N83447.AR.000026
NAS FORT WORTH
5090.3a

DRAFT FINAL INSTALLATION RESTORATION PROGRAM REMEDIAL INVESTIGATION FEASIBILITY STUDY STAGE 2 VOLUME 2 OF 9 NAS FORT WORTH TX
4/1/1989
RADIAN CORPORATION

File: 17G
A.F.

NAVAL AIR STATION
FORT WORTH JRB
CARSWELL FIELD
TEXAS

ADMINISTRATIVE RECORD
COVER SHEET

AR File Number 32

File: 17A-10
D.B.

32

INSTALLATION RESTORATION PROGRAM
RI/FS STAGE 2

CARSWELL AFB, TEXAS

RADIAN CORPORATION
8501 MO-PAC BOULEVARD
P. O. BOX 201088
AUSTIN, TEXAS 78720-1088

APRIL 1989

FINAL DRAFT (9/87 - 9/88)
VOLUME 2: APPENDICES A-E

PREPARED FOR:

HEADQUARTERS STRATEGIC AIR COMMAND
(HQ SAC/DE)
OFFUTT AIR FORCE BASE, NEBRASKA 68113-5001

UNITED STATES AIR FORCE
OCCUPATIONAL & ENVIRONMENTAL HEALTH LABORATORY
TECHNICAL SERVICES DIVISION (USAFOEHL/TS)
BROOKS AIR FORCE BASE, TEXAS 78235-5501

20th★★★★ Anniversary
RADIAN CORPORATION

8501 Mo-Pac Blvd.
P.O. Box 201088
Austin, TX 78720-1088
(512)454-4797

INSTALLATION RESTORATION PROGRAM

RI/FS STAGE 2

DRAFT FINAL
VOLUME 2: APPENDICES A-E

FOR

CARSWELL AFB, TEXAS

HEADQUARTERS STRATEGIC AIR COMMAND
(HQ SAC/DE)
OFFUTT AIR FORCE BASE, NEBRASKA 68113-5001

APRIL 1989

PREPARED BY

RADIAN CORPORATION
8501 MO-PAC BOULEVARD
P. O. BOX 201088
AUSTIN, TEXAS 78720-1088

USAF CONTRACT NO. F33615-87-D-4023, DELIVERY ORDER NO. 0004
RADIAN CONTRACT NO. 227-005-04

USAFOEHL TECHNICAL PROGRAM MANAGER

KARL W. RATZLAFF

USAF OCCUPATIONAL & ENVIRONMENTAL HEALTH LABORATORY (USAFOEHL)
TECHNICAL SERVICES DIVISION (TS)
BROOKS AIR FORCE BASE, TEXAS 78235-5501

VOLUME 2

TABLE OF CONTENTS

		Page
Appendix A:	Statement of Work	A-1
Appendix B:	Lithologic Logs and Well Data	B-1
	Lithologic Logs	B-1
	Well Data	B-71
Appendix C:	Raw Field Data	C-1
	Well Purging Records	C-1
	Slug Test Results	C-13
Appendix D:	Surveying Data	D-1
Appendix E:	Chain-of-Custody Records	E-1

TAB

A

- D R A F T -

APPENDIX A

Statement of Work

CONTRACTOR'S COPY

55X

ORDER FOR SUPPLIES OR SERVICES

PAGE 1 OF 35

2. PROC INSTRUMENT ID NO. (PIIN): F33615-87-D-4023
3. CALL/ORDER NO.: 0004
4. DATE OF ORDER*: MAIL DATE
5. REQUISITION/PURCHASE REQUEST PROJECT NO.: FY7624-87-01503
6. CERTIFIED FOR NATIONAL DEFENSE UNDER: DO-C9
DOC REG 2/DMS REG 1 RATING

M... packages & papers with this number.

7. BY CODE F08419
DEPARTMENT OF THE AIR FORCE
AIR FORCE SYSTEMS COMMAND
AERONAUTICAL SYSTEMS DIV/PMRSC
WRIGHT-PATTERSON AFB OH 45433-6503
CONTRACT NEGOTIATOR:
PATRICE M. HUTSON
PHONE: (513)-255-5911

8. ADMINISTERED BY CODE S4404A
DCASMA SAN ANTONIO
615 EAST HOUSTON ST.
P.O. BOX 1040
SAN ANTONIO TX 78294-1040

CONTRACTOR NAME AND ADDRESS CODE 29913
ADIAN CORPORATION
8501 MO-PAC BLVD
P. O. BOX 9948
AUSTIN TX 78766

PHONE: (512)-454-4797
COUNTY: TRAVIS

FACILITY CODE (IF "9" FOR MULTIPLE FACILITIES SEE SECT "G")

10. MAIL INVOICES TO

11. DISCOUNT FOR PROMPT PAYMENT
1ST N % DAYS NET DAYS
2ND % DAYS OTHER (IF "9" SEE SECT "B")
3RD % DAYS

A. PURCHASE OFFICE POINT OF CONTACT
LRX/L83/LRX

B. RESERVED FOR SERVICE/AGENCY USE

13. PAYMENT WILL BE MADE BY CODE S4403A IF "9" SEE SECT "G"
DCASR DALLAS
1200 MAIN ST
DALLAS TX 75202-4399

14. TYPE CONTRACTOR: A
15. SECURITY CLASS: U
16. DATE OF DD 254

CONTRACT ADMINISTRATION DATA

A. FAST PAY	B. CONTRACT (1) KIND	(2) TYPE	C. ABSTRACT RECIP ADD POINT	D. SPL CONT PROVISIONS	E. CONT ADMIN FUNC LMT	17. (RESERVED)	18. SVC/AGENCY USE	19. SURV CRIT	20. TOTAL AMOUNT
	O	Y						C	NOT-TO-EXCEED 1,068,279.00

APPROPRIATION AND ACCOUNTING DATA

A. SECTY CODE	B. ACRN	C. APPROPRIATION	D. LIMIT SUBHEAD	E. SUPPLEMENTAL ACCOUNTING CLASSIFICATION
U	AA	5773400		307 6799 19858E 070000 53200 000000 525700

F. CPN RECIPIENT CODE: 25700
G. OBLIGATION AMOUNT: 1,068,279.00
H. NON-CLIN/ELIN PAYMENT PROV
I. SVC AGENCY USE: FY7624-87-01503

DELIVERY X
PURCHASE

J. NON-DOD CONTRACT NO.
This delivery order is subject to instructions contained on this side of form only and is issued in accordance with and subject to terms and conditions of above numbered contract, or Non-DOD Contract No.

Reference your AF FORM 616, S87-349, DTD 17 APR 87 AND CHG 1, DTD 10 JUN 87, AND S87-392 DTD 18 JUN 87 AND CHG 1, DTD 30 JUN 87

Furnish the following on terms specified herein. Incorporated herein are U.S. Government General Provisions of Purchase Order on DD Form 1155 (EXCEPT CLAUSE NO 13 APPLIES ONLY IF THIS BOX ☐ IS CHECKED) AND NO 15 IF THIS BOX ☐ IS CHECKED), special provisions _____ and delivery as indicated. This purchase is negotiated order authority of 10 USC 2304(a)( )
specified in the schedule if within the U.S., its possessions or Puerto Rico; if otherwise, under 2304(a)(6).
If checked Additional General Provisions apply, supplier shall sign Acceptance on DD Form 1155 and return ...

If quantity accepted by the Government is same as quantity ordered, indicate by ✓ mark. If different enter actual quantity accepted below quantity ordered and encircle.

23. UNITED STATES OF AMERICA Barbara A. Mumma 24 SEP 1987 (YYMMMDD)
BARBARA A. MUMMA
BY: NAME OF CONTRACTING/ORDERING OFFICER AND DATE

24. TOTAL
25. DIFFERENCES

QUANTITY ORDERED HAS BEEN
INSPECTED ☐ RECEIVED ☐ ACCEPTED, AND CONFORMS TO THE CONTRACT EXCEPT AS STATED

26. SHIP NO.
27. G.B. VOUCHER NO.
29. INITIALS

☐ PARTIAL
☐ FINAL

31. PAID BY
32. Amount Verified Correct For

DATE SIGNATURE OF AUTHORIZED GOVERNMENT REPRESENTATIVE

30. PAYMENT
☐ COMPLETE
☐ PARTIAL
☐ FINAL

33. CHECK NUMBER

I CERTIFY THIS AMOUNT IS CORRECT AND PROPER FOR PAYMENT

34. BILL OF LADING NO.

SIGNATURE AND TITLE OF CERTIFYING OFFICER

RECEIVED AT 37. RECEIVED BY
38. DATE RECEIVED
39. TOTAL CONTAINERS
40. S/R ACCOUNT NUMBER
41. S/R VOUCHER NO.

PREVIOUS EDITION IS OBSOLETE.

SC FORM AUG 80 700

*When used as a format contract this will be the effective date.

AFSC—Andrews AFB Md 1988

PART I SECTION B OF THE SCHEDULE SUPPLIES LINE ITEM DATA	1. PROC INSTRUMENT ID NO. (PIIN) DRAFT F33615-87-D-4023	2. SPIIN 0004	3. PAGE 2 OF 35

4. ITEM NO. 0001 | 5. QUANTITY* 1 | 6. PURCH UNIT LO | 7. UNIT PRICE $N | 8. TOTAL ITEM AMOUNT* $N

9. SCTY CLAS U | 10. ACRN AA | 11. NSN N | 12. FSCM AND PART NUMBER | 13. CIRR

14. SITE CODES A.PQA D B.ACP D C.FOB D | 15. NOUN SAMPLING, ANALYSIS AND DATA | 16. SVC/AGENCY USE

17. PR/MIPR DATA FY7624-87-01503 | 18. AUTHORIZED RATE A.PROGRESS PAY % B.RECOUP % | 19. CONTRACT PERCENT FEE % | 20. SVC ID NO. | 21. ITEM/PROJ MGR FY7624

22. 1ST DISCOUNT A. % B.DAYS | 23. 2ND DISCOUNT A. % B.DAYS | 24. 3RD DISCOUNT A. % B.DAYS | 25. NET DAYS | 26. QUANTITY VARIANCE A. OVER % B. UNDER % | 27. TYPE CONTRACT | 28. OPR

29. DESCRIPTIVE DATA

CONDUCT WORK IAW THE TASK DESCRIPTION OF THIS ORDER AND SECTION C, THE DESCRIPTION/SPECIFICATIONS OF THE BASIC CONTRACT SUBMIT DATA IAW ATTACHMENT #1, THE CONTRACT DATA REQUIREMENTS LIST OF THE BASIC CONTRACT, AS IMPLEMENTED BY PARAGRAPH VI OF THE TASK DESCRIPTION.

4. ITEM NO. 0002 | 5. QUANTITY* 1 | 6. PURCH UNIT LO | 7. UNIT PRICE $N | 8. TOTAL ITEM AMOUNT* $N

9. SCTY CLAS U | 10. ACRN AA | 11. NSN N | 12. FSCM AND PART NUMBER | 13. CIRR

14. SITE CODES A.PQA D B.ACP D C.FOB D | 15. NOUN SUPPORT | 16. SVC/AGENCY USE

17. PR/MIPR DATA FY7624-87-01503 | 18. AUTHORIZED RATE A.PROGRESS PAY % B.RECOUP % | 19. CONTRACT PERCENT FEE % | 20. SVC ID NO. | 21. ITEM/PROJ MGR FY7624

22. 1ST DISCOUNT A. % B.DAYS | 23. 2ND DISCOUNT A. % B.DAYS | 24. 3RD DISCOUNT A. % B.DAYS | 25. NET DAYS | 26. QUANTITY VARIANCE A. OVER % B. UNDER % | 27. TYPE CONTRACT | 28. OPR

29. DESCRIPTIVE DATA

PROVIDE SUPPORT IN ACCORDANCE WITH THE TASK DESCRIPTION OF THIS ORDER AND SECTION C, THE DESCRIPTION/SPECIFICATIONS OF THE BASIC CONTRACT.

*REPRESENTS NET AMOUNT OF INCREASE/DECREASE WHEN MODIFYING EXISTING ITEM NO.

N = NOT APPLICABLE
U = UNDEFINITIZED
NSP = NOT SEPARATELY PRICED

E = ESTIMATED
− (IN QTY AND $) = DECREASE
+ OR − (IN ITEM NO.) = ADDITION OR DELETION
CIRR: CONTROLLED ITEM RPT RQMT

SITE CODES: S = SOURCE, D = DESTINATION, O = INTERMEDIATE

AFSC FORM 705 JAN 85 PREVIOUS EDITION WILL BE USED. AFSC—Andrews AFB Md 1989

70E

PART I SECTION B OF THE SCHEDULE SUPPLIES LINE ITEM DATA	1. PROC INSTRUMENT ID NO. (PIIN) DRAFT F33615-87-D-4023	2. SPIIN 0004	3. PAGE 3 OF 35

4. ITEM NO.	5. QUANTITY*	6. PURCH UNIT	7. UNIT PRICE	8. TOTAL ITEM AMOUNT*
003	1	LO	$N	$N

9. ACRN	11. NSN	12. FSCM AND PART NUMBER	13. CIRR
L AA	N		

14. SITE CODES A. IA B. ACP C. FOB	15. NOUN	16. SVC/AGENCY USE
D D	COMPUTER SOFTWARE	

17. PR/MIPR DATA	18. AUTHORIZED RATE A. PROGRESS PAY B. RECOUP	19. CONTRACT PERCENT FEE	20. SVC ID NO.	21. ITEM/PROJ MGR
Y7624-87-01503	% %	%		FY7624

22. 1ST DISCOUNT A. B. DAYS	23. 2ND DISCOUNT A. B. DAYS	24. 3RD DISCOUNT A. B. DAYS	25. NET DAYS	26. QUANTITY VARIANCE A. OVER B. UNDER	27. TYPE CONTRACT	28. OPR
%	%	%		% %		

29. DESCRIPTIVE DATA

FURNISH SOFTWARE IN ACCORDANCE WITH THE TASK DESCRIPTION OF THIS ORDER AND SECTION C, THE DESCRIPTION/SPECIFICATIONS OF THE BASIC CONTRACT. SUBMIT SOFTWARE IAW ATTACHMENT #2, THE CONTRACT DATA REQUIREMENTS LIST OF THE BASIC CONTRACT, AS IMPLEMENTED BY PARAGRAPH VI OF THE TASK DESCRIPTION.

4. ITEM NO.	5. QUANTITY*	6. PURCH UNIT	7. UNIT PRICE	8. TOTAL ITEM AMOUNT*
0004	1	LO	$N	$N

9. ACRN	11. NSN	12. FSCM AND PART NUMBER	13. CIRR
U AA	N		

14. SITE CODES A. P B. ACP C. FOB	15. NOUN	16. SVC/AGENCY USE
I D D	CHEM ANALYSIS AND DATA	

17. PR/MIPR DATA	18. AUTHORIZED RATE A. PROGRESS PAY B. RECOUP	19. CONTRACT PERCENT FEE	20. SVC ID NO.	21. ITEM/PROJ MGR
FY7624-87-01503	% %	%		FY7624

22. 1ST DISCOUNT A. B. DAYS	23. 2ND DISCOUNT A. B. DAYS	24. 3RD DISCOUNT A. B. DAYS	25. NET DAYS	26. QUANTITY VARIANCE A. OVER B. UNDER	27. TYPE CONTRACT	28. OPR
%	%	%		% %		

29. DESCRIPTIVE DATA

PERFORM CHEMICAL TESTS IAW THE TASK DESCRIPTION OF THIS ORDER AND SECTION C, THE DESCRIPTION/SPECIFICATIONS OF THE BASIC CONTRACT. SUBMIT DATA IAW ATTACHMENT #1, THE CONTRACT DATA REQUIREMENTS LIST OF THE BASIC CONTRACT, AS IMPLEMENTED BY PARAGRAPH VI OF THE TASK DESCRIPTION.

*REPRESENTS NET AMOUNT OF INCREASE/DECREASE WHEN MODIFYING EXISTING ITEM NO.

N = NOT APPLICABLE
U = UNDEFINITIZED
NSP = NOT SEPARATELY PRICED

E = ESTIMATED
− (IN QTY AND $) = DECREASE
+ OR − (IN ITEM NO.) = ADDITION OR DELETION
CIRR: CONTROLLED ITEM RPT RQMT

SITE CODES: S = SOURCE, D = DESTINATION, O = INTERMEDIATE

STATEMENT OF WORK

87 Aug 12

THE INSTALLATION RESTORATION PROGRAM
STAGE 2

Carswell AFB, Texas

I. DESCRIPTION OF WORK

1.1 Scope. The objective of the Air Force Installation Restoration Program (IRP) is to assess past hazardous waste disposal and spill sites on Air Force installations and develop remedial actions consistent with the National Contingency Plan (NCP) for those sites which pose a threat to human health and welfare or the environment. The intent is to conduct the remedial investigation and feasibility study in parallel, where feasible, instead of in serial fashion. The USAFOEHL/TS Handbook, mailed under separate cover, is an integral part of this task and the contractor shall comply with all Handbook requirements. Section 1 of the Handbook lists all documents that apply to this Statement of Work. The contractor shall accomplish the following actions for this stage 2 of the IRP process at Carswell AFB, Texas:

a. literature search,

b. determination of public health and environmental requirements,

c. field investigation,

d. qualitative risk assessment,

e. scoping and initial screening of remedial actions,

f. development of data quality objectives (DQOs),

g. preparation of a final report.

1.2 Literature search. Conduct a literature search to determine the geological, hydrogeological, and environmental settings for this investigation. Requirements are supplied under separate cover (see "Environmental Setting", section II of the Report Format, contained in Section 3, USAFOEHL/TS Handbook). When gathering information for the demographic setting and conducting the well inventory, consider only those populations and wells within a one mile radius of the base. Sources include: IRP Phase I Report, federal and state geological agency reports, academic theses and related university research, municipality and county reports, and historical and current aerial photographs. Cite all bibliographic references reviewed, including personal communications, in the appropriate part of the report. Identify gaps in data or analysis that prevent an adequate determination of contaminant migration patterns or other factors that are critical to assessing the hazard potential associated with the individual sites.

- D R A F T -

1.2.1 Air Quality. Review waste practices, investigative actions completed, and available ambient air quality data from the Texas Air Control Board or other regulatory sources, and determine, for each site, the potential for exposure via air emissions. Report the results of this review in Section IV of the Final Report (paragraph 1.9.1).

1.2.2 Surface Water. Review available records concerning surface water quality, stream flow, and drainage pattern. Develop a surface water sampling scheme based on this review. Report the recommended strategy in Section VI of the Final Report (paragraph 1.9.1) and show the basis for the recommendation in section IV of the Final Report (paragraph 1.9.1).

1.3 **Public Health and Environmental Requirements.** Determine the necessary requirements to develop data quality objectives (DQOs), and to evaluate the threat of contaminants to public health and welfare or the environment through a literature search of documents identified under separate cover (USAFOEHL/TS Handbook, Section 2). This effort shall satisfy the requirement in the CERCLA amendments of 1986 to identify all Applicable or Relevant and Appropriate Requirements (ARARs).

1.4. **Field Investigation.**

1.4.1 **Drilling supervision.** The field investigation including all drilling and sampling operations shall be supervised by a registered geologist or hydrogeologist. A detailed log of the conditions and materials penetrated during the course of the work shall be maintained by the geologist/hydrogeologist on site. Decisions on well locations, well depths, screened intervals, and other well construction details shall be made collectively by the USAFOEHL Technical Program Manager (TPM) and the supervising geologist/hydrogeologist.

1.4.2 **Regulatory requirements and permits.** All well drilling, development, purging, sampling methods, and other activities pertaining to this effort must conform to state and other applicable regulatory agency requirements. Cite references in an appendix to the Final Report (paragraph 1.9.1). Complete permits, applications, and other documents which may be required by local and/or state regulatory agencies for the installation of test wells. File these documents with appropriate agencies and pay all permitting and filing fees.

1.4.3 **Borehole Installation.**

1.4.3.1 **Soil borings.** Accomplish all borings using hollow-stem auger techniques. Conduct a maximum of 35 soil borings not to exceed a total of 1305 linear feet (see Annex A, Table A-3 for distribution by site). Obtain split spoon samples using ASTM Method D-1586. Collect a maximum of 118 boring samples (see Annex A, Table A-3 for distribution by site).

1.4.3.2 **Lithologic samples.** Describe lithologies of drill cuttings at five (5) foot intervals and at changes of stratigraphy and prepare

borehole log descriptions. Include pilot boring logs and well completion summaries in the Final Report (paragraph 1.9.1). Monitor all cuttings at the interval specified above with an HNu or organic vapor analyzer (OVA) and record the vapor levels detected.

1.4.3.3 **Air monitoring during drilling.** Monitor the ambient air during all well drilling and soil boring work with a photoionization meter or equivalent organic vapor detector to identify the generation of potentially hazardous and/or toxic vapors or gases. Include air monitoring results in the boring logs. If soil encountered during borehole drilling or test pit work is suspected to be hazardous because of abnormal discoloration, odor or air monitoring levels, containerize the soil cuttings in new, unused drums. (Note: Contractor is responsible for providing all necessary containers, i.e., 55-gallon drums.) Enter into the boring logs the depths(s) from which suspected contaminated soil cuttings were collected.

1.4.3.4 **Soil Toxicity Sampling.** Collect a maximum of 50 composite samples, one from the contents of each drum specified in paragraph 1.4.3.3. Test each composite sample for metals (EP Toxicity 40 CFR 261.24), for volatile organic compounds (Method SW5030/SW8240), and for base/ neutral and acid extractable organic compounds (Method SW3550/SW8270) to determine if the soil cuttings must be disposed of as hazardous waste.

1.4.3.5 **Water level measurements.** Whenever possible, measure water levels in all boreholes after the water level has stabilized. Examine the water surface for the presence of hydrocarbons. Include this information in the boring logs.

1.4.3.6 **Sealing boreholes.** For those boreholes that will not be converted to test wells, tremie-grout the borehole to the surface with a bentonite/cement slurry. Boreholes must be adequately resealed to preclude future migration of contaminants.

1.4.3.7 **Marking borehole locations.** Permanently mark each soil boring location. Record the location on a project map for each specific site or zone, whichever is applicable.

1.4.4 **Well Installation.** Complete a maximum of 26 boreholes as upper zone monitoring wells and one (1) borehole as a Paluxy monitoring well for a total of 27 wells (see Annex A, Table A-3 for distribution by site). Specific placement of wells will be defined in the Work Plan. Total footage for all wells in this task shall not exceed 1091 linear feet. Total screening for all wells in this task shall not exceed 500 linear feet.

1.4.4.1 **Well drilling.** Drill all upper zone wells using Hollow-stem Auger techniques. Drill all Paluxy wells using Air/mud rotary techniques. Avoid installing wells in depressions or areas subject to frequent flooding and standing water. If wells must be installed in such areas, design the wells such that standing water does not leak into the top of the casing or cascade down the annular space.

1.4.4.2 **Well casing requirements.** Construct each shallow well with two-inch inside diameter (I.D.) Schedule 40 PVC casing. Use threaded screw-type joints only. Glued fittings are not permitted. Flush-thread all connections.

1.4.4.3 **Well depth.** Install wells at a sufficient depth to collect samples representative of aquifer quality and to intercept contaminants if they are present.

1.4.4.4 **Well screening requirements.**

a. Screen each shallow well using two-inch I.D. PVC casing having up to 0.020 inch slots. Slot size may be smaller based upon borehole geology. Each well screen shall be a maximum of thirty five (35) feet in length. Cap the bottom of the screen.

b. Screen all wells so as to collect floating contaminants and to allow for all yearly fluctuations of the water table. Screen all wells a minimum of ten (10) feet.

c. Once the casing is in place, install the sand pack. If the formation is compatible with the screen slot size, allow the soil formation to collapse around the well screen. Supplement the natural gravel pack with washed and bagged rounded silica sand or gravel with a grain size distribution compatible with the screen and soil formation. Place the pack from the bottom of the borehole to three (3) feet above the top of the screen. Tremie a three (3) foot bentonite seal (granulated or pellets) above the sand/gravel pack. Ensure that the bentonite forms a complete seal. Grout the remainder of the annulus to the land surface with a Type I Portland cement/bentonite slurry.

1.4.4.5 **Well completion.** Complete all test wells using the following specifications:

a. Coordinate with the Base point of contact (POC) to determine well completion (flush or projected above the ground surface) requirements.

(1) If well stick-up is of concern in an area, complete the well flush with the land surface. Cut the casing two to three inches below land surface, and install a protective locking lid consisting of a cast iron valve box assembly. Center the lid assembly in a three (3) foot diameter concrete pad sloped away from the valve box. Ensure that free drainage is maintained within the valve box. Also, provide a screw-type casing cap to prevent infiltration of surface water. Maintain a minimum of one (1) foot clearance between the casing top and the bottom of the valve box. Clearly mark the well number on the valve box lid and well casing using the impact labelling method.

(2) If an above-ground-surface completion is used, extend the well casing two or three feet above land surface. Provide an end plug or casing cap for each well. Shield the extended casing with a steel guard pipe (sleeve) which is placed over the casing and cap, and seated in a two-foot by two-foot by four-inch (2' X 2' X 4") concrete surface pad. Slope

the pad away from the well sleeve. Install a lockable cap or lid on the guard pipe. Install three (3), three-inch diameter cement-filled steel guard posts if the Base POC determines the well is in an area which needs such protection. The guard posts shall be five (5) feet in total length and installed radially from each wellhead. Recess the guard posts approximately two (2) feet into the ground and set in concrete. Do not install the guard posts in the concrete pad placed at the well base. Fill each guard post with concrete. Clearly mark the well number on the well sleeve exterior using both paint and impact lettering. Base POC will specify color to blend with paint scheme of the base.

b. Provide locks for both flush and above-ground well assemblies. The locks must either have identical keys or be keyed for opening with one master key. Turn over the lock keys to the Base POC following completion of the field effort.

c. Include well completion summaries in the Final Report (paragraph 1.9.1).

1.4.4.6 **Well logs.** For each well, prepare a well log/well schematic showing how the well was constructed.

1.4.4.7 **Well development.** Develop each well as soon as practical after completion with a submersible pump, bailer, and/or airlift method. Continue well development until the discharge water is clear and free of sediment to the fullest extent possible. Measure the rate of water production, the pH, specific conductance, and water temperature during well development and include this information in the Final Report (paragraph 1.9.1).

1.4.4.8 **Surveying.** Determine by certified land surveyor the elevations and locations of all newly installed test wells, soil borings, and sampling points. This shall be a third order survey. Notch the top of the riser casing where well elevations are established. Record the positions on both project and site specific maps. Bench marks used must have previously been established from and be traceable to a USCGS or USGS survey marker. Clearly identify all bench mark locations on the base map.

1.4.4.9 **Water level measurements.** Measure water levels at all test wells as feet below the top of casing elevation to the nearest 0.01 foot. Report as mean sea level (MSL). Measure static water levels in wells prior to well development and before all well purging which precedes sampling events.

1.4.4.10 **Well abandonment.** Recommend well abandonment method(s) or technique(s) which are applicable to the type of test wells installed and the geological conditions. Consider that these wells will be abandoned at some future date after the study objectives have been met and there is no longer a need for the wells. The actual process of well abandonment is not a part of this task order. Insure that the recommended method(s) is consistent with state and local well abandonment guidelines or regulations.

1.4.5 **Shallow soil augerings.** Conduct a maximum of 11 shallow soil

augerings using a hand or power auger (see Annex A, Table A-3 for distribution by site). Total footage for all shallow soil augerings shall not exceed 70 feet. Collect a maximum of 31 soil samples from the hand augerings as shown in Table A-3, Annex A. Permanently mark each location. Record the location on a project map for each specific site or zone, whichever is applicable. Specific locations shall be defined in the Work Plan with coordination by the USAFOEHL.

1.4.6 **Well and Boring Precautions.** Mark the field locations of all test wells, soil borings, and shallow soil augerings during the planning/mobilization phase of the field investigation. Consult with base personnel to minimize disruption of base activities, to properly position wells with respect to site locations, and to avoid underground utilities. A utilities map, if available, shall be consulted before any drilling or boring activities take place.

1.4.7 **Well and borehole cleanup.** Remove all well/borehole cuttings per direction of base civil engineer and clean the general area following the completion of each well/borehole. Containerize and store cuttings suspected to be contaminated according to Paragraph 1.4.3.3. Transport these drums to a location within the installation boundary designated by the Base POC. The base is responsible for ultimate disposal of contaminated soils using base resources.

1.4.8 **Geophysical Surveys**

1.4.8.1 **Soil gas surveys.** Establish appropriate grid systems and conduct a maximum of two (2) days, 16 hours of soil gas survey (see Annex A Table A-3 for distribution by site). Prepare a posting map of soil gas values relative to their location on the grid used. Provide this map as an attachment to the first R & D Status Report (paragraph 1.9.2.5) submitted after completion of the soil gas survey.

1.4.8.2 **Magnetometer Survey** Perform a magnetometer survey at Site 10, Waste Burial Area, to assist in borehole placement. Perform a magnetometer survey at site 1 to investigate anomolies found in stage 1 effort.

1.4.9 **Sample Collection.**

1.4.9.1 **Ground and surface water samples.** Collect a maximum of 100 groundwater and 8 surface water samples (see Annex A, Table A-3 for distribution by site). The maximum number of analyses for each parameter is given in Table A-4, Annex A.

1.4.9.2 **Soil and sediment samples.** Collect a maximum of 10 soil and surface sediment samples (see Annex A. Table A-3 for distribution by site). The maximum number of analyses for each parameter is given in Table A-5, Annex A.

1.4.10 **Detailed requirements for sampling and analysis.** Refer to Annex B and C for detailed requirements on field sampling, sample preservation, sample holding times, sampling equipment decontamination, and

chemical analysis.

a. All chemical/physical analyses shall conform to state and other applicable Federal and local regulatory agency legal requirements. If a regulatory agency specifies that a type of analysis be performed in a certified laboratory, assure compliance with the requirement and furnish documentation showing laboratory certification with the first analytical data supplied to the USAFOEHL/TS.

b. Archiving Data. Archive all raw data, including QA/QC and standards data, for not less than five years after project completion. Supply these data to the USAFOEHL/TS upon request.

1.4.11 **Site-Specific Requirements.** Refer to Annex A, Table A-3 for site specific tasks. Placement of wells, boreholes, augerings will be included in the Work Plan and will be based on both technical considerations and field conditions.

1.5 Qualitative Risk Assessment. After a thorough review of all data gathered during the field investigation and the establishment of ARARs (paragraph 1.3), determine the potential risk to human health and welfare or the environment from the contaminants identified at the various sites investigated. Do the following:

a. Identify the physical and chemical characteristics of the site contaminants (e.g., toxicity, carcinogenicity, flammability, etc.)

b. Identify release mechanisms (e.g., volatilization, leaching) and estimate the volume of contaminants released or being released at each IRP site.

c. Identify potential human and environmental receptors and receptor characteristics which might increase vulnerability to the effects of contaminants.

d. Determine potential contaminant exposure pathways (e.g., direct contact, inhalation of vapors/dust, ingestion of contaminated water or soil, ingestion of aquatic organisms, etc.).

e. Determine representative rates of migration associated with individual sites. Rates of flow, groundwater velocities, and times necessary to reach receptors shall be calculated based on a range of conservative assumptions.

f. Identify those IRP sites having no significant impact upon human health and welfare or the environment (i.e., a "finding of no significant impact" or FONSI)

g. Identify those IRP sites which pose an immediate and direct health hazard and require swift remedial actions.

h. Score all IRP sites where a remedial alternative has been selected using the Defense Prioritization System (DPS) (copy mailed under

separate cover).

i. Include results of the qualitative risk assessment in Section IV of the Final Report (paragraph 1.9.1).

1.6 FONSIs. Using the forms/format provided by the Base Point of Contact (POC) (copies mailed under separate cover), prepare draft FONSIs for each IRP site where the results of this initial investigation indicate that there is no significant threat to human health and welfare or the environment (paragraph 1.9.2.4).

1.7 Preliminary alternative remedial actions. For all past hazardous waste disposal and spill sites investigated at Carswell AFB, TX, except those where a FONSI is applicable, utilize the data and conclusions obtained from the hydrogeological survey, site characterization, and qualitative risk assessment to develop preliminary alternative remedial actions. Do the following:

a. Identify general response actions, or classes of responses. General response actions considered should include the "no action" alternative as a baseline against which others can be measured.

b. Identify possible technologies for each general response action identified.

c. Screen the technologies to eliminate inapplicable and infeasible technologies based on site conditions, waste characteristics, and technical requirements. Eliminate or modify those technologies that may prove extremely difficult to implement, be unproven, will require unreasonable time periods, that do not effectively contribute to the protection of public health and welfare or the environment, or that may have significant adverse effects. Give special consideration to those technologies that permanently contain, immobilize, destroy, or recycle contaminants, and technologies that promote energy recovery. Cost as a screening factor should only be used to discriminate among technologies which provide similar results. A technology which will result in destruction or reduction of waste's mobility, toxicity, and volume (MTV), although it may have a high capital cost, should not be eliminated.

d. If applicable, group the technologies into operable units (OUs). An operable unit is a discrete part of the entire response action that decreases a release, threat of release, or pathway of exposure.

e. Develop remedial alternatives based upon the technologies remaining after the initial screening. Alternatives developed shall include the following categories:

(1) Alternatives for off-site treatment or disposal

(2) Alternatives that attain ARARs

(3) Alternatives that exceed ARARs

(4) Alternatives that do not attain ARARs

(5) No action

Further, alternatives outside of these categories may also be developed, such as non-cleanup alternatives (e.g., alternative water supply, relocation, etc).

f. Documentation of the remedial alternative development process, including the decision rationale, shall be included in Section V of the Final Report (paragraph 1.9.1). The finalized list of preliminary remedial alternatives shall be placed in Section VI of the Final Report.

1.8 Data quality objectives (DQOs). Identify and define the data quality objectives (DQOs) necessary to perform the detailed evaluation of remedial alternatives and to conduct the quantitative risk assessment required in any follow-on IRP task order. Incorporate the DQOs into Section V of the the Final Report (paragraph 1.9.1).

1.9 Reports

1.9.1 **Final Report.** Prepare a draft Final Report delineating all findings from this initial investigative stage of the remedial investigation/feasibility study. This Final Report must also include a detailed discussion of the recommended alternative remedial actions and a description of the work proposed, including the Data Quality Objectives (DQOs), for any follow-on remedial investigation and feasibility study that may be required. Forward the report to the USAFOEHL/TS for Air Force and regulatory agency review (Item VI, Sequence No. 4, paragraph 6.1).

1.9.1.1 **Tables and figures.** All data relevant to the findings of this investigation that were captured in the field or made available through other studies shall be tabulated for analysis and review. The contractor shall provide as many tables and figures as possible. Lists of required figures and tables are found as attachments to the Report Format (USAFOEHL/TS Handbook, Section 3). All figures and tables shall be clear and easy to interpret, shall be of publishable quality, and shall contain legends that identify the symbols used for the purposes of illustration.

1.9.1.2 **Descriptive Statistics.** See Section 10 of the USAFOEHL/TS Handbook. This information will be incorporated into the Installation Restoration Program Information Management System (IRPIMS) and shall not be considered part of the Draft and Final Reports.

1.9.1.3 **Draft reports.** Draft reports are considered "drafts" only in the sense that they have not been reviewed and approved by the Air Force. In all other respects, "drafts" must be complete, in the proper format, and free of grammatical and typographical errors. All draft reports shall be thoroughly screened through in-house peer technical review before being released to USAFOEHL/TS.

1.9.1.4 **Report format.** Strictly adhere to the USAFOEHL/TS report format (USAFOEHL/TS Handbook, Section 3, mailed under separate cover) for

preparation of draft and final reports. This format is an integral part of the delivery order.

1.9.1.5 **Microfiche copies of final report.** Provide three (3) microfiche copies of the approved final report (Item VI, Sequence No. 17, Paragraph 6.1).

1.9.2 **Plans for Current Effort.**

1.9.2.1 **IRP Work Plan for Stage 2.** Revise the Work Plan for this effort (provided under separate cover) using the Work Plan Format provided under separate cover (USAFOEHL/TS Handbook, Section 4). The work plan is due four (4) weeks after Notice to Proceed (NTP). Distribute copies of the work plan as specified by USAFOEHL/TS (Item VI, Sequence No. 4, Paragraph 6.1).

1.9.2.2 **Quality Assurance Project Plan (QAPP) for Stage 2.** Revise the QAPP for this effort (provided under separate cover) using the QAPP Format provided under separate cover (USAFOEHL/TS Handbook, Section 5). The QAPP is due five (5) weeks after Notice to Proceed (NTP) (Item VI, Sequence No. 4, paragraph 6.1).

1.9.2.3 **Health and Safety Plan for Stage 2.** Revise the written Health and Safety Plan (provided under separate cover) within four (4) weeks after NTP (Item VI, Sequence No. 2, Paragraph 6.1). Comply with USAF, OSHA, EPA, state and local health and safety regulations regarding the proposed work effort. Use EPA guidelines for designating the appropriate levels of protection needed at the study sites. Coordinate the Health and Safety Plan directly with applicable regulatory agencies prior to submittal to USAFOEHL/TS.

1.9.2.4 **FONSIs.** Incorporate FONSIs into an appendix of the Final Report (paragraph 1.9.1). Provide five (5) copies of each FONSI to the Base Point of Contact (POC) after approval by the USAFOEHL/TS TPM (Item VI, Sequence No. 3, Paragraph 6.1).

1.9.2.5 **R & D Status Reports.** Include all data as required by the USAFOEHL/TS Handbook, Section 6 (provided under separate cover). Tabulated field and laboratory test results and QA/QC data shall be incorporated into the next monthly R & D Status Report as they become available and forwarded to the USAFOEHL/TS (Item VI, Sequence No. 1, Paragraph 6.1).

1.9.2.6 **Data Management.** In addition to the hard copy of the field and laboratory test results submitted with the monthly R & D Status Report, data collected in this effort shall be archived with Air Force compatible computer hardware and software and forwarded to the USAFOEHL/TS per format and media instruction provided (USAFOEHL/TS Handbook, Section 7). (Item VI, Atch 2, Sequence No. 1, Paragraph 6.2).

1.9.2.7 **Informal Technical Information Report.** Upon completion of all analyses, tabulate and incorporate all results into an Informal Technical Information Report and forward the report to USAFOEHL/TS no later than three (3) weeks after all analyses have been completed (Item VI,

Sequence 3, Paragraph 6.1). Use the format provided in the USAFOEHL/TS Handbook, Section 8, provided under separate cover.

1.9.3 **Plans for Follow-up Effort.** The contractor shall initiate preparation of plans for the follow-up effort only after all regulatory agency and Air Force comments have been incorporated into the second Draft Report. The follow-up plans shall be delivered at the same time as the Final Report (paragraph 1.9.1).

1.9.3.1 **IRP Work Plan For Next Effort (IRPWP-2).** Use the Work Plan Format provided under separate cover (USAFOEHL/TS Handbook, Section 4). Forward all copies to the USAFOEHL/TS (Item VI, Sequence No. 4, Paragraph 6.1).

1.9.3.2 **QAPP for Next Effort (QAPP-2).** Use the QAPP Format provided under separate cover (USAFOEHL/TS Handbook, Section 5). Forward all copies to USAFOEHL/TS (Item VI, Sequence No. 4, Paragraph 6.1).

1.9.3.3. In a separate letter to the final Work Plan, submit a lump sum cost estimate of the effort required to perform the Work Plan (Sequence 2, Item VI).

1.10 **Meetings.** A maximum of three (3) contractor personnel shall attend four (4) meetings at Carswell AFB TX. Each meeting shall be two 8-hour workdays in duration. All meetings shall be coordinated by USAFOEHL/TS.

1.11 **Special Notifications.** Immediately report to the USAFOEHL/TS Technical Program Manager or his supervisor, via telephone, data/results generated during this investigation which indicate an imminent health risk. Follow the telephone notification with a written notice within three (3) days and attach a copy of the laboratory raw data (e.g., chromatograms, standards used for calibration, etc).

II. SITE LOCATION AND DATES:

Carswell AFB TX
Date to be established

III. BASE SUPPORT

The Base will:

3.1 Locate underground utilities and issue digging or other appropriate permits to the IRP contractor prior to the commencement of digging or drilling operations.

3.2 Assign accumulation points within the installation for the contractor to deliver any drill cuttings or well installation/development fluids generated from the required work which are suspected to be hazardous. The contractor is responsible for providing all necessary containers (55-gallon drums) and for transporting the containerized

- D R A F T -

material to the accumulation point.

3.3 Take custody of any drill cuttings or well installation/ development fluids suspected to be hazardous and properly dispose of the material according to applicable state and/or federal regulations.

3.4 Provide the contractor with existing engineering plans, drawings, diagrams, aerial photographs, etc., to evaluate IRP sites under investigation.

3.5 Provide the contractor with the required forms/format for preparation of "Finding of No Significant Impact" (FONSIs) justifications.

3.6 Arrange for, and have available prior to the start up of field work, the following services, materials, work space, and items of equipment to support the contractor during the investigation:

a. Personnel identification badges, vehicle passes and/or entry permits.

b. A dedicated staging area (approximately 1000 square feet) for storing equipment and supplies.

c. A supply (e.g., fire hydrant, stand pipe, etc.) of large quantities of potable water for borehole flushing, equipment cleaning, etc.

d. A paved area where drilling equipment can be cleaned and decontaminated. A source of potable water (i.e., ordinary outdoor water faucet) and a 110/115 VAC electrical outlet must be available within 25 feet of the paved area for steam cleaner hookup. Drainage from this paved area shall be through an oil/water separator.

e. A set of keys to the locks on any existing test/monitoring wells at Carswell AFB TX. The keys shall be returned to the Base POC by the contractor when the survey has been completed.

IV. GOVERNMENT FURNISHED PROPERTY: NONE.

V. GOVERNMENT POINTS OF CONTACT:

5.1 USAFOEHL/TS
Technical Program Manager (TPM)
Capt Arthur S. Kaminski
USAFOEHL/TSS
Brooks AFB TX 78235-5501
(512) 536-2158
AV 240-2158/2159
1-800-821-4528

5.2 Carswell AFB TX
Environmental Coordinator
7 CSG/DEEV
Carswell AFB TX 76127
817-735-6261
AV 739-6261

- D R A F T -

VI. DELIVERABLES

6.1 Attachment 1 of the basic contract. In addition to Sequence numbers 1, 5 and 11 listed in Attachment 1 to the basic contract which apply to all orders, the Sequence numbers and dates listed below are applicable to this order:

Sequence No.	Para No.	Block 10	Block 11	Block 12	Block 13	Block 14
4 (Work Plan)	I.1.9.2.1	ONE/R	87OCT12	87OCT30	87DEC30	20
4 (QAPP)	I.1.9.2.2	ONE/R	87OCT12	87NOV06	87DEC30	
2 (Health & Safety)	I.1.9.2.3	OTIME	87OCT12	87OCT30		20
3 (FONSIs)	I.1.9.2.4	OTIME	87DEC30	88JAN29		****
4 (Tech. Rpt)	I.1.9.1	ONE/R	88FEB29	88APR01	88OCT31	**
3 (Prelim. Data)	I.1.9.2.7	OTIME	*	*		4
4 (Work Plan-2)	I.1.9.3.1	ONE/R	87DEC30	88OCT31	88DEC30	4
4 (QAPP-2)	I.1.9.3.2	ONE/R	87DEC30	88OCT31	88DEC30	4
2 (COST LTR)	I.1.9.3.3	OTIME	87DEC30	88OCT31		
14		MONTHLY	87OCT30	87NOV16	***	3
15		MONTHLY	87OCT30	87NOV16	***	3
17 (Microfiche)	I.1.9.1	OTIME	88OCT01	88OCT31		3

6.2 Attachment 2 of the basic contract.

Sequence No.	Para No.	Block 10	Block 11	Block 12	Block 13	Block 14
1	I.1.9.2.6	OTIME	87DEC15	88APR01		1

6.3 Notes:.

* Upon completion of the total analytical effort and not later than three weeks after all analyses have been completed.

** One first draft report (15 copies), one second draft report (25 copies), and one final report (50 copies plus the original camera-ready copy) are required. Incorporate Air Force comments into the second draft and final reports as specified by the USAFOEHL/TS. Supply the USAFOEHL/TS with an advance copy of the first draft, second draft, and final reports for acceptance prior to distribution. Distribute the remaining 14 copies

of the first draft report, 24 copies of the second draft report, and 49 copies of the final report as specified by the USAFOEHL/TS.

*** Submit monthly thereafter.

**** Five (5) copies of each FONSI shall be provided to the Base Point of Contact (POC). Forward an advance copy of each FONSI to USAFOEHL/TS for approval prior to distribution to the Base POC.

Table A-1

Approximate Number of Analyses by Site

PARAMETER [Water Samples]	ANALYTICAL METHOD	SITE 1	SITE 3	SITE 4	SITE 5	SITE 10	SITE 11	SITE 12	SITE 13	SITE 15	SITE 16	SITE 17	BSS	WSA	Base Wells	Surface Samples	Total
Alkalinity - Carbonate, Bicarbonate, & Hydroxide (Field Test)	A403	12	12	18	18	-	4	10	-	-	8	10	8	-	-	-	100
Fluoride	E340.2	12	12	18	18	-	4	10	-	-	8	10	-	-	-	-	92
Chloride	E325.3	12	12	18	18	-	4	10	-	-	8	10	-	-	-	-	92
Nitrate	E353.1	12	12	18	18	-	4	10	-	-	8	10	-	-	-	-	92
Orthophosphate	E365.1	12	12	18	18	-	4	10	-	-	8	10	-	-	-	-	92
Sulfate	E375.4	12	12	18	18	-	4	10	-	-	8	10	-	-	-	-	92
Chlorinated Phenoxy Acid Herbicides	A509B	-	12	-	-	-	-	-	-	-	-	-	-	-	-	-	12
Specific Conductance (Field Test)	E120.1	12	12	18	18	-	4	10	-	-	8	10	8	-	-	-	100
pH (Field Test)	E150.1	12	12	18	18	-	4	10	-	-	8	10	8	-	-	-	100
Total Dissolved Solids	E160.1	12	12	18	18	-	4	10	-	-	8	10	8	-	-	-	100
Temperature (Field Test)	E170.1	12	12	18	18	-	4	10	-	-	8	10	8	-	-	-	100
Metal Screen (25 metals)	E200.7	12	12	18	18	-	4	10	-	-	8	10	8	-	-	-	100
Arsenic	E206.2	12	12	18	18	-	4	10	-	-	8	10	8	-	-	-	100
Lead	E239.2	12	12	-	-	-	-	-	-	-	8	10	8	-	-	-	50
Mercury	E245.1	12	12	18	18	-	4	10	-	-	8	10	8	-	-	-	100
Selenium	E270.2	12	12	18	18	-	4	10	-	-	8	-	8	-	-	-	90
Oil and Grease	E413.2	12	12	-	-	-	-	-	-	-	8	-	-	-	-	-	32
Petroleum Hydrocarbons	E418.1	-	-	-	-	-	4	10	-	-	-	10	8	-	-	-	32
Purgeable Halocarbons	E601	12	12	18	18	-	4	10	-	-	8	10	8	-	-	-	100
Phenols	E604	-	12	-	-	-	-	-	-	-	-	-	-	-	-	-	12
Organochlorine Pesticides	E608	-	12	-	-	-	-	-	-	-	-	-	-	-	-	-	12
Extractable Priority Pollutants	E625	2	2	2	2	-	2	2	-	-	-	2	-	-	-	-	14
Purgeable Aromatics	SW5030/ SW8020	12	12	18	18	-	4	10	-	-	8	10	8	-	-	-	100

- DRAFT -

ANNEX A
Table A-2
Approximate Number of Analyses by Site

PARAMETER (Soil Samples)	ANALYTICAL METHOD	SITE 1	SITE 3	SITE 4	SITE 5	SITE 10	SITE 11	SITE 12	SITE 13	SITE 15	SITE 16	SITE 17	BSS	WSA	Drill Cuttings	Back-ground	Total
Oil and Grease	SW3550/ E413.2	6	15	9	15	18	-	-	-	-	-	-	-	-	-	-	63
Petroleum Hydrocarbons	SW3550/ E418.1	-	-	-	-	18	-	28	10	-	-	15	12	-	-	-	83
Metal Screen (23 metals)	SW3050/ SW6010	6	15	9	15	18	-	28	10	-	-	-	-	16	-	-	117
Arsenic	SW3050/ SW7060	6	15	9	15	18	-	-	-	-	-	-	-	-	-	-	63
Lead	SW3050/ SW7420	-	-	-	-	-	-	-	-	-	-	15	12	-	-	-	27
Mercury	SW7471	6	15	9	15	18	-	-	10	-	-	-	-	-	-	-	73
Selenium	SW3050/ SW7740	6	15	9	15	18	-	-	-	-	-	-	-	-	-	-	63
Organochlorine Pesticides and PCB's	SW3550/ SW8080	-	-	-	-	18	-	-	-	15	-	-	-	-	-	-	33
Volatile Organic Compounds	SW5030/ SW8240	6	15	9	15	18	-	28	10	-	-	15	12	16	50	-	194
Semivolatile Organic Compounds	SW3550/ SW8270	6	15	9	15	18	-	28	10	-	-	-	-	16	50	-	167
Chlorinated Phenoxy Herbicides	SW8150	-	-	-	-	18	-	-	-	15	-	-	-	-	-	-	33
Organophosphorous Pesticides	SW8140/ SW3550	-	-	-	-	-	-	-	-	15	-	-	-	-	-	-	15
Extraction Procedure Toxicity	40 CFR 261.24	-	-	-	-	-	-	-	-	-	-	-	-	-	50	-	50
Soil Moisture Content	ASTM D2216	6	15	9	15	18	-	28	-	15	-	15	12	16	-	-	149

SITES	1	3	4	5	10	11	12	13	15	16	17	WSA	BSS	BKGND	TOTAL
BOREHOLES (c)	2	6	3	5	3	0	7	0	0	0	5	0	4	0	35
BOREHOLE DEPTH	60	403	105	173	69	0	184	0	0	0	173	0	138	0	1305
UZ WELLS (from boreholes above)	2	5	3	5	0	0	2	0	0	0	5	0	4	0	26
DEPTH UZ WELLS	60	173	105	173	0	0	69	0	0	0	173	0	138	0	891
PALUXY WELLS	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
DEPTH PALUXY WELLS	0	200	0	0	0	0	0	0	0	0	0	0	0	0	200
HAND AUGERS	0	0	0	0	0	0	0	0	3	0	0	8	0	0	11
DEPTH AUGERS	0	0	0	0	0	0	0	0	30	0	0	40	0	0	70
SOIL SAMPS FROM AUGERS	0	0	0	0	0	0	0	0	15	0	0	16	0	0	31
SPLIT SPOON SAMPLES	6	15	9	15	18	0	28	0	0	0	15	0	12	0	118
SLUG TESTS	2	0	5	5	0	0	3	0	0	0	3	0	0	0	18
SOIL GAS DAYS	0	0	0	0	0	0	0	0	0	0	2	0	2	0	4
SOIL-SED SAMP ROUNDS	0	0	0	0	0	0	0	2	0	0	0	0	0	0	2
SOIL-SED SAMPLE POINTS	0	0	0	0	0	0	0	5	0	0	0	0	0	0	5
SOIL-SED SAMPLES	0	0	0	0	0	0	0	10	0	0	0	0	0	0	10
SURF WATER SAMP ROUNDS	0	0	0	0	0	0	0	0	0	2	0	0	0	0	2
SURF WATER SAMP POINTS	0	0	0	0	0	0	0	0	0	4	0	0	0	0	4
SURF WATER SAMPLES	0	0	0	0	0	0	0	0	0	8	0	0	0	0	8
GW SAMPLING ROUNDS	2	2	2	2	0	2	2	0	0	0	2	0	2	0	2
GW SAMP POINTS	6	6	9	9	0	2	5	0	0	0	5	0	4	0	50
TOT GW SAMPLES	12	12	18	18	0	4	10	0	0	0	10	0	8	0	100

NOTES

a. The numbers in this table represent the maximum effort to be performed. Actual work performed may be less due to technical considerations.

b. Sites are as follows:

Site 1	Landfill 1
Site 3	Landfill 3
Site 4	Landfill 4
Site 5	Landfill 5
Site 10	Waste Burial Area
Site 11	Fire Department Training Area 1
Site 12	Fire Department Training Area 2
Site 13	Flightline Drainage Ditch
Site 15	Entomology Dry Well
Site 16	Unnamed Stream
Site 17	POL Tank Farm
WSA	Weapons Storage Area (Off Base)
BSS	Base Service Station

c. Some boreholes are not to be completed as monitoring wells.

ANNEX A

Table A-4

Analytical Methods, Detection Limits, and Total Number of Analyses

PARAMETER	ANALYTICAL METHOD (a)	DETECTION LIMIT (b)	REPORTING UNITS(c)	NUMBER OF ANALYSES	TRIP BLANKS	AMB COND BLANKS	EQUIP BLANKS	DUP/REP	SECOND COLUMN	TOTAL ANALYSES
Alkalinity - Carbonate, Bicarbonate, & Hydroxide (Field Test)	A403	10	mg/L	100	-	-	10	10	-	120
Flouride	E340.2	0.1	mg/L	92	-	-	10	10	-	112
Chloride	E325.3	1.0	mg/L	92	-	-	10	10	-	112
Nitrate	E353.1	0.02	mg/L	92	-	-	10	10	-	112
Orthophosphate	E365.1	0.02	mg/L	92	-	-	10	10	-	112
Sulfate	E375.4	0.5	mg/L	92	-	-	10	10	-	112
Chlorinated Phenoxy Acid Herbicides	A509B	(m)	ug/L	12	-	-	2	2	8	24
Specific Conductance (Field Test)	E120.1	-	umhos/cm	100	-	-	-	-	-	100
pH (Field Test)	E150.1	-	pH Units	100	-	-	-	-	-	100
Total Dissolved Solids	E160.1	10	mg/L	100	-	-	-	10	-	110
Temperature (Field Test)	E170.1	-	deg C	100	-	-	-	-	-	100
Metal Screen (25 metals)	E200.7	(d)	mg/L	100	-	-	10	10	-	120
Arsenic	E206.2	0.005	mg/L	100	-	-	10	10	-	120
Lead	E239.2	0.005	mg/L	50	-	-	5	5	-	60
Mercury	E245.1	0.001	mg/L	100	-	-	10	10	-	120
Selenium	E270.2	0.005	mg/L	90	-	-	9	9	-	108
Oil and Grease	E413.2	0.2	mg/L	32	-	-	4	4	-	40
Petroleum Hydrocarbons	E418.1	1	mg/L	32	-	-	4	4	-	40
Purgeable Halocarbons	E601	(e)	ug/L	100	10	10	10	10	70	210
Phenols	E604	(1)	ug/L	12	-	-	2	2	8	24
Organochlorine Pesticides	E608	(f)	ug/L	12	-	-	2	2	8	24
Extractable Priority Pollutants	E625	(g)	ug/L	14	-	-	2	2	-	18
Purgeable Aromatics	SW5030/ SW8020	(h)	ug/L	100	10	10	10	10	70	210

- DRAFT -

Analytical Methods, Detection Limits, and Total Number of Analyses

PARAMETER	ANALYTICAL METHOD (a)	DETECTION LIMIT (b)	REPO UNIT.	NUMBER OF ANALYSES	TRIP BLANKS	AMB COND BLANKS	EQUIP BLANKS	DUP/REP	OND LUMN	TOTAL ANALYSES
Oil and Grease	SW3550/ E413.2	10	mg/kg	63	-	-	-	7	-	70
Petroleum Hydrocarbons	SW3550/ E418.1	50	mg/kg	83	-	-	-	9	-	92
Metal Screen (23 metals)	SW3050/ SW6010	(d)	mg/kg	117	-	-	-	12	-	129
Arsenic	SW3050/ SW7060	0.5	mg/kg	63	-	-	-	7	-	70
Lead	SW3050/ SW7420	0.5	mg/kg	27	-	-	-	3	-	30
Mercury	SW7471	0.5	mg/kg	73	-	-	-	7	-	80
Selenium	SW3050/ SW7740	1	mg/kg	63	-	-	-	7	-	70
Organochlorine Pesticides and PCB's	SW3550/ SW8080	(f)	mg/kg	33	-	-	-	4	19	56
Volatile Organic Compounds	SW5030/ SW8240	(i)	mg/kg	194	20	-	-	20	-	234
Semivolatile Organic Compounds	SW3550/ SW8270	(g)	mg/kg	167	-	-	-	17	-	184
Chlorinated Phenoxy Herbicides	SW8150	(m)	mg/kg	33	-	-	-	4	19	56
Organophosphorous Pesticides	SW8140/ SW3550		mg/kg	15	-	-	-	2	9	26
Extraction Procedure Toxicity	40 CFR 261.24	(j)	mg/L	50	-	-	-	5	-	55
Soil Moisture Content	ASTM D2216	-	per cent (%)	149	-	-	-	15	-	164

- DRAFT -

- D R A F T -

NOTES

a The methods cited are from the following sources:

"A" Methods — Standard Methods for the Examination of Water and Wastewater, 16th Edition (1985)

"E" Methods — Methods for Chemical Analysis of Water and Wastes, EPA Manual, 600/4-79-020 (USEPA, 1983 - with additions)

Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater, 40 CFR 136, Appendix A

Inductively Coupled Plasma - Atomic Emission Spectrometer Method for Trace Element Analysis of Water and Wastes, 40 CFR 136, Appendix C

"SW" Methods — Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, 3rd Edition (USEPA, 1986)

b Contractor shall comply to the established criteria for Limits of Detection in Annex B.

c For soil/sediment samples, report results as mg/kg of dry soil or sediment. Report moisture content for each sample.

d Metals in water and soil/sediment samples. Limits of Detection must be at or below the values specified. (E200.7, SW6010)

Metal		Detection Limits Water (mg/L)	Soil/Sediment (mg/kg)
Aluminum	Al	0.2	20
Antimony	Sb	0.2	20
Arsenic	As	0.3	-
Barium	Ba	0.01	1
Beryllium	Be	0.002	0.2
Boron	B	0.03	3
Cadmium	Cd	0.005	2
Calcium	Ca	0.05	5
Chromium	Cr	0.03	4
Cobalt	Co	0.04	4
Copper	Cu	0.03	3
Iron	Fe	0.04	4
Lead	Pb	0.2	20
Magnesium	Mg	0.2	20
Manganese	Mn	0.01	1
Molybdenum	Mo	0.04	4
Nickel	Ni	0.015	5
Potassium	K	(determine at time of analysis)	
Selenium	Se	0.4	-
Silica		0.3	30
Silver	Ag	0.03	4
Sodium	Na	0.9	90
Thallium	Tl	0.2	20
Vanadium	V	0.04	4
Zinc	Zn	0.01	1

- Purgeable halocarbons in water and soil/sediment samples. Limits of detection must be at or below the values specified. (E601, SW8010)

Parameter	Detection Limits Water (ug/L)	Soil/Sediment (mg/kg)
Bromodichloromethane	0.5	0.1
Bromoform	1	0.1
Bromomethane	6	0.1
Carbon tetrachloride	0.6	0.1
Chlorobenzene	1.2	0.1
Chloroethane	3	0.1
2-Chloroethyl vinyl ether	0.7	0.1
Chloroform	0.2	0.1
Chloromethane	0.4	0.1
Dibromochloromethane	0.5	0.1
1,2-Dichlorobenzene	0.5	0.1
1,3-Dichlorobenzene	1	0.1
1,4-Dichlorobenzene	0.5	0.1
Dichlorodifluoromethane	9	0.1
1,1-Dichloroethane	0.4	0.1
1,2-Dichloroethane	0.2	0.1
1,1-Dichloroethene	0.7	0.1
trans-1,2-Dichloroethene	0.5	0.1
1,2-Dichloropropane	0.2	0.1
cis-1,3-Dichloropropene	1	0.1
trans-1,3-Dichloropropene	2	0.1
Methylene chloride	2	0.1
1,1,2,2-Tetrachloroethane	0.2	0.1
Tetrachloroethene	0.2	0.1
1,1,1-Trichloroethane	0.2	0.1
1,1,2-Trichloroethane	0.1	0.1
Trichloroethene	0.6	0.1
Trichlorofluoromethane	5	0.1
Vinyl Chloride	0.2	0.1
Benzyl chloride	-	0.1
Bromobenzene	-	0.1
Bis(2-chloroethoxy)methane	-	0.1
Bis(2-chloroisopropyl) ether	-	0.1
Chloroacetaldehyde	-	0.1
Chloral	-	0.1
1-Chlorohexane	-	0.1
Chloromethyl methyl ether	-	0.1
2-Chlorotoluene	-	0.1
Dibromomethane	-	0.1
1,1,1,2-Tetrachloroethane	-	0.1
1,2,3-Trichloropropane	-	0.1

f Organochlorine pesticides in water and soil/sediment samples. Limits of detection must be at or below the values specified. (E608, SW8080)

Parameter	Detection Limits Water (ug/L)	Soil/Sediment (mg/kg)
Aldrin	0.05	0.01
alpha-BHC	0.05	0.01
beta-BHC	0.05	0.01
delta-BHC	0.05	0.01
gamma-BHC	0.05	0.01
Chlordane	0.05	0.1
4,4'-DDD	0.1	0.02
4,4'-DDE	0.1	0.02
4,4'-DDT	0.1	0.02
Dieldrin	0.02	0.02
Endrin	0.06	0.02
Endrin aldehyde	0.1	0.02
Endosulfan I	0.05	0.01
Endosulfan II	0.1	0.02
Endosulfan sulfate	0.1	0.02
Heptachlor	0.02	0.01
Heptachlor epoxide	0.05	0.01
Toxaphene	1	0.2

- D R A F T -

PCB-1016	0.5	0.1
PCB-1221	0.5	0.1
PCB-1232	0.5	0.1
PCB-1242	0.5	0.1
PCB-1248	0.5	0.1
PCB-1254	1	0.2
PCB-1260	1	0.2

g Semivolatile organic compounds in water and soil/sediment samples. Limits of detection must be at or below the values specified. (E625, SW8270)

Analyte(Base/neutral & acid extractables)	Detection Limits Water (ug/L)	Soil/Sediment (mg/kg)
Acenaphthene	10	0.5
Acenaphthylene	10	0.5
Anthracene	10	0.5
Benzo(a)anthracene	10	0.5
Benzo(b)fluoranthene	10	0.5
Benzo(k)fluoranthene	10	0.5
Benzo(a)pyrene	10	0.5
Benzo(ghi)perylene	10	0.5
Benzyo butyl phthalate	10	0.5
4-Bromophenyl phenyl ether	10	0.5
bis(2-Chloroethoxy)methane	10	0.5
bis(2-Chloroethyl) ether	10	0.5
bis(2-Chloroisopropyl) ether	10	0.5
2-Chloronaphthalene	10	0.5
4-Chlorophenyl phenyl ether	10	0.5
Chrysene	10	0.5
Dibenzo(a,h)anthracene	10	0.5
Di-n-butylphthalate	10	0.5
1,2-Dichlorobenzene	5	0.5
1,3-Dichlorobenzene	5	0.5
1,4-Dichlorobenzene	5	0.5
3,3'-Dichlorobenzidine	20	0.5
Diethyl phthalate	20	0.5
Dimethyl phthalate	10	0.5
2,4-Dinitrotoluene	10	0.5
2,6-Dinitrotoluene	10	0.5
Di-n-octyl phthalate	10	0.5
bis(2-ethylhexyl)phthalate	10	0.5
Fluoranthene	10	0.5
Fluorene	10	0.5
Hexachlorobenzene	10	0.5
Hexachlorobutadiene	10	0.5
Hexachloroethane	10	0.5
Indeno(1,2,3-cd)pyrene	10	0.5
Isophorone	10	0.5
Naphthalene	10	0.5
Nitrobenzene	10	0.5
n-Nitrosodi-n-propylamine	10	0.5
Phenanthrene	10	0.5
Pyrene	10	0.5
1,2,4-Trichlorobenzene	10	0.5
4-Chloro-3-methylphenol	10	0.5
2-Chlorophenol	10	0.5
2,4-Dichlorophenol	10	0.5
2,4-Dimethylphenol	10	0.5
2,4-Dinitrophenol	50	1.5
2-Methyl-4,6-dinitrophenol	50	1.5
2-Nitrophenol	10	0.5
4-Nitrophenol	10	0.5
Pentachlorophenol	10	0.5
Phenol	10	0.5
2,4,5-Trichlorophenol	50	1.5
2,4,6-Trichlorophenol	10	0.5

- D R A F T -

h Purgeable aromatic compounds in water and soil/sediment samples. Limits of detection must be at or below the values specified. (E602, SW8020)

Analyte	Detection Limits Water (ug/L)	Soil/Sediment (mg/kg)
Benzene	0.7	0.2
Chlorobenzene	1	0.2
1,2-Dichlorobenzene	2	0.2
1,3-Dichlorobenzene	2	0.2
1,4-Dichlorobenzene	0.5	0.2
Ethylbenzene	1	0.2
Toluene	1	0.2
Xylenes	2	0.2

i Volatile organic compounds (VOCs) in water and soil/sediment samples. Limits of detection must be at or below the values specified. (E624, SW8240)

Analyte	Detection Limits Water (ug/L)	Soil/Sediment (mg/kg)
Acetone	10	0.1
Benzene	3	0.1
Bromodichloromethane	5	0.1
Bromoform	5	0.1
Bromomethane	10	0.1
2-Butanone (MEK)	10	0.1
Carbon disulfide	5	0.1
Carbon tetrachloride	3	0.1
Chlorobenzene	5	0.1
Chloroethane	10	0.1
2-Chloroethyl vinyl ether	10	0.1
Chloroform	5	0.1
Chloromethane	10	0.1
Dibromochloromethane	5	0.1
1,2-Dichlorobenzene	5	0.1
1,3-Dichlorobenzene	5	0.1
1,4-Dichlorobenzene	5	0.1
1,1-Dichloroethane	5	0.1
1,2-Dichloroethane	3	0.1
1,1-Dichloroethene	3	0.1
trans-1,2-Dichloroethene	5	0.1
1,2-Dichloropropane	5	0.1
cis-1,3-Dichloropropene	5	0.1
trans-1,3-Dichloropropene	5	0.1
Diethyl ether	10	0.1
Ethylbenzene	5	0.1
Methylene chloride	5	0.1
2-Methyl-2-pentanone (MIBK)	10	0.1
1,1,2,2-Tetrachloroethane	5	0.1
Tetrachloroethene	3	0.1
Toluene	5	0.1
1,1,1-Trichloroethane	5	0.1
1,1,2-Trichloroethane	5	0.1
Trichloroethene	3	0.1
Trichlorofluoromethane	10	0.1
Vinyl chloride	0.5	0.1
Xylenes (total, all isomers)	5	0.1

j Analyze for all 52 toxic characteristic contaminants listed in the Federal Register. Establish Limits of Detection in accordance with Annex B. Where samples are indicated, sample one well per site, with two sampling rounds per well.

Detection Limits and Regulatory Limits for EP TOX

Metal	Detection Limits (mg/L)	40 CFR 261.24 Max Concentration
As	0.5	5.0
Ba	0.5	100.
Cd	0.1	1.0
Cr	0.5	5.0
Pb	0.5	5.0
Hg	0.002	0.2
Se	0.1	1.0
Ag	0.5	5.0

k Report must include calibration standards and precision data.

l Phenols in water and soil/sediment samples. Limits of Detection must be at or below the values specified. (E604, SW8040)

Analyte	Detection Limits Water (ug/L)	Soil/Sediment (mg/kg)
4-Chloro-3-methylphenol	1.8	0.2
2-Chlorophenol	1.6	0.2
2,4-Dichlorophenol	2.0	0.3
2,4-Dimethylphenol	1.6	0.2
2,4-Dinitrophenol	65.	8.7
2-Methyl-4,6-dinitrophenol	80.	11.
2-Nitrophenol	2.3	0.3
4-Nitrophenol	14.	1.9
Pentachlorophenol	37.	5.0
Phenol	0.5	0.09
2,4,6-Trichlorophenol	3.2	0.4

m Chlorinated phenoxy acid herbicides in water and soil/sediment samples. Limits of Detection must be at or below the values specified. (A509B, SW8150)

Analyte	Detection Limits Water (ug/L)	Soil/Sediment (mg/kg)
2,4-D	6.0	0.8
2,4,5-T	1.0	0.1
2,4,5-TP (Silvex)	0.8	0.1
2,4-DB	-	0.6
Dalapon	-	3.9
Dicamba	-	0.18
Dichloroprop	-	0.44
Dinoseb	-	0.05
MCPA	-	166.
MCPP	-	128.

Annex B

SPECIFIC REQUIREMENTS FOR CHEMICAL ANALYSES

B.1 **Analytical parameters.** The analytical parameters are summarized in Annex A along with the required methods.

B.2 **Limits of Detection.** Definition: the minimum concentration of a substance that can be measured and reported with 99% confidence that the true value is greater than zero. Analytical laboratories shall establish a Limit of Detection (LOD) for each parameter and analyte listed in Annex A using procedures outlined in one of the following references:

a. the applicable EPA or Standard method,

b. 40 Code of Federal Regulations (CFR) 136, Appendix B, or,

c. "Principles of Environmental Analysis" (Analytical Chemistry, Vol 55, pages 2210 - 2218, Dec 1983).

B.2.1 **Approval of Limits of Detection.** A list of the laboratory-established Limits of Detection shall be incorporated into a table and included in the contractor's Quality Assurance Project Plan (QAPP). Limits of Detection must be approved by the USAFOEHL/TS Technical Program Manager prior to samples being submitted to the laboratory for analysis.

B.2.2 **Approval criteria.** Limits of Detection exceeding any one of the following criteria will not be approved:

a. LOD greater than the established Federal or state standard/criterion

b. LOD greater than the "Detection Limit" listed in Annex A of this delivery order

B.2.3 **Interference with detection of analyte in samples.** If the approved LOD for a particular analyte/parameter cannot be met because of matrix and/or other interferences, the laboratory shall report the detection limit actually achieved and explain in a footnote on the test report the difficulties encountered.

B.3 **Second-column GC confirmation.** For those methods which employ gas chromatography (GC) as the analytical technique (E601, E608, SW8020, SW8080, and SW8150) positive confirmation of identity is required for all analytes having concentrations higher than the Limit of Detection (LOD). Conduct positive confirmations by second-column GC; however, gas chromatography/mass spectroscopy (GC/MS) can be used for positive confirmation if the quantity of each analyte to be confirmed is above the detection level of the GC/MS instrument. Analytes which cannot be confirmed will be reported as "Not Detected" in the body of the report, but the second-column GC or GC/MS analytical results (numerical and non-numerical) shall be provided in the report appendix along with the results

of the first column analysis. Base the quantification of confirmed analytes on the first-column analysis. The maximum number of second-column confirmational analyses shall not exceed fifty percent (50 %) of the actual number of field samples (to include duplicates, replicates, ambient conditions blanks, trip blanks, and equipment blanks). If the number of samples requiring second column confirmation exceeds this allowance, contact the USAFOEHL/TS Technical Program Manager. The total number of samples listed in Annex A includes the allowance applicable to each GC method. If GC/MS, or a combination of second-column GC and GC/MS, is used, the total cost of all such analyses for a particular parameter shall not exceed the funding allowed for positive confirmation using only second column GC.

- D R A F T -

Annex C

SPECIFIC FIELD REQUIREMENTS

C.1 **FIELD SAMPLING, SAMPLE PRESERVATION AND HOLDING TIMES** . Strictly comply with the sampling techniques contained in Standard Methods for the Examination of Water and Wastewater, 16th Edition (1985); ASTM, Section 11, Water and Environmental Technology; Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, 3rd Edition (USEPA, 1986); Methods for Chemical analysis of Water and Wastes, EPA Manual 600/4-79-020 (1983); and the Handbook for Sampling and Sample Preservation of Water and Wastewater, EPA Document 600/4-82-029 (1982). For water samples, follow the sample preservations and maximum holding times specified in 40 Code of Federal Regulations (CFR) 136.3 (e), Table II. Preservations and maximum holding times for all other sample matrices shall be in accordance with the applicable method.

C.2 **Sampling groundwater test wells.**

a. After development, allow wells to stabilize for a minimum of three (3) days before sampling. When possible, sample areas having low levels of contamination prior to sampling those having high levels. Record weather conditions prevalent at time of sampling (e.g., wind direction and speed, ambient temperature, precipitation). The Base Weather Service can be of assistance in supplying such information.

b. Prior to purging the wells, examine the surface of the water table for the presence of hydrocarbons and take water level measurements to the nearest 0.01 foot with respect to the established survey point on top of the well casing. If applicable, measure the thickness of the hydrocarbon layer. Record all observations and measurements and incorporate them into the Final Report (paragraph 1.9.1).

c. Purge the well using a submersible pump, bailer, or other acceptable method. Purge until a minimum of three (3) well volumes (based on borehole diameter) of water has been displaced and the pH, temperature, specific conductance, color, and odor of the discharge have stabilized using the following criteria: pH $\pm$ 0.1 unit, temperature $\pm$ 0.5C, and specific conductance $\pm$ 10 umhos/cm. Include the final measurements in the Results section of the Final Report (paragraph 1.9.1).

d. Collect water samples with a Teflon bailer. To collect representative aquifer samples where floating hydrocarbons are present, use a "thief sampler" or similar point sampling device to minimize the influence of the free product.

e. If the well(s) cannot be sampled due to incomplete well development, unusual well characteristics, or other reason(s), indicate the reason(s) in the Final Report (paragraph 1.9.1).

f. Remeasure water levels after sampling and after the water conditions in the wells have stabilized. Record measurements in the field log.

- D R A F T -

C.3 **Collection of surface water/sediment samples.** Collect samples so as not to cause cross-contamination; obtain downstream samples first, and obtain the water sample at each location before the sediment sample. Measure pH, temperature, and specific conductance at each surface water sampling point. Permanently mark the location where surface water or sediment samples are collected. Record the location on a project map for each specific site or zone, whichever applies.

C.4 **Collection of test pit samples.** Collect representative soil samples directly from the backhoe bucket, or the bottom or side of the test pit. Insure that the samples collected have not contacted the cover soil or backhoe bucket.

C.5 **Specific Requirements for Decontamination**

C.5.1 **Decontamination of sampling equipment.** Decontaminate all sampling equipment, including internal components, prior to use and between samples to avoid cross-contamination. Wash equipment with a laboratory-grade detergent followed by drinking quality water, ASTM Type II Reagent Water, pesticide-grade methanol, and pesticide-grade hexane rinses. Allow sufficient time for the solvent to evaporate and the equipment to dry completely before reuse. Sampling equipment used to collect samples for organics analysis shall not be allowed to come in contact with any type of plastic (e.g. plastic storage bags).

C.5.2 **Type II Reagent Water.** Insure that the Type II Reagent Water used to decontaminate sampling equipment is free of contaminants which may interfere with the required laboratory analyses. Type II Reagent Water is prepared using a still designed to produce a distillate having a conductivity of less than 1.0 micromho/cm (at 25 deg C). Double distillation and special features (e.g., degassing, activated charcoal filtration) are usually required to achieve the Type II Reagent Water specification. Distilled water purchased from local supply stores (e.g., supermarket) is not Type II Reagent Water. Furnish the analytical data or manufacturer's certification which verifies the quality of the Type II Reagent Water.

C.5.3 **Dedication of monofilament line.** Dedicate for each well the monofilament line or steel wire used to lower sampling equipment into the well. Do not use a line or wire in more than one well.

C.5.4 **Water level probe decontamination.** Decontaminate the calibrated water level probe for measuring well volume and water level elevation before use in each well.

C.5.5 **Drilling rig and tool decontamination.** Thoroughly clean and decontaminate the drilling rig and tools before initial use and after each borehole completion. As a minimum, steam clean drill bits after each borehole is installed. Drill from the "least" to the "most" contaminated sites, if possible.

C.5.6 **Well Security.** All wells shall be secured as soon as possible

after drilling. Provide locks for both flush and above-ground well assemblies. Turn over the lock keys to the Base POC following completion of the field and sampling effort.

C.6 **Field quality assurance/quality control.** The following field quality assurance/quality control (QA/QC) samples are required:

a. One (1) trip blank with every batch of VOC samples (both soils and water) sent to the laboratory. Definition of trip blank: a sample bottle is filled with ASTM Type II Reagent Water, transported to the site, handled like a sample, and returned to the laboratory for analysis (trip blanks are not to be opened in the field). The trip blank for soils is Type II Reagent Water just as in the case of water samples.

b. One (1) ambient conditions blank per VOC sampling round (water) at a particular site or zone. Definition of Ambient Conditions Blank: Type II Reagent Water is poured into a sample container at the site, then is handled like a sample and transported to the laboratory for analysis.

c. One (1) set of equipment blanks for every day of groundwater sampling (all parameters analyzed). Definition of Equipment Blank: Type II Reagent water is poured into the sampling device, or pumped through it (in the case of sampling pumps), transferred to the sample bottle, and then transported to the laboratory for analysis.

d. Ten (10) percent field duplicates (all parameters analyzed) for water samples. Definition of Duplicate: two samples collected independently at a sampling location during a single act of sampling. Field duplicates shall be indistinguishable from other analytical samples so that personnel performing the analyses are not able to determine which samples are duplicates.

e. Ten (10) percent field replicates (all parameters analyzed) for soil/sediment samples. Definition of Replicate: a single sample (e.g., one bailer volume, one grab sample) is collected, then divided into two equal parts for the purpose of analysis. Replicate sample are often called "Splits." Field replicates shall be indistinguishable from other analytical samples so that personnel performing the analyses are not able to determine which samples are duplicates.

C.7 **Number of required samples.** Annex A specifies the maximum number of field QA/QC samples allowed for each analytical parameter.

C.8 **Chain-of-custody records.** Maintain chain-of-custody records for all field and QA/QC samples.

PART I SECTION F OF THE SCHEDULE
SUPPLIES SCHEDULE DATA

1. PROC INSTRUMENT ID NO. (PIIN): F33615-87-D-4023 | 2. SPIIN: 0004 | 3. PAGE 34 OF 35

DRAFT

4. ITEM NO. 0001 | 5. ACRN AA | 6. TSP PRI | 7. MILSTRIP DOC NO. AND SUFFIX | 8. CON ITEM SERIAL NO. | 9. ENDING SERIAL NO. (WHEN APPL) | 10. CLIN IDENT EXHIBIT

11. DEL SCHED DATE	12. ENDING DATE (WHEN APPL)	13. DEL SCHEDULE QTY*	14. SCTY CLAS	15. SHIP TO	16. MARK FOR
A. 88DEC30	A.	A. 1	U	FY7624	
B.	B.	B.	D.	D.	D.
C.	C.	C.	E.	E.	E.

17. DESCRIPTIVE DATA

SEE SECTION H OF THE BASIC CONTRACT FOR FY7624 ADDRESS.
TECHNICAL EFFORT SHALL BE COMPLETED NO LATER THAN 88 FEB 29.

ALL DATA SHALL BE DELIVERED IAW ATTACHMENT #1 OF THE BASIC CONTRACT AS IMPLEMENTED BY PARAGRAPH VI OF THE TASK DESCRIPTION NO LATER THAN 88 OCT 31.
THE DATA SHALL BE ACCEPTED BY THE GOVERNMENT NOT LATER THAN THE DATE SHOWN IN BLOCK 11A.

4. ITEM NO. 0002 | 5. ACRN AA | 6. TSP PRI | 7. MILSTRIP DOC NO. AND SUFFIX | 8. CON ITEM SERIAL NO. | 9. ENDING SERIAL NO. (WHEN APPL) | 10. CLIN IDENT EXHIBIT

11. DEL SCHED DATE	12. ENDING DATE (WHEN APPL)	13. DEL SCHEDULE QTY*	14. SCTY CLAS	15. SHIP TO	16. MARK FOR
A. 88DEC30	A.	A. 1	U	FY7624	
B.	B.	B.	D.	D.	D.
C.	C.	C.	E.	E.	E.

17. DESCRIPTIVE DATA

SEE SECTION H OF THE BASIC CONTRACT FOR FY7624 ADDRESS.
TECHNICAL EFFORT SHALL BE COMPLETED NO LATER THAN 88 FEB 29.

4. ITEM NO. 0004 | 5. ACRN AA | 6. TSP PRI | 7. MILSTRIP DOC NO. AND SUFFIX | 8. CON ITEM SERIAL NO. | 9. ENDING SERIAL NO. (WHEN APPL) | 10. CLIN IDENT EXHIBIT

11. DEL SCHED DATE	12. ENDING DATE (WHEN APPL)	13. DEL SCHEDULE QTY*	14. SCTY CLAS	15. SHIP TO	16. MARK FOR
A. 88DEC30	A.	A. 1	U	FY7624	
B.	B.	B.	D.	D.	D.
C.	C.	C.	E.	E.	E.

17. DESCRIPTIVE DATA

SEE SECTION H OF THE BASIC CONTRACT FOR FY7624 ADDRESS.
TECHNICAL EFFORT SHALL BE COMPLETED NO LATER THAN 88 FEB 29.

ALL CHEMICAL ANALYSIS DATA SHALL BE DELIVERED IAW ATTACHMENT #1 AS IMPLEMENTED BY PARAGRAPH VI OF THE TASK DESCRIPTION. NO LATER THAN 88 OCT 31.
THE DATA SHALL BE ACCEPTED BY THE GOVERNMENT NOT LATER THAN THE DATE SHOWN IN BLOCK 11A.

*REPRESENTS A NET INCREASE/DECREASE WHEN NO + OR − APPEARS AFTER THE ITEM NO.
E = ESTIMATED
− (IN QTY) = DECREASE
+ OR − (IN ITEM NO.) = ADDITION OR DELETION

ART I SECTION F OF THE SCHEDULE
SUPPLIES SCHEDULE DATA

1. PROC INSTRUMENT ID NO. (PIIN)	2. SPIIN	3.
DRAFT F33615-87-D-4023	0004	PAGE 35 OF 35

4. ITEM NO.	5. ACRN	6. TSP PRI	7. MILSTRIP DOC NO. AND SUFFIX	8. CON ITEM SERIAL NO.	9. ENDING SERIAL NO. (WHEN APPL)	10. CLIN IDENT EXHIBIT
)003	AA					

11. DEL SCHED DATE	12. ENDING DATE (WHEN APPL)	13. DEL SCHEDULE QTY*	14. SCTY CLAS	15. SHIP TO	16. MARK FOR
A. EC30	A.	A. 1	U	FY7624	

	11. DEL SCHED DATE	12. ENDING DATE (WHEN APPL)	13. DEL SCHEDULE QTY*
B.	B.	B.	D. D. D.
C.	C.	C.	E. E. E.

17. DESCRIPTIVE DATA

SEE SECTION H OF THE BASIC CONTRACT FOR FY7624 ADDRESS.
E HNICAL EFFORT SHALL BE COMPLETED NO LATER THAN 88 FEB 29.

ALL SOFTWARE SHALL BE DELIVERED IAW ATTACHMENT #2 AS IMPLEMENTED
BY PARAGRAPH VI OF THE TASK DESCRIPTION NO LATER THAN 87 DEC 15.

4. ITEM NO.	5. ACRN	6. TSP PRI	7. MILSTRIP DOC NO. AND SUFFIX	8. CON ITEM SERIAL NO.	9. ENDING SERIAL NO. (WHEN APPL)	10. CLIN IDENT EXHIBIT

11. DEL SCHED DATE	12. ENDING DATE (WHEN APPL)	13. DEL SCHEDULE QTY*	14. SCTY CLAS	15. SHIP TO	16. MARK FOR
A.	A.	A.			

	11. DEL SCHED DATE	12. ENDING DATE (WHEN APPL)	13. DEL SCHEDULE QTY*
B.	B.	B.	D. D. D.
C.	C.	C.	E. E. E.

17. DESCRIPTIVE DATA

4. ITEM NO.	5. ACRN	6. TSP PRI	7. MILSTRIP DOC NO. AND SUFFIX	8. CON ITEM SERIAL NO.	9. ENDING SERIAL NO. (WHEN APPL)	10. CLIN IDENT EXHIBIT

11. EL SCHED DATE	12. ENDING DATE (WHEN APPL)	13. DEL SCHEDULE QTY*	14. SCTY CLAS	15. SHIP TO	16. MARK FOR
A.	A.	A.			

	11. DEL SCHED DATE	12. ENDING DATE (WHEN APPL)	13. DEL SCHEDULE QTY*
B.	B.	B.	D. D. D.
C.	C.	C.	E. E. E.

7. DESCRIPTIVE DATA

EPP...S A NET INCREASE/DECREASE WHEN NO + OR – APPEARS AFTER THE ITEM NO.
= E IMATED
(IN QTY) = DECREASE
OR – (IN ITEM NO.) = ADDITION OR DELETION

TAB

B

- D R A F T -

APPENDIX B

Lithologic Logs and Well Data

- D R A F T -

DRILLING LOG | RADIAN CORPORATION	INSTALLATION: CARSWELL AFB, TX | SHEET 1 OF 2 SHEETS
1. PROJECT: CARSWELL AFB, IRP PHASE II STAGE 2	7. TOTAL DEPTH OF HOLE: 30 ft BGL
LOCATION: Site 1	8. DATUM FOR ELEVATION SHOWN: sea level
3. DRILLING AGENCY: Atec Associates	9. MANUFACTURER'S DESIGNATION OF DRILL: Mobile Drill B-61
4. HOLE NO.: 1E	10. NO. OF SAMPLES TAKEN: 6
5. NAME OF GEOLOGIST: Guy J. Childs	11. ELEVATION GROUND WATER: 540.76 ft MSL (2/26/88)
6. COORDINATES OF HOLE: X: 2025407.53 Y: 401173.21	12. DATE HOLE ESTABLISHED: 2/12/88
	13. ELEVATION TOP OF HOLE: 559.40 ft MSL

Depth (Ft.)	Graphic Log	Sample ID	Soil Class/Code	Visual Description
0		1E-1	F/CMNT	FILL: CLAY WITH GRAVEL, CONCRETE FRAGMENTS.
2		1E-2	S/CLLR	CLAY: DARK BROWN, DARK GRAY TO BLACK, SOME GRAVEL AND SILT.
5		1E-3	S/CLLR	CLAY: DARK BROWN TO BLACK, SOME SILT AND FINE GRAINED SAND, TRACE GRAVEL. GRADES TO LIGHT BROWN SILTY SAND AT 7 FEET.
10		1E-4	S/CLLR	CLAY: MEDIUM BROWN, SOME SILT, MODERATE PLASTICITY, OCCASIONAL LIMESTONE FRAGMENTS.
15		1E-5	S/CLLR	CLAY: MEDIUM BROWN TO GRAY, INCREASING SILT, SOME SAND, LOW PLASTICITY, MINOR LIMESTONE PEBBLES, TRACE BROKEN SHELL FRAGMENTS.
20		1E-6	S/CLLR	SILTY CLAY: BROWN TO GRAY, INCREASING FINE GRAINED SAND, TRACE ROCK FRAGMENTS, BROKEN SHELL FRAGMENTS, MOIST. WATER AT 22 FEET.

- D R A F T -

DRILLING LOG | RADIAN CORPORATION	INSTALLATION: CARSWELL AFB, TX | SHEET 2 OF 2 SHEETS
1. PROJECT: CARSWELL AFB, IRP PHASE II STAGE 2	7. TOTAL DEPTH OF HOLE: 30 ft BGL
	8. DATUM FOR ELEVATION SHOWN: sea level
2. LOCATION: Site 1	9. MANUFACTURER'S DESIGNATION OF DRILL: Mobile Drill B-61
3. DRILLING AGENCY: Atec Associates	10. NO. OF SAMPLES TAKEN: 6
4. HOLE NO.: 1E	11. ELEVATION GROUND WATER: 540.76 ft MSL (2/26/88)
5. NAME OF GEOLOGIST: Guy J. Childs	12. DATE HOLE ESTABLISHED: 2/12/88
6. COORDINATES OF HOLE: X: 2025407.53 Y: 401173.21	13. ELEVATION TOP OF HOLE: 559.40 ft MSL

Depth (Ft.)	Graphic Log	Sample ID	Soil Class/Code	Visual Description
25			S/CLLR	SILTY CLAY: BROWN TO GRAY, INCREASING FINE GRAINED SAND, TRACE ROCK FRAGMENTS, BROKEN SHELL FRAGMENTS.
30			S/CLLR	END OF BORING AT 30 FEET.

- D R A F T -

DRILLING LOG	RADIAN CORPORATION	INSTALLATION: CARSWELL AFB, TX	SHEET 1 OF 2 SHEETS

1. PROJECT: CARSWELL AFB, IRP PHASE II STAGE 2
LOCATION: Site 1
3. DRILLING AGENCY: Atec Associates
4. HOLE NO.: 1F
5. NAME OF GEOLOGIST: Guy J. Childs
6. COORDINATES OF HOLE:
X: 2025607.46 Y: 401002.55
7. TOTAL DEPTH OF HOLE: 33 ft BGL
8. DATUM FOR ELEVATION SHOWN: sea level
9. MANUFACTURER'S DESIGNATION OF DRILL: Mobile Drill B-61
10. NO. OF SAMPLES TAKEN: 6
11. ELEVATION GROUND WATER: 540.20 ft MSL (2/26/88)
12. DATE HOLE ESTABLISHED: 2/14/88
13. ELEVATION TOP OF HOLE: 559.50 ft MSL

Depth (Ft.)	Graphic Log	Sample ID	Soil Class/Code	Visual Description
0		1F-1	S/CLLR	CLAY: DARK BROWN TO DARK GRAY BLACK, MINOR SILT AND SAND, FEW GRAVELS.
2		1F-2	S/CLLR	SAME AS ABOVE
5		1F-3	S/CLLR	SILTY CLAY: BROWN TO GRAY, COMMON FINE GRAINED SAND, LOW PLASTICITY.
10		1F-4	S/SLCL	CLAYEY SILT: BROWN TO BROWN GRAY, SOME FINE GRAINED SAND.
15		1F-5	S/CLLR	SILTY CLAY: BROWN, MOTTLED GRAY, SOME SAND, COMMON GRAVEL, PEBBLES.
20		1F-6	S/CLLR	SANDY CLAY: MEDIUM BROWN, OCCASIONAL GRAY STREAKS, FINE GRAINED SAND, SILTY. WATER AT 22 FEET.

- D R A F T -

DRILLING LOG | RADIAN CORPORATION	INSTALLATION: CARSWELL AFB, TX | SHEET 2 OF 2 SHEETS
1. PROJECT: CARSWELL AFB, IRP PHASE II STAGE 2	7. TOTAL DEPTH OF HOLE: 33 ft BGL
	8. DATUM FOR ELEVATION SHOWN: sea level
2. LOCATION: Site 1	9. MANUFACTURER'S DESIGNATION OF DRILL: Mobile Drill B-61
3. DRILLING AGENCY: Atec Associates	10. NO. OF SAMPLES TAKEN: 6
4. HOLE NO.: 1F	11. ELEVATION GROUND WATER: 540.20 ft MSL (2/26/88)
5. NAME OF GEOLOGIST: Guy J. Childs	12. DATE HOLE ESTABLISHED: 2/14/88
6. COORDINATES OF HOLE: X: 2025607.46 Y: 401002.55	13. ELEVATION TOP OF HOLE: 559.50 ft MSL

Depth (Ft.)	Graphic Log	Sample ID	Soil Class/Code	Visual Description
25			S/CLLR	SANDY CLAY: MEDIUM BROWN, OCCASIONAL GRAY STREAKS, FINE GRAINED SAND, SILTY.
33			S/CLLR	END OF BORING AT 33 FEET.

- D R A F T -

DRILLING LOG	RADIAN CORPORATION	INSTALLATION: CARSWELL AFB, TX	SHEET 1 OF 1 SHEETS

1. PROJECT: CARSWELL AFB, IRP PHASE II STAGE 2	7. TOTAL DEPTH OF HOLE: 18 ft BGL
2. LOCATION: Site 3	8. DATUM FOR ELEVATION SHOWN: sea level
3. DRILLING AGENCY: Atec Associates	9. MANUFACTURER'S DESIGNATION OF DRILL: Mobile Drill B-61
4. HOLE NO.: 3A	10. NO. OF SAMPLES TAKEN: 5
5. NAME OF GEOLOGIST: Guy J. Childs	11. ELEVATION GROUND WATER:
6. COORDINATES OF HOLE: X: 2017786.72 Y: 398360.53	12. DATE HOLE ESTABLISHED: 1/26/88
	13. ELEVATION TOP OF HOLE: 633.47 ft MSL

Depth (Ft.)	Graphic Log	Sample ID	Soil Class/Code	Visual Description
0		3A-1	S/CLLR	CLAY: MEDIUM BROWN, SOME SILT, COMMON GRAVEL, MODERATE PLASTICITY.
2		3A-2	S/CLLR	CLAY: DARK BROWN/GRAY TO DARK GRAY, ABUNDANT CALCAREOUS ROCK FRAGMENTS.
4		3A-3	S/SLSM	SILT: REDDISH BROWN, SOME CLAY; OCCASIONAL VERY THIN, VERY FINE GRAINED, TAN SAND INTERBEDS.
9		3A-4	S/SLSM	SILT: TAN WITH SOME WHITE MOTTLING, LIMONITIC STAINING, CLAYEY, GRAVELLY, CALCAREOUS ROCK FRAGMENTS.
14		3A-5	S/SLLR	SANDY SILT: LIGHT BROWN TO TAN, SOME FINE GRAINED SAND, VERY MOIST.
18			R/LMSN	LIMESTONE: TAN, WEATHERED. END OF BORING AT 18 FEET.

- D R A F T -

DRILLING LOG | RADIAN CORPORATION	INSTALLATION: CARSWELL AFB, TX | SHEET 1 OF 2 SHEETS
1. PROJECT: CARSWELL AFB, IRP PHASE II STAGE 2	7. TOTAL DEPTH OF HOLE: 21 ft BGL
	8. DATUM FOR ELEVATION SHOWN: sea level
2. LOCATION: Site 3	9. MANUFACTURER'S DESIGNATION OF DRILL: Mobile Drill B-61
3. DRILLING AGENCY: Atec Associates	10. NO. OF SAMPLES TAKEN: 6
4. HOLE NO.: 3B	11. ELEVATION GROUND WATER:
5. NAME OF GEOLOGIST: Guy J. Childs	12. DATE HOLE ESTABLISHED: 1/26/88
6. COORDINATES OF HOLE: X: 2018291.94 Y: 398345.88	13. ELEVATION TOP OF HOLE: 633.84 ft MSL

Depth (Ft.)	Graphic Log	Sample ID	Soil Class/Code	Visual Description
0		3B-1	S/CLLR	SILTY CLAY: BROWN TO DARK GRAY, MODERATE PLASTICITY.
2		3B-2	S/CLLR	SILTY CLAY: DARK BROWN TO DARK GRAY/BLACK; REDDISH BROWN FINE GRAINED SAND, SOME GRAVEL, MODERATE PLASTICITY.
4		3B-3	S/SLSM	SILT: MEDIUM BROWN, SOME CLAY, CALCAREOUS NODULES; BECOMING LIGHTER AT 7 FEET.
9		3B-4	S/SLLR	SILT: TAN, OCCASIONAL CALCAREOUS STREAKS, TRACE VERY FINE GRAINED SAND.
14		3B-5	S/CLLR	SILTY CLAY: OLIVE BROWN, LOW PLASTICITY, MOIST.
19		3B-6	S/SILT	SILT: LIGHT BROWN, MOIST.
19.5			R/SHLE	SHALE: SHALEY LAYER AT 19.5 FEET.

- D R A F T -

DRILLING LOG	RADIAN CORPORATION	INSTALLATION: CARSWELL AFB, TX	SHEET 2 OF 2 SHEETS

1. PROJECT: CARSWELL AFB, IRP PHASE II STAGE 2
   LOCATION: Site 3
3. DRILLING AGENCY: Atec Associates
4. HOLE NO.: 3B
5. NAME OF GEOLOGIST: Guy J. Childs
6. COORDINATES OF HOLE:
   X: 2018291.94 Y: 398345.88
7. TOTAL DEPTH OF HOLE: 21 ft BGL
8. DATUM FOR ELEVATION SHOWN: sea level
9. MANUFACTURER'S DESIGNATION OF DRILL: Mobile Drill B-61
10. NO. OF SAMPLES TAKEN: 6
11. ELEVATION GROUND WATER:
12. DATE HOLE ESTABLISHED: 1/26/88
13. ELEVATION TOP OF HOLE: 633.84 ft MSL

Depth (Ft.)	Graphic Log	Sample ID	Soil Class/Code	Visual Description
21			R/LMSN	LIMESTONE: MEDIUM GRAY; REFUSAL AND END OF BORING AT 21 FEET.

- D R A F T -

DRILLING LOG	RADIAN CORPORATION	INSTALLATION: CARSWELL AFB, TX	SHEET 1 OF 1 SHEETS

1. PROJECT: CARSWELL AFB, IRP PHASE II STAGE 2	7. TOTAL DEPTH OF HOLE: 12 ft BGL
	8. DATUM FOR ELEVATION SHOWN: sea level
2. LOCATION: Site 3	9. MANUFACTURER'S DESIGNATION OF DRILL: Mobile Drill B-61
3. DRILLING AGENCY: Atec Associates	10. NO. OF SAMPLES TAKEN: 4
4. HOLE NO.: 3C	11. ELEVATION GROUND WATER:
5. NAME OF GEOLOGIST: Guy J. Childs	12. DATE HOLE ESTABLISHED: 1/27/88
6. COORDINATES OF HOLE: X: 2018292.28 Y: 397831.27	13. ELEVATION TOP OF HOLE: 635.39 ft MSL

Depth (Ft.)	Graphic Log	Sample ID	Soil Class/Code	Visual Description
0		3C-1	S/CLLR	CLAY: MEDIUM BROWN, SOME SILT, COMMON PEBBLES.
2		3C-2	S/CLLR	CLAY: LIGHT BROWN, MINOR SILT, ABUNDANT LIMESTONE FRAGMENTS.
4		3C-3	S/CLLR	CLAY: MEDIUM BROWN, TRACE SILT, MODERATE PLASTICITY. AT 7 FEET BECOMING TAN WITH SOME LIMONITIC STAINING; ALSO INCREASING SILT, FINE GRAINED SAND, AND PEBBLES.
9		3C-4	S/CLLR	SILTY CLAY: TAN, SOME SAND.
12			R/LMSN	LIMESTONE: LIGHT GRAY, HARD. REFUSAL AND END OF BORING AT 12 FEET.

- D R A F T -

DRILLING LOG | RADIAN CORPORATION	INSTALLATION: CARSWELL AFB, TX | SHEET 1 OF 1 SHEETS
1. PROJECT: CARSWELL AFB, IRP PHASE II STAGE 2	7. TOTAL DEPTH OF HOLE: 16 ft BGL
LOCATION: Site 3	8. DATUM FOR ELEVATION SHOWN: sea level
3. DRILLING AGENCY: Atec Associates	9. MANUFACTURER'S DESIGNATION OF DRILL: Mobile Drill B-61
4. HOLE NO.: 3D	10. NO. OF SAMPLES TAKEN: 5
5. NAME OF GEOLOGIST: Guy J. Childs	11. ELEVATION GROUND WATER: 612.64
6. COORDINATES OF HOLE: X: 2017477.4 Y: 398698.98	12. DATE HOLE ESTABLISHED: 1/27/88
	13. ELEVATION TOP OF HOLE: 621.60 ft MSL

Depth (Ft.)	Graphic Log	Sample ID	Soil Class/Code	Visual Description
0		3D-1	S/CLLR	SILTY CLAY: LIGHT BROWN/TAN, SOME LIMONITE STAINING, TRACE BROKEN SHELL FRAGMENTS, LOW PLASTICITY, DRY.
2		3D-2	S/CLLR	SAME AS ABOVE
4		3D-3	S/SLSM	SILT: MEDIUM BROWN, SOME GRAVEL AND CLAY, PEBBLES, DRY.
9		3D-4	S/SLSM	CLAYEY SILT: MEDIUM BROWN, GRAVELLY, SOME LIMESTONE FRAGMENTS, WET. WATER AT 10 FEET.
15		3D-5	R/SHLE	SHALE: MEDIUM GRAY, WELL INDURATED.
15.5			R/SHLE	REFUSAL AND END OF BORING AT 15.5 FEET.

- D R A F T -

DRILLING LOG	RADIAN CORPORATION	INSTALLATION: CARSWELL AFB, TX	SHEET 1 OF 1 SHEETS

1. PROJECT: CARSWELL AFB, IRP PHASE II STAGE 2
2. LOCATION: Site 3
3. DRILLING AGENCY: Atec Associates
4. HOLE NO.: 3E
5. NAME OF GEOLOGIST: Guy J. Childs
6. COORDINATES OF HOLE: X: 2019005.28 Y: 398358.43
7. TOTAL DEPTH OF HOLE: 16 ft BGL
8. DATUM FOR ELEVATION SHOWN: sea level
9. MANUFACTURER'S DESIGNATION OF DRILL: Mobile Drill B-61
10. NO. OF SAMPLES TAKEN: 5
11. ELEVATION GROUND WATER:
12. DATE HOLE ESTABLISHED: 1/27/88
13. ELEVATION TOP OF HOLE: 622.87 ft MSL

Depth (Ft.)	Graphic Log	Sample ID	Soil Class/Code	Visual Description
0		3E-1	S/CLLR	SILTY CLAY: DARK BROWN GRADING TO LIGHT BROWN, COMMON ORGANICS.
2		3E-2	S/CLLR	SILTY CLAY: LIGHT REDDISH BROWN, WHITE CALCAREOUS MOTTLING, LOW PLASTICITY.
4		3E-3	S/SILT	SILT: LIGHT BROWN/TAN, OCCASIONAL LIMESTONE FRAGMENTS.
9		3E-4	S/SILT	SILT: LIGHT BROWN, COMMON LIMESTONE FRAGMENTS.
14		3E-5	S/SILT	SILT: LIGHT BROWN, SOME LIMESTONE FRAGMENTS.
16			R/SHLE	SHALE: DARK GRAY. REFUSAL AND END OF BORING AT 16 FEET.

- D R A F T -

DRILLING LOG	RADIAN CORPORATION	INSTALLATION: CARSWELL AFB, TX	SHEET 1 OF 2 SHEETS
1. PROJECT: CARSWELL AFB, IRP PHASE II STAGE 2		7. TOTAL DEPTH OF HOLE: 36 ft BGL	
		8. DATUM FOR ELEVATION SHOWN: sea level	
LOCATION: Site 4		9. MANUFACTURER'S DESIGNATION OF DRILL: Mobile Drill B-61	
3. DRILLING AGENCY: Atec Associates		10. NO. OF SAMPLES TAKEN: 6	
4. HOLE NO.: 4F		11. ELEVATION GROUND WATER: 592.36 ft MSL (3/4/88)	
5. NAME OF GEOLOGIST: Guy J. Childs		12. DATE HOLE ESTABLISHED: 2/10/88	
6. COORDINATES OF HOLE: X: 2020255.75 Y: 397680.42		13. ELEVATION TOP OF HOLE: 622.80 ft MSL	

Depth (Ft.)	Graphic Log	Sample ID	Soil Class/Code	Visual Description
0		4F-1	S/CLLR	CLAY: DARK BROWN, SOME SILT.
2		4F-2	S/CLLR	CLAY: DARK BROWN, INCREASING SILT.
3			S/SLLR	SILT: TAN, SOME FINE GRAINED SAND, COMMON WEATHERED LIMESTONE PEBBLES.
6		4F-3	S/SDLR	SAND: ORANGE BROWN TO TAN, FINE TO MEDIUM GRAINED, OCCASIONAL LIMESTONE GRAVEL.
10		4F-4	S/SAND	SAND: TAN TO RUST BROWN, FINE TO MEDIUM GRAINED.
15		4F-5	S/SAND	SAND: LIGHT TAN, FINE TO MEDIUM GRAINED.
20		4F-6	S/SAND	SAME AS ABOVE

- D R A F T -

DRILLING LOG	RADIAN CORPORATION	INSTALLATION: CARSWELL AFB, TX	SHEET 2 OF 2 SHEETS

1. PROJECT: CARSWELL AFB, IRP PHASE II STAGE 2	7. TOTAL DEPTH OF HOLE: 36 ft BGL
	8. DATUM FOR ELEVATION SHOWN: sea level
2. LOCATION: Site 4	9. MANUFACTURER'S DESIGNATION OF DRILL: Mobile Drill B-61
3. DRILLING AGENCY: Atec Associates	10. NO. OF SAMPLES TAKEN: 6
4. HOLE NO.: 4F	11. ELEVATION GROUND WATER: 592.36 ft MSL (3/4/88)
5. NAME OF GEOLOGIST: Guy J. Childs	12. DATE HOLE ESTABLISHED: 2/10/88
6. COORDINATES OF HOLE: X: 2020255.75 Y: 397680.42	13. ELEVATION TOP OF HOLE: 622.80 ft MSL

Depth (Ft.)	Graphic Log	Sample ID	Soil Class/Code	Visual Description
25			S/SAND	WATER AT 25 FEET.
32			S/SDGR	SAND AND GRAVEL
35.5			S/SDGR	END OF BORING AT 35.5 FEET.

- D R A F T -

DRILLING LOG	RADIAN CORPORATION	INSTALLATION: CARSWELL AFB, TX	SHEET 1 OF 2 SHEETS

1. PROJECT: CARSWELL AFB, IRP PHASE II STAGE 2
   LOCATION: Site 4
2. DRILLING AGENCY: Atec Associates
3. HOLE NO.: 4G
4. NAME OF GEOLOGIST: Guy J. Childs
5. COORDINATES OF HOLE:
   X: 2020857.61 Y: 397836.73
6. TOTAL DEPTH OF HOLE: 40 ft BGL
7. DATUM FOR ELEVATION SHOWN: sea level
8. MANUFACTURER'S DESIGNATION OF DRILL: Mobile Drill B-61
9. NO. OF SAMPLES TAKEN: 9
10. ELEVATION GROUND WATER: 593.38 ft MSL (2/29/88)
11. DATE HOLE ESTABLISHED: 2/2/88
12. ELEVATION TOP OF HOLE: 619.10 ft MSL

Depth (Ft.)	Graphic Log	Sample ID	Soil Class/Code	Visual Description
0		4G-1	S/CLLR	CLAY: DARK BROWN, SOME SILT, MODERATE PLASTICITY, MOIST.
2		4G-2	S/CLLR	CLAY: MEDIUM TO LIGHT BROWN.
4		4G-3	S/SLLR	SILT: LIGHT BROWN, SOME COARSE GRAINED SAND AND GRAVEL, CRUMBLY.
9		4G-4	S/SDLR	SAND: LIGHT ORANGE/BROWN, MEDIUM TO FINE GRAINED, OCCASIONAL PEBBLES.
14		4G-5	S/SDSM	SAND: LIGHT TAN, FINE TO VERY FINE GRAINED, SOME SILT, TRACE ORANGE MOTTLING.
19		4G-6	S/SAND	SAND: LIGHT TAN, MEDIUM TO COARSE GRAINED, TRACE RUST STREAKS.

- D R A F T -

DRILLING LOG	RADIAN CORPORATION	INSTALLATION: CARSWELL AFB, TX	SHEET 2 OF 2 SHEETS

1. PROJECT: CARSWELL AFB, IRP PHASE II STAGE 2	7. TOTAL DEPTH OF HOLE: 40 ft BGL
	8. DATUM FOR ELEVATION SHOWN: sea level
2. LOCATION: Site 4	9. MANUFACTURER'S DESIGNATION OF DRILL: Mobile Drill B-61
3. DRILLING AGENCY: Atec Associates	10. NO. OF SAMPLES TAKEN: 9
4. HOLE NO.: 4G	11. ELEVATION GROUND WATER: 593.38 ft MSL (2/29/88)
5. NAME OF GEOLOGIST: Guy J. Childs	12. DATE HOLE ESTABLISHED: 2/2/88
6. COORDINATES OF HOLE: X: 2020857.61 Y: 397836.73	13. ELEVATION TOP OF HOLE: 619.10 ft MSL

Depth (Ft.)	Graphic Log	Sample ID	Soil Class/Code	Visual Description
24		4G-7	S/SAND	SAND: LIGHT TAN, MEDIUM TO COARSE GRAINED, TRACE RUST STREAKS. WATER AT 25 FEET.
27		4G-8	S/GRSM	GRAVELS: MEDIUM TO LARGE COBBLES, DOMINANTLY ROUNDED, BROKEN SHELL FRAGMENTS, COARSE TO MEDIUM GRAINED SAND.
34		4G-9	S/GRSM	INCREASING GRAVELS.
39.5			R/LMSN	LIMESTONE: GRAY, HARD. REFUSAL AND END OF BORING AT 40 FEET.

- D R A F T -

DRILLING LOG	RADIAN CORPORATION	INSTALLATION: CARSWELL AFB, TX	SHEET 1 OF 2 SHEETS

1. PROJECT: CARSWELL AFB, IRP PHASE II STAGE 2
   LOCATION: Site 4
2. DRILLING AGENCY: Atec Associates
4. HOLE NO.: 4H
5. NAME OF GEOLOGIST: Guy J. Childs
6. COORDINATES OF HOLE:
   X: 2020916.84 Y: 397541.43
7. TOTAL DEPTH OF HOLE: 29 ft BGL
8. DATUM FOR ELEVATION SHOWN: sea level
9. MANUFACTURER'S DESIGNATION OF DRILL: Mobile Drill B-61
10. NO. OF SAMPLES TAKEN: 5
11. ELEVATION GROUND WATER: 593.30 ft MSL (2/29/88)
12. DATE HOLE ESTABLISHED: 2/10/88
13. ELEVATION TOP OF HOLE: 610.50 ft MSL

Depth (Ft.)	Graphic Log	Sample ID	Soil Class/Code	Visual Description
0		4H-1	S/CLAY	CLAY: DARK BROWN TO REDDISH BROWN, MOIST.
2		4H-2	S/CLLR	CLAY: DARK RED/BROWN, SOME SILT, SOME PEBBLES, DRY.
4		4H-3	S/SDSL	SILTY SAND: RUST BROWN, FINE GRAINED SAND.
6			S/SAND	SAND: TAN, SOME ORANGE/BROWN MOTTLING, FINE TO MEDIUM GRAINED.
9		4H-4	S/SAND	SAND: LIGHT TAN, FINE TO MEDIUM GRAINED, BECOMING MOIST.
14		4H-5	S/SDSM	SAND: LIGHT TAN TO RUST BROWN, FINE TO MEDIUM GRAINED, VERY THIN SILT INTERBEDS. WATER AT 16 FEET.

- D R A F T -

DRILLING LOG | RADIAN CORPORATION	INSTALLATION: CARSWELL AFB, TX | SHEET 2 OF 2 SHEETS
1. PROJECT: CARSWELL AFB, IRP PHASE II STAGE 2	7. TOTAL DEPTH OF HOLE: 29 ft BGL
	8. DATUM FOR ELEVATION SHOWN: sea level
2. LOCATION: Site 4	9. MANUFACTURER'S DESIGNATION OF DRILL: Mobile Drill B-61
3. DRILLING AGENCY: Atec Associates	10. NO. OF SAMPLES TAKEN: 5
4. HOLE NO.: 4H	11. ELEVATION GROUND WATER: 593.30 ft MSL (2/29/88)
5. NAME OF GEOLOGIST: Guy J. Childs	12. DATE HOLE ESTABLISHED: 2/10/88
6. COORDINATES OF HOLE: X: 2020916.84 Y: 397541.43	13. ELEVATION TOP OF HOLE: 610.50 ft MSL

Depth (Ft.)	Graphic Log	Sample ID	Soil Class/Code	Visual Description
27			R/LMSN	LIMESTONE: HARD LAYER AT 27 FEET, PROBABLY LIMESTONE.
29			R/LMSN	END OF BORING AT 29 FEET.

- D R A F T -

DRILLING LOG	RADIAN CORPORATION	INSTALLATION: CARSWELL AFB, TX	SHEET 1 OF 2 SHEETS

1. PROJECT: CARSWELL AFB, IRP PHASE II STAGE 2
LOCATION: Site 5
3. DRILLING AGENCY: Atec Associates
4. HOLE NO.: 5D
5. NAME OF GEOLOGIST: Guy J. Childs
6. COORDINATES OF HOLE:
X: 2019960.19 Y: 398362.32
7. TOTAL DEPTH OF HOLE: 24 ft BGL
8. DATUM FOR ELEVATION SHOWN: sea level
9. MANUFACTURER'S DESIGNATION OF DRILL: Mobile Drill B-61
10. NO. OF SAMPLES TAKEN: 6
11. ELEVATION GROUND WATER: 597.06 ft MSL (3/2/88)
12. DATE HOLE ESTABLISHED: 1/30/88
13. ELEVATION TOP OF HOLE: 608.50 ft MSL

Depth (Ft.)	Graphic Log	Sample ID	Soil Class/Code	Visual Description
0		5D-1	S/CLLR	CLAY: MEDIUM TO LIGHT BROWN, SOME SILT, ABUNDANT FINE TO COARSE GRAINED SAND, SOME GRAVEL, ORGANICS.
2		5D-2	S/CLLR	SAME AS ABOVE
4		5D-3	S/SDSL	SILTY SAND: RUST BROWN, FINE GRAINED SAND, INCREASING MOISTURE.
9		5D-4	S/SAND	SAND: LIGHT TO MEDIUM BROWN, FINE TO MEDIUM GRAINED, VERY MOIST. WATER AT 12.9 FEET.
14		5D-5	S/SAND	SAND: TAN, MEDIUM TO FINE GRAINED.
19		5D-6	S/SDFN	SAND: LIGHT TAN, FINE GRAINED, SOME MEDIUM GRAINED, SOME SILT.

- D R A F T -

DRILLING LOG | RADIAN CORPORATION	INSTALLATION: CARSWELL AFB, TX | SHEET 2 OF 2 SHEETS
1. PROJECT: CARSWELL AFB, IRP PHASE II STAGE 2	7. TOTAL DEPTH OF HOLE: 24 ft BGL
	8. DATUM FOR ELEVATION SHOWN: sea level
2. LOCATION: Site 5	9. MANUFACTURER'S DESIGNATION OF DRILL: Mobile Drill B-61
3. DRILLING AGENCY: Atec Associates	10. NO. OF SAMPLES TAKEN: 6
4. HOLE NO.: 5D	11. ELEVATION GROUND WATER: 597.06 ft MSL (3/2/88)
5. NAME OF GEOLOGIST: Guy J. Childs	12. DATE HOLE ESTABLISHED: 1/30/88
6. COORDINATES OF HOLE: X: 2019960.19 Y: 398362.32	13. ELEVATION TOP OF HOLE: 608.50 ft MSL

Depth (Ft.)	Graphic Log	Sample ID	Soil Class/Code	Visual Description
24			S/GRVL	GRAVEL: LIMESTONE COBBLES. REFUSAL AND END OF BORING AT 24 FEET.

- D R A F T -

DRILLING LOG | RADIAN CORPORATION	INSTALLATION: CARSWELL AFB, TX | SHEET 1 OF 2 SHEETS
1. PROJECT: CARSWELL AFB, IRP PHASE II STAGE 2	7. TOTAL DEPTH OF HOLE: 40 ft BGL
LOCATION: Site 5	8. DATUM FOR ELEVATION SHOWN: sea level
3. DRILLING AGENCY: Atec Associates	9. MANUFACTURER'S DESIGNATION OF DRILL: Mobile Drill B-61
4. HOLE NO.: 5E	10. NO. OF SAMPLES TAKEN: 9
5. NAME OF GEOLOGIST: Guy J. Childs	11. ELEVATION GROUND WATER: 596.70 ft MSL (3/2/88)
6. COORDINATES OF HOLE: X: 2019748.19 Y: 397802.46	12. DATE HOLE ESTABLISHED: 2/1/88
	13. ELEVATION TOP OF HOLE: 623.90 ft MSL

Depth (Ft.)	Graphic Log	Sample ID	Soil Class/Code	Visual Description
0		5E-1	S/CLLR	CLAY: DARK TO MEDIUM BROWN, MINOR SILT, SOME PEBBLES.
2		5E-2	S/CLLR	CLAY: MEDIUM BROWN, INCREASING SILT CONTENT.
4		5E-3	S/CLLR	SILTY CLAY: MEDIUM TO LIGHT BROWN, COMMON CALCAREOUS STREAKS, VARIABLE AMOUNTS OF SAND, LOW PLASTICITY.
9		5E-4	S/SLLR	SANDY SILT: TAN, VERY FINE GRAINED, TRACE SILTY CLAY INTERBEDS.
14		5E-5	S/SDFN	SAND: LIGHT TAN, VERY FINE TO FINE GRAINED, SOME SILT.
19		5E-6	S/SDFN	SAND: LIGHT TAN, ORANGE MOTTLING, FINE TO VERY FINE GRAINED, SOME SILT, MOIST.

- D R A F T -

DRILLING LOG	RADIAN CORPORATION	INSTALLATION: CARSWELL AFB, TX	SHEET 2 OF 2 SHEETS
1. PROJECT: CARSWELL AFB, IRP PHASE II STAGE 2		7. TOTAL DEPTH OF HOLE: 40 ft BGL	
		8. DATUM FOR ELEVATION SHOWN: sea level	
2. LOCATION: Site 5		9. MANUFACTURER'S DESIGNATION OF DRILL: Mobile Drill B-61	
3. DRILLING AGENCY: Atec Associates		10. NO. OF SAMPLES TAKEN: 9	
4. HOLE NO.: 5E		11. ELEVATION GROUND WATER: 596.70 ft MSL (3/2/88)	
5. NAME OF GEOLOGIST: Guy J. Childs		12. DATE HOLE ESTABLISHED: 2/1/88	
6. COORDINATES OF HOLE: X: 2019748.19 Y: 397802.46		13. ELEVATION TOP OF HOLE: 623.90 ft MSL	

Depth (Ft.)	Graphic Log	Sample ID	Soil Class/Code	Visual Description
24		5E-7	S/SAND	SAND: LIGHT TAN, FINE TO MEDIUM GRAINED, TRACE COARSE GRAINED, WET. WATER AT 27 FEET.
29		5E-8	S/SAND	SAME AS ABOVE
33		5E-9	S/SDGR	SAND AND GRAVEL: SAND WITH GRAVEL LAYERS, MEDIUM TO FINE SIZE GRAVEL, MEDIUM TO FINE GRAINED SAND, SOME BROKEN SHELL FRAGMENTS.
40			S/SDGR	END OF BORING AT 40 FEET.

- D R A F T -

DRILLING LOG	RADIAN CORPORATION	INSTALLATION: CARSWELL AFB, TX	SHEET 1 OF 2 SHEETS

1. PROJECT: CARSWELL AFB, IRP PHASE II STAGE 2	7. TOTAL DEPTH OF HOLE: 37 ft BGL
2. LOCATION: Site 5	8. DATUM FOR ELEVATION SHOWN: sea level
3. DRILLING AGENCY: Atec Associates	9. MANUFACTURER'S DESIGNATION OF DRILL: Mobile Drill B-61
4. HOLE NO.: 5F	10. NO. OF SAMPLES TAKEN: 7
5. NAME OF GEOLOGIST: Guy J. Childs	11. ELEVATION GROUND WATER: 593.97 ft MSL (3/4/88)
6. COORDINATES OF HOLE: X: 2020535.56 Y: 397904.64	12. DATE HOLE ESTABLISHED: 2/9/88
	13. ELEVATION TOP OF HOLE: 619.45 ft MSL

Depth (Ft.)	Graphic Log	Sample ID	Soil Class/Code	Visual Description
0		5F-1	S/CLLR	CLAY: DARK BROWN, SOME SILT, MOIST, ORGANICS.
2		5F-2	S/CLLR	CLAY: DARK REDDISH/BROWN, INCREASING SILT, LOW PLASTICITY.
4		5F-3	S/SLLR	SANDY SILT: ORANGE BROWN GOING TO LIGHT BROWN WITH DEPTH, MEDIUM TO FINE GRAINED SAND, OCCASIONAL COARSE GRAINED SAND.
9		5F-4	S/SLLR	GRAVELLY SILT: TAN, COMMON LIMESTONE COBBLES, DRY, CRUMBLY.
14		5F-5	S/SAND	SAND: TAN TO RUST, FINE TO MEDIUM GRAINED, MOIST.
19		5F-6	S/SAND	SAND: RUST BROWN TO TAN, FINE TO MEDIUM GRAINED. WATER AT 24 FEET.

- D R A F T -

DRILLING LOG	RADIAN CORPORATION	INSTALLATION: CARSWELL AFB, TX	SHEET 2 OF 2 SHEETS

1. PROJECT: CARSWELL AFB, IRP PHASE II STAGE 2	7. TOTAL DEPTH OF HOLE: 37 ft BGL
	8. DATUM FOR ELEVATION SHOWN: sea level
2. LOCATION: Site 5	9. MANUFACTURER'S DESIGNATION OF DRILL: Mobile Drill B-61
3. DRILLING AGENCY: Atec Associates	10. NO. OF SAMPLES TAKEN: 7
4. HOLE NO.: 5F	11. ELEVATION GROUND WATER: 593.97 ft MSL (3/4/88)
5. NAME OF GEOLOGIST: Guy J. Childs	12. DATE HOLE ESTABLISHED: 2/9/88
6. COORDINATES OF HOLE: X: 2020535.56 Y: 397904.64	13. ELEVATION TOP OF HOLE: 619.45 ft MSL

Depth (Ft.)	Graphic Log	Sample ID	Soil Class/Code	Visual Description
29		5F-7	S/SAND	SAND: LIGHT TAN, FINE TO MEDIUM GRAINED.
37			S/SAND	END OF BORING AT 37 FEET.

- D R A F T -

DRILLING LOG	RADIAN CORPORATION	INSTALLATION: CARSWELL AFB, TX	SHEET 1 OF 2 SHEETS
1. PROJECT: CARSWELL AFB, IRP PHASE II STAGE 2		7. TOTAL DEPTH OF HOLE: 29 ft BGL	
		8. DATUM FOR ELEVATION SHOWN: sea level	
LOCATION: Site 5		9. MANUFACTURER'S DESIGNATION OF DRILL: Mobile Drill B-61	
3. DRILLING AGENCY: Atec Associates		10. NO. OF SAMPLES TAKEN: 5	
4. HOLE NO.: 5G		11. ELEVATION GROUND WATER: 590.31 ft MSL (2/29/88)	
5. NAME OF GEOLOGIST: Guy J. Childs		12. DATE HOLE ESTABLISHED: 2/8/88	
6. COORDINATES OF HOLE: X: 2020894.69 Y: 398174.57		13. ELEVATION TOP OF HOLE: 612.00 ft MSL	

Depth (Ft.)	Graphic Log	Sample ID	Soil Class/Code	Visual Description
0		5G-1	S/CLLR	CLAY: DARK BROWN TO REDDISH BROWN, SOME SILT, MOIST.
2		5G-2	S/CLLR	CLAY: DARK REDDISH TO REDDISH BROWN, INCREASING SILT, COMMON LIMESTONE FRAGMENTS, DRY.
4		5G-3	S/SLLR	GRAVELLY SILT: MEDIUM TO LIGHT BROWN, COMMON LIMESTONE FRAGMENTS. INCREASED GRAVEL AT 7 FEET.
		5G-4	S/SDLR	SAND: ORANGE/BROWN, FINE TO MEDIUM GRAINED, SOME SILT AND GRAVEL, DRY.
14		5G-5	S/SAND	SAND: LIGHT TAN, FINE TO MEDIUM GRAINED, MOIST. WATER AT 16 FEET.
9			S/SAND	SAND: LIGHT TAN, FINE TO MEDIUM GRAINED.

- D R A F T -

DRILLING LOG	RADIAN CORPORATION	INSTALLATION: CARSWELL AFB, TX	SHEET 2 OF 2 SHEETS
1. PROJECT: CARSWELL AFB, IRP PHASE II STAGE 2		7. TOTAL DEPTH OF HOLE: 29 ft BGL	
		8. DATUM FOR ELEVATION SHOWN: sea level	
2. LOCATION: Site 5		9. MANUFACTURER'S DESIGNATION OF DRILL: Mobile Drill B-61	
3. DRILLING AGENCY: Atec Associates		10. NO. OF SAMPLES TAKEN: 5	
4. HOLE NO.: 5G		11. ELEVATION GROUND WATER: 590.31 ft MSL (2/29/88)	
5. NAME OF GEOLOGIST: Guy J. Childs		12. DATE HOLE ESTABLISHED: 2/8/88	
6. COORDINATES OF HOLE: X: 2020894.69 Y: 398174.57		13. ELEVATION TOP OF HOLE: 612.00 ft MSL	

Depth (Ft.)	Graphic Log	Sample ID	Soil Class/Code	Visual Description
29			R/NDPS	REFUSAL AND END OF BORING AT 29 FEET.

- D R A F T -

DRILLING LOG	RADIAN CORPORATION	INSTALLATION: CARSWELL AFB, TX	SHEET 1 OF 2 SHEETS

1. PROJECT: CARSWELL AFB, IRP PHASE II STAGE 2
   LOCATION: Site 5
2. DRILLING AGENCY: Atec Associates
3. HOLE NO.: 5H
4. NAME OF GEOLOGIST: Guy J. Childs
5. COORDINATES OF HOLE:
   X: 2020546.91 Y: 398351.69
6. TOTAL DEPTH OF HOLE: 26 ft BGL
7. DATUM FOR ELEVATION SHOWN: sea level
8. MANUFACTURER'S DESIGNATION OF DRILL: Mobile Drill B-61
9. NO. OF SAMPLES TAKEN: 6
10. ELEVATION GROUND WATER: 591.94 ft MSL (2/29/88)
11. DATE HOLE ESTABLISHED: 2/9/88
12. ELEVATION TOP OF HOLE: 608.40 ft MSL

Depth (Ft.)	Graphic Log	Sample ID	Soil Class/Code	Visual Description
0		5H-1	S/CLLR	CLAY: DARK BROWN, SOME SILT, COMMON ORGANICS, MOIST.
2		5H-2	S/CLLR	CLAY: DARK BROWN, SOME GRAVEL, INCREASING SILT, HARD.
4		5H-3	S/SLLR	SILT: MEDIUM TO LIGHT BROWN, ABUNDANT LIMESTONE FRAGMENTS, PEBBLES, OCCASIONAL CALCITE STREAKS, CRUMBLY, DRY.
9		5H-4	S/SLLR	SANDY SILT: LIGHT BROWN/TAN, FINE GRAINED SAND, SOME MEDIUM AND COARSE GRAINED.
14		5H-5	S/SAND	SAND: LIGHT TAN, FINE TO MEDIUM GRAINED, WET. WATER AT 15 FEET.
19		5H-6	S/SAND	SAME AS ABOVE

- D R A F T -

DRILLING LOG	RADIAN CORPORATION	INSTALLATION: CARSWELL AFB, TX	SHEET 2 OF 2 SHEETS
1. PROJECT: CARSWELL AFB, IRP PHASE II STAGE 2		7. TOTAL DEPTH OF HOLE: 26 ft BGL	
		8. DATUM FOR ELEVATION SHOWN: sea level	
2. LOCATION: Site 5		9. MANUFACTURER'S DESIGNATION OF DRILL: Mobile Drill B-61	
3. DRILLING AGENCY: Atec Associates		10. NO. OF SAMPLES TAKEN: 6	
4. HOLE NO.: 5H		11. ELEVATION GROUND WATER: 591.94 ft MSL (2/29/88)	
5. NAME OF GEOLOGIST: Guy J. Childs		12. DATE HOLE ESTABLISHED: 2/9/88	
6. COORDINATES OF HOLE: X: 2020546.91 Y: 398351.69		13. ELEVATION TOP OF HOLE: 608.40 ft MSL	

Depth (Ft.)	Graphic Log	Sample ID	Soil Class/Code	Visual Description
25			R/LMSN	BEDROCK AT 25 FEET, PROBABLY LIMESTONE.
25.6			R/LMSN	REFUSAL AND END OF BORING AT 25.6 FEET.

- D R A F T -

DRILLING LOG	RADIAN CORPORATION	INSTALLATION: CARSWELL AFB, TX	SHEET 1 OF 2 SHEETS

1. PROJECT: CARSWELL AFB, IRP PHASE II STAGE 2
LOCATION: Site 10
3. DRILLING AGENCY: Atec Associates
4. HOLE NO.: 10D
5. NAME OF GEOLOGIST: Guy J. Childs
6. COORDINATES OF HOLE:
X: 2020078.59 Y: 397857.53
7. TOTAL DEPTH OF HOLE: 29 ft BGL
8. DATUM FOR ELEVATION SHOWN: sea level
9. MANUFACTURER'S DESIGNATION OF DRILL: Mobile Drill B-61
10. NO. OF SAMPLES TAKEN: 7
11. ELEVATION GROUND WATER:
12. DATE HOLE ESTABLISHED: 1/28/88
13. ELEVATION TOP OF HOLE: 623.33 ft MSL

Depth (Ft.)	Graphic Log	Sample ID	Soil Class/Code	Visual Description
0		10D-1	S/CLLR	CLAY: DARK BROWN, SOME SILT, MODERATE PLASTICITY, COMMON ORGANICS
2		10D-2	S/SLLR	SILT: LIGHT BROWN, TRACE FINE GRAIN SAND, CALCAREOUS STREAKS, FEW CALCAREOUS NODULES, CRUMBLY, DRY.
4		10D-3	S/SLLR	INCREASE SAND FROM 10D-2: SILT: LIGHT BROWN, TRACE FINE GRAIN SAND, CALCAROUS STREAKS, FEW CALCAREOUS NODULES, CRUMBLY, DRY.
9		10D-4	S/SLLR	SILT: MEDIUM BROWN, TRACE LIMESTONE FRAGMENTS, CALCAREOUS STREAKS.
14		10D-5	S/SAND	SAND: ORANGE BROWN, FINE TO MEDIUM GRAIN, DRY.
17			S/SILT	SILT: TAN, COMMON WHITE CALCAREOUS MOTTLING.
19		10D-6	S/SDFN	SAND: TAN, FINE TO VERY FINE GRAINED.

- D R A F T -

DRILLING LOG	RADIAN CORPORATION	INSTALLATION: CARSWELL AFB, TX	SHEET 2 OF 2 SHEETS
1. PROJECT: CARSWELL AFB, IRP PHASE II STAGE 2		7. TOTAL DEPTH OF HOLE: 29 ft BGL	
		8. DATUM FOR ELEVATION SHOWN: sea level	
2. LOCATION: Site 10		9. MANUFACTURER'S DESIGNATION OF DRILL: Mobile Drill B-61	
3. DRILLING AGENCY: Atec Associates		10. NO. OF SAMPLES TAKEN: 7	
4. HOLE NO.: 10D		11. ELEVATION GROUND WATER:	
5. NAME OF GEOLOGIST: Guy J. Childs		12. DATE HOLE ESTABLISHED: 1/28/88	
6. COORDINATES OF HOLE: X: 2020078.59 Y: 397857.53		13. ELEVATION TOP OF HOLE: 623.33 ft MSL	

Depth (Ft.)	Graphic Log	Sample ID	Soil Class/Code	Visual Description
24		10D-7	S/SAND	SAND: TAN, FINE TO MEDIUM GRAINED. WATER AT 27 FEET.
29			S/SAND	END OF BORING AT 29 FEET.

- D R A F T -

DRILLING LOG	RADIAN CORPORATION	INSTALLATION: CARSWELL AFB, TX	SHEET 1 OF 2 SHEETS

1. PROJECT: CARSWELL AFB, IRP PHASE II STAGE 2
LOCATION: Site 10
3. DRILLING AGENCY: Atec Associates
4. HOLE NO.: 10E
5. NAME OF GEOLOGIST: Guy J. Childs
6. COORDINATES OF HOLE:
X: 2020147.65 Y: 397896.37
7. TOTAL DEPTH OF HOLE: 29 ft BGL
8. DATUM FOR ELEVATION SHOWN: sea level
9. MANUFACTURER'S DESIGNATION OF DRILL: Mobile Drill B-61
10. NO. OF SAMPLES TAKEN: 7
11. ELEVATION GROUND WATER:
12. DATE HOLE ESTABLISHED: 1/29/88
13. ELEVATION TOP OF HOLE: 622.52 ft MSL

Depth (Ft.)	Graphic Log	Sample ID	Soil Class/Code	Visual Description
0		10E-1	S/CLLR	CLAY: DARK BROWN, MOIST, MINOR SILT.
2		10E-2	S/CLLR	CLAY: DARK REDDISH BROWN GRADES TO MEDIUM DARK BROWN.
4		10E-3	S/SLLR	SANDY SILT: MEDIUM TO LIGHT BROWN, TRACE GRAVEL, SOME CLAY, DRY.
9		10E-4	S/SLLR	SANDY SILT: MEDIUM BROWN, INCREASING GRAVEL.
12		10E-5	S/SAND	SAND: MEDIUM BROWN TO TAN, MEDIUM TO FINE GRAINED.
19		10E-6	S/SAND	SAND: TAN, MEDIUM TO COARSE GRAINED, TRACE BROKEN SHELL FRAGMENTS.

- D R A F T -

DRILLING LOG	RADIAN CORPORATION	INSTALLATION: CARSWELL AFB, TX	SHEET 2 OF 2 SHEETS
1. PROJECT: CARSWELL AFB, IRP PHASE II STAGE 2		7. TOTAL DEPTH OF HOLE: 29 ft BGL	
		8. DATUM FOR ELEVATION SHOWN: sea level	
2. LOCATION: Site 10		9. MANUFACTURER'S DESIGNATION OF DRILL: Mobile Drill B-61	
3. DRILLING AGENCY: Atec Associates		10. NO. OF SAMPLES TAKEN: 7	
4. HOLE NO.: 10E		11. ELEVATION GROUND WATER:	
5. NAME OF GEOLOGIST: Guy J. Childs		12. DATE HOLE ESTABLISHED: 1/29/88	
6. COORDINATES OF HOLE: X: 2020147.65 Y: 397896.37		13. ELEVATION TOP OF HOLE: 622.52 ft MSL	

Depth (Ft.)	Graphic Log	Sample ID	Soil Class/Code	Visual Description
24		10E-7	S/SDSM	SAND: TAN, MEDIUM TO FINE GRAINED, TRACE THIN LAYERS OF CLAYEY SILT. WATER AT 27 FEET.
29			S/SDSM	END OF BORING AT 29 FEET.

- D R A F T -

DRILLING LOG	RADIAN CORPORATION	INSTALLATION: CARSWELL AFB, TX	SHEET 1 OF 2 SHEETS

1. PROJECT: CARSWELL AFB, IRP PHASE II STAGE 2
2. LOCATION: Site 10
3. DRILLING AGENCY: Atec Associates
4. HOLE NO.: 10F
5. NAME OF GEOLOGIST: Guy J. Childs
6. COORDINATES OF HOLE: X: 2020196.19 Y: 397946.08
7. TOTAL DEPTH OF HOLE: 29 ft BGL
8. DATUM FOR ELEVATION SHOWN: sea level
9. MANUFACTURER'S DESIGNATION OF DRILL: Mobile Drill B-61
10. NO. OF SAMPLES TAKEN: 7
11. ELEVATION GROUND WATER:
12. DATE HOLE ESTABLISHED: 1/29/88
13. ELEVATION TOP OF HOLE: 621.47 ft MSL

Depth (Ft.)	Graphic Log	Sample ID	Soil Class/Code	Visual Description
0		10F-1	S/CLLR	CLAY: DARK BROWN, SOME SILT, MOIST.
2		10F-2	S/CLLR	CLAY: RED BROWN, SOME LIMESTONE FRAGMENTS, HIGH PLASTICITY.
4		10F-3	S/SLLR	GRAVELLY SILT: LIGHT BROWN, ABUNDANT LIMESTONE COBBLES AND FRAGMENTS.
9		10F-4	S/SAND	SAND: TAN TO BEIGE, FINE TO MEDIUM GRAINED, DRY, SOME SILT.
14		10F-5	S/SAND	INCREASING COARSE GRAINED SAND, INCREASING MOISTURE.
19		10F-6	S/SDFN	SAND: LIGHT TAN, VERY FINE TO FINE GRAINED, TRACE COARSE GRAINED; MOIST.

- D R A F T -

DRILLING LOG	RADIAN CORPORATION	INSTALLATION: CARSWELL AFB, TX	SHEET 2 OF 2 SHEETS

1. PROJECT: CARSWELL AFB, IRP PHASE II STAGE 2	7. TOTAL DEPTH OF HOLE: 29 ft BGL
	8. DATUM FOR ELEVATION SHOWN: sea level
2. LOCATION: Site 10	9. MANUFACTURER'S DESIGNATION OF DRILL: Mobile Drill B-61
3. DRILLING AGENCY: Atec Associates	10. NO. OF SAMPLES TAKEN: 7
4. HOLE NO.: 10F	11. ELEVATION GROUND WATER:
5. NAME OF GEOLOGIST: Guy J. Childs	12. DATE HOLE ESTABLISHED: 1/29/88
6. COORDINATES OF HOLE: X: 2020196.19 Y: 397946.08	13. ELEVATION TOP OF HOLE: 621.47 ft MSL

Depth (Ft.)	Graphic Log	Sample ID	Soil Class/Code	Visual Description
24		10F-7	S/SAND	SAND: TAN, FINE TO MEDIUM GRAINED, WET. WATER AT 27 FEET.
29			S/SAND	END OF BORING AT 29 FEET.

- D R A F T -

DRILLING LOG	RADIAN CORPORATION	INSTALLATION: CARSWELL AFB, TX	SHEET 1 OF 2 SHEETS

1. PROJECT: CARSWELL AFB, IRP PHASE II STAGE 2
2. LOCATION: Site 12
3. DRILLING AGENCY: Atec Associates
4. HOLE NO.: 12D
5. NAME OF GEOLOGIST: Guy J. Childs
6. COORDINATES OF HOLE: X: 2019943.01 Y: 397511.4
7. TOTAL DEPTH OF HOLE: 36 ft BGL
8. DATUM FOR ELEVATION SHOWN: sea level
9. MANUFACTURER'S DESIGNATION OF DRILL: Mobile Drill B-61
10. NO. OF SAMPLES TAKEN: 6
11. ELEVATION GROUND WATER: 595.74 ft MSL (3/3/88)
12. DATE HOLE ESTABLISHED: 2/19/88
13. ELEVATION TOP OF HOLE: 624.80 ft MSL

Depth (Ft.)	Graphic Log	Sample ID	Soil Class/Code	Visual Description
0		12D-1	S/CLLR	CLAY: DARK BROWN GRAY, SOME SILT, TRACE FINE GRAINED SAND, MODERATE PLASTICITY.
5		12D-2	S/CLLR	SILTY CLAY: OLIVE GRAY, INCREASING SAND, TRACE PEBBLES.
10		12D-3	S/CLLR	SANDY CLAY: GRAY TAN, SOME FINE GRAINED SAND.
15		12D-4	S/SAND	SAND: TAN, FINE TO MEDIUM GRAINED, DOMINANTLY FINE GRAINED; DRY, REDDISH BROWN AT 17 FEET.
20		12D-5	S/SAND	SAND: TAN TO LIGHT BROWN, FINE TO MEDIUM GRAINED.

- D R A F T -

DRILLING LOG	RADIAN CORPORATION	INSTALLATION: CARSWELL AFB, TX	SHEET 2 OF 2 SHEETS
1. PROJECT: CARSWELL AFB, IRP PHASE II STAGE 2		7. TOTAL DEPTH OF HOLE: 36 ft BGL	
		8. DATUM FOR ELEVATION SHOWN: sea level	
2. LOCATION: Site 12		9. MANUFACTURER'S DESIGNATION OF DRILL: Mobile Drill B-61	
3. DRILLING AGENCY: Atec Associates		10. NO. OF SAMPLES TAKEN: 6	
4. HOLE NO.: 12D		11. ELEVATION GROUND WATER: 595.74 ft MSL (3/3/88)	
5. NAME OF GEOLOGIST: Guy J. Childs		12. DATE HOLE ESTABLISHED: 2/19/88	
6. COORDINATES OF HOLE: X: 2019943.01 Y: 397511.4		13. ELEVATION TOP OF HOLE: 624.80 ft MSL	

Depth (Ft.)	Graphic Log	Sample ID	Soil Class/Code	Visual Description
25		12D-6	S/SDLR	SAND: LIGHT TAN, FINE TO MEDIUM GRAINED, SOME COARSE, OCCASIONAL GRAVEL AND SHELL FRAGMENTS; MOIST TO WET. WATER AT 28.5 FEET.
36			S/SDLR	END OF BORING AT 36 FEET.

- D R A F T -

DRILLING LOG | RADIAN CORPORATION	INSTALLATION: CARSWELL AFB, TX | SHEET 1 OF 2 SHEETS
1. PROJECT: CARSWELL AFB, IRP PHASE II STAGE 2	7. TOTAL DEPTH OF HOLE: 40 ft BGL
LOCATION: Site 12	8. DATUM FOR ELEVATION SHOWN: sea level
3. DRILLING AGENCY: Atec Associates	9. MANUFACTURER'S DESIGNATION OF DRILL: Mobile Drill B-61
4. HOLE NO.: 12E	10. NO. OF SAMPLES TAKEN: 6
5. NAME OF GEOLOGIST: Guy J. Childs	11. ELEVATION GROUND WATER: 595.16 ft MSL (3/3/88)
6. COORDINATES OF HOLE: X: 2020019.35 Y: 397324.25	12. DATE HOLE ESTABLISHED: 2/23/88
	13. ELEVATION TOP OF HOLE: 624.50 ft MSL

Depth (Ft.)	Graphic Log	Sample ID	Soil Class/Code	Visual Description
0		12E-1	S/CLLR	CLAY: BROWN TO GRAY, SOME SILT, TRACE FINE GRAINED SAND; INCREASED SILT WITH DEPTH, MODERATE PLASTICITY.
4		12E-2	S/CLLR	SAME AS ABOVE
6			S/CLLR	GRAVELLY CLAY: TAN, COMMON LIMESTONE PEBBLES, SOME WHITE CALCAREOUS STREAKS.
9		12E-3	S/SLSM	CLAYEY SILT: LIGHT BROWN, DRY.
14		12E-4	S/SDFN	SAND: RUST BROWN/TAN, FINE TO VERY FINE GRAINED.
19		12E-5	S/SAND	SAND: TAN, MEDIUM TO FINE GRAINED.

- D R A F T -

DRILLING LOG	RADIAN CORPORATION	INSTALLATION: CARSWELL AFB, TX	SHEET 2 OF 2 SHEETS
1. PROJECT: CARSWELL AFB, IRP PHASE II STAGE 2		7. TOTAL DEPTH OF HOLE: 40 ft BGL	
		8. DATUM FOR ELEVATION SHOWN: sea level	
2. LOCATION: Site 12		9. MANUFACTURER'S DESIGNATION OF DRILL: Mobile Drill B-61	
3. DRILLING AGENCY: Atec Associates		10. NO. OF SAMPLES TAKEN: 6	
4. HOLE NO.: 12E		11. ELEVATION GROUND WATER: 595.16 ft MSL (3/3/88)	
5. NAME OF GEOLOGIST: Guy J. Childs		12. DATE HOLE ESTABLISHED: 2/23/88	
6. COORDINATES OF HOLE: X: 2020019.35 Y: 397324.25		13. ELEVATION TOP OF HOLE: 624.50 ft MSL	

Depth (Ft.)	Graphic Log	Sample ID	Soil Class/Code	Visual Description
24		12E-6	S/SDLR	SAND: TAN, MEDIUM TO FINE GRAINED, SOME COARSE GRAINED SILT AND CLAY LAYERS; TRACE GRAVEL.
29			S/SDSM	WATER AT 29 FEET, GRAVEL AND SAND, MEDIUM TO COARSE, SUBANGULAR AND SUBROUNDED GRAINS.
40			R/LMSN	REFUSAL AT 40 FEET, PROBABLY LIMESTONE. END OF BORING 40 FEET.

- D R A F T -

DRILLING LOG	RADIAN CORPORATION	INSTALLATION: CARSWELL AFB, TX	SHEET 1 OF 1 SHEETS

1. PROJECT: CARSWELL AFB, IRP PHASE II STAGE 2
2. LOCATION: Site 12
3. DRILLING AGENCY: Atec Associates
4. HOLE NO.: 12G
5. NAME OF GEOLOGIST: Guy J. Childs
6. COORDINATES OF HOLE: X: 2019819.73 Y: 397111.16
7. TOTAL DEPTH OF HOLE: 17 ft BGL
8. DATUM FOR ELEVATION SHOWN: sea level
9. MANUFACTURER'S DESIGNATION OF DRILL: Mobile Drill B-61
10. NO. OF SAMPLES TAKEN: 4
11. ELEVATION GROUND WATER:
12. DATE HOLE ESTABLISHED: 2/20/88
13. ELEVATION TOP OF HOLE: 629.22 ft MSL

Depth (Ft.)	Graphic Log	Sample ID	Soil Class/Code	Visual Description
0		12G-1	S/CLLR	CLAY: DARK BROWN GRAY, SOME SILT, TRACE FINE GRAINED SAND; INCREASING GRAVEL WITH DEPTH.
4		12G-2	S/CLLR	SILTY CLAY: TAN, VARIABLE FINE GRAINED SAND, OCCASIONAL WHITE CALCAREOUS STREAKS.
9		12G-3	S/CLLR	SANDY CLAY: TAN, SOME GRAY MOTTLING AND FINE GRAINED SAND.
14		12G-4	S/CLLR	SANDY CLAY: TAN, GRADING TO SANDY SILT; OCCASIONAL GRAVEL.
17			S/GRVL	GRAVEL LAYER AT 17 FEET. REFUSAL AND END OF BORING AT 17 FEET.

- D R A F T -

DRILLING LOG	RADIAN CORPORATION	INSTALLATION: CARSWELL AFB, TX	SHEET 1 OF 2 SHEETS
1. PROJECT: CARSWELL AFB, IRP PHASE II STAGE 2		7. TOTAL DEPTH OF HOLE: 25 ft BGL	
		8. DATUM FOR ELEVATION SHOWN: sea level	
2. LOCATION: Site 12		9. MANUFACTURER'S DESIGNATION OF DRILL: Mobile Drill B-61	
3. DRILLING AGENCY: Atec Associates		10. NO. OF SAMPLES TAKEN: 5	
4. HOLE NO.: 12H		11. ELEVATION GROUND WATER:	
5. NAME OF GEOLOGIST: Guy J. Childs		12. DATE HOLE ESTABLISHED: 2/23/88	
6. COORDINATES OF HOLE: X: 2019813.89 Y: 397175.34		13. ELEVATION TOP OF HOLE: 629.06 ft MSL	

Depth (Ft.)	Graphic Log	Sample ID	Soil Class/Code	Visual Description
0		12H-1	S/SLLR	GRAVELLY SILT: DARK BROWN TO ASH GRAY; AT 1 FOOT BECOMING CLAYEY SILT WITH A STRONG HYDROCARBON ODOR.
4		12H-2	S/CLLR	SILTY CLAY: MEDIUM BROWN, VARIABLE AMOUNTS OF FINE GRAINED SAND, SOME FINE GRAVEL.
9		12H-3	S/CLLR	SILTY CLAY: TAN - RUST BROWN, SOME GRAY MOTTLING.
14		12H-4	S/CLLR	SANDY CLAY: LIGHT ORANGE BROWN TO GRAY, VERY FINE TO FINE GRAINED INTERBEDDED GRAY SAND, MODERATE TO LOW PLASTICITY.
19		12H-5	S/SDFN	SAND: TAN, FINE GRAINED, TRACES REDDISH BROWN CLAY STREAKS, MOIST.

- D R A F T -

DRILLING LOG	RADIAN CORPORATION	INSTALLATION: CARSWELL AFB, TX	SHEET 2 OF 2 SHEETS

1. PROJECT: CARSWELL AFB, IRP PHASE II STAGE 2
   LOCATION: Site 12
3. DRILLING AGENCY: Atec Associates
4. HOLE NO.: 12H
5. NAME OF GEOLOGIST: Guy J. Childs
6. COORDINATES OF HOLE: X: 2019813.89 Y: 397175.34
7. TOTAL DEPTH OF HOLE: 25 ft BGL
8. DATUM FOR ELEVATION SHOWN: sea level
9. MANUFACTURER'S DESIGNATION OF DRILL: Mobile Drill B-61
10. NO. OF SAMPLES TAKEN: 5
11. ELEVATION GROUND WATER:
12. DATE HOLE ESTABLISHED: 2/23/88
13. ELEVATION TOP OF HOLE: 629.06 ft MSL

Depth (Ft.)	Graphic Log	Sample ID	Soil Class/Code	Visual Description
25			R/LMSN	REFUSAL AND END OF BORING AT 25 FEET, PROBABLY LIMESTONE; HYDROCARBON ODOR ENTIRE DEPTH OF BORING.

- D R A F T -

DRILLING LOG | RADIAN CORPORATION	INSTALLATION: CARSWELL AFB, TX | SHEET 1 OF 2 SHEETS
1. PROJECT: CARSWELL AFB, IRP PHASE II STAGE 2	7. TOTAL DEPTH OF HOLE: 25 ft BGL
	8. DATUM FOR ELEVATION SHOWN: sea level
2. LOCATION: Site 12	9. MANUFACTURER'S DESIGNATION OF DRILL: Mobile Drill B-61
3. DRILLING AGENCY: Atec Associates	10. NO. OF SAMPLES TAKEN: 5
4. HOLE NO.: 12I	11. ELEVATION GROUND WATER:
5. NAME OF GEOLOGIST: Guy J. Childs	12. DATE HOLE ESTABLISHED: 2/24/88
6. COORDINATES OF HOLE: X: 2019814.97 Y: 397231.2	13. ELEVATION TOP OF HOLE: 269.15 ft MSL

Depth (Ft.)	Graphic Log	Sample ID	Soil Class/Code	Visual Description
0		12I-1	S/SLLR	GRAVELLY SILT: DARK BROWN-GRAY; AT 1 FOOT BECOMING CLAYEY SILT.
4		12I-2	S/CLLR	SILTY CLAY: MEDIUM BROWN, TRACE AMOUNTS OF FINE GRAINED SAND, OCCASIONAL FINE GRAINED GRAVEL.
9		12I-3	S/CLLR	SILTY CLAY: LIGHT BROWN TO REDDISH BROWN, MOTTLED GRAY.
14		12I-4	S/CLLR	SANDY CLAY: ORANGE BROWN TAN TO GRAY, LENSES OF FINE GRAINED SAND.
19		12I-5	S/SDFN	SAND: TAN, FINE GRAINED, SOME RUSTY BROWN SILT.

- D R A F T -

DRILLING LOG	RADIAN CORPORATION	INSTALLATION: CARSWELL AFB, TX	SHEET 2 OF 2 SHEETS

1. PROJECT: CARSWELL AFB, IRP PHASE II STAGE 2
2. LOCATION: Site 12
3. DRILLING AGENCY: Atec Associates
4. HOLE NO.: 12I
5. NAME OF GEOLOGIST: Guy J. Childs
6. COORDINATES OF HOLE: X: 2019814.97 Y: 397231.2
7. TOTAL DEPTH OF HOLE: 25 ft BGL
8. DATUM FOR ELEVATION SHOWN: sea level
9. MANUFACTURER'S DESIGNATION OF DRILL: Mobile Drill B-61
10. NO. OF SAMPLES TAKEN: 5
11. ELEVATION GROUND WATER:
12. DATE HOLE ESTABLISHED: 2/24/88
13. ELEVATION TOP OF HOLE: 269.15 ft MSL

Depth (Ft.)	Graphic Log	Sample ID	Soil Class/Code	Visual Description
24			R/LMSN	LIMESTONE: LIGHT GRAY; HYDROCARBON ODOR FROM 0 TO 22 FEET.
25			R/LMSN	REFUSAL AND END OF BORING AT 25 FEET.

- D R A F T -

DRILLING LOG	RADIAN CORPORATION	INSTALLATION: CARSWELL AFB, TX	SHEET 1 OF 2 SHEETS

1. PROJECT: CARSWELL AFB, IRP PHASE II STAGE 2	7. TOTAL DEPTH OF HOLE: 25 ft BGL
	8. DATUM FOR ELEVATION SHOWN: sea level
2. LOCATION: Site 12	9. MANUFACTURER'S DESIGNATION OF DRILL: Mobile Drill B-61
3. DRILLING AGENCY: Atec Associates	10. NO. OF SAMPLES TAKEN: 5
4. HOLE NO.: 12J	11. ELEVATION GROUND WATER:
5. NAME OF GEOLOGIST: Guy J. Childs	12. DATE HOLE ESTABLISHED: 2/24/88
6. COORDINATES OF HOLE: X: 2019858.53 Y: 397175.26	13. ELEVATION TOP OF HOLE: 628.66 ft MSL

Depth (Ft.)	Graphic Log	Sample ID	Soil Class/Code	Visual Description
0		12J-1	S/SLLR	GRAVELLY SILT: DARK BROWN TO DARK GRAY; AT 1 FOOT BECOMING CLAYEY SILT. MODERATE TO STRONG HYDROCARBON ODOR.
4		12J-2	S/CLLR	SILTY CLAY: MEDIUM BROWN, SOME FINE SAND AND GRAVEL. HYDROCARBON ODOR DECREASES WITH DEPTH.
9		12J-3	S/CLLR	SILTY CLAY: TAN-RUST BROWN, GRAY MOTTLING; AT 11 FEET CLAYEY SILT, TAN TO REDDISH BROWN, ABUNDANT GRAY MOTTLING, SOME BROKEN SHELL FRAGMENTS AND PEA GRAVEL.
14		12J-4	S/CLLR	SANDY CLAY: ORANGE RUST WITH INTERBEDDED GRAY.
19		12J-5	S/SDFN	SAND: TAN, FINE GRAINED, SOME REDDISH-BROWN SILT; SLIGHT HYDROCARBON ODOR.

- D R A F T -

DRILLING LOG	RADIAN CORPORATION	INSTALLATION: CARSWELL AFB, TX	SHEET 2 OF 2 SHEETS

1. PROJECT: CARSWELL AFB, IRP PHASE II STAGE 2
   LOCATION: Site 12
2. DRILLING AGENCY: Atec Associates
4. HOLE NO.: 12J
5. NAME OF GEOLOGIST: Guy J. Childs
6. COORDINATES OF HOLE:
   X: 2019858.53 Y: 397175.26
7. TOTAL DEPTH OF HOLE: 25 ft BGL
8. DATUM FOR ELEVATION SHOWN: sea level
9. MANUFACTURER'S DESIGNATION OF DRILL: Mobile Drill B-61
10. NO. OF SAMPLES TAKEN: 5
11. ELEVATION GROUND WATER:
12. DATE HOLE ESTABLISHED: 2/24/88
13. ELEVATION TOP OF HOLE: 628.66 ft MSL

Depth (Ft.)	Graphic Log	Sample ID	Soil Class/Code	Visual Description
23			R/SHLE	SHALE: GRAY
24			R/LMSN	LIMESTONE: LIGHT GRAY, LAMINATED.
25			R/LMSN	REFUSAL AND END OF BORING AT 25 FEET.

- D R A F T -

DRILLING LOG	RADIAN CORPORATION	INSTALLATION: CARSWELL AFB, TX	SHEET 1 OF 2 SHEETS

1. PROJECT: CARSWELL AFB, IRP PHASE II STAGE 2	7. TOTAL DEPTH OF HOLE: 25 ft BGL
	8. DATUM FOR ELEVATION SHOWN: sea level
2. LOCATION: Site 12	9. MANUFACTURER'S DESIGNATION OF DRILL: Mobile Drill B-61
3. DRILLING AGENCY: Atec Associates	10. NO. OF SAMPLES TAKEN: 5
4. HOLE NO.: 12K	11. ELEVATION GROUND WATER:
5. NAME OF GEOLOGIST: Guy J. Childs	12. DATE HOLE ESTABLISHED: 2/20/88
6. COORDINATES OF HOLE: X: 2019904.66 Y: 397222.63	13. ELEVATION TOP OF HOLE: 626.74 ft MSL

Depth (Ft.)	Graphic Log	Sample ID	Soil Class/Code	Visual Description
0		12K-1	S/CLLR	CLAY: DARK BROWN, SOME SILT, MINOR FINE GRAINED SAND, INCREASING GRAVEL WITH DEPTH, MOIST TO DRY.
5		12K-2	S/CLLR	CLAY: INCREASING GRAVEL, POOR SAMPLE RECOVERY.
10		12K-3	S/SLLR	SILT: LIGHT BROWN, OCCASIONAL LIGHT GRAY MOTTLING, SOME INTERBEDDED FINE GRAINED SAND, TRACE GRAVEL.
15		12K-4	S/SLLR	SANDY SILT: LIGHT BROWN, FINE GRAINED SAND, OCCASIONAL GRAVEL.
20		12K-5	S/SAND	SAND: TAN TO RUST BROWN, FINE TO MEDIUM GRAINED, SOME COARSE GRAINED; LIMESTONE GRAVEL LAYER AT 22 FEET; OCCASIONAL SILT AND CLAY LENSES.

- D R A F T -

DRILLING LOG	RADIAN CORPORATION	INSTALLATION: CARSWELL AFB, TX	SHEET 2 OF 2 SHEETS
1. PROJECT: CARSWELL AFB, IRP PHASE II STAGE 2		7. TOTAL DEPTH OF HOLE: 25 ft BGL	
		8. DATUM FOR ELEVATION SHOWN: sea level	
LOCATION: Site 12		9. MANUFACTURER'S DESIGNATION OF DRILL: Mobile Drill B-61	
3. DRILLING AGENCY: Atec Associates		10. NO. OF SAMPLES TAKEN: 5	
4. HOLE NO.: 12K		11. ELEVATION GROUND WATER:	
5. NAME OF GEOLOGIST: Guy J. Childs		12. DATE HOLE ESTABLISHED: 2/20/88	
6. COORDINATES OF HOLE: X: 2019904.66 Y: 397222.63		13. ELEVATION TOP OF HOLE: 626.74 ft MSL	

Depth (Ft.)	Graphic Log	Sample ID	Soil Class/Code	Visual Description
25			S/SAND	END OF BORING AT 25 FEET.

- D R A F T -

DRILLING LOG	RADIAN CORPORATION	INSTALLATION: CARSWELL AFB, TX	SHEET 1 OF 1 SHEETS
1. PROJECT: CARSWELL AFB, IRP PHASE II STAGE 2		7. TOTAL DEPTH OF HOLE: 1 ft BGL	
		8. DATUM FOR ELEVATION SHOWN: sea level	
2. LOCATION: Site 15		9. MANUFACTURER'S DESIGNATION OF DRILL: Mobile Drill B-61	
3. DRILLING AGENCY: Atec Associates		10. NO. OF SAMPLES TAKEN: 1	
4. HOLE NO.: 15D		11. ELEVATION GROUND WATER:	
5. NAME OF GEOLOGIST: Guy J. Childs		12. DATE HOLE ESTABLISHED: 3/31/88	
6. COORDINATES OF HOLE: X: 2025216.6 Y: 399834.12		13. ELEVATION TOP OF HOLE: 561.08 ft MSL	

Depth (Ft.)	Graphic Log	Sample ID	Soil Class/Code	Visual Description
0			F/ASPH	SURFACE ASPHALT FILL; SILTY GRAVEL.
0.01		15D-1	S/GRSL	DARK BROWN WITH ASPHALT AND LIMESTONE FRAGMENTS
1			/	REFUSAL AT 1 FOOT. END OF BORING AT 1 FOOT.

- D R A F T -

DRILLING LOG	RADIAN CORPORATION	INSTALLATION: CARSWELL AFB, TX	SHEET 1 OF 1 SHEETS

1. PROJECT: CARSWELL AFB, IRP PHASE II STAGE 2	7. TOTAL DEPTH OF HOLE: 4 ft BGL
LOCATION: Site 15	8. DATUM FOR ELEVATION SHOWN: sea level
3. DRILLING AGENCY: Atec Associates	9. MANUFACTURER'S DESIGNATION OF DRILL: Mobile Drill B-61
4. HOLE NO.: 15E	10. NO. OF SAMPLES TAKEN: 2
5. NAME OF GEOLOGIST: Guy J. Childs	11. ELEVATION GROUND WATER:
6. COORDINATES OF HOLE: X: 2025211.35 Y: 399891.44	12. DATE HOLE ESTABLISHED: 3/29/88
	13. ELEVATION TOP OF HOLE: 564.15 ft MSL

Depth (Ft.)	Graphic Log	Sample ID	Soil Class/Code	Visual Description
0			S/GRSL	FILL: DARK BROWN SILTY GRAVEL, SOME ASPHALT AND LIMESTONE FRAGMENTS
1		CAR8-03-045	S/GRSL	
3		15E-1	S/GRSL	@ 3 FEET: SILT: DARK BROWN WITH ROCK FRAGMENTS AND ASPHALT, POOR SAMPLE RECOVERY
4			/	ASPHALT, POOR SAMPLE RECOVERY. REFUSAL AT 4 FEET. END OF BORINT AT 4 FEET.

- D R A F T -

DRILLING LOG | RADIAN CORPORATION	INSTALLATION: CARSWELL AFB, TX | SHEET 1 OF 1 SHEETS
1. PROJECT: CARSWELL AFB, IRP PHASE II STAGE 2	7. TOTAL DEPTH OF HOLE: 4 ft BGL
	8. DATUM FOR ELEVATION SHOWN: sea level
2. LOCATION: Site 15	9. MANUFACTURER'S DESIGNATION OF DRILL: Mobile Drill B-61
3. DRILLING AGENCY: Atec Associates	10. NO. OF SAMPLES TAKEN: 1
4. HOLE NO.: 15F	11. ELEVATION GROUND WATER:
5. NAME OF GEOLOGIST: Guy J. Childs	12. DATE HOLE ESTABLISHED: 3/29/88
6. COORDINATES OF HOLE: X: 2025183.93 Y: 400002.02	13. ELEVATION TOP OF HOLE: 566.40 ft MSL

Depth (Ft.)	Graphic Log	Sample ID	Soil Class/Code	Visual Description
0			S/PTHM	TOPSOIL COVERED WITH GRASS TO 6".
1			S/SLLR	FILL: SILT; DARK BROWN, DARK GRAY, SOME BLACK
2		CAR8-03-046	S/SLLR	CLAYEY: OCCASIONAL WOOD FRAGMENTS; LIMESTONE FRAGMENTS; TRACE METAL SHAVINGS
4			S/SLLR	INCREASE CLAY; NO SAMPLE RETAINED, CAVITY. REFUSAL AT 4 FEET. END OF BORING 4 FEET. AUGERED 2 ADDITIONAL HOES TO A MAXIMUM DEPTH OF 2 FEET.

- D R A F T -

DRILLING LOG	RADIAN CORPORATION	INSTALLATION: CARSWELL AFB, TX	SHEET 1 OF 1 SHEETS

1. PROJECT: CARSWELL AFB, IRP PHASE II STAGE 2
2. LOCATION: Site 15
3. DRILLING AGENCY: Atec Associates
4. HOLE NO.: 15G
5. NAME OF GEOLOGIST: Guy J. Childs
6. COORDINATES OF HOLE: X: 2025213.65 Y: 399856.32
7. TOTAL DEPTH OF HOLE: 2 ft BGL
8. DATUM FOR ELEVATION SHOWN: sea level
9. MANUFACTURER'S DESIGNATION OF DRILL: Mobile Drill B-61
10. NO. OF SAMPLES TAKEN: 1
11. ELEVATION GROUND WATER:
12. DATE HOLE ESTABLISHED: 3/31/88
13. ELEVATION TOP OF HOLE: 563.50 ft MSL

Depth (Ft.)	Graphic Log	Sample ID	Soil Class/Code	Visual Description
0			S/GRSL	FILL: SILTY GRAVEL MEDIUM TO DARK BROWN.
1		15G-1	S/CLLR	SILTY GRAVELLY CLAY: LIGHT BROWN, SOME ORANGE MOTTLING, COMMON SMALL LIMESTONE FRAGMENTS.

- D R A F T -

DRILLING LOG + RADIAN CORPORATION	INSTALLATION: CARSWELL AFB, TX | SHEET 1 OF 1 SHEETS
1. PROJECT: CARSWELL AFB, IRP PHASE II STAGE 2	7. TOTAL DEPTH OF HOLE: 1 ft BGL
	8. DATUM FOR ELEVATION SHOWN: sea level
2. LOCATION: Site 15	9. MANUFACTURER'S DESIGNATION OF DRILL: Mobile Drill B-61
3. DRILLING AGENCY: Atec Associates	10. NO. OF SAMPLES TAKEN: 1
4. HOLE NO.: 15H	11. ELEVATION GROUND WATER:
5. NAME OF GEOLOGIST: Guy J. Childs	12. DATE HOLE ESTABLISHED: 4/1/88
6. COORDINATES OF HOLE: X: 2025192.12 Y: 399921.9	13. ELEVATION TOP OF HOLE: 564.74 ft MSL

Depth (Ft.)	Graphic Log	Sample ID	Soil Class/Code	Visual Description
0			S/GRSL	FILL: SILTY GRAVEL; DARK BROWN ASPHALT AND LIMESTONE FRAGMENTS.
0.01		15H-1	S/GRSL	0-1 FOOT: FILL: SILTY GRAVEL DARK BROWN ASPHALT AND LIMESTONE FRAGMENTS.

- D R A F T -

DRILLING LOG	RADIAN CORPORATION	INSTALLATION: CARSWELL AFB, TX	SHEET 1 OF 1 SHEETS

1. PROJECT: CARSWELL AFB, IRP PHASE II STAGE 2
2. LOCATION: Site 15
3. DRILLING AGENCY: Atec Associates
4. HOLE NO.: 151
5. NAME OF GEOLOGIST: Guy J. Childs
6. COORDINATES OF HOLE: X: 2025212.86 Y: 399949.76
7. TOTAL DEPTH OF HOLE: 2 ft BGL
8. DATUM FOR ELEVATION SHOWN: sea level
9. MANUFACTURER'S DESIGNATION OF DRILL: Mobile Drill B-61
10. NO. OF SAMPLES TAKEN: 1
11. ELEVATION GROUND WATER:
12. DATE HOLE ESTABLISHED: 4/1/88
13. ELEVATION TOP OF HOLE: 564.89 ft MSL

Depth (Ft.)	Graphic Log	Sample ID	Soil Class/Code	Visual Description
0			S/GRSL	FILL: SILT GRAVEL, DARK BROWN. SOME ASPHALT AND LIMESTONE FRAGMENTS.
1		151-1	S/GRSL	0-2 FEET: FILL: SILTY GRAVEL, DARK BROWN SOME ASPHALT AND LIMESTONE FRAGMENTS. REFUSAL AT 2 FEET

- D R A F T -

DRILLING LOG	RADIAN CORPORATION	INSTALLATION: CARSWELL AFB, TX	SHEET 1 OF 1 SHEETS

1. PROJECT: CARSWELL AFB, IRP PHASE II STAGE 2	7. TOTAL DEPTH OF HOLE: 3 ft BGL
	8. DATUM FOR ELEVATION SHOWN: sea level
2. LOCATION: Site 15	9. MANUFACTURER'S DESIGNATION OF DRILL: Mobile Drill B-61
3. DRILLING AGENCY: Atec Associates	10. NO. OF SAMPLES TAKEN: 1
4. HOLE NO.: 15J	11. ELEVATION GROUND WATER:
5. NAME OF GEOLOGIST: Guy J. Childs	12. DATE HOLE ESTABLISHED: 4/1/88
6. COORDINATES OF HOLE: X: 2025212.6 Y: 400023.75	13. ELEVATION TOP OF HOLE: 567.62 ft MSL

Depth (Ft.)	Graphic Log	Sample ID	Soil Class/Code	Visual Description
0			S/PTHM	GRASS COVER UNDERLAIN WITH 6" BROWN SILT; ROCK FRAGMENTS. FILL: SILT, YELLOW BROWN OCCASIONAL LIMESTONE.
0.5			S/SLLR	GRASS COVER UNDERLAIN WITH 6" BROWN SILT; ROCK FRAGMENTS. FILL: SILT, YELLOW BROWN OCCASIONAL LIMESTONE.
1		15J-1	S/SLLR	FRAGMENTS, SOME CLAY
3			/	REFUSAL AT 3 FEET. END OF BORING 3 FEET.

- D R A F T -

DRILLING LOG	RADIAN CORPORATION	INSTALLATION: CARSWELL AFB, TX	SHEET 1 OF 1 SHEETS

1. PROJECT: CARSWELL AFB, IRP PHASE II STAGE 2	7. TOTAL DEPTH OF HOLE: 20 ft BGL
LOCATION: Site 17	8. DATUM FOR ELEVATION SHOWN: sea level
3. DRILLING AGENCY: Atec Associates	9. MANUFACTURER'S DESIGNATION OF DRILL: Mobile Drill B-61
4. HOLE NO.: 17I	10. NO. OF SAMPLES TAKEN: 3
5. NAME OF GEOLOGIST: Guy J. Childs	11. ELEVATION GROUND WATER: 564.96 ft MSL (3/1/88)
6. COORDINATES OF HOLE: X: 2023849.67 Y: 400225.13	12. DATE HOLE ESTABLISHED: 2/15/88
	13. ELEVATION TOP OF HOLE: 575.20 ft MSL

Depth (Ft.)	Graphic Log	Sample ID	Soil Class/Code	Visual Description
0		17I-1	S/CLLR	CLAY: BROWN TO BLACK, SOME SILT, MINOR GRAVEL.
3			S/SLLR	SILT: LIGHT TAN, SOME FINE GRAINED SAND, DRY.
7		17I-2	S/CLLR	SILTY CLAY: GRAY, SOME SAND, TRACE SHELL FRAGMENTS, LOW PLASTICITY, WET; HYDROCARBON ODOR (BENZENE DRAEGER REACTION). WATER AT 9 FEET.
11		17I-3	S/SLLR	SILT: LIGHT TAN GRAY, TRACE SAND AND GRAVEL; HYDROCARBON ODOR (DRAEGER REACTION).
13			S/CLAY	CLAY: OLIVE GRAY, MODERATE PLASTICITY, SOME BROWN STREAKS, DECREASING HYDROCARBON ODOR.
15			S/SDLR	SAND: GRAY TO BROWN, FINE GRAINED, WET, TRACE LIMESTONE FRAGMENTS.
20			R/LMSN	REFUSAL AT 20 FEET, END OF BORING 20 FEET; PROBABLY LIMESTONE.

- D R A F T -

DRILLING LOG	RADIAN CORPORATION	INSTALLATION: CARSWELL AFB, TX	SHEET 1 OF 1 SHEETS
1. PROJECT: CARSWELL AFB, IRP PHASE II STAGE 2		7. TOTAL DEPTH OF HOLE: 21 ft BGL	
		8. DATUM FOR ELEVATION SHOWN: sea level	
2. LOCATION: Site 17		9. MANUFACTURER'S DESIGNATION OF DRILL: Mobile Drill B-61	
3. DRILLING AGENCY: Atec Associates		10. NO. OF SAMPLES TAKEN: 4	
4. HOLE NO.: 17J		11. ELEVATION GROUND WATER: 562.96 ft MSL (3/1/88)	
5. NAME OF GEOLOGIST: Guy J. Childs		12. DATE HOLE ESTABLISHED: 2/17/88	
6. COORDINATES OF HOLE: X: 2023809.58 Y: 400362.97		13. ELEVATION TOP OF HOLE: 577.00 ft MSL	

Depth (Ft.)	Graphic Log	Sample ID	Soil Class/Code	Visual Description
0		17J-1	S/CLLR	CLAY: DARK BROWN/ BLACK, OCCASIONAL PEBBLES, MODERATE PLASTICITY, TRACE SILT.
5		17J-2	S/SLSM	CLAYEY SILT: TAN TO GRAY, DRY, TRACE FINE GRAINED SAND.
10		17J-3	S/CLLR	SILTY CLAY: TAN TO GRAY, HIGH PLASTICITY.
15		17J-4	S/SAND	SAND: YELLOW BROWN, FINE TO MEDIUM GRAINED, INCREASED GRAIN SIZE WITH DEPTH.
16			S/GRVL	GRAVEL
20			S/GRVL	REFUSAL AND END OF BORING AT 20.5 FEET.

- D R A F T -

DRILLING LOG	RADIAN CORPORATION	INSTALLATION: CARSWELL AFB, TX	SHEET 1 OF 1 SHEETS

1. PROJECT: CARSWELL AFB, IRP PHASE II STAGE 2
LOCATION: Site 17
3. DRILLING AGENCY: Atec Associates
4. HOLE NO.: 17K
5. NAME OF GEOLOGIST: Guy J. Childs
6. COORDINATES OF HOLE:
X: 2024001.9 Y: 400193.17

7. TOTAL DEPTH OF HOLE: 18 ft BGL
8. DATUM FOR ELEVATION SHOWN: sea level
9. MANUFACTURER'S DESIGNATION OF DRILL: Mobile Drill B-61
10. NO. OF SAMPLES TAKEN: 3
11. ELEVATION GROUND WATER: 563.90 ft MSL (3/1/88)
12. DATE HOLE ESTABLISHED: 2/16/88
13. ELEVATION TOP OF HOLE: 573.84 ft MSL

Depth (Ft.)	Graphic Log	Sample ID	Soil Class/Code	Visual Description
0		17K-1	S/CLLR	SILTY CLAY: DARK BROWN TO BLACK, TRACE AMOUNTS OF SAND, DRY.
5		17K-2	S/CLLR	SILTY CLAY: TAN, SOME MOTTLED GRAY, OCCASIONAL BROKEN SHELL FRAGMENTS, LOW PLASTICITY, DRY, MINOR AMOUNT OF SAND, TRACE PEBBLES. WATER AT 9 FEET.
10		17K-3	S/CLLR	SILTY CLAY: TAN, MOTTLED GRAY, MODERATE PLASTICITY, VARIABLE BROWN STREAKS, INCREASING SAND WITH DEPTH.
15			S/SAND	SAND: LIGHT TAN, FINE GRAINED, WET.
18			R/LMSN	PROBABLY LIMESTONE AT 18 FEET.
19			R/LMSN	REFUSAL AND END OF BORING AT 19 FEET.

- D R A F T -

DRILLING LOG	RADIAN CORPORATION	INSTALLATION: CARSWELL AFB, TX	SHEET 1 OF 1 SHEETS
1. PROJECT: CARSWELL AFB, IRP PHASE II STAGE 2		7. TOTAL DEPTH OF HOLE: 20 ft BGL	
		8. DATUM FOR ELEVATION SHOWN: sea level	
2. LOCATION: Site 17		9. MANUFACTURER'S DESIGNATION OF DRILL: Mobile Drill B-61	
3. DRILLING AGENCY: Atec Associates		10. NO. OF SAMPLES TAKEN: 4	
4. HOLE NO.: 17L		11. ELEVATION GROUND WATER: 564.55 ft MSL (3/1/88)	
5. NAME OF GEOLOGIST: Guy J. Childs		12. DATE HOLE ESTABLISHED: 2/17/88	
6. COORDINATES OF HOLE: X: 2023966.04 Y: 400394.21		13. ELEVATION TOP OF HOLE: 574.40 ft MSL	

Depth (Ft.)	Graphic Log	Sample ID	Soil Class/Code	Visual Description
0		17L-1	S/CLAY	CLAY: DARK BROWN /BLACK, SOME ORGANICS, MODERATE PLASTICITY.
5		17L-2	S/CLLR	SILTY CLAY: TAN TO GRAY, LOW PLASTICITY, BECOMING SANDY AT 8 FEET, HYDROCARBON ODOR. WATER AT 9 FEET.
10		17L-3	S/CLAY	CLAY: LIGHT OLIVE GRAY, OCCASIONAL BROWN STREAKS, HIGH PLASTICITY.
12			S/SAND	SAND: LIGHT BROWN, FINE TO MEDIUM GRAINED.
15		17L-4	S/GRSM	SAND AND GRAVEL: MEDIUM TO COARSE GRAINED SAND, ROUNDED FINE TO MEDIUM SIZE GRAVEL.
20			S/GRSM	REFUSAL AND END OF BORING AT 20 FEET. HNU READING = 17 ppm AT 20 FEET.

- D R A F T -

DRILLING LOG	RADIAN CORPORATION	INSTALLATION: CARSWELL AFB, TX	SHEET 1 OF 1 SHEETS

1. PROJECT: CARSWELL AFB, IRP PHASE II STAGE 2
2. LOCATION: Site 17
3. DRILLING AGENCY: Atec Associates
4. HOLE NO.: 17M
5. NAME OF GEOLOGIST: Guy J. Childs
6. COORDINATES OF HOLE: X: 2024264.07 Y: 400380.91
7. TOTAL DEPTH OF HOLE: 16 ft BGL
8. DATUM FOR ELEVATION SHOWN: sea level
9. MANUFACTURER'S DESIGNATION OF DRILL: Mobile Drill B-61
10. NO. OF SAMPLES TAKEN: 3
11. ELEVATION GROUND WATER: 563.30 ft MSL (3/2/88)
12. DATE HOLE ESTABLISHED: 2/16/88
13. ELEVATION TOP OF HOLE: 572.60 ft MSL

Depth (Ft.)	Graphic Log	Sample ID	Soil Class/Code	Visual Description
0		17M-1	S/CLLR	CLAY: DARK BROWN/BLACK, SOME GRAVEL, MODERATE PLASTICITY.
4		17M-2	S/CLLR	SILTY CLAY: LIGHT GRAY TO TAN, TRACE FINE GRAINED SAND AND BROKEN SHELL FRAGMENTS; HYDROCARBON ODOR.
9		17M-3	S/CLLR	SILTY CLAY: GRAY, TRACE FINE GRAINED SAND, MOIST TO WET. WATER AT 10 FEET.
13			S/SDLR	SAND: LIGHT BROWN, MEDIUM TO COARSE GRAINED, SOME FINE GRAINED, VARIABLE AMOUNTS OF PEA GRAVEL; HYDROCARBON ODOR.
16			R/LMSN	REFUSAL AT 16 FEET, END OF BORING AT 16 FEET; PROBABLY LIMESTONE.

- D R A F T -

DRILLING LOG	RADIAN CORPORATION	INSTALLATION: CARSWELL AFB, TX	SHEET 1 OF 1 SHEETS

1. PROJECT: CARSWELL AFB, IRP PHASE II STAGE 2
2. LOCATION: Site BSS
3. DRILLING AGENCY: Atec Associates
4. HOLE NO.: BSSA
5. NAME OF GEOLOGIST: Guy J. Childs
6. COORDINATES OF HOLE: X: 2024357.78 Y: 402068.84
7. TOTAL DEPTH OF HOLE: 11 ft BGL
8. DATUM FOR ELEVATION SHOWN: sea level
9. MANUFACTURER'S DESIGNATION OF DRILL: Mobile Drill B-61
10. NO. OF SAMPLES TAKEN: 3
11. ELEVATION GROUND WATER: 562.30 ft MSL (3/4/88)
12. DATE HOLE ESTABLISHED: 2/15/88
13. ELEVATION TOP OF HOLE: 566.90 ft MSL

Depth (Ft.)	Graphic Log	Sample ID	Soil Class/Code	Visual Description
0			F/ASPH	FILL: ASPHALT, COBBLES, GRAVEL.
1		BSSA-1	S/CLAY	CLAY: MEDIUM-DARK BROWN TO DARK GRAY.
4		BSSA-2	S/CLLR	SILTY CLAY: LIGHT GRAY/BROWN, OCCASIONAL PEBBLES.
7		BSSA-3	S/SDLR	SAND: YELLOW/BROWN, FINE TO MEDIUM GRAINED, OCCASIONAL LIMESTONE FRAGMENTS. WATER AT 7 FEET.
11			R/LMSN	LIMESTONE: REFUSAL AT 11 FEET, PROBABLY LIMESTONE. END OF BORING AT 11 FEET.

- D R A F T -

DRILLING LOG | RADIAN CORPORATION	INSTALLATION: CARSWELL AFB, TX | SHEET 1 OF 1 SHEETS
1. PROJECT: CARSWELL AFB, IRP PHASE II STAGE 2	7. TOTAL DEPTH OF HOLE: 10 ft BGL
LOCATION: Site BSS	8. DATUM FOR ELEVATION SHOWN: sea level
3. DRILLING AGENCY: Atec Associates	9. MANUFACTURER'S DESIGNATION OF DRILL: Mobile Drill B-61
4. HOLE NO.: BSSB	10. NO. OF SAMPLES TAKEN: 3
5. NAME OF GEOLOGIST: Guy J. Childs	11. ELEVATION GROUND WATER: 559.28 ft MSL (3/4/88)
6. COORDINATES OF HOLE: X: 2024331.93 Y: 402390.17	12. DATE HOLE ESTABLISHED: 2/15/88
	13. ELEVATION TOP OF HOLE: 567.10 ft MSL

Depth (Ft.)	Graphic Log	Sample ID	Soil Class/Code	Visual Description
0		BSSB-1	S/CLLR	CLAY: MEDIUM TO DARK BROWN, SILTY, SOME GRAVEL.
2		BSSB-2	S/SILT	SILT: BROWN TO GRAY.
3			S/SDFN	SAND: OLIVE GRAY, FINE GRAINED, MINOR SILT; HYDROCARBON ODOR (BENZENE DRAEGER REACTION).
5		BSSB-3	S/SDFN	SAND: DARK OLIVE GRAY, FINE GRAINED; BECOMING MOIST WITH DEPTH.
			S/SAND	SAND: LIGHT BROWN, FINE TO MEDIUM GRAINED; HYDROCARBON ODOR (BENZENE DRAEGER REACTION). WATER AT 8 FEET.
10			R/LMSN	LIMESTONE: LIGHT GRAY, INDURATED. HYDROCARBON ODOR FROM GROUNDWATER. REFUSAL AND END OF BORING AT 10 FEET.

- D R A F T -

DRILLING LOG	RADIAN CORPORATION	INSTALLATION: CARSWELL AFB, TX	SHEET 1 OF 1 SHEETS

1. PROJECT: CARSWELL AFB, IRP PHASE II STAGE 2	7. TOTAL DEPTH OF HOLE: 12 ft BGL
	8. DATUM FOR ELEVATION SHOWN: sea level
2. LOCATION: Site BSS	9. MANUFACTURER'S DESIGNATION OF DRILL: Mobile Drill B-61
3. DRILLING AGENCY: Atec Associates	10. NO. OF SAMPLES TAKEN: 4
4. HOLE NO.: BSSC	11. ELEVATION GROUND WATER: 548.72 ft MSL (3/4/88)
5. NAME OF GEOLOGIST: Guy J. Childs	12. DATE HOLE ESTABLISHED: 2/14/88
6. COORDINATES OF HOLE: X: 2024565.7 Y: 402254.07	13. ELEVATION TOP OF HOLE: 560.00 ft MSL

Depth (Ft.)	Graphic Log	Sample ID	Soil Class/Code	Visual Description
0		BSSC-1	S/CLLR	SILTY CLAY: DARK GRAY, SOME FINE GRAINED SAND, MINOR PEBBLES.
2		BSSC-2	S/CLLR	SAME AS ABOVE
4		BSSC-3	S/SLSM	CLAYEY SILT: LIGHT BROWN/GRAY, FINE GRAINED SAND, FEW LIMESTONE FRAGMENTS.
9		BSSC-4	S/CLLR	GRAVELLY CLAY: ABUNDANT LIMESTONE FRAGMENTS, WET.
10			S/GRCL	GRAVEL AND CLAY: INCREASING GRAVEL. WATER AT 10 FEET.
12			R/LMSN	LIMESTONE: LIGHT GRAY, INDURATED. REFUSAL AND END OF BORING AT 12 FEET.

- D R A F T -

DRILLING LOG | RADIAN CORPORATION	INSTALLATION: CARSWELL AFB, TX | SHEET 1 OF 1 SHEETS
1. PROJECT: CARSWELL AFB, IRP PHASE II STAGE 2	7. TOTAL DEPTH OF HOLE: 6 ft BGL
LOCATION: Site BSS	8. DATUM FOR ELEVATION SHOWN: sea level
3. DRILLING AGENCY: Atec Associates	9. MANUFACTURER'S DESIGNATION OF DRILL: Mobile Drill B-61
4. HOLE NO.: BSSD	10. NO. OF SAMPLES TAKEN: 3
5. NAME OF GEOLOGIST: Guy J. Childs	11. ELEVATION GROUND WATER:
6. COORDINATES OF HOLE: X: 2024487.37 Y: 402418.08	12. DATE HOLE ESTABLISHED: 2/14/88
	13. ELEVATION TOP OF HOLE: 561.45 ft MSL

Depth (Ft.)	Graphic Log	Sample ID	Soil Class/Code	Visual Description
0		BSSD-1	S/CLLR	SILTY CLAY: DARK GRAY, OCCASIONAL PEBBLES, SOME SAND.
2		BSSD-2	S/CLLR	SAME AS ABOVE
4		BSSD-3	S/SLLR	SILT: DARK GRAY, MINOR CLAY, SOME LIMESTONE.
6			R/LMSN	LIMESTONE: LIGHT GRAY. REFUSAL AND END OF BORING AT 6 FEET.

- D R A F T -

DRILLING LOG	RADIAN CORPORATION	INSTALLATION: CARSWELL AFB, TX	SHEET 1 OF 1 SHEETS

1. PROJECT: CARSWELL AFB, IRP PHASE II STAGE 2
2. LOCATION: Site WSA
3. DRILLING AGENCY: Atec Associates
4. HOLE NO.: WSAD
5. NAME OF GEOLOGIST: Guy J. Childs
6. COORDINATES OF HOLE: X: 1993221.25 Y: 402356.18
7. TOTAL DEPTH OF HOLE: 1 ft BGL
8. DATUM FOR ELEVATION SHOWN: sea level
9. MANUFACTURER'S DESIGNATION OF DRILL: Mobile Drill B-61
10. NO. OF SAMPLES TAKEN: 1
11. ELEVATION GROUND WATER:
12. DATE HOLE ESTABLISHED: 3/30/88
13. ELEVATION TOP OF HOLE: 755.75 ft MSL

Depth (Ft.)	Graphic Log	Sample ID	Soil Class/Code	Visual Description
0			S/PTHM	DARK BROWN SILTY SOIL, MOIST, ORGANICS
0.01		CAR8-03-059	S/CLLR	SILTY CLAY: TAN, SOME ORANGE AND GRAY MOTTLING OCCASSIONAL VERY SMALL LIMESTONE FRAGMENTS.

- D R A F T -

DRILLING LOG	RADIAN CORPORATION	INSTALLATION: CARSWELL AFB, TX	SHEET 1 OF 1 SHEETS

1. PROJECT; CARSWELL AFB, IRP PHASE II STAGE 2
   LOCATION: Site WSA
2. DRILLING AGENCY: Atec Associates
4. HOLE NO.: WSAE
5. NAME OF GEOLOGIST: Guy J. Childs
6. COORDINATES OF HOLE:
   X: 1993221.26 Y: 402356.19
7. TOTAL DEPTH OF HOLE: 1 ft BGL
8. DATUM FOR ELEVATION SHOWN: sea level
9. MANUFACTURER'S DESIGNATION OF DRILL: Mobile Drill B-61
10. NO. OF SAMPLES TAKEN: 1
11. ELEVATION GROUND WATER:
12. DATE HOLE ESTABLISHED: 3/30/88
13. ELEVATION TOP OF HOLE: 756.24 ft MSL

Depth (Ft.)	Graphic Log	Sample ID	Soil Class/Code	Visual Description
0			S/PTHM	GRASS OVER DARK SILTY SOIL, MOIST
0.01		CAR8-03-057	S/CLLR	SILTY CLAY: TAN, DARK WITH GRAY AND ORANGE STRIKES. MODERATE PLASTICITY; OCCASIONAL LIMESTONE FRAGMENTS, SMALL; MOIST

- D R A F T -

DRILLING LOG	RADIAN CORPORATION	INSTALLATION: CARSWELL AFB, TX	SHEET 1 OF 1 SHEETS

1. PROJECT: CARSWELL AFB, IRP PHASE II STAGE 2	7. TOTAL DEPTH OF HOLE: 1 ft BGL
	8. DATUM FOR ELEVATION SHOWN: sea level
2. LOCATION: Site WSA	9. MANUFACTURER'S DESIGNATION OF DRILL: Mobile Drill B-61
3. DRILLING AGENCY: Atec Associates	10. NO. OF SAMPLES TAKEN: 1
4. HOLE NO.: WSAF	11. ELEVATION GROUND WATER:
5. NAME OF GEOLOGIST: Guy J. Childs	12. DATE HOLE ESTABLISHED: 3/30/88
6. COORDINATES OF HOLE: X: 1993123.27 Y: 402249.52	13. ELEVATION TOP OF HOLE: 755.57 ft MSL

Depth (Ft.)	Graphic Log	Sample ID	Soil Class/Code	Visual Description
0			S/PTHM	GRASS OVER DARK SILTY SOIL, MOIST
0.01		CAR8-03-056	S/CLLR	SILTY CLAY: BROWNISH - GRAY MOD. PLASTICITY; MOIST BOTTOM 2" GRADING INTO TANNISH SILTY CLAY WITH LIMESTONE FRAGMENTS; DRY

- D R A F T -

DRILLING LOG	RADIAN CORPORATION	INSTALLATION: CARSWELL AFB, TX	SHEET 1 OF 1 SHEETS

1. PROJECT: CARSWELL AFB, IRP PHASE II STAGE 2	7. TOTAL DEPTH OF HOLE: 1 ft BGL
2. LOCATION: Site WSA	8. DATUM FOR ELEVATION SHOWN: sea level
3. DRILLING AGENCY: Atec Associates	9. MANUFACTURER'S DESIGNATION OF DRILL: Mobile Drill B-61
4. HOLE NO.: WSAG	10. NO. OF SAMPLES TAKEN: 1
5. NAME OF GEOLOGIST: Guy J. Childs	11. ELEVATION GROUND WATER:
6. COORDINATES OF HOLE: X: 1993140.13 Y: 402181.89	12. DATE HOLE ESTABLISHED: 3/30/88
	13. ELEVATION TOP OF HOLE: 754.71 ft MSL

Depth (Ft.)	Graphic Log	Sample ID	Soil Class/Code	Visual Description
0			S/PTHM	GRASSY COVER ON SILTY SOIL, WET
0.01		CAR8-03-055	S/CLLR	SILTY CLAY: BROWNISH GRAY; WET; HIGH PLASTICITY; BOTTOM 3" GRADING INTO TANNISH SILTY CLAY, DRY WITH LIMESTONE FRAGMENTS

- D R A F T -

DRILLING LOG	RADIAN CORPORATION	INSTALLATION: CARSWELL AFB, TX	SHEET 1 OF 1 SHEETS

1. PROJECT: CARSWELL AFB, IRP PHASE II STAGE 2	7. TOTAL DEPTH OF HOLE: 1 ft BGL
	8. DATUM FOR ELEVATION SHOWN: sea level
2. LOCATION: Site WSA	9. MANUFACTURER'S DESIGNATION OF DRILL: Mobile Drill B-61
3. DRILLING AGENCY: Atec Associates	10. NO. OF SAMPLES TAKEN: 1
4. HOLE NO.: WSAH	11. ELEVATION GROUND WATER:
5. NAME OF GEOLOGIST: Guy J. Childs	12. DATE HOLE ESTABLISHED: 3/30/88
6. COORDINATES OF HOLE: X: 1993183.12 Y: 402127.28	13. ELEVATION TOP OF HOLE: 753.94 ft MSL

Depth (Ft.)	Graphic Log	Sample ID	Soil Class/Code	Visual Description
0			S/PTHM	GRASSY COVER WITH DARK SILTY SOIL.
0.01		Car8-03-053	S/CLLR	TOP 6" DARK SILTY SOIL, WET REMAINING 6" SILTY CLAY; TANNISH WITH SLIGHT ORANGISH TINT. OCCASIONAL WEATHERED LIMESTONE FRAGMENTS; DRY

- D R A F T -

DRILLING LOG | RADIAN CORPORATION	INSTALLATION: CARSWELL AFB, TX | SHEET 1 OF 1 SHEETS
1. PROJECT: CARSWELL AFB, IRP PHASE II STAGE 2	7. TOTAL DEPTH OF HOLE: 3 ft BGL
	8. DATUM FOR ELEVATION SHOWN: sea level
LOCATION: Site WSA	9. MANUFACTURER'S DESIGNATION OF DRILL: Mobile Drill B-61
3. DRILLING AGENCY: Atec Associates	10. NO. OF SAMPLES TAKEN: 2
4. HOLE NO.: WSAI	11. ELEVATION GROUND WATER:
5. NAME OF GEOLOGIST: Guy J. Childs	12. DATE HOLE ESTABLISHED: 3/30/88
6. COORDINATES OF HOLE: X: 1993222.15 Y: 402073.87	13. ELEVATION TOP OF HOLE: 752.94 ft MSL

Depth (Ft.)	Graphic Log	Sample ID	Soil Class/Code	Visual Description
0			S/PTHM	3 FEET CUT, TOP 6" - TOP SOIL.
0.01		CAR8-03-051	S/CLLR	SILTY CLAY: TAN, LOW PLASTICITY, MOTTLED ORANGE, OCCASIONAL LIMESTONE FRAGMENTS
2		CAR8-03-052	S/CLLR	SILTY CLAY: TAN, LOW PLASTICITY, MOTTLED ORANGE; OCCASIONAL LIMESTONE FRAGMENTS

- D R A F T -

DRILLING LOG | RADIAN CORPORATION	INSTALLATION: CARSWELL AFB, TX | SHEET 1 OF 1 SHEETS
1. PROJECT: CARSWELL AFB, IRP PHASE II STAGE 2	7. TOTAL DEPTH OF HOLE: ft BGL
	8. DATUM FOR ELEVATION SHOWN: sea level
2. LOCATION: Site WSA	9. MANUFACTURER'S DESIGNATION OF DRILL: Mobile Drill B-61
3. DRILLING AGENCY: Atec Associates	10. NO. OF SAMPLES TAKEN: 2
4. HOLE NO.: WSAJ	11. ELEVATION GROUND WATER:
5. NAME OF GEOLOGIST: Guy J. Childs	12. DATE HOLE ESTABLISHED: 3/29/88
6. COORDINATES OF HOLE: X: 1993302.77 Y: 401984.24	13. ELEVATION TOP OF HOLE: 750.85 ft MSL

Depth (Ft.)	Graphic Log	Sample ID	Soil Class/Code	Visual Description
0			S/PTHM	TOP SOIL - GRASS, ORGANICS, SILTY CLAY: DARK BROWN
0.01		CAR8-03-049	S/CLLR	MODERATE PLASTICITY; MOIST COMMON ORGANICS.
3		CAR8-03-050	S/CLLR	SILTY CLAY: TAN; TRACE MOTTLING, LIMESTONE FRAGMENTS.
4.25			/	REFUSAL AT 4.25 FEET. TOTAL DEPTH 4.25 FEET. LIMESTONE.

- D R A F T -

DRILLING LOG	RADIAN CORPORATION	INSTALLATION: CARSWELL AFB, TX	SHEET 1 OF 1 SHEETS

1. PROJECT: CARSWELL AFB, IRP PHASE II STAGE 2
2. LOCATION: Site WSA
3. DRILLING AGENCY: Atec Associates
4. HOLE NO.: WSAK
5. NAME OF GEOLOGIST: Guy J. Childs
6. COORDINATES OF HOLE: X: 1993443.8 Y: 401943.92
7. TOTAL DEPTH OF HOLE: 3 ft BGL
8. DATUM FOR ELEVATION SHOWN: sea level
9. MANUFACTURER'S DESIGNATION OF DRILL: Mobile Drill B-61
10. NO. OF SAMPLES TAKEN: 2
11. ELEVATION GROUND WATER:
12. DATE HOLE ESTABLISHED: 3/29/88
13. ELEVATION TOP OF HOLE: 744.21 ft MSL

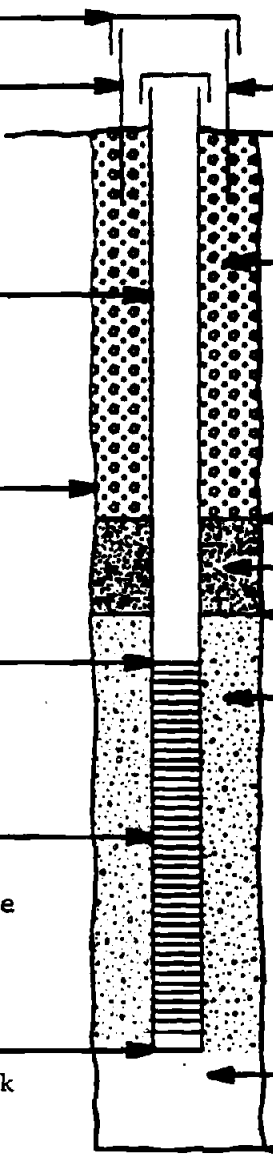
Depth (Ft.)	Graphic Log	Sample ID	Soil Class/Code	Visual Description
0			S/PTHM	TOP SOIL - GRASS COVER - GRAVELLY SILT:MEDIUM BROWN, MOIST
0.01		CAR8-03-047	S/CLLR	SILTY CLAY: DARK BROWN MOIST
2		CAR8-03-048	S/CLLR	WEATHERED LIMESTONE FRAGMENTS

WELL CONSTRUCTION SCHEMATIC

- D R A F T -

PROJECT Carswell AFB IRP Phase II Stage 2
SITE Base Service Station (BSS)
COORDINATES 402,068.84192 2,024,337.78905
DATE COMPLETED 2/15/88
SUPERVISED BY Guy J. Childs
DRILLER ATEC Associates, Inc.
DRILLING METHOD Hollow-Stem Auger

WELL NO. BSS-A
AQUIFER Upper Zone
DEPTH TO WATER 7.0'



LOCKING CAP

STEEL PROTECTIVE PIPE

ELEVATION OF MEASURING POINT 566.38'

MEASURING POINT HEIGHT ABOVE GROUND LEVEL -0.52'

GROUND SURFACE

TYPE OF GROUT Lone Star Portland Type II with bentonite slurry

DESCRIPTION OF RISER PIPE 2" PVC-SCH. 40

DIAMETER OF BOREHOLE 6.625"

DEPTH TO TOP OF SEAL 2'

TYPE OF SEAL Bentonite 1/4" pellets

DEPTH TO TOP OF SAND PACK 4'

DEPTH TO TOP OF SCREEN 6'

TYPE OF SAND PACK Super blast coarse 8-20

DESCRIPTION OF SCREEN 2" PVC-SCH. 40 with 0.020" screen slot size

DEPTH TO BOTTOM OF SCREEN 10.0' (11.0' if bottom blank included)

TYPE OF FILLER BELOW PLUGGED SECTION Super blast coarse 8-20

TOTAL DEPTH OF BOREHOLE 11'

D87 - 1240A

WELL CONSTRUCTION SCHEMATIC

- D R A F T -

PROJECT Carswell AFB IRP Phase II Stage 2

SITE Base Service Station (BSS)

COORDINATES 402,390.17981 2,024,331.93158

DATE COMPLETED 2/15/88

SUPERVISED BY Guy J. Childs

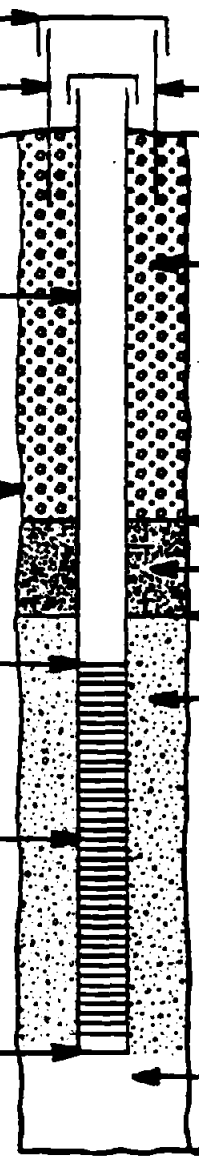
DRILLER ATEC Associates, Inc.

DRILLING METHOD Hollow-Stem Auger

WELL NO. BSS-B

AQUIFER Upper Zone

DEPTH TO WATER 8.0'



LOCKING CAP

STEEL PROTECTIVE PIPE

ELEVATION OF MEASURING POINT 569.73'

MEASURING POINT HEIGHT ABOVE GROUND LEVEL 2.63'

GROUND SURFACE

TYPE OF GROUT Lone Star Portland Type II with bentonite slurry

DESCRIPTION OF RISER PIPE 2" PVC-SCH. 40

DIAMETER OF BOREHOLE 7"

DEPTH TO TOP OF SEAL 1'

TYPE OF SEAL Bentonite 1/4" pellets

DEPTH TO TOP OF SAND PACK 3'

DEPTH TO TOP OF SCREEN 5'

TYPE OF SAND PACK Super blast coarse 8-20

DESCRIPTION OF SCREEN 2" PVC-SCH. 40 with 0.020" screen slot size

DEPTH TO BOTTOM OF SCREEN 9.0' (10.0' if bottom blank included)

TYPE OF FILLER BELOW PLUGGED SECTION Super blast coarse 8-20

TOTAL DEPTH OF BOREHOLE 10'

D87 - 1240A

WELL CONSTRUCTION SCHEMATIC

- D R A F T -

PROJECT Carswell AFB IRP Phase II Stage 2

SITE Base Service Station (BSS)

COORDINATES 402,254.07567 2,024,565.70484

DATE COMPLETED 2/15/88

SUPERVISED BY Guy J. Childs

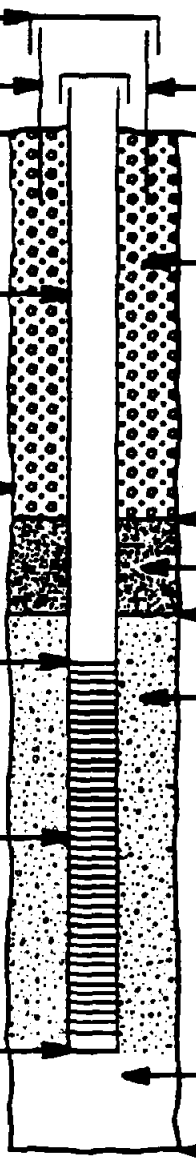
DRILLER ATEC Associates, Inc.

DRILLING METHOD Hollow-Stem Auger

WELL NO. BSS-C

AQUIFER Upper Zone

DEPTH TO WATER 10.0'



LOCKING CAP

STEEL PROTECTIVE PIPE

ELEVATION OF MEASURING POINT 559.57'

MEASURING POINT HEIGHT ABOVE GROUND LEVEL -0.43'

GROUND SURFACE

TYPE OF GROUT Lone Star Portland Type II with bentonite slurry

DESCRIPTION OF RISER PIPE 2" PVC-SCH. 40

DIAMETER OF BOREHOLE 6.625"

DEPTH TO TOP OF SEAL 2'

TYPE OF SEAL Bentonite 1/4" pellets

DEPTH TO TOP OF SAND PACK 4'

DEPTH TO TOP OF SCREEN 7'

TYPE OF SAND PACK Super blast coarse 8-20

DESCRIPTION OF SCREEN 2" PVC-SCH. 40 with 0.020" screen slot size

DEPTH TO BOTTOM OF SCREEN 1.0' (12.0' if bottom blank included)

TYPE OF FILLER BELOW PLUGGED SECTION Super blast coarse 8-20

TOTAL DEPTH OF BOREHOLE 12'

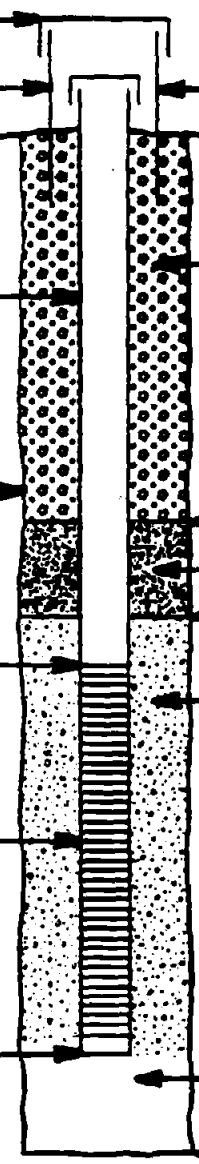
D87 · 1240A

WELL CONSTRUCTION SCHEMATIC

- D R A F T -

PROJECT Carswell AFB IRP Phase II Stage 2
SITE Landfill 1 (Site 1)
COORDINATES 401,173.20809 2,025,407.53205
DATE COMPLETED 2/14/88
SUPERVISED BY Guy J. Childs
DRILLER ATEC Associates, Inc.
DRILLING METHOD Hollow-Stem Auger

WELL NO. 1E
AQUIFER Upper Zone
DEPTH TO WATER 22.0'



LOCKING CAP

STEEL PROTECTIVE PIPE

ELEVATION OF MEASURING POINT 562.25'

MEASURING POINT HEIGHT ABOVE GROUND LEVEL 2.85'

GROUND SURFACE

TYPE OF GROUT Lone Star Portland Type II with bentonite slurry

DESCRIPTION OF RISER PIPE 2" PVC-SCH. 40

DIAMETER OF BOREHOLE 7"

DEPTH TO TOP OF SEAL 10'

TYPE OF SEAL Bentonite 1/4" pellets

DEPTH TO TOP OF SAND PACK 12'

DEPTH TO TOP OF SCREEN 16.75'

TYPE OF SAND PACK Super blast coarse 8-20

DESCRIPTION OF SCREEN 2" PVC-SCH. 40 with 0.020" screen slot size

DEPTH TO BOTTOM OF SCREEN 28.5' (29.5' with 1' blank on bottom)

TYPE OF FILLER BELOW PLUGGED SECTION Super blast coarse 8-20

TOTAL DEPTH OF BOREHOLE 30'

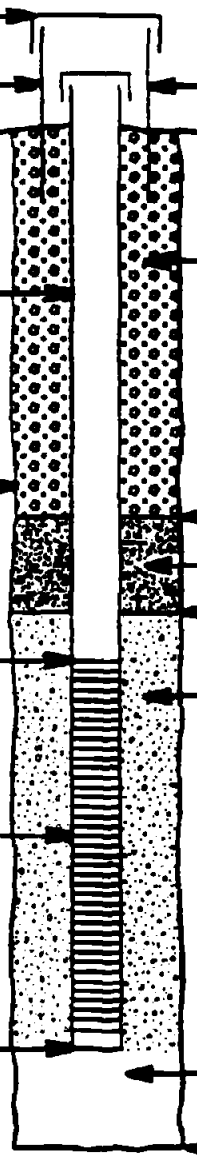
D87 - 1240A

WELL CONSTRUCTION SCHEMATIC

- D R A F T -

PROJECT Carswell AFB IRP Phase II Stage 2
SITE Landfill 1 (Site 1)
COORDINATES 401,002.55061 2,025,607.46316
DATE COMPLETED 2/14/88
SUPERVISED BY Guy J. Childs
DRILLER ATEC Associates, Inc.
DRILLING METHOD Hollow-Stem Auger

WELL NO. 1F
AQUIFER Upper Zone
DEPTH TO WATER 22.0'



LOCKING CAP

STEEL PROTECTIVE PIPE

ELEVATION OF MEASURING POINT 562.26'

MEASURING POINT HEIGHT ABOVE GROUND LEVEL 2.76'

GROUND SURFACE

TYPE OF GROUT Lone Star Portland Type II with bentonite slurry

DESCRIPTION OF RISER PIPE 2" PVC-SCH. 40

DIAMETER OF BOREHOLE 7"

DEPTH TO TOP OF SEAL 10.5'

TYPE OF SEAL Bentonite 1/4" pellets

DEPTH TO TOP OF SAND PACK 12.5'

DEPTH TO TOP OF SCREEN 17.25'

TYPE OF SAND PACK Super blast coarse 8-20

DESCRIPTION OF SCREEN 2" PVC-SCH. 40 with 0.020" screen slot size

DEPTH TO BOTTOM OF SCREEN 28.0' (29.0' with blank on bottom)

TYPE OF FILLER BELOW PLUGGED SECTION Super blast coarse 8-20

TOTAL DEPTH OF BOREHOLE 33'

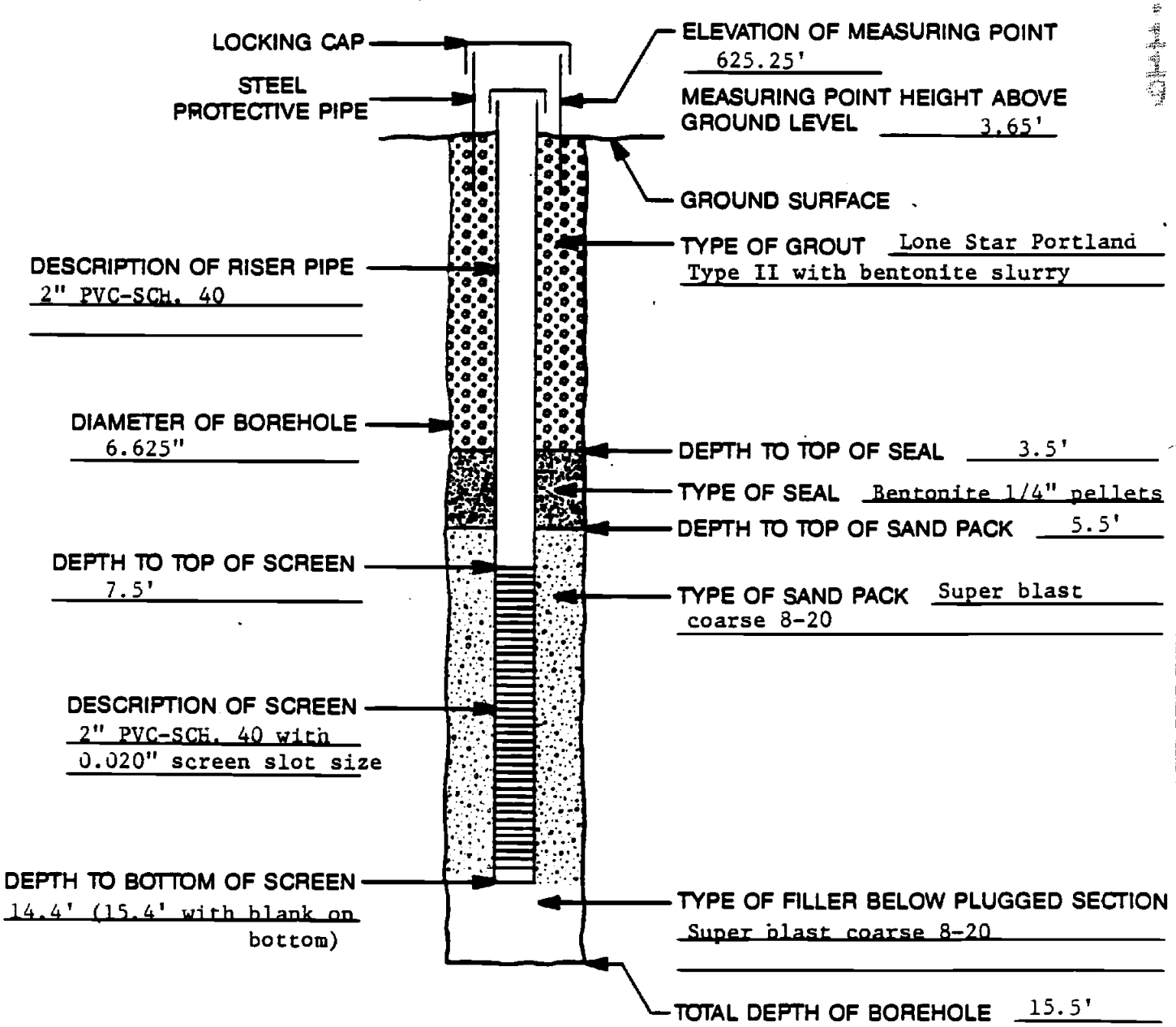
D87 - 1240A

WELL CONSTRUCTION SCHEMATIC

- D R A F T -

PROJECT Carswell AFB IRP Phase II Stage 2
SITE Landfill 3 (Site 3)
COORDINATES 398,698.98292 2,017,477.40425
DATE COMPLETED 1/27/88
SUPERVISED BY Guy J. Childs
DRILLER ATEC Associates, Inc.
DRILLING METHOD Hollow-Stem Auger

WELL NO. 3D
AQUIFER Upper Zone
DEPTH TO WATER 10.0'



D87 - 1240A

WELL CONSTRUCTION SCHEMATIC

- D R A F T -

PROJECT Carswell AFB IRP Phase II Stage 2

SITE Landfill 4 (Site 4)

COORDINATES 397,680.42416 2,020,255.75892

DATE COMPLETED 2/10/88

SUPERVISED BY Guy J. Childs

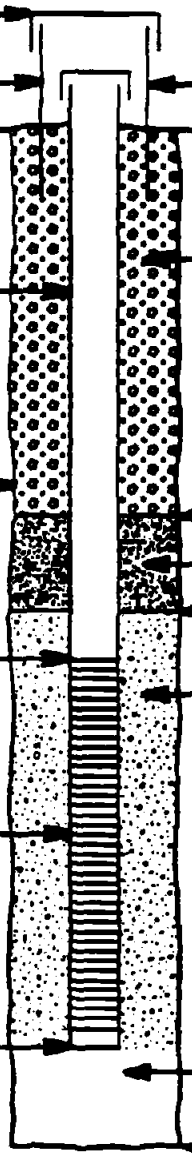
DRILLER ATEC Associates, Inc.

DRILLING METHOD Hollow-Stem Auger

WELL NO. 4F

AQUIFER Upper Zone

DEPTH TO WATER 25.0'



LOCKING CAP

STEEL PROTECTIVE PIPE

ELEVATION OF MEASURING POINT 625.36'

MEASURING POINT HEIGHT ABOVE GROUND LEVEL 2.56'

GROUND SURFACE

TYPE OF GROUT Lone Star Portland Type II with bentonite slurry

DESCRIPTION OF RISER PIPE 2" PVC-SCH. 40

DIAMETER OF BOREHOLE 7"

DEPTH TO TOP OF SEAL 13.5'

TYPE OF SEAL Bentonite 1/4" pellets

DEPTH TO TOP OF SAND PACK 15.5'

DEPTH TO TOP OF SCREEN 20'

TYPE OF SAND PACK Super blast coarse 8-20

Natural sand, fine to medium, from 27.0'-35.5'

DESCRIPTION OF SCREEN 2" PVC-SCH. 40 with 0.020" screen slot size-wrapped with medium size filter fabric.

DEPTH TO BOTTOM OF SCREEN 34.0' (35.0' to bottom of blank)

TYPE OF FILLER BELOW PLUGGED SECTION Natural sand, fine to medium

TOTAL DEPTH OF BOREHOLE 35.5'

D87 - 1240A

WELL CONSTRUCTION SCHEMATIC

- D R A F T -

PROJECT Carswell AFB IRP Phase II Stage 2

SITE Landfill 4 (Site 4)

COORDINATES 397,836.73039 2,020,857.61303

DATE COMPLETED 2/8/88

SUPERVISED BY Guy J. Childs

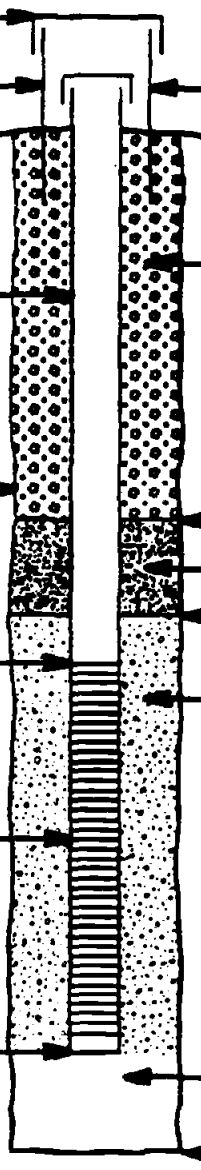
DRILLER ATEC Associates, Inc.

DRILLING METHOD Hollow-Stem Auger

WELL NO. 4G

AQUIFER Upper Zone

DEPTH TO WATER 25.0'



LOCKING CAP

STEEL PROTECTIVE PIPE

ELEVATION OF MEASURING POINT 620.02'

MEASURING POINT HEIGHT ABOVE GROUND LEVEL 0.92'

GROUND SURFACE

TYPE OF GROUT Lone Star Portland Type II with bentonite slurry

DESCRIPTION OF RISER PIPE 2" PVC-SCH. 40

DIAMETER OF BOREHOLE 6.625"

DEPTH TO TOP OF SEAL 17'

TYPE OF SEAL Bentonite 1/4" pellets

DEPTH TO TOP OF SAND PACK 19'

DEPTH TO TOP OF SCREEN 21'

TYPE OF SAND PACK Blast sand coarse 8-20

DESCRIPTION OF SCREEN 2" PVC-SCH. 40 with 0.020" screen slot size

DEPTH TO BOTTOM OF SCREEN 35.0' (36.0' with 1' bottom blank)

TYPE OF FILLER BELOW PLUGGED SECTION Blast sand coarse 8-20

TOTAL DEPTH OF BOREHOLE 40'

D87 - 1240A

WELL CONSTRUCTION SCHEMATIC

- D R A F T -

PROJECT Carswell AFB IRP Phase II Stage 2

SITE Landfill 4 (Site 4)

COORDINATES 397,541.43725 2,020,916.84913

DATE COMPLETED 2/10/88

SUPERVISED BY Guy J. Childs

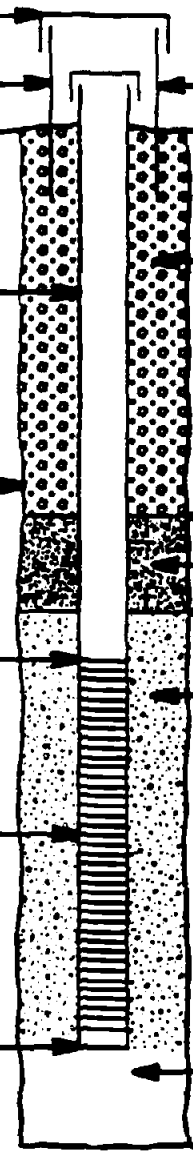
DRILLER ATEC Associates, Inc.

DRILLING METHOD Hollow-Stem Auger

WELL NO. 4H

AQUIFER Upper Zone

DEPTH TO WATER 16.0'



LOCKING CAP

STEEL PROTECTIVE PIPE

ELEVATION OF MEASURING POINT 613.43'

MEASURING POINT HEIGHT ABOVE GROUND LEVEL 2.93'

GROUND SURFACE

TYPE OF GROUT Lone Star Portland Type II with bentonite slurry

DESCRIPTION OF RISER PIPE 2" PVC-SCH. 40

DIAMETER OF BOREHOLE 6.625"

DEPTH TO TOP OF SEAL 8'

TYPE OF SEAL Bentonite 1/4" pellets

DEPTH TO TOP OF SAND PACK 10'

DEPTH TO TOP OF SCREEN 13'

TYPE OF SAND PACK Super blast coarse 8-20 (10'-15') Natural sand pack (15'-29')

DESCRIPTION OF SCREEN 2" PVC-SCH. 40 with 0.020" screen slot size wrapped with medium size filter fabric

DEPTH TO BOTTOM OF SCREEN 27.0' (28.0' with 1' blank at bottom)

TYPE OF FILLER BELOW PLUGGED SECTION Natural sand pack

TOTAL DEPTH OF BOREHOLE 29'

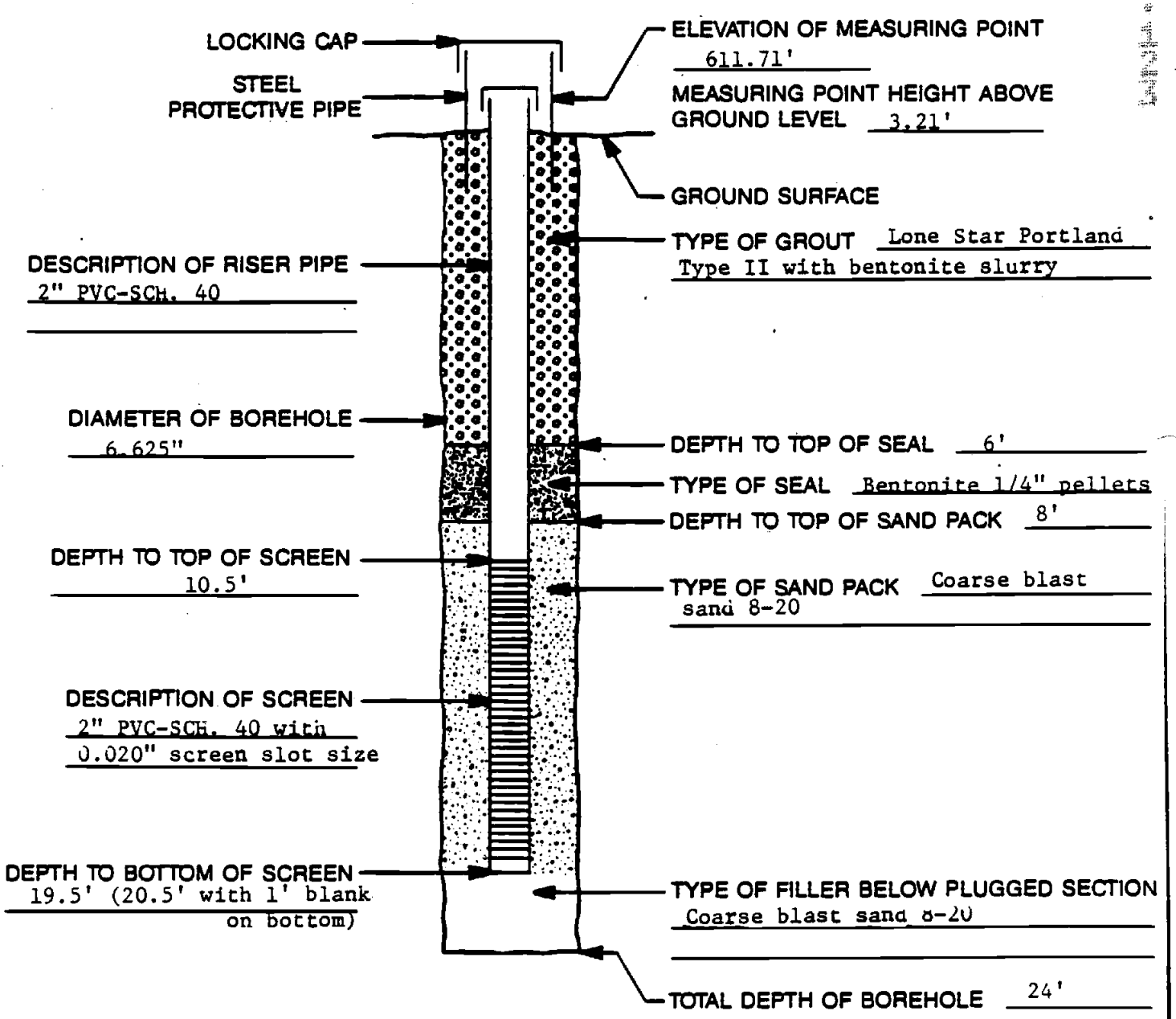
D87 - 1240A

WELL CONSTRUCTION SCHEMATIC

- D R A F T -

PROJECT Carswell AFB IRP Phase II Stage 2
SITE Landfill 5 (Site 5)
COORDINATES 398,362.32313 2,019,960.19729
DATE COMPLETED 1/30/88
SUPERVISED BY Guy J. Childs
DRILLER ATEC Associates, Inc.
DRILLING METHOD Hollow-Stem Auger

WELL NO. 5D
AQUIFER Upper Zone
DEPTH TO WATER 12.9'



D87 - 1240A

WELL CONSTRUCTION SCHEMATIC

- D R A F T -

PROJECT Carswell AFB IRP Phase II Stage 2

SITE Landfill 5 (Site 5)

COORDINATES 397,802.46440 2,019,748.19597

DATE COMPLETED 2/1/88

SUPERVISED BY Guy J. Childs

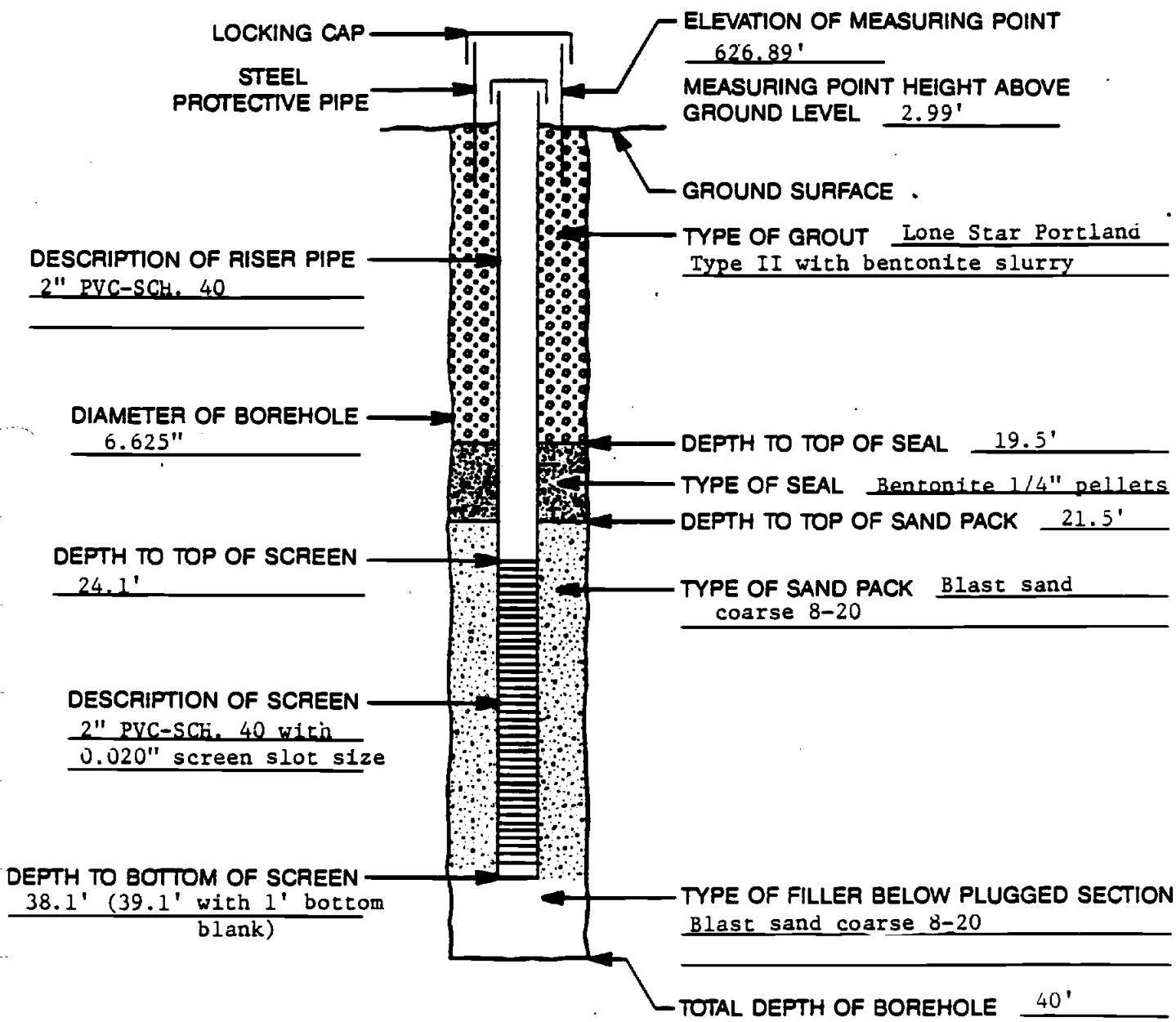
DRILLER ATEC Associates, Inc.

DRILLING METHOD Hollow-Stem Auger

WELL NO. 5E

AQUIFER Upper Zone

DEPTH TO WATER 27.0'



D87 - 1240A

WELL CONSTRUCTION SCHEMATIC

- D R A F T -

PROJECT Carswell AFB IRP Phase II Stage 2

SITE Landfill 5 (Site 5)

COORDINATES 397,904.64236 2,020,535.56245

DATE COMPLETED 2/9/88

SUPERVISED BY Guy J. Childs

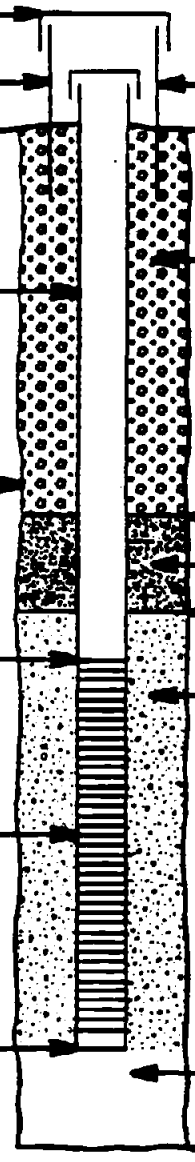
DRILLER ATEC Associates, Inc.

DRILLING METHOD Hollow-Stem Auger

WELL NO. 5F

AQUIFER Upper Zone

DEPTH TO WATER 24.0'



LOCKING CAP

STEEL PROTECTIVE PIPE

ELEVATION OF MEASURING POINT 618.95'

MEASURING POINT HEIGHT ABOVE GROUND LEVEL -0.50'

GROUND SURFACE

TYPE OF GROUT Lone Star Portland Type II with bentonite slurry

DESCRIPTION OF RISER PIPE 2" PVC-SCH. 40

DIAMETER OF BOREHOLE 6.625"

DEPTH TO TOP OF SEAL 14'

TYPE OF SEAL Bentonite 1/4" pellets

DEPTH TO TOP OF SAND PACK 16'

DEPTH TO TOP OF SCREEN 21'

TYPE OF SAND PACK Natural gravel pack; fine to medium grain

DESCRIPTION OF SCREEN 2" PVC-SCH. 40 with 0.020" screen slot size wrapped with medium size filter fabric

DEPTH TO BOTTOM OF SCREEN 35.0' (36.0' with 1' bottom blank)

TYPE OF FILLER BELOW PLUGGED SECTION Natural gravel pack, fine to medium grain

TOTAL DEPTH OF BOREHOLE 37'

D87-1240A

WELL CONSTRUCTION SCHEMATIC

- D R A F T -

PROJECT Carswell AFB IRP Phase II Stage 2

SITE Landfill 5 (Site 5)

COORDINATES 398,174.57747 2,020,894.69337

DATE COMPLETED 2/8/88

SUPERVISED BY Guy J. Childs

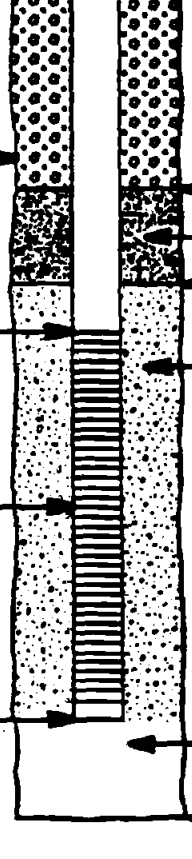
DRILLER ATEC Associates, Inc.

DRILLING METHOD Hollow-Stem Auger

WELL NO. 5G

AQUIFER Upper Zone

DEPTH TO WATER 16.0'



LOCKING CAP

STEEL PROTECTIVE PIPE

ELEVATION OF MEASURING POINT 615.39'

MEASURING POINT HEIGHT ABOVE GROUND LEVEL 3.39'

GROUND SURFACE

TYPE OF GROUT Lone Star Portland Type II with bentonite slurry

DESCRIPTION OF RISER PIPE 2" PVC-SCH. 40

DIAMETER OF BOREHOLE 6.625"

DEPTH TO TOP OF SEAL 9'

TYPE OF SEAL Bentonite 1/4" pellets

DEPTH TO TOP OF SAND PACK 11'

DEPTH TO TOP OF SCREEN 14.25'

TYPE OF SAND PACK Natural gravel pack (18'-29') blast sand coarse 8-20 (11'18')

DESCRIPTION OF SCREEN 2" PVC-SCH. 40 with 0.020" screen slot size wrapped with medium size filter fabric

DEPTH TO BOTTOM OF SCREEN 26.0' (27.0' with bottom blank length)

TYPE OF FILLER BELOW PLUGGED SECTION Natural gravel pack

TOTAL DEPTH OF BOREHOLE 29'

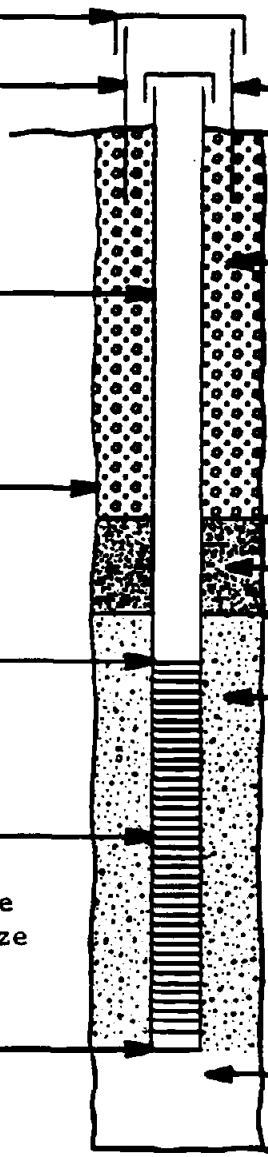
D87 - 1240A

WELL CONSTRUCTION SCHEMATIC

- D R A F T -

PROJECT Carswell AFB IRP Phase II Stage 2
SITE Landfill 5 (Site 5)
COORDINATES 398,351.69445 2,020,546.91832
DATE COMPLETED 2/9/88
SUPERVISED BY Guy J. Childs
DRILLER ATEC Associates, Inc.
DRILLING METHOD Hollow-Stem Auger

WELL NO. 5H
AQUIFER Upper Zone
DEPTH TO WATER 15.0'



LOCKING CAP

STEEL PROTECTIVE PIPE

ELEVATION OF MEASURING POINT 610.62'

MEASURING POINT HEIGHT ABOVE GROUND LEVEL 2.22'

GROUND SURFACE

TYPE OF GROUT Lone Star Portland Type II with bentonite slurry

DESCRIPTION OF RISER PIPE 2" PVC-SCH. 40

DIAMETER OF BOREHOLE 6.625"

DEPTH TO TOP OF SEAL 6'

TYPE OF SEAL Benronite 1/4" pellets

DEPTH TO TOP OF SAND PACK 8'

DEPTH TO TOP OF SCREEN 12.85'

TYPE OF SAND PACK 8'-16' super blast coarse 8-20, 16'-25.6' natural gravel pack

DESCRIPTION OF SCREEN 2" PVC-SCH. 40 with 0.020" screen slot size wrapped with medium size filter fabric

DEPTH TO BOTTOM OF SCREEN 23.6' (24.6' with bottom blank length)

TYPE OF FILLER BELOW PLUGGED SECTION Natural gravel pack

TOTAL DEPTH OF BOREHOLE 25.6'

D87 - 1240A

WELL CONSTRUCTION SCHEMATIC

- D R A F T -

PROJECT Carswell AFB IRP Phase II Stage 2

SITE POL Tank Farm (Site 17)

COORDINATES 400,225.13342 2,023,849.67063

DATE COMPLETED 2/15/88

SUPERVISED BY Guy J. Childs

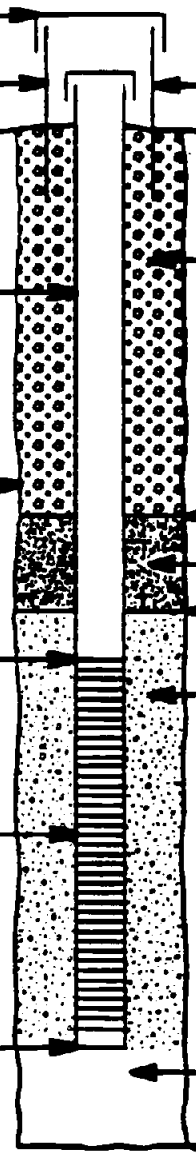
DRILLER ATEC Associates, Inc.

DRILLING METHOD Hollow-Stem Auger

WELL NO. 17I

AQUIFER Upper Zone

DEPTH TO WATER 9.0'



LOCKING CAP

STEEL PROTECTIVE PIPE

DESCRIPTION OF RISER PIPE
2" PVC-SCH. 40

DIAMETER OF BOREHOLE
7"

DEPTH TO TOP OF SCREEN
4.75'

DESCRIPTION OF SCREEN
2" PVC-SCH. 40 with
0.020" screen slot size

DEPTH TO BOTTOM OF SCREEN
16.5' (17.5' if bottom blank included)

ELEVATION OF MEASURING POINT
578.19'

MEASURING POINT HEIGHT ABOVE GROUND LEVEL 2.99'

GROUND SURFACE

TYPE OF GROUT Lone Star Portland Type II with bentonite slurry

DEPTH TO TOP OF SEAL 2'

TYPE OF SEAL Bentonite 1/4" pellets

DEPTH TO TOP OF SAND PACK 4'

TYPE OF SAND PACK Super blast coarse 8-20

TYPE OF FILLER BELOW PLUGGED SECTION
Super blast coarse 8-20

TOTAL DEPTH OF BOREHOLE 20'

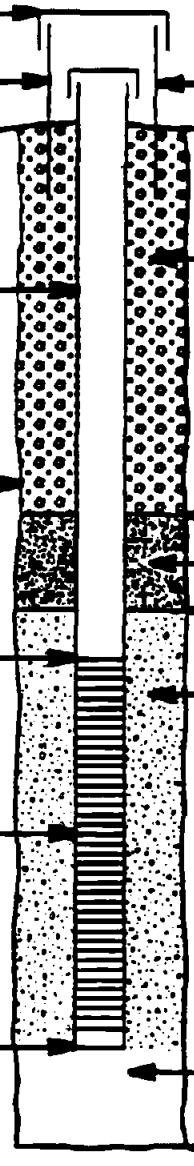
D87-1240A

WELL CONSTRUCTION SCHEMATIC

- D R A F T -

PROJECT Carswell AFB IRP Phase II Stage 2
SITE POL Tank Farm (Site 17)
COORDINATES 400,362.97881 2,023,809.58530
DATE COMPLETED 2/17/88
SUPERVISED BY Guy J. Childs
DRILLER ATEC Associates, Inc.
DRILLING METHOD Hollow-Stem Auger

WELL NO. 17J
AQUIFER Upper Zone
DEPTH TO WATER Not encountered



LOCKING CAP

STEEL PROTECTIVE PIPE

ELEVATION OF MEASURING POINT 579.79'

MEASURING POINT HEIGHT ABOVE GROUND LEVEL 2.79'

GROUND SURFACE

TYPE OF GROUT Lone Star Portland Type II with bentonite slurry

DESCRIPTION OF RISER PIPE 2" PVC-SCH. 40

DIAMETER OF BOREHOLE 7"

DEPTH TO TOP OF SEAL 3.5'

TYPE OF SEAL Bentonite 1/4" pellets

DEPTH TO TOP OF SAND PACK 5.5'

DEPTH TO TOP OF SCREEN 7.45'

TYPE OF SAND PACK Blast sand, coarse 8-20

DESCRIPTION OF SCREEN 2" PVC-SCH. 40 with 0.020" screen slot size

DEPTH TO BOTTOM OF SCREEN 19.2' (20.2' with bottom blank section)

TYPE OF FILLER BELOW PLUGGED SECTION Blast sand, coarse 8-20

TOTAL DEPTH OF BOREHOLE 20.5'

D87-1240A

WELL CONSTRUCTION SCHEMATIC

-DRAFT-

PROJECT Carswell AFB IRP Phase II Stage 2

SITE POL Tank Farm (Site 17)

COORDINATES 400,193.17235 2,024,001.90555

DATE COMPLETED 2/16/88

SUPERVISED BY Guy J. Childs

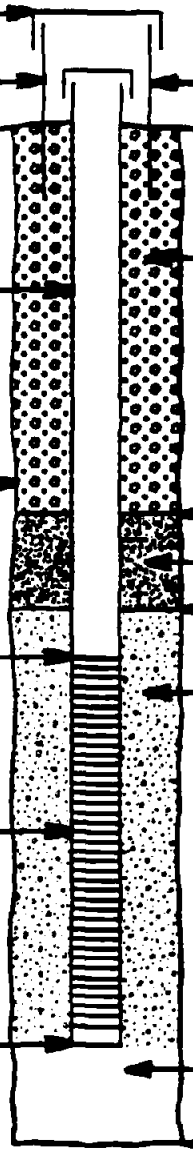
DRILLER ATEC Associates, Inc.

DRILLING METHOD Hollow-Stem Auger

WELL NO. 17K

AQUIFER Upper Zone

DEPTH TO WATER 9.0'



LOCKING CAP

STEEL PROTECTIVE PIPE

DESCRIPTION OF RISER PIPE
2" PVC-SCH. 40

DIAMETER OF BOREHOLE
7"

DEPTH TO TOP OF SCREEN
8.7'

DESCRIPTION OF SCREEN
2" PVC-SCH. 40 with 0.020" screen slot size

DEPTH TO BOTTOM OF SCREEN
17.7' (18.7' with bottom blank included)

ELEVATION OF MEASURING POINT
575.34'

MEASURING POINT HEIGHT ABOVE GROUND LEVEL 1.54'

GROUND SURFACE

TYPE OF GROUT Lone Star Portland Type II with bentonite slurry

DEPTH TO TOP OF SEAL 4'

TYPE OF SEAL Bentonite 1/4" pellets

DEPTH TO TOP OF SAND PACK 6'

TYPE OF SAND PACK Blast sand 8-20

TYPE OF FILLER BELOW PLUGGED SECTION
Blast sand 8-20

TOTAL DEPTH OF BOREHOLE 19'

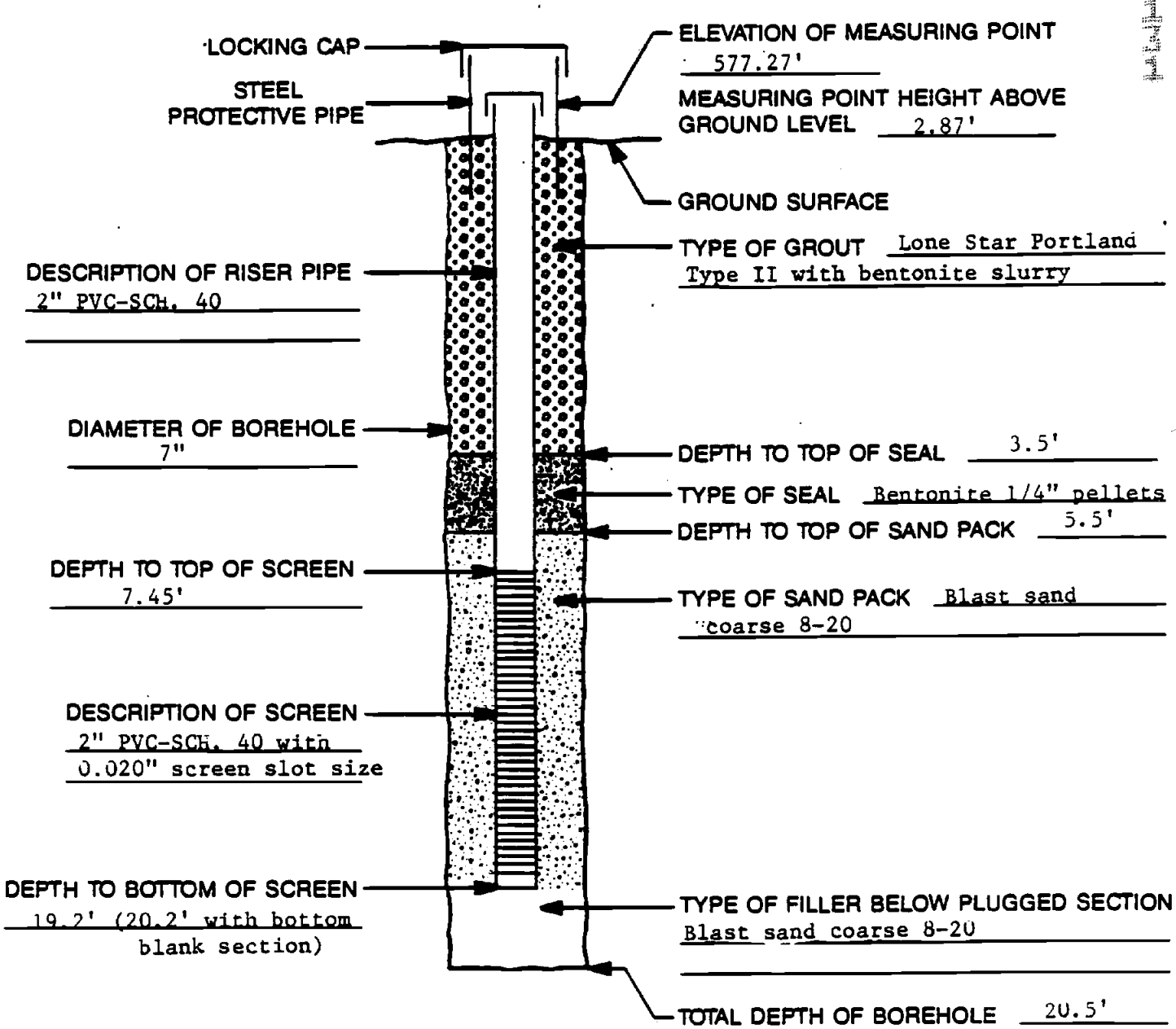
D87 1240A

WELL CONSTRUCTION SCHEMATIC

- D R A F T -

PROJECT Carswell AFB IRP Phase II Stage 2
SITE POL Tank Farm (Site 17)
COORDINATES 400,394.21647 2,023,966.04349
DATE COMPLETED 2/17/88
SUPERVISED BY Guy J. Childs
DRILLER ATEC Associates, Inc.
DRILLING METHOD Hollow-Stem Auger

WELL NO. 17 L
AQUIFER Upper Zone
DEPTH TO WATER 9.0'



D87 - 1240A

WELL CONSTRUCTION SCHEMATIC

- D R A F T -

PROJECT Carswell AFB IRP Phase II Stage 2

SITE POL Tank Farm (Site 17)

COORDINATES 400,380.91204 2,024,264.07312

DATE COMPLETED 2/16/88

SUPERVISED BY Guy J. Childs

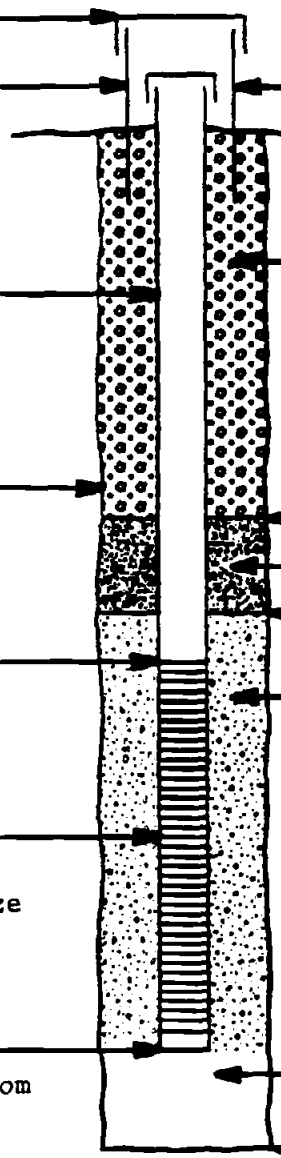
DRILLER ATEC Associates, Inc.

DRILLING METHOD Hollow-Stem Auger

WELL NO. 17M

AQUIFER Upper Zone

DEPTH TO WATER 10.0'



LOCKING CAP

STEEL PROTECTIVE PIPE

ELEVATION OF MEASURING POINT 574.28'

MEASURING POINT HEIGHT ABOVE GROUND LEVEL 1.68'

GROUND SURFACE

TYPE OF GROUT Lone Star Portland Type II with bentonite slurry

DESCRIPTION OF RISER PIPE 2" PVC-SCH. 40

DIAMETER OF BOREHOLE 6.625"

DEPTH TO TOP OF SEAL 2'

TYPE OF SEAL Bentonite 1/4" pellets

DEPTH TO TOP OF SAND PACK 4'

DEPTH TO TOP OF SCREEN 5.9'

TYPE OF SAND PACK Blast sand coarse 8-20

DESCRIPTION OF SCREEN 2" PVC-SCH. 40 with 0.020" screen slot size

DEPTH TO BOTTOM OF SCREEN 14.9' (15.9' with 1' bottom blank length)

TYPE OF FILLER BELOW PLUGGED SECTION Blast sand coarse 8-20

TOTAL DEPTH OF BOREHOLE 16'

D87 - 1240A

TAB

C

- D R A F T -

APPENDIX C

Raw Field Data

WELL PURGING RECORDS

CHEMISTRY LOG DATA - CARSWELL AFB - STAGE 2

Location ID	Sample ID	Log Date	Volumn_gal	pH_value	SC_value	Temp_value
10A	03-22	02-Mar-88	.50	6.82	815.00	18.00
	03-22	02-Mar-88	1.00	6.78	818.00	19.00
	03-22	02-Mar-88	1.50	6.84	820.00	18.00
	04-50	13-Apr-88	1.00	6.40	820.00	19.00
	04-50	13-Apr-88	2.00	6.73	830.00	19.00
	04-50	13-Apr-88	3.50	7.00	830.00	19.00
	04-51	13-Apr-88	NV	NV	NV	NV
	04-52	13-Apr-88	NV	NV	NV	NV
10B	03-28	03-Mar-88	1.00	6.64	789.00	18.00
	03-28	03-Mar-88	2.00	6.80	814.00	19.00
	03-28	03-Mar-88	2.50	6.76	804.00	19.00
	04-60	14-Apr-88	1.00	6.78	780.00	18.00
	04-60	14-Apr-88	1.50	6.77	790.00	18.00
	04-60	14-Apr-88	2.00	7.04	790.00	19.00
	04-61	14-Apr-88	NV	NV	NV	NV
	04-61	14-Apr-88	NV	NV	NV	NV
10C	03-29	03-Mar-88	1.00	6.57	1000.00	18.00
	03-29	03-Mar-88	2.00	6.63	940.00	18.50
	03-29	03-Mar-88	3.00	6.64	940.00	18.50
	03-29	03-Mar-88	3.50	6.66	930.00	18.00
	04-62	14-Apr-88	1.00	6.63	910.00	20.00
	04-62	14-Apr-88	2.00	6.65	950.00	20.00
	04-62	14-Apr-88	3.50	6.73	920.00	20.00
	04-63	14-Apr-88	NV	NV	NV	NV
11A	02-151	24-Feb-88	2.00	NV	NV	NV
	04-02	05-Apr-88	.50	6.63	810.00	17.00
	04-02	05-Apr-88	1.00	6.58	840.00	17.00
	04-02	05-Apr-88	1.50	6.60	840.00	17.00
	04-02	05-Apr-88	2.00	6.65	830.00	17.00
11B	02-152	24-Feb-88	.50	NV	NV	NV
	02-152	24-Feb-88	1.00	NV	NV	NV
	02-152	24-Feb-88	1.50	NV	NV	NV
	02-152	24-Feb-88	2.00	NV	NV	NV
	02-152	24-Feb-88	2.50	NV	NV	NV
	02-152	24-Feb-88	3.00	NV	NV	NV
	04-03	05-Apr-88	1.00	7.10	1210.00	17.00
	04-03	05-Apr-88	2.00	6.86	1100.00	16.00
	04-03	05-Apr-88	2.50	6.80	1100.00	16.00

NV: Value is not available

CHEMISTRY LOG DATA - CARSWELL AFB - STAGE 2

Location ID	Sample ID	Log Date	Volumn_gal	pH_value	SC_value	Temp_value
12A	02-154	25-Feb-88	.50	7.06	600.00	18.00
	02-154	25-Feb-88	1.00	7.12	770.00	19.00
	02-154	25-Feb-88	2.00	7.12	570.00	19.00
	02-154	25-Feb-88	3.00	7.12	550.00	19.00
	04-04	06-Apr-88	1.00	6.71	510.00	17.00
	04-04	06-Apr-88	2.00	7.25	510.00	17.00
	04-04	06-Apr-88	3.00	6.86	500.00	17.00
	04-04	06-Apr-88	4.00	6.90	490.00	17.00
12B	03-24	03-Mar-88	1.00	6.51	739.00	19.00
	03-24	03-Mar-88	2.00	6.65	728.00	19.00
	03-24	03-Mar-88	2.50	6.51	738.00	19.00
	04-57	13-Apr-88	1.00	7.01	720.00	19.00
	04-57	13-Apr-88	2.00	6.87	750.00	19.00
	04-57	13-Apr-88	2.50	7.92	740.00	19.00
12C	03-26	03-Mar-88	1.00	6.49	843.00	18.00
	03-26	03-Mar-88	2.00	6.64	848.00	19.00
	03-26	03-Mar-88	3.00	6.67	825.00	19.00
	03-26	03-Mar-88	3.50	6.65	820.00	19.00
	04-59	11-Apr-88	1.00	6.87	790.00	20.00
	04-59	11-Apr-88	2.00	6.96	820.00	19.50
	04-59	11-Apr-88	3.50	6.97	820.00	19.00
12D	03-23	03-Mar-88	1.00	6.48	841.00	19.00
	03-23	03-Mar-88	2.00	6.56	830.00	19.00
	03-23	03-Mar-88	2.50	6.56	838.00	18.00
	04-53	13-Apr-88	1.00	6.94	790.00	20.00
	04-53	13-Apr-88	2.00	6.83	810.00	20.00
	04-53	13-Apr-88	3.00	6.86	820.00	20.00
	04-54	13-Apr-88	NV	NV	NV	NV
	04-55	13-Apr-88	NV	NV	NV	NV
12E	03-27	03-Mar-88	1.00	6.33	1040.00	18.00
	03-27	03-Mar-88	2.00	6.48	960.00	18.00
	03-27	03-Mar-88	2.50	6.54	930.00	18.00
	04-56	13-Apr-88	1.00	6.62	850.00	20.00
	04-56	13-Apr-88	2.00	6.54	850.00	19.50
	04-56	13-Apr-88	2.50	6.56	830.00	19.00
	04-58	11-Apr-88	NV	NV	NV	NV
16DN3	04-24	08-Apr-88	NV	7.48	690.00	16.00
16DN4	04-25	08-Apr-88	NV	7.80	700.00	16.00

NV: Value is not available

CHEMISTRY LOG DATA - CARSWELL AFB - STAGE 2

Location ID	Sample ID	Log Date	Volumn_gal	pH_value	SC_value	Temp_value
16UP1	04-22	08-Apr-88	NV	7.10	690.00	16.00
16UP2	04-23	08-Apr-88	NV	7.13	690.00	16.00
17I	03-08	01-Mar-88	1.00	7.07	864.00	19.00
	03-08	01-Mar-88	2.00	7.04	812.00	18.00
	03-08	01-Mar-88	3.00	7.03	820.00	18.00
	03-08	01-Mar-88	3.50	7.06	820.00	18.00
	04-64	14-Apr-88	1.00	6.70	820.00	18.50
	04-64	14-Apr-88	2.00	6.92	800.00	18.50
	04-64	14-Apr-88	2.50	6.74	790.00	18.00
17J	03-13	01-Mar-88	1.00	7.16	707.00	20.00
	03-13	01-Mar-88	2.00	7.13	708.00	19.50
	03-13	01-Mar-88	3.00	7.20	708.00	19.00
	03-13	01-Mar-88	3.50	7.18	709.00	19.00
	04-69	15-Apr-88	1.00	6.64	690.00	17.00
	04-69	15-Apr-88	2.00	6.67	720.00	17.00
	04-69	15-Apr-88	3.00	6.67	720.00	17.00
	04-70	15-Apr-88	NV	NV	NV	NV
	04-70	15-Apr-88	NV	NV	NV	NV
	04-71	15-Apr-88	NV	NV	NV	NV
17K	03-11	01-Mar-88	1.00	7.41	667.00	20.00
	03-11	01-Mar-88	2.00	7.39	657.00	18.00
	03-11	01-Mar-88	3.00	7.26	683.00	19.00
	03-11	01-Mar-88	4.00	7.23	688.00	19.00
	04-68	14-Apr-88	1.00	7.06	680.00	19.00
	04-68	14-Apr-88	2.00	6.96	700.00	18.00
	04-68	14-Apr-88	3.00	6.90	710.00	18.00
17L	03-12	01-Mar-88	1.00	6.80	750.00	20.00
	03-12	01-Mar-88	2.00	6.82	746.00	20.00
	03-12	01-Mar-88	3.00	6.87	741.00	20.50
	03-12	01-Mar-88	4.00	6.89	728.00	20.50
	03-12	01-Mar-88	4.50	6.92	729.00	20.50
	04-72	15-Apr-88	1.00	6.64	710.00	18.00
	04-72	15-Apr-88	2.00	6.74	730.00	18.00
	04-72	15-Apr-88	3.50	6.87	740.00	18.00
	04-73	15-Apr-88	.00	NV	NV	NV
17M	03-14	02-Mar-88	.50	6.46	797.00	17.00
	03-14	02-Mar-88	1.50	6.64	757.00	18.00

NV: Value is not available

CHEMISTRY LOG DATA - CARSWELL AFB - STAGE 2

Location ID	Sample ID	Log Date	Volumn_gal	pH_value	SC_value	Temp_value
	03-14	02-Mar-88	2.50	6.63	764.00	18.00
	04-65	14-Apr-88	1.00	6.94	730.00	19.50
	04-65	14-Apr-88	2.00	7.07	750.00	19.00
	04-65	14-Apr-88	2.50	6.83	750.00	19.00
1A	02-159	26-Feb-88	.20	6.63	856.00	13.00
	02-159	26-Feb-88	.30	6.78	842.00	13.00
	02-159	26-Feb-88	.50	5.76	710.00	14.00
	02-159	26-Feb-88	.50	6.80	835.00	13.00
	02-159	26-Feb-88	1.00	5.81	690.00	14.00
	02-159	26-Feb-88	1.00	5.66	1340.00	20.00
	02-159	26-Feb-88	1.50	5.81	700.00	14.00
	02-159	26-Feb-88	1.50	5.49	1440.00	20.00
	04-12	07-Apr-88	.25	6.28	670.00	14.00
	04-12	07-Apr-88	.75	7.05	650.00	14.00
	04-12	07-Apr-88	1.00	7.08	650.00	14.00
	04-12	07-Apr-88	3.50	7.02	660.00	14.00
	04-13	07-Apr-88	NV	NV	NV	NV
	04-14	07-Apr-88	NV	NV	NV	NV
1B	02-158	26-Feb-88	.25	5.72	800.00	19.00
	02-158	01-Mar-88	.25	5.72	800.00	19.00
	04-15	07-Apr-88	NV	6.73	840.00	17.00
	04-15	07-Apr-88	NV	6.51	820.00	17.00
	04-15	07-Apr-88	NV	6.90	840.00	17.00
1C	02-160	26-Feb-88	1.00	5.85	770.00	21.00
	02-160	26-Feb-88	2.00	5.82	780.00	21.50
	02-160	26-Feb-88	3.00	5.82	790.00	21.00
	02-160	26-Feb-88	4.00	5.80	800.00	21.50
	02-160	26-Feb-88	5.00	5.80	800.00	21.50
	02-160	26-Feb-88	6.00	5.79	800.00	21.50
	02-160	26-Feb-88	7.00	5.86	810.00	21.50
	04-17	07-Apr-88	2.00	6.35	800.00	20.00
	04-17	07-Apr-88	4.00	6.51	790.00	20.00
	04-17	07-Apr-88	6.00	6.68	790.00	20.00
1D	02-161	26-Feb-88	.50	5.66	1340.00	20.00
	02-161	26-Feb-88	2.00	5.70	1430.00	20.00
	04-16	07-Apr-88	1.00	6.49	1330.00	19.00
	04-16	07-Apr-88	1.50	6.47	1330.00	19.00
	04-16	07-Apr-88	2.00	6.48	1310.00	19.00
1E	02-163	26-Feb-88	1.00	6.83	840.00	20.00

NV: Value is not available

CHEMISTRY LOG DATA - CARSWELL AFB - STAGE 2

Location ID	Sample ID	Log Date	Volumn_gal	pH_value	SC_value	Temp_value
	02-163	26-Feb-88	2.00	6.74	850.00	21.00
	02-163	26-Feb-88	3.00	6.71	860.00	20.00
	02-163	26-Feb-88	4.00	6.92	860.00	20.00
	04-18	07-Apr-88	1.00	6.35	810.00	19.00
	04-18	07-Apr-88	3.00	6.30	830.00	19.00
	04-18	07-Apr-88	5.00	7.01	820.00	19.00
	04-20	07-Apr-88	NV	NV	NV	NV
1F	02-162	26-Feb-88	1.00	6.83	920.00	21.00
	02-162	26-Feb-88	2.00	6.81	890.00	21.00
	02-162	26-Feb-88	3.00	6.82	880.00	21.00
	02-162	26-Feb-88	4.00	6.80	880.00	21.00
	04-19	07-Apr-88	1.00	6.19	850.00	20.00
	04-19	07-Apr-88	3.00	6.18	850.00	19.00
	04-19	07-Apr-88	5.00	6.18	830.00	20.00
	04-21	08-Apr-88	NV	NV	NV	NV
3D	04-01	05-Apr-88	.50	6.75	1070.00	17.00
	04-01	05-Apr-88	1.00	6.75	1140.00	17.00
	04-01	05-Apr-88	1.50	6.74	1040.00	17.00
	04-01	05-Apr-88	2.00	6.83	1040.00	17.00
4A	02-157	25-Feb-88	1.00	7.25	630.00	20.00
	02-157	25-Feb-88	2.00	7.25	620.00	19.00
	02-157	25-Feb-88	3.00	7.30	620.00	19.00
	02-157	25-Feb-88	4.50	7.35	620.00	20.00
	04-06	06-Apr-88	1.00	6.88	600.00	17.00
	04-06	06-Apr-88	3.00	7.15	590.00	17.00
	04-06	06-Apr-88	5.00	7.10	620.00	17.00
	04-07	06-Apr-88	NV	NV	NV	NV
	04-08	06-Apr-88	NV	NV	NV	NV
	04-08	06-Apr-88	10.00	7.82	550.00	19.00
	04-08	06-Apr-88	20.00	7.86	560.00	19.00
	04-08	06-Apr-88	30.00	7.80	560.00	19.00
	04-08	06-Apr-88	40.00	7.74	560.00	20.00
4B	02-156	25-Feb-88	.50	7.04	570.00	18.00
	02-156	25-Feb-88	1.00	7.20	570.00	17.00
	02-156	25-Feb-88	1.50	7.25	570.00	16.00
	04-09	06-Apr-88	.50	6.62	650.00	16.00
	04-09	06-Apr-88	1.00	6.57	620.00	16.00
	04-09	06-Apr-88	1.50	6.84	620.00	16.00
	04-09	06-Apr-88	2.00	6.61	610.00	15.00
	04-10	06-Apr-88	NV	NV	NV	NV

NV: Value is not available

CHEMISTRY LOG DATA - CARSWELL AFB - STAGE 2

Location ID	Sample ID	Log Date	Volumn_gal	pH_value	SC_value	Temp_value
4C	02-164	29-Feb-88	1.00	6.67	1010.00	18.50
	02-164	29-Feb-88	2.00	6.74	985.00	18.50
	02-164	29-Feb-88	3.00	6.77	994.00	18.50
	02-164	29-Feb-88	4.00	6.78	999.00	18.00
	04-26	08-Apr-88	2.00	7.61	950.00	18.00
	04-26	08-Apr-88	3.00	6.68	960.00	17.00
	04-26	08-Apr-88	4.00	6.39	970.00	17.00
4D	03-33	04-Mar-88	1.00	6.54	781.00	18.00
	03-33	04-Mar-88	2.00	6.72	787.00	18.00
	03-33	04-Mar-88	3.00	6.81	783.00	19.00
4E	03-31	04-Mar-88	1.00	6.65	750.00	17.00
	03-31	04-Mar-88	2.00	6.73	740.00	18.00
	03-31	04-Mar-88	3.00	6.91	740.00	18.00
	03-32	04-Mar-88	1.00	6.68	740.00	18.00
	03-32	04-Mar-88	2.00	6.78	740.00	18.00
	03-32	04-Mar-88	3.00	6.78	740.00	18.00
	04-35	11-Apr-88	1.00	6.94	720.00	18.00
	04-35	11-Apr-88	2.00	6.90	670.00	18.00
	04-35	11-Apr-88	2.50	6.91	670.00	18.00
4F	04-41	12-Apr-88	NV	NV	NV	NV
	04-42	12-Apr-88	NV	NV	NV	NV
4G	02-166	29-Feb-88	1.00	7.07	856.00	17.00
	02-166	29-Feb-88	2.00	7.06	852.00	18.00
	02-166	29-Feb-88	3.00	7.03	865.00	18.00
	02-166	29-Feb-88	4.00	7.04	865.00	18.00
	04-30	11-Apr-88	1.00	5.00	780.00	18.00
	04-30	11-Apr-88	2.00	5.00	790.00	19.00
	04-30	11-Apr-88	3.00	5.00	800.00	19.00
4H	02-165	29-Feb-88	1.00	6.93	833.00	18.50
	02-165	29-Feb-88	2.00	7.09	823.00	18.50
	02-165	29-Feb-88	3.00	7.22	821.00	18.50
	02-165	29-Feb-88	4.00	7.24	817.00	18.50
	04-27	11-Apr-88	1.00	5.00	800.00	17.00
	04-27	11-Apr-88	3.00	5.00	780.00	17.00
	04-27	11-Apr-88	5.00	5.00	790.00	17.00
	04-29	11-Apr-88	NV	NV	NV	NV
5A	03-16	02-Mar-88	.50	6.64	881.00	18.00

NV: Value is not available

CHEMISTRY LOG DATA - CARSWELL AFB - STAGE 2

Location ID	Sample ID	Log Date	Volumn_gal	pH_value	SC_value	Temp_value
	03-16	02-Mar-88	1.00	6.66	884.00	18.00
	03-16	02-Mar-88	1.50	6.68	870.00	18.00
	04-46	12-Apr-88	NV	NV	NV	NV
5B	03-30	03-Mar-88	1.00	6.67	929.00	14.00
	03-30	03-Mar-88	2.00	6.77	919.00	13.00
	03-30	03-Mar-88	3.00	6.76	909.00	13.00
	03-30	03-Mar-88	3.50	6.80	908.00	13.00
	04-44	12-Apr-88	1.00	6.96	900.00	17.00
	04-44	12-Apr-88	2.00	7.14	890.00	17.00
	04-44	12-Apr-88	3.00	7.21	890.00	16.00
5C	03-15	02-Mar-88	1.00	6.54	777.00	18.00
	03-15	02-Mar-88	2.00	6.63	779.00	18.00
	03-15	02-Mar-88	3.00	6.66	780.00	18.00
	03-15	02-Mar-88	3.50	6.67	781.00	18.00
	04-48	13-Apr-88	NV	NV	NV	NV
	04-49	13-Apr-88	1.00	6.77	780.00	17.00
	04-49	13-Apr-88	2.00	6.73	770.00	17.00
	04-49	13-Apr-88	3.50	6.81	790.00	16.00
5D	03-19	02-Mar-88	1.00	6.64	979.00	18.00
	03-19	02-Mar-88	2.00	6.67	978.00	18.00
	03-19	02-Mar-88	3.00	6.70	973.00	18.00
	04-43	12-Apr-88	1.00	7.12	920.00	17.00
	04-43	12-Apr-88	2.00	7.40	940.00	17.00
	04-43	12-Apr-88	3.00	7.58	940.00	17.00
5E	03-21	02-Mar-88	1.00	6.80	836.00	18.50
	03-21	02-Mar-88	2.00	6.82	833.00	19.00
	03-21	02-Mar-88	2.50	6.86	833.00	18.50
	04-45	12-Apr-88	1.00	6.67	810.00	20.00
	04-45	12-Apr-88	2.00	6.69	810.00	20.00
	04-45	12-Apr-88	2.50	6.62	810.00	19.00
5F	03-37	04-Mar-88	1.00	6.54	779.00	18.00
	03-37	04-Mar-88	3.00	6.78	779.00	19.00
	03-37	04-Mar-88	4.00	6.64	767.00	19.00
	03-37	04-Mar-88	5.00	6.63	764.00	18.00
	03-37	04-Mar-88	5.50	6.64	764.00	19.00
	04-66	14-Apr-88	1.00	6.62	790.00	19.50
	04-66	14-Apr-88	3.00	6.59	810.00	19.00
	04-66	14-Apr-88	5.00	6.58	810.00	19.00
	04-67	14-Apr-88	NV	NV	NV	NV

NV: Value is not available

CHEMISTRY LOG DATA - CARSWELL AFB - STAGE 2

Location ID	Sample ID	Log Date	Volumn_gal	pH_value	SC_value	Temp_value
SG	02-168	29-Feb-88	1.00	7.04	802.00	20.00
	02-168	29-Feb-88	2.00	7.10	799.00	20.00
	02-168	29-Feb-88	3.00	6.98	794.00	20.00
	02-168	29-Feb-88	4.00	7.10	802.00	20.00
	02-168	29-Feb-88	5.00	7.05	799.00	19.00
	04-32	11-Apr-88	1.00	6.87	740.00	17.50
	04-32	11-Apr-88	3.00	6.92	750.00	18.00
	04-32	11-Apr-88	4.00	6.85	710.00	17.50
	04-33	11-Apr-88	NV	NV	NV	NV
	04-34	11-Apr-88	NV	NV	NV	NV
SH	02-169	29-Feb-88	1.00	7.23	819.00	19.00
	02-169	29-Feb-88	2.00	7.22	806.00	18.00
	02-169	29-Feb-88	3.00	7.27	803.00	19.00
	02-169	29-Feb-88	4.00	7.24	795.00	19.00
	02-169	29-Feb-88	5.00	7.26	795.00	19.00
	04-31	11-Apr-88	1.00	6.83	730.00	17.50
	04-31	11-Apr-88	3.00	6.86	740.00	17.00
	04-31	11-Apr-88	5.00	6.98	750.00	17.00
BSSA	03-34	04-Mar-88	1.00	6.56	901.00	16.00
	03-34	04-Mar-88	2.00	6.62	899.00	16.00
	03-34	04-Mar-88	2.50	6.69	900.00	16.00
	04-77	15-Apr-88	NV	NV	NV	NV
	04-77	15-Apr-88	.00	NV	NV	NV
	04-77	15-Apr-88	1.00	6.82	950.00	20.00
	04-77	15-Apr-88	1.50	6.82	960.00	19.50
	04-77	15-Apr-88	2.00	6.93	960.00	19.00
BSSB	03-35	04-Mar-88	.10	6.46	1143.00	16.00
	03-35	04-Mar-88	.25	6.63	1143.00	16.00
	03-35	04-Mar-88	.50	6.62	1160.00	16.00
	04-74	15-Apr-88	.00	NV	NV	NV
	04-74	15-Apr-88	1.00	6.71	1060.00	20.00
	04-74	15-Apr-88	2.00	6.84	1150.00	19.00
	04-74	15-Apr-88	3.00	6.75	1160.00	18.50
	04-75	15-Apr-88	NV	NV	NV	NV
	04-79	15-Apr-88	NV	NV	NV	NV
	04-80	15-Apr-88	NV	NV	NV	NV
BSSC	04-76	15-Apr-88	NV	6.93	890.00	18.00
	04-76	15-Apr-88	NV	6.78	830.00	19.00

NV: Value is not available

CHEMISTRY LOG DATA - CARSWELL AFB - STAGE 2

Location ID	Sample ID	Log Date	Volumn_gal	pH_value	SC_value	Temp_value
P1	02-153	24-Feb-88	10.00	NV	NV	NV
	02-153	24-Feb-88	20.00	NV	NV	NV
	02-153	24-Feb-88	30.00	NV	NV	NV
	02-153	24-Feb-88	40.00	NV	NV	NV
	02-153	24-Feb-88	50.00	NV	NV	NV
	02-153	24-Feb-88	60.00	NV	NV	NV
	02-153	24-Feb-88	70.00	NV	NV	NV
	02-153	24-Feb-88	80.00	NV	NV	NV
	02-153	24-Feb-88	85.00	NV	NV	NV
	02-153	24-Feb-88	90.00	NV	NV	NV
	02-153	24-Feb-88	95.00	NV	NV	NV
	02-153	24-Feb-88	100.00	NV	NV	NV
P2	02-155	25-Feb-88	10.00	7.56	600.00	20.00
	02-155	25-Feb-88	20.00	7.96	590.00	20.00
	02-155	25-Feb-88	30.00	8.07	590.00	20.00
	02-155	25-Feb-88	40.00	8.07	590.00	20.00
	02-155	25-Feb-88	45.00	8.09	600.00	20.00
	02-155	25-Feb-88	50.00	8.06	590.00	20.00
	02-155	25-Feb-88	60.00	8.08	590.00	20.00
	02-155	25-Feb-88	70.00	8.08	590.00	20.00
	02-155	25-Feb-88	80.00	8.08	600.00	20.00
	02-155	25-Feb-88	90.00	8.10	590.00	20.00
	02-155	25-Feb-88	100.00	8.08	590.00	20.00
	04-11	06-Apr-88	10.00	7.68	540.00	20.00
	04-11	06-Apr-88	30.00	7.79	560.00	20.00
	04-11	06-Apr-88	40.00	7.79	560.00	20.00
	04-11	06-Apr-88	120.00	7.79	560.00	20.00

NV: Value is not available

SLUG TEST DATA - CARSWELL AFB - STAGE 2

Installation ID	Location ID	Elapsed Time	Log Date	Logging Co.	Method	Depth
CRSWL	1D	.0000	13 April 1988	RADN	SI	4.0900
CRSWL	1D	.0033	13 April 1988	RADN	SI	4.0800
CRSWL	1D	.0066	13 April 1988	RADN	SI	4.1700
CRSWL	1D	.0099	13 April 1988	RADN	SI	4.1100
CRSWL	1D	.0133	13 April 1988	RADN	SI	4.1300
CRSWL	1D	.0166	13 April 1988	RADN	SI	4.1500
CRSWL	1D	.0200	13 April 1988	RADN	SI	4.1400
CRSWL	1D	.0233	13 April 1988	RADN	SI	4.1800
CRSWL	1D	.0266	13 April 1988	RADN	SI	4.1600
CRSWL	1D	.0300	13 April 1988	RADN	SI	4.1800
CRSWL	1D	.0333	13 April 1988	RADN	SI	4.1900
CRSWL	1D	.0500	13 April 1988	RADN	SI	4.2000
CRSWL	1D	.0666	13 April 1988	RADN	SI	4.2100
CRSWL	1D	.0833	13 April 1988	RADN	SI	4.2100
CRSWL	1D	.1000	13 April 1988	RADN	SI	4.2200
CRSWL	1D	.1166	13 April 1988	RADN	SI	4.2200
CRSWL	1D	.1333	13 April 1988	RADN	SI	4.2200
CRSWL	1D	.1500	13 April 1988	RADN	SI	4.2200
CRSWL	1D	.1666	13 April 1988	RADN	SI	4.2200
CRSWL	1D	.1833	13 April 1988	RADN	SI	4.2200
CRSWL	1D	.2000	13 April 1988	RADN	SI	4.2200
SWL	1D	.2166	13 April 1988	RADN	SI	4.2200
SWL	1D	.2333	13 April 1988	RADN	SI	4.2200
CRSWL	1D	.2500	13 April 1988	RADN	SI	4.2200
CRSWL	1D	.2666	13 April 1988	RADN	SI	4.2200
CRSWL	1D	.2833	13 April 1988	RADN	SI	4.2200
CRSWL	1D	.3000	13 April 1988	RADN	SI	4.2200
CRSWL	1D	.3166	13 April 1988	RADN	SI	4.2200
CRSWL	1D	.3333	13 April 1988	RADN	SI	4.2200
CRSWL	1D	.4167	13 April 1988	RADN	SI	4.2100
CRSWL	1D	.5000	13 April 1988	RADN	SI	4.2100
CRSWL	1D	.5833	13 April 1988	RADN	SI	4.2100
CRSWL	1D	.6667	13 April 1988	RADN	SI	4.2000
CRSWL	1D	.7500	13 April 1988	RADN	SI	4.1900
CRSWL	1D	.8333	13 April 1988	RADN	SI	4.1900
CRSWL	1D	.9167	13 April 1988	RADN	SI	4.1800
CRSWL	1D	1.0000	13 April 1988	RADN	SI	4.1800
CRSWL	1D	1.0833	13 April 1988	RADN	SI	4.1700
CRSWL	1D	1.1667	13 April 1988	RADN	SI	4.1700
CRSWL	1D	1.2500	13 April 1988	RADN	SI	4.1600
CRSWL	1D	1.3333	13 April 1988	RADN	SI	4.1500
CRSWL	1D	1.4166	13 April 1988	RADN	SI	4.1500
CRSWL	1D	1.5000	13 April 1988	RADN	SI	4.1400
CRSWL	1D	1.5833	13 April 1988	RADN	SI	4.1300
CRSWL	1D	1.6667	13 April 1988	RADN	SI	4.1200
CRSWL	1D	1.7500	13 April 1988	RADN	SI	4.1100
CRSWL	1D	1.8333	13 April 1988	RADN	SI	4.1100

SLUG TEST DATA - CARSWELL AFB - STAGE 2

Installation ID	Location ID	Elapsed Time	Log Date	Logging Co.	Method	Depth
CRSWL	1D	1.9167	13 April 1988	RADN	SI	4.1100
CRSWL	1D	2.0000	13 April 1988	RADN	SI	4.1000
CRSWL	1D	2.5000	13 April 1988	RADN	SI	4.0600
CRSWL	1D	3.0000	13 April 1988	RADN	SI	4.0400
CRSWL	1D	3.5000	13 April 1988	RADN	SI	4.0100
CRSWL	1D	4.0000	13 April 1988	RADN	SI	3.9800
CRSWL	1D	4.5000	13 April 1988	RADN	SI	3.9600
CRSWL	1D	5.0000	13 April 1988	RADN	SI	3.9400
CRSWL	1D	5.5000	13 April 1988	RADN	SI	3.9200
CRSWL	1D	6.0000	13 April 1988	RADN	SI	3.9100
CRSWL	1D	6.5000	13 April 1988	RADN	SI	3.8900
CRSWL	1D	7.0000	13 April 1988	RADN	SI	3.8700
CRSWL	1D	7.5000	13 April 1988	RADN	SI	3.8500
CRSWL	1D	8.0000	13 April 1988	RADN	SI	3.8400
CRSWL	1D	8.5000	13 April 1988	RADN	SI	3.8200
CRSWL	1D	9.0000	13 April 1988	RADN	SI	3.8100
CRSWL	1D	9.5000	13 April 1988	RADN	SI	3.7900
CRSWL	1D	10.0000	13 April 1988	RADN	SI	3.7800
CRSWL	1D	12.0000	13 April 1988	RADN	SI	3.7200
CRSWL	1D	14.0000	13 April 1988	RADN	SI	3.6700
CRSWL	1D	16.0000	13 April 1988	RADN	SI	3.6300
CRSWL	1D	18.0000	13 April 1988	RADN	SI	3.5700
CRSWL	1D	20.0000	13 April 1988	RADN	SI	3.5300
CRSWL	1D	22.0000	13 April 1988	RADN	SI	3.4900
CRSWL	1D	24.0000	13 April 1988	RADN	SI	3.4600
CRSWL	1D	26.0000	13 April 1988	RADN	SI	3.4200
CRSWL	1D	28.0000	13 April 1988	RADN	SI	3.3900
CRSWL	1D	30.0000	13 April 1988	RADN	SI	3.3600
CRSWL	1D	32.0000	13 April 1988	RADN	SI	3.3200
CRSWL	1D	34.0000	13 April 1988	RADN	SI	3.2900
CRSWL	1D	36.0000	13 April 1988	RADN	SI	3.2600
CRSWL	1D	38.0000	13 April 1988	RADN	SI	3.2400
CRSWL	1D	40.0000	13 April 1988	RADN	SI	3.2200
CRSWL	1D	42.0000	13 April 1988	RADN	SI	3.1900
CRSWL	1D	44.0000	13 April 1988	RADN	SI	3.1600
CRSWL	1D	46.0000	13 April 1988	RADN	SI	3.1400
CRSWL	1D	48.0000	13 April 1988	RADN	SI	3.1000
CRSWL	1D	50.0000	13 April 1988	RADN	SI	3.0800
CRSWL	1D	52.0000	13 April 1988	RADN	SI	3.0500
CRSWL	1D	54.0000	13 April 1988	RADN	SI	3.0400
CRSWL	1D	56.0000	13 April 1988	RADN	SI	3.0100
CRSWL	1D	58.0000	13 April 1988	RADN	SI	2.9900
CRSWL	1D	60.0000	13 April 1988	RADN	SI	2.9700
CRSWL	1D	62.0000	13 April 1988	RADN	SI	2.9600
CRSWL	1D	64.0000	13 April 1988	RADN	SI	2.9400
CRSWL	1D	66.0000	13 April 1988	RADN	SI	2.9200
CRSWL	1D	68.0000	13 April 1988	RADN	SI	2.9100

SLUG TEST DATA - CARSWELL AFB - STAGE 2

Installation ID	Location ID	Elapsed Time	Log Date	Logging Co.	Method	Depth
CRSWL	1D	70.0000	13 April 1988	RADN	SI	2.8900
CRSWL	1D	72.0000	13 April 1988	RADN	SI	2.8800
CRSWL	1D	74.0000	13 April 1988	RADN	SI	2.8700
CRSWL	1D	76.0000	13 April 1988	RADN	SI	2.8500
CRSWL	1D	78.0000	13 April 1988	RADN	SI	2.8400
CRSWL	1D	80.0000	13 April 1988	RADN	SI	2.8300
CRSWL	1D	82.0000	13 April 1988	RADN	SI	2.8200
CRSWL	1D	84.0000	13 April 1988	RADN	SI	2.8100
CRSWL	1D	86.0000	13 April 1988	RADN	SI	2.8000
CRSWL	1D	88.0000	13 April 1988	RADN	SI	2.7800
CRSWL	1D	90.0000	13 April 1988	RADN	SI	2.7700
CRSWL	1D	92.0000	13 April 1988	RADN	SI	2.7700
CRSWL	1D	94.0000	13 April 1988	RADN	SI	2.7600
CRSWL	1D	96.0000	13 April 1988	RADN	SI	2.7500
CRSWL	1D	98.0000	13 April 1988	RADN	SI	2.7400
CRSWL	1D	100.0000	13 April 1988	RADN	SI	2.7300
CRSWL	1D	110.0000	13 April 1988	RADN	SI	2.7000
CRSWL	1D	120.0000	13 April 1988	RADN	SI	2.6800
CRSWL	1D	130.0000	13 April 1988	RADN	SI	2.6500
CRSWL	1D	140.0000	13 April 1988	RADN	SI	2.6400
CRSWL	1D	150.0000	13 April 1988	RADN	SI	2.6300
CRSWL	1D	160.0000	13 April 1988	RADN	SI	2.6200
RSWL	1D	170.0000	13 April 1988	RADN	SI	2.6100
CRSWL	1D	180.0000	13 April 1988	RADN	SI	2.6100
CRSWL	1D	190.0000	13 April 1988	RADN	SI	2.6100

SLUG TEST DATA · CARSWELL AFB · STAGE 2

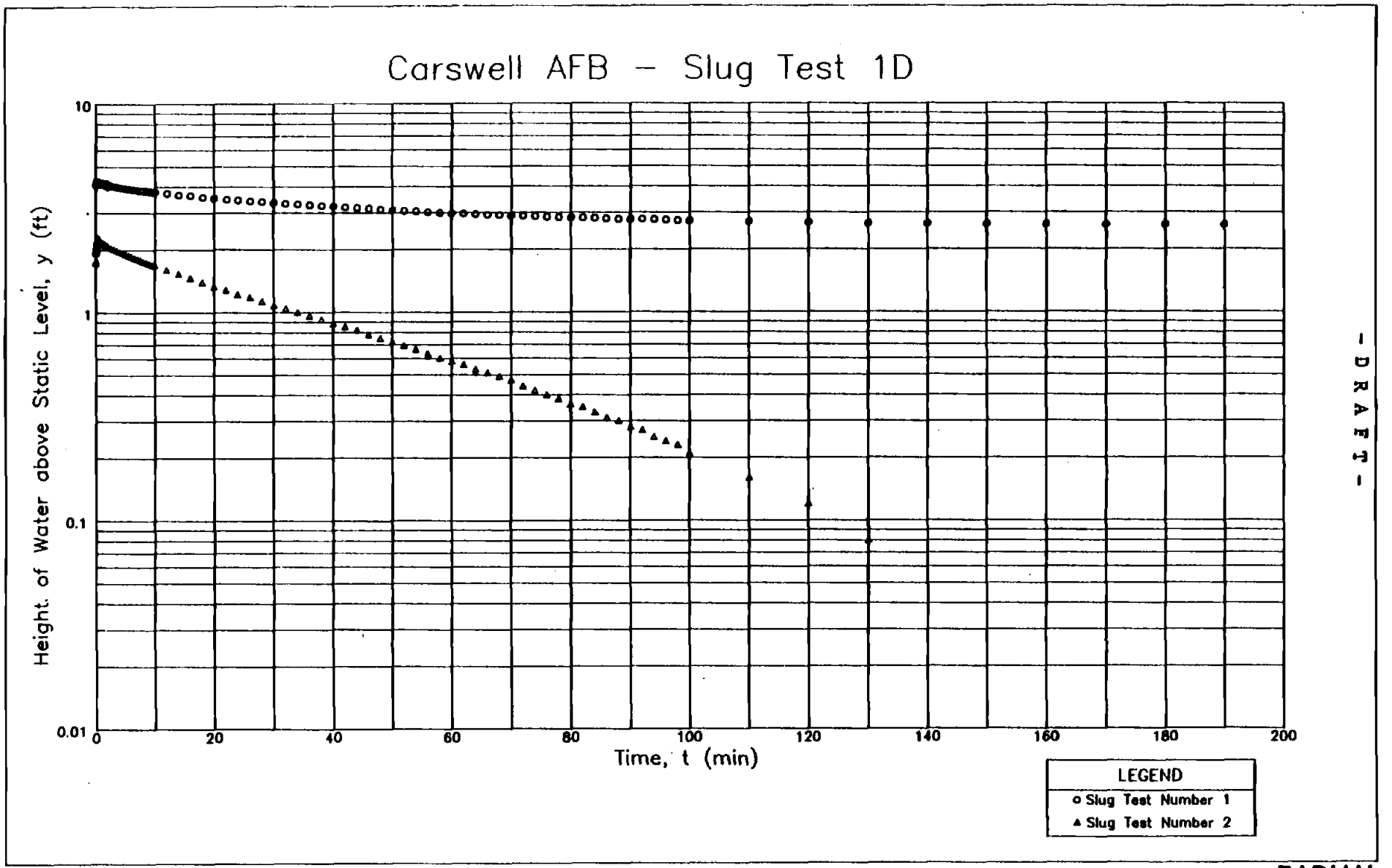
Installation ID	Location ID	Elapsed Time	Log Date	Logging Co.	Method	Depth
CRSWL	1D	.0000	13 April 1988	RADN	SI	2.0900
CRSWL	1D	.0033	13 April 1988	RADN	SI	1.7300
CRSWL	1D	.0066	13 April 1988	RADN	SI	2.0000
CRSWL	1D	.0099	13 April 1988	RADN	SI	2.0400
CRSWL	1D	.0133	13 April 1988	RADN	SI	1.7700
CRSWL	1D	.0166	13 April 1988	RADN	SI	2.0100
CRSWL	1D	.0200	13 April 1988	RADN	SI	1.9800
CRSWL	1D	.0233	13 April 1988	RADN	SI	1.9300
CRSWL	1D	.0266	13 April 1988	RADN	SI	2.0400
CRSWL	1D	.0300	13 April 1988	RADN	SI	1.9900
CRSWL	1D	.0333	13 April 1988	RADN	SI	2.0100
CRSWL	1D	.0500	13 April 1988	RADN	SI	2.0400
CRSWL	1D	.0666	13 April 1988	RADN	SI	2.0900
CRSWL	1D	.0833	13 April 1988	RADN	SI	2.1300
CRSWL	1D	.1000	13 April 1988	RADN	SI	2.1600
CRSWL	1D	.1166	13 April 1988	RADN	SI	2.1900
CRSWL	1D	.1333	13 April 1988	RADN	SI	2.2100
CRSWL	1D	.1500	13 April 1988	RADN	SI	2.2200
CRSWL	1D	.1666	13 April 1988	RADN	SI	2.2400
CRSWL	1D	.1833	13 April 1988	RADN	SI	2.2500
CRSWL	1D	.2000	13 April 1988	RADN	SI	2.2600
CRSWL	1D	.2166	13 April 1988	RADN	SI	2.2700
CRSWL	1D	.2333	13 April 1988	RADN	SI	2.2700
CRSWL	1D	.2500	13 April 1988	RADN	SI	2.2800
CRSWL	1D	.2666	13 April 1988	RADN	SI	2.2800
CRSWL	1D	.2833	13 April 1988	RADN	SI	2.2800
CRSWL	1D	.3000	13 April 1988	RADN	SI	2.2800
CRSWL	1D	.3166	13 April 1988	RADN	SI	2.2900
CRSWL	1D	.3333	13 April 1988	RADN	SI	2.2900
CRSWL	1D	.4167	13 April 1988	RADN	SI	2.2800
CRSWL	1D	.5000	13 April 1988	RADN	SI	2.2700
CRSWL	1D	.5833	13 April 1988	RADN	SI	2.2500
CRSWL	1D	.6667	13 April 1988	RADN	SI	2.2400
CRSWL	1D	.7500	13 April 1988	RADN	SI	2.2300
CRSWL	1D	.8333	13 April 1988	RADN	SI	2.2100
CRSWL	1D	.9167	13 April 1988	RADN	SI	2.2000
CRSWL	1D	1.0000	13 April 1988	RADN	SI	2.1900
CRSWL	1D	1.0833	13 April 1988	RADN	SI	2.1800
CRSWL	1D	1.1667	13 April 1988	RADN	SI	2.1700
CRSWL	1D	1.2500	13 April 1988	RADN	SI	2.1600
CRSWL	1D	1.3333	13 April 1988	RADN	SI	2.1500
CRSWL	1D	1.4166	13 April 1988	RADN	SI	2.1400
CRSWL	1D	1.5000	13 April 1988	RADN	SI	2.1300
CRSWL	1D	1.5833	13 April 1988	RADN	SI	2.1200
CRSWL	1D	1.6667	13 April 1988	RADN	SI	2.1200
CRSWL	1D	1.7500	13 April 1988	RADN	SI	2.1100
CRSWL	1D	1.8333	13 April 1988	RADN	SI	2.1000

SLUG TEST DATA - CARSWELL AFB - STAGE 2

Installation ID	Location ID	Elapsed Time	Log Date	Logging Co.	Method	Depth
CRSWL	1D	1.9167	13 April 1988	RADN	SI	2.0900
CRSWL	1D	2.0000	13 April 1988	RADN	SI	2.0900
CRSWL	1D	2.5000	13 April 1988	RADN	SI	2.0500
CRSWL	1D	3.0000	13 April 1988	RADN	SI	2.0200
CRSWL	1D	3.5000	13 April 1988	RADN	SI	1.9900
CRSWL	1D	4.0000	13 April 1988	RADN	SI	1.9600
CRSWL	1D	4.5000	13 April 1988	RADN	SI	1.9400
CRSWL	1D	5.0000	13 April 1988	RADN	SI	1.9100
CRSWL	1D	5.5000	13 April 1988	RADN	SI	1.8800
CRSWL	1D	6.0000	13 April 1988	RADN	SI	1.8600
CRSWL	1D	6.5000	13 April 1988	RADN	SI	1.8300
CRSWL	1D	7.0000	13 April 1988	RADN	SI	1.8100
CRSWL	1D	7.5000	13 April 1988	RADN	SI	1.7900
CRSWL	1D	8.0000	13 April 1988	RADN	SI	1.7600
CRSWL	1D	8.5000	13 April 1988	RADN	SI	1.7400
CRSWL	1D	9.0000	13 April 1988	RADN	SI	1.7200
CRSWL	1D	9.5000	13 April 1988	RADN	SI	1.7000
CRSWL	1D	10.0000	13 April 1988	RADN	SI	1.6800
CRSWL	1D	12.0000	13 April 1988	RADN	SI	1.6000
CRSWL	1D	14.0000	13 April 1988	RADN	SI	1.5300
CRSWL	1D	16.0000	13 April 1988	RADN	SI	1.4600
CRSWL	1D	18.0000	13 April 1988	RADN	SI	1.3900
CRSWL	1D	20.0000	13 April 1988	RADN	SI	1.3300
CRSWL	1D	22.0000	13 April 1988	RADN	SI	1.2800
CRSWL	1D	24.0000	13 April 1988	RADN	SI	1.2200
CRSWL	1D	26.0000	13 April 1988	RADN	SI	1.1800
CRSWL	1D	28.0000	13 April 1988	RADN	SI	1.1300
CRSWL	1D	30.0000	13 April 1988	RADN	SI	1.0800
CRSWL	1D	32.0000	13 April 1988	RADN	SI	1.0400
CRSWL	1D	34.0000	13 April 1988	RADN	SI	1.0000
CRSWL	1D	36.0000	13 April 1988	RADN	SI	.9600
CRSWL	1D	38.0000	13 April 1988	RADN	SI	.9200
CRSWL	1D	40.0000	13 April 1988	RADN	SI	.8800
CRSWL	1D	42.0000	13 April 1988	RADN	SI	.8500
CRSWL	1D	44.0000	13 April 1988	RADN	SI	.8200
CRSWL	1D	46.0000	13 April 1988	RADN	SI	.7800
CRSWL	1D	48.0000	13 April 1988	RADN	SI	.7500
CRSWL	1D	50.0000	13 April 1988	RADN	SI	.7200
CRSWL	1D	52.0000	13 April 1988	RADN	SI	.6900
CRSWL	1D	54.0000	13 April 1988	RADN	SI	.6600
CRSWL	1D	56.0000	13 April 1988	RADN	SI	.6300
CRSWL	1D	58.0000	13 April 1988	RADN	SI	.6000
CRSWL	1D	60.0000	13 April 1988	RADN	SI	.5800
CRSWL	1D	62.0000	13 April 1988	RADN	SI	.5600
CRSWL	1D	64.0000	13 April 1988	RADN	SI	.5300
CRSWL	1D	66.0000	13 April 1988	RADN	SI	.5100
CRSWL	1D	68.0000	13 April 1988	RADN	SI	.4900

SLUG TEST DATA · CARSWELL AFB · STAGE 2

Installation ID	Location ID	Elapsed Time	Log Date	Logging Co.	Method	Depth
CRSWL	1D	70.0000	13 April 1988	RADN	SI	.4700
CRSWL	1D	72.0000	13 April 1988	RADN	SI	.4400
CRSWL	1D	74.0000	13 April 1988	RADN	SI	.4200
CRSWL	1D	76.0000	13 April 1988	RADN	SI	.4000
CRSWL	1D	78.0000	13 April 1988	RADN	SI	.3800
CRSWL	1D	80.0000	13 April 1988	RADN	SI	.3600
CRSWL	1D	82.0000	13 April 1988	RADN	SI	.3500
CRSWL	1D	84.0000	13 April 1988	RADN	SI	.3300
CRSWL	1D	86.0000	13 April 1988	RADN	SI	.3100
CRSWL	1D	88.0000	13 April 1988	RADN	SI	.3000
CRSWL	1D	90.0000	13 April 1988	RADN	SI	.2800
CRSWL	1D	92.0000	13 April 1988	RADN	SI	.2700
CRSWL	1D	94.0000	13 April 1988	RADN	SI	.2500
CRSWL	1D	96.0000	13 April 1988	RADN	SI	.2400
CRSWL	1D	98.0000	13 April 1988	RADN	SI	.2300
CRSWL	1D	100.0000	13 April 1988	RADN	SI	.2100
CRSWL	1D	110.0000	13 April 1988	RADN	SI	.1600
CRSWL	1D	120.0000	13 April 1988	RADN	SI	.1200
CRSWL	1D	130.0000	13 April 1988	RADN	SI	.0800



RADIAN CORPORATION

- DRAFT -

RADIAN CORPORATION

CALCULATION SHEET

-DRAFT-

CALC. NO. _____

SIGNATURE LH French DATE 18 June 88 CHECKED _____ DATE _____

PROJECT Caswell AFB IRP Stage 2 JOB NO. 227-005-04-03

SUBJECT Analysis of Slug Test Data - Well 1D SHEET 1 OF 2 SHEETS

[Ref. Bouwer and Rice, (1976) Water Resources Research, v. 12, no. 3]

Solving the analog equation: $\ln(R_e/r_w)$ ...

$$\ln(R_e/r_w) = \left(\frac{1.1}{\ln(H/r_w)} + \frac{C}{L/r_w}\right)^{-1}$$

where, $H = 3.6$ ft, $L = 10$ ft, $r_w = 0.28$ ft, $C = 2.25$ $\Rightarrow \ln(R_e/r_w) = 2.07$

Hydraulic Conductivity, $K = \dfrac{r_c^2 \ln(R_e/r_w)}{2L}\left[\frac{1}{t}\ln\left(\frac{y_c}{y_t}\right)\right]$

where, $r_c^2 = 6.94 \times 10^{-3}$ ft^2

$t = 20$ min

$y_t = 1.3$ ft

$y_c = 2.25$ ft

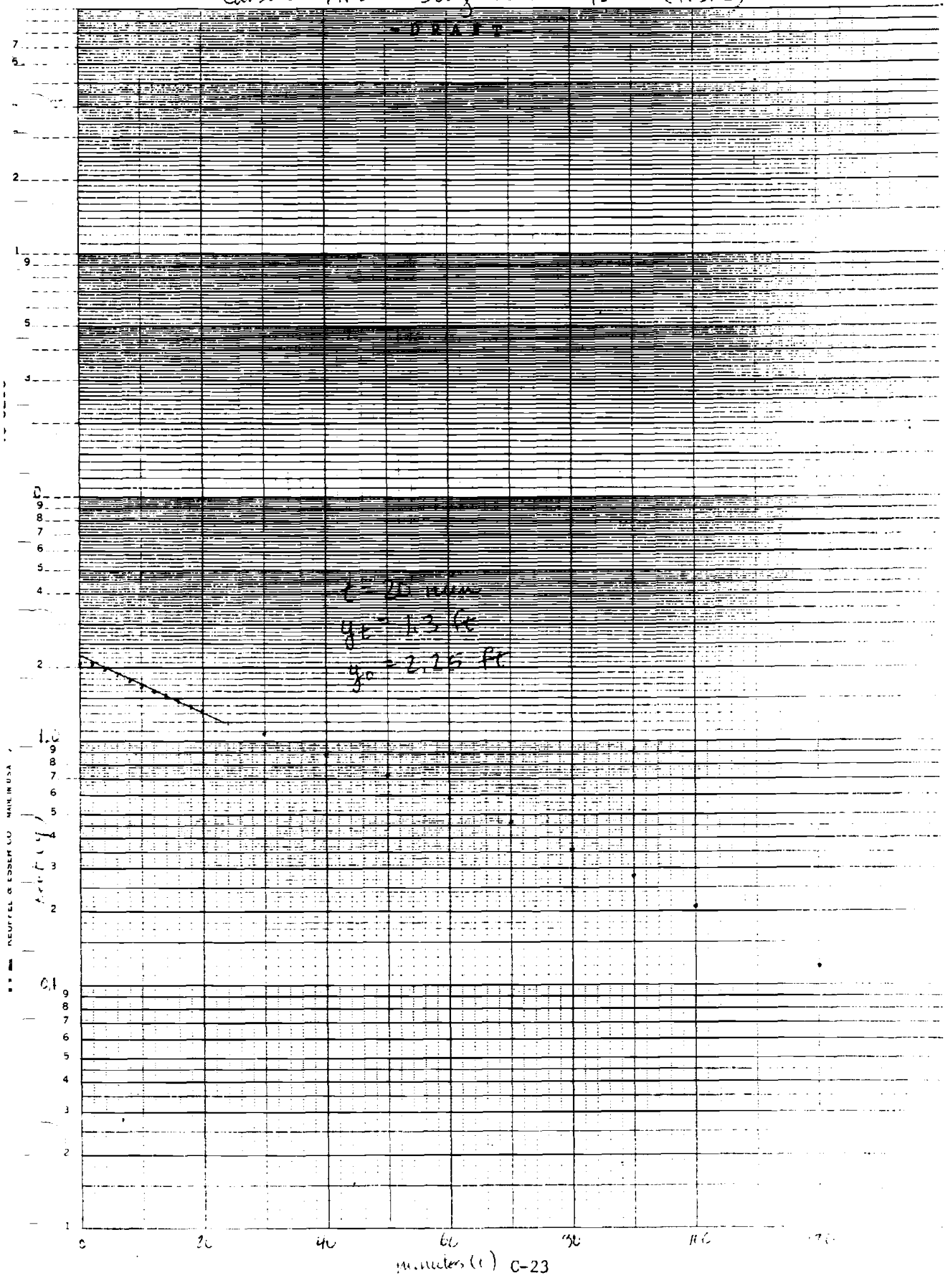
See attached graph

Solving for $K \Rightarrow$

$$K = \frac{(6.94\times10^{-3})(2.07)}{2\times10}\left[\frac{1}{20}\ln\left(\frac{2.25}{1.3}\right)\right] \times \frac{3.48}{60}$$

$$K = 1 \times 10^{-5}$$

Carswell AFB Slug Test 1D (Test 2)



SLUG TEST DATA · CARSWELL AFB · STAGE 2

Installation ID	Location ID	Elapsed Time	Log Date	Logging Co.	Method	Depth
CRSWL	1E	.0000	13 April 1988	RADN	SI	6.2100
CRSWL	1E	.0033	13 April 1988	RADN	SI	6.2100
CRSWL	1E	.0066	13 April 1988	RADN	SI	6.1200
CRSWL	1E	.0099	13 April 1988	RADN	SI	6.0000
CRSWL	1E	.0133	13 April 1988	RADN	SI	5.9300
CRSWL	1E	.0166	13 April 1988	RADN	SI	5.8500
CRSWL	1E	.0200	13 April 1988	RADN	SI	5.8800
CRSWL	1E	.0233	13 April 1988	RADN	SI	5.6900
CRSWL	1E	.0266	13 April 1988	RADN	SI	5.7700
CRSWL	1E	.0300	13 April 1988	RADN	SI	5.6700
CRSWL	1E	.0333	13 April 1988	RADN	SI	5.4700
CRSWL	1E	.0500	13 April 1988	RADN	SI	5.0500
CRSWL	1E	.0666	13 April 1988	RADN	SI	4.6700
CRSWL	1E	.0833	13 April 1988	RADN	SI	4.3900
CRSWL	1E	.1000	13 April 1988	RADN	SI	4.1600
CRSWL	1E	.1166	13 April 1988	RADN	SI	3.8800
CRSWL	1E	.1333	13 April 1988	RADN	SI	3.6300
CRSWL	1E	.1500	13 April 1988	RADN	SI	3.4200
CRSWL	1E	.1666	13 April 1988	RADN	SI	3.1800
CRSWL	1E	.1833	13 April 1988	RADN	SI	2.9500
CRSWL	1E	.2000	13 April 1988	RADN	SI	2.7400
CRSWL	1E	.2166	13 April 1988	RADN	SI	2.5500
CRSWL	1E	.2333	13 April 1988	RADN	SI	2.3800
CRSWL	1E	.2500	13 April 1988	RADN	SI	2.2200
CRSWL	1E	.2666	13 April 1988	RADN	SI	2.0700
CRSWL	1E	.2833	13 April 1988	RADN	SI	1.9300
CRSWL	1E	.3000	13 April 1988	RADN	SI	1.7600
CRSWL	1E	.3166	13 April 1988	RADN	SI	1.5700
CRSWL	1E	.3333	13 April 1988	RADN	SI	1.3800
CRSWL	1E	.4167	13 April 1988	RADN	SI	.9600
CRSWL	1E	.5000	13 April 1988	RADN	SI	.9300
CRSWL	1E	.5833	13 April 1988	RADN	SI	.9000
CRSWL	1E	.6667	13 April 1988	RADN	SI	.8700
CRSWL	1E	.7500	13 April 1988	RADN	SI	.8500
CRSWL	1E	.8333	13 April 1988	RADN	SI	.8200
CRSWL	1E	.9167	13 April 1988	RADN	SI	.7900
CRSWL	1E	1.0000	13 April 1988	RADN	SI	.7700
CRSWL	1E	1.0833	13 April 1988	RADN	SI	.7400
CRSWL	1E	1.1667	13 April 1988	RADN	SI	.7200
CRSWL	1E	1.2500	13 April 1988	RADN	SI	.6900
CRSWL	1E	1.3333	13 April 1988	RADN	SI	.6700
CRSWL	1E	1.4166	13 April 1988	RADN	SI	.6500
CRSWL	1E	1.5000	13 April 1988	RADN	SI	.6300
CRSWL	1E	1.5833	13 April 1988	RADN	SI	.6000
CRSWL	1E	1.6667	13 April 1988	RADN	SI	.5800
CRSWL	1E	1.7500	13 April 1988	RADN	SI	.5600
CRSWL	1E	1.8333	13 April 1988	RADN	SI	.5400

SLUG TEST DATA - CARSWELL AFB - STAGE 2

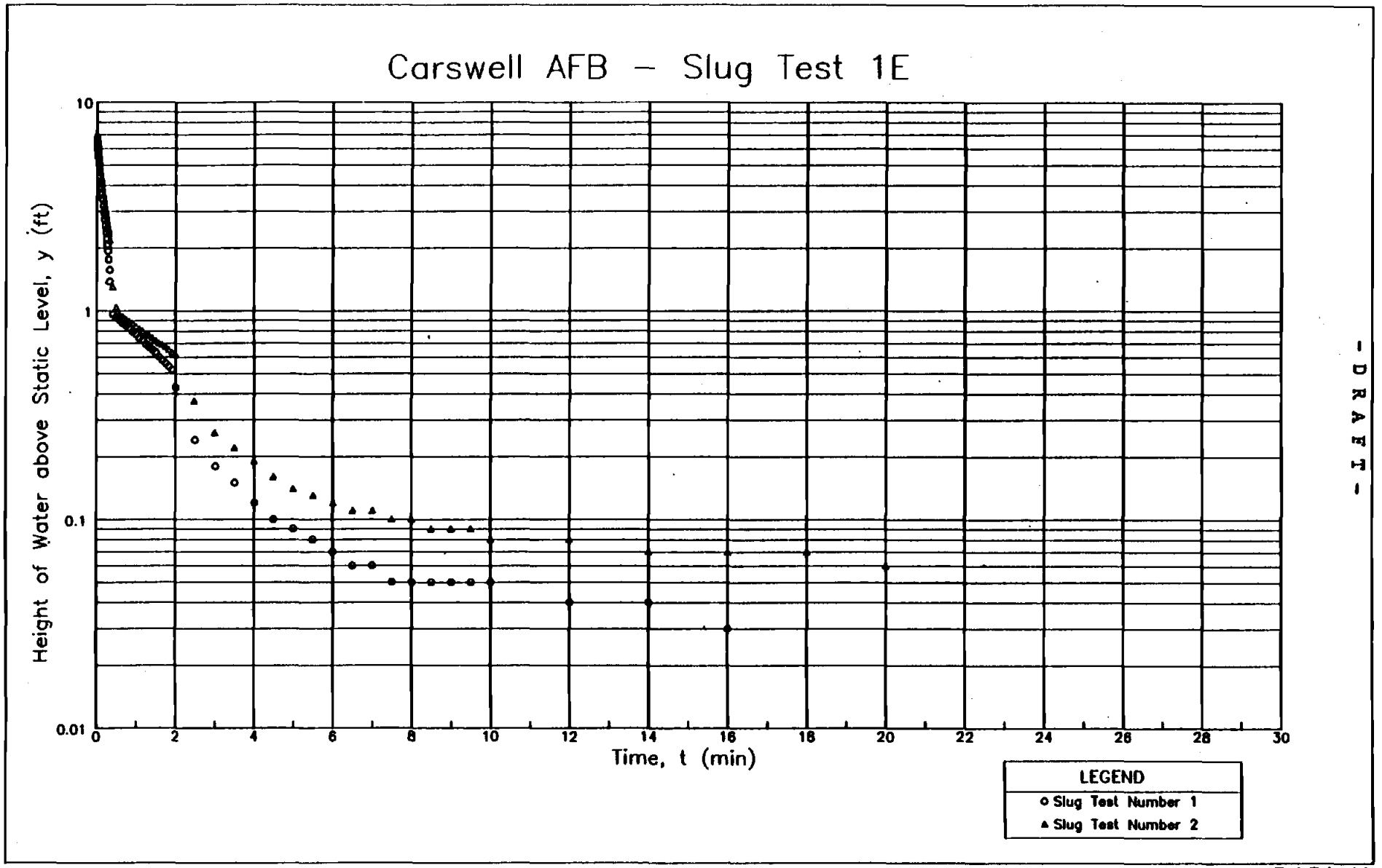
Installation ID	Location ID	Elapsed Time	Log Date	Logging Co.	Method	Depth
CRSWL	1E	1.9167	13 April 1988	RADN	SI	.5200
CRSWL	1E	2.0000	13 April 1988	RADN	SI	.4300
CRSWL	1E	2.5000	13 April 1988	RADN	SI	.2400
CRSWL	1E	3.0000	13 April 1988	RADN	SI	.1800
CRSWL	1E	3.5000	13 April 1988	RADN	SI	.1500
CRSWL	1E	4.0000	13 April 1988	RADN	SI	.1200
CRSWL	1E	4.5000	13 April 1988	RADN	SI	.1000
CRSWL	1E	5.0000	13 April 1988	RADN	SI	.0900
CRSWL	1E	5.5000	13 April 1988	RADN	SI	.0800
CRSWL	1E	6.0000	13 April 1988	RADN	SI	.0700
CRSWL	1E	6.5000	13 April 1988	RADN	SI	.0600
CRSWL	1E	7.0000	13 April 1988	RADN	SI	.0600
CRSWL	1E	7.5000	13 April 1988	RADN	SI	.0500
CRSWL	1E	8.0000	13 April 1988	RADN	SI	.0500
CRSWL	1E	8.5000	13 April 1988	RADN	SI	.0500
CRSWL	1E	9.0000	13 April 1988	RADN	SI	.0500
CRSWL	1E	9.5000	13 April 1988	RADN	SI	.0500
CRSWL	1E	10.0000	13 April 1988	RADN	SI	.0500
CRSWL	1E	12.0000	13 April 1988	RADN	SI	.0400
CRSWL	1E	14.0000	13 April 1988	RADN	SI	.0400
CRSWL	1E	16.0000	13 April 1988	RADN	SI	.0300

SLUG TEST DATA - CARSWELL AFB - STAGE 2

Installation ID	Location ID	Elapsed Time	Log Date	Logging Co.	Method	Depth
CRSWL	1E	.0000	13 April 1988	RADN	SI	7.0200
CRSWL	1E	.0033	13 April 1988	RADN	SI	6.9000
CRSWL	1E	.0066	13 April 1988	RADN	SI	6.8700
CRSWL	1E	.0099	13 April 1988	RADN	SI	6.8800
CRSWL	1E	.0133	13 April 1988	RADN	SI	6.7900
CRSWL	1E	.0166	13 April 1988	RADN	SI	6.6900
CRSWL	1E	.0200	13 April 1988	RADN	SI	6.6800
CRSWL	1E	.0233	13 April 1988	RADN	SI	6.5600
CRSWL	1E	.0266	13 April 1988	RADN	SI	6.4100
CRSWL	1E	.0300	13 April 1988	RADN	SI	6.3200
CRSWL	1E	.0333	13 April 1988	RADN	SI	6.2800
CRSWL	1E	.0500	13 April 1988	RADN	SI	5.8600
CRSWL	1E	.0666	13 April 1988	RADN	SI	5.5000
CRSWL	1E	.0833	13 April 1988	RADN	SI	5.1600
CRSWL	1E	.1000	13 April 1988	RADN	SI	4.8900
CRSWL	1E	.1166	13 April 1988	RADN	SI	4.6100
CRSWL	1E	.1333	13 April 1988	RADN	SI	4.3200
CRSWL	1E	.1500	13 April 1988	RADN	SI	4.0800
CRSWL	1E	.1666	13 April 1988	RADN	SI	3.8400
CRSWL	1E	.1833	13 April 1988	RADN	SI	3.6000
CRSWL	1E	.2000	13 April 1988	RADN	SI	3.3800
CRSWL	1E	.2166	13 April 1988	RADN	SI	3.2100
CRSWL	1E	.2333	13 April 1988	RADN	SI	3.0200
CRSWL	1E	.2500	13 April 1988	RADN	SI	2.8600
CRSWL	1E	.2666	13 April 1988	RADN	SI	2.7200
CRSWL	1E	.2833	13 April 1988	RADN	SI	2.5800
CRSWL	1E	.3000	13 April 1988	RADN	SI	2.4600
CRSWL	1E	.3166	13 April 1988	RADN	SI	2.3400
CRSWL	1E	.3333	13 April 1988	RADN	SI	2.1800
CRSWL	1E	.4167	13 April 1988	RADN	SI	1.3000
CRSWL	1E	.5000	13 April 1988	RADN	SI	1.0400
CRSWL	1E	.5833	13 April 1988	RADN	SI	.9500
CRSWL	1E	.6667	13 April 1988	RADN	SI	.9400
CRSWL	1E	.7500	13 April 1988	RADN	SI	.9100
CRSWL	1E	.8333	13 April 1988	RADN	SI	.8900
CRSWL	1E	.9167	13 April 1988	RADN	SI	.8700
CRSWL	1E	1.0000	13 April 1988	RADN	SI	.8400
CRSWL	1E	1.0833	13 April 1988	RADN	SI	.8200
CRSWL	1E	1.1667	13 April 1988	RADN	SI	.8000
CRSWL	1E	1.2500	13 April 1988	RADN	SI	.7800
CRSWL	1E	1.3333	13 April 1988	RADN	SI	.7600
CRSWL	1E	1.4166	13 April 1988	RADN	SI	.7400
CRSWL	1E	1.5000	13 April 1988	RADN	SI	.7200
CRSWL	1E	1.5833	13 April 1988	RADN	SI	.7000
CRSWL	1E	1.6667	13 April 1988	RADN	SI	.6900
CRSWL	1E	1.7500	13 April 1988	RADN	SI	.6700
CRSWL	1E	1.8333	13 April 1988	RADN	SI	.6500

SLUG TEST DATA - CARSWELL AFB - STAGE 2

Installation ID	Location ID	Elapsed Time	Log Date	Logging Co.	Method	Depth
CRSWL	1E	1.9167	13 April 1988	RADN	SI	.6300
CRSWL	1E	2.0000	13 April 1988	RADN	SI	.6200
CRSWL	1E	2.5000	13 April 1988	RADN	SI	.3700
CRSWL	1E	3.0000	13 April 1988	RADN	SI	.2600
CRSWL	1E	3.5000	13 April 1988	RADN	SI	.2200
CRSWL	1E	4.0000	13 April 1988	RADN	SI	.1900
CRSWL	1E	4.5000	13 April 1988	RADN	SI	.1600
CRSWL	1E	5.0000	13 April 1988	RADN	SI	.1400
CRSWL	1E	5.5000	13 April 1988	RADN	SI	.1300
CRSWL	1E	6.0000	13 April 1988	RADN	SI	.1200
CRSWL	1E	6.5000	13 April 1988	RADN	SI	.1100
CRSWL	1E	7.0000	13 April 1988	RADN	SI	.1100
CRSWL	1E	7.5000	13 April 1988	RADN	SI	.1000
CRSWL	1E	8.0000	13 April 1988	RADN	SI	.1000
CRSWL	1E	8.5000	13 April 1988	RADN	SI	.0900
CRSWL	1E	9.0000	13 April 1988	RADN	SI	.0900
CRSWL	1E	9.5000	13 April 1988	RADN	SI	.0900
CRSWL	1E	10.0000	13 April 1988	RADN	SI	.0800
CRSWL	1E	12.0000	13 April 1988	RADN	SI	.0800
CRSWL	1E	14.0000	13 April 1988	RADN	SI	.0700
CRSWL	1E	16.0000	13 April 1988	RADN	SI	.0700
CRSWL	1E	18.0000	13 April 1988	RADN	SI	.0700
CRSWL	1E	20.0000	13 April 1988	RADN	SI	.0600



RADIAN CORPORATION

- DRAFT -

RADIAN CORPORATION

CALCULATION SHEET
- DRAFT -

CALC. NO. _____

SIGNATURE W G McIntyre DATE 13 July 88 CHECKED _____ DATE _____

PROJECT Caswell AFB IRP Stage 2 JOB NO. 227-005-04-03

SUBJECT Analysis of Slug Test Data - WELL E SHEET _____ OF _____ SHEETS

[Ref. Bower and Rice, 1976, Water Resources Research, V 12, No 3]

Solving the analog equation: $\ln(R_e/r_w)$...

$$\ln(R_e/r_w) = \left(\frac{1.1}{\ln(H/r_w)} + C/L/r_w\right)^{-1}$$

where, $H = 11$ ft.
$L = 10$ ft.
$r_w = 0.28$ ft
$C = 2.25$
$\Rightarrow \ln R_e/r_w = 2.28$

Hydraulic Conductivity, $K = \dfrac{r_c^2 \ln(R_e/r_w)}{2L}\left[\dfrac{1}{t}\ln\left(\dfrac{y_0}{y_t}\right)\right]$

where, $r_c^2 = 6.94 \times 10^{-3}$ ft^2

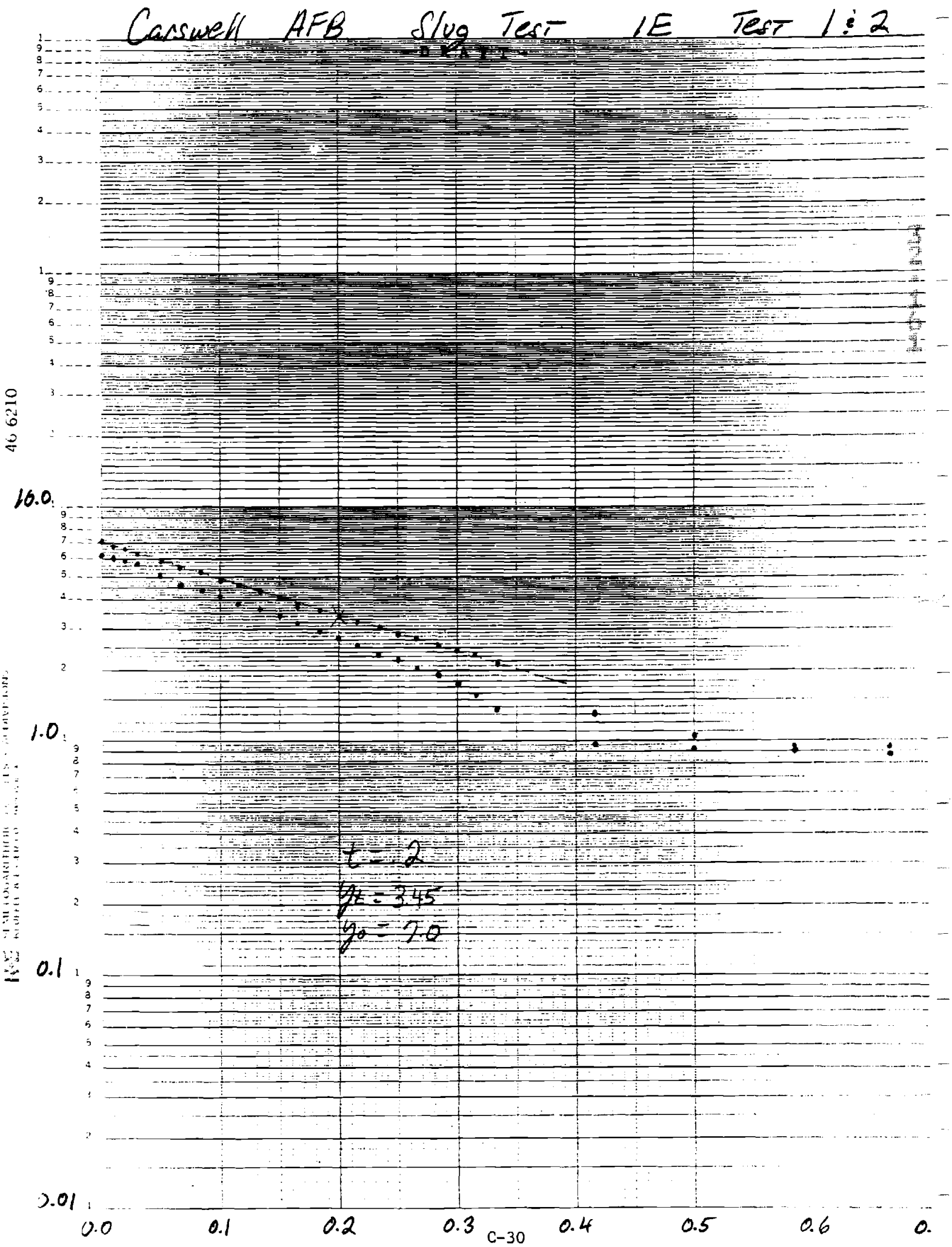
$t = 0.2$ min
$y_t = 3.45$ ft
$y_0 = 7.0$ ft.
} from plot of data on attached graph

Solving for K,

$$K = \frac{(6.94 \times 10^{-3})(2.28)}{2 \times 10}\left[\frac{1}{0.2}\ln\left(\frac{7.0}{3.45}\right)\right] \times \frac{30.48 \text{ cm/ft}}{60 \text{ sec/min}}$$

$$K = 1.42 \times 10^{-3} \text{ cm/sec}$$

4-81-3361


Carswell AFB Slug Test 1E Test 1:2
16.0
1.0
0.1
0.01
0.0
0.1
0.2
0.3
0.4
0.5
0.6
t = 2
yt = 3.45
yo = 7.0

SLUG TEST DATA - CARSWELL AFB - STAGE 2

Installation ID	Location ID	Elapsed Time	Log Date	Logging Co.	Method	Depth
CRSWL	4A	.0000	6 April 1988	RADN	SI	10.2600
CRSWL	4A	.0033	6 April 1988	RADN	SI	10.2900
CRSWL	4A	.0066	6 April 1988	RADN	SI	10.1000
CRSWL	4A	.0099	6 April 1988	RADN	SI	9.9700
CRSWL	4A	.0133	6 April 1988	RADN	SI	9.9700
CRSWL	4A	.0166	6 April 1988	RADN	SI	9.9300
CRSWL	4A	.0200	6 April 1988	RADN	SI	9.9400
CRSWL	4A	.0233	6 April 1988	RADN	SI	9.9000
CRSWL	4A	.0266	6 April 1988	RADN	SI	9.8300
CRSWL	4A	.0300	6 April 1988	RADN	SI	9.7700
CRSWL	4A	.0333	6 April 1988	RADN	SI	9.7600
CRSWL	4A	.0500	6 April 1988	RADN	SI	9.5700
CRSWL	4A	.0666	6 April 1988	RADN	SI	9.4600
CRSWL	4A	.0833	6 April 1988	RADN	SI	9.3100
CRSWL	4A	.1000	6 April 1988	RADN	SI	9.1800
CRSWL	4A	.1166	6 April 1988	RADN	SI	9.0500
CRSWL	4A	.1333	6 April 1988	RADN	SI	8.9300
CRSWL	4A	.1500	6 April 1988	RADN	SI	8.8100
CRSWL	4A	.1666	6 April 1988	RADN	SI	8.6900
CRSWL	4A	.1833	6 April 1988	RADN	SI	8.5800
CRSWL	4A	.2000	6 April 1988	RADN	SI	8.4700
SWL	4A	.2166	6 April 1988	RADN	SI	8.3600
SWL	4A	.2333	6 April 1988	RADN	SI	8.2600
CRSWL	4A	.2500	6 April 1988	RADN	SI	8.1600
CRSWL	4A	.2666	6 April 1988	RADN	SI	8.0600
CRSWL	4A	.2833	6 April 1988	RADN	SI	7.9700
CRSWL	4A	.3000	6 April 1988	RADN	SI	7.8700
CRSWL	4A	.3166	6 April 1988	RADN	SI	7.7800
CRSWL	4A	.3333	6 April 1988	RADN	SI	7.6900
CRSWL	4A	.4167	6 April 1988	RADN	SI	7.2700
CRSWL	4A	.5000	6 April 1988	RADN	SI	6.8900
CRSWL	4A	.5833	6 April 1988	RADN	SI	6.5500
CRSWL	4A	.6667	6 April 1988	RADN	SI	6.2400
CRSWL	4A	.7500	6 April 1988	RADN	SI	5.9500
CRSWL	4A	.8333	6 April 1988	RADN	SI	5.6800
CRSWL	4A	.9167	6 April 1988	RADN	SI	5.4400
CRSWL	4A	1.0000	6 April 1988	RADN	SI	5.2100
CRSWL	4A	1.0833	6 April 1988	RADN	SI	5.0000
CRSWL	4A	1.1667	6 April 1988	RADN	SI	4.8000
CRSWL	4A	1.2500	6 April 1988	RADN	SI	4.6200
CRSWL	4A	1.3333	6 April 1988	RADN	SI	4.4400
CRSWL	4A	1.4166	6 April 1988	RADN	SI	4.2800
CRSWL	4A	1.5000	6 April 1988	RADN	SI	4.1200
CRSWL	4A	1.5833	6 April 1988	RADN	SI	3.9800
CRSWL	4A	1.6667	6 April 1988	RADN	SI	3.8400
CRSWL	4A	1.7500	6 April 1988	RADN	SI	3.7100
CRSWL	4A	1.8333	6 April 1988	RADN	SI	3.5900

SLUG TEST DATA - CARSWELL AFB - STAGE 2

Installation ID	Location ID	Elapsed Time	Log Date	Logging Co.	Method	Depth
CRSWL	4A	1.9167	6 April 1988	RADN	SI	3.4700
CRSWL	4A	2.0000	6 April 1988	RADN	SI	3.3600
CRSWL	4A	2.5000	6 April 1988	RADN	SI	2.8200
CRSWL	4A	3.0000	6 April 1988	RADN	SI	2.4100
CRSWL	4A	3.5000	6 April 1988	RADN	SI	2.0900
CRSWL	4A	4.0000	6 April 1988	RADN	SI	1.8400
CRSWL	4A	4.5000	6 April 1988	RADN	SI	1.6500
CRSWL	4A	5.0000	6 April 1988	RADN	SI	1.4900
CRSWL	4A	5.5000	6 April 1988	RADN	SI	1.3700
CRSWL	4A	6.0000	6 April 1988	RADN	SI	1.2700
CRSWL	4A	6.5000	6 April 1988	RADN	SI	1.1800
CRSWL	4A	7.0000	6 April 1988	RADN	SI	1.1100
CRSWL	4A	7.5000	6 April 1988	RADN	SI	1.0500
CRSWL	4A	8.0000	6 April 1988	RADN	SI	1.0000
CRSWL	4A	8.5000	6 April 1988	RADN	SI	.9600
CRSWL	4A	9.0000	6 April 1988	RADN	SI	.9300
CRSWL	4A	9.5000	6 April 1988	RADN	SI	.8900
CRSWL	4A	10.0000	6 April 1988	RADN	SI	.8500
CRSWL	4A	12.0000	6 April 1988	RADN	SI	.7500
CRSWL	4A	14.0000	6 April 1988	RADN	SI	.6700
CRSWL	4A	16.0000	6 April 1988	RADN	SI	.6100
CRSWL	4A	18.0000	6 April 1988	RADN	SI	.5600
CRSWL	4A	20.0000	6 April 1988	RADN	SI	.5200
CRSWL	4A	22.0000	6 April 1988	RADN	SI	.4900
CRSWL	4A	24.0000	6 April 1988	RADN	SI	.4700
CRSWL	4A	26.0000	6 April 1988	RADN	SI	.4500
CRSWL	4A	28.0000	6 April 1988	RADN	SI	.4300
CRSWL	4A	30.0000	6 April 1988	RADN	SI	.4000
CRSWL	4A	32.0000	6 April 1988	RADN	SI	.3900
CRSWL	4A	34.0000	6 April 1988	RADN	SI	.3800
CRSWL	4A	36.0000	6 April 1988	RADN	SI	.3700
CRSWL	4A	38.0000	6 April 1988	RADN	SI	.3600
CRSWL	4A	40.0000	6 April 1988	RADN	SI	.3500
CRSWL	4A	42.0000	6 April 1988	RADN	SI	.3300
CRSWL	4A	44.0000	6 April 1988	RADN	SI	.3300
CRSWL	4A	46.0000	6 April 1988	RADN	SI	.3200
CRSWL	4A	48.0000	6 April 1988	RADN	SI	.3200
CRSWL	4A	50.0000	6 April 1988	RADN	SI	.3100
CRSWL	4A	52.0000	6 April 1988	RADN	SI	.3000
CRSWL	4A	54.0000	6 April 1988	RADN	SI	.3000
CRSWL	4A	56.0000	6 April 1988	RADN	SI	.3000
CRSWL	4A	58.0000	6 April 1988	RADN	SI	.2900
CRSWL	4A	60.0000	6 April 1988	RADN	SI	.2800
CRSWL	4A	62.0000	6 April 1988	RADN	SI	.2800
CRSWL	4A	64.0000	6 April 1988	RADN	SI	.2800
CRSWL	4A	66.0000	6 April 1988	RADN	SI	.2700
CRSWL	4A	68.0000	6 April 1988	RADN	SI	.2800

SLUG TEST DATA - CARSWELL AFB - STAGE 2

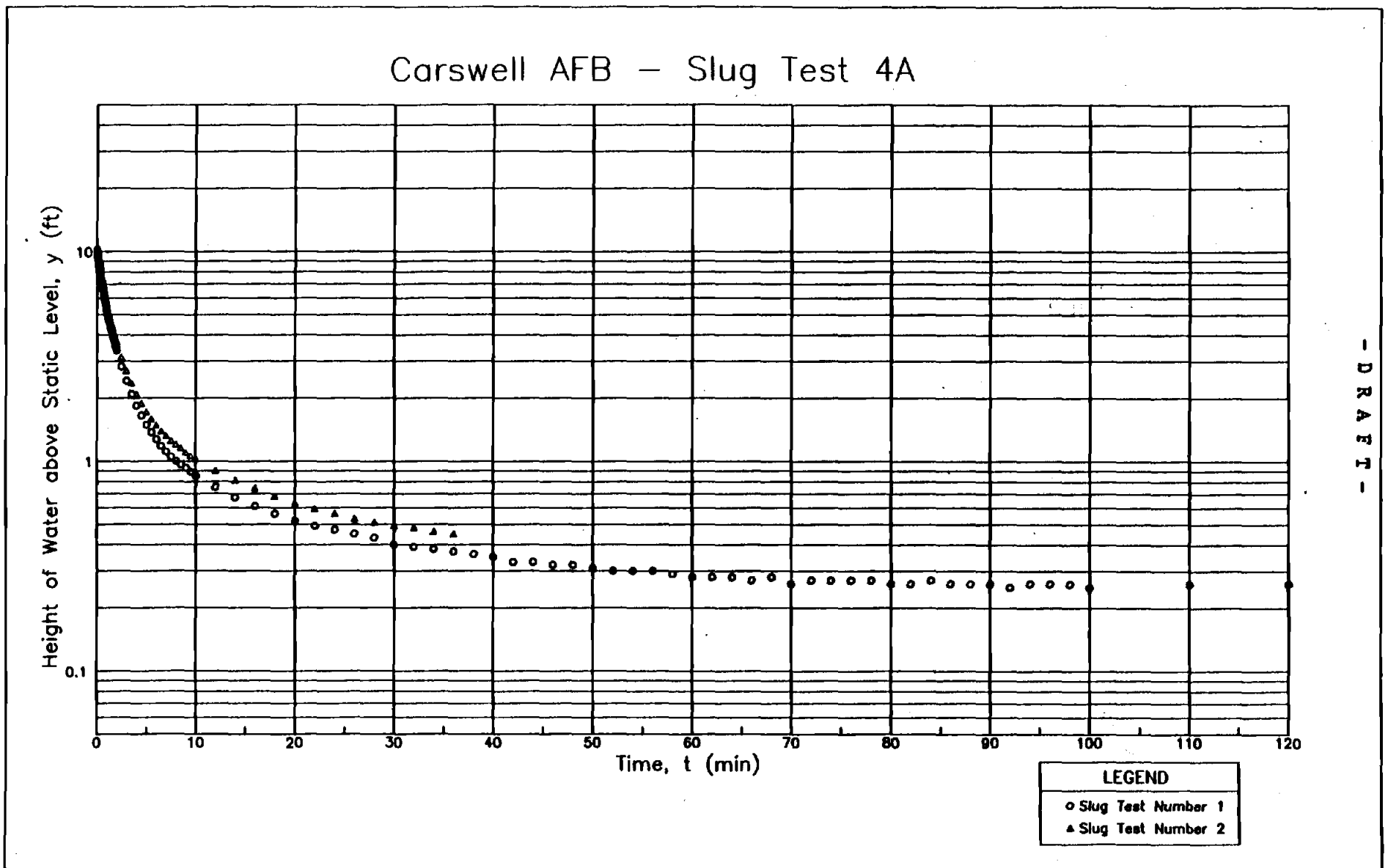
Installation ID	Location ID	Elapsed Time	Log Date	Logging Co.	Method	Depth
CRSWL	4A	70.0000	6 April 1988	RADN	SI	.2600
CRSWL	4A	72.0000	6 April 1988	RADN	SI	.2700
CRSWL	4A	74.0000	6 April 1988	RADN	SI	.2700
CRSWL	4A	76.0000	6 April 1988	RADN	SI	.2700
CRSWL	4A	78.0000	6 April 1988	RADN	SI	.2700
CRSWL	4A	80.0000	6 April 1988	RADN	SI	.2600
CRSWL	4A	82.0000	6 April 1988	RADN	SI	.2600
CRSWL	4A	84.0000	6 April 1988	RADN	SI	.2700
CRSWL	4A	86.0000	6 April 1988	RADN	SI	.2600
CRSWL	4A	88.0000	6 April 1988	RADN	SI	.2600
CRSWL	4A	90.0000	6 April 1988	RADN	SI	.2600
CRSWL	4A	92.0000	6 April 1988	RADN	SI	.2500
CRSWL	4A	94.0000	6 April 1988	RADN	SI	.2600
CRSWL	4A	96.0000	6 April 1988	RADN	SI	.2600
CRSWL	4A	98.0000	6 April 1988	RADN	SI	.2600
CRSWL	4A	100.0000	6 April 1988	RADN	SI	.2500
CRSWL	4A	110.0000	6 April 1988	RADN	SI	.2600
CRSWL	4A	120.0000	6 April 1988	RADN	SI	.2600

SLUG TEST DATA - CARSWELL AFB - STAGE 2

Installation ID	Location ID	Elapsed Time	Log Date	Logging Co.	Method	Depth
CRSWL	4A	.0000	6 April 1988	RADN	SI	10.5100
CRSWL	4A	.0033	6 April 1988	RADN	SI	10.4900
CRSWL	4A	.0066	6 April 1988	RADN	SI	10.4600
CRSWL	4A	.0099	6 April 1988	RADN	SI	10.4200
CRSWL	4A	.0133	6 April 1988	RADN	SI	10.3900
CRSWL	4A	.0166	6 April 1988	RADN	SI	10.3700
CRSWL	4A	.0200	6 April 1988	RADN	SI	10.3400
CRSWL	4A	.0233	6 April 1988	RADN	SI	10.3100
CRSWL	4A	.0266	6 April 1988	RADN	SI	10.2800
CRSWL	4A	.0300	6 April 1988	RADN	SI	10.2500
CRSWL	4A	.0333	6 April 1988	RADN	SI	10.2200
CRSWL	4A	.0500	6 April 1988	RADN	SI	10.0900
CRSWL	4A	.0666	6 April 1988	RADN	SI	9.9700
CRSWL	4A	.0833	6 April 1988	RADN	SI	9.8400
CRSWL	4A	.1000	6 April 1988	RADN	SI	9.7100
CRSWL	4A	.1166	6 April 1988	RADN	SI	9.5900
CRSWL	4A	.1333	6 April 1988	RADN	SI	9.4800
CRSWL	4A	.1500	6 April 1988	RADN	SI	9.3700
CRSWL	4A	.1666	6 April 1988	RADN	SI	9.2500
CRSWL	4A	.1833	6 April 1988	RADN	SI	9.1500
CRSWL	4A	.2000	6 April 1988	RADN	SI	9.0400
CRSWL	4A	.2166	6 April 1988	RADN	SI	8.9300
CRSWL	4A	.2333	6 April 1988	RADN	SI	8.8300
CRSWL	4A	.2500	6 April 1988	RADN	SI	8.7300
CRSWL	4A	.2666	6 April 1988	RADN	SI	8.6300
CRSWL	4A	.2833	6 April 1988	RADN	SI	8.5400
CRSWL	4A	.3000	6 April 1988	RADN	SI	8.4400
CRSWL	4A	.3166	6 April 1988	RADN	SI	8.3500
CRSWL	4A	.3333	6 April 1988	RAON	SI	8.2600
CRSWL	4A	.4167	6 April 1988	RAON	SI	7.8300
CRSWL	4A	.5000	6 April 1988	RAON	SI	7.4400
CRSWL	4A	.5833	6 April 1988	RADN	SI	7.0800
CRSWL	4A	.6667	6 April 1988	RADN	SI	6.7500
CRSWL	4A	.7500	6 April 1988	RADN	SI	6.4500
CRSWL	4A	.8333	6 April 1988	RADN	SI	6.1600
CRSWL	4A	.9167	6 April 1988	RADN	SI	5.9000
CRSWL	4A	1.0000	6 April 1988	RADN	SI	5.6600
CRSWL	4A	1.0833	6 April 1988	RADN	SI	5.4300
CRSWL	4A	1.1667	6 April 1988	RADN	SI	5.2100
CRSWL	4A	1.2500	6 April 1988	RADN	SI	5.0200
CRSWL	4A	1.3333	6 April 1988	RADN	SI	4.8300
CRSWL	4A	1.4166	6 April 1988	RADN	SI	4.6600
CRSWL	4A	1.5000	6 April 1988	RADN	SI	4.5000
CRSWL	4A	1.5833	6 April 1988	RADN	SI	4.3400
CRSWL	4A	1.6667	6 April 1988	RADN	SI	4.2000
CRSWL	4A	1.7500	6 April 1988	RADN	SI	4.0600
CRSWL	4A	1.8333	6 April 1988	RADN	SI	3.9300

SLUG TEST DATA - CARSWELL AFB - STAGE 2

Installation ID	Location ID	Elapsed Time	Log Date	Logging Co.	Method	Depth
CRSWL	4A	1.9167	6 April 1988	RADN	SI	3.8100
CRSWL	4A	2.0000	6 April 1988	RADN	SI	3.7000
CRSWL	4A	2.5000	6 April 1988	RADN	SI	3.1300
CRSWL	4A	3.0000	6 April 1988	RADN	SI	2.6900
CRSWL	4A	3.5000	6 April 1988	RADN	SI	2.3600
CRSWL	4A	4.0000	6 April 1988	RADN	SI	2.0900
CRSWL	4A	4.5000	6 April 1988	RADN	SI	1.8800
CRSWL	4A	5.0000	6 April 1988	RADN	SI	1.7200
CRSWL	4A	5.5000	6 April 1988	RADN	SI	1.5900
CRSWL	4A	6.0000	6 April 1988	RADN	SI	1.4800
CRSWL	4A	6.5000	6 April 1988	RADN	SI	1.3900
CRSWL	4A	7.0000	6 April 1988	RADN	SI	1.3200
CRSWL	4A	7.5000	6 April 1988	RADN	SI	1.2500
CRSWL	4A	8.0000	6 April 1988	RADN	SI	1.2000
CRSWL	4A	8.5000	6 April 1988	RADN	SI	1.1500
CRSWL	4A	9.0000	6 April 1988	RADN	SI	1.1000
CRSWL	4A	9.5000	6 April 1988	RADN	SI	1.0600
CRSWL	4A	10.0000	6 April 1988	RADN	SI	1.0300
CRSWL	4A	12.0000	6 April 1988	RADN	SI	.9000
CRSWL	4A	14.0000	6 April 1988	RADN	SI	.8100
CRSWL	4A	16.0000	6 April 1988	RADN	SI	.7400
CRSWL	4A	18.0000	6 April 1988	RADN	SI	.6800
CRSWL	4A	20.0000	6 April 1988	RADN	SI	.6300
CRSWL	4A	22.0000	6 April 1988	RADN	SI	.5900
CRSWL	4A	24.0000	6 April 1988	RADN	SI	.5600
CRSWL	4A	26.0000	6 April 1988	RADN	SI	.5300
CRSWL	4A	28.0000	6 April 1988	RADN	SI	.5100
CRSWL	4A	30.0000	6 April 1988	RADN	SI	.4900
CRSWL	4A	32.0000	6 April 1988	RADN	SI	.4800
CRSWL	4A	34.0000	6 April 1988	RADN	SI	.4600
CRSWL	4A	36.0000	6 April 1988	RADN	SI	.4500



RADIAN CORPORATION

- DRAFT -

FADIAN CORPORATION

CALCULATION SHEET

- DRAFT -

CALC. NO. _____

SIGNATURE LN French DATE 18 June 88 CHECKED _____ DATE _____

PROJECT Caswell AFB IRP Stage 2 JOB NO. 227-005-04-03

SUBJECT Analysis of Slug Test Data - Well 4A SHEET 1 OF 2 SHEETS

[Ref. Bouwer and Rice, 1976, Water Resources Research, v.12, no.3]

Solving the analog equation: $\ln(R_e/r_w)$ ...

$$\ln(R_e/r_w) = \left(\frac{1.1}{\ln(H/r_w)} + \frac{C}{L/r_w}\right)^{-1}$$

where, $H = \cancel{3.98}\ 10.72$
$L = 10$ ft
$r_w = 0.28$ ft
$C = 2.25$

$\Rightarrow \ln R_e/r_w = 2.\cancel{09}\ 7.4$

Hydraulic conductivity, $K = \dfrac{r_c^2 \ln(R_e/r_w)}{2L}\left[\frac{1}{t}\ln\left(\frac{y_0}{y_t}\right)\right]$

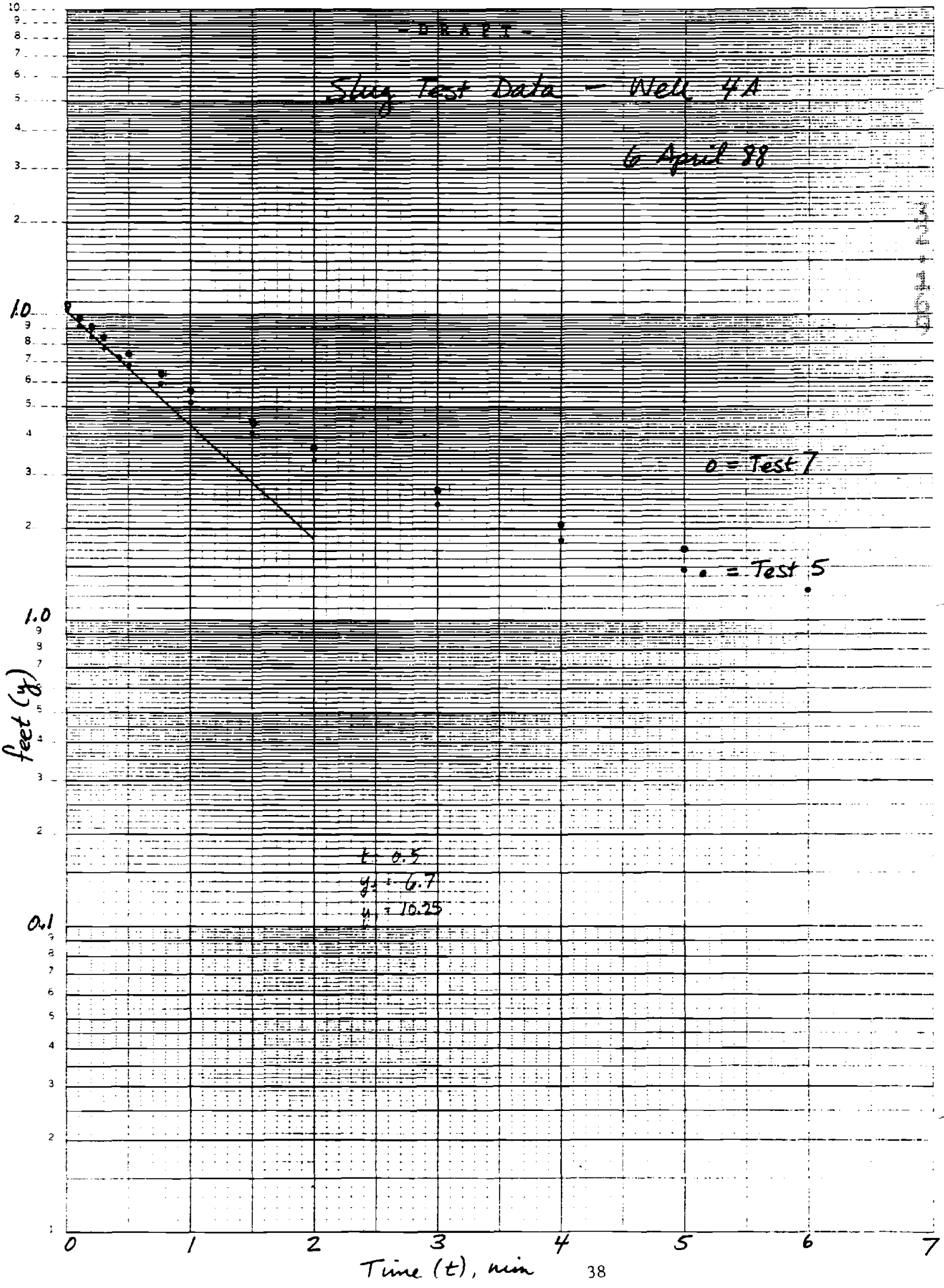
where, $r_c^2 = 6.94 \times 10^{-3}$ ft^2
$t = 0.5$ min
$y_t = 6.7$ ft
$y_0 = 10.25$ ft

solving for K,

$$K = \frac{(6.94 \times 10^{-3})(2.\cancel{09}\ 74)}{2 \times 10}\left[\frac{1}{0.5}\ln\left(\frac{10.25}{6.7}\right)\right] \times \frac{30.48 \text{ cm/ft}}{60 \text{ sec/min}}$$

$$K = \cancel{3.13}\ 4.1 \times 10^{-4} \text{ cm/sec}$$

4-81-3361


- DRAFT -
Slug Test Data - Well 4A
6 April 88
o = Test 7
• = Test 5
t = 0.5
y = 6.7
u = 10.25
feet (y)
Time (t), min
0
1
2
3
4
5
6
7
1.0
0.1

SLUG TEST DATA · CARSWELL AFB · STAGE 2

Installation ID	Location ID	Elapsed Time	Log Date	Logging Co.	Method	Depth
CRSWL	4D	.0000	11 April 1988	RADN	SI	1.4800
CRSWL	4D	.0033	11 April 1988	RADN	SI	1.3700
CRSWL	4D	.0066	11 April 1988	RADN	SI	.8700
CRSWL	4D	.0099	11 April 1988	RADN	SI	1.0900
CRSWL	4D	.0133	11 April 1988	RADN	SI	.8200
CRSWL	4D	.0166	11 April 1988	RADN	SI	.7800
CRSWL	4D	.0200	11 April 1988	RADN	SI	.7900
CRSWL	4D	.0233	11 April 1988	RADN	SI	.6700
CRSWL	4D	.0266	11 April 1988	RADN	SI	.6300
CRSWL	4D	.0300	11 April 1988	RADN	SI	.6400
CRSWL	4D	.0333	11 April 1988	RADN	SI	.6600
CRSWL	4D	.0500	11 April 1988	RADN	SI	.6500
CRSWL	4D	.0666	11 April 1988	RADN	SI	.6000
CRSWL	4D	.0833	11 April 1988	RADN	SI	.5300
CRSWL	4D	.1000	11 April 1988	RADN	SI	.4800
CRSWL	4D	.1166	11 April 1988	RADN	SI	.4500
CRSWL	4D	.1333	11 April 1988	RADN	SI	.4200
CRSWL	4D	.1500	11 April 1988	RADN	SI	.4000
CRSWL	4D	.1666	11 April 1988	RADN	SI	.3800
CRSWL	4D	.1833	11 April 1988	RADN	SI	.3700
CRSWL	4D	.2000	11 April 1988	RADN	SI	.3600
CRSWL	4D	.2166	11 April 1988	RADN	SI	.3500
CRSWL	4D	.2333	11 April 1988	RADN	SI	.3300
CRSWL	4D	.2500	11 April 1988	RADN	SI	.3300
CRSWL	4D	.2666	11 April 1988	RADN	SI	.3200
CRSWL	4D	.2833	11 April 1988	RADN	SI	.3100
CRSWL	4D	.3000	11 April 1988	RADN	SI	.3000
CRSWL	4D	.3166	11 April 1988	RADN	SI	.2900
CRSWL	4D	.3333	11 April 1988	RADN	SI	.2800
CRSWL	4D	.4167	11 April 1988	RADN	SI	.2500
CRSWL	4D	.5000	11 April 1988	RADN	SI	.2200
CRSWL	4D	.5833	11 April 1988	RADN	SI	.2000
CRSWL	4D	.6667	11 April 1988	RADN	SI	.1800
CRSWL	4D	.7500	11 April 1988	RADN	SI	.1700
CRSWL	4D	.8333	11 April 1988	RADN	SI	.1500
CRSWL	4D	.9167	11 April 1988	RADN	SI	.1400
CRSWL	4D	1.0000	11 April 1988	RADN	SI	.1300
CRSWL	4D	1.0833	11 April 1988	RADN	SI	.1200
CRSWL	4D	1.1667	11 April 1988	RADN	SI	.1100
CRSWL	4D	1.2500	11 April 1988	RADN	SI	.1100
CRSWL	4D	1.3333	11 April 1988	RADN	SI	.1000
CRSWL	4D	1.4166	11 April 1988	RADN	SI	.0900
CRSWL	4D	1.5000	11 April 1988	RADN	SI	.0900
CRSWL	4D	1.5833	11 April 1988	RADN	SI	.0900
CRSWL	4D	1.6667	11 April 1988	RADN	SI	.0800
CRSWL	4D	1.7500	11 April 1988	RADN	SI	.0700
CRSWL	4D	1.8333	11 April 1988	RADN	SI	.0700

SLUG TEST DATA - CARSWELL AFB - STAGE 2

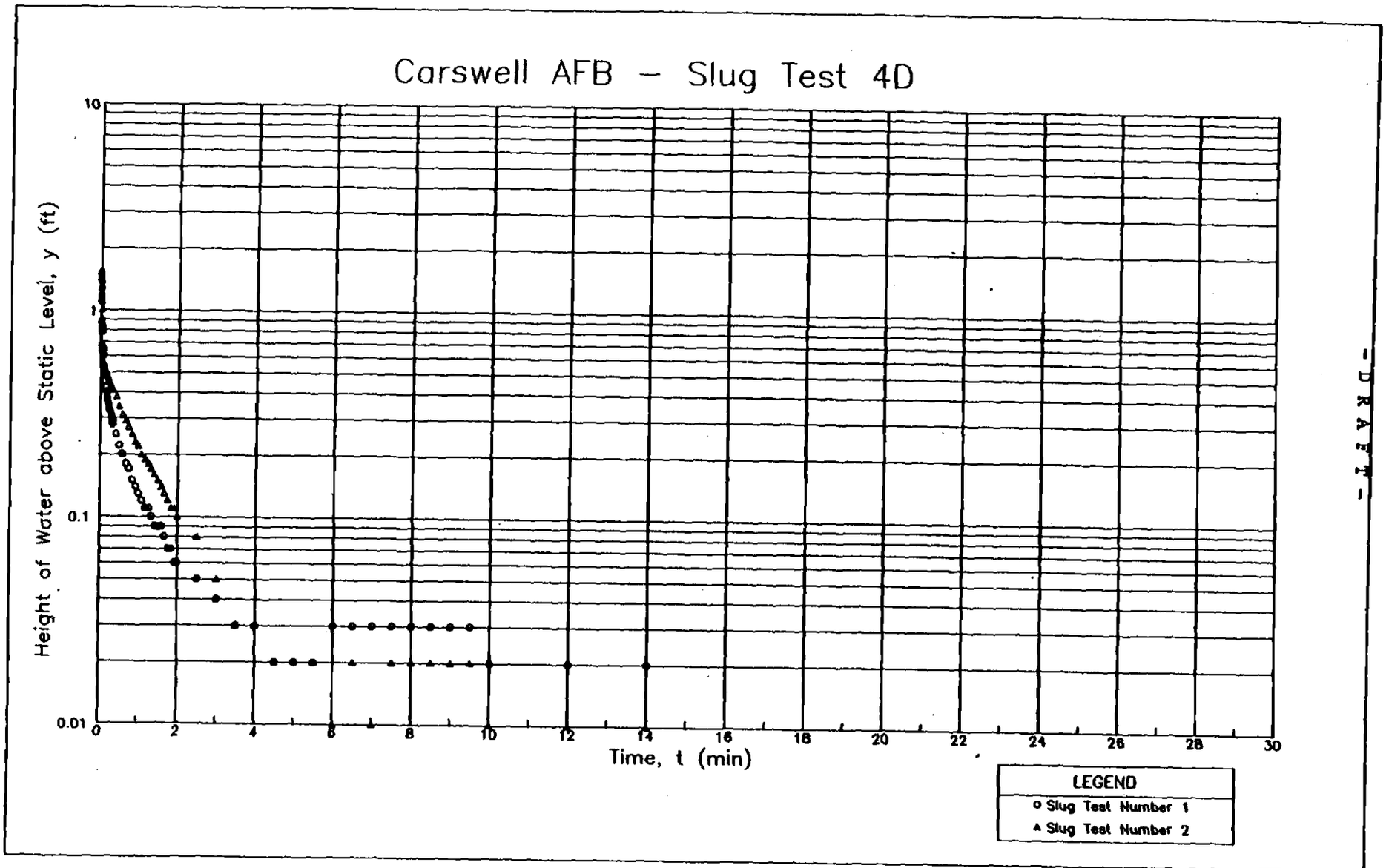
Installation ID	Location ID	Elapsed Time	Log Date	Logging Co.	Method	Depth
CRSWL	4D	1.9167	11 April 1988	RADN	SI	.0600
CRSWL	4D	2.0000	11 April 1988	RADN	SI	.0600
CRSWL	4D	2.5000	11 April 1988	RADN	SI	.0500
CRSWL	4D	3.0000	11 April 1988	RADN	SI	.0400
CRSWL	4D	3.5000	11 April 1988	RADN	SI	.0300
CRSWL	4D	4.0000	11 April 1988	RADN	SI	.0300
CRSWL	4D	4.5000	11 April 1988	RADN	SI	.0200
CRSWL	4D	5.0000	11 April 1988	RADN	SI	.0200
CRSWL	4D	5.5000	11 April 1988	RADN	SI	.0200
CRSWL	4D	6.0000	11 April 1988	RADN	SI	.0300
CRSWL	4D	6.5000	11 April 1988	RADN	SI	.0300
CRSWL	4D	7.0000	11 April 1988	RADN	SI	.0300
CRSWL	4D	7.5000	11 April 1988	RADN	SI	.0300
CRSWL	4D	8.0000	11 April 1988	RADN	SI	.0300
CRSWL	4D	8.5000	11 April 1988	RADN	SI	.0300
CRSWL	4D	9.0000	11 April 1988	RADN	SI	.0300
CRSWL	4D	9.5000	11 April 1988	RADN	SI	.0300
CRSWL	4D	10.0000	11 April 1988	RADN	SI	.0200
CRSWL	4D	12.0000	11 April 1988	RADN	SI	.0200
CRSWL	4D	14.0000	11 April 1988	RADN	SI	.0200

SLUG TEST DATA - CARSWELL AFB - STAGE 2

Installation ID	Location ID	Elapsed Time	Log Date	Logging Co.	Method	Depth
CRSWL	4D	.0000	11 April 1988	RADN	SI	1.5500
CRSWL	4D	.0033	11 April 1988	RADN	SI	1.2900
CRSWL	4D	.0066	11 April 1988	RADN	SI	1.1800
CRSWL	4D	.0099	11 April 1988	RADN	SI	1.2000
CRSWL	4D	.0133	11 April 1988	RADN	SI	1.2800
CRSWL	4D	.0166	11 April 1988	RADN	SI	.9000
CRSWL	4D	.0200	11 April 1988	RADN	SI	1.0000
CRSWL	4D	.0233	11 April 1988	RADN	SI	.8500
CRSWL	4D	.0266	11 April 1988	RADN	SI	.8700
CRSWL	4D	.0300	11 April 1988	RADN	SI	.8600
CRSWL	4D	.0333	11 April 1988	RADN	SI	.7900
CRSWL	4D	.0500	11 April 1988	RADN	SI	.6800
CRSWL	4D	.0666	11 April 1988	RADN	SI	.6200
CRSWL	4D	.0833	11 April 1988	RADN	SI	.5500
CRSWL	4D	.1000	11 April 1988	RADN	SI	.5200
CRSWL	4D	.1166	11 April 1988	RADN	SI	.5100
CRSWL	4D	.1333	11 April 1988	RADN	SI	.5100
CRSWL	4D	.1500	11 April 1988	RADN	SI	.5000
CRSWL	4D	.1666	11 April 1988	RADN	SI	.4900
CRSWL	4D	.1833	11 April 1988	RADN	SI	.4800
CRSWL	4D	.2000	11 April 1988	RADN	SI	.4700
CRSWL	4D	.2166	11 April 1988	RADN	SI	.4700
CRSWL	4D	.2333	11 April 1988	RADN	SI	.4600
CRSWL	4D	.2500	11 April 1988	RADN	SI	.4500
CRSWL	4D	.2666	11 April 1988	RADN	SI	.4400
CRSWL	4D	.2833	11 April 1988	RADN	SI	.4300
CRSWL	4D	.3000	11 April 1988	RADN	SI	.4300
CRSWL	4D	.3166	11 April 1988	RADN	SI	.4200
CRSWL	4D	.3333	11 April 1988	RADN	SI	.4100
CRSWL	4D	.4167	11 April 1988	RADN	SI	.3800
CRSWL	4D	.5000	11 April 1988	RADN	SI	.3400
CRSWL	4D	.5833	11 April 1988	RADN	SI	.3100
CRSWL	4D	.6667	11 April 1988	RADN	SI	.2900
CRSWL	4D	.7500	11 April 1988	RADN	SI	.2700
CRSWL	4D	.8333	11 April 1988	RADN	SI	.2500
CRSWL	4D	.9167	11 April 1988	RADN	SI	.2300
CRSWL	4D	1.0000	11 April 1988	RADN	SI	.2200
CRSWL	4D	1.0833	11 April 1988	RADN	SI	.2000
CRSWL	4D	1.1667	11 April 1988	RADN	SI	.1900
CRSWL	4D	1.2500	11 April 1988	RADN	SI	.1800
CRSWL	4D	1.3333	11 April 1988	RADN	SI	.1700
CRSWL	4D	1.4166	11 April 1988	RADN	SI	.1600
CRSWL	4D	1.5000	11 April 1988	RADN	SI	.1500
CRSWL	4D	1.5833	11 April 1988	RADN	SI	.1400
CRSWL	4D	1.6667	11 April 1988	RADN	SI	.1300
CRSWL	4D	1.7500	11 April 1988	RADN	SI	.1200
CRSWL	4D	1.8333	11 April 1988	RADN	SI	.1100

SLUG TEST DATA - CARSWELL AFB - STAGE 2

Installation ID	Location ID	Elapsed Time	Log Date	Logging Co.	Method	Depth
CRSWL	4D	1.9167	11 April 1988	RADN	SI	.1100
CRSWL	4D	2.0000	11 April 1988	RADN	SI	.1000
CRSWL	4D	2.5000	11 April 1988	RADN	SI	.0800
CRSWL	4D	3.0000	11 April 1988	RADN	SI	.0500
CRSWL	4D	3.5000	11 April 1988	RADN	SI	.0300
CRSWL	4D	4.0000	11 April 1988	RADN	SI	.0300
CRSWL	4D	4.5000	11 April 1988	RADN	SI	.0200
CRSWL	4D	5.0000	11 April 1988	RADN	SI	.0200
CRSWL	4D	5.5000	11 April 1988	RADN	SI	.0200
CRSWL	4D	6.0000	11 April 1988	RADN	SI	.0100
CRSWL	4D	6.5000	11 April 1988	RADN	SI	.0200
CRSWL	4D	7.0000	11 April 1988	RADN	SI	.0100
CRSWL	4D	7.5000	11 April 1988	RADN	SI	.0200
CRSWL	4D	8.0000	11 April 1988	RADN	SI	.0200
CRSWL	4D	8.5000	11 April 1988	RADN	SI	.0200
CRSWL	4D	9.0000	11 April 1988	RADN	SI	.0200
CRSWL	4D	9.5000	11 April 1988	RADN	SI	.0200
CRSWL	4D	10.0000	11 April 1988	RADN	SI	.0100
CRSWL	4D	12.0000	11 April 1988	RADN	SI	.0100
CRSWL	4D	14.0000	11 April 1988	RADN	SI	.0100



RADIAN CORPORATION

- DRAFT -

RADIAN CORPORATION

CALCULATION SHEET
- DRAFT -

CALC. NO. _____

SIGNATURE W. G. McIntyre DATE 13 July 88 CHECKED _____ DATE _____

PROJECT Carswell AFB IRP Stage 2 JOB NO. 227-005-04-03

SUBJECT Analysis of Slug Test Data - Well 4D SHEET _____ OF _____ SHEETS

[Ref. Bower and Rice, 1976, Water Resources Research, V 12, no. 3]

Solving the analog equation: $\ln(R_e/r_w)$ . . .

$$\ln(R_e/r_w) = \left(\frac{1}{\ln(H/r_w)} + \frac{C}{L/r_w}\right)^{-1}$$

where, $H = 11.3$ ft, $L = 10.0$ ft, $r_w = 0.28$ ft, $C = 2.25$ $\Big\}$ $\ln R_e/r_w = 2.77$

Hydraulic Conductivity, $K = \dfrac{r_c^2 \ln(R_e/r_w)}{2L}\left[\dfrac{1}{t}\ln\left(\dfrac{y_0}{y_t}\right)\right]$

Where, $r_c^2 = 6.94 \times 10^{-3}$ ft^2

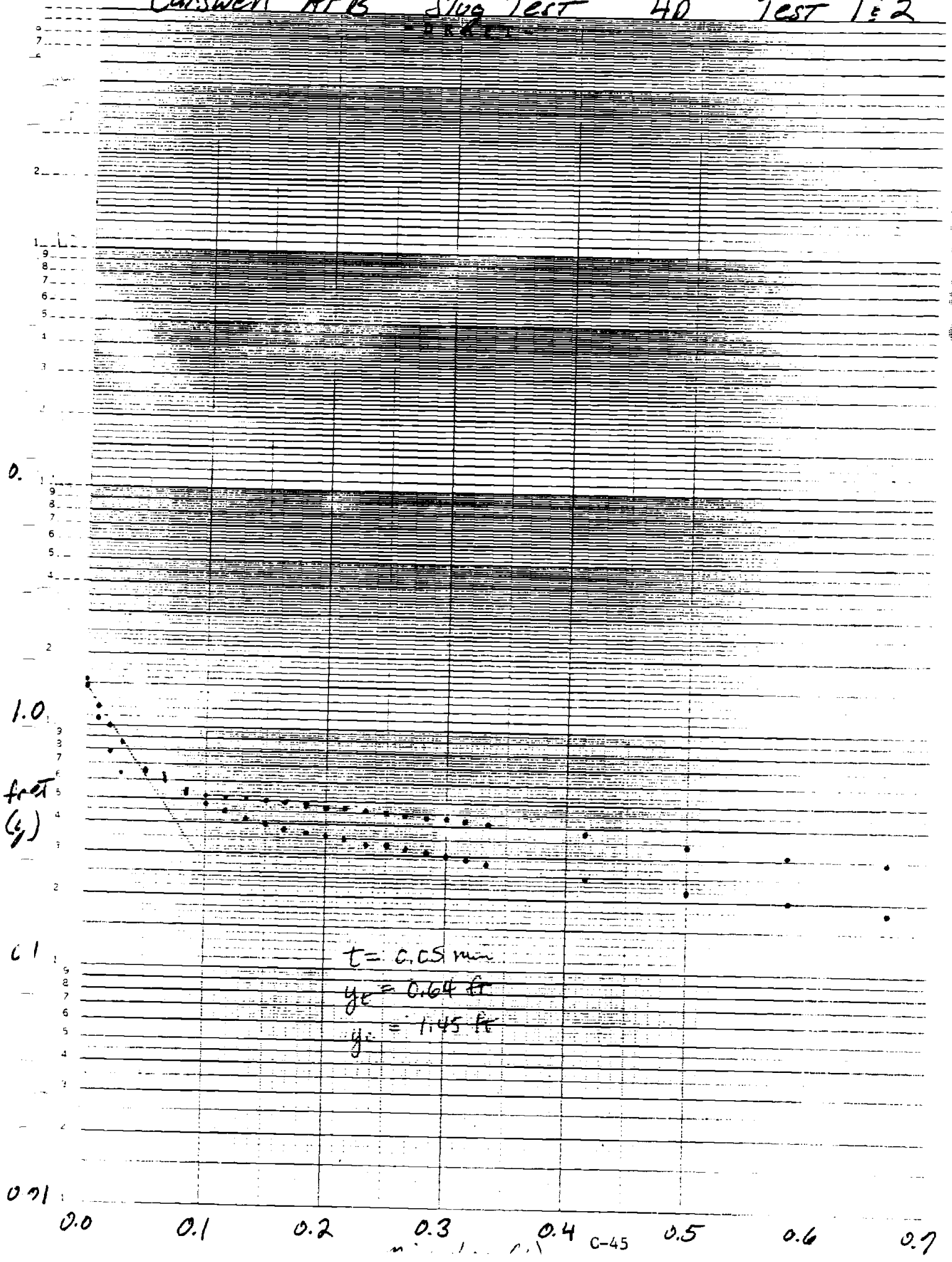
$t = .05$, $y_t = 0.64$, $y_0 = 1.45$ $\Big\}$ from plot of data on attached graph

Solving for K,

$$K = \frac{(6.94 \times 10^{-3})(2.77)}{2 \times 10}\left[\frac{1}{.05}\ln\left(\frac{1.45}{.64}\right)\right] \times \frac{30.48}{60}$$

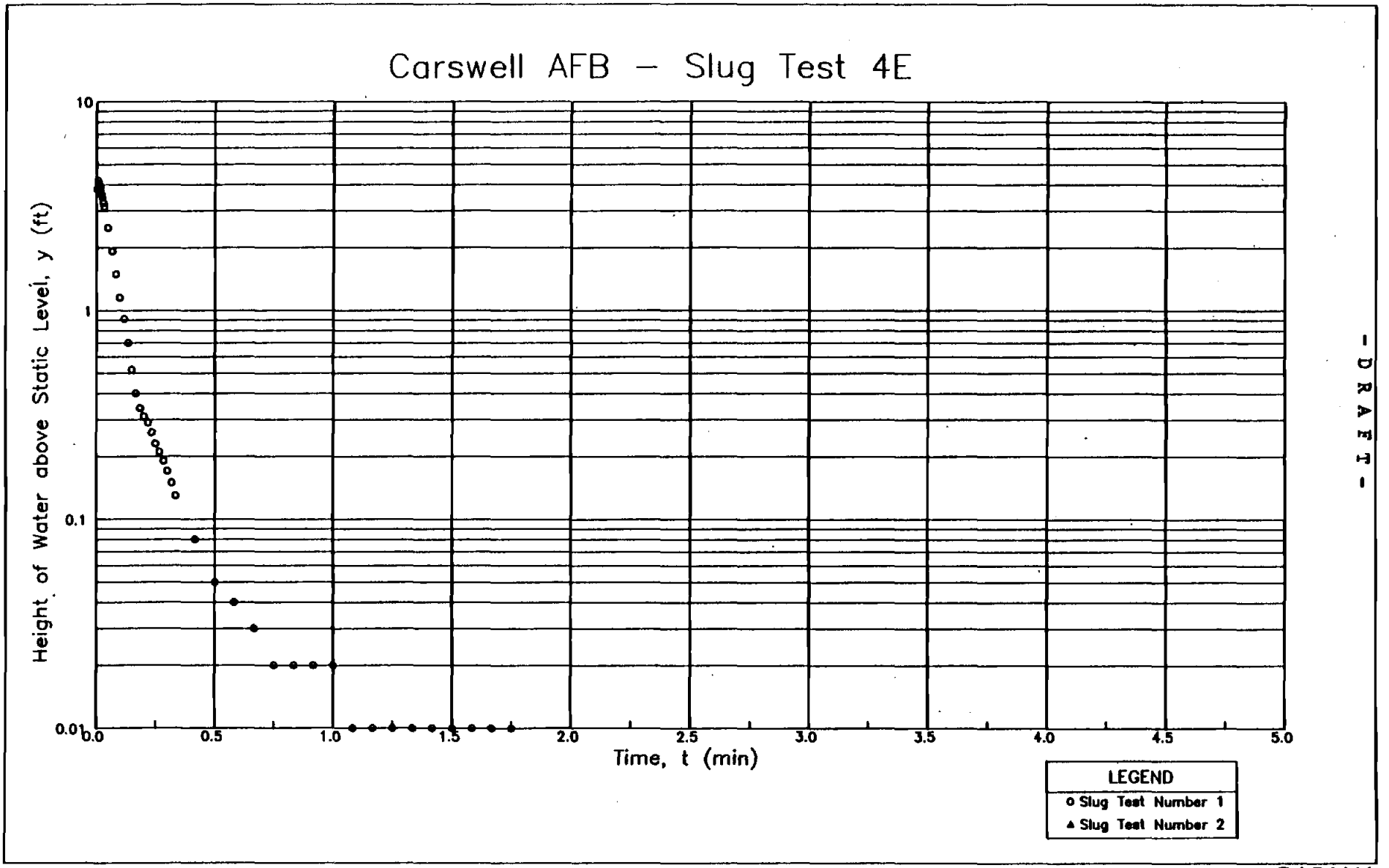
$$K = 1.98 \times 10^{-3} \text{ cm/sec}$$

Carswell AFB Slug Test 4D Test 1 & 2



SLUG TEST DATA - CARSWELL AFB - STAGE 2

Installation ID	Location ID	Elapsed Time	Log Date	Logging Co.	Method	Depth
CRSWL	4E	.0000	7 April 1988	RADN	SI	3.8400
CRSWL	4E	.0033	7 April 1988	RADN	SI	3.9100
CRSWL	4E	.0066	7 April 1988	RADN	SI	4.1900
CRSWL	4E	.0099	7 April 1988	RADN	SI	4.0400
CRSWL	4E	.0133	7 April 1988	RADN	SI	3.9800
CRSWL	4E	.0166	7 April 1988	RADN	SI	3.9100
CRSWL	4E	.0200	7 April 1988	RADN	SI	3.6800
CRSWL	4E	.0233	7 April 1988	RADN	SI	3.5900
CRSWL	4E	.0266	7 April 1988	RADN	SI	3.4800
CRSWL	4E	.0300	7 April 1988	RADN	SI	3.2800
CRSWL	4E	.0333	7 April 1988	RADN	SI	3.1300
CRSWL	4E	.0500	7 April 1988	RADN	SI	2.4800
CRSWL	4E	.0666	7 April 1988	RADN	SI	1.9200
CRSWL	4E	.0833	7 April 1988	RADN	SI	1.4900
CRSWL	4E	.1000	7 April 1988	RADN	SI	1.1500
CRSWL	4E	.1166	7 April 1988	RADN	SI	.9100
CRSWL	4E	.1333	7 April 1988	RADN	SI	.7000
CRSWL	4E	.1500	7 April 1988	RADN	SI	.5200
CRSWL	4E	.1666	7 April 1988	RADN	SI	.4000
CRSWL	4E	.1833	7 April 1988	RADN	SI	.3400
CRSWL	4E	.2000	7 April 1988	RADN	SI	.3100
CRSWL	4E	.2166	7 April 1988	RADN	SI	.2900
CRSWL	4E	.2333	7 April 1988	RADN	SI	.2600
CRSWL	4E	.2500	7 April 1988	RADN	SI	.2300
CRSWL	4E	.2666	7 April 1988	RADN	SI	.2100
CRSWL	4E	.2833	7 April 1988	RADN	SI	.1900
CRSWL	4E	.3000	7 April 1988	RADN	SI	.1700
CRSWL	4E	.3166	7 April 1988	RADN	SI	.1500
CRSWL	4E	.3333	7 April 1988	RADN	SI	.1300
CRSWL	4E	.4167	7 April 1988	RADN	SI	.0800
CRSWL	4E	.5000	7 April 1988	RADN	SI	.0500
CRSWL	4E	.5833	7 April 1988	RADN	SI	.0400
CRSWL	4E	.6667	7 April 1988	RADN	SI	.0300
CRSWL	4E	.7500	7 April 1988	RADN	SI	.0200
CRSWL	4E	.8333	7 April 1988	RADN	SI	.0200
CRSWL	4E	.9167	7 April 1988	RADN	SI	.0200
CRSWL	4E	1.0000	7 April 1988	RADN	SI	.0200
CRSWL	4E	1.0833	7 April 1988	RADN	SI	.0100
CRSWL	4E	1.1667	7 April 1988	RADN	SI	.0100
CRSWL	4E	1.2500	7 April 1988	RADN	SI	.0100
CRSWL	4E	1.3333	7 April 1988	RADN	SI	.0100
CRSWL	4E	1.4166	7 April 1988	RADN	SI	.0100
CRSWL	4E	1.5000	7 April 1988	RADN	SI	.0100
CRSWL	4E	1.5833	7 April 1988	RADN	SI	.0100
CRSWL	4E	1.6667	7 April 1988	RADN	SI	.0100
CRSWL	4E	1.7500	7 April 1988	RADN	SI	.0100



RADIAN CORPORATION

- DRAFT -

RADIAN CORPORATION

CALCULATION SHEET

- D R A F T -

CALC. NO. _____

SIGNATURE J.H. French DATE 18 June 88 CHECKED _____ DATE _____

PROJECT Carswell AFB IRP Stage 2 JOB NO. 227-005-04-03

SUBJECT Analysis of Slug Test Data - Well 4E SHEET 1 OF 2 SHEETS

[Ref. Bouwer and Rice, 1976, Water Resources Research, v.12, no. 3]

Solving the analog equation: $\ln(R_e/r_w)$ ...

$$\ln\left(\frac{R_e}{r_w}\right) = \left(\frac{1.1}{\ln(H/r_w)} + \frac{C}{L/r_w}\right)^{-1}$$

where, $H = 11.6$ ft, $L = 10$ ft, $r_w = 0.28$ ft, $C = 2.25$ $\Rightarrow \ln R_e/r_w = 2.79$

Hydraulic conductivity, $K = \dfrac{r_c^2 \ln(R_e/r_w)}{2L}\left[\frac{1}{t}\ln\left(\frac{y_0}{y_t}\right)\right]$

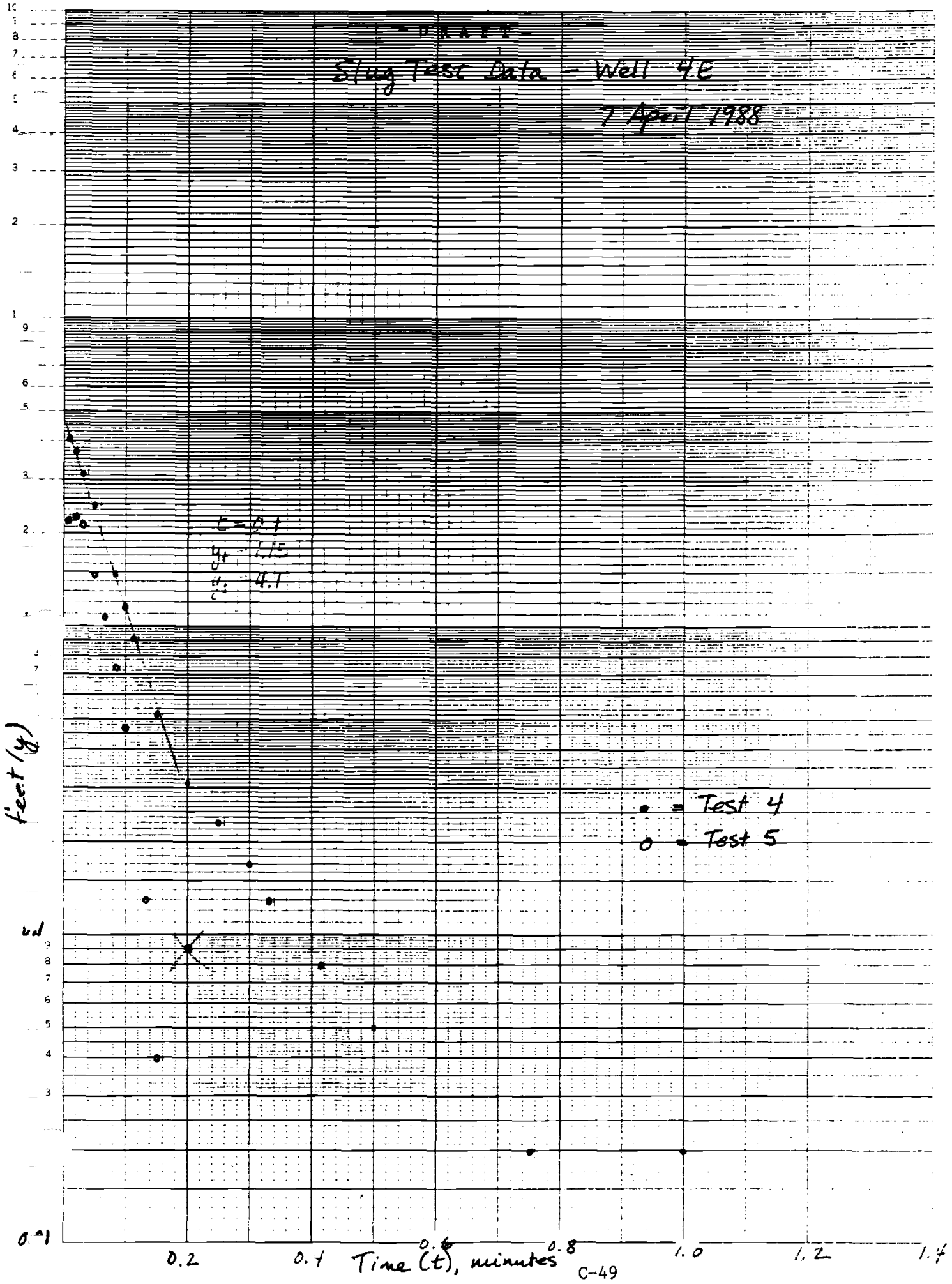
where, $r_c^2 = 6.94 \times 10^{-3}\ ft^2$

$t = 0.1$ min, $y_0 = 4.1$ ft, $y_t = 1.15$ ft } from plot of data points on attached graph

solving for K,

$$K = \frac{(6.94\times10^{-3})(2.79)}{2\times10}\left[\frac{1}{0.1}\ln\left(\frac{4.1}{1.15}\right)\right] \times \frac{30.48\ cm/ft}{60\ sec/min}$$

$$K = 6.25 \times 10^{-3}\ cm/sec$$

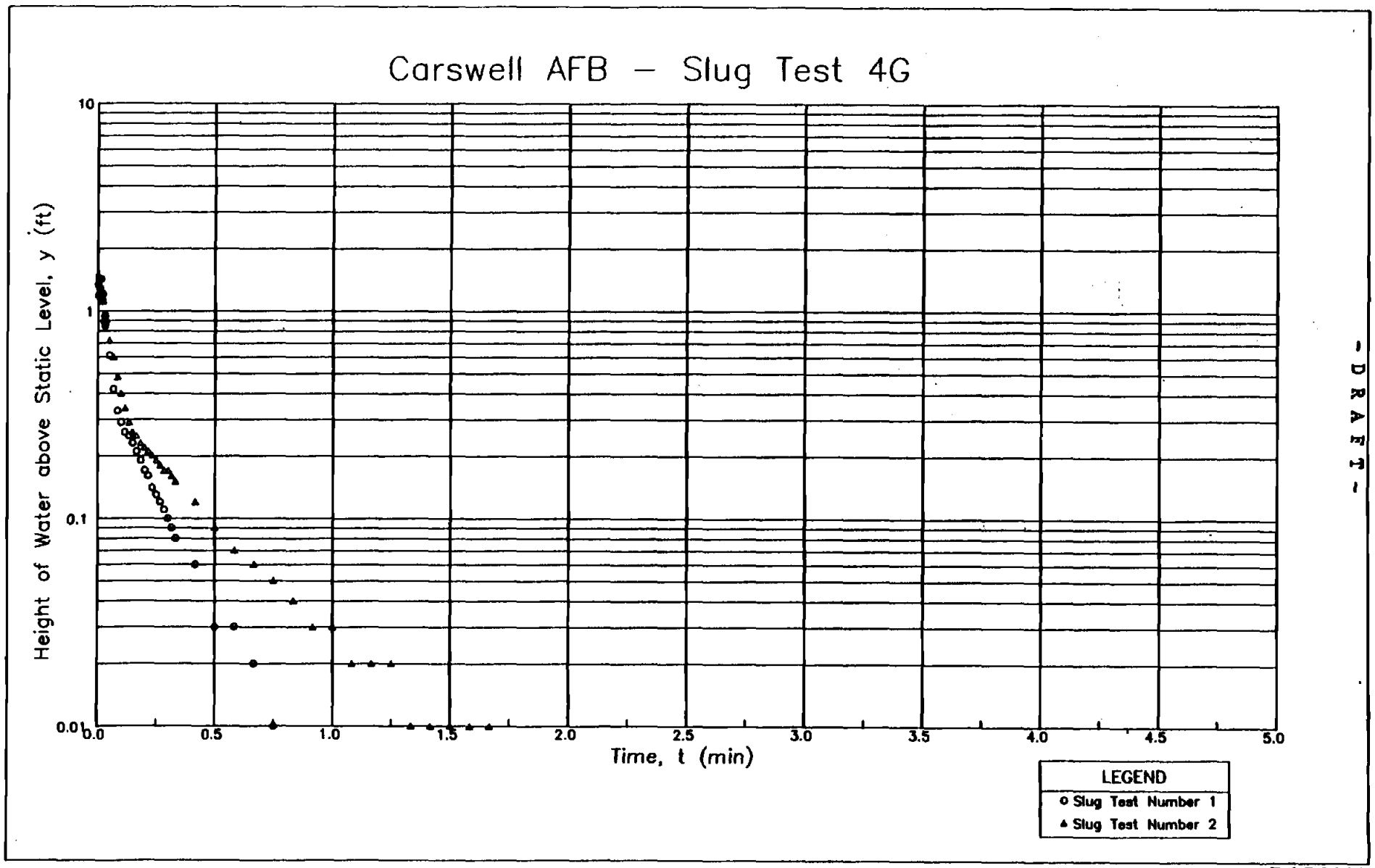

— DRAFT —
Slug Test Data - Well 4E
7 April 1988
t = 0.1
y0 = 4.15
yt = 4.1
• = Test 4
o = Test 5
feet (y)
0.2
0.4
0.6
0.8
1.0
1.2
1.4
Time (t), minutes

SLUG TEST DATA - CARSWELL AFB - STAGE 2

Installation ID	Location ID	Elapsed Time	Log Date	Logging Co.	Method	Depth
CRSWL	4G	.0000	7 April 1988	RADN	SI	1.3500
CRSWL	4G	.0033	7 April 1988	RADN	SI	1.1900
CRSWL	4G	.0066	7 April 1988	RADN	SI	1.4300
CRSWL	4G	.0099	7 April 1988	RADN	SI	1.2800
CRSWL	4G	.0133	7 April 1988	RADN	SI	1.4300
CRSWL	4G	.0166	7 April 1988	RADN	SI	1.1900
CRSWL	4G	.0200	7 April 1988	RADN	SI	1.1200
CRSWL	4G	.0233	7 April 1988	RADN	SI	1.2100
CRSWL	4G	.0266	7 April 1988	RADN	SI	.8900
CRSWL	4G	.0300	7 April 1988	RADN	SI	.8500
CRSWL	4G	.0333	7 April 1988	RADN	SI	.8800
CRSWL	4G	.0500	7 April 1988	RADN	SI	.6100
CRSWL	4G	.0666	7 April 1988	RADN	SI	.4200
CRSWL	4G	.0833	7 April 1988	RADN	SI	.3300
CRSWL	4G	.1000	7 April 1988	RADN	SI	.2900
CRSWL	4G	.1166	7 April 1988	RADN	SI	.2600
CRSWL	4G	.1333	7 April 1988	RADN	SI	.2500
CRSWL	4G	.1500	7 April 1988	RADN	SI	.2300
CRSWL	4G	.1666	7 April 1988	RADN	SI	.2100
CRSWL	4G	.1833	7 April 1988	RADN	SI	.1900
CRSWL	4G	.2000	7 April 1988	RADN	SI	.1700
CRSWL	4G	.2166	7 April 1988	RADN	SI	.1600
CRSWL	4G	.2333	7 April 1988	RADN	SI	.1400
CRSWL	4G	.2500	7 April 1988	RADN	SI	.1300
CRSWL	4G	.2666	7 April 1988	RADN	SI	.1200
CRSWL	4G	.2833	7 April 1988	RADN	SI	.1100
CRSWL	4G	.3000	7 April 1988	RADN	SI	.1000
CRSWL	4G	.3166	7 April 1988	RADN	SI	.0900
CRSWL	4G	.3333	7 April 1988	RADN	SI	.0800
CRSWL	4G	.4167	7 April 1988	RADN	SI	.0600
CRSWL	4G	.5000	7 April 1988	RADN	SI	.0300
CRSWL	4G	.5833	7 April 1988	RADN	SI	.0300
CRSWL	4G	.6667	7 April 1988	RADN	SI	.0200
CRSWL	4G	.7500	7 April 1988	RADN	SI	.0100

SLUG TEST DATA - CARSWELL AFB - STAGE 2

Installation ID	Location ID	Elapsed Time	Log Date	Logging Co.	Method	Depth
CRSWL	4G	.0000	7 April 1988	RADN	SI	1.5000
CRSWL	4G	.0033	7 April 1988	RADN	SI	1.4200
CRSWL	4G	.0066	7 April 1988	RADN	SI	1.2100
CRSWL	4G	.0099	7 April 1988	RADN	SI	1.2700
CRSWL	4G	.0133	7 April 1988	RADN	SI	1.1400
CRSWL	4G	.0166	7 April 1988	RADN	SI	1.2800
CRSWL	4G	.0200	7 April 1988	RADN	SI	1.1100
CRSWL	4G	.0233	7 April 1988	RADN	SI	1.1200
CRSWL	4G	.0266	7 April 1988	RADN	SI	.9700
CRSWL	4G	.0300	7 April 1988	RADN	SI	.9400
CRSWL	4G	.0333	7 April 1988	RADN	SI	.9700
CRSWL	4G	.0500	7 April 1988	RADN	SI	.7200
CRSWL	4G	.0666	7 April 1988	RADN	SI	.6000
CRSWL	4G	.0833	7 April 1988	RADN	SI	.4800
CRSWL	4G	.1000	7 April 1988	RADN	SI	.4000
CRSWL	4G	.1166	7 April 1988	RADN	SI	.3400
CRSWL	4G	.1333	7 April 1988	RADN	SI	.2900
CRSWL	4G	.1500	7 April 1988	RADN	SI	.2600
CRSWL	4G	.1666	7 April 1988	RADN	SI	.2500
CRSWL	4G	.1833	7 April 1988	RADN	SI	.2300
CRSWL	4G	.2000	7 April 1988	RADN	SI	.2200
CRSWL	4G	.2166	7 April 1988	RADN	SI	.2100
CRSWL	4G	.2333	7 April 1988	RADN	SI	.2000
CRSWL	4G	.2500	7 April 1988	RADN	SI	.1900
CRSWL	4G	.2666	7 April 1988	RADN	SI	.1800
CRSWL	4G	.2833	7 April 1988	RADN	SI	.1700
CRSWL	4G	.3000	7 April 1988	RADN	SI	.1700
CRSWL	4G	.3166	7 April 1988	RADN	SI	.1600
CRSWL	4G	.3333	7 April 1988	RADN	SI	.1500
CRSWL	4G	.4167	7 April 1988	RADN	SI	.1200
CRSWL	4G	.5000	7 April 1988	RADN	SI	.0900
CRSWL	4G	.5833	7 April 1988	RADN	SI	.0700
CRSWL	4G	.6667	7 April 1988	RADN	SI	.0600
CRSWL	4G	.7500	7 April 1988	RADN	SI	.0500
CRSWL	4G	.8333	7 April 1988	RADN	SI	.0400
CRSWL	4G	.9167	7 April 1988	RADN	SI	.0300
CRSWL	4G	1.0000	7 April 1988	RADN	SI	.0300
CRSWL	4G	1.0833	7 April 1988	RADN	SI	.0200
CRSWL	4G	1.1667	7 April 1988	RADN	SI	.0200
CRSWL	4G	1.2500	7 April 1988	RADN	SI	.0200
CRSWL	4G	1.3333	7 April 1988	RADN	SI	.0100
CRSWL	4G	1.4166	7 April 1988	RADN	SI	.0100
CRSWL	4G	1.5000	7 April 1988	RADN	SI	.0100
CRSWL	4G	1.5833	7 April 1988	RADN	SI	.0100
CRSWL	4G	1.6667	7 April 1988	RADN	SI	.0100



RADIAN CORPORATION

- DRAFT -

PADIAN CORPORATION

CALCULATION SHEET

-DRAFT-

CALC. NO. _____

SIGNATURE *Lu French* DATE *18 June 88* CHECKED _____ DATE _____

PROJECT *Caruswell AFB IRP Stage 2* JOB NO. *227-005-04-03*

SUBJECT *Analysis of Slug Test Data - Well 4G* SHEET _____ OF _____ SHEETS

[Ref. Bouwer and Rice, 1976, Water Resources Research, v. 12, no. 3]

Solving the analog equation: $\ln(R_e/r_w)$ ...

$$\ln\left(\frac{R_e}{r_w}\right) = \left(\frac{1.1}{\ln(H/r_w)} + \frac{C}{L/r_w}\right)^{-1}$$

where, $H = 10.3$ ft, $L = 15$ ft, $r_w = 0.28$ ft, $C = 2.75$ $\Rightarrow \ln R_e/r_w = 2.8$

Hydraulic Conductivity, $K = \dfrac{r_c^2 \ln(R_e/r_w)}{2L}\left[\frac{1}{t}\ln\left(\frac{y_0}{y_t}\right)\right]$

where, $r_c^2 = 6.94 \times 10^{-3}$ ft^2

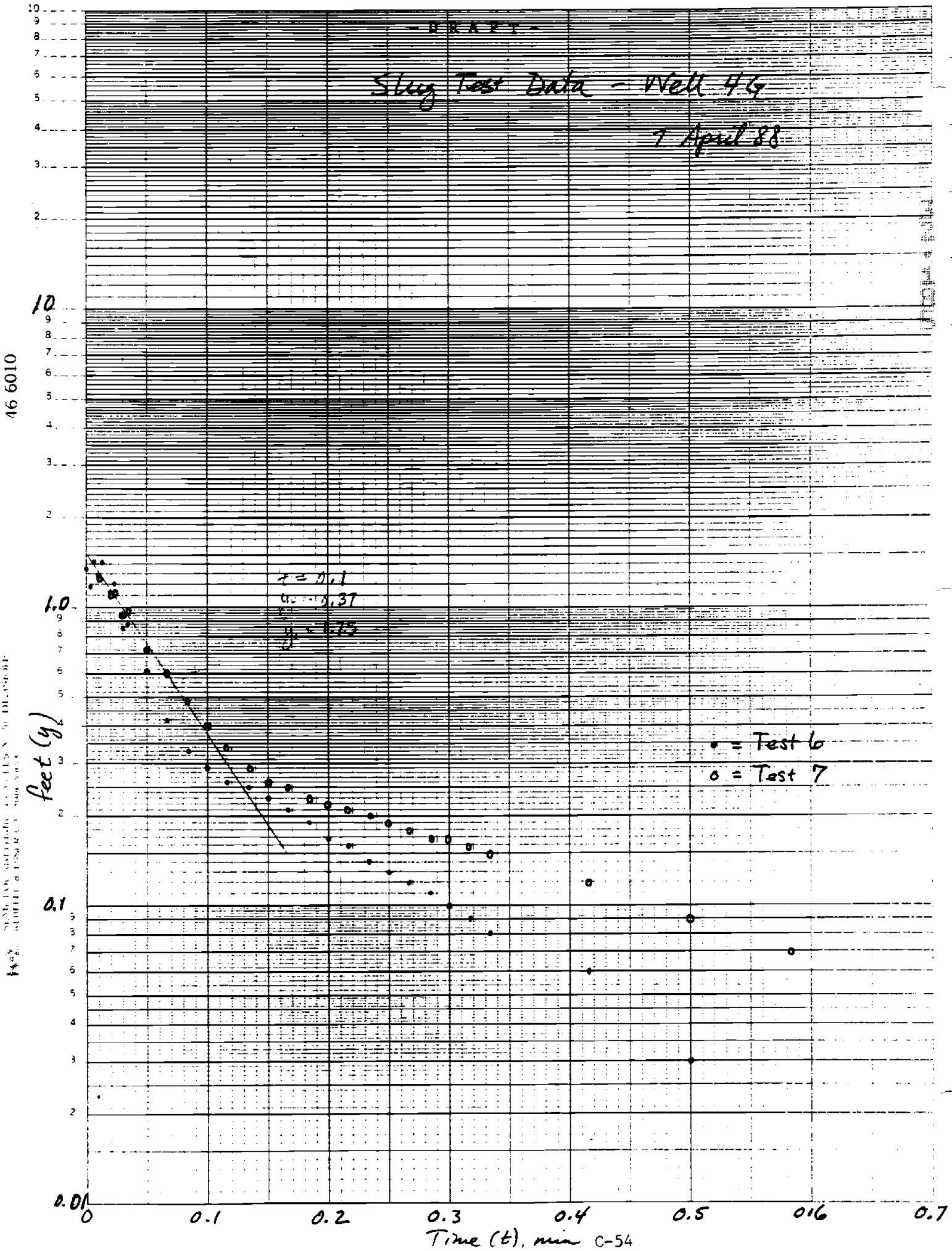
$t = 0.1$ min, $y_t = 0.37$ ft, $y_0 = 1.25$ ft } from plot of data on attached graph

solving for K,

$$K = \frac{(6.94\times10^{-3})(2.8)}{2\times15}\left[\frac{1}{0.1}\ln\left(\frac{1.25}{0.37}\right)\right]\times\frac{30.48\text{ cm/ft}}{60\text{ sec/min}}$$

$$K = 4\times10^{-3}\text{ cm/sec}$$

4-81-3361


- DRAFT -
Slug Test Data - Well 4G
7 April 88
τ = 0.1
u = 5.37
y = 0.75
• = Test 6
o = Test 7
feet (y)
Time (t), min
46 6010

SLUG TEST DATA - CARSWELL AFB - STAGE 2

Installation ID	Location ID	Elapsed Time	Log Date	Logging Co.	Method	Depth
CRSWL	5A	.0000	8 April 1988	RADN	SI	1.9500
CRSWL	5A	.0033	8 April 1988	RADN	SI	1.9000
CRSWL	5A	.0066	8 April 1988	RADN	SI	1.8800
CRSWL	5A	.0099	8 April 1988	RADN	SI	1.8200
CRSWL	5A	.0133	8 April 1988	RADN	SI	1.8100
CRSWL	5A	.0166	8 April 1988	RADN	SI	1.7700
CRSWL	5A	.0200	8 April 1988	RADN	SI	1.7300
CRSWL	5A	.0233	8 April 1988	RADN	SI	1.7000
CRSWL	5A	.0266	8 April 1988	RADN	SI	1.6700
CRSWL	5A	.0300	8 April 1988	RADN	SI	1.6400
CRSWL	5A	.0333	8 April 1988	RADN	SI	1.6200
CRSWL	5A	.0500	8 April 1988	RADN	SI	1.5100
CRSWL	5A	.0666	8 April 1988	RADN	SI	1.4100
CRSWL	5A	.0833	8 April 1988	RADN	SI	1.3000
CRSWL	5A	.1000	8 April 1988	RADN	SI	1.2100
CRSWL	5A	.1166	8 April 1988	RADN	SI	1.1500
CRSWL	5A	.1333	8 April 1988	RADN	SI	1.0900
CRSWL	5A	.1500	8 April 1988	RADN	SI	1.0500
CRSWL	5A	.1666	8 April 1988	RADN	SI	1.0100
CRSWL	5A	.1833	8 April 1988	RADN	SI	.9800
CRSWL	5A	.2000	8 April 1988	RADN	SI	.9500
[illegible]WL	5A	.2166	8 April 1988	RADN	SI	.9300
[illegible]WL	5A	.2333	8 April 1988	RADN	SI	.9000
CRSWL	5A	.2500	8 April 1988	RADN	SI	.8800
CRSWL	5A	.2666	8 April 1988	RADN	SI	.8600
CRSWL	5A	.2833	8 April 1988	RADN	SI	.8300
CRSWL	5A	.3000	8 April 1988	RADN	SI	.8100
CRSWL	5A	.3166	8 April 1988	RADN	SI	.7900
CRSWL	5A	.3333	8 April 1988	RADN	SI	.7700
CRSWL	5A	.4167	8 April 1988	RADN	SI	.6700
CRSWL	5A	.5000	8 April 1988	RADN	SI	.6000
CRSWL	5A	.5833	8 April 1988	RADN	SI	.5300
CRSWL	5A	.6667	8 April 1988	RADN	SI	.4800
CRSWL	5A	.7500	8 April 1988	RADN	SI	.4400
CRSWL	5A	.8333	8 April 1988	RADN	SI	.4000
CRSWL	5A	.9167	8 April 1988	RADN	SI	.3700
CRSWL	5A	1.0000	8 April 1988	RADN	SI	.3400
CRSWL	5A	1.0833	8 April 1988	RADN	SI	.3200
CRSWL	5A	1.1667	8 April 1988	RADN	SI	.2900
CRSWL	5A	1.2500	8 April 1988	RADN	SI	.2700
CRSWL	5A	1.3333	8 April 1988	RADN	SI	.2500
CRSWL	5A	1.4166	8 April 1988	RADN	SI	.2400
CRSWL	5A	1.5000	8 April 1988	RADN	SI	.2200
CRSWL	5A	1.5833	8 April 1988	RADN	SI	.2100
CRSWL	5A	1.6667	8 April 1988	RADN	SI	.1900
CRSWL	5A	1.7500	8 April 1988	RADN	SI	.1800
CRSWL	5A	1.8333	8 April 1988	RADN	SI	.1700

SLUG TEST DATA - CARSWELL AFB - STAGE 2

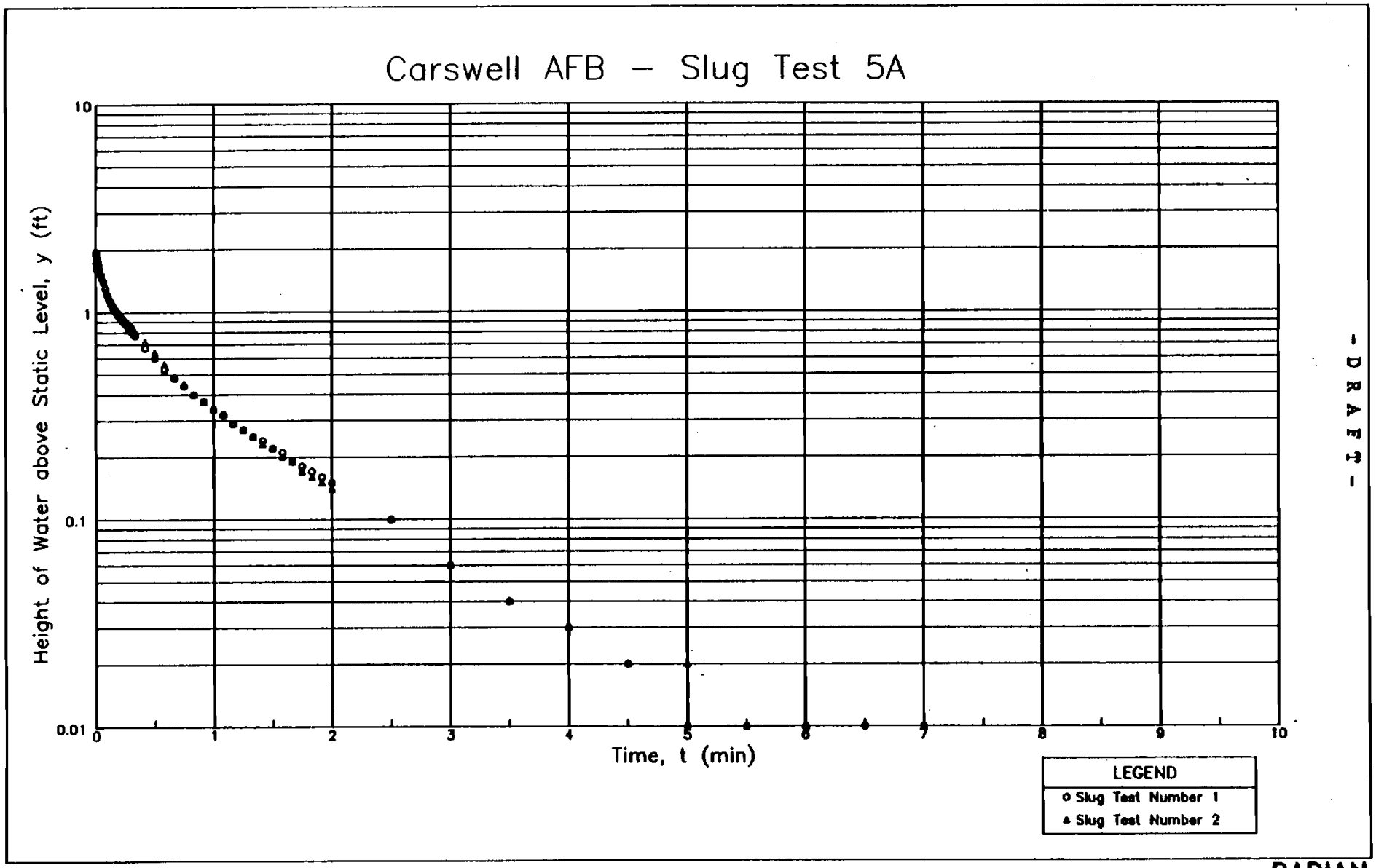
Installation ID	Location ID	Elapsed Time	Log Date	Logging Co.	Method	Depth
CRSWL	5A	1.9167	8 April 1988	RADN	SI	.1600
CRSWL	5A	2.0000	8 April 1988	RADN	SI	.1500
CRSWL	5A	2.5000	8 April 1988	RADN	SI	.1000
CRSWL	5A	3.0000	8 April 1988	RADN	SI	.0600
CRSWL	5A	3.5000	8 April 1988	RADN	SI	.0400
CRSWL	5A	4.0000	8 April 1988	RADN	SI	.0300
CRSWL	5A	4.5000	8 April 1988	RADN	SI	.0200
CRSWL	5A	5.0000	8 April 1988	RADN	SI	.0100
CRSWL	5A	5.5000	8 April 1988	RADN	SI	.0100
CRSWL	5A	6.0000	8 April 1988	RADN	SI	.0100
CRSWL	5A	6.5000	8 April 1988	RADN	SI	.0100
CRSWL	5A	7.0000	8 April 1988	RADN	SI	.0100

SLUG TEST DATA · CARSWELL AFB · STAGE 2

Installation ID	Location ID	Elapsed Time	Log Date	Logging Co.	Method	Depth
CRSWL	5A	.0000	8 April 1988	RADN	SI	1.8000
CRSWL	5A	.0033	8 April 1988	RADN	SI	1.7700
CRSWL	5A	.0066	8 April 1988	RADN	SI	1.7400
CRSWL	5A	.0099	8 April 1988	RADN	SI	1.7100
CRSWL	5A	.0133	8 April 1988	RADN	SI	1.6600
CRSWL	5A	.0166	8 April 1988	RADN	SI	1.6300
CRSWL	5A	.0200	8 April 1988	RADN	SI	1.6100
CRSWL	5A	.0233	8 April 1988	RADN	SI	1.5900
CRSWL	5A	.0266	8 April 1988	RADN	SI	1.5700
CRSWL	5A	.0300	8 April 1988	RADN	SI	1.5500
CRSWL	5A	.0333	8 April 1988	RADN	SI	1.5400
CRSWL	5A	.0500	8 April 1988	RADN	SI	1.4800
CRSWL	5A	.0666	8 April 1988	RADN	SI	1.4000
CRSWL	5A	.0833	8 April 1988	RADN	SI	1.3200
CRSWL	5A	.1000	8 April 1988	RADN	SI	1.2400
CRSWL	5A	.1166	8 April 1988	RADN	SI	1.1900
CRSWL	5A	.1333	8 April 1988	RADN	SI	1.1400
CRSWL	5A	.1500	8 April 1988	RADN	SI	1.1000
CRSWL	5A	.1666	8 April 1988	RADN	SI	1.0600
CRSWL	5A	.1833	8 April 1988	RADN	SI	1.0200
CRSWL	5A	.2000	8 April 1988	RADN	SI	1.0000
CRSWL	5A	.2166	8 April 1988	RADN	SI	.9700
CRSWL	5A	.2333	8 April 1988	RADN	SI	.9400
CRSWL	5A	.2500	8 April 1988	RADN	SI	.9200
CRSWL	5A	.2666	8 April 1988	RADN	SI	.9000
CRSWL	5A	.2833	8 April 1988	RADN	SI	.8800
CRSWL	5A	.3000	8 April 1988	RADN	SI	.8600
CRSWL	5A	.3166	8 April 1988	RADN	SI	.8400
CRSWL	5A	.3333	8 April 1988	RADN	SI	.8100
CRSWL	5A	.4167	8 April 1988	RADN	SI	.7200
CRSWL	5A	.5000	8 April 1988	RADN	SI	.6400
CRSWL	5A	.5833	8 April 1988	RADN	SI	.5600
CRSWL	5A	.6667	8 April 1988	RADN	SI	.4900
CRSWL	5A	.7500	8 April 1988	RADN	SI	.4500
CRSWL	5A	.8333	8 April 1988	RADN	SI	.4000
CRSWL	5A	.9167	8 April 1988	RADN	SI	.3700
CRSWL	5A	1.0000	8 April 1988	RADN	SI	.3400
CRSWL	5A	1.0833	8 April 1988	RADN	SI	.3200
CRSWL	5A	1.1667	8 April 1988	RADN	SI	.2900
CRSWL	5A	1.2500	8 April 1988	RADN	SI	.2700
CRSWL	5A	1.3333	8 April 1988	RADN	SI	.2500
CRSWL	5A	1.4166	8 April 1988	RADN	SI	.2300
CRSWL	5A	1.5000	8 April 1988	RADN	SI	.2200
CRSWL	5A	1.5833	8 April 1988	RADN	SI	.2000
CRSWL	5A	1.6667	8 April 1988	RADN	SI	.1900
CRSWL	5A	1.7500	8 April 1988	RADN	SI	.1700
CRSWL	5A	1.8333	8 April 1988	RADN	SI	.1600

SLUG TEST DATA - CARSWELL AFB - STAGE 2

Installation ID	Location ID	Elapsed Time	Log Date	Logging Co.	Method	Depth
CRSWL	5A	1.9167	8 April 1988	RADN	SI	.1500
CRSWL	5A	2.0000	8 April 1988	RADN	SI	.1400
CRSWL	5A	2.5000	8 April 1988	RADN	SI	.1000
CRSWL	5A	3.0000	8 April 1988	RADN	SI	.0600
CRSWL	5A	3.5000	8 April 1988	RADN	SI	.0400
CRSWL	5A	4.0000	8 April 1988	RADN	SI	.0300
CRSWL	5A	4.5000	8 April 1988	RADN	SI	.0200
CRSWL	5A	5.0000	8 April 1988	RADN	SI	.0200
CRSWL	5A	5.5000	8 April 1988	RADN	SI	.0100
CRSWL	5A	6.0000	8 April 1988	RADN	SI	.0100



RADIAN CORPORATION

- DRAFT -

RADIAN CORPORATION

CALCULATION SHEET
- DRAFT -

CALC. NO. _____

SIGNATURE W. G. McPatton DATE 13 July 88 CHECKED _____ DATE _____

PROJECT Carswell AFB IRP Stage 2 JOB NO. 227-005-04-03

SUBJECT Analysis of Slug Test Data-Well 5A SHEET _____ OF _____ SHEETS

[Ref. Bower and Rice, 1976, Water Resources Research, V 12, No. 3]

Solving the analog equation: $\ln(R_e/r_w)$ . . .

$$\ln(R_e/r_w) = \left(\frac{1.1}{\ln(H/r_w)} + \frac{C}{L/r_w}\right)^{-1}$$

where, $H = 9.2$ ft, $L = 10$ ft, $r_w = 0.28$ ft, $C = 2.2$ $\Big\}$ $\ln R_e/r_w = 2.65$

Hydraulic Conductivity, $K = \dfrac{r_c^2 \ln(R_e/r_w)}{2L}\left[\dfrac{1}{t}\ln\left(\dfrac{y_0}{y_t}\right)\right]$

where, $r_c^2 = 6.94 \times 10^{-3}$ ft^2

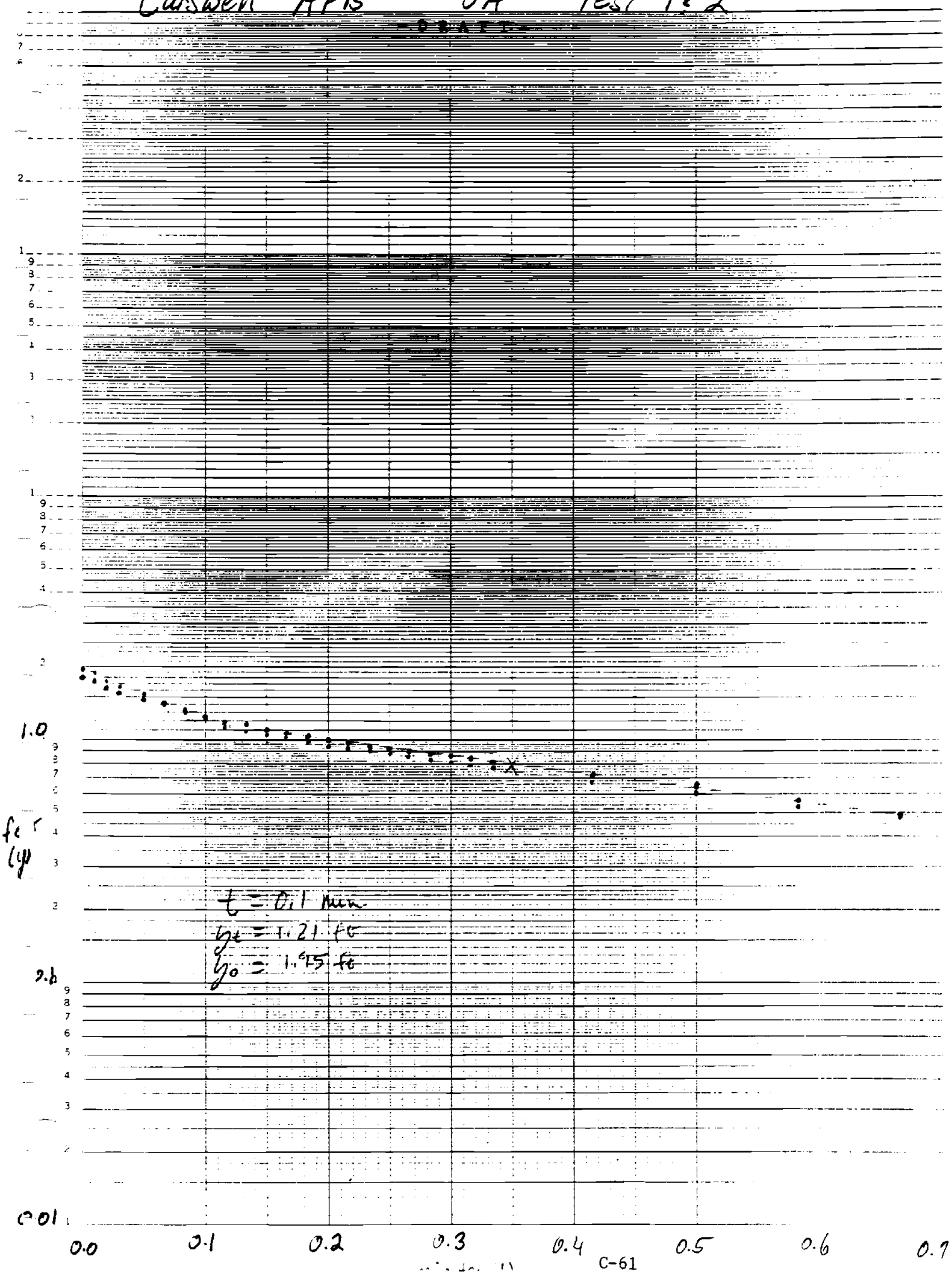
$t = 0.1$ min, $y_t = 1.21$ ft, $y_0 = 1.95$ ft $\Big\}$ from plot of data on attached graph

Solving for K,

$$K = \frac{(6.94 \times 10^{-3})(2.65)}{2 \times 10}\left[\frac{1}{0.1}\ln\left(\frac{1.95}{1.21}\right)\right] \times \frac{30.48 \text{ cm/ft}}{60 \text{ sec/min}}$$

$$K = 2.22 \times 10^{-3} \text{ cm/sec}$$

Carswell AFB 5A Test 1 & 2



SLUG TEST DATA - CARSWELL AFB - STAGE 2

Installation ID	Location ID	Elapsed Time	Log Date	Logging Co.	Method	Depth
CRSWL	5B	.0000	7 April 1988	RADN	SI	2.4800
CRSWL	5B	.0033	7 April 1988	RADN	SI	2.4000
CRSWL	5B	.0066	7 April 1988	RADN	SI	2.3200
CRSWL	5B	.0099	7 April 1988	RADN	SI	2.2400
CRSWL	5B	.0133	7 April 1988	RADN	SI	2.1600
CRSWL	5B	.0166	7 April 1988	RADN	SI	2.0900
CRSWL	5B	.0200	7 April 1988	RADN	SI	2.0200
CRSWL	5B	.0233	7 April 1988	RADN	SI	1.9500
CRSWL	5B	.0266	7 April 1988	RADN	SI	1.8900
CRSWL	5B	.0300	7 April 1988	RADN	SI	1.8300
CRSWL	5B	.0333	7 April 1988	RADN	SI	1.7800
CRSWL	5B	.0500	7 April 1988	RADN	SI	1.5100
CRSWL	5B	.0666	7 April 1988	RADN	SI	1.2900
CRSWL	5B	.0833	7 April 1988	RADN	SI	1.1100
CRSWL	5B	.1000	7 April 1988	RADN	SI	.9500
CRSWL	5B	.1166	7 April 1988	RADN	SI	.8200
CRSWL	5B	.1333	7 April 1988	RADN	SI	.7000
CRSWL	5B	.1500	7 April 1988	RADN	SI	.6100
CRSWL	5B	.1666	7 April 1988	RADN	SI	.5300
CRSWL	5B	.1833	7 April 1988	RADN	SI	.4600
CRSWL	5B	.2000	7 April 1988	RADN	SI	.4000
CRSWL	5B	.2166	7 April 1988	RADN	SI	.3500
CRSWL	5B	.2333	7 April 1988	RADN	SI	.3100
CRSWL	5B	.2500	7 April 1988	RADN	SI	.2800
CRSWL	5B	.2666	7 April 1988	RADN	SI	.2500
CRSWL	5B	.2833	7 April 1988	RADN	SI	.2300
CRSWL	5B	.3000	7 April 1988	RADN	SI	.2000
CRSWL	5B	.3166	7 April 1988	RADN	SI	.1900
CRSWL	5B	.3333	7 April 1988	RADN	SI	.1700
CRSWL	5B	.4167	7 April 1988	RADN	SI	.1200
CRSWL	5B	.5000	7 April 1988	RADN	SI	.0900
CRSWL	5B	.5833	7 April 1988	RADN	SI	.0700
CRSWL	5B	.6667	7 April 1988	RADN	SI	.0600
CRSWL	5B	.7500	7 April 1988	RADN	SI	.0600
CRSWL	5B	.8333	7 April 1988	RADN	SI	.0500
CRSWL	5B	.9167	7 April 1988	RADN	SI	.0500
CRSWL	5B	1.0000	7 April 1988	RADN	SI	.0400
CRSWL	5B	1.0833	7 April 1988	RADN	SI	.0400
CRSWL	5B	1.1667	7 April 1988	RADN	SI	.0400
CRSWL	5B	1.2500	7 April 1988	RADN	SI	.0400
CRSWL	5B	1.3333	7 April 1988	RADN	SI	.0300
CRSWL	5B	1.4166	7 April 1988	RADN	SI	.0300
CRSWL	5B	1.5000	7 April 1988	RADN	SI	.0300
CRSWL	5B	1.5833	7 April 1988	RADN	SI	.0300
CRSWL	5B	1.6667	7 April 1988	RADN	SI	.0300
CRSWL	5B	1.7500	7 April 1988	RADN	SI	.0300
CRSWL	5B	1.8333	7 April 1988	RADN	SI	.0300

SLUG TEST DATA - CARSWELL AFB - STAGE 2

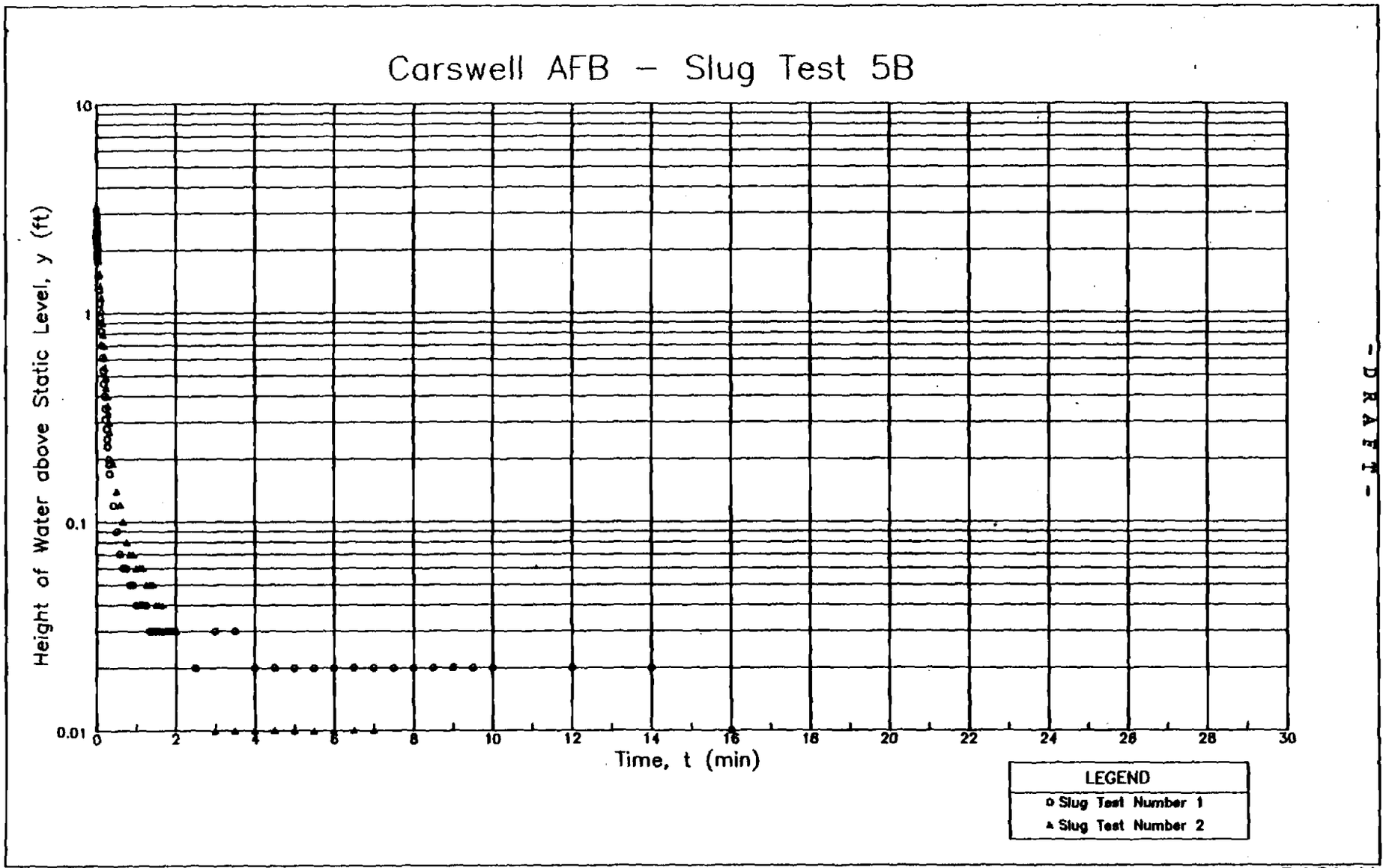
Installation ID	Location ID	Elapsed Time	Log Date	Logging Co.	Method	Depth
CRSWL	5B	1.9167	7 April 1988	RADN	SI	.0300
CRSWL	5B	2.0000	7 April 1988	RADN	SI	.0300
CRSWL	5B	2.5000	7 April 1988	RADN	SI	.0200
CRSWL	5B	3.0000	7 April 1988	RADN	SI	.0300
CRSWL	5B	3.5000	7 April 1988	RADN	SI	.0300
CRSWL	5B	4.0000	7 April 1988	RADN	SI	.0200
CRSWL	5B	4.5000	7 April 1988	RADN	SI	.0200
CRSWL	5B	5.0000	7 April 1988	RADN	SI	.0200
CRSWL	5B	5.5000	7 April 1988	RADN	SI	.0200
CRSWL	5B	6.0000	7 April 1988	RADN	SI	.0200
CRSWL	5B	6.5000	7 April 1988	RADN	SI	.0200
CRSWL	5B	7.0000	7 April 1988	RADN	SI	.0200
CRSWL	5B	7.5000	7 April 1988	RADN	SI	.0200
CRSWL	5B	8.0000	7 April 1988	RADN	SI	.0200
CRSWL	5B	8.5000	7 April 1988	RADN	SI	.0200
CRSWL	5B	9.0000	7 April 1988	RADN	SI	.0200
CRSWL	5B	9.5000	7 April 1988	RADN	SI	.0200
CRSWL	5B	10.0000	7 April 1988	RADN	SI	.0200
CRSWL	5B	12.0000	7 April 1988	RADN	SI	.0200
CRSWL	5B	14.0000	7 April 1988	RADN	SI	.0200
CRSWL	5B	16.0000	7 April 1988	RADN	SI	.0100

SLUG TEST DATA - CARSWELL AFB - STAGE 2

Installation ID	Location ID	Elapsed Time	Log Date	Logging Co.	Method	Depth
CRSWL	5B	.0000	7 April 1988	RADN	SI	3.2500
CRSWL	5B	.0033	7 April 1988	RADN	SI	3.1700
CRSWL	5B	.0066	7 April 1988	RADN	SI	3.0700
CRSWL	5B	.0099	7 April 1988	RADN	SI	2.9900
CRSWL	5B	.0133	7 April 1988	RADN	SI	2.8900
CRSWL	5B	.0166	7 April 1988	RADN	SI	2.8100
CRSWL	5B	.0200	7 April 1988	RADN	SI	2.7200
CRSWL	5B	.0233	7 April 1988	RADN	SI	2.6400
CRSWL	5B	.0266	7 April 1988	RADN	SI	2.5500
CRSWL	5B	.0300	7 April 1988	RADN	SI	2.4800
CRSWL	5B	.0333	7 April 1988	RADN	SI	2.4000
CRSWL	5B	.0500	7 April 1988	RADN	SI	2.0700
CRSWL	5B	.0666	7 April 1988	RADN	SI	1.7900
CRSWL	5B	.0833	7 April 1988	RADN	SI	1.5500
CRSWL	5B	.1000	7 April 1988	RADN	SI	1.3500
CRSWL	5B	.1166	7 April 1988	RADN	SI	1.1800
CRSWL	5B	.1333	7 April 1988	RADN	SI	1.0300
CRSWL	5B	.1500	7 April 1988	RADN	SI	.9000
CRSWL	5B	.1666	7 April 1988	RADN	SI	.7900
CRSWL	5B	.1833	7 April 1988	RADN	SI	.7000
CRSWL	5B	.2000	7 April 1988	RADN	SI	.6200
CRSWL	5B	.2166	7 April 1988	RADN	SI	.5500
CRSWL	5B	.2333	7 April 1988	RADN	SI	.4900
CRSWL	5B	.2500	7 April 1988	RADN	SI	.4400
CRSWL	5B	.2666	7 April 1988	RADN	SI	.4000
CRSWL	5B	.2833	7 April 1988	RADN	SI	.3600
CRSWL	5B	.3000	7 April 1988	RADN	SI	.3300
CRSWL	5B	.3166	7 April 1988	RADN	SI	.3000
CRSWL	5B	.3333	7 April 1988	RADN	SI	.2700
CRSWL	5B	.4167	7 April 1988	RADN	SI	.1900
CRSWL	5B	.5000	7 April 1988	RADN	SI	.1400
CRSWL	5B	.5833	7 April 1988	RADN	SI	.1200
CRSWL	5B	.6667	7 April 1988	RADN	SI	.1000
CRSWL	5B	.7500	7 April 1988	RADN	SI	.0800
CRSWL	5B	.8333	7 April 1988	RADN	SI	.0700
CRSWL	5B	.9167	7 April 1988	RADN	SI	.0700
CRSWL	5B	1.0000	7 April 1988	RADN	SI	.0600
CRSWL	5B	1.0833	7 April 1988	RADN	SI	.0600
CRSWL	5B	1.1667	7 April 1988	RADN	SI	.0600
CRSWL	5B	1.2500	7 April 1988	RADN	SI	.0500
CRSWL	5B	1.3333	7 April 1988	RADN	SI	.0500
CRSWL	5B	1.4166	7 April 1988	RADN	SI	.0500
CRSWL	5B	1.5000	7 April 1988	RADN	SI	.0400
CRSWL	5B	1.5833	7 April 1988	RADN	SI	.0400
CRSWL	5B	1.6667	7 April 1988	RADN	SI	.0400
CRSWL	5B	1.7500	7 April 1988	RADN	SI	.0300
CRSWL	5B	1.8333	7 April 1988	RADN	SI	.0300

SLUG TEST DATA - CARSWELL AFB - STAGE 2

Installation ID	Location ID	Elapsed Time	Log Date	Logging Co.	Method	Depth
CRSWL	5B	1.9167	7 April 1988	RADN	SI	.0300
CRSWL	5B	2.0000	7 April 1988	RADN	SI	.0300
CRSWL	5B	2.5000	7 April 1988	RADN	SI	.0200
CRSWL	5B	3.0000	7 April 1988	RADN	SI	.0100
CRSWL	5B	3.5000	7 April 1988	RADN	SI	.0100
CRSWL	5B	4.0000	7 April 1988	RADN	SI	.0100
CRSWL	5B	4.5000	7 April 1988	RADN	SI	.0100
CRSWL	5B	5.0000	7 April 1988	RADN	SI	.0100
CRSWL	5B	5.5000	7 April 1988	RADN	SI	.0100
CRSWL	5B	6.0000	7 April 1988	RADN	SI	.0100
CRSWL	5B	6.5000	7 April 1988	RADN	SI	.0100
CRSWL	5B	7.0000	7 April 1988	RADN	SI	.0100



RADIAN CORPORATION

- DRAFT -

[Ref. Bower and Rice, 1976, Water Resources Research, V. 12, No. 3]

Solving the analog equation: $\ln(R_e/r_w)$ ...

$$\ln(R_e/r_w) = \left(\frac{1.1}{\ln(H/r_w)} + C/(L/r_w)\right)^{-1}$$

where, $H = 6.85$ ft, $L = 5$ ft, $r_w = 0.28$ ft, $C = 1.55$ $\Big\}$ $\ln R_e/r_w = 2.32$

$$\text{Hydraulic Conductivity, } K = \frac{r_c^2 \ln(R_e/r_w)}{2L}\left[\frac{1}{t}\ln\left(\frac{y_0}{y_t}\right)\right]$$

where, $r_c^2 = 6.94 \times 10^{-3}$ ft^2

$t = 0.3$ min, $y_t = 0.15$ ft, $y_0 = 2.4$ ft $\Big\}$ from plot of data on attached graph

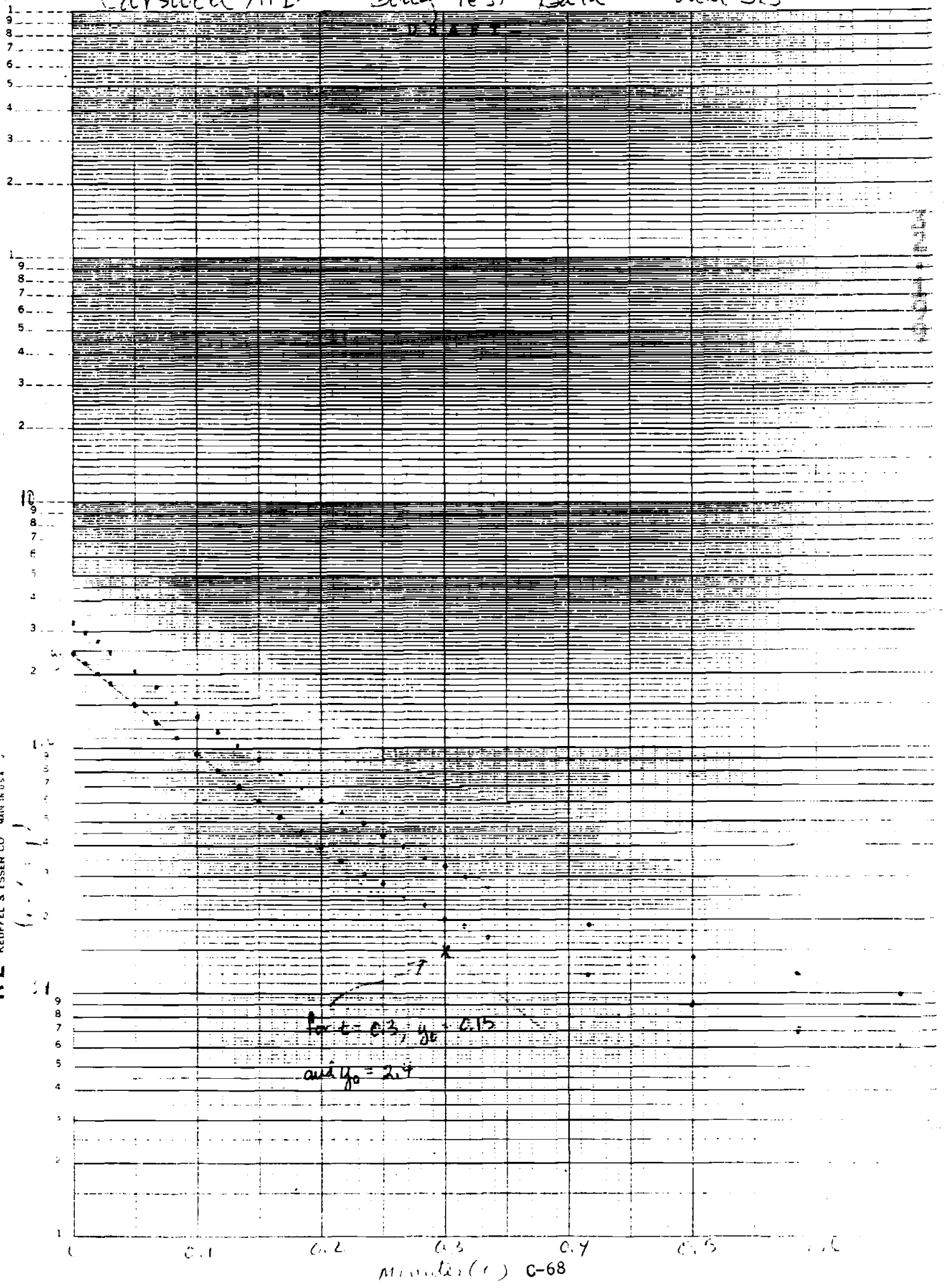
Solving for K,

$$K = \frac{(6.94 \times 10^{-3})(2.32)}{2 \times 10}\left[\frac{1}{0.3}\ln\left(\frac{2.4}{.15}\right)\right] \times \frac{30.48 \text{ cm/ft}}{60 \text{ sec/min}}$$

$$K = 3.74 \times 10^{-3} \text{ cm/sec}$$

4-81-3361

Carswell AFB Slug Test Data well 5B



SLUG TEST DATA · CARSWELL AFB · STAGE 2

Installation ID	Location ID	Elapsed Time	Log Date	Logging Co.	Method	Depth
CRSWL	5C	.0000	11 April 1988	RADN	SI	1.9900
CRSWL	5C	.0033	11 April 1988	RADN	SI	2.1000
CRSWL	5C	.0066	11 April 1988	RADN	SI	1.9200
CRSWL	5C	.0099	11 April 1988	RADN	SI	1.8300
CRSWL	5C	.0133	11 April 1988	RADN	SI	1.7800
CRSWL	5C	.0166	11 April 1988	RADN	SI	1.6800
CRSWL	5C	.0200	11 April 1988	RADN	SI	1.6300
CRSWL	5C	.0233	11 April 1988	RADN	SI	1.6000
CRSWL	5C	.0266	11 April 1988	RADN	SI	1.5500
CRSWL	5C	.0300	11 April 1988	RADN	SI	1.5400
CRSWL	5C	.0333	11 April 1988	RADN	SI	1.5100
CRSWL	5C	.0500	11 April 1988	RADN	SI	1.4600
CRSWL	5C	.0666	11 April 1988	RADN	SI	1.4300
CRSWL	5C	.0833	11 April 1988	RADN	SI	1.3900
CRSWL	5C	.1000	11 April 1988	RADN	SI	1.3300
CRSWL	5C	.1166	11 April 1988	RADN	SI	1.2200
CRSWL	5C	.1333	11 April 1988	RADN	SI	1.1600
CRSWL	5C	.1500	11 April 1988	RADN	SI	1.1000
CRSWL	5C	.1666	11 April 1988	RADN	SI	1.0600
CRSWL	5C	.1833	11 April 1988	RADN	SI	1.0200
CRSWL	5C	.2000	11 April 1988	RADN	SI	1.0000
CRSWL	5C	.2166	11 April 1988	RADN	SI	.9800
CRSWL	5C	.2333	11 April 1988	RADN	SI	.9500
CRSWL	5C	.2500	11 April 1988	RADN	SI	.9400
CRSWL	5C	.2666	11 April 1988	RADN	SI	.9300
CRSWL	5C	.2833	11 April 1988	RADN	SI	.9100
CRSWL	5C	.3000	11 April 1988	RADN	SI	.9000
CRSWL	5C	.3166	11 April 1988	RADN	SI	.8900
CRSWL	5C	.3333	11 April 1988	RADN	SI	.8700
CRSWL	5C	.4167	11 April 1988	RADN	SI	.8200
CRSWL	5C	.5000	11 April 1988	RADN	SI	.7800
CRSWL	5C	.5833	11 April 1988	RADN	SI	.7500
CRSWL	5C	.6667	11 April 1988	RADN	SI	.7000
CRSWL	5C	.7500	11 April 1988	RADN	SI	.6800
CRSWL	5C	.8333	11 April 1988	RADN	SI	.6500
CRSWL	5C	.9167	11 April 1988	RADN	SI	.6200
CRSWL	5C	1.0000	11 April 1988	RADN	SI	.6000
CRSWL	5C	1.0833	11 April 1988	RADN	SI	.5700
CRSWL	5C	1.1667	11 April 1988	RADN	SI	.5500
CRSWL	5C	1.2500	11 April 1988	RADN	SI	.5300
CRSWL	5C	1.3333	11 April 1988	RADN	SI	.5000
CRSWL	5C	1.4166	11 April 1988	RADN	SI	.4800
CRSWL	5C	1.5000	11 April 1988	RADN	SI	.4600
CRSWL	5C	1.5833	11 April 1988	RADN	SI	.4400
CRSWL	5C	1.6667	11 April 1988	RADN	SI	.4100
CRSWL	5C	1.7500	11 April 1988	RADN	SI	.3900
CRSWL	5C	1.8333	11 April 1988	RADN	SI	.3800

SLUG TEST DATA - CARSWELL AFB - STAGE 2

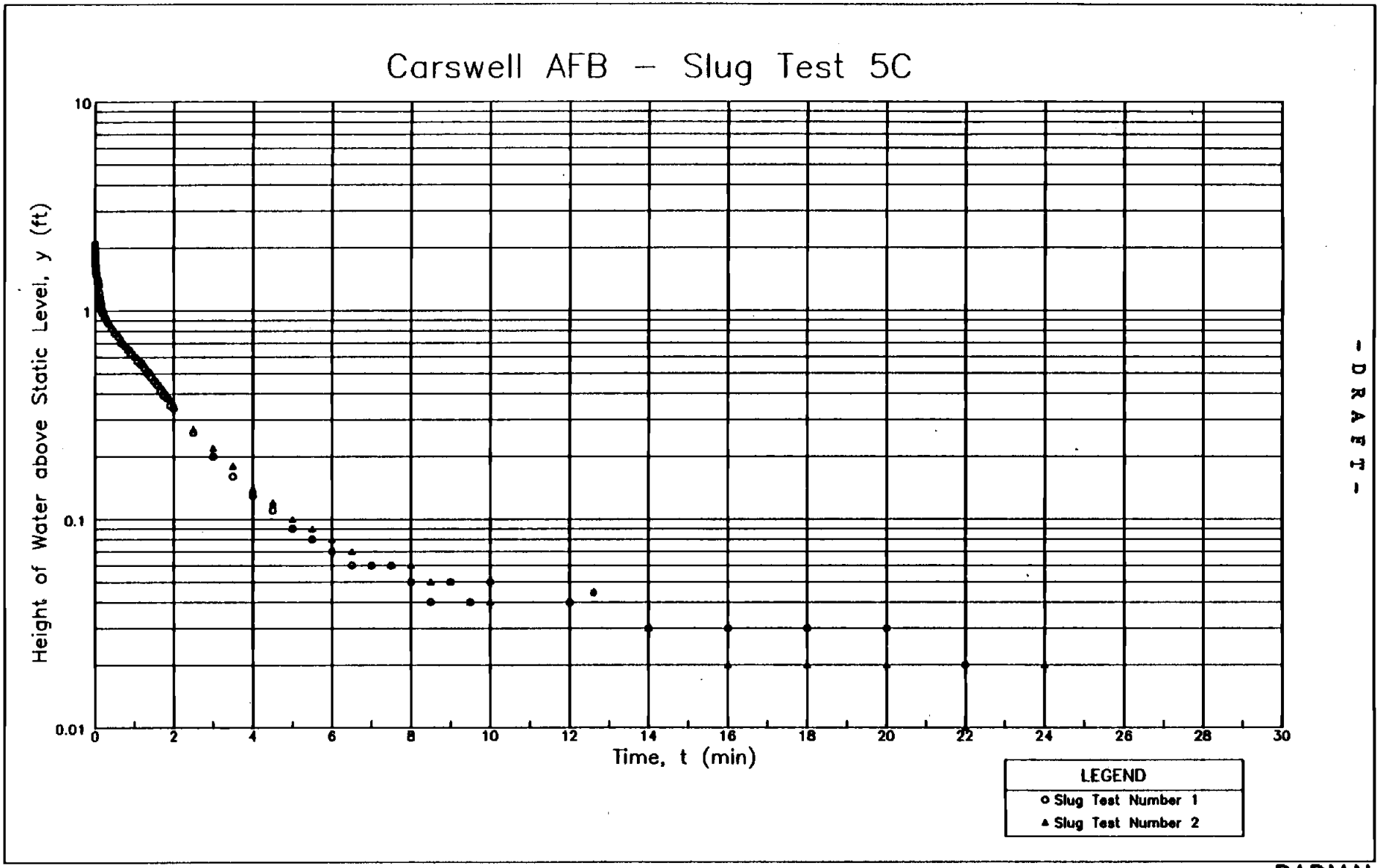
Installation ID	Location ID	Elapsed Time	Log Date	Logging Co.	Method	Depth
CRSWL	5C	1.9167	11 April 1988	RADN	SI	.3500
CRSWL	5C	2.0000	11 April 1988	RADN	SI	.3400
CRSWL	5C	2.5000	11 April 1988	RADN	SI	.2600
CRSWL	5C	3.0000	11 April 1988	RADN	SI	.2000
CRSWL	5C	3.5000	11 April 1988	RADN	SI	.1600
CRSWL	5C	4.0000	11 April 1988	RADN	SI	.1300
CRSWL	5C	4.5000	11 April 1988	RADN	SI	.1100
CRSWL	5C	5.0000	11 April 1988	RADN	SI	.0900
CRSWL	5C	5.5000	11 April 1988	RADN	SI	.0800
CRSWL	5C	6.0000	11 April 1988	RADN	SI	.0700
CRSWL	5C	6.5000	11 April 1988	RADN	SI	.0600
CRSWL	5C	7.0000	11 April 1988	RADN	SI	.0600
CRSWL	5C	7.5000	11 April 1988	RADN	SI	.0600
CRSWL	5C	8.0000	11 April 1988	RADN	SI	.0500
CRSWL	5C	8.5000	11 April 1988	RADN	SI	.0400
CRSWL	5C	9.0000	11 April 1988	RADN	SI	.0500
CRSWL	5C	9.5000	11 April 1988	RADN	SI	.0400
CRSWL	5C	10.0000	11 April 1988	RADN	SI	.0500
CRSWL	5C	12.0000	11 April 1988	RADN	SI	.0400
CRSWL	5C	14.0000	11 April 1988	RADN	SI	.0300
CRSWL	5C	16.0000	11 April 1988	RADN	SI	.0300
CRSWL	5C	18.0000	11 April 1988	RADN	SI	.0300
CRSWL	5C	20.0000	11 April 1988	RADN	SI	.0300
CRSWL	5C	22.0000	11 April 1988	RADN	SI	.0200

SLUG TEST DATA - CARSWELL AFB - STAGE 2

Installation ID	Location ID	Elapsed Time	Log Date	Logging Co.	Method	Depth
CRSWL	5C	.0000	11 April 1988	RADN	SI	1.9100
CRSWL	5C	.0033	11 April 1988	RADN	SI	1.8300
CRSWL	5C	.0066	11 April 1988	RADN	SI	1.7800
CRSWL	5C	.0099	11 April 1988	RADN	SI	1.7500
CRSWL	5C	.0133	11 April 1988	RADN	SI	1.6900
CRSWL	5C	.0166	11 April 1988	RADN	SI	1.6700
CRSWL	5C	.0200	11 April 1988	RADN	SI	1.6300
CRSWL	5C	.0233	11 April 1988	RADN	SI	1.5700
CRSWL	5C	.0266	11 April 1988	RADN	SI	1.5500
CRSWL	5C	.0300	11 April 1988	RADN	SI	1.5300
CRSWL	5C	.0333	11 April 1988	RADN	SI	1.5000
CRSWL	5C	.0500	11 April 1988	RADN	SI	1.4000
CRSWL	5C	.0666	11 April 1988	RADN	SI	1.3000
CRSWL	5C	.0833	11 April 1988	RADN	SI	1.2100
CRSWL	5C	.1000	11 April 1988	RADN	SI	1.1400
CRSWL	5C	.1166	11 April 1988	RADN	SI	1.1000
CRSWL	5C	.1333	11 April 1988	RADN	SI	1.0600
CRSWL	5C	.1500	11 April 1988	RADN	SI	1.0300
CRSWL	5C	.1666	11 April 1988	RADN	SI	1.0100
CRSWL	5C	.1833	11 April 1988	RADN	SI	1.0000
CRSWL	5C	.2000	11 April 1988	RADN	SI	.9800
CRSWL	5C	.2166	11 April 1988	RADN	SI	.9700
CRSWL	5C	.2333	11 April 1988	RADN	SI	.9600
CRSWL	5C	.2500	11 April 1988	RADN	SI	.9500
CRSWL	5C	.2666	11 April 1988	RADN	SI	.9400
CRSWL	5C	.2833	11 April 1988	RADN	SI	.9200
CRSWL	5C	.3000	11 April 1988	RADN	SI	.9200
CRSWL	5C	.3166	11 April 1988	RADN	SI	.9100
CRSWL	5C	.3333	11 April 1988	RADN	SI	.9000
CRSWL	5C	.4167	11 April 1988	RADN	SI	.8500
CRSWL	5C	.5000	11 April 1988	RADN	SI	.8100
CRSWL	5C	.5833	11 April 1988	RADN	SI	.7800
CRSWL	5C	.6667	11 April 1988	RADN	SI	.7400
CRSWL	5C	.7500	11 April 1988	RADN	SI	.7000
CRSWL	5C	.8333	11 April 1988	RADN	SI	.6700
CRSWL	5C	.9167	11 April 1988	RADN	SI	.6500
CRSWL	5C	1.0000	11 April 1988	RADN	SI	.6200
CRSWL	5C	1.0833	11 April 1988	RADN	SI	.6000
CRSWL	5C	1.1667	11 April 1988	RADN	SI	.5800
CRSWL	5C	1.2500	11 April 1988	RADN	SI	.5600
CRSWL	5C	1.3333	11 April 1988	RADN	SI	.5300
CRSWL	5C	1.4166	11 April 1988	RADN	SI	.5100
CRSWL	5C	1.5000	11 April 1988	RADN	SI	.4800
CRSWL	5C	1.5833	11 April 1988	RADN	SI	.4600
CRSWL	5C	1.6667	11 April 1988	RADN	SI	.4400
CRSWL	5C	1.7500	11 April 1988	RADN	SI	.4200
CRSWL	5C	1.8333	11 April 1988	RADN	SI	.4000

SLUG TEST DATA - CARSWELL AFB - STAGE 2

Installation ID	Location ID	Elapsed Time	Log Date	Logging Co.	Method	Depth
CRSWL	5C	1.9167	11 April 1988	RADN	SI	.3800
CRSWL	5C	2.0000	11 April 1988	RADN	SI	.3600
CRSWL	5C	2.5000	11 April 1988	RADN	SI	.2700
CRSWL	5C	3.0000	11 April 1988	RADN	SI	.2200
CRSWL	5C	3.5000	11 April 1988	RADN	SI	.1800
CRSWL	5C	4.0000	11 April 1988	RADN	SI	.1400
CRSWL	5C	4.5000	11 April 1988	RADN	SI	.1200
CRSWL	5C	5.0000	11 April 1988	RADN	SI	.1000
CRSWL	5C	5.5000	11 April 1988	RADN	SI	.0900
CRSWL	5C	6.0000	11 April 1988	RADN	SI	.0800
CRSWL	5C	6.5000	11 April 1988	RADN	SI	.0700
CRSWL	5C	7.0000	11 April 1988	RADN	SI	.0600
CRSWL	5C	7.5000	11 April 1988	RADN	SI	.0600
CRSWL	5C	8.0000	11 April 1988	RADN	SI	.0600
CRSWL	5C	8.5000	11 April 1988	RADN	SI	.0500
CRSWL	5C	9.0000	11 April 1988	RADN	SI	.0500
CRSWL	5C	9.5000	11 April 1988	RADN	SI	.0400
CRSWL	5C	10.0000	11 April 1988	RADN	SI	.0400
CRSWL	5C	12.0000	11 April 1988	RADN	SI	.0400
CRSWL	5C	14.0000	11 April 1988	RADN	SI	.0300
CRSWL	5C	16.0000	11 April 1988	RADN	SI	.0200
CRSWL	5C	18.0000	11 April 1988	RADN	SI	.0200
CRSWL	5C	20.0000	11 April 1988	RADN	SI	.0200
CRSWL	5C	22.0000	11 April 1988	RADN	SI	.0100
CRSWL	5C	24.0000	11 April 1988	RADN	SI	.0200



RADIAN CORPORATION

- DRAFT -

RADIAN CORPORATION

CALCULATION SHEET
- DRAFT -

CALC. NO. _____

SIGNATURE W.G. McAntee DATE 13 July 88 CHECKED _____ DATE _____

PROJECT Carswell AFB IRP Stage 2 JOB NO. 227-005-04-03

SUBJECT Analysis of slug Test Data - Well 5C SHEET _____ OF _____ SHEETS

[Ref. Bower and Rice, 1976, Water Resources Research, V. 12, no 3]

Solving the analog equation: $\ln(R_e/r_w)$ . . .

$$\ln(R_e/r_w) = \left(\frac{1.1}{\ln(H/r_w)} + \frac{C}{L/r_w}\right)^{-1}$$

Where, $H = 11.11$ ft
$L = 15$ ft
$r_w = 0.28$ ft
$C = 2.75$
} $\ln R_e/r_w = 2.85$

Hydraulic Conductivity, $K = \frac{r_c^2 \ln(R_e/r_w)}{2L}\left[\frac{1}{t}\ln\left(\frac{y_0}{y_t}\right)\right]$

Where, $r_c^2 = 6.94 \times 10^{-3}$ ft^2

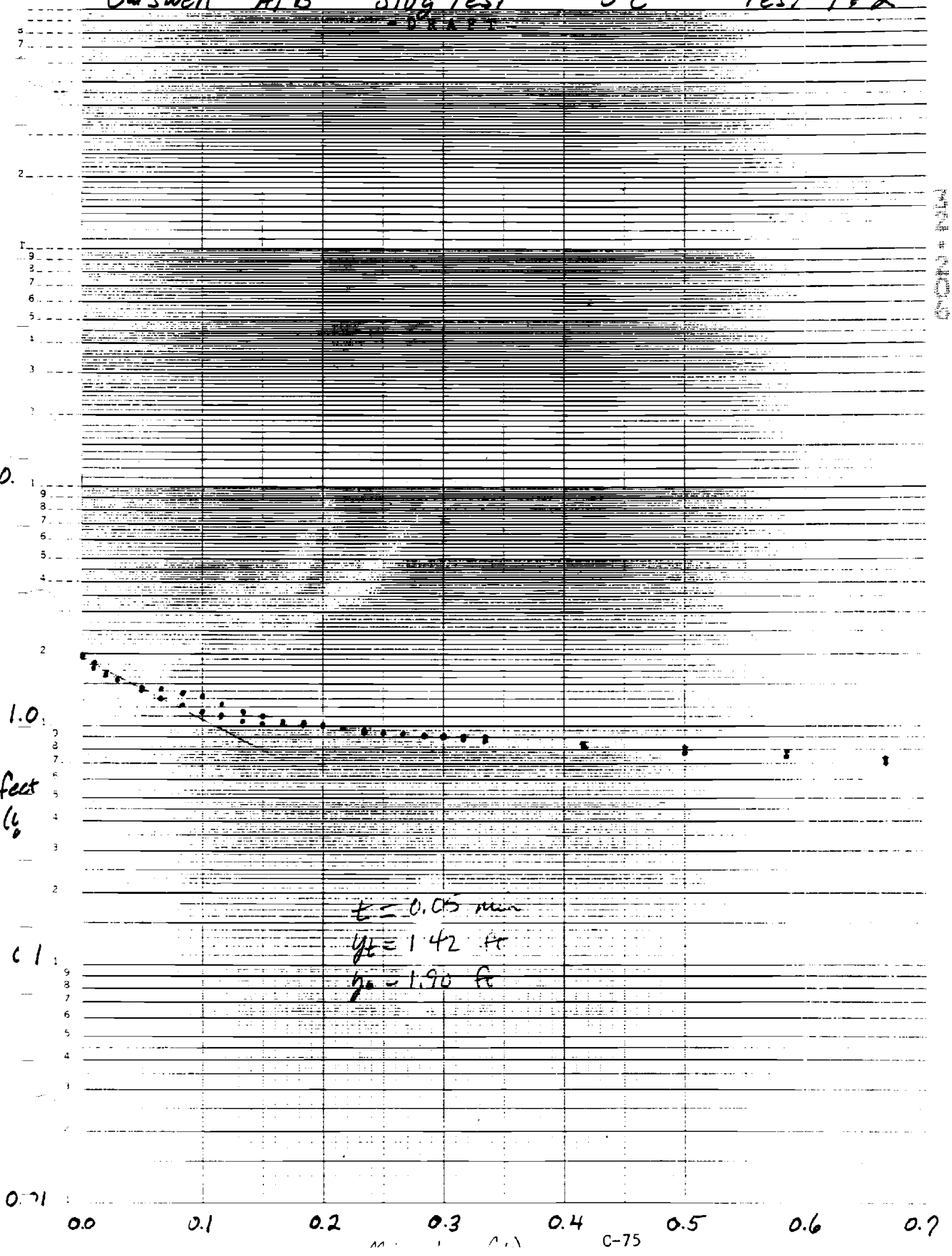
$t = 0.05$ min
$y_t = 1.42$ ft
$y_0 = 1.90$ ft
} from plot of data on attached graph

Solving for K,

$$K = \frac{(6.94 \times 10^{-3})(2.85)}{2 \times 15}\left[\frac{1}{0.05}\ln\left(\frac{1.90}{1.42}\right)\right] \times \frac{30.48 \text{ cm/ft}}{60 \text{ sec/min}}$$

$K = 1.95 \times 10^{-3}$ cm/sec

Carswell AFB Slug Test 5C Test 1 & 2



SLUG TEST DATA - CARSWELL AFB - STAGE 2

Installation ID	Location ID	Elapsed Time	Log Date	Logging Co.	Method	Depth
CRSWL	5D	.0000	11 April 1988	RADN	SI	5.3300
CRSWL	5D	.0033	11 April 1988	RADN	SI	5.2000
CRSWL	5D	.0066	11 April 1988	RADN	SI	5.1100
CRSWL	5D	.0099	11 April 1988	RADN	SI	5.0200
CRSWL	5D	.0133	11 April 1988	RADN	SI	4.9700
CRSWL	5D	.0166	11 April 1988	RADN	SI	4.9400
CRSWL	5D	.0200	11 April 1988	RADN	SI	4.9100
CRSWL	5D	.0233	11 April 1988	RADN	SI	4.9200
CRSWL	5D	.0266	11 April 1988	RADN	SI	4.7600
CRSWL	5D	.0300	11 April 1988	RADN	SI	4.6100
CRSWL	5D	.0333	11 April 1988	RADN	SI	4.5400
CRSWL	5D	.0500	11 April 1988	RADN	SI	4.2600
CRSWL	5D	.0666	11 April 1988	RADN	SI	3.9500
CRSWL	5D	.0833	11 April 1988	RADN	SI	3.7000
CRSWL	5D	.1000	11 April 1988	RADN	SI	3.4700
CRSWL	5D	.1166	11 April 1988	RADN	SI	3.2700
CRSWL	5D	.1333	11 April 1988	RADN	SI	3.0800
CRSWL	5D	.1500	11 April 1988	RADN	SI	2.9100
CRSWL	5D	.1666	11 April 1988	RADN	SI	2.7600
CRSWL	5D	.1833	11 April 1988	RADN	SI	2.6300
CRSWL	5D	.2000	11 April 1988	RADN	SI	2.5100
CRSWL	5D	.2166	11 April 1988	RADN	SI	2.3900
CRSWL	5D	.2333	11 April 1988	RADN	SI	2.2900
CRSWL	5D	.2500	11 April 1988	RADN	SI	2.1900
CRSWL	5D	.2666	11 April 1988	RADN	SI	2.1000
CRSWL	5D	.2833	11 April 1988	RADN	SI	2.0200
CRSWL	5D	.3000	11 April 1988	RADN	SI	1.9400
CRSWL	5D	.3166	11 April 1988	RADN	SI	1.8600
CRSWL	5D	.3333	11 April 1988	RADN	SI	1.7900
CRSWL	5D	.4167	11 April 1988	RADN	SI	1.5600
CRSWL	5D	.5000	11 April 1988	RADN	SI	1.3900
CRSWL	5D	.5833	11 April 1988	RADN	SI	1.2900
CRSWL	5D	.6667	11 April 1988	RADN	SI	1.1900
CRSWL	5D	.7500	11 April 1988	RADN	SI	1.0900
CRSWL	5D	.8333	11 April 1988	RADN	SI	1.0100
CRSWL	5D	.9167	11 April 1988	RADN	SI	.9400
CRSWL	5D	1.0000	11 April 1988	RADN	SI	.8800
CRSWL	5D	1.0833	11 April 1988	RADN	SI	.8400
CRSWL	5D	1.1667	11 April 1988	RADN	SI	.8000
CRSWL	5D	1.2500	11 April 1988	RADN	SI	.7600
CRSWL	5D	1.3333	11 April 1988	RADN	SI	.7100
CRSWL	5D	1.4166	11 April 1988	RADN	SI	.6700
CRSWL	5D	1.5000	11 April 1988	RADN	SI	.6500
CRSWL	5D	1.5833	11 April 1988	RADN	SI	.6400
CRSWL	5D	1.6667	11 April 1988	RADN	SI	.5900
CRSWL	5D	1.7500	11 April 1988	RADN	SI	.5400
CRSWL	5D	1.8333	11 April 1988	RADN	SI	.5200

SLUG TEST DATA - CARSWELL AFB - STAGE 2

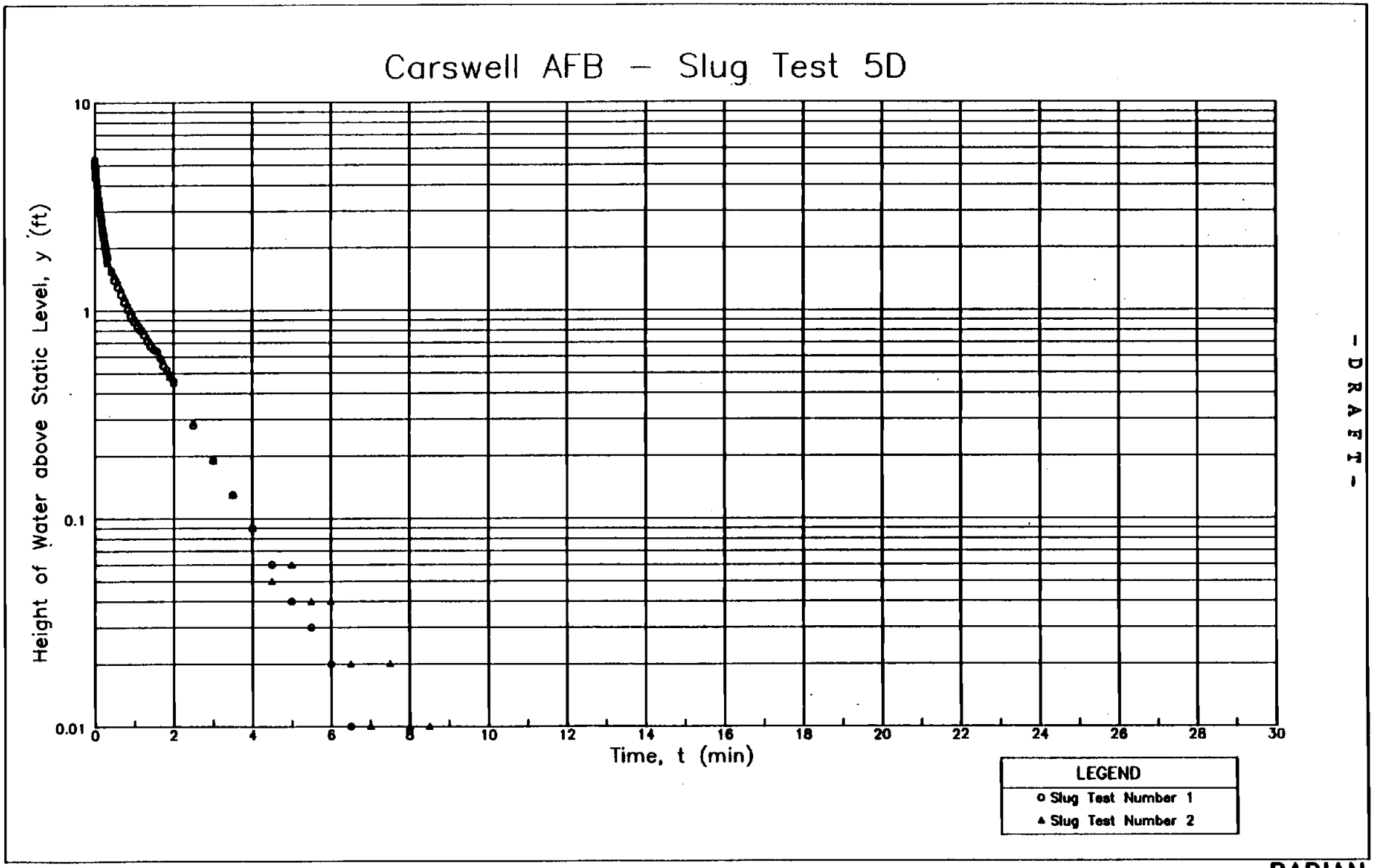
Installation ID	Location ID	Elapsed Time	Log Date	Logging Co.	Method	Depth
CRSWL	5D	1.9167	11 April 1988	RADN	SI	.4900
CRSWL	5D	2.0000	11 April 1988	RADN	SI	.4600
CRSWL	5D	2.5000	11 April 1988	RADN	SI	.2800
CRSWL	5D	3.0000	11 April 1988	RADN	SI	.1900
CRSWL	5D	3.5000	11 April 1988	RADN	SI	.1300
CRSWL	5D	4.0000	11 April 1988	RADN	SI	.0900
CRSWL	5D	4.5000	11 April 1988	RADN	SI	.0600
CRSWL	5D	5.0000	11 April 1988	RADN	SI	.0400
CRSWL	5D	5.5000	11 April 1988	RADN	SI	.0300
CRSWL	5D	6.0000	11 April 1988	RADN	SI	.0200
CRSWL	5D	6.5000	11 April 1988	RADN	SI	.0100

SLUG TEST DATA - CARSWELL AFB - STAGE 2

Installation ID	Location ID	Elapsed Time	Log Date	Logging Co.	Method	Depth
CRSWL	5D	.0000	11 April 1988	RADN	SI	5.1300
CRSWL	5D	.0033	11 April 1988	RADN	SI	5.0900
CRSWL	5D	.0066	11 April 1988	RADN	SI	4.9900
CRSWL	5D	.0099	11 April 1988	RADN	SI	4.8800
CRSWL	5D	.0133	11 April 1988	RADN	SI	4.8100
CRSWL	5D	.0166	11 April 1988	RADN	SI	4.7800
CRSWL	5D	.0200	11 April 1988	RADN	SI	4.7200
CRSWL	5D	.0233	11 April 1988	RADN	SI	4.6200
CRSWL	5D	.0266	11 April 1988	RADN	SI	4.5400
CRSWL	5D	.0300	11 April 1988	RADN	SI	4.4900
CRSWL	5D	.0333	11 April 1988	RADN	SI	4.4000
CRSWL	5D	.0500	11 April 1988	RADN	SI	4.0900
CRSWL	5D	.0666	11 April 1988	RADN	SI	3.8100
CRSWL	5D	.0833	11 April 1988	RADN	SI	3.5700
CRSWL	5D	.1000	11 April 1988	RADN	SI	3.3500
CRSWL	5D	.1166	11 April 1988	RADN	SI	3.1400
CRSWL	5D	.1333	11 April 1988	RADN	SI	2.9600
CRSWL	5D	.1500	11 April 1988	RADN	SI	2.8000
CRSWL	5D	.1666	11 April 1988	RADN	SI	2.6400
CRSWL	5D	.1833	11 April 1988	RADN	SI	2.5000
CRSWL	5D	.2000	11 April 1988	RADN	SI	2.3700
CRSWL	5D	.2166	11 April 1988	RADN	SI	2.2500
CRSWL	5D	.2333	11 April 1988	RADN	SI	2.1400
CRSWL	5D	.2500	11 April 1988	RADN	SI	2.0300
CRSWL	5D	.2666	11 April 1988	RADN	SI	1.9400
CRSWL	5D	.2833	11 April 1988	RADN	SI	1.8600
CRSWL	5D	.3000	11 April 1988	RADN	SI	1.8000
CRSWL	5D	.3166	11 April 1988	RADN	SI	1.7400
CRSWL	5D	.3333	11 April 1988	RADN	SI	1.6900
CRSWL	5D	.4167	11 April 1988	RADN	SI	1.5400
CRSWL	5D	.5000	11 April 1988	RADN	SI	1.4900
CRSWL	5D	.5833	11 April 1988	RADN	SI	1.4000
CRSWL	5D	.6667	11 April 1988	RADN	SI	1.2800
CRSWL	5D	.7500	11 April 1988	RADN	SI	1.1700
CRSWL	5D	.8333	11 April 1988	RADN	SI	1.0900
CRSWL	5D	.9167	11 April 1988	RADN	SI	1.0100
CRSWL	5D	1.0000	11 April 1988	RADN	SI	.9400
CRSWL	5D	1.0833	11 April 1988	RADN	SI	.8800
CRSWL	5D	1.1667	11 April 1988	RADN	SI	.8400
CRSWL	5D	1.2500	11 April 1988	RADN	SI	.8000
CRSWL	5D	1.3333	11 April 1988	RADN	SI	.7500
CRSWL	5D	1.4166	11 April 1988	RADN	SI	.7100
CRSWL	5D	1.5000	11 April 1988	RADN	SI	.6700
CRSWL	5D	1.5833	11 April 1988	RADN	SI	.6400
CRSWL	5D	1.6667	11 April 1988	RADN	SI	.6000
CRSWL	5D	1.7500	11 April 1988	RADN	SI	.5700
CRSWL	5D	1.8333	11 April 1988	RADN	SI	.5300

SLUG TEST DATA · CARSWELL AFB · STAGE 2

Installation ID	Location ID	Elapsed Time	Log Date	Logging Co.	Method	Depth
CRSWL	5D	1.9167	11 April 1988	RADN	SI	.4800
CRSWL	5D	2.0000	11 April 1988	RADN	SI	.4500
CRSWL	5D	2.5000	11 April 1988	RADN	SI	.2900
CRSWL	5D	3.0000	11 April 1988	RADN	SI	.1900
CRSWL	5D	3.5000	11 April 1988	RADN	SI	.1300
CRSWL	5D	4.0000	11 April 1988	RADN	SI	.0900
CRSWL	5D	4.5000	11 April 1988	RADN	SI	.0500
CRSWL	5D	5.0000	11 April 1988	RADN	SI	.0600
CRSWL	5D	5.5000	11 April 1988	RADN	SI	.0400
CRSWL	5D	6.0000	11 April 1988	RADN	SI	.0400
CRSWL	5D	6.5000	11 April 1988	RADN	SI	.0200
CRSWL	5D	7.0000	11 April 1988	RADN	SI	.0100
CRSWL	5D	7.5000	11 April 1988	RADN	SI	.0200
CRSWL	5D	8.0000	11 April 1988	RADN	SI	.0100
CRSWL	5D	8.5000	11 April 1988	RADN	SI	.0100



RADIAN CORPORATION

- DRAFT -

RADIAN CORPORATION

CALCULATION SHEET
- DRAFT -

CALC. NO. _____

SIGNATURE W. G. McIntyre DATE 15 July 88 CHECKED _____ DATE _____

PROJECT Carswell AFB IRP Stage 2 JOB NO. 227-005-04-03

SUBJECT Analysis of slug test Data-well 5D SHEET _____ OF _____ SHEETS

[Ref. Bower and Rice, 1976, Water Resources Research, V.12, No. 3]

Solving the analog equation: $\ln\left(\frac{R_e}{r_w}\right)$ ...

$$\ln\left(\frac{R_e}{r_w}\right) = \left(\frac{1.1}{\ln\left(\frac{H}{r_w}\right)} + \frac{C}{L/r_w}\right)^{-1}$$

where, $H = 8.82$ ft, $L = 10$ ft, $r_w = 0.28$ ft, $C = 2.2$ } $\ln R_e/r_w = 2.63$

Hydraulic Conductivity, $K = \frac{r_c^2 \ln\left(\frac{R_e}{r_w}\right)}{2L}\left[\frac{1}{t}\ln\left(\frac{y_0}{y_t}\right)\right]$

where, $r_c^2 = 6.94 \times 10^{-3}$ ft^2

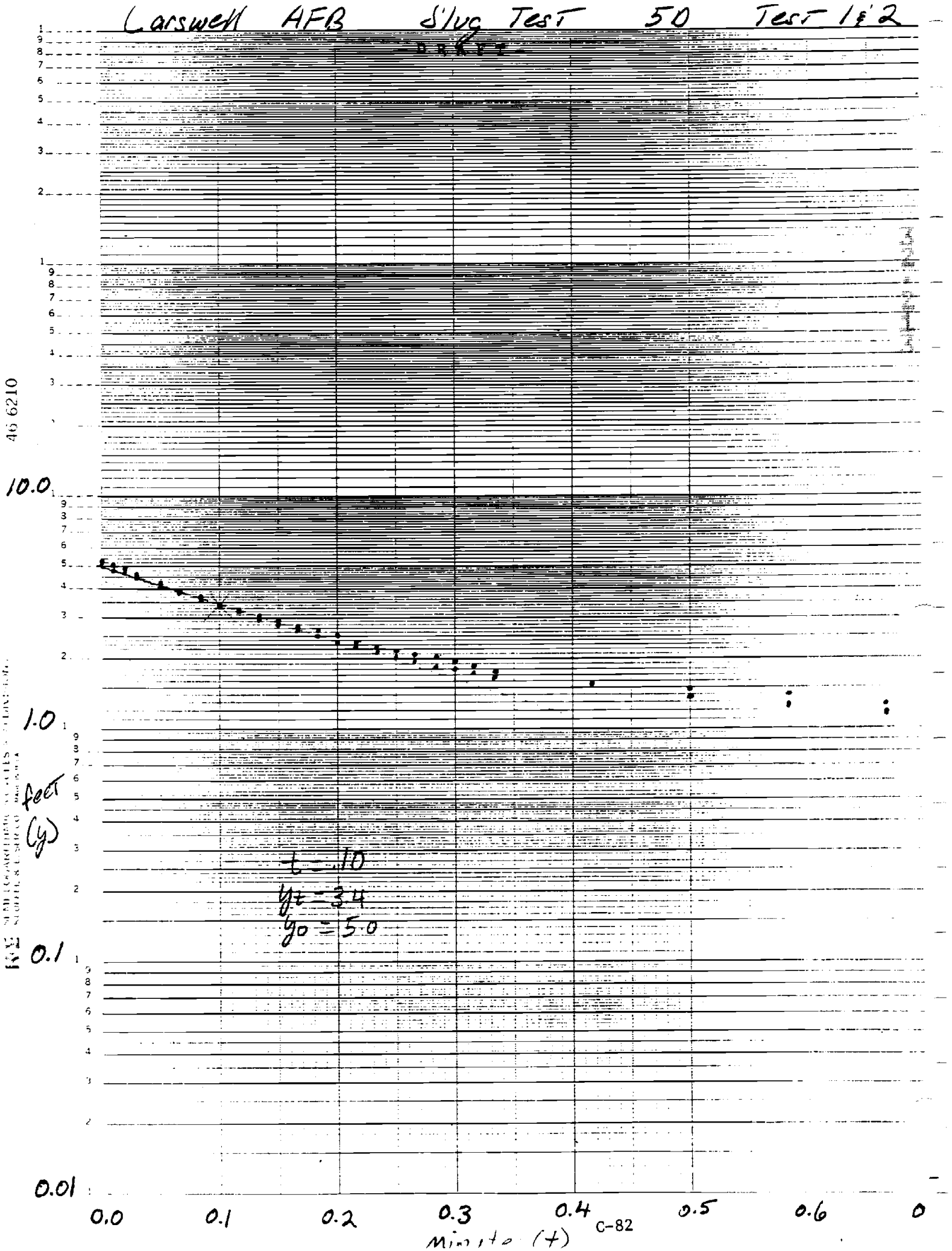
$t = 0.1$ min, $y_t = 3.4$ ft, $y_0 = 5.0$ ft } from plot of data on attached graph

Solving for K,

$$K = \frac{(6.94 \times 10^{-3})(2.63)}{2 \times 10}\left[\frac{1}{.10}\ln\left(\frac{5}{3.4}\right)\right] \times \frac{30.48 \text{ cm/ft}}{60 \text{ sec/min}}$$

$$K = 1.79 \times 10^{-3} \text{ cm/sec}$$

4-81-3361


Carswell AFB Slug Test 50 Test 1 & 2
10.0
1.0
0.1
0.01
feet (y)
t = .10
yt = 3.4
yo = 5.0
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0
minute (t)

SLUG TEST DATA - CARSWELL AFB - STAGE 2

Installation ID	Location ID	Elapsed Time	Log Date	Logging Co.	Method	Depth
CRSWL	5E	.0000	8 April 1988	RADN	SI	1.3700
CRSWL	5E	.0033	8 April 1988	RADN	SI	1.4000
CRSWL	5E	.0066	8 April 1988	RADN	SI	1.3600
CRSWL	5E	.0099	8 April 1988	RADN	SI	1.3200
CRSWL	5E	.0133	8 April 1988	RADN	SI	1.3600
CRSWL	5E	.0166	8 April 1988	RADN	SI	1.3000
CRSWL	5E	.0200	8 April 1988	RADN	SI	1.3500
CRSWL	5E	.0233	8 April 1988	RADN	SI	1.2800
CRSWL	5E	.0266	8 April 1988	RADN	SI	1.3000
CRSWL	5E	.0300	8 April 1988	RADN	SI	1.2600
CRSWL	5E	.0333	8 April 1988	RADN	SI	1.2600
CRSWL	5E	.0500	8 April 1988	RADN	SI	1.2600
CRSWL	5E	.0666	8 April 1988	RADN	SI	1.2600
CRSWL	5E	.0833	8 April 1988	RADN	SI	1.2500
CRSWL	5E	.1000	8 April 1988	RADN	SI	1.2300
CRSWL	5E	.1166	8 April 1988	RADN	SI	1.1800
CRSWL	5E	.1333	8 April 1988	RADN	SI	1.1400
CRSWL	5E	.1500	8 April 1988	RADN	SI	1.0800
CRSWL	5E	.1666	8 April 1988	RADN	SI	1.0200
CRSWL	5E	.1833	8 April 1988	RADN	SI	.9500
CRSWL	5E	.2000	8 April 1988	RADN	SI	.8700
SWL	5E	.2166	8 April 1988	RADN	SI	.7900
SWL	5E	.2333	8 April 1988	RADN	SI	.7200
CRSWL	5E	.2500	8 April 1988	RADN	SI	.6600
CRSWL	5E	.2666	8 April 1988	RADN	SI	.6000
CRSWL	5E	.2833	8 April 1988	RADN	SI	.5400
CRSWL	5E	.3000	8 April 1988	RADN	SI	.4900
CRSWL	5E	.3166	8 April 1988	RADN	SI	.4500
CRSWL	5E	.3333	8 April 1988	RADN	SI	.4000
CRSWL	5E	.4167	8 April 1988	RADN	SI	.2600
CRSWL	5E	.5000	8 April 1988	RADN	SI	.1800
CRSWL	5E	.5833	8 April 1988	RADN	SI	.1300
CRSWL	5E	.6667	8 April 1988	RADN	SI	.1000
CRSWL	5E	.7500	8 April 1988	RADN	SI	.0900
CRSWL	5E	.8333	8 April 1988	RADN	SI	.0700
CRSWL	5E	.9167	8 April 1988	RADN	SI	.0700
CRSWL	5E	1.0000	8 April 1988	RADN	SI	.0600
CRSWL	5E	1.0833	8 April 1988	RADN	SI	.0600
CRSWL	5E	1.1667	8 April 1988	RADN	SI	.0500
CRSWL	5E	1.2500	8 April 1988	RADN	SI	.0500
CRSWL	5E	1.3333	8 April 1988	RADN	SI	.0500
CRSWL	5E	1.4166	8 April 1988	RADN	SI	.0500
CRSWL	5E	1.5000	8 April 1988	RADN	SI	.0400
CRSWL	5E	1.5833	8 April 1988	RADN	SI	.0400
CRSWL	5E	1.6667	8 April 1988	RADN	SI	.0400
CRSWL	5E	1.7500	8 April 1988	RADN	SI	.0400
CRSWL	5E	1.8333	8 April 1988	RADN	SI	.0300

SLUG TEST DATA - CARSWELL AFB - STAGE 2

Installation ID	Location ID	Elapsed Time	Log Date	Logging Co.	Method	Depth
CRSWL	5E	1.9167	8 April 1988	RADN	SI	.0300
CRSWL	5E	2.0000	8 April 1988	RADN	SI	.0300
CRSWL	5E	2.5000	8 April 1988	RADN	SI	.0200
CRSWL	5E	3.0000	8 April 1988	RADN	SI	.0200
CRSWL	5E	3.5000	8 April 1988	RADN	SI	.0200
CRSWL	5E	4.0000	8 April 1988	RADN	SI	.0100
CRSWL	5E	4.5000	8 April 1988	RADN	SI	.0100
CRSWL	5E	5.0000	8 April 1988	RADN	SI	.0100

SLUG TEST DATA - CARSWELL AFB - STAGE 2

Installation ID	Location ID	Elapsed Time	Log Date	Logging Co.	Method	Depth
CRSWL	5E	.0000	8 April 1988	RADN	SI	1.3100
CRSWL	5E	.0033	8 April 1988	RADN	SI	1.3500
CRSWL	5E	.0066	8 April 1988	RADN	SI	1.3900
CRSWL	5E	.0099	8 April 1988	RADN	SI	1.3300
CRSWL	5E	.0133	8 April 1988	RADN	SI	1.3600
CRSWL	5E	.0166	8 April 1988	RADN	SI	1.3700
CRSWL	5E	.0200	8 April 1988	RADN	SI	1.3600
CRSWL	5E	.0233	8 April 1988	RADN	SI	1.3500
CRSWL	5E	.0266	8 April 1988	RADN	SI	1.3700
CRSWL	5E	.0300	8 April 1988	RADN	SI	1.3700
CRSWL	5E	.0333	8 April 1988	RADN	SI	1.3600
CRSWL	5E	.0500	8 April 1988	RADN	SI	1.3600
CRSWL	5E	.0666	8 April 1988	RADN	SI	1.3500
CRSWL	5E	.0833	8 April 1988	RADN	SI	1.3600
CRSWL	5E	.1000	8 April 1988	RADN	SI	1.3400
CRSWL	5E	.1166	8 April 1988	RADN	SI	1.3200
CRSWL	5E	.1333	8 April 1988	RADN	SI	1.3000
CRSWL	5E	.1500	8 April 1988	RADN	SI	1.2800
CRSWL	5E	.1666	8 April 1988	RADN	SI	1.2500
CRSWL	5E	.1833	8 April 1988	RADN	SI	1.2200
CRSWL	5E	.2000	8 April 1988	RADN	SI	1.2000
CRSWL	5E	.2166	8 April 1988	RADN	SI	1.1600
CRSWL	5E	.2333	8 April 1988	RADN	SI	1.1300
CRSWL	5E	.2500	8 April 1988	RADN	SI	1.0900
CRSWL	5E	.2666	8 April 1988	RADN	SI	1.0500
CRSWL	5E	.2833	8 April 1988	RADN	SI	1.0000
CRSWL	5E	.3000	8 April 1988	RADN	SI	.9400
CRSWL	5E	.3166	8 April 1988	RADN	SI	.8700
CRSWL	5E	.3333	8 April 1988	RADN	SI	.7900
CRSWL	5E	.4167	8 April 1988	RADN	SI	.4900
CRSWL	5E	.5000	8 April 1988	RADN	SI	.3100
CRSWL	5E	.5833	8 April 1988	RADN	SI	.2000
CRSWL	5E	.6667	8 April 1988	RADN	SI	.1300
CRSWL	5E	.7500	8 April 1988	RADN	SI	.1000
CRSWL	5E	.8333	8 April 1988	RADN	SI	.0800
CRSWL	5E	.9167	8 April 1988	RADN	SI	.0600
CRSWL	5E	1.0000	8 April 1988	RADN	SI	.0600
CRSWL	5E	1.0833	8 April 1988	RADN	SI	.0500
CRSWL	5E	1.1667	8 April 1988	RADN	SI	.0400
CRSWL	5E	1.2500	8 April 1988	RADN	SI	.0400
CRSWL	5E	1.3333	8 April 1988	RADN	SI	.0400
CRSWL	5E	1.4166	8 April 1988	RADN	SI	.0400
CRSWL	5E	1.5000	8 April 1988	RADN	SI	.0400
CRSWL	5E	1.5833	8 April 1988	RADN	SI	.0400
CRSWL	5E	1.6667	8 April 1988	RADN	SI	.0400
CRSWL	5E	1.7500	8 April 1988	RADN	SI	.0400
CRSWL	5E	1.8333	8 April 1988	RADN	SI	.0400

SLUG TEST DATA - CARSWELL AFB - STAGE 2

Installation ID	Location ID	Elapsed Time	Log Date	Logging Co.	Method	Depth
CRSWL	5E	1.9167	8 April 1988	RADN	SI	.0400
CRSWL	5E	2.0000	8 April 1988	RADN	SI	.0400
CRSWL	5E	2.5000	8 April 1988	RADN	SI	.0300
CRSWL	5E	3.0000	8 April 1988	RADN	SI	.0300
CRSWL	5E	3.5000	8 April 1988	RADN	SI	.0300
CRSWL	5E	4.0000	8 April 1988	RADN	SI	.0200
CRSWL	5E	4.5000	8 April 1988	RADN	SI	.0200
CRSWL	5E	5.0000	8 April 1988	RADN	SI	.0100
CRSWL	5E	5.5000	8 April 1988	RADN	SI	.0100
CRSWL	5E	6.0000	8 April 1988	RADN	SI	.0100
CRSWL	5E	6.5000	8 April 1988	RADN	SI	.0100
CRSWL	5E	7.0000	8 April 1988	RADN	SI	.0100
CRSWL	5E	7.5000	8 April 1988	RADN	SI	.0100
CRSWL	5E	8.0000	8 April 1988	RADN	SI	.0100
CRSWL	5E	8.5000	8 April 1988	RADN	SI	.0100
CRSWL	5E	9.0000	8 April 1988	RADN	SI	.0100
CRSWL	5E	9.5000	8 April 1988	RADN	SI	.0100
CRSWL	5E	10.0000	8 April 1988	RADN	SI	.0100
CRSWL	5E	12.0000	8 April 1988	RADN	SI	.0100
CRSWL	5E	14.0000	8 April 1988	RADN	SI	.0100
CRSWL	5E	16.0000	8 April 1988	RADN	SI	.0100

RADIAN CORPORATION

CALCULATION SHEET
- DRAFT -

CALC. NO. _____

SIGNATURE W. B. McFatine DATE 15 July 88 CHECKED _____ DATE _____

PROJECT Carswell AFB IRP Stage 2 JOB NO. 227-005-04-03

SUBJECT Analysis of Slug Test Data - WCM5F SHEET _____ OF _____ SHEETS

[Ref. Bower and Rice, 1976, Water Resources Research, V.12, No.3]

Solving the analog equation: $\ln\left(\frac{R_e}{r_w}\right)$...

$$\ln\left(\frac{R_e}{r_w}\right) = \left(\frac{1.1}{\ln\left(\frac{H}{r_w}\right)} + \frac{C}{L/r_w}\right)^{-1}$$

where, $H = 11.71$ ft
$L = 13$ ft
$r_w = .28$ ft
$C = 2.65$

$\Big\}\ \ln\left(\frac{R_e}{r_w}\right) = 2.84$

Hydraulic Conductivity, $K = \frac{r_c^2 \ln\left(\frac{R_e}{r_w}\right)}{2L}\left[\frac{1}{t}\ln\left(\frac{y_0}{y_t}\right)\right]$

where, $r_c^2 = 6.94 \times 10^{-3}$ ft^2

$t = 0.2$ min
$y_t = .86$ ft
$y_0 = 2.7$ ft

$\Big\}$ from plot of data on attached graph

Solving for K,

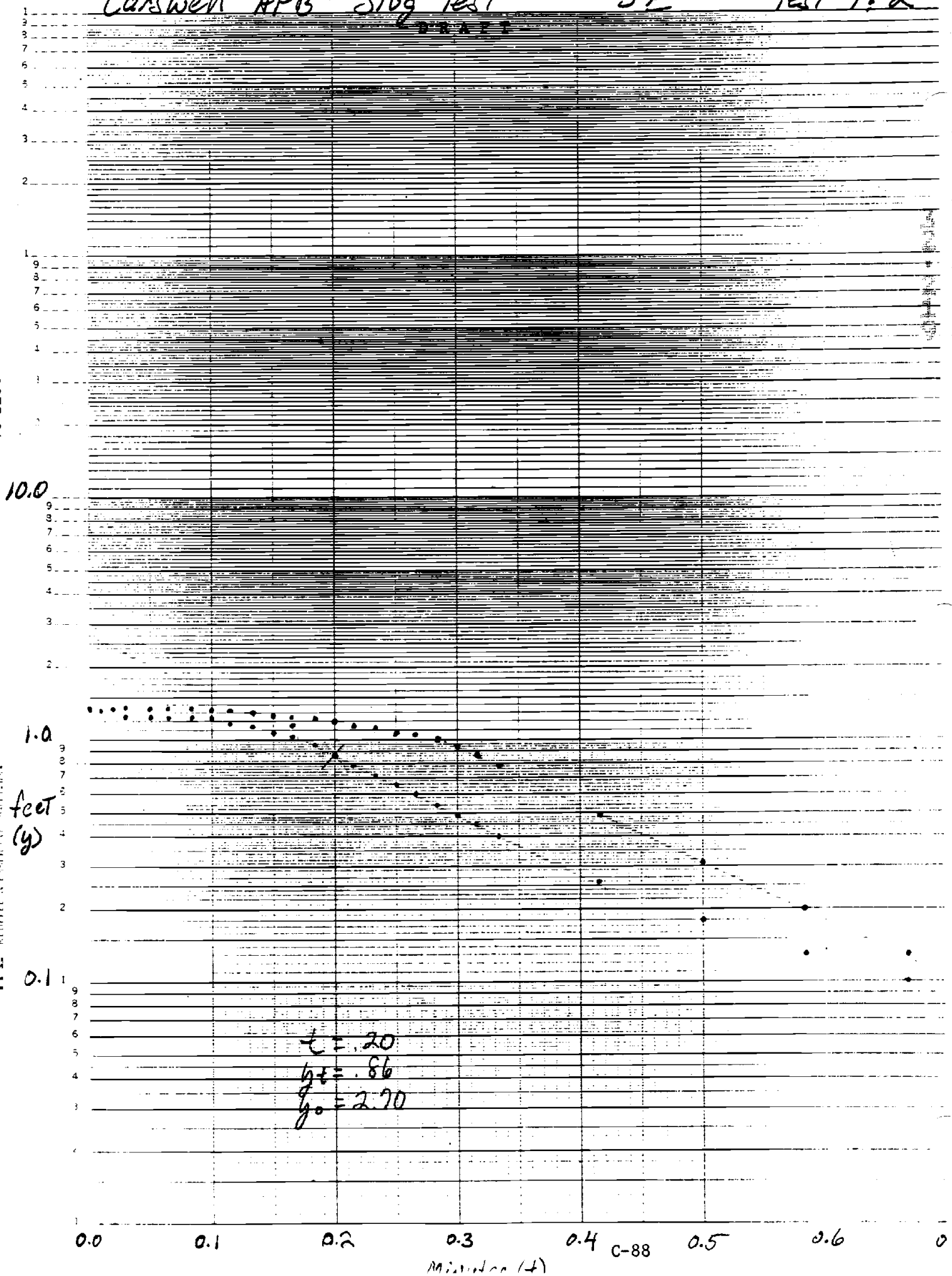
$$K = \frac{(6.94 \times 10^{-3})(2.84)}{2 \times 13}\left[\frac{1}{.2}\ln\left(\frac{2.7}{.86}\right)\right] \times \frac{30.48 \text{ cm/ft}}{60 \text{ sec/min}}$$

$$K = 2.20 \times 10^{-3} \text{ cm/sec}$$

4-81-3361

Carswell AFB Slug Test 5E Test 1 & 2

DRAFT



SLUG TEST DATA · CARSWELL AFB · STAGE 2

Installation ID	Location ID	Elapsed Time	Log Date	Logging Co.	Method	Depth
CRSWL	12A	.0000	5 April 1988	RADN	SI	10.9000
CRSWL	12A	.0033	5 April 1988	RADN	SI	11.1800
CRSWL	12A	.0066	5 April 1988	RADN	SI	11.3600
CRSWL	12A	.0099	5 April 1988	RADN	SI	11.8200
CRSWL	12A	.0133	5 April 1988	RADN	SI	12.0700
CRSWL	12A	.0166	5 April 1988	RADN	SI	12.1900
CRSWL	12A	.0200	5 April 1988	RADN	SI	12.3900
CRSWL	12A	.0233	5 April 1988	RADN	SI	12.4900
CRSWL	12A	.0266	5 April 1988	RADN	SI	12.6500
CRSWL	12A	.0300	5 April 1988	RADN	SI	13.0500
CRSWL	12A	.0333	5 April 1988	RADN	SI	13.2600
CRSWL	12A	.0500	5 April 1988	RADN	SI	13.9200
CRSWL	12A	.0666	5 April 1988	RADN	SI	14.4500
CRSWL	12A	.0833	5 April 1988	RADN	SI	13.8400
CRSWL	12A	.1000	5 April 1988	RADN	SI	13.6900
CRSWL	12A	.1166	5 April 1988	RADN	SI	13.3900
CRSWL	12A	.1333	5 April 1988	RADN	SI	13.0100
CRSWL	12A	.1500	5 April 1988	RADN	SI	12.6900
CRSWL	12A	.1666	5 April 1988	RADN	SI	12.4000
CRSWL	12A	.1833	5 April 1988	RADN	SI	12.1400
CRSWL	12A	.2000	5 April 1988	RADN	SI	11.8900
CRSWL	12A	.2166	5 April 1988	RADN	SI	11.6500
SWL	12A	.2333	5 April 1988	RADN	SI	11.3800
CRSWL	12A	.2500	5 April 1988	RADN	SI	11.1600
CRSWL	12A	.2666	5 April 1988	RADN	SI	10.9400
CRSWL	12A	.2833	5 April 1988	RADN	SI	10.7300
CRSWL	12A	.3000	5 April 1988	RADN	SI	10.5200
CRSWL	12A	.3166	5 April 1988	RADN	SI	10.3200
CRSWL	12A	.3333	5 April 1988	RADN	SI	10.1200
CRSWL	12A	.4167	5 April 1988	RADN	SI	9.1700
CRSWL	12A	.5000	5 April 1988	RADN	SI	8.3000
CRSWL	12A	.5833	5 April 1988	RADN	SI	7.4800
CRSWL	12A	.6667	5 April 1988	RADN	SI	6.7400
CRSWL	12A	.7500	5 April 1988	RADN	SI	6.0700
CRSWL	12A	.8333	5 April 1988	RADN	SI	5.4600
CRSWL	12A	.9167	5 April 1988	RADN	SI	4.8900
CRSWL	12A	1.0000	5 April 1988	RADN	SI	4.3800
CRSWL	12A	1.0833	5 April 1988	RADN	SI	3.8700
CRSWL	12A	1.1667	5 April 1988	RADN	SI	3.4500
CRSWL	12A	1.2500	5 April 1988	RADN	SI	3.0800
CRSWL	12A	1.3333	5 April 1988	RADN	SI	2.7400
CRSWL	12A	1.4166	5 April 1988	RADN	SI	2.4400
CRSWL	12A	1.5000	5 April 1988	RADN	SI	2.1600
CRSWL	12A	1.5833	5 April 1988	RADN	SI	1.9300
CRSWL	12A	1.6667	5 April 1988	RADN	SI	1.7200
CRSWL	12A	1.7500	5 April 1988	RADN	SI	1.5300
CRSWL	12A	1.8333	5 April 1988	RADN	SI	1.3700

SLUG TEST DATA - CARSWELL AFB - STAGE 2

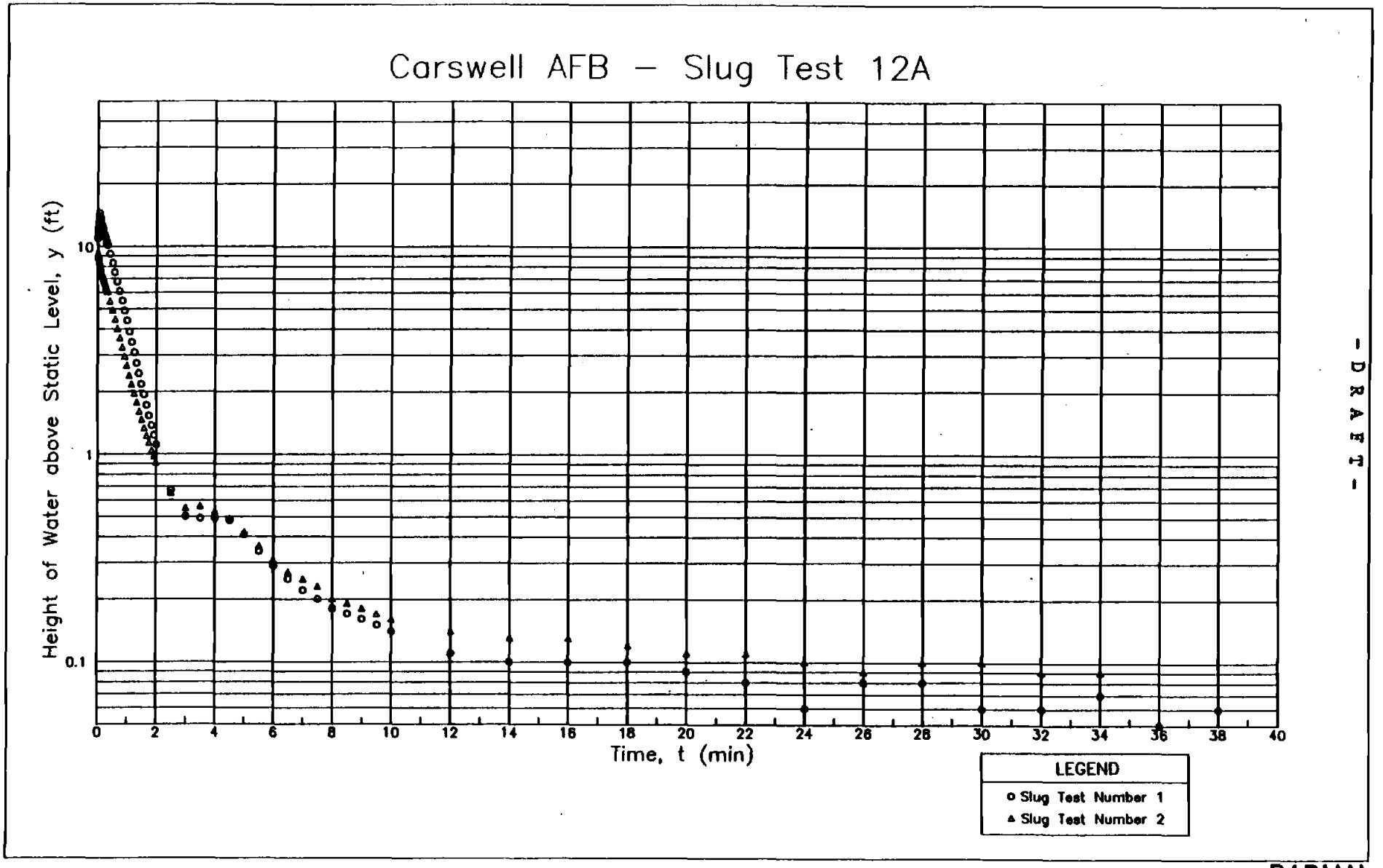
Installation ID	Location ID	Elapsed Time	Log Date	Logging Co.	Method	Depth
CRSWL	12A	1.9167	5 April 1988	RADN	SI	1.2300
CRSWL	12A	2.0000	5 April 1988	RADN	SI	1.1100
CRSWL	12A	2.5000	5 April 1988	RADN	SI	.6700
CRSWL	12A	3.0000	5 April 1988	RADN	SI	.5000
CRSWL	12A	3.5000	5 April 1988	RADN	SI	.4900
CRSWL	12A	4.0000	5 April 1988	RADN	SI	.4900
CRSWL	12A	4.5000	5 April 1988	RADN	SI	.4800
CRSWL	12A	5.0000	5 April 1988	RADN	SI	.4100
CRSWL	12A	5.5000	5 April 1988	RADN	SI	.3400
CRSWL	12A	6.0000	5 April 1988	RADN	SI	.2900
CRSWL	12A	6.5000	5 April 1988	RADN	SI	.2500
CRSWL	12A	7.0000	5 April 1988	RADN	SI	.2200
CRSWL	12A	7.5000	5 April 1988	RADN	SI	.2000
CRSWL	12A	8.0000	5 April 1988	RADN	SI	.1800
CRSWL	12A	8.5000	5 April 1988	RADN	SI	.1700
CRSWL	12A	9.0000	5 April 1988	RADN	SI	.1600
CRSWL	12A	9.5000	5 April 1988	RADN	SI	.1500
CRSWL	12A	10.0000	5 April 1988	RADN	SI	.1400
CRSWL	12A	12.0000	5 April 1988	RADN	SI	.1100
CRSWL	12A	14.0000	5 April 1988	RADN	SI	.1000
CRSWL	12A	16.0000	5 April 1988	RADN	SI	.1000
CRSWL	12A	18.0000	5 April 1988	RADN	SI	.1000
CRSWL	12A	20.0000	5 April 1988	RADN	SI	.0900
CRSWL	12A	22.0000	5 April 1988	RADN	SI	.0800
CRSWL	12A	24.0000	5 April 1988	RADN	SI	.0600
CRSWL	12A	26.0000	5 April 1988	RADN	SI	.0800
CRSWL	12A	28.0000	5 April 1988	RADN	SI	.0800
CRSWL	12A	30.0000	5 April 1988	RADN	SI	.0600
CRSWL	12A	32.0000	5 April 1988	RADN	SI	.0600
CRSWL	12A	34.0000	5 April 1988	RADN	SI	.0700
CRSWL	12A	36.0000	5 April 1988	RADN	SI	.0500
CRSWL	12A	38.0000	5 April 1988	RADN	SI	.0600

SLUG TEST DATA - CARSWELL AFB - STAGE 2

Installation ID	Location ID	Elapsed Time	Log Date	Logging Co.	Method	Depth
CRSWL	12A	.0000	5 April 1988	RADN	SI	9.3600
CRSWL	12A	.0033	5 April 1988	RADN	SI	9.0100
CRSWL	12A	.0066	5 April 1988	RADN	SI	9.2000
CRSWL	12A	.0099	5 April 1988	RADN	SI	9.1500
CRSWL	12A	.0133	5 April 1988	RADN	SI	8.9000
CRSWL	12A	.0166	5 April 1988	RADN	SI	8.8900
CRSWL	12A	.0200	5 April 1988	RADN	SI	8.9000
CRSWL	12A	.0233	5 April 1988	RADN	SI	8.8100
CRSWL	12A	.0266	5 April 1988	RADN	SI	8.8300
CRSWL	12A	.0300	5 April 1988	RADN	SI	8.8900
CRSWL	12A	.0333	5 April 1988	RADN	SI	8.7600
CRSWL	12A	.0500	5 April 1988	RADN	SI	8.5000
CRSWL	12A	.0666	5 April 1988	RADN	SI	8.4100
CRSWL	12A	.0833	5 April 1988	RADN	SI	8.1600
CRSWL	12A	.1000	5 April 1988	RADN	SI	7.9800
CRSWL	12A	.1166	5 April 1988	RADN	SI	7.8300
CRSWL	12A	.1333	5 April 1988	RADN	SI	7.6800
CRSWL	12A	.1500	5 April 1988	RADN	SI	7.5200
CRSWL	12A	.1666	5 April 1988	RADN	SI	7.3600
CRSWL	12A	.1833	5 April 1988	RADN	SI	7.2300
CRSWL	12A	.2000	5 April 1988	RADN	SI	7.0900
CRSWL	12A	.2166	5 April 1988	RADN	SI	6.9500
CRSWL	12A	.2333	5 April 1988	RADN	SI	6.8100
CRSWL	12A	.2500	5 April 1988	RADN	SI	6.6700
CRSWL	12A	.2666	5 April 1988	RADN	SI	6.5400
CRSWL	12A	.2833	5 April 1988	RADN	SI	6.4100
CRSWL	12A	.3000	5 April 1988	RADN	SI	6.2800
CRSWL	12A	.3166	5 April 1988	RADN	SI	6.1500
CRSWL	12A	.3333	5 April 1988	RADN	SI	6.0300
CRSWL	12A	.4167	5 April 1988	RADN	SI	5.4400
CRSWL	12A	.5000	5 April 1988	RADN	SI	4.9100
CRSWL	12A	.5833	5 April 1988	RADN	SI	4.4300
CRSWL	12A	.6667	5 April 1988	RADN	SI	4.0000
CRSWL	12A	.7500	5 April 1988	RADN	SI	3.6100
CRSWL	12A	.8333	5 April 1988	RADN	SI	3.2600
CRSWL	12A	.9167	5 April 1988	RADN	SI	3.9400
CRSWL	12A	1.0000	5 April 1988	RADN	SI	2.6600
CRSWL	12A	1.0833	5 April 1988	RADN	SI	2.3900
CRSWL	12A	1.1667	5 April 1988	RADN	SI	2.1600
CRSWL	12A	1.2500	5 April 1988	RADN	SI	1.9500
CRSWL	12A	1.3333	5 April 1988	RADN	SI	1.7700
CRSWL	12A	1.4166	5 April 1988	RADN	SI	1.6000
CRSWL	12A	1.5000	5 April 1988	RADN	SI	1.4600
CRSWL	12A	1.5833	5 April 1988	RADN	SI	1.3300
CRSWL	12A	1.6667	5 April 1988	RADN	SI	1.2200
CRSWL	12A	1.7500	5 April 1988	RADN	SI	1.1300
CRSWL	12A	1.8333	5 April 1988	RADN	SI	1.0400

SLUG TEST DATA - CARSWELL AFB - STAGE 2

Installation ID	Location ID	Elapsed Time	Log Date	Logging Co.	Method	Depth
CRSWL	12A	1.9167	5 April 1988	RADN	SI	.9700
CRSWL	12A	2.0000	5 April 1988	RADN	SI	.9100
CRSWL	12A	2.5000	5 April 1988	RADN	SI	.6500
CRSWL	12A	3.0000	5 April 1988	RADN	SI	.5500
CRSWL	12A	3.5000	5 April 1988	RADN	SI	.5600
CRSWL	12A	4.0000	5 April 1988	RADN	SI	.5300
CRSWL	12A	4.5000	5 April 1988	RADN	SI	.4900
CRSWL	12A	5.0000	5 April 1988	RADN	SI	.4200
CRSWL	12A	5.5000	5 April 1988	RADN	SI	.3600
CRSWL	12A	6.0000	5 April 1988	RADN	SI	.3100
CRSWL	12A	6.5000	5 April 1988	RADN	SI	.2700
CRSWL	12A	7.0000	5 April 1988	RADN	SI	.2500
CRSWL	12A	7.5000	5 April 1988	RADN	SI	.2300
CRSWL	12A	8.0000	5 April 1988	RADN	SI	.2000
CRSWL	12A	8.5000	5 April 1988	RADN	SI	.1900
CRSWL	12A	9.0000	5 April 1988	RADN	SI	.1800
CRSWL	12A	9.5000	5 April 1988	RADN	SI	.1700
CRSWL	12A	10.0000	5 April 1988	RADN	SI	.1600
CRSWL	12A	12.0000	5 April 1988	RADN	SI	.1400
CRSWL	12A	14.0000	5 April 1988	RADN	SI	.1300
CRSWL	12A	16.0000	5 April 1988	RADN	SI	.1300
CRSWL	12A	18.0000	5 April 1988	RADN	SI	.1200
CRSWL	12A	20.0000	5 April 1988	RADN	SI	.1100
CRSWL	12A	22.0000	5 April 1988	RADN	SI	.1100
CRSWL	12A	24.0000	5 April 1988	RADN	SI	.1000
CRSWL	12A	26.0000	5 April 1988	RADN	SI	.0900
CRSWL	12A	28.0000	5 April 1988	RADN	SI	.1000
CRSWL	12A	30.0000	5 April 1988	RADN	SI	.1000
CRSWL	12A	32.0000	5 April 1988	RADN	SI	.0900
CRSWL	12A	34.0000	5 April 1988	RADN	SI	.0900



RADIAN CORPORATION

- DRAFT -

RADIAN CORPORATION

CALCULATION SHEET

- DRAFT -

CALC. NO. _____

SIGNATURE L N French DATE 18 June 88 CHECKED _____ DATE _____

PROJECT Carswell AFB IRP Stage 2 JOB NO. 227-005-04-03

SUBJECT Analysis of Slug Test Data - Well 12A SHEET 1 OF 2 SHEETS

[Ref. Bouwer and Rice, 1976, Water Resources Research v. 12 no 3]

Solving the analog equation: $\ln R_e/r_w$ ...

$$\ln R_e/r_w = \left(\frac{1.1}{\ln(H/r_w)} + C/L/r_w\right)^{-1}$$

where, $H = 8.43$ ft, $L = 10$ ft, $r_w = 0.28$ ft, $C = 2.25$ $\Rightarrow \ln(R_e/r_w) = 2.59$

Hydraulic conductivity, $K = \dfrac{r_c^2 \ln(R_e/r_w)}{2L}\left[\dfrac{1}{t}\ln\left(\dfrac{y_o}{y_t}\right)\right]$

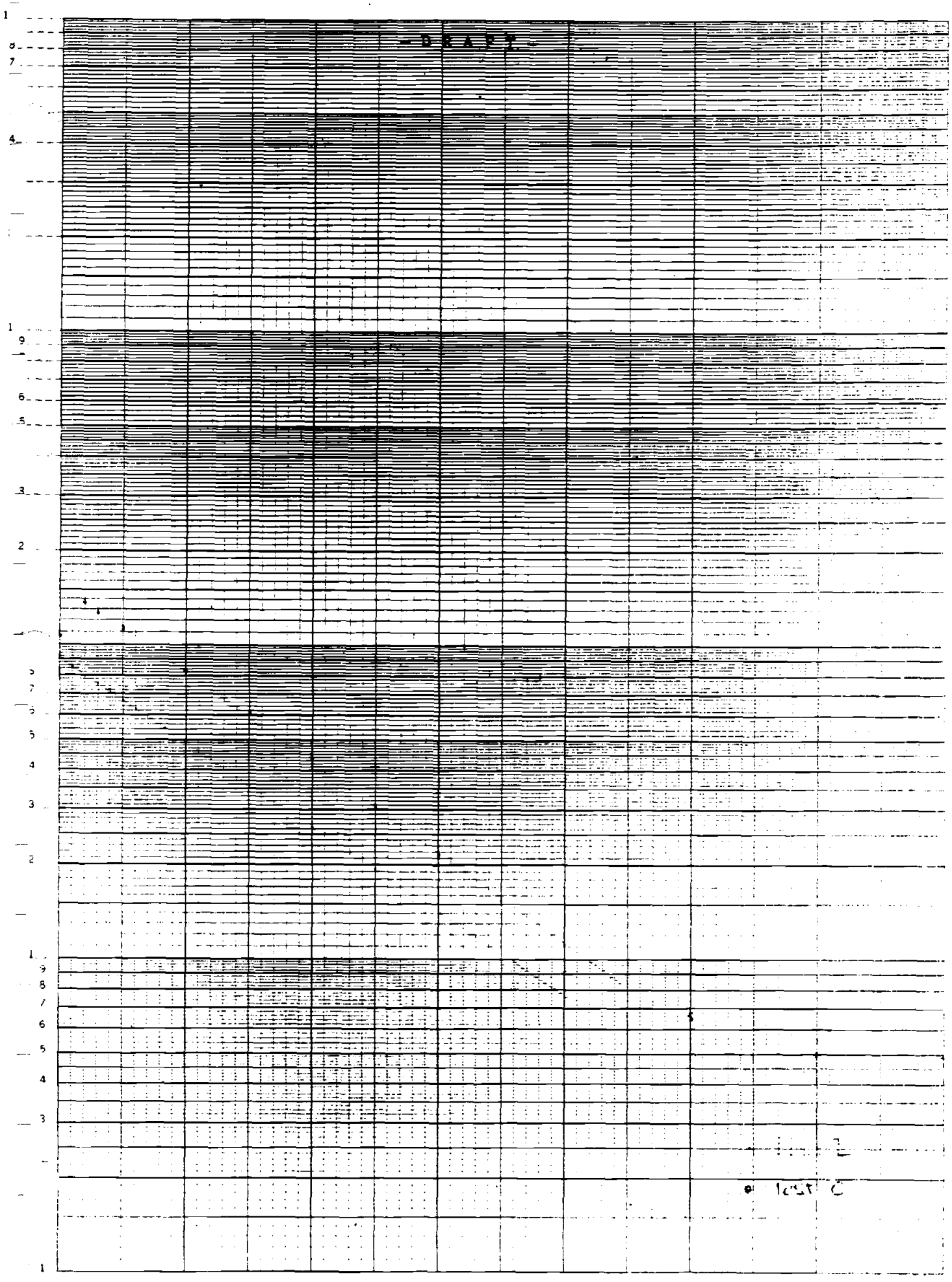
where, $r_c^2 = 6.94 \times 10^{-3}$ ft^2

$t = 1$ min, $y_o = 9.36$ ft, $y_t = 2.66$ ft } from plot of water levels on attached graph

solving for K,

$$K = \frac{(6.94\times10^{-3})(2.59)}{2\times10}\left[\frac{1}{1}\ln\left(\frac{9.36}{2.66}\right)\right] \times \frac{30.48 \text{ cm/ft}}{60 \text{ sec/min}}$$

$$K = 5.74 \times 10^{-4} \text{ cm/sec}$$


DRAFT
TEST C

SLUG TEST DATA - CARSWELL AFB - STAGE 2

Installation ID	Location ID	Elapsed Time	Log Date	Logging Co.	Method	Depth
CRSWL	12B	.0000	8 April 1988	RADN	SI	.4200
CRSWL	12B	.0033	8 April 1988	RADN	SI	.4100
CRSWL	12B	.0066	8 April 1988	RADN	SI	.4100
CRSWL	12B	.0099	8 April 1988	RADN	SI	.3900
CRSWL	12B	.0133	8 April 1988	RADN	SI	.3700
CRSWL	12B	.0166	8 April 1988	RADN	SI	.3800
CRSWL	12B	.0200	8 April 1988	RADN	SI	.3400
CRSWL	12B	.0233	8 April 1988	RADN	SI	.3200
CRSWL	12B	.0266	8 April 1988	RADN	SI	.3000
CRSWL	12B	.0300	8 April 1988	RADN	SI	.2900
CRSWL	12B	.0333	8 April 1988	RADN	SI	.3100
CRSWL	12B	.0500	8 April 1988	RADN	SI	.2400
CRSWL	12B	.0666	8 April 1988	RADN	SI	.2400
CRSWL	12B	.0833	8 April 1988	RADN	SI	.2500
CRSWL	12B	.1000	8 April 1988	RADN	SI	.2600
CRSWL	12B	.1166	8 April 1988	RADN	SI	.2800
CRSWL	12B	.1333	8 April 1988	RADN	SI	.2800
CRSWL	12B	.1500	8 April 1988	RADN	SI	.2900
CRSWL	12B	.1666	8 April 1988	RADN	SI	.2900
CRSWL	12B	.1833	8 April 1988	RADN	SI	.2900
CRSWL	12B	.2000	8 April 1988	RADN	SI	.2900
CRSWL	12B	.2166	8 April 1988	RADN	SI	.2800
CRSWL	12B	.2333	8 April 1988	RADN	SI	.2800
CRSWL	12B	.2500	8 April 1988	RADN	SI	.2800
CRSWL	12B	.2666	8 April 1988	RADN	SI	.2800
CRSWL	12B	.2833	8 April 1988	RADN	SI	.2700
CRSWL	12B	.3000	8 April 1988	RADN	SI	.2700
CRSWL	12B	.3166	8 April 1988	RADN	SI	.2600
CRSWL	12B	.3333	8 April 1988	RADN	SI	.2600
CRSWL	12B	.4167	8 April 1988	RADN	SI	.2400
CRSWL	12B	.5000	8 April 1988	RADN	SI	.2300
CRSWL	12B	.5833	8 April 1988	RADN	SI	.2100
CRSWL	12B	.6667	8 April 1988	RADN	SI	.2000
CRSWL	12B	.7500	8 April 1988	RADN	SI	.2000
CRSWL	12B	.8333	8 April 1988	RADN	SI	.1900
CRSWL	12B	.9167	8 April 1988	RADN	SI	.1800
CRSWL	12B	1.0000	8 April 1988	RADN	SI	.1700
CRSWL	12B	1.0833	8 April 1988	RADN	SI	.1600
CRSWL	12B	1.1667	8 April 1988	RADN	SI	.1600
CRSWL	12B	1.2500	8 April 1988	RADN	SI	.1500
CRSWL	12B	1.3333	8 April 1988	RADN	SI	.1400
CRSWL	12B	1.4166	8 April 1988	RADN	SI	.1400
CRSWL	12B	1.5000	8 April 1988	RADN	SI	.1300
CRSWL	12B	1.5833	8 April 1988	RADN	SI	.1300
CRSWL	12B	1.6667	8 April 1988	RADN	SI	.1200
CRSWL	12B	1.7500	8 April 1988	RADN	SI	.1200
CRSWL	12B	1.8333	8 April 1988	RADN	SI	.1100

SLUG TEST DATA · CARSWELL AFB · STAGE 2

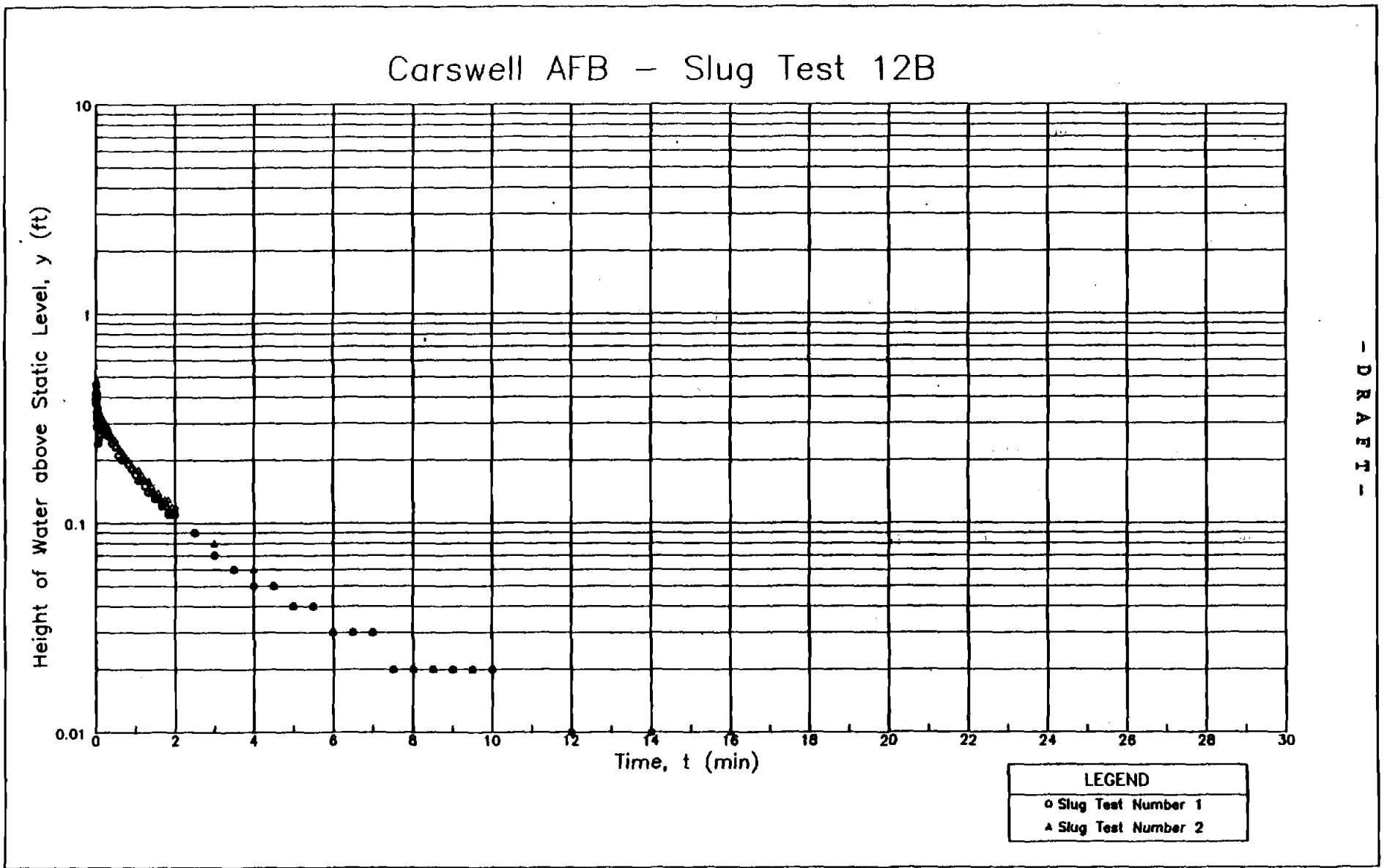
Installation ID	Location ID	Elapsed Time	Log Date	Logging Co.	Method	Depth
CRSWL	12B	1.9167	8 April 1988	RADN	SI	.1100
CRSWL	12B	2.0000	8 April 1988	RADN	SI	.1100
CRSWL	12B	2.5000	8 April 1988	RADN	SI	.0900
CRSWL	12B	3.0000	8 April 1988	RADN	SI	.0700
CRSWL	12B	3.5000	8 April 1988	RADN	SI	.0600
CRSWL	12B	4.0000	8 April 1988	RADN	SI	.0500
CRSWL	12B	4.5000	8 April 1988	RADN	SI	.0500
CRSWL	12B	5.0000	8 April 1988	RADN	SI	.0400
CRSWL	12B	5.5000	8 April 1988	RADN	SI	.0400
CRSWL	12B	6.0000	8 April 1988	RADN	SI	.0300
CRSWL	12B	6.5000	8 April 1988	RADN	SI	.0300
CRSWL	12B	7.0000	8 April 1988	RADN	SI	.0300
CRSWL	12B	7.5000	8 April 1988	RADN	SI	.0200
CRSWL	12B	8.0000	8 April 1988	RADN	SI	.0200
CRSWL	12B	8.5000	8 April 1988	RADN	SI	.0200
CRSWL	12B	9.0000	8 April 1988	RADN	SI	.0200
CRSWL	12B	9.5000	8 April 1988	RADN	SI	.0200
CRSWL	12B	10.0000	8 April 1988	RADN	SI	.0200
CRSWL	12B	12.0000	8 April 1988	RADN	SI	.0100
CRSWL	12B	14.0000	8 April 1988	RADN	SI	.0100

SLUG TEST DATA - CARSWELL AFB - STAGE 2

Installation ID	Location ID	Elapsed Time	Log Date	Logging Co.	Method	Depth
CRSWL	12B	.0000	8 April 1988	RADN	SI	.4800
CRSWL	12B	.0033	8 April 1988	RADN	SI	.4800
CRSWL	12B	.0066	8 April 1988	RADN	SI	.4700
CRSWL	12B	.0099	8 April 1988	RADN	SI	.4700
CRSWL	12B	.0133	8 April 1988	RADN	SI	.4600
CRSWL	12B	.0166	8 April 1988	RADN	SI	.4400
CRSWL	12B	.0200	8 April 1988	RADN	SI	.4800
CRSWL	12B	.0233	8 April 1988	RADN	SI	.4600
CRSWL	12B	.0266	8 April 1988	RADN	SI	.4300
CRSWL	12B	.0300	8 April 1988	RADN	SI	.4200
CRSWL	12B	.0333	8 April 1988	RADN	SI	.4300
CRSWL	12B	.0500	8 April 1988	RADN	SI	.4000
CRSWL	12B	.0666	8 April 1988	RADN	SI	.3700
CRSWL	12B	.0833	8 April 1988	RADN	SI	.3600
CRSWL	12B	.1000	8 April 1988	RADN	SI	.3400
CRSWL	12B	.1166	8 April 1988	RADN	SI	.3300
CRSWL	12B	.1333	8 April 1988	RADN	SI	.3300
CRSWL	12B	.1500	8 April 1988	RADN	SI	.3200
CRSWL	12B	.1666	8 April 1988	RADN	SI	.3200
CRSWL	12B	.1833	8 April 1988	RADN	SI	.3100
CRSWL	12B	.2000	8 April 1988	RADN	SI	.3100
CRSWL	12B	.2166	8 April 1988	RADN	SI	.3000
CRSWL	12B	.2333	8 April 1988	RADN	SI	.3000
CRSWL	12B	.2500	8 April 1988	RADN	SI	.3000
CRSWL	12B	.2666	8 April 1988	RADN	SI	.2900
CRSWL	12B	.2833	8 April 1988	RADN	SI	.2900
CRSWL	12B	.3000	8 April 1988	RADN	SI	.2900
CRSWL	12B	.3166	8 April 1988	RADN	SI	.2800
CRSWL	12B	.3333	8 April 1988	RADN	SI	.2800
CRSWL	12B	.4167	8 April 1988	RADN	SI	.2600
CRSWL	12B	.5000	8 April 1988	RADN	SI	.2500
CRSWL	12B	.5833	8 April 1988	RADN	SI	.2300
CRSWL	12B	.6667	8 April 1988	RADN	SI	.2200
CRSWL	12B	.7500	8 April 1988	RADN	SI	.2100
CRSWL	12B	.8333	8 April 1988	RADN	SI	.2000
CRSWL	12B	.9167	8 April 1988	RADN	SI	.1900
CRSWL	12B	1.0000	8 April 1988	RADN	SI	.1800
CRSWL	12B	1.0833	8 April 1988	RADN	SI	.1800
CRSWL	12B	1.1667	8 April 1988	RADN	SI	.1700
CRSWL	12B	1.2500	8 April 1988	RADN	SI	.1600
CRSWL	12B	1.3333	8 April 1988	RADN	SI	.1600
CRSWL	12B	1.4166	8 April 1988	RADN	SI	.1500
CRSWL	12B	1.5000	8 April 1988	RADN	SI	.1400
CRSWL	12B	1.5833	8 April 1988	RADN	SI	.1400
CRSWL	12B	1.6667	8 April 1988	RADN	SI	.1300
CRSWL	12B	1.7500	8 April 1988	RADN	SI	.1300
CRSWL	12B	1.8333	8 April 1988	RADN	SI	.1300

SLUG TEST DATA - CARSWELL AFB - STAGE 2

Installation ID	Location ID	Elapsed Time	Log Date	Logging Co.	Method	Depth
CRSWL	12B	1.9167	8 April 1988	RADN	SI	.1200
CRSWL	12B	2.0000	8 April 1988	RADN	SI	.1200
CRSWL	12B	2.5000	8 April 1988	RADN	SI	.0900
CRSWL	12B	3.0000	8 April 1988	RADN	SI	.0800
CRSWL	12B	3.5000	8 April 1988	RADN	SI	.0600
CRSWL	12B	4.0000	8 April 1988	RADN	SI	.0600
CRSWL	12B	4.5000	8 April 1988	RADN	SI	.0500
CRSWL	12B	5.0000	8 April 1988	RADN	SI	.0400
CRSWL	12B	5.5000	8 April 1988	RADN	SI	.0400
CRSWL	12B	6.0000	8 April 1988	RADN	SI	.0300
CRSWL	12B	6.5000	8 April 1988	RADN	SI	.0300
CRSWL	12B	7.0000	8 April 1988	RADN	SI	.0300
CRSWL	12B	7.5000	8 April 1988	RADN	SI	.0200
CRSWL	12B	8.0000	8 April 1988	RADN	SI	.0200
CRSWL	12B	8.5000	8 April 1988	RADN	SI	.0200
CRSWL	12B	9.0000	8 April 1988	RADN	SI	.0200
CRSWL	12B	9.5000	8 April 1988	RADN	SI	.0200
CRSWL	12B	10.0000	8 April 1988	RADN	SI	.0200
CRSWL	12B	12.0000	8 April 1988	RADN	SI	.0100
CRSWL	12B	14.0000	8 April 1988	RADN	SI	.0100
CRSWL	12B	16.0000	8 April 1988	RADN	SI	.0100



RADIAN CORPORATION

- DRAFT -

ADIAN CORPORATION

CALCULATION SHEET
- DRAFT -

CALC. NO. _____

SIGNATURE W. D. McAtee DATE 15 July 88 CHECKED _____ DATE _____

PROJECT Carswell AFB IRP Stage 2 JOB NO. 227-005-04-03

SUBJECT Analysis of Slug Test Data - Well 12B SHEET _____ OF _____ SHEETS

[Ref. Bower and Rice, 1976, Water Resources Research, V. 12, No. 3]

Solving the analog equation : $\ln\left(\frac{R_e}{r_w}\right)$ . . .

$$\ln\left(\frac{R_e}{r_w}\right) = \left(\frac{1.1}{\ln\left(\frac{H}{r_w}\right)} + \frac{C}{L/r_w}\right)^{-1}$$

where, $\left.\begin{array}{l} H = 9.75 \text{ ft} \\ L = 10 \text{ ft} \\ r_w = .28 \text{ ft} \\ C = 2.25 \end{array}\right\} \ln\left(\frac{R_e}{r_w}\right) = 2.58$

Hydraulic Conductivity, $K = \frac{r_c^2 \ln\left(\frac{R_e}{r_w}\right)}{2L}\left[\frac{1}{t}\ln\left(\frac{y_0}{y_t}\right)\right]$

where, $r_c^2 = 6.94 \times 10^{-3} \text{ ft}^2$

$\left.\begin{array}{l} t = 0.1 \text{ min} \\ y_t = 0.34 \text{ ft} \\ y_0 = 0.47 \text{ ft} \end{array}\right\}$ from plot of data on attached graph

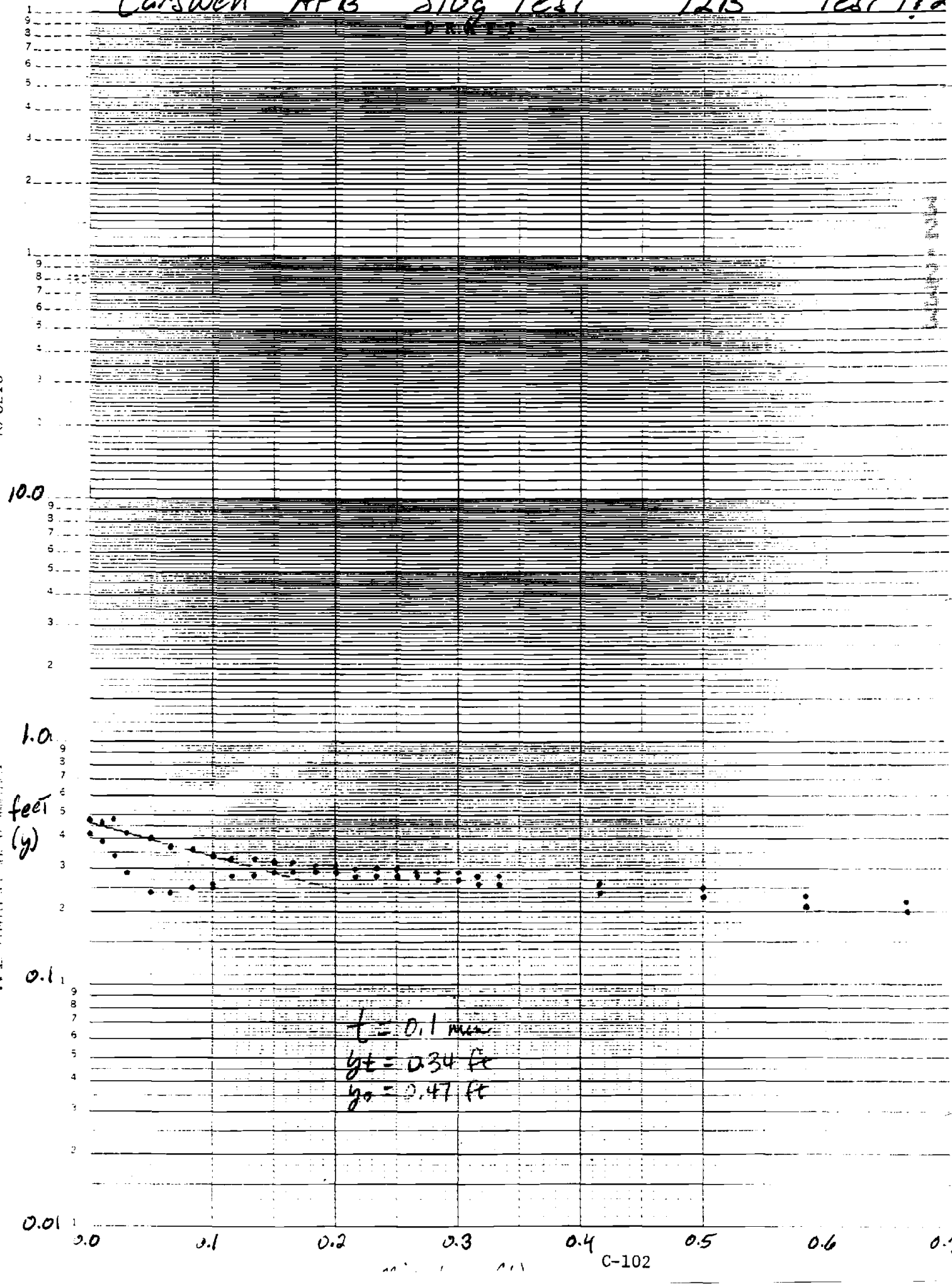
Solving for K,

$$K = \frac{(6.94 \times 10^{-3})(2.58)}{2 \times 10}\left[\frac{1}{0.1}\ln\left(\frac{0.47}{0.34}\right)\right] \times \frac{30.48 \text{ cm/ft}}{60 \text{ sec/min}}$$

$$K = 1.47 \times 10^{-3} \text{ cm/sec}$$

4-81-3361

Carswell AFB Slug Test 12B Test 1 & 2



SLUG TEST DATA - CARSWELL AFB - STAGE 2

Installation ID	Location ID	Elapsed Time	Log Date	Logging Co.	Method	Depth
CRSWL	12C	.0000	8 April 1988	RADN	SI	2.6000
CRSWL	12C	.0033	8 April 1988	RADN	SI	2.5100
CRSWL	12C	.0066	8 April 1988	RADN	SI	2.4500
CRSWL	12C	.0099	8 April 1988	RADN	SI	2.4300
CRSWL	12C	.0133	8 April 1988	RADN	SI	2.3400
CRSWL	12C	.0166	8 April 1988	RADN	SI	2.2900
CRSWL	12C	.0200	8 April 1988	RADN	SI	2.2800
CRSWL	12C	.0233	8 April 1988	RADN	SI	2.2200
CRSWL	12C	.0266	8 April 1988	RADN	SI	2.2000
CRSWL	12C	.0300	8 April 1988	RADN	SI	2.1500
CRSWL	12C	.0333	8 April 1988	RADN	SI	2.1000
CRSWL	12C	.0500	8 April 1988	RADN	SI	1.9600
CRSWL	12C	.0666	8 April 1988	RADN	SI	1.8700
CRSWL	12C	.0833	8 April 1988	RADN	SI	1.8100
CRSWL	12C	.1000	8 April 1988	RADN	SI	1.7500
CRSWL	12C	.1166	8 April 1988	RADN	SI	1.7000
CRSWL	12C	.1333	8 April 1988	RADN	SI	1.6500
CRSWL	12C	.1500	8 April 1988	RADN	SI	1.6100
CRSWL	12C	.1666	8 April 1988	RADN	SI	1.5700
CRSWL	12C	.1833	8 April 1988	RADN	SI	1.5400
CRSWL	12C	.2000	8 April 1988	RADN	SI	1.5100
WL	12C	.2166	8 April 1988	RADN	SI	1.4800
WL	12C	.2333	8 April 1988	RADN	SI	1.4500
CRSWL	12C	.2500	8 April 1988	RADN	SI	1.4300
CRSWL	12C	.2666	8 April 1988	RADN	SI	1.4100
CRSWL	12C	.2833	8 April 1988	RADN	SI	1.3800
CRSWL	12C	.3000	8 April 1988	RADN	SI	1.3600
CRSWL	12C	.3166	8 April 1988	RADN	SI	1.3400
CRSWL	12C	.3333	8 April 1988	RADN	SI	1.3200
CRSWL	12C	.4167	8 April 1988	RADN	SI	1.2300
CRSWL	12C	.5000	8 April 1988	RADN	SI	1.1600
CRSWL	12C	.5833	8 April 1988	RADN	SI	1.1000
CRSWL	12C	.6667	8 April 1988	RADN	SI	1.0500
CRSWL	12C	.7500	8 April 1988	RADN	SI	1.0000
CRSWL	12C	.8333	8 April 1988	RADN	SI	.9700
CRSWL	12C	.9167	8 April 1988	RADN	SI	.9400
CRSWL	12C	1.0000	8 April 1988	RADN	SI	.8900
CRSWL	12C	1.0833	8 April 1988	RADN	SI	.7800
CRSWL	12C	1.1667	8 April 1988	RADN	SI	.6700
CRSWL	12C	1.2500	8 April 1988	RADN	SI	.5700
CRSWL	12C	1.3333	8 April 1988	RADN	SI	.4800
CRSWL	12C	1.4166	8 April 1988	RADN	SI	.4000
CRSWL	12C	1.5000	8 April 1988	RADN	SI	.3600
CRSWL	12C	1.5833	8 April 1988	RADN	SI	.3000
CRSWL	12C	1.6667	8 April 1988	RADN	SI	.2600
RSWL	12C	1.7500	8 April 1988	RADN	SI	.2200
RSWL	12C	1.8333	8 April 1988	RADN	SI	.2000

SLUG TEST DATA - CARSWELL AFB - STAGE 2

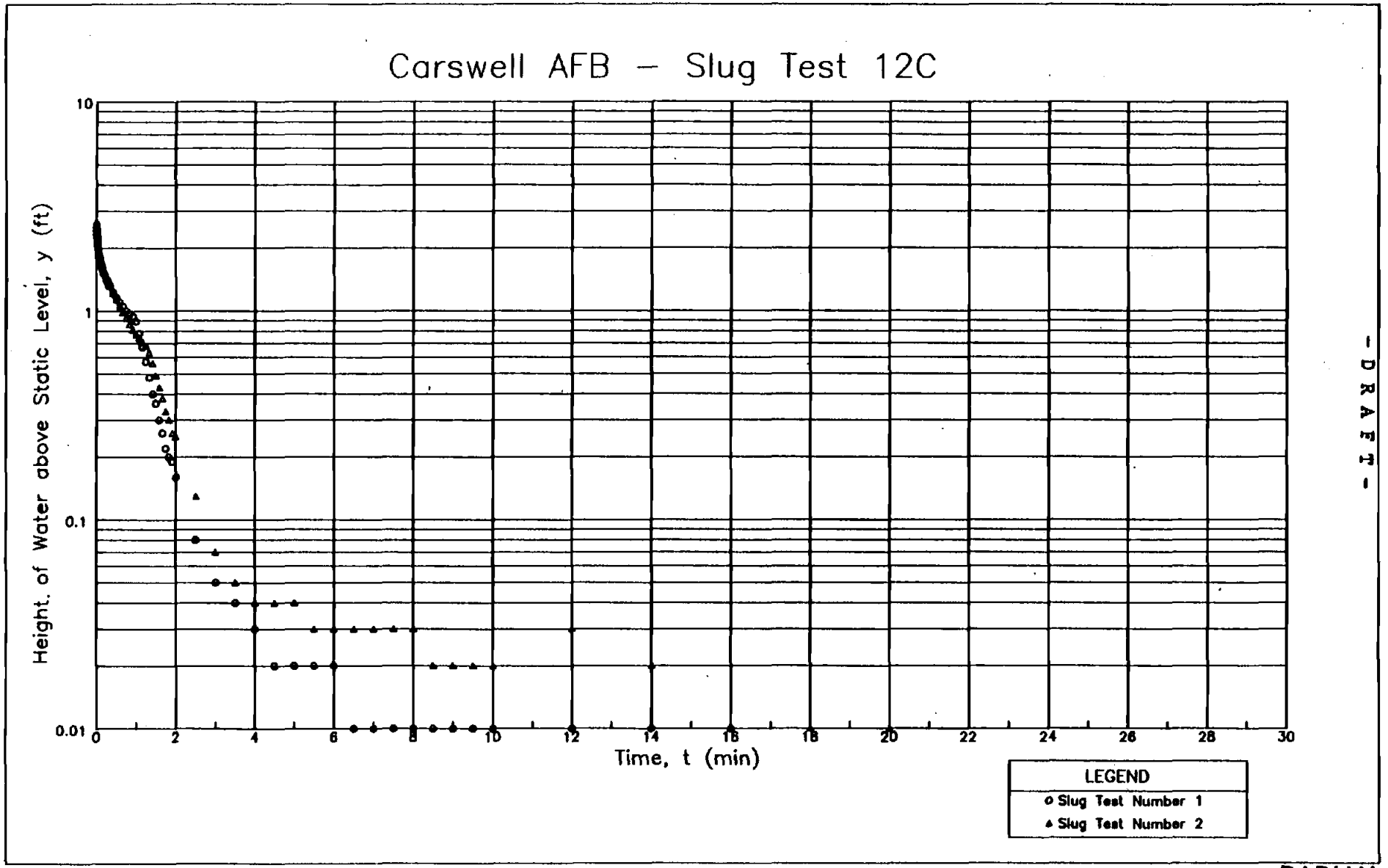
Installation ID	Location ID	Elapsed Time	Log Date	Logging Co.	Method	Depth
CRSWL	12C	1.9167	8 April 1988	RADN	SI	.1900
CRSWL	12C	2.0000	8 April 1988	RADN	SI	.1600
CRSWL	12C	2.5000	8 April 1988	RADN	SI	.0800
CRSWL	12C	3.0000	8 April 1988	RADN	SI	.0500
CRSWL	12C	3.5000	8 April 1988	RADN	SI	.0400
CRSWL	12C	4.0000	8 April 1988	RADN	SI	.0300
CRSWL	12C	4.5000	8 April 1988	RADN	SI	.0200
CRSWL	12C	5.0000	8 April 1988	RADN	SI	.0200
CRSWL	12C	5.5000	8 April 1988	RADN	SI	.0200
CRSWL	12C	6.0000	8 April 1988	RADN	SI	.0200
CRSWL	12C	6.5000	8 April 1988	RADN	SI	.0100
CRSWL	12C	7.0000	8 April 1988	RADN	SI	.0100
CRSWL	12C	7.5000	8 April 1988	RADN	SI	.0100
CRSWL	12C	8.0000	8 April 1988	RADN	SI	.0100
CRSWL	12C	8.5000	8 April 1988	RADN	SI	.0100
CRSWL	12C	9.0000	8 April 1988	RADN	SI	.0100
CRSWL	12C	9.5000	8 April 1988	RADN	SI	.0100
CRSWL	12C	10.0000	8 April 1988	RADN	SI	.0100
CRSWL	12C	12.0000	8 April 1988	RADN	SI	.0100
CRSWL	12C	14.0000	8 April 1988	RADN	SI	.0100
CRSWL	12C	16.0000	8 April 1988	RADN	SI	.0100

SLUG TEST DATA - CARSWELL AFB - STAGE 2

Installation ID	Location ID	Elapsed Time	Log Date	Logging Co.	Method	Depth
CRSWL	12C	.0000	8 April 1988	RADN	SI	2.4800
CRSWL	12C	.0033	8 April 1988	RADN	SI	2.3800
CRSWL	12C	.0066	8 April 1988	RADN	SI	2.3600
CRSWL	12C	.0099	8 April 1988	RADN	SI	2.3600
CRSWL	12C	.0133	8 April 1988	RADN	SI	2.2300
CRSWL	12C	.0166	8 April 1988	RADN	SI	2.1800
CRSWL	12C	.0200	8 April 1988	RADN	SI	2.1900
CRSWL	12C	.0233	8 April 1988	RADN	SI	2.1500
CRSWL	12C	.0266	8 April 1988	RADN	SI	2.1000
CRSWL	12C	.0300	8 April 1988	RADN	SI	2.0600
CRSWL	12C	.0333	8 April 1988	RADN	SI	2.0200
CRSWL	12C	.0500	8 April 1988	RADN	SI	1.9100
CRSWL	12C	.0666	8 April 1988	RADN	SI	1.8400
CRSWL	12C	.0833	8 April 1988	RADN	SI	1.7800
CRSWL	12C	.1000	8 April 1988	RADN	SI	1.7300
CRSWL	12C	.1166	8 April 1988	RADN	SI	1.6800
CRSWL	12C	.1333	8 April 1988	RADN	SI	1.6500
CRSWL	12C	.1500	8 April 1988	RADN	SI	1.6100
CRSWL	12C	.1666	8 April 1988	RADN	SI	1.5700
CRSWL	12C	.1833	8 April 1988	RADN	SI	1.5400
CRSWL	12C	.2000	8 April 1988	RADN	SI	1.5100
CRSWL	12C	.2166	8 April 1988	RADN	SI	1.4800
CRSWL	12C	.2333	8 April 1988	RADN	SI	1.4500
CRSWL	12C	.2500	8 April 1988	RADN	SI	1.4200
CRSWL	12C	.2666	8 April 1988	RADN	SI	1.4000
CRSWL	12C	.2833	8 April 1988	RADN	SI	1.3700
CRSWL	12C	.3000	8 April 1988	RADN	SI	1.3500
CRSWL	12C	.3166	8 April 1988	RADN	SI	1.3300
CRSWL	12C	.3333	8 April 1988	RADN	SI	1.3100
CRSWL	12C	.4167	8 April 1988	RADN	SI	1.2100
CRSWL	12C	.5000	8 April 1988	RADN	SI	1.1300
CRSWL	12C	.5833	8 April 1988	RADN	SI	1.0500
CRSWL	12C	.6667	8 April 1988	RADN	SI	.9800
CRSWL	12C	.7500	8 April 1988	RADN	SI	.9200
CRSWL	12C	.8333	8 April 1988	RADN	SI	.8600
CRSWL	12C	.9167	8 April 1988	RADN	SI	.8100
CRSWL	12C	1.0000	8 April 1988	RADN	SI	.7700
CRSWL	12C	1.0833	8 April 1988	RADN	SI	.7400
CRSWL	12C	1.1667	8 April 1988	RADN	SI	.7100
CRSWL	12C	1.2500	8 April 1988	RADN	SI	.6800
CRSWL	12C	1.3333	8 April 1988	RADN	SI	.6300
CRSWL	12C	1.4166	8 April 1988	RADN	SI	.5600
CRSWL	12C	1.5000	8 April 1988	RADN	SI	.4900
CRSWL	12C	1.5833	8 April 1988	RADN	SI	.4300
CRSWL	12C	1.6667	8 April 1988	RADN	SI	.3800
CRSWL	12C	1.7500	8 April 1988	RADN	SI	.3300
CRSWL	12C	1.8333	8 April 1988	RADN	SI	.3000

SLUG TEST DATA - CARSWELL AFB - STAGE 2

Installation ID	Location ID	Elapsed Time	Log Date	Logging Co.	Method	Depth
CRSWL	12C	1.9167	8 April 1988	RADN	SI	.2600
CRSWL	12C	2.0000	8 April 1988	RADN	SI	.2500
CRSWL	12C	2.5000	8 April 1988	RADN	SI	.1300
CRSWL	12C	3.0000	8 April 1988	RADN	SI	.0700
CRSWL	12C	3.5000	8 April 1988	RADN	SI	.0500
CRSWL	12C	4.0000	8 April 1988	RADN	SI	.0400
CRSWL	12C	4.5000	8 April 1988	RADN	SI	.0400
CRSWL	12C	5.0000	8 April 1988	RADN	SI	.0400
CRSWL	12C	5.5000	8 April 1988	RADN	SI	.0300
CRSWL	12C	6.0000	8 April 1988	RADN	SI	.0300
CRSWL	12C	6.5000	8 April 1988	RADN	SI	.0300
CRSWL	12C	7.0000	8 April 1988	RADN	SI	.0300
CRSWL	12C	7.5000	8 April 1988	RADN	SI	.0300
CRSWL	12C	8.0000	8 April 1988	RADN	SI	.0300
CRSWL	12C	8.5000	8 April 1988	RADN	SI	.0200
CRSWL	12C	9.0000	8 April 1988	RADN	SI	.0200
CRSWL	12C	9.5000	8 April 1988	RADN	SI	.0200
CRSWL	12C	10.0000	8 April 1988	RADN	SI	.0200
CRSWL	12C	12.0000	8 April 1988	RADN	SI	.0300
CRSWL	12C	14.0000	8 April 1988	RADN	SI	.0200
CRSWL	12C	16.0000	8 April 1988	RADN	SI	.0100
CRSWL	12C	18.0000	8 April 1988	RADN	SI	.0100
CRSWL	12C	20.0000	8 April 1988	RADN	SI	.0100



RADIAN CORPORATION

- DRAFT -

RADIAN CORPORATION

CALCULATION SHEET
- DRAFT -

CALC. NO. _____

SIGNATURE W. G. McAntyre DATE 15 July 88 CHECKED _____ DATE _____

PROJECT Carswell AFB IRP Stage 2 JOB NO. 227-005-04-C3

SUBJECT Analysis of Slug Test Data - Well 12c SHEET _____ OF _____ SHEETS

[Ref. Bower and Rice, 1976, Water Resources Research, v.12, n.c.3]

Solving the analog equation: $\ln\left(\frac{R_e}{r_w}\right)$ . . .

$$\ln\left(\frac{R_e}{r_w}\right) = \left(\frac{1}{\ln\left(\frac{H}{r_w}\right)} + \frac{C}{L/r_w}\right)^{-1}$$

where, $H = 7.51$ ft, $L = 10$ ft, $r_w = .28$ ft, $C = 2.25$ } $\ln\left(\frac{R_e}{r_w}\right) = 2.52$

Hydraulic Conductivity, $K = \frac{r_c^2 \ln\left(\frac{R_e}{r_w}\right)}{2L}\left[\frac{1}{t}\ln\left(\frac{y_o}{y_t}\right)\right]$

where, $r_c^2 = 6.94 \times 10^{-3}$ ft^2

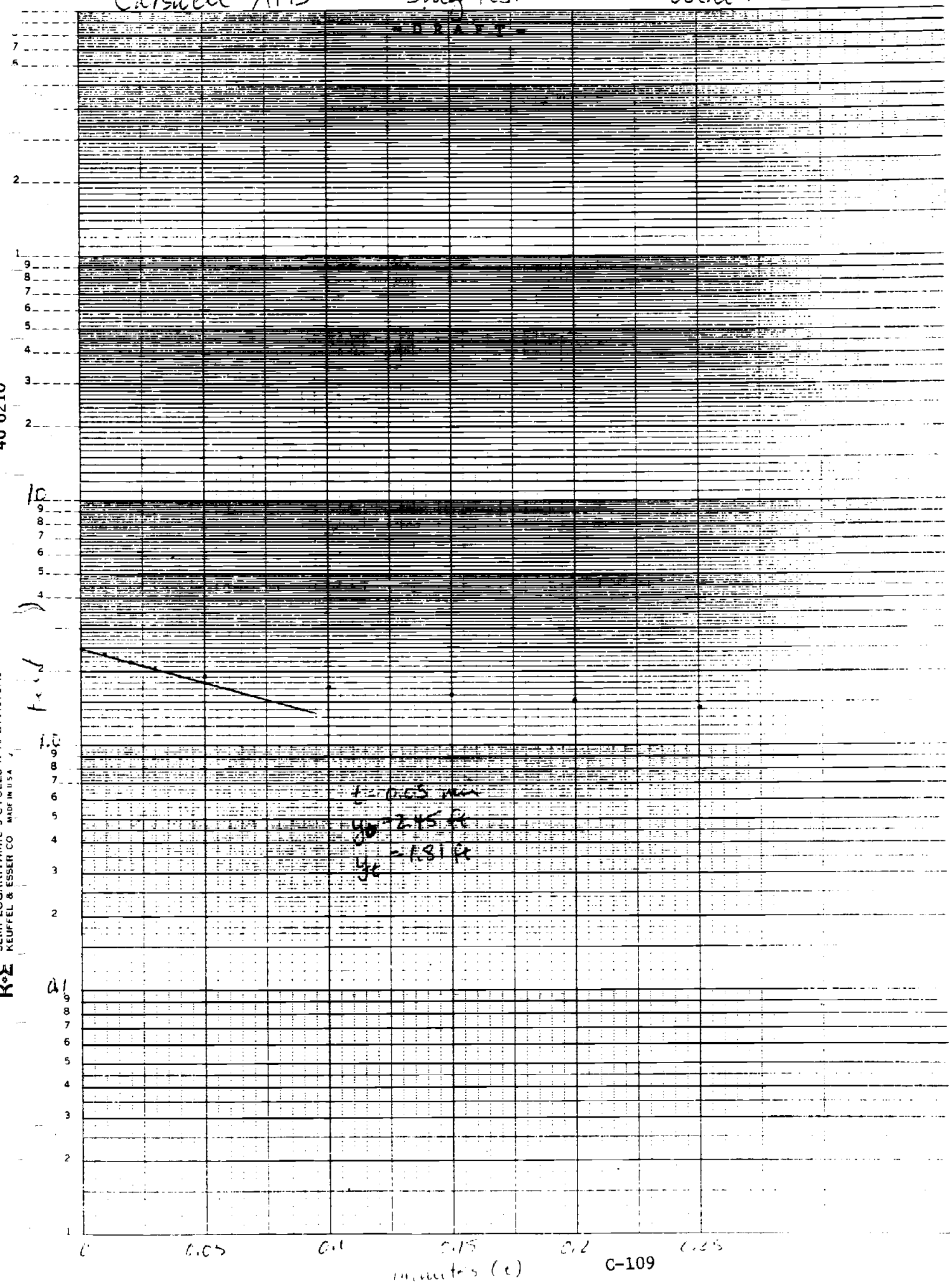
$t = 005$ min, $y_t = 1.81$ ft, $y_o = 2.45$ ft } from plot of data on attached graph

Solving for K,

$$K = \frac{(6.94 \times 10^{-3})(2.52)}{2 \times 10}\left[\frac{1}{.05}\ln\left(\frac{2.45}{1.81}\right)\right] \times \frac{30.48 \text{ cm/ft}}{60 \text{ sec/min}}$$

$$K = 2.68 \times 10^{-3} \text{ cm/sec}$$

Carswell AFB Slug Test Well 12C



SLUG TEST DATA - CARSWELL AFB - STAGE 2

Installation ID	Location ID	Elapsed Time	Log Date	Logging Co.	Method	Depth
CRSWL	17J	.0000	11 April 1988	RADN	SI	2.1200
CRSWL	17J	.0033	11 April 1988	RADN	SI	2.1200
CRSWL	17J	.0066	11 April 1988	RADN	SI	2.0100
CRSWL	17J	.0099	11 April 1988	RADN	SI	1.9400
CRSWL	17J	.0133	11 April 1988	RADN	SI	1.9100
CRSWL	17J	.0166	11 April 1988	RADN	SI	1.8000
CRSWL	17J	.0200	11 April 1988	RADN	SI	1.8400
CRSWL	17J	.0233	11 April 1988	RADN	SI	1.7100
CRSWL	17J	.0266	11 April 1988	RADN	SI	1.8100
CRSWL	17J	.0300	11 April 1988	RADN	SI	1.8600
CRSWL	17J	.0333	11 April 1988	RADN	SI	1.9200
CRSWL	17J	.0500	11 April 1988	RADN	SI	2.1500
CRSWL	17J	.0666	11 April 1988	RADN	SI	2.3200
CRSWL	17J	.0833	11 April 1988	RADN	SI	2.2300
CRSWL	17J	.1000	11 April 1988	RADN	SI	2.0400
CRSWL	17J	.1166	11 April 1988	RADN	SI	1.8600
CRSWL	17J	.1333	11 April 1988	RADN	SI	1.7000
CRSWL	17J	.1500	11 April 1988	RADN	SI	1.5700
CRSWL	17J	.1666	11 April 1988	RADN	SI	1.5200
CRSWL	17J	.1833	11 April 1988	RADN	SI	1.4700
CRSWL	17J	.2000	11 April 1988	RADN	SI	1.4400
CRSWL	17J	.2166	11 April 1988	RADN	SI	1.4000
CRSWL	17J	.2333	11 April 1988	RADN	SI	1.3800
CRSWL	17J	.2500	11 April 1988	RADN	SI	1.3600
CRSWL	17J	.2666	11 April 1988	RADN	SI	1.3400
CRSWL	17J	.2833	11 April 1988	RADN	SI	1.3200
CRSWL	17J	.3000	11 April 1988	RADN	SI	1.3000
CRSWL	17J	.3166	11 April 1988	RADN	SI	1.2900
CRSWL	17J	.3333	11 April 1988	RADN	SI	1.2800
CRSWL	17J	.4167	11 April 1988	RADN	SI	1.1700
CRSWL	17J	.5000	11 April 1988	RADN	SI	.9600
CRSWL	17J	.5833	11 April 1988	RADN	SI	.8100
CRSWL	17J	.6667	11 April 1988	RADN	SI	.6900
CRSWL	17J	.7500	11 April 1988	RADN	SI	.5900
CRSWL	17J	.8333	11 April 1988	RADN	SI	.5000
CRSWL	17J	.9167	11 April 1988	RADN	SI	.4300
CRSWL	17J	1.0000	11 April 1988	RADN	SI	.3700
CRSWL	17J	1.0833	11 April 1988	RADN	SI	.3300
CRSWL	17J	1.1667	11 April 1988	RADN	SI	.2900
CRSWL	17J	1.2500	11 April 1988	RADN	SI	.2600
CRSWL	17J	1.3333	11 April 1988	RADN	SI	.2400
CRSWL	17J	1.4166	11 April 1988	RADN	SI	.2200
CRSWL	17J	1.5000	11 April 1988	RADN	SI	.2000
CRSWL	17J	1.5833	11 April 1988	RADN	SI	.1800
CRSWL	17J	1.6667	11 April 1988	RADN	SI	.1700
CRSWL	17J	1.7500	11 April 1988	RADN	SI	.1600
CRSWL	17J	1.8333	11 April 1988	RADN	SI	.1500

SLUG TEST DATA - CARSWELL AFB - STAGE 2

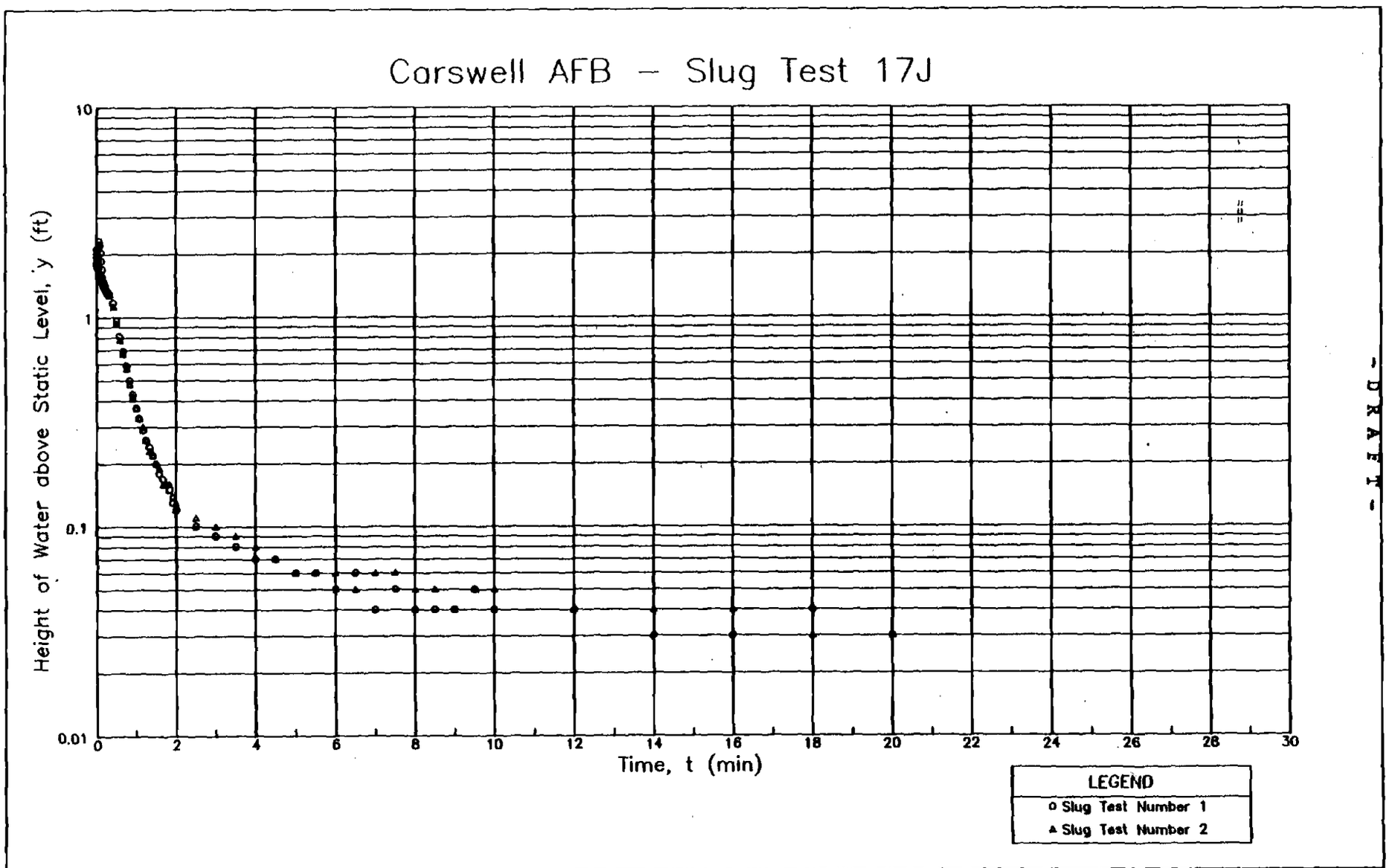
Installation ID	Location ID	Elapsed Time	Log Date	Logging Co.	Method	Depth
CRSWL	17J	1.9167	11 April 1988	RADN	SI	.1300
CRSWL	17J	2.0000	11 April 1988	RADN	SI	.1200
CRSWL	17J	2.5000	11 April 1988	RADN	SI	.1000
CRSWL	17J	3.0000	11 April 1988	RADN	SI	.0900
CRSWL	17J	3.5000	11 April 1988	RADN	SI	.0800
CRSWL	17J	4.0000	11 April 1988	RADN	SI	.0700
CRSWL	17J	4.5000	11 April 1988	RADN	SI	.0700
CRSWL	17J	5.0000	11 April 1988	RADN	SI	.0600
CRSWL	17J	5.5000	11 April 1988	RADN	SI	.0600
CRSWL	17J	6.0000	11 April 1988	RADN	SI	.0500
CRSWL	17J	6.5000	11 April 1988	RADN	SI	.0600
CRSWL	17J	7.0000	11 April 1988	RADN	SI	.0400
CRSWL	17J	7.5000	11 April 1988	RADN	SI	.0500
CRSWL	17J	8.0000	11 April 1988	RADN	SI	.0400
CRSWL	17J	8.5000	11 April 1988	RADN	SI	.0400
CRSWL	17J	9.0000	11 April 1988	RADN	SI	.0400
CRSWL	17J	9.5000	11 April 1988	RADN	SI	.0500
CRSWL	17J	10.0000	11 April 1988	RADN	SI	.0400
CRSWL	17J	12.0000	11 April 1988	RADN	SI	.0400
CRSWL	17J	14.0000	11 April 1988	RADN	SI	.0300
CRSWL	17J	16.0000	11 April 1988	RADN	SI	.0300
CRSWL	17J	18.0000	11 April 1988	RADN	SI	.0400
RSWL	17J	20.0000	11 April 1988	RADN	SI	.0300

SLUG TEST DATA - CARSWELL AFB - STAGE 2

Installation ID	Location ID	Elapsed Time	Log Date	Logging Co.	Method	Depth
CRSWL	17J	.0000	11 April 1988	RADN	SI	1.8900
CRSWL	17J	.0033	11 April 1988	RADN	SI	1.8500
CRSWL	17J	.0066	11 April 1988	RADN	SI	1.8300
CRSWL	17J	.0099	11 April 1988	RADN	SI	1.8300
CRSWL	17J	.0133	11 April 1988	RADN	SI	1.8100
CRSWL	17J	.0166	11 April 1988	RADN	SI	1.8200
CRSWL	17J	.0200	11 April 1988	RADN	SI	1.8000
CRSWL	17J	.0233	11 April 1988	RADN	SI	1.8200
CRSWL	17J	.0266	11 April 1988	RADN	SI	1.8500
CRSWL	17J	.0300	11 April 1988	RADN	SI	1.8200
CRSWL	17J	.0333	11 April 1988	RADN	SI	1.8000
CRSWL	17J	.0500	11 April 1988	RADN	SI	1.7600
CRSWL	17J	.0666	11 April 1988	RADN	SI	1.6900
CRSWL	17J	.0833	11 April 1988	RADN	SI	1.6200
CRSWL	17J	.1000	11 April 1988	RADN	SI	1.5700
CRSWL	17J	.1166	11 April 1988	RADN	SI	1.5300
CRSWL	17J	.1333	11 April 1988	RADN	SI	1.4900
CRSWL	17J	.1500	11 April 1988	RADN	SI	1.4600
CRSWL	17J	.1666	11 April 1988	RADN	SI	1.4400
CRSWL	17J	.1833	11 April 1988	RADN	SI	1.4200
CRSWL	17J	.2000	11 April 1988	RADN	SI	1.4000
CRSWL	17J	.2166	11 April 1988	RADN	SI	1.3800
CRSWL	17J	.2333	11 April 1988	RADN	SI	1.3700
CRSWL	17J	.2500	11 April 1988	RADN	SI	1.3600
CRSWL	17J	.2666	11 April 1988	RADN	SI	1.3400
CRSWL	17J	.2833	11 April 1988	RADN	SI	1.3200
CRSWL	17J	.3000	11 April 1988	RADN	SI	1.3100
CRSWL	17J	.3166	11 April 1988	RADN	SI	1.3000
CRSWL	17J	.3333	11 April 1988	RADN	SI	1.2800
CRSWL	17J	.4167	11 April 1988	RADN	SI	1.1200
CRSWL	17J	.5000	11 April 1988	RADN	SI	.9300
CRSWL	17J	.5833	11 April 1988	RADN	SI	.7800
CRSWL	17J	.6667	11 April 1988	RADN	SI	.6700
CRSWL	17J	.7500	11 April 1988	RADN	SI	.5700
CRSWL	17J	.8333	11 April 1988	RADN	SI	.4800
CRSWL	17J	.9167	11 April 1988	RADN	SI	.4200
CRSWL	17J	1.0000	11 April 1988	RADN	SI	.3700
CRSWL	17J	1.0833	11 April 1988	RADN	SI	.3300
CRSWL	17J	1.1667	11 April 1988	RADN	SI	.3000
CRSWL	17J	1.2500	11 April 1988	RADN	SI	.2600
CRSWL	17J	1.3333	11 April 1988	RADN	SI	.2300
CRSWL	17J	1.4166	11 April 1988	RADN	SI	.2200
CRSWL	17J	1.5000	11 April 1988	RADN	SI	.2000
CRSWL	17J	1.5833	11 April 1988	RADN	SI	.1900
CRSWL	17J	1.6667	11 April 1988	RADN	SI	.1600
CRSWL	17J	1.7500	11 April 1988	RADN	SI	.1600
CRSWL	17J	1.8333	11 April 1988	RADN	SI	.1600

SLUG TEST DATA · CARSWELL AFB · STAGE 2

Installation ID	Location ID	Elapsed Time	Log Date	Logging Co.	Method	Depth
CRSWL	17J	1.9167	11 April 1988	RADN	SI	.1400
CRSWL	17J	2.0000	11 April 1988	RADN	SI	.1300
CRSWL	17J	2.5000	11 April 1988	RADN	SI	.1100
CRSWL	17J	3.0000	11 April 1988	RADN	SI	.1000
CRSWL	17J	3.5000	11 April 1988	RADN	SI	.0900
CRSWL	17J	4.0000	11 April 1988	RADN	SI	.0800
CRSWL	17J	4.5000	11 April 1988	RADN	SI	.0700
CRSWL	17J	5.0000	11 April 1988	RADN	SI	.0600
CRSWL	17J	5.5000	11 April 1988	RADN	SI	.0600
CRSWL	17J	6.0000	11 April 1988	RADN	SI	.0600
CRSWL	17J	6.5000	11 April 1988	RADN	SI	.0500
CRSWL	17J	7.0000	11 April 1988	RADN	SI	.0600
CRSWL	17J	7.5000	11 April 1988	RADN	SI	.0600
CRSWL	17J	8.0000	11 April 1988	RADN	SI	.0500
CRSWL	17J	8.5000	11 April 1988	RADN	SI	.0500
CRSWL	17J	9.0000	11 April 1988	RADN	SI	.0400
CRSWL	17J	9.5000	11 April 1988	RADN	SI	.0500
CRSWL	17J	10.0000	11 April 1988	RADN	SI	.0500
CRSWL	17J	12.0000	11 April 1988	RADN	SI	.0400
CRSWL	17J	14.0000	11 April 1988	RADN	SI	.0400
CRSWL	17J	16.0000	11 April 1988	RADN	SI	.0400
CRSWL	17J	18.0000	11 April 1988	RADN	SI	.0300
CRSWL	17J	20.0000	11 April 1988	RADN	SI	.0300



RADIAN CORPORATION

- DRAFT -

CANADIAN CORPORATION

CALCULATION SHEET

- DRAFT -

CALC. NO. _____

SIGNATURE H. French DATE 18 June 88 CHECKED _____ DATE _____

PROJECT Caswell AFB IRP Stage 2 JOB NO. 227-005-04-03

SUBJECT Analysis of Slug Test Data - Well 17J SHEET 1 OF 2 SHEETS

[Ref. Bouwer and Rice, 1976, Water Resources Research, v. 12, no. 3]

Solving the analog equation : $\ln(R_e/r_w)$

$$\ln\left(\frac{R_e}{r_w}\right) = \left(\frac{1.1}{\ln(H/r_w)} + \frac{C}{L/r_w}\right)^{-1}$$

where, $H = 7.65$ ft, $L = 12.5$ ft, $r_w = 0.28$ ft, $C = 2.4$ $\Rightarrow \ln(R_e/r_w) = 2.59$

Hydraulic Conductivity, K, $= \dfrac{r_c^2 \ln(R_e/r_w)}{2L}\left[\frac{1}{t}\ln\left(\frac{y_t}{y_0}\right)\right]$

where, $r_c^2 = 6.94 \times 10^{-3}$ ft^2

$t = 1$ min, $y_t = 0.37$ ft, $y_0 = 2$ ft } see attached plot

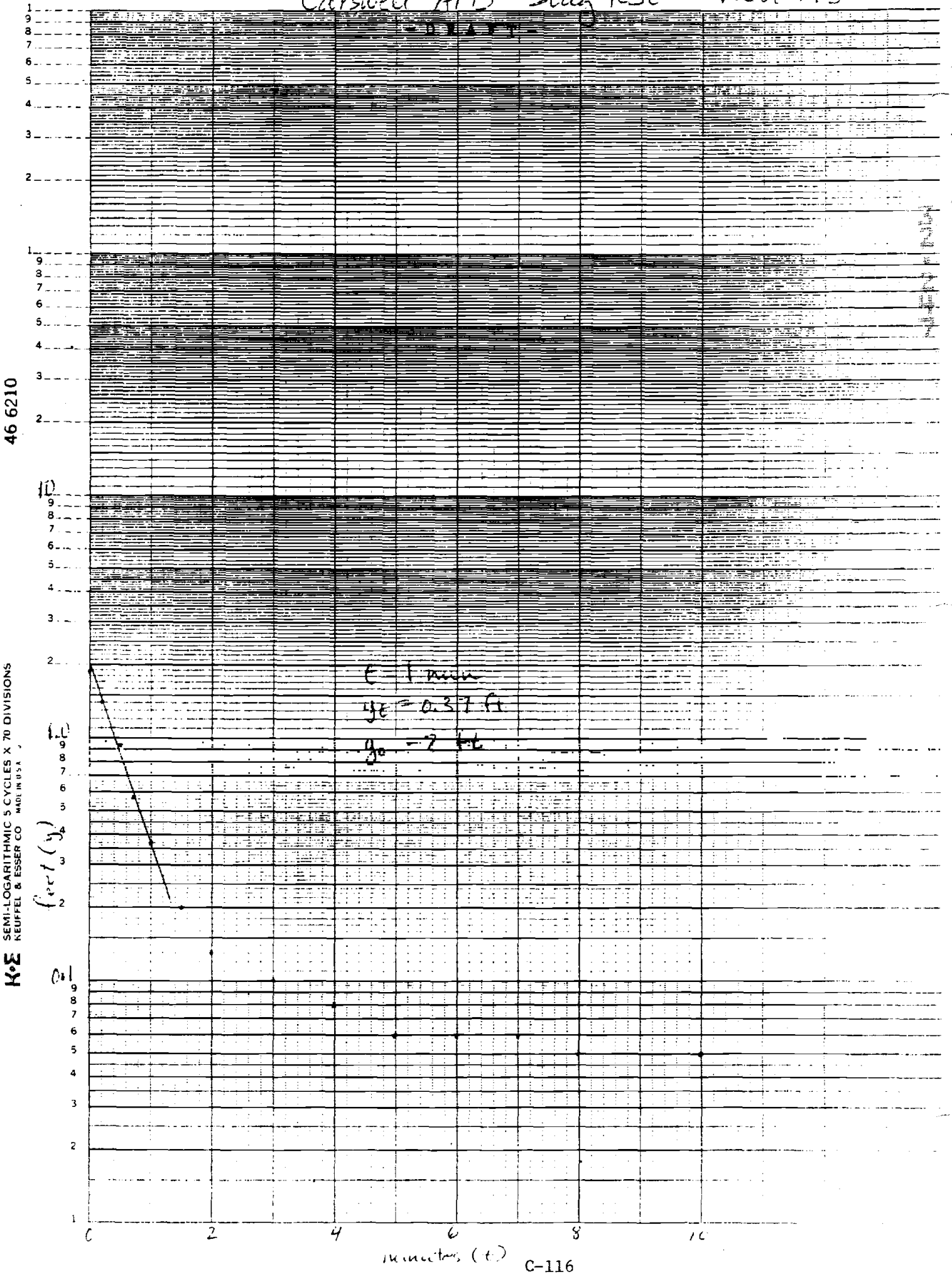
Solving for K,

$$K = \frac{(6.94 \times 10^{-3})(2.59)}{2 \times 12.5}\left[\frac{1}{1}\ln\left(\frac{2}{0.37}\right)\right] \times \frac{30.48}{60}$$

$$K = 6.13 \times 10^{-4} \text{ cm/sec}$$

4-81-3361

Carswell AFB Slug Test Well 17J

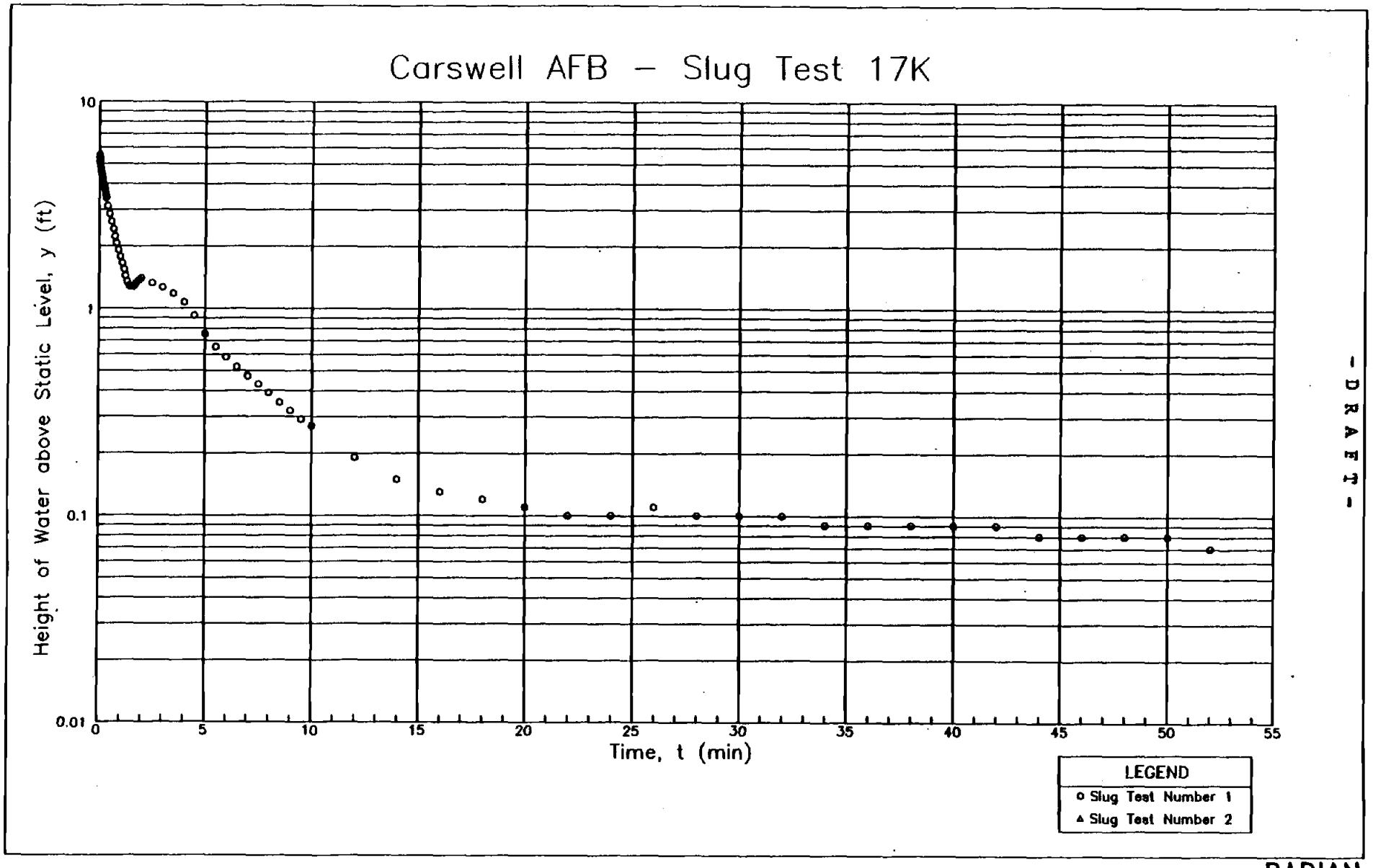


SLUG TEST DATA - CARSWELL AFB - STAGE 2

Installation ID	Location ID	Elapsed Time	Log Date	Logging Co.	Method	Depth
CRSWL	17K	.0000	12 April 1988	RADN	SI	5.5400
CRSWL	17K	.0033	12 April 1988	RADN	SI	5.5000
CRSWL	17K	.0066	12 April 1988	RADN	SI	5.4000
CRSWL	17K	.0099	12 April 1988	RADN	SI	5.4300
CRSWL	17K	.0133	12 April 1988	RADN	SI	5.3700
CRSWL	17K	.0166	12 April 1988	RADN	SI	5.3300
CRSWL	17K	.0200	12 April 1988	RADN	SI	5.3100
CRSWL	17K	.0233	12 April 1988	RADN	SI	5.2700
CRSWL	17K	.0266	12 April 1988	RADN	SI	5.2300
CRSWL	17K	.0300	12 April 1988	RADN	SI	5.2000
CRSWL	17K	.0333	12 April 1988	RADN	SI	5.1600
CRSWL	17K	.0500	12 April 1988	RADN	SI	5.0100
CRSWL	17K	.0666	12 April 1988	RADN	SI	4.8700
CRSWL	17K	.0833	12 April 1988	RADN	SI	4.7400
CRSWL	17K	.1000	12 April 1988	RADN	SI	4.6200
CRSWL	17K	.1166	12 April 1988	RADN	SI	4.5000
CRSWL	17K	.1333	12 April 1988	RADN	SI	4.4000
CRSWL	17K	.1500	12 April 1988	RADN	SI	4.2900
CRSWL	17K	.1666	12 April 1988	RADN	SI	4.2000
CRSWL	17K	.1833	12 April 1988	RADN	SI	4.1100
CRSWL	17K	.2000	12 April 1988	RADN	SI	4.0200
CRSWL	17K	.2166	12 April 1988	RADN	SI	3.9300
CRSWL	17K	.2333	12 April 1988	RADN	SI	3.8500
CRSWL	17K	.2500	12 April 1988	RADN	SI	3.7700
CRSWL	17K	.2666	12 April 1988	RADN	SI	3.7000
CRSWL	17K	.2833	12 April 1988	RADN	SI	3.6300
CRSWL	17K	.3000	12 April 1988	RADN	SI	3.5500
CRSWL	17K	.3166	12 April 1988	RADN	SI	3.4800
CRSWL	17K	.3333	12 April 1988	RADN	SI	3.4100
CRSWL	17K	.4167	12 April 1988	RADN	SI	3.1100
CRSWL	17K	.5000	12 April 1988	RADN	SI	2.8500
CRSWL	17K	.5833	12 April 1988	RADN	SI	2.6200
CRSWL	17K	.6667	12 April 1988	RADN	SI	2.4100
CRSWL	17K	.7500	12 April 1988	RADN	SI	2.2200
CRSWL	17K	.8333	12 April 1988	RADN	SI	2.0600
CRSWL	17K	.9167	12 April 1988	RADN	SI	1.9100
CRSWL	17K	1.0000	12 April 1988	RADN	SI	1.7700
CRSWL	17K	1.0833	12 April 1988	RADN	SI	1.6500
CRSWL	17K	1.1667	12 April 1988	RADN	SI	1.5400
CRSWL	17K	1.2500	12 April 1988	RADN	SI	1.4300
CRSWL	17K	1.3333	12 April 1988	RADN	SI	1.3400
CRSWL	17K	1.4166	12 April 1988	RADN	SI	1.2800
CRSWL	17K	1.5000	12 April 1988	RADN	SI	1.2700
CRSWL	17K	1.5833	12 April 1988	RADN	SI	1.2700
CRSWL	17K	1.6667	12 April 1988	RADN	SI	1.2900
CRSWL	17K	1.7500	12 April 1988	RADN	SI	1.3300
CRSWL	17K	1.8333	12 April 1988	RADN	SI	1.3600

SLUG TEST DATA - CARSWELL AFB - STAGE 2

Installation ID	Location ID	Elapsed Time	Log Date	Logging Co.	Method	Depth
CRSWL	17K	1.9167	12 April 1988	RADN	SI	1.3700
CRSWL	17K	2.0000	12 April 1988	RADN	SI	1.4000
CRSWL	17K	2.5000	12 April 1988	RADN	SI	1.3200
CRSWL	17K	3.0000	12 April 1988	RADN	SI	1.2600
CRSWL	17K	3.5000	12 April 1988	RADN	SI	1.1800
CRSWL	17K	4.0000	12 April 1988	RADN	SI	1.0700
CRSWL	17K	4.5000	12 April 1988	RADN	SI	.9200
CRSWL	17K	5.0000	12 April 1988	RADN	SI	.7500
CRSWL	17K	5.5000	12 April 1988	RADN	SI	.6500
CRSWL	17K	6.0000	12 April 1988	RADN	SI	.5800
CRSWL	17K	6.5000	12 April 1988	RADN	SI	.5200
CRSWL	17K	7.0000	12 April 1988	RADN	SI	.4700
CRSWL	17K	7.5000	12 April 1988	RADN	SI	.4300
CRSWL	17K	8.0000	12 April 1988	RADN	SI	.3900
CRSWL	17K	8.5000	12 April 1988	RADN	SI	.3500
CRSWL	17K	9.0000	12 April 1988	RADN	SI	.3200
CRSWL	17K	9.5000	12 April 1988	RADN	SI	.2900
CRSWL	17K	10.0000	12 April 1988	RADN	SI	.2700
CRSWL	17K	12.0000	12 April 1988	RADN	SI	.1900
CRSWL	17K	14.0000	12 April 1988	RADN	SI	.1500
CRSWL	17K	16.0000	12 April 1988	RADN	SI	.1300
CRSWL	17K	18.0000	12 April 1988	RADN	SI	.1200
CRSWL	17K	20.0000	12 April 1988	RADN	SI	.1100
CRSWL	17K	22.0000	12 April 1988	RADN	SI	.1000
CRSWL	17K	24.0000	12 April 1988	RADN	SI	.1000
CRSWL	17K	26.0000	12 April 1988	RADN	SI	.1100
CRSWL	17K	28.0000	12 April 1988	RADN	SI	.1000
CRSWL	17K	30.0000	12 April 1988	RADN	SI	.1000
CRSWL	17K	32.0000	12 April 1988	RADN	SI	.1000
CRSWL	17K	34.0000	12 April 1988	RADN	SI	.0900
CRSWL	17K	36.0000	12 April 1988	RADN	SI	.0900
CRSWL	17K	38.0000	12 April 1988	RADN	SI	.0900
CRSWL	17K	40.0000	12 April 1988	RADN	SI	.0900
CRSWL	17K	42.0000	12 April 1988	RADN	SI	.0900
CRSWL	17K	44.0000	12 April 1988	RADN	SI	.0800
CRSWL	17K	46.0000	12 April 1988	RADN	SI	.0800
CRSWL	17K	48.0000	12 April 1988	RADN	SI	.0800
CRSWL	17K	50.0000	12 April 1988	RADN	SI	.0800
CRSWL	17K	52.0000	12 April 1988	RADN	SI	.0700



RADIAN CORPORATION

- DRAFT -

RADIAN CORPORATION

CALCULATION SHEET
- DRAFT -

CALC. NO. _____

SIGNATURE W. G. McFatrige DATE 21 July 88 CHECKED _____ DATE _____

PROJECT Carswell AFB IRP Stage 2 JOB NO. 227-005-04-03

SUBJECT Analysis of Slug Test Data - Well 17K SHEET _____ OF _____ SHEETS

[Ref. Bower and Rice, 1976, Water Resources Research, V.12, NO.3]

Solving the analog equation: $\ln\left(\frac{R_e}{r_w}\right)$ . . .

$$\ln\left(\frac{R_e}{r_w}\right) = \left(\frac{1.1}{\ln\left(\frac{H}{r_w}\right)} + \frac{C}{L/r_w}\right)^{-1}$$

where, $H = 8.51$ ft
$L = 10$ ft
$r_w = .28$ ft
$C = 2.25$

$\Rightarrow \ln\left(\frac{R_e}{r_w}\right) = 2.60$

Hydraulic Conductivity, $K = \frac{r_c^2 \ln\left(\frac{R_e}{r_w}\right)}{2L}\left[\frac{1}{t}\ln\left(\frac{y_0}{y_t}\right)\right]$

where, $r_c^2 = 6.94 \times 10^{-3}$ ft^2

$t = 0.2$ min
$y_t = 4.1$ ft
$y_0 = 5.2$ ft

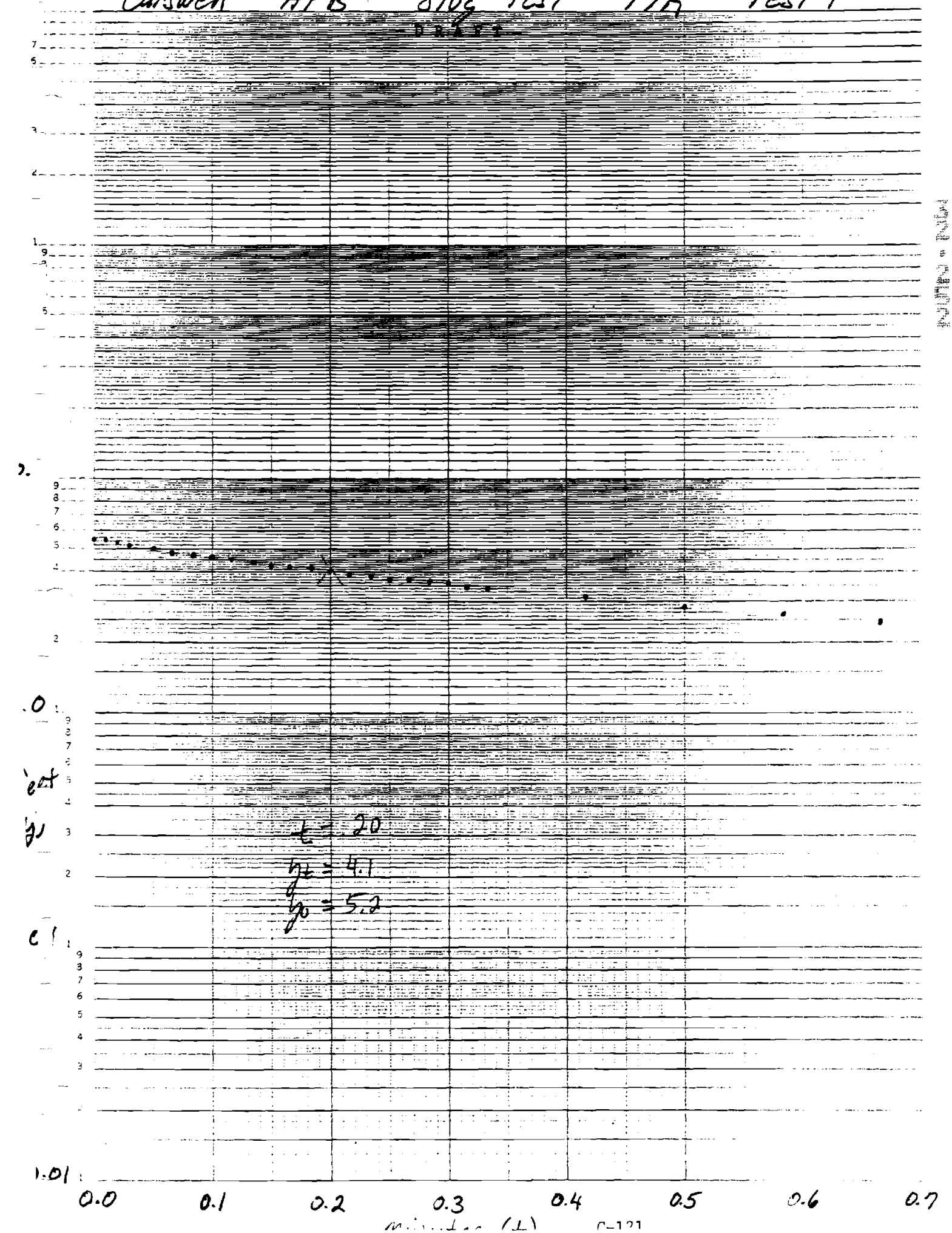
from plot of data on attached graph

Solving for k,

$$K = \frac{(6.94 \times 10^{-3})(2.60)}{2 \times 10}\left[\frac{1}{.2}\ln\left(\frac{5.2}{4.1}\right)\right] \times \frac{30.48 \text{ cm/ft}}{60 \text{ sec/min}}$$

$$K = 5.44 \times 10^{-4} \text{ cm/sec}$$

Carswell AFB Slug Test 17K Test 1



SLUG TEST DATA - CARSWELL AFB - STAGE 2

Installation ID	Location ID	Elapsed Time	Log Date	Logging Co.	Method	Depth
CRSWL	17L	.0000	12 April 1988	RADN	SI	.3100
CRSWL	17L	.0033	12 April 1988	RADN	SI	.2700
CRSWL	17L	.0066	12 April 1988	RADN	SI	.2100
CRSWL	17L	.0099	12 April 1988	RADN	SI	.1600
CRSWL	17L	.0133	12 April 1988	RADN	SI	.0900
CRSWL	17L	.0166	12 April 1988	RADN	SI	.0700
CRSWL	17L	.0200	12 April 1988	RADN	SI	.0500
CRSWL	17L	.0233	12 April 1988	RADN	SI	.1100
CRSWL	17L	.0266	12 April 1988	RADN	SI	.1400
CRSWL	17L	.0300	12 April 1988	RADN	SI	.1600
CRSWL	17L	.0333	12 April 1988	RADN	SI	.1600
CRSWL	17L	.0500	12 April 1988	RADN	SI	.1100
CRSWL	17L	.0666	12 April 1988	RADN	SI	.1000
CRSWL	17L	.0833	12 April 1988	RADN	SI	.1000
CRSWL	17L	.1000	12 April 1988	RADN	SI	.0900
CRSWL	17L	.1166	12 April 1988	RADN	SI	.0800
CRSWL	17L	.1333	12 April 1988	RADN	SI	.0800
CRSWL	17L	.1500	12 April 1988	RADN	SI	.0800
CRSWL	17L	.1666	12 April 1988	RADN	SI	.0700
CRSWL	17L	.1833	12 April 1988	RADN	SI	.0700
CRSWL	17L	.2000	12 April 1988	RADN	SI	.0700
CRSWL	17L	.2166	12 April 1988	RADN	SI	.0700
CRSWL	17L	.2333	12 April 1988	RADN	SI	.0600
CRSWL	17L	.2500	12 April 1988	RADN	SI	.0600
CRSWL	17L	.2666	12 April 1988	RADN	SI	.0600
CRSWL	17L	.2833	12 April 1988	RADN	SI	.0600
CRSWL	17L	.3000	12 April 1988	RADN	SI	.0600
CRSWL	17L	.3166	12 April 1988	RADN	SI	.0600
CRSWL	17L	.3333	12 April 1988	RADN	SI	.0600
CRSWL	17L	.4167	12 April 1988	RADN	SI	.0500
CRSWL	17L	.5000	12 April 1988	RADN	SI	.0500
CRSWL	17L	.5833	12 April 1988	RADN	SI	.0400
CRSWL	17L	.6667	12 April 1988	RADN	SI	.0400
CRSWL	17L	.7500	12 April 1988	RADN	SI	.0300
CRSWL	17L	.8333	12 April 1988	RADN	SI	.0300
CRSWL	17L	.9167	12 April 1988	RADN	SI	.0300
CRSWL	17L	1.0000	12 April 1988	RADN	SI	.0300
CRSWL	17L	1.0833	12 April 1988	RADN	SI	.0300
CRSWL	17L	1.1667	12 April 1988	RADN	SI	.0200
CRSWL	17L	1.2500	12 April 1988	RADN	SI	.0200
CRSWL	17L	1.3333	12 April 1988	RADN	SI	.0200
CRSWL	17L	1.4166	12 April 1988	RADN	SI	.0200
CRSWL	17L	1.5000	12 April 1988	RADN	SI	.0200
CRSWL	17L	1.5833	12 April 1988	RADN	SI	.0200
CRSWL	17L	1.6667	12 April 1988	RADN	SI	.0200
CRSWL	17L	1.7500	12 April 1988	RADN	SI	.0200
CRSWL	17L	1.8333	12 April 1988	RADN	SI	.0200

SLUG TEST DATA - CARSWELL AFB - STAGE 2

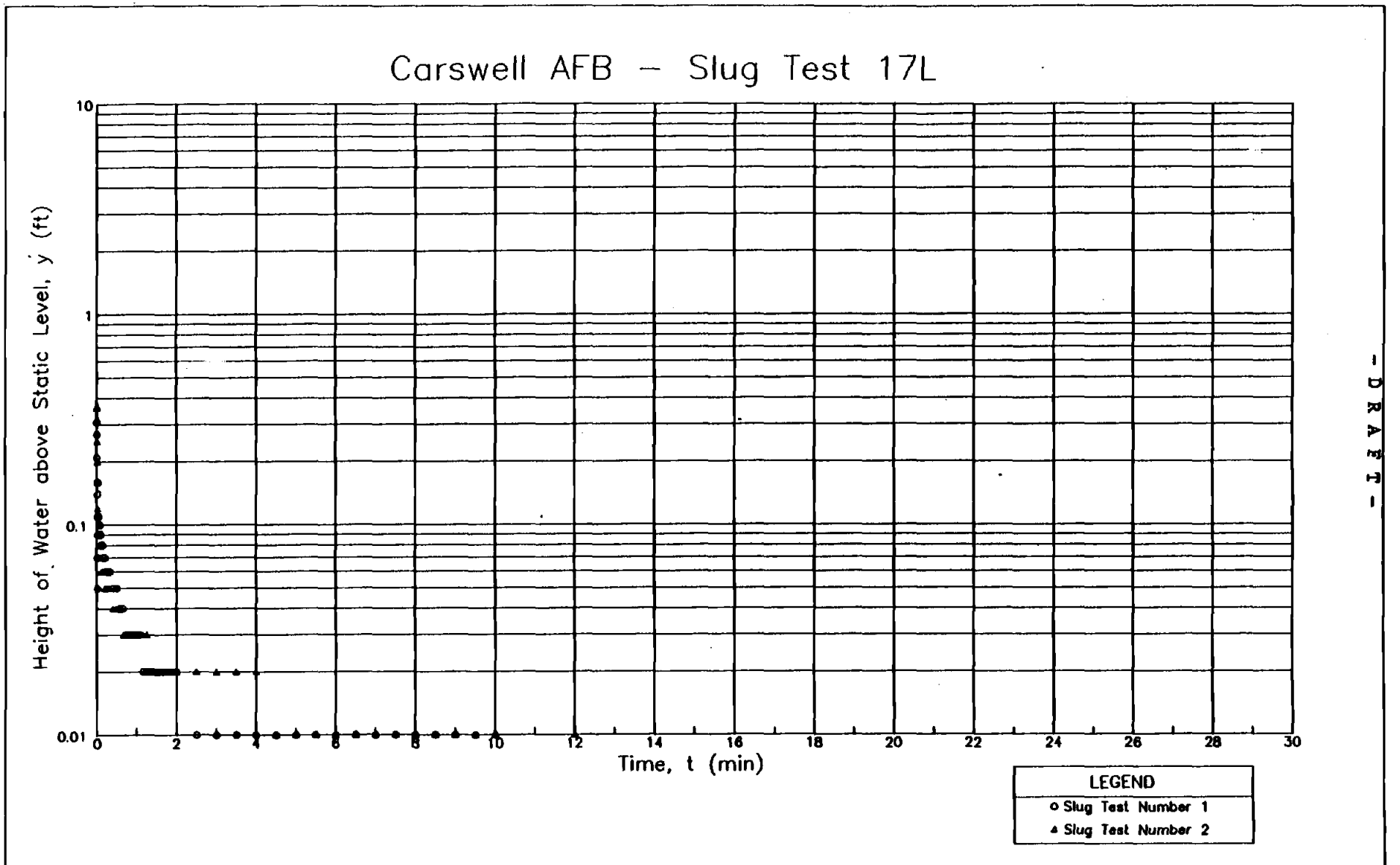
Installation ID	Location ID	Elapsed Time	Log Date	Logging Co.	Method	Depth
CRSWL	17L	1.9167	12 April 1988	RADN	SI	.0200
CRSWL	17L	2.0000	12 April 1988	RADN	SI	.0200
CRSWL	17L	2.5000	12 April 1988	RADN	SI	.0100
CRSWL	17L	3.0000	12 April 1988	RADN	SI	.0100
CRSWL	17L	3.5000	12 April 1988	RADN	SI	.0100
CRSWL	17L	4.0000	12 April 1988	RADN	SI	.0100
CRSWL	17L	4.5000	12 April 1988	RADN	SI	.0100
CRSWL	17L	5.0000	12 April 1988	RADN	SI	.0100
CRSWL	17L	5.5000	12 April 1988	RADN	SI	.0100
CRSWL	17L	6.0000	12 April 1988	RADN	SI	.0100
CRSWL	17L	6.5000	12 April 1988	RADN	SI	.0100
CRSWL	17L	7.0000	12 April 1988	RADN	SI	.0100
CRSWL	17L	7.5000	12 April 1988	RADN	SI	.0100
CRSWL	17L	8.0000	12 April 1988	RADN	SI	.0100
CRSWL	17L	8.5000	12 April 1988	RADN	SI	.0100
CRSWL	17L	9.0000	12 April 1988	RADN	SI	.0100
CRSWL	17L	9.5000	12 April 1988	RADN	SI	.0100
CRSWL	17L	10.0000	12 April 1988	RADN	SI	.0100

SLUG TEST DATA - CARSWELL AFB - STAGE 2

Installation ID	Location ID	Elapsed Time	Log Date	Logging Co.	Method	Depth
CRSWL	17L	.0000	12 April 1988	RADN	SI	.3100
CRSWL	17L	.0033	12 April 1988	RADN	SI	.3600
CRSWL	17L	.0066	12 April 1988	RADN	SI	.3600
CRSWL	17L	.0099	12 April 1988	RADN	SI	.3700
CRSWL	17L	.0133	12 April 1988	RADN	SI	.3200
CRSWL	17L	.0166	12 April 1988	RADN	SI	.3100
CRSWL	17L	.0200	12 April 1988	RADN	SI	.2500
CRSWL	17L	.0233	12 April 1988	RADN	SI	.2000
CRSWL	17L	.0266	12 April 1988	RADN	SI	.1600
CRSWL	17L	.0300	12 April 1988	RADN	SI	.1200
CRSWL	17L	.0333	12 April 1988	RADN	SI	.1100
CRSWL	17L	.0500	12 April 1988	RADN	SI	.0900
CRSWL	17L	.0666	12 April 1988	RADN	SI	.0800
CRSWL	17L	.0833	12 April 1988	RADN	SI	.0700
CRSWL	17L	.1000	12 April 1988	RADN	SI	.0700
CRSWL	17L	.1166	12 April 1988	RADN	SI	.0600
CRSWL	17L	.1333	12 April 1988	RADN	SI	.0600
CRSWL	17L	.1500	12 April 1988	RADN	SI	.0600
CRSWL	17L	.1666	12 April 1988	RADN	SI	.0600
CRSWL	17L	.1833	12 April 1988	RADN	SI	.0600
CRSWL	17L	.2000	12 April 1988	RADN	SI	.0500
CRSWL	17L	.2166	12 April 1988	RADN	SI	.0500
CRSWL	17L	.2333	12 April 1988	RADN	SI	.0500
CRSWL	17L	.2500	12 April 1988	RADN	SI	.0500
CRSWL	17L	.2666	12 April 1988	RADN	SI	.0500
CRSWL	17L	.2833	12 April 1988	RADN	SI	.0500
CRSWL	17L	.3000	12 April 1988	RADN	SI	.0500
CRSWL	17L	.3166	12 April 1988	RADN	SI	.0500
CRSWL	17L	.3333	12 April 1988	RADN	SI	.0500
CRSWL	17L	.4167	12 April 1988	RADN	SI	.0400
CRSWL	17L	.5000	12 April 1988	RADN	SI	.0400
CRSWL	17L	.5833	12 April 1988	RADN	SI	.0400
CRSWL	17L	.6667	12 April 1988	RADN	SI	.0300
CRSWL	17L	.7500	12 April 1988	RADN	SI	.0300
CRSWL	17L	.8333	12 April 1988	RADN	SI	.0300
CRSWL	17L	.9167	12 April 1988	RADN	SI	.0300
CRSWL	17L	1.0000	12 April 1988	RADN	SI	.0300
CRSWL	17L	1.0833	12 April 1988	RADN	SI	.0300
CRSWL	17L	1.1667	12 April 1988	RADN	SI	.0300
CRSWL	17L	1.2500	12 April 1988	RADN	SI	.0300
CRSWL	17L	1.3333	12 April 1988	RADN	SI	.0200
CRSWL	17L	1.4166	12 April 1988	RADN	SI	.0200
CRSWL	17L	1.5000	12 April 1988	RADN	SI	.0200
CRSWL	17L	1.5833	12 April 1988	RADN	SI	.0200
CRSWL	17L	1.6667	12 April 1988	RADN	SI	.0200
CRSWL	17L	1.7500	12 April 1988	RADN	SI	.0200
CRSWL	17L	1.8333	12 April 1988	RADN	SI	.0200

SLUG TEST DATA - CARSWELL AFB - STAGE 2

Installation ID	Location ID	Elapsed Time	Log Date	Logging Co.	Method	Depth
CRSWL	17L	1.9167	12 April 1988	RADN	SI	.0200
CRSWL	17L	2.0000	12 April 1988	RADN	SI	.0200
CRSWL	17L	2.5000	12 April 1988	RADN	SI	.0200
CRSWL	17L	3.0000	12 April 1988	RADN	SI	.0200
CRSWL	17L	3.5000	12 April 1988	RADN	SI	.0200
CRSWL	17L	4.0000	12 April 1988	RADN	SI	.0200
CRSWL	17L	4.5000	12 April 1988	RADN	SI	.0100
CRSWL	17L	5.0000	12 April 1988	RADN	SI	.0100
CRSWL	17L	5.5000	12 April 1988	RADN	SI	.0100
CRSWL	17L	6.0000	12 April 1988	RADN	SI	.0100
CRSWL	17L	6.5000	12 April 1988	RADN	SI	.0100
CRSWL	17L	7.0000	12 April 1988	RADN	SI	.0100
CRSWL	17L	7.5000	12 April 1988	RADN	SI	.0100
CRSWL	17L	8.0000	12 April 1988	RADN	SI	.0100
CRSWL	17L	8.5000	12 April 1988	RADN	SI	.0100
CRSWL	17L	9.0000	12 April 1988	RADN	SI	.0100
CRSWL	17L	9.5000	12 April 1988	RADN	SI	.0100
CRSWL	17L	10.0000	12 April 1988	RADN	SI	.0100
CRSWL	17L	12.0000	12 April 1988	RADN	SI	.0100



RADIAN CORPORATION

- DRAFT -

RADIAN CORPORATION

CALCULATION SHEET

-DRAFT-

CALC. NO. _____

SIGNATURE H A French DATE 18 June 88 CHECKED _____ DATE _____

PROJECT Carswell AFB IRP Stage 2 JOB NO. 227-005-04-03

SUBJECT Analysis of Slug Test Data - Well 17L SHEET 1 OF 2 SHEETS

[Ref. Bouwer and Rice, 1976, Water Resources Research, v. 12, no. 3]

Solving the analog equation: $\ln(R_e/r_w)$.

$$\ln(R_e/r_w) = \left(\frac{1.1}{\ln(H/r_w)} + \frac{C}{L/r_w}\right)^{-1}$$

where, $H = 9.97$ ft, $L = 12.5$ ft, $r_w = 0.28$ ft, $C = 2.4$ $\Rightarrow \ln(R_e/r_w) = 2.76$

Hydraulic Conductivity, $K = \dfrac{r_c^2 \ln(R_e/r_w)}{2L}\left[\frac{1}{t}\ln(y_0/y_t)\right]$

where, $r_c^2 = 6.94 \times 10^{-3}\ ft^2$

$t = 0.05$ min, $y_t = 0.09$ ft, $y_0 = 0.43$ ft $\Rightarrow$ from attached graph

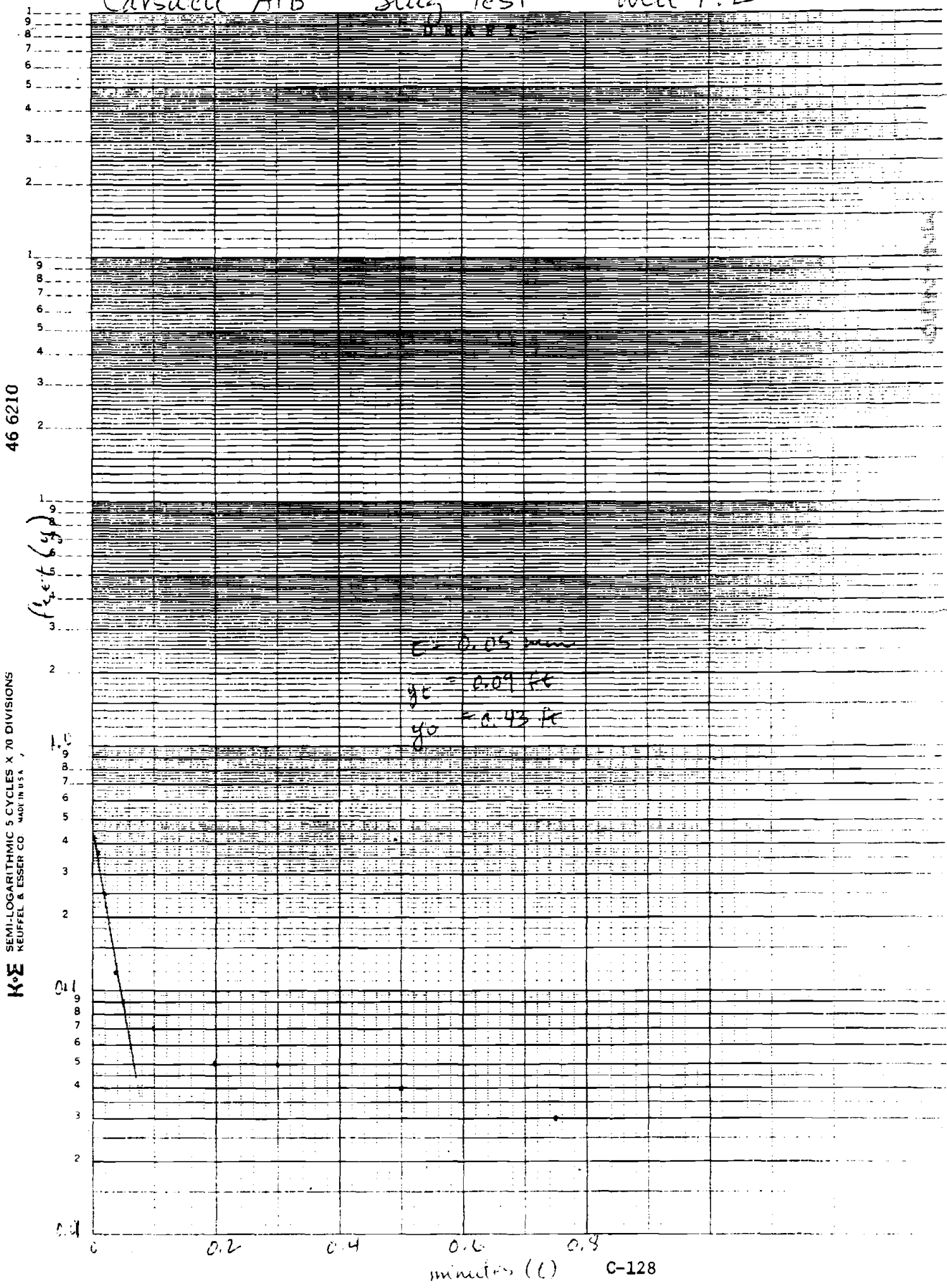
Solving for K,

$$K = \frac{(6.94\times10^{-3})(2.76)}{2\times12.5}\left[\frac{1}{0.05}\ln\left(\frac{0.43}{0.09}\right)\right]\times\frac{30.48}{60}$$

$$K = 1.21\times10^{-2}\ cm/sec$$

4-81-3361

Carswell AFB Slug Test Well 17L



SLUG TEST DATA - CARSWELL AFB - STAGE 2

Installation ID	Location ID	Elapsed Time	Log Date	Logging Co.	Method	Depth
CRSWL	17M	.0000	12 April 1988	RADN	SI	3.0900
CRSWL	17M	.0033	12 April 1988	RADN	SI	3.0300
CRSWL	17M	.0066	12 April 1988	RADN	SI	3.0200
CRSWL	17M	.0099	12 April 1988	RADN	SI	3.0000
CRSWL	17M	.0133	12 April 1988	RADN	SI	3.0100
CRSWL	17M	.0166	12 April 1988	RADN	SI	2.9600
CRSWL	17M	.0200	12 April 1988	RADN	SI	2.9400
CRSWL	17M	.0233	12 April 1988	RADN	SI	2.9300
CRSWL	17M	.0266	12 April 1988	RADN	SI	2.9100
CRSWL	17M	.0300	12 April 1988	RADN	SI	2.9000
CRSWL	17M	.0333	12 April 1988	RADN	SI	2.8600
CRSWL	17M	.0500	12 April 1988	RADN	SI	2.8000
CRSWL	17M	.0666	12 April 1988	RADN	SI	2.7700
CRSWL	17M	.0833	12 April 1988	RADN	SI	2.7600
CRSWL	17M	.1000	12 April 1988	RADN	SI	2.7400
CRSWL	17M	.1166	12 April 1988	RADN	SI	2.7200
CRSWL	17M	.1333	12 April 1988	RADN	SI	2.7000
CRSWL	17M	.1500	12 April 1988	RADN	SI	2.6900
CRSWL	17M	.1666	12 April 1988	RADN	SI	2.6700
CRSWL	17M	.1833	12 April 1988	RADN	SI	2.6500
CRSWL	17M	.2000	12 April 1988	RADN	SI	2.6400
CRSWL	17M	.2166	12 April 1988	RADN	SI	2.6200
CRSWL	17M	.2333	12 April 1988	RADN	SI	2.6100
CRSWL	17M	.2500	12 April 1988	RADN	SI	2.5900
CRSWL	17M	.2666	12 April 1988	RADN	SI	2.5700
CRSWL	17M	.2833	12 April 1988	RADN	SI	2.5600
CRSWL	17M	.3000	12 April 1988	RADN	SI	2.5400
CRSWL	17M	.3166	12 April 1988	RADN	SI	2.5300
CRSWL	17M	.3333	12 April 1988	RADN	SI	2.5100
CRSWL	17M	.4167	12 April 1988	RADN	SI	2.4300
CRSWL	17M	.5000	12 April 1988	RADN	SI	2.3500
CRSWL	17M	.5833	12 April 1988	RADN	SI	2.2800
CRSWL	17M	.6667	12 April 1988	RADN	SI	2.1800
CRSWL	17M	.7500	12 April 1988	RADN	SI	2.0900
CRSWL	17M	.8333	12 April 1988	RADN	SI	2.0200
CRSWL	17M	.9167	12 April 1988	RADN	SI	1.8900
CRSWL	17M	1.0000	12 April 1988	RADN	SI	1.7000
CRSWL	17M	1.0833	12 April 1988	RADN	SI	1.6000
CRSWL	17M	1.1667	12 April 1988	RADN	SI	1.5200
CRSWL	17M	1.2500	12 April 1988	RADN	SI	1.4400
CRSWL	17M	1.3333	12 April 1988	RADN	SI	1.3700
CRSWL	17M	1.4166	12 April 1988	RADN	SI	1.3000
CRSWL	17M	1.5000	12 April 1988	RADN	SI	1.2400
CRSWL	17M	1.5833	12 April 1988	RADN	SI	1.1800
CRSWL	17M	1.6667	12 April 1988	RADN	SI	1.1300
CRSWL	17M	1.7500	12 April 1988	RADN	SI	1.0700
CRSWL	17M	1.8333	12 April 1988	RADN	SI	1.0200

SLUG TEST DATA - CARSWELL AFB - STAGE 2

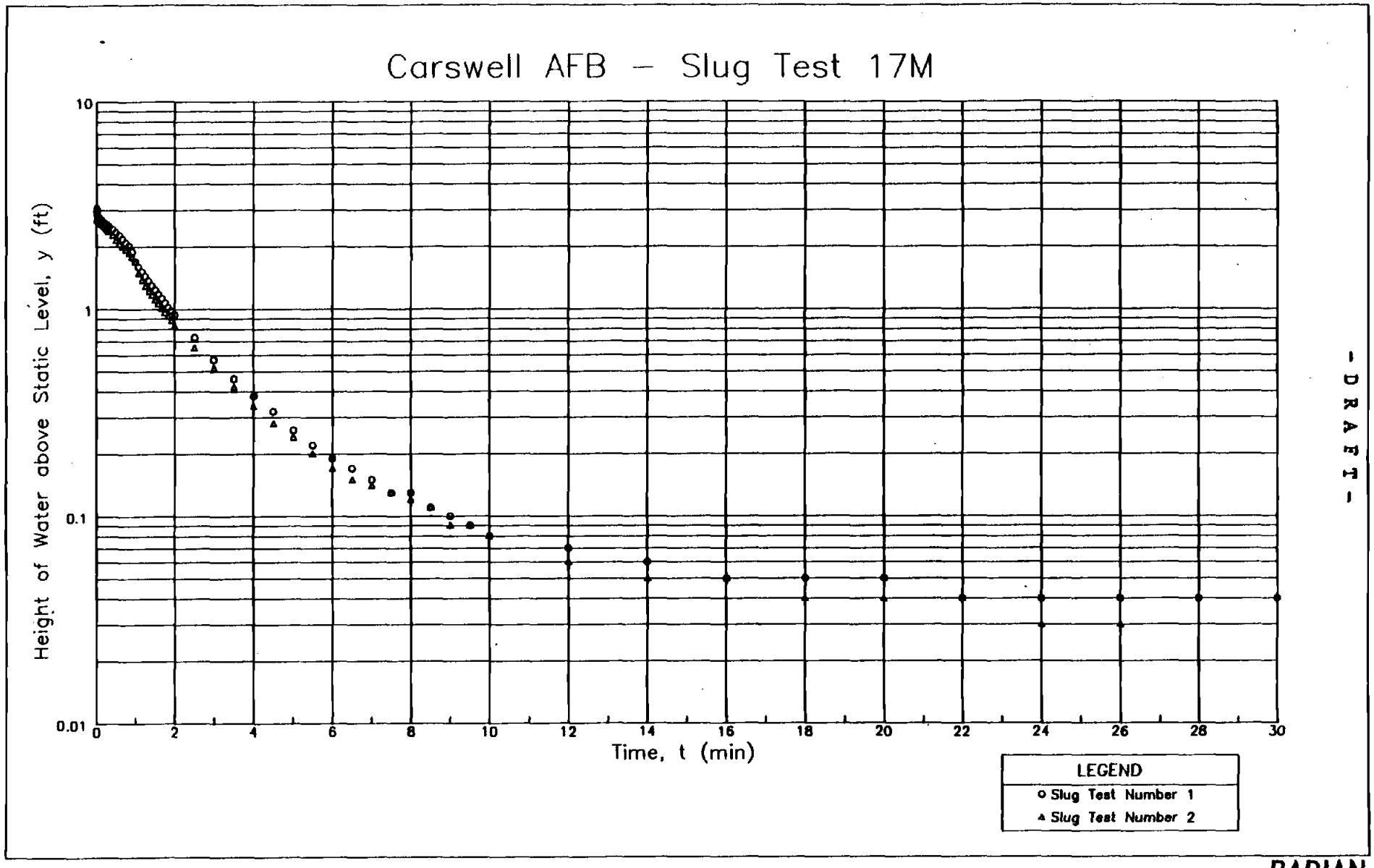
Installation ID	Location ID	Elapsed Time	Log Date	Logging Co.	Method	Depth
CRSWL	17M	1.9167	12 April 1988	RADN	SI	.9800
CRSWL	17M	2.0000	12 April 1988	RADN	SI	.9400
CRSWL	17M	2.5000	12 April 1988	RADN	SI	.7300
CRSWL	17M	3.0000	12 April 1988	RADN	SI	.5700
CRSWL	17M	3.5000	12 April 1988	RADN	SI	.4600
CRSWL	17M	4.0000	12 April 1988	RADN	SI	.3800
CRSWL	17M	4.5000	12 April 1988	RADN	SI	.3200
CRSWL	17M	5.0000	12 April 1988	RADN	SI	.2600
CRSWL	17M	5.5000	12 April 1988	RADN	SI	.2200
CRSWL	17M	6.0000	12 April 1988	RADN	SI	.1900
CRSWL	17M	6.5000	12 April 1988	RADN	SI	.1700
CRSWL	17M	7.0000	12 April 1988	RADN	SI	.1500
CRSWL	17M	7.5000	12 April 1988	RADN	SI	.1300
CRSWL	17M	8.0000	12 April 1988	RADN	SI	.1300
CRSWL	17M	8.5000	12 April 1988	RADN	SI	.1100
CRSWL	17M	9.0000	12 April 1988	RADN	SI	.1000
CRSWL	17M	9.5000	12 April 1988	RADN	SI	.0900
CRSWL	17M	10.0000	12 April 1988	RADN	SI	.0800
CRSWL	17M	12.0000	12 April 1988	RADN	SI	.0700
CRSWL	17M	14.0000	12 April 1988	RADN	SI	.0600
CRSWL	17M	16.0000	12 April 1988	RADN	SI	.0500
CRSWL	17M	18.0000	12 April 1988	RADN	SI	.0500
CRSWL	17M	20.0000	12 April 1988	RADN	SI	.0500
CRSWL	17M	22.0000	12 April 1988	RADN	SI	.0400
CRSWL	17M	24.0000	12 April 1988	RADN	SI	.0400
CRSWL	17M	26.0000	12 April 1988	RADN	SI	.0400
CRSWL	17M	28.0000	12 April 1988	RADN	SI	.0400
CRSWL	17M	30.0000	12 April 1988	RADN	SI	.0400

SLUG TEST DATA - CARSWELL AFB - STAGE 2

Installation ID	Location ID	Elapsed Time	Log Date	Logging Co.	Method	Depth
CRSWL	17M	.0000	12 April 1988	RADN	SI	2.7200
CRSWL	17M	.0033	12 April 1988	RADN	SI	2.7200
CRSWL	17M	.0066	12 April 1988	RADN	SI	2.7300
CRSWL	17M	.0099	12 April 1988	RADN	SI	2.7300
CRSWL	17M	.0133	12 April 1988	RADN	SI	2.7200
CRSWL	17M	.0166	12 April 1988	RADN	SI	2.7200
CRSWL	17M	.0200	12 April 1988	RADN	SI	2.7200
CRSWL	17M	.0233	12 April 1988	RADN	SI	2.7200
CRSWL	17M	.0266	12 April 1988	RADN	SI	2.7200
CRSWL	17M	.0300	12 April 1988	RADN	SI	2.7100
CRSWL	17M	.0333	12 April 1988	RADN	SI	2.7100
CRSWL	17M	.0500	12 April 1988	RADN	SI	2.6900
CRSWL	17M	.0666	12 April 1988	RADN	SI	2.6800
CRSWL	17M	.0833	12 April 1988	RADN	SI	2.6600
CRSWL	17M	.1000	12 April 1988	RADN	SI	2.6400
CRSWL	17M	.1166	12 April 1988	RADN	SI	2.6200
CRSWL	17M	.1333	12 April 1988	RADN	SI	2.6000
CRSWL	17M	.1500	12 April 1988	RADN	SI	2.5800
CRSWL	17M	.1666	12 April 1988	RADN	SI	2.5600
CRSWL	17M	.1833	12 April 1988	RADN	SI	2.5500
CRSWL	17M	.2000	12 April 1988	RADN	SI	2.5300
SWL	17M	.2166	12 April 1988	RADN	SI	2.5100
SWL	17M	.2333	12 April 1988	RADN	SI	2.4900
CRSWL	17M	.2500	12 April 1988	RADN	SI	2.4700
CRSWL	17M	.2666	12 April 1988	RADN	SI	2.4500
CRSWL	17M	.2833	12 April 1988	RADN	SI	2.4300
CRSWL	17M	.3000	12 April 1988	RADN	SI	2.4100
CRSWL	17M	.3166	12 April 1988	RADN	SI	2.3900
CRSWL	17M	.3333	12 April 1988	RADN	SI	2.3700
CRSWL	17M	.4167	12 April 1988	RADN	SI	2.2700
CRSWL	17M	.5000	12 April 1988	RADN	SI	2.1500
CRSWL	17M	.5833	12 April 1988	RADN	SI	2.0700
CRSWL	17M	.6667	12 April 1988	RADN	SI	2.0000
CRSWL	17M	.7500	12 April 1988	RADN	SI	1.9300
CRSWL	17M	.8333	12 April 1988	RADN	SI	1.8600
CRSWL	17M	.9167	12 April 1988	RADN	SI	1.7800
CRSWL	17M	1.0000	12 April 1988	RADN	SI	1.6900
CRSWL	17M	1.0833	12 April 1988	RADN	SI	1.4900
CRSWL	17M	1.1667	12 April 1988	RADN	SI	1.3800
CRSWL	17M	1.2500	12 April 1988	RADN	SI	1.2900
CRSWL	17M	1.3333	12 April 1988	RADN	SI	1.2200
CRSWL	17M	1.4166	12 April 1988	RADN	SI	1.1700
CRSWL	17M	1.5000	12 April 1988	RADN	SI	1.1100
CRSWL	17M	1.5833	12 April 1988	RADN	SI	1.0600
CRSWL	17M	1.6667	12 April 1988	RADN	SI	1.0100
CRSWL	17M	1.7500	12 April 1988	RADN	SI	.9600
CRSWL	17M	1.8333	12 April 1988	RADN	SI	.9200

SLUG TEST DATA - CARSWELL AFB - STAGE 2

Installation ID	Location ID	Elapsed Time	Log Date	Logging Co.	Method	Depth
CRSWL	17M	1.9167	12 April 1988	RADN	SI	.8800
CRSWL	17M	2.0000	12 April 1988	RADN	SI	.8300
CRSWL	17M	2.5000	12 April 1988	RADN	SI	.6500
CRSWL	17M	3.0000	12 April 1988	RADN	SI	.5200
CRSWL	17M	3.5000	12 April 1988	RADN	SI	.4200
CRSWL	17M	4.0000	12 April 1988	RADN	SI	.3400
CRSWL	17M	4.5000	12 April 1988	RADN	SI	.2800
CRSWL	17M	5.0000	12 April 1988	RADN	SI	.2400
CRSWL	17M	5.5000	12 April 1988	RADN	SI	.2000
CRSWL	17M	6.0000	12 April 1988	RADN	SI	.1700
CRSWL	17M	6.5000	12 April 1988	RADN	SI	.1500
CRSWL	17M	7.0000	12 April 1988	RADN	SI	.1400
CRSWL	17M	7.5000	12 April 1988	RADN	SI	.1300
CRSWL	17M	8.0000	12 April 1988	RADN	SI	.1200
CRSWL	17M	8.5000	12 April 1988	RADN	SI	.1100
CRSWL	17M	9.0000	12 April 1988	RADN	SI	.0900
CRSWL	17M	9.5000	12 April 1988	RADN	SI	.0900
CRSWL	17M	10.0000	12 April 1988	RADN	SI	.0800
CRSWL	17M	12.0000	12 April 1988	RADN	SI	.0600
CRSWL	17M	14.0000	12 April 1988	RADN	SI	.0500
CRSWL	17M	16.0000	12 April 1988	RADN	SI	.0500
CRSWL	17M	18.0000	12 April 1988	RADN	SI	.0400
CRSWL	17M	20.0000	12 April 1988	RADN	SI	.0400
CRSWL	17M	22.0000	12 April 1988	RADN	SI	.0400
CRSWL	17M	24.0000	12 April 1988	RADN	SI	.0300
CRSWL	17M	26.0000	12 April 1988	RADN	SI	.0300



RADIAN CORPORATION

- DRAFT -

RADIAN CORPORATION

CALCULATION SHEET
- DRAFT -

CALC. NO. _____

SIGNATURE W. G. McIntyre DATE 21 July 88 CHECKED _____ DATE _____

PROJECT Carswell AFB IRP Stage 2 JOB NO. 227-005-04-03

SUBJECT Analysis of Slug Test Data - Well 12M SHEET _____ OF _____ SHEETS

[Ref. Bower and Rice, 1976, Water Resources Research, V. 12, No. 3]

Solving the analog equation: $\ln\left(\frac{R_e}{r_w}\right)$ . . .

$$\ln\left(\frac{R_e}{r_w}\right) = \left(\frac{1.1}{\ln\left(\frac{H}{r_w}\right)} + \frac{C}{L/r_w}\right)^{-1}$$

where, $\left.\begin{array}{l} H = 6.16 \text{ ft} \\ L = 10 \text{ ft} \\ r_w = 0.25 \text{ ft} \\ C = 2.25 \end{array}\right\} \Rightarrow \ln\left(\frac{R_e}{r_w}\right) = 2.34$

Hydraulic Conductivity, $K = \frac{r_c^2 \ln\left(\frac{R_e}{r_w}\right)}{2L}\left[\frac{1}{t}\ln\left(\frac{y_0}{y_t}\right)\right]$

where, $r_c^2 = 6.94 \times 10^{-3} \text{ ft}^2$

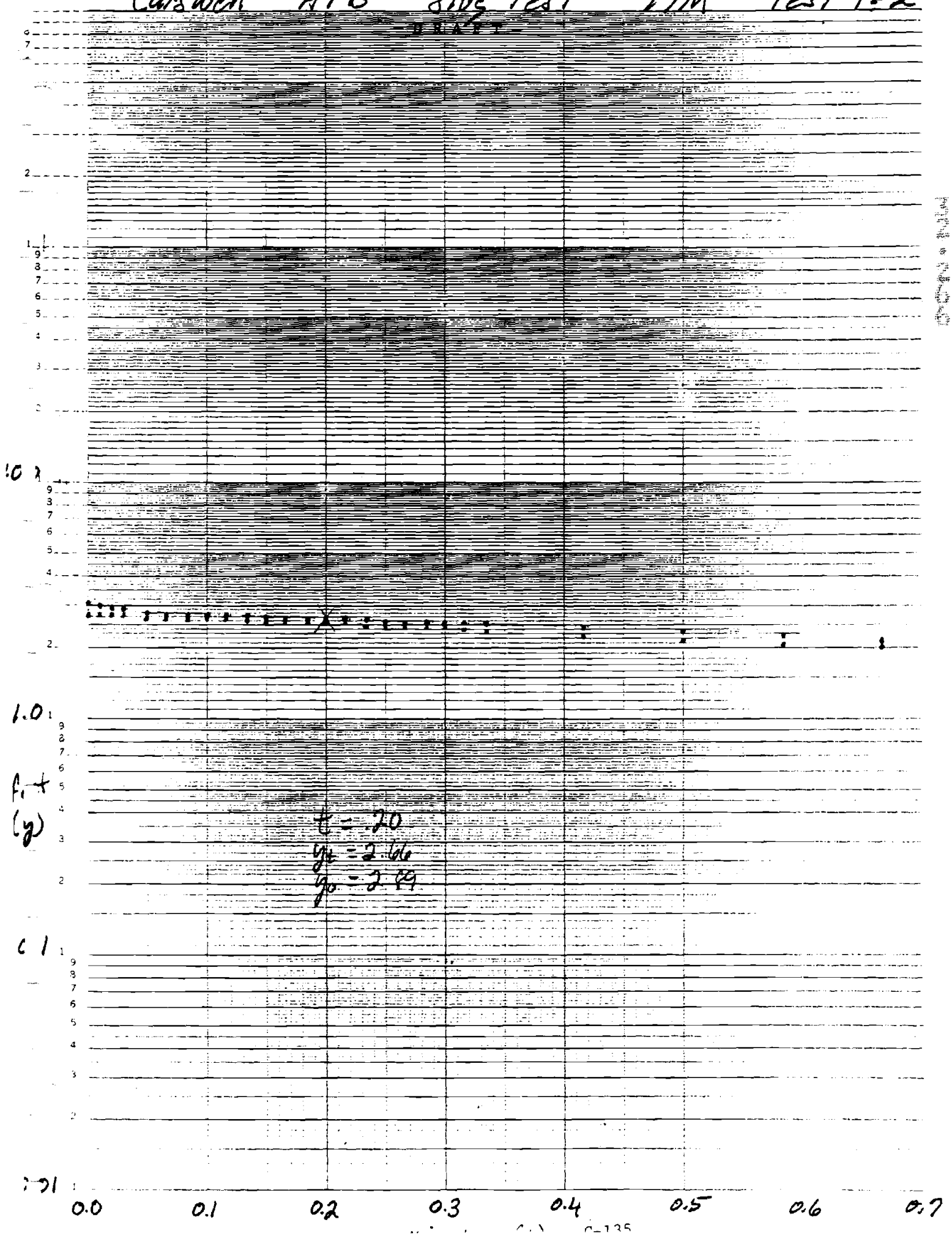
$\left.\begin{array}{l} t = 1.0 \text{ min} \\ y_t = 1.7 \text{ ft} \\ y_0 = 3.1 \text{ ft} \end{array}\right\}$ from plot of data on attached graph

Solving for K,

$$K = \frac{(6.94 \times 10^{-3})(2.34)}{2 \times 10}\left[\frac{1}{1.0}\ln\left(\frac{3.1}{1.7}\right)\right] \times \frac{30.48 \text{ cm/ft}}{60 \text{ sec/min}}$$

$$K = 2.53 \times 10^{-4} \text{ cm/sec}$$

Carswell AFB Slug Test 17M Test 1&2



TAB

D

APPENDIX D

Surveying Data

- D R A F T -

HYDROGEOLOGIC INVESTIGATION
CARSWELL AIR FORCE BASE
FORT WORTH, TEXAS

Texas State Plane Coordinate and Elevation
of
Test Wells,
Soil Gas Probes and
Sampling Points

April 8, 1988

BRITTAIN & CRAWFORD
LAND SURVEYING &
TOPOGRAPHIC MAPPING
(817) 926-0211 - Metro 429-5112
P.O. Box 11374 * 3908 South Freeway
Fort Worth, Texas 76110

- D R A F T -

EXISTING WELL SITES

NUMBER		NORTH "Y"	EAST "X"	ELEVATION OF TOP OF P.V.C.	ELEVATION OF NATURA GROUND AT WELL
BSS	A(45)	402,068.84192	2,024,357.78905	566.38	566.9
BSS	B(34)	402,390.17981	2,024,331.93158	569.73	567.1
BSS	C(36)	402,254.07567	2,024,565.70484	559.57	560.0
BSS	D(38)	402,418.08908	2,024,487.37097	561.45	
P1	(111)	397,712.30601	2,019,695.14307	*628.58	625.5
P2	(96)	397,542.85438	2,020,627.90845	*618.78	615.5
1A	(131)	401,089.90010	2,025,128.18992	570.27	566.5
1B	(132)	401,268.84868	2,025,291.18966	560.25	560.49 (ASP)
1C	(134)	401,032.46237	2,025,482.01757	560.00	560.31 (ASP)
1D	(137)	400,852.84768	2,025,642.78693	563.93	560.5
1E	(135)	401,173.20809	2,025,407.53205	562.25	559.4
1F	(136)	401,002.55061	2,025,607.46316	562.26	559.5
3A	(121)	398,360.53325	2,017,786.72397		633.47
3B	(118)	398,345.88397	2,018,291.94176		633.84
3C	(117)	397,831.27206	2,018,292.28878		635.39
3D	(120)	398,698.98292	2,017,477.40425	625.25	621.6
3E	(119)	398,358.43081	2,019,005.28691		622.87
4A	(129)	396,920.99434	2,020,042.19064	625.76	624.6
4B	(130)	396,940.34767	2,020,463.63663	619.90	618.4
4C	(98)	397,217.02642	2,020,785.31555	613.04	610.9
4D	(97)	397,446.17694	2,020,610.98175	615.35	613.1
4E	(95)	397,651.12948	2,020,607.56231	618.54	617.5
4F	(93)	397,680.42416	2,020,255.75892	625.36	622.8
4G	(100)	397,836.73039	2,020,857.61303	620.02	619.1
4H	(99)	397,541.43725	2,020,916.84913	613.43	610.5
5A	(109)	398,061.75689	2,019,781.72497	623.18	619.4
5B	(90)	398,520.35788	2,020,283.72459	600.45	597.4
5C	(104)	398,339.27594	2,020,196.97152	608.68	606.8
5D	(103)	398,362.32313	2,019,960.19729	611.71	608.5
5E	(110)	397,802.46440	2,019,748.19597	626.89	623.9
5F	(94)	397,904.64236	2,020,535.56245	618.95	619.4
5G	(88)	398,174.57747	2,020,894.69337	615.39	612.0
5H	(89)	398,351.69445	2,020,546.91832	610.62	608.4
10A	(108)	397,913.30549	2,020,009.97063	626.70	624.2
10B	(92)	397,899.01251	2,020,243.06886	624.46	621.1
10C	(91)	398,197.02603	2,020,267.33493	617.24	615.4
10D	(107)	397,857.53638	2,020,078.59020		623.33
10E	(106)	397,896.37914	2,020,147.65721		622.52
10F	(105)	397,946.08160	2,020,196.19956		621.47
11A	(101)	398,941.02097	2,020,086.99390	608.22	604.8
11B	(102)	398,653.41765	2,020,136.88570	608.14	603.8
12A	(124)	397,175.89292	2,019,636.22169	635.66	632.0
12B	(113)	397,333.41742	2,019,895.65480	627.55	625.6
12C	(115)	397,213.82758	2,019,968.84527	628.05	625.5
12D	(112)	397,511.40056	2,019.943.01512	627.45	624.8
12E	(114)	397,324.25035	2,020,019.35440	627.48	624.5
12G	(127)	397,111.16499	2,019,819.73011		629.22
12H	(126)	397,175.34773	2,019,813.89486		629.06
12I	(125)	397,231.20475	2,019,814.97473		269.15
12J	(128)	397,175.26975	2,019,858.53625		628.66
12K	(116)	397,222.63773	2,019,904.66442		626.74

- D R A F T -

Page 2

NUMBER		NORTH "X"	EAST "Y"	ELEVATION OF TOP P.V.C. PIPE	ELEVATION OF NATURAL GROUND AT WELL
15A	(149)	400,123.22038	2,025,232.61342	570.24	570.7
15B	(148)	399,906.57343	2,025,252.78758	567.12	564.2
15C	(144)	399,884.41824	2,025,168.58849	566.89	564.3
17I	(75)	400,225.13342	2,023,849.67063	578.19	575.2
17J	(56)	400,362.97881	2,023,809.58530	579.79	577.0
17K	(72)	400,193.17235	2,024,001.90555	575.34	573.8
17L	(61)	400,394.21647	2,023,966.04349	577.27	574.4
17M	(65)	400,380.91204	2,024,264.07312	574.28	572.6

*NOTE: WELLS P1 & P2 - THE ELEVATIONS SHOWN ARE THE TOP OF THE OPERATOR NUT.

SOIL- GAS PROBE LOCATION

NUMBER	NORTH "Y"	EAST "X"	ELEVATION AT STAKE
BSS AREA			
SG1 (33)	402,388.24229	2,024,336.96845	566.44
SG2 (30)	402,378.99134	2,024,379.60217	562.77
SG3 (31)	402,471.54435	2,0224,313.69233	566.71
SG4 (32)	402,586.55036	2,024,321.39620	562.12
SG5 (39)	402,420.40282	2,024,483.37759	561.40
SG6 (29)	402,309.05737	2,024,383.72313	565.15
SG7 (28)	402,187.16036	2,024,428.51305	565.28
SG8 (47)	402,112.22970	2,024,290.55200	567.52
SG9 (46)	402.066.05327	2,024,355.95261	566.85
SG10 (43)	402,349.08909	2,024,296.30915	568.47
SG11 (41)	402,453.77518	2,024,622.48820	560.22
SG12 (42)	402,490.34405	2,024,683.65766	559.28
SG13 (40)	402,508.64439	2,024,444.83459	561.00
SG14 (37)	402,331.57014	2,024,523.47171	561.16
SG15 (35)	402,241.00250	2,024,571.13068	559.67
SG16 (44)	401,932.11186	2,024,389.9795	563.06
SITE 17			
SG1 (83)	400,238.76379	2,023,854.32996	576.31
SG2 (84)	400,250.53397	2,023,914.86376	575.89
SG3 (85)	400,273.50891	2,023,986.69438	575.23
SG4 (54)	400,541.32091	2,023,852.92476	574.95
SG5 (87)	400,312.84942	2,023,876.87866	572.85
SG6 (86)	400,316.02757	2,023,928.91387	572.81
SG7 (58)	400,441.13104	2,023,911.59675	572.93
SG8 (57)	400,417.36669	2,023,840.33169	573.01
SG9 (77)	400,392.10534	2,023,703.25968	572.89
SG10 (76)	400,373.40148	2,023,642.07455	573.13
SG11 (80)	400,264.87372	2,023,672.90239	572.79
SG12 (79)	400,281.82329	2,023,730.36647	572.54
SG13 (78)	400,345.67433	2,023,735.97449	572.67
SG14 (74)	400,130.84394	2,023,906.63146	574.42
SG15 (81)	400,197.87635	2,023,635.98145	579.45
SG16 (82)	400,226.72387	2,023,789.98550	576.50
SG17 (73)	400,163.99000	2,023,952.26755	573.81
SG18 (71)	400,093.87666	2,024,069.17455	572.20
SG19 (60)	400,392.34379	2,023,965.67513	574.45
SG20 (55)	400,365.18263	2,023,809.10179	576.88
SG21 (51)	400,637.87110	2,023,836.54942	575.77
SG22 (52)	400,696.85280	2,023,760.73956	578.54
SG23 (50)	400,683.64777	2,023,896.59370	575.88
SG24 (59)	400,519,21935	2,023,939.62934	575.86
SG25 (53)	400,538.53416	2,023,770.99463	576.51
SG26 (68)	400,672.75437	2,024,042.50887	573.35
SG27 (67)	400,562.31385	2,024,193.65813	573.63
SG28 (69)	400,446.97381	2,024,087.30361	572.82
SG29 (66)	400,377.26883	2,024,239.32224	573.82
SG30 (70)	400,235.43412	2,024,133.94276	573.79
SG31 (48)	400,904.73683	2,023,758.58301	580.05
SG32 (62)	400,950.88151	2,023,755.60795	580.82
SG33 (49)	400,806.37445	2,023,898.4856	576.44

Page 2
Soil-Gas Probe Location

NUMBER	NORTH "Y"	EAST "X"	ELEVATION AT STAKE
AREA 13			
13G (151)	401,104.51840	2,023,419.71388	580.05
13H (153)	401,047.52598	2,023,564.74519	578.21
13I (155)	400,904,15744	2,023,673.83199	575.03
13J (154)	401,000.73387	2,023,621.33462	578.25
13K (152)	401,089.76972	2,023,494.57584	579.44
AREA 15			
15D (145)	399,834.12372	2,025,216.6032	561.08
15E (147)	399,891.43856	2,025,211.35458	564.15
15F (140)	400,002.01826	2,025,183.93225	566.40
15G (146)	399,856.31835	2,025,213.64903	563.50
15H (143)	399,921.89856	2,025,192.11768	564.74
15I (142)	399,949.75508	2,025,212.86214	564.89
15J (141)	400,023.75280	2,025,212.60273	567.62

TAB

E

KADIAN
8501 Mo-Pa
P.O. Box 201088
Austin, TX 78720-1088

Chain of Custody Record

PROJECT CARSWELL AFB IRP STAGE II

SITE SITE 3

COLLECTOR Guy J Childs

SAMPLE I.D.	TYPE	DATE/TIME	Analyses	REMARKS
Car-01-003	Soil	1/26/88/1000	Oil & Grease E 413.2, METAL SCREEN SW 6010, Arsenic SW 7060, MERCURY SW 7471, Selenium SW 7740 Soil Moisture D 2216	- DRAFT -
Car-01-006	Soil	1/26/88/1300		
Car-01-009	Soil	1/27/88/1000		
Car-01-012	Soil	1/27/88/1700		
Car-01-015	Soil	1/27/88/1800		

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
Guy J Childs	1/27/88	2000	FEDEX 5910117765		1-28-88	1000	[illegible]
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:

RECEIVED FOR LABORATORY BY:	DATE	TIME	REMARKS

501 N
P.O. Box 201
Austin, TX 78720-1088

Chain of Custody Record

PROJECT: CARSWELL AFB IRP STAGE II

SITE: SITE 3

COLLECTOR: Gary J Childs

SAMPLE I.D.	TYPE	DATE/TIME	Analyses	REMARKS
Car-01-001	Soil	1/26/88/1000	EPA 8240 3 vials	
Car-01-002	Soil	1/26/88/1000	EPA 8270	
Car-01-004	Soil	1-26-88/1300	EPA 8240 3 vials	
Car-01-005	Soil	1-26-88/1300	EPA 8270	
Car-01-007	Soil	1-27-88/1000	EPA 8240 3 vials	
Car-01-008	Soil	1-27-88/1000	EPA 8270	
Car-01-010	Soil	1-27-88/1700	EPA 8240 3 vials	
Car-01-011	Soil	1-27-88/1700	EPA 8270	

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
Gary J Childs	1/27/88	1945	FEDEX. 5910118001				
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:

RECEIVED FOR LABORATORY BY:	DATE	TIME	REMARKS
David Palm	1/28/88	9:30	

TURAFI

E-2

5001160

RADIAN CORPORATION
8501 Mo-Pac Blvd.
P.O. Box 201088
Austin, TX 78720-1088

Chain of Custody Record

PROJECT: Carswell AFB IRI Stage II

SITE: Site 3

COLLECTOR: Guy J Childs

SAMPLE I.D.	TYPE	DATE/TIME	Analyses	REMARKS
Car-01-012	Soil	1/27/88/1800	EPA 8240	
Car-01-014	Soil	1/27/88/1800	EPA 8270	

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
Guy J Childs	1/27/88	1955	FEDEX 5910118001				
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:

RECEIVED FOR LABORATORY BY:	DATE	TIME	REMARKS
[illegible]	1/28/88	9:30	

DRAFT

CORPORATION
5501 M...
P.O. Box 20.
Austin, TX 78720-1088

Chain of Custody Record

PROJECT: CARSWELL AFB IRP STAGE II

SITE: Site 10

COLLECTOR: Gary J Childs

Analyses

SAMPLE I.D.	TYPE	DATE/TIME		REMARKS
Car-01-016	Soil	1/28/88 1700	EPA 8240	3-40ml
Car-01-017	Soil	1/28/88 1700	EPA 8270	1-500ml
Car-01-019	Soil	1/29/88 1430	EPA 8240	3-40ml
Car-01-021	Soil	1/29/88 1430	EPA 8270	1-500ml
Car-01-022	Soil	1/29/88 1530	EPA 8240	3-40ml
Car-01-024	Soil	1/29/88 1530	EPA 8270	1-500ml
Car-01-025	Soil	1/29/88 1600	EPA 8240	3-40ml
Car-01-026	Soil	1/29/88 1700	EPA 8240	~~3-40ml~~ ~~1-500ml~~
Car-01-027	Soil	1/29/88 1700	EPA 8240	3-40ml

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
Gary J Childs	1/29/88	1900	FEDEX 5910117780				
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:

RECEIVED FOR LABORATORY BY:	DATE	TIME	REMARKS
[illegible]	30 88		Opened 2-1-88 [illegible]

8801004

RADIAN CORPORATION

8501 Mo-Pac Blvd.
P.O. Box 201088
Austin, TX 78720-1088

Chain of Custody Record

PROJECT: CARSWELL AFB IRP STAGE II

SITE: Site 10

COLLECTOR: Guy J Childs

SAMPLE I.D.	TYPE	DATE/TIME	Analyses	REMARKS
Car-01-018 GSC	Soil	1/28/88 1700	Oil + Grease E 413.2, METAL Screen SW 6010, ARSENIC SW 7060, LEAD SW 7420	1-500ml
Car-01-020 GSC	Soil	1/29/88 1430	MERCURY SW 7471, Selenium SW 7740, ~~VOC SW8~~ GSC Soil Moisture D2216	
Car-01-023	Soil	1/29/88 1530		
Car-01-030	Soil	1/29/88 1700		
Car-01-031	Soil	1/29/88 1700		

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
Guy J Childs	1/29/88	1900	FEDEX 5910117776		1-30-88	1000	Jim Lindsey
Jim Lindsey	2-1-88	1045	G77.5 KW				

RECEIVED FOR LABORATORY BY:	DATE	TIME	REMARKS

DRAFT

RADIAN
8501 Mo-Pac
P.O. Box 201088
Austin, TX 78720-1088

Chain of Custody Record

Analyses

PROJECT CARSWELL AFB IRP STAGE II

SITE Site 10

COLLECTOR Guy Childs

SAMPLE I.D.	TYPE	DATE/TIME	Analyses	REMARKS
Car-01-028	Soil	1/29/88 1700	EPA 8270 GC	1-500ml ~~3-40ml~~ GC
Car-01 029	Soil	1/29/88 1700	EPA 8270	1-500ml

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
Guy Childs	1/29/88	1900	FEDEX 5910117780				
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:

RECEIVED FOR LABORATORY BY:	DATE	TIME	REMARKS
[illegible]	1-30-88		Opened 2 ~~3~~ 1-88 CIR

5802009

RADIAN CORPORATION

8501 Mo-Pac Blvd.
P.O. Box 201088
Austin, TX 78720-1088

Chain of Custody Record

PROJECT: Brooks AFB IRP STAGE II

SITE: Site 5

COLLECTOR: Guy J Childs

Analyses

SAMPLE I.D.	TYPE	DATE/TIME	Analyses	REMARKS
Ca8-01-032	Soil	1/30/88/1000	EPA 8240 bottles labeled Ca8-02-032 DJP	3-40ml
Ca8-01-033	Soil	1/30/88/1000	EPA 8270	1-500ml
Ca8-02-001	Soil	2/1/88/0930	EPA 8240	3-40ml
Ca8-02-002	Soil	2/1/88/0930	EPA 8270	1-500ml
Ca8-02-004	Soil	2/1/88/1100	EPA ~~8240~~ GC 8240	3-40ml
Ca8-02-005	Soil	2/1/88/1100	EPA 8270	1-500ml

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
[illegible]	2/2/88	1700	FEDEX 5 [illegible] 7802				
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:

RECEIVED FOR LABORATORY BY:	DATE	TIME	REMARKS
[illegible]	[illegible]	[illegible]	

DRAFT

RADIAN CORPORATION
8501 Mo-Pac
P.O. Box 2010
Austin, TX 78720-1088

Chain of Custody Record

PROJECT Caswell AFB IRP Stage II

SITE Site 5

COLLECTOR Guy T Childs

Analyses

SAMPLE I.D.	TYPE	DATE/TIME	Analyses	REMARKS
Car 8-01-034	Soil	1/30/88/1000	Oil & Grease E413.2, Metal Screen SW 6010, Arsenic SW7060, Mercury SW7471 Selenium SW7740, Soil Moisture D2216	1-500 ml
Car 8-02-003	Soil	2/1/88/0930	↓	↓
Car 8-02-006	Soil	2/1/88/1100	↓	↓

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
Guy Childs	2/2/88	1700	FEDEX 5910117791		2-3-88	1000	[illegible]
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
[illegible]	2 3 88	1030	[illegible]				

RECEIVED FOR LABORATORY BY:	DATE	TIME	REMARKS

- DRAFT -

RADIAN CORPORATION
8501 Mo-Pac Blvd.
P.O. Box 201088
Austin, TX 78720-1088

#5802009

Chain of Custody Record

Analyses

PROJECT PARSUCC AFB IRP STAGE II

SITE SITE 4

COLLECTOR Guy J Childs

SAMPLE I.D.	TYPE	DATE/TIME	Analyses	REMARKS
Fin 8-02-007	Soil	2/3/88/1000	EPA 8240	3-40ml
Fin 8-02-008	Soil	2/3/88/1000	EPA 8270	1-500ml

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
[illegible]	2/3/88	1700	FEDEX 5911117802				
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:

RECEIVED FOR LABORATORY BY:	DATE	TIME	REMARKS
Donald Brown	2/3/88	7:00	

PAGE 1

E-9

RADIAN CORPORATION
8501 Mo-Pac
P.O. Box 201088
Austin, TX 78720-1088

Chain of Custody Record

PROJECT: CARSWELL AFB IRP STAGE II

SITE: Site 4

COLLECTOR: Guy J Childs

Analyses

SAMPLE I.D.	TYPE	DATE/TIME		REMARKS
Car 8-02-009	Soil	2/2/88/1000	O. & Grease E 413.2, Metal Screen, SW 6010, Arsenic SW 7060, Mercury SW 7471 Selenium SW 7740, Soil Moisture D2216	1-500ml

DRAFT

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
Guy Childs	2/2/88	1700	FedEX 5911011791		2/3/88	1000	Gil Murdoch
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
Gil Murdoch	2/3/88	1630	[illegible]				

RECEIVED FOR LABORATORY BY:	DATE	TIME	REMARKS

E-10

RADIAN CORPORATION
8501 Mo-Pac Blvd.
P.O. Box 201088
Austin, TX 78720-1088

Chain of Custody Record

PROJECT: Carswell AFB IRP Stage II

SITE: Site 5

COLLECTOR: Guy J Childs

Analyses

SAMPLE I.D.	TYPE	DATE/TIME	Analyses	REMARKS
Car 8-02-010	Soil	2/5/88 1100	EPA 8240	3x40 ml
Car 8-02-011	Soil	2/5/88 1100	EPA 8270	1x500 ml
Car 8-02-013	Soil	2/9/88 1030	EPA 8240	3x40 ml
Car 8-02-014	Soil	2/9/88 1030	EPA 8270	1x500 ml
Car 8-02-016	Soil	2/9/88 1400	EPA 8240	3x40 ml
Car 8-02-017	Soil	2/9/88 1400	EPA 8270	1x500 ml
Car 8-02-019	Soil	2/9/88 1510	EPA 8240	3x40 ml
Car 8-02-020	Soil	2/9/88 1500	EPA 8270	1x500 ml

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
Guy J Childs	2/10/88	1700	FEDEX 591011 7861				
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:

RECEIVED FOR LABORATORY BY:	DATE	TIME	REMARKS
[illegible]	2-11-88	[illegible]	[illegible]

CORPORATION
9501 Mo-Pac
P.O. Box 201
Austin, TX 78720-1088

Chain of Custody Record

PROJECT: CARSWELL AFB IRP STAGE II

SITE: Site 5

COLLECTOR: Guy J Childs

Analyses

SAMPLE I.D.	TYPE	DATE/TIME	Analyses	REMARKS
Car 8-02-012	Soil	2/8/88 1100	Oil & Grease E 413.2, Metal Screen SW 6010, Arsenic SW7060, Mercury SW 7471, Selenium, SW 7740 Soil Moisture D2216	DRAFT
Car 8-02-015	Soil	2/8/88 1030		
Car 8-02-018	Soil	2/9/88 1400		
Car 8-02-021	Soil	2/9/88 1500		

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
Guy J Childs	2/10/88	1700	FEDEX, 3910117835		2 11 88	1000	[illegible]
[illegible]	2 11 88	1500	[illegible]	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:

RECEIVED FOR LABORATORY BY:	DATE	TIME	REMARKS

RADIAN CORPORATION
8501 Mo-Pac Blvd.
P.O. Box 201088
Austin, TX 78720-1088

Chain of Custody Record

PROJECT: Caswell AFB IRP STAGE 2

SITE: Site 4

COLLECTOR: Guy J Childs

SAMPLE I.D.	TYPE	DATE/TIME	Analyses	REMARKS
Car 8-02-022	Soil	2/10/88 0900	EPA 8240	3 x 40 ml
Car 8-02-023	Soil	2/10/88 0900	EPA 8270	1 x 500 ml
Car 8-02-025	Soil	2/10/88 1200	EPA 8240	3 x 40 ml
Car 8-02-026	Soil	2/10/88 1200	EPA 8240	3 x 40 ml
Car 8-02-027	Soil	2/10/88 1200	EPA ~~8240 GC~~ 8270	1 x 500 ml
Car 8-02-028	Soil	2/10/88 1200	EPA 8270	1 x 500 ml

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
Guy J Childs	2/10/88	1700	FEDEX 5910017861				
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:

RECEIVED FOR LABORATORY BY:	DATE	TIME	REMARKS
[illegible]	2/11/88	[illegible]	[illegible]

RADIAN CORPORATION
8501 Mo-Pac
P.O. Box 201088
Austin, TX 78720-1088

Chain of Custody Record

PROJECT: Carswell AFB IRP STAGE 2

SITE: Site 4

COLLECTOR: Guy J Childs

Analyses

SAMPLE I.D.	TYPE	DATE/TIME	Analyses	REMARKS
Car 8-02-024	Soil	2/10/88 0900	Oil & Grease E413.2, Metal Screen SW6010, Arsenic SW7060, Mercury SW7471, Selenium SW7740, Soil Moisture D2216	- DRAFT -
Car 8-02-029	Soil	2/10/88 1200		
Car 8-02-030	Soil	2/10/88 1200	" " " "	

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
Guy J Childs	2/10/88	1700	FEDEX 5910117835		2-11-88	1000	[illegible]
[illegible]	2-11-88	1500	[illegible]				

RECEIVED FOR LABORATORY BY:	DATE	TIME	REMARKS

10-86-25948

RADIAN CORPORATION
8501 Mo-Pac Blvd.
P.O. Box 201088
Austin, TX 78720-1088

Chain of Custody Record

PROJECT: Carswell AFB

SITE: Site 1

COLLECTOR: Guy J Childs

SAMPLE I.D.	TYPE	DATE/TIME	Analyses	REMARKS
Car 8-02-031	Soil	2/14/88/0810	EPA 8240	3x40ml VOA
Car 8-02-032	Soil	2/14/88/0930	EPA 8270	1x250ml
Car 8-02-034	Soil	2/14/88/0930	EPA 8240	3x40ml
Car 8-02-035	Soil	2/14/88/0930	EPA 8270	1x250ml
Car 8-02-037	Soil	2/14/88/1015	EPA 8240	3x40ml
Car 8-02-038	Soil	2/14/88/1015	EPA 8270	1x250ml
Car 8-02-040	Soil	2/14/88/1215	EPA 8240	3x40ml
Car 8-02-041	Soil	2/14/88/1215	EPA 8270	1x250ml

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
Guy J Childs	2/15/88	1700	Fed Ex. 5910117872				
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:

RECEIVED FOR LABORATORY BY:	DATE	TIME	REMARKS
[illegible]	2-16-88	1930	Fedex C9101178772

RADIAN CORPORATION
8501 Mo-Pac
P.O. Box 201088
Austin, TX 78720-1088

Chain of Custody Record

PROJECT: Carswell AFB

SITE: Site 1

COLLECTOR: Guy J Childs

Analyses

SAMPLE I.D.	TYPE	DATE/TIME	Analyses	REMARKS
Car 8-02-033	Soil	2/14/88 0810	Oil + Grease E 413.2, Metal Screen SW 6010, Arsenic SW 7060, ~~Lead SW7420~~	Inf
Car 8-02-036	Soil	2/14/88 0930	Mercury SW 7471, Selenium SW 7740	
Car 8-02-039	Soil	2/14/88 1015	Soil Moisture D2216.	
Car 8-02-042	Soil	2/14/88 1215		

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
Guy J Childs	2/15/88	1720	Fed Ex. 5910117824		2-16-88	1000	Jane Lindsey
Jane Lindsey	2-16-88	1600					

RECEIVED FOR LABORATORY BY:	DATE	TIME	REMARKS

- DRAFT -

10-86-25948

RADIAN CORPORATION
8501 Mo-Pac Blvd.
P.O. Box 201088
Austin, TX 78720-1088

Chain of Custody Record

PROJECT: Caswell AFB IRP Stage 2

SITE: BSS

COLLECTOR: Guy J Childs

Analyses

SAMPLE I.D.	TYPE	DATE/TIME	Analyses	REMARKS
Cas8-02-043	Soil	2/14/88/1330	EPA 8240	3 x 40 ML
Cas8-02-045	Soil	2/14/88/1420	EPA 8240	3 x 40 ML
Cas8-02-047	Soil	2/15/88/1100	EPA 8240	3 x 40 ML
Cas8-02-049	Soil	2/15/88/1230	EPA 8240	3 x 40 ML
Cas8-02-051	Soil	2/15/88/1230	EPA 8240	3 x 40 ML

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
Guy J Childs	2/15/88	1700	Fed Ex. 5910 47872				
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:

RECEIVED FOR LABORATORY BY:	DATE	TIME	REMARKS
[illegible]	2-11-88	[illegible]	[illegible]

RADIAN CORPORATION
8501 Mo-Pac
P.O. Box 201088
Austin, TX 78720-1088

Chain of Custody Record

PROJECT: Carswell AFB IRP Stage II

SITE: BSS

COLLECTOR: Guy J Childs

Analyses

SAMPLE I.D.	TYPE	DATE/TIME	Analyses	REMARKS
Car8-02-044	Soil	2/14/88 1330	Petroleum HC E418.1, lead SW7420, Soil Moisture D2216	
Car8-02-046	Soil	2/14/88 1420		
Car8-02-048	Soil	2/15/88 1100		
Car8-02-050	Soil	2/15/88 1230		
Car8-02-052	Soil	2/15/88 1230		

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
Guy Childs	2/15/88	1720	FedEx 5910117824		2-16-88	1000	Jane Mudsey
Jane Mudsey	2-16-88	1600	[illegible]				

RECEIVED FOR LABORATORY BY:	DATE	TIME	REMARKS

DRAFT

10-86-25948

RADIAN CORPORATION
8501 Mo-Pac Blvd.
P.O. Box 201088
Austin, TX 78720-1088

Chain of Custody Record

PROJECT Carswell AFB IRP Stage 2

SITE Site 17

COLLECTOR Guy J Childs

SAMPLE I.D.	TYPE	DATE/TIME	Analyses	REMARKS
Car8-02-053	Soil	2/15/88 1400	EPA 8240	3x40ml
Car8-02-055	Soil	2/15/88 1500	EPA 8240	↓

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
Guy Childs	2/15/88	1700	FedEx 5910117872				
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:

RECEIVED FOR LABORATORY BY:	DATE	TIME	REMARKS
[illegible]	2.11.88	1120	Fed Ex 5910117872

- DRAFT -

PR - - - - - - ON
8501 Mo-Pac
P.O. Box 201088
Austin, TX 78720-1088

Chain of Custody Record

PROJECT: Carswell AFB IRP Stage II

SITE: Site 17

COLLECTOR: Guy J Childs

Analyses

SAMPLE I.D.	TYPE	DATE/TIME		REMARKS
Car 8-02-054	Soil	2/15/88 1400	Petroleum HC E418.1, LEAD SW7420, Soil Moisture D2216	
Car 8-02-056	Soil	2/15/88 1500	" " "	

- DRAFT -

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
Guy J Childs	2/15/88	1720	Fed Ex 5901178247		2-16-88	1000	Jane Lundsey
RELINQUISHED BY: Jane Lundsey	DATE 2-16-88	TIME 1600	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:

RECEIVED FOR LABORATORY BY:	DATE	TIME	REMARKS

10-86-25948

RADIAN CORPORATION
8501 Mo-Pac Blvd.
P.O. Box 201088
Austin, TX 78720-1088

Chain of Custody Record

PROJECT: Carswell AFB IRP Stage II

SITE: Site 17

COLLECTOR: Guy J Childs

SAMPLE I.D.	TYPE	DATE/TIME	Analyses	REMARKS
Car8-02-057	Soil	2/16/88 1100	EPA 8240	
Car8-02-058	Soil	2/16/88 1100	EPA 8240	
Car8-02-061	Soil	2/16/88 1600	EPA 8240	
Car8-02-063	Soil	2/17/88 1030	EPA 8240	
Car8-02-065	Soil	2/17/88 1200	EPA 8240	
Car8-02-067	Soil	2/17/88 1345	EPA 8240	

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
[illegible]	2/18/88	[illegible]	Fed Ex 4910117883				
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:

RECEIVED FOR LABORATORY BY:	DATE	TIME	REMARKS

- DRAFT -

8501 Mo-Pac
P.O. Box 2010
Austin, TX 78720-1088

Chain of Custody Record

PROJECT: Caswell AFB IRP STAGE II

SITE: Site 17

COLLECTOR: Guy J Childs

Analyses

SAMPLE I.D.	TYPE	DATE/TIME	Analyses	REMARKS
Car8-02-059	Soil	2/16/88 1100	Total Petroleum Hydrocarbon	- DRAFT -
Car8-02-060	Soil	2/16/88 1100	E 418-1, lead SW7420,	
Car8-02-062	Soil	2/16/88 1600	Soil Moisture D2216	
Car8-02-064	Soil	2/17/88 1030	↓	
Car8-02-066	Soil	2/17/88 1200	↓	
~~Car8-02-067~~	~~Soil~~	~~2/17/88 1300~~	↓	
GJC			GJC	

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
Guy J Childs	2/18/88	1430	FED EX 5910117846		2/19/88	1000	[illegible]
RELINQUISHED BY:	DATE	TIME	RECEIVED BY: Gary S. [illegible]	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:

RECEIVED FOR LABORATORY BY:	DATE	TIME	REMARKS

DDU2115

RADIAN CORPORATION
8501 Mo-Pac Blvd.
P.O. Box 201088
Austin, TX 78720-1088

Chain of Custody Record

PROJECT: Caswell AFB IRP Stage II

SITE: Site 10

COLLECTOR: Guy J Childs

Analyses

SAMPLE I.D.	TYPE	DATE/TIME	Analyses	REMARKS
Car8-02-068	Soil	2/19/88 0945	Petroleum HC E418.1	
Car8-02-070	Soil	2/19/88 1100		
Car8-02-072	Soil	2/19/88 1120		
Car8-02-074	Soil	2/19/88 1210		
Car8-02-075	Soil	2/19/88 1210		
Car8-02-078	Soil	2/19/88 1215		
do not analyze				

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
Guy Childs	2/19/88	1930	FEDEX-5916117850		2-20-88		[illegible]
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:

RECEIVED FOR LABORATORY BY:	DATE	TIME	REMARKS

- DRAFT -

RADIAN CORPORATION
8501 Mo-Pac
P.O. Box 201088
Austin, TX 78720-1088

Chain of Custody Record

PROJECT: Carswell AFB IRP STAGE II

SITE: Site 10

COLLECTOR: Guy J Childs

Analyses: ORG Pest/PCBs SW 8080; Cl Phenoxy Herb SW 8150

SAMPLE I.D.	TYPE	DATE/TIME	REMARKS
Car8-02-069	Soil	2/19/88 0910	
Car8-02-071	Soil	2/19/88 1100	
Car8-02-073	Soil	2/19/88 1120	
Car8-02-076	Soil	2/19/88 1210	
Car8-02-077	Soil	2/19/88 1210	
*Car8-02-079	Soil	2/19/88 1245	*should not be analyzed as per Larry French. Sample was taken by accident. Hold for disposal. U.S. Brown 2/22/88 9:50A

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
Guy J Childs	2/19/88	1930	FED EX. 5910117894				
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:

RECEIVED FOR LABORATORY BY:	DATE	TIME	REMARKS
[illegible]	2-20-88	0930	Federal 5910117 8941

DRAFT

10-86-25948

RADIAN CORPORATION
8501 Mo-Pac Blvd.
P.O. Box 201088
Austin, TX 78720-1088

Chain of Custody Record

PROJECT: Carswell AFB IRP STAGE II

SITE: Site 12

COLLECTOR: Guy J Childs

Analyses

SAMPLE I.D.	TYPE	DATE/TIME	Analyses	REMARKS
Car 8-02-083	Soil	2/19/88 1630	EPA 8240	
Car 8-02-084	Soil	2/19/88 1630	EPA 8270	
Car 8-02-080	Soil	2/19/88 1520	EPA 8240	1 Vial w/ incidental sp data
Car 8-02-081	Soil	2/19/88 1520	EPA 8270	

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
Guy J Childs	2/19/88	1930	FEDEX 5910117894				
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:

RECEIVED FOR LABORATORY BY:	DATE	TIME	REMARKS

DRAFT

RADIAN
8501 Mo-Pac
P.O. Box 201088
Austin, TX 78720-1088

Chain of Custody Record

PROJECT: Carswell AFB IRP Stage II

SITE: ~~BBS~~ Site ~~BBS~~ 12

COLLECTOR: Guy J Childs

Analyses

SAMPLE I.D.	TYPE	DATE/TIME	Analyses	REMARKS
Car8-02-086	Soil	2/20/88 0930	EPA 8240	
Car8-02-087	Soil	2/20/88 0930	EPA 8270	
Car8-02-089	Soil	2/20/88 1130	EPA 8240	
Car8-02-090	Soil	2/20/88 1130	EPA 8270	
Car8-02-092	Soil	2/23/88 0930	EPA 8240	
Car8-02-~~093~~ 094	Soil	2/23/88 0930	EPA 8270	
Car8-02-095	Soil	2/23/88 0950	EPA 8240	100A w/inverted septa cap
Car8-02-096 097	Soil	2/23/88 0950	EPA 8270	
Car8-02-098	Soil	2/23/88 1100	EPA 8240	

- DRAFT -

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
Guy J Childs	2/23/88	2000	FEDEX 5910117920				
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:

RECEIVED FOR LABORATORY BY:	DATE	TIME	REMARKS
[illegible]	2-25	14:00	I.D. switch made by Guy Childs 2/25/88 8:10A Federal 5910117920

RADIAN CORPORATION
8501 Mo-Pac Blvd.
P.O. Box 201088
Austin, TX 78720-1088

3802130

Chain of Custody Record

PROJECT: Caswell AFB IRP Stage II

SITE: Site 12

COLLECTOR: Guy J Childs

Analyses: Petroleum HC E418.1, Metal Screen SW 6010, and Soil Moisture D2216

SAMPLE I.D.	TYPE	DATE/TIME	REMARKS
Cas8-02-088	Soil	2/20/88 0930	
Cas8-02-091	Soil	2/20/88 1130	
Cas8-02-~~094~~ 093	Soil	2/23/88 0930	
Cas8-02-~~097~~ 096	Soil	2/23/88 0950	
Cas8-02-~~100~~ 099	Soil	2/23/88 1100	
Cas8-02-104	Soil	2/23/88 1500	
Cas8-02-107	Soil	2/23/88 1520	
Cas8-02-110	Soil	2/23/88 1600	
Cas8-02-113	Soil	2/23/88	

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
Guy J Childs	2/23/88	2000	FEDEX 5910117916		2/24/88	0930	Jane Lundsey
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
Jane Lundsey	2/24/88	1600	[illegible]				

RECEIVED FOR LABORATORY BY:	DATE	TIME	REMARKS
			did not receive 094, 097, 100 did receive 093, 096, 099

- DRAFT -

86-25948

RADIAN CORPORATION

8501 Mo-Pac
P.O. Box 201088
Austin, TX 78720-1088

Chain of Custody Record

PROJECT: Carswell AFB IRP Stage II

SITE: Site 12

COLLECTOR: Guy J Childs

SAMPLE I.D.	TYPE	DATE/TIME	Analyses	REMARKS
Car8-02-~~099~~ 100 wpb	Soil	2/23/88 1100	EPA 8270	-DRAFT-
Car8-02-101	Soil	2/23/88 1300	EPA 8240	
Car8-02-102	Soil	2/23/88 1500	EPA 8240	
Car8-02-103	Soil	2/23/88 1500	EPA 8270	
Car8-02-105	Soil	2/23/88 1520	EPA 8240	
Car8-02-106	Soil	2/23/88 1520	EPA 8270	
Car8-02-108	Soil	2/23/88 1520	EPA 8240	
Car8-02-109	Soil	2/23/88 1520	EPA 8270	
Car8-02-111	Soil	2/23/88 1600	EPA 8240	

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
Guy J Childs	2/23/88	2000	FEDEX. 5910117990				
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:

RECEIVED FOR LABORATORY BY:	DATE	TIME	REMARKS
C. Kamin	2-24-88	1400	I.D. suitable made by Guy Childs. 2/25/88 8:10 cmb Federal 5910117990

#5802085

RADIAN CORPORATION

8501 Mo-Pac Blvd.
P.O. Box 201088
Austin, TX 78720-1088

Chain of Custody Record

PROJECT: Caswell AFB IRP STAGE II

SITE: Site 12

COLLECTOR: Gary J Childs

SAMPLE I.D.	TYPE	DATE/TIME	Analyses	REMARKS
Cas8-02-112	Soil	2/23/88 1600	EPA 8270	
Cas8-02-114	Soil	2/23/88 1630	EPA 8240	
Cas8-02-115	Soil	2/23/88 1630	EPA 8270	
Cas8-02-117	Soil	2/23/88 1700	EPA 8240	
Cas8-02-118	Soil	2/23/88 1700	EPA 8270	

-DRAFT-

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
Gary J Childs	2/23/88	2000	FEDEX 5910117920				
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:

RECEIVED FOR LABORATORY BY:	DATE	TIME	REMARKS
[illegible]	2/24/88	[illegible]	[illegible]

8501 Mo-Pac
PO. Box 201088
Austin, TX 78720-1088

Chain of Custody Record

PROJECT: Carswell AFBIRP STAGE II

SITE: Site 12

COLLECTOR: Guy J Childs

Analyses

SAMPLE I.D.	TYPE	DATE/TIME		REMARKS
Car8-02-116	Soil	2/23/88 1630	Petroleum HC E418.1, METAL SCREEN SW 6010 And Soil Moisture D2216.	
Car8-02-119	Soil	2/23/88 1700		

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
Guy J Childs	2/23/88	1800	FED EX. 5910117916		2/24/88	0930	Fed Ex
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
[illegible]	2/25/88	1600	[illegible]				

RECEIVED FOR LABORATORY BY:	DATE	TIME	REMARKS

- DRAFT -

A 5002080

RADIAN CORPORATION

8501 Mo-Pac Blvd.
P.O. Box 201088
Austin, TX 78720-1088

Chain of Custody Record

PROJECT CARSWELL AFB IRP STAGE II

SITE Site 12

COLLECTOR Guy J Childs

Analyses

SAMPLE I.D.	TYPE	DATE/TIME		REMARKS
Car8-02-120	Soil	2/24/88 0940	EPA 8240	DRAFT
Car8-02-121	Soil	2/24/88 ↓	EPA 8270	
Car8-02-123	Soil	2/24/88 1025	EPA 8240	
Car8-02-124	Soil	2/24/88 ↓	EPA 8270	
Car8-02-126	Soil	2/24/88 1050	EPA 8240	
Car8-02-127	Soil	2/24/88 1050	EPA 8270	
Car8-02-129	Soil	2/24/88 1215	EPA 8240	
Car8-02-130	Soil	2/24/88 1215	EPA 8270	

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
Guy J Childs	2/24/88	1800	FED EX: 5910117931				
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:

RECEIVED FOR LABORATORY BY:	DATE	TIME	REMARKS
[illegible]	2 25 88	[illegible]	[illegible] 5910112978 [illegible]

KAMIAN CORPORATION
8501 Mo-Pac
P.O. Box 201066
Austin, TX 78720-1088

Chain of Custody Record

PROJECT: CARSWELL AFB IRP STAGE II

SITE: Site 12

COLLECTOR: Guy J Childs

SAMPLE I.D.	TYPE	DATE/TIME	Analyses	REMARks
Cm8-02-132	Soil	2/24/88 1215	EPA 8240	
Cm8-02-133	Soil	2/24/88 1215	EPA 8270	
Cm8-02-135	Soil	2/24/88 1245	EPA 8240	
Cm8-02-136	Soil	2/24/88 1245	EPA 8270	
Cm8-02-138	Soil	2/24/88 1330	EPA 8240	
Cm8-02-139	Soil	2/24/88 1330	EPA 8270	

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
Guy J Childs	2/24/88		FEDEX 5910117931				
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:

RECEIVED FOR LABORATORY BY:	DATE	TIME	REMARKS
C. Kamu	2-25-88	12:00	Federal 5910117931

- DRAFT -

S002089

RADIAN CORPORATION

8501 Mo-Pac Blvd.
P.O. Box 201088
Austin, TX 78720-1088

Chain of Custody Record

PROJECT: CARSWELL AFB

SITE: SITE 17 + SITE BSS

COLLECTOR: Guy J Childs

Analyses

SAMPLE I.D.	TYPE	DATE/TIME	Analyses	REMARKS
Car8-02-141	Soil	2/24/88 1800	EPA 8240	
Car8-02-142	Soil	2/24/88 1800	EPA 8270	
Car8-02-143	Soil	2/24/88 1800	EP TOXICITY	
Car8-02-144	Soil	2/24/88 1800	EPA 8240	
Car8-02-145	Soil	2/24/88 1800	EPA 8270	
Car8-02-146	Soil	2/24/88 1800	EP TOXICITY	

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
Guy J Childs	2/24/88	1845	FEDEX 5910117931				
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:

RECEIVED FOR LABORATORY BY:	DATE	TIME	REMARKS
	2.25 88		

- DRAFT -

RADIAN CORPORATION
8501 Mo-Pac
P.O. Box 201088
Austin, TX 78720-1088

Chain of Custody Record

PROJECT: Carswell AFB IRP STAGE II

SITE: Site 12

COLLECTOR: Guy J Childs

Analyses: Total Petroleum HC 418.1, Metal Screen SW 6010, Soil Moisture D2216

SAMPLE I.D.	TYPE	DATE/TIME	REMARKS
Car8-02-122	Soil	2/24/88 0940	
Car8-02-125	Soil	2/24/88 1035	
Car8-02-128	Soil	2/24/88 1050	
Car8-02-131	Soil	2/24/88 1215	
Car8-02-134	Soil	2/24/88 1215	
Car8-02-137	Soil	2/24/88 1245	
Car8-02-140	Soil	2/24/88 1330	

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
Guy J Childs	2/24/88	1800	FEDEX 5910117942 Edgar E. Tisdale	[illegible]	2-26-88	0900	[illegible]
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:

RECEIVED FOR LABORATORY BY:	DATE	TIME	REMARKS

- DRAFT -

480 d 130

RADIAN CORPORATION

8501 Mo-Pac Blvd.
P.O. Box 201088
Austin, TX 78720-1088

Chain of Custody Record

BLUE COOLER - AUSTIN

PROJECT: Carswell AFB

SITE: FIGHTLINE AFB

COLLECTOR: W.G. McIntyre ; T. Petrossian

Analyses

SAMPLE I.D.	TYPE	DATE/TIME	602 (8020)	601	Fluoride, Chloride	Sulfate, TDS	Ortho Phosphate	Nitrate	METALS	Oil & Grease	Petroleum HC		REMARKS
02-150	GROUNDWATER	2/24/88			X	X	X	X	X	X	X		
02-151					X	X	X	X	X		X		
02-152					X	X	X	X	X		X		
02-153				X	X	X	X	X					
		TOTALS	8	8	4			4	4	1	3		
		BOTTLES											
		GT	NO 3L BOTTLE										

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
[illegible]	24 FEB	1702	Edgar T. Sdel				
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:

RECEIVED FOR LABORATORY BY:	DATE	TIME	REMARKS

- DRAFT -

6501 Mo-ra
P.O. Box 201
Austin, TX 78720-1088

Chain of Custody Record

Analyses

PROJECT Carswell AFB

SITE Fl/Ethylene

COLLECTOR W.G. McIntyre / R. Petrossian

SAMPLE I.D.	TYPE	DATE/TIME	[illegible]	[illegible]	[illegible]	[illegible]	REMARKS
02-150	Groundwater	2/24/88	X	X	X	X	
02-151	do	↓			X		
		TOTAL -	5 BOTTLES				

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
[illegible]	2/24/88	1755					
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:

RECEIVED FOR LABORATORY BY:	DATE	TIME	REMARKS
[illegible]	88	10	Federal [illegible] 593

- DRAFT -

3402190
191

RADIAN CORPORATION

8501 Mo-Pac Blvd.
P.O. Box 201088
Austin, TX 78720-1088

Chain of Custody Record

PROJECT: Carswell AFB

SITE: 04

COLLECTOR: R. Petrossian / W. Grant McIntyre

Analyses

SAMPLE I.D.	TYPE	DATE/TIME	602 (8020)	601	Fluoride/chloride	Sulfate, TDS	Orthophosphate	Nitrate	Metals	Petroleum HC		REMARKS
02-156	Groundwater	25 Feb 88	X	X	X	X	X	X	X			
02-157	Groundwater	25 Feb 88	X	X	X	X	X	X	X			
02-154	"	"	X	X	X	X	X	X	X	X		
02-155	"	"	X	X	X	X	X	X	X			

DRAFT

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
W. G. McIntyre	25 Feb 88	1547	2-26-88 10:10		2/26/88	1600	
	2/27/88	1100					

RECEIVED FOR LABORATORY BY:	DATE	TIME	REMARKS
			Rec'd in Sacramento 2-26-88. Samples were not unpacked. Sent to Austin 2-26-88. SAT Del. [illegible]

8501 Mo-Pac
P.O. Box 201088
Austin, TX 78720-1088

Chain of Custody Record

PROJECT Carswell AFB

SITE 4 & 12

COLLECTOR R. Petrossian / W. Gr. McIntyre

Analyses: Ex. Pr. Pol. 625

SAMPLE I.D.	TYPE	DATE/TIME	Ex. Pr. Pol. 625	REMARKS
02-154	Groundwater	2/25/88	X ✓	
02-155		2/25/88	X Did not Receive cit	
02-156			✓	
		Total	2 x 1 Liter	

- DRAFT -

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
[illegible]	2-26-88	1530			2-26-88	1000	Jane Lundsen
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
Jane Lundsen	2-26-88	1600					

RECEIVED FOR LABORATORY BY:	DATE	TIME	REMARKS
[illegible]	2-27-[illegible]	0930	Did not receive 02-155 Ordered 25118 91625

RADIAN CORPORATION
8501 Mo-Pac Blvd.
P.O. Box 201088
Austin, TX 78720-1088

Chain of Custody Record

PROJECT: Carswell AFB
SITE: 01
COLLECTOR: R. Petrassian / Grant McIntyre

Analyses

SAMPLE I.D.	TYPE	DATE/TIME	602 (8020)	601	Fluoride/Chloride	Sulfate/TDS	Orthophosphate	Nitrate	Metals	Oil and Grease	REMARKS
02-159	Groundwater	26Feb88	X	X	X	X	X	X	X	X	
02-160	"	"	X	X	X	X	X	X	X	X	
02-161	"	"	X	X	X	X	X	X	X	X	
02-162	"	"	X	X	X	X	X	X	X	X	
02-163	Groundwater	26Feb88	X	X	X	X	X	X	X	X	

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
W. McIntyre	26Feb88	1624	[signature]	[signature]	2/27/88	1100	
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:

RECEIVED FOR LABORATORY BY:	DATE	TIME	REMARKS

- DRAFT -

RADIAN CORPORATION
8501 Mo-Pac
P.O. Box 201088
Austin, TX 78720-1088

Chain of Custody Record

PROJECT: Carswell AFB

SITE: 01

COLLECTOR: R. Patterson / G. McIntyre

Analyses: Extt. Priority Pol. (625)

SAMPLE I.D.	TYPE	DATE/TIME	Extt. Priority Pol. (625)	REMARKS
02-159	Groundwater	26 Feb 88	X	

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
G. McIntyre	26 Feb 88	16:27					
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:

RECEIVED FOR LABORATORY BY:	DATE	TIME	REMARKS
R Morgan	2-27-88 ~~7:27~~ PM	10:30	FEDERAL 694 2334324

DRAFT

8803005
006

RADIAN CORPORATION

8501 Mo-Pac Blvd.
P.O. Box 201088
Austin, TX 78720-1088

Chain of Custody Record

AUSTIN - Blue Cooler

PROJECT: CARSWELL AFB

SITE: 4 & 5

COLLECTOR: W.G. McIntyre / R. Petrossian

Analyses

SAMPLE I.D.	WELL ID	TYPE	DATE/TIME	601	602	TDS, ORTHO PHOSPHATE	Fluoride, Chloride, Sulfate	Nitrate	Metals	REMARKS
02-164	4C	Groundwater	29 FEB88	↓	↓	↓	↓	↓	↓	- DRAFT -
02-165	4H	↓	↓	↓	↓	↓	↓	↓	↓	
02-166	4G	↓	↓	↓	↓	↓	↓	↓	↓	
02-167	4G	DUPLICATE	↓	↓	↓	↓	↓	↓	↓	
02-168	5G	Groundwater	↓	↓	↓	↓	↓	↓	↓	
02-169	5H	↓	↓	↓	↓	↓	↓	↓	↓	
			BOTTLES	12	12	6		6	6	

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
[signature]	29 FEB88	1532			3-1-88	1000	[signature]
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:

RECEIVED FOR LABORATORY BY:	DATE	TIME	REMARKS

RADIAN CORPORATION
8501 Mo-Pac
P.O. Box 201088
Austin, TX 78720-1088

Chain of Custody Record

Red Coleman - Austin

PROJECT Carswell AFB

SITE 17, 1,

COLLECTOR W. McIntyre / R. Petrossian

Analyses: 602, 601, Nitrate, Metals, TDS, Cr, Ni, Sulfate, Fluoride, Chloride, Petroleum Hydrocarbons 418.1

SAMPLE I.D.	WELL ID	TYPE	DATE/TIME	602	601	Nitrate	Metals	TDS, Cr, Ni, Sulfate, Fluoride, Chloride	Petroleum Hydrocarbons 418.1	REMARKS
02-158	1B	Groundwater	01 MAR 88	X						ALL THE 17
03-08	17I	"	"	X	X	X	X	X	X	WELLS MAY
03-11	17K	"	"	X	X	X	X	X	X	CONTAIN HC
03-12	17L	"	"	X	X	X	X	X	X	CAREFUL ON
03-13	17J	"	"	X	X	X	X	X	X	601 & 602
03-10	FIELD BLANK 17I	FB BASE DI	"	X	X					ALSO BE
03-09	TRIP BLANK 17I	TB RADIAN DI	"	X	X					CAREFUL OF
				28 VOA's		12 500 mL Plastic		4 1 Liter		THE STREAM
				26 VOA's						SAMPLE - POSSIBLE

HC or something

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
[signature]	1 MAR 88				3-2-88	1000	[signature]
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:

RECEIVED FOR LABORATORY BY:	DATE	TIME	REMARKS

5603404

RADIAN CORPORATION

8501 Mo-Pac Blvd.
P.O. Box 201088
Austin, TX 78720-1088

Chain of Custody Record

BLUE COLEMAN-SAC

PROJECT: CARSWELL AFB

SITE: 17

COLLECTOR: W. McIntyre / R. Petrossian

Analyses: Extra Pol 625

SAMPLE I.D.	WELL ID	TYPE	DATE/TIME	Analyses	REMARKS
03-08 17 I		Groundwater	01 Mar 88	X	
				1 BOTTLE	

- DRAFT -

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
[illegible]	1 Mar 88	1705					
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:

RECEIVED FOR LABORATORY BY:	DATE	TIME	REMARKS
[illegible]	[illegible]	1:20	[illegible] 4[illegible]71

8803029
031

RADIAN CORPORATION

8501 Mo-Pac Blvd.
P.O. Box 201088
Austin, TX 78720-1088

Chain of Custody Record

Austin

PROJECT Carswell AFB

SITE 05-10-17

COLLECTOR W. S. McIntyre & R. Petrossian

Analyses

SAMPLE I.D.	TYPE	DATE/TIME	Purg. HC-601	Purg. Aron.-602	Metals	Nitrate	Petroleum HC	Oil & Grease	Fluoride, Chloride	Orthophosphate	Sulfate, Alkalinity	TDS	REMARKS
03-14 (17m)	Groundwater	02 Mar 88	X	X	X	X	X		X				All wells
03-15 (5C)	"		X	X	X	X			X				may contain
03-16 (5A)	"		X	X	X	X			X				hydrocarbons
03-17 Trip Blank	Radian DI H_2O		X	X									carried on
03-18 Field Blanks	AFB DI H_2O		X	X									601 & 602
03-19 (5D)	Groundwater		X	X	X	X			X				
03-20 Equipment B.	AFB DI H_2O		X	X	X	X			X				
03-21 (5E)	Groundwater		X	X	X	X			X				
03-22 (10A)	"	02 Mar 88	X	X	X	X	X	X	X	X	X	X	

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
W. S. McIntyre	02 Mar 88 ~~1202~~	1702			3 3 88	1000	Jane Lindsey
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:

RECEIVED FOR LABORATORY BY:	DATE	TIME	REMARKS

KAUFAN CORPORATION
8501 Mo-Pac
P.O. Box 201088
Austin, TX 78720-1088

Chain of Custody Record

Sacramento

PROJECT Carswell AFB

SITE 05-10

COLLECTOR W. G. McIntyre & R. Petrossian

Analyses

SAMPLE I.D.	TYPE	DATE/TIME	Ext. Priority Pol.	Cl. Phenoxy Acid Herb	Organochlorine Pest	Phenols	REMARKS
1J 03-16 (5A)	Groundwater	02 Mar 88	X				
2J 03-22 (10A)	Groundwater	02 Mar 88	X	X	X		

- DRAFT -

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
W. G. McIntyre	02 Mar 88	1633					
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:

RECEIVED FOR LABORATORY BY:	DATE	TIME	REMARKS
[illegible]	3-3-88	9 AM	FEDERAL 47184841 0

00030135
036

RADIAN CORPORATION

8501 Mo-Pac Blvd.
P.O. Box 201088
Austin, TX 78720-1088

Chain of Custody Record

Austin - Blue Cooler

PROJECT Carswell AFB

SITE 12

COLLECTOR W. G. McIntyre & R. Petrossian

Analyses by

SAMPLE I.D.	TYPE	DATE/TIME	Nitrate 353.1	Metals	Petroleum HC 418.1	Fluoride, Chloride	Orthophosphate	Sulfate, Alkalinity	TDS	REMARKS
03-23 (12D)	Groundwater	03Mar88	X	X	X	X				
03-24 (12B)	"	"	X	X	X	X				
03-25 Duplicate			X	X	X	X				
03-26 (12C)	Groundwater	03Mar88	X	X	X	X				

- DRAFT -

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
W. G. McIntyre	03Mar88	1710			3 Mar 88	1000	Fed Ex
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:

RECEIVED FOR LABORATORY BY:	DATE	TIME	REMARKS

CORPORATION
8501 Mo-Pac
P.O. Box 2016
Austin, TX 78720-1088

Chain of Custody Record

Austin - Redcoder

PROJECT Carswell AFB

SITE 05-10-12

COLLECTOR W.G. McIntyre & R. Petrossian

Analyses

SAMPLE I.D.	TYPE	DATE/TIME	Purg. HC 601	Purg. Arom. 602	Nitrate 353.1	Metals	Petroleum HC 418.1	Oil & Grease 413.2	Fluoride, Chloride	Orthophosphate	Sulfate, Alkalinity	TDS	REMARKS
03-23 (12D)	Groundwater	03Mar88	X	X									
03-24 (12B)			X	X									
03-25 Duplicate			X	X									
03-26 (12C)			X	X									
03-27 (12E)			X	X	X	X	X		X				
03-28 (10B)			X	X	X	X	X	X	X				
03-29 (10C)			X	X	X	X	X	X	X				
03-30 (5B)	Groundwater	03Mar88	X	X	X	X			X				

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
W.G. McIntyre	03Mar88	1725			3 4 88	1000	[illegible]
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:

RECEIVED FOR LABORATORY BY:	DATE	TIME	REMARKS

- DRAFT -

580301

RADIAN CORPORATION

8501 Mo-Pac Blvd.
P.O. Box 201088
Austin, TX 78720-1088

Chain of Custody Record

Sacramento - Red Cooler

PROJECT: Carswell AFB

SITE: ~~28 & 29~~ 10

COLLECTOR: W. G. McIntyre & R. Petrossian

Analyses: Phenols 604; Organic Cl Pest 608; Cl Phenoxy Herb Herb A509B

SAMPLE I.D.	TYPE	DATE/TIME	Phenols 604	Organic Cl Pest 608	Cl Phenoxy Herb Herb A509B	REMARKS
03-28 (10B)	Groundwater	03Mar88	X	X	X	
03-29 (10C)	Groundwater	03Mar88	X	X	X	

- DRAFT -

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
W. G. McIntyre	03Mar88	1656					
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:

RECEIVED FOR LABORATORY BY:	DATE	TIME	REMARKS
[illegible]	2-4-88	1130	FEDERAL [illegible]

J501 Morey
P.O. Box 20
Austin, TX 78720-1088

Chain of Custody Record

PROJECT: CARSWELL AFB

SITE: 05, 04, 30

COLLECTOR: W.F. McIntyre / R. Petrossian

Analyses

SAMPLE I.D.	WELL ID	TYPE	DATE/TIME	601 & 602	TDS, ALKALINITY, FLUORIDE, CHLORIDE, ORTHOPHOSPHATE	SULPHATE	METALS 200.7	200.2	239.2	245.1	270.2	NITRATE	PETROLEUM HC 418.1	REMARKS
03-31	4F	Groundwater	03/04/88		X	X	X		X	X				
03-32	4E				X	X	X		X	X				
03-33	4D				X	X	X		X	X				
03-34	BSS-A						X	X	X	X		X		NO BOTTLES
03-35	BSS-B						X	X	X	X		X		
03-36	BSS-C						X	X	X	X		X		
03-37	5F				X	X	X		X	X				
03-38	5F	DUPLICATE			X	X	X		X	X				

TOTAL BOTTLES: 32 VOA's 21 500ml PLASTIC 3 1 LITER GLASS

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
[signature]	04 MAR 88 1714	1714			3 5 88	1100	[signature]
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:

RECEIVED FOR LABORATORY BY:	DATE	TIME	REMARKS
			[illegible]

E-50

PAGE 1 OF 1

8803042

RADIAN CORPORATION
8501 Mo-Pac Blvd.
P.O. Box 201088
Austin, TX 78720-1088

Chain of Custody Record

PROJECT: CARSWELL AFB

SITE: 13, 03

COLLECTOR: K. Petrosian / W.G. McIntyre

Analyses

SAMPLE I.D.	LOC ID	TYPE	DATE/TIME	418.1 Pet Hydro	6010 Metal Screen	7471 Mercury	Oil & Grease	REMARKS
03-39	13G	Soil	05 Mar 88	X	X	X		
03-40	13K	"	"	X	X	X		
03-41	3H	"	"	X	X	X		
03-42	13J	"	"	X	X	X		
03-43	13I	"	"	X	X	X		
03-44	3D	Groundwater	"				X	

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
[illegible]	03/07/88	1139					
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:

RECEIVED FOR LABORATORY BY:	DATE	TIME	REMARKS

-DRAFT-

8501 Mo-Pac
P.O. Box 201088
Austin, TX 78720-1088

Chain of Custody Record

PROJECT: Dallas Wells AFB

SITE: 13

COLLECTOR: R. Petrossian / N.O. McIntyre

Analyses: 8270, 8240

SAMPLE I.D.	LOC ID	TYPE	DATE/TIME	8270	8240	REMARKS
03-39	13G	Soil	03/07/88	X	X	1 ea. for 8270
03-40	13K	"	"	↓	↓	3 ea. for 8240
03-41	13H	"	"			
03-42	13J	"	"			
03-43	I	"				

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
[illegible]	03/07/88	1417					
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
			[illegible]				

RECEIVED FOR LABORATORY BY:	DATE	TIME	REMARKS
[illegible]	3-8-88	9am	FEDERAL 7632284[illegible]

I-52

AFI-

10.86.25048

RADIAN CORPORATION
8501 Mo-Pac Blvd.
P.O. Box 201088
Austin, TX 78720-1088

Chain of Custody Record

PROJECT: Carswell AFB IRP STAGE II

SITE: Site 15

COLLECTOR: Guy J Childs WG Mentzer

Analyses

SAMPLE I.D.	TYPE	DATE/TIME		REMARKS
Cu18-03-045	Soil	3/29/88 0915	ORG PEST SW 8140	
Cu18-03-046	↓	↓ 1230	↓ ↓	

-DRAFT-

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
Guy J Childs	3/30/88	1810					
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:

RECEIVED FOR LABORATORY BY:	DATE	TIME	REMARKS

RADIAN
8501 Mo-Pac
P.O. Box 201088
Austin, TX 78720-1088

Chain of Custody Record

PROJECT: Carswell AFB IRP STAGE II

SITE: Site 15

COLLECTOR: Guy J Child W G McIntyre

SAMPLE I.D.	TYPE	DATE/TIME	Analyses		REMARKS
CW8-03-045	Soil	3/29/88 0945	Cl Phenoxy Herb	SW8150	
CW8-03-046	Soil	↓ 1330	↓	↓	

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
Guy J Child	3/30/88	1825					
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:

RECEIVED FOR LABORATORY BY:	DATE	TIME	REMARKS

-DRAFT-

RADIAN CORPORATION
8501 Mo-Pac Blvd.
P.O. Box 201088
Austin, TX 78720-1088

Chain of Custody Record

PROJECT: Carswell AFB IRP STAGE II

SITE: Site 15

COLLECTOR: Guy J Childs W.G. McIntyre

SAMPLE I.D.	TYPE	DATE/TIME	Analyses	REMARKS
118-03-045	Soil	3/29/88 0915	ORG PEST/PCB SW 8080	
118-03-046	Soil	↓ 1230	↓ ↓	

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
Guy J Childs	3/30/88	1825					
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:

RECEIVED FOR LABORATORY BY:	DATE	TIME	REMARKS

- DRAFT -

KADIAN
8501 Mo-Pac
P.O. Box 201000
Austin, TX 78720-1088

Chain of Custody Record

Analyses

PROJECT: Carswell AFB IRP STABEX

SITE: Site 15

COLLECTOR: Guy J Childs C/G McIntyre

SAMPLE I.D.	TYPE	DATE/TIME		REMARKS
Car8-03-045	Soil	3/29/88 0915	Soil Moisture D2216	
Car8-03-046	↓	↓ 1230		

- DRAFT -

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
Guy J Childs	3/30/88	1810					
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:

RECEIVED FOR LABORATORY BY:	DATE	TIME	REMARKS

8803173

RADIAN CORPORATION

8501 Mo-Pac Blvd.
P.O. Box 201088
Austin, TX 78720-1088

Chain of Custody Record

Analyses

PROJECT: Parsell AFB IRP Stage II

SITE: Weapons Storage Area

COLLECTOR: Guy J Childs; R. G. McIntyre

SAMPLE I.D.	TYPE	DATE/TIME		REMARKS
Ca18-03-047	Soil	3/29/88 1530	SW6010 METAL SCREEN	
Ca18-03-048	↓	1534	↓	
Ca18-03-049		1604		
Ca18-03-050		1635		
Ca18-03-051		3/30/88 0900		
Ca18-03-052		0920		
Ca18-03-053		1015		
Ca18-03-054		1015		
Ca18-03-055		1200		

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
[illegible]	3/30/88	1815			3-31-88	1000	[illegible]
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:

RECEIVED FOR LABORATORY BY:	DATE	TIME	REMARKS

- DRAFT -

RADIAN
8501 Mo-Pac
P.O. Box 201088
Austin, TX 78720-1088

Chain of Custody Record

PROJECT: Carswell AFB IRP Stage II

SITE: Weapons Storage Area

COLLECTOR: Guy J Childs W.G. McIntyre

SAMPLE I.D.	TYPE	DATE/TIME	Analyses	REMARKS
Car8-03-047	Soil	3/29/88 1520	Soil Moisture D2216	
Car8-03-048	↓	1534	↓	
Car8-03-049		1604		
Car8-03-050		1635		
Car8-03-051		3/30/88 0930		
Car8-03-052		0930		
Car8-03-053		1015		
Car8-03-054		1015		
Car8-03-055		1200		

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
Guy J Childs	3/30/88	1815					
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:

RECEIVED FOR LABORATORY BY:	DATE	TIME	REMARKS

- DRAFT -

RADIAN CORPORATION
8501 Mo-Pac Blvd.
P.O. Box 201088
Austin, TX 78720-1088

Chain of Custody Record

PROJECT: Carswell AFB IRP STAGE II

SITE: Weapons Storage Area

COLLECTOR: Guy J. Childs; W. G. McIntyre

Analyses

SAMPLE I.D.	TYPE	DATE/TIME	Analyses	REMARKS
Car8-03-047	Soil	3/30/88 1500	SW 8240	
Car8-03-048		1530		
Car8-03-049		1600		
Car8-03-050		1625		
Car8-03-051		3/30/88 0920		
Car8-03-052		0930		
Car8-03-053		1015		
Car8-03-054		1015		
Car8-03-055		1700		

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
Guy J. Childs	3/30/88	1820					
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:

RECEIVED FOR LABORATORY BY:	DATE	TIME	REMARKS

-DRAFT-

8501 Mo-Pa
P.O. Box 201
Austin, TX 78720-1088

Chain of Custody Record

Analyses

PROJECT: Carswell AFB IRP STAGE II

SITE: Weapons Storage Area

COLLECTOR: Guy J Childs ; WG McIntyre

SAMPLE I.D.	TYPE	DATE/TIME	Analyses	REMARKS
SB8-03-047	Soil	3/30/88 1520	SW 8270	
SB8-03-048		1534		
SB8-03-049		1604		
SB8-03-050		1635		
SB8-03-051		3/30/88 0920		
SB8-03-052		0930		
SB8-03-053		1015		
SB8-03-054		1015		
SB8-03-055		1200		

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
Guy J Childs	3/30/88	1830					
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:

RECEIVED FOR LABORATORY BY:	DATE	TIME	REMARKS

- DRAFT -

RADIAN CORPORATION
8501 Mo-Pac Blvd.
P.O. Box 201088
Austin, TX 78720-1088

Chain of Custody Record

Analyses

PROJECT: Carswell AFB IRP Stage II

SITE: Weapons Storage Area

COLLECTOR: Gary J Chilek, W.G. McIntyre

SAMPLE I.D.	TYPE	DATE/TIME	Analyses		REMARKS
Cw8-03-056	Soil	3/30/88 1410	SW 6010	Metal Screen	
Cw8-03-057	↓	1440	↓	↓	
Cw8-03-058	↓	1440	↓	↓	
Cw8-03-059	↓	1535	↓	↓	

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
Gary J Chilek	3/31/88	1910			3-31-88	1000	[illegible]
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:

RECEIVED FOR LABORATORY BY:	DATE	TIME	REMARKS

- DRAFT -

8501 Mo-Pac
P.O. Box 2010
Austin, TX 78720-1088

Chain of Custody Record

PROJECT: Carswell AFB IRP STAGE II

SITE: Weapons Storage Area

COLLECTOR: Guy J Childs, W.G. McIntyre

Analyses

SAMPLE I.D.	TYPE	DATE/TIME	Analyses	REMARKS
Car8-03-056	Soil	3/30/88 1400	Soil Moisture D2216	
Car8-03-057	↓	1440	↓	
Car8-03-059	↓	1535	↓	

DRAFT

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
Guy J Childs	3/30/88	1910					
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:

RECEIVED FOR LABORATORY BY:	DATE	TIME	REMARKS

RADIAN CORPORATION

8501 Mo-Pac Blvd.
P.O. Box 201088
Austin, TX 78720-1088

Chain of Custody Record

Analyses

PROJECT: Carswell AFB IRP STAGE II

SITE: Weapons Storage Area

COLLECTOR: Guy T Childs ; W.G. McIntyre

SAMPLE I.D.	TYPE	DATE/TIME	Analyses	REMARKS
Cw18-03-056	Soil	3/30/88 1400	SW 8240	
Cw18-03-057		1440		
~~Cw18-03-059~~		1535		
~~Cw18-03-060~~	WATER	3/30/88 1640	SW 8240	

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
Guy T Childs	3/30/88	1820					
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:

RECEIVED FOR LABORATORY BY:	DATE	TIME	REMARKS

- DRAFT -

RC-25848

CORPORATION
6301 Mo-Pac
P.O. Box 201L
Austin, TX 78720-1088

Chain of Custody Record

Analyses

PROJECT: Carswell AFB IRP STAGE II

SITE: Weapons Storage Area

COLLECTOR: Guy J Childs; WG McIntyre

SAMPLE I.D.	TYPE	DATE/TIME	Analyses	REMARKS
[illegible]-03-056	Soil	3/30/88 1400	SW 8270	
[illegible]-03-057	↓	1440	↓	
[illegible]-03-058	↓	1440	↓	
[illegible]-03-059	↓	1535	↓	

- DRAFT -

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
Guy Childs	3/30/88	1830					
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:

RECEIVED FOR LABORATORY BY:	DATE	TIME	REMARKS

8804003

RADIAN CORPORATION

8501 Mo-Pac Blvd.
P.O. Box 201088
Austin, TX 78720-1088

Chain of Custody Record

PROJECT: Carswell AFB IRP Stage II

SITE: Site 13

COLLECTOR: W. G. McIntyre; Guy J Childs

SAMPLE I.D.	TYPE	DATE/TIME	Analyses	REMARKS
CAR 8-03-061	SEDIMENT	3/31/88 0847	Petroleum HC E418.1, Metal Screen SW6010, Mercury SW 7471	
CAR 8-03-062	SEDIMENT	0905		
CAR 8-03-063	SEDIMENT	0930		
CAR 8-03-064	SEDIMENT	1000		
CAR 8-03-065	SEDIMENT	1027		
CAR 8-03-066	SEDIMENT	1100		

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
Guy J Childs	3/31/88	1700					
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:

RECEIVED FOR LABORATORY BY:	DATE	TIME	REMARKS
Cindy Fischang	4-1-88	11:00	

- DRAFT -

RADIAN
8501 Mo-Pac
P.O. Box 201088
Austin, TX 78720-1088

Chain of Custody Record

Analyses

PROJECT: Carswell AFB IRP STAGE II

SITE: Site 13

COLLECTOR: W.G McIntyre; Guy J Childs

SAMPLE I.D.	TYPE	DATE/TIME		REMARKS
CAr8-03-061	SEDIMENT	3/31/88 0847	EPA 8270	-DRAFT-
CAr8-03-062	↓	0905	↓	
CAr8-03-063		0930		
CAr8-03-064		1000		
CAr8-03-065		1027		
CAr8-03-066		1100		

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
Guy J Childs	4/1/88 ~~3/31/88~~	1530 ~~1630~~					
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:

RECEIVED FOR LABORATORY BY:	DATE	TIME	REMARKS
J Morgan	4-2-88	9 AM	FEDERAL 144443674

E-66

[illegible] left a message [illegible] 4/4/88 #5804009

Guy Childs resolved discrepancies [illegible] 4/4/88 3:00p

RADIAN CORPORATION

8501 Mo-Pac Blvd.
P.O. Box 201088
Austin, TX 78720-1088

Chain of Custody Record

Analyses

PROJECT: Carswell AFB IRP STAGE II

SITE: Site 13

COLLECTOR: W. G. McIntyre, Guy J Childs

SAMPLE I.D.	TYPE	DATE/TIME	Analyses	REMARKS
Ca18-03-061	SEDIMENT	3/31/88 0847	SW 8240	2 40ML VOLES
Ca18-03-062		0905		
Ca18-03-063		0930		
Ca18-03-064		1000		
Ca18-03-065		1027		
Ca18-03-066		1100		
Ca18-03-067		1200	No [illegible]	
Trip Blank			Trip Blank not on Custody	

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
Guy J Childs	4-1-88 ~~3/31/88~~	1530					
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:

RECEIVED FOR LABORATORY BY:	DATE	TIME	REMARKS
[illegible]	4-2-88	9[illegible]	[illegible]

DRAFT

E-67

RADIAN
8501 Mo-Pac
P.O. Box 201088
Austin, TX 78720-1088

Chain of Custody Record

Analyses

PROJECT: Carswell AFB IRP Stage II

SITE: Site 15

COLLECTOR: Guy J Childs

SAMPLE I.D.	TYPE	DATE/TIME	Analyses	REMARKS
CA18-03-068	Soil	3/31/88 1250	ORG. Pest SW 8140	
CA18-03-069		1320	Soil Moisture D2216	
CA18-03-070		4/1/88 1230		
CA18-03-071		1305		
CA18-03-072		1340		
CA18-03-073		1340		

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
[signature]	4-1-88	1530					
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:

RECEIVED FOR LABORATORY BY:	DATE	TIME	REMARKS

- DRAFT -

#S804010

RADIAN CORPORATION

8501 Mo-Pac Blvd.
P.O. Box 201088
Austin, TX 78720-1088

Chain of Custody Record

PROJECT: Carswell AFB IRP Stage II

SITE: Site 15

COLLECTOR: Guy T Childs

SAMPLE I.D.	TYPE	DATE/TIME	Analyses	REMARKS
Car8-03-068	Soil	3/31/88 1350	Cl Phenoxy Herb SW8150 +	- DRAFT -
Car8-03-069	↓	↓ 1320	ORG PEST/PCB SW8080	
Car8-03-070	↓	4/1/88 1230	↓	
Car8-03-071	↓	↓ 1305	↓	
Car8-03-072	↓	1340	↓	[illegible] Car8 03 072
Car8-03-073	Soil	↓ 1340	↓	~~[illegible]~~
~~Trip Blank~~	~~[illegible]~~		~~[illegible]~~	

Time sampling [illegible] labeled 03-072. [illegible] from Guy Childs, Car 73 [illegible] 72. [illegible] labeled 03-072. [illegible]

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
Guy T Childs	4-1-88	1530					4/4/88 [illegible]
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:

RECEIVED FOR LABORATORY BY:	DATE	TIME	REMARKS
[illegible]	[illegible]	[illegible]	[illegible]

E-09

RADIAN

8501 Mo-Pac
P.O. Box 201088
Austin, TX 78720-1088

add 1x J

Chain of Custody Record

Austin - Blue Igloo

PROJECT: CARSWELL AFB

SITE: 11 & 03

COLLECTOR: M. POWERS / R. PETROSSIAN

Analyses

SAMPLE I.D.	TYPE	DATE/TIME	601	602	NITRATE	Fluoride, Chloride	Sulfate, TDS, Alkalinity	Metals Screen + As	Pb, Selenium	PETRO (Hydrocarbons)	Oil & Grease	REMARKS
04-01	GROUNDWATER	04/05/88	X	X	X	X	X	X	X	FORGOT IT	X	
04-02	"	↓	↓	↓	X	X	X	X	noted + noted		X	
04-03	"	↓	↓	↓	X	X	X	X	X		X	
		TOTAL =	12 VOAS			9 500ml plastic					3 WM AMBER GLASS	

DRAFT

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
R. Petrossian	04/05/88	1825					
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:

RECEIVED FOR LABORATORY BY:	DATE	TIME	REMARKS
Linda Fielding	4-6-88	10 00	Sample 04-01 for Oil and Grease needed further pH adjusted.

#5804017

RADIAN CORPORATION

8501 Mo-Pac Blvd.
P.O. Box 201088
Austin, TX 78720-1088

Chain of Custody Record

SACRAMENTO - REQ 16100

PROJECT: CARSWELL AFB

SITE: 11 & 03

COLLECTOR: M. FOWERS / F. PETROSSIAN

Analyses: X PRIOR POL; Phenols; Diesel Fuel; CL P Only Fuel in Hole

SAMPLE I.D.	WELL ID	TYPE	DATE/TIME	X PRIOR POL	Phenols	Diesel Fuel	CL P Only Fuel in Hole	REMARKS
04-01	3D	Groundwater	04/15/88	2 bottles X	X	X	X	8 BOTTLES
04-02	11D	↓	↓	2 bottles X				2 BOTTLES
04-03	11E	↓	↓				NO (ZERO)	BOTTLES MARK W/SHIPMENT
			TOTAL =	60 bottles 1000 mL AMBER				
				Talked to Greg [illegible] about missing samples. He said that they were put on COC by accident. DTP 4/6/88				

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
[illegible]	4/15/88	1852					
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:

RECEIVED FOR LABORATORY BY:	DATE	TIME	REMARKS
[illegible]	4-16-88	[illegible]	[illegible]

RADIAN
8501 Mo-Pac
P.O. Box 201088
Austin, TX 78720-1088

Chain of Custody Record

AUSTIN - Blue

PROJECT CARSWELL AFB

SITE 04

COLLECTOR M. Powers / R. Petrossian

N Analyses

SAMPLE I.D.	WELL ID	TYPE	DATE/TIME	601 & 602	TDS etc.	Nitrate	Metals - 200.7 200.4	245.1 270.2	Oil & Grease	Pet HC		REMARKS
04-01	3D	Groundwater	04/06/88	X						X	2x1 LITERS	
04-04	12A			X	X	X	X	X		X	18x 500 mL Plastic	
04-05	P-1			X	X	X	X	X			32x 40 mL VOA's	
04-06	4A			X	X	X	X	X				
04-07	4A	TRIP B		X								
04-08	4A	FIELD B		X								
04-09	4B			X	X	X	X	X				
04-10	4B	EQUIP RINSE		X	X	X	X	X				
04-11	P-2			X	X	X	X	X				

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
R. Petrossian	04/06/88	1807					
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:

RECEIVED FOR LABORATORY BY:	DATE	TIME	REMARKS
[illegible]	4-7-88	0930	All of prescribed samples verified

RADIAN CORPORATION

8501 Mo-Pac Blvd.
P.O. Box 201088
Austin, TX 78720-1088

Chain of Custody Record

SACRAMENTO · E. [illegible]

PROJECT: CARSWELL AFB

SITE: [illegible] 9

COLLECTOR: M. [illegible] / [illegible] PETERSSON

Analyses: Extra Pb/Cd

SAMPLE I.D.	WELL ID	TYPE	DATE/TIME		REMARKS
04 05	P-1	Groundwater	04/06/88	1	
04-06	4A	↓	↓	1	
			4	4 [illegible]	

- DRAFT -

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
[illegible]	[illegible]	[illegible]					
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:

RECEIVED FOR LABORATORY BY:	DATE	TIME	REMARKS
[illegible]	4-7-88	[illegible]	CERCLA 47187X[illegible]

RADIAN CORPORATION
8501 Mo-Pac
P.O. Box 201088
Austin, TX 78720-1088

Chain of Custody Record

AUSTIN - TRIP NO. 34

PROJECT CHRISWELL AFB

SITE 01

COLLECTOR MAJORS / RAETROSSIAN

Analyses: 601 & 602; Nitrate; Metals, As; Pb, Hg, Se; TDS; Fluoride, Chloride; Sulfate, Nitrate; O.&G. Grease

SAMPLE I.D.	USL ID	TYPE	DATE/TIME	601 & 602	Nitrate	Metals, As	Pb, Hg, Se	TDS	Fluoride, Chloride	Sulfate, Nitrate	O.&G. Grease	REMARKS
01-6	1D	GROUNDWATER	07APR88	X	X	X	X	X	X		X	NOTE - 602
01-7	1C	↓	↓	X	X	X	X	X	X		X	
01-8	1E	↓	↓	X	X	X	X	X	X		X	
		TOTAL →	3 LITER	9	500 ml	PLASTIC			12	JARS		

DRAFT

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
[illegible]	07APR88	1750					
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:

RECEIVED FOR LABORATORY BY:	DATE	TIME	REMARKS
Lindy [illegible]	4-8-88	10:00	pH of preserved samples verified.

#S804038

RADIAN CORPORATION

8501 Mo-Pac Blvd.
P.O. Box 201088
Austin, TX 78720-1088

Chain of Custody Record

SACRAMENTO – RED Coleman Polylite

PROJECT CARSWELL AFB

SITE 01

COLLECTOR M. POWERS / R. PETROSSIAN

Analyses: 625

SAMPLE I.D.	WELL ID	TYPE	DATE/TIME	625	REMARKS
04-18	1 E	Groundwater	07 APR 88	X	
04-20	DUPLICATE	DUPLICATE	↓	X	
TOTAL =	4 1-LITER	AMBER	GLASS		

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
M. Powers	4/7/88	1808					
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:

RECEIVED FOR LABORATORY BY:	DATE	TIME	REMARKS
[illegible]	4/8/88	130 AM ~~PM~~	~~FINAL~~ ORIGINAL

– DRAFT –

RADIAN CORPORATION
8501 Mo-Pa[illegible]
P.O. Box 20[illegible]
Austin, TX 78720-1088

Chain of Custody Record

PAATAI - BLUE COLEMAN

PROJECT CARSWELL AFB

SITE 01

COLLECTOR M. POWERS / R. PETROSSIAN

SAMPLE I.D.	WELL ID	TYPE	DATE/TIME	Oil & Grease	601 & 602	Nitrate	Metals - As, Pb, Hg	Metal Screen - 200.7	Fluoride, Chloride	Sulfate, TDS	Orthophosphate	REMARKS
04-12	1A	GROUNDWATER	07 APR 88	X	X	X	X	X	X	X	X	
04-19	1F	GROUNDWATER	↓	X	X	X	X	X	X	X	X	
04-20	DUPLICATE	DUPLICATE	↓	X	X	X	X	X	X	X	X	
04-13		TRIP BLANK	↓		X							
04-14		FIELD BLANK	↓		X							
		3 1 Liter wide mouth, 9 500ml PLASTIC, 20 VOA's										

- DRAFT -

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
M. Powers	4/7/88	18:03					
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:

RECEIVED FOR LABORATORY BY:	DATE	TIME	REMARKS
Cindy Zimmerman	4-5-88	10:00	pH of preserved samples verified.

8804040
8804041

RADIAN CORPORATION

8501 Mo-Pac Blvd.
P.O. Box 201088
Austin, TX 78720-1088

Chain of Custody Record

Austin - Red Coleman

PROJECT: CARSWELL AFB

SITE: 04 & 01 & 16

COLLECTOR: M. Powers / R. Petrossian

Analytes

SAMPLE I.D.	Well ID	TYPE	DATE/TIME	601	602	Nitrate	Fluoride, Chloride, Sulfate, TDS, orthophosphate	Metal Screen, As	Pb, Hg, Se	Oil and Grease	REMARKS
04-21	1F	Equip. Blank	08 Apr 88	X	X	X	X	X	X	X	X	
04-22	16 up1	Surface water		X	X	X	X	X	X	X	X	
04-23	16 up2	Surface water		X	X	X	X	X	X	X	X	
04-24	16 Dn3	Surface water		X	X	X	X	X	X	X	X	
04-25	16 Dn4	Surface water		X	X	X	X	X	X	X	X	
04-26	4C	Ground water	08 Apr 88	X	X	X	X	X	X	X		

NOTE: Analyse NOT needed for TDS on 04-21 (1F)
Analyse NOT needed for Lead on 04-26 (4C)

- DRAFT -

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
W. J. McIntyre	8 Apr 88	1655					
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:

RECEIVED FOR LABORATORY BY:	DATE	TIME	REMARKS
Linda Gardner	4-7-88	1100	Sample 04-21 for Oil and Grease needed further pH adjustment. All other preserved samples checked for pH.

RADIAN CORPORATION
8501 Mo-Pac
P.O. Box 201088
Austin, TX 78720-1088

Chain of Custody Record

AUSTIN-BLUE HOLE

PROJECT CHRISWELL AFB

SITE 04 & 05

COLLECTOR GARY GRAY / R. ROTROSSEN

Analyses: 601 & 602; Nitrate 353.1; Metals - 200.7 & 200.8; 245.1 & 270.2; TDS, 340.2 & 365.3; 3754 365.1

SAMPLE I.D.	WELL ID	TYPE	DATE/TIME	601 & 602	Nitrate 353.1	Metals - 200.7 & 200.8	245.1 & 270.2	TDS, 340.2 & 365.3	3754 365.1	REMARKS
04-57	4H	GROUNDWATER	04/88	X	X	X	X	X	X	ALL THE TRIP
04-58	4H	TRIP BLANK		X						BLANKS ALREADY
04-59	4H	FIELD BLANK	"	X						HAD BUBBLES
04-60	4G	GROUNDWATER	"	X	X	X	X	X	X	IN THEM EXCEPT
04-61	5H	"	"	X	X	X	X	X	X	FOR ABOUT 10
04-62	5G	"	"	X	X	X	X	X	X	TOTAL BOTTLES = 15 TOTAL
04-63	5G	TRIP BLANK	"	X						36 VOA'S
04-64	5G	FIELD BLANK	"	X						
04-65	4E	GROUNDWATER	"	X	X	X	X	X	X	

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
[signature]	04/88	18:44					
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:

RECEIVED FOR LABORATORY BY:	DATE	TIME	REMARKS
[signature]	4 12 88	0730	04 35 1103 preserved on receipt others preserved OK

8804056
57

RADIAN CORPORATION

8501 Mo-Pac Blvd.
P.O. Box 201088
Austin, TX 78720-1088

Chain of Custody Record

AUSTIN - RED COLEMAN

PROJECT CARSWELL AFB

SITE 04 & 05

COLLECTOR M. Powers & R. Petrossian

Analyses

SAMPLE I.D.	WELL ID	TYPE	DATE/TIME	601 & 602	Metals 200.7	206.2, 245.1, 270.2	Nitrate	TDS 340.2, 325.3	365.	REMARKS
04-43	5D	Ground water	12 APR 88	X	X	X	X	X	X	
04-44	5A	↓	↓	X	X	X	X	X	X	
04-47	5A	DUPLICATE	↓	X	X	X	X	X	X	
			TOTAL							
			BOTTLES =	12 VOA's						
				9 500 ml PLASTIC						

-DRAFT-

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
[illegible]	12 APR 88	1807					
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:

RECEIVED FOR LABORATORY BY:	DATE	TIME	REMARKS
Linda [illegible]	4-12-88	11:00	pH of preserved samples verified.

RADIAN CORPORATION
8501 Mo-Pac
P.O. Box 201088
Austin, TX 78720-1088

Chain of Custody Record

AUSTIN - BILL COLEMAN

PROJECT CARSWELL AFB

SITE 04 & 05

COLLECTOR MATTHEWS & CROSSMAN

Analyses

SAMPLE I.D.	WELL ID	TYPE	DATE/TIME	601 & 602	Metals 200.7, 200.9	241.1 + 2.7.2	Nitrate	TDS, 340.2, 325.3	375.4, 325.3					REMARKS
04-36	4D	GROUNDWATER	12 APR 88	X	X	X	X	X	X					TOTAL BOTTLES
04-37	4D	EQUIP RINSE		X	X	X	X	X	X					36 VOA's
04-38	4F			X	X	X	X	X	X					21 500 ml
04-39	4F	DUPLICATE		X	X	X	X	X	X					PLASTIC
04-40	4F	TRIP BLANK		X										
04-41	4E	FIELD BLANK		X										
04-42	4F	EQUIP RINSE		X	X	X	X	X	X					
04-44	5B	GROUND H2O		X	X	X	X	X	X					
04-45	5E	"	"	X	X	X	X	X	X					

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
[illegible]	12 APR 88	1815					
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:

RECEIVED FOR LABORATORY BY:	DATE	TIME	REMARKS
Cindy Bieschang	4-13-[illegible]	11:00	Samples 04-36 and 04-45 needed further pH adjustment for metals [illegible]

38040X-2
003
004

RADIAN CORPORATION

8501 Mo-Pac Blvd.
P.O. Box 201088
Austin, TX 78720-1088

Chain of Custody Record

HUNTING BELLE TERMOS

PROJECT CARSWELL AFB

SITE 12

COLLECTOR J. CANNO

Analyses

SAMPLE I.D.	WELL ID	TYPE	DATE/TIME	VOA & GC	Fluoride, Chloride	Cadmium, Total Metals	Nitrate	Metals - Total	Metals - Total	PETROLEUM HYD.			REMARKS
04-58	12E	Groundwater	13 APR 88	X	X	X	X	X	X	X			EQUIPMENT RINSE
04-59	12C	"	"	X	X	X	X	X	X	X			
04-56	12E	"	"	X	X	X	X	X	X	X			
			TOTAL BOTTLES	12 VOA's									
				9 500ml plastic									
				6 500ml WM BRIERE									

DRAFT

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
[illegible]	13 APR 88	1805					
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:

RECEIVED FOR LABORATORY BY:	DATE	TIME	REMARKS
[illegible]	4 14 [illegible]	1000	Sample 04-59 needed further pH adjustment for metals split. Samples 04-59 and 04-56 needed [illegible]

CORPORATION
6001 Mo-Pac
P.O. Box 20106
Austin, TX 78720-1088

Chain of Custody Record

AUSTIN - BLUE COLEMAN

PROJECT: CARSWELL AFB

SITE: 10 & 05 & 12

COLLECTOR: F. CHAVEZ & R. PETROSSIAN

Analyses

SAMPLE I.D.	WELL ID	TYPE	DATE/TIME	601 & 602	Fluoride, Chloride, Sulfate	TDS, Orthophosphate	Nitrate	Metals 200.7, 200.8	7470	7421	8270	8260	REMARKS
04-50	10A	Groundwater	13 APR 88	X	X	X	X	X	X	X	X	X	Bottles
04-50	5C	"		X	X	X	X	X	X				15 500mL
04-48	5C	EQUIP RINSE		X	X	X	X	X	X				4 500mL
04-51	10A	TRIP BLANK		X									36 VOA
04-52	10A	FIELD BLANK		X									1L amber
04-53	12D	Groundwater		X	X	X	X	X	X	X			
04-54	12D	TRIP BLANK		X									
04-55	12D	FIELD BLANK		X									
04-57	12B	Groundwater	✓	X	X	X	X	X	X	X			

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
[illegible]	13 APR 88	1828					
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:

RECEIVED FOR LABORATORY BY:	DATE	TIME	REMARKS
[illegible]	4-14-88	1000	Sample 04-57 needed further pH adjustment for Nitrate split.

10-86-25948

5804076

RADIAN CORPORATION

8501 Mo-Pac Blvd.
P.O. Box 201088
Austin, TX 78720-1088

Chain of Custody Record

SACRAMENTO - RED16200

PROJECT: CARSWELL AFB

SITE: 012 9

COLLECTOR: G. SHAW & R. PETROSSIAN

Analyses: 625 (1-BOTTLE); Phenols (4-BOTTLES); 608 (2-1L BOTTLES); A509B (2-1L BOTTLES, 500 ML AMBER)

SAMPLE I.D.	TYPE	DATE/TIME	625	Phenols	608	A509B	REMARKS
64-50 10A	Groundwater	APR 13 88	X	X	X		I know this
64-59 12C	"		X				are not 2
							for 625.
		TOTAL					Sorry
		BOTTLES	4 5 1L AMBER				Kim
			4 500 ml AMBER				

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
[illegible]	13 APR 88	1744					
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:

RECEIVED FOR LABORATORY BY:	DATE	TIME	REMARKS
[illegible]	1 14 88	[illegible]	[illegible]

CORPORATION
8501 Mo-Pac E
P.O. Box 201088
Austin, TX 78720-1088

74

Chain of Custody Record

AUSTIN - LAKE MADISON COLEMAN

PROJECT CRISWELL RFB

SITE

COLLECTOR J SHAW / R PETERSON

Analyses

SAMPLE I.D.	TYPE	DATE/TIME	418.1	601/602	602	243.1	270.2	Nitrate	TDS	240.2	325.3	375.4	351.3	601/8	602	REMARKS
04-61 10B EQUIPR.	Groundwater	14 APR 88	X											X		
04-62 10C			X											X		
04-64 17I			X											X		
04-66 NPL 5F				X	X	X	X	X						X		
04-67 " 5F	EQUIP RINSE													X		
04-68 NPL 17M			X	X	X	X	X	X						X		
04-68 " 17K			X	X	X	X	X	X						X		
04-63 10C	DUP													X		
	TOTAL	28 VOA'S	10 500 mL AMBER, 9 500 mL													PLASTIC

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
[signature]	14 APR 88	2007					
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:

RECEIVED FOR LABORATORY BY:	DATE	TIME	REMARKS
[signature]	4 15 88	1000	Samples 04-64, 04-66, 04-68 needed further pH adjustment w/ HNO3. Samples 04-64, 04-65, 04-68 needed further pH adjustment w/ HCl. Samples 04-60, 04-64, 04-65 needed further pH adjustment w/ H2SO4.

- DRAFT -

10-86-25948

58040183

RADIAN CORPORATION

8501 Mo-Pac Blvd.
P.O. Box 201088
Austin, TX 78720-1088

Chain of Custody Record

SACRAMENTO - RED SMALL

PROJECT CARSWELL AFB

SITE 10

COLLECTOR G. SHAW / R. PETROSIAN

Analyses

SAMPLE I.D.		TYPE	DATE/TIME	A8260B	608	601 Phenols		REMARKS
04-62	10C	Groundwater	14APR88	X	X	X	2x1l	
04-63	10C	DUPLICATE	"		X	X		
04-60	10B		"	X				
04-61	10B	EQUIP RINSE	"		X			
			TOTAL					
			BOTTLES	= 10 1L AMBER				

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
[illegible]	14APR88	1945					
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:

RECEIVED FOR LABORATORY BY:	DATE	TIME	REMARKS
[illegible]	4-15-88	9 am	SACNOAA 1943222[illegible]

- DRAFT -

E-85

KADIAN CORPORATION
8501 Mo-Pac Blvd
P.O. Box 201088
Austin, TX 78720-1088

074

Chain of Custody Record

HULTIN - MARRADON COLEMAN

PROJECT PHASE WELL NFB

SITE [illegible] 10

COLLECTOR [illegible] / K. Petersson

Analyses

SAMPLE I.D.	TYPE	DATE/TIME	Water	Nitrate	TDS	Cl	602	601	OVG	REMARKS
04-64 MW 17I	SW	April 14 88	X	X	X					
04-67 MW 5F	EQUIP RINSE	↓	X	X	X					
04-63 10C	DUP	↓	X	X	X					
04-65 10B		↓	X	X	X	X	X	X	X	
04-61 10B	EQUIP RINSE	↓	X	X	X				X	
04-62 10C		↓	X	X	X				X	
04-15 MW 1B		↓				X				
		~~TOTAL~~	3 500 ml NUMBER						7 VOA'S	
			18 500 ml PLASTIC							

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
[illegible]	14 APR 88	2017					
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:

RECEIVED FOR LABORATORY BY:	DATE	TIME	REMARKS
[illegible]	4-15-88	1000	Samples 04-64, 04-66, 04-68 needed further pH adjustment with HNO_3. Samples 04-64, 04-65, 04-66 needed further pH adjustment with HCl. Samples 04-60, 04-64, 04-65 need further pH adjustment with H_2SO_4

DRAFT

10-86-25948

RADIAN CORPORATION
8501 Mo-Pac Blvd.
P.O. Box 201088
Austin, TX 78720-1088

Chain of Custody Record

SACRAMENTO - SMOLL MAIKROON

PROJECT CARSWELL AFB

SITE [illegible]

COLLECTOR F. SHAW / R. PETROSSIAN

Analyses

SAMPLE I.D.	TYPE	DATE/TIME	[illegible]	[illegible]	[illegible]	REMARKS
04-61 [illegible]	[illegible]	[illegible]	X	X	1	[illegible]
04-[illegible] [illegible]	"	"	X	X	1	
[illegible] [illegible]	"	"		X		
[illegible] 10F	"	"	X			
		TOTAL				
		BOTTLES	10	1	[illegible]	

- DRAFT -

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
[illegible]	[illegible]	1955					
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:

RECEIVED FOR LABORATORY BY:	DATE	TIME	REMARKS
			[illegible]

RADIAN CORPORATION
8501 Mo-Pac
P.O. Box 201088
Austin, TX 78720-1088

Chain of Custody Record

AUSTIN - BLUE LITTLE COLEMAN

PROJECT CARSWELL AFB

SITE 10

COLLECTOR G. SHAW / K. PETROSSIAN

Analyses: 413.2 ONG; 418.1 HC

SAMPLE I.D.		TYPE	DATE/TIME	413.2 ONG	418.1 HC	REMARKS
04-60	10B	Groundwater	14 APR 88	X		
04-61	10B	Equip Rinse	"	X	X	
04-62	10C	Groundwater	"	X	X	
04-63	10C	DUP	"	X	X	
			TOTAL BOTTLES	9 500mL AMBER		

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
[signature]	15 APR 88	1933					
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:

RECEIVED FOR LABORATORY BY:	DATE	TIME	REMARKS
Cindy Zeiding	4-16-88	1100	pH of preserved samples verified.

- DRAFT -

0-86-25948

#5804131

RADIAN CORPORATION

8501 Mo-Pac Blvd.
P.O. Box 201088
Austin, TX 78720-1088

Chain of Custody Record

Analyses

PROJECT

SITE

COLLECTOR

SAMPLE I.D.	I.L	TYPE	DATE/TIME	504 Metals	Acrylic			REMARKS
[illegible]	[illegible]	[illegible]	22 Apr 88	X	X	X	(2x1L each)	Re-sample
[illegible]	[illegible]	Effluent [illegible]	22 Apr 88		X		(1x1L)	
			TOTAL =	7 x 1L AMBER				

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
[illegible]	[illegible]	[illegible]					
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:

RECEIVED FOR LABORATORY BY:	DATE	TIME	REMARKS
[illegible]	[illegible]	[illegible]	[illegible]

DRAFT

RADIAN CORPORATION
8501 Mo-Pac
P.O. Box 201088
Austin, TX 78720-1088

Chain of Custody Record

AUSTIN – RED Coleman

PROJECT CARSWELL AFB

SITE 30

COLLECTOR F. SHAW / R. Petrossian

Analyses

SAMPLE I.D.	WELL ID	TYPE	DATE/TIME	418.1	HC	TDS	Metal Screen - 200.7	206.2	239.2	245.1	270.2	601 & 602	REMARKS
04-74	BSS-B	Groundwater	15 APR 88	X	X		X	X			X		
04-75	BSS-B	DUP	"	X	X		X	X			X		
04-76	BSS-C	Groundwater	"	X	X		X	X			X		
04-77	BSS-A	"		X	X		X	X			X		
04-78	BSS-A	Equip Blank	"	X			X	X			X		
04-79	BSS-B	FIELD BLANK	"								X		
04-80	BSS-B	TRIP BLANK	"								X		
			TOTAL BOTTLES	10 500mL AMBER							28 VOAS		
				8 500mL PLASTIC									

DRAFT

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
[signature]	15 APR 88	1902					
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:

RECEIVED FOR LABORATORY BY:	DATE	TIME	REMARKS
Cindy Zieschang	4-16-88	11.00	Received sample 04-98 preserved w/ HNO_3. Samples 04-74 needed further pH adjustment for HC split.

10-86-25948

8304C79
80

RADIAN CORPORATION

8501 Mo-Pac Blvd.
P.O. Box 201088
Austin, TX 78720-1088

Chain of Custody Record

AUSTIN

PROJECT CARSWELL AFB

SITE 17

COLLECTOR F. SHOW / R. PETROSSIAN

Analyses

SAMPLE I.D.		TYPE	DATE/TIME	418.1 HC	601 & 602	340.2, 325.3, 375.4 GPI	353.1	160.1, 160.2, 353.1	200.7, 200.2, 239.2	245.1	270.2	wrong 040	REMARKS
04-69	17J	Groundwater	15 APR 88	X	X	X X	X	X	X	X			There was
04-70	17J	DUP		X	X	X X	X	X	X	X			supposed to be
04-71	17J	Equip Blank		X	X	X X	X	X	X	X	X	X	a 17J Equip Blk
04-72	17L	Groundwater		X	X	X X	X	X	X	X			tested for 418.1
04-73	17L	Equip Blank		X	X	X X	X	X	X	X			but I didn't
				no sample									see it, will send
													another. Rick
			TOTAL BOTTLES =	2 1 L AMBER						15 500 mL			
				5 500 mL AMBER						5 70 VOA's			

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
[signature]	15 APR 88	1925					
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:

RECEIVED FOR LABORATORY BY:	DATE	TIME
Cindy Zieschang	4-16-88	1100

REMARKS Samples 04-69, 04-70 needed further pH adjustment for metals split. Samples 04-69, 04-70, 04-72 needed further pH adjustment for HC split.

10-86-25948

6501 Mo-Pac F
P.O. Box 20108
Austin, TX 78720-1088

Chain of Custody Record

AUSTIN - BLUE COLEMAN

PROJECT: CARSWELL AFB

SITE: 3

COLLECTOR: R. PETROSSIAN / G. SHAW

Analyses: O.L & GREASE

SAMPLE I.D.	WELL ID	TYPE	DATE/TIME	O.L & GREASE	REMARKS
04-01	3D	GROUNDWATER	16APR88	X	
			TOTAL BOTTLES	4 x 500 mL AMBER	

- DRAFT -

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
[illegible]	16APR88	11:30					
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:

RECEIVED FOR LABORATORY BY:	DATE	TIME	REMARKS
Cindy Zuerchang	4-16-88	11:00	pH of sample verified.

10-86-25948

FINAL PAGE

ADMINISTRATIVE RECORD

FINAL PAGE

FINAL PAGE

ADMINISTRATIVE RECORD

FINAL PAGE