DRAFT

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

Volume 2: Appendices A – E

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Energy Systems Division
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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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Energy Systems Division,
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January 1994

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

Appendix A:

Data Validation and Usability

Appendix A-1: Data Validation

Appendix A-2: Data Usability

Appendix A-1:

Data Validation

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 it's 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

Appendix A-1: Data Validation

Report 1

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

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:

- o data validation log,
- o telephone log,
- o completeness log, and
- o 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
JCQC1TW	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
JCQC1TW	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, PhD
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

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

ECHEM INC.
SAMPLE PREPARATION AND ANALYSIS SUMMARY
FOR NYSDEC

CLIENT: Argonne Nat'l Labs
SITE: Air Force Plant 59
CASE NO.
SDG NO. J5554
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
TCQC1TW		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		5690-001		11-07-91	11-08-91	11-19-91	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. 3/91

ECHEM INC.
ORGANICS
COMPLETENESS LOG

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

CASE # SDG# 1-5554

	SAMPLE #	JCCN5CS	JCDW1AS	JCDW1BS	JCDW1CS	JCDW3AS	JCSD1AS	JCSD2AS	JCSW4AS	JCSW4BS	JCSW4CS	JCSW5AS	JCSW5BS	JCSW6AS	JCSW6BS	JCSW8AS	JCSW8BS	JCOC17W	JCOC28W	JCOC3XW	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
	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																								
	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																								
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.
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

Semivolatiles:	JCCNSCS	JCDW1AS	JCDW1BS	JCDW1CS
	JCDW3AS	JCDW3BS	JCQC1TW	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/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.

HOLDING TIMES:

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

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

Action:

- 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:

- 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
		JCDW3AS
		JCDW3BS
	11-19-91/13:40	JCSW8AS
	11-20-91/09:47	JCQC1TW
		JCQC2BW
	12-14-91/13:26	JCSW6AS
		JCDW1AS
		JCDW1BS
		JCDW1CS
GCMSD(#4)	12-16-91/16:23	JCSW4AS
		JCCNSCS
		JCSW4BS
		JCSW4CS

Action:

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

Sincerely,
ECHEM INC.

Bruce K. Wallin, PhD
Vice President

enclosures

Air Force Plant 59
Case No. NONE

Table I. Validation Action Summary

Sample No.	SVOA
JCDW1AS	
JCDW1BS	
JCCNSCS(RE)	R2, (R1)
JCDW1CS	
JCDW3AS	
JCDW3BS	
JCQC1TW	
JCQC2BW	
JCQC3XW	
JCSD1AS	
JCSD2AS	
JCSW4AS	J3
JCSW4BS	
JCSW5AS	
JCSW5BS	
JCSW6AS	
JCSW4CS	
JCSW8AS	
JCSW8BS	
JCSW6BS	

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 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.
ORGANICS
COMPLETENESS LOG

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

CASE # SDG# 1-5554

	SAMPLE #	JCCNSC5	JCDW1A5	JCDW1B5	JCDW1C5	JCDW3A5	JCDW3B5	JCQC1TW	JCQC2BW	JCQC3XW	JCSD1A5	JCSD2A5	JCSW4A5	JCSW4B5	JCSW4C5	JCSW5A5	JCSW5B5	JCSW6A5	JCSW6B5	JCSW8A5	JCSW8B5
	1A																				
	1E																				
	2A																				
	2B																				
	3A																				
VOA	3B																				
	4A																				
	5A																				
	6A																				
	7A																				
	8A																				
	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
SVOA	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
	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

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	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
JCQC1TW		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

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	JCDW1CS	JCDW3AS
	JCDW3BS	JCQC2BW	JCQC1TW	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 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 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	ALD	DIEL	END	DDT
Q1-0058(MSB)					140/136	

Action:

- o none, sample results reported as CRQL U

Sincerely,
ECHEM INC.

Bruce K. Wallin, PhD
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.

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) 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 (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
SITE: Air Force Plant 59
CASE NO.
SDG NO. 1-5554
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	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. 3/91

ECHEM INC.
ORGANICS
COMPLETENESS LOG

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

	SAMPLE #	JCCN3CS	JCDW1AS	JCDW1CS	JCDW3AS	JCDW3BS	JCQC2BW	JMQC1TW	JCQC3XW	JCSD1AS	JCSD2AS	JCSW04AS	JCSW05AS	JCSW4BS	JCSW4CS	JCSW5BS	JCSW6AS	JCSW6BS	JCSW8AS	JCSW8BS				
VOA	1A																							
	1E																							
	2A																							
	2B																							
	3A																							
	3B																							
	4A																							
	5A																							
	6A																							
	7A																							
	8A																							
SVOA	1B																							
	1C																							
	1F																							
	2C																							
	2D																							
	3C																							
	3D																							
	4B																							
	5B																							
	6B																							
	6C																							
	7B																							
	7C																							
	8B																							
	8C																							
PEST	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					
	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.

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
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
		JCSW8BS
CCB3	beryllium	JCSW5AS
		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 analyte 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:

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

- 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)

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 CLP (Vol. VIII, E-116) are tabulated below:

SAMPLE	ELEMENT	%D
JCSW5BS	zinc	12.4

Action:

- 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, PhD
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 #	ICSW6AS	ICSW8BS	ICCN5CS	ICDW1AS	ICDW1BS	ICDW1CS	ICDW3AS	ICDW3BS	ICACITW	ICAC3XW	ICSD1AS	ICSD2AS	ICSW4AS	ICSW4BS	ICSW4CS	ICSW5AS	ICSW5BS	ICSW6BS	ICSW8AS	ICQC2BW
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

ECHEM INC.

SAMPLE PREPARATION AND ANALYSIS SUMMARY

FOR NYSDEC

CLIENT: Argonne Nat'l Labs

SITE: Air Force Plant 59

CASE NO. _____

SDG NO. 1-5554

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 ✓		5554-002		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 ✓		5602-001		11-05-91	11-07-91	11-13-91	8	6
JCDW3BS ✓		5602-002	Soil	11-05-91	11-07-91	11-13-91	8	6
JCQC1TW ✓		5602-003	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. 3/91

ECHEM INC.
SAMPLE PREPARATION AND ANALYSIS SUMMARY
FOR NYSDEC

CLIENT: Argonne Nat'l Labs
SITE: Air Force Plant 59
CASE NO.
SDG NO. I-5554
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	11-13-91	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		5839-010		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
JCQC1TW		5602-003	WATER	11-06-91	11-07-91	11-13-91	7	6
JCQC2XW		5630-001	WATER	11-08-91	11-07-91	11-13-91	6	6
JCSD1AS		5770-006	Soil	11-09-91	11-18-91	11-21-91	4	3
JCSD2AS		5770-004		11-11-91	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
JCQC2BW		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. 3/91

Appendix A-1:

Report 5

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

Volatiles:	JCCNCAW	JCCW1AW	JCCW2AW
(USEPA 524.2)	JC0F1AW	JC0F2AW	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 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:

	PERCENT RECOVERIES		
SAMPLE	D4DCE	D8T	BFB
JCCW2AW	121		
JCCW1AW	126		
JC0F2AW	123		

Action:

- o for sample JC0F2AW recovery ≥10%; sample results ≥MDL are flagged as estimated (J)
- o for samples JCCW2AW and JCCW1AW none, results reported as MDL 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
JC0F2AW		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

BLANKS:

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 BLANK5	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	JC0F1AW
	JC0F2AW

Action:

- o associated sample results <MDL (flagged J); changed to MDL (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	JC0F1AW
		JC0F2AW	
		TRIP BLANK4	
		TRIP BLANK5	
		TRIP BLANK7	

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)
- 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 validator 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:

- 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
- 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
		JCCW1AW
	11-27-91/13:47	JC0F1AW
		JC0F2AW
	11-30-90/12:40	TRIP BLANK7
B	11-22-91/16:28	JCCNCAW
		TRIP BLANK5
		TRIP BLANK4

Action:

- o for RRF $\leq$0.10, results $\geq$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, PhD
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
JC0F2AW	J2,J4,R4
TRIP BLANK4	R4
TRIP BLANK5	R4
TRIP BLANK7	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 #	JCCNCAW	JCCWIAW	JCCW2AW	JCOF1AW	JCOF2AW	TRIP BLANK 4	TRIP BLANK 5	TRIP BLANK 7
	1A	X	X	X	X	X	X	X	X
	1E	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

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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	3/16	3/17		
	2-5807	1-8-92	8/0	0/5	0/5	0/5		

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
SITE: Air Force Plant 59
CASE NO.
SDG NO. 2-5807
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 BLANK4		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. 3/91

Appendix A-1:

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-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
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
		JCCW1AW
		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, PhD
Vice President

enclosures

Air Force Plant 59
Case No. NONE

Table I. Validation Action Summary

Sample No.	SVOA
JCCNCAW	
JCCW1AW	
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

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, 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	RECEIPT
JCCNCAW		5808-001	WATER	11-18-91	11-18-91	11-21-91	3	3
JCCW1AW		5807-002	WATER	11-17-91	11-18-91	11-21-91	4	3
JCOF1AW		5868-001	WATER	11-27-91	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

ORGANICS
COMPLETENESS LOG

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

CASE # SDG# 2-5807

	SAMPLE #	JCCNCAW	JCCW1AW	JCOF1AW	JCOF2AW	JCCW2AW
VOA	1A					
	1E					
	2A					
	2B					
	3A					
	3B					
	4A					
	5A					
	6A					
	7A					
	8A					
	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					
SVOA	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
	8B	X	X	X	X	X
	8C	X	X	X	X	X
	1D					
	2E					
	2F					
	3E					
PEST	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
JC0F1AW JC0F2AW

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	
JC0F1AW	
JC0F2AW	

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	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	11-22-91	4	4

COMMENTS:

HOLD TIME COLLECT = DATE COLLECTED MINUS DATE EXTRACTED

HOLD TIME RECEIPT = DATE RECEIVED MINUS DATE EXTRACTED

REV. 3/91

ECHEM INC.
ORGANICS
COMPLETENESS LOG

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

	SAMPLE #	JCCNCAW	JCCW1AW	JCCW2AW	JCOF1AW	JCOF2AW
VOA	1A					
	1E					
	2A					
	2B					
	3A					
	3B					
	4A					
	5A					
	6A					
	7A					
	8A					
SVOA	1B					
	1C					
	1F					
	2C					
	2D					
	3C					
	3D					
	4B					
	5B					
	6B					
	6C					
	7B					
	7C					
	8B					
	8C					
PEST	1D	X	X	X	X	X
	2E	X	X	X	X	X
	2F					
	3E	X	X	X	X	X
	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

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

TAL Inorganics: JCCNCAW JCCW1AW
JCCW2AW JC0F1AW
JC0F2AW

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:

	HOLDING TIME (DAYS) FROM	
SAMPLE	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-106) are tabulated below:

CALIBRATION DATE/TIME	INSTRUMENT	ELEMENT	%OF TRUE
12-17-91/08:30	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	
CCB7	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	JC0F2AW
	copper	JC0F1AW
	nickel	JC0F2AW
	vanadium	
CCB7	zinc	JC0F1AW
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
ICB1	calcium	-45
	iron	-15
CCB1	calcium	-60
CCB2	antimony	-4.6
	calcium	-93
	iron	-24
	vanadium	-10
CCB3	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
JC0F2AW	arsenic	118

Action:

- none, sample results reported as IDL U

Sincerely,
ECHEM INC.

Bruce K. Wallin, PhD
Vice President

enclosures

Air Force Plant 59
Case No. NONE

Table I. Validation Action Summary

Aluminum		Magnesium	
Antimony		Manganese	
Arsenic		Mercury	
Barium	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 reproduceability.

ECHEM INC.

SAMPLE PREPARATION AND ANALYSIS SUMMARY

FOR NYSDEC

CLIENT: Argonne Nat'l Labs

SITE: Air Force Plant 59

CASE NO. _____ SDG NO. 2-5807

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. 3/91

ECHEM INC.

SAMPLE PREPARATION AND ANALYSIS SUMMARY

FOR NYSDEC

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

CASE NO. SDG NO. 2-5807 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
JCCW1AW		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. 3/91

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

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
	JC4H1AS	JC4H2AS	JC6H1AS	
	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 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
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	AVG. RRF
B#2	12-10-91	2-butanone		.069

Associated samples:

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

Action:

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

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.	VOA
JCBG1AS	
JCSW7AS	
JCSW7BS	
JCSW9AS	
JCSW9BS	
JC1H1AS	
JC1H1CS	R4
JC3H1AS	
JC4H1AS	
JC4H2AS	
JC6H1AS	
TRIP BLANK9	
HOLD BLANK10	
HOLD BLANK11	
TRIP BLANK9	
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 (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 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: 6044/6004/6007/5983 SDG NO. 3-5983

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
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

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:

- 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
SITE: IRP Supplemental S.I.
CASE NO.
SDG NO. 3-5983
ANALYTICAL FRACTION: Semivolatiles

CLIENT SAMPLE ID	EPA SAMPLE NO.	LAB. SAMPLE ID	MATRIX	DATE COLLECTED	DATE RECEIVED	DATE EXTRACTED	HOLD TIME TO EXTRACTION	
							COLLECT	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

Appendix A-1:

Report 11

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

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
JCBG1AS	
JCSW7AS	
JCSW7BS	
JCSW9AS	
JCSW9BS	
JC1H1AS	
JC1H1CS	
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
SITE: IRP Supplemental S.I.
TASK CASE NO.
SDG NO. 3-5983
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	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
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
JC1H1AS		6007-001		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

COMMENTS:

HOLD TIME COLLECT = DATE COLLECTED MINUS DATE EXTRACTED

HOLD TIME RECEIPT = DATE RECEIVED MINUS DATE EXTRACTED

REV. 3/91

ECHEM INC.
ORGANICS
COMPLETENESS LOG

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

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

	SAMPLE #	JCBG1AS	JCSW07AS	JCSW17BS	JCSW09AS	JCSW09BS	JC1H1AS	JC1H1CS	JC3H1AS	JC4H1AS	JC4H2AS	JC611AS	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							
	1C	X	X	X	X	X	X	X	X	X	X							
	1F	X	X	X	X	X	X	X	X	X	X							
	2C																	
	2D	X	X	X	X	X	X	X	X	X	X							
	3C																	
	3D	X	X	X	X	X	X	X	X	X	X							
SVOA	4B	X	X	X	X	X	X	X	X	X	X							
	5B	X	X	X	X	X	X	X	X	X	X							
	6B	X	X	X	X	X	X	X	X	X	X							
	6C	X	X	X	X	X	X	X	X	X	X							
	7B	X	X	X	X	X	X	X	X	X	X							
	7C	X	X	X	X	X	X	X	X	X	X							
	8B	X	X	X	X	X	X	X	X	X	X							
	8C	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

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Appendix A-1:

Report 12

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

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:

			ACTION LEVEL	
BLANK ID	PARAMETER	CONCENTRATION	WATER	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:

- for recoveries <30%, results ≥IDL are flagged as estimated (J) and detection limit values (IDL U) are flagged as unusable (R)
- 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 >5CRDL with RPD's that exceed 20% and for samples containing <5CRDL 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:

- 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:

- 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.

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.
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		
—	3-5-983	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: Aramco Mt'll Lab
CASE # SDG# 3-5983

SAMPLE #	JC8G1AS	JCSW7AS	JCSW7BS	JCSW9AS	JCSW9BS	JC1H1CS	JC3H1AS	JC4H1AS	JC4H2AS	JC6H1AS
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

ECHEM INC.
SAMPLE PREPARATION AND ANALYSIS SUMMARY
FOR NYSDEC

CLIENT: Argonne Nat'l Lab
CASE NO. V
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
JC1H1CS		6007-002		12-04-91	12-05-91	12-11-91	7	6
JC3H1AS		6007-003		12-04-91	12-05-91	12-11-91	7	6
JC4H1AS		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
JC6H1AS		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. 3/91

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. 3/91

Appendix A-1:

Report 13

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

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:

	PERCENT RECOVERIES		
SAMPLE	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/TIME	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:

- for RRF $\leq$0.10, results $\geq$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

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 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

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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
Q1-0086	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 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	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	JCSW5AW	JCSW6AW
		JCSW3AW	JCDW6AW
		JCDW3AW	JCDW9AW
		JCBG2BW	
	01-30-92/22:33	JCDW4AW	JCDW8AW
		JCDW8RW	JCSW4AW
		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	
JCSW5AW	
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	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

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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:

- data validation log,
- telephone log,
- completeness log, and
- 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
JCDW4AW					128/126	

Action:

- 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	
JCSW5AW	
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
SITE: IRP Supplemental S.I.
CASE NO.
SDG NO. 5-6384
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	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. 3/91

ECHEM INC.

ORGANICS

COMPLETENESS LOG

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

TASK CASE #6384/6415/6444 SDG# S-6384

	SAMPLE #	SCBG&BW	SCDPIWAW	SCDW1WAW	SCDW3AW	SCDW4AW	SCDW5AW	SCDW6AW	SCDW8AW	SCDW8RW	SCDW9AW	SCSW1AW	SCSW3AW	SCSW4AW	SCSW5AW	SCSW6AW	SCSW7AW	SCSW8AW	SCSW9AW	TRIP BLANK12	TRIP BLANK14	TRIP BLANK15	HOLD BLANK13	HOLD BLANK16
VOA	1A	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
	2A	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
	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
	5A	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
	7A	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
	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
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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	ACTION LEVEL 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	

Associated 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
PBW	nickel	JCSW1AW
	vanadium	JCSW3AW
		JCSW6AW
	vanadium	JCSW5AW
		JCSW8AW

Action:

- o associated sample results $\geq$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 JCDW3AW
CCB4	zinc	JCDW4AW
CCB8	vanadium	JCSW8AW JCDPWAW JCDW8AW 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	ELEMENT	% RECOVERY
JCDW4AW	antimony	69

Action:

- 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:

- 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:

- 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

Aluminum		Magnesium	
Antimony	J4	Manganese	
Arsenic		Mercury	J6
Barium		Nickel	A1
Beryllium	A1	Potassium	
Cadmium		Selenium	J7
Calcium		Silver	
Chromium		Sodium	
Cobalt		Thallium	J7
Copper	A1	Vanadium	A1,J3
Iron	A1	Zinc	A1,J3
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 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 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.

R1 - 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

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ECHEM INC.
INORGANICS
COMPLETENESS LOG

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

SAMPLE #	JCRG2BW	JCDPWAW	JCDWIAW	JCDW3AW	JCDW4AW	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
__NA__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
TASK/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

ECHEM INC.
SAMPLE PREPARATION AND ANALYSIS SUMMARY
FOR NYSDEC

CLIENT: Argonne 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. 3/91

Appendix A-1:

Report 17

ECHEM INC.
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25 March 1992

Dr. A. Dallas Wait
Director, Chemistry Division
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
	JCSW3BW	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
	JCSW1BW
	JCDW3BW
	JCDW3RW
VBLK6	JCSW3BW

TRIP BLANK ID.	ASSOCIATED SAMPLES
TRIP BLANK17	JCSW3BW
	JCDW9BW

FIELD BLANK ID.	ASSOCIATED SAMPLES
HOLD BLANK17	JCSW3BW

Action:

- associated sample results <MDL (flagged J); changed to MDL (U)
- 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
C(#3)	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 $\leq$0.10, results $\geq$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 1,1,2,2-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

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# 6-167703

	SAMPLE #	TCDPW8W	TCDW1BW	TCDW3BW	TCDW4BW	TCDW5BW	TCDW6BW	TCDW8RW	TCDW9BW	TCDW3RW	TCSW1BW	TCSW3BW	TCSW4BW	TCSW5WBW	TCSW6RW	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	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	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	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	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	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	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	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	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	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
SITE: AFP 59
CASE NO.
SDG NO. 6-6703
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

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
Director, Chemistry Division
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 (R)

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.

							RECOVERY (%)				
SAMPLE	PHE	CLPH	DCB	DNP	TCB	CRE	ACE	NPH	DNT	PCP	PYR
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

INSTR.	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	

INSTR.	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	

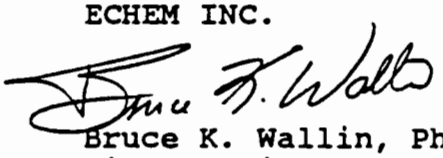
Associated samples:

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 SITE: AFP 59

CASE NO. SDG NO. 6-6703 ANALYTICAL FRACTION: Semivolatiles

CLIENT SAMPLE ID	EPA SAMPLE NO.	LAB. SAMPLE ID	MATRIX	DATE COLLECTED	DATE RECEIVED	DATE EXTRACTED	HOLD TIME TO EXTRACTION	
							COLLECT	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
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
Director, Chemistry Division
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	JCDW5BW	JCDW6BW	JCDW8BW
	JCDW9BW	JCSW1BW	JCSW3BW	JCSW4BW
	JCSW5BW	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	
MB					140	

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.	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 (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 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
JCDW3RW		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
Director, Chemistry Division
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	JCSW8BW	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:

			ACTION LEVEL	
BLANK ID	PARAMETER	CONCENTRATION	WATER	SOIL
CCB5	calcium	119	595	
	iron	36	180	
	nickel	7	35	
	zinc	5	25	
CCB6	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.	
PB	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	JCDW8BW
		JCDW4BW	

Action:

- 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
JCDW4BWMS	thallium	63

Action:

- 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:

- 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:

- 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:

- 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. 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 reproduceability.

ECHEM INC.
INORGANICS
COMPLETENESS LOG

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

SAMPLE #	ICDPW1BW	ICDW01BW	ICDW03BW	ICDW03RW	ICDW04BW	ICDW05BW	ICDW06BW	ICDW08BW	ICDW09BW	ICSW01BW	ICSW03BW	ICSW04BW	ICSW05BW	ICSW06BW	ICSW07BW	ICSW08BW	ICSW09BW
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
SITE: AFP 59
CASE NO.
SDG NO. 6-6703
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
JCDPWBW		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. U
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. 3/91

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
Director, Chemistry Division
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/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 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

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

ECHEM INC.

ORGANICS
COMPLETENESS LOG

SITE: AFP 59 CLIENT: Argonne Nat'l

CASE # SDG# 7-[illegible]-779

	SAMPLE #	JC3LIAS
VOA	1A	X
	1E	X
	2A	
	2B	X
	3A	
	3B	X
	4A	X
	5A	X
	6A	X
	7A	X
	8A	X
SVOA	1B	X
	1C	X
	1F	X
	2C	
	2D	X
	3C	
	3D	X
	4B	X
	5B	X
	6B	X
	6C	X
	7B	X
	7C	X
	8B	X
	8C	X
PEST	1D	X
	2E	
	2F	
	3E	
	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
JC2L1A5		6779-001	SOIL	01-31-92	01-31-92	02-06-92	1c	6

COMMENTS:

HOLD TIME COLLECT = DATE COLLECTED MINUS DATE ANALYZED

HOLD TIME RECEIPT = DATE RECEIVED MINUS DATE ANALYZED

REV. 3/91

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
Director, Chemistry Division
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
* * - 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
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

INSTR.	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:

- 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 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 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	RECEIPT
JC3LIA-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

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
Director, Chemistry Division
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 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.

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	RECEIPT
TC2 LIAS		6779-001	SOIL	01-31-92	02-01-92	02-11-92	1	10

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.

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

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 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

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Environmental Consultants with Offices in Cambridge, MA, Boulder, CO and Ann Arbor, MI

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 was 44%. Therefore, the lead data are considered usable but estimated (j) values and may be biased 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 I): Aldrin at 7.6 ppb in JCDW1AS, 4,4'-DDE 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 JC5W9B5.

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 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 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 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 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 JC2L1AS) 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 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. 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 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.

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 JC2L1AS contained 130 ppb of Aroclor 1260 and JCIH1AS 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 PAHs 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 PAHs 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 JC2L1AS 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 (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. 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 selenium 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 usable 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, 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, 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. 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 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 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 nickel 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 contaminants 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 fluoranthene, pyrene, chrysene, and bis(2-ethylhexyl)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 5 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

Dallas Wait

A. Dallas Wait, Ph.D.
Director, Chemistry Division

Enclosures

Appendix B: Well Data and Lithologic 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:	6 1/4" & 6 1/4"
LOCATION:	Johnson City, NY	RIG TYPE:	Canterra CT 350	GROUND ELEVATION:	831.83'
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:	831.93'
SCREEN:	4" Cont. Wound PVC	SEAL LENGTH/TYPE:	5' / Bentonite	TOC ELEVATION	834.57'
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 gray 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) 9'-10' Brown fine to coarse sand, trace silt and clay	10
12		0	2/5/5/7	6"	10'-11.5' SAB 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	4/5/23/28	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					62.5' Heaving sands in casing. SAB cuttings. cuttings	60
62.5					Roller bit refused at 62.5' – Boulder likely.	
65					Boring terminated at 62.5'. Alternating layers of coarse sand and gravel from 38' to 62.5'. (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:	Canterra 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:	88.0'	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				DESCRIPTION	DEPTH
	SAMPLE NUMBER	HNU (PPM)	STP TEST BLOWS / 6"	REC (in.)		
33	cutting					
35	3 4	0	3/5/7/13	24"	33' – 34.5' SAB 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') (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.) 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. 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				DESCRIPTION	DEPTH
	SAMPLE NUMBER	HNU (PPM)	STP TEST BLOWS / 6"	REC (in.)		
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:	Canterra 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 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				DESCRIPTION	DEPTH
	SAMPLE NUMBER	HNU (PPM)	STP TEST BLOWS / 6"	REC (in.)		
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) 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
78				0	(Begin 11-25-91 at 0600) (Water at 14.3') 78' Eight feet of heaving sand in casing. Gray coarse sand and fine gravel in cuttings. No large gravel felt.	75
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:	Cantera 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						
					(Begin 11-19-91 at 0600 hours)	
75	--- 12	0	6/20/31/33	18"	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:	Canterra 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:	48.5' / 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 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	9/9/8/7	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. (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') 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				DESCRIPTION	DEPTH
	SAMPLE NUMBER	HNU (PPM)	STP TEST BLOWS / 6"	REC (in.)		
33						
35	5	0	cuttings		SAB (8" casing set at 36') (End 1200 hours)	35
38						
40	6	0	5/6/11/14	24"	(Begin 11-15-91 at 0600 hours) (Drive 6" casing) 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 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 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				DESCRIPTION	DEPTH
	SAMPLE NUMBER	HNU (PPM)	STP TEST BLOWS / 6"	REC (in.)		
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
86.5					(Begin 11-16-91 at 0600 hour) (Water level at 17.5') 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:	Canterra 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	829.70'
SLOT SIZE:	0.010	FILTER LENGTH/TYPE:	22.5' / No. 2 Sand	STICK UP/DOWN:	-0.50'

DEPTH	SAMPLE COLLECTION DATA				DESCRIPTION	DEPTH
	SAMPLE NUMBER	HNU (PPM)	STP TEST BLOWS / 6"	REC (in.)		
2	1	0	8/16/20	6"	Asphalt (Begin 10-31-91 at 1239 hour) 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 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 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 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				DESCRIPTION	DEPTH
	SAMPLE NUMBER	HNU (PPM)	STP TEST BLOWS / 6"	REC (in.)		
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 8" 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				DESCRIPTION	DEPTH
	SAMPLE NUMBER	HNU (PPM)	STP TEST BLOWS / 6"	REC (in.)		
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:	Cantera 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'	PROTOP 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 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				DESCRIPTION	DEPTH
	SAMPLE NUMBER	HNU (PPM)	STP TEST BLOWS / 6"	REC (in.)		
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						
	12				58' – 59.5' Gray, fine to coarse sand and gravel, trace silt and clay	
60	13	0	32/28/22/22	18"	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				DESCRIPTION	DEPTH
	SAMPLE NUMBER	HNU (PPM)	STP TEST BLOWS / 6"	REC (in.)		
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:	Cantera 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	
10					(3" spoon)	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
					SAB	
50					SAB (End 1500 hour)	50
					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:	Canterra 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				DESCRIPTION	DEPTH
	SAMPLE NUMBER	HNU (PPM)	STP TEST BLOWS / 6"	REC (in.)		
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						5
8		0	9/8/6/12	6"	6' - 7' SAB 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) 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 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 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				DESCRIPTION	DEPTH
	SAMPLE NUMBER	HNU (PPM)	STP TEST BLOWS / 6"	REC (in.)		
31	ST-1 (Cont.)		--	0" 36"	28'-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' 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				DESCRIPTION	DEPTH
	SAMPLE NUMBER	HNU (PPM)	STP TEST BLOWS / 6"	REC (in.)		
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'	
					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:	Canterra 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)	
30	SWS ST 1		---	25" 36"	SAB Shelby Tube Sample 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:	Canterra 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:Cemt 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 1406 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
					(Begin 11-17-91 at 0600 hour)	
29					Brown fine sand and silt, little clay	
30					Boring terminated at 29' (End 0635 hour) (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:	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 15'-16' Brown, coarse sand, trace gravel, moist (3" spoon)	15
18	CHEM	0	8/11/16/19	8"	16'-17' SAB 17'-18' Brown, coarse gravel and coarse sand, wet (3" spoon)	
26.5					SAB (End 0840 hours)	20 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.: SW8	PROJECT: AFP#59 IRP SI	DATE: 11/4/91

PROJECT NO:	91230	DRILLER:	MARCOR	DRILLING BIT:	8 1/4"
LOCATION:	Johnson City, NY	RIG TYPE:	Canterra CT 350	GROUND ELEVATION:	830.20'
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:	23'	GROUT LENGTH/TYPE:	7.5' / 10:90 Bent:Cemt Mix	PAD ELEVATION:	830.26'
SCREEN:	2" Cont. Wound PVC	SEAL LENGTH/TYPE:	3' / Bentonite	TOC ELEVATION	829.85'
SLOT SIZE:	0.010	FILTER LENGTH/TYPE:	12.5' / No. 2 Sand	STICK UP/DOWN:	-0.35'

DEPTH	SAMPLE COLLECTION DATA: SAMPLE NUMBER	HNU (PPM)	STP TEST BLOWS / 6"	REC (in.)	DESCRIPTION	DEPTH
4"					Asphalt (Begin 1629 hour)	
					4" – 1' Railroad tie	
2					1'–2' Brownish, black gravel fill	
					2'–3' Brown gravel and sand fill	
4		0	28/35/14/10	12"	3'–4' Brown sand , some silt, some clay, trace gravel	
						5
7						
9		3	2/2/3/3	24"	Gray, fine sand, some silt, trace clay and gravel	
						10
					Brown, fine sand and silt, trace clay and gravel (Note: Cuttings from 7'–14' have strong petroleum odor and gray, oily sheen)	
14						
16		0	1/3/2/2	6"	Wet, gray, coarse sand and gravel, trace clay and silt (First water at 14.4')	15
					SAB (End 1800 hours)	20
22						
23					(Begin 11–05–91 at 0600) (water at 16.77)	
					Boring terminated at 23' (End 0900 hour) (water level in well after completion is 13.06')	25
30						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) 2' – 3' Yellow, coarse sand 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 (End 1000 hours)	20 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				DESCRIPTION	DEPTH
	SAMPLE NUMBER	HNU (PPM)	STP TEST BLOWS / 6"	REC (in.)		
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 (2) 0.0	3/2/1/5	2"	(1) Gray, coarse sand in spoon tip. (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' (Bruker determined existance of alaphitic alkenes and napthalene) (End 1000 HOUR)	15 20 25 30

PROPORTIONS USED: TRACE = 0–10%, LITTLE = 10–20%, SOME 20–35%, AND = 35–50%

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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:**	Canterra 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
6"					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 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 Oily, gray coarse sand	
					Boring terminated at 14' (Bruker detect alaphitic alkenes and napthalene) (End 1245 hours)	15 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.: 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:	Canterra 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				DESCRIPTION	DEPTH
	SAMPLE NUMBER	HNU (PPM)	STP TEST BLOWS / 6"	REC (in.)		
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' Boring installed at 30° from verticle (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:	Canterra CT 150	GROUND ELEVATION:	829.27'
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	
					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'	20
					Boring installed at 30° from verticle	
					(End 1700 hours)	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.: 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:	Canterra 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				DESCRIPTION	DEPTH
	SAMPLE NUMBER	HNU (PPM)	STP TEST BLOWS / 6"	REC (in.)		
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) 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' (End 1555 Hour)	15 20 25 30

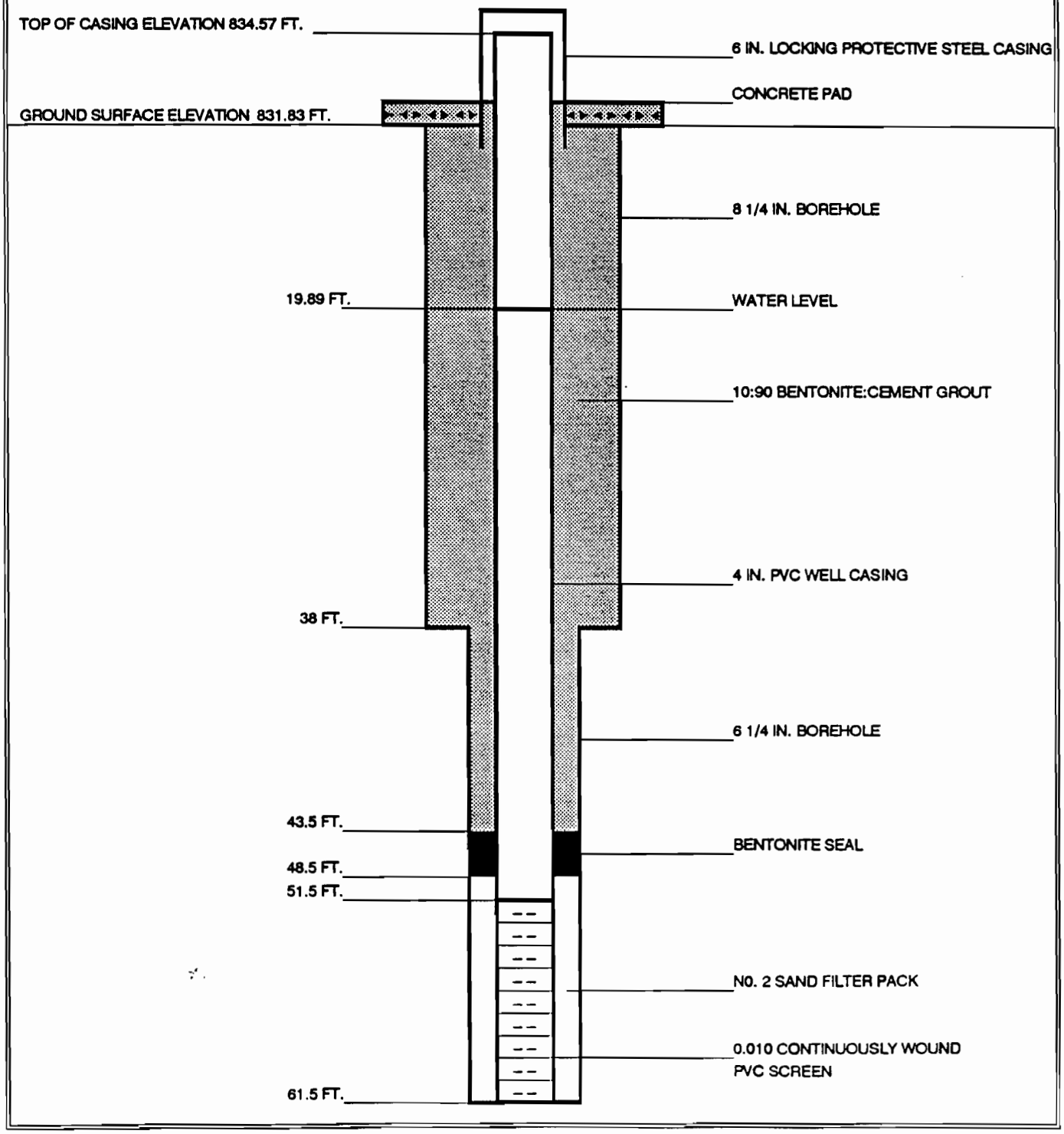
PROPORTIONS USED: TRACE = 0–10%, LITTLE = 10–20%, SOME 20–35%, AND = 35–50%

Appendix B-2:

Well Completion Record

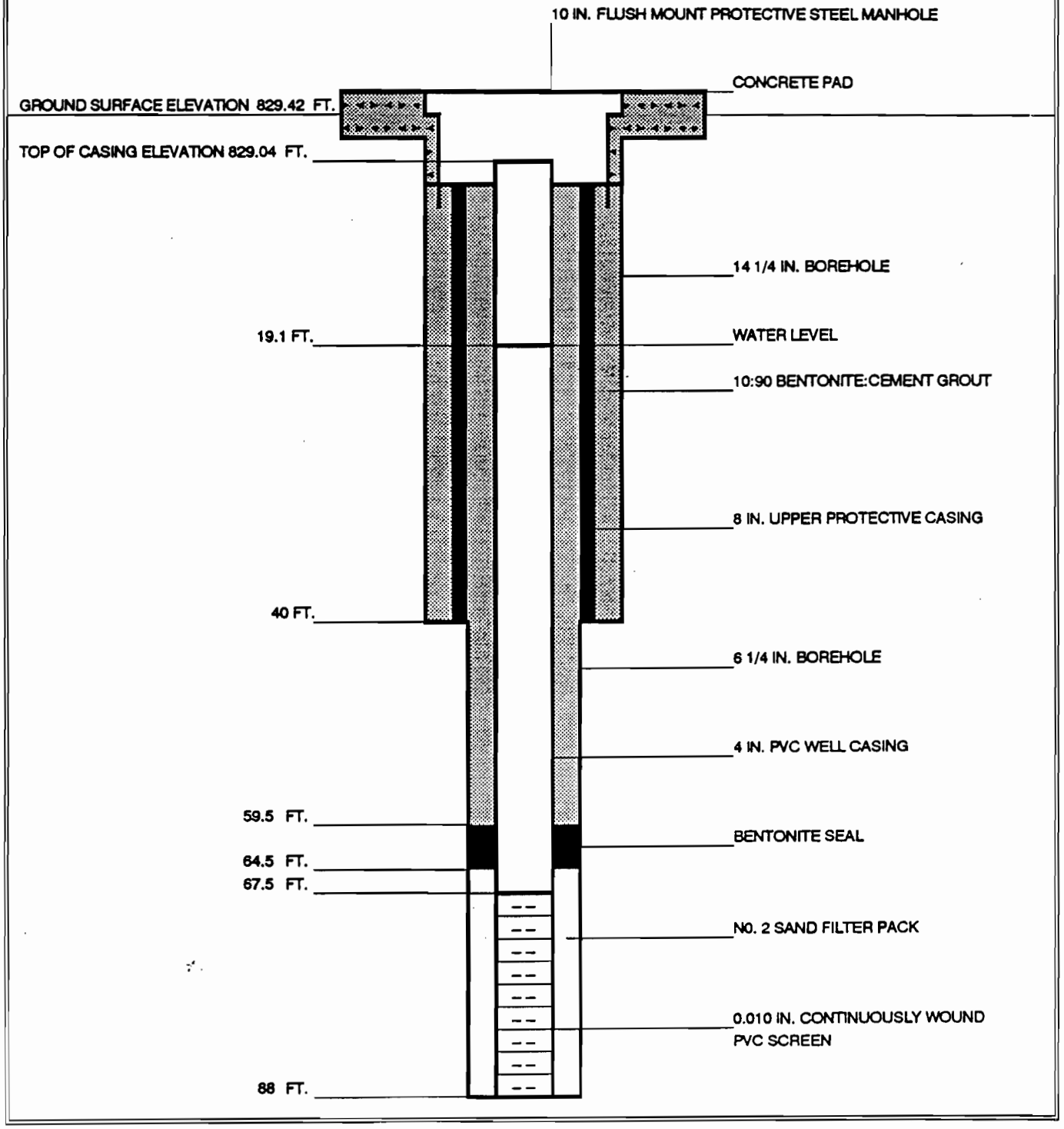
DW1 WELL COMPLETION RECORD | ARGONNE NATIONAL LABORATORY

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:	831.83 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:	6 in. SU Lock Steel
WELL DEPTH:	61.5 ft.	GROUT LENTGH/TYPE:	43.5 ft. / 10:90 Bent:Cemt. Mix	PAD ELEVATION:	831.93 ft.
SCREEN:	4 In. Con. Wnd PVC	SEAL LENGTH/TYPE:	5 ft. / bentonite	TOC ELEVATION:	834.57 ft.
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.



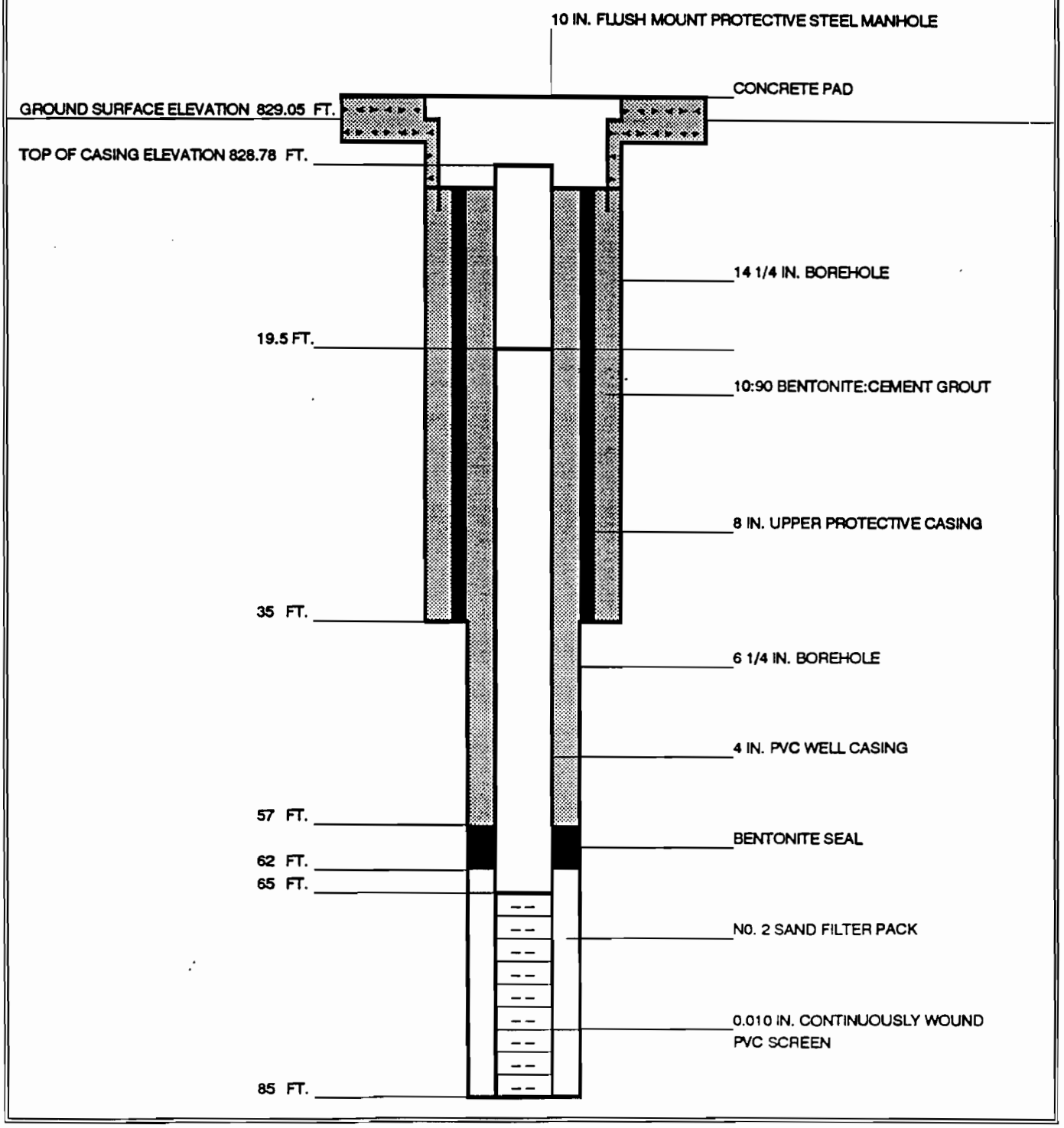
DW3 WELL COMPLETION RECORD | ARGONNE NATIONAL LABORATORY

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.



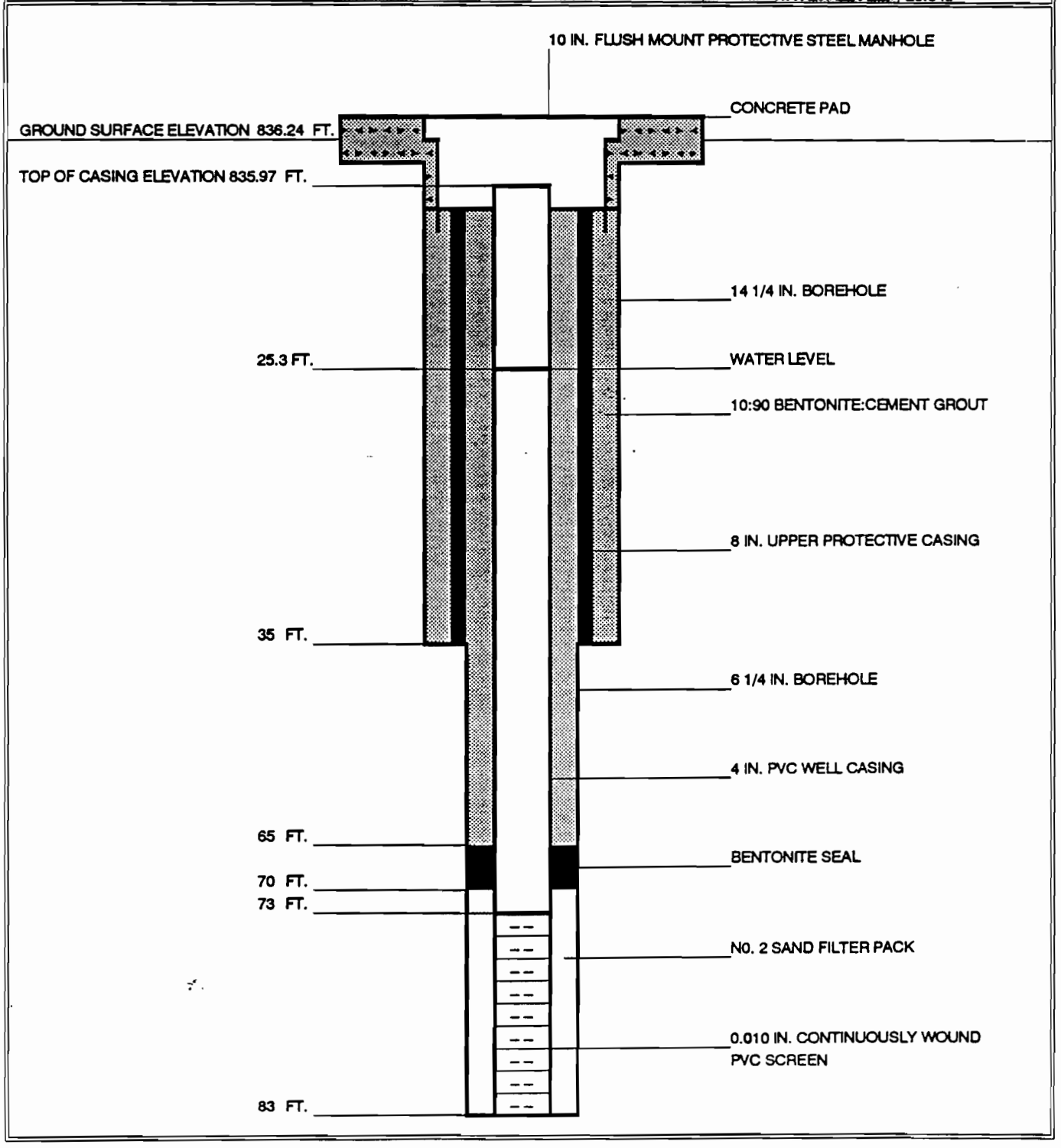
DW4 WELL COMPLETION RECORD | ARGONNE NATIONAL LABORATORY

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.



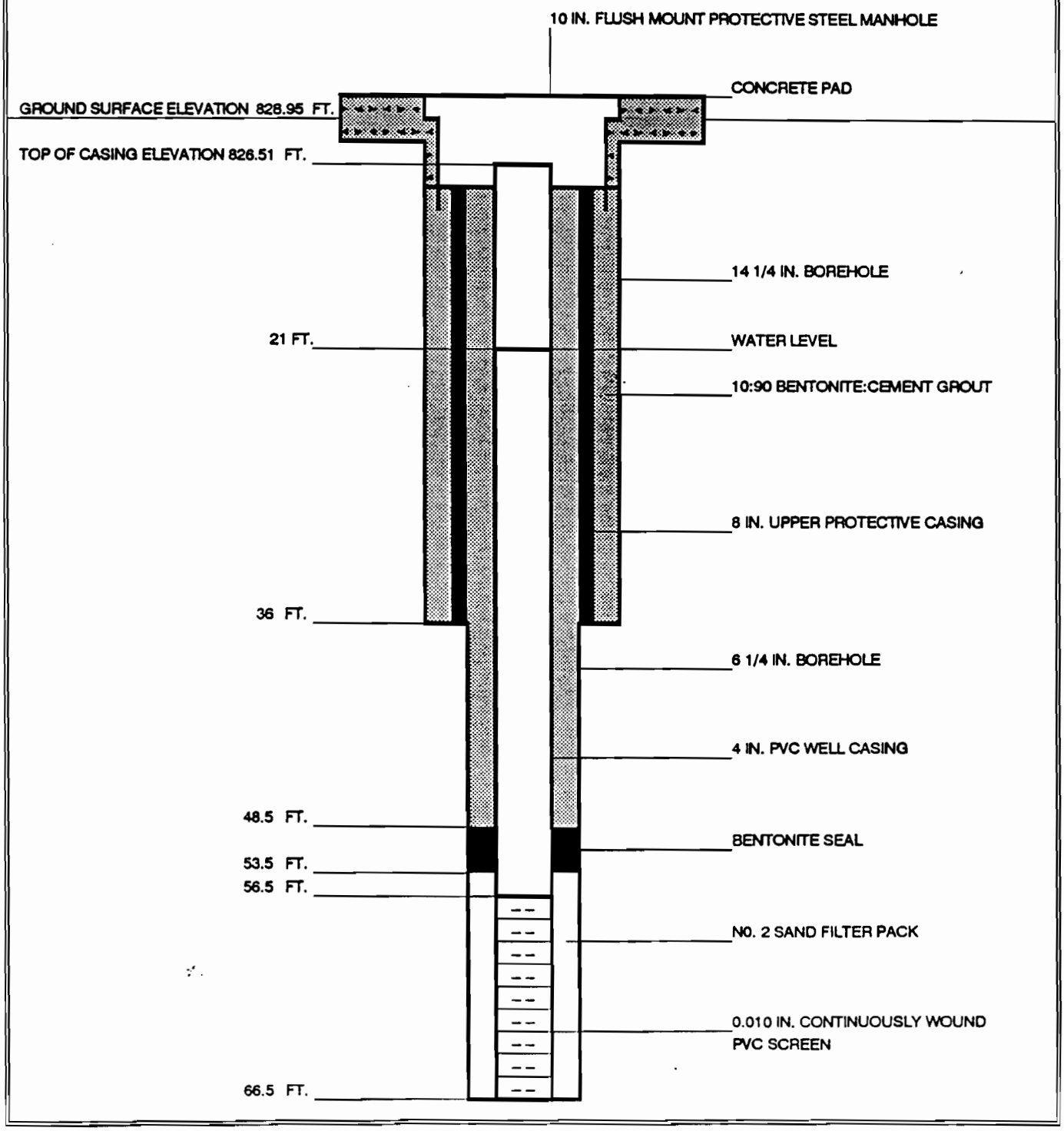
DW5 WELL COMPLETION RECORD | ARGONNE NATIONAL LABORATORY

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.



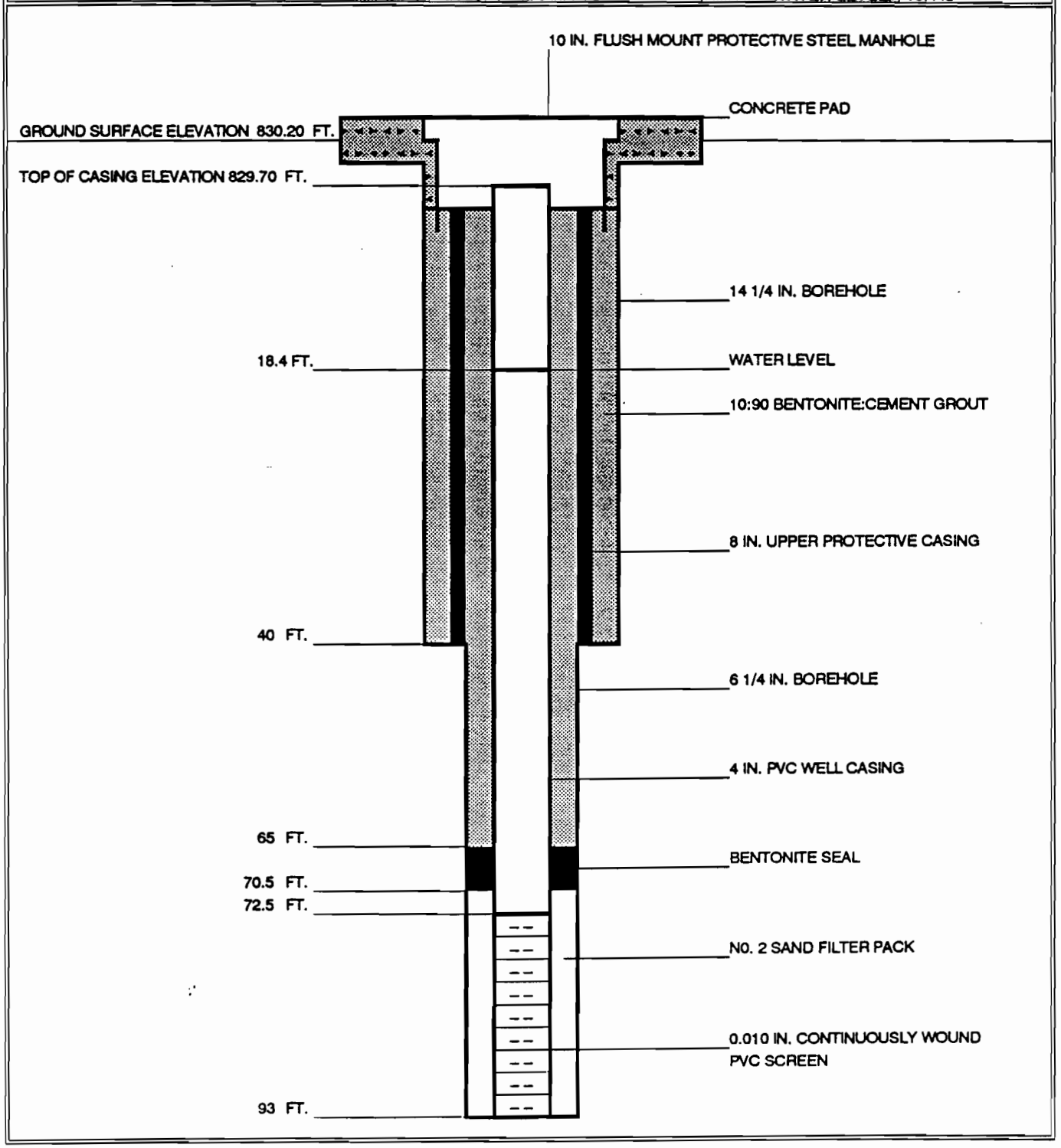
DW6 WELL COMPLETION RECORD | ARGONNE NATIONAL LABORATORY

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 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:	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.



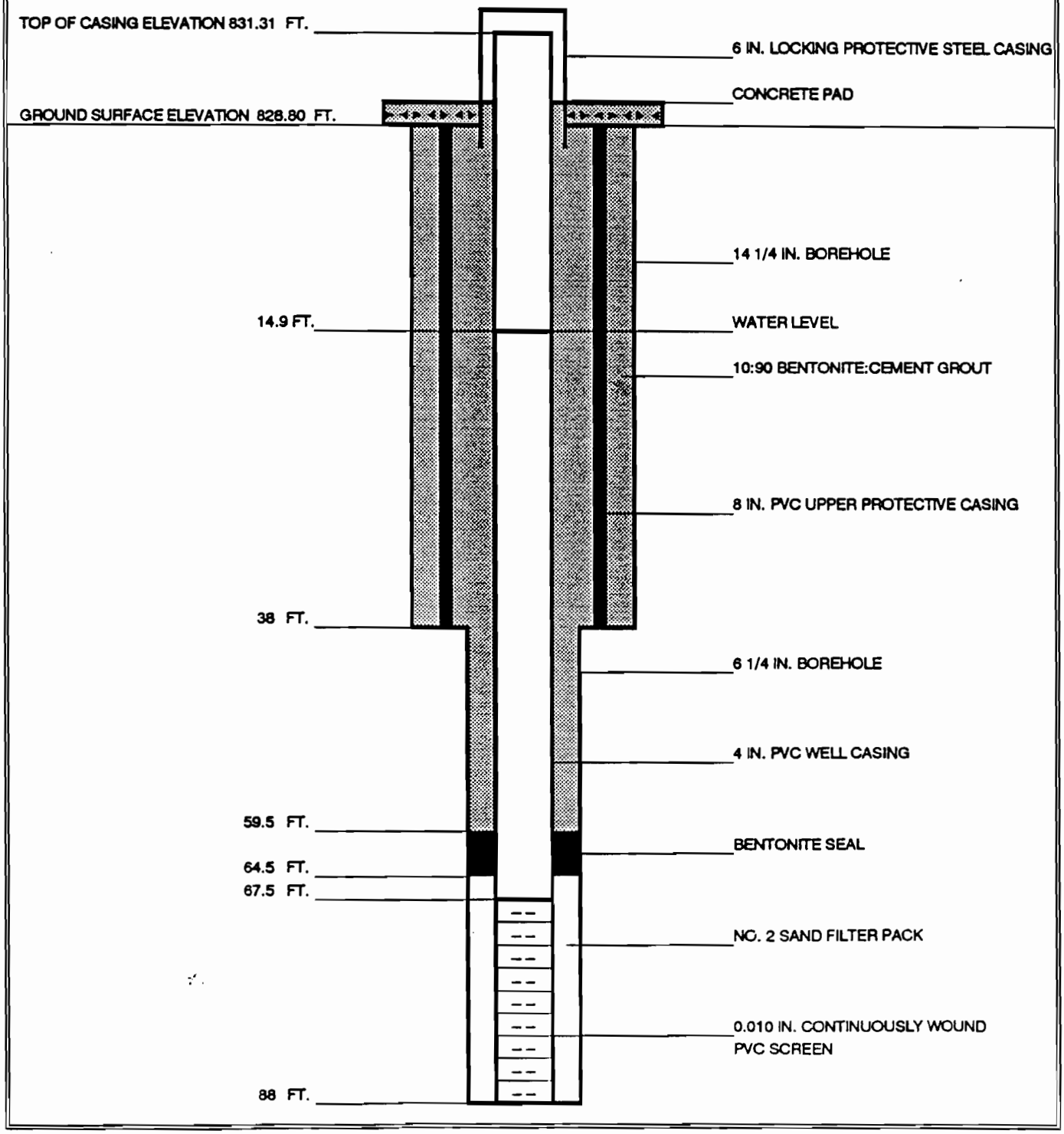
DW8 WELL COMPLETION RECORD | ARGONNE NATIONAL LABORATORY

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.



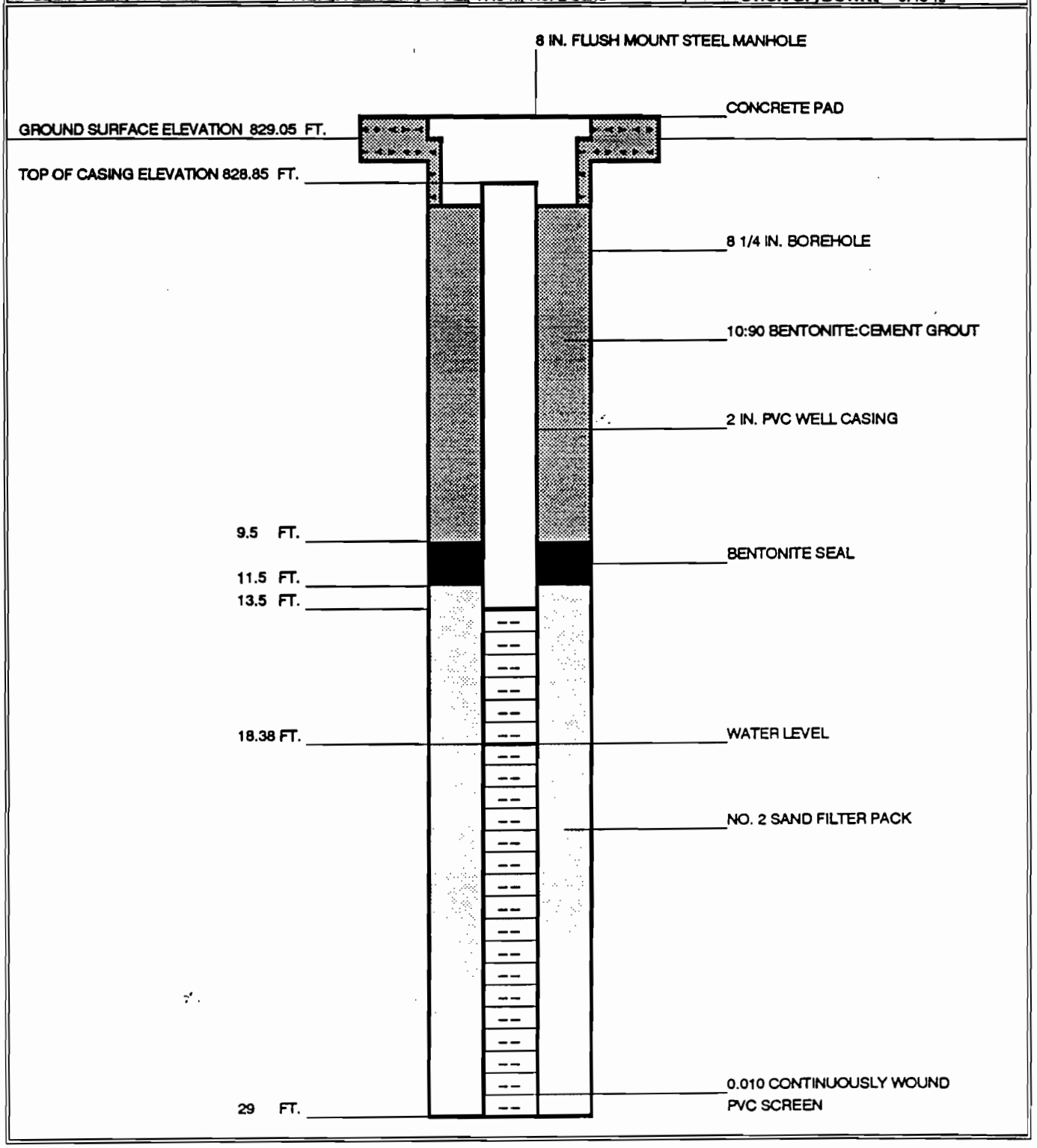
DW9 WELL COMPLETION RECORD | ARGONNE NATIONAL LABORATORY

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 Hau	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:	38 ft. 8 in. PVC	WATER LEVEL:	14.9 ft.



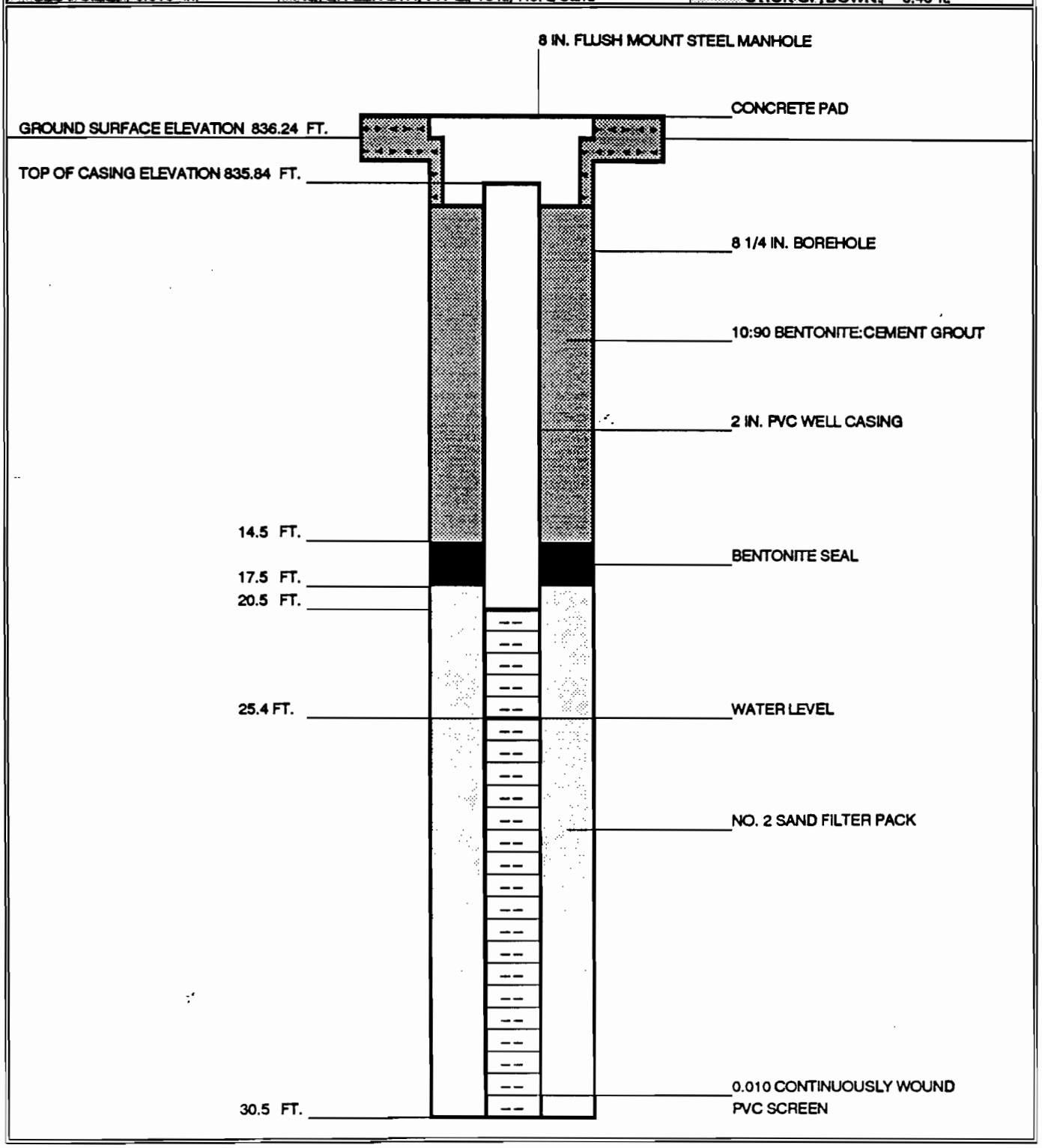
SW4 WELL COMPLETION RECORD | ARGONNE NATIONAL LABORATORY

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.



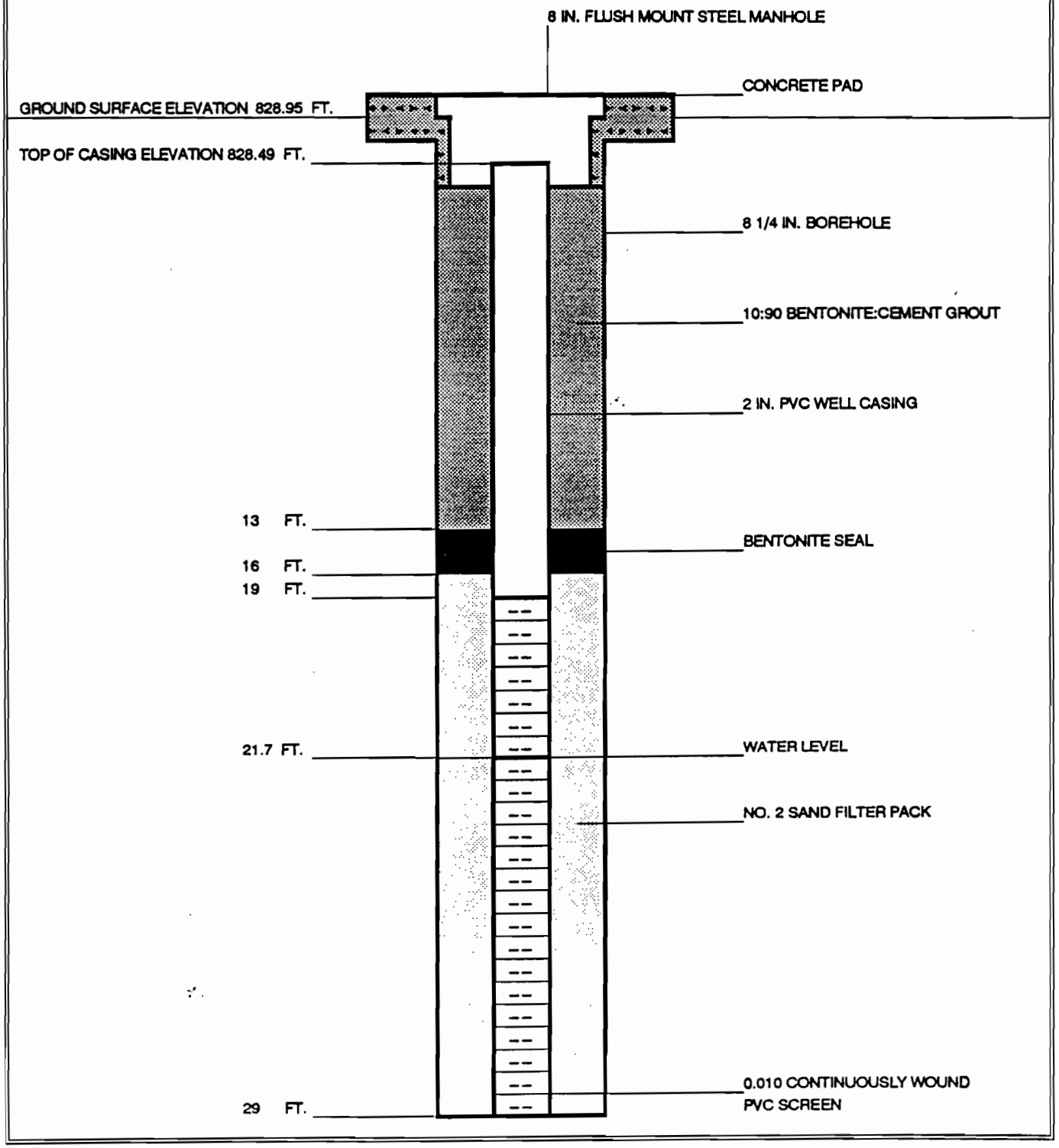
SW5 WELL COMPLETION RECORD | ARGONNE NATIONAL LABORATORY

PROJECT NO:	91230	DRILLER:	MARCOR	DRILLING BIT:	8 1/4 in.
LOCATION:	Johnson City, NY	RIG TYPE:	Canterra CT 350	GROUND ELEVATION:	836.24 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:	30.5 ft.	GROUT LENTGH/TYPE:	14.5 ft. / 10:90 Bent:Cemt. Mix	PAD ELEVATION:	836.32 ft.
SCREEN:	2 in. Con. Wnd PVC	SEAL LENGTH/TYPE:	3 ft. / bentonite	TOC ELEVATION:	835.84 ft.
SLOT SIZE:	0.010 in.	FILTER LENGTH/TYPE:	13 ft./ No. 2 Sand	STICK UP/DOWN:	-0.40 ft.



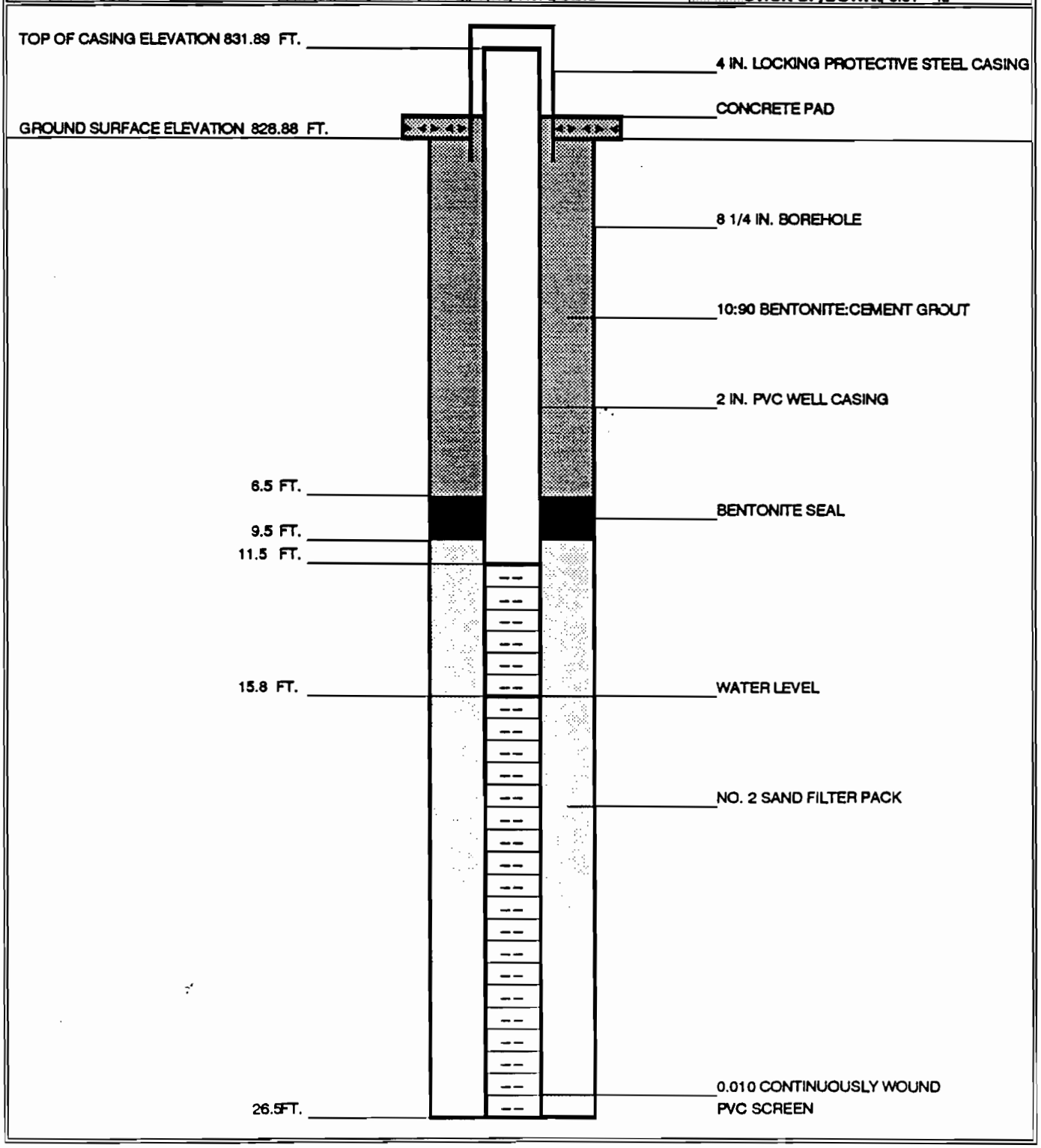
SW6 WELL COMPLETION RECORD | ARGONNE NATIONAL LABORATORY

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.



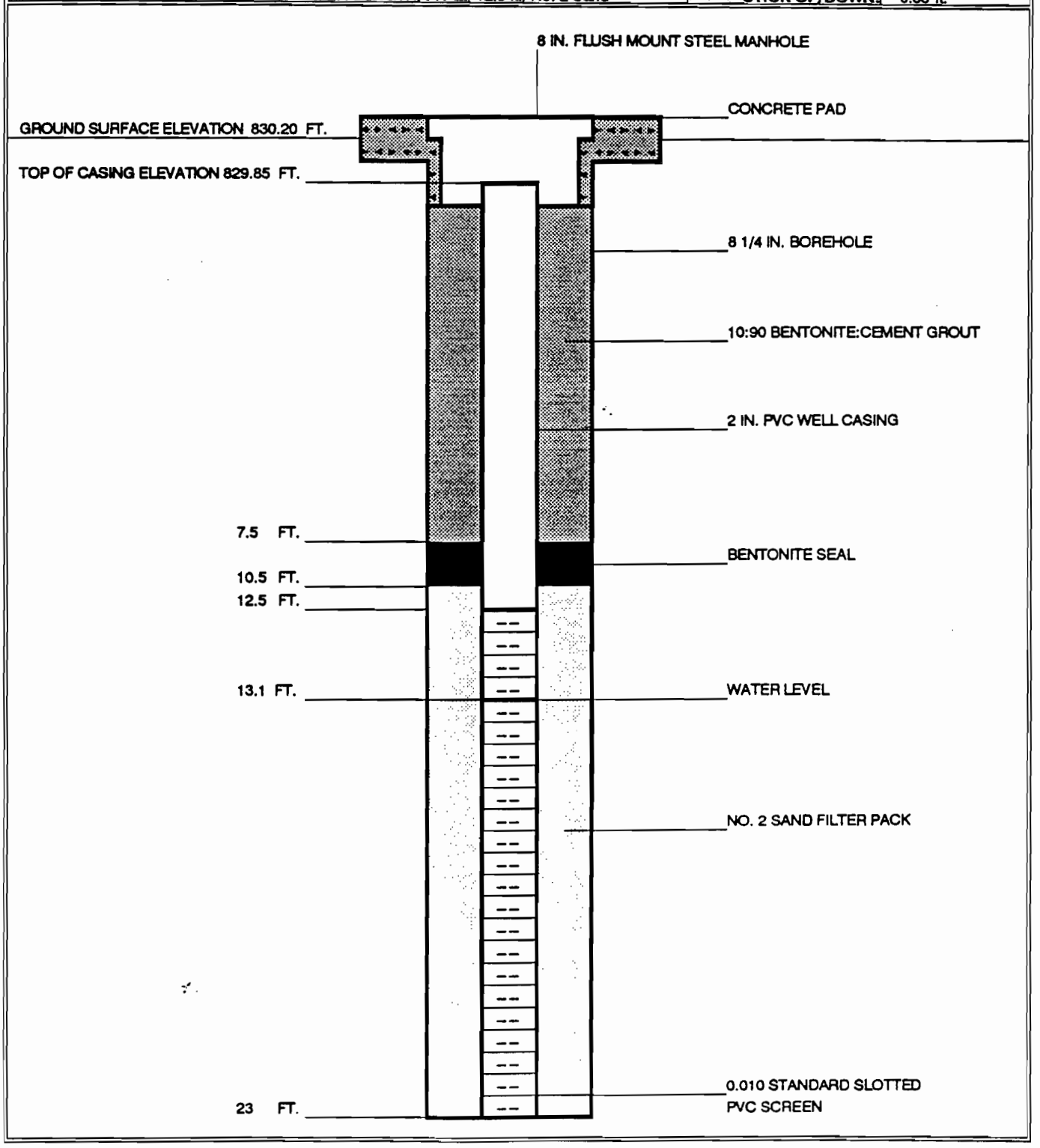
SW7 WELL COMPLETION RECORD | ARGONNE NATIONAL LABORATORY

PROJECT NO:	91230	DRILLER:	MARCOR	DRILLING BIT:	8 1/4 in.
LOCATION:	Johnson City, NY	RIG TYPE:	Canterra CT 350	GROUND ELEVATION:	828.88ft.
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:	829.12ft.
SCREEN:	2 in. Con. Wnd PVC	SEAL LENGTH/TYPE:	3 ft. / bentonite	TOC ELEVATION:	831.89ft.
SLOT SIZE:	0.010 in.	FILTER LENGTH/TYPE:	17 ft./ No. 2 Sand	STICK UP/DOWN:	3.01 ft.



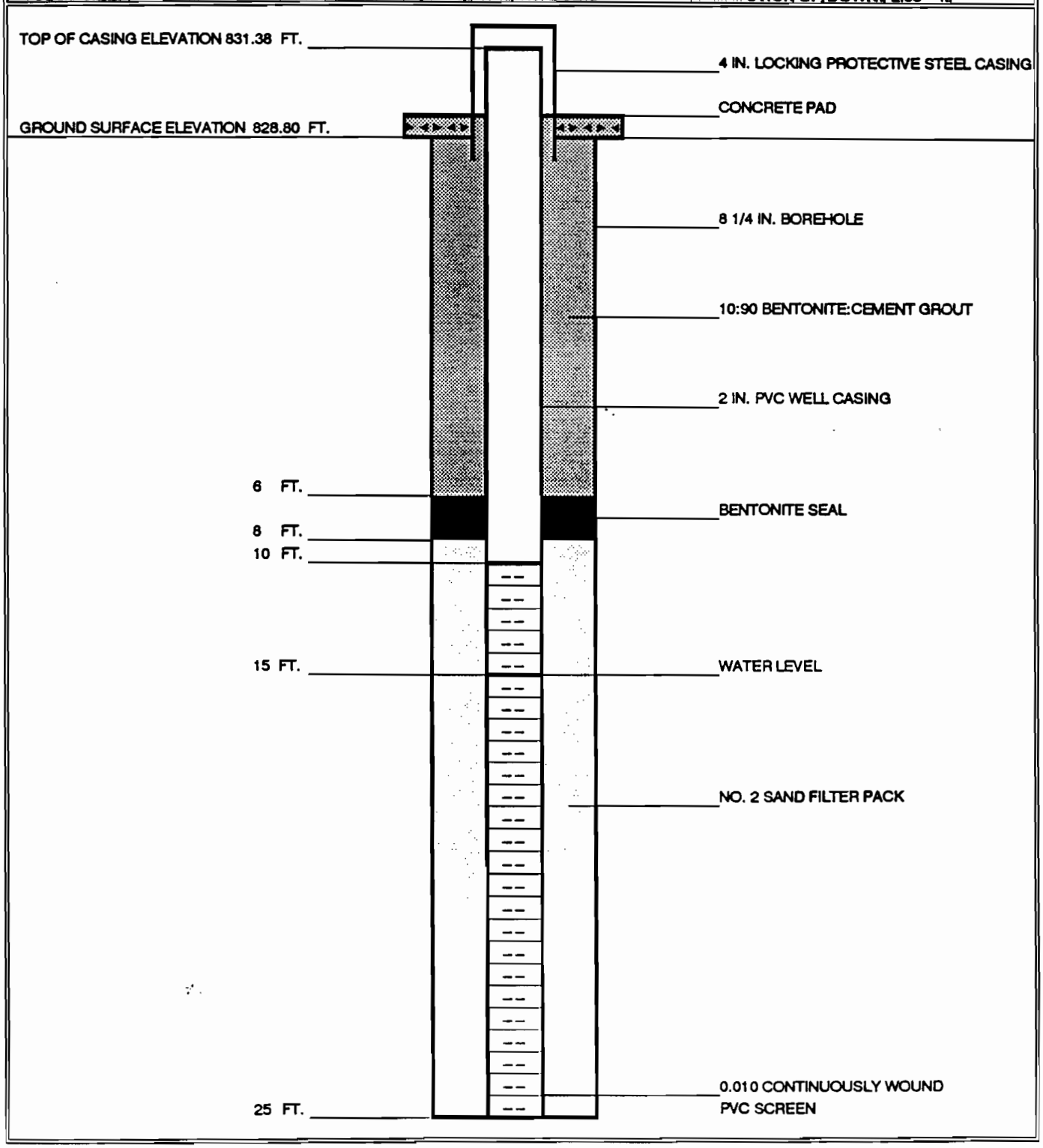
SW8 WELL COMPLETION RECORD | ARGONNE NATIONAL LABORATORY

PROJECT NO:	91230	DRILLER:	MARCOR	DRILLING BIT:	8 1/4 in.
LOCATION:	Johnson City, NY	RIG TYPE:	Canterra CT 350	GROUND ELEVATION:	830.20 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:	23 ft.	GROUT LENTGH/TYPE:	7.5 ft. / 10:90 Bent:Cemt. Mix	PAD ELEVATION:	830.26 ft.
SCREEN:	2 in. Strd. Slot PVC	SEAL LENGTH/TYPE:	3 ft. / bentonite	TOC ELEVATION:	829.85 ft.
SLOT SIZE:	0.010 in.	FILTER LENGTH/TYPE:	12.5 ft./ No. 2 Sand	STICK UP/DOWN:	-0.35 ft.



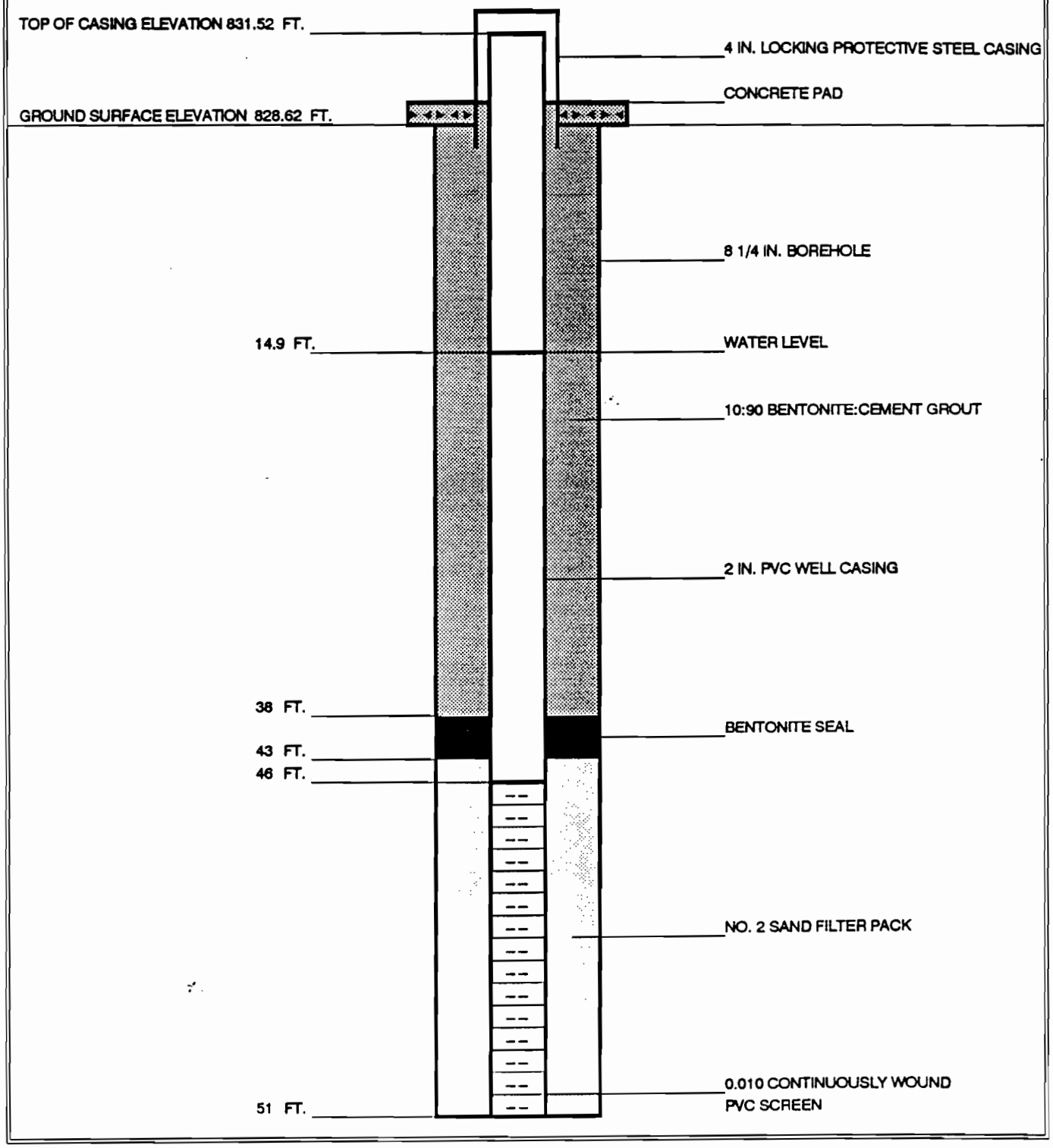
SW9 WELL COMPLETION RECORD | ARGONNE NATIONAL LABORATORY

PROJECT NO:	91230	DRILLER:	MARCOR	DRILLING BIT:	8 1/4 in.
LOCATION:	Johnson City, NY	RIG TYPE:	Canterra CT 350	GROUND ELEVATION:	828.80 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:	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:	828.62 ft.
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:	828.83 ft.
SCREEN:	2 in. Con. Wnd PVC	SEAL LENGTH/TYPE:	5 ft. / bentonite	TOC ELEVATION:	831.52 ft.
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

PROJECT 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
WELL DEPTH:	83 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 yieding – 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
Well initially developed by bailing – 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:	829.85 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.

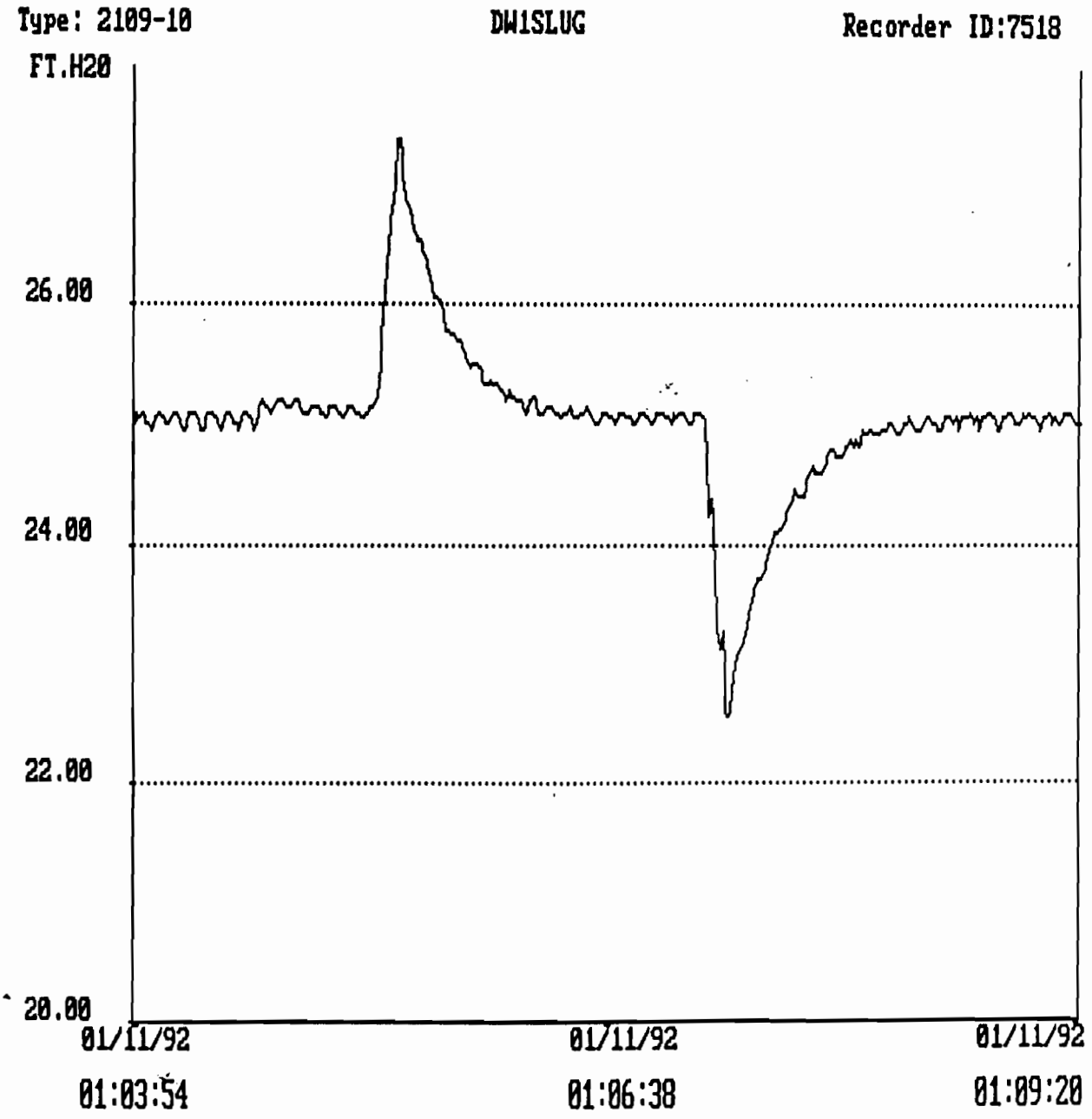
DATE	12/13/91					END			
TIME	1405	1419	1440	1510	1520	1530			
RATE (GPM)									
DEPTH TO WATER (FT)	16.72	30.6	30.78	31.04	31.3	31.7			
VOLUME (gal)	0	5	10	12	14	17			
TEMPERATURE (°C)	---(1)	14.6	14.3	13.1	13.0	[13.0](2)			
pH	---	6.67	6.41	6.44	6.42	[6.43]			
CONDUCTIVITY (mS)	---	11.76	5.28	5.50	5.41	[5.33]			
TURBIDITY (NTUs)	---	---	---	---	---	>200(3)			

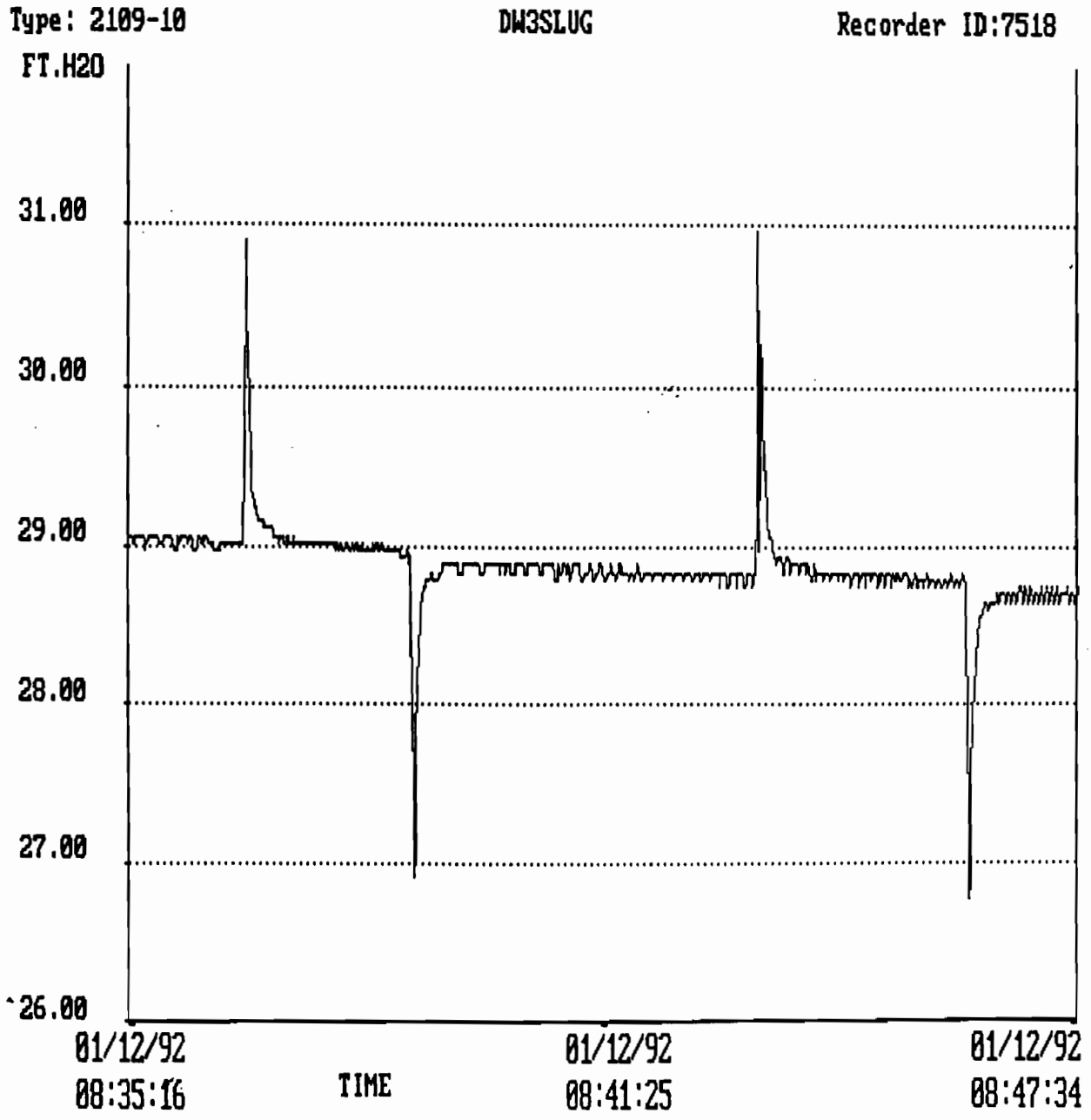
DATE									
TIME									
RATE (GPM)									
DEPTH TO WATER (FT)									
VOLUME (GAL)									
TEMPERATURE (°C)									
pH									
CONDUCTIVITY (mS)									
TURBIDITY (NTUs)									

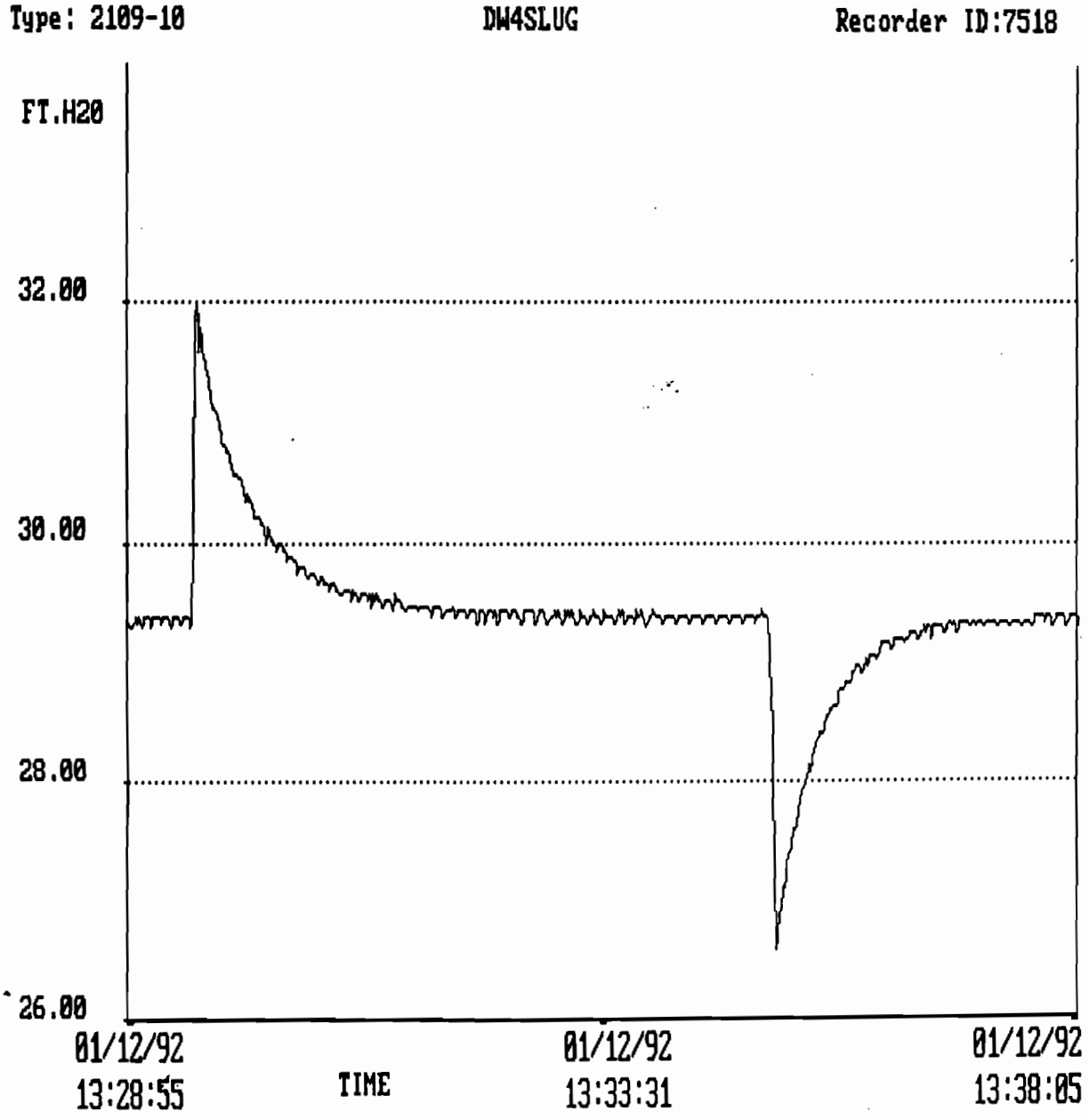
(1) --- means no reading
(2) **[Number]** means parameter has stabilized or is acceptable
(3) Unable to install pump at time of well development – well was developed by bailing – unable to remove fines to <200 NTUs

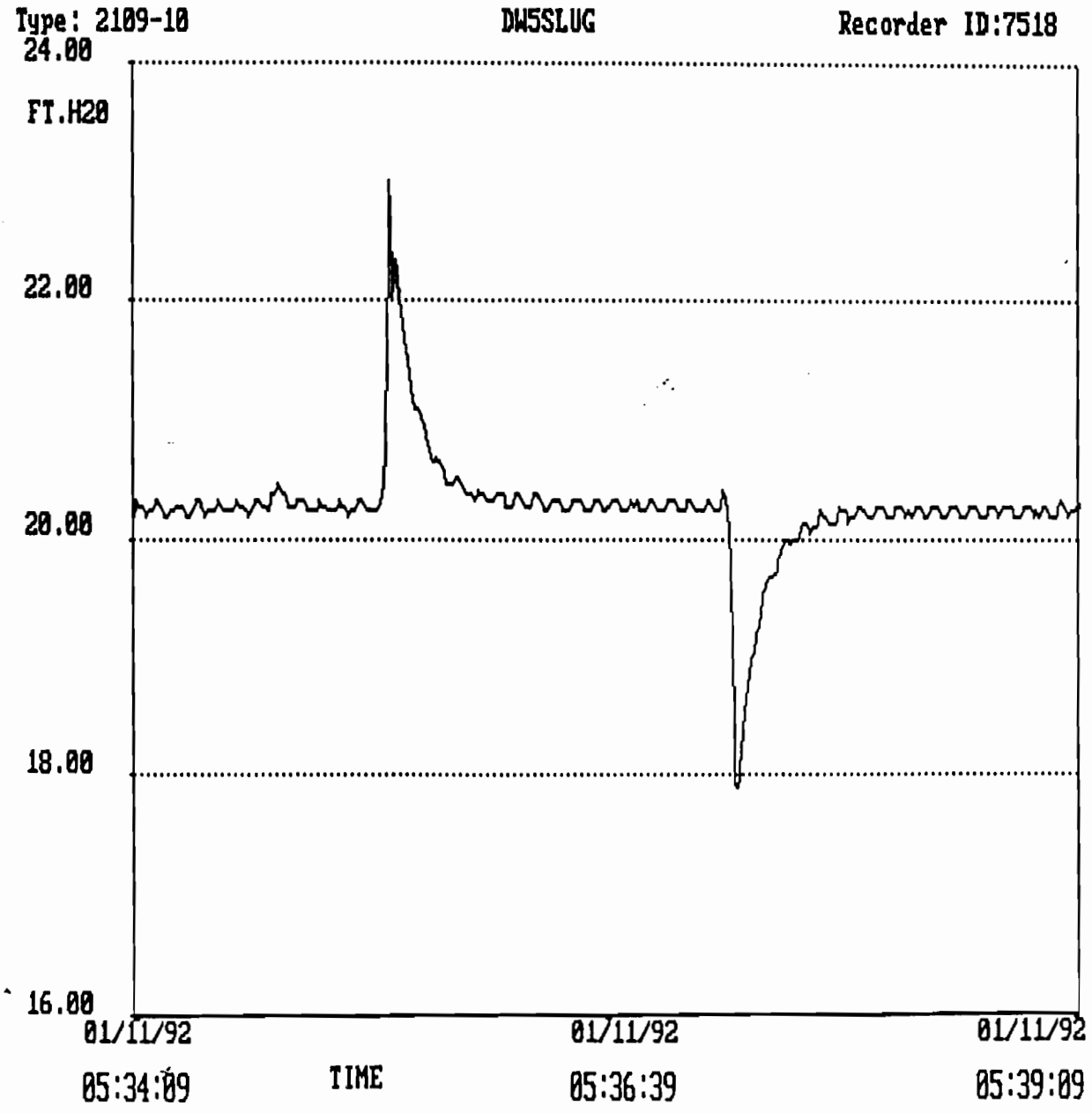
Appendix C-2:

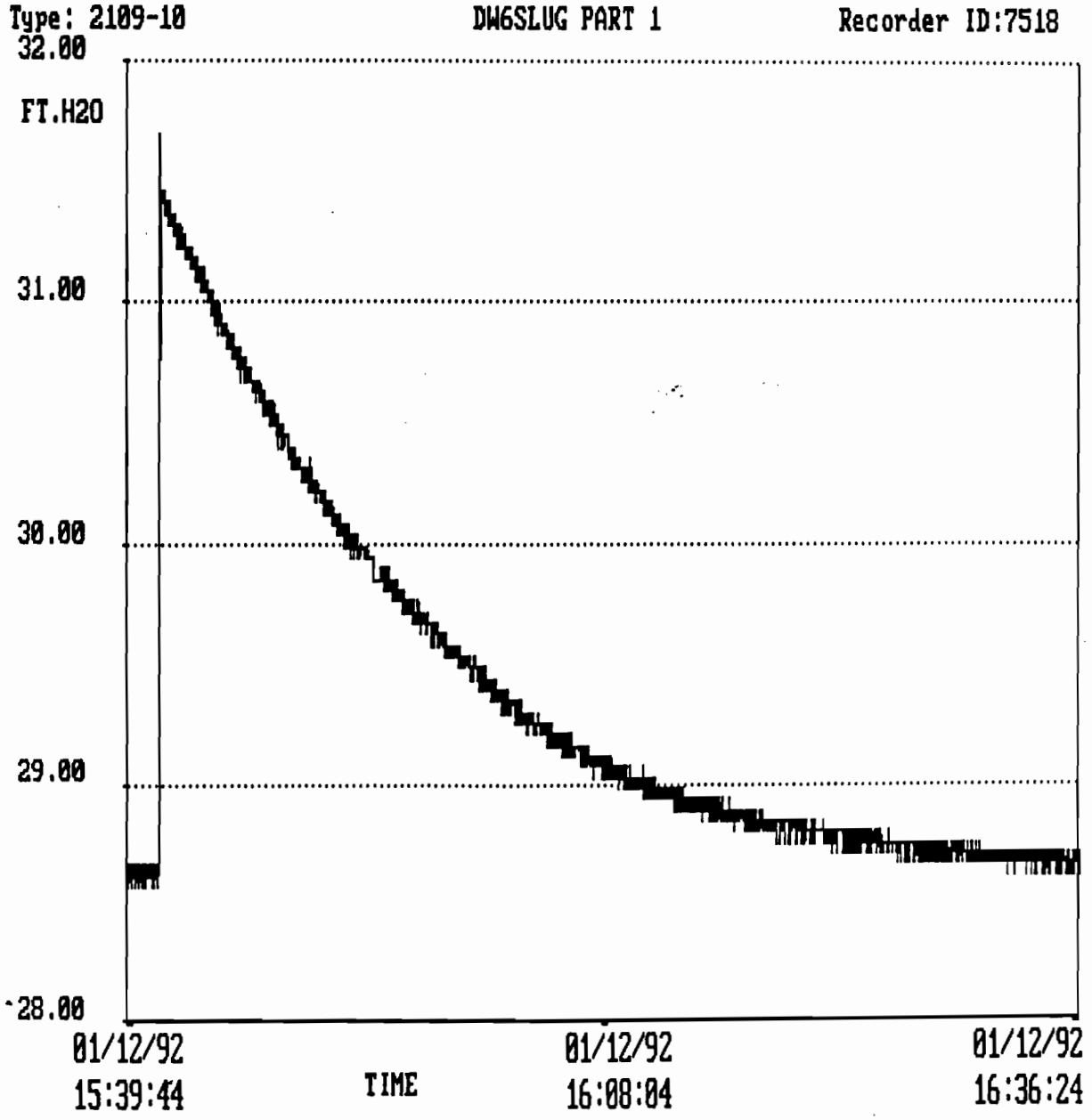
Aquifer Slug Test Recovery Curves

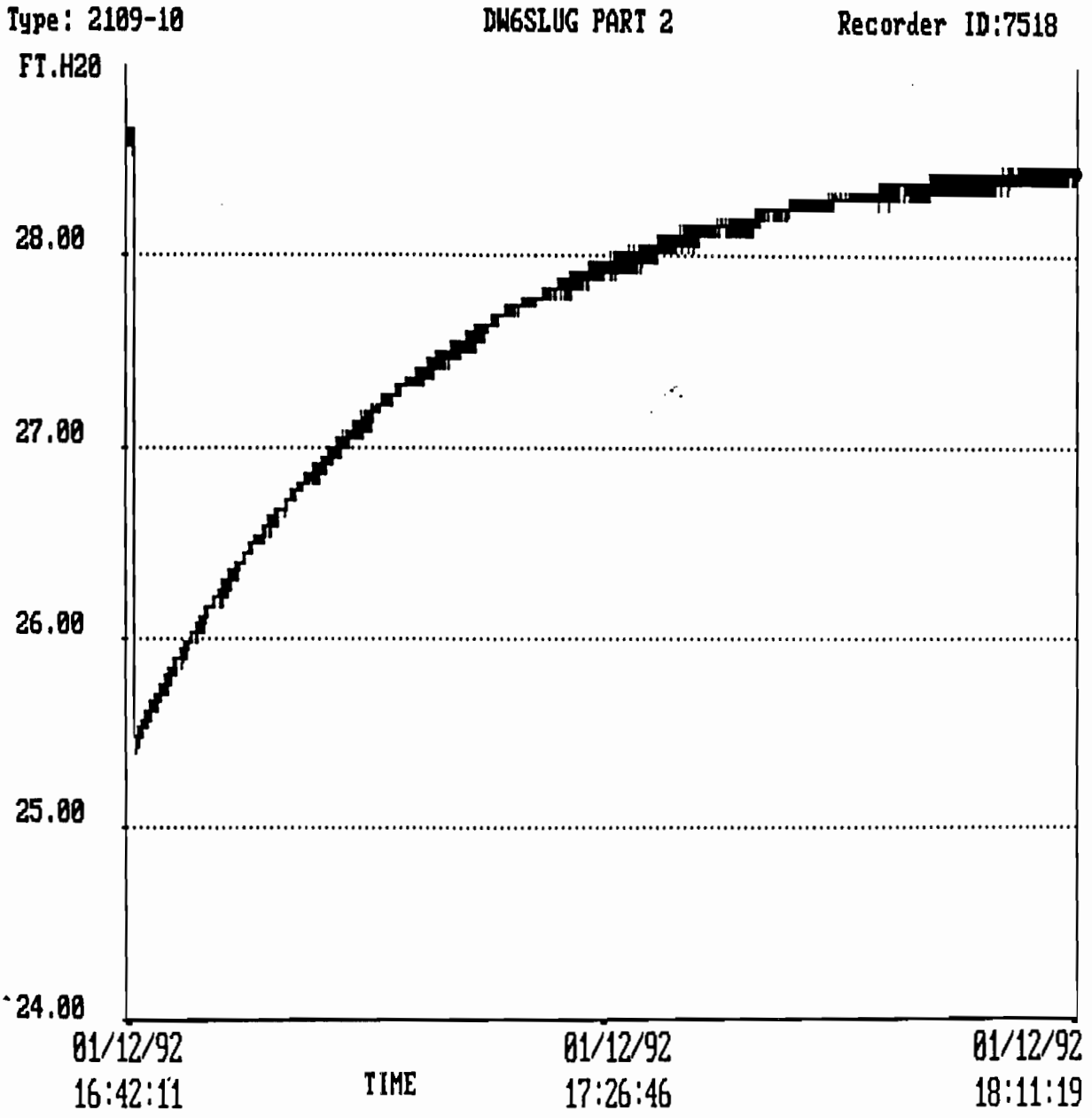

Type: 2109-10
DW1SLUG
Recorder ID:7518
FT.H20
26.00
24.00
22.00
20.00
01/11/92
01:03:54
01/11/92
01:06:38
01/11/92
01:09:20

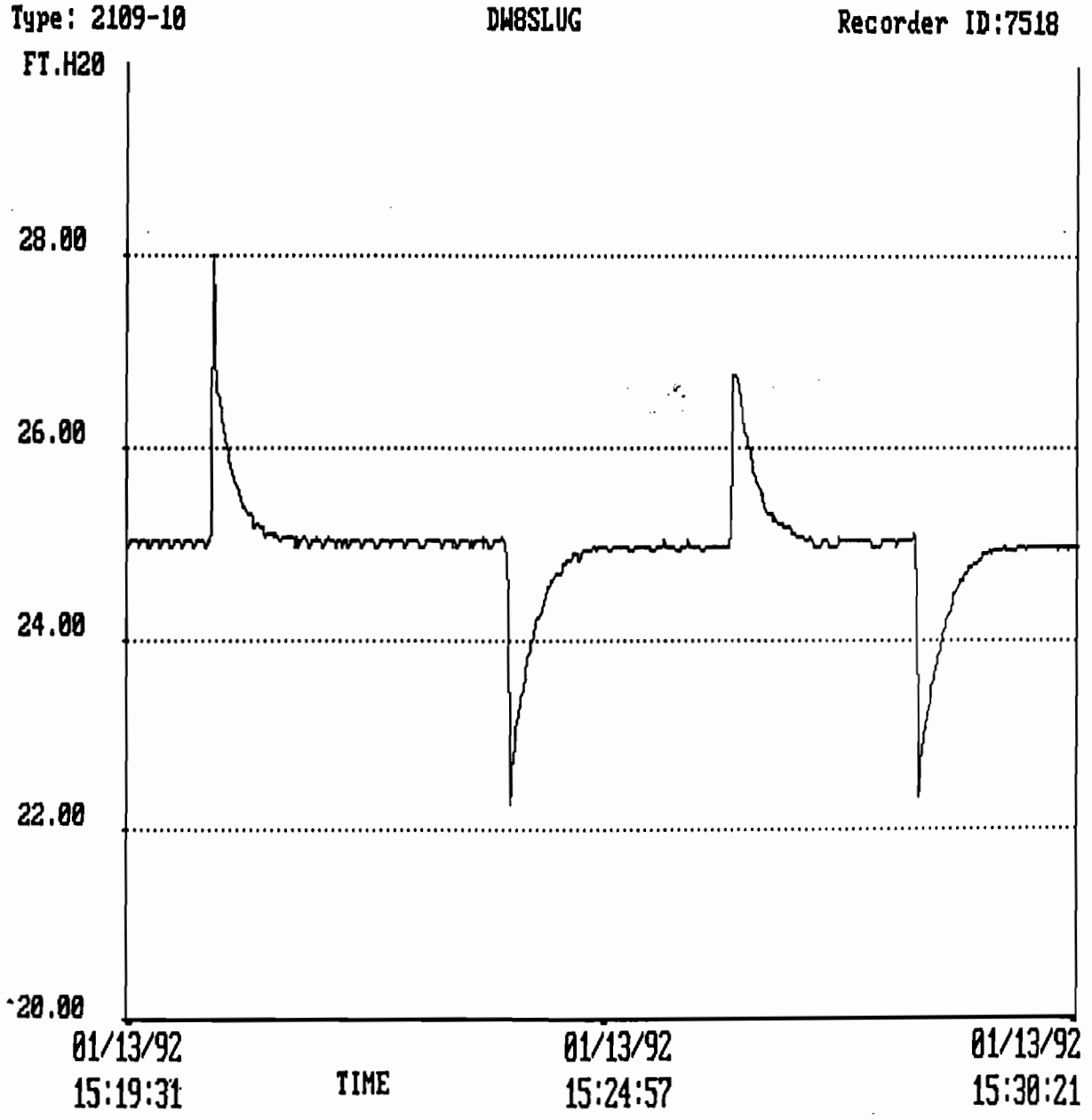

Type: 2109-10
DW3SLUG
Recorder ID:7518
FT.H2O
31.00
30.00
29.00
28.00
27.00
26.00
01/12/92
08:35:16
TIME
01/12/92
08:41:25
01/12/92
08:47:34

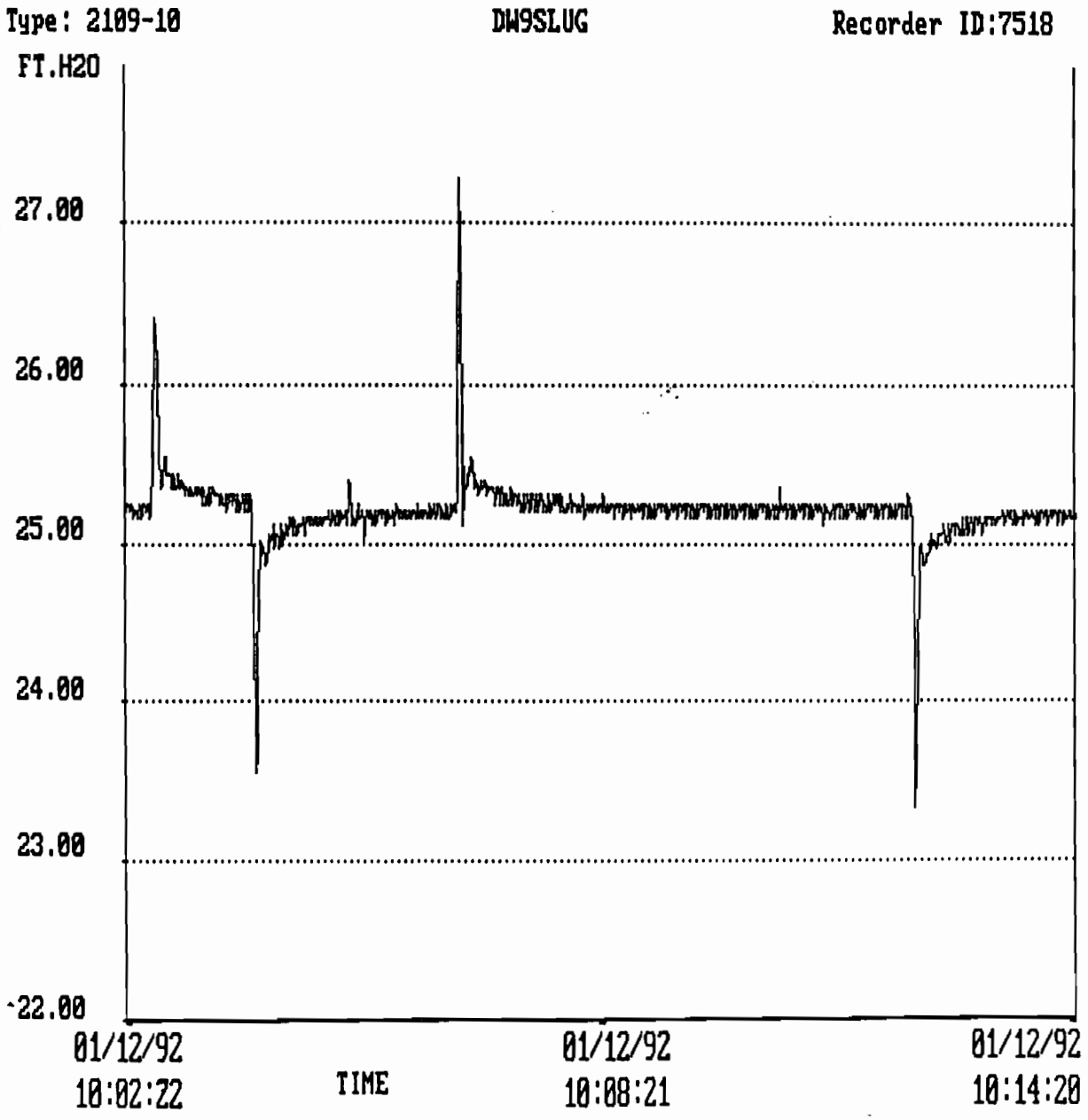

Type: 2109-10
DW4SLUG
Recorder ID:7518
FT.H20
32.00
30.00
28.00
26.00
01/12/92
13:28:55
TIME
01/12/92
13:33:31
01/12/92
13:38:05

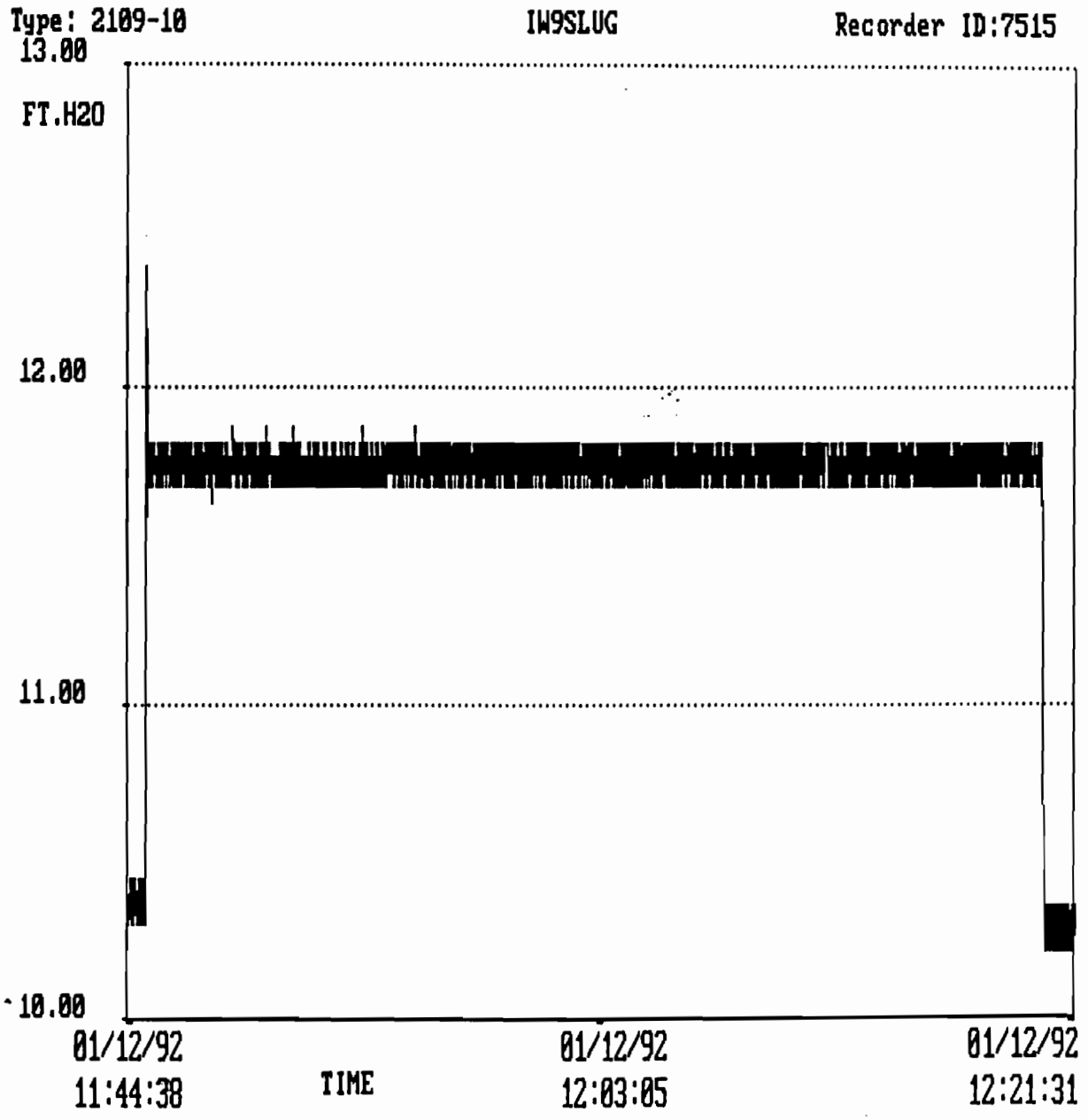

Type: 2109-10
DW5SLUG
Recorder ID:7518
24.00
FT.H20
22.00
20.00
18.00
16.00
01/11/92
05:34:09
TIME
01/11/92
05:36:39
01/11/92
05:39:09

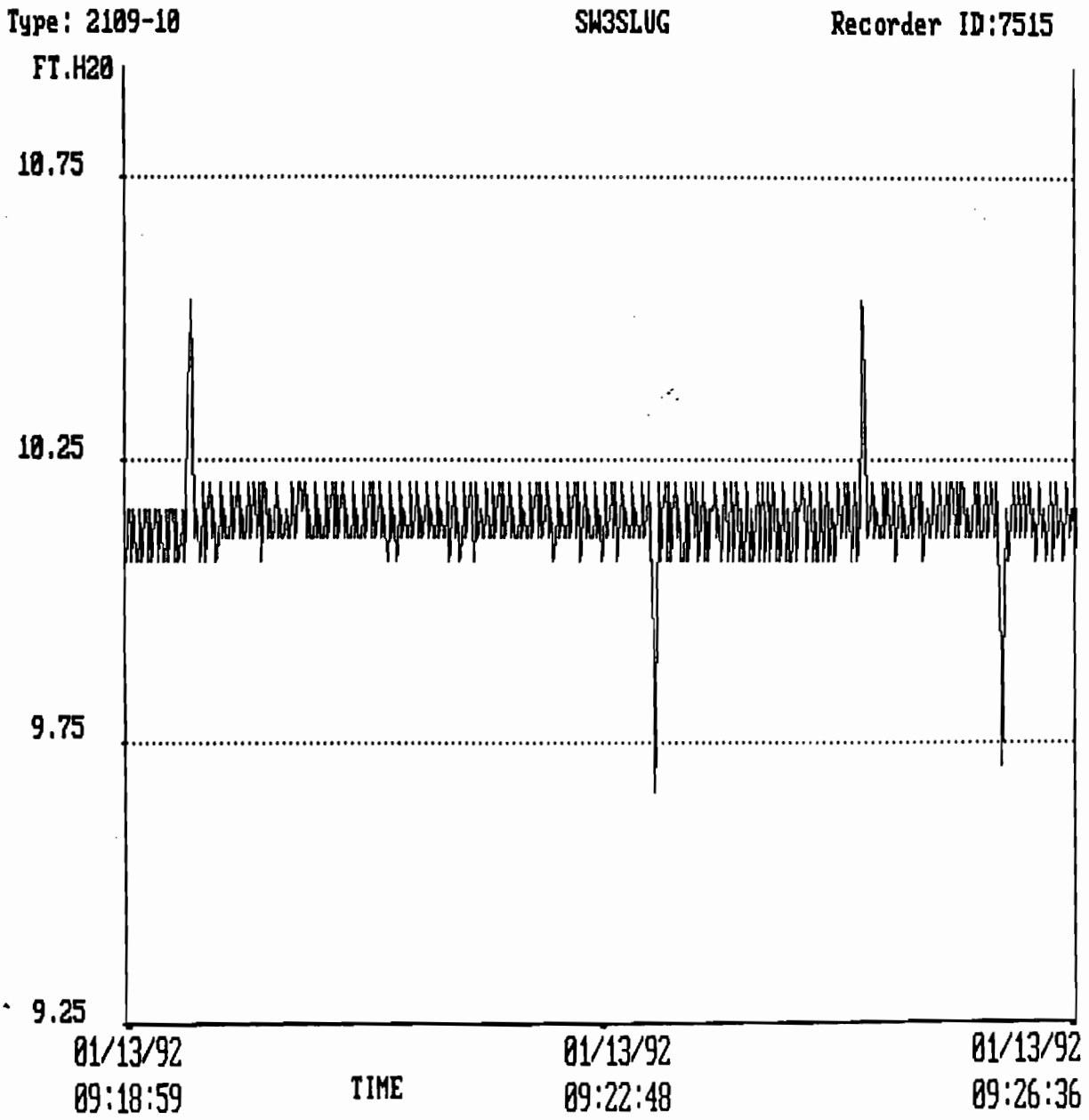

Type: 2109-10
DW6SLUG PART 1
Recorder ID:7518
32.00
FT.H2O
31.00
30.00
29.00
28.00
01/12/92
15:39:44
TIME
01/12/92
16:08:04
01/12/92
16:36:24

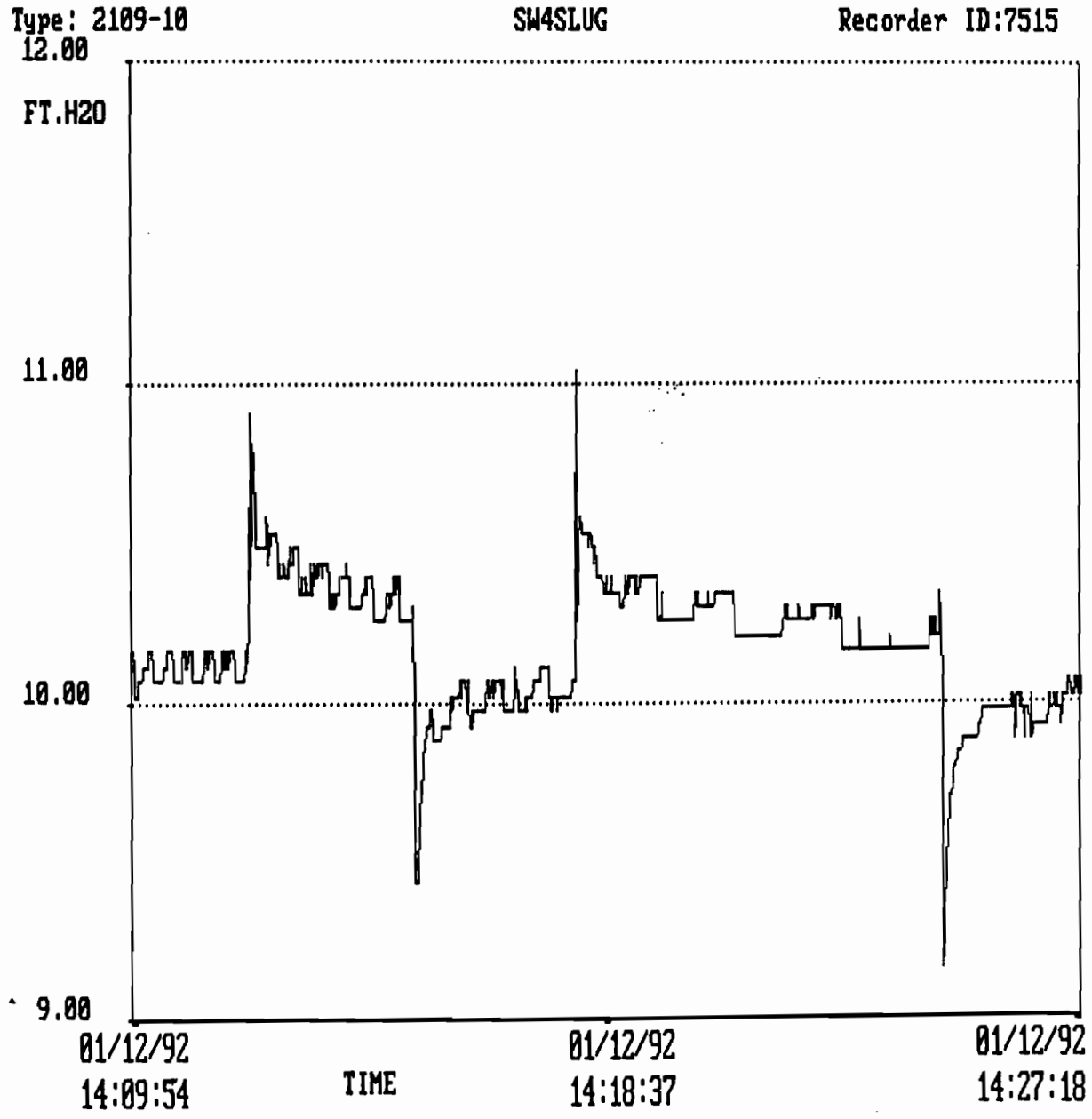

Type: 2109-10
DW6SLUG PART 2
Recorder ID:7518
FT.H20
28.00
27.00
26.00
25.00
24.00
01/12/92
16:42:11
TIME
01/12/92
17:26:46
01/12/92
18:11:19

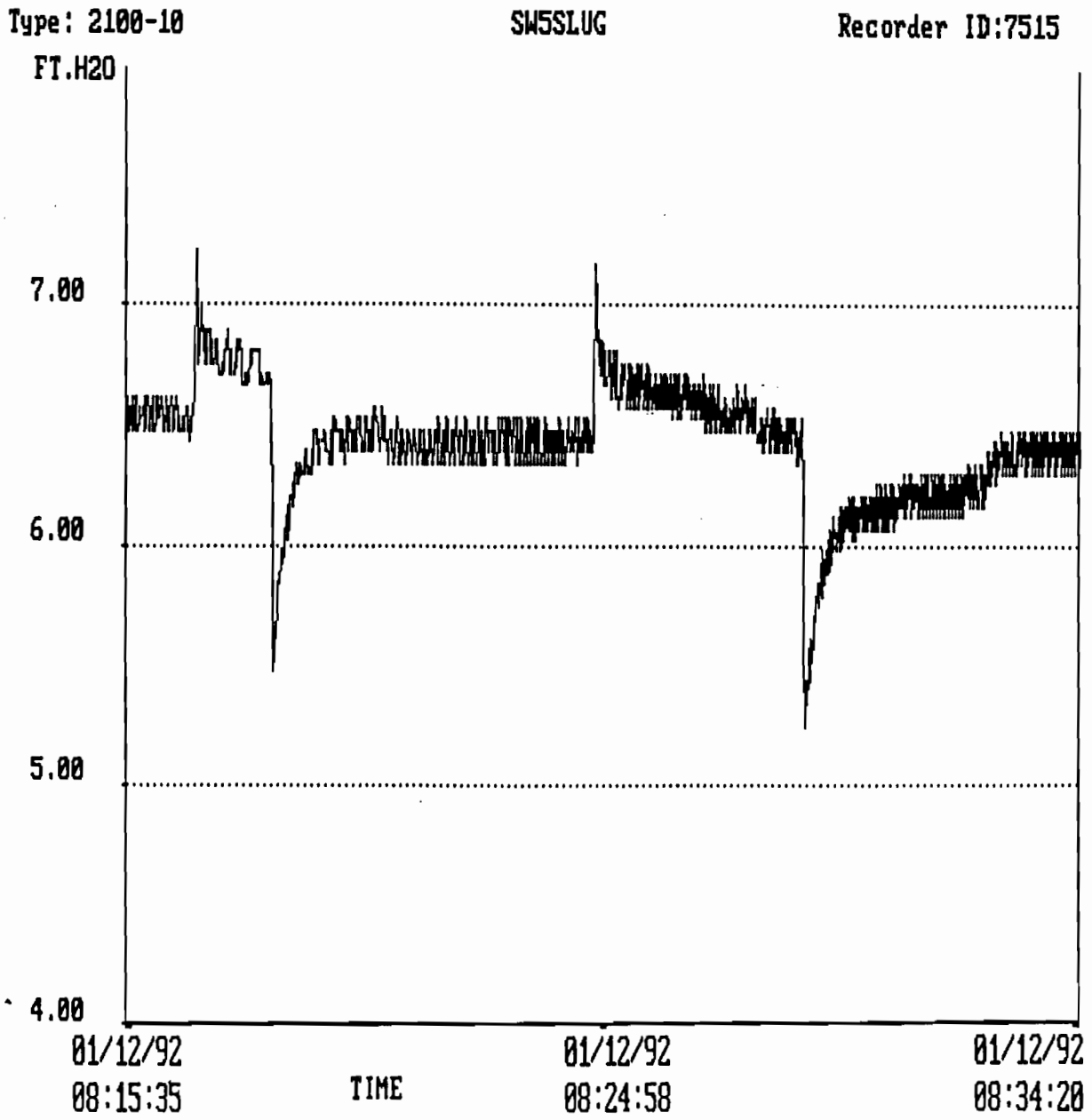

Type: 2109-10
DW8SLUG
Recorder ID:7518
FT.H20
28.00
26.00
24.00
22.00
20.00
01/13/92
15:19:31
TIME
01/13/92
15:24:57
01/13/92
15:30:21

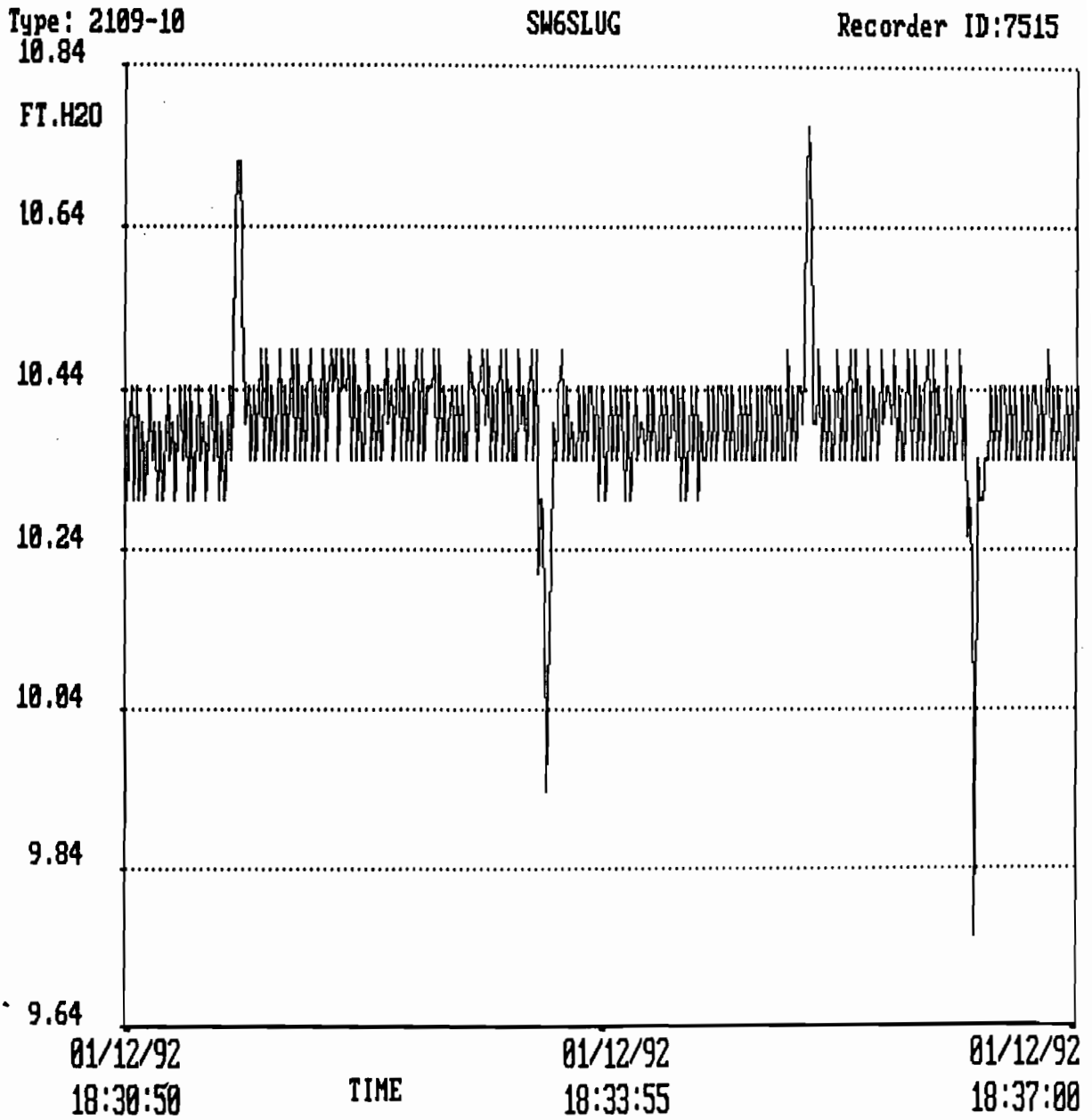

Type: 2109-10
DW9SLUG
Recorder ID:7518
FT.H2O
27.00
26.00
25.00
24.00
23.00
22.00
01/12/92
10:02:22
TIME
01/12/92
10:08:21
01/12/92
10:14:20

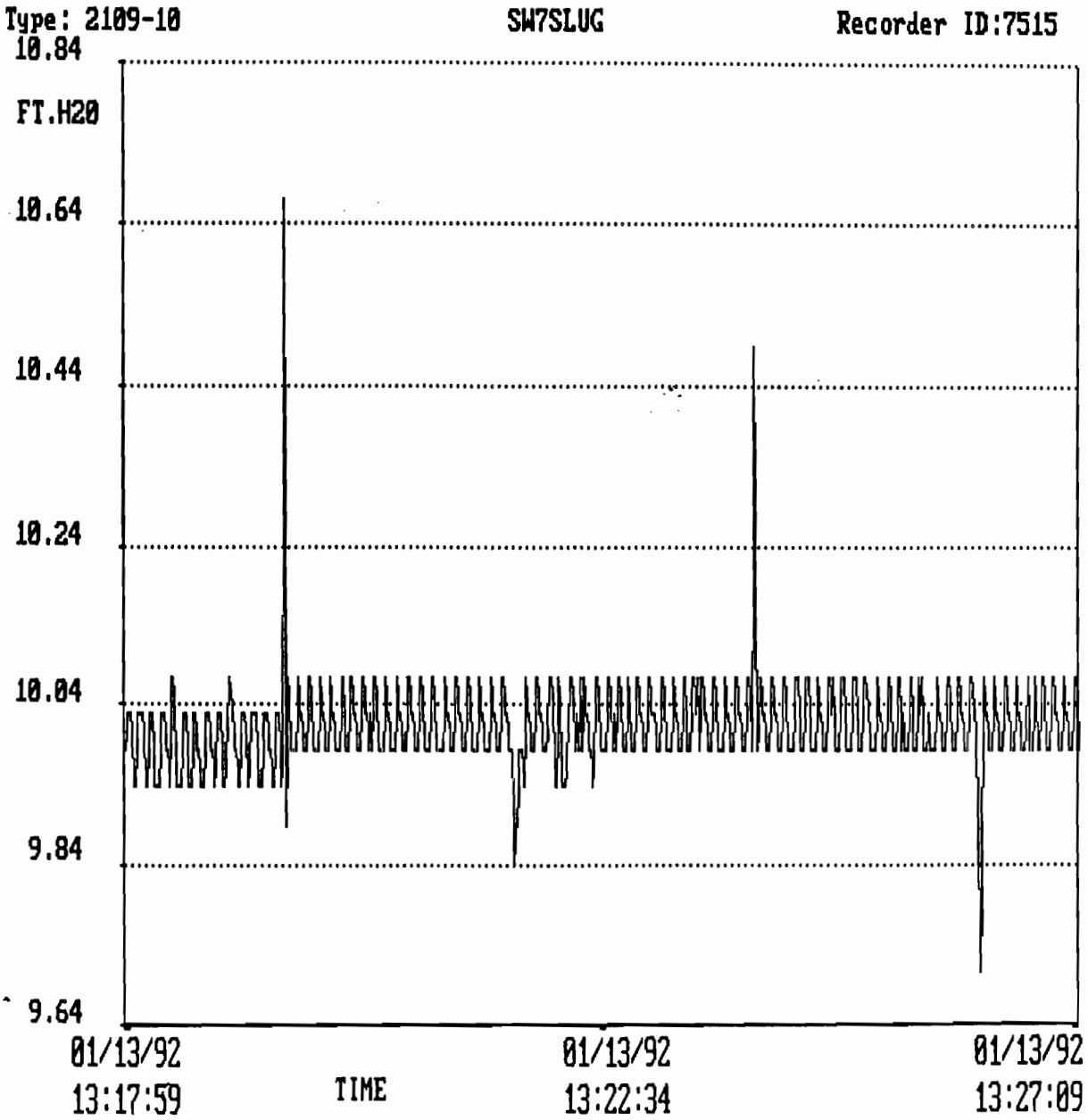

Type: 2109-10
IW9SLUG
Recorder ID:7515
13.00
FT.H2O
12.00
11.00
10.00
01/12/92
11:44:38
TIME
01/12/92
12:03:05
01/12/92
12:21:31

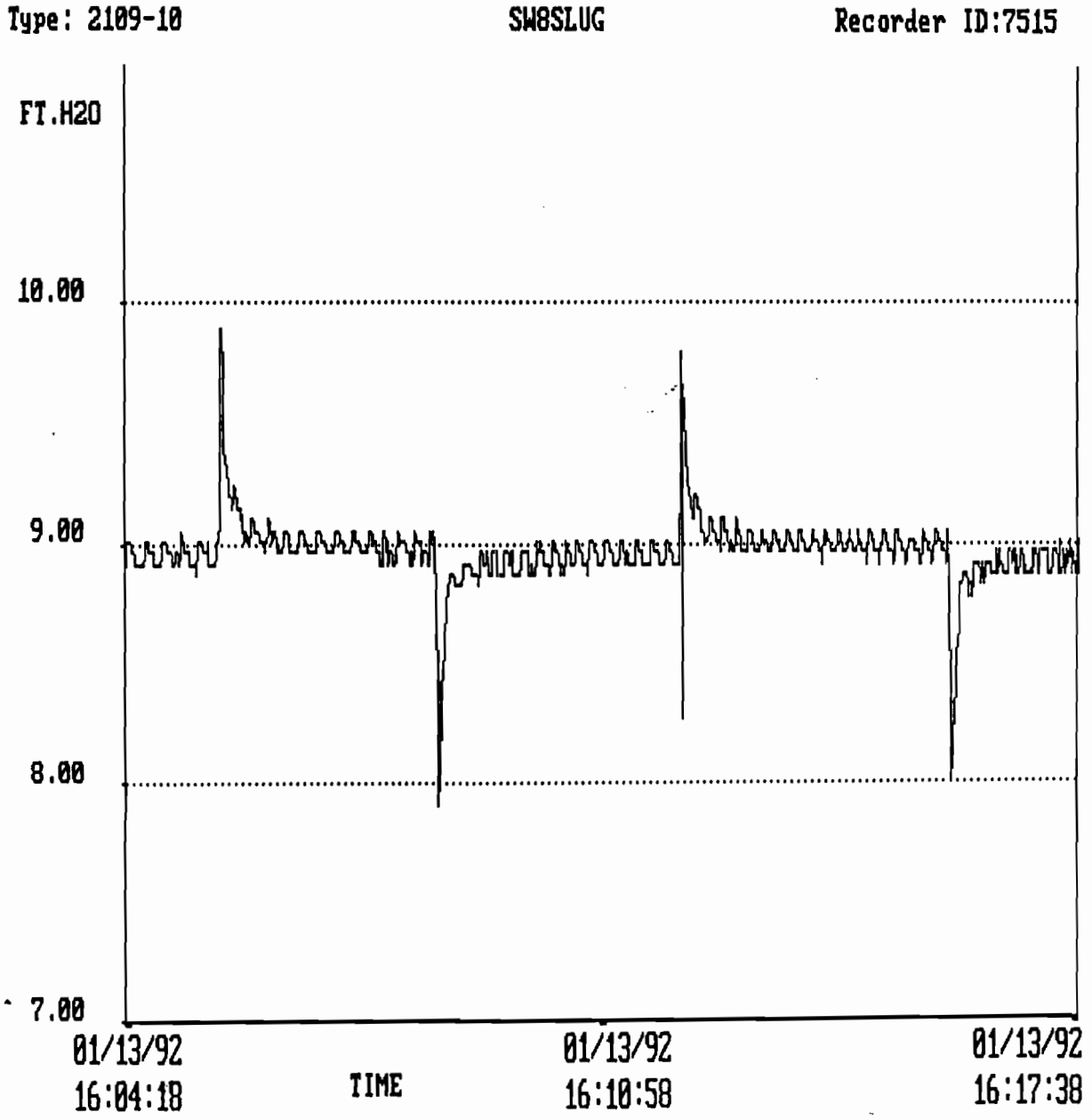

Type: 2109-10
SW3SLUG
Recorder ID:7515
FT.H20
10.75
10.25
9.75
9.25
01/13/92
09:18:59
TIME
01/13/92
09:22:48
01/13/92
09:26:36

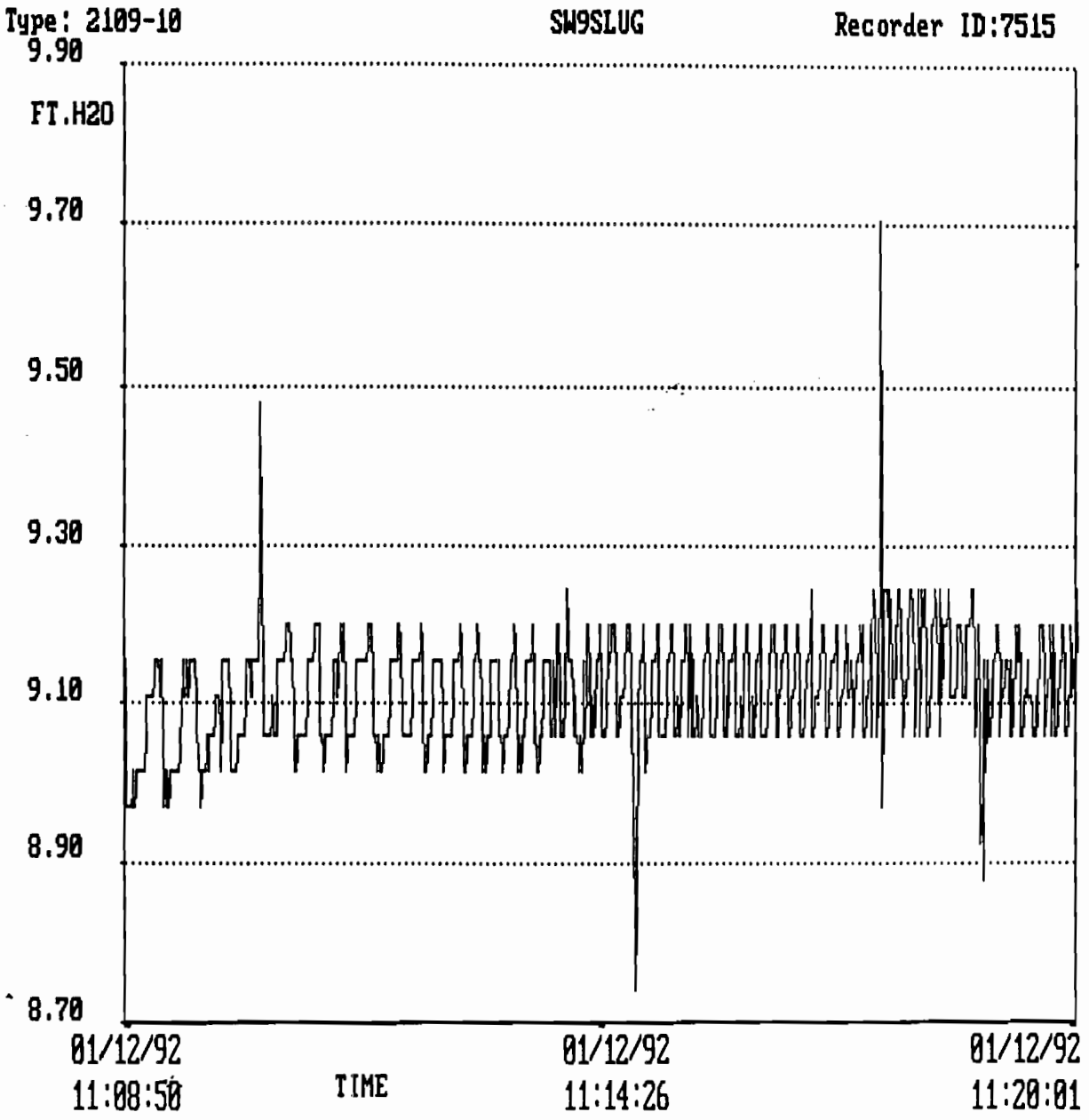

Type: 2109-10
SW4SLUG
Recorder ID:7515
12.00
FT.H2O
11.00
10.00
9.00
01/12/92
14:09:54
TIME
01/12/92
14:18:37
01/12/92
14:27:18


Type: 2100-10
SW5SLUG
Recorder ID:7515
FT.H2O
7.00
6.00
5.00
4.00
01/12/92
08:15:35
TIME
01/12/92
08:24:58
01/12/92
08:34:20


Type: 2109-10
SW6SLUG
Recorder ID:7515
10.84
FT.H2O
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

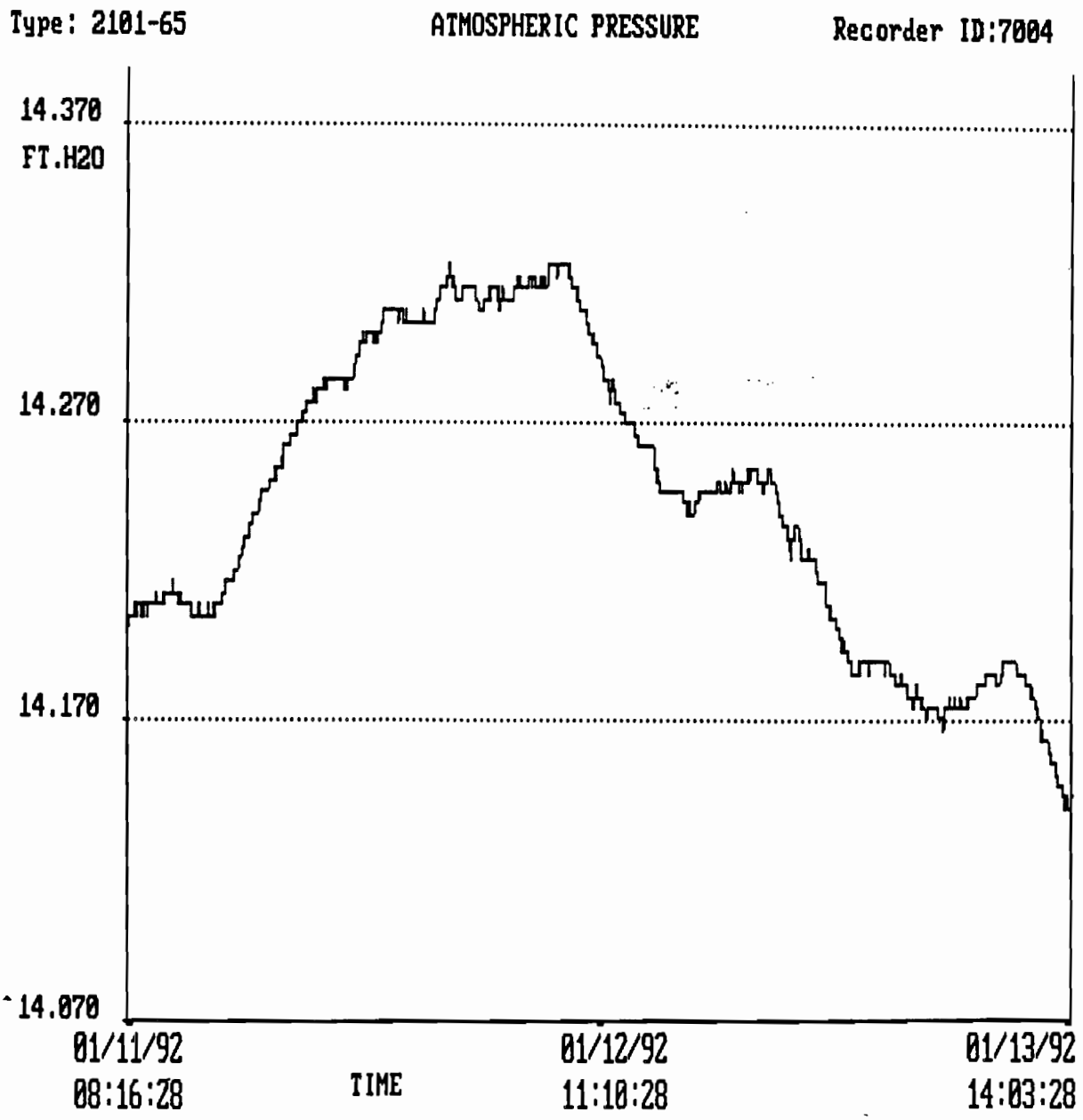

Type: 2109-10
SW7SLUG
Recorder ID:7515
10.84
FT.H20
10.64
10.44
10.24
10.04
9.84
9.64
01/13/92
13:17:59
TIME
01/13/92
13:22:34
01/13/92
13:27:09

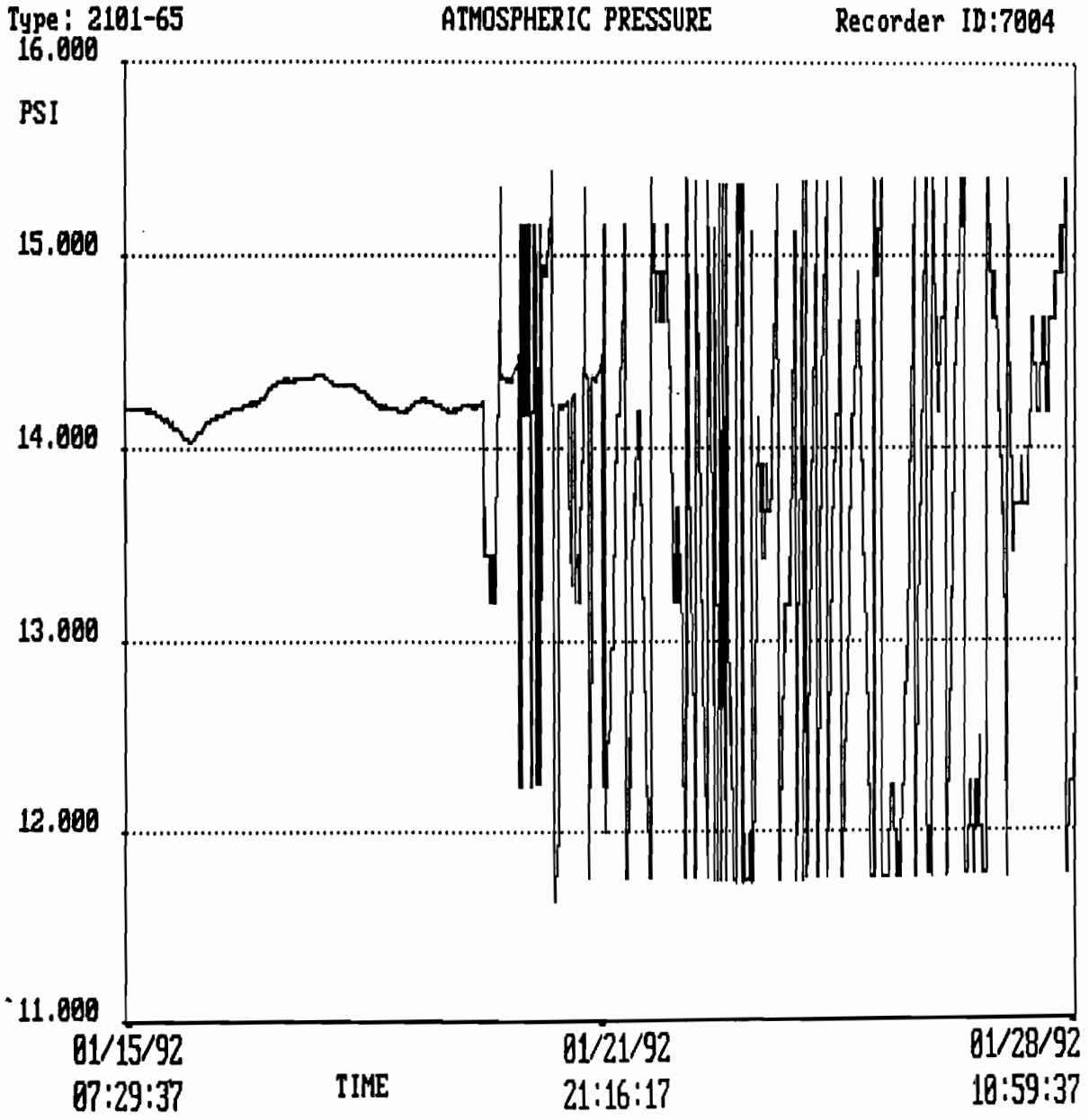

Type: 2109-10
SW8SLUG
Recorder ID:7515
FT.H2O
10.00
9.00
8.00
7.00
01/13/92
16:04:18
TIME
01/13/92
16:10:58
01/13/92
16:17:38

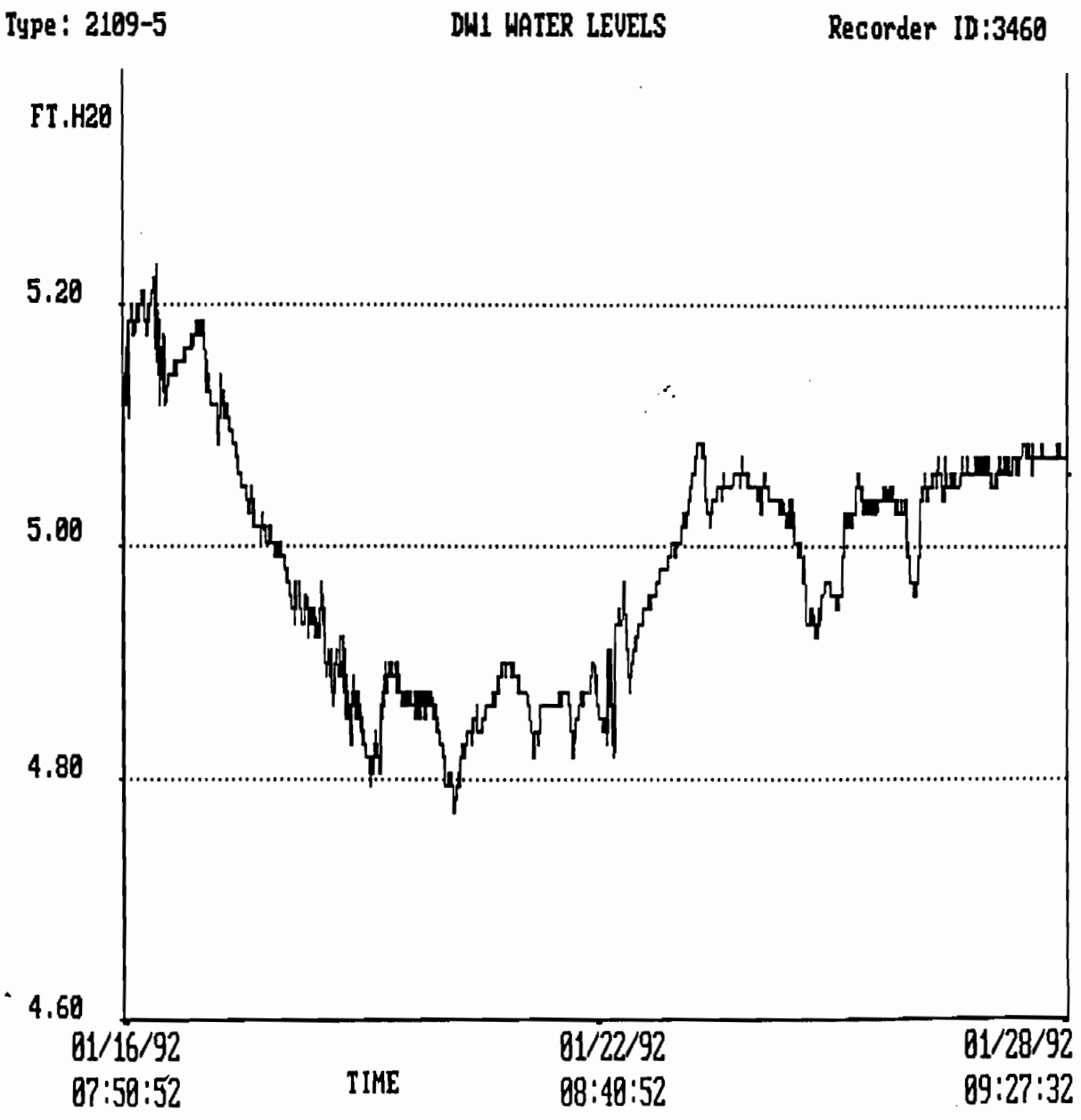

Type: 2109-10
SW9SLUG
Recorder ID:7515
9.90
FT.H2O
9.70
9.50
9.30
9.10
8.90
8.70
01/12/92
11:08:50
TIME
01/12/92
11:14:26
01/12/92
11:20:01

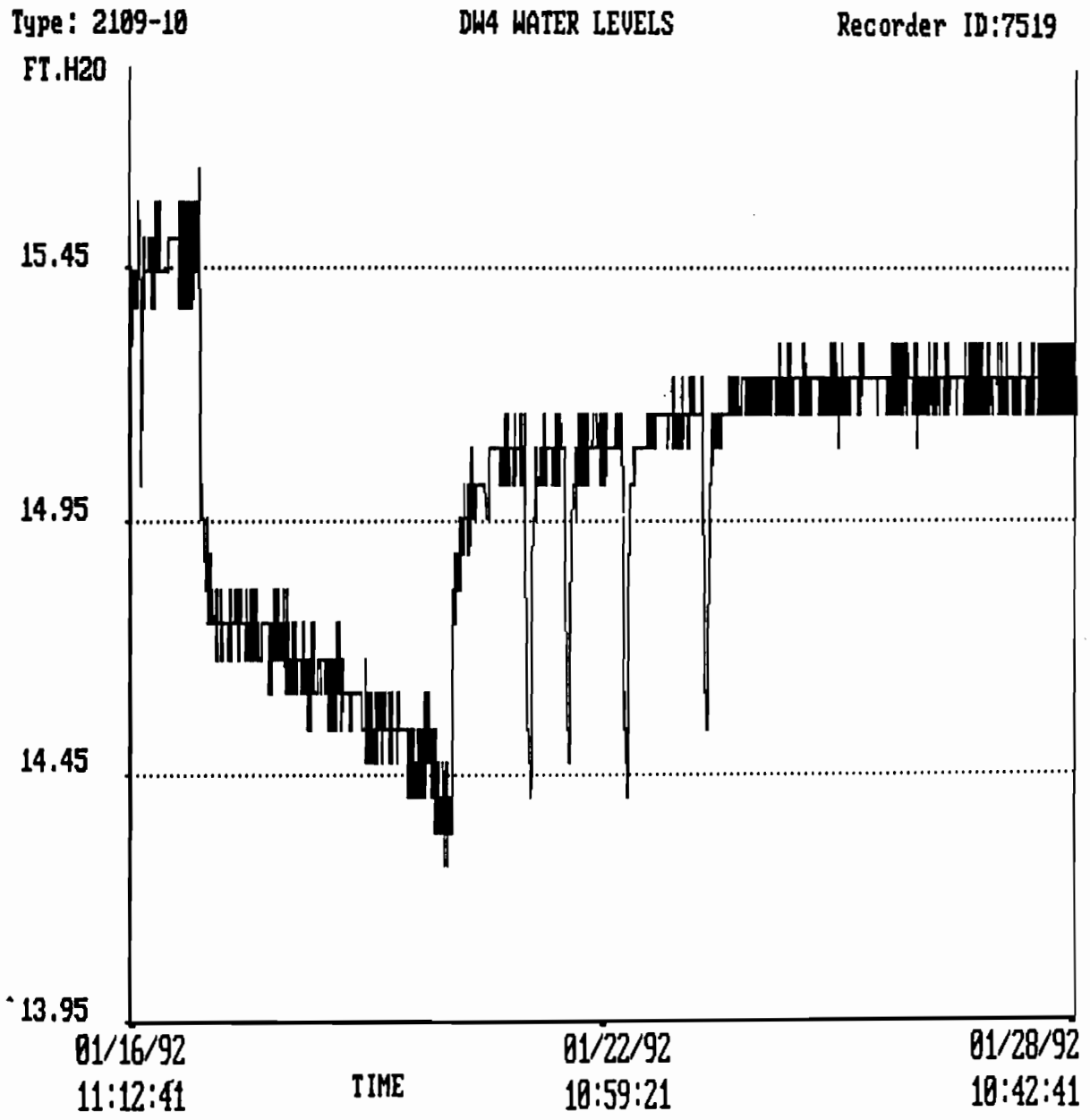
Appendix C-3:

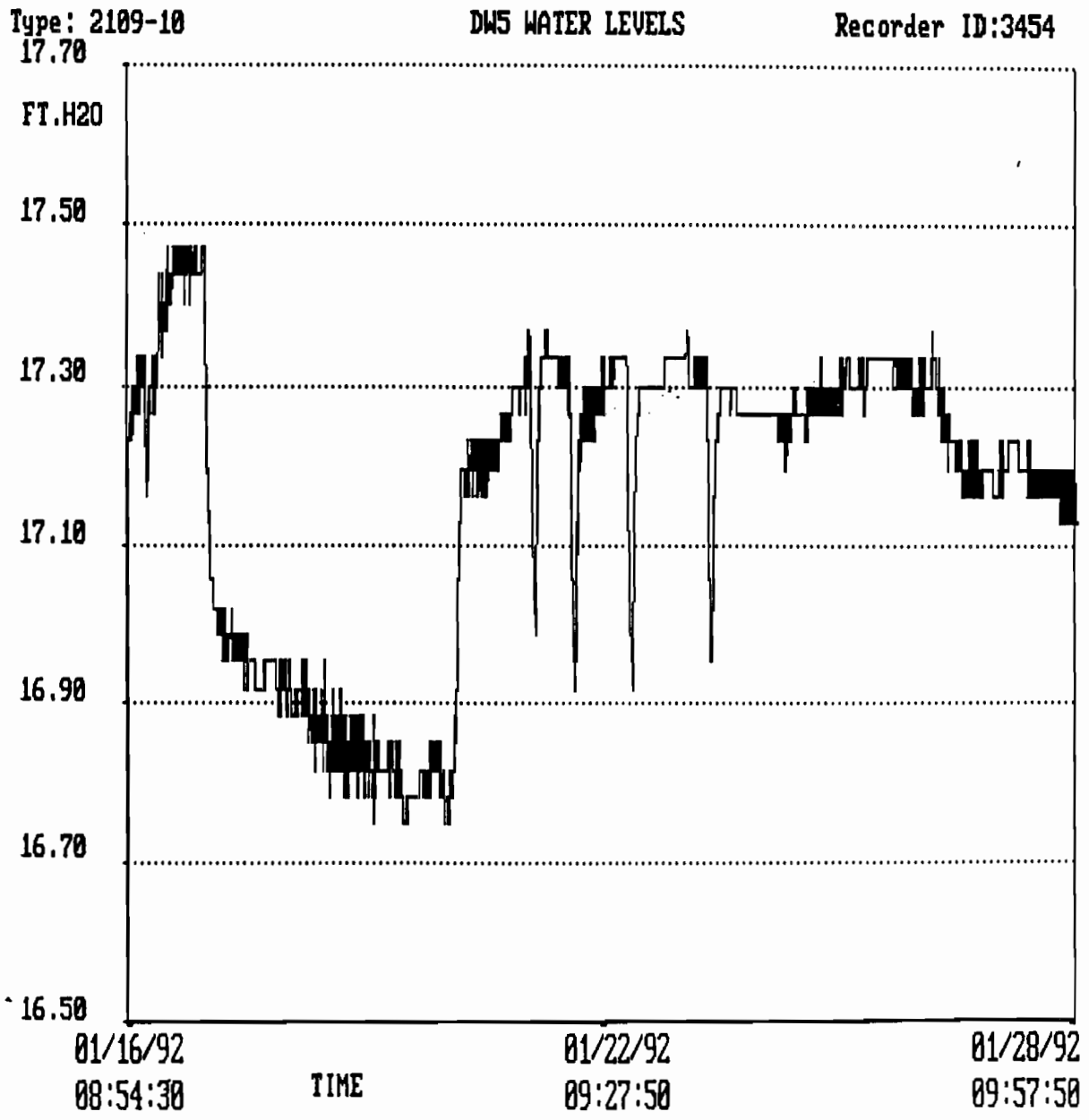
Water Level Data

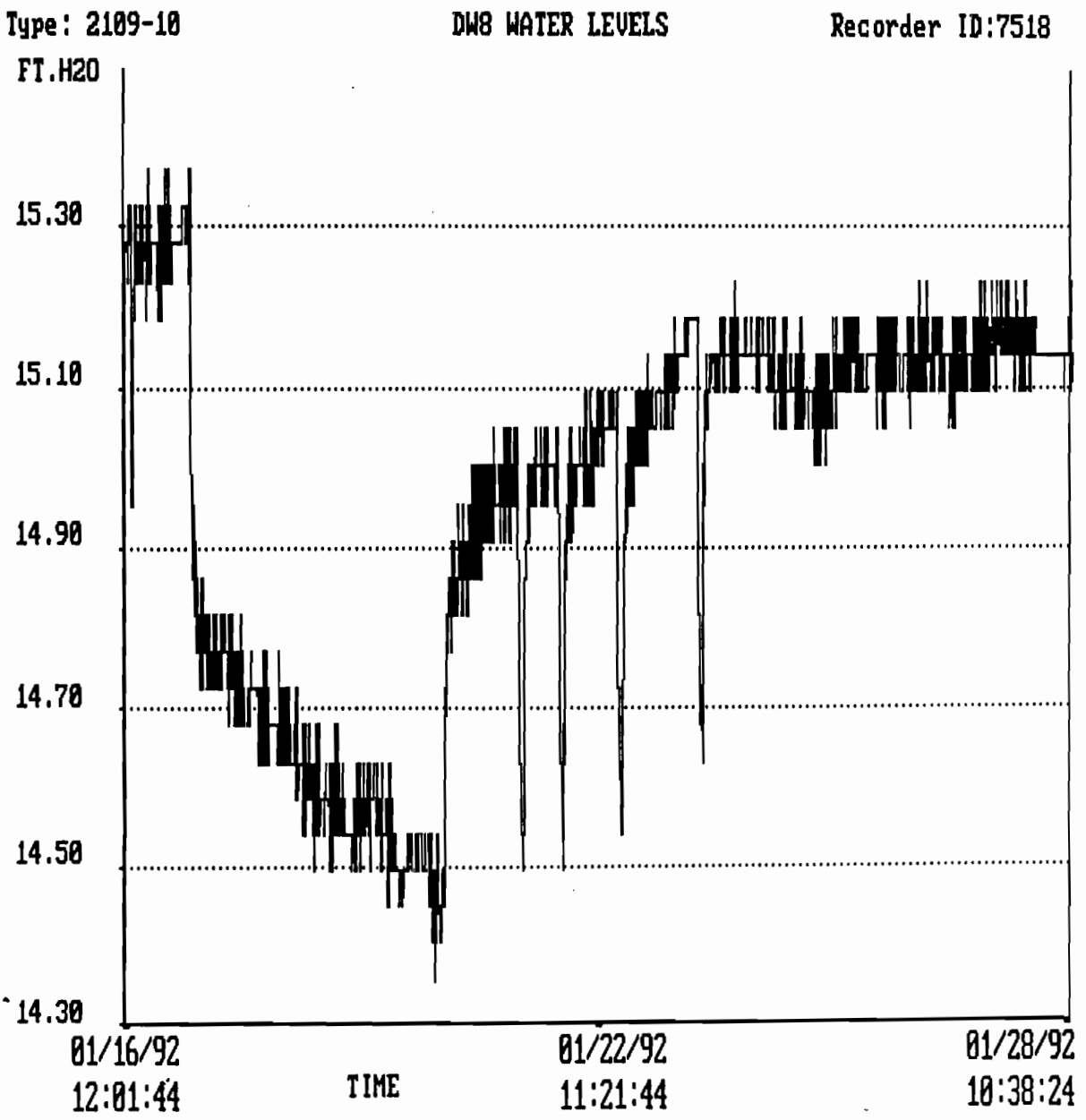

Type: 2101-65
ATMOSPHERIC PRESSURE
Recorder ID:7004
14.370
FT.H20
14.270
14.170
14.070
01/11/92
08:16:28
TIME
01/12/92
11:10:28
01/13/92
14:03:28

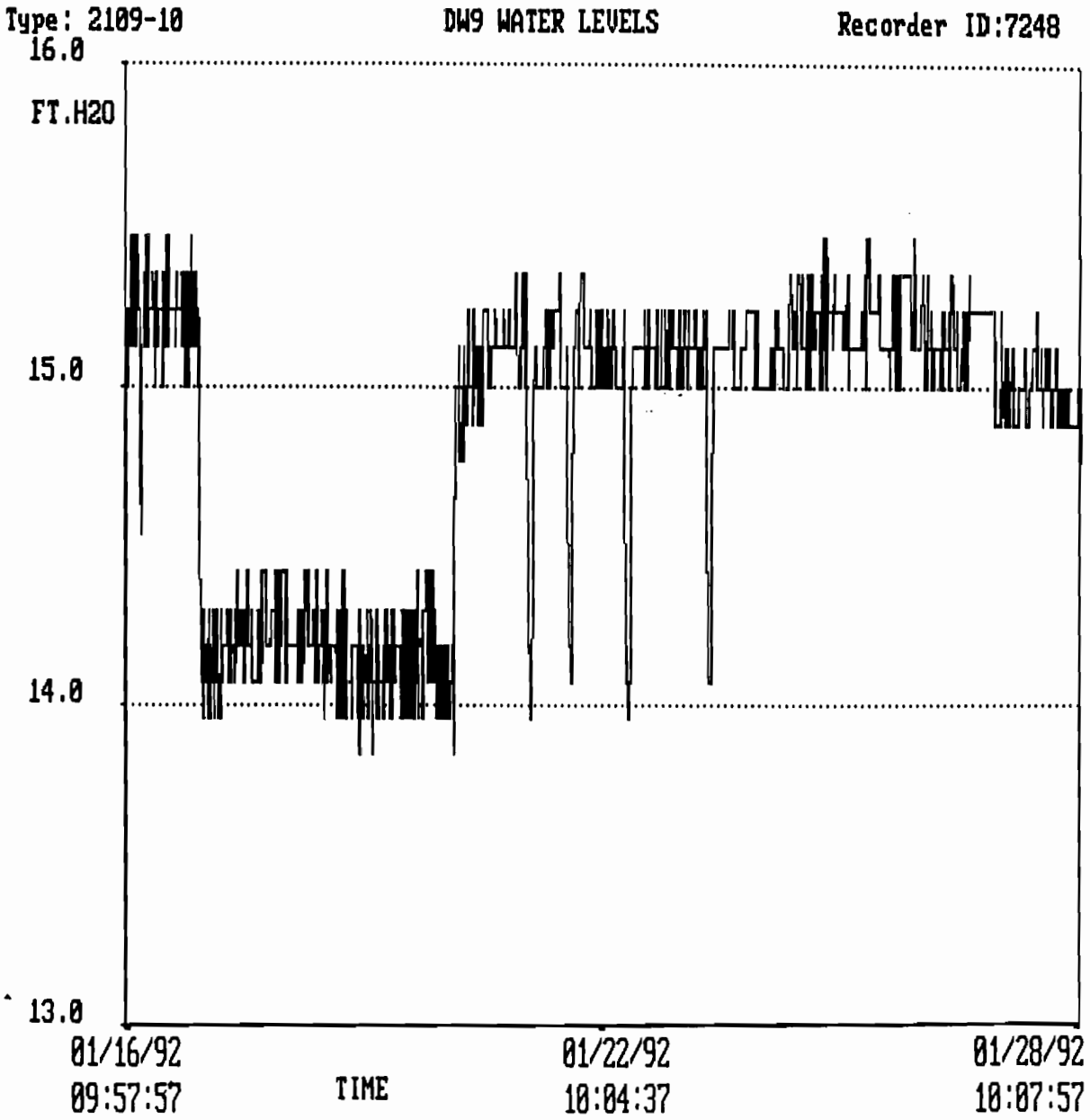

Type: 2101-65
ATMOSPHERIC PRESSURE
Recorder ID:7004
16.000
PSI
15.000
14.000
13.000
12.000
11.000
01/15/92
07:29:37
TIME
01/21/92
21:16:17
01/28/92
10:59:37

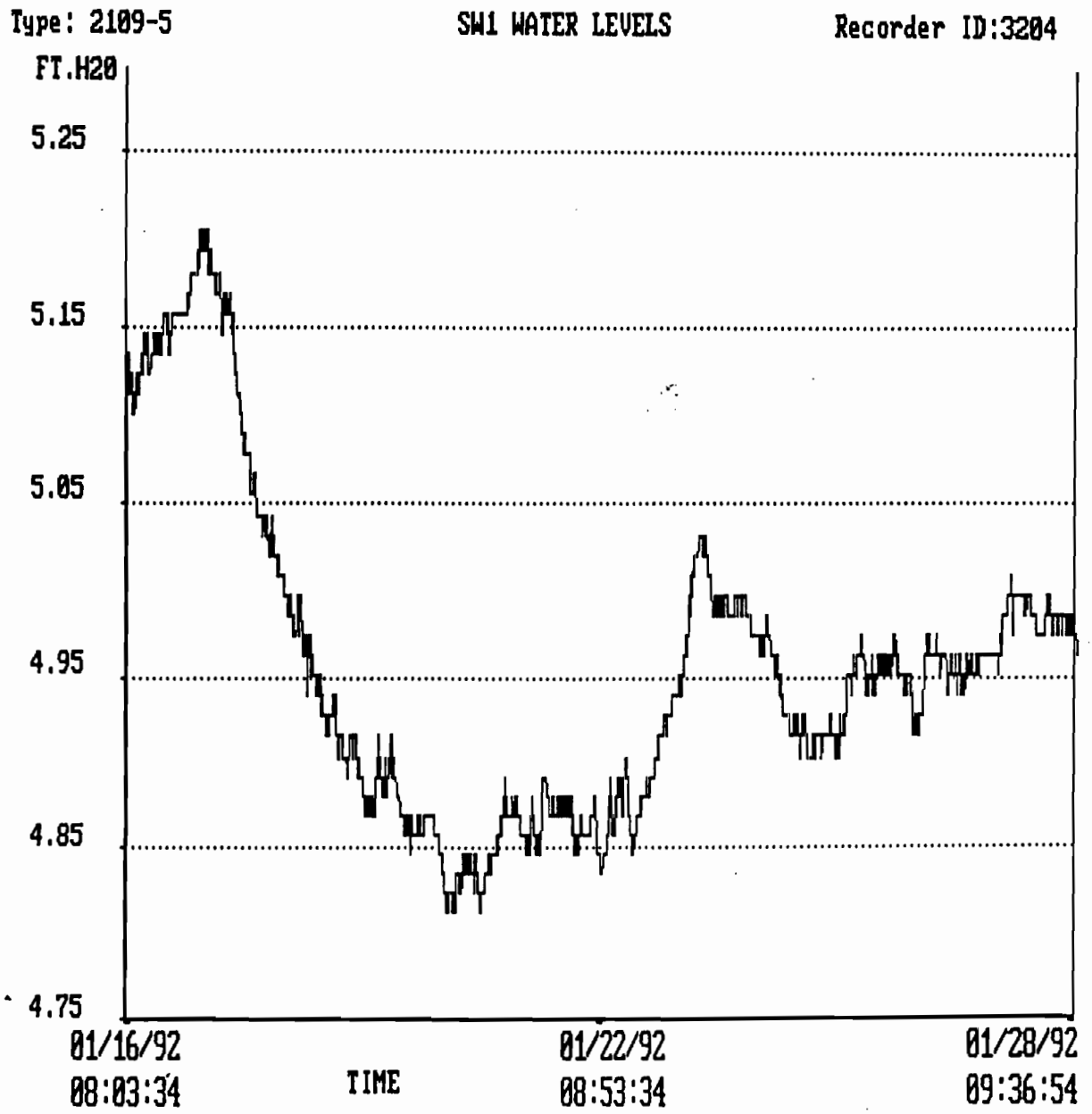

Type: 2109-5
DW1 WATER LEVELS
Recorder ID:3460
FT.H20
5.20
5.00
4.80
4.60
01/16/92
07:50:52
TIME
01/22/92
08:40:52
01/28/92
09:27:32

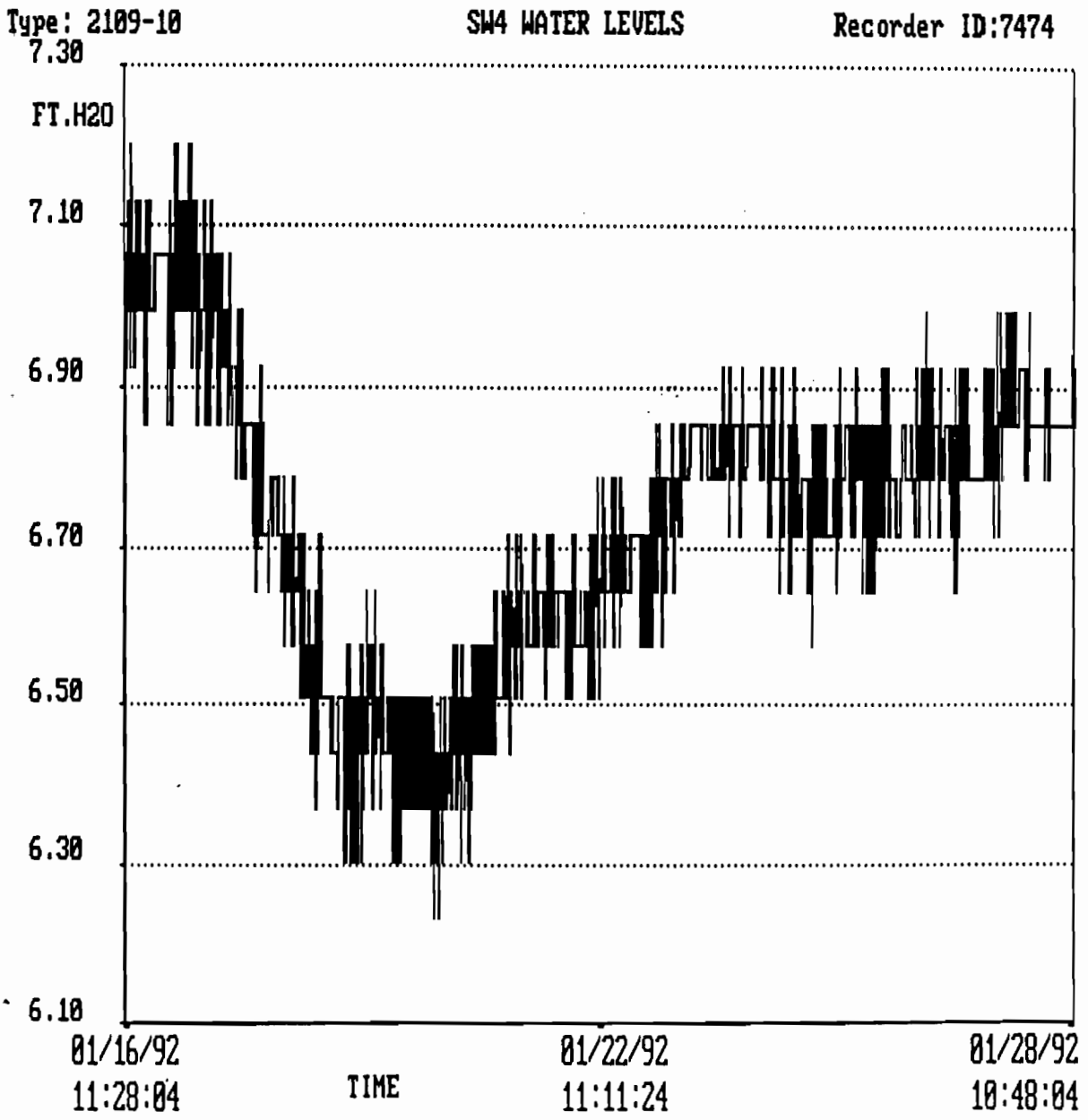

Type: 2109-10
DW4 WATER LEVELS
Recorder ID:7519
FT.H2O
15.45
14.95
14.45
13.95
01/16/92
11:12:41
TIME
01/22/92
10:59:21
01/28/92
10:42:41

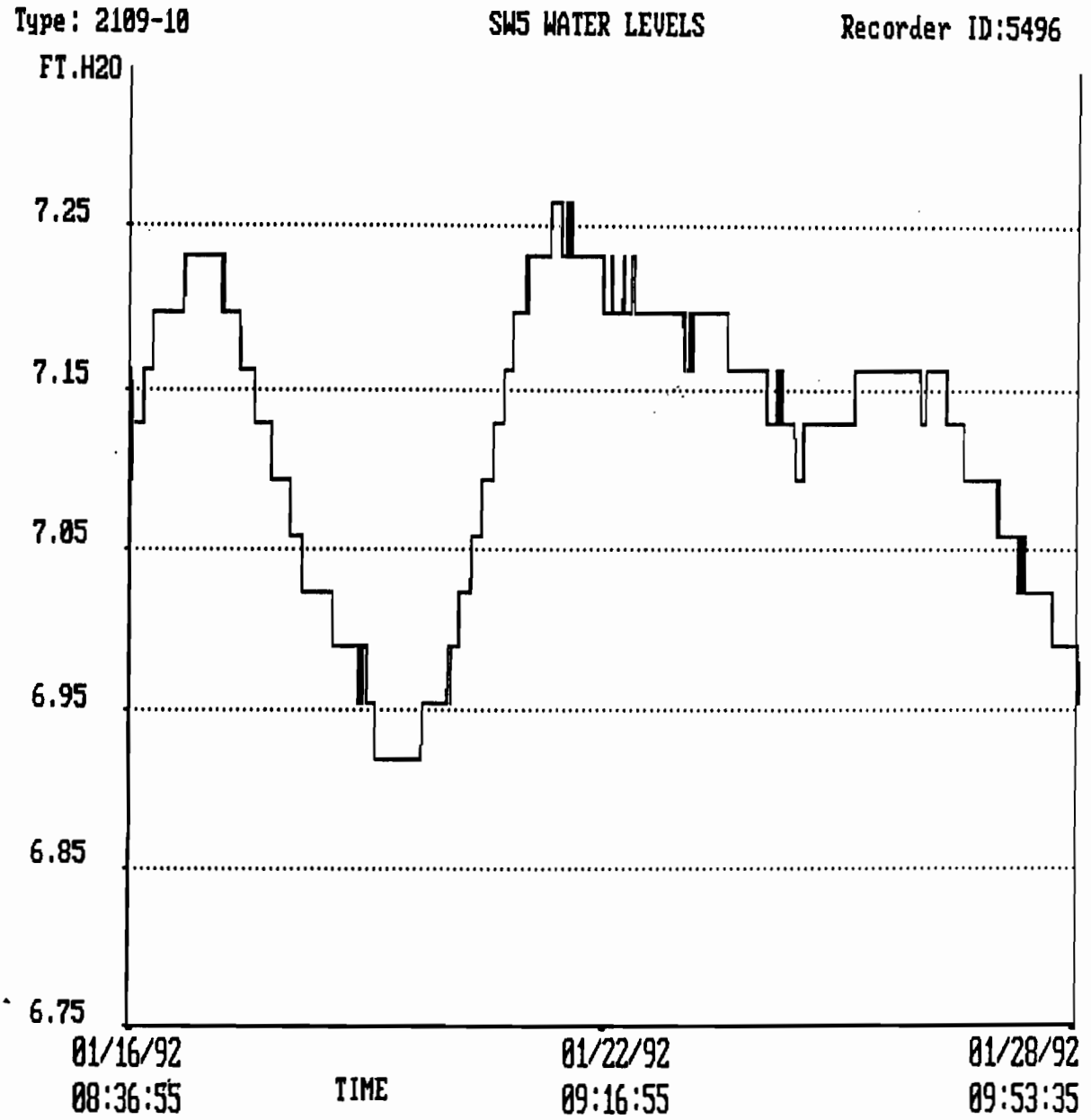

Type: 2109-10
DW5 WATER LEVELS
Recorder ID:3454
17.70
FT.H2O
17.50
17.30
17.10
16.90
16.70
16.50
01/16/92
08:54:30
TIME
01/22/92
09:27:50
01/28/92
09:57:50

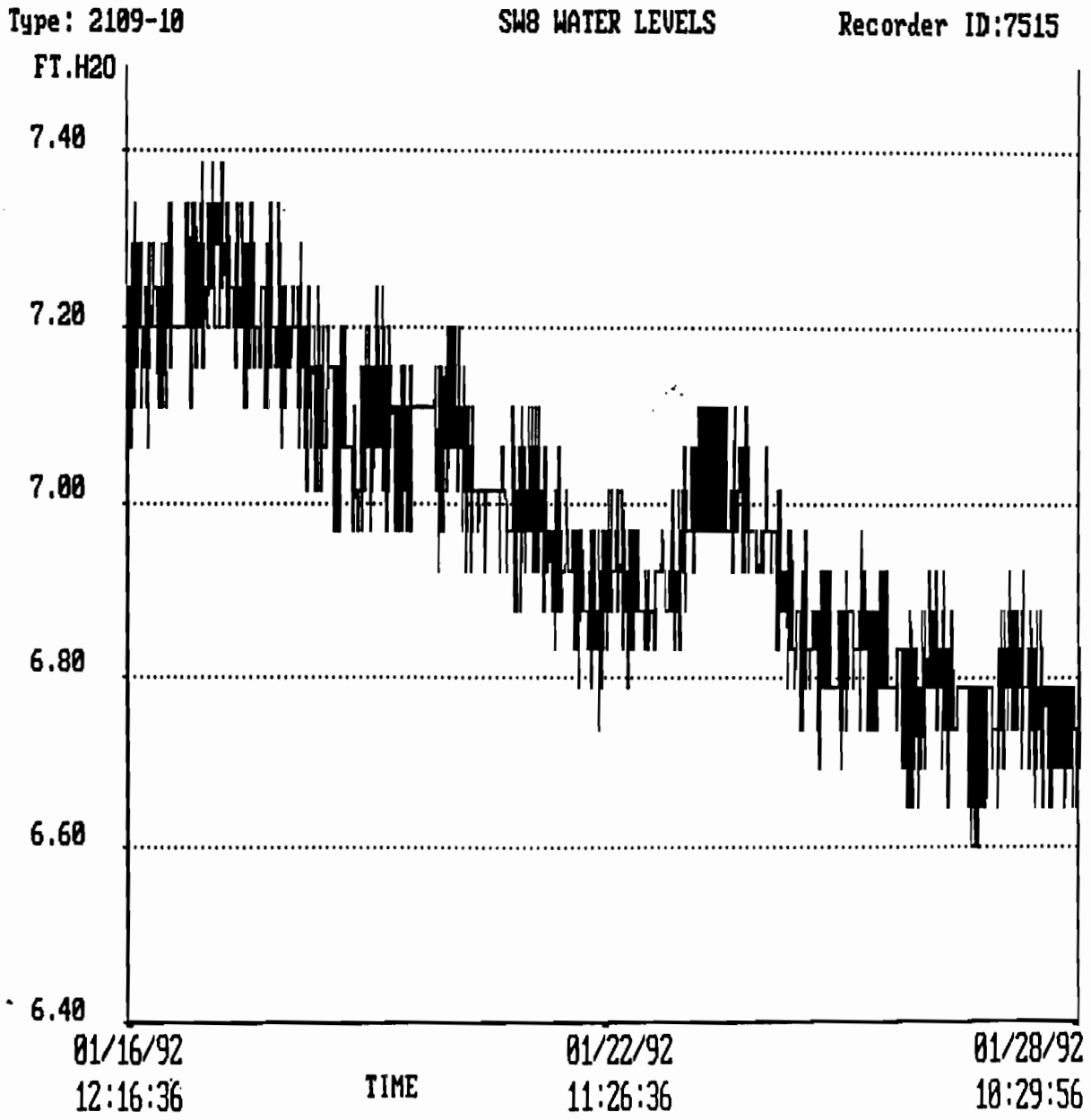

Type: 2109-10
DW8 WATER LEVELS
Recorder ID:7518
FT.H2O
15.30
15.10
14.90
14.70
14.50
14.30
01/16/92
12:01:44
TIME
01/22/92
11:21:44
01/28/92
10:38:24

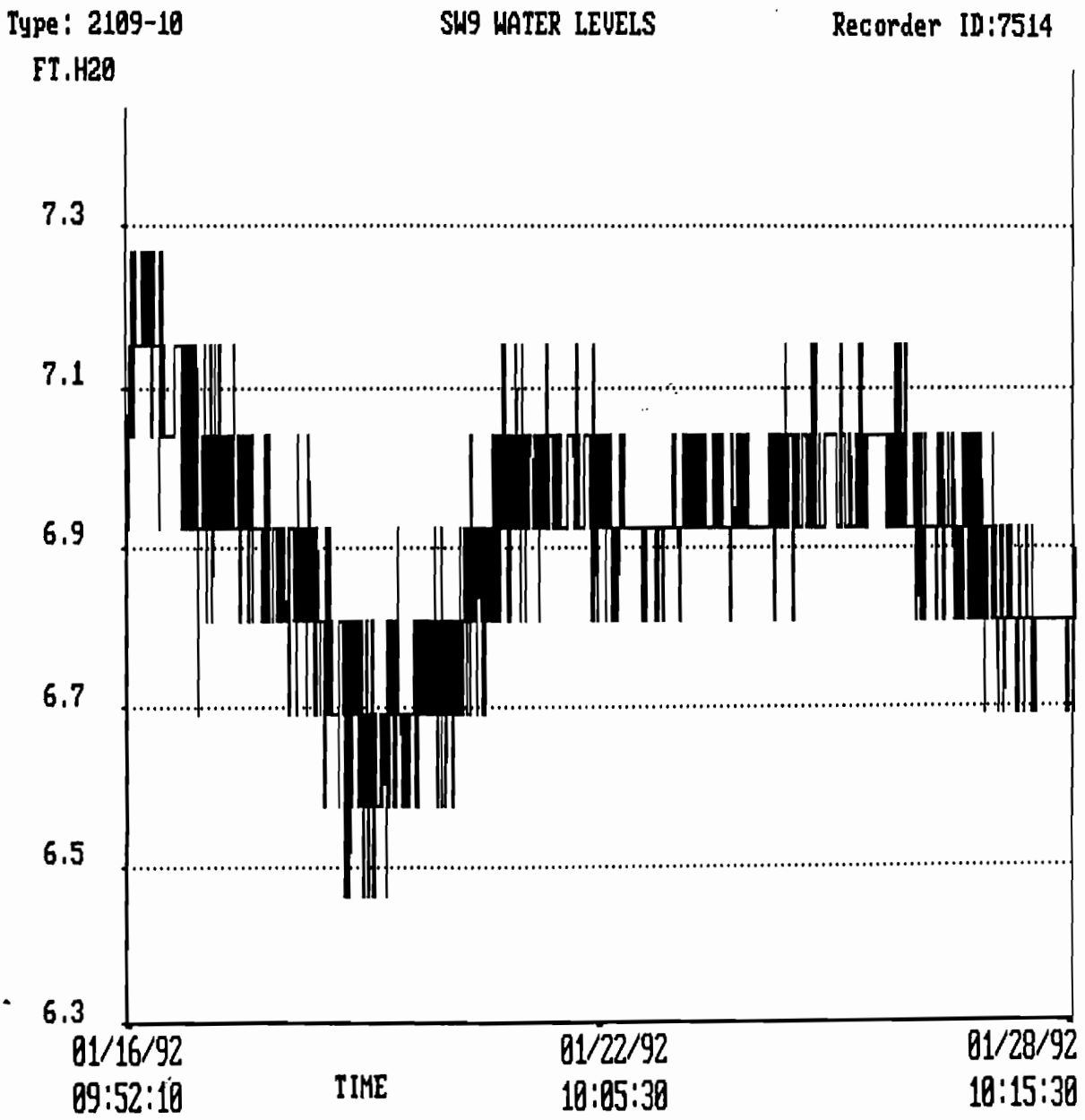

Type: 2109-10
DW9 WATER LEVELS
Recorder ID:7248
16.0
FT.H2O
15.0
14.0
13.0
01/16/92
09:57:57
TIME
01/22/92
10:04:37
01/28/92
10:07:57


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.H2O
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

MARCOR
OF NEW YORK, Inc.
120 Elmgrove Park
Rochester, NY 14624
(716) 247-6955

FACSIMILE TRANSMITTAL COVER SHEET

PLEASE DELIVER THE FORTHCOMING PAGES TO:

NAME: Joe Hau

FIRM/DEPARTMENT: Argonne @ G.E

FAX MACHINE NUMBER: 607-770-5728

FROM: Mary

DATE: 1-16-91

Transmission includes 12 page(s)-not including this cover sheet.

If you do not receive all the pages indicated above, please call (716) 247-6955.

++

Comments and/or Special Instructions:

soil analytical results

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

Robert F. van der Horst, P.E.

VAN DER HORST

Marcor of New York
Soils Testing
page 2

SUMMARY OF TESTING FROM SHELBY TUBE SAMPLES

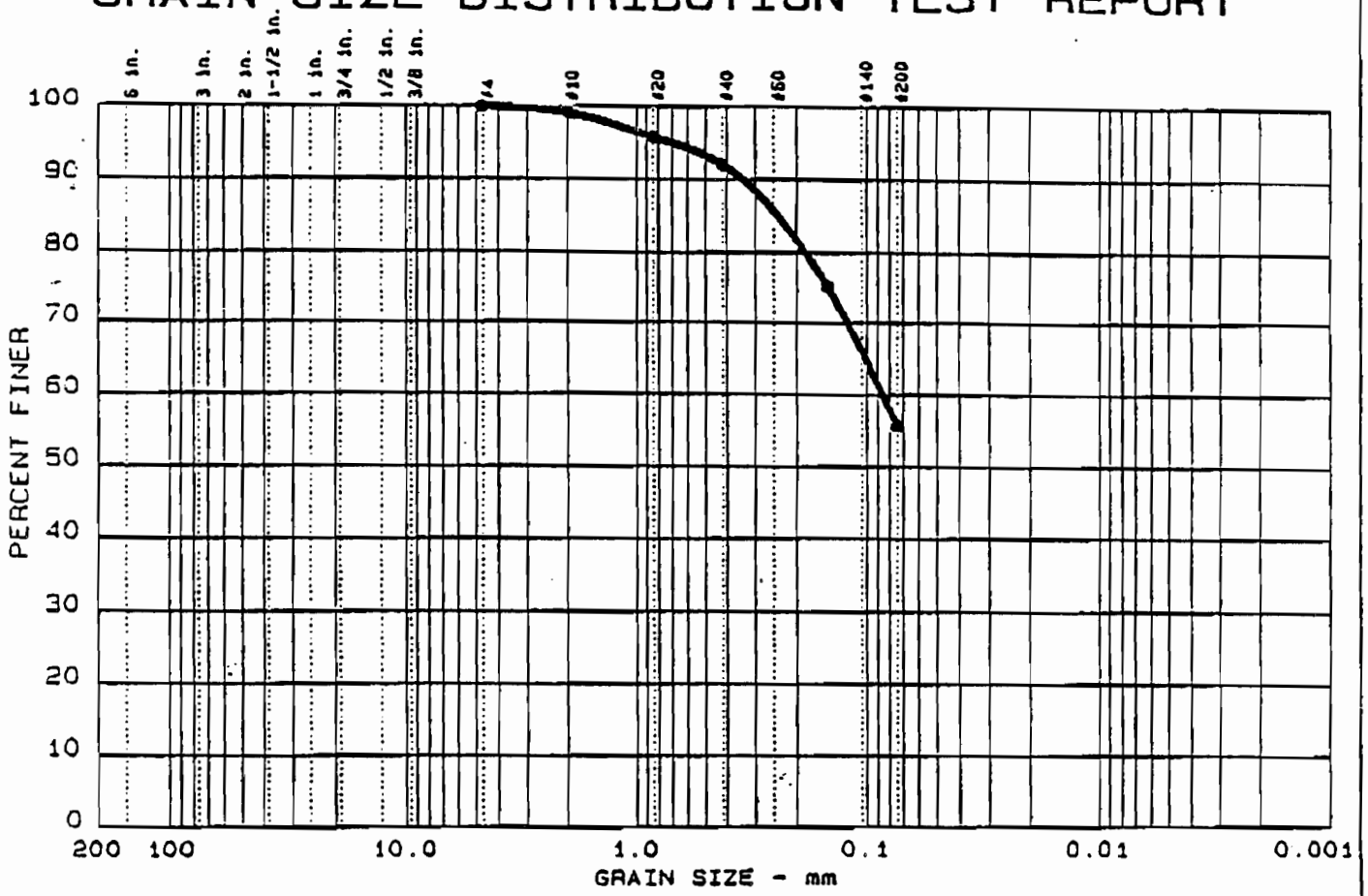
SAMPLE I.D.	PERMEABILITY (K=cm/sec)	% GRAVEL	% SAND	% SILT	% CLAY
DW6-ST-1 (LAB 313)	2.3×10^{-4}	0.0	44.4	55.6	see note 1
DW5-ST-1 (LAB 316)	1.6×10^{-5}	0.0	0.0	74.5	24.8
DW9-SP-1 (LAB 330)	8.1×10^{-4}	0.4	64.4	19.3	15.9

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	%+75mm	% 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

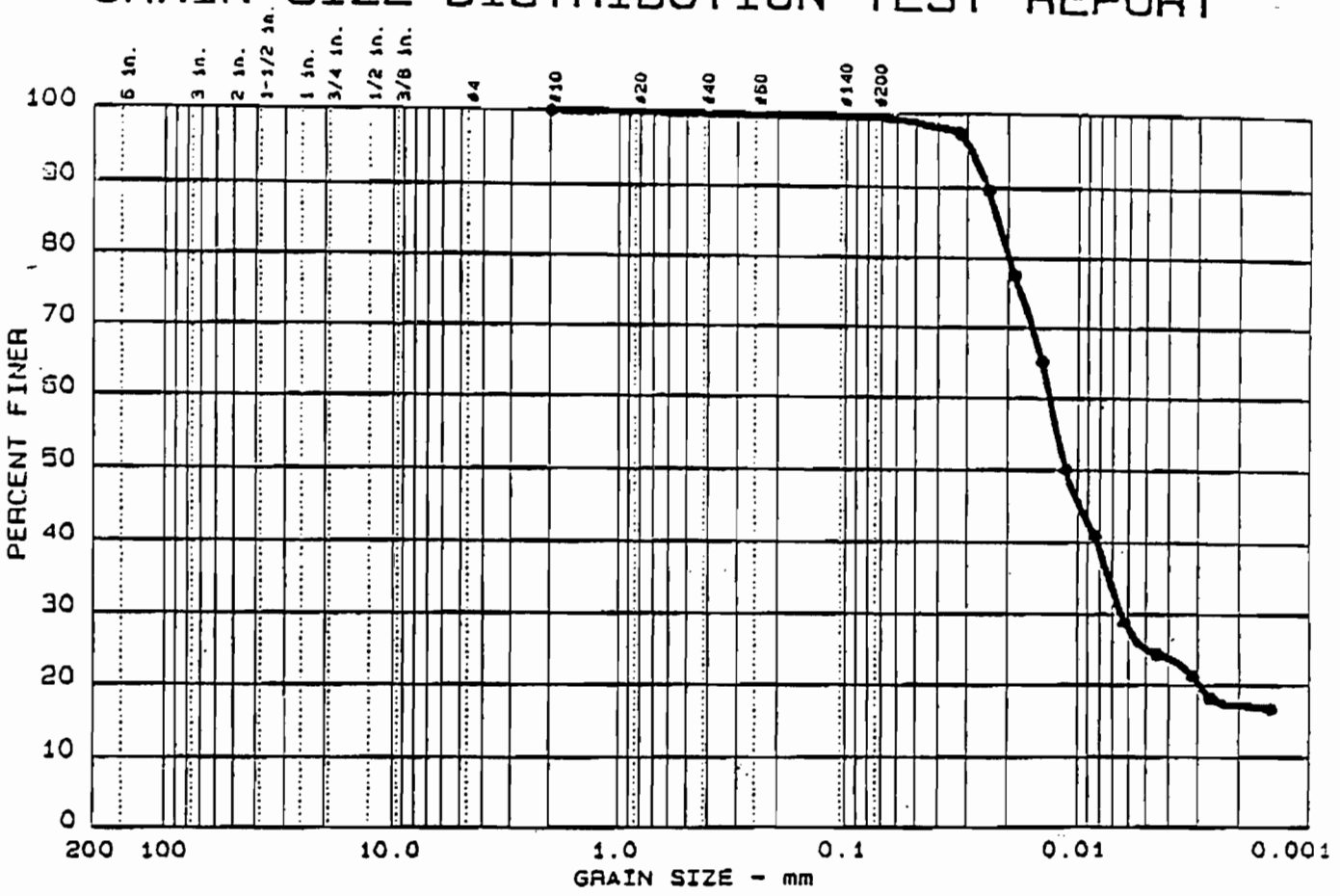
Date: 12-30-91

Remarks:
MARCOR SITE AFP#59

VAN DER HORST 100 Elmgrove Park Rochester, NY 14624

Figure No. 313

GRAIN SIZE DISTRIBUTION TEST REPORT



	Test	%+75 mm	% 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	

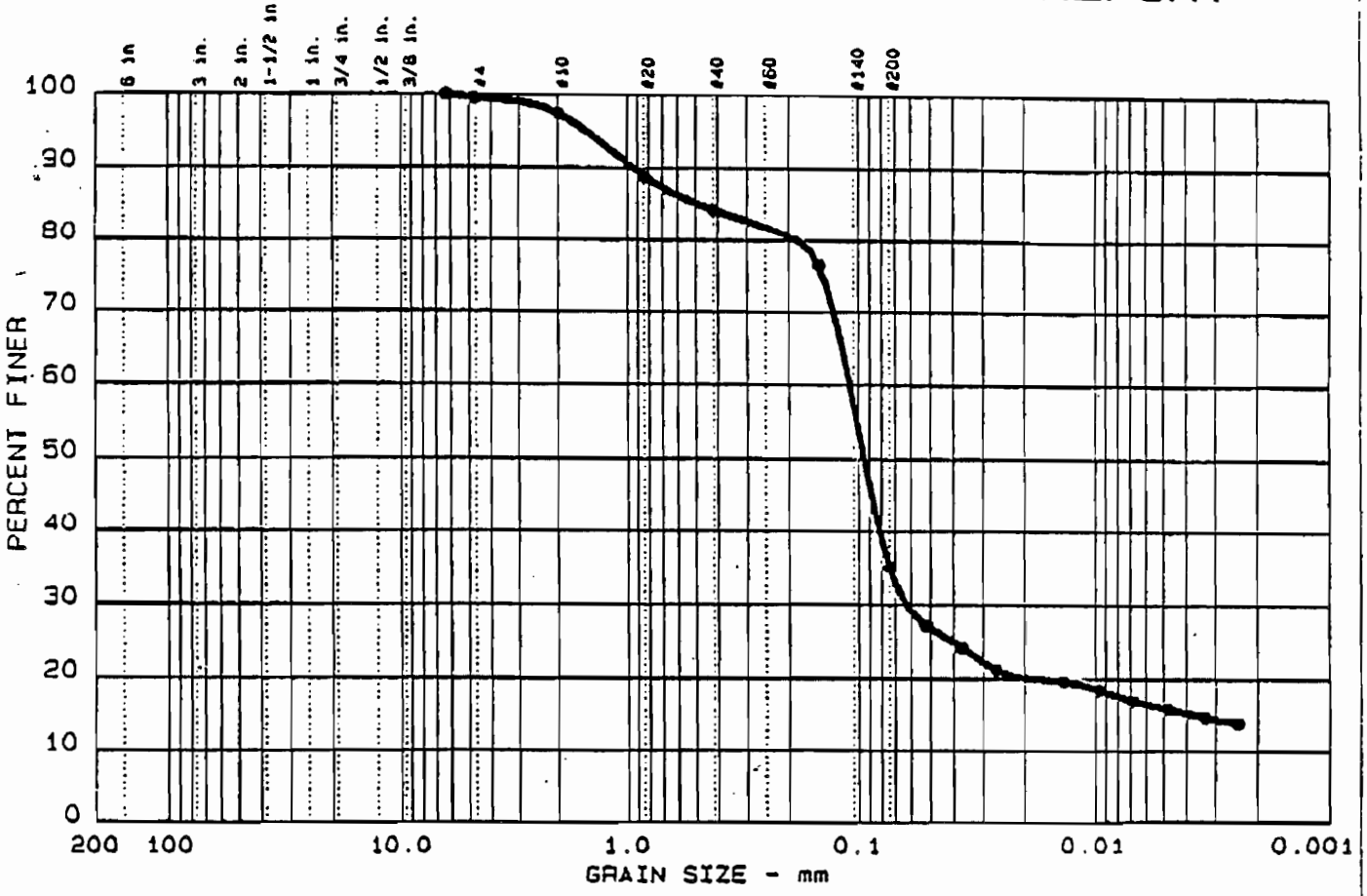
Project No.: VDH-91-069
Project: MARCOR OF NEW YORK
● Location: ~~DW5~~-ST-1, SHELBY TUBE SAMPLE
S
Date: 12-30-91

VANDERHORST 100 Elmgrove Park Rochester, NY 14624

Remarks:
MARCOR SITE AFP#59

Figure No. 316

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

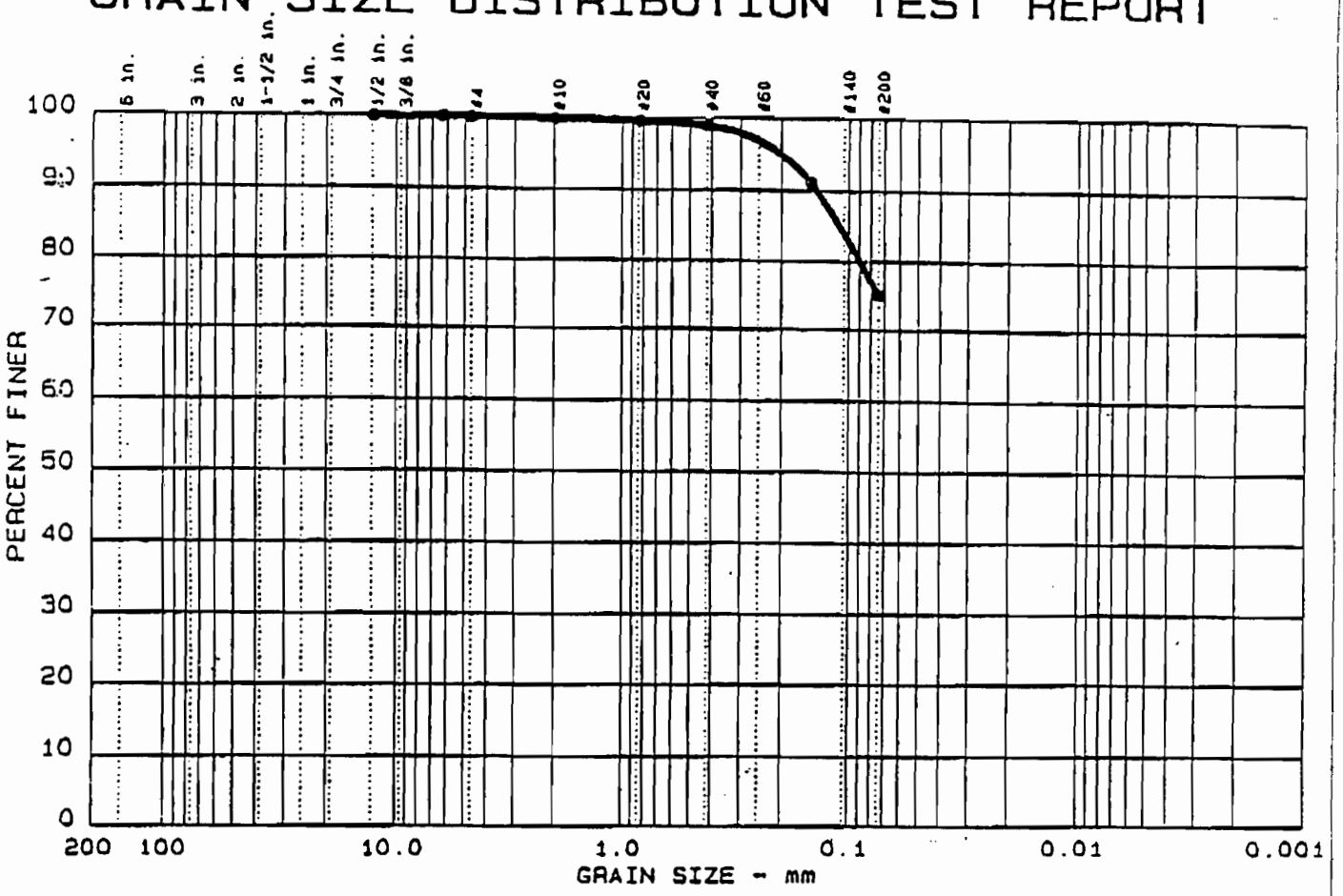
Date: 12-30-91

VANDERHORST 100 Elmgrove Park Rochester, NY 14624

Remarks:
MARCOR SITE AFP#59
JOHNSON CITY, NEW YORK

Figure No. 330

GRAIN SIZE DISTRIBUTION TEST REPORT



	Test	%+75 mm	% 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.: VDH-91-069
Project: MARCOR OF NEW YORK
● Location: OW8-SA-1

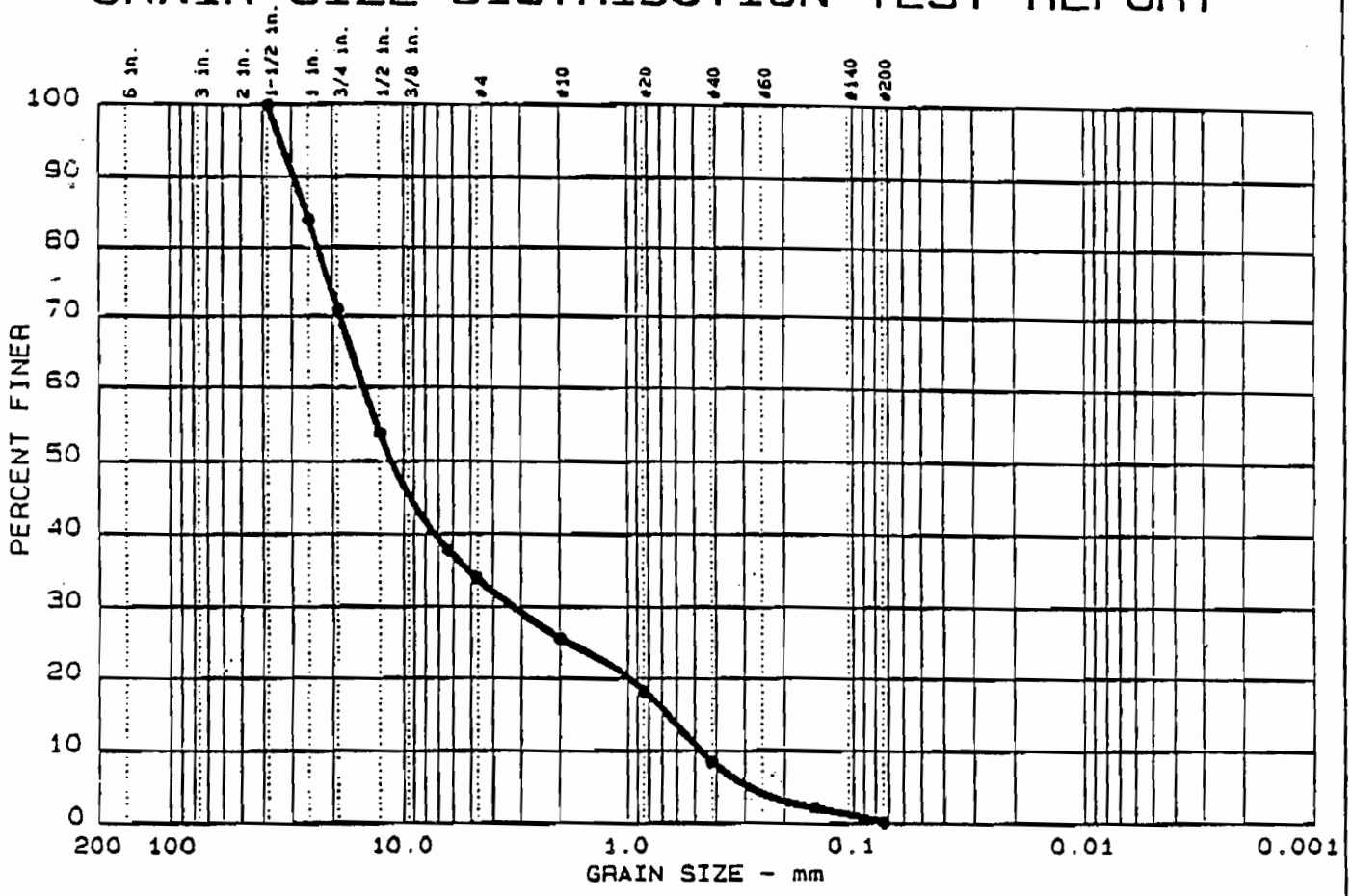
Date: 12-23-91

Remarks:

VANDERHORST 100 Elmgrove Park Rochester, NY 14624

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: OW3-SA-1, 10'-18'

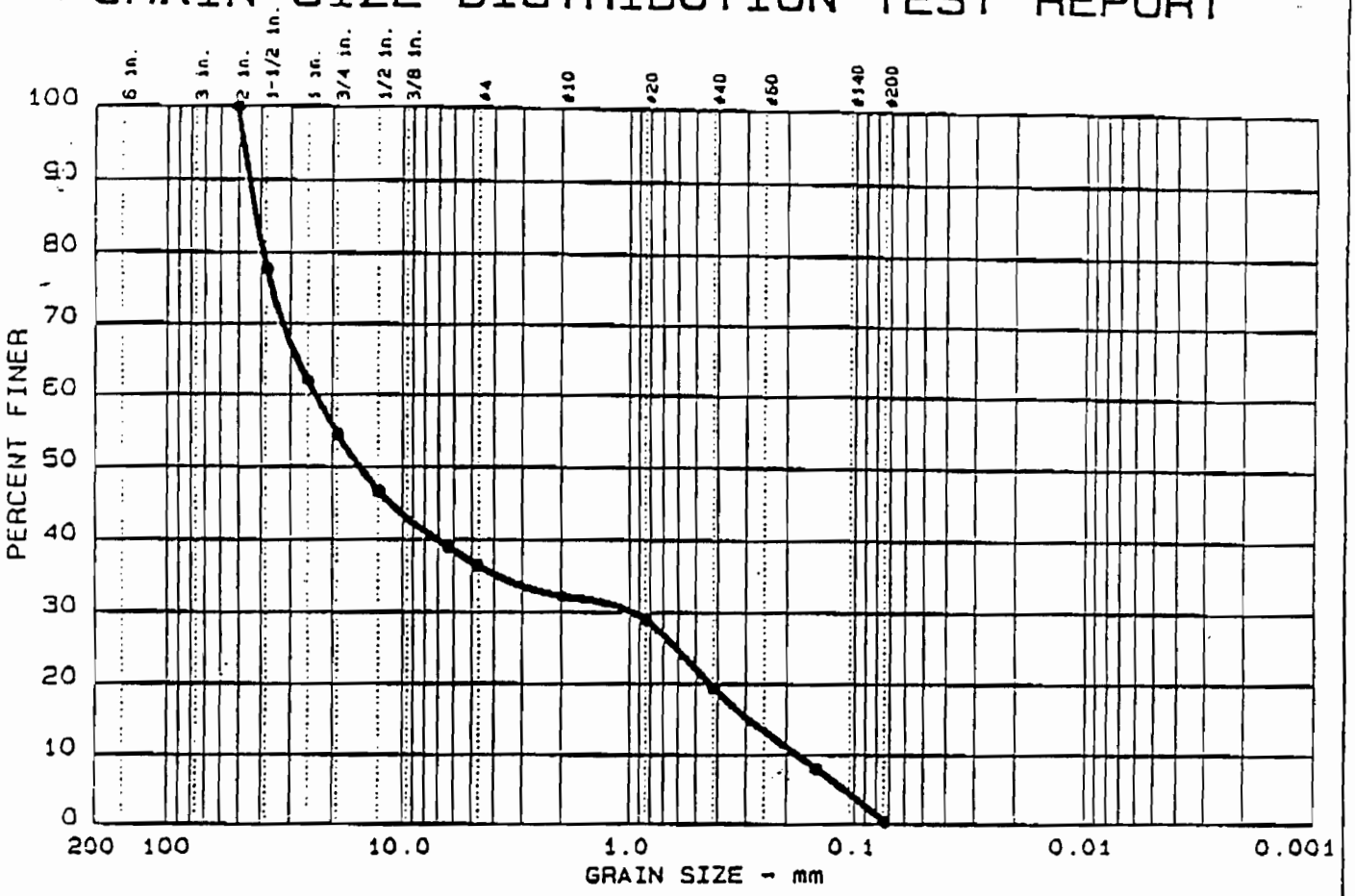
Date: 12-23-91

Remarks:

VANDERHORST 100 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.: VDN-91-069
Project: MARCOR OF NEW YORK
● Location: NW-S-SA-1, 8'-10'

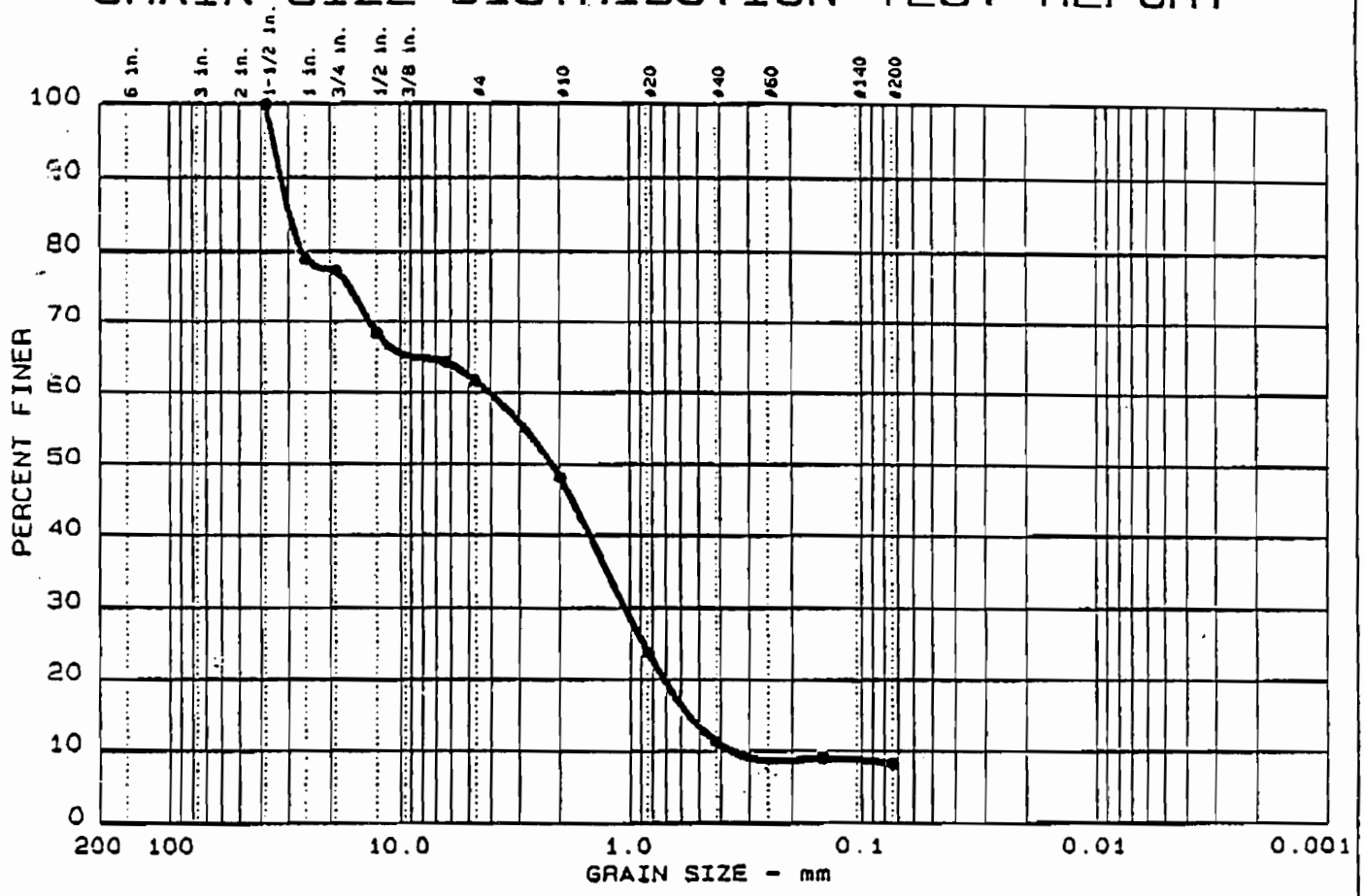
Date: 12-23-91

Remarks:

VANDERHORST 100 Elmgrove Park Rochester, NY 14624

Figure No. 314

GRAIN SIZE DISTRIBUTION TEST REPORT



	Test	%+75 mm	% 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: OW5-SA-2

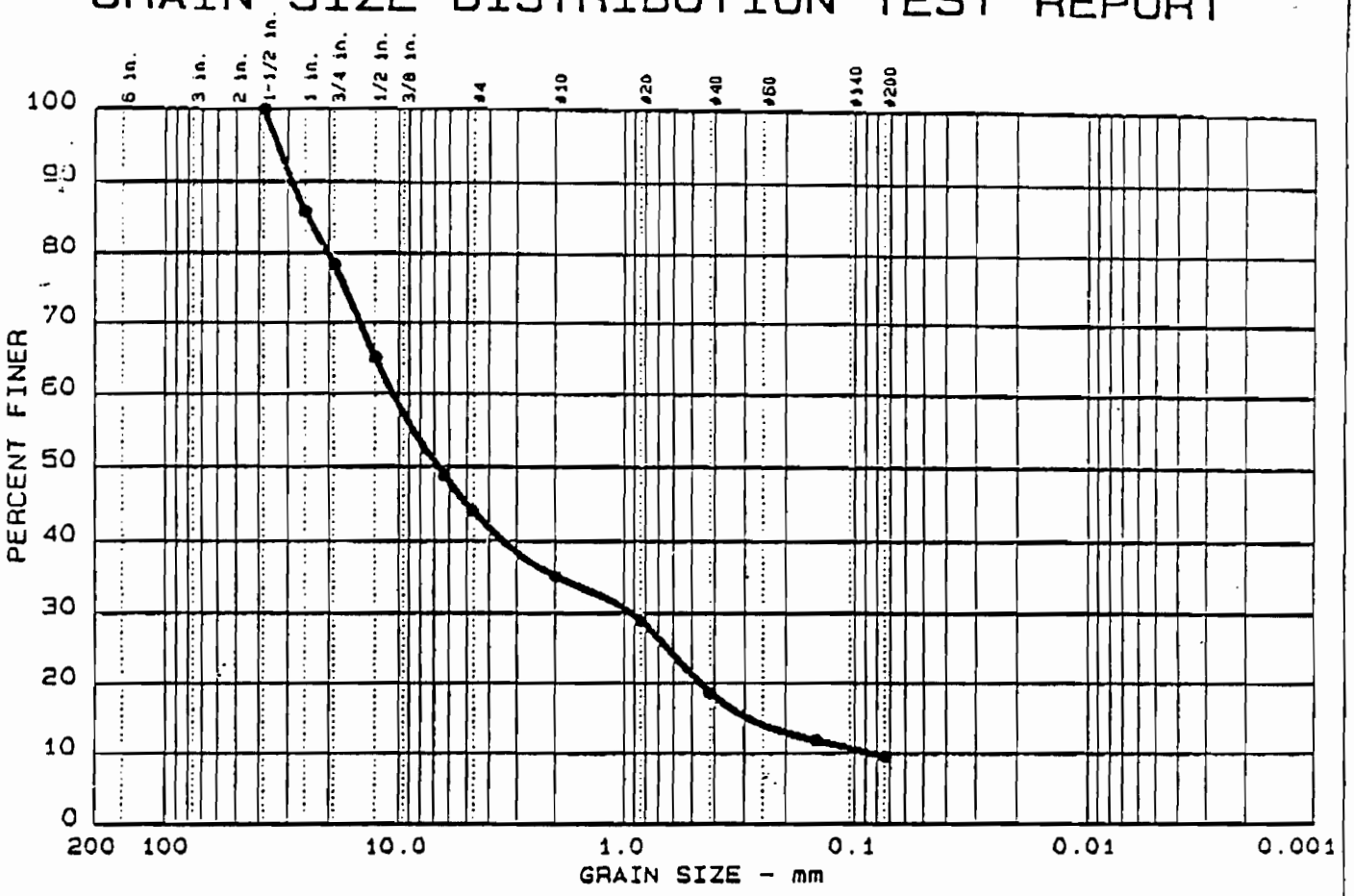
Date: 12-23-91

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

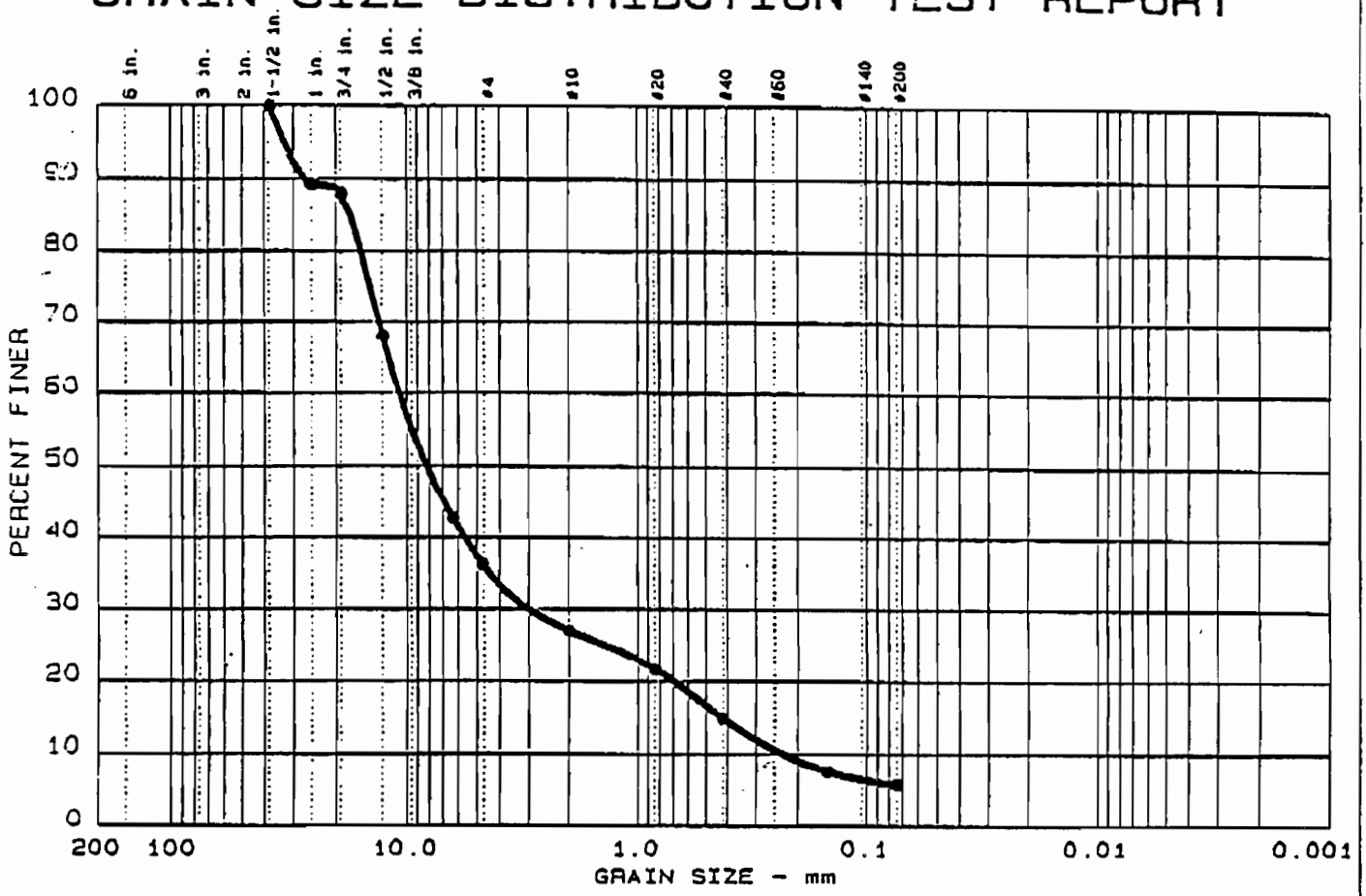
Date: 12-30-91

VANDERHORST 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

VANDERHORST 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-5-12.

ANL A

USAF ORMATION (BCHWCI)

AFIID					WCM-CODE	GZC-CODE	SAQ-CODE	SB-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	IW9	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

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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

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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

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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 0.8 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	~~NI~~ .003	ft/d
AFP#59	IW9	12-Jan-92	S		
AFP#59	IW9	12-Jan-92	T	~~NW~~ .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 P-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

4 NOV 91

Page 1 of 1

Company Name	Project Manager/Contact
Argonne	Wyman Harrison 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)

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	PARAMETERS FOR ANALYSIS: SW/PCB/PEST	MET/Cn	VOA
JCSW8AS	4 NOV 91	1710				✓														✓	✓	✓
TRIP BLANK					✓																	✓
JCSW8BS	4 NOV 91	1715				✓														✓	✓	✓

REMARKS: NYS DEC ASP

Task No.

Note: Petroleum product odor noted in JCSW8AS.

Poor recovery JCSW8BS - Sample contains gravel

SAMPLERS LAURA [illegible] SIGNATURE:

NAME: BARNEY NASHOLD Barney Nashold

SAMPLES RELINQUISHED BY:		SAMPLES RECEIVED BY:	
NAME: BARNEY W NASHOLD	DATE: 5 NOV 91	NAME: LAURA [illegible]	DATE: [illegible]
SIGNATURE: Barney W Nashold	TIME: 0800 HR	SIGNATURE:	TIME: [illegible]
NAME: [illegible]	DATE:	NAME:	DATE:
SIGNATURE:	TIME:	SIGNATURE:	TIME:
NAME:	DATE:	NAME:	DATE:
SIGNATURE:	TIME:	SIGNATURE:	TIME:

Received For Laboratory By: (Signature) [illegible] DATE: 11/5/91 TIME: 1017

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#

(TRIP2)

Chain of Custody Record

7 NOV 91

Page 1 of 1

Company Name	Project Manager/Contact
Argonne N.L.	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)

NYSDECASP

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	PARAMETERS FOR ANALYSIS: SV/PCB/PEST	MET/CN	VOA
JCDW3AS	5NOV	1315	✓		✓	✓														✓	✓	✓
JCDW3BS	5NOV	1630	✓			✓														✓	✓	✓
JCQC1TW	6NOV	1415	✓		✓															✓	✓	✓
JCQC2BW	6NOV	1445	✓		✓															✓	✓	✓

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 E. GIBLIN BARNEY NASHOLD **SIGNATURE:** BNashold

SAMPLES RELINQUISHED BY:		SAMPLES RECEIVED BY:	
NAME: BARNEY NASHOLD SIGNATURE: BNashold	DATE: 7 NOV 91 TIME: 0815	NAME: LAURA E. GIBLIN SIGNATURE:	DATE: TIME:
NAME: LAURA E. GIBLIN SIGNATURE:	DATE: TIME:	NAME: SIGNATURE:	DATE: TIME:
NAME: SIGNATURE:	DATE: TIME:	NAME: SIGNATURE:	DATE: TIME:

Received For Laboratory By: (Signature) [signature] 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

#698/2

TRIP 3

7NOV91 Cooler D-055

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) [circled], 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	SV	VOA	PCB PEST	METALS	CYANIDE					
JCQC3XW	7Nov91	1500	✓		✓	✓ [struck]														✓	✓	✓	✓	✓					
TRIP BLANK																					✓								
HOLD BLANK																					✓								

REMARKS: TRIP BLANK 3 ENCLOSED
= rinsate of bailers
NYSDEC ASP

Task No.

SAMPLERS NAME: LAURA E. G[illegible] / BARNEY NASHOLD SIGNATURE: [signature] / BNashold

SAMPLES RELINQUISHED BY:		SAMPLES RECEIVED BY:	
NAME: BARNEY NASHOLD SIGNATURE: BNashold	DATE: 7NOV91 TIME: 1630HR	NAME: SIGNATURE:	DATE: TIME:
NAME: SIGNATURE:	DATE: TIME:	NAME: SIGNATURE:	DATE: TIME:
NAME: SIGNATURE:	DATE: TIME:	NAME: SIGNATURE:	DATE: TIME:

Received For Laboratory By: (Signature) [signature] 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

2/89

Note: bogus time - Fedex delivered at 1200 HR on 8 NOV. Bud 7Nov91

B/16 11/7/91 1153

TRIP 4

18 NOV 91

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.

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	Time	TYPE Comp.	TYPE 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				✓														✓	✓	✓	✓	✓					
JCCW1AW	17 Nov 91	1530			✓															✓	✓	✓	✓	✓					
JCSD1AS	17 Nov 91	1600			✓															✓	✓	✓	✓	✓					
TRIP 4	18 Nov 91	1000			✓															✓		(Method 524.2 VOC)							

PARAMETERS FOR ANALYSIS

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:** B Nashold

Soils in Galson Cooler DØ53
Waters in Galson Cooler DØ64

SAMPLES RELINQUISHED BY:		SAMPLES RECEIVED BY:	
NAME: BARNEY NASHOLD SIGNATURE: B Nashold	DATE: 18NOV91 TIME: 1000 HR	NAME: LAURA KLEIN SIGNATURE:	DATE: TIME:
NAME: SIGNATURE:	DATE: TIME:	NAME: SIGNATURE:	DATE: TIME:
NAME: SIGNATURE:	DATE: TIME:	NAME: SIGNATURE:	DATE: TIME:

Received For Laboratory By: (Signature) DATE: TIME: 1145

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

2889

18 NOV 91

TRIP 5

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.

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	Time	TYPE Comp.	TYPE Grab	Aqueous	Soil	Other	A	B	C	D	E	F	G	H	I	J	K	Laboratory ID Number	PARAMETERS FOR ANALYSIS: 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 G. Blin

SIGNATURE: Barney Nashold / Laura G. Blin

Galson cooler D-052

SAMPLES RELINQUISHED BY:		SAMPLES RECEIVED BY:	
NAME: Barney Nashold SIGNATURE: B Nashold	DATE: 18 NOV TIME: 1715	NAME: SIGNATURE:	DATE: TIME:
NAME: SIGNATURE:	DATE: TIME:	NAME: SIGNATURE:	DATE: TIME:
NAME: SIGNATURE:	DATE: TIME:	NAME: SIGNATURE:	DATE: 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 6

21 NOV 91

Chain of Custody Record

Page 1 of 1

Company Name	Project Manager/Contact	Galson Laboratories	Special QA/QC Protocol (Circle)
ARGONNE	WYMAN HARRISON BARNEY NASHOLD	6601 Kirkville Road East E. Syracuse, New York 13057 315-432-0506 or 800-950-0506	EPA CLP · EPA SW 846 · **NYS DEC** (circled) · NYS DOH · NJ TIER I · CALIFORNIA · NJ TIER II · OTHER (Specify)
Project No. AFP-59	**Project Name** ERP Supplement [illegible]		

SAMPLE LOCATION / SAMPLE ID	Date	Time	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~~ [illegible]																													
JCSW5AS	21 NOV 91	0710				✓														✓	✓	✓	✓	✓					
JCSW5BS	[illegible] 91	0833				✓														✓	✓	✓	✓	✓					
JCSW5BS-M	21 NOV 91	0833				✓														✓	✓	✓	✓	✓	(MS/MSD)				
JCCNSCS	[illegible] 91	1030				✓														✓	✓	✓	✓	✓					
JCDW1AS	21 NOV 91	0840				✓														✓	✓	✓	✓	✓					
JCDW1BS	[illegible]	1050				✓														✓	✓	✓	✓	✓					
JCDW1CS	21 NOV 91	0745				✓														✓	✓	✓	✓	✓					
TRIP 6	[illegible]	1500			✓															✓	(Method 524.2 [illegible])								

REMARKS: NYS DEC ASP.

Sample JCCNSCS replaces sample JCCNSAS

Sample JCSW5BS-M = MS/MSD

Task No.

SAMPLERS NAME: Barney Nashold **SIGNATURE:** B Nashold

Laura [illegible] [illegible]

Galson Cooler D-050

SAMPLES RELINQUISHED BY:		SAMPLES RECEIVED BY:	
NAME: Barney Nashold SIGNATURE: B Nashold	DATE: 21 NOV 91 TIME: 1500	NAME: [illegible] SIGNATURE: [illegible]	DATE: 21 NOV 91 TIME: [illegible]
NAME: [illegible] SIGNATURE: [illegible]	DATE: 21 NOV 91 TIME: [illegible]	NAME: [illegible] SIGNATURE: [illegible]	DATE: [illegible] TIME: [illegible]
NAME: SIGNATURE:	DATE: TIME:	NAME: SIGNATURE:	DATE: 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 7

Chain of Custody Record

Page 1 of 1

Company Name	Project Manager/Contact
Argonne	Wyman Harrison / Barney Nasiold

Project No.	Project Name
AFP-57	IRP Supplemental RI

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	Time	TYPE: Comp.	Grab	Aqueous	Soil	Other	A	B	C	D	E	F	G	H	I	J	K	Laboratory ID Number	PARAMETERS FOR ANALYSIS: VOA	SV	PCB/PEST	METALS	CN					
JCOF1AW	22Nov91	0730			✓															✓	✓	✓	✓	✓					
JCOF2AW	22Nov91	0930			✓															✓	✓	✓	✓	✓					
JCOF2AW-M	22Nov91	0930			✓															✓	✓	✓	✓	✓	(TAL	METALS			D)
TRIP 7	22Nov91	0900			✓															✓	(met	hod	524	.2	VOC)				

REMARKS: NYS DEC ASP.

Task No.

Sample JCOF2AW-M MS/MSD for surface water

SAMPLERS NAME: [illegible] **SIGNATURE:** BMarshold

Galson cooler # D-052

SAMPLES RELINQUISHED BY:		SAMPLES RECEIVED BY:	
NAME: BARNEY NASIOLD	DATE: 23NOV91	NAME: LAURA GIBLIN	DATE: 23NOV91
SIGNATURE: BMarshold	TIME: 1000	SIGNATURE: [illegible]	TIME: 1000
NAME: [illegible]	DATE: 23NOV91	NAME: Geraldine ESPIRITU	DATE: 23Nov91
SIGNATURE: [illegible]	TIME: 1140	SIGNATURE: Geraldine Espiritu	TIME: 1140
NAME:	DATE:	NAME:	DATE:
SIGNATURE:	TIME:	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

2/89#

TRIP 8

26 NOV 91

Chain of Custody Record

Page 1 of 1

Company Name	Project Manager/Contact
Argonne	Wyman Harrison Barney Nashold
Project No.	**Project Name**
AFP-59	Environmental 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)

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	SV	PCB/PEST	METALS	CN					
JCSW4AS	26 NOV 91	0815				✓														✓	✓	✓	✓	✓					
JCSW4BS	26 NOV 91	0845				✓														✓	✓	✓	✓	✓					
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: B W Nashold, Laura Giblin

Galson color D-036

SAMPLES RELINQUISHED BY:		SAMPLES RECEIVED BY:	
NAME: BARNEY NASHOLD SIGNATURE: B W Nashold	DATE: 26 NOV 91 TIME: 1300	NAME: Laura Giblin SIGNATURE:	DATE: 26 NOV 91 TIME: 1310
NAME: Laura Giblin SIGNATURE:	DATE: 26 NOV 91 TIME: 1535	NAME: Bryan J Coleman SIGNATURE: Bryan J Coleman	DATE: 26 NOV 91 TIME: 1535
NAME: SIGNATURE:	DATE: TIME:	NAME: SIGNATURE:	DATE: TIME:

Received For Laboratory By: (Signature) Bryan 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#

TRIP 9 FEDEX AB# 1323800870

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 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	Time	TYPE Comp.	TYPE 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	1155				✓														✓	✓	✓	✓	✓				
JC4H2AS	03DEC 91	1430				✓														✓	✓	✓	✓	✓				
Trip 9	03DEC 91	1330			✓															✓	(Method 524.2 VOC)							

REMARKS: NYS DEC ASP.

Task No.

Blank reports rec'd 4 DEC 1048HR / Blank 12 DEC 91

SAMPLERS NAME: Barney Nashold Laura G. Blin SIGNATURE: BWNashold Laura G. Blin

Galson code: ~~D-055~~ 03NOV91 D-036

SAMPLES RELINQUISHED BY:		SAMPLES RECEIVED BY:	
NAME: BARNEY NASHOLD SIGNATURE: BWNashold	DATE: 3DEC'91 TIME: 1830	NAME: SIGNATURE:	DATE: TIME:
NAME: SIGNATURE:	DATE: TIME:	NAME: SIGNATURE:	DATE: TIME:
NAME: SIGNATURE:	DATE: TIME:	NAME: SIGNATURE:	DATE: 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# 132380088

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.

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	Time	TYPE Comp.	TYPE Grab	Aqueous	Soil	Other	A	B	C	D	E	F	G	H	I	J	K	Laboratory ID Number	PARAMETERS FOR ANALYSIS: VOA	SV	PCB/PEST	METALS	CN
JC1H1AS	04DEC 91	0940				✓														✓	✓	✓	✓	✓
JC1H1CS	04DEC 91	1000				✓														✓	✓	✓	✓	✓
JC3H1AS	04DEC 91	1225				✓														✓	✓	✓	✓	✓
JC6H1AS	04DEC 91	1600				✓														✓	✓	✓	✓	✓
TRIP 10	04DEC 91	1745			✓															✓		(Method 524.2 VOC)		

REMARKS: NYS DEC ASP. ☆Note: Only enough sample was available for Bu14DEC91 at the location represented by JC1H1AS 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: Bu Nashold, Laura S. Giblin

Galson Cooler # D-075

SAMPLES RELINQUISHED BY:		SAMPLES RECEIVED BY:	
NAME: BARNEY NASHOLD SIGNATURE: Bu Nashold	DATE: 4 DEC 91 TIME: 1745	NAME: SIGNATURE:	DATE: TIME:
NAME: SIGNATURE:	DATE: TIME:	NAME: SIGNATURE:	DATE: TIME:
NAME: SIGNATURE:	DATE: TIME:	NAME: SIGNATURE:	DATE: 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

Cooler D-057

Page 1 of 1

Chain of Custody Record

Company Name	Project Manager/Contact
ARGONNE	Wyman Hurrison 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)

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	PARAMETERS FOR ANALYSIS: 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. Saturday Delivery

Note: Fedex confirmed delivery 7 DEC 91 1102.
Brian Coleman recorded, on cooler, time that he opened cooler: 9 Dec 0530.

Task No.

SAMPLERS NAME: Barney Nashold **SIGNATURE:** Barney Nashold

SAMPLES RELINQUISHED BY:		SAMPLES RECEIVED BY:	
NAME: BARNEY NASHOLD	DATE: 6 DEC 91	NAME:	DATE:
SIGNATURE: BarNashold	TIME: 1430	SIGNATURE:	TIME:
NAME:	DATE:	NAME:	DATE:
SIGNATURE:	TIME:	SIGNATURE:	TIME:
NAME:	DATE:	NAME:	DATE:
SIGNATURE:	TIME:	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

#698/2

TRIP 12

Chain of Custody Record

Page 1 of 1

Company Name	Project Manager/Contact
Argonne	[illegible]

Project No.	Project Name
ATP.59	[illegible]

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 (circled) NYS DOH
NJ TIER I CALIFORNIA
NJ TIER II OTHER (Specify)

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	SV	PCB/PEST	Metals	CN
JCBG2AW	9 DEC 91	1510		✓	✓														-	✓	✓	✓	✓	✓
JCSW1AS	10 DEC 91	[illegible]				✓														✓	✓	✓	✓	✓
JCSW9BS	[illegible]	[illegible]				✓														✓	✓	✓	✓	✓
[illegible] ES-M	[illegible]	[illegible]				✓														✓	✓	✓	✓	✓
TRIP 12	[illegible]	1230			✓															✓	(method 524.2 VOC)			

Task No.

REMARKS: NYS DEC ASP.
Sample JCSW9ES-M : MS/MSD

SAMPLERS NAME: [illegible] **SIGNATURE:** B. Nashold

Galson Cooler D-055

SAMPLES RELINQUISHED BY:		SAMPLES RECEIVED BY:	
NAME: BARNEY NASHOLD SIGNATURE: B. Nashold	DATE: 10 DEC 91 TIME: 1230	NAME: [illegible] SIGNATURE:	DATE: TIME:
NAME: SIGNATURE:	DATE: TIME:	NAME: SIGNATURE:	DATE: TIME:
NAME: SIGNATURE:	DATE: TIME:	NAME: SIGNATURE:	DATE: TIME:

Received For Laboratory By: (Signature) [illegible] DATE: [illegible] TIME: [illegible] 1330

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 13

Chain of Custody Record

Coolers D-074, #165, D-077

Page 1 of 1

Company Name	Project Manager/Contact
ARGONNE	JUYMAN 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)

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	PARAMETERS FOR ANALYSIS: 3 VOA	2 SV	1 PCB/PEST	1 METALS	2 Cn	2 METHOD 524.2	2 METHOD 524.2 VOA				Number of containers
JCDW1AW	5JAN	1045		✓	✓															✓	✓	✓	✓	✓	✓						
JCSW1AW	5JAN	1215		✓	✓															✓	✓	✓	✓	✓	✓						
JCDW5AW	5JAN	1700		✓	✓															✓	✓	✓	✓	✓	✓						
JCSW5AW	5JAN	1800		✓	✓															✓	✓	✓	✓	✓	✓						
JCDW6AW	6JAN	1418		✓	✓															✓	✓	✓	✓	✓	✓						
~~JC Dup~~ JCSW6AW	6JAN	1500		✓	✓															✓	✓	✓	✓	✓	✓						
TRIP BLANK #13	6JAN	1655			✓																				✓						

REMARKS: NYSDECASP

Task No.

SAMPLERS NAME: BARNEY NASHOLD SIGNATURE: Bn Nashold

(Cooler D-074 = cluster 6, #165 = cluster 1
D-077 = cluster 5)

SAMPLES RELINQUISHED BY:		SAMPLES RECEIVED BY:	
NAME: BARNEY NASHOLD SIGNATURE: Bn Nashold	DATE: 6 JAN 92 TIME: 1655	NAME: SIGNATURE:	DATE: TIME:
NAME: SIGNATURE:	DATE: TIME:	NAME: Anne Lee SIGNATURE: Connie Lee	DATE: 1/6/92 TIME: ~~1655~~ 1915
NAME: SIGNATURE:	DATE: TIME:	NAME: SIGNATURE:	DATE: TIME:

Received For Laboratory By: (Signature) Connie 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

2/88

TRIP 14

Chain of Custody Record

Number of containers.
Page 1 of 1

Galson Laboratories
6601 Kirkville Road East
E. Syracuse, New York 13057
315-432-0506 or 800-950-0506

Company Name	Project Manager/Contact	Project No.	Project Name
Argonne	WYMAN HARRISON / BARNEY NASHOLD	AFP-59	IRP Supplemental S.I.

Special QA/QC Protocol (Circle): EPA CLP, EPA SW 846, NYS DEC, NYS DOH, NJ TIER I, CALIFORNIA, NJ TIER II, OTHER (Specify)

Type: Comp. / Grab / Aqueous / Soil / Other; columns A B C D E F G H I J K; Laboratory ID Number

SAMPLE LOCATION / SAMPLE ID	Date (92)	Time	VOA (3)	SV (2)	PCB/PEST (1)	METALS (1)	Cn (2)	METHOD 53[illegible] (2)	Cooler #
JCBG2BW	7JAN	0900	✓	✓	✓	✓	✓		D050
JCDW3AW	7JAN	1111	✓	✓	✓	✓	✓		D03[illegible]
JCSW3AW	7JAN	1301	✓	✓	✓	✓	✓		D03[illegible]
JCDW9AW	7JAN	1650	✓	✓	✓	✓	✓		Z
JCSW9AW	7JAN	1727	✓	✓	✓	✓	✓		Z
JCDW4AW	8JAN	1505	✓	✓	✓	✓	✓		D036
JCDW4AW-M	8JAN	1505	✓	✓	✓	✓	✓	MS/MSD	D036
JCSW4AW	8JAN	1625	✓	✓	✓	✓	✓		059
JCSW7AW	8JAN	1710	✓	✓	✓	✓	✓		059
									B[illegible]
									B[illegible]
TRIP BLANK 14	8JAN	1845						✓	D03[illegible]

Task No.

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 [illegible].

SAMPLERS NAME: SIGNATURE:

SAMPLES RELINQUISHED BY:
NAME: BARNEY NASHOLD DATE: 8JAN
SIGNATURE: B.W. Nashold TIME: 1845
NAME: DATE:
SIGNATURE: TIME:
NAME: DATE:
SIGNATURE: TIME:

SAMPLES RECEIVED BY:
NAME: [illegible] DATE:
SIGNATURE: TIME:
NAME: Ann Lee DATE: 1-8-91
SIGNATURE: Anne Lee TIME: 21:00
NAME: DATE:
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

2/89

TRIP ~~#~~ 15

10 JAN 91

Chain of Custody Record

Page 1 of 1

Company Name	Project Manager/Contact
Argonne	[illegible]

Project No.	Project Name
[illegible]	TRP supplemental [illegible]

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 '92	Time	Comp.	Grab	Aqueous	Soil	Other	Laboratory ID Number	Parameters for Analysis: 3 VOA	2 V	1	1	2	2	Number Bott. / Cooler
JC DW8 AW	1JAN	1355			✓				✓	✓	✓	✓	✓		D055
JC DW8 BW	1JAN	1430			✓				✓	✓	✓	✓	✓		D055
JC SW8 AW	1JAN	1510			✓				✓	✓	✓	✓	✓		D065
JC DP01 AW	[illegible]	1551			✓				✓	✓	✓	✓	✓		D065
TRIP 15	[illegible]	0950			✓									✓	D058

Task No.

REMARKS: [illegible] CC A3P

SAMPLERS NAME: Barney Nashold **SIGNATURE:** B Nashold

SAMPLES RELINQUISHED BY:		SAMPLES RECEIVED BY:	
NAME: BARNEY NASHOLD SIGNATURE: B Nashold	DATE: 10JAN TIME: 0950	NAME: [illegible] SIGNATURE: [illegible]	DATE: 10JAN92 TIME: 0550
NAME: [illegible] SIGNATURE:	DATE: 10-[illegible]-92 TIME: 1225	NAME: SIGNATURE:	DATE: TIME:
NAME: SIGNATURE:	DATE: TIME:	NAME: SIGNATURE:	DATE: TIME:

Received For Laboratory By: (Signature) [illegible] DATE: [illegible] TIME: 1225

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

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)

SAMPLE LOCATION / SAMPLE ID	Date JAN 1992	Time	TYPE Comp.	TYPE Grab	Aqueous	Soil	Other	A	B	C	D	E	F	G	H	I	J	K	Laboratory ID Number	PARAMETERS FOR ANALYSIS: VOA (3ea)	SV (2ea)	PCB/PEST (1ea)	METALS (1ea)	Cn (2ea)	Method 524.2 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
~~TRIP 16~~																				✓	✓	✓	✓	✓					eBW
JCQC4WW	30	1755																		✓									D073
JCQC5XW	30	1810																		✓									D073
TRIP BLANK #16	30	1830																							✓				D005

REMARKS: Two ea VOA's, One each of DW4 & SW4 temporarily capped with unlined caps. Note tags on these containers. *One VOA sample was broken during packing of JCSW7BW. Two containers sent. JCDW4BW-M is a field split for MS/MSD. (Blank prep date = 12/23/91)

Task No.

SAMPLERS NAME: BWM BARNEY NASHOLD SIGNATURE: BWMarshold

SAMPLES RELINQUISHED BY:		SAMPLES RECEIVED BY:	
NAME: BARNEY NASHOLD SIGNATURE: BWMarshold	DATE 30 JAN 92 TIME: 1830	NAME: SIGNATURE:	DATE: TIME:
NAME: SIGNATURE:	DATE: TIME:	NAME: SIGNATURE:	DATE: TIME:
NAME: SIGNATURE:	DATE: TIME:	NAME: SIGNATURE:	DATE: 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

2189#

TRIP 17

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 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.	TYPE Grab	Aqueous	Soil	Other	A	B	C	D	E	F	G	H	I	J	K	Laboratory ID Number	PARAMETERS FOR ANALYSIS: VOA	SV	PCB/PEST	METALS	Cn	METHOD 524.2
JCDWSBW	31 JAN	1100		✓	✓															✓	✓	✓	✓	✓	
~~JCSW5 DUP~~																									
JCSW5BW	31 JAN	1140		✓	✓															✓	✓	✓	✓	✓	
JC2LIAS	31 JAN	1700		✓	✓	✓														✓	✓	✓	✓	✓	
JCDW6BW	FEB	230		✓	✓															✓	✓	✓	✓	✓	
JCSW6BW	FEB	1305		✓	✓															✓	✓	✓	✓	✓	
JCDW1BW	FEB	1440		✓	✓															✓	✓	✓	✓	✓	
JCSW1BW	FEB	1571		✓	✓															✓	✓	✓	✓	✓	
TRIP BLANK # 17	FEB	715			✓																				✓

REMARKS: Not homogenized in field. Please homogenize in lab.
JC2LIAS↑

Task No.

SAMPLERS NAME: BARNEY NASHOLD SIGNATURE: B Nashold
NAME: Laura E Giblin Laura E Giblin

SAMPLES RELINQUISHED BY:		SAMPLES RECEIVED BY:	
NAME: BARNEY NASHOLD SIGNATURE: B Nashold	DATE: FEB 7 TIME: 1715	NAME: LAURA E GIBLIN SIGNATURE: Laura E Giblin	DATE: TIME:
NAME: SIGNATURE:	DATE: TIME:	NAME: SIGNATURE:	DATE: TIME:
NAME: SIGNATURE:	DATE: TIME:	NAME: SIGNATURE:	DATE: 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 18

Chain of Custody Record

03FEB92

Company Name	Project Manager/Contact	Project No.	Project Name
[illegible]	[illegible]	[illegible]	[illegible]

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 (circled) — NYS DOH
NJ TIER I — CALIFORNIA
NJ TIER II — OTHER (Specify)

SAMPLE LOCATION / SAMPLE ID	Date	Time	Comp.	Grab	Aqueous	Soil	Other	A	B	C	D	E	F	G	H	I	J	K	Laboratory ID Number	3 VOA	2 SV	1 PCB/PEST	1 [illegible]	2 [illegible]	2 [illegible]				Cooler
JCDW3BW	[illegible]	1110		✓	✓															✓	✓	✓	✓	✓					D053
J[illegible]BW	[illegible]	1120		✓	✓															✓	✓	✓	✓	✓					D-053
JCSW2BW	[illegible]	1215		✓	✓															✓	✓	✓	✓	✓					D-075
JCDW1BW	[illegible]	1045		✓	✓															✓	✓	✓	✓	✓					[illegible]
JCSW9BW	[illegible]	1118		✓	✓															✓	✓	✓	✓	✓					D-031
[illegible]BW	[illegible]	1215		✓	✓															✓	✓	✓	✓	✓					D-051
TRIP 18	[illegible]	[illegible]			✓																				✓				D-031

REMARKS: [illegible]

Task No.

SAMPLERS NAME: BARNEY NASHOLD, LAURA E. [illegible] SIGNATURE: [illegible]

SAMPLES RELINQUISHED BY:		SAMPLES RECEIVED BY:	
NAME: BARNEY NASHOLD SIGNATURE: [illegible]	DATE: 03 Feb 92 TIME: 1800	NAME: LAURA E. [illegible] SIGNATURE: [illegible]	DATE: 03 Feb 92 TIME: 1[illegible]
NAME: [illegible] SIGNATURE:	DATE: 03 Feb 92 TIME: 1850	NAME: Anne Lee SIGNATURE: [illegible]	DATE: [illegible] TIME: [illegible]
NAME: SIGNATURE:	DATE: TIME:	NAME: SIGNATURE:	DATE: 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