TIME
01/22/92
10:04:37
01/28/92
10:07:57


Type: 2109-5
SW1 WATER LEVELS
Recorder ID:3204
FT.H20
5.25
5.15
5.05
4.95
4.85
4.75
01/16/92
08:03:34
TIME
01/22/92
08:53:34
01/28/92
09:36:54


Type: 2109-10
SW4 WATER LEVELS
Recorder ID:7474
7.30
FT.H2O
7.10
6.90
6.70
6.50
6.30
6.10
01/16/92
11:28:04
TIME
01/22/92
11:11:24
01/28/92
10:48:04


Type: 2109-10
SW5 WATER LEVELS
Recorder ID:5496
FT.H2O
7.25
7.15
7.05
6.95
6.85
6.75
01/16/92
08:36:55
TIME
01/22/92
09:16:55
01/28/92
09:53:35


Type: 2109-10
SW8 WATER LEVELS
Recorder ID:7515
FT.H20
7.40
7.20
7.00
6.80
6.60
6.40
01/16/92
12:16:36
TIME
01/22/92
11:26:36
01/28/92
10:29:56


Type: 2109-10
SW9 WATER LEVELS
Recorder ID:7514
FT.H20
7.3
7.1
6.9
6.7
6.5
6.3
01/16/92
09:52:10
TIME
01/22/92
10:05:30
01/28/92
10:15:30

# Appendix C-4:

# Geotechnical Analysis

JAN 16 '92 14:21 P. 1

MARCOR
OF NEW YORK, INC.
120 Elmgrove Park
Rochester, NY 14624
(716) 247-6955

**FACSIMILE TRANSMITTAL COVER SHEET**

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FROM: Mary

DATE: 1-16-91

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++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++

Comments and/or Special Instructions:

soil analytical results

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WEST COAST

VAN DER HORST

GEOTECHNICAL ENGINEERING

CONSTRUCTION MONITORING

MATERIALS TESTING

December 31, 1991

Ms. Mary Angevine
Marcor of New York
120 Elmgrove Park
Rochester, New York 14624

Re: Laboratory Testing
Soil Samples
Site AFP#59
VDH-91-069

Dear Mary:

VAN DER HORST has completed testing on the 10 different samples for the referenced project. The samples included seven(7) sets of samples in glass jars and three(3) undisturbed shelby tube samples.

All of the jar samples were tested for gradation. All of the jar samples were determined to be non-plastic and therefore hydrometer analysis and atterberg limits were not performed on these samples. These samples are being held in case remolded permeability tests are required.

The three(3) shelby tube samples were each tested for permeability and gradation. A hydrometer analysis was included for 2 of the shelby tube samples because of the high percentage of silts. Atterberg limits testing was not performed on any of the shelby tube samples because they were non-plastic. It is noted that tube sample DW5-ST-1 was a Gray silt with occasional pinkish-brown clay partings. The clay partings were about 1/8 of an inch thick and there was an insufficient amount to perform atterberg limits.

The following TABLES summarize the results of the laboratory testing and the individual gradation tests results are attached to this letter report. Should you have any questions please contact our office.

Very Truly Yours,

Robert F. van der Horst, P.E.

100 Elmgrove Park • Rochester, NY 14624 • 716/426-0670 • Fax 716/426-0675

VAN DER HORST

Marcor of New York
Soils Testing
page 2

SUMMARY OF TESTING FROM SHELBY TUBE SAMPLES

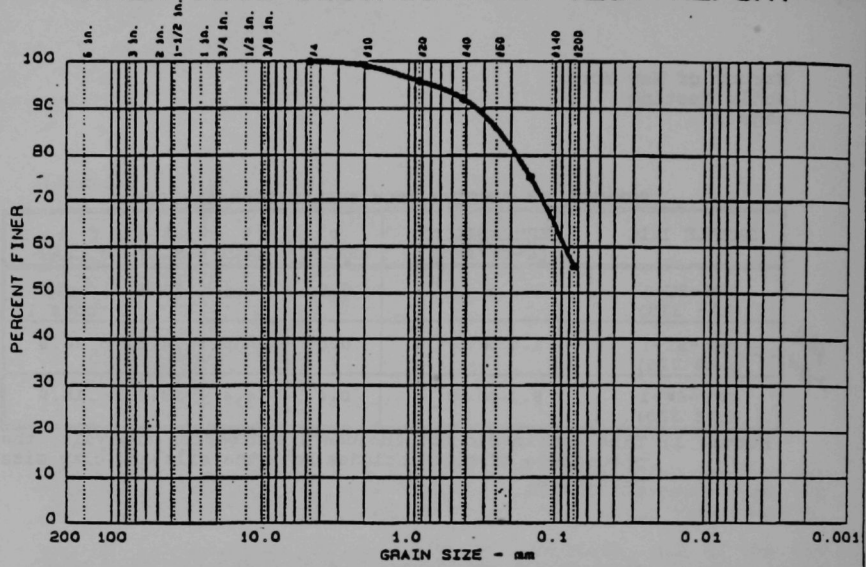
| SAMPLE I.D. | PERMEABILITY (K=cm/sec) | % GRAVEL | % SAND | % SILT | % CLAY |
|---|---|---|---|---|---|
| DW6-ST-1 (LAB 313) | $2.3 \times 10^{-4}$ | 0.0 | 44.4 | 55.6 | see note 1 |
| DW5-ST-1 (LAB 316) | $1.6 \times 10^{-5}$ | 0.0 | 0.0 | 74.5 | 24.8 |
| DW9-SP-1 (LAB 330) | $8.1 \times 10^{-4}$ | 0.4 | 64.4 | 19.3 | 15.9 |

Notes: 1) This sample did not include a hydrometer analysis; the percentage of silt includes both the silt and clay size particles.

SUMMARY OF TESTS FROM JAR SAMPLES

| SAMPLE I.D. | % GRAVEL | % SAND | % FINES |
|---|---|---|---|
| DW8-SA-1 (LAB 310) | 0.1 | 24.9 | 75.0 |
| DW8-SA-2 (LAB 311) | 0.0 | 72.4 | 27.6 |
| DW3-SA-1 (LAB 312) | 65.9 | 33.9 | 0.2 |
| DW5-SA-1 (LAB 314) | 63.5 | 36.1 | 0.4 |
| DW5-SA-2 (LAB 315) | 38.2 | 53.4 | 8.4 |
| DW9-SA-1 (LAB 328) | 55.9 | 34.6 | 9.5 |
| IW7-SA-1 (LAB 329) | 63.7 | 30.4 | 5.9 |

# GRAIN SIZE DISTRIBUTION TEST REPORT




| | Test | %+75 mm | % GRAVEL | % SAND | % SILT | % CLAY |
|---|---|---|---|---|---|---|
| ● | 4 | 0.0 | 0.0 | 44.4 | 55.6 | |
| | | | | | | |
| | | | | | | |

| | LL | PI | $D_{85}$ | $D_{60}$ | $D_{50}$ | $D_{30}$ | $D_{15}$ | $D_{10}$ | $C_c$ | $C_u$ |
|---|---|---|---|---|---|---|---|---|---|---|
| ● | | | 0.24 | 0.09 | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |

| MATERIAL DESCRIPTION | USCS | AASHTO |
|---|---|---|
| ● GRAY SANDY SILT | ML | |

Project No.: VOH-91-069
Project: MARCOR OF NEW YORK
● Location: OW6-ST-1 SHELBY TUBE SAMPLE

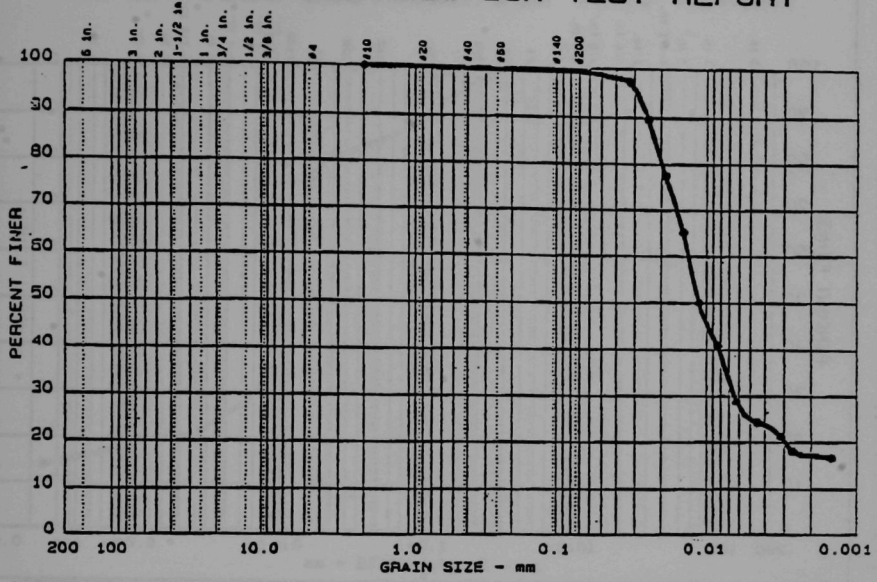
Date: 12-30-91

VAN DER HORST 100 Elmgrove Park Rochester, NY 14624

Remarks:
MARCOR SITE AFP#59

Figure No. 313

# GRAIN SIZE DISTRIBUTION TEST REPORT




| | Test | %+75mm | % GRAVEL | % SAND | % SILT | % CLAY |
|---|---|---|---|---|---|---|
| ● | 5 | 0.0 | 0.0 | 0.7 | 74.5 | 24.8 |
| | | | | | | |
| | | | | | | |

| | LL | PI | $D_{85}$ | $D_{60}$ | $D_{50}$ | $D_{30}$ | $D_{15}$ | $D_{10}$ | $C_c$ | $C_u$ |
|---|---|---|---|---|---|---|---|---|---|---|
| ● | | | | | 0.01 | 0.006 | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |

| MATERIAL DESCRIPTION | USCS | AASHTO |
|---|---|---|
| ● GRAY SILT, LITTLE CLAY | ML | |

Project No.: VDH-91-069
Project: MARCOR OF NEW YORK
● Location: ~~DW~~S-ST-1, SHELBY TUBE SAMPLE
S
9#4 2-18-92

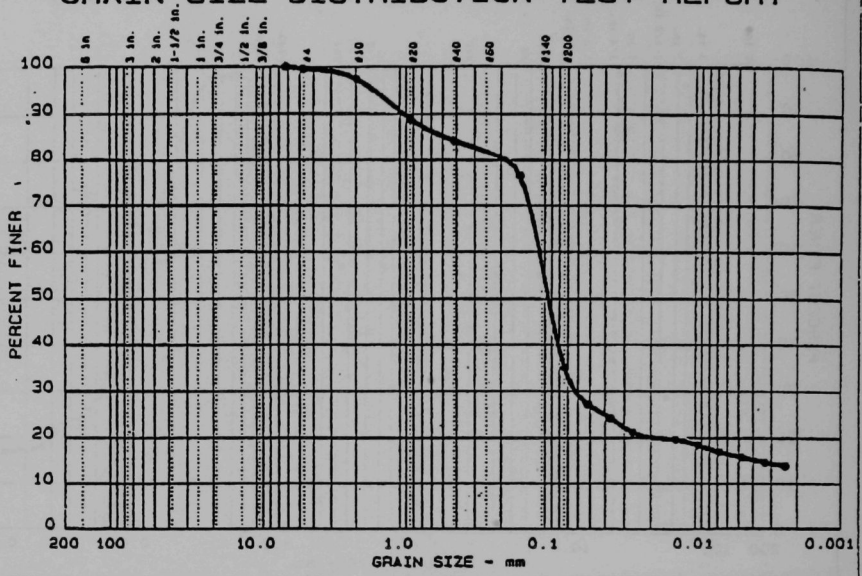
Date: 12-30-91

VANDERHORST 100 Elmgrove Park Rochester, NY 14624

Remarks:
MARCOR SITE AFP#59

Figure No. 315

# GRAIN SIZE DISTRIBUTION TEST REPORT




| | Test | %+75mm | % GRAVEL | % SAND | % SILT | % CLAY |
|---|---|---|---|---|---|---|
| ● | 8 | 0.0 | 0.4 | 64.4 | 19.3 | 15.9 |
| | | | | | | |
| | | | | | | |

| | LL | PI | $D_{85}$ | $D_{60}$ | $D_{50}$ | $D_{30}$ | $D_{15}$ | $D_{10}$ | $C_c$ | $C_u$ |
|---|---|---|---|---|---|---|---|---|---|---|
| ● | | | 0.48 | 0.11 | 0.09 | 0.063 | 0.0037 | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |

| MATERIAL DESCRIPTION | USCS | AASHTO |
|---|---|---|
| ● GRAY FINE SILTY SAND, little clay (non-plastic) | SM | |

Project No.: VOH-91-069
Project: MARCOR OF NEW YORK
● Location: OW9-SP-1 SHELBY TUBE SAMPLE

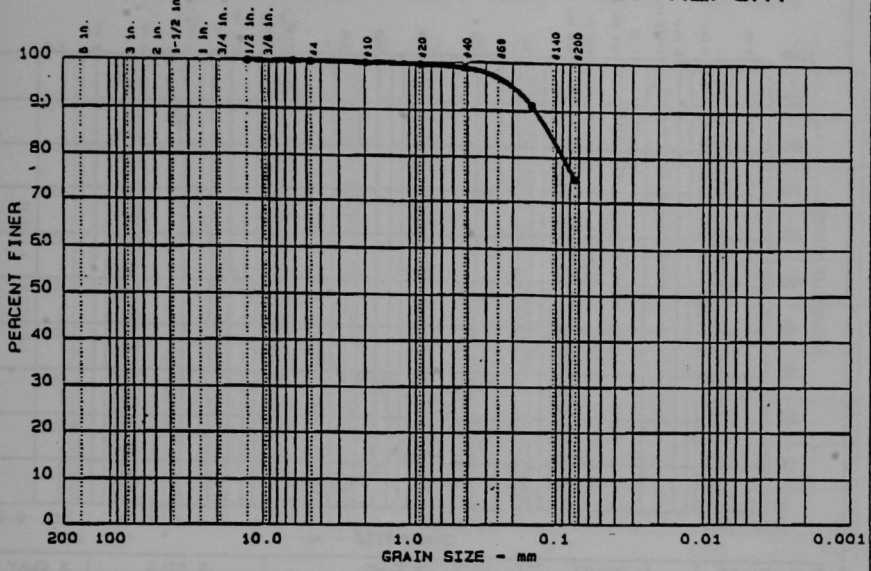
Date: 12-30-91

VANDERHORST 168 Elmgrove Park Rochester, NY 14624

Remarks:
MARCOR SITE AFP#59
JOHNSON CITY, NEW YORK

Figure No. 330

# GRAIN SIZE DISTRIBUTION TEST REPORT




| | Test | %+75mm | % GRAVEL | % SAND | % SILT | % CLAY |
|---|---|---|---|---|---|---|
| ● | 1 | 0.0 | 0.1 | 24.9 | 75.0 | |
| | | | | | | |
| | | | | | | |

| | LL | PI | $D_{85}$ | $D_{60}$ | $D_{50}$ | $D_{30}$ | $D_{15}$ | $D_{10}$ | $C_c$ | $C_u$ |
|---|---|---|---|---|---|---|---|---|---|---|
| ● | | | 0.11 | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |

| MATERIAL DESCRIPTION | USCS | AASHTO |
|---|---|---|
| ● GRAY CLAYEY SILT, some Sand | ML | |

Project No.: VOH-91-069
Project: MARCOR OF NEW YORK
● Location: OW8-SA-1

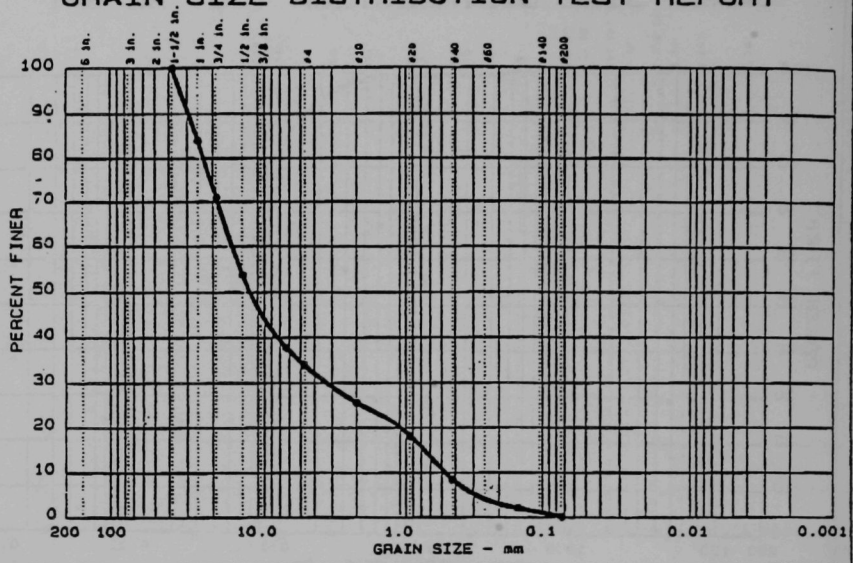
Date: 12-23-91

VAN DER HORST 100 Elmgrove Park Rochester, NY 14624

Remarks:

Figure No. 310

# GRAIN SIZE DISTRIBUTION TEST REPORT




| | Test | %+75mm | % GRAVEL | % SAND | % SILT | % CLAY |
|---|---|---|---|---|---|---|
| ● | 3 | 0.0 | 65.9 | 33.9 | 0.2 | |
| | | | | | | |
| | | | | | | |

| | LL | PI | $D_{85}$ | $D_{60}$ | $D_{50}$ | $D_{30}$ | $D_{15}$ | $D_{10}$ | $C_c$ | $C_u$ |
|---|---|---|---|---|---|---|---|---|---|---|
| ● | | | 26.00 | 14.86 | 11.27 | 3.251 | 0.6637 | 0.4699 | 1.51 | 31.6 |
| | | | | | | | | | | |
| | | | | | | | | | | |

| MATERIAL DESCRIPTION | USCS | AASHTO |
|---|---|---|
| ● GRAY BROWN GRAVEL, some Sand, trace silt | GW | |

Project No.: VOH-91-069
Project: MARCOR OF NEW YORK
● Location: DW3-SA-1, 10'-18'

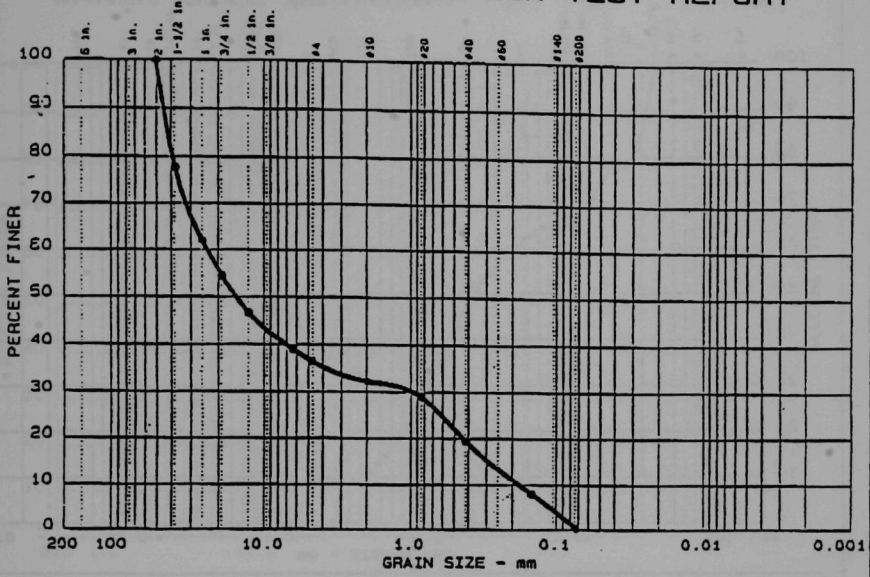
Date: 12-23-91

Remarks:

VAN DER HORST 160 Elmgrove Park Rochester, NY 14624

Figure No. 312

# GRAIN SIZE DISTRIBUTION TEST REPORT




| | Test | %+75mm | % GRAVEL | % SAND | % SILT | % CLAY |
|---|---|---|---|---|---|---|
| ● | 14 | 0.0 | 63.5 | 36.1 | 0.4 | |
| | | | | | | |
| | | | | | | |

| | LL | PI | $D_{85}$ | $D_{60}$ | $D_{50}$ | $D_{30}$ | $D_{15}$ | $D_{10}$ | $C_c$ | $C_u$ |
|---|---|---|---|---|---|---|---|---|---|---|
| ● | | | 42.27 | 23.50 | 15.35 | 0.957 | 0.2924 | 0.1803 | 0.22 | 130.3 |
| | | | | | | | | | | |
| | | | | | | | | | | |

| MATERIAL DESCRIPTION | USCS | AASHTO |
|---|---|---|
| ● BROWN GRAVEL AND SAND, trace silt | GP | |

Project No.: VON-91-069
Project: MARCOR OF NEW YORK
● Location: NW-S-SA-1, 8'-10'

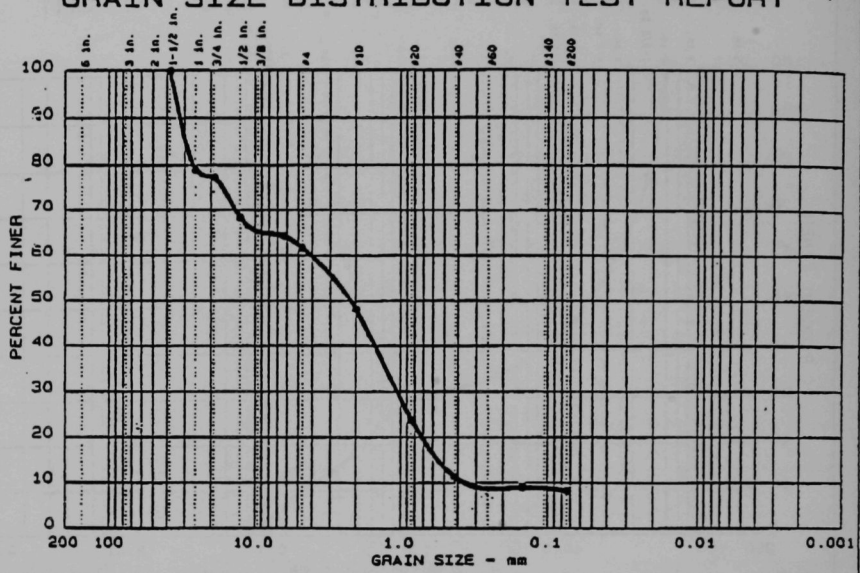
Date: 12-23-91

VAN DER HORST 100 Kimgrove Park Rochester, NY 14624

Remarks:

Figure No. 314

# GRAIN SIZE DISTRIBUTION TEST REPORT




| | Test | %+75mm | % GRAVEL | % SAND | % SILT | % CLAY |
|---|---|---|---|---|---|---|
| ● | 2 | 0.0 | 38.2 | 53.4 | 8.4 | |
| | | | | | | |
| | | | | | | |

| | LL | PI | $D_{85}$ | $D_{60}$ | $D_{50}$ | $D_{30}$ | $D_{15}$ | $D_{10}$ | $C_c$ | $C_u$ |
|---|---|---|---|---|---|---|---|---|---|---|
| ● | | | 29.85 | 4.07 | 2.16 | 1.047 | 0.5559 | 0.3631 | 0.74 | 11.2 |
| | | | | | | | | | | |
| | | | | | | | | | | |

| MATERIAL DESCRIPTION | USCS | AASHTO |
|---|---|---|
| ● GRAY BROWN SAND AND GRAVEL, trace silt | SP-SM | |

Project No.: VOH-91-069
Project: MARCOR OF NEW YORK
● Location: OWS-SA-2

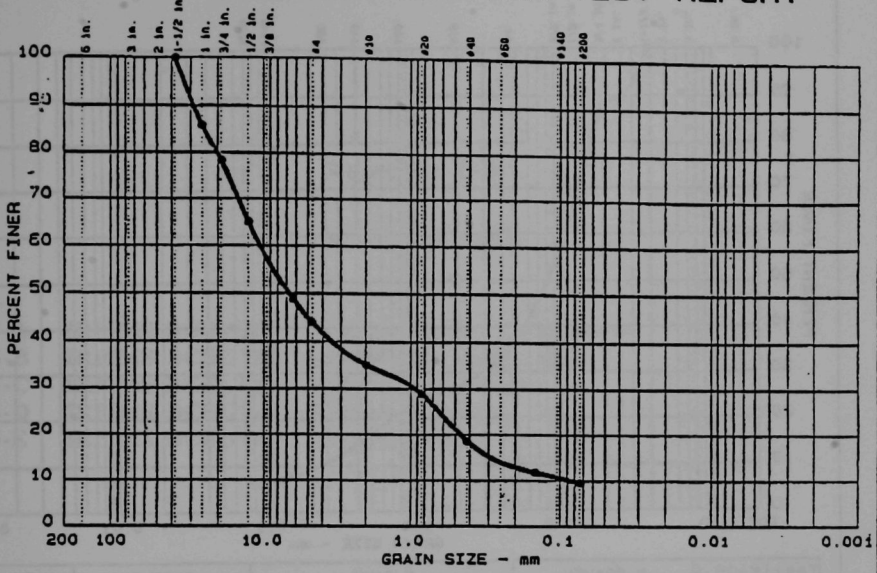
Date: 12-23-91

VANDERHORST 100 Elmgrove Park Rochester, NY 14624

Remarks:

Figure No. 315

# GRAIN SIZE DISTRIBUTION TEST REPORT




| | Test | %+75mm | % GRAVEL | % SAND | % SILT | % CLAY |
|---|---|---|---|---|---|---|
| ● | 6 | 0.0 | 55.9 | 34.6 | 9.5 | |
| | | | | | | |
| | | | | | | |

| | LL | PI | $D_{85}$ | $D_{60}$ | $D_{50}$ | $D_{30}$ | $D_{15}$ | $D_{10}$ | $C_c$ | $C_u$ |
|---|---|---|---|---|---|---|---|---|---|---|
| ● | | | 24.55 | 10.59 | 6.75 | 0.922 | 0.2914 | 0.0831 | 0.96 | 127.5 |
| | | | | | | | | | | |
| | | | | | | | | | | |

| MATERIAL DESCRIPTION | USCS | AASHTO |
|---|---|---|
| ● BROWN SANDY GRAVEL, TRACE SILT | GP-GM | |

Project No.: VOH-91-069
Project: MARCOR OF NEW YORK
● Location: DW9-SA-1

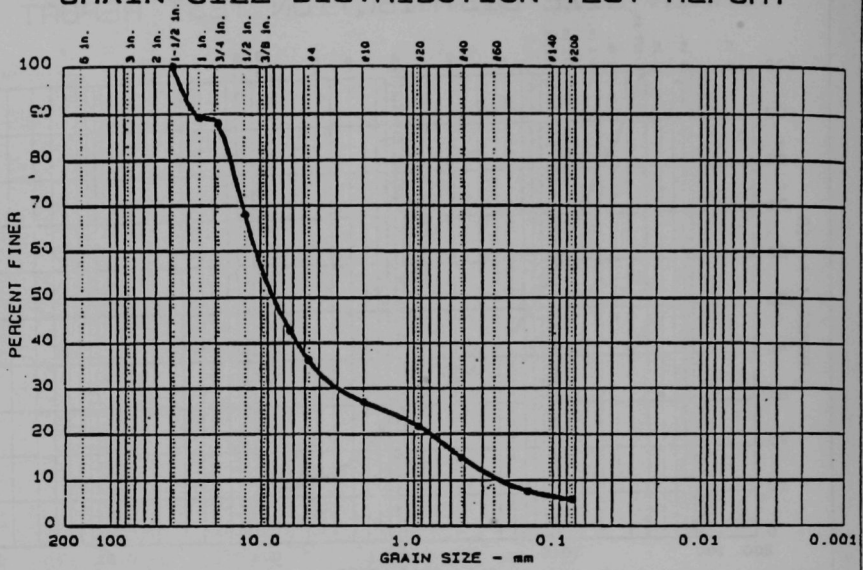
Date: 12-30-91

VAN DER HORST 100 Elmgrove Park Rochester, NY 14624

Remarks:
MARCOR SITE AFP#59
JOHNSON CITY, NEW YORK

Figure No. 328

# GRAIN SIZE DISTRIBUTION TEST REPORT




| | Test | %+75 mm | % GRAVEL | % SAND | % SILT | % CLAY |
|---|---|---|---|---|---|---|
| ● | 7 | 0.0 | 63.7 | 30.4 | 5.9 | |
| | | | | | | |
| | | | | | | |

| | LL | PI | $D_{85}$ | $D_{60}$ | $D_{50}$ | $D_{30}$ | $D_{15}$ | $D_{10}$ | $C_c$ | $C_u$ |
|---|---|---|---|---|---|---|---|---|---|---|
| ● | | | 17.28 | 10.78 | 8.24 | 2.992 | 0.4276 | 0.2323 | 3.58 | 46.4 |
| | | | | | | | | | | |
| | | | | | | | | | | |

| MATERIAL DESCRIPTION | USCS | AASHTO |
|---|---|---|
| ● BROWN SANDY GRAVEL. TRACE SILT | GP-GM | |

Project No.: VDH-91-069
Project: MARCOR OF NEW YORK
● Location: IW7-SA-1

Date: 12-30-91

VAN DER HORST 100 Cimarron Park Rochester, NY 14624

Remarks:
MARCOR SITE AFP#59
JOHNSON CITY, NEW YORK

Figure No. 329

# Appendix C-5:

## IRPIMS Materials

| | | |
|---|---|---|
| C-5-A | IRPIMS BCHWCI | well completion information |
| C-5-B | IRPIMS BCHGWD | groundwater information |
| C-5-C | IRPIMS BCHLTD | lithologic description |
| C-5-D | IRPIMS BCHGWD | hydrologic parameters |
| C-5-E | IRPIMS BCHGWD | borehole widths |

# Appendix C-5-A:

# IRPIMS BCHWCI

# Well Completion Information

D-5-R.

ANL A

USAF

ORMATION (BCHWCI)

| AFIID | | | | | WCM-CODE | GZC-CODE | SAQ-CODE | SE-DEPTH | FPL | MP-ELEV | TOT-DEPTH | CAS-DIAM | CMA-CODE | SB-DEPTH | SCR-LENGTH | SOLIA | SCR-DIAM | PCTOPEN | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AFP#5 | | | | | GS | W | BTNY | 48.5 | 13.0 | 834.57 | 61.5 | 4.0 | PVC | 51.5 | 10.0 | 0.01 | 4.0 | ~ 8.0% | NO WELL FOOTER |
| AFP#59 | DW3 | 08-Nov-91 | USAF | MNW | GS | C | BTNY | 64.5 | 23.5 | 829.04 | 88.0 | 4.0 | PVC | 67.5 | 20.0 | 0.01 | 4.0 | ~ 8.0% | 1/2' FOOTER |
| AFP#59 | DW4 | 25-Nov-91 | USAF | MNW | GS | C | BTNY | 62.0 | 23.0 | 828.78 | 85.0 | 4.0 | PVC | 65.0 | 20.0 | 0.01 | 4.0 | ~ 8.0% | NO WELL FOOTER |
| AFP#59 | DW5 | 19-Nov-91 | USAF | MNW | GS | C | BTNY | 70.0 | 13.0 | 835.97 | 83.0 | 4.0 | PVC | 73.0 | 10.0 | 0.01 | 4.0 | ~ 8.0% | NO WELL FOOTER |
| AFP#59 | DW6 | 16-Nov-91 | USAF | MNW | GS | A | BTNY | 53.5 | 13.0 | 828.51 | 66.5 | 4.0 | PVC | 56.5 | 10.0 | 0.01 | 4.0 | ~ 8.0% | NO WELL FOOTER |
| AFP#59 | DW8 | 03-Nov-91 | USAF | MNW | GS | C | BTNY | 70.5 | 22.5 | 829.70 | 93.0 | 4.0 | PVC | 72.5 | 20.0 | 0.01 | 4.0 | ~ 3.0% | 1/2' FOOTER |
| AFP#59 | DW9 | 09-Dec-91 | USAF | MNW | GS | C | BTNY | 64.5 | 23.5 | 831.31 | 88.0 | 4.0 | PVC | 67.5 | 20.0 | 0.01 | 4.0 | ~ 8.0% | 1/2' FOOTER |
| AFP#59 | SW4 | 02-Dec-91 | USAF | MNW | GS | W | BTNY | 11.5 | 17.5 | 828.85 | 29.0 | 2.0 | PVC | 13.5 | 15.0 | 0.01 | 2.0 | ~ 8.0% | 1/2' FOOTER |
| AFP#59 | SW5 | 20-Nov-91 | USAF | MNW | GS | W | BTNY | 17.5 | 13.0 | 835.84 | 30.5 | 2.0 | PVC | 20.5 | 10.0 | 0.01 | 2.0 | ~ 8.0% | NO WELL FOOTER |
| AFP#59 | SW6 | 17-Nov-91 | USAF | MNW | GS | W | BTNY | 16.0 | 13.0 | 828.49 | 29.0 | 2.0 | PVC | 19.0 | 10.0 | 0.01 | 2.0 | ~ 8.0% | NO WELL FOOTER |
| AFP#59 | SW7 | 06-Dec-91 | USAF | MNW | GS | W | BTNY | 9.5 | 17.0 | 831.89 | 26.5 | 2.0 | PVC | 11.5 | 15.0 | 0.01 | 2.0 | ~ 8.0% | NO WELL FOOTER |
| AFP#59 | SW8 | 04-Nov-91 | USAF | MNW | GS | W | BTNY | 10.5 | 12.5 | 829.85 | 23.0 | 2.0 | PVC | 12.5 | 10.0 | 0.01 | 2.0 | ~ 3.0% | 1/2' FOOTER |
| AFP#59 | SW9 | 10-Dec-91 | USAF | MNW | GS | W | BTNY | 8.0 | 17.0 | 831.38 | 25.0 | 2.0 | PVC | 10.0 | 15.0 | 0.01 | 2.0 | ~ 8.0% | NO WELL FOOTER |
| AFP#59 | 1W9 | 10-Dec-91 | USAF | OBS | GS | L | BTNY | 43.0 | 8.0 | 831.52 | 51.0 | 2.0 | PVC | 46.0 | 5.0 | 0.01 | 2.0 | ~ 8.0% | NO WELL FOOTER |

NOTE: MPELEV = NOTCHED TOP OF CASING. SEDEPTH, FPL, TOTDEPTH, AND SBDEPTH ARE MEASURED FROM GROUND SURFACE.

ANL AFP#59 IRP SI

USAF IRPIMS DW1 GROUNDWATER LEVEL DATA (BCHGWD)

| AFIID | LOCID | LOGDATE | LOGCODE | LOGTIME | STATDEP | PRODRATE | PUMPDEP | DEPWAT | RECTIME | SOUNDING | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| AFP#59 | DW1 | 22-Nov-91 | Hydro-Terra | 1030 | 19.84 | --- | --- | --- | --- | 64.24 | @ Installation |
| AFP#59 | DW1 | 26-Nov-91 | Hydro-Terra | 1045 | 22.80 | --- | --- | --- | --- | 64.24 | Check |
| AFP#59 | DW1 | 12-Dec-91 | Hydro-Terra | 745 | 20.66 | --- | --- | --- | --- | 64.24 | Start Well Development |
| AFP#59 | DW1 | 12-Dec-91 | Hydro-Terra | 800 | --- | 6.0 | 60.0 | 27.00 | --- | 64.24 | Well Development |
| AFP#59 | DW1 | 12-Dec-91 | Hydro-Terra | 805 | --- | 6.0 | 60.0 | 27.73 | --- | 64.24 | Well Development |
| AFP#59 | DW1 | 12-Dec-91 | Hydro-Terra | 810 | --- | 6.0 | 60.0 | 27.81 | --- | 64.24 | Well Development |
| AFP#59 | DW1 | 12-Dec-91 | Hydro-Terra | 815 | --- | 6.0 | 60.0 | 27.82 | --- | 64.24 | Well Development |
| AFP#59 | DW1 | 12-Dec-91 | Hydro-Terra | 820 | --- | 6.0 | 60.0 | 28.11 | --- | 64.24 | Well Development |
| AFP#59 | DW1 | 12-Dec-91 | Hydro-Terra | 825 | --- | 6.0 | 60.0 | 28.18 | --- | 64.24 | Well Development |
| AFP#59 | DW1 | 12-Dec-91 | Hydro-Terra | 830 | --- | 6.0 | 60.0 | 28.22 | --- | 64.24 | Well Development |
| AFP#59 | DW1 | 12-Dec-91 | Hydro-Terra | 835 | --- | 6.0 | 60.0 | 28.34 | --- | 64.24 | Well Development |
| AFP#59 | DW1 | 12-Dec-91 | Hydro-Terra | 840 | --- | 6.0 | 60.0 | 28.38 | --- | 64.24 | Well Development |
| AFP#59 | DW1 | 12-Dec-91 | Hydro-Terra | 845 | --- | 6.0 | 60.0 | 28.42 | --- | 64.24 | Well Development |
| AFP#59 | DW1 | 12-Dec-91 | Hydro-Terra | 850 | --- | 6.0 | 60.0 | 28.43 | --- | 64.24 | End Well Development |
| AFP#59 | DW1 | 12-Dec-91 | Hydro-Terra | 855 | --- | --- | --- | 20.68 | 5.0 | 64.24 | Recovery |
| AFP#59 | DW1 | 02-Jan-92 | Hydro-Terra | 1513 | 20.26 | --- | --- | --- | --- | 64.24 | @ 1st Sampling |
| AFP#59 | DW1 | 02-Jan-92 | Hydro-Terra | 1548 | --- | 5.0 | 57.5 | 23.68 | --- | 64.24 | End Purge |
| AFP#59 | DW1 | 02-Jan-92 | Hydro-Terra | 1553 | --- | --- | --- | 20.26 | 5.0 | 64.24 | Recovery |
| AFP#59 | DW1 | 11-Jan-92 | Hydro-Terra | 1218 | 20.29 | --- | --- | --- | --- | 64.24 | @ Slug Test |
| AFP#59 | DW1 | 31-Jan-92 | Hydro-Terra | 1345 | 20.42 | --- | --- | --- | --- | 64.24 | @ 2nd Sampling |
| AFP#59 | DW1 | 31-Jan-92 | Hydro-Terra | 1410 | --- | 6.0 | 57.5 | --- | --- | 64.24 | End Purge |
| AFP#59 | DW1 | 31-Jan-92 | Hydro-Terra | 1415 | --- | --- | --- | 20.40 | 5.0 | 64.24 | Recovery |

# Appendix C-5-B:

# IRPIMS BCHGWD

# Groundwater Information

ANL AFP#59 IRP SI

USAF IRPIMS DW3 GROUNDWATER LEVEL DATA (BCHGWD)

| AFIID | LOCID | LOGDATE | LOGCODE | LOGTIME | STATDEP | PRODRATE | PUMPDEP | DEPWAT | RECTIME | SOUNDING | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| AFP#59 | DW3 | 08-Nov-91 | Hydro-Terra | 1600 | 19.07 | --- | --- | --- | --- | 87.62 | @ Installation |
| AFP#59 | DW3 | 26-Nov-91 | Hydro-Terra | 1050 | 18.70 | --- | --- | --- | --- | 87.62 | Check |
| AFP#59 | DW3 | 11-Dec-91 | Hydro-Terra | 1112 | 15.29 | --- | --- | --- | --- | 87.62 | Start Well Development |
| AFP#59 | DW3 | 11-Dec-91 | Hydro-Terra | 1117 | --- | 7.9 | 85 | 15.92 | --- | 87.62 | Well Development |
| AFP#59 | DW3 | 11-Dec-91 | Hydro-Terra | 1127 | --- | 7.9 | 85 | 16.04 | --- | 87.62 | Well Development |
| AFP#59 | DW3 | 11-Dec-91 | Hydro-Terra | 1132 | --- | 7.9 | 85 | 16.04 | --- | 87.62 | Well Development |
| AFP#59 | DW3 | 11-Dec-91 | Hydro-Terra | 1137 | --- | 7.9 | 85 | 16.06 | --- | 87.62 | Well Development |
| AFP#59 | DW3 | 11-Dec-91 | Hydro-Terra | 1142 | --- | 7.9 | 85 | 15.41 | --- | 87.62 | Well Development |
| AFP#59 | DW3 | 11-Dec-91 | Hydro-Terra | 1145 | --- | 7.9 | 85 | --- | --- | 87.62 | Well Development |
| AFP#59 | DW3 | 11-Dec-91 | Hydro-Terra | 1147 | --- | 7.9 | 85 | 15.92 | --- | 87.62 | Well Development |
| AFP#59 | DW3 | 11-Dec-91 | Hydro-Terra | 1152 | --- | 7.9 | 85 | 16.00 | --- | 87.62 | Well Development |
| AFP#59 | DW3 | 11-Dec-91 | Hydro-Terra | 1157 | --- | 7.9 | 85 | 16.02 | --- | 87.62 | Well Development |
| AFP#59 | DW3 | 11-Dec-91 | Hydro-Terra | 1202 | --- | 7.9 | 85 | 16.00 | --- | 87.62 | Well Development |
| AFP#59 | DW3 | 11-Dec-91 | Hydro-Terra | 1207 | --- | 7.9 | 85 | 16.05 | --- | 87.62 | End Well Development |
| AFP#59 | DW3 | 11-Dec-91 | Hydro-Terra | 1212 | --- | --- | --- | 15.35 | 5.0 | 87.62 | Recovery |
| AFP#59 | DW3 | 07-Jan-92 | Hydro-Terra | 830 | 15.19 | --- | --- | --- | --- | 87.62 | @ 1st Sampling |
| AFP#59 | DW3 | 07-Jan-92 | Hydro-Terra | 906 | --- | 6.0 | 80 | 16.58 | --- | 87.62 | End Purge |
| AFP#59 | DW3 | 07-Jan-92 | Hydro-Terra | 911 | --- | --- | --- | 15.19 | 5.0 | 87.62 | Recovery |
| AFP#59 | DW3 | 07-Jan-92 | Hydro-Terra | 835 | 15.28 | --- | --- | --- | --- | 87.62 | @ Slug Test |
| AFP#59 | DW3 | 02-Feb-92 | Hydro-Terra | 910 | 15.48 | --- | --- | --- | --- | 87.62 | @ 2nd Sampling |
| AFP#59 | DW3 | 02-Feb-92 | Hydro-Terra | 945 | --- | 6.0 | 80 | --- | --- | 87.62 | End Purge |
| AFP#59 | DW3 | 02-Feb-92 | Hydro-Terra | 950 | --- | --- | --- | 15.48 | 5.0 | 87.62 | Recovery |

ANL AFP#59 IRP SI

USAF IRPIMS DW4 GROUNDWATER LEVEL DATA (BCHGWD)

| AFIID | LOCID | LOGDATE | LOGCODE | LOGTIME | STATDEP | PRODRATE | PUMPDEP | DEPWAT | RECTIME | SOUNDING | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| AFP#59 | DW4 | 25-Nov-91 | Hydro-Terra | 1800 | 19.50 | --- | --- | --- | --- | 84.73 | @ Installation |
| AFP#59 | DW4 | 26-Nov-91 | Hydro-Terra | 1100 | 18.70 | --- | --- | --- | --- | 84.73 | Check |
| AFP#59 | DW4 | 12-Dec-91 | Hydro-Terra | 950 | 15.34 | --- | --- | --- | --- | 84.73 | Start Well Development |
| AFP#59 | DW4 | 12-Dec-91 | Hydro-Terra | 955 | --- | 5.0 | 85.0 | 23.96 | --- | 84.73 | Well Development |
| AFP#59 | DW4 | 12-Dec-91 | Hydro-Terra | 1000 | --- | 5.0 | 85.0 | 27.14 | --- | 84.73 | Well Development |
| AFP#59 | DW4 | 12-Dec-91 | Hydro-Terra | 1005 | --- | 5.0 | 85.0 | 27.62 | --- | 84.73 | Well Development |
| AFP#59 | DW4 | 12-Dec-91 | Hydro-Terra | 1010 | --- | 6.0 | 85.0 | 28.79 | --- | 84.73 | Well Development |
| AFP#59 | DW4 | 12-Dec-91 | Hydro-Terra | 1015 | --- | 6.0 | 85.0 | 29.39 | --- | 84.73 | Well Development |
| AFP#59 | DW4 | 12-Dec-91 | Hydro-Terra | 1020 | --- | 6.0 | 85.0 | 30.43 | --- | 84.73 | Well Development |
| AFP#59 | DW4 | 12-Dec-91 | Hydro-Terra | 1025 | --- | 6.0 | 85.0 | 30.74 | --- | 84.73 | Well Development |
| AFP#59 | DW4 | 12-Dec-91 | Hydro-Terra | 1030 | --- | 6.0 | 85.0 | 30.60 | --- | 84.73 | Well Development |
| AFP#59 | DW4 | 12-Dec-91 | Hydro-Terra | 1035 | --- | 6.0 | 85.0 | 30.84 | --- | 84.73 | Well Development |
| AFP#59 | DW4 | 12-Dec-91 | Hydro-Terra | 1040 | --- | 6.0 | 85.0 | 31.04 | --- | 84.73 | Well Development |
| AFP#59 | DW4 | 12-Dec-91 | Hydro-Terra | 1045 | --- | 6.0 | 85.0 | 31.58 | --- | 84.73 | Well Development |
| AFP#59 | DW4 | 12-Dec-91 | Hydro-Terra | 1050 | --- | 6.0 | 85.0 | 31.72 | --- | 84.73 | Well Development |
| AFP#59 | DW4 | 12-Dec-91 | Hydro-Terra | 1055 | --- | 6.0 | 85.0 | 31.71 | --- | 84.73 | Well Development |
| AFP#59 | DW4 | 12-Dec-91 | Hydro-Terra | 1100 | --- | 6.0 | 85.0 | 31.93 | --- | 84.73 | Well Development |
| AFP#59 | DW4 | 12-Dec-91 | Hydro-Terra | 1105 | --- | 6.0 | 85.0 | 32.03 | --- | 84.73 | Well Development |
| AFP#59 | DW4 | 12-Dec-91 | Hydro-Terra | 1110 | --- | 6.0 | 85.0 | 31.99 | --- | 84.73 | Well Development |
| AFP#59 | DW4 | 12-Dec-91 | Hydro-Terra | 1115 | --- | 6.0 | 85.0 | 32.04 | --- | 84.73 | End Well Development |
| AFP#59 | DW4 | 12-Dec-91 | Hydro-Terra | 1120 | --- | --- | --- | 16.07 | 5.0 | 84.73 | Recovery |
| AFP#59 | DW4 | 08-Jan-92 | Hydro-Terra | 1015 | 14.61 | --- | --- | --- | --- | 84.73 | @ 1st Sampling |
| AFP#59 | DW4 | 08-Jan-92 | Hydro-Terra | 1100 | --- | 5.0 | 85.0 | 17.95 | --- | 84.73 | End Purge |
| AFP#59 | DW4 | 08-Jan-92 | Hydro-Terra | 1105 | --- | --- | --- | 14.64 | 5.0 | 84.73 | Recovery |
| AFP#59 | DW4 | 12-Jan-92 | Hydro-Terra | 1315 | 14.64 | --- | --- | --- | --- | 84.73 | @Slug Test |
| AFP#59 | DW4 | 29-Jan-92 | Hydro-Terra | 1255 | 14.74 | --- | --- | --- | --- | 84.73 | @ 2nd Sampling |
| AFP#59 | DW4 | 29-Jan-92 | Hydro-Terra | 1330 | --- | 6.0 | 85.0 | --- | --- | 84.73 | End Purge |
| AFP#59 | DW4 | 29-Jan-92 | Hydro-Terra | 1335 | --- | --- | --- | 14.74 | 5.0 | 84.73 | Recovery |

ANL AFP#59 IRP SI

USAF IRPIMS DW5 GROUNDWATER LEVEL DATA (BCHGWD)

| AFIID | LOCID | LOGDATE | LOGCODE | LOGTIME | STATDEP | PRODRATE | PUMPDEP | DEPWAT | RECTIME | SOUNDING | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| AFP#59 | DW5 | 19-Nov-91 | Hydro-Terra | 1530 | 25.26 | --- | --- | --- | --- | 82.73 | @ Installation |
| AFP#59 | DW5 | 26-Nov-91 | Hydro-Terra | 1110 | 24.66 | --- | --- | --- | --- | 82.73 | Check |
| AFP#59 | DW5 | 11-Dec-91 | Hydro-Terra | 1610 | 22.33 | --- | --- | --- | --- | 82.73 | Start Well Development |
| AFP#59 | DW5 | 11-Dec-91 | Hydro-Terra | 1619 | --- | 7.1 | 81.0 | 24.05 | --- | 82.73 | Well Development |
| AFP#59 | DW5 | 11-Dec-91 | Hydro-Terra | 1625 | --- | 7.1 | 81.0 | 24.12 | --- | 82.73 | Well Development |
| AFP#59 | DW5 | 11-Dec-91 | Hydro-Terra | 1630 | --- | 7.1 | 81.0 | 24.17 | --- | 82.73 | Well Development |
| AFP#59 | DW5 | 11-Dec-91 | Hydro-Terra | 1635 | --- | 7.1 | 81.0 | 24.23 | --- | 82.73 | Well Development |
| AFP#59 | DW5 | 11-Dec-91 | Hydro-Terra | 1640 | --- | 7.1 | 81.0 | 24.30 | --- | 82.73 | Well Development |
| AFP#59 | DW5 | 11-Dec-91 | Hydro-Terra | 1645 | --- | 7.1 | 81.0 | 24.38 | --- | 82.73 | Well Development |
| AFP#59 | DW5 | 11-Dec-91 | Hydro-Terra | 1650 | --- | 7.1 | 81.0 | 24.46 | --- | 82.73 | Well Development |
| AFP#59 | DW5 | 11-Dec-91 | Hydro-Terra | 1655 | --- | 7.1 | 81.0 | 24.51 | --- | 82.73 | Well Development |
| AFP#59 | DW5 | 11-Dec-91 | Hydro-Terra | 1700 | --- | 7.1 | 81.0 | 24.56 | --- | 82.73 | Well Development |
| AFP#59 | DW5 | 11-Dec-91 | Hydro-Terra | 1705 | --- | 7.1 | 81.0 | 24.55 | --- | 82.73 | Well Development |
| AFP#59 | DW5 | 11-Dec-91 | Hydro-Terra | 1710 | --- | 7.1 | 81.0 | 24.60 | --- | 82.73 | Well Development |
| AFP#59 | DW5 | 11-Dec-91 | Hydro-Terra | 1714 | --- | 7.1 | 81.0 | 24.60 | --- | 82.73 | Well Development |
| AFP#59 | DW5 | 11-Dec-91 | Hydro-Terra | 1720 | --- | 7.1 | 81.0 | 24.65 | --- | 82.73 | Well Development |
| AFP#59 | DW5 | 11-Dec-91 | Hydro-Terra | 1725 | --- | 7.1 | 81.0 | 24.68 | --- | 82.73 | Well Development |
| AFP#59 | DW5 | 11-Dec-91 | Hydro-Terra | 1730 | --- | 7.1 | 81.0 | 24.69 | --- | 82.73 | End Well Development |
| AFP#59 | DW5 | 11-Dec-91 | Hydro-Terra | 1735 | --- | --- | --- | 22.90 | 5.0 | 82.73 | Recovery |
| AFP#59 | DW5 | 07-Jan-92 | Hydro-Terra | 1455 | 22.60 | --- | --- | --- | --- | 82.73 | @ 1st Sampling |
| AFP#59 | DW5 | 07-Jan-92 | Hydro-Terra | 1525 | --- | 5.0 | 76.0 | 23.63 | --- | 82.73 | End Purge |
| AFP#59 | DW5 | 07-Jan-92 | Hydro-Terra | 1530 | --- | --- | --- | 22.60 | 5.0 | 82.73 | Recovery |
| AFP#59 | DW5 | 11-Jan-92 | Hydro-Terra | 1600 | 22.56 | --- | --- | --- | --- | 82.73 | @Slug Test |
| AFP#59 | DW5 | 31-Jan-92 | Hydro-Terra | 840 | 22.66 | --- | --- | --- | --- | 82.73 | @ 2nd Sampling |
| AFP#59 | DW5 | 31-Jan-92 | Hydro-Terra | 915 | --- | 5.0 | 76.0 | --- | --- | 82.73 | End Purge |
| AFP#59 | DW5 | 31-Jan-92 | Hydro-Terra | 920 | --- | --- | --- | 22.66 | 5.0 | 82.73 | Recovery |

ANL AFP#59 IRP SI

USAF IRPIMS DW6 GROUNDWATER LEVEL DATA (BCHGWD)

| AFIID | LOCID | LOGDATE | LOGCODE | LOGTIME | STATDEP | PRODRATE | PUMPDEP | DEPWAT | RECTIME | SOUNDING | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| AFP#59 | DW6 | 16-Nov-91 | Hydro-Terra | 1400 | 21.00 | --- | --- | --- | --- | 66.06 | @ Installation |
| AFP#59 | DW6 | 11-Dec-91 | Hydro-Terra | 1355 | 14.81 | --- | --- | --- | --- | 66.06 | Start Well Development |
| AFP#59 | DW6 | 11-Dec-91 | Hydro-Terra | 1400 | --- | 7.4 | 64.0 | 64.00 | --- | 66.06 | Well Development |
| AFP#59 | DW6 | 11-Dec-91 | Hydro-Terra | 1406 | --- | 7.4 | 64.0 | 55.00 | --- | 66.06 | End Well Development |
| AFP#59 | DW6 | 11-Dec-91 | Hydro-Terra | 1424 | --- | --- | --- | 38.00 | 18.0 | 66.06 | Recovery |
| AFP#59 | DW6 | 12-Dec-91 | Hydro-Terra | 1510 | 14.92 | --- | --- | --- | --- | 66.06 | Start Well Development |
| AFP#59 | DW6 | 12-Dec-91 | Hydro-Terra | 1525 | --- | 1.5 | 64.0 | 39.37 | --- | 66.06 | Well Development |
| AFP#59 | DW6 | 12-Dec-91 | Hydro-Terra | 1545 | --- | 1.5 | 64.0 | 53.00 | --- | 66.06 | Well Development |
| AFP#59 | DW6 | 12-Dec-91 | Hydro-Terra | 1556 | --- | 1.5 | 64.0 | 64.00 | --- | 66.06 | End Well Development |
| AFP#59 | DW6 | 12-Dec-91 | Hydro-Terra | 1611 | --- | --- | --- | 41.30 | 15.0 | 66.06 | Recovery |
| AFP#59 | DW6 | 13-Dec-91 | Hydro-Terra | 705 | 14.80 | --- | --- | --- | --- | 66.06 | Start Well Development |
| AFP#59 | DW6 | 13-Dec-91 | Hydro-Terra | 710 | --- | 1.5 | 64.0 | 26.60 | --- | 66.06 | Well Development |
| AFP#59 | DW6 | 13-Dec-91 | Hydro-Terra | 715 | --- | 1.5 | 64.0 | 35.14 | --- | 66.06 | Well Development |
| AFP#59 | DW6 | 13-Dec-91 | Hydro-Terra | 720 | --- | 1.5 | 64.0 | 42.67 | --- | 66.06 | Well Development |
| AFP#59 | DW6 | 13-Dec-91 | Hydro-Terra | 725 | --- | 1.5 | 64.0 | 48.71 | --- | 66.06 | Well Development |
| AFP#59 | DW6 | 13-Dec-91 | Hydro-Terra | 730 | --- | 1.5 | 64.0 | 54.50 | --- | 66.06 | Well Development |
| AFP#59 | DW6 | 13-Dec-91 | Hydro-Terra | 735 | --- | 1.5 | 64.0 | 64.00 | --- | 66.06 | Well Development |
| AFP#59 | DW6 | 13-Dec-91 | Hydro-Terra | 740 | --- | 1.5 | 64.0 | 64.00 | --- | 66.06 | Well Development |
| AFP#59 | DW6 | 13-Dec-91 | Hydro-Terra | 745 | --- | 1.5 | 64.0 | 64.00 | --- | 66.06 | Well Development |
| AFP#59 | DW6 | 13-Dec-91 | Hydro-Terra | 750 | --- | 1.5 | 64.0 | 64.00 | --- | 66.06 | End Well Development |
| AFP#59 | DW6 | 13-Dec-91 | Hydro-Terra | 755 | --- | --- | --- | 45.52 | 5.0 | 66.06 | Recovery |
| AFP#59 | DW6 | 06-Jan-92 | Hydro-Terra | 1035 | 14.66 | --- | --- | --- | --- | 66.06 | @ 1st Sampling |
| AFP#59 | DW6 | 06-Jan-92 | Hydro-Terra | 1120 | --- | 0.75 | 59.0 | 59.00 | --- | 66.06 | End Purge |
| AFP#59 | DW6 | 06-Jan-92 | Hydro-Terra | 1125 | --- | --- | --- | 38.71 | 5.0 | 66.06 | Recovery |
| AFP#59 | DW6 | 12-Jan-92 | Hydro-Terra | 1530 | 14.84 | --- | --- | --- | --- | 66.06 | @Slug Test |
| AFP#59 | DW6 | 01-Jan-92 | Hydro-Terra | 845 | 15.08 | --- | --- | --- | --- | 66.06 | @ 2nd Sampling |
| AFP#59 | DW6 | 01-Jan-92 | Hydro-Terra | 915 | --- | 1.0 | 59.0 | 59.00 | --- | 66.06 | End Purge |
| AFP#59 | DW6 | 01-Jan-92 | Hydro-Terra | 920 | --- | --- | --- | 29.96 | 5.0 | 66.06 | Recovery |

ANL AFP#59 IRP SI

USAF IRPIMS DW8 GROUNDWATER LEVEL DATA (BCHGWD)

| AFIID | LOCID | LOGDATE | LOGCODE | LOGTIME | STATDEP | PRODRATE | PUMPDEP | DEPWAT | RECTIME | SOUNDING | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| AFP#59 | DW8 | 03-Nov-91 | Hydro-Terra | 1450 | 18.37 | --- | --- | --- | --- | 92.50 | @ Installation |
| AFP#59 | DW8 | 26-Dec-91 | Hydro-Terra | 1125 | 17.92 | --- | --- | --- | --- | 92.50 | Check |
| AFP#59 | DW8 | 13-Dec-91 | Hydro-Terra | 844 | 15.60 | --- | --- | --- | --- | 92.50 | Start Well Development |
| AFP#59 | DW8 | 13-Dec-91 | Hydro-Terra | 850 | --- | 6.0 | 90.0 | 25.46 | --- | 92.50 | Well Development |
| AFP#59 | DW8 | 13-Dec-91 | Hydro-Terra | 855 | --- | 6.0 | 90.0 | 25.60 | --- | 92.50 | Well Development |
| AFP#59 | DW8 | 13-Dec-91 | Hydro-Terra | 900 | --- | 6.0 | 90.0 | 25.80 | --- | 92.50 | Well Development |
| AFP#59 | DW8 | 13-Dec-91 | Hydro-Terra | 905 | --- | 6.0 | 90.0 | 25.87 | --- | 92.50 | Well Development |
| AFP#59 | DW8 | 13-Dec-91 | Hydro-Terra | 910 | --- | 6.0 | 90.0 | 24.81 | --- | 92.50 | Well Development |
| AFP#59 | DW8 | 13-Dec-91 | Hydro-Terra | 915 | --- | 6.0 | 90.0 | 25.89 | --- | 92.50 | Well Development |
| AFP#59 | DW8 | 13-Dec-91 | Hydro-Terra | 920 | --- | 6.0 | 90.0 | 26.64 | --- | 92.50 | Well Development |
| AFP#59 | DW8 | 13-Dec-91 | Hydro-Terra | 925 | --- | 6.0 | 90.0 | 26.64 | --- | 92.50 | Well Development |
| AFP#59 | DW8 | 13-Dec-91 | Hydro-Terra | 930 | --- | 6.0 | 90.0 | 26.77 | --- | 92.50 | Well Development |
| AFP#59 | DW8 | 13-Dec-91 | Hydro-Terra | 935 | --- | 6.0 | 90.0 | 26.84 | --- | 92.50 | Well Development |
| AFP#59 | DW8 | 13-Dec-91 | Hydro-Terra | 940 | --- | 6.0 | 90.0 | 27.03 | --- | 92.50 | Well Development |
| AFP#59 | DW8 | 13-Dec-91 | Hydro-Terra | 945 | --- | 6.0 | 90.0 | 27.14 | --- | 92.50 | End Well Development |
| AFP#59 | DW8 | 13-Dec-91 | Hydro-Terra | 950 | --- | --- | --- | 15.67 | 5.0 | 92.50 | Recovery |
| AFP#59 | DW8 | 09-Jan-92 | Hydro-Terra | 1025 | 15.30 | --- | --- | --- | --- | 92.50 | @ 1st Sampling |
| AFP#59 | DW8 | 09-Jan-92 | Hydro-Terra | 1100 | --- | 6.00 | 85.0 | 18.51 | --- | 92.50 | End Purge |
| AFP#59 | DW8 | 09-Jan-92 | Hydro-Terra | 1105 | --- | --- | 85.0 | 15.30 | 5.0 | 92.50 | Recovery |
| AFP#59 | DW8 | 13-Jan-92 | Hydro-Terra | 1520 | 15.37 | --- | --- | --- | --- | 92.50 | @Slug Test |
| AFP#59 | DW8 | 30-Jan-92 | Hydro-Terra | 1230 | 15.86 | --- | --- | --- | --- | 92.50 | @ 2nd Sampling |
| AFP#59 | DW8 | 30-Jan-92 | Hydro-Terra | 1310 | --- | 6.0 | 85.0 | --- | --- | 92.50 | End Purge |
| AFP#59 | DW8 | 30-Jan-92 | Hydro-Terra | 1315 | --- | --- | --- | 15.86 | 5.0 | 92.50 | Recovery |

ANL AFP#59 IRP SI

USAF IRPIMS DW9 GROUNDWATER LEVEL DATA (BCHGWD)

| AFIID | LOCID | LOGDATE | LOGCODE | LOGTIME | STATDEP | PRODRATE | PUMPDEP | DEPWAT | RECTIME | SOUNDING | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| AFP#59 | DW9 | 09-Dec-91 | Hydro-Terra | 1845 | 14.90 | --- | --- | --- | --- | 90.51 | @ Installation |
| AFP#59 | DW9 | 12-Dec-91 | Hydro-Terra | 1325 | 17.28 | --- | --- | --- | --- | 90.51 | Start Well Development |
| AFP#59 | DW9 | 12-Dec-91 | Hydro-Terra | 1330 | --- | 7.5 | 85.0 | 18.48 | --- | 90.51 | Well Development |
| AFP#59 | DW9 | 12-Dec-91 | Hydro-Terra | 1335 | --- | 7.5 | 85.0 | 18.42 | --- | 90.51 | Well Development |
| AFP#59 | DW9 | 12-Dec-91 | Hydro-Terra | 1340 | --- | 7.5 | 85.0 | 18.43 | --- | 90.51 | Well Development |
| AFP#59 | DW9 | 12-Dec-91 | Hydro-Terra | 1345 | --- | 7.5 | 85.0 | 18.43 | --- | 90.51 | Well Development |
| AFP#59 | DW9 | 12-Dec-91 | Hydro-Terra | 1350 | --- | 7.5 | 85.0 | 18.43 | --- | 90.51 | Well Development |
| AFP#59 | DW9 | 12-Dec-91 | Hydro-Terra | 1355 | --- | 7.5 | 85.0 | 18.43 | --- | 90.51 | Well Development |
| AFP#59 | DW9 | 12-Dec-91 | Hydro-Terra | 1400 | --- | 7.5 | 85.0 | 18.39 | --- | 90.51 | Well Development |
| AFP#59 | DW9 | 12-Dec-91 | Hydro-Terra | 1405 | --- | 7.5 | 85.0 | 18.43 | --- | 90.51 | Well Development |
| AFP#59 | DW9 | 12-Dec-91 | Hydro-Terra | 1410 | --- | 7.5 | 85.0 | 18.51 | --- | 90.51 | End Well Development |
| AFP#59 | DW9 | 12-Dec-91 | Hydro-Terra | 1415 | --- | --- | --- | 17.36 | 5.0 | 90.51 | Recovery |
| AFP#59 | DW9 | 07-Jan-92 | Hydro-Terra | 1400 | 17.41 | --- | --- | --- | --- | 90.51 | @ 1st Sampling |
| AFP#59 | DW9 | 07-Jan-92 | Hydro-Terra | 1435 | --- | 6.0 | 82.0 | 18.39 | --- | 90.51 | End Purge |
| AFP#59 | DW9 | 07-Jan-92 | Hydro-Terra | 1440 | --- | --- | 82.0 | 17.41 | 5.0 | 90.51 | Recovery |
| AFP#59 | DW9 | 12-Jan-92 | Hydro-Terra | 1000 | 17.56 | --- | --- | --- | --- | 90.51 | @Slug Test |
| AFP#59 | DW9 | 03-Feb-92 | Hydro-Terra | 830 | 17.86 | --- | --- | --- | --- | 90.51 | @ 2nd Sampling |
| AFP#59 | DW9 | 03-Feb-92 | Hydro-Terra | 905 | --- | 6.0 | 82.0 | --- | --- | 90.51 | End Purge |
| AFP#59 | DW9 | 03-Feb-92 | Hydro-Terra | 910 | --- | --- | --- | 17.86 | 5.0 | 90.51 | Recovery |

ANL AFP#59 IRP SI

USAF IRPIMS SW1 GROUNDWATER LEVEL DATA (BCHGWD)

| AFIID | LOCID | LOGDATE | LOGCODE | LOGTIME | STATDEP | PRODRATE | PUMPDEP | DEPWAT | RECTIME | SOUNDING | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| AFP#59 | SW1 | 26-Nov-91 | Hydro-Terra | 1140 | 22.81 | --- | --- | --- | --- | 29.65 | Check |
| AFP#59 | SW1 | 07-Jan-92 | Hydro-Terra | 1643 | | --- | --- | --- | --- | 29.65 | @ 1st Sampling |
| AFP#59 | SW1 | 07-Jan-92 | Hydro-Terra | 1718 | --- | 2.0 | 22.5 | --- | --- | 29.65 | End Purge |
| AFP#59 | SW1 | 07-Jan-92 | Hydro-Terra | 1723 | --- | --- | --- | | 5.0 | 29.65 | Recovery |
| AFP#59 | SW1 | 13-Jan-92 | Hydro-Terra | 1208 | 20.23 | --- | --- | --- | --- | 29.65 | @Slug Test |
| AFP#59 | SW1 | 31-Jan-92 | Hydro-Terra | 1505 | 20.36 | --- | --- | --- | --- | 29.65 | @ 2nd Sampling |
| AFP#59 | SW1 | 31-Jan-92 | Hydro-Terra | 1530 | --- | 0.3 | 26.0 | --- | --- | 29.65 | End Purge |
| AFP#59 | SW1 | 31-Jan-92 | Hydro-Terra | 1535 | --- | --- | --- | 20.36 | 5.0 | 29.65 | Recovery |

ANL AFP#59 IRP SI

USAF IRPIMS SW3 GROUNDWATER LEVEL DATA (BCHGWD)

| AFIID | LOCID | LOGDATE | LOGCODE | LOGTIME | STATDEP | PRODRATE | PUMPDEP | DEPWAT | RECTIME | SOUNDING | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| AFP#59 | SW3 | 26-Nov-91 | Hydro-Terra | 1150 | 20.87 | --- | --- | --- | --- | 30.51 | Check |
| AFP#59 | SW3 | 07-Dec-91 | Hydro-Terra | 1035 | 17.40 | --- | --- | --- | --- | 30.51 | @ 1st Sampling |
| AFP#59 | SW3 | 07-Dec-91 | Hydro-Terra | 1048 | --- | 3.5 | 28.5 | 18.71 | --- | 30.51 | End Purge |
| AFP#59 | SW3 | 07-Dec-91 | Hydro-Terra | 1053 | --- | --- | --- | 17.40 | 5.0 | 30.51 | Recovery |
| AFP#59 | SW3 | 13-Jan-92 | Hydro-Terra | 910 | 17.51 | --- | --- | --- | --- | 30.51 | @Slug Test |
| AFP#59 | SW3 | 02-Feb-92 | Hydro-Terra | 1035 | 17.68 | --- | --- | --- | --- | 30.51 | @ 2nd Sampling |
| AFP#59 | SW3 | 02-Feb-92 | Hydro-Terra | 1050 | --- | 3.0 | 28.5 | --- | --- | 30.51 | End Purge |
| AFP#59 | SW3 | 02-Feb-92 | Hydro-Terra | 1055 | --- | --- | --- | 17.68 | 5.0 | 30.51 | Recovery |

ANL AFP#59 IRP SI

USAF IRPIMS SW4 GROUNDWATER LEVEL DATA (BCHGWD)

| AFIID | LOCID | LOGDATE | LOGCODE | LOGTIME | STATDEP | PRODRATE | PUMPDEP | DEPWAT | RECTIME | SOUNDING | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| AFP#59 | SW4 | 02-Dec-91 | Hydro-Terra | 1200 | 18.38 | --- | --- | --- | --- | 28.57 | @ Installation |
| AFP#59 | SW4 | 12-Dec-91 | Hydro-Terra | 1134 | 15.31 | --- | --- | --- | --- | 28.57 | Start Well Development |
| AFP#59 | SW4 | 12-Dec-91 | Hydro-Terra | 1140 | --- | 0.25 | 26.0 | 26.00 | --- | 28.57 | Well Development |
| AFP#59 | SW4 | 12-Dec-91 | Hydro-Terra | 1145 | --- | 0.25 | 26.0 | 26.00 | --- | 28.57 | Well Development |
| AFP#59 | SW4 | 12-Dec-91 | Hydro-Terra | 1150 | --- | 0.25 | 26.0 | 23.35 | --- | 28.57 | Well Development |
| AFP#59 | SW4 | 12-Dec-91 | Hydro-Terra | 1155 | --- | 0.25 | 26.0 | 23.95 | --- | 28.57 | Well Development |
| AFP#59 | SW4 | 12-Dec-91 | Hydro-Terra | 1200 | --- | 0.25 | 26.0 | 23.37 | --- | 28.57 | Well Development |
| AFP#59 | SW4 | 12-Dec-91 | Hydro-Terra | 1205 | --- | 0.25 | 26.0 | 26.00 | --- | 28.57 | Well Development |
| AFP#59 | SW4 | 12-Dec-91 | Hydro-Terra | 1210 | --- | 0.25 | 26.0 | 26.00 | --- | 28.57 | Well Development |
| AFP#59 | SW4 | 12-Dec-91 | Hydro-Terra | 1215 | --- | 0.25 | 26.0 | 26.00 | --- | 28.57 | Well Development |
| AFP#59 | SW4 | 12-Dec-91 | Hydro-Terra | 1220 | --- | 0.25 | 26.0 | 26.00 | --- | 28.57 | Well Development |
| AFP#59 | SW4 | 12-Dec-91 | Hydro-Terra | 1225 | --- | 0.25 | 26.0 | 26.00 | --- | 28.57 | End Well Development |
| AFP#59 | SW4 | 12-Dec-91 | Hydro-Terra | 1230 | --- | --- | --- | 19.78 | 5.0 | 28.57 | Recovery |
| AFP#59 | SW4 | 08-Jan-92 | Hydro-Terra | 1205 | 14.67 | --- | --- | --- | --- | 28.57 | @ 1st Sampling |
| AFP#59 | SW4 | 08-Jan-92 | Hydro-Terra | 1235 | --- | 0.30 | 26.0 | 24.40 | --- | 28.57 | End Purge |
| AFP#59 | SW4 | 08-Jan-92 | Hydro-Terra | 1240 | --- | --- | --- | 18.48 | 5.0 | 28.57 | Recovery |
| AFP#59 | SW4 | 13-Jan-92 | Hydro-Terra | 1400 | 14.69 | --- | --- | --- | --- | 28.57 | @Slug Test |
| AFP#59 | SW4 | 29-Jan-92 | Hydro-Terra | 1430 | 14.76 | --- | --- | --- | --- | 28.57 | @ 2nd Sampling |
| AFP#59 | SW4 | 29-Jan-92 | Hydro-Terra | 1500 | --- | 0.3 | 26.0 | 17.98 | --- | 28.57 | End Purge |
| AFP#59 | SW4 | 29-Jan-92 | Hydro-Terra | 1505 | --- | --- | --- | 15.63 | 5.0 | 28.57 | Recovery |

ANL AFP#59 IRP SI

USAF IRPIMS SW5 GROUNDWATER LEVEL DATA (BCHGWD)

| AFIID | LOCID | LOGDATE | LOGCODE | LOGTIME | STATDEP | PRODRATE | PUMPDEP | DEPWAT | RECTIME | SOUNDING | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| AFP#59 | SW5 | 20-Nov-91 | Hydro-Terra | 1100 | 25.40 | --- | --- | --- | --- | 30.10 | @ Installation |
| AFP#59 | SW5 | 26-Nov-91 | Hydro-Terra | 1155 | 24.90 | --- | --- | --- | --- | 30.10 | Check |
| AFP#59 | SW5 | 24-Nov-91 | Hydro-Terra | 1100 | 25.22 | --- | --- | --- | --- | 30.10 | Start Well Development – Bailing |
| AFP#59 | SW5 | 24-Nov-91 | Hydro-Terra | 1130 | --- | 0.16 | 28.5 | 25.28 | --- | 30.10 | Well Development – Bailing |
| AFP#59 | SW5 | 24-Nov-91 | Hydro-Terra | 1200 | --- | 0.16 | 28.5 | 26.35 | --- | 30.10 | End Well Development – Bailing |
| AFP#59 | SW5 | 11-Dec-91 | Hydro-Terra | 1545 | 22.15 | --- | --- | --- | --- | 30.10 | Start Well Development – Pump |
| AFP#59 | SW5 | 11-Dec-91 | Hydro-Terra | 1546 | --- | 0.25 | 28.5 | 28.50 | --- | 30.10 | End Well Development – Pump |
| AFP#59 | SW5 | 07-Jan-92 | Hydro-Terra | 1640 | 22.50 | --- | --- | --- | --- | 30.10 | @ 1st Sampling |
| AFP#59 | SW5 | 07-Jan-92 | Hydro-Terra | 1648 | --- | 0.3 | 28.5 | 29.50 | --- | 30.10 | End Purge |
| AFP#59 | SW5 | 07-Jan-92 | Hydro-Terra | 1653 | --- | --- | --- | 23.45 | 5.0 | 30.10 | Recovery |
| AFP#59 | SW5 | 12-Jan-92 | Hydro-Terra | 800 | 22.42 | --- | --- | --- | --- | 30.10 | @Slug Test |
| AFP#59 | SW5 | 31-Jan-92 | Hydro-Terra | 1015 | 22.50 | --- | --- | --- | --- | 30.10 | @ 2nd Sampling |
| AFP#59 | SW5 | 31-Jan-92 | Hydro-Terra | 1025 | --- | 0.3 | 28.5 | 28.50 | --- | 30.10 | End Purge |
| AFP#59 | SW5 | 31-Jan-92 | Hydro-Terra | 1030 | --- | --- | --- | 23.00 | 5.0 | 30.10 | Recovery |

ANL AFP#59 IRP SI

USAF IRPIMS SW6 GROUNDWATER LEVEL DATA (BCHGWD)

| AFIID | LOCID | LOGDATE | LOGCODE | LOGTIME | STATDEP | PRODRATE | PUMPDEP | DEPWAT | RECTIME | SOUNDING | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| AFP#59 | SW6 | 17-Nov-91 | Hydro-Terra | 900 | 17.88 | --- | --- | --- | --- | 28.54 | @ Installation |
| AFP#59 | SW6 | 26-Nov-91 | Hydro-Terra | 1200 | 17.38 | --- | --- | --- | --- | 28.54 | Check |
| AFP#59 | SW6 | 23-Nov-91 | Hydro-Terra | 1000 | 20.60 | --- | --- | --- | --- | 28.54 | Start Well Development - Bailing |
| AFP#59 | SW6 | 23-Nov-91 | Hydro-Terra | 1020 | --- | 0.20 | 27.0 | 20.68 | --- | 28.54 | Well Development - Bailing |
| AFP#59 | SW6 | 23-Nov-91 | Hydro-Terra | 1045 | --- | 0.20 | 27.0 | 20.65 | --- | 28.54 | End Well Development - Bailing |
| AFP#59 | SW6 | 06-Jan-92 | Hydro-Terra | 1230 | 15.07 | --- | --- | --- | --- | 28.54 | @ 1st Sampling |
| AFP#59 | SW6 | 06-Jan-92 | Hydro-Terra | 1245 | --- | 3.8 | 27.0 | 16.64 | --- | 28.54 | End Purge |
| AFP#59 | SW6 | 06-Jan-92 | Hydro-Terra | 1250 | --- | --- | --- | 15.07 | 5.0 | 28.54 | Recovery |
| AFP#59 | SW6 | 12-Jan-92 | Hydro-Terra | 1825 | 15.08 | --- | --- | --- | --- | 28.54 | @Slug Test |
| AFP#59 | SW6 | 01-Feb-92 | Hydro-Terra | 1010 | 15.22 | --- | --- | --- | --- | 28.54 | @ 2nd Sampling |
| AFP#59 | SW6 | 01-Feb-92 | Hydro-Terra | 1025 | --- | 3.8 | 27.0 | --- | --- | 28.54 | End Purge |
| AFP#59 | SW6 | 01-Feb-92 | Hydro-Terra | 1229 | --- | --- | --- | 15.29 | 124.0 | 28.54 | Recovery |

ANL AFP#59 IRP SI

USAF IRPIMS SW7 GROUNDWATER LEVEL DATA (BCHGWD)

| AFIID | LOCID | LOGDATE | LOGCODE | LOGTIME | STATDEP | PRODRATE | PUMPDEP | DEPWAT | RECTIME | SOUNDING | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| AFP#59 | SW7 | 06-Dec-91 | Hydro-Terra | 1000 | 15.80 | --- | --- | --- | --- | 29.51 | @ Installation |
| AFP#59 | SW7 | 13-Dec-91 | Hydro-Terra | 1545 | 15.68 | --- | --- | --- | --- | 29.51 | Start Well Development – Bailing |
| AFP#59 | SW7 | 13-Dec-91 | Hydro-Terra | 1553 | --- | 0.25 | 27.0 | 15.68 | --- | 29.51 | Well Development – Bailing |
| AFP#59 | SW7 | 13-Dec-91 | Hydro-Terra | 1605 | --- | 0.25 | 27.0 | 15.70 | --- | 29.51 | Well Development – Bailing |
| AFP#59 | SW7 | 13-Dec-91 | Hydro-Terra | 1625 | --- | 0.25 | 27.0 | 15.70 | --- | 29.51 | End Well Development – Bailing |
| AFP#59 | SW7 | 08-Jan-92 | Hydro-Terra | 1350 | 18.23 | --- | --- | --- | --- | 29.51 | @ 1st Sampling |
| AFP#59 | SW7 | 08-Jan-92 | Hydro-Terra | 1405 | --- | 2.5 | 27.0 | 20.74 | --- | 29.51 | End Purge |
| AFP#59 | SW7 | 08-Jan-92 | Hydro-Terra | 1410 | --- | --- | --- | 18.23 | 5.0 | 29.51 | Recovery |
| AFP#59 | SW7 | 13-Jan-92 | Hydro-Terra | 1210 | 18.36 | --- | --- | --- | --- | 29.51 | @Slug Test |
| AFP#59 | SW7 | 30-Jan-92 | Hydro-Terra | 955 | 18.32 | --- | --- | --- | --- | 29.51 | @ 2nd Sampling |
| AFP#59 | SW7 | 30-Jan-92 | Hydro-Terra | 1010 | --- | 2.5 | 27.0 | --- | --- | 29.51 | End Purge |
| AFP#59 | SW7 | 30-Jan-92 | Hydro-Terra | 1015 | --- | --- | --- | 18.32 | 5.0 | 29.51 | Recovery |

ANL AFP#59 IRP SI

USAF IRPIMS SW8 GROUNDWATER LEVEL DATA (BCHGWD)

| AFIID | LOCID | LOGDATE | LOGCODE | LOGTIME | STATDEP | PRODRATE | PUMPDEP | DEPWAT | RECTIME | SOUNDING | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| AFP#59 | SW8 | 04-Nov-91 | Hydro-Terra | 830 | 13.06 | --- | --- | --- | --- | 22.65 | @ Installation |
| AFP#59 | SW8 | 26-Nov-91 | Hydro-Terra | 1205 | 12.65 | --- | --- | --- | --- | 22.65 | Check |
| AFP#59 | SW8 | 23-Nov-91 | Hydro-Terra | 1215 | 12.52 | 0.16 | --- | --- | --- | 22.65 | Start Well Development – Bailing |
| AFP#59 | SW8 | 23-Nov-91 | Hydro-Terra | 1245 | --- | 0.16 | 21.0 | 12.60 | --- | 22.65 | Well Development – Bailing |
| AFP#59 | SW8 | 23-Nov-91 | Hydro-Terra | 1315 | --- | 0.16 | 21.0 | 12.60 | --- | 22.65 | End Well Development – Bailing |
| AFP#59 | SW8 | 09-Jan-92 | Hydro-Terra | 1235 | 12.91 | --- | --- | --- | --- | 22.65 | @ 1st Sampling |
| AFP#59 | SW8 | 09-Jan-92 | Hydro-Terra | 1250 | --- | 0.8 | 21.0 | 14.83 | --- | 22.65 | End Purge |
| AFP#59 | SW8 | 09-Jan-92 | Hydro-Terra | 1255 | --- | --- | --- | 12.91 | 5.0 | 22.65 | Recovery |
| AFP#59 | SW8 | 13-Jan-92 | Hydro-Terra | 1520 | 13.03 | --- | --- | --- | --- | 22.65 | @Slug Test |
| AFP#59 | SW8 | 30-Jan-92 | Hydro-Terra | 1400 | 13.05 | --- | --- | --- | --- | 22.65 | @ 2nd Sampling |
| AFP#59 | SW8 | 30-Jan-92 | Hydro-Terra | 1415 | --- | 0.8 | 21.0 | --- | --- | 22.65 | End Purge |
| AFP#59 | SW8 | 30-Jan-92 | Hydro-Terra | 1420 | --- | --- | --- | 13.08 | 5.0 | 22.65 | Recovery |

ANL AFP#59 IRP SI

USAF IRPIMS SW9 GROUNDWATER LEVEL DATA (BCHGWD)

| AFIID | LOCID | LOGDATE | LOGCODE | LOGTIME | STATDEP | PRODRATE | PUMPDEP | DEPWAT | RECTIME | SOUNDING | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| AFP#59 | SW9 | 10-Dec-91 | Hydro-Terra | 1000 | 17.00 | --- | --- | --- | --- | 27.58 | @ Installation |
| AFP#59 | SW9 | 13-Dec-91 | Hydro-Terra | 1320 | 17.20 | --- | --- | --- | --- | 27.58 | Start Well Development – Bailing |
| AFP#59 | SW9 | 13-Dec-91 | Hydro-Terra | 1334 | --- | 0.25 | 25.0 | 17.20 | --- | 27.58 | Well Development – Bailing |
| AFP#59 | SW9 | 13-Dec-91 | Hydro-Terra | 1351 | --- | 0.25 | 25.0 | 17.25 | --- | 27.58 | Well Development – Bailing |
| AFP#59 | SW9 | 13-Dec-91 | Hydro-Terra | 1400 | --- | 0.25 | 25.0 | 17.25 | --- | 27.58 | End Well Development – Bailing |
| AFP#59 | SW9 | 07-Jan-92 | Hydro-Terra | 1535 | 17.66 | --- | --- | --- | --- | 27.58 | @ 1st Sampling |
| AFP#59 | SW9 | 07-Jan-92 | Hydro-Terra | 1550 | --- | 3.5 | 25.0 | 17.99 | --- | 27.58 | End Purge |
| AFP#59 | SW9 | 07-Jan-92 | Hydro-Terra | 1555 | --- | --- | --- | 17.66 | 5.0 | 27.58 | Recovery |
| AFP#59 | SW9 | 12-Jan-92 | Hydro-Terra | 1050 | 17.80 | --- | --- | --- | --- | 27.58 | @Slug Test |
| AFP#59 | SW9 | 03-Feb-92 | Hydro-Terra | 955 | 18.10 | --- | --- | --- | --- | 27.58 | @ 2nd Sampling |
| AFP#59 | SW9 | 03-Feb-92 | Hydro-Terra | 1010 | --- | 3.5 | 25.0 | --- | --- | 27.58 | End Purge |
| AFP#59 | SW9 | 03-Feb-92 | Hydro-Terra | 1015 | --- | --- | --- | 18.10 | 5.0 | 27.58 | Recovery |

ANL AFP#59 IRP SI

USAF IRPIMS IW9 GROUNDWATER LEVEL DATA (BCHGWD)

| AFIID | LOCID | LOGDATE | LOGCODE | LOGTIME | STATDEP | PRODRATE | PUMPDEP | DEPWAT | RECTIME | SOUNDING | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| AFP#59 | IW9 | 13-Dec-91 | Hydro-Terra | 1405 | 16.72 | --- | --- | --- | --- | 53.90 | Start Well Development – Bailing |
| AFP#59 | IW9 | 13-Dec-91 | Hydro-Terra | 1419 | --- | 0.20 | 51.0 | 23.60 | --- | 53.90 | Well Development – Bailing |
| AFP#59 | IW9 | 13-Dec-91 | Hydro-Terra | 1440 | --- | 0.20 | 51.0 | 25.47 | --- | 53.90 | Well Development – Bailing |
| AFP#59 | IW9 | 13-Dec-91 | Hydro-Terra | 1510 | --- | 0.20 | 51.0 | 31.04 | --- | 53.90 | Well Development – Bailing |
| AFP#59 | IW9 | 13-Dec-91 | Hydro-Terra | 1520 | --- | 0.20 | 51.0 | 36.30 | --- | 53.90 | Well Development – Bailing |
| AFP#59 | IW9 | 13-Dec-91 | Hydro-Terra | 1530 | --- | 0.20 | 51.0 | 43.96 | --- | 53.90 | End Well Development – Bailing |
| AFP#59 | IW9 | 12-Jan-92 | Hydro-Terra | 1140 | 17.86 | --- | --- | --- | --- | 53.90 | @Slug Test |

# Appendix C-5-C:

# IRPIMS BCHLTD

# Lithologic Description

ANL AFP#59 IRP SI

USAF IRPIMS LITHOLOGIC DESCRIPTION DATA (BCHLTD)

| AFIID | LOCID | LOGCODE | LOGDATE | BEG-DEPTH | END-DEPTH | LITH-CODE | ASTM-CODE | STRAT-ORDER | VISDESC |
|---|---|---|---|---|---|---|---|---|---|
| AFP#59 | DW1 | Hydro-Terra | 22-Nov-91 | 0.0 | 0.3 | ASPT | --- | 1 | Asphalt |
| AFP#59 | DW1 | Hydro-Terra | 22-Nov-91 | 0.3 | 2.0 | GVLB | GPGM | 1 | Fill and Gravel Alluvium, brown and gray |
| AFP#59 | DW1 | Hydro-Terra | 22-Nov-91 | 2.0 | 9.0 | GVLB | GPGM | 2 | Fine-Grained Alluvium, brown |
| AFP#59 | DW1. | Hydro-Terra | 22-Nov-91 | 9.0 | 11.5 | SDGR | SMSP | 2 | Fine-Grained Alluvium, brown |
| AFP#59 | DW1 | Hydro-Terra | 22-Nov-91 | 11.5 | 37.5 | SDGR | SMPS | 3 | Glacial Outwash, brown |
| AFP#59 | DW1 | Hydro-Terra | 22-Nov-91 | 37.5 | 62.5 | SDGR | GPGM | 6 | Coarse-Grained Ice-Contact Deposits, brown, heaving |
| AFP#59 | DW3 | Hydro-Terra | 08-Nov-91 | 0.0 | 0.3 | ASPT | --- | 1 | Fill and Gravel Alluvium, brown |
| AFP#59 | DW3 | Hydro-Terra | 08-Nov-91 | 0.3 | 5.0 | GVLB | GP | 1 | Fill and Gravel Alluvium, brown |
| AFP#59 | DW3 | Hydro-Terra | 08-Nov-91 | 5.0 | 34.5 | GVLB | GW | 3 | Glacial Outwash, dark brown |
| AFP#59 | DW3 | Hydro-Terra | 08-Nov-91 | 34.5 | 37.5 | SDSL | SMML | 4 | Fine-Grained Ice-Contact Deposits, gray |
| AFP#59 | DW3 | Hydro-Terra | 08-Nov-91 | 37.5 | 47.5 | SDSL | SMML | 4 | Fine-Grained Ice-Contact Deposits, gray |
| AFP#59 | DW3 | Hydro-Terra | 08-Nov-91 | 47.5 | 51.5 | SDGR | SP | 5 | Glacial Lake Beds, gray |
| AFP#59 | DW3 | Hydro-Terra | 08-Nov-91 | 51.5 | 54.5 | SDSL | SM | 5 | Glacial Lake Beds, gray |
| AFP#59 | DW3 | Hydro-Terra | 08-Nov-91 | 54.5 | 57.5 | SDGR | SM | 5 | Glacial Lake Beds, gray |
| AFP#59 | DW3 | Hydro-Terra | 08-Nov-91 | 57.5 | 68.5 | SDSL | SPSM | 4 | Fine-Grained Ice-Contact Deposits, gray |
| AFP#59 | DW3 | Hydro-Terra | 08-Nov-91 | 68.5 | 88.0 | GVLG | GMGP | 6 | Coarse-Grained Ice-Contact Deposits, gray |
| AFP#59 | DW4 | Hydro-Terra | 25-Nov-91 | 0.0 | 0.3 | ASPT | --- | 1 | Asphalt |
| AFP#59 | DW4 | Hydro-Terra | 25-Nov-91 | 0.3 | 2.0 | GVLB | GP | 1 | Fill and Gravel Alluvium, yellowish-brown |
| AFP#59 | DW4 | Hydro-Terra | 25-Nov-91 | 2.0 | 15.0 | GVLB | GPSP | 3 | Glacial Outwash, brown |
| AFP#59 | DW4 | Hydro-Terra | 25-Nov-91 | 15.0 | 37.5 | SDSL | ML | 4 | Fine-Grained Ice-Contact Deposits, brown to gray |
| AFP#59 | DW4 | Hydro-Terra | 25-Nov-91 | 37.5 | 68.0 | SDGR | SMSP | 6 | Coarse-Grained Ice-Contact Deposits, brown, heaving |
| AFP#59 | DW4 | Hydro-Terra | 25-Nov-91 | 68.0 | 87.5 | SDGR | SP | 6 | Coarse-Grained Ice-Contact Deposits, gray, heaving |
| AFP#59 | DW4 | Hydro-Terra | 25-Nov-91 | 87.5 | 92.5 | SDGR | GMSP | 6 | Coarse-Grained Ice-Contact Deposits, gray, heaving |
| AFP#59 | DW5 | Hydro-Terra | 19-Nov-91 | 0.0 | 0.3 | ASPT | --- | 1 | Asphalt |
| AFP#59 | DW5 | Hydro-Terra | 19-Nov-91 | 0.3 | 3.0 | GVLB | SP | 1 | Fill and Gravel Alluvium, brown |
| AFP#59 | DW5 | Hydro-Terra | 19-Nov-91 | 3.0 | 7.0 | SDSL | SPSM | 3 | Glacial Outwash, brown |
| AFP#59 | DW5 | Hydro-Terra | 19-Nov-91 | 7.0 | 23.0 | GVLB | GP | 3 | Glacial Outwash, brown |
| AFP#59 | DW5 | Hydro-Terra | 19-Nov-91 | 23.0 | 38.0 | SDSL | ML | 4 | Fine-Grained Ice-Contact Deposits, brown to gray |
| AFP#59 | DW5 | Hydro-Terra | 19-Nov-91 | 38.0 | 39.5 | SDGR | SPSM | 4 | Fine-Grained Ice-Contact Deposits, gray |
| AFP#59 | DW5 | Hydro-Terra | 19-Nov-91 | 39.5 | 48.0 | SDSL | SMML | 4 | Fine-Grained Ice-Contact Deposits, gray |
| AFP#59 | DW5 | Hydro-Terra | 19-Nov-91 | 48.0 | 53.5 | SDSL | SM | 5 | Glacial Lake Beds, gray |
| AFP#59 | DW5 | Hydro-Terra | 19-Nov-91 | 53.5 | 55.0 | SDSL | SM | 5 | Glacial Lake Beds, gray |
| AFP#59 | DW5 | Hydro-Terra | 19-Nov-91 | 55.0 | 59.5 | SDSL | SM | 5 | Glacial Lake Beds, gray |
| AFP#59 | DW5 | Hydro-Terra | 19-Nov-91 | 59.5 | 74.5 | SDSL | MLSM | 4 | Fine-Grained Ice-Contact Deposits, gray |
| AFP#59 | DW5 | Hydro-Terra | 19-Nov-91 | 74.5 | 82.0 | SDGR | SMSP | 6 | Coarse-Grained Ice-Contact Deposits |
| AFP#59 | DW5 | Hydro-Terra | 19-Nov-91 | 82.0 | 83.0 | HRDP | GMSP | 7 | Glacial Till, gray, very hard |

ANL AFP#59 IRP SI

USAF IRPIMS LITHOLOGIC DESCRIPTION DATA (BCHLTD)

| AFIID | LOCID | LOGCODE | LOGDATE | BEG-DEPTH | END-DEPTH | LITH-CODE | ASTM-CODE | STRAT-ORDER | VISDESC |
|---|---|---|---|---|---|---|---|---|---|
| AFP#59 | DW6 | Hydro-Terra | 16-Nov-91 | 0.0 | 0.3 | ASPT | --- | 1 | Asphalt |
| AFP#59 | DW6 | Hydro-Terra | 16-Nov-91 | 0.3 | 1.5 | GVLB | GP | 1 | Fill and Gravel Alluvium, brown |
| AFP#59 | DW6 | Hydro-Terra | 16-Nov-91 | 1.5 | 2.0 | SDSL | SM | 1 | Fill and Gravel Alluvium, brown |
| AFP#59 | DW6 | Hydro-Terra | 16-Nov-91 | 2.0 | 25.0 | GVLB | GMSP | 3 | Glacial Outwash, brown |
| AFP#59 | DW6 | Hydro-Terra | 16-Nov-91 | 25.0 | 57.5 | SDSL | ML | 4 | Fine-Grained Ice-Contact Deposits, gray |
| AFP#59 | DW6 | Hydro-Terra | 16-Nov-91 | 57.5 | 59.0 | GVLG | SP | 5 | Glacial Lake Beds, gray |
| AFP#59 | DW6 | Hydro-Terra | 16-Nov-91 | 59.0 | 61.5 | SDSL | SMML | 5 | Glacial Lake Beds, gray |
| AFP#59 | DW6 | Hydro-Terra | 16-Nov-91 | 61.5 | 64.0 | SDSL | SMSP | 5 | Glacial Lake Beds, gray |
| AFP#59 | DW6 | Hydro-Terra | 16-Nov-91 | 64.0 | 86.5 | SDSL | SMML | 6 | Coarse-Grained Ice-Contact Deposits, gray |
| AFP#59 | DW8 | Hydro-Terra | 03-Nov-91 | 0.0 | 0.3 | ASPT | --- | 1 | Asphalt |
| AFP#59 | DW8 | Hydro-Terra | 03-Nov-91 | 0.3 | 3.5 | GVLB | GP | 1 | Fill and Gravel Alluvium, brownish-black |
| AFP#59 | DW8 | Hydro-Terra | 03-Nov-91 | 3.5 | 4.0 | SDSL | OL | 1 | Fill and Gravel Alluvium, brown |
| AFP#59 | DW8 | Hydro-Terra | 03-Nov-91 | 4.0 | 9.5 | SDGR | SPSM | 2 | Fine-Grained Alluvium, brown |
| AFP#59 | DW8 | Hydro-Terra | 03-Nov-91 | 9.5 | 13.0 | SDSL | SM | 3 | Glacial Outwash, brown |
| AFP#59 | DW8 | Hydro-Terra | 03-Nov-91 | 13.0 | 20.0 | SDGR | GMSP | 3 | Glacial Outwash, brown |
| AFP#59 | DW8 | Hydro-Terra | 03-Nov-91 | 20.0 | 77.0 | SDSL | ML | 4 | Fine-Grained Ice-Contact Deposits, gray |
| AFP#59 | DW8 | Hydro-Terra | 03-Nov-91 | 77.0 | 89.0 | SDSL | SM | 6 | Coarse-Grained Ice-Contact Deposits, gray |
| AFP#59 | DW8 | Hydro-Terra | 03-Nov-91 | 89.0 | 93.0 | HRDP | GPSP | 7 | Glacial Till, gray, very hard |
| AFP#59 | DW9 | Hydro-Terra | 09-Dec-92 | 0.0 | 0.3 | PTHM | OL | 1 | Fill and Gravel Alluvium, brown turf |
| AFP#59 | DW9 | Hydro-Terra | 09-Dec-92 | 0.3 | 2.0 | SDSL | SPSM | 1 | Fill and Gravel Alluvium, brown |
| AFP#59 | DW9 | Hydro-Terra | 09-Dec-92 | 2.0 | 3.0 | SD | SW | 1 | Fill and Gravel Alluvium, yellow |
| AFP#59 | DW9 | Hydro-Terra | 09-Dec-92 | 3.0 | 4.0 | SDGR | SP | 3 | Glacial Outwash, dark brown |
| AFP#59 | DW9 | Hydro-Terra | 09-Dec-92 | 4.0 | 10.0 | SDGR | GPSP | 3 | Glacial Outwash, dark brown |
| AFP#59 | DW9 | Hydro-Terra | 09-Dec-92 | 10.0 | 16.0 | GVLB | GMGP | 3 | Glacial Outwash, brown |
| AFP#59 | DW9 | Hydro-Terra | 09-Dec-92 | 16.0 | 34.0 | SDGR | GPSP | 3 | Glacial Outwash, brown |
| AFP#59 | DW9 | Hydro-Terra | 09-Dec-92 | 34.0 | 37.5 | SDGR | SP | 4 | Fine-Grained Ice-Contact Deposits, brown |
| AFP#59 | DW9 | Hydro-Terra | 09-Dec-92 | 37.5 | 41.5 | SDSL | MLSM | 4 | Fine-Grained Ice-Contact Deposits, gray |
| AFP#59 | DW9 | Hydro-Terra | 09-Dec-92 | 41.5 | 43.0 | SDSL | SM | 4 | Fine-Grained Ice-Contact Deposits, gray |
| AFP#59 | DW9 | Hydro-Terra | 09-Dec-92 | 43.0 | 44.0 | SDGR | SP | 5 | Glacial Lake Beds, gray |
| AFP#59 | DW9 | Hydro-Terra | 09-Dec-92 | 44.0 | 53.0 | SDSL | MLSM | 5 | Glacial Lake Beds, gray |
| AFP#59 | DW9 | Hydro-Terra | 09-Dec-92 | 53.0 | 57.5 | SDGR | GMSP | 5 | Glacial Lake Beds, gray |
| AFP#59 | DW9 | Hydro-Terra | 09-Dec-92 | 57.5 | 59.5 | SDGR | GMSP | 4 | Fine-Grained Ice-Contact Deposits, gray |
| AFP#59 | DW9 | Hydro-Terra | 09-Dec-92 | 59.5 | 60.0 | SDSL | ML | 4 | Fine-Grained Ice-Contact Deposits, gray |
| AFP#59 | DW9 | Hydro-Terra | 09-Dec-92 | 60.0 | 67.6 | SDGR | GMSP | 4 | Fine-Grained Ice-Contact Deposits, gray |
| AFP#59 | DW9 | Hydro-Terra | 09-Dec-92 | 67.6 | 90.0 | SDGR | GMSP | 6 | Coarse-Grained Ice-Contact Deposits, gray |
| AFP#59 | SW4 | Hydro-Terra | 02-Dec-92 | 0.0 | 0.3 | ASPT | --- | 1 | Asphalt |
| AFP#59 | SW4 | Hydro-Terra | 02-Dec-92 | 0.3 | 2.0 | GVLB | GP | 1 | Fill and Gravel Alluvium, yellowish-brown |
| AFP#59 | SW4 | Hydro-Terra | 02-Dec-92 | 2.0 | 15.0 | GVLB | GPSP | 3 | Glacial Outwash, brown |
| AFP#59 | SW4 | Hydro-Terra | 02-Dec-92 | 15.0 | 29.0 | SDSL | ML | 4 | Fine-Grained Ice-Contact Deposits, brown to gray |

ANL AFP#59 IRP SI

USAF IRPIMS LITHOLOGIC DESCRIPTION DATA (BCHLTD)

| AFIID | LOCID | LOGCODE | LOGDATE | BEG-DEPTH | END-DEPTH | LITH-CODE | ASTM-CODE | STRAT-ORDER | VISDESC |
|---|---|---|---|---|---|---|---|---|---|
| AFP#59 | SW5 | Hydro-Terra | 20-Nov-91 | 0.0 | 0.3 | ASPT | --- | 1 | Asphalt |
| AFP#59 | SW5 | Hydro-Terra | 20-Nov-91 | 0.3 | 3.0 | GVLB | SP | 1 | Fill and Gravel Alluvium, brown |
| AFP#59 | SW5 | Hydro-Terra | 20-Nov-91 | 3.0 | 7.0 | SDSL | SPSM | 3 | Glacial Outwash, brown |
| AFP#59 | SW5 | Hydro-Terra | 20-Nov-91 | 7.0 | 23.0 | GVLB | GP | 3 | Glacial Outwash, brown |
| AFP#59 | SW5 | Hydro-Terra | 20-Nov-91 | 23.0 | 30.0 | SDSL | ML | 4 | Fine-Grained Ice-Contact Deposits, brown to gray |
| AFP#59 | SW6 | Hydro-Terra | 17-Nov-91 | 0.0 | 0.3 | ASPT | --- | 1 | Asphalt |
| AFP#59 | SW6 | Hydro-Terra | 17-Nov-91 | 0.3 | 1.5 | GVLB | GP | 1 | Fill and Gravel Alluvium, brown |
| AFP#59 | SW6 | Hydro-Terra | 17-Nov-91 | 1.5 | 2.0 | SDSL | SM | 1 | Fill and Gravel Alluvium, brown |
| AFP#59 | SW6 | Hydro-Terra | 17-Nov-91 | 2.0 | 25.0 | GVLB | GMSP | 3 | Glacial Outwash, brown |
| AFP#59 | SW6 | Hydro-Terra | 17-Nov-91 | 25.0 | 29.0 | SDSL | ML | 4 | Fine-Grained Ice-Contact Deposits, gray, OVM 0.5 to 0.6 ppm at 25.5' |
| AFP#59 | SW7 | Hydro-Terra | 06-Dec-92 | 0.0 | 2.0 | PTHM | OL | 1 | Fill and Gravel Alluvium, grass and topsoil |
| AFP#59 | SW7 | Hydro-Terra | 06-Dec-92 | 2.0 | 7.0 | SDGR | GMSM | 3 | Glacial Outwash, brown |
| AFP#59 | SW7 | Hydro-Terra | 06-Dec-92 | 7.0 | 15.0 | SDGR | GMSP | 3 | Glacial Outwash, brown |
| AFP#59 | SW7 | Hydro-Terra | 06-Dec-92 | 15.0 | 17.0 | SDGR | SP | 3 | Glacial Outwash, brown |
| AFP#59 | SW7 | Hydro-Terra | 06-Dec-92 | 17.0 | 26.5 | GVLB | GMGP | 3 | Glacial Outwash, brown |
| AFP#59 | IW7 | Hydro-Terra | 05-Dec-92 | 0.0 | 2.0 | PTHM | OL | 1 | Fill and Gravel Alluvium, grass and topsoil |
| AFP#59 | IW7 | Hydro-Terra | 05-Dec-92 | 2.0 | 7.0 | SDGR | GMSM | 3 | Glacial Outwash, brown |
| AFP#59 | IW7 | Hydro-Terra | 05-Dec-92 | 7.0 | 15.0 | SDGR | GMSP | 3 | Glacial Outwash, brown |
| AFP#59 | IW7 | Hydro-Terra | 05-Dec-92 | 15.0 | 17.0 | SDGR | SP | 3 | Glacial Outwash, brown |
| AFP#59 | IW7 | Hydro-Terra | 05-Dec-92 | 17.0 | 26.5 | GVLB | GMGP | 3 | Glacial Outwash, brown |
| AFP#59 | IW7 | Hydro-Terra | 05-Dec-92 | 26.5 | 29.5 | SDSL | ML | 4 | Fine-Grained Ice-Contact Deposits, brown |
| AFP#59 | IW7 | Hydro-Terra | 05-Dec-92 | 29.5 | 36.0 | SDSL | SMSP | 4 | Fine-Grained Ice-Contact Deposits, brown |
| AFP#59 | IW7 | Hydro-Terra | 05-Dec-92 | 36.0 | 44.0 | SDGR | GMSP | 4 | Fine-Grained Ice-Contact Deposits, brown |
| AFP#59 | SW8 | Hydro-Terra | 04-Nov-91 | 0.0 | 0.3 | ASPT | --- | 1 | Asphalt |
| AFP#59 | SW8 | Hydro-Terra | 04-Nov-91 | 0.3 | 3.0 | GVLB | GP | 1 | Fill and Gravel Alluvium, brownish-black |
| AFP#59 | SW8 | Hydro-Terra | 04-Nov-91 | 3.0 | 5.0 | SDSL | OL | 1 | Fill and Gravel Alluvium, brown |
| AFP#59 | SW8 | Hydro-Terra | 04-Nov-91 | 5.0 | 9.5 | SDGR | SPSM | 2 | Fine-Grained Alluvium, brown |
| AFP#59 | SW8 | Hydro-Terra | 04-Nov-91 | 9.5 | 12.0 | SDSL | SM | 3 | Glacial Outwash, brown, strong petroleum odor 7'-14' |
| AFP#59 | SW8 | Hydro-Terra | 04-Nov-91 | 12.0 | 23.0 | SDGR | GMSP | 3 | Glacial Outwash, brown |
| AFP#59 | SW9 | Hydro-Terra | 10-Dec-92 | 0.0 | 0.3 | PTHM | OL | 1 | Fill and Gravel Alluvium, brown turf |
| AFP#59 | SW9 | Hydro-Terra | 10-Dec-92 | 0.3 | 2.0 | SDSL | SPSM | 1 | Fill and Gravel Alluvium, brown |
| AFP#59 | SW9 | Hydro-Terra | 10-Dec-92 | 2.0 | 3.0 | SD | SW | 1 | Fill and Gravel Alluvium, yellow |
| AFP#59 | SW9 | Hydro-Terra | 10-Dec-92 | 3.0 | 4.0 | SDGR | SP | 3 | Glacial Outwash, dark brown |
| AFP#59 | SW9 | Hydro-Terra | 10-Dec-92 | 4.0 | 10.0 | SDGR | GPSP | 3 | Glacial Outwash, dark brown |
| AFP#59 | SW9 | Hydro-Terra | 10-Dec-92 | 10.0 | 16.0 | GVLB | GMGP | 3 | Glacial Outwash, brown |
| AFP#59 | SW9 | Hydro-Terra | 10-Dec-92 | 16.0 | 25.0 | SDGR | GPSP | 3 | Glacial Outwash, brown |

ANL AFP#59 IRP SI

USAF IRPIMS LITHOLOGIC DESCRIPTION DATA (BCHLTD)

| AFIID | LOCID | LOGCODE | LOGDATE | BEG-DEPTH | END-DEPTH | LITH-CODE | ASTM-CODE | STRAT-ORDER | VISDESC |
|---|---|---|---|---|---|---|---|---|---|
| AFP#59 | IW9 | Hydro-Terra | 10-Dec-92 | 0.0 | 0.3 | PTHM | OL | 1 | Fill and Gravel Alluvium, brown turf |
| AFP#59 | IW9 | Hydro-Terra | 10-Dec-92 | 0.3 | 2.0 | SDSL | SPSM | 1 | Fill and Gravel Alluvium, brown |
| AFP#59 | IW9 | Hydro-Terra | 10-Dec-92 | 2.0 | 3.0 | SD | SW | 1 | Fill and Gravel Alluvium, yellow |
| AFP#59 | IW9 | Hydro-Terra | 10-Dec-92 | 3.0 | 4.0 | SDGR | SP | 3 | Glacial Outwash, dark brown |
| AFP#59 | IW9 | Hydro-Terra | 10-Dec-92 | 4.0 | 10.0 | SDGR | GPSP | 3 | Glacial Outwash, dark brown |
| AFP#59 | IW9 | Hydro-Terra | 10-Dec-92 | 10.0 | 16.0 | GVLB | GMGP | 3 | Glacial Outwash, brown |
| AFP#59 | IW9 | Hydro-Terra | 10-Dec-92 | 16.0 | 34.0 | SDGR | GPSP | 3 | Glacial Outwash, brown |
| AFP#59 | IW9 | Hydro-Terra | 10-Dec-92 | 34.0 | 37.5 | SDGR | SP | 4 | Fine-Grained Ice-Contact Deposits, gray |
| AFP#59 | IW9 | Hydro-Terra | 10-Dec-92 | 37.5 | 41.5 | SDSL | MLSM | 4 | Fine-Grained Ice-Contact Deposits, gray |
| AFP#59 | IW9 | Hydro-Terra | 10-Dec-92 | 41.5 | 43.0 | SDSL | SM | 4 | Fine-Grained Ice-Contact Deposits, gray |
| AFP#59 | IW9 | Hydro-Terra | 10-Dec-92 | 43.0 | 44.0 | SDGR | SP | 5 | Glacial Lake Beds, gray |
| AFP#59 | IW9 | Hydro-Terra | 10-Dec-92 | 44.0 | 51.0 | SDSL | MLSM | 5 | Glacial Lake Beds, gray |
| AFP#59 | A4H1 | Hydro-Terra | 03-Dec-92 | 0.0 | 0.3 | ASPT | --- | 1 | Asphalt |
| AFP#59 | A4H1 | Hydro-Terra | 03-Dec-92 | 0.3 | 1.5 | GVLB | GP | 1 | Fill and Gravel Alluvium, brown |
| AFP#59 | A4H1 | Hydro-Terra | 03-Dec-92 | 1.5 | 18.0 | SDGR | GMSP | 3 | Glacial Outwash, brown low ppm hydrocarbon detection |
| AFP#59 | A4H2 | Hydro-Terra | 03-Dec-92 | 0.0 | 0.3 | ASPT | --- | 1 | Asphalt |
| AFP#59 | A4H2 | Hydro-Terra | 03-Dec-92 | 0.3 | 2.5 | GVLB | GP | 1 | Fill and Gravel Alluvium, brown |
| AFP#59 | A4H2 | Hydro-Terra | 03-Dec-92 | 2.5 | 19.0 | SDGR | GMSM | 3 | Glacial Outwash, brown |
| AFP#59 | A1H1 | Hydro-Terra | 04-Dec-92 | 0.0 | 0.5 | FILL | --- | 1 | Fill and Gravel Alluvium, brown |
| AFP#59 | A1H1 | Hydro-Terra | 04-Dec-92 | 0.5 | 8.0 | FILL | GPSP | 1 | Fill and Gravel Alluvium, brown |
| AFP#59 | A1H1 | Hydro-Terra | 04-Dec-92 | 8.0 | 14.0 | SDGR | SPGP | 3 | Glacial Outwash, oily stain, low ppm hydrocarbon detected |
| AFP#59 | A3H1 | Hydro-Terra | 04-Dec-92 | 0.0 | 0.5 | FILL | --- | 1 | Fill and Gravel Alluvium, brown |
| AFP#59 | A3H1 | Hydro-Terra | 04-Dec-92 | 0.5 | 2.0 | FILL | GM | 1 | Fill and Gravel Alluvium, brown |
| AFP#59 | A3H1 | Hydro-Terra | 04-Dec-92 | 2.0 | 10.0 | FILL | MLSM | 1 | Fill and Gravel Alluvium, gray, oily stain |
| AFP#59 | A3H1 | Hydro-Terra | 04-Dec-92 | 10.0 | 14.0 | SDGR | GPSP | 3 | Glacial Outwash, gray, oily stain, low ppm hydrocarbon detect |
| AFP#59 | A6H1 | Hydro-Terra | 04-Dec-92 | 0.0 | 0.3 | ASPT | --- | 1 | Asphalt |
| AFP#59 | A6H1 | Hydro-Terra | 04-Dec-92 | 0.3 | 2.0 | FILL | GP | 1 | Fill and Gravel Alluvium, brown |
| AFP#59 | A6H1 | Hydro-Terra | 04-Dec-92 | 2.0 | 10.0 | FILL | SP | 1 | Fill and Gravel Alluvium, brown |
| AFP#59 | A6H1 | Hydro-Terra | 04-Dec-92 | 10.0 | 14.0 | SDGR | GPSP | 3 | Glacial Outwash, brown |

# Appendix C-5-D:

# IRPIMS BCHGWD

# Hydrologic Parameters

ANL AFP#59 IRP SI — SLUG TEST

USAF IRPIMS HYDROLOGIC PARAMETER DATA (BCHGWD)

| AFIID | LOCID | LOGDATE | * CALC-PARCODE | ** PARVAL | UTMCODE |
|---|---|---|---|---|---|
| AFP#59 | DW1 | 11-Jan-92 | NE | | |
| AFP#59 | DW1 | 11-Jan-92 | K | 14.2 | ft/d |
| AFP#59 | DW1 | 11-Jan-92 | S | | |
| AFP#59 | DW1 | 11-Jan-92 | T | 1025 | ft²/d |
| AFP#59 | DW3 | 07-Jan-92 | NE | | |
| AFP#59 | DW3 | 07-Jan-92 | K | 2 | ft/d |
| AFP#59 | DW3 | 07-Jan-92 | S | | |
| AFP#59 | DW3 | 07-Jan-92 | T | 150 | ft²/d |
| AFP#59 | DW4 | 12-Jan-92 | NE | | |
| AFP#59 | DW4 | 12-Jan-92 | K | 4.5 | ft/d |
| AFP#59 | DW4 | 12-Jan-92 | S | | |
| AFP#59 | DW4 | 12-Jan-92 | T | 325 | ft²/d |
| AFP#59 | DW5 | 11-Jan-92 | NE | | |
| AFP#59 | DW5 | 11-Jan-92 | K | 12 | ft/d |
| AFP#59 | DW5 | 11-Jan-92 | S | | |
| AFP#59 | DW5 | 11-Jan-92 | T | 725 | ft²/d |
| AFP#59 | DW6 | 12-Jan-92 | NE | | |
| AFP#59 | DW6 | 12-Jan-92 | K | 0.1 | ft/d |
| AFP#59 | DW6 | 12-Jan-92 | S | | |
| AFP#59 | DW6 | 12-Jan-92 | T | 7 | ft²/d |
| AFP#59 | DW8 | 13-Jan-92 | NE | | |
| AFP#59 | DW8 | 13-Jan-92 | K | 8 | ft/d |
| AFP#59 | DW8 | 13-Jan-92 | S | | |
| AFP#59 | DW8 | 13-Jan-92 | T | 620 | ft²/d |
| AFP#59 | DW9 | 12-Jan-92 | NE | | |
| AFP#59 | DW9 | 12-Jan-92 | K | 2.6 | ft/d |
| AFP#59 | DW9 | 12-Jan-92 | S | | |
| AFP#59 | DW9 | 12-Jan-92 | T | 190 | ft/d |
| AFP#59 | SW1 | 13-Jan-92 | NE | | |
| AFP#59 | SW1 | 13-Jan-92 | K | 1.0 | ft/d |
| AFP#59 | SW1 | 13-Jan-92 | S | | |
| AFP#59 | SW1 | 13-Jan-92 | T | 70 | ft²/d |

ANL AFP#59 IRP SI — SLUG TEST

USAF IRPIMS HYDROLOGIC PARAMETER DATA (BCHGWD)

| AFIID | LOCID | LOGDATE | CALC-PARCODE | PARVAL | UTMCODE |
|---|---|---|---|---|---|
| AFP#59 | SW3 | 13-Jan-92 | NE | | |
| AFP#59 | SW3 | 13-Jan-92 | K | NI | |
| AFP#59 | SW3 | 13-Jan-92 | S | | |
| AFP#59 | SW3 | 13-Jan-92 | T | NI | |
| AFP#59 | SW4 | 13-Jan-92 | NE | | |
| AFP#59 | SW4 | 13-Jan-92 | K | 0.7 | ft/d |
| AFP#59 | SW4 | 13-Jan-92 | S | | |
| AFP#59 | SW4 | 13-Jan-92 | T | 50 | ft/d |
| AFP#59 | SW5 | 12-Jan-92 | NE | | |
| AFP#59 | SW5 | 12-Jan-92 | K | 0.8 | ft/d |
| AFP#59 | SW5 | 12-Jan-92 | S | | |
| AFP#59 | SW5 | 12-Jan-92 | T | 50 | ft²/d |
| AFP#59 | SW6 | 12-Jan-92 | NE | | |
| AFP#59 | SW6 | 12-Jan-92 | K | 0.05 | ft/d |
| AFP#59 | SW6 | 12-Jan-92 | S | | |
| AFP#59 | SW6 | 12-Jan-92 | T | 4 | ft²/d |
| AFP#59 | SW7 | 13-Jan-92 | NE | | |
| AFP#59 | SW7 | 13-Jan-92 | K | NI | |
| AFP#59 | SW7 | 13-Jan-92 | S | | |
| AFP#59 | SW7 | 13-Jan-92 | T | NI | |
| AFP#59 | SW8 | 13-Jan-92 | NE | | |
| AFP#59 | SW8 | 13-Jan-92 | K | 23 | ft/d |
| AFP#59 | SW8 | 13-Jan-92 | S | | |
| AFP#59 | SW8 | 13-Jan-92 | T | 1800 | ft²/d |
| AFP#59 | SW9 | 12-Jan-92 | NE | | |
| AFP#59 | SW9 | 12-Jan-92 | K | 0.2 | ft/d |
| AFP#59 | SW9 | 12-Jan-92 | S | | |
| AFP#59 | SW9 | 12-Jan-92 | T | 15 | ft²/d |
| AFP#59 | IW9 | 12-Jan-92 | NE | | |
| AFP#59 | IW9 | 12-Jan-92 | K | ~~NWL~~ | |
| AFP#59 | IW9 | 12-Jan-92 | S | | |
| AFP#59 | IW9 | 12-Jan-92 | T | ~~NW~~ | |

.003 ft/day

.03 ft²/d

* NE cannot be determined from a slug test.

** S cannot be determined reliably from a slug test

** NI means no interpretation possible; recovered in less than one unit.

~~NW means no withdrawal slug test performed~~

# Appendix C-5-E:

# IRPIMS BCHGWD

# Borehole Widths

ANL AFP#59 IRP SI
USAF IRPIMS BOREHOLE WIDTHS

| AFIID | LOCID | BEG-DEPTH | END-DEPTH | WIDTH (INCH) |
|---|---|---|---|---|
| AFP#59 | DW1 | 0.0 | 61.5 | 6.25 |
| AFP#59 | DW3 | 0.0 | 40.0 | 14.25 |
| AFP#59 | DW3 | 40.0 | 88.0 | 6.25 |
| AFP#59 | DW4 | 0.0 | 35.0 | 14.25 |
| AFP#59 | DW4 | 35.0 | 92.5 | 6.25 |
| AFP#59 | DW5 | 0.0 | 35.0 | 14.25 |
| AFP#59 | DW5 | 35.0 | 83.0 | 6.25 |
| AFP#59 | DW6 | 0.0 | 36.0 | 14.25 |
| AFP#59 | DW6 | 36.0 | 86.5 | 6.25 |
| AFP#59 | DW8 | 0.0 | 40.0 | 14.25 |
| AFP#59 | DW8 | 40.0 | 93.0 | 6.25 |
| AFP#59 | DW9 | 0.0 | 38.0 | 14.25 |
| AFP#59 | DW9 | 38.0 | 90.0 | 6.25 |
| AFP#59 | SW4 | 0.0 | 29.0 | 8.25 |
| AFP#59 | SW5 | 0.0 | 30.0 | 8.25 |
| AFP#59 | SW6 | 0.0 | 29.0 | 8.25 |
| AFP#59 | SW7 | 0.0 | 29.5 | 8.25 |
| AFP#59 | IW7 | 0.0 | 44.0 | 8.25 |
| AFP#59 | SW8 | 0.0 | 23.0 | 8.25 |
| AFP#59 | SW9 | 0.0 | 25.0 | 8.25 |
| AFP#59 | IW9 | 0.0 | 51.0 | 8.25 |
| AFP#59 | 4H1 | 0.0 | 18.0 | 8.25 |
| AFP#59 | 4H2 | 0.0 | 19.0 | 8.25 |
| AFP#59 | 1H1 | 0.0 | 14.0 | 8.25 |
| AFP#59 | 1H2 | 0.0 | 14.0 | 8.25 |
| AFP#59 | 6H1 | 0.0 | 14.0 | 8.25 |

# Appendix C-6:

## Data Set for Potentiometric Surface

## DATA SET FOR POTENTIOMETRIC SURFACE MAPS

AVERAGE POTENTIOMETRIC SURFACE
DEEP AQUIFER JANUARY 17–27, 1992

| EASTING | NORTHING | WATER LEVEL |
|---|---|---|
| 666219 | 771231 | 814.26 |
| 665697 | 770548 | 814.02 |
| 664993 | 771285 | 813.72 |
| 666034 | 770353 | 814.36 |
| 664926 | 770357 | 814.16 |

STATIC POTENTIOMETRIC SURFACE
DEEP AQUIFER JANUARY 11–13,1992

| EASTING | NORTHING | WATER LEVEL |
|---|---|---|
| 666219 | 771231 | 814.28 |
| 664948 | 770534 | 813.76 |
| 665697 | 770548 | 814.14 |
| 664993 | 771285 | 813.41 |
| 664972 | 770831 | 813.67 |
| 666034 | 770353 | 814.33 |
| 664926 | 770357 | 813.75 |

AVERAGE POTENTIOMETRIC SURFACE
SHALLOW AQUIFER JANUARY 17–27, 1992

| EASTING | NORTHING | WATER LEVEL |
|---|---|---|
| 666222 | 771240 | 814.23 |
| 665697 | 770553 | 813.85 |
| 664994 | 771289 | 813.72 |
| 664972 | 770358 | 816.9 |
| 664931 | 770357 | 813.81 |
| 664935 | 770253 | 813.51 |
| 665087 | 770231 | 813.84 |
| 665235 | 770227 | 814.17 |
| 665382 | 770214 | 814.5 |
| 665638 | 770196 | 815.05 |
| 665814 | 770189 | 815.42 |
| 665965 | 770179 | 815.8 |
| 666014 | 770164 | 816.7 |
| 666147 | 770217 | 817.4 |
| 666210 | 770333 | 817.69 |
| 666263 | 770460 | 818.02 |
| 666323 | 770576 | 818.31 |
| 666369 | 770688 | 818.57 |
| 666440 | 770917 | 819.12 |

STATIC POTENTIOMETRIC SURFACE
SHALLOW AQUIFER JANUARY 11–13,1992

| EASTING | NORTHING | WATER LEVEL |
|---|---|---|
| 666222 | 771240 | 814.35 |
| 664939 | 770535 | 813.46 |
| 665697 | 770553 | 814.16 |
| 664994 | 771289 | 813.42 |
| 664972 | 770837 | 813.41 |
| 665377 | 770565 | 813.53 |
| 666033 | 770358 | 816.82 |
| 664931 | 770357 | 813.58 |
| 664935 | 770253 | 813.51 |
| 665087 | 770231 | 813.84 |
| 665235 | 770227 | 814.17 |
| 665382 | 770214 | 814.5 |
| 665638 | 770196 | 815.05 |
| 665814 | 770189 | 815.42 |
| 665965 | 770179 | 815.8 |
| 666014 | 770164 | 816.7 |
| 666147 | 770217 | 817.4 |
| 666210 | 770333 | 817.69 |
| 666263 | 770460 | 818.02 |
| 666323 | 770576 | 818.31 |
| 666369 | 770688 | 818.57 |
| 666440 | 770917 | 819.12 |

# Appendix D:

## Surveying Data
## Sampling Locations at AFP 59

## Surveying Data
## Sampling Locations at P-59.

Horizontal measures are in feet and on the State Plane Coordinate System.
Elevations are in feet above MSL.
Ground surface elevations are shown unless otherwise indicated.

| WELLS | | | | | |
|---|---|---|---|---|---|
| Well ID Designation | Top of Casing | Ground Surface | NORTHING | EASTING | ELEVATION |
| DW1 | x | | 771230.68 | 666218.81 | 834.57 |
| SW1 | x | | 771240.06 | 666221.54 | 834.48 |
| DW1/SW1 | | x | 771239.32 | 666221.26 | 831.93 |
| SW2 | x | | 770360.55 | 665434.49 | 830.79 |
| SW2 | | x | 770359.64 | 665434.38 | 828.83 |
| DW3 | x | | 770534.20 | 664948.18 | 829.04 |
| SW3 | x | | 770535.02 | 664938.89 | 830.97 |
| DW3/SW3 | | x | 770534.96 | 664939.76 | 829.46 |
| DW4 | | | 770548.15 | 665697.03 | 828.78 |
| SW4 | x | | 770552.49 | 665696.94 | 828.85 |
| DW4/SW4 | | x | | | 829.05 |
| DW5 | x | | 771284.96 | 664993.06 | 835.97 |
| SW5 | x | | 771289.28 | 664993.62 | 835.84 |
| DW5/SW5 | | x | 771286.87 | 664993.43 | 836.24 |
| DW6 | x | | 770830.91 | 664971.51 | 828.51 |
| SW6 | x | | 770836.67 | 664971.59 | 828.49 |
| DW6/SW6 | | x | 770835.09 | 664971.62 | 828.95 |
| SW7 | x | | 770564.89 | 665376.59 | 831.89 |
| SW7 | | x | 770562.93 | 665376.83 | 828.88 |
| DW8 | x | | 770352.97 | 666034.40 | 829.70 |
| SW8 | x | | 770358.28 | 666033.37 | 829.85 |
| DW8-SW8 | x | x | 770355.68 | 666033.65 | 830.20 |
| DW9 | x | | 770357.35 | 664925.85 | 831.31 |
| SW9 | x | | 770356.75 | 664931.10 | 831.38 |
| DW9/SW9 | | x | 770356.97 | 664928.47 | 828.80 |
| IW9 | x | | 770356.21 | 664937.50 | 831.52 |
| IW9 | | x | 770357.12 | 664935.20 | 828.62 |
| DPW | (center) | x | 770569.13 | 665392.16 | 828.88* |

(Continued on next page) *Derived

continued.

| | Named-Sites | | | |
|---|---|---|---|---|
| SITE No. | Sample No. | NORTHING | EASTING | ELEVATION |
| Site A-1 | A1 H1 | 770415.57 | 665984.03 | 828.67 |
| Site A-2 | 2L 1 * | 770516.29 | 665765.83 | 829.34 |
| Site A-3 | A3 H1 | 770411.17 | 666012.08 | 828.58 |
| Site A-4 | A4 H1 | 770495.74 | 665711.75 | 829.19 |
| Site A-4 | A4 H2 | 770507.49 | 665711.81 | 829.27 |
| Site A-6 | A6 H1 | 771057.13 | 665881.34 | 832.03 |

| Plugged, previous-study boreholes near ANL boreholes. | | | |
|---|---|---|---|
| Location | NORTHING | EASTING | ELEVATION |
| (old bore near A4H1) | 770494.13 | 665711.24 | 829.22 |
| (old bore near A4H2) | 770509.34 | 665713.04 | 829.39 |
| (old bore near A6H1) | 771056.89 | 665886.29 | 832.01 |

| Choconut Creek | | | | |
|---|---|---|---|---|
| Location | Sample No. | NORTHING | EASTING | ELEVATION |
| (Regional background stream sampling locations upgradient from Johnson City.) | | | | |
| CNC* | JCCNCAW | 802750 | 669600 | 1300 |
| CNS* | JCCNSCS | 802750 | 669600 | 1300 |
| (Local background stream sampling locations upgradient from P-59 outfalls.) | | | | |
| CWS-1 | CW 1 | 770268.08 | 666170.51 | 817.42 |
| CSS-1 | SD 1 | 770268.08 | 666170.51 | 817.42 |
| (Stream sampling locations downgradient from P-59 outfalls.) | | | | |
| CWS-2 | CW 2 | 770251.94 | 664976.83 | 814.36 |
| CSS-2 | SD 2 | 770246.-- | 664976.-- | 814.-- |

| Outfalls | | | |
|---|---|---|---|
| Location | NORTHING | EASTING | ELEVATION |
| OF1 invert | 770263.89 | 665195.82 | 824.02 |
| OF-2 invert | 770205.07 | 665989.82 | 823.07 |
| OF-3 invert | 770311.15 | 665002.41 | 817.69 |

(Continued on next page) *Derived

continued.

| Background Soil and Groundwater Sampling Locations | | | | |
|---|---|---|---|---|
| Media | Sample ID | NORTHING | EASTING | ELEVATION |
| soil | BG1 | 770417.87 | 864903.25 | 840.78 |
| ground water* | BG2 | 773100 | 670150 | 840 |
| (Background surface water is shown with creek samples above.) | | | | |

| MEM Hand Sample Locations | | | |
|---|---|---|---|
| Location | NORTHING | EASTING | ELEVATION |
| HA01 | 770531.05 | 665317.62 | 829.35 |
| HA02 | 770542.50 | 665315.44 | 829.42 |
| HA03 | 770562.99 | 665315.76 | 829.28 |
| HA04 | 770566.95 | 665309.02 | 829.00 |
| HA05 | 770543.78 | 665307.42 | 829.42 |
| HA06 | 770533.83 | 665307.47 | 829.41 |
| HA07 | 770425.86 | 665923.69 | 828.29 |
| HA08 | 770466.75 | 665878.37 | 827.54 |
| HA09 | 770468.73 | 665807.69 | 827.61 |
| HA10 | 770471.27 | 665726.49 | 828.17 |
| HA11 | 770467.17 | 665662.48 | 828.28 |
| HA12 | 770479.45 | 665404.37 | 827.75 |
| HA13 | 770413.30 | 665460.33 | 829.56 |
| HA14 | 770285.56 | 664997.87 | 817.95 |
| HA15 | 770341.73 | 665717.91 | 828.24 |
| HA16 | 770403.93 | 665941.78 | 828.36 |
| HA17 | 770514.59 | 665765.83 | 833.88 |
| HA18 | (Not shown. See site map.) | | |

# Appendix E:

## Chain-of-Custody Forms

(TRIP 1)

# Chain of Custody Record

Page 1 of 1

| Company Name | Project Manager/Contact |
|---|---|
| Argonne | Wyman Harrison<br>Barney Nashold (FS) |

| Project No. | Project Name |
|---|---|
| AFP-59 | IRP Supplemental S.I. |

**Galson Laboratories**
6601 Kirkville Road East
E. Syracuse, New York 13057
315-432-0506 or 800-950-0506

Special QA/QC Protocol (Circle)

| | |
|---|---|
| EPA CLP | EPA SW 846 |
| NYS DEC | NYS DOH |
| NJ TIER I | CALIFORNIA |
| NJ TIER II | OTHER (Specify) |

PARAMETERS FOR ANALYSIS

| SAMPLE LOCATION / SAMPLE ID | Date | Time | TYPE Comp. | Grab | Aqueous | Soil | Other | A | B | C | D | E | F | G | H | I | J | K | Laboratory ID Number | SV/PCB/PEST | MET/Cn | VOA | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| JCSW8AS | 4 NOV 91 | 1710 | | | | ✓ | | | | | | | | | | | | | | ✓ | ✓ | ✓ | | | | | | | |
| TRIP BLANK | | | | | ✓ | | | | | | | | | | | | | | | | | ✓ | | | | | | | |
| JCSW8BS | 4 NOV 91 | 1715 | | | | ✓ | | | | | | | | | | | | | | ✓ | ✓ | ✓ | | | | | | | |

REMARKS: NYS DEC ASP

Note: Petroleum product odor noted in JCSW8AS.
Poor recovery JCSW8BS - Sample contains gravel

Task No.

SAMPLERS NAME: LAURA [illegible] BARNEY NASHOLD
SIGNATURE: BNashold

| SAMPLES RELINQUISHED BY: | | SAMPLES RECEIVED BY: | |
|---|---|---|---|
| NAME: BARNEY NASHOLD<br>SIGNATURE: Barney Nashold | DATE: 5 NOV 91<br>TIME: 0800 HR | NAME: LAURA [illegible]<br>SIGNATURE: [illegible] | DATE: [illegible]<br>TIME: [illegible] |
| NAME: [illegible]<br>SIGNATURE: | DATE:<br>TIME: | NAME:<br>SIGNATURE: | DATE:<br>TIME: |
| NAME:<br>SIGNATURE: | DATE:<br>TIME: | NAME:<br>SIGNATURE: | DATE:<br>TIME: |

Received For Laboratory By: (Signature) [illegible] DATE: [illegible] TIME: [illegible]

Custody Seal Intact? Sample ☐ Yes ☐ No ☐ N.A.

Shipment Complete? ☐ Yes ☐ No

| LabStor. Location (Ref. #) | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | |

2893

(TRIP 2)

# Chain of Custody Record

7 NOV 91

Page 1 of 1

| Company Name | Project Manager/Contact |
|---|---|
| Argonne N.L. | WYMAN HARRISON<br>BARNEY NASHOLD |
| **Project No.** | **Project Name** |
| AFP-59 | IRP Supplemental S.I. |

**Galson Laboratories**
6601 Kirkville Road East
E. Syracuse, New York 13057
315-432-0506 or 800-950-0506

**Special QA/QC Protocol (Circle)**

| | |
|---|---|
| EPA CLP | EPA SW 846 |
| NYS DEC | NYS DOH |
| NJ TIER I | CALIFORNIA |
| NJ TIER II | OTHER (Specify) |

**PARAMETERS FOR ANALYSIS**

| SAMPLE LOCATION / SAMPLE ID | Date | Time | TYPE Comp. | Grab | Aqueous | Soil | Other | A | B | C | D | E | F | G | H | I | J | K | Laboratory ID Number | SV/PCB/PEST | MET/Cn | VOA | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| JCDW3AS | 5NOV91 | 1315 | ✓ | | ✓ | ✓ | | | | | | | | | | | | | | ✓ | ✓ | ✓ | | | | | | | | |
| JCDW3BS | 5NOV91 | 1630 | ✓ | | | ✓ | | | | | | | | | | | | | | ✓ | ✓ | ✓ | | | | | | | | |
| JCQC1TW | 6NOV91 | 1415 | ✓ | | ✓ | | | | | | | | | | | | | | | ✓ | ✓ | ✓ | | | | | | | | |
| JCQC2BW | 6NOV91 | 1445 | ✓ | | ✓ | | | | | | | | | | | | | | | ✓ | ✓ | ✓ | | | | | | | | |

NYSDECASP

**REMARKS:** two each 40 ml trip blanks, TRIP 2, enclosed
JCQC1TW = Rinsate of hand tools
JCQC1BW = Rinsate of split barrel samplers

Task No.

**SAMPLERS NAME:** LAURA GIBLIN BARNEY NASHOLD **SIGNATURE:** [illegible] BNashold

| SAMPLES RELINQUISHED BY: | | SAMPLES RECEIVED BY: | |
|---|---|---|---|
| NAME: BARNEY NASHOLD<br>SIGNATURE: BNashold | DATE: 7 NOV 91<br>TIME: 0815 | NAME: LAURA GIBLIN<br>SIGNATURE: [illegible] | DATE: [illegible]<br>TIME: [illegible] |
| NAME: LAURA GIBLIN<br>SIGNATURE: [illegible] | DATE: [illegible]<br>TIME: [illegible] | NAME:<br>SIGNATURE: | DATE:<br>TIME: |
| NAME:<br>SIGNATURE: | DATE:<br>TIME: | NAME:<br>SIGNATURE: | DATE:<br>TIME: |

Received For Laboratory By: (Signature) [illegible] DATE: 11/7/91 TIME: 10 11

Custody Seal Intact? Sample ☒ Yes ☐ No ☐ N.A.

Shipment Complete? ☒ Yes ☐ No

| LabStor. Location (Ref. #) | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | |

2089

TRIP 3

# Chain of Custody Record

Page 1 of 1

| Company Name | Project Manager/Contact |
|---|---|
| Argonne | Barney NASHOLD WYMAN HARRISON |

| Project No. | Project Name |
|---|---|
| AFP-58 | IRP Supplemental S.I. |

**Galson Laboratories**
6601 Kirkville Road East
E. Syracuse, New York 13057
315-432-0506 or 800-950-0506

Special QA/QC Protocol (Circle)
EPA CLP — EPA SW 846
NYS DEC — NYS DOH
NJ TIER I — CALIFORNIA
NJ TIER II — OTHER (Specify)

PARAMETERS FOR ANALYSIS

| SAMPLE LOCATION / SAMPLE ID | Date | Time | TYPE Comp. | Grab | Aqueous | Soil | Other | A | B | C | D | E | F | G | H | I | J | K | Laboratory ID Number | SV | VOA | PCB PEST | METALS | CYANIDE | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| JCQC3XW | 7Nov91 | 1500 | ✓ | | ✓ | ✓ | | | | | | | | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | |
| TRIP BLANK | | | | | | Water | | | | | | | | | | | | | | | ✓ | | | | | | | | |
| HOLD BLANK | | | | | | | | | | | | | | | | | | | | | ✓ | | | | | | | | |

REMARKS: TRIP BLANK 3 ENCLOSED
= rinsate of bailers
NYSDEC ASP

Task No.

SAMPLERS NAME: LAURA E. GIBBS / BARNEY NASHOLD
SIGNATURE: [illegible] / BNashold

| SAMPLES RELINQUISHED BY: | | SAMPLES RECEIVED BY: | |
|---|---|---|---|
| NAME: BARNEY NASHOLD<br>SIGNATURE: BNashold | DATE: 7NOV91<br>TIME: 1630HR | NAME:<br>SIGNATURE: | DATE:<br>TIME: |
| NAME:<br>SIGNATURE: | DATE:<br>TIME: | NAME:<br>SIGNATURE: | DATE:<br>TIME: |
| NAME:<br>SIGNATURE: | DATE:<br>TIME: | NAME:<br>SIGNATURE: | DATE:<br>TIME: |

Received For Laboratory By: (Signature) B Nolan
DATE: 11/7/91
TIME: 1701

Custody Seal Intact? Sample ☐ Yes ☐ No ☐ N.A.
Shipment Complete? ☐ Yes ☐ No

| LabStor. Location (Ref. #) | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | |

#5692

Note: begin time - Federal delivered at 1200 HR on 8 Nov. BNashold 7 Nov 91

B/6 11/7/91 1155

TRIP 4

18 NOV 91

# Chain of Custody Record

Page 1 of 1

| Company Name | Project Manager/Contact |
|---|---|
| Argonne | WYMAN Harrison<br>Barney Nashold |

| Project No. | Project Name |
|---|---|
| AFP-59 | IRP Supplemental S.I. |

**Galson Laboratories**
6601 Kirkville Road East
E. Syracuse, New York 13057
315-432-0506 or 800-950-0506

Special QA/QC Protocol (Circle)

| | |
|---|---|
| EPA CLP | EPA SW 846 |
| NYS DEC | NYS DOH |
| NJ TIER I | CALIFORNIA |
| NJ TIER II | OTHER (Specify) |

PARAMETERS FOR ANALYSIS

| SAMPLE LOCATION / SAMPLE ID | Date | Time | TYPE Comp. | Grab | Aqueous | Soil | Other | A | B | C | D | E | F | G | H | I | J | K | Laboratory ID Number | VOA | SV | PCB/PEST | METALS | Cn | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| JCSW6AS | 16 Nov 91 | 1430 | | | | ✓ | | | | | | | | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | |
| JCSW6BS | 16 Nov 91 | 1530 | | | | ✓ | | | | | | | | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | |
| JCCW2AW | 17 Nov 91 | 1400 | | | ✓ | | | | | | | | | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | |
| JCSD2AS | 17 Nov 91 | 1430 | | | | ✓ | | | | | | | | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | |
| JCCW4AW | 17 Nov 91 | 1530 | | | ✓ | | | | | | | | | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | |
| JCSD1AS | 17 Nov 91 | 1600 | | | ✓ | | | | | | | | | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | |
| TRIP 4 | 18 Nov 91 | 1000 | | | ✓ | | | | | | | | | | | | | | | ✓ | | (Method 524.2 VOC) | | | | | | | |

REMARKS: NYSDEC ASP. NOTE: TRIP BLANK Not labled. Please label "TRIP 4"

Task No.

(Note: The 4th character in the 4th + 6th sample ID's shown (JCSD...) is the letter D, not the letter O or numerical zero.)

SAMPLERS NAME: Barney Nashold SIGNATURE: Barney Nashold

Soils in Galson Cooler D053
Waters in Galson Cooler D064

| SAMPLES RELINQUISHED BY: | | SAMPLES RECEIVED BY: | |
|---|---|---|---|
| NAME: BARNEY NASHOLD<br>SIGNATURE: Barney Nashold | DATE: 18 NOV 91<br>TIME: 1000 HR | NAME: LAURA KLEIN<br>SIGNATURE: | DATE: 18 NOV 91<br>TIME: 1045 |
| NAME: LAURA KLEIN<br>SIGNATURE: | DATE: 18 NOV 91<br>TIME: 1045 HR | NAME:<br>SIGNATURE: | DATE:<br>TIME: |
| NAME:<br>SIGNATURE: | DATE:<br>TIME: | NAME:<br>SIGNATURE: | DATE:<br>TIME: |

Received For Laboratory By: (Signature) [illegible] DATE: [illegible] TIME: 1045

Custody Seal Intact? Sample ☒ Yes ☐ No ☒ N.A. KL

Shipment Complete? ☒ Yes ☐ No

| LabStor. Location (Ref. #) | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | |

2/89

E-6

TRIP 5

# Chain of Custody Record



| Company Name | Project Manager/Contact |
|---|---|
| Argonne | Wyman Harrison<br>Barney Nashold |

| Project No. | Project Name |
|---|---|
| AFP-59 | IRP Supplemental S.I. |

**Galson Laboratories**
6601 Kirkville Road East
E. Syracuse, New York 13057
315-432-0506 or 800-950-0506

Special QA/QC Protocol (Circle)
EPA CLP — EPA SW 846
NYS DEC — NYS DOH
NJ TIER I — CALIFORNIA
NJ TIER II — OTHER (Specify)

PARAMETERS FOR ANALYSIS

| SAMPLE LOCATION / SAMPLE ID | Date | Time | TYPE Comp. | Grab | Aqueous | Soil | Other | A | B | C | D | E | F | G | H | I | J | K | Laboratory ID Number | VOA | SV | PCB/PEST | METALS | Cn | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| JCCNCAW | 18 NOV 91 | 1315 | | | ✓ | | | | | | | | | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | | | | |
| JCCNSAS | 18 NOV 91 | 1500 | | | | ✓ | | | | | | | | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | | | | |
| TRIP 5 | 18 NOV 91 | 1715 | | | ✓ | | | | | | | | | | | | | | | ✓ | (Method 524.2 VOC) | | | | | | | |

REMARKS: NYSDEC ASP.

Task No.

SAMPLERS NAME: Barney Nashold, Laura Giblin
SIGNATURE: Barney Nashold, Laura Giblin
Galson cooler D-052

| SAMPLES RELINQUISHED BY: | | SAMPLES RECEIVED BY: | |
|---|---|---|---|
| NAME: Barney Nashold<br>SIGNATURE: B Nashold | DATE: 18 NOV 91<br>TIME: 1715 | NAME:<br>SIGNATURE: | DATE:<br>TIME: |
| NAME:<br>SIGNATURE: | DATE:<br>TIME: | NAME:<br>SIGNATURE: | DATE:<br>TIME: |
| NAME:<br>SIGNATURE: | DATE:<br>TIME: | NAME:<br>SIGNATURE: | DATE:<br>TIME: |

Received For Laboratory By: (Signature) DATE: TIME:

Custody Seal Intact? Sample ☐ Yes ☐ No ☐ N.A.

Shipment Complete? ☐ Yes ☐ No

| LabStor. Location (Ref. #) | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | |

2/89

21 Nov 91

Trip 6

# Chain of Custody Record



| Company Name | Project Manager/Contact |
|---|---|
| ARGONNE | WYMAN HARRISON<br>BARNEY NASHOLD |

| Project No. | Project Name |
|---|---|
| IFP-59 | IRP Supplement 1 S.I. |

**Galson Laboratories**
6601 Kirkville Road East
E. Syracuse, New York 13057
315-432-0506 or 800-950-0506

Special QA/QC Protocol (Circle)
EPA CLP — EPA SW 846
NYS DEC — NYS DOH
NJ TIER I — CALIFORNIA
NJ TIER II — OTHER (Specify)

PARAMETERS FOR ANALYSIS

| SAMPLE LOCATION / SAMPLE ID | Date | Time | TYPE Comp. | Grab | Aqueous | Soil | Other | A | B | C | D | E | F | G | H | I | J | K | Laboratory ID Number | VOA | SV | PCB/PEST | METALS | CN | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ~~JCSW5AS~~ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| JCSW5AS | 20 Nov 91 | 0710 | | | | ✓ | | | | | | | | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | |
| JCSW5BS | 20 Nov 91 | 1830 | | | | ✓ | | | | | | | | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | |
| JCSW5BS-M | 20 Nov 91 | 1830 | | | | ✓ | | | | | | | | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | (MS/MSD) | | | | |
| JCCNSCS | 20 Nov 91 | 1630 | | | | ✓ | | | | | | | | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | |
| JCDW1AS | 21 Nov 91 | 0840 | | | | ✓ | | | | | | | | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | |
| JCDW1BS | 21 Nov 91 | 1430 | | | | ✓ | | | | | | | | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | |
| JCDW1CS | 21 Nov 91 | 0945 | | | | ✓ | | | | | | | | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | |
| TRIP 6 | 21 Nov 91 | 1500 | | | ✓ | | | | | | | | | | | | | | | ✓ | (Method 524.2 HCl) | | | | | | | | |

REMARKS: NYS DEC ASP.

Task No.

Sample JCCNSCS replaces sample JCCNSAS
Sample JCSW5BS-M = MS/MSD

SAMPLERS NAME: Barney Nasholds Laura Gilin SIGNATURE: B Nasholds

Galson Cooler D-050

| SAMPLES RELINQUISHED BY: | | SAMPLES RECEIVED BY: | |
|---|---|---|---|
| NAME: Barney Nasholds<br>SIGNATURE: B Nasholds | DATE: 21 Nov 91<br>TIME: 1500 | NAME: [illegible]<br>SIGNATURE: [illegible] | DATE: 21 Nov 91<br>TIME: 1500 |
| NAME: [illegible]<br>SIGNATURE: [illegible] | DATE: 21 Nov 91<br>TIME: [illegible] | NAME: [illegible]<br>SIGNATURE: [illegible] | DATE: [illegible]<br>TIME: [illegible] |
| NAME:<br>SIGNATURE: | DATE:<br>TIME: | NAME:<br>SIGNATURE: | DATE:<br>TIME: |

Received For Laboratory By: (Signature) [illegible] DATE: [illegible] TIME: [illegible]

Custody Seal Intact? Sample ☐ Yes ☐ No ☐ N.A.

Shipment Complete? ☒ Yes ☐ No

| LabStor. Location (Ref. #) | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | |

2089

E-8

TRIP 7

# Chain of Custody Record

Page 1 of 1

| Company Name | Project Manager/Contact |
|---|---|
| Argonne | Wyman Hartman / Barney Nashold |

| Project No. | Project Name |
|---|---|
| AFP-57 | TRIP [illegible] I. |

**Galson Laboratories**
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E. Syracuse, New York 13057
315-432-0506 or 800-950-0506

Special QA/QC Protocol (Circle)
EPA CLP — EPA SW 846
(NYS DEC) — NYS DOH
NJ TIER I — CALIFORNIA
NJ TIER II — OTHER (Specify)

PARAMETERS FOR ANALYSIS

| SAMPLE LOCATION / SAMPLE ID | Date | Time | TYPE Comp. | TYPE Grab | Aqueous | Soil | Other | A | B | C | D | E | F | G | H | I | J | K | Laboratory ID Number | VOA | 5V | PCB/PEST | METALS | CN | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| JC0F1AW | 23 Nov 97 | 0730 | | | ✓ | | | | | | | | | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | | | | |
| JC0F2AW | 23 Nov 97 | [illegible] | | | ✓ | | | | | | | | | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | | | | |
| JC0F2AW-M | 23 Nov 97 | [illegible] | | | ✓ | | | | | | | | | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | (MS | MSD) | | |
| TRIP 7 | 23 Nov 97 | 1300 | | | ✓ | | | | | | | | | | | | | | | ✓ | (method 524.2 VOC) | | | | | | | |

REMARKS: NYS DEC ASP.

Task No.

Sample JC0F2AW-M MS/MSD for surface water

SAMPLERS NAME: [illegible] SIGNATURE: BNashold

Galson Order # D-052

| SAMPLES RELINQUISHED BY: | | SAMPLES RECEIVED BY: | |
|---|---|---|---|
| NAME: BARNEY NASHOLD<br>SIGNATURE: BNashold | DATE: 23 NOV 97<br>TIME: 1000 | NAME: LAURA GIBLIN<br>SIGNATURE: [illegible] | DATE: 23 NOV 97<br>TIME: 1000 |
| NAME: [illegible]<br>SIGNATURE: [illegible] | DATE: 23 NOV 97<br>TIME: 1140 | NAME: Geraldine Espiritu<br>SIGNATURE: Geraldine Espiritu | DATE: 23 Nov 97<br>TIME: 1140 |
| NAME:<br>SIGNATURE: | DATE:<br>TIME: | NAME:<br>SIGNATURE: | DATE:<br>TIME: |

Received For Laboratory By: (Signature) DATE: TIME:

Custody Seal Intact? Sample ☐ Yes ☐ No ☐ N.A.

Shipment Complete? ☐ Yes ☐ No

| LabStor. Location (Ref. #) | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | |

2/89 #

TRIP 8

26 NOV 91

# Chain of Custody Record



| Company Name | Project Manager/Contact |
|---|---|
| Argonne | Wyman Harrison Barney Nashold |

| Project No. | Project Name |
|---|---|
| AFP-59 | I.C.F. Yaborough S.J. |

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E. Syracuse, New York 13057
315-432-0506 or 800-950-0506

Special QA/QC Protocol (Circle)
EPA CLP — EPA SW 846
NYS DEC — NYS DOH
NJ TIER I — CALIFORNIA
NJ TIER II — OTHER (Specify)

PARAMETERS FOR ANALYSIS

| SAMPLE LOCATION / SAMPLE ID | Date | Time | TYPE Comp. | Grab | Aqueous | Soil | Other | A | B | C | D | E | F | G | H | I | J | K | Laboratory ID Number | VOA | SV | PCB/PEST | METALS | CN | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| JCSW4AS | 26 NOV 91 | 0815 | | | | ✓ | | | | | | | | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | | | | |
| JCSW4BS | 26 NOV 91 | 0945 | | | | ✓ | | | | | | | | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | | | | |
| JCSW4CS | 26 NOV 91 | 0900 | | | | ✓ | | | | | | | | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | | | | |
| TRIP 8 | 26 NOV 91 | 1300 | | | ✓ | | | | | | | | | | | | | | | ✓ | (method 524.2 VOC) | | | | | | | |

REMARKS: NYS DEC ASP.

Task No.

SAMPLERS NAME: Barney Nashold, Laura Giblin

SIGNATURE: BWNashold, Laura Giblin

Galson cooler D-036

| SAMPLES RELINQUISHED BY: | | SAMPLES RECEIVED BY: | |
|---|---|---|---|
| NAME: BARNEY NASHOLD<br>SIGNATURE: BWNashold | DATE: 26 NOV 91<br>TIME: 1300 | NAME: Laura Giblin<br>SIGNATURE: [illegible] | DATE: 26 NOV 91<br>TIME: 1300 |
| NAME: Laura Giblin<br>SIGNATURE: [illegible] | DATE: 26 NOV 91<br>TIME: [illegible] | NAME: Bryan J Coleman<br>SIGNATURE: Bryan J Coleman | DATE: 26 NOV 91<br>TIME: 1535 |
| NAME:<br>SIGNATURE: | DATE:<br>TIME: | NAME:<br>SIGNATURE: | DATE:<br>TIME: |

Received For Laboratory By: (Signature) Bryan J Coleman DATE: 26 NOV 91 TIME: 1535

Custody Seal Intact? Sample: ☒ Yes ☐ No ☐ N.A.

Shipment Complete? ☒ Yes ☐ No

| LabStor. Location (Ref. #) | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | |

2/89

E-10

TRIP 9 FEDEX AB# 1323800870

Page ___ of ___

| Company Name | Project Manager/Contact |
|---|---|
| Argonne | Wyman Harrison<br>Barney Nashold |
| **Project No.** | **Project Name** |
| AFP-59 | IRP Supplemental SI |

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315-432-0506 or 800-950-0506

**Special QA/QC Protocol (Circle)**

| | |
|---|---|
| EPA CLP | EPA SW 846 |
| (NYS DEC) | NYS DOH |
| NJ TIER I | CALIFORNIA |
| NJ TIER II | OTHER (Specify) |

| SAMPLE LOCATION / SAMPLE ID | Date | Time | TYPE Comp. | Grab | Aqueous | Soil | Other | A | B | C | D | E | F | G | H | I | J | K | Laboratory ID Number | VOA | SV | PCB/PEST | METALS | CN | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| JC4H1AS | 03DEC 91 | 1455 | | | | ✓ | | | | | | | | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | | | | |
| JC4H2AS | 03Dec 91 | 1630 | | | | ✓ | | | | | | | | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | | | | |
| Trip 9 | 03DEC 91 | 1330 | | | ✓ | | | | | | | | | | | | | | | ✓ | (method | 524.2 | VOC) | | | | | |

**PARAMETERS FOR ANALYSIS**

REMARKS: NYS DEC ASP.

Task No.

SAMPLERS NAME: Barney Nashold Laura Giblin SIGNATURE: Barney Nashold Laura Giblin

Barney Nashold: received 4 DEC 1048HR / Bill 12 DEC 91

Galson cooler ~~D-055~~ 03NOV91 D-036

| SAMPLES RELINQUISHED BY: | | SAMPLES RECEIVED BY: | |
|---|---|---|---|
| NAME: BARNEY NASHOLD<br>SIGNATURE: Barney Nashold | DATE: 3DEC91<br>TIME: 1830 | NAME:<br>SIGNATURE: | DATE:<br>TIME: |
| NAME:<br>SIGNATURE: | DATE:<br>TIME: | NAME:<br>SIGNATURE: | DATE:<br>TIME: |
| NAME:<br>SIGNATURE: | DATE:<br>TIME: | NAME:<br>SIGNATURE: | DATE:<br>TIME: |

Received For Laboratory By: / (Signature) DATE: TIME:

Custody Seal Intact? Sample ☐ Yes ☐ No ☐ N.A.

Shipment Complete? ☐ Yes ☐ No

| LabStor. Location (Ref. #) | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | |

2/89

TRIP #10 FEDEX AB# 1323800088

# Chain of Custody Record



| Company Name | Project Manager/Contact |
|---|---|
| Argonne | Wyman Harrison<br>Barney Nashold |

| Project No. | Project Name |
|---|---|
| AFP-57 | IRP Supplemental S.I. |

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315-432-0506 or 800-950-0506

Special QA/QC Protocol (Circle)
EPA CLP — EPA SW 846
NYS DEC — NYS DOH
NJ TIER I — CALIFORNIA
NJ TIER II — OTHER (Specify)

| SAMPLE LOCATION / SAMPLE ID | Date | Time | TYPE Comp. | Grab | Aqueous | Soil | Other | A | B | C | D | E | F | G | H | I | J | K | Laboratory ID Number | VOA | SV | PCB/PEST | METALS | CN | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| JC1HIAS | 04DEC 91 | 0940 | | | | ✓ | | | | | | | | | | | | | | ✓ | ☆ | ☆ | ☆ | ☆ | | | | | |
| JC1HICS | 04DEC 91 | 1000 | | | | ✓ | | | | | | | | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | |
| JC3HIAS | 04DEC 91 | 1225 | | | | ✓ | | | | | | | | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | |
| JC6HIAS | 04DEC 91 | 1600 | | | | ✓ | | | | | | | | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | |
| TRIP 10 | 04DEC 91 | 1745 | | | ✓ | | | | | | | | | | | | | | | ✓ | (Method 524.2 VOC) | | | | | | | | |

REMARKS: NYS DEC ASP. ☆Note: Only enough sample was available ~~for~~ BUM4DEC91 at the location represented by JC1HIAS to fill the 120ml VOA bottle. Please perform more analyses if possible. Our order of interest is coincidentally the same as the order in which parameters are listed above: VOA/SV/PCB/PEST/Metals/CN

Task No.

SAMPLERS NAME: Barney Nashold, Laura Giblin

SIGNATURE: BuNashold, Laura Giblin

Galson Cooler # D-075

| SAMPLES RELINQUISHED BY: | | SAMPLES RECEIVED BY: | |
|---|---|---|---|
| NAME: BARNEY NASHOLD<br>SIGNATURE: BuNashold | DATE: 4DEC91<br>TIME: 1745 | NAME:<br>SIGNATURE: | DATE:<br>TIME: |
| NAME:<br>SIGNATURE: | DATE:<br>TIME: | NAME:<br>SIGNATURE: | DATE:<br>TIME: |
| NAME:<br>SIGNATURE: | DATE:<br>TIME: | NAME:<br>SIGNATURE: | DATE:<br>TIME: |

Received For Laboratory By: (Signature) DATE: 5 Dec 91 TIME: 1245

Custody Seal Intact? Sample ☐ Yes ☐ No ☐ N.A.

Shipment Complete? ☐ Yes ☐ No

| LabStor. Location (Ref. #) | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | |

2/89#

TRIP # 11

# Chain of Custody Record



| Company Name | Project Manager/Contact |
|---|---|
| ARGONNE | Wyman Harrison<br>Barney Nashold |

| Project No. | Project Name |
|---|---|
| AFP-59 | IRP Supplemental S.I. |

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315-432-0506 or 800-950-0506

Special QA/QC Protocol (Circle)
EPA CLP — EPA SW 846
NYS DEC — NYS DOH
NJ TIER I — CALIFORNIA
NJ TIER II — OTHER (Specify)

PARAMETERS FOR ANALYSIS

| SAMPLE LOCATION / SAMPLE ID | Date | Time | TYPE Comp. | Grab | Aqueous | Soil | Other | A | B | C | D | E | F | G | H | I | J | K | Laboratory ID Number | VOA | SV | PCB/PEST | METALS | CN | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| JCSW7AS | 06 DEC 91 | 0745 | | | | ✓ | | | | | | | | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | | | | |
| JCSW7BS | 06 DEC 91 | 0800 | | | | ✓ | | | | | | | | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | | | | |
| JCBG1AS | 6 DEC 91 | 1100 | | | | ✓ | | | | | | | | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | | | | |
| TRIP BLANK #11 | 6 DEC 91 | 1430 | | | ✓ | | | | | | | | | | | | | | | ✓ | METHOD 524.2 VOC | | | | | | | |

REMARKS: NYS DEC ASP.

Task No.

Saturday Delivery
Note: Fedex confirmed del. was 7 DEC 91 1102.
Brian Coleman recorded, in error, time that he opened cooler: 9 Dec 0530.

SAMPLERS NAME: Laura Gobla, Barney Nashold
SIGNATURE: Laura Gobla, BWNashold

| SAMPLES RELINQUISHED BY: | | SAMPLES RECEIVED BY: | |
|---|---|---|---|
| NAME: BARNEY NASHOLD<br>SIGNATURE: BWNashold | DATE: 6 DEC 91<br>TIME: 1430 | NAME:<br>SIGNATURE: | DATE:<br>TIME: |
| NAME:<br>SIGNATURE: | DATE:<br>TIME: | NAME:<br>SIGNATURE: | DATE:<br>TIME: |
| NAME:<br>SIGNATURE: | DATE:<br>TIME: | NAME:<br>SIGNATURE: | DATE:<br>TIME: |

Received For Laboratory By: (Signature) DATE: TIME:

Custody Seal Intact? Sample ☐ Yes ☐ No ☐ N.A.

Shipment Complete? ☐ Yes ☐ No

| LabStor. Location (Ref. #) | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | |

#2898

TRIP 12

# Chain of Custody Record



| Company Name | Project Manager/Contact |
|---|---|
| Argonne | [illegible] |

| Project No. | Project Name |
|---|---|
| AF-59 | Argonne |

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Special QA/QC Protocol (Circle)
EPA CLP — EPA SW 846
NYS DEC — NYS DOH
NJ TIER I — CALIFORNIA
NJ TIER II — OTHER (Specify)

PARAMETERS FOR ANALYSIS

| SAMPLE LOCATION / SAMPLE ID | Date | Time | TYPE Comp. | Grab | Aqueous | Soil | Other | A | B | C | D | E | F | G | H | I | J | K | Laboratory ID Number | VOA | SV | PCB/PEST | Metals | CN | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| JCBG2AW | 9 DEC 91 | 1510 | | ✓ | ✓ | | | | | | | | | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | | | | |
| JCSW1AS | [illegible] | [illegible] | | | | ✓ | | | | | | | | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | | | | |
| JCSW4BS | [illegible] | [illegible] | | | | ✓ | | | | | | | | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | | | | |
| JCSW1BS-M | [illegible] | [illegible] | | | | ✓ | | | | | | | | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | | | | |
| TRIP 12 | [illegible] | 1230 | | | ✓ | | | | | | | | | | | | | | | ✓ | (methanol | | | 5 | 2 | 2 | VOC) | |

REMARKS: NYS DEC ASP.
Sample JCSW4BS-M: MS/MSD

Task No.

SAMPLERS NAME: [illegible] SIGNATURE: BWNashold

Green Cooler D-055

| SAMPLES RELINQUISHED BY: | | SAMPLES RECEIVED BY: | |
|---|---|---|---|
| NAME: BARNEY NASHOLD<br>SIGNATURE: BWNashold | DATE: 10 DEC 91<br>TIME: 1230 | NAME: [illegible]<br>SIGNATURE: | DATE:<br>TIME: |
| NAME:<br>SIGNATURE: | DATE:<br>TIME: | NAME:<br>SIGNATURE: | DATE:<br>TIME: |
| NAME:<br>SIGNATURE: | DATE:<br>TIME: | NAME:<br>SIGNATURE: | DATE:<br>TIME: |

Received For Laboratory By: DATE: [illegible]
(Signature): [illegible] TIME: [illegible]

Custody Seal Intact? Sample ☒ Yes ☐ No ☐ N.A.
Shipment Complete? ☒ Yes ☐ No

| LabStor. Location (Ref. #) | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | |

2698

E-14

TRIP 13

Coolers D-074, #165, D-077

# Chain of Custody Record

Page 1 of 1

| Company Name | Project Manager/Contact |
|---|---|
| ARGONNE | WYMAN HARRISON BARNEY NASHOLD |
| **Project No.** | **Project Name** |
| AFP-59 | IRP Supplemental S.I. |

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Special QA/QC Protocol (Circle)
EPA CLP — EPA SW 846
(NYSDEC) — NYS DOH
NJ TIER I — CALIFORNIA
NJ TIER II — OTHER (Specify)

PARAMETERS FOR ANALYSIS

| SAMPLE LOCATION / SAMPLE ID | Date 1992 | Time | TYPE Comp. | Grab | Aqueous | Soil | Other | A | B | C | D | E | F | G | H | I | J | K | Laboratory ID Number | VOA | SV | PCB/PEST | METALS | Cn | METHOD 524.2 VOA | METHOD 524.2 VOA | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | | | | | | 3 | 2 | 1 | 1 | 2 | 2 | | | | |
| JCDW1AW | 5JAN | 1045 | | ✓ | ✓ | | | | | | | | | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | | |
| JCSW1AW | 5JAN | 1315 | | ✓ | ✓ | | | | | | | | | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | | |
| JCDW5AW | 5JAN | 1700 | | ✓ | ✓ | | | | | | | | | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | | |
| JCSW5AW | 5JAN | 1800 | | ✓ | ✓ | | | | | | | | | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | | |
| JCDW6AW | 6JAN | 1418 | | ✓ | ✓ | | | | | | | | | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | | |
| ~~JCDW~~ JCSW6AW | 6JAN | 1500 | | ✓ | ✓ | | | | | | | | | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | | |
| TRIP BLANK #13 | 6JAN | 1655 | | | ✓ | | | | | | | | | | | | | | | | | | | | ✓ | ✓ | | | | |

Number of Containers

Task No.

REMARKS: NYSDECASP

SAMPLERS NAME: BARNEY NASHOLD SIGNATURE: Barney Nasholds

(Coolers D-074 = cluster 6, #165 = cluster 1
D-077 = cluster 5)

| SAMPLES RELINQUISHED BY: | | SAMPLES RECEIVED BY: | |
|---|---|---|---|
| NAME: BARNEY NASHOLD<br>SIGNATURE: Barney Nasholds | DATE: 6 JAN 92<br>TIME: 1655 | NAME:<br>SIGNATURE: | DATE:<br>TIME: |
| NAME:<br>SIGNATURE: | DATE:<br>TIME: | NAME: Anne Lee<br>SIGNATURE: Anne Lee | DATE: 1/6/92<br>TIME: 1915 |
| NAME:<br>SIGNATURE: | DATE:<br>TIME: | NAME:<br>SIGNATURE: | DATE:<br>TIME: |

Received For Laboratory By: (Signature) Anne Lee DATE: 1/6/92 TIME: 1915

Custody Seal Intact? Sample: ☐ Yes ☐ No ☐ N.A.

Shipment Complete? ☐ Yes ☐ No

| LabStor. Location (Ref. #) | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | |

2898

TRIP 14

# Chain of Custody Record

Number of containers

Page 1 of 1

| Company Name | Project Manager/Contact |
|---|---|
| Argonne | WYMAN HARRISON BARNEY NASHOLD |

| Project No. | Project Name |
|---|---|
| AFP-59 | IRP Supplemental S.I. |

**Galson Laboratories**
6601 Kirkville Road East
E. Syracuse, New York 13057
315-432-0506 or 800-950-0506

Special QA/QC Protocol (Circle)

| | |
|---|---|
| EPA CLP | EPA SW 846 |
| NYS DEC | NYS DOH |
| NJ TIER I | CALIFORNIA |
| NJ TIER II | OTHER (Specify) |

PARAMETERS FOR ANALYSIS

| SAMPLE LOCATION / SAMPLE ID | Date 92 | Time | TYPE Comp. | Grab | Aqueous | Soil | Other | A | B | C | D | E | F | G | H | I | J | K | Laboratory ID Number | VOA (3) | SV (2) | PCB/PEST (1) | METALS (1) | Cn (2) | METHOD 537 + HGA (2) | | | | | | Cooler # |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| JCBG2BW | 7JAN | 0900 | | | | | | | | | | | | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | D050 |
| JCDW3AW | 7JAN | 1111 | | | | | | | | | | | | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | D024 |
| JCSW3AW | 7JAN | 1201 | | | | | | | | | | | | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | D020 |
| JCDW9AW | 7JAN | 1650 | | | | | | | | | | | | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | N |
| JCSW9AW | 7JAN | 1727 | | | | | | | | | | | | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | N |
| JCDW4AW | 8JAN | 1505 | | | | | | | | | | | | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | D036 |
| JCDW4AW-M | 8JAN | 1505 | | | | | | | | | | | | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | MS/MSD | | | | | | D036 |
| JCSW4AW | 8JAN | 1625 | | | | | | | | | | | | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | 059 |
| JCSW7AW | 8JAN | 1710 | | | | | | | | | | | | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | 059 |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | Bun |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | Bun |
| TRIP BLANK 14 | 8JAN | 1845 | | | | | | | | | | | | | | | | | | | | | | | ✓ | | | | | | D034 |

REMARKS: Black greasy substance observed in JCDW4AW. It may be 'Crisco' used by drillers. Teflon lid liners fell out of lids of containers for JCDW4AW SV + JCDW4AW-M PCB/PEST. Containers were closed without liners for about 15 min. New caps with liners were then put on.

Task No.

SAMPLERS NAME:

SIGNATURE:

| SAMPLES RELINQUISHED BY: | | SAMPLES RECEIVED BY: | |
|---|---|---|---|
| NAME: BARNEY NASHOLD<br>SIGNATURE: B. Nashold | DATE: 8JAN<br>TIME: 1845 | NAME:<br>SIGNATURE: | DATE:<br>TIME: |
| NAME:<br>SIGNATURE: | DATE:<br>TIME: | NAME: Anne Lee<br>SIGNATURE: Anne Lee | DATE: 1-8-92<br>TIME: 21:00 |
| NAME:<br>SIGNATURE: | DATE:<br>TIME: | NAME:<br>SIGNATURE: | DATE:<br>TIME: |

Received For Laboratory By: (Signature) DATE: TIME:

Custody Seal Intact? Sample ☐ Yes ☐ No ☐ N.A.

Shipment Complete? ☐ Yes ☐ No

| LabStor. Location (Ref. #) | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | |

2869

TRIP ~~#~~ 15

10 JAN 92

# Chain of Custody Record

Page 1 of 1

| Company Name | Project Manager/Contact |
|---|---|
| [illegible] | [illegible] |

| Project No. | Project Name |
|---|---|
| [illegible] | TRIP [illegible] |

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6601 Kirkville Road East
E. Syracuse, New York 13057
315-432-0506 or 800-950-0506

Special QA/QC Protocol (Circle)
EPA CLP — EPA SW 846
NYS DEC — NYS DOH
NJ TIER I — CALIFORNIA
NJ TIER II — OTHER (Specify)

PARAMETERS FOR ANALYSIS

| SAMPLE LOCATION / SAMPLE ID | Date '92 | Time | TYPE Comp. | Grab | Aqueous | Soil | Other | A | B | C | D | E | F | G | H | I | J | K | Laboratory ID Number | VOA | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | | | | | | Number Rcti |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| JC D08 AW | 13 JAN | [illegible] | | | ✓ | | | | | | | | | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | Conti |
| JC D08 BW | 13 JAN | 1430 | | | ✓ | | | | | | | | | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | D055 |
| JC D08 AW | 13 JAN | 1510 | | | ✓ | | | | | | | | | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | D055 |
| JC D08 AW | 13 JAN | 1551 | | | ✓ | | | | | | | | | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | D065 |
| TRIP 15 | 10 JAN | 0950 | | | ✓ | | | | | | | | | | | | | | | | | | | | ✓ | | | | | | D058 |

REMARKS: [illegible] CS A30

Task No.

SAMPLERS NAME: Barney Nashold
SIGNATURE: B. Nashold

| SAMPLES RELINQUISHED BY: | | SAMPLES RECEIVED BY: | |
|---|---|---|---|
| NAME: BARNEY NASHOLD<br>SIGNATURE: B. Nashold | DATE: 10 JAN 92<br>TIME: 0950 | NAME: [illegible]<br>SIGNATURE: | DATE: 10 JAN 92<br>TIME: 0550 |
| NAME:<br>SIGNATURE: | DATE: 10 [illegible] 92<br>TIME: 1225 | NAME:<br>SIGNATURE: | DATE:<br>TIME: |
| NAME:<br>SIGNATURE: | DATE:<br>TIME: | NAME:<br>SIGNATURE: | DATE:<br>TIME: |

Received For Laboratory By: (Signature) [illegible] DATE: [illegible] TIME: [illegible]

Custody Seal Intact? Sample ☑ Yes ☐ No ☐ N.A.

Shipment Complete? ☑ Yes ☐ No

| LabStor. Location (Ref. #) | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | |

2/89

TRIP 16

# Chain of Custody Record



| Company Name | Project Manager/Contact |
|---|---|
| Argonne | WYMAN HARRISON<br>BARNEY NASHOLD |
| **Project No.** | **Project Name** |
| AFP-59 | IRP SUPPLEMENTAL S.I. |

**Galson Laboratories**
6601 Kirkville Road East
E. Syracuse, New York 13057
315-432-0506 or 800-950-0506

Special QA/QC Protocol (Circle)
EPA CLP — EPA SW 846
NYS DEC — NYS DOH
NJ TIER I — CALIFORNIA
NJ TIER II — OTHER (Specify)

PARAMETERS FOR ANALYSIS

| SAMPLE LOCATION / SAMPLE ID | Date JAN 1992 | Time | TYPE Comp. | Grab | Aqueous | Soil | Other | A | B | C | D | E | F | G | H | I | J | K | Laboratory ID Number | VOA (3ea) | SV (2ea) | PCB/PEST (1ea) | METALS (1ea) | Cn (3ea) | Method 504.1 VOA | | | | | Cooler # |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| JCDW4BW | 29 | 1540 | | | | | | | | | | | | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | D055 |
| JCDW4BW-M | 29 | 1540 | | | | | | MS/MSD | | | | | | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | D073 |
| JCSW4BW | 29 | 1640 | | | | | | | | | | | | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | D073 |
| JCSW7BW | 30 | 1050 | | | | | | | | | | | | | | | | | | * | ✓ | ✓ | ✓ | ✓ | | | | | | D055 |
| JCDW8BW | 30 | 1450 | | | | | | | | | | | | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | D005 |
| JCSW8BW | 30 | 1535 | | | | | | | | | | | | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | D005 |
| | | | | | | | | | | | | | | | | | | | *BWM | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | BWM |
| ~~TRIP 16~~ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | BWM |
| JCQC4WW | 30 | 1755 | | | | | | | | | | | | | | | | | | ✓ | | | | | | | | | | D073 |
| JCQC5XW | 30 | 1810 | | | | | | | | | | | | | | | | | | ✓ | | | | | | | | | | D073 |
| TRIP BLANK #16 | 30 | 1830 | | | | | | | | | | | | | | | | | | | | | | | ✓ | | | | | D005 |

Task No.

**REMARKS:** Two ea VOA's, One each of DW4 & SW4 temporarily capped with unlined caps. Note tags as those containers. *One VOA sample was broken during packing of JCSW7BW. Two containers sent. JCDW4BW-M is a field split for MS/MSD. (Blank per date =

**SAMPLERS NAME:** BWM BARNEY NASHOLD **SIGNATURE:** BWNashold 12/23/91)

| SAMPLES RELINQUISHED BY: | | SAMPLES RECEIVED BY: | |
|---|---|---|---|
| NAME: BARNEY NASHOLD<br>SIGNATURE: BWNashold | DATE 30 JAN 92<br>TIME: 1830 | NAME:<br>SIGNATURE: | DATE:<br>TIME: |
| NAME:<br>SIGNATURE: | DATE:<br>TIME: | NAME:<br>SIGNATURE: | DATE:<br>TIME: |
| NAME:<br>SIGNATURE: | DATE:<br>TIME: | NAME:<br>SIGNATURE: | DATE:<br>TIME: |

Received For Laboratory By: (Signature) DATE: TIME:

Custody Seal Intact? Sample ☑ Yes ☐ No ☐ N.A.

Shipment Complete? ☐ Yes ☐ No

| LabStor. Location (Ref. #) | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | |

2/89

TRIP 17

# Chain of Custody Record



| Company Name | Project Manager/Contact |
|---|---|
| Argonne | WYMAN HARRISON<br>BARNEY NASHOLD |
| **Project No.** | **Project Name** |
| AFP-59 | IRP Supplemental SI |

**Galson Laboratories**
6601 Kirkville Road East
E. Syracuse, New York 13057
315-432-0506 or 800-950-0506

**Special QA/QC Protocol (Circle)**

| | |
|---|---|
| EPA CLP | EPA SW 846 |
| (NYS DEC) | NYS DOH |
| NJ TIER I | CALIFORNIA |
| NJ TIER II | OTHER (Specify) |

| SAMPLE LOCATION / SAMPLE ID | Date 1992 | Time | TYPE Comp. | Grab | Aqueous | Soil | Other | A | B | C | D | E | F | G | H | I | J | K | Laboratory ID Number | VOA | SV | PCB/PEST | METALS | Cn | METHOD 524.2 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| JCDW5BW | JAN 31 | 1100 | | ✓ | ✓ | | | | | | | | | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | |
| ~~JCSW 0BW~~ | ---- | ---- | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| JCSW5BW | JAN 31 | 1140 | | ✓ | ✓ | | | | | | | | | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | |
| JCZLIAS | JAN 31 | 1700 | | ✓ | ✓ | | | | | | | | | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | |
| JCDW6BW | FEB 1 | 230 | | ✓ | ✓ | | | | | | | | | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | |
| JCSW6BW | FEB 1 | 1315 | | ✓ | ✓ | | | | | | | | | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | |
| JCDW1BW | FEB 1 | 1440 | | ✓ | ✓ | | | | | | | | | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | |
| JCSW1BW | FEB 1 | 1571 | | ✓ | ✓ | | | | | | | | | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | |
| TRIP BLANK # 17 | FEB 1 | 715 | | | ✓ | | | | | | | | | | | | | | | | | | | | ✓ | | | | |

**REMARKS:** Not homogenized in field. Please homogenize in lab.
JCZLIAS

**Task No.**

**SAMPLERS NAME:** BARNEY NASHOLD LAURA E GIBLIN **SIGNATURE:** B Nashold Laura E Giblin

| SAMPLES RELINQUISHED BY: | SAMPLES RECEIVED BY: |
|---|---|
| NAME: BARNEY NASHOLD DATE: FEB 1<br>SIGNATURE: B Nashold TIME: 1715 | NAME: LAURA E GIBLIN DATE:<br>SIGNATURE: Laura E Giblin TIME: |
| NAME: DATE:<br>SIGNATURE: TIME: | NAME: DATE:<br>SIGNATURE: TIME: |
| NAME: DATE:<br>SIGNATURE: TIME: | NAME: DATE:<br>SIGNATURE: TIME: |

Received For Laboratory By: (Signature) DATE: TIME:

Custody Seal Intact? Sample ☐ Yes ☐ No ☐ N.A.

Shipment Complete? ☐ Yes ☐ No

| LabStor. Location (Ref. #) | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | |

2892

TRIP 18

# Chain of Custody Record



| Company Name | Project Manager/Contact |
|---|---|
| Algonac | Lyman Davison / Barney Ushold |

| Project No. | Project Name |
|---|---|
| TP-59 | TRP Sampling 1/31 |

**Galson Laboratories**
6601 Kirkville Road East
E. Syracuse, New York 13057
315-432-0506 or 800-950-0506

Special QA/QC Protocol (Circle)

| | |
|---|---|
| EPA CLP | EPA SW 846 |
| NYS DEC | NYS DOH |
| NJ TIER I | CALIFORNIA |
| NJ TIER II | OTHER (Specify) |

PARAMETERS FOR ANALYSIS

| SAMPLE LOCATION / SAMPLE ID | Date | Time | TYPE Comp. | Grab | Aqueous | Soil | Other | A | B | C | D | E | F | G | H | I | J | K | Laboratory ID Number | VOA (3) | SV (2) | PCB/PEST (1) | Metals (1) | Cl (2) | Cyanide (2) | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| JCDW3BW | [illegible] | 1110 | | ✓ | ✓ | | | | | | | | | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | Cooler |
| JCDW1BW | [illegible] | 1120 | | ✓ | ✓ | | | | | | | | | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | D053 |
| JCSW3BW | [illegible] | 1115 | | ✓ | ✓ | | | | | | | | | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | D-053 |
| JCDW1BW | [illegible] | 1045 | | ✓ | ✓ | | | | | | | | | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | D-055 |
| JCSW9BW | [illegible] | 1118 | | ✓ | ✓ | | | | | | | | | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | D-051 |
| TCDW1BW | [illegible] | 1115 | | ✓ | ✓ | | | | | | | | | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | D-051 |
| TRIP 18 | [illegible] | [illegible] | | | ✓ | | | | | | | | | | | | | | | | | | | | ✓ | | | | | | |

REMARKS: [illegible]

Task No.

SAMPLERS NAME: BARNEY NASHOLD / LAURAE GIELIN
SIGNATURE: Barney Nasholed

| SAMPLES RELINQUISHED BY: | | SAMPLES RECEIVED BY: | |
|---|---|---|---|
| NAME: BARNEY NASHOLD<br>SIGNATURE: Barney Nasholed | DATE: 03 Feb 92<br>TIME: 1800 | NAME: LAURAE GIELIN<br>SIGNATURE: [illegible] | DATE: 03 Feb 92<br>TIME: 1549 |
| NAME: [illegible]<br>SIGNATURE: | DATE: 03 Feb 92<br>TIME: 1850 | NAME: Anne Lee<br>SIGNATURE: [illegible] | DATE: 2/5/92<br>TIME: [illegible] |
| NAME:<br>SIGNATURE: | DATE:<br>TIME: | NAME:<br>SIGNATURE: | DATE:<br>TIME: |

Received For Laboratory By: (Signature) DATE: TIME:

Custody Seal Intact? Sample ☐ Yes ☐ No ☐ N.A.

Shipment Complete? ☑ Yes ☐ No

| LabStor. Location (Ref. #) | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | |

2/89

3 4444 00033656 0

B