Completion Report DOE/ID/01638-1
Modification No. A004
Contract No. DE-A507-76ID01638

MASTER

Submitted to

U. S. Department of Energy
Idaho Operations Office

DOE/ID/01638--1

DE82 014286

HYDROCHEMISTRY OF SELECTED PARAMETERS AT THE RAFT RIVER KGRA, CASSIA COUNTY, IDAHO

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David L. Graham

Dale R. Ralston

David W. Allman

College of Mines and Earth Resources
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ABSTRACT

Low to moderate temperature (<150°C) geothermal fluids are being developed by ÉG & G Idaho, Inc. and the U. S. Department of Energy in the southern Raft River Valley of Idaho. Five deep geothermal wells ranging in depth from 4911 feet to 6543 feet (1490 to 1980 meters) and two intermediate depth (3858 feet or 1170 meters) injection wells have been drilled within the Raft River KGRA. Several shallower (1423-500 feet or 430-150 meters) wells have also been constructed to monitor the environmental effects of geothermal development on the shallower aquifer systems.

Sampling of water from wells within the KGRA has been conducted since the onset of the project in 1974. Five analytical laboratories have conducted analyses on waters from the KGRA. Charge-balance error calculations conducted on the data produced from these laboratories indicated that data from three laboratories were reliable while two were not. A method of equating all data was established by using linear regression analyses on sets of paired data from various laboratories.

The chemical data collected from the deep goethermal wells indicates that a two reservoir system exists within the Raft River KGRA. Each reservoir is associated with a major structural feature. These features are known as the Bridge Fault System (BFS) and the Narrows Structure (NS). The BFS is a series of normal faults. These trend in a northeasterly direction and dip steeply towards the valley floor. The NS is a right lateral strike-slip fault trending roughly east-west.

The majority of the geothermal activity occurs near the intersection of these two features.

The fluids associated with the BFS have much lower concentrations of dissolved constituents than the fluids from the NS. The BFS fluids have a total dissolved soilds (TDS) level of about 1300 mg/l (milligrams per liter) while the fluids from the NS exhibit a TDS of about 4300 mg/l. The fluids from both systems are alkali chloride type geothermal waters with the major cation being Na^+ and the major anion being Cl^-. Based on reservoir analyses, the BFS appears to be able to transmit fluid more rapidly than the NS. This facilitates a longer residence time for the fluids in the NS thus resulting in a more concentrated fluid.

Geothermal fluids move vertically up fractures from depth and then mix laterally with water from shallower aquifers. The mix of geothermal fluids is best exhibited in well USGS-1. A shallow plume of geothermal fluid has resulted along the major fractures. This plume does not appear to extend to the south or east more than a mile from the central geothermal area. The most pronounced movement is along the BFS. This is believed to be due to the fact that this fracture system is more transmissive than the NS.

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INTRODUCTION

Statement of the Problem

The southern Raft River Valley has long been recognized as a potential geothermal area (Figure 1). Stearns and others (1938) mentioned the geothermal resources of the area while conducting a study of the geology and ground water resources of the Snake River Plain. Extensive geologic, hydrologic, geochemical, and geophysical studies have been conducted in the Raft River Valley by ERDA (Energy Research and Development Administration), U. S. Geological Survey, and Aeroject Nuclear (EG & G Idaho, Inc.) starting in the early 1970's. To date, five deep geothermal production wells and two intermediate depth injections wells have been drilled in the Raft River KGRA (Known Geothermal Resource Area).

It is the intent of this study to examine the hydrogeologic regime at the Raft River KGRA using existing hydrochemical data collected from geothermal, monitor, and irrigation wells. This project was funded in part by a research contract with EG & G Idaho, Inc.

Purpose and Objectives

The purpose of this study is to gain additional knowledge on the subsurface hydrochemical and hydrogeological environment at the Raft River KGRA. This additional knowledge will compliment other research activities to facilitate maximum utilization of the geothermal resource.

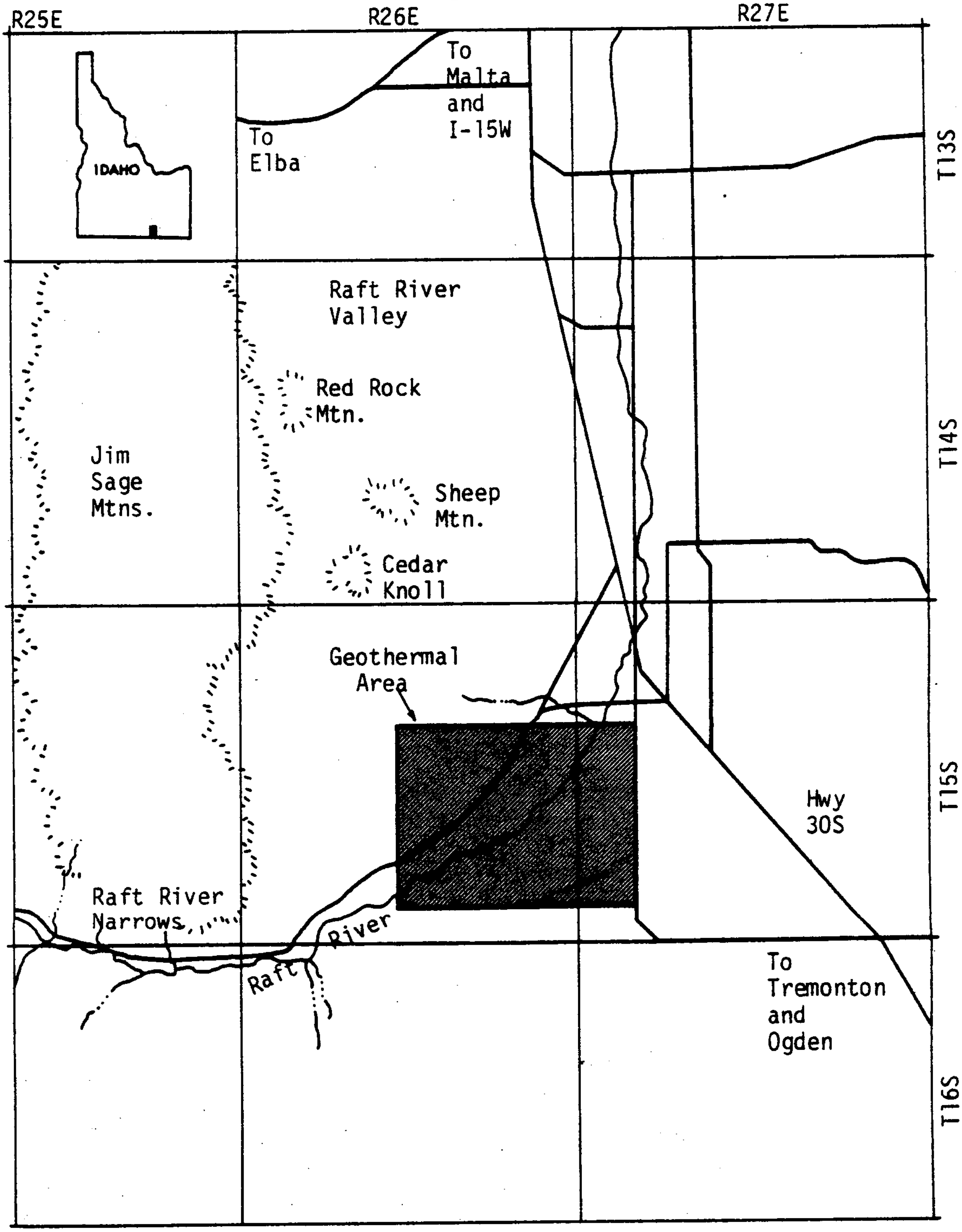


Figure 1. Location of the Raft River Geothermal Study Area.

The general objective of the study is to utilize selected hydrochemical data to further evaluate the hydrogeologic controls for and the extent of geothermal resource(s) in the Raft River KGRA. This general objective will be accomplished by achieving the following four specific objectives:

1. review available information on the hydrogeology and development of geothermal resources in the study area,
2. compile and analyze available hydrochemical data and develop a reliable data base,
3. describe the hydrochemistry of geothermal resources in the study area, and
4. evaluate the hydrogeologic controls and extent of geothermal systems utilizing hydrochemical data.

Method of Study

Existing data related to the hydrogeology and hydrochemistry of geothermal resources in the study area were assembled. This was accomplished during two summers of work (1978-1979). During the second summer, all hydrochemical data were organized and a computer data base was established. Charge-balance error calculations were conducted on all complete analyses. Those analyses having percent errors greater than five percent were eliminated.

Linear regressions were fitted to selected determinations from laboratories generating reliable data versus laboratories producing unreliable analyses. The resulting equations were used to generate a corrected value for the questionable data. In this manner a new data base was generated so that more data could be utilized for future studies.

The data from reliable laboratories were then used to describe the hydrochemistry of ground water at the Raft River KGRA. Stiff diagrams and Schoeller semi-logrithmic plots were used to graphically display the data. A statistical test was performed on the hydrochemical data to test the hypothesis that two distinct geothermal reservoirs exist within the Raft River KGRA.

Previous Investigations

Many reports have been written on the geology and water resources of the Raft River Basin. These are best exemplified by the work completed by Anderson (1931), Stearns and others (1938), and Walker and others (1970). However, most of this work is not directly related to the Raft River KGRA.

Williams and others (1976) published a report on the geology and geophysics of the Raft River KGRA. Covington (1977a, 1977b, 1977c, 1977d, 1978, 1979b, 1979c, 1979d) produced a series of open-file reports correlating the geology as interpretted from drill cuttings to borehole geophysics for all deep wells. Two recent reports by Kennedy (1980) and Devine (1980) discuss the geology and depositional environments of the sediments found in the basin as interpretted from well cuttings or core samples.

Two reports have been written on the shallow ground water system at the Raft River KGRA. The first was a masters thesis at the University of Idaho by Morilla (1976) investigating the possibility of using the shallow ground water system in the cooling cycle of a power plant. The second, Nichols (1979), was an aquifer simulation model of the shallow system based on previous collected data.

Reports have been published on geochemical modeling of the Raft River KGRA. The most notable, by Overton and others (1979), attempted to characterize the geothermal reservoir based on geochemical data available at the time. Conclusions were drawn concerning the source of heat supplying the resource, mineralization, and groundwater movement within the system.

Many reports have been produced by EG & G Idaho, Inc. covering a multitude of topics related to the geothermal resources at the Raft River KGRA. Most of these papers have not been formally published but were for in-house use. Subjects studied include analysis of pump and injection tests, water chemistry, drilling, well design, geology, reservoir engineering, environmental impacts and economics.

HYDROGEOLOGY AND DEVELOPMENT OF THE RAFT RIVER KGRA

Regional Geology

The Raft River Valley lies in a north-south trending basin that was warped and downfaulted in late Cenozoic time. Sediments fill the valley to a depth of 4000 to 5000 feet (1220-1525 meters). These sediments overlie a basement core of metamorphic rocks (Devine, 1980).

Large fault block mountains rise above the valley as much as 6000 feet (1830 meters). There are six major mountain ranges in the area. These are tha Albion Range, Raft River Mountains, Black Pine Range, Sublett Range, and the Jim Sage and Cottrell ranges (Figure 2). The mountain ranges surrounding the basin are composed of Tertiary, Paleozoic, and Precambrian rocks. On the west, the valley is bounded by the Albion Range which is a gniess dome complex mantled by Paleozoic metamorphic rocks. The Jim Sage and Cottrell ranges flank the northwest margin of the valley. These ranges are composed of Tertiary rhyolite and tuffaceous rocks. The Black Pine and Sublett ranges define the eastern flank of the valley. These mountains consist of Pennsylvanian and Permian sedimentary rocks. The sourthern most end of the valley is bounded by the Raft River Mountains which trend east-west. These mountains have the same general geology as that found in the Albion Mountains.

All mountain ranges surrounding the valley have contributed sedimentary debris to the valley. As a result, the valley has filled with some 4900 feet (1500 meters) of material (thicknesses vary spacially within the valley).

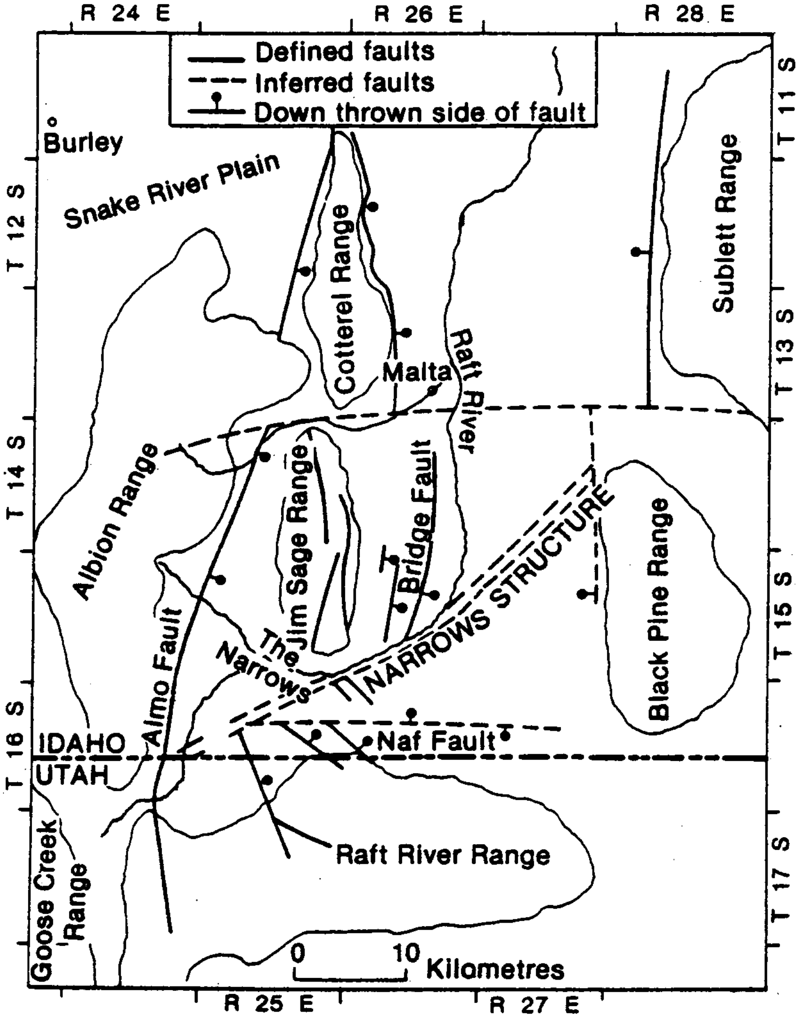


Figure 2. Location of major structural features in the vicinity of the Raft River KGRA.

The ranges surrounding the Raft River Basin have undergone numerous tectonic episodes that have resulted in their present form. Several periods of faulting and folding have been documented by Anderson (1931) and Compton (1972). Intense thrust faulting followed by Basin and Range type faulting have had the greatest impact on the present topography.

Geology of the Raft River KGRA

The Raft River KGRA is situated at the southern most end of the Jim Sage Mountains (Figure 1). Covington (1977a, 1977b, 1977c, 1977d, 1978, 1979c, 1979d) described the sediments found in the seven geothermal wells drilled in the KGRA. These descriptions were based on analysis of drill cuttings and geophysical logs. Covington concluded that the rocks belong to the Salt Lake formation. These sediments are underlain by a metamorphic complex similar to those found in the Albion and Raft River mountains.

Within the KGRA, the Salt Lake formation can be separated into upper and lower units based on Covington's logs. The upper unit consists mainly of gravels, sandstones, and siltstones. It ranges in thickness from 2375 feet (720 meters) in well RRGP-5 to 4125 feet (1250 meters) in well RRGE-3. The lower unit is composed of sandstones and siltstones. It ranges from 1250 feet (380 meters) thick in wells RRGE-2 and RRGE-3 to 2875 feet (870 meters) in well RRGP-5. The sandstones in the lower unit are finer grained than those in the upper unit (Devine, 1980).

Two recent reports have been written on the geology of the Raft River KGRA. Both of these reports are based on analyses of well cuttings and/or core samples. Kennedy (1980) described the upper 990 feet

(300 meters) of sediments. This analysis was based upon drill cuttings from seven monitor wells drilled at the KGRA. He concluded that the major process responsible for deposition of the upper sediments was coalescing alluvial fans formed at the base of the surrounding mountain ranges. Kennedy also stated that these fans have since been disected by other processes, mainly the meandering Raft River. Devine (1980), studied cores taken from the seven geothermal wells. He came to the same basic conclusion as did Kennedy; the sediments at depth appear to be the result of high energy alluvial fan deposits.

These sediments have been cut by several faults that act as a conduit system for the geothermal fluids. The major structural features in the KGRA are the Bridge Fault System and the Narrow Structure. The Bridge Fault System is a series of normal faults located along the southeast flank of the Jim Sage Mountains. This system trends in a northeasterly direction and dips steeply toward the valley (Figure 2). The Narrows Structure appears to be a right lateral strike-slip fault trending roughly east-west. It passes just south of the Jim Sage Mountains. Other faults are suspected in the area but are not manifested at the surface. Reservoir testing has shown that several faults or boundaries do exist in the immediate area of the KGRA.

Development of Geothermal Resource(s)

In the early 1970's extensive geologic, geochemical, geophysical, and hydrologic studies were initiated by ERDA (Energy Research and Development Administration), U. S. Geological Survey, and Aerojet Nuclear. A thorough exploration drilling program was implemented by the U. S.

Geological Survey. Water chemistry and heat flow studies were conducted at various drill locations (Williams and others, 1974; Williams and others, 1976; EG & G Idaho, Inc., 1979).

The general geology of the Raft River KGRA became apparent as geologic mapping and geophysical surveys were completed. Two major structural features were recognized in the area: Bridge Fault System and the Narrows Structure (Figure 2). These two systems intersect in the KGRA. It was believed that by drilling into these structural features, high fluid temperatures and increased hydraulic conductivity due to fracturing would be encountered.

The site of the first deep geothermal well at the Raft River KGRA was chosen by Aerojet Nuclear and the U. S. Geological Survey in 1974. RRGE-1 (Raft River Geothermal Exploration Well) was located near two hot (100°C) shallow irrigation wells so that it would intersect the Bridge Fault System at or near the contact between the Tertiary sediments and the older Paleozoic and Precambrian rocks. The location of this well can be seen in Figure 3. A maximum temperature of 146°C (295°F) and a flow of 600 gpm (gallons per minute) (28 L/sec) resulted.

Locations for additional wells were chosen as new data were accumulated. To date, five deep wells and two intermediate depth wells have been drilled. Wells RRGE-1, RRGE-2, RRGP-4 (double legged), and RRGP-5 are located along the Bridge Fault System. RRGE-3, which was triple legged, was drilled further to the east to intersect the Narrows Structure. Two wells, RRGI-6 and RRGI-7 were drilled as injection wells and are of intermediate depth (3858 feet) (1170 meters). Figure 3 shows the location of these wells. Figure 4 shows the depth and casing schedule of the deep and intermediate wells.

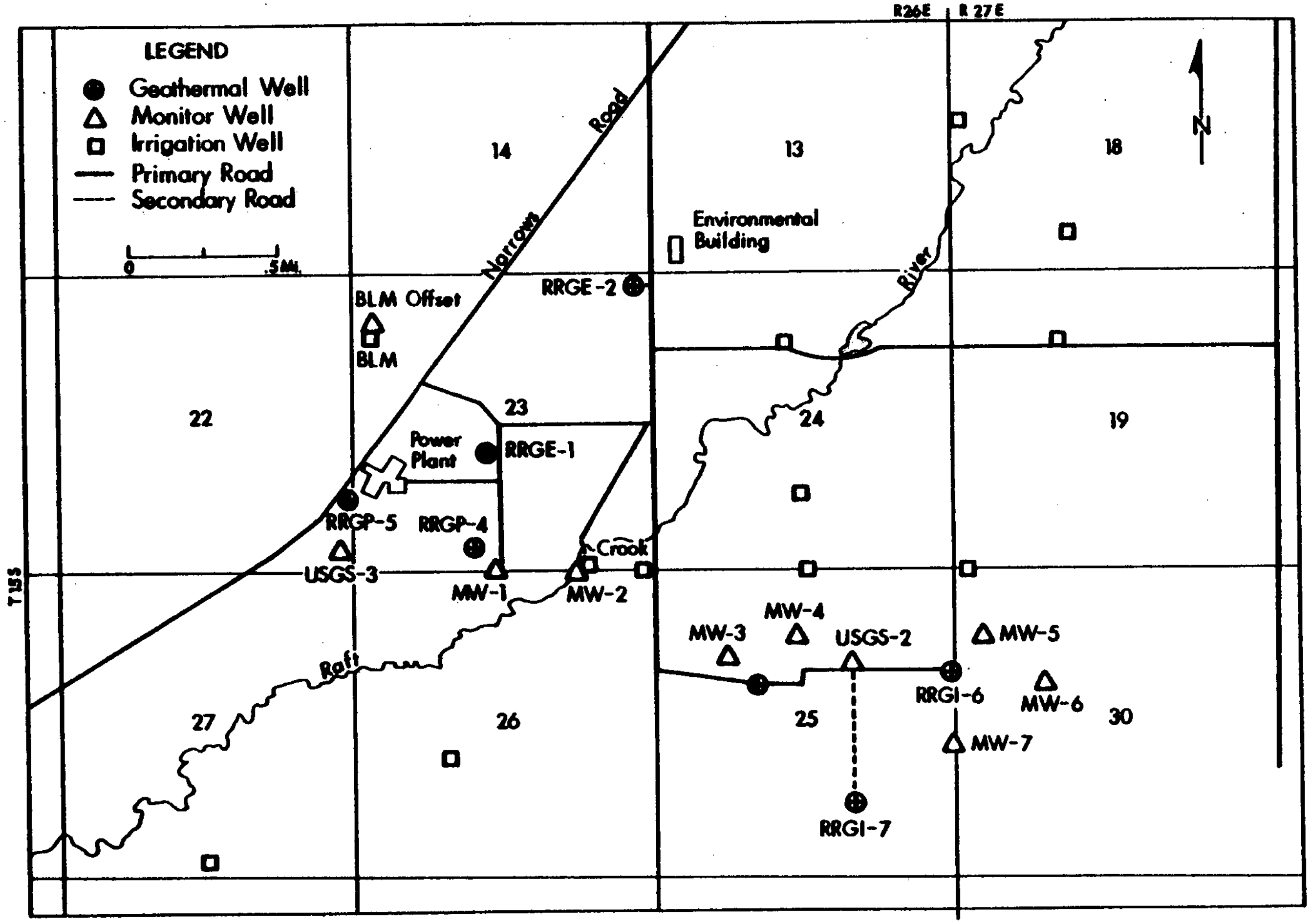


Figure 3. Location of the wells in the vicinity of the Raft River KGRA.

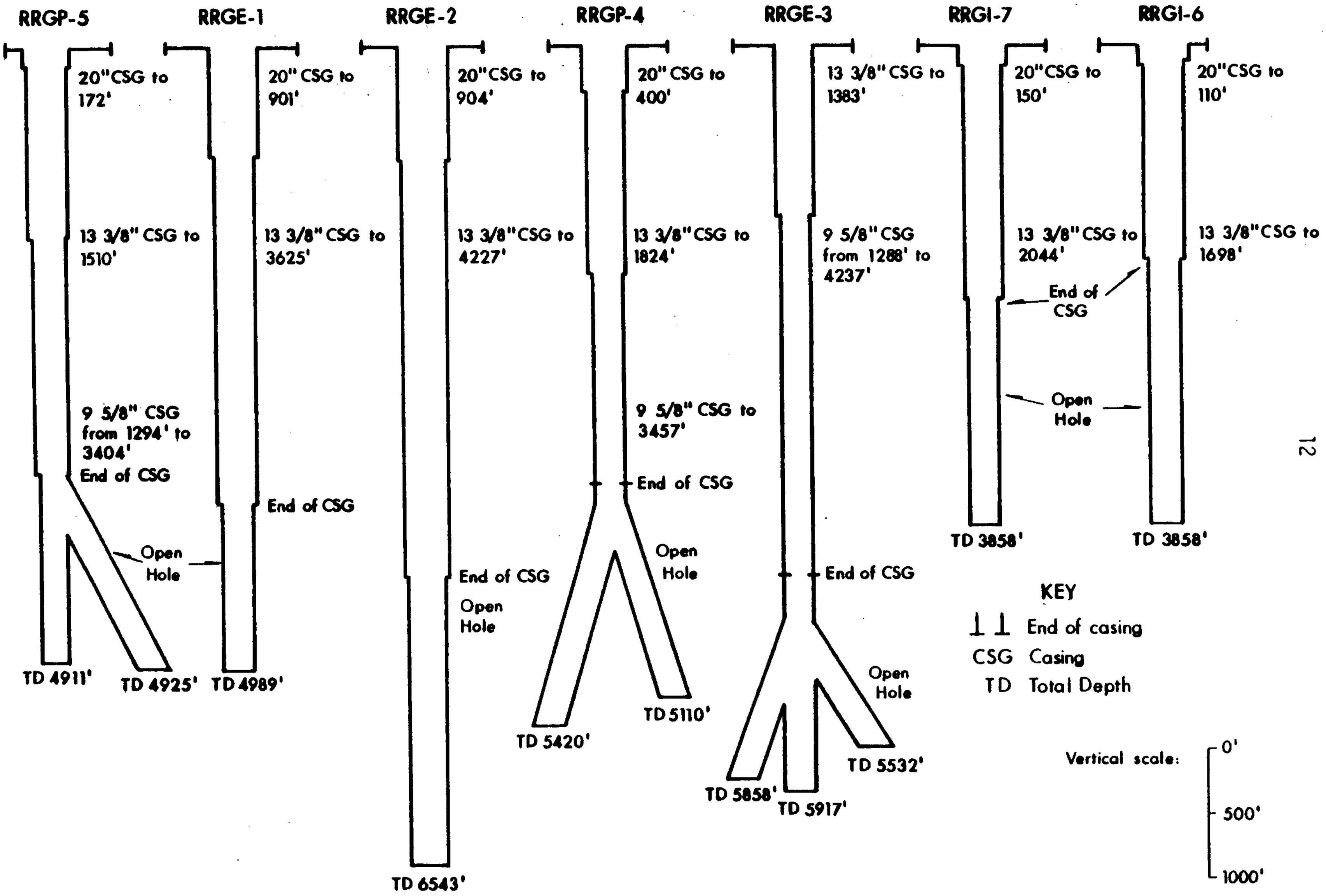


Figure 4. Depths and casing schedules of the seven geothermal wells at the Raft River geothermal site.

There are nine monitor wells at the Raft River Geothermal site. Seven of these were drilled by EG & G Idaho, Inc. and range from 500 to 1309 feet (150 to 400 meters) in depth. Two wells were drilled by the U. S. Geological Survey and are 800 and 1423 feet deep (240 and 435 meters) deep. These wells are used to determine the affects resulting from injection and/or production on the shallow aquifer. These wells are periodically pumped and sampled for water quality. Pressure changes and water level fluctuations are also measured in these wells. The location of these wells are shown in Figure 3. The depth and casing schedule of the wells are shown in Figure 5.

Groundwater Flow Systems

There are distinct hydrologic and hydrochemical systems within the Raft River KGRA. The deep geothermal aquifer(s) range from approximately 2000-4000 feet (610-1220 meters). Above this system(s) are an intermediate zone between 1400 and 2000 feet (430-610 meters) and a shallow unconfined system that extends to less than 500 feet (150 meters).

Shallow Aquifer

The stratigraphy of the Raft River Valley sediments is complex. It has resulted from alluvial and fluvial depositional processes acting alone or in concert. The processes have produced a sequence of generally fine grained sediments; individual units are and may be followed for only very short distances. The discontinuous nature of individual units results in a complex sequence of "local" aquifers and local confining units. As a result, the shallow aquifer does not respond as a simple unconfined ground water system. The aquifer tends to respond as a leaky

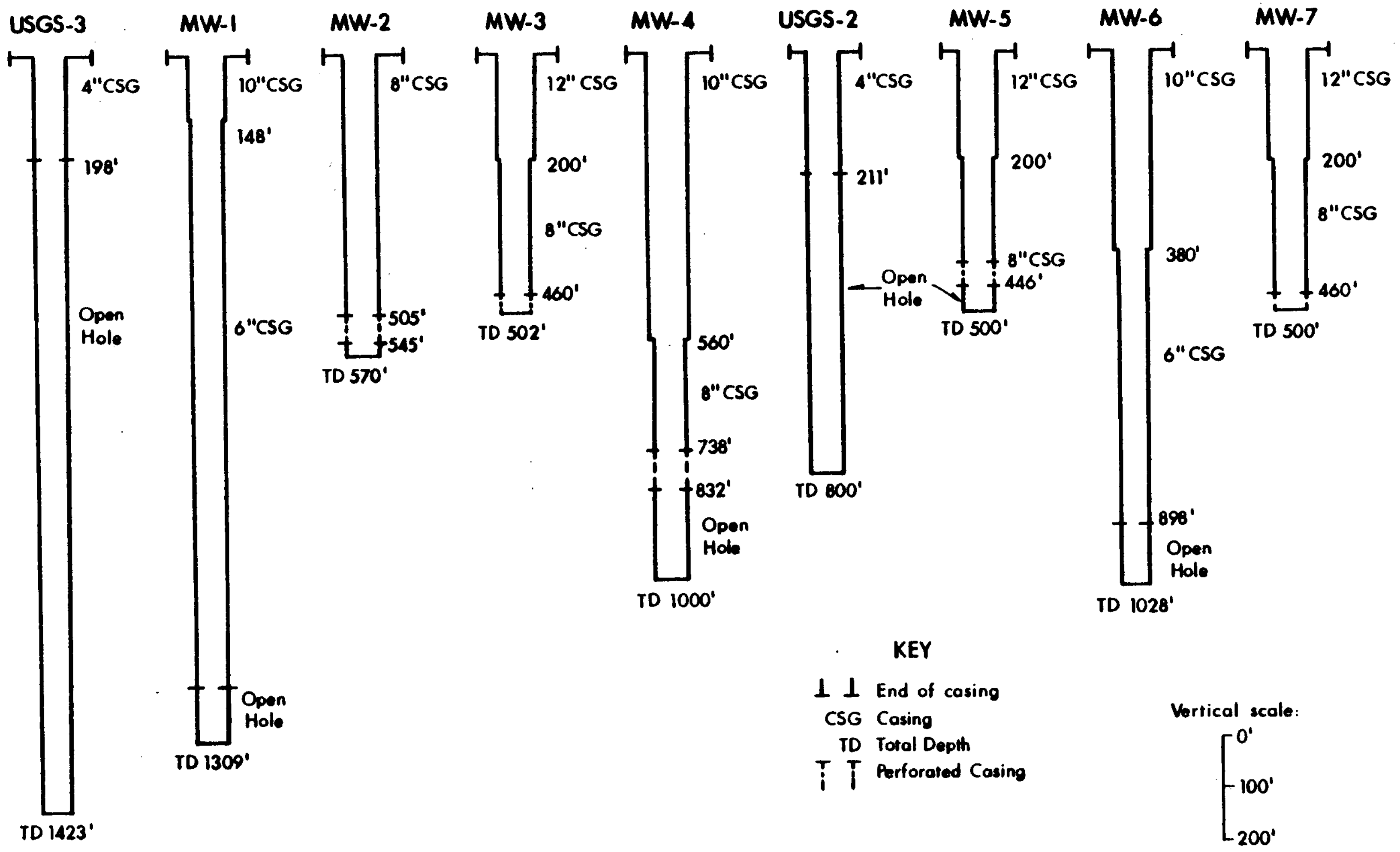


Figure 5. Depths and casing schedules of the monitor wells in the vicinity of the Raft River KGRA.

artesian system when stressed for short periods of time and as an unconfined system when stressed over long periods of time (Morilla, 1976).

Morilla (1976) conducted a pump test on the shallow system in the vicinity of the Raft River Geothermal site. The data from the test in the KGRA indicated a mean transmissivity of 5 x 10^5 $ft^2 day^{-1}$ and a mean storage coefficient of 5 x 10^{-3}. Morilla (1976, p. 79) concluded that:

> The long-term hydrologic impacts of aquifer development will be controlled by the change in aquifer characteristics from leaky-artesian to water table conditions. The initial and final values of the coefficient of storage are estimated to be 0.005 and 0.18.

This conclusion was based on calculations derived from the formation of an analytic model of the shallow ground water system.

Steady-state and transient simulation analyses were used by Nichols (1979) to evaluate and modify earlier concepts about the hydrodynamics of the unconfined system in the southern portion of the Raft River Basin. He concluded that ground water flow and stream loss in the vicinity of the Raft River Narrows were not the principal means of recharge to the aquifer. Nichols stated that the majority (∿66 percent) of the recharge enters the shallow aquifer as vertical leakage from deeper systems. The upward leakage occurs through relatively thick confining beds with low hydraulic conductivity. The upward leakage is best exhibited by two shallow wells with exceedingly high temperatures. These are the Crook Well, 535 feet deep (160 meters), and the BLM well, 387 feet deep (120 meters). The locations of these wells are shown on Figure 3. Both wells have temperatures of approximately 100°C.

Nichols concluded that geothermal development would have limited affect on the shallow aquifer system. Theoretical calculations showed that the effects of development of the geothermal resources might not be noticed in the unconfined system for 100 years or more.

Intermediate Zone

An intermediate system has been documented during drilling of the deep geothermal wells. It appears as an area of lost circulation on most well logs. The zone is capable of accepting several hundred gallons per minute of drilling fluid. The system varies between 1400 and 2000 feet (430-610 meters) in depth across the valley. Only USGS well #3 is bottomed in this zone.

Deep Geothermal System(s)

The geothermal system(s) in the Raft River KGRA are characterized by moderately high temperatures (less than 150°C) with high well head pressures ranging from 130 to 180 psig (pounds per square inch relative to atmospheric pressure). The flow in the system is definitely on the highly fractured nature of the formations (Stoker and others, 1977).

Data from deep wells indicate that two semi-isolated geothermal systems may be present on the Raft River KGRA. These are associated with the two major structural features controlling ground water flow. The hydrologic data indicate that the Bridge Fault System (BFS) is able to transmit fluids more readily than the Narrows Structure (NS). Numerous production and/or injection tests have been conducted on seven geothermal wells in the KGRA which demonstrate that wells RRGE-1, RRGE-2 and RRGP-5 have significantly higher hydraulic conductivity values than other wells. Both of these wells are located in the BFS (EG & G Idaho, Inc., 1979; Narasimhan and Witherspoon, 1977).

During pump and/or injection tests on wells in the other fracture system. Wells in one system have been monitored for interference. Hydraulic interferences from one system to the other have not been detected to date (EG & G Idaho, Inc., 1979).

COMPILATION AND EXAMINATION OF HYDROCHEMICAL DATA

Introduction

Water samples have been collected and analyzed for chemical constituents from deep geothermal wells, injection wells, monitor wells, irrigation wells, and the Raft River since the inception of the project. All available data were assembled and compiled for this project (Appendix A). At least five different analytical laboratories have been involved in performing chemical analyses throughout the course of the project. These laboratories were:

1. Idaho National Engineering Laboratory (INEL),
2. Idaho Department of Water Resources (IDWR),
3. U. S. Geological Survey (USGS),
4. Raft River Laboratory (RR), and
5. Energy Incorporated (EI).

Numerous individuals have collected water samples at the Raft River site. It is not known whether all samplers carefully followed the same sampling procedure. For this study it is assumed that carelessness in sampling is reflected in the degree of completeness and accuracy of the reported results. Some reported lab results were not included in the computer data base for this study. Data were eliminated from consideration on the basis of: 1) partial analyses, 2) unidentifiable analyses (e.g. lab, well, etc.) and 3) analyses other than major constituents (e.g. gases, isotopes).

Charge-Balance Error Calculations

A condition of electroneutrality exists in electrolyte solutions. This occurs when the sum of the positive ionic charges equals the sum of the negative ionic charges. This relationship can be expressed by the following equation

$$\Sigma ZM_C = \Sigma ZM_A$$

where Z is the ionic charge, M_C the molality of cation species, and M_A the molality of the anion species. Significant deviations from equality can be attributed to analytical erros or to the fact that ionic species of significant concentrations were not included in the analysis. A deviation from equality can be expressed as a percent in accordance with the following relationship

$$E = \frac{\Sigma ZM_C - \Sigma ZM_A}{\Sigma ZM_C + \Sigma ZM_A} \times 100$$

where E is the charge-balance error expressed in percent (Freeze and Cherry, 1979). If chemical analyses are expressed as meq (milliequivalents per liter), the valence term in the above equations can be omitted. An error greater than five percent for any analysis is usually considered unacceptable. It must be kept in mind that large offsetting analytical errors may be present in a sample which has an acceptable charge-balance.

This procedure was the main criteria used for eliminating poor analyses from the analytical data for the Raft River KGRA. The percentage of analyses with errors less than five percent for each laboratory are listed in Table 1. All analyses with errors less than five percent have been presented in Appendix C.

Table 1. Percent of usable analyses for each laboratory, Raft River KGRA.

Laboratory*	No. of Analyses	No. of Analyses with % error <5%	% Usable Analyses
INEL	50	40	80
IDWR	157	146	93
USGS	14	13	93
RR**	346	-	-
EI	25	14	56

* INEL - Idaho National Engineering Laboratory
IDWR - Idaho Department of Water Resources
USGS - U. S. Geological Survey
RR - Raft River Laboratory
EI - Energy Incorporated

** RR lab does not conduct a thorough enough analyses to facilitate a calculation for charge-balance error.

Analysis of Individual Laboratories

INEL

The chemical plant at the INEL site is a well established analytical chemistry laboratory. They have well trained technicians, the latest analytical equipment, and a stringent quality control program. Based on the above information plus the results from charge-galance error calculations (Table 1), the data generated by this laboratory are considered to be of reliable quality.

IDWR

IDWR personnel collected samples and did a partial analysis on site in a mobile laboratory. The remainder of the analysis was performed at the Bureau of Reclamation Laboratory in Boise, Idaho. Charge-balance error values for this laboratory are very good. The data produced by IDWR are thus considered to be of reliable quality.

USGS

The USGS collected and analyzed samples from core holes drilled at the Raft River site. These samples were collected using USGS standard procedures and the analyses were determined at a USGS laboratory. Charge-balance error calculations indicate that these data are of reliable quality.

RR

The Raft River laboratory is located at the Raft River Geothermal site. It was used to analyze samples collected on a weekly basis. This lab was utilized extensively during drilling operations to do on-site analyses. The data produced by this laboratory is quite erratic when compared to INEL data on split samples. The variation in results can be attributed to untrained laboratory technicians, several different technicians performing the analyses, instrument changes, and lack of a quality control program (EG & G Idaho, Inc., 1979). The data from this laboratory are judged to not be reliable as a result of these variables.

EI

This is a private analytical chemistry laboratory. Most of the water they have analyzed has been from the monitor wells at the Raft

River site. Many discrepancies appear when the data from this laboratory is compared to that produced by INEL. Charge-balance error calculations indicate that the data are extremely unreliable.

Technique for Equating Data From All Laboratories

The data produced by INEL, IDWR, and USGS were considered to be reliable and reproducible. However, the data for RR and EI were not. RR produced the majority of the data from the Raft River KGRA (see Table 1). Also, EI performed the majority of the analyses on the monitor wells. For these reasons, it was felt that it may be advantageous for further studies to be able to utilize all of these data. This could be accomplished if the data from RR and EI could be equated to data from a reliable laboratory.

Relationships were established between RR and EI data and data from the reliable labs by the use of linear regression analyses. Sets of paired data were produced when EG & G Idaho, Inc. had samples split and distributed to three laboratories for analysis. The laboratories were INEL, RR, and EI. The results of these analyses are listed in Table 2. Linear regressions were fitted to selected determinations for INEL versus RR and INEL versus EI. INEL data were considered to be the reference standard. The results produced a series of equations. These equations were then used to equate the RR and EI data to that of INEL. An example of a typical linear regression is shown in Figure 6. The remainder of these regressions are listed in Appendix B. Table 3 is a listing of the equations used to adjust the RR and EI data. The resulting data are listed in Appendix C.

Table 2. Analyses from INEL, RR, and EI laboratories on split samples (EG & G Idaho, Inc., 1979). Concentrations are in milligrams per liter (mg/l).

Well Name	pH	Elec. Cond. (µmhos/cm)	TDS	ALK (HCO_3)	Cl	F	SO_4	Ca	Na	K	Li	SiO_2
INEL Lab												
RRGE-1	7.3	2987	1607	34	709	5.7	40	53	469	33	1.6	134
RRGE-2	7.6	2157	1161	42	701	7.9	29	32	331	31	1.0	155
RRGE-3	7.2	7997	4280	26	2116	3.7	44	127	1245	103	3.4	158
RRGP-5B	7.5	2857	1482	40	590	6.2	40	50	179	34	1.6	136
RRGI-6	7.3	11594	6330	62	3636	5.8	60	199	2020	32	5.1	91
Raft River Lab												
RRGE-1	7.5	2800	--	37	913	7.6	--	55	--	--	--	148
RRGE-2	7.7	2000	--	45	610	10.4	--	33	--	--	--	163
RRGE-3	7.4	7250	--	26	2740	5.0	--	233	--	--	--	186
RRGP-5B	7.8	2600	--	44	838	8.2	--	55	--	--	--	162
RRGI-6	7.5	10500	--	63	3915	7.3	--	170	--	--	--	110
Energy Inc. Lab												
RRGE-1	7.5	1846	1634	34	1016	3.0	64	60	--	--	--	148
RRGE-2	8.0	1500	1196	42	747	3.8	38	33	--	--	--	150
RRGE-3	7.5	4950	4366	26	2634	2.0	59	221	--	--	--	182
RRGP-5B	8.0	2910	1618	40	1089	3.2	56	52	--	--	--	140
RRGI-6	7.8	8150	6286	66	3619	2.8	61	163	--	--	--	96
INEL Lab												
MW-1	7.8	11350	6590	25	3670	2.8	67	210	2270	28	4.1	79
MW-2	7.6	5700	3130	26	1700	5.7	68	140	1320	24	2.6	84
MW-3	7.5	7700	4920	46	2400	5.6	48	170	1350	54	3.1	92
MW-4	7.6	7800	4510	30	2610	5.6	48	160	1450	23	3.3	82
MW-5	7.8	2000	1180	114	560	0.1	20	110	485	12	0.4	34
MW-6	10.6	7600	4270	99	2340	4.1	63	170	1170	62	2.8	30
MW-7	7.8	2300	1300	102	650	1.0	25	94	375	14	0.6	43
Raft River Lab												
MW-1	8.1	10400	--	28	4130	3.4	--	223	1970	--	--	--
MW-2	7.6	5400	--	28	2000	6.1	--	138	920	--	--	--
MW-3	7.5	5200	--	44	2730	5.7	--	182	1250	--	--	--
MW-4	8.0	7400	--	29	2850	5.9	--	157	1350	--	--	--
MW-5	7.6	1900	--	102	639	0.7	--	132	221	--	--	--
MW-6	--	--	--	--	--	--	--	--	--	--	--	--
MW-7	7.6	2200	--	--	707	1.3	--	129	287	--	--	--
Energy Inc. Lab												
MW-1	7.9	7750	6270	25	2680	3.4	66	215	2220	30	3.7	80
MW-2	7.6	4400	3190	26	1740	5.4	57	125	1000	25	2.5	87
MW-3	7.8	5500	4350	55	2420	5.1	52	177	1280	54	2.8	101
MW-4	8.1	5750	4370	41	2420	4.9	51	217	1400	25	3.2	67
MW-5	8.0	2000	1240	168	610	0.5	40	169	190	17	1.7	37
MW-6	10.7	5600	4240	87	2360	3.4	62	180	1280	53	2.4	33
MW-7	8.0	2250	1380	107	640	1.0	32	110	350	12	1.6	36

-- no determination

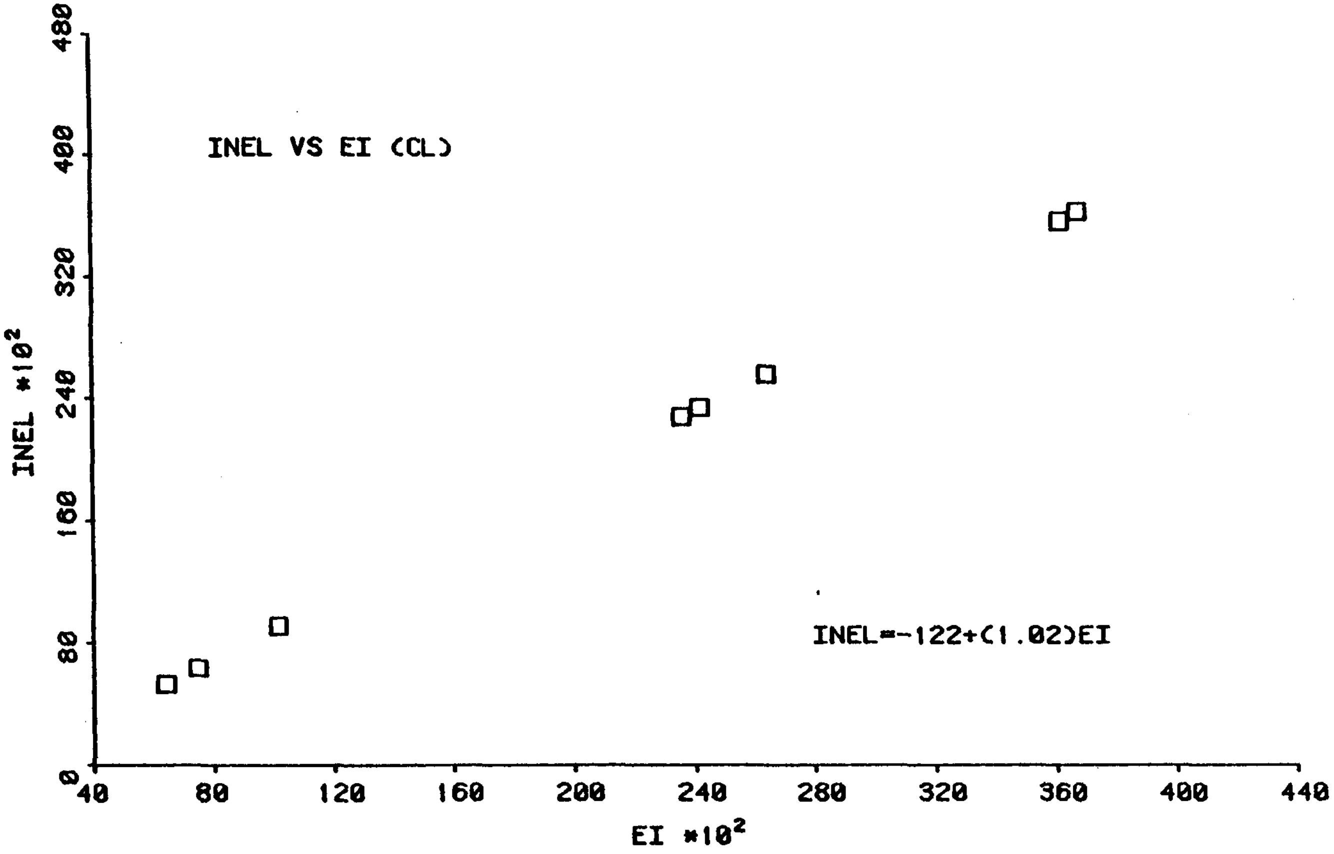


Figure 6. Regression analysis of INEL vs EI for chloride. The resulting equation is given in the lower right of the figure.

Table 3. Equations used to adjust data from RR and EI laboratories.

Equation	Constituent
INEL = -122+(1.02) EI	Cl
INEL = -191+(1.09) EI	TDS
INEL = 1.42(1.0) EI	F
INEL = -3.44+(1.02) EI	Na
INEL = -7.07+(1.01) EI	SO_4
INEL = -164+(1.45) EI	Cond
INEL = -2.43+(1.11) EI	K
INEL = -3.67+(1.03) EI	Alk (HCO_3)
INEL = 11.12+(0.86) EI	SiO_2
INEL = 17.31+(0.77) EI	Ca
INEL = -1.52+(1.57) EI	Li
INEL = -1.36+(0.89) RR	Cl
INEL = 0.49+(0.75) RR	F
INEL = -0.85+(0.996) RR	Alk (HCO_3)
INEL = 18.19+(0.76) RR	Ca
INEL = 11.17+(1.11) RR	Na
INEL = 256+(1.09) RR	Cond
INEL = -7.16+(0.93) RR	SiO_2

Data Used in Examination of Hydrochemical Controls and Extent of the Geothermal System(s)

The data produced by INEL, IDWR, and USGS were utilized for examination of hydrochemical controls and analysis of the extent of the geothermal systems. The data produced by INEL were used for the analysis of the geothermal and monitor wells. The IDWR data were used when discussing any irrigation wells and the USGS data were utilized for USGS core holes. Table 4 lists the sources of usable data for each well type.

Table 4. Source of data (laboratory) for each type of well at the Raft River KGRA.

Well Type	Source of Data[1]
Geothermal wells	INEL, RR, EI
Injection wells	INEL, RR, EI
Monitor wells	INEL, RR, EI
USGS wells	USGS, RR
Irrigation wells	IDWR, RR

[1] Laboratory underlined produced most reliable data.

HYDROCHEMISTRY OF THE RAFT RIVER KGRA

Introduction

The data available for the analysis of hydrochemistry of the deep geothermal system(s) comes from seven data points included within an area of approximately two square miles. Knowledge of the hydrochemistry and hydrogeology of the deep system outside this area is essentially nonexistant. Only speculation and intuition can be exercised when attempting to discuss the deep systems beyond these boundaries.

The hydrochemistry data from an individual well represents a unique geologic and hydrochemical environment. The chemical data obtained from each well are related to rock type, flow path, time in transit, and temperature. Data from individual wells may represent mixtures of different unique aquifers.

Table 5 lists concentration values for selected chemical constituents for the seven geothermal wells. Table 6 lists constituents for selected irrigation wells in the vicinity of the KGRA. A listing of reliable data for all wells is given in Appendix C.

Chemical Classification of Geothermal Fluids

Several chemical classification systems have been developed for geothermal systems. The most notable are those proposed by White (1957) and Ellis and Mahon (1964). These classification systems can be applied to volcanic and nonvolcanic areas and waters issuing from hot springs or

Table 5. Average concentrations of selected chemical constituents for the seven geothermal wells in the Raft River KGRA. Concentrations are given in milligrams per liter (mg/l).

Well No.	Fracture System	Elec. Cond. (μmhos/cm)	Cl	F	Alk (HCO_3)	SO_4	Ca	Na	K	Li	Sr	Si
RRGE-1	BFS	3400	750	5.0	37.7	40	53	560	33.0	1.6	1.4	64.0
RRGE-2	BFS	2600	615	6.9	48.4	50	38	424	35.0	1.1	1.2	90.4
RRGP-5	BFS	3100	860	-	43.1	-	41	493	31.0	1.4	1.2	57.0
RRGP-4	Mixture	5000	1490	4.7	34.6	70	145	964	28.0	3.1	6.4	48.5
RRGE-3	NS	8900	2350	4.1	27.9	60	200	1278	103.5	3.0	5.2	78.7
RRGI-6	N/A	9900	2850	5.1	57.2	60	200	1720	32.0	5.1	8.0	44.0
RRGI-7	N/A	12000	4200	4.8	21.4	-	350	2200	-	-	-	37.0

-	No determination
N/A	Not applicable
BFS	Bridge Fault System
NS	Narrows Structure

Table 6. Average concentrations of chemical constituents for selected irrigation wells near the Raft River KGRA. Concentrations are given in milligrams per liter (mg/l). All wells are located in T15S.

Well No.	Elec. Cond. (μmhos/cm)	Cl	F	Alk (HCO_3)	SO_4	Ca	Na	K	Li	Sr	Si
26E 24cad1	2100	550	1.5	220	70	122	266	3	-	-	30
26E 23abd1	4200	1300	5.3	142	100	98	723	20	0.7	-	51
26E 26cab1	5400	1250	2.1	565	365	241	785	14	0.6	-	50
27E 29bcc1	2200	390	0.2	170	30	155	120	4	-	-	30
27E 18bcc1	1250	330	0.5	145	28	98	120	13	0.2	-	69
26E 23ddd1	3600	1100	4.1	140	58	62	650	18	1.7	-	52

\- No determination

pumped from wells. These classification schemes are more for convenience in comparing geothermal systems than for actually defining origins of waters (Ellis and Mahon, 1977).

Four general classification categories have been suggested. These include:

1. Alkali chloride waters,
2. Acid sulfate waters,
3. Acid-sulfate-chloride waters, and
4. Bicarbonate waters.

In alkali chloride waters, the main dissolved salts are sodium and potassium chlorides. More concentrated fluids may also be high in calcium. These waters usually contain appreciable amounts of silica. Other species normally found in significant concentrations are sulfate, bicarbonate, fluoride, and lithium. The pH of these waters range from slightly acidic to slightly alkaline (pH 5-9). The ratio of chloride to sulfate is usually quite high. Alkali chloride waters have been found associated with both volcanic and sedimentary rocks (Ellis and Mahon, 1977).

Acid sulfate waters are found in volcanic areas where carbon dioxide and sulfur gases remain in the vapors rising through the rocks. They are also present in areas where steam arises from underground high-temperature water. These waters are normally low in chloride; hydrogen sulfide in the steam oxidized to sulfate. Constituents present in the waters are mainly leached from the surrounding wall rock (Ellis and Mahon, 1977).

Acid-sulfate-chloride waters are quite common. As their name implies they contain appreciable amounts of chloride and sulfate. These waters may originate in several ways. Several mechanisms are:

1. Mixing of waters 1 and 2,
2. The sulfide in water 1 can become oxidized at depth to form bisulfate ions. The dissociation constant of bisulfate rises rapidly with a decrease in temperature. As a result, when these waters rise from depth and cool there can be a drop in pH due to this dissociation,
3. If high temperature chloride waters come in contact with sulfur containing fluids at depth, hydrolysis of sulfur to hydrogen sulfide and sulfuric acid can produce acid conditions.
4. In active volcanic areas, high temperature steam can rise from molten rock and condense in shallow groundwaters (Ellis and Mahon, 1977).

Bicarbonate waters can occur in volcanic geothermal areas. These fluids are usually low in chloride and contain high concentrations of bicarbonate. These fluids have varying amounts of sulfate. Sodium is usually the main cation since calcium carbonate is not very soluble at high temperatures (Ellis and Mahon, 1977).

The geothermal fluids at the Raft River KGRA can be best classified as alkali chloride waters. Table 5 lists the chemical constituents found in these waters. The main cations are sodium, calcium, and potassium. The dominant anion is chloride. The pH for all waters is near neutral. Significant amounts of sulfate, bicarbonate, fluoride, and lithium are also present.

Major Ion Species of the Geothermal Fluids

Fluids found in geothermal systems are aqueous solutions of inorganic salts. These salts ionize to form ionic solutions with the exception of silica. Silica may form small amounts of nonionic material. The salts in the solution are nearly 100 percent ionized. As a result, the most common reactions that occur are simple ionic reactions between cations and anions (Wahl, 1972).

The dominant ions in the geothermal fluids at the Raft River KGRA are chloride and sodium. Several other ions are also present in varying amounts but in no way approach the concentration levels of Cl^- and Na^+. These other ions include fluoride (F^-), sulfate (SO_4^-), bicarbonate (HCO_3^-), calcium (Ca^{++}), lithium (Li^+), potassium (K^+), and strontium (Sr). Silica (SiO_2) is also a major chemical species present.

Mineral availability and mineral solubility are the two main variables responsible for the geochemical evolution of ground water. Sufficient amounts of a particular mineral must be available in order for chemical weathering processes to proceed in breaking down the mineral. The more soluble the mineral, the more readily it can be broken down and dispersed in the ground water system. Substantial time is needed to liberate many of the ion species from the mineral phase in ground water flow systems with a normal temperature regime. However, reactions rates can be excellerated in goethermal areas due to the increase in temperature. Slow reactions are always speeded up by an increase in temperature. As a general rule, it can be said that reactions have their rates doubled or tripled by a 10°C increase in temperature. As a result, equilibrium is always more easily attained at high temperatures (Krauskopf, 1979). Table 7 lists numerous chemical equilibrium reactions that may be of importance in controlling consituent composition in geothermal systems.

Chloride

In deep sedimentary basins, Cl^- is usually the dominant anion. The proportion of Cl^- to total anions usually increases with increasing salinity. Igneous rocks normally do not yield large amounts of chloride to ground water systems. Most chloride is contributed to ground water by sedimentary rocks.

Once Cl^- enters the ground water system, it increases in concentration in the direction of flow. This occurs because Cl^- does not significantly enter into oxidation reduction reactions, form important solute complexes with other ions, form salts of low solubility, or significantly adsorb on mineral surfaces (Hem, 1970).

The chloride concentrations in the Raft River KGRA area show an increase with increased salinity as is common in most sedimentary basins. The concentrations of chloride in the Raft River area are essentially comparable to those seen in other geothermal areas exhibiting an alkali chloride water type.

Sodium

Sodium is normally the dominant cation in chloride waters of sedimentary basins. The most common source of sodium in ground water is from the chemical breakdown of feldspar minerals. The minerals include orthoclase, potassium feldspar and plagioclase, ranging in composition from the pure sodium form albite to the pure calcium form anorthite. Potassium

Table 7. Chemical equilibria reactions important in controlling constituent composition in geothermal systems (after Helgeson, 1970).

Dolomite

$CaMg(CO_3)_2 \rightleftarrows Ca^{+2} + Mg^{+2} + 2CO_3^{-2}$

Anhydrite

$CaSO_4 \rightleftarrows Ca^{+2} + SO_4^{-2}$

Gypsum

$CaSO_4 \cdot 2H_2O \rightleftarrows Ca^{+2} + SO_4^{-2} + 2H_2O$

Quartz

$SiO_2 + 2H_2O \rightleftarrows H_4SiO_4$

Low Albite

$NaAlSi_3O_8 + 4H^+ + 4H_2O \rightleftarrows Na^+ + 3H_4SiO_4 + Al^{+3}$

Analcite

$NaAlSi_2O_6 \cdot H_2O + H_2O + 4H^+ \rightleftarrows Na^+ + Al^{+3} + 2H_4SiO_4$

Biotite

$KFe_3AlSi_3O_{10}(OH)_2 + 10H^+ \rightleftarrows K^+3Fe^{+2} + Al^{+3} + 3H_4SiO_4$

Montmorillonite (Na or K)

$(K \text{ or } Na)_{0.33}Al_{2.33}Si_{3.67}O_{10}(OH)_2 + 7.33H^+ + 2.67H_2O \rightleftarrows 0.33(Na \text{ or } K) + 2.33Al^{\pm 3} + 3.67H_4SiO_4$

Montmorillonite (Ca or Ma)

$(Ca \text{ or } Ma)_{0.17}Al_{2.33}Si_{3.67}O_{10}(OH)_2 + 7.33H^+ + 2.67H_2O \rightleftarrows 0.17(Ca \text{ or } Ma) + 2.33Al^{+3} + 3.67H_4SiO_4$

Illite

$K_{0.6}Mg_{0.25}Al_{2.30}Si_{3.50}O_{10}(OH)_2 + 8H^+ + 2H_2O \rightleftarrows 0.6K^+ + 0.25Mg^{+2} + 2.30Al^{+3} + 3.5H_4SiO_4$

Calcite

$CaCO_3 \rightleftarrows Ca^{+2} + CO_3^{-2}$

Kalonite

$Al_2Si_2O_5(OH)_9 + 6H^+ \rightleftarrows H_2O + 2Al^{+3} + 2H_4SiO_4$

Muscovite

$KAl_3Si_3O_{10}(OH)_2 + 10H^+ \rightleftarrows K^+ + 3Al^{+3} + 3H_4SiO_4$

Microcline

$KAlSi_3O_i + 4H^+ + 4H_2O \rightleftarrows K^+ + 3H_4SiO_4 + Al^{+3}$

Anorthite

$CaAl_2Si_2O_8 + 8H^+ \rightleftarrows Ca^{+2} + 2Al^{+3} + 2H_4SiO_4$

---

feldspar is very resistant to chemical attack. The sodium and calcium species are much more susceptible to breakdown, however. The latter forms yield the metal ion and silica to solution (Hem, 1970). These reactions are listed in Table 7.

Once sodium has been brought into solution, it tends to remain in that status. The sodium ion tends to be readily adsorbed on mineral surfaces. It is also readily exchanged by Ca^{++} that is in solution. As a result, Na^{+} is liberated into solution and the Ca^{++} is adsorbed on the mineral surface. White (1965) states that Na^{+} is appreciably more mobile than Ca^{++}. The reason for this behavior is due to its double charge; the calcium ion has a greater tendency to be adsorbed on cation-exchanging clays.

Sodium concentrations are relatively high in the geothermal fluids in the Raft River KGRA. They are much higher than the calcium concentrations. This is probably best explained by the mechanism described in the previous paragraph. The valley fill material in the Raft River basin contains large amounts of fine grained sediments which have many exchange sites available for cation exchange to occur. Water moving through these sediments could exchange Ca^{++} ions for Na^{+} ions thus increasing the Na^{+} concentrations while decreasing the Ca^{++} concentrations.

Fluoride

Fluorine is the most electronegative element know. It forms fluoride ions in solutions. In natural aqueous systems, other oxidation states are not found. Fluoride can form strong complexes with many cations. Some of the common mineral species of low solubility contain fluoride.

Fluorine occurs in igneous, metamorphic, and sedimentary rocks. The highest concentrations are found associated with acidic igneous rocks. The most common fluorine minerals are fluorite (CaF_2) and fluorapatite ($Ca_5F(PO_4)_3$). The common fluorine minerals are relatively insoluble. Concentrations of F^- in groundwater are controlled by the amount of fluorine in the host rock through which the water flows rather than by the solubility of the fluorine minerals. The opposite is true in hydrothermal systems, however.

The ionic radius of F^- is identical to that of OH^-(1.33Å). As a result, F^- can replace OH^- in many layered silicate minerals. This is best demonstrated in clay minerals, micas, and hornblende. Fluoride concentrations can be relatively high in sedimentary rocks because of this replacement.

Maximum fluoride concentrations are usually controlled by fluorite (CaF_2) solubility in natural hydrothermal solutions (Mahon, 1964). CaF_2 solubility is increased by increased salt concentrations and pressure. In pure water, the solubility of fluorite passes through a maximum near 100°C (Holland and Malinin, 1979). Holland further states that the effect of NaCl on the solubility of fluorite in aqueous solutions is due largely to the decrease in the activity coefficient of Ca^{++} and F^- with increasing ionic strength of the solutions and to the formation of the species NaF. Below 150°C, there is a dramatic decrease in fluorite solubility in NaCl solutions.

The fluoride concentrations in the Raft River geothermal fluids are not excessively high. Ellis and Mahon (1977) state that alkali chloride waters normally have fluoride concentrations in the range of

1-10 ppm. The values in Table 5 are well within this range. The fluoride concentrations in some irrigation wells approach those found in the geothermal fluids (see Table 6). This is most likely due to the mixing of geothermal fluids with the shallower waters.

Sulfate

The most common sulfate bearing minerals are gypsum ($CaSO_4 \cdot 2H_2O$) and anhydrite ($CaSO_4$). These minerals dissolve quite readily at low temperature when in contact with water. Ground water must travel considerable distances in most sedimentary terrains before $SO_4^=$ becomes a dominant anion. This can be explained by the fact that gypsum and anhydrite are rarely found in more than trace amounts in most sediments.

Bicarbonate

Bicarbonate content in groundwater is normally derived from soil zone CO_2 dissolving calcite and dolomite. HCO_3^- is usually the dominant anion at shallow depths in sedimentary basins and in recharge zones. In most groundwaters the pH range is between 6 to 9. HCO_3^- is the dominant carbonate species in this range. As groundwater moves from a recharge to a discharge zone, the HCO_3^- content decreases appreciably due to a decrease in CO_2.

The geothermal fluids in the Raft River KGRA are deficient in HCO_3^- as compared to the shallower waters (see Tables 5 and 6). The deep geothermal fluids are low due to the fact they have lost considerable amounts of CO_2 gas. The shallow aquifer waters have high HCO_3^- concentrations since they are in close proximity to a recharge zone.

Calcium

Calcium is a major constituent of many igneous and metamorphic rock minerals. Calcium is found in chain silicates, pyroxene, amphibole, and feldspars. Concentrations of calcium in ground waters derived from igneous rocks are usually low. The most abundant source of calcium in ground water comes from the dissolution of carbonate minerals. The two most common carbonate minerals are calcite and dolomite. Calcite is also a component of some types of zeolites and montmorillinite clay. Reactions showing the breakdown of these minerals are listed in Table 7.

Cation exchange equilibria has a great influence on the concentration of calcium in most ground waters. Ca^{++} is readily exchanged on mineral surfaces for Na^{+}. The reverse of this process (i.e., Na^{+} for Ca^{++}) is not common except in some highly irrigated basins (Hem, 1970). In sedimentary basins with a NaCl type water, Ca^{++} tends to increase with increasing salinity, depth, and age of the rocks (White, 1965). This phenomenon is seen in the geothermal fluids at Raft River. The calcium concentrations increase dramatically with increased salinity (see Table 5).

Lithium

Lithium tends to be concentrated in pegmatites and evaporites. Lithium is not adsorbed readily by common ion exchange minerals. As a result, when lithium is brought into solution by chemical weathering, it is prone to stay in this state (Hem, 1970).

Extensive hydrothermal alteration must take place in geothermal systems to create appreciable concentrations of lithium in waters.

Moderate temperatures (200°-300°C are more favorable for hydrothermal alteration than very high temperatures (500°-600°C) (Ellis and Mahon, 1977).

The lack of appreciable amounts of lithium in the Raft River geothermal fluids is best explained by the fact that there is only a small source of lithium available in the rocks. Also, the temperatures at the Raft River KGRA are not in the range to create appreciable concentrations of lithium through extensive hydrothermal alteration.

Potassium

Potassium is slightly less common than sodium in igneous rocks. However, it is much more common in sedimentary rocks. The principle silicate minerals from which potassium is derived are the feldspars, orthoclase and microcline, and the micas. The potassium feldspars are very resistive to attack by water but do breakdown with sufficient time. Potassium is most often found as unaltered feldspar or mica particles and clay minerals when associated with sediments. Potassium is adsorbed by clay minerals quite easily. Concentrations of potassium are relatively low in most natural waters. Only in waters with high TDS or high temperature will potassium be found in levels exceeding a few tens of mg/l (Hem, 1970).

The concentrations of K^+ in the geothermal fluids at Raft River are relatively high. However, they are substantially lower than waters from other alkali chloride geothermal areas (i.e. K^+ concentrations to 500 mg/l). Abundant source material is available to produce relatively high concentrations of potassium. This source material is mainly in the form of feldspar and mica minerals. Perhaps the limiting factor on the concentration of potassium are the high volumes of fine grained sediments in the valley fill to which it could be adsorbed.

Strontium

Strontium is found in minor amounts in the geothermal waters in the Raft River KGRA (1-5 mg/l). Strohtium behaves much like calcium. Strontium is common in sedimentary rocks in the minerals strontianite and celestite. The former is a carbonate mineral and the latter a sulfate mineral. Strontianite is slightly less soluble than calcite. The strontium to calcite ratio in most limestone is usually less than 1:1000 (Hem, 1970). The solubility of strontianite decreases with increasing temperature. Above 200°C, the solubility of strontianite exceeds that of calcite (Holland and Malinin, 1979).

Silica

Silica (SiO_2) as quartz is a major constituent of many igneous rocks. It also constitutes the bulk of the grains of most sandstones. Quartz is one of the most resistant minerals to chemical attack. Amorphous forms of quartz such as cristobalite and chalcedony are more readily weathered. Most of the silica found in natural waters is probably the result of chemical weathering of silicate minerals even though it is highly resistive (Hem, 1970).

SiO_2 occurs at different depths in different forms. These forms are quartz, chalcedony, cristobalite, and amorphours silica species. Quartz is the most stable form and has the lowest solubility. Quartz solubility is little affected by the presence of dissolved salts or by changes in pressure.

The solubility of silica is temperature sensitive. With increased temperature there is a corresponding increase in silica solubility. In this fashion, silica can be used as a geothermometer. This relationship has been discussed thoroughly by several authors. For a detailed discussion of this relationship, the reader is directed to the work by Ellis and Mahon (1964 and 1977) and Fournier (1973).

The Raft River wells show this relationship. RRGE-2 is the hottest well and exhibits the highest SiO_2 value. Wells RRGI-6 and 7 are the coolest wells and have the lowest SiO_2 concentrations.

Chemical Geothermometers

Several minerals can be used as indicators of reservoir temperatures. The most common geothermometers are based on the solubility of silica and the partitioning of sodium and potassium between aluminosilicates and solutions. Both of these phenomenon are temperature sensitive.

Temperatures at depth in a geothermal system can be estimated from silica concentrations (in parts per million) in the discharge water at the surface. The following formula can be used to calculate the temperature

$$t°C = 1533.5/(5.768 - \log SiO_2) - 273.15.$$

This equation assumes adiabatic, isoenthalpic cooling (Ellis and Mahon, 1977).

Temperatures can also be estimated using the relationship of Na^+ to K^+. This ratio is based on the exchange reaction

$$K^+ + Na - feldspar = K - feldspar + Na^+.$$

This relationship has been found to give relatively good values for waters associated with high-temperature geothermal systems. This method works good for near neutral pH waters low in calcium ($Ca^{\frac{1}{2}}/Na)<1$) (Ellis and Mahon, 1977). The following formula has been developed by Truesdell (1975) for calculating the temperature from the Na/K ratio.

$$t°C = [855.6/\log(Na/K + 0.8573)] - 273.15$$

Concentrations of Na and K should be in parts per million.

This procedure produces anomalous temperature values if the waters are high in calcium and of low temperature. A calcium corrected geothermometer was proposed by Fournier and Truesdell (1973). In this approach the partitioning of calcium is taken into account. This method is based on the following relationship:

$$t°C = \frac{1647}{\log(Na/K) + \beta \log(Ca^{\frac{1}{2}}/Na) + 2.24} - 273.15$$

where: $\beta = \frac{4}{3}$ for $Ca^{\frac{1}{2}}/Na > 1$ and $t < 100°C$

$\beta = \frac{1}{3}$ for $Ca^{\frac{1}{2}}/Na < 1$ or if $t_{4/3} > 100°C$

Molal concentrations should be used to calculate ($Ca^{\frac{1}{2}}/Na$). If this relationship is less than 1, a value of $\beta = \frac{1}{3}$ is used. If $Ca^{\frac{1}{2}}/Na$ is greater than 1, a value of $\beta = \frac{4}{3}$ is used. If temperatures in excess of 100°C are calculated using the latter value, a β value of $\frac{1}{3}$ should be used (Ellis and Mahon, 1977).

Temperatures for the various wells at the Raft River KGRA have been calculated using the various methods discussed above. These temperature calculations are listed in Table 8. The best values were obtained from the SiO_2 geothermometer. These values are in accordance with measured temperatures. Erroneous data were obtained from the Na/K and Na-K-Ca methods. This is probably due to exchange mechanisms and possibly mixing.

Table 8. Calculated chemical geothermometers for the seven geothermal wells at the Raft River KGRA.

Well	T°C (observed)	T°C (SiO_2)	T°C (Na/K)	T°C (Na-K-Ca)
RRGE-1	138	147	152	114
RRGE-2	139	167	172	131
RRGE-3	147	159	167	126
RRGP-4	---	136	57	76
RRGP-5	130	148	205	129
RRGI-6	122	131	49	74
RRGI-7	101	125	---	---

-- No determination

HYDROCHEMICAL EVALUATION OF THE HYDROGEOLOGIC CONTROLS AND EXTENT OF GEOTHERMAL SYSTEM WITHIN THE RAFT RIVER KGRA

Introduction

The Bridge Fault System and the Narrows Structure are the two major structural features controlling the flow of geothermal fluids within the KGRA (see Figure 2). The spacial configuration of these two structural features are generally understood but detailed subsurface documentation is lacking (Niemi and Nelson, 1977). It is the intent of this chapter to demonstrate, using hydrochemical data, that these two structural features represent separate geothermal reservoirs.

Statistical Evaluation of the Two Reservoir Hypothesis Based on Hydrochemical Data

A number of authors have suggested that there are two separate geothermal reservoirs at the Raft River KGRA (Niemi and Nelson, 1977; EG & G Idaho, Inc., 1979; Overton, 1977; Williams and others, 1976). This is based on two sources of evidence. First, reservoir tests have not indicated an interconnection or response in wells located in the Bridge Fault System with the well located in the Narrows Structure. Second, preliminary analysis indicated a significant difference in the chemical composition of the fluids derived from the two systems-

A statistical evaluation was conducted to test the two reservoir hypothesis. Data from wells representing the Bridge Fault System were compared to data from the well representing the Narrows Structure. Only the data from the INEL laboratory were utilized in this analysis. The chemical constituents used were HCO_3^-, Cl^-, F^-, Na^+, Ca^{+2}, Li^+, K^+, and Si. These constituents were used because the computer program could not accept blank or zero values. These constituents were consistantly determined by the INEL laboratory thus allowing for more data to be utilized in the analysis. A total of 23 observations were used in the analysis. Twelve were from well RRGE-3 and 11 from wells RRGE-1, RRGE-2 and RRGP-5.

The basic model to be tested was as follows. Wells RRGE-1, RRGE-2, and RRGP-5 were grouped as a population because they all penetrate the Bridge Fault System. Well RRGE-3 was treated as another population since it penetrates the Narrows Structure. Well RRGP-4 was not utilized in the analysis because it appears to be a mixture of the two systems. Wells RRGI-6 and RRGI-7 were also not included because they are shallower wells and do not intercept either fracture system.

A mulivariate analysis of variance was used to test the hypothesis. The analysis was performed using a digital computer and the Statistical Analysis System (SAS) softwave package available at the University of Idaho (Goodnight, 1979). The multivariate analysis of variance (MANOVA) procedure offered by SAS utilizes four separate tests. These are: 1) the Hotelling Lawley Trace, 2) Pillai's Trace, 3) Wilk's Criterion, and 4) Roy's Maximum Root Criterion. All four test for equality of the means of n (in this case n = 2) multivariate normal distributions.

The hypothesis to be tested is that the mean of the joint distribution of the chemical constituents of one system (or population) is equal to the mean of the constituents of the other. The converse of this statement is the alternate hypothesis. That is, the mean of one system is not equal to the mean of the other system. The null hypothesis (H_0) can thus be stated as $\mu_1 = \mu_2$ where μ represents the mean of the joint distribution of chemical constituents for each population. The alternate hypothesis (H_a) is therefore $\mu_1 \neq \mu_2$.

The results from the analysis are listed in Table 9. The first column is the method used to calculate the statistic. The second column is the calculated F statistic for each method. The third column gives the probability of exceeding the F statistic. Essentially, this states that the probability of rejecting H_0 when in fact H_0 is true is <.0001. Or, stated another way, we are 99.99% sure that there is a difference between the two populations.

Table 9. Results of MANOVA test.

Method	F Statistic	Prob. >F
Hotelling-Lawley Trace	1080.36	0.0001
Pillai's Trace	1080.36	0.0001
Wilk's Criterion	1080.36	0.0001

The three methods arrive at the same conclusion; there are significant differences between chemical data from ground water from the two fracture systems. Therefore, H_0 is rejected in favor of H_a.

Differences in Chemistry Associated with the Two Fracture Systems

Statistically it has been demonstrated that the chemistries associated with these two systems are significantly different. The characteristics of the two geothermal systems are apparent on graphical plots of the chemical data. Two graphical techniques were employed using the data from the geothermal wells: Stiff diagrams and Schoeller semilogrithmic plots. Stiff diagrams were also constructed for monitor and selected irrigation wells. The construction of these particular diagrams are discussed in Hem (1970) and Zaporozec (1972).

Stiff diagrams are constructed by plotting ion concentrations in milliequivalents per liter (meq/l). The major cations are plotted opposite the major anions. The result is a graphical display of chemical data. Waters of the same chemical type will have the same pattern. Conversely, waters of differing chemistry will have a quite different pattern. Stiff diagrams for the seven geothermal wells are presented in Figure 7.

Comparing the patterns produced for each well, it is obvious that all of the patterns have a similar shape. This is due to two major factors. First, both waters have been, and presently are, in contact with the same rock type. The sediments filling the valley have all been derived from the surrounding mountain ranges. Similar mineralogy would therefore be expected within the sediments throughout the valley. A second cause for this similarity is due to the overwhelming dominance of Na^+ and Cl^- as the main cation and the main anion in both geothermal systems. The other ion species are much less dominant and as a result the shape of the patterns is controlled by the concentrations of Na^+ and Cl^-.

The major differences in chemistry between the two fracture systems can also be seen on the diagrams on Figure 7. The geothermal fluids in the Bridge Fault System have much lower concentrations of Na^+, Cl^- and Ca^{+2} than those associated with the Narrows Structure (see Table 5).

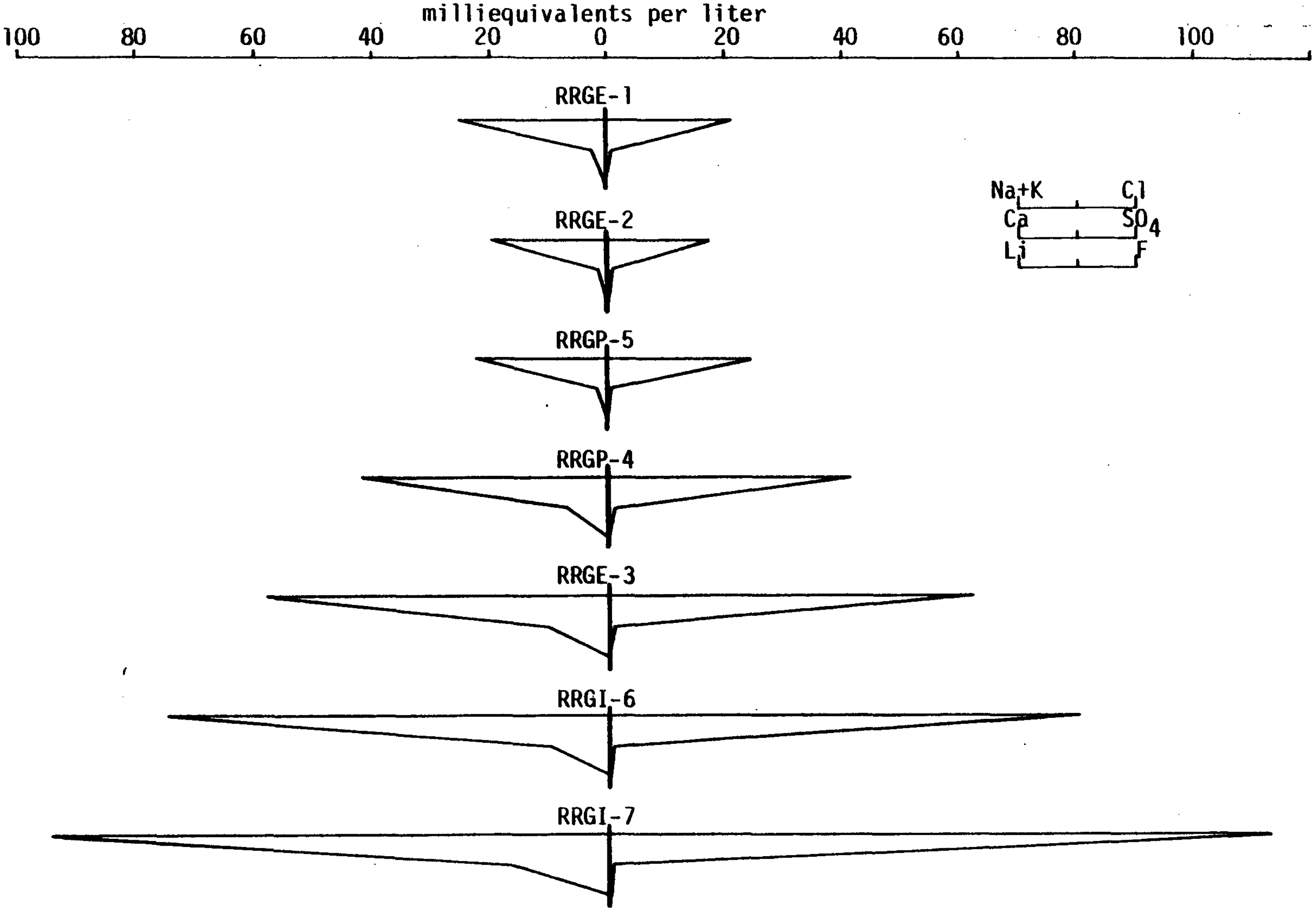


Figure 7. Stiff diagrams of the seven geothermal wells at the Raft River KGRA.

Minor ions within the two systems tend to dissapear on these diagrams due to their relatively low concentrations. Differences in these minor ions are more easily distinguished on Schoeller semi-logrithmic plots.

Schoeller semi-logrithmic plots are constructed by plotting various ions species along the arithmatic scale of semi-logrithmic graph paper. Corresponding ion concentrations in meq/l are plotted along the logrithmic scale. A pattern develops for each chemical type of water as with the Stiff diagrams. Schoeller plots have been constructed for each geothermal well. The resulting plots are illustrated in Figures 8 and 9. Well RRGE-3 has been shown on both diagrams for comparison.

This graphical technique also shows the dominance of Na^+ and Cl^-. A somewhat similar pattern develops for each well. The differences between fracture systems can be readily distinguished as discussed above. The chemistries for wells RRGE-1, RRGE-2, and RRGP-5 are nearly identical with only slight variations occurring in the minor constituents. A definite change in chemistry is indicated between these fluids and those associated with well RRGE-3. Wells RRGI-6 and RRGI-7 have somewhat different chemistries from either of the fracture systems. They are stratigraphically above and located too far south and east to reflect the specific chemistry of either of the two major systems. The fluids from these two wells are probably partially derived from the Narrows Structure due to leakage but are significantly modified by ion exchange reactions occurring in the sediments at a shallow depth. These fluids are also altered by the comingling of fluids from different producing zones. Well RRGP-4 reflects a fluid mix of the two major systems.

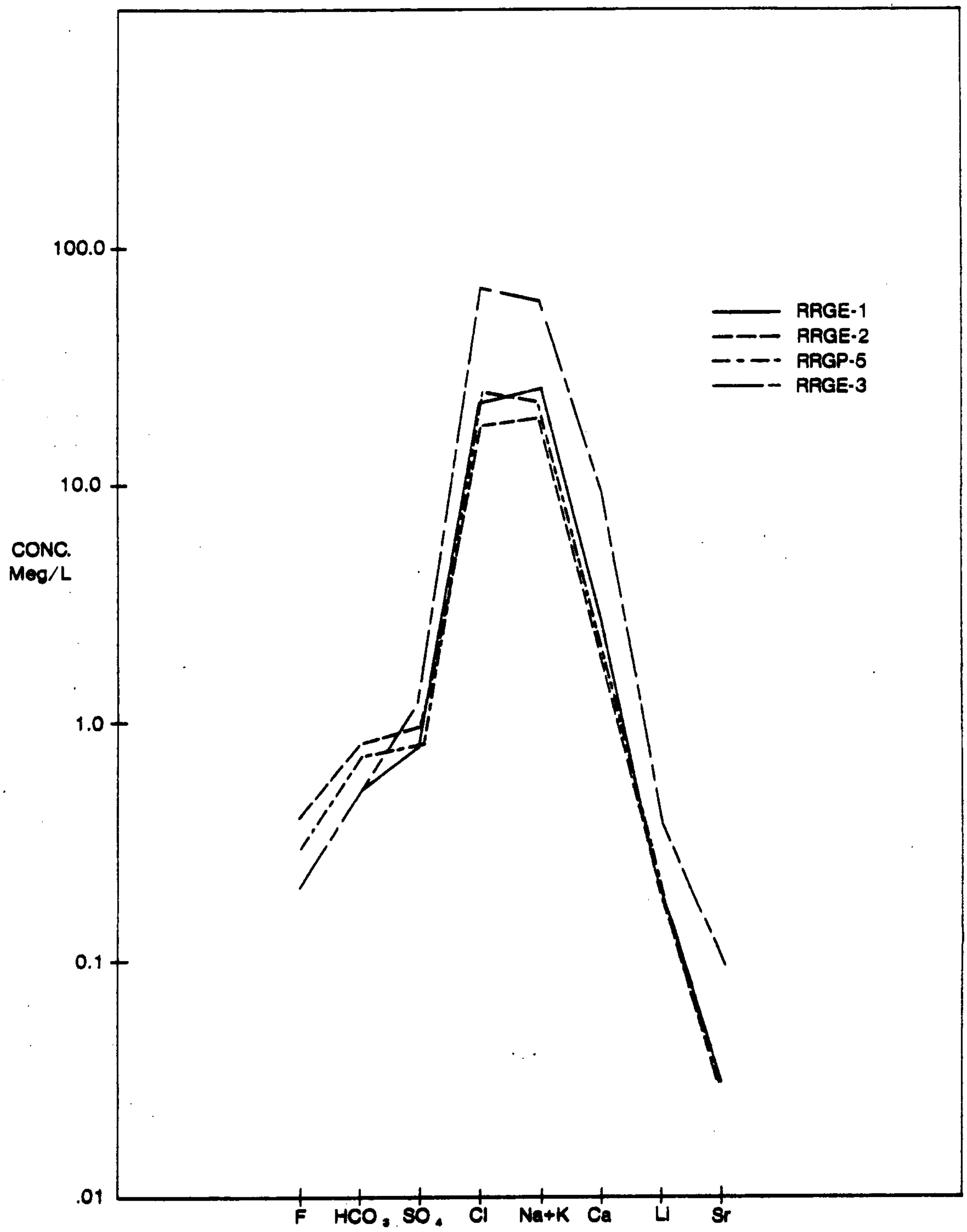


Figure 8. Schoeller semi-logrithmic plots for wells RRGE-1, RRGE-2, RRGP-5, and RRGE-3, Raft River KGRA.

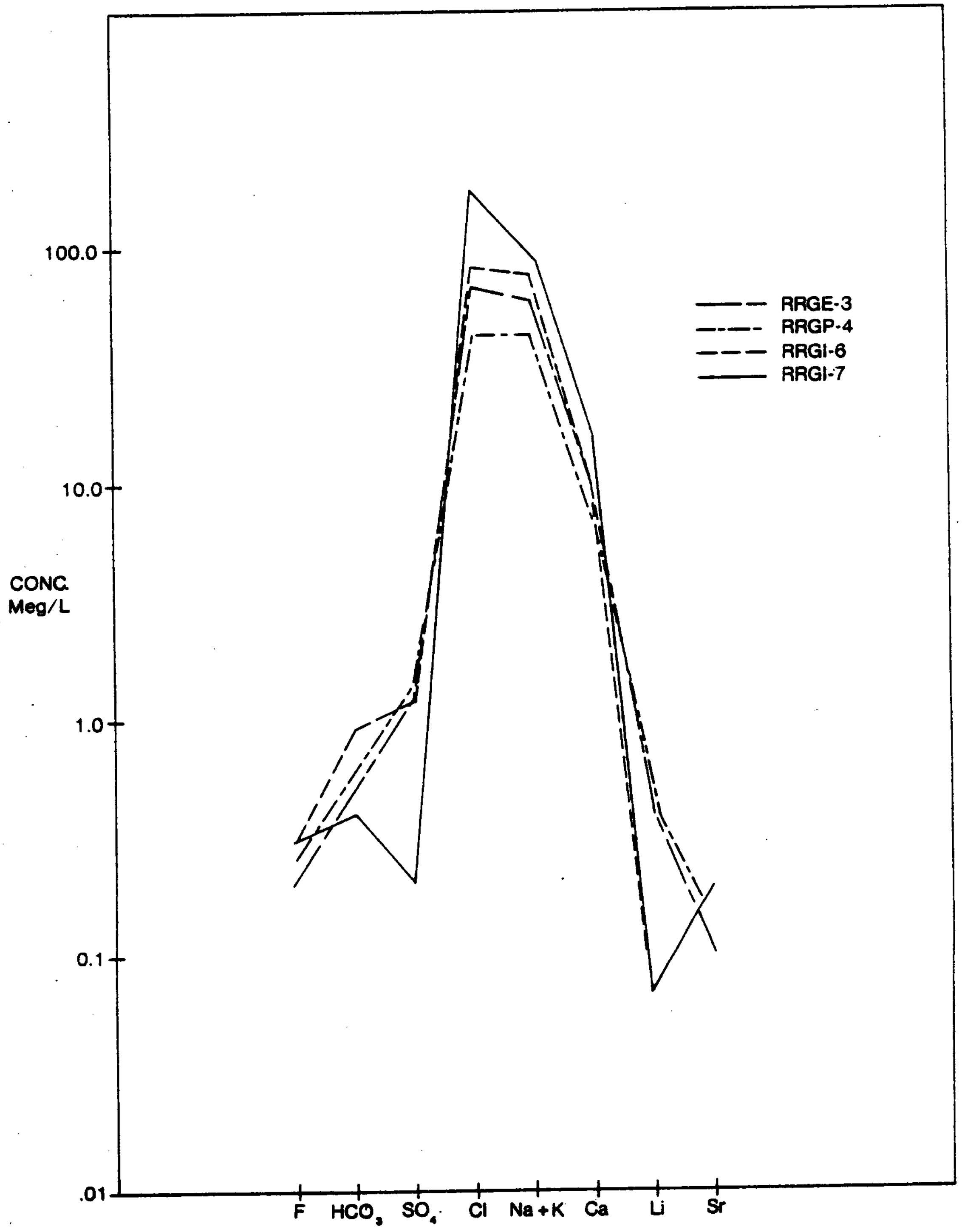


Figure 9. Schoeller semi-logrithmic plots for wells RRGE-3, RRGE-4, RRGI-6, and RRGI-7, Raft River KGRA.

Dissolved constituents associated with the Bridge Fault System are much lower than those in the Narrows Structure (see Table 5). This difference is probably best explained by the fact that the Bridge Fault System apparently transmits fluids more readily than the Narrows Structure. This would allow for reactions to progress further between the rock and fluid in the Narrows Structure resulting in a more concentrated solution.

Affects of Geothermal Fluids on the Intermediate and Shallow Aquifers

Interconnection between intermediate and shallow aquifers has been demonstrated by the response of monitor and irrigation wells to production and injection tests of the deep wells. This relationship is also apparent when the chemical data are examined.

Nearly all water from shallow and intermediate depth wells in the vicinity of the geothermal site reflect the chemistry of the deep geothermal systems. MW-1, MW-4, MW-6, and USGS-3 are all moderate depth wells (1000-1400 feet or 300-420 meters). The water from these wells closely resembles the geothermal fluids. MW-2, MW-3, MW-6, USGS-2, and the Crook and BLM wells are shallower (387-800 feet or 120-240 meters) but they still show the influence of the geothermal fluids. Other irrigation wells in the vicinity of the geothermal development area also show this characteristic chemistry.

Stiff diagrams were constructed for all of the above mentioned wells. The resulting patterns are shown in Figures 10, 11 and 12. It is obvious that the waters in these wells are Na Cl dominated as are the geothermal fluids. The deeper wells reflect a chemistry that is nearly identical to the geothermal fluids. Some of these wells produce

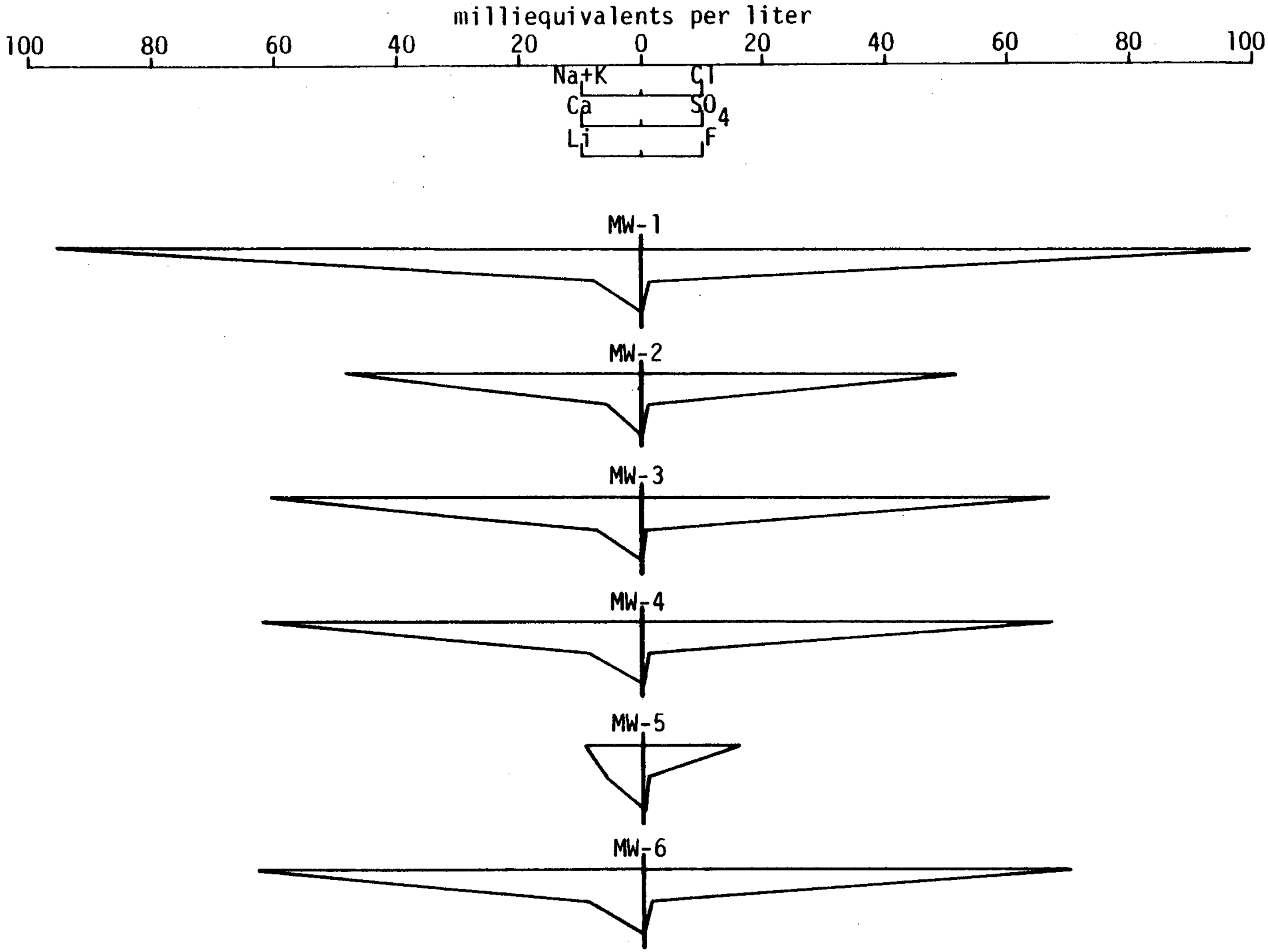


Figure 10. Stiff diagrams for the monitor wells at the Raft River KGRA.

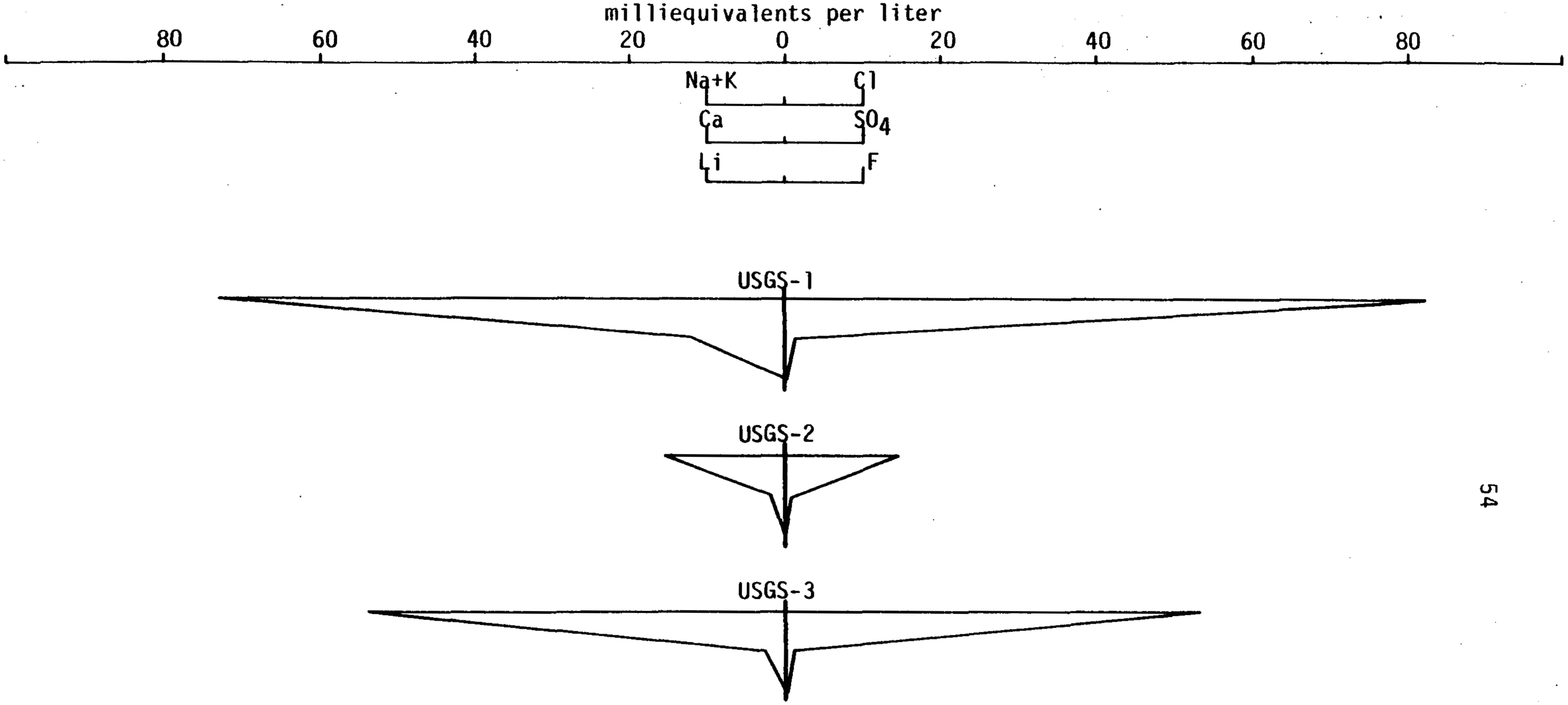


Figure 11. Stiff diagrams for three of the USGS wells in the vicinity of the Raft River KGRA.

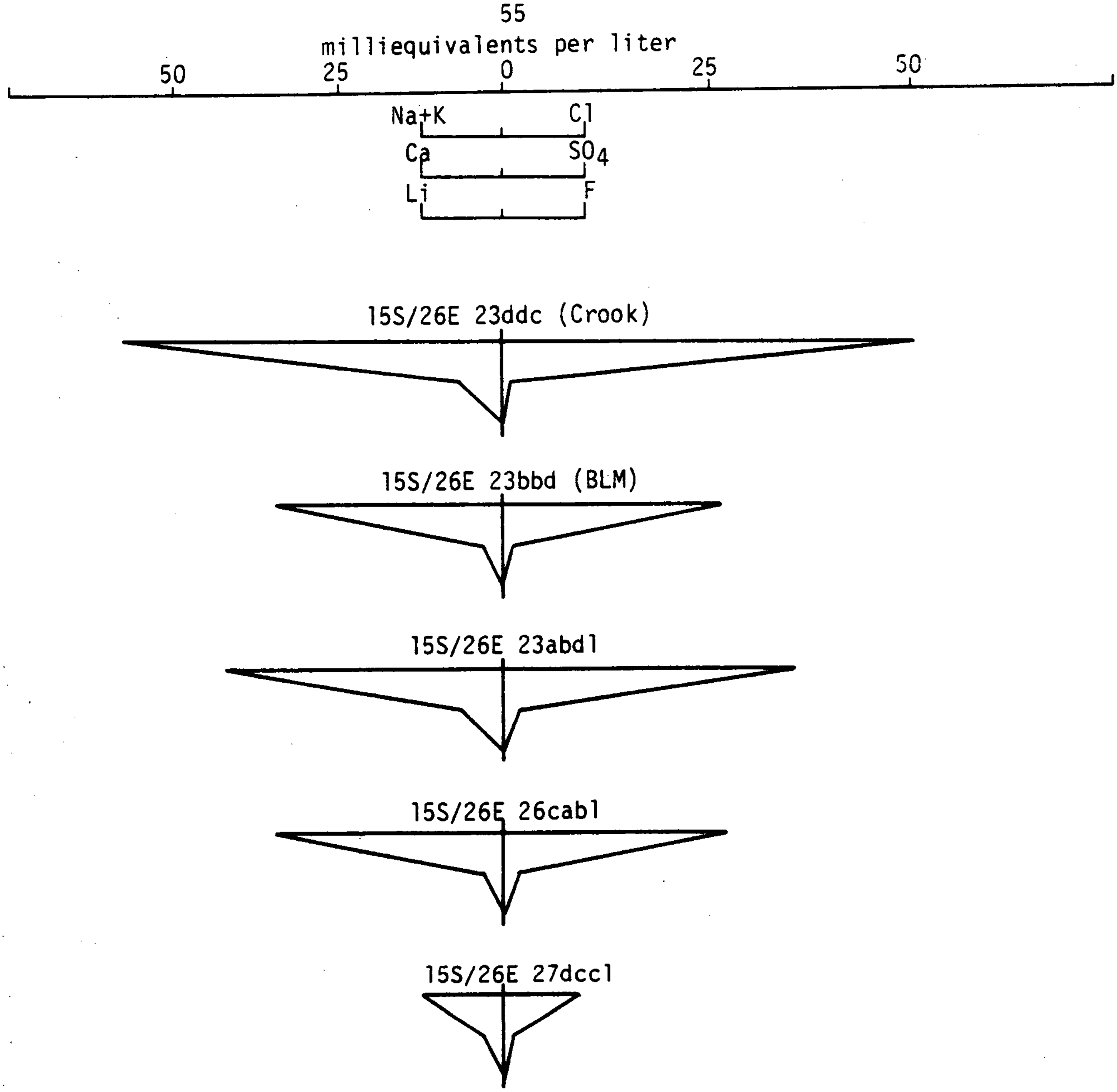


Figure 12. Stiff diagrams for selected irrigation wells in the vicinity of the Raft River KGRA.

water that has a greater ionic strength than the deeper fluids. This occurs as the hot geothermal fluids encounter sediments that are younger and less compact as they move upward. As a result, there is a large abundance of unaltered minerals available for reaction with the hot fluids.

The water in most of these wells most closely resemble the geothermal fluids produced in the Narrows Structure. This would be expected due to the location of the wells (see Figure 3). These waters are high in Na^+, Cl^- and have higher Ca^{++} concentrations than the Bridge Fault System fluids. The waters in USGS-3 more closely resemble the Bridge Fault System, however.

Stiff diagrams were constructed for irrigation wells in the vicinity of the geothermal site. The resulting patterns are displayed in Figure 13. It is obvious that there is a definite chemical difference between these waters and those associated with the geothermal system. Cl^- is still the dominant anion, however, Na^+ becomes less dominant in the southeasterly direction. Ca^{+2} eventually becomes more dominant than Na^+. This is due in part to an increase in calcium rich carbonate rocks. There is more CO_2 available in the water which expedites the dissolution of $CaCO_3$ and $CaMgCO_3$ since these wells are usually very shallow.

Several shallow wells located in the central geothermal development area show little or no influence from geothermal fluids. USGS-2 appears to be only slightly affected by geothermal fluids. It is NaCl dominated but it is a much more dilute water. MW-5 also demonstrates this behavior. This well is 500 feet (150 meters) deep and has a chemistry more indicative of the shallow irrigation wells located further to the east. Both

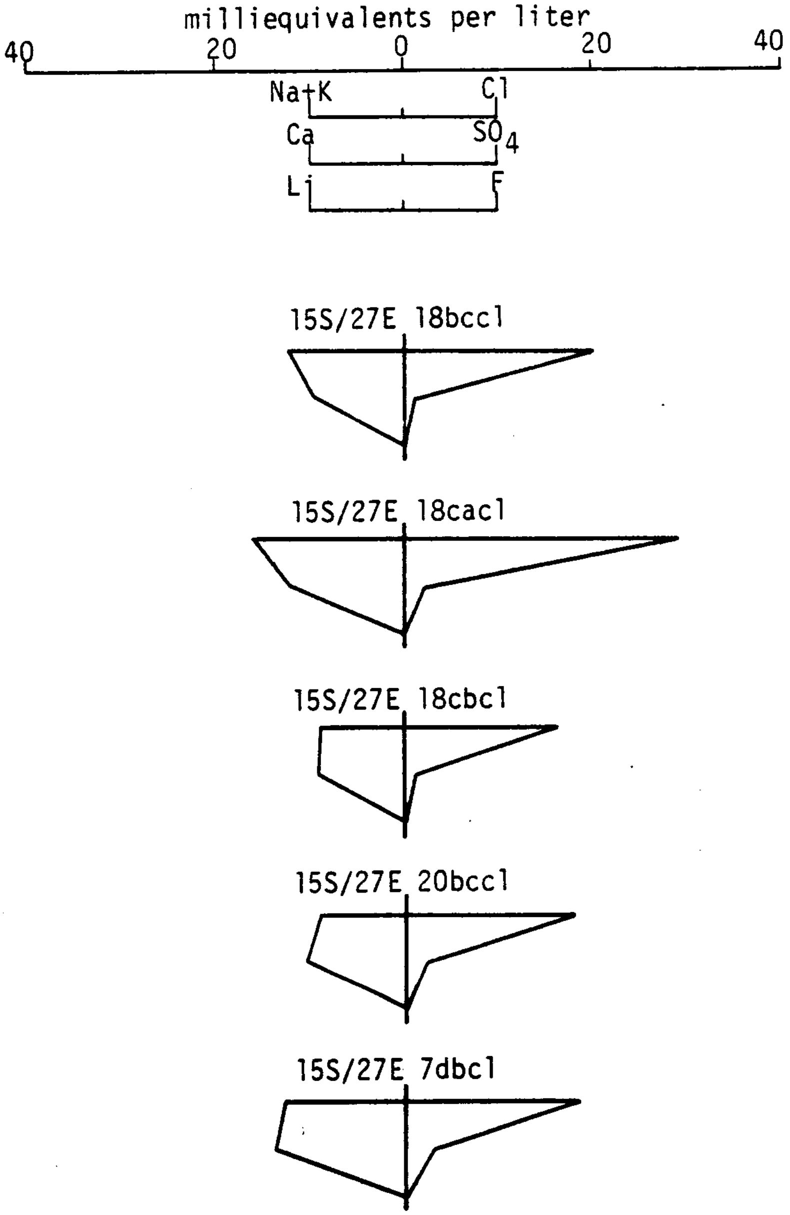


Figure 13. Stiff diagram for selected irrigation wells not affected by geothermal fluids in the vicinity of the Raft River KGRA.

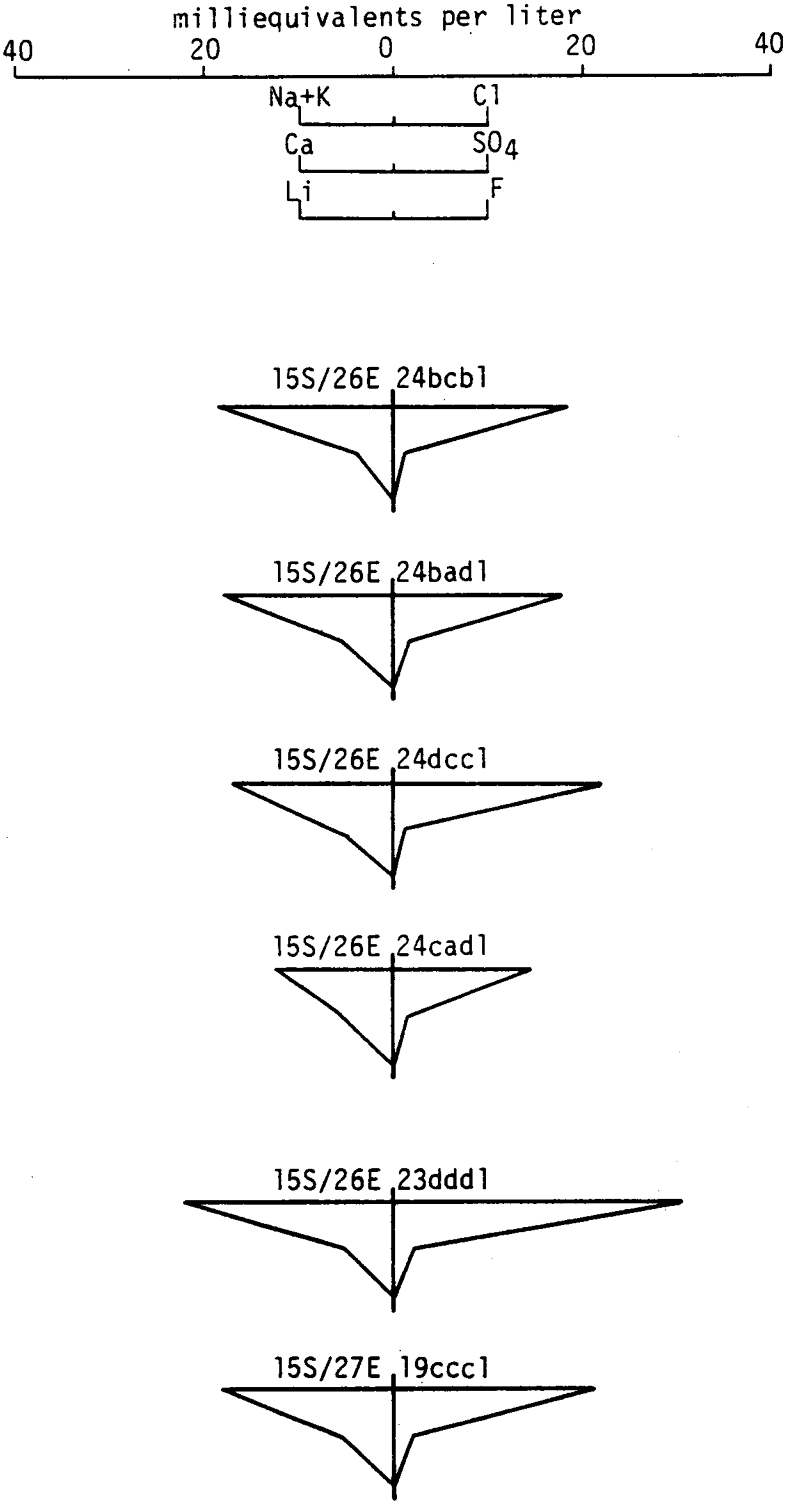


Figure 13. Continued.

of these wells are located near other wells which reflect the presence of upward migrating geothermal fluids.

USGS-1 is located approximately two miles northeast of RRGE-2. It appears that this well is receiving fluids from Bridge Fault or a fault associated with the Bridge Fault. Several faults have been mapped west of this well along the eastern flank of the Jim Sage Mountains. These faults are nearly parallel with the Bridge Fault. Figure 11 shows the pattern produced when the chemical data from this well are plotted on a Stiff diagram. The pattern is remarkably similar to those produced by the geothermal fluids. There is an increase in Ca^{+2} in the water associated with USGS-1 with respect to the Bridge Fault fluids. There is also an increase in Mg^{+2} in these waters. This most probably is due to increased dissolution of calcite and dolomite in the shallow aquifers. This well is only cased to 283 feet (85 meters) The temperature in this well, 29°C (84°F), is further evidence that there is probable mixing of geothermal fluids and shallow waters.

The data from USGS-1 are significant in that they demonstrate the possible extent of the geothermal resource. It appears that the geothermal activity in the Bridge Fault System extends to the northeast for a considerable distance. More detailed work is needed in defining the actual extent of the geothermal resource.

Well 26E 26cabl is located about one mile southwest of RRGE-1 and one mile west southwest of RRGE-3 (see Figure 3). The chemistry of this well indicates that there is some mixing occurring with geothermal fluids (see Figure 12). It is an NaCl dominated water. This dominance is markedly reduced from that seen in the geothermal fluids or the waters in the wells located nearer the intersection of the two major fracture systems. Further west and south, well 26E 27dccl also demonstrates this same characteristic chemistry but to an even lesser degree than well 26cabl.

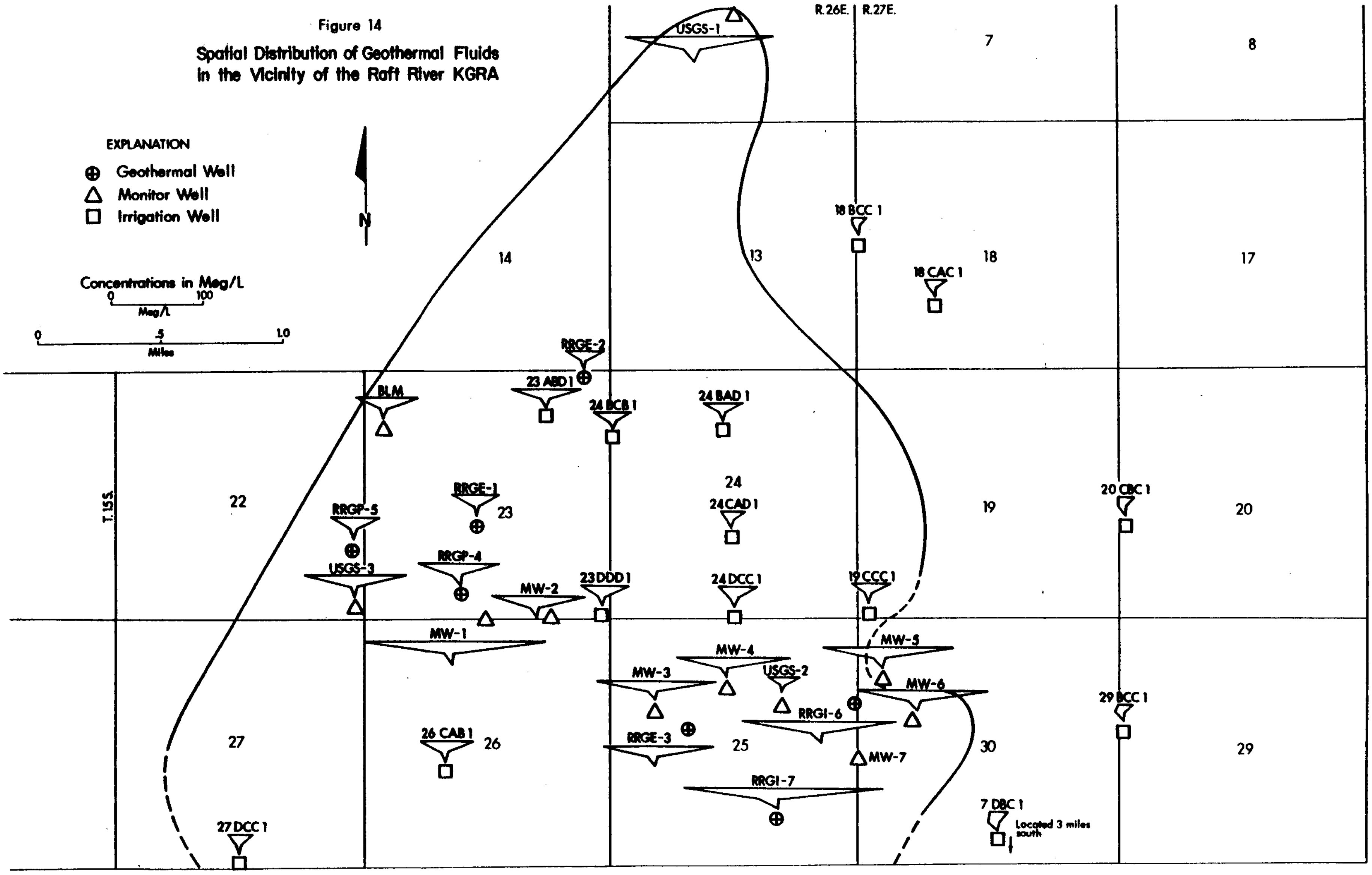
Figure 14 displays the spacial distribution of geothermal influence throughout the valley. Stiff diagrams have been plotted for numerous wells. These include geothermal, monitor, and irrigation wells. The area influenced by geothermal fluids is readily discernable. The predominance of the geothermal systems appears to diminish in a southerly direction. This is evident both to the southwest and southeast. This occurrence could result from several factors: 1) it is possible that the resource does not extend southward, 2) sufficient fracturing may not be present to the south to allow the geothermal fluids to migrate upward, and 3) the geothermal resource may exist in this direction but existing wells in the area are not deep enough to encounter the resource. More data are needed to adequately define the southern limit of the resource.

Movement of Geothermal Fluids

It is evident that there are two major fracture controlled geothermal reservoirs within the Raft River KGRA based on reservoir testing and statistical analysis of hydrochemical data. The direction of flow within these fractures is not known. Chloride values might indicate that fluid movement may be from northeast to southwest along the Bridge Fault System. Chloride tends to increase in the direction of flow in ground water systems. Cl^- increases in the Bridge Fault System from 600 mg/l

Figure 14

Spatial Distribution of Geothermal Fluids in the Vicinity of the Raft River KGRA



in well RRGE-2 to 880 mg/l in well RRGP-5. Well RRGE-1 has a Cl^- concentration of 750 mg/l. Interpretations of flow direction from chemistry in the absence of data on hydraulic potential can only be taken as conjective. No flow direction can be postulated for the Narrows Structure due to the lack of data points in the system.

Water of nearly the same chemical composition enters the two fracture systems. The Bridge Fault System is believed to have a higher hydraulic conductivity which facilitates much more rapid fluid movement than the Narrows Structure. As a consequence, the ion concentrations in the Narrows Structure may be more concentrated due to a longer residence time. This simple hypothesis may explain the varying chemistries between the two fracture systems.

The geothermal fluids appear to be confined to relatively narrow bands controlled by structural features. The fluids associated with the Bridge Fault System are confined to a fairly narrow band (∿1 mile) trending parallel to the strike of the fault. Upward and lateral movement of the geothermal fluids occurs most readily at or near the intersection of the two major structural features. The lateral movement of water is excellerated by the heavy pumping of the shallow irrigation wells in the vicinity of the geothermal development. The geothermal fluids do not appear to have migrated laterally great distances in any direction from the developed area. The heavy line on Figure 14 depicts a rough boundary of the area influenced by geothermal fluids.

A plume of geothermal fluid mixed with shallow meteoric water extends to the southwest along the Narrows Structure for at least two miles. The lateral movement of the geothermal fluids to the east does not extend more than a short distance beyond MW-6. Well 15S/27E 7dbc1 is located approximately three miles south of the injection well area. The chemistry of this well does not exhibit any evidence of mixing with geothermal fluids. It is concluded that the geothermal fluids extend to the south less than three miles. Geothermal fluids extend northeastward along the Bridge Fault System for considerable distances. USGS-1 strongly reflects the chemistry of the deep geothermal fluids.

CONCLUSIONS AND RECOMMENDATIONS

The following conclusions can be drawn based on an examination of available hydrochemical data in and near the Raft River KGRA.

1. The data produced by the INEL, IDWR, and USGS laboratories are of good quality. Data from the RR and EI laboratories are questionable.
2. The adjusted data in Appendix C is more indicative of the waters within the Raft River KGRA than the raw data listed in Appendix A.
3. Analysis of hydrochemical data support the hypothesis that there are two separate geothermal reservoirs in the Raft River KGRA, One is associated with the Bridge Fault System and the other with the Narrows Structure.
4. The differences in chemistry between the two major fracture systems are mainly due to residence time of the fluids in the fractures. The Bridge Fault System transmits fluids much more rapidly than the Narrows Structure and has a lower concentration of dissolved constituents.
5. The geothermal fluids move upward along fractures and laterally through the upper sediments. A plume has resulted which extends for some distance along the Bridge Fault system.

The recommendations given below are directed toward two topics: a) the quality of the data produced by the analytical laboratories, and

b) future drilling at the Raft River KGRA.

1. The adjusted data in Appendix C should be used for further studies.
2. The data produced by the Energy Incorporated (EI) laboratory should be carefully scrutinized in the future.
3. Cation/anion balances should be conducted on all future chemical analyses.
4. The Raft River laboratory should conduct a more thorough analysis on each sample and exercise a better program of quality control.
5. Further exploratory drilling of shallow to intermediate depth should be undertaken to accurately delineate the extent of the geothermal system.
6. If a new geothermal well is to be drilled, it should be located along the Bridge Fault System to the northeast of the present wells.

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APPENDIX A

Original Data

LAB-INEL

WELL NAME	DATE	PH	TEMP	COND	TDS	HARD	HCO3	CL	F	SO4	NA	CA	K	LI	SR	SI
RRGE-1	111278	0.0	0.	2980.	1656.	0.	33.2	830.	5.6	45.0	466.	56.	34.	1.6	1.4	64.
RRGE-1	111278	0.0	0.	3000.	1658.	0.	34.6	834.	5.8	35.8	472.	50.	32.	1.6	1.4	64.
RRGE-2	32177	0.0	271.	2900.	0.	0.	41.4	665.	10.0	0.0	412.	44.	34.	1.2	0.8	70.
RRGE-2	111278	0.0	0.	2160.	0.	0.	42.4	568.	79.6	0.0	326.	32.	30.	1.0	0.8	0.
RRGE-2	111278	0.0	0.	2160.	1206.	0.	42.0	592.	7.8	27.8	336.	32.	32.	1.0	0.8	74.
RRGE-2	11579	7.3	0.	2400.	2660.	0.	34.9	659.	6.8	52.8	449.	34.	36.	1.1	1.2	120.
RRGE-2	11579	7.5	0.	2400.	2660.	0.	41.6	645.	6.5	56.1	426.	36.	36.	1.1	1.2	110.
RRGE-2	11579	7.3	0.	2390.	2840.	0.	83.3	654.	6.8	47.6	428.	34.	36.	1.2	1.2	120.
RRGE-2	12079	0.0	0.	2733.	1299.	0.	51.2	574.	10.1	49.3	371.	30.	30.	1.1	0.0	81.
RRGE-2	41279	7.5	0.	2450.	1322.	0.	23.9	682.	8.6	50.0	511.	49.	38.	1.3	2.1	70.
RRGE-2	41279	0.0	0.	2520.	1296.	0.	74.8	680.	8.5	56.0	416.	46.	38.	1.2	1.4	76.
RRGE-2	41279	0.0	0.	2510.	1288.	0.	72.8	676.	9.0	54.0	466.	46.	38.	1.2	1.8	72.
RRGE-2	12079	0.0	0.	2751.	1234.	0.	45.2	629.	9.5	47.4	365.	30.	3.	1.1	0.0	74.
RRGE-3	20177	0.0	280.	0.	4160.	0.	30.4	2124.	4.4	65.0	1178.	182.	102.	2.2	0.0	88.
RRGE-3	20177	0.0	280.	0.	4160.	0.	33.2	2168.	4.8	64.2	1182.	198.	96.	2.2	0.0	84.
RRGE-3	61077	0.0	296.	8960.	4740.	0.	25.6	2220.	4.6	66.0	1228.	186.	102.	3.2	5.0	102.
RRGE-3	61077	0.0	286.	8960.	4780.	0.	25.6	2240.	4.8	66.0	1254.	200.	94.	3.4	5.4	88.
RRGE-3	72177	0.0	280.	0.	4460.	0.	26.0	2280.	5.1	67.2	1330.	202.	110.	3.4	5.0	76.
RRGE-3	72177	0.0	290.	9740.	4660.	0.	0.0	0.	0.0	0.0	0.	0.	0.	0.0	0.0	0.
RRGE-3	72177	0.0	290.	0.	4600.	0.	26.0	2280.	5.3	68.6	1348.	200.	106.	3.6	5.4	60.
RRGE-3	72177	0.0	290.	7466.	4520.	0.	0.0	0.	0.0	0.0	0.	0.	0.	0.0	0.0	0.
RRGE-3	72177	0.0	290.	0.	4840.	0.	26.8	2340.	5.2	67.0	1360.	204.	106.	3.6	5.2	68.
RRGE-3	72177	0.0	290.	9960.	4480.	0.	0.0	0.	0.0	0.0	0.	0.	0.	0.0	0.0	0.
RRGE-3	72177	0.0	290.	0.	4380.	0.	23.6	2300.	4.9	56.2	1282.	196.	98.	3.4	5.0	68.
RRGE-3	111278	0.0	0.	8000.	4300.	0.	25.8	2152.	3.7	44.6	1240.	258.	102.	2.4	5.2	76.
RRGE-3	111278	0.0	0.	8000.	4360.	0.	25.8	2080.	3.7	42.4	1250.	246.	104.	2.4	5.2	78.
RRGE-3	12079	0.0	0.	8866.	4123.	0.	39.4	2261.	4.9	60.9	1194.	175.	105.	3.2	0.0	81.
RRGE-3	12079	0.0	0.	8866.	4096.	0.	36.1	2266.	4.9	60.1	1178.	178.	105.	3.2	0.0	75.
RRGE-4	52777	0.0	0.	4760.	2120.	0.	58.0	906.	8.4	0.0	0.	0.	0.	0.0	0.0	0.
RRGE-4	52777	8.0	0.	4150.	2050.	0.	52.4	892.	7.8	0.0	0.	0.	0.	0.0	0.0	0.
RRGE-4	110877	0.0	232.	7620.	4626.	0.	25.4	0.	0.0	78.0	0.	142.	0.	0.0	0.0	50.
RRGE-4	110877	0.0	232.	7620.	4744.	0.	23.2	0.	0.0	78.0	0.	144.	0.	0.0	6.6	48.
RRGE-4	110877	7.4	232.	7330.	4448.	0.	23.9	2510.	4.5	61.0	1560.	160.	28.	3.4	6.4	45.
RRGE-4	110877	7.4	232.	7220.	4498.	0.	24.3	2640.	4.5	61.2	1490.	140.	28.	2.8	6.3	51.
RRGE-5	111278	0.0	0.	2860.	1416.	0.	40.8	602.	6.2	45.6	180.	46.	32.	1.6	1.2	64.
RRGE-5	111278	0.0	0.	2860.	1598.	0.	39.2	582.	6.2	33.8	178.	54.	36.	1.6	1.2	66.
RRGP-5	53179	6.9	0.	2690.	1660.	0.	28.9	800.	7.2	0.0	484.	41.	31.	1.4	1.2	57.
RRGE-6	111278	0.0	0.	11600.	6420.	0.	61.6	3576.	5.7	66.4	2020.	214.	32.	5.0	8.0	44.
RRGE-6	111278	0.0	0.	11600.	6340.	0.	62.4	3696.	5.8	53.0	2020.	184.	32.	5.2	8.0	44.
RRGE-7	80778	0.0	0.	12000.	7440.	0.	21.4	4170.	4.8	0.0	2200.	350.	0.	0.0	0.0	37.
RRGE-7	80778	0.0	0.	12000.	0.	0.	30.8	4000.	5.1	0.1	2000.	280.	0.	0.0	0.0	41.
MW-1	121378	7.8	0.	11350.	6590.	0.	24.5	3670.	2.1	67.0	2270.	210.	28.	4.1	7.0	37.
MW-1	20679	7.7	0.	11300.	6650.	0.	25.0	4110.	6.7	84.0	2270.	190.	30.	4.1	6.3	63.
MW-2	20679	7.4	0.	5700.	3360.	0.	27.0	1970.	2.4	57.6	1030.	120.	26.	2.7	3.5	69.
MW-2	121379	7.6	0.	5700.	3130.	0.	26.2	1700.	5.7	67.5	1320.	140.	24.	4.1	3.8	39.
MW-3	20778	0.0	0.	0.	0.	0.	0.0	2194.	2.0	167.0	1050.	330.	35.	0.0	3.2	35.
MW-3	20778	0.0	0.	0.	0.	0.	0.0	2133.	3.3	165.0	1000.	330.	35.	0.0	3.2	33.
MW-3	121378	7.5	0.	7700.	4920.	0.	45.8	2400.	5.6	67.5	1350.	170.	54.	3.1	1.8	43.
MW-3	20779	7.5	0.	7600.	4590.	0.	52.0	2770.	5.7	58.9	1370.	150.	58.	3.1	1.9	62.
MW-4	121378	7.7	0.	7800.	4520.	0.	29.7	2610.	5.6	19.8	1450.	160.	23.	3.3	0.8	38.

**NOTE: 0 INDICATES NO DETERMINATION
CONCENTRATIONS IN MG/L
TEMPERATURE IN DEGREES F

LAB-INEL

WELL NAME	DATE	PH	TEMP	COND	TDS	HARD	HCO3	CL	F	SO4	NA	CA	K	LI	SR	SI
MW-4	20779	7.8	0.	7800.	4840.	0.	30.6	2770.	5.6	53.4	1520.	150.	31.	3.3	1.4	67.
MW-5	121378	7.8	0.	2000.	1180.	0.	113.6	560.	1.0	19.8	485.	110.	12.	0.4	0.8	16.
MW-5	20779	7.6	0.	2000.	1520.	0.	102.0	610.	0.5	22.0	279.	98.	13.	0.3	1.1	1.
MW-6	121378	10.6	0.	7600.	4270.	0.	15.0	2340.	4.1	62.7	1170.	170.	62.	2.8	1.4	14.
MW-6	20779	7.7	0.	8700.	5430.	0.	44.3	2930.	4.9	73.1	1570.	230.	56.	3.1	1.3	85.
MW-7	121378	7.8	0.	2300.	1300.	0.	101.5	650.	1.0	24.8	375.	94.	14.	0.6	0.8	20.
MW-7	20779	7.8	0.	2310.	1370.	0.	110.0	690.	0.9	32.0	333.	99.	14.	0.6	1.0	17.
BLM	32778	0.0	0.	0.	1810.	0.	39.0	930.	5.8	54.3	580.	50.	25.	1.5	1.4	34.
BLM	20679	7.8	0.	3200.	1830.	0.	40.2	950.	5.3	64.9	577.	44.	21.	1.4	1.5	68.

**NOTE: 0 INDICATES NO DETERMINATION
CONCENTRATIONS IN MG/L
TEMPERATURE IN DEGREES F

LAB-IDWR

WELL NAME	DATE	PH	TEMP	COND	TDS	HARD	HCO3	CL	F	SO4	NA	CA	K	LI	SR	SI
16S-24E 12CCA1	82275	7.2	54.	1180.	0.	0.	363.7	160.	0.3	43.6	106.	108.	5.	0.0	0.0	44.
16S-24E 12CCA1	51476	7.2	53.	875.	0.	0.	263.3	129.	1.3	49.0	62.	91.	5.	0.1	0.0	35.
15S-24E 27DAA1	60777	7.1	58.	990.	0.	0.	162.3	213.	0.4	65.3	59.	106.	6.	0.0	0.0	55.
15S-24E 27DAA1	82275	7.1	55.	1130.	0.	0.	182.4	197.	0.4	86.4	71.	107.	6.	0.0	0.0	46.
15S-24E 27DAA1	51476	7.2	52.	970.	0.	0.	329.4	73.	4.3	148.8	126.	57.	3.	0.1	0.0	36.
15S-24E 27DAA1	82676	7.6	58.	1140.	0.	0.	171.4	223.	0.3	91.2	66.	115.	6.	0.0	0.0	52.
15S-25E 33CCD1	82676	7.8	53.	1850.	0.	0.	256.2	392.	0.1	153.6	145.	180.	6.	0.0	0.0	41.
15S-25E 33CCD1	82275	7.0	54.	1460.	0.	0.	232.5	280.	0.2	98.8	90.	153.	9.	0.0	0.0	39.
15S-26E 24DCC1	82676	7.9	89.	2510.	0.	0.	158.0	652.	2.5	50.9	342.	97.	13.	0.8	0.0	63.
15S-26E 24DCC1	53179	7.5	88.	3300.	0.	0.	156.8	911.	2.4	76.8	428.	161.	17.	0.9	0.0	51.
15S-26E 24DCC1	82478	7.6	89.	2880.	0.	0.	151.9	787.	2.3	62.4	368.	139.	15.	0.8	0.0	64.
15S-26E 26CAB1	51476	7.3	57.	5400.	0.	0.	563.6	1252.	2.1	364.8	784.	241.	14.	0.6	0.0	50.
15S-26E 26CAB1	82275	7.9	75.	3900.	0.	0.	148.9	1109.	5.1	66.3	731.	57.	14.	1.6	0.0	66.
15S-26E 26CAB1	72778	8.1	77.	3750.	0.	0.	125.1	1085.	5.7	51.9	695.	103.	12.	0.4	0.0	53.
15S-26E 26CAB1	62678	7.4	64.	1700.	0.	0.	225.1	440.	2.9	57.6	335.	28.	7.	0.6	0.0	46.
15S-26E 26CAB1	53179	8.1	73.	3730.	0.	0.	127.5	1071.	6.0	55.7	697.	43.	12.	1.5	0.0	49.
15S-26E 26CAB1	60777	7.9	76.	3900.	0.	0.	124.4	1095.	5.0	60.5	690.	50.	13.	1.4	0.0	68.
15S-26E 23DDC1	60777	7.5	57.	1070.	0.	0.	245.2	208.	0.8	81.6	96.	102.	7.	0.1	0.0	40.
15S-26E 23DDC1	62678	7.3	55.	925.	0.	0.	254.4	172.	0.7	65.3	89.	73.	5.	0.2	0.0	30.
15S-26E 23DDC1	72778	7.8	55.	1125.	0.	0.	252.0	199.	0.8	72.0	91.	103.	7.	0.0	0.0	33.
15S-26E 23DDC1	53179	7.5	52.	1051.	0.	0.	252.0	181.	0.8	64.4	87.	99.	6.	0.0	0.0	31.
15S-26E 23DDC1	51476	7.3	61.	1290.	0.	0.	215.3	315.	0.9	58.6	152.	106.	9.	0.3	0.0	35.
15S-26E 23DDC1	82275	7.3	59.	1150.	0.	0.	241.0	155.	1.1	65.3	105.	97.	8.	0.1	0.0	40.
15S-26E 23DDC	90277	7.1	57.	1110.	0.	0.	245.8	256.	0.6	79.7	97.	108.	7.	0.0	0.0	57.
15S-26E 23DDC1	82478	7.2	57.	1160.	0.	0.	242.9	203.	0.9	71.1	90.	101.	7.	0.0	0.0	40.
15S-26E 23DDD1	62678	7.0	105.	3600.	0.	0.	139.1	1097.	4.1	57.6	648.	62.	18.	1.7	0.0	52.
15S-26E 23DDD1	51476	7.1	88.	3400.	0.	0.	181.8	879.	2.6	61.4	455.	139.	16.	0.9	0.0	49.
15S-26E 23DDD1	53179	7.5	104.	3890.	0.	0.	141.6	1095.	4.5	103.8	641.	104.	18.	0.7	0.0	50.
15S-26E 23DDD1	72778	7.4	108.	3900.	0.	0.	136.7	1152.	4.6	56.7	635.	95.	18.	0.5	0.0	62.
15S-26E 23DDD1	82478	7.4	108.	3930.	0.	0.	132.4	1127.	4.7	52.8	643.	99.	18.	1.5	0.0	77.
15S-26E 23DDD1	82275	7.1	102.	3750.	0.	0.	138.5	1051.	3.8	55.7	608.	111.	20.	1.5	0.0	59.
15S-26E 23DDD1	60777	7.3	90.	2800.	0.	0.	204.3	731.	2.1	74.9	358.	118.	13.	0.8	0.0	60.
15S-26E 23DDD	90277	7.2	103.	3400.	0.	0.	154.3	1007.	3.5	62.4	578.	62.	17.	1.3	0.0	57.
15S-26E 23DDD	82676	7.8	108.	4000.	0.	0.	131.6	1166.	4.4	93.8	653.	94.	18.	1.6	0.0	71.
15S-26E 25ABB1	72778	7.7	89.	2800.	0.	0.	155.6	824.	2.4	69.2	375.	148.	15.	0.9	0.0	43.
15S-26E 25ABB1	60777	7.5	89.	2600.	0.	0.	153.7	673.	2.3	48.0	350.	103.	14.	0.8	0.0	65.
15S-26E 24BAD1	51476	7.3	89.	3000.	0.	0.	176.9	721.	2.3	55.7	417.	89.	16.	0.9	0.0	54.
15S-26E 24BAD1	82275	7.2	72.	2400.	0.	0.	198.9	640.	1.9	59.5	368.	103.	15.	0.8	0.0	50.
15S-26E 24BAD1	82676	7.6	80.	2550.	0.	0.	194.6	679.	2.1	58.6	369.	106.	13.	0.8	0.0	51.
15S-26E 24BAD1	60777	7.3	80.	2600.	0.	0.	197.0	651.	1.9	61.4	371.	102.	13.	0.8	0.0	52.
15S-26E 24BAD1	72778	8.0	84.	2500.	0.	0.	205.0	684.	2.1	62.4	373.	105.	13.	0.8	0.0	36.
15S-26E 24BAD1	82478	7.6	82.	2610.	0.	0.	199.5	682.	2.0	61.4	366.	107.	13.	0.8	0.0	51.
15S-26E 24BAD1	53179	7.2	59.	2530.	0.	0.	271.5	631.	1.2	86.5	317.	154.	11.	0.5	0.0	37.
15S-26E 24BCB1	72778	8.0	77.	2400.	0.	0.	193.4	662.	5.4	63.9	419.	0.	11.	0.9	0.0	46.
15S-26E 24BCB1	53179	7.6	73.	2460.	0.	0.	195.9	617.	5.6	61.5	407.	60.	11.	0.9	0.0	50.
15S-26E 24BCB1	82275	7.9	75.	2480.	0.	0.	166.7	646.	4.6	59.7	430.	61.	13.	1.0	0.0	60.
15S-26E 24BCB1	62678	7.4	74.	2200.	0.	0.	199.5	639.	4.4	64.3	406.	52.	11.	0.9	0.0	57.
15S-26E 24BCB1	60777	7.7	64.	3000.	0.	0.	291.0	770.	2.7	71.0	420.	133.	14.	0.8	0.0	65.
15S-26E 24BCB1	82676	8.0	61.	2400.	0.	0.	212.3	601.	2.3	57.6	319.	113.	11.	0.6	0.0	52.
15S-26E 60001	72778	7.3	54.	1630.	0.	0.	237.4	377.	0.8	58.6	176.	112.	5.	0.3	0.0	38.

**NOTE: 0 INDICATES NO DETERMINATION
CONCENTRATIONS IN MG/L
TEMPERATURE IN DEGREES F

LAJ-IOWR

WELL NAME	DATE	PH	TEMP	COND	TDS	HARD	HCO3	CL	F	SO4	NA	CA	K	LI	SR	SI
15S-26E 6ABC1	72778	7.7	53.	1960.	0.	0.	255.1	450.	1.4	68.2	210.	126.	9.	0.4	0.0	40.
15S-26E 25BDC1	72778	7.5	90.	2200.	0.	0.	132.4	650.	2.8	94.1	363.	75.	19.	0.9	0.0	52.
15S-26E 19CCC1	72778	7.3	68.	2700.	0.	0.	193.4	731.	2.2	78.8	375.	122.	18.	0.8	0.0	42.
15S-26E 18CAC1	72778	7.6	61.	1850.	0.	0.	201.4	440.	0.4	45.1	178.	119.	6.	0.3	0.0	39.
15S-26E 18BCC1	72778	7.5	0.	1360.	0.	0.	142.2	338.	0.5	30.7	112.	101.	12.	0.2	0.0	74.
15S-26E 17BCB1	72778	7.4	54.	2300.	0.	0.	264.6	565.	1.1	89.3	277.	144.	12.	0.5	0.0	37.
15S-26E 8CBC1	72778	7.9	55.	1050.	0.	0.	205.0	233.	0.3	47.1	79.	95.	6.	0.0	0.0	40.
15S-26E 20CBC1	72778	7.5	53.	1150.	0.	0.	160.5	260.	0.2	34.1	90.	94.	3.	0.0	0.0	30.
15S-26E 24CAD1	72778	7.9	82.	2100.	0.	0.	219.1	554.	1.5	69.2	266.	122.	13.	0.6	0.0	36.
15S-26E 24CAD1	60777	7.8	83.	2200.	0.	0.	214.7	563.	1.5	68.2	291.	120.	13.	0.7	0.0	56.
15S-26E 24CAD1	53179	7.8	82.	2220.	0.	0.	218.5	535.	1.6	69.2	284.	116.	13.	0.6	0.0	41.
15S-26E 24CAD1	82275	7.3	82.	2200.	0.	0.	211.7	560.	1.5	49.6	295.	126.	14.	0.7	0.0	50.
15S-26E 24CAD1	62678	7.3	83.	2300.	0.	0.	221.4	547.	1.5	77.3	295.	91.	13.	0.7	0.0	58.
15S-26E 24BAD	90277	7.7	77.	2500.	0.	0.	201.9	677.	2.0	62.4	371.	107.	13.	0.8	0.0	43.
15S-26E 24BAB1	62678	7.2	80.	2250.	0.	0.	202.5	635.	1.9	63.4	367.	74.	13.	0.3	0.0	38.
15S-26E 24DCC	90277	7.4	89.	2500.	0.	0.	159.2	676.	2.4	52.8	344.	107.	14.	0.2	0.0	50.
15S-26E 27DCC	82676	8.1	59.	1450.	0.	0.	245.2	321.	2.4	60.5	220.	60.	9.	0.4	0.0	52.
15S-26E 27DCC	90277	7.5	60.	1430.	0.	0.	249.5	323.	2.6	60.5	237.	55.	8.	0.3	0.0	44.
15S-26E 27DCC1	53179	7.7	60.	1480.	0.	0.	248.4	316.	2.7	62.4	223.	60.	7.	0.3	0.0	42.
15S-26E 27DCC1	60777	7.9	61.	1310.	0.	0.	250.7	295.	2.3	62.4	214.	56.	8.	0.3	0.0	54.
15S-26E 27DCC1	82275	7.7	59.	1400.	0.	0.	248.3	309.	2.4	55.3	233.	59.	9.	0.4	0.0	55.
15S-26E 27DCC1	51476	7.6	59.	1450.	0.	0.	250.7	302.	2.3	64.3	220.	62.	9.	0.4	0.0	52.
15S-26E 27DCC1	62678	7.3	59.	1380.	0.	0.	248.3	322.	2.6	61.4	235.	43.	8.	0.3	0.0	52.
15S-26E 23ABD1	51476	7.7	84.	4700.	0.	0.	133.0	1280.	5.1	115.2	777.	99.	25.	1.6	0.0	68.
15S-26E 23ABD1	72778	7.5	83.	4200.	0.	0.	142.2	1277.	5.3	100.9	723.	98.	20.	0.7	0.0	51.
15S-26E 23ABD1	53179	7.8	85.	4160.	0.	0.	141.6	1173.	5.6	0.0	740.	87.	19.	0.3	0.0	56.
15S-26E 23ABD1	82478	7.6	84.	4370.	0.	0.	137.3	1279.	4.9	96.0	755.	99.	19.	1.8	0.0	68.
15S-26E 23ABD1	60777	7.7	84.	4400.	0.	0.	131.1	1257.	5.1	92.2	777.	92.	20.	1.7	0.0	78.
15S-26E 23ABD1	62678	7.4	83.	4000.	0.	0.	135.4	1232.	4.8	94.1	769.	72.	18.	1.9	0.0	65.
15S-26E 23ABD1	82275	0.0	84.	4500.	0.	0.	123.3	1321.	4.9	90.3	809.	107.	23.	2.0	0.0	65.
15S-26E 23ABD	90277	7.6	84.	4300.	0.	0.	130.5	1251.	5.1	97.0	736.	96.	20.	1.8	0.0	57.
15S-26E 23ABD	82676	7.9	86.	4700.	0.	0.	124.4	1287.	5.2	94.1	796.	100.	20.	2.0	0.0	66.
15S-26E 25BCA1	72778	7.2	91.	5700.	0.	0.	71.4	1828.	3.3	178.8	899.	222.	39.	2.0	0.0	59.
15S-26E 7CBC1	72778	7.3	50.	1890.	0.	0.	295.3	409.	0.7	74.9	156.	163.	9.	0.2	0.0	35.
15S-27E 8CBC1	82478	7.4	55.	1110.	0.	0.	197.7	234.	0.3	40.3	76.	97.	5.	0.0	0.0	59.
15S-26E 29BCC1	72778	7.6	53.	1130.	0.	0.	159.3	254.	0.2	40.8	81.	101.	3.	0.0	0.0	29.
15S-27E 8CBC1	62678	7.6	55.	970.	0.	0.	198.3	224.	0.2	44.6	76.	72.	6.	0.0	0.0	50.
15S-27E 2CCBC1	53179	7.7	52.	1081.	0.	0.	159.9	254.	0.2	31.7	96.	91.	3.	0.0	0.0	29.
15S-27E 7CBC1	51476	7.1	47.	1475.	0.	0.	316.6	285.	0.7	64.3	135.	130.	130.	0.1	0.0	42.
15S-27E 7CBC	90277	7.0	51.	1830.	0.	0.	284.4	442.	0.7	72.0	176.	72.	9.	0.3	0.0	51.
15S-27E 6CDD	90277	7.3	54.	1520.	0.	0.	230.0	364.	0.8	53.8	181.	54.	9.	0.3	0.0	40.
15S-27E 6ABC1	60777	7.6	54.	1760.	0.	0.	250.7	44.	1.5	70.1	225.	120.	10.	0.4	0.0	53.
15S-27E 6ABC1	51476	7.2	52.	1820.	0.	0.	220.5	239.	1.3	55.7	215.	117.	10.	0.4	0.0	46.
15S-27E 6ABC	82676	7.8	52.	1860.	0.	0.	257.4	464.	1.5	67.2	221.	125.	10.	0.4	0.0	50.
15S-27E 8CBC1	82275	0.0	50.	0.	0.	0.	344.1	305.	0.5	29.6	201.	98.	4.	0.1	0.0	30.
15S-27E 8CBC1	53179	7.6	55.	1069.	0.	0.	198.3	228.	0.3	46.1	79.	93.	6.	0.0	0.0	45.
15S-27E 8CBC1	60777	7.5	56.	1030.	0.	0.	202.5	236.	0.3	48.0	77.	94.	6.	0.0	0.0	57.
15S-27E 8CBC	90277	7.5	55.	1100.	0.	0.	205.0	244.	0.2	47.0	82.	99.	6.	0.0	0.0	39.
15S-27E 20CBC1	62678	7.5	51.	990.	0.	0.	158.6	257.	0.2	31.7	57.	32.	4.	0.0	0.0	31.
15S-27E 20CBC1	82275	7.4	52.	1160.	0.	0.	159.3	264.	0.2	30.7	100.	98.	4.	0.0	0.0	32.

**NOTE: 0 INDICATES NO DETERMINATION
CONCENTRATIONS IN MG/L
TEMPERATURE IN DEGREES F

LAB-IDWR

WELL NAME	DATE	PH	TEMP	COND	TDS	HARD	HCO3	CL	F	SO4	NA	CA	K	LI	SR	SI
15S-27E 20CBC1	51476	7.5	52.	1400.	0.	0.	170.2	375.	0.2	31.2	115.	118.	4.	0.1	0.0	38.
15S-27E 20CBC1	60777	7.4	53.	1030.	0.	0.	156.8	264.	0.2	31.2	91.	91.	4.	0.0	0.0	37.
14S-27E 32BDD2	90277	7.2	53.	2150.	0.	0.	270.8	535.	0.2	83.5	155.	184.	9.	0.1	0.0	43.
15S-27E 19CCC1	82275	7.2	66.	2900.	0.	0.	197.7	739.	2.7	74.9	400.	130.	20.	0.9	0.0	53.
15S-27E 19CCC1	53179	7.8	66.	2780.	0.	0.	193.4	755.	2.3	75.9	354.	123.	19.	0.8	0.0	47.
15S-27E 19CCC1	51476	7.4	63.	3200.	0.	0.	198.9	777.	2.2	89.3	415.	131.	21.	0.8	0.0	60.
15S-27E 19CCC1	62678	7.1	67.	2600.	0.	0.	195.2	753.	2.1	78.7	359.	94.	18.	0.9	0.0	49.
15S-27E 18CAC1	82676	7.9	56.	2750.	0.	0.	276.3	687.	0.6	75.4	262.	201.	11.	0.5	0.0	45.
15S-27E 18CAC1	51476	7.2	45.	1170.	0.	0.	269.6	202.	0.9	59.5	116.	92.	7.	0.2	0.0	38.
15S-27E 18CAC1	82275	7.3	59.	1870.	0.	0.	190.4	462.	0.5	48.0	152.	124.	7.	0.3	0.0	43.
15S-27E 18CAC1	62678	7.4	60.	1590.	0.	0.	195.2	447.	0.5	42.2	187.	90.	6.	0.3	0.0	36.
15S-27E 18CAC1	53179	7.8	60.	1715.	0.	0.	194.0	432.	0.5	46.1	183.	114.	5.	0.3	0.0	39.
15S-27E 6ABC1	62678	7.7	54.	1740.	0.	0.	237.9	458.	1.3	66.2	232.	93.	9.	0.4	0.0	36.
15S-27E 6ABC1	82275	7.0	52.	1960.	0.	0.	227.0	459.	1.4	49.1	232.	122.	11.	0.5	0.0	49.
15S-27E 6ABC1	82478	7.3	54.	1960.	0.	0.	242.3	469.	1.4	63.4	223.	126.	9.	0.4	0.0	48.
15S-27E 6ABC1	53179	7.6	53.	182800.	0.	0.	247.1	454.	1.4	61.5	235.	122.	10.	0.4	0.0	38.
15S-27E 6CDDD1	60777	7.3	56.	1440.	0.	0.	230.6	351.	0.8	57.6	173.	105.	9.	0.3	0.0	33.
15S-27E 6DDDD1	82275	7.5	53.	1570.	0.	0.	233.7	352.	0.9	43.3	178.	109.	9.	0.3	0.0	42.
15S-27E 6DDD1	82478	7.2	55.	1660.	0.	0.	229.4	374.	0.8	54.8	173.	113.	8.	0.3	0.0	47.
15S-27E 6CDD1	51476	7.1	53.	1610.	0.	0.	240.9	359.	0.9	59.5	174.	112.	9.	0.3	0.0	45.
15S-27E 6CDD1	53179	7.3	54.	1560.	0.	0.	236.8	369.	0.9	57.6	184.	109.	8.	0.3	0.0	34.
15S-27E 6CDD1	62678	7.3	54.	1420.	0.	0.	236.1	362.	0.8	58.6	177.	83.	9.	0.3	0.0	39.
15S-27E 7CBC1	53179	7.3	51.	1670.	0.	0.	281.3	418.	0.8	71.7	174.	157.	9.	0.3	0.0	34.
15S-27E 7CBC1	62678	7.3	51.	1490.	0.	0.	295.8	345.	0.6	71.0	154.	110.	9.	0.2	0.0	33.
15S-27E 7CBC1	82275	7.2	50.	1720.	0.	0.	282.5	351.	0.7	43.4	152.	146.	10.	0.2	0.0	43.
15S-27E 7CBC1	82478	7.1	51.	1870.	0.	0.	284.3	420.	0.6	70.1	160.	165.	9.	0.2	0.0	46.
15S-27E 7CBC1	60777	7.1	51.	1750.	0.	0.	275.1	400.	0.7	76.8	180.	162.	10.	0.3	0.0	48.
15S-27E 17BCB1	53179	7.7	52.	2310.	0.	0.	258.7	574.	1.1	88.4	292.	151.	12.	0.5	0.0	38.
15S-27E 17BCB1	62678	7.3	53.	2100.	0.	0.	258.6	547.	1.0	85.5	275.	111.	11.	0.5	0.0	42.
15S-27E 17BCB1	51476	7.2	51.	2500.	0.	0.	332.4	520.	0.9	115.2	266.	166.	11.	0.5	0.0	34.
15S-27E 17BCB1	82275	7.2	50.	2400.	0.	0.	327.1	542.	1.0	46.2	280.	167.	12.	0.4	0.0	46.
15S-27E 17BCB	90277	7.5	51.	2200.	0.	0.	286.1	554.	1.0	94.1	266.	151.	11.	0.5	0.0	60.
14S-27E 32BCD1	82478	7.2	50.	4750.	0.	0.	341.1	1266.	0.6	321.8	575.	287.	278.	0.3	0.0	44.
14S-27E 32BDD1	82275	6.9	52.	2250.	0.	0.	278.3	525.	0.7	111.4	193.	206.	10.	0.2	0.0	49.
14S-27E 32BCD1	60777	7.3	52.	5300.	0.	0.	352.0	1402.	0.6	408.0	378.	542.	13.	0.2	0.0	51.
14S-27E 32BDD1	90277	7.3	50.	3500.	0.	0.	300.7	966.	0.5	193.9	255.	363.	10.	0.2	0.0	38.
14S-27E 32CBC	90277	7.3	52.	1420.	0.	0.	258.0	317.	0.8	63.4	144.	118.	8.	0.2	0.0	53.
14S-27E 32CBC1	62678	7.4	52.	1100.	0.	0.	231.2	261.	0.9	45.1	141.	67.	7.	0.3	0.0	32.
14S-27E 32CBD	90277	7.6	54.	990.	0.	0.	185.4	229.	0.9	28.8	139.	51.	5.	0.3	0.0	38.
13S-27E 22DBB1	82478	7.9	66.	577.	0.	0.	156.2	91.	0.5	19.2	22.	55.	9.	0.0	0.0	70.
13S-27E 22BAA1	82478	7.2	57.	3490.	0.	0.	109.2	1046.	0.2	41.3	43.	399.	14.	0.0	0.0	55.
14S-27E 32CBC1	72778	7.4	52.	1325.	0.	0.	215.4	301.	1.0	42.3	147.	85.	7.	0.3	0.0	33.
14S-27E 32CBC1	53179	7.3	52.	1299.	0.	0.	210.5	293.	1.0	44.2	155.	84.	7.	0.3	0.0	34.
15S-27E 9CCC1	62478	7.3	66.	2920.	0.	0.	193.4	774.	2.1	74.9	396.	130.	19.	0.9	0.0	62.
15S-27E 7CBC	82676	7.7	50.	1550.	0.	0.	289.8	317.	0.7	69.1	145.	136.	8.	0.1	0.0	45.
15S-27E 18BCC	90277	7.6	71.	1300.	0.	0.	144.6	345.	0.4	29.8	118.	95.	12.	0.2	0.0	53.
15S-27E 18BCC	82676	8.0	71.	1340.	0.	0.	138.5	354.	0.5	32.2	120.	100.	11.	0.1	0.0	67.
15S-27E 29BCC1	82275	7.3	50.	2200.	0.	0.	170.2	393.	0.2	29.8	121.	155.	4.	0.0	0.0	30.
15S-27E 29BCC1	82478	7.3	53.	1240.	0.	0.	162.3	288.	0.2	47.1	90.	113.	3.	0.0	0.0	35.
15S-27E 29BCC1	60777	7.3	52.	1250.	0.	0.	162.9	323.	0.2	61.4	98.	118.	3.	0.0	0.0	32.

**NOTE: O INDICATES NO DETERMINATION
CONCENTRATIONS IN MG/L
TEMPERATURE IN DEGREES F

LAB-IOWR

WELL NAME	DATE	PH	TEMP	COND	TDS	HARD	HCO3	CL	F	SO4	NA	CA	K	LI	SR	SI
15S-27E 29BCC1	62678	7.4	54.	1020.	0.	0.	159.8	261.	0.0	45.1	93.	77.	3.	0.0	0.0	25.
15S-27E 18CAC	60777	7.8	60.	1730.	0.	0.	191.5	470.	0.5	48.0	188.	123.	7.	0.3	0.0	50.
15S-27E 19CCC	90277	7.3	66.	2800.	0.	0.	201.9	790.	2.2	88.3	410.	129.	19.	0.9	0.0	32.
15S-27E 18BCC1	53179	7.7	71.	1481.	0.	0.	144.6	369.	0.5	34.6	134.	105.	11.	0.2	0.0	58.
15S-27E 18BCC1	60777	7.4	72.	1370.	0.	0.	144.6	378.	0.4	31.7	134.	105.	12.	0.1	0.0	75.
15S-27E 18BCC1	82275	7.3	72.	1250.	0.	0.	146.4	333.	0.5	28.8	121.	98.	13.	0.2	0.0	69.
15S-27E 18BCC1	62678	7.6	72.	1280.	0.	0.	144.6	362.	0.4	31.2	127.	75.	12.	0.2	0.0	58.
15S-27E 8BCC1	82478	7.6	72.	1390.	0.	0.	141.6	348.	0.5	27.9	114.	102.	11.	0.2	0.0	67.
MW-1	72778	7.7	158.	11000.	0.	0.	34.2	3709.	3.1	74.9	2006.	208.	32.	4.0	0.0	64.
BLM	72778	7.7	202.	3000.	0.	0.	55.5	886.	7.8	57.6	552.	52.	21.	0.4	0.0	76.
USGS-3	82478	7.9	74.	6070.	0.	0.	58.0	1897.	4.3	62.4	1397.	60.	16.	0.6	0.0	68.
CROOK	72778	8.1	206.	5800.	0.	0.	47.0	1865.	6.2	55.7	1017.	128.	32.	2.0	0.0	70.
1-DOMESTIC	72778	7.6	86.	2200.	0.	0.	127.5	594.	4.4	51.9	854.	56.	11.	0.7	0.0	45.

**NOTE: 0 INDICATES NO DETERMINATION
CONCENTRATIONS IN MG/L
TEMPERATURE IN DEGREES F

LAB-USGS

WELL NAME	DATE	PH	TEMP	COND	TDS	HARD	HCO3	CL	F	SO4	NA	CA	K	LI	SR	SI
USGS-1	90574	7.8	81.	8910.	0.	610.	83.0	3600.	4.0	47.0	2000.	240.	270.	1.0	1.4	85.
USGS-1	90674	7.8	81.	7360.	0.	590.	93.0	2800.	3.2	49.0	1500.	230.	200.	0.9	1.8	85.
USGS-1	90674	7.9	84.	7760.	0.	590.	83.0	2800.	3.1	45.0	1500.	230.	21C.	0.9	1.7	84.
USGS-1	90774	7.8	84.	10900.	0.	790.	70.0	3500.	3.2	43.0	1800.	310.	270.	1.1	2.3	82.
USGS-1	120574	7.8	78.	9980.	0.	760.	58.0	3900.	3.9	45.0	2000.	300.	270.	1.3	1.8	88.
USGS-1	120674	7.6	64.	2920.	0.	420.	131.0	890.	0.8	31.0	400.	140.	40.	0.3	C.9	60.
USGS-2	101774	7.8	86.	1960.	0.	160.	179.0	470.	2.3	78.0	330.	51.	14.	0.0	0.0	41.
USGS-2	11475	7.7	86.	1950.	0.	100.	176.0	570.	2.8	32.0	370.	35.	34.	6.6	0.3	88.
USGS-3	120674	8.1	179.	6610.	0.	140.	63.0	2000.	5.0	52.0	1300.	56.	14.	1.8	2.0	56.
USGS-3	11375	8.2	173.	6600.	0.	140.	73.0	2100.	5.1	51.0	1300.	56.	13.	0.4	2.1	51.
USGS-3	33175	0.0	111.	5100.	0.	140.	69.0	1700.	5.2	49.0	1100.	55.	11.	1.6	1.4	39.
USGS-3	40175	6.3	133.	5000.	0.	150.	54.0	1800.	4.9	0.0	1200.	59.	13.	1.7	1.2	48.
USGS-4	32875	6.8	104.	1540.	0.	180.	138.0	380.	4.4	44.0	240.	58.	13.	0.7	0.3	37.
USGS-5	32875	7.2	53.	439.	0.	130.	161.0	61.	0.6	15.0	28.	39.	4.	0.0	0.1	38.

**NOTE: 0 INDICATES NO DETERMINATION
CONCENTRATIONS IN MG/L
TEMPERATURE IN DEGREES F

LAB-RR

WELL NAME	DATE	PH	TEMP	COND	TDS	HARD	HCO3	CL	F	SO4	NA	CA	K	LI	SR	SI
RRGE-1	21979	8.3	0.	3000.	0.	64.	37.1	854.	7.9	0.0	540.	0.	0.	0.0	0.0	0.
RRGE-1	82878	8.3	201.	3000.	0.	125.	35.9	814.	0.0	0.0	0.	0.	0.	0.0	0.0	0.
RRGE-1	21279	8.3	0.	3000.	0.	130.	38.0	965.	8.1	0.0	551.	0.	0.	0.0	0.0	0.
RRGE-1	20579	8.2	0.	2900.	0.	152.	43.2	1000.	7.7	0.0	518.	0.	0.	0.0	0.0	0.
RRGE-1	12979	8.3	0.	2800.	0.	148.	37.9	1070.	7.8	0.0	492.	0.	0.	0.0	0.0	0.
RRGE-1	12279	8.3	0.	2700.	0.	150.	42.2	954.	7.8	0.0	497.	0.	0.	0.0	0.0	0.
RRGE-1	122578	8.3	0.	2700.	0.	136.	42.4	1010.	6.5	0.0	615.	0.	0.	0.0	0.0	0.
RRGE-1	51479	7.8	0.	2000.	0.	84.	44.2	644.	8.6	0.0	380.	0.	0.	0.0	0.0	0.
RRGE-1	50779	7.7	0.	2000.	0.	120.	49.6	623.	8.8	0.0	376.	0.	0.	0.0	0.0	0.
RRGE-1	43079	7.6	0.	3000.	0.	132.	40.4	730.	6.6	0.0	489.	0.	0.	0.0	0.0	0.
RRGE-1	42379	8.2	0.	2700.	0.	140.	36.8	915.	7.8	0.0	510.	0.	0.	0.0	0.0	0.
RRGE-1	41679	8.4	0.	2700.	0.	136.	59.0	937.	7.6	0.0	513.	0.	0.	0.0	0.0	0.
RRGE-1	40979	8.1	0.	2700.	0.	130.	38.2	935.	7.9	0.0	543.	0.	0.	0.0	0.0	0.
RRGE-1	121878	8.5	0.	2900.	0.	158.	44.2	1000.	8.4	0.0	510.	0.	0.	0.0	0.0	0.
RRGE-1	121178	8.4	0.	2800.	0.	153.	48.8	957.	8.3	0.0	537.	0.	0.	0.0	0.0	0.
RRGE-1	120478	8.2	0.	2900.	0.	144.	45.2	843.	7.4	0.0	582.	0.	0.	0.0	0.0	0.
RRGE-1	112778	8.1	194.	2900.	0.	140.	41.6	924.	6.0	0.0	0.	0.	0.	0.0	0.0	0.
RRGE-1	102378	8.3	199.	3900.	0.	150.	39.8	853.	6.5	0.0	0.	0.	0.	0.0	0.0	0.
RRGE-1	101678	8.3	196.	3100.	0.	142.	38.6	872.	7.8	0.0	0.	0.	0.	0.0	0.0	0.
RRGE-1	100978	8.1	190.	2800.	0.	119.	47.2	743.	6.0	0.0	0.	0.	0.	0.0	0.0	0.
RRGE-1	100278	8.9	203.	2900.	0.	148.	51.1	848.	8.0	0.0	0.	0.	0.	0.0	0.0	0.
RRGE-1	92178	8.5	196.	2800.	0.	150.	32.5	740.	8.3	0.0	0.	0.	0.	0.0	0.0	0.
RRGE-1	91178	7.9	194.	3000.	0.	130.	39.2	865.	7.8	0.0	0.	0.	0.	0.0	0.0	0.
RRGE-1	82178	8.5	0.	3550.	0.	145.	36.1	852.	0.0	0.0	0.	0.	0.	0.0	0.0	0.
RRGE-1	80778	8.5	0.	2800.	0.	150.	44.3	760.	8.6	0.0	0.	0.	0.	0.0	0.0	0.
RRGE-1	73178	8.6	0.	2800.	0.	125.	36.9	750.	7.8	0.0	0.	0.	0.	0.0	0.0	0.
RRGE-1	72478	8.5	0.	2900.	0.	100.	41.4	775.	9.3	0.0	0.	0.	0.	0.0	0.0	0.
RRGE-1	71778	8.4	0.	2900.	0.	110.	32.5	600.	7.7	0.0	0.	0.	0.	0.0	0.0	0.
RRGE-1	71078	8.2	0.	3250.	0.	117.	0.0	800.	7.3	0.0	0.	0.	0.	0.0	0.0	0.
RRGE-1	70378	8.3	0.	3400.	0.	110.	22.1	800.	0.0	0.0	0.	0.	0.	0.0	0.0	0.
RRGE-1	62678	8.3	0.	2950.	0.	130.	20.0	750.	8.0	0.0	0.	0.	0.	0.0	0.0	0.
RRGE-1	61978	8.4	0.	2600.	0.	110.	0.0	800.	7.8	0.0	0.	0.	0.	0.0	0.0	0.
RRGE-1	61278	8.4	0.	3000.	0.	120.	0.0	755.	8.2	0.0	0.	0.	0.	0.0	0.0	0.
RRGE-1	60578	0.0	0.	3000.	0.	115.	0.0	655.	8.4	0.0	0.	0.	0.	0.0	0.0	0.
RRGE-1	53078	8.5	0.	2800.	0.	115.	35.6	725.	9.0	0.0	0.	0.	0.	0.0	0.0	0.
RRGE-1	52278	7.7	0.	2900.	0.	112.	44.6	750.	9.0	0.0	0.	0.	0.	0.0	0.0	0.
RRGE-1	51578	6.9	0.	3000.	0.	110.	40.9	750.	7.5	0.0	0.	0.	0.	0.0	0.0	0.
RRGE-1	50878	7.8	0.	2800.	0.	120.	20.7	705.	7.8	0.0	0.	0.	0.	0.0	0.0	0.
RRGE-1	50178	6.4	0.	2800.	0.	110.	45.7	800.	5.7	0.0	0.	0.	0.	0.0	0.0	0.
RRGE-2	21279	8.4	0.	2500.	0.	100.	52.0	889.	9.5	0.0	419.	0.	0.	0.0	0.0	0.
RRGE-2	20579	8.5	0.	2200.	0.	88.	41.7	725.	10.2	0.0	384.	0.	0.	0.0	0.0	0.
RRGE-2	12279	8.9	0.	2300.	0.	122.	69.7	746.	9.5	0.0	420.	0.	0.	0.0	0.0	0.
RRGE-2	52879	7.9	0.	2400.	0.	100.	40.8	722.	8.8	0.0	422.	0.	0.	0.0	0.0	0.
RRGE-2	51479	7.6	0.	2000.	0.	114.	42.4	681.	8.1	0.0	415.	0.	0.	0.0	0.0	0.
RRGE-2	40979	7.1	0.	2400.	0.	102.	0.0	729.	8.7	0.0	438.	0.	0.	0.0	0.0	0.
RRGE-2	121878	7.6	165.	1800.	0.	88.	43.8	567.	11.5	0.0	314.	0.	0.	0.0	0.0	0.
RRGE-2	121178	7.6	170.	1900.	0.	82.	46.8	513.	11.4	0.0	324.	0.	0.	0.0	0.0	0.
RRGE-2	120478	7.5	171.	1780.	0.	90.	43.4	565.	11.1	0.0	303.	0.	0.	0.0	0.0	0.
RRGE-2	112778	8.8	189.	2300.	0.	104.	37.2	772.	10.4	0.0	0.	0.	0.	0.0	0.0	0.
RRGE-2	60578	0.0	0.	2400.	0.	85.	0.0	600.	9.0	0.0	0.	0.	0.	0.0	0.0	0.

**NOTE: 0 INDICATES NO DETERMINATION
CONCENTRATIONS IN MG/L
TEMPERATURE IN DEGREES F

LAB-RR

WELL NAME	DATE	PH	TEMP	COND	TDS	HARD	HCO3	CL	F	SO4	NA	CA	K	LI	SR	SI
RRGE-2	53078	7.5	0.	2200.	0.	75.	46.4	550.	10.5	0.0	0.	0.	0.	0.0	0.0	0.
RRGE-2	21979	8.8	0.	2800.	0.	100.	37.0	718.	9.2	0.0	392.	0.	0.	0.0	0.0	0.
RRGE-3	21979	7.9	0.	7900.	0.	224.	26.8	3650.	4.6	0.0	1100.	0.	0.	0.0	0.0	0.
RRGE-3	21279	6.8	0.	7800.	0.	540.	26.4	3110.	4.7	0.0	1160.	0.	0.	0.0	0.0	0.
RRGE-3	20579	7.0	0.	6700.	0.	554.	26.8	3150.	4.7	0.0	1150.	0.	0.	0.0	0.0	0.
RRGE-3	12979	6.9	0.	2600.	0.	558.	26.9	2720.	4.9	0.0	1100.	0.	0.	0.0	0.0	0.
RRGE-3	12279	7.1	0.	6900.	0.	564.	48.8	2540.	4.9	0.0	1200.	0.	0.	0.0	0.0	0.
RRGE-3	122578	6.9	158.	6900.	0.	566.	28.0	2720.	4.3	0.0	1380.	0.	0.	0.0	0.0	0.
RRGE-3	121878	6.8	171.	6800.	0.	560.	26.2	2740.	5.1	0.0	1150.	0.	0.	0.0	0.0	0.
RRGE-3	121178	7.0	171.	6700.	0.	472.	27.0	2190.	5.1	0.0	1220.	0.	0.	0.0	0.0	0.
RRGE-3	120478	6.7	162.	6800.	0.	568.	26.0	2500.	5.2	0.0	1190.	0.	0.	0.0	0.0	0.
RRGE-3	112778	7.4	167.	6800.	0.	568.	27.2	2280.	5.2	0.0	0.	0.	0.	0.0	0.0	0.
RRGE-3	100978	8.2	0.	8000.	0.	584.	26.4	2560.	5.1	0.0	0.	0.	0.	0.0	0.0	0.
RRGE-3	62678	8.1	0.	8500.	0.	525.	26.8	2650.	6.7	0.0	0.	0.	0.	0.0	0.0	0.
RRGE-3	61978	7.3	0.	8600.	0.	565.	0.0	2700.	6.5	0.0	0.	0.	0.	0.0	0.0	0.
RRGE-3	61278	7.3	0.	9000.	0.	565.	0.0	2700.	6.8	0.0	0.	0.	0.	0.0	0.0	0.
RRGE-3	60578	0.0	0.	8600.	0.	550.	0.0	2775.	6.9	0.0	0.	0.	0.	0.0	0.0	0.
RRGE-3	53078	7.9	0.	10900.	0.	595.	34.1	3305.	8.0	0.0	0.	0.	0.	0.0	0.0	0.
RRGE-3	50178	7.0	0.	3150.	0.	551.	0.0	2260.	5.6	0.0	0.	0.	0.	0.0	0.0	0.
RRGP-4	21979	7.0	0.	4100.	0.	212.	39.0	1670.	6.3	0.0	655.	0.	0.	0.0	0.0	0.
RRGP-4	21279	7.2	0.	4200.	0.	224.	33.2	1710.	6.1	0.0	756.	0.	0.	0.0	0.0	0.
RRGP-4	20579	7.1	0.	4400.	0.	204.	33.2	1820.	6.3	0.0	759.	0.	0.	0.0	0.0	0.
RRGP-4	12979	7.2	0.	3550.	0.	213.	35.2	1780.	6.4	0.0	707.	0.	0.	0.0	0.0	0.
RRGP-4	12279	7.2	0.	4000.	0.	220.	32.4	1750.	6.3	0.0	741.	0.	0.	0.0	0.0	0.
RRGP-4	122578	7.5	0.	4000.	0.	196.	34.6	1560.	5.5	0.0	873.	0.	0.	0.0	0.0	0.
RRGP-4	121878	7.4	180.	4000.	0.	204.	32.5	1620.	7.0	0.0	710.	0.	0.	0.0	0.0	0.
RRGP-4	121178	7.3	135.	1400.	0.	222.	36.6	1400.	6.7	0.0	728.	0.	0.	0.0	0.0	0.
RRGP-4	120478	7.3	140.	4300.	0.	230.	34.5	1400.	6.2	0.0	805.	0.	0.	0.0	0.0	0.
RRGP-4	112778	7.0	0.	4400.	0.	224.	36.0	1670.	6.7	0.0	0.	0.	0.	0.0	0.0	0.
RRGP-4	102378	8.8	0.	5000.	0.	254.	65.2	1310.	7.0	0.0	0.	0.	0.	0.0	0.0	0.
RRGP-4	101678	8.9	0.	0.	0.	238.	63.7	1490.	6.9	0.0	0.	0.	0.	0.0	0.0	0.
RRGP-4	92578	8.1	0.	7400.	0.	404.	26.4	2590.	6.0	0.0	0.	0.	0.	0.0	0.0	0.
RRGE-4	50878	8.0	0.	2500.	0.	81.	10.0	650.	8.5	0.0	0.	0.	0.	0.0	0.0	0.
RRGP-5	60578	0.0	0.	3700.	0.	120.	0.0	975.	8.1	0.0	0.	0.	0.	0.0	0.0	0.
RRGP-5	61278	8.3	0.	2800.	0.	160.	0.0	725.	11.8	0.0	0.	0.	0.	0.0	0.0	0.
RRGP-5	61578	8.1	0.	2150.	0.	100.	0.0	900.	8.7	0.0	0.	0.	0.	0.0	0.0	0.
RRGP-5	70378	8.1	0.	4000.	0.	110.	31.7	1000.	0.0	0.0	0.	0.	0.	0.0	0.0	0.
RRGP-5	120478	7.5	154.	2800.	0.	439.	45.1	2800.	8.1	0.0	439.	0.	0.	0.0	0.0	0.
RRGP-5	121178	7.5	135.	2500.	0.	132.	54.4	734.	8.4	0.0	454.	0.	0.	0.0	0.0	0.
RRGP-5	21979	7.3	0.	2600.	0.	114.	44.5	853.	7.9	0.0	431.	0.	0.	0.0	0.0	0.
RRGP-5	12979	7.3	0.	2500.	0.	102.	44.2	987.	8.2	0.0	419.	0.	0.	0.0	0.0	0.
RRGP-5	12279	7.5	0.	2600.	0.	156.	51.6	850.	7.7	0.0	414.	0.	0.	0.0	0.0	0.
RRGP-5	122578	7.6	156.	2400.	0.	136.	46.0	817.	8.7	0.0	419.	0.	0.	0.0	0.0	0.
RRGP-5	52879	7.2	0.	2400.	0.	114.	72.2	820.	7.1	0.0	472.	0.	0.	0.0	0.0	0.
RRGP-5	51479	7.4	0.	2400.	0.	110.	50.8	839.	7.7	0.0	478.	0.	0.	0.0	0.0	0.
RRGP-5	50779	8.6	0.	2400.	0.	130.	39.9	802.	7.5	0.0	450.	0.	0.	0.0	0.0	0.
RRGP-5	43079	8.0	0.	2400.	0.	130.	39.4	754.	7.7	0.0	425.	0.	0.	0.0	0.0	0.
RRGP-5	42379	6.9	0.	2400.	0.	120.	39.2	740.	7.6	0.0	423.	0.	0.	0.0	0.0	0.
RRGP-5	121878	7.5	154.	2550.	0.	142.	44.9	926.	8.6	0.0	442.	0.	0.	0.0	0.0	0.
RRGI-6	51578	7.4	0.	9800.	0.	410.	50.4	3045.	6.3	0.0	0.	0.	0.	0.0	0.0	0.

**NOTE: 0 INDICATES NO DETERMINATION
CONCENTRATIONS IN MG/L
TEMPERATURE IN DEGREES F

LAB-RR

WELL NAME	DATE	PH	TEMP	COND	TDS	HARD	HCO3	CL	F	SO4	NA	CA	K	LI	SR	SI
RRGI-6	53078	7.3	0.	10500.	0.	393.	60.3	3150.	8.5	0.0	0.	0.	0.	0.0	0.0	0.
RRGI-6	61278	7.3	0.	10900.	0.	427.	0.0	3300.	8.2	0.0	0.	0.	0.	0.0	0.0	0.
RRGI-6	112778	7.6	162.	10700.	0.	436.	60.1	3970.	7.5	0.0	0.	0.	0.	0.0	0.0	0.
RRGI-6	120478	7.1	158.	10200.	0.	438.	50.6	3810.	7.1	0.0	2200.	0.	0.	0.0	0.0	0.
RRGI-6	121178	7.1	171.	10200.	0.	420.	65.1	3930.	7.6	0.0	2200.	0.	0.	0.0	0.0	0.
RRGI-6	121878	7.3	171.	10300.	0.	442.	60.0	4200.	7.6	0.0	2120.	0.	0.	0.0	0.0	0.
RRGI-6	12279	8.5	0.	2300.	0.	134.	76.8	780.	9.4	0.0	374.	0.	0.	0.0	0.0	0.
RRGI-6	12979	7.8	0.	2200.	0.	138.	45.6	858.	9.3	0.0	331.	0.	0.	0.0	0.0	0.
BLM	21979	7.7	0.	3100.	0.	156.	38.5	1120.	8.0	0.0	541.	0.	0.	0.0	0.0	0.
BLM	12979	7.8	0.	2800.	0.	160.	40.9	1160.	7.3	0.0	524.	0.	0.	0.0	0.0	0.
BLM	122578	0.0	199.	3500.	0.	156.	37.8	1030.	7.8	0.0	536.	0.	0.	0.0	0.0	0.
BLM	52879	7.6	0.	2900.	0.	146.	41.8	991.	7.0	0.0	548.	0.	0.	0.0	0.0	0.
BLM	51479	7.3	0.	2600.	0.	0.	41.4	959.	8.4	0.0	590.	0.	0.	0.0	0.0	0.
BLM	51479	8.0	0.	2600.	0.	142.	36.8	974.	7.8	0.0	590.	0.	0.	0.0	0.0	0.
BLM	50779	7.5	0.	2800.	0.	164.	39.5	970.	7.0	0.0	548.	0.	0.	0.0	0.0	0.
BLM	43079	7.6	0.	2800.	0.	130.	38.6	912.	6.7	0.0	520.	0.	0.	0.0	0.0	0.
BLM	42379	7.7	0.	2800.	0.	132.	38.5	946.	7.2	0.0	635.	0.	0.	0.0	0.0	0.
BLM	41679	7.6	0.	2900.	0.	138.	37.5	1000.	7.2	0.0	534.	0.	0.	0.0	0.0	0.
BLM	40979	7.8	0.	2900.	0.	124.	45.2	864.	7.3	0.0	583.	0.	0.	0.0	0.0	0.
BLM	121878	8.0	196.	3200.	0.	140.	38.5	942.	7.8	0.0	586.	0.	0.	0.0	0.0	0.
BLM	121178	7.8	196.	3000.	0.	162.	41.9	920.	7.6	0.0	646.	0.	0.	0.0	0.0	0.
BLM	120478	7.8	190.	3300.	0.	172.	38.7	3300.	7.5	0.0	500.	0.	0.	0.0	0.0	0.
BLM	112778	7.8	198.	3400.	0.	168.	38.6	1040.	7.9	0.0	0.	0.	0.	0.0	0.0	0.
BLM	102378	8.0	200.	3400.	0.	142.	39.2	105.	6.9	0.0	0.	0.	0.	0.0	0.0	0.
BLM	101678	8.0	199.	3400.	0.	154.	40.4	976.	7.1	0.0	0.	0.	0.	0.0	0.0	0.
BLM	100978	7.8	199.	3500.	0.	154.	36.2	881.	6.7	0.0	0.	0.	0.	0.0	0.0	0.
BLM	100278	8.0	196.	3300.	0.	146.	39.8	915.	7.6	0.0	0.	0.	0.	0.0	0.0	0.
BLM	92578	7.8	196.	3100.	0.	140.	37.0	941.	7.5	0.0	0.	0.	0.	0.0	0.0	0.
BLM	92178	7.7	193.	3200.	0.	160.	40.7	872.	7.7	0.0	0.	0.	0.	0.0	0.0	0.
BLM	91178	7.3	194.	6000.	0.	130.	35.2	560.	7.6	0.0	0.	0.	0.	0.0	0.0	0.
BLM	82178	7.3	0.	3300.	0.	135.	39.4	898.	8.2	0.0	0.	0.	0.	0.0	0.0	0.
BLM	80778	7.1	0.	2900.	0.	170.	42.4	810.	7.9	0.0	0.	0.	0.	0.0	0.0	0.
BLM	73178	7.4	0.	3100.	0.	305.	38.7	800.	8.1	0.0	0.	0.	0.	0.0	0.0	0.
BLM	72678	7.3	0.	2900.	0.	121.	36.0	810.	7.8	0.0	0.	0.	0.	0.0	0.0	113.
BLM	72478	7.3	0.	3000.	0.	120.	37.6	825.	8.0	0.0	0.	0.	0.	0.0	0.0	0.
BLM	71778	7.2	0.	3000.	0.	120.	35.3	800.	8.2	0.0	0.	0.	0.	0.0	0.0	0.
BLM	71078	7.5	0.	3450.	0.	120.	0.0	855.	7.1	0.0	0.	0.	0.	0.0	0.0	0.
BLM	70378	7.7	0.	3100.	0.	135.	23.2	850.	0.0	0.0	0.	0.	0.	0.0	0.0	0.
BLM	62678	7.4	0.	2900.	0.	120.	12.6	800.	8.0	0.0	0.	0.	0.	0.0	0.0	0.
BLM	61978	7.7	0.	2600.	0.	125.	0.0	810.	7.8	0.0	0.	0.	0.	0.0	0.0	0.
BLM	61278	8.1	0.	3050.	0.	152.	0.0	865.	9.6	0.0	0.	0.	0.	0.0	0.0	0.
BLM	53078	7.8	0.	3250.	0.	120.	36.4	850.	9.2	0.0	0.	0.	0.	0.0	0.0	0.
BLM	51578	7.6	0.	3250.	0.	123.	38.0	850.	7.3	0.0	0.	0.	0.	0.0	0.0	0.
BLM	50878	7.8	0.	3200.	0.	115.	8.6	850.	6.8	0.0	0.	0.	0.	0.0	0.0	0.
BLM	50178	7.6	0.	3100.	0.	115.	43.6	895.	6.5	0.0	0.	0.	0.	0.0	0.0	0.
CROOK	82878	7.8	82.	2750.	0.	310.	27.4	1914.	0.0	0.0	0.	0.	0.	0.0	0.0	0.
CROOK	52879	8.1	0.	5000.	0.	328.	35.4	2090.	5.8	0.0	1080.	0.	0.	0.0	0.0	0.
CROOK	51479	8.4	0.	4800.	0.	308.	28.4	2040.	6.6	0.0	1130.	0.	0.	0.0	0.0	0.
CROOK	51479	8.3	0.	4900.	0.	312.	31.5	1780.	5.4	0.0	1040.	0.	0.	0.0	0.0	0.
CROOK	50779	8.0	0.	5000.	0.	320.	33.2	1990.	5.7	0.0	1070.	0.	0.	0.0	0.0	0.

**NOTE: 0 INDICATES NO DETERMINATION
CONCENTRATIONS IN MG/L
TEMPERATURE IN DEGREES F

WELL NAME	DATE	PH	TEMP	COND	TDS	HARD	LAB-HR HCO3	CL	F	SO4	NA	CA	K	LI	SR	SI
CROOK	43079	7.5	0.	2200.	0.	318.	34.0	1920.	5.3	0.0	1000.	0.	0.	0.0	0.0	0.
CROOK	42379	7.8	0.	5000.	0.	326.	31.7	1950.	5.7	0.0	1020.	0.	0.	0.0	0.0	0.
CROOK	41679	8.1	0.	5000.	0.	318.	29.4	2040.	5.9	0.0	1020.	0.	0.	0.0	0.0	0.
CROOK	40979	7.5	0.	4900.	0.	298.	33.8	1820.	5.9	0.0	1050.	0.	0.	0.0	0.0	0.
CROOK	21979	7.8	0.	5300.	0.	318.	32.7	2220.	9.3	0.0	943.	0.	0.	0.0	0.0	0.
CROOK	121878	8.1	171.	4500.	0.	296.	51.6	1540.	6.0	0.0	929.	0.	0.	0.0	0.0	0.
CROOK	121178	7.8	171.	5600.	0.	296.	54.0	1760.	5.8	0.0	879.	0.	0.	0.0	0.0	0.
CROOK	120478	7.4	171.	4700.	0.	322.	53.2	1760.	5.6	0.0	791.	0.	0.	0.0	0.0	0.
CROOK	112778	7.5	174.	5100.	0.	306.	52.2	1770.	5.8	0.0	0.	0.	0.	0.0	0.0	0.
CROOK	100978	8.3	203.	5700.	0.	318.	29.0	1560.	5.3	0.0	0.	0.	0.	0.0	0.0	0.
CROOK	100278	8.3	201.	5750.	0.	316.	34.4	1740.	6.0	0.0	0.	0.	0.	0.0	0.0	0.
CROOK	92578	8.0	190.	5700.	0.	310.	37.2	1940.	6.1	0.0	0.	0.	0.	0.0	0.0	0.
CROOK	92178	7.5	165.	5600.	0.	335.	30.5	1650.	6.2	0.0	0.	0.	0.	0.0	0.0	0.
CROOK	91178	7.5	198.	6000.	0.	310.	28.3	2260.	6.3	0.0	0.	0.	0.	0.0	0.0	0.
CROOK	82178	8.0	0.	6000.	0.	315.	20.0	1922.	7.4	0.0	0.	0.	0.	0.0	0.0	0.
CROOK	80778	7.9	0.	5750.	0.	305.	29.3	1800.	7.6	0.0	0.	0.	0.	0.0	0.0	0.
CROOK	73178	7.8	0.	5700.	0.	290.	26.9	1700.	7.6	0.0	0.	0.	0.	0.0	0.0	0.
CROOK	72478	7.8	0.	5650.	0.	305.	28.0	1725.	7.5	0.0	0.	0.	0.	0.0	0.0	0.
CROOK	71778	8.0	0.	5900.	0.	270.	26.2	1800.	7.5	0.0	0.	0.	0.	0.0	0.0	0.
CROOK	71078	7.9	0.	6200.	0.	285.	0.0	1750.	6.7	0.0	0.	0.	0.	0.0	0.0	0.
CROOK	70378	8.3	0.	6200.	0.	290.	18.7	1750.	0.0	0.0	0.	0.	0.	0.0	0.0	0.
CROOK	62678	7.8	0.	5700.	0.	305.	8.4	1750.	7.9	0.0	0.	0.	0.	0.0	0.0	0.
CROOK	61978	8.2	0.	5350.	0.	302.	0.0	1800.	7.2	0.0	0.	0.	0.	0.0	0.0	0.
CROOK	61278	8.2	0.	5800.	0.	320.	0.0	1705.	7.2	0.0	0.	0.	0.	0.0	0.0	0.
CROOK	53078	7.9	0.	5900.	0.	271.	27.6	1755.	8.8	0.0	0.	0.	0.	0.0	0.0	0.
CROOK	52278	7.4	0.	5800.	0.	295.	34.6	1750.	8.0	0.0	0.	0.	0.	0.0	0.0	0.
CROOK	51578	7.2	0.	5650.	0.	310.	30.9	1795.	6.6	0.0	0.	0.	0.	0.0	0.0	0.
CROOK	50878	8.1	0.	5700.	0.	302.	5.5	1655.	6.8	0.0	0.	0.	0.	0.0	0.0	0.
CROOK	50178	8.1	0.	5750.	0.	285.	34.4	1755.	5.6	0.0	0.	0.	0.	0.0	0.0	0.
MW-1	122578	7.8	162.	10600.	0.	526.	22.6	4160.	3.5	0.0	1940.	0.	0.	0.0	0.0	0.
MW-1	21979	7.7	0.	10200.	0.	548.	24.8	4450.	3.0	0.0	1860.	0.	0.	0.0	0.0	0.
MW-1	121178	8.1	163.	10400.	0.	558.	27.5	4130.	3.4	0.0	1970.	970.	0.	0.0	0.0	0.
MW-1	120478	7.6	163.	10800.	0.	546.	22.8	4300.	3.5	0.0	1900.	0.	0.	0.0	0.0	0.
MW-1	112778	7.5	165.	10500.	0.	524.	27.6	3970.	3.4	0.0	0.	0.	0.	0.0	0.0	0.
MW-1	102378	7.8	147.	11000.	0.	526.	23.8	3500.	3.0	0.0	0.	0.	0.	0.0	0.0	0.
MW-1	101678	7.8	142.	10700.	0.	526.	23.7	3540.	3.0	0.0	0.	0.	0.	0.0	0.0	0.
MW-1	100978	7.7	104.	10900.	0.	518.	23.2	3450.	3.0	0.0	0.	0.	0.	0.0	0.0	0.
MW-1	100278	8.1	156.	10500.	0.	530.	26.0	3480.	2.8	0.0	0.	0.	0.	0.0	0.0	0.
MW-1	92578	7.9	165.	10800.	0.	530.	21.4	3740.	2.9	0.0	0.	0.	0.	0.0	0.0	0.
MW-1	92178	7.3	147.	10400.	0.	505.	25.8	3620.	3.1	0.0	0.	0.	0.	0.0	0.0	0.
MW-1	91178	7.1	139.	11200.	0.	520.	13.4	4040.	3.1	0.0	0.	0.	0.	0.0	0.0	0.
MW-1	82178	7.3	0.	10700.	0.	540.	28.1	3800.	0.0	0.0	0.	0.	0.	0.0	0.0	0.
MW-1	80778	7.2	0.	11000.	0.	590.	19.4	3500.	6.0	0.0	0.	0.	0.	0.0	0.0	0.
MW-1	73178	7.2	0.	10800.	0.	490.	26.4	3500.	6.0	0.0	0.	0.	0.	0.0	0.0	0.
MW-1	72678	7.1	0.	11200.	0.	470.	21.2	3475.	5.8	0.0	0.	0.	0.	0.0	0.0	110.
MW-1	72478	7.7	0.	10450.	0.	490.	23.8	3500.	5.0	0.0	0.	0.	0.	0.0	0.0	0.
MW-1	71778	7.3	0.	11200.	0.	460.	21.3	3600.	6.3	0.0	0.	0.	0.	0.0	0.0	0.
MW-1	71078	8.1	0.	11400.	0.	490.	0.0	3500.	5.8	0.0	0.	0.	0.	0.0	0.0	0.
MW-1	70378	7.7	0.	11200.	0.	480.	13.3	3500.	0.0	0.0	0.	0.	0.	0.0	0.0	0.
MW-1	62678	7.8	0.	10900.	0.	470.	10.9	3560.	0.0	0.0	0.	0.	0.	0.0	0.0	0.

**NOTE: 0 INDICATES NO DETERMINATION
CONCENTRATIONS IN MG/L
TEMPERATURE IN DEGREES F

LAB-RR

WELL NAME	DATE	PH	TEMP	COND	TDS	HARD	HCO3	CL	F	SO4	NA	CA	K	LI	SR	SI
MW-1	53078	7.9	0.	11150.	0.	482.	23.6	3500.	7.2	0.0	0.	0.	0.	0.0	0.0	0.
MW-1	52278	7.3	0.	11000.	0.	470.	22.4	3500.	6.5	0.0	0.	0.	0.	0.0	0.0	0.
MW-1	51578	7.1	0.	11000.	0.	495.	24.3	3550.	5.5	0.0	0.	0.	0.	0.0	0.0	0.
MW-1	50878	8.1	0.	11000.	0.	479.	5.0	3600.	5.5	0.0	0.	0.	0.	0.0	0.0	0.
MW-1	50178	8.5	0.	10900.	0.	490.	36.0	3575.	5.1	0.0	0.	0.	0.	0.0	0.0	0.
MW-2	21279	7.4	0.	5300.	0.	344.	25.8	1980.	5.8	0.0	1010.	0.	0.	0.0	0.0	0.
MW-2	122578	7.8	189.	5700.	0.	350.	26.0	2040.	6.1	0.0	963.	0.	0.	0.0	1.0	0.
MW-2	121178	7.6	189.	5400.	0.	344.	28.0	2000.	6.1	0.0	920.	0.	0.	0.0	0.0	0.
MW-3	50779	8.1	0.	6200.	0.	400.	32.8	2500.	5.0	0.0	1390.	0.	0.	0.0	0.0	0.
MW-3	121178	7.5	0.	5200.	0.	456.	44.0	2730.	5.7	0.0	1250.	0.	0.	0.0	0.0	0.
MW-3	72678	7.1	0.	5600.	0.	572.	48.5	1555.	5.6	0.0	0.	0.	0.	0.0	0.0	122.
MW-4	121178	8.0	0.	7400.	0.	392.	28.8	2650.	5.9	0.0	1350.	0.	0.	0.0	0.0	0.
MW-6	50779	7.6	0.	7000.	0.	532.	39.0	2830.	4.3	0.0	1560.	0.	0.	0.0	0.0	0.
MW-5	121178	7.6	0.	1990.	0.	342.	102.4	639.	0.7	0.0	221.	0.	0.	0.0	0.0	0.
MW-7	121178	7.6	0.	2200.	0.	322.	100.0	707.	1.3	0.0	287.	0.	0.	0.0	0.0	0.
USGS-3	52879	7.6	0.	5300.	0.	154.	44.0	2130.	4.5	0.0	1090.	0.	0.	0.0	0.0	0.
USGS-3	52179	8.0	0.	4750.	0.	152.	42.3	2080.	5.1	0.0	1240.	0.	0.	0.0	0.0	0.
USGS-3	51479	7.7	0.	5200.	0.	174.	45.0	2080.	5.7	0.0	1130.	0.	0.	0.0	0.0	0.
USGS-3	50779	7.7	0.	5000.	0.	172.	41.4	2000.	4.6	0.0	1120.	0.	0.	0.0	0.0	0.
USGS-3	43079	7.9	0.	5000.	0.	176.	43.6	2040.	4.2	0.0	1110.	0.	0.	0.0	0.0	0.
USGS-3	42379	7.8	0.	5000.	0.	150.	43.6	2040.	4.5	0.0	1100.	0.	0.	0.0	0.0	0.
USGS-3	41679	7.7	0.	4800.	0.	162.	41.3	2070.	4.7	0.0	1100.	0.	0.	0.0	0.0	0.
USGS-3	40979	7.9	0.	5200.	0.	152.	47.4	1940.	4.7	0.0	1070.	0.	0.	0.0	0.0	0.
USGS-3	21979	7.3	0.	5600.	0.	172.	47.0	2250.	4.7	0.0	1040.	0.	0.	0.0	0.0	0.
UDY	82878	7.4	82.	2750.	0.	402.	144.4	672.	0.0	0.0	0.	0.	0.	0.0	0.0	0.
UDY	51479	7.5	0.	2000.	0.	300.	0.0	697.	2.2	0.0	385.	0.	0.	0.0	0.0	0.
UDY	50779	7.5	0.	2400.	0.	282.	159.7	651.	2.2	0.0	367.	0.	0.	0.0	0.0	0.
UDY	42379	7.8	91.	2500.	0.	254.	139.6	792.	2.5	0.0	406.	0.	0.	0.0	0.0	0.
UDY	92578	7.6	79.	2800.	0.	316.	148.8	819.	2.2	0.0	0.	0.	0.	0.0	0.0	0.
UDY	92178	7.5	77.	2500.	0.	370.	149.2	242.	2.1	0.0	0.	0.	0.	0.0	0.0	0.
UDY	91178	7.4	79.	1300.	0.	328.	151.2	265.	2.2	0.0	0.	0.	0.	0.0	0.0	0.
UDY	82178	7.9	0.	2700.	0.	310.	161.2	675.	5.3	0.0	0.	0.	0.	0.0	0.0	0.
UDY	80778	7.3	0.	2450.	0.	291.	115.8	650.	5.5	0.0	0.	0.	0.	0.0	0.0	0.
UDY	73178	7.4	0.	2400.	0.	310.	151.2	600.	5.5	0.0	0.	0.	0.	0.0	0.0	0.
UDY	72678	7.5	0.	2450.	0.	295.	147.5	595.	5.2	0.0	0.	0.	0.	0.0	0.0	32.
UDY	72478	7.2	0.	2500.	0.	300.	150.9	600.	5.5	0.0	0.	0.	0.	0.0	0.0	0.
UDY	71778	7.4	0.	2500.	0.	300.	142.3	650.	5.7	0.0	0.	0.	0.	0.0	0.0	0.
UDY	71078	8.0	0.	2800.	0.	280.	0.0	755.	5.4	0.0	0.	0.	0.	0.0	0.0	0.
UDY	70378	7.6	0.	2700.	0.	285.	89.9	625.	0.0	0.0	0.	0.	0.	0.0	0.0	0.
UDY	62678	7.0	0.	2500.	0.	315.	103.6	625.	5.6	0.0	0.	0.	0.	0.0	0.0	0.
UDY	61578	7.4	0.	2000.	0.	272.	0.0	600.	5.6	0.0	0.	0.	0.	0.0	0.0	0.
UDY	61278	7.5	0.	2600.	0.	270.	0.0	575.	5.8	0.0	0.	0.	0.	0.0	0.0	0.
UDY	53078	7.3	0.	2500.	0.	262.	150.2	605.	6.5	0.0	0.	0.	0.	0.0	0.0	0.
UDY	50878	7.6	0.	2800.	0.	242.	28.5	695.	5.3	0.0	0.	0.	0.	0.0	0.0	0.
UDY	50178	7.0	0.	3600.	0.	298.	18.8	1000.	1.8	0.0	0.	0.	0.	0.0	0.0	0.
MILLER-1	72678	7.5	0.	1400.	0.	230.	167.7	300.	5.7	0.0	0.	0.	0.	0.0	0.0	94.
CROCK HOT	72678	7.6	0.	5800.	0.	288.	26.1	1700.	7.1	0.0	0.	0.	0.	0.0	0.0	118.
CROCK DOM.	72678	7.2	0.	900.	0.	300.	185.5	150.	0.9	0.0	0.	0.	0.	0.0	0.0	73.
PEWITT	72678	7.3	104.	3900.	0.	191.	131.7	1050.	8.4	0.0	0.	0.	0.	0.0	0.0	0.
STEWART-1	72678	7.6	0.	2300.	0.	145.	136.4	560.	6.5	0.0	0.	0.	0.	0.0	0.0	62.

**NOTE: 0 INDICATES NO DETERMINATION
CONCENTRATIONS IN MG/L
TEMPERATURE IN DEGREES F

LAB-KR

WELL NAME	DATE	PH	TEMP	COND	TDS	HARD	HCO3	CL	F	SO4	NA	CA	K	LI	SR	SI
STEWART-2	72678	7.1	0.	2000.	0.	337.	159.2	480.	1.3	0.0	0.	0.	0.	0.0	0.0	[illegible]
STEWART-3	72678	7.2	0.	2750.	0.	400.	111.6	705.	1.8	0.0	0.	0.	0.	0.0	0.0	85.
DAR-1	72678	7.4	0.	4200.	0.	235.	97.6	1075.	6.7	0.0	0.	0.	0.	0.0	0.0	100.
DAR-2	72678	7.7	0.	3600.	0.	104.	86.8	995.	6.9	0.0	0.	0.	0.	0.0	0.0	102.
1-DOMESTIC	82878	7.1	77.	2300.	0.	206.	69.4	585.	0.0	0.0	0.	0.	0.	0.0	0.0	0.
1-DOMESTIC	21279	8.5	0.	3000.	0.	158.	45.0	1120.	8.1	0.0	492.	0.	0.	0.0	0.0	0.
1-DOMESTIC	20579	8.3	0.	2500.	0.	158.	96.6	811.	4.3	0.0	403.	0.	0.	0.0	0.0	0.
1-DOMESTIC	12279	7.8	0.	2200.	0.	200.	89.6	757.	4.3	0.0	397.	0.	0.	0.0	0.0	0.
1-DOMESTIC	122578	0.0	57.	2100.	0.	188.	92.7	650.	4.8	0.0	350.	0.	0.	0.0	0.0	0.
1-DOMESTIC	52879	7.5	0.	2200.	0.	178.	93.4	620.	4.2	0.0	364.	0.	0.	0.0	0.0	0.
1-DOMESTIC	43079	7.8	0.	2000.	0.	194.	92.6	673.	3.8	0.0	350.	0.	0.	0.0	0.0	0.
1-DOMESTIC	41679	7.7	0.	2000.	0.	170.	89.2	648.	4.5	0.0	340.	0.	0.	0.0	0.0	0.
1-DOMESTIC	21979	7.8	0.	2300.	0.	80.	100.2	644.	4.4	0.0	349.	0.	0.	0.0	0.0	0.
1-DOMESTIC	121878	7.6	57.	2500.	0.	206.	91.0	673.	5.4	0.0	372.	0.	0.	0.0	0.0	0.
1-DOMESTIC	121178	7.6	57.	2400.	0.	200.	94.5	669.	4.9	0.0	348.	0.	0.	0.0	0.0	0.
1-DOMESTIC	120478	7.6	50.	2400.	0.	218.	90.8	715.	4.6	0.0	320.	0.	0.	0.0	0.0	0.
1-DOMESTIC	112778	7.8	66.	2400.	0.	214.	94.0	683.	5.0	0.0	0.	0.	0.	0.0	0.0	0.
1-DOMESTIC	102378	7.8	70.	2200.	0.	196.	95.5	603.	4.3	0.0	0.	0.	0.	0.0	0.0	0.
1-DOMESTIC	101678	8.1	90.	1740.	0.	192.	100.2	659.	4.8	0.0	0.	0.	0.	0.0	0.0	0.
1-DOMESTIC	100578	7.8	77.	2100.	0.	190.	90.9	682.	4.6	0.0	0.	0.	0.	0.0	0.0	0.
1-DOMESTIC	100278	7.9	70.	2000.	0.	190.	101.2	643.	4.5	0.0	0.	0.	0.	0.0	0.0	0.
1-DOMESTIC	92578	7.7	70.	2300.	0.	187.	92.8	520.	4.3	0.0	0.	0.	0.	0.0	0.0	0.
1-DOMESTIC	92178	7.7	75.	2100.	0.	185.	89.4	577.	4.5	0.0	0.	0.	0.	0.0	0.0	0.
1-DOMESTIC	91178	7.4	75.	2250.	0.	155.	86.4	685.	4.6	0.0	0.	0.	0.	0.0	0.0	0.
1-DOMESTIC	82778	7.8	0.	2200.	0.	195.	94.6	583.	6.5	0.0	0.	0.	0.	0.0	0.0	0.
1-DOMESTIC	80778	7.6	0.	2000.	0.	120.	93.1	740.	6.9	0.0	0.	0.	0.	0.0	0.0	0.
1-DOMESTIC	73178	7.5	0.	1900.	0.	500.	85.8	500.	6.5	0.0	0.	0.	0.	0.0	0.0	0.
1-DOMESTIC	72678	7.3	0.	2000.	0.	160.	87.6	510.	6.2	0.0	0.	0.	0.	0.0	0.0	92.
1-DOMESTIC	72478	7.4	0.	2000.	0.	100.	88.0	525.	7.0	0.0	0.	0.	0.	0.0	0.0	0.
1-DOMESTIC	71778	8.9	0.	2100.	0.	110.	122.4	500.	6.7	0.0	0.	0.	0.	0.0	0.0	0.
1-DOMESTIC	70378	8.1	0.	2300.	0.	170.	57.3	500.	0.0	0.0	0.	0.	0.	0.0	0.0	0.
1-DOMESTIC	62678	8.5	0.	2000.	0.	140.	66.0	500.	6.5	0.0	0.	0.	0.	0.0	0.0	0.
1-DOMESTIC	61978	7.6	0.	1800.	0.	150.	0.0	550.	6.4	0.0	0.	0.	0.	0.0	0.0	0.
3-DOMESTIC	82878	7.5	195.	3600.	0.	163.	36.6	914.	0.0	0.0	0.	0.	0.	0.0	0.0	0.
3-DOMESTIC	112778	7.4	91.	5000.	0.	569.	60.2	1670.	4.1	0.0	0.	0.	0.	0.0	0.0	0.
3-DOMESTIC	102378	7.6	93.	4900.	0.	554.	57.0	1500.	3.6	0.0	0.	0.	0.	0.0	0.0	0.
3-DOMESTIC	101678	8.0	94.	5000.	0.	432.	58.6	1480.	3.8	0.0	0.	0.	0.	0.0	0.0	0.
3-DOMESTIC	100978	7.6	95.	5100.	0.	522.	48.6	1430.	3.6	0.0	0.	0.	0.	0.0	0.0	0.
3-DOMESTIC	100278	7.6	91.	4800.	0.	600.	61.1	1490.	7.3	0.0	0.	0.	0.	0.0	0.0	0.
3-DOMESTIC	92578	7.4	91.	5100.	0.	750.	74.9	1330.	2.7	0.0	0.	0.	0.	0.0	0.0	0.
3-DOMESTIC	92178	7.3	92.	5000.	0.	500.	52.0	1440.	3.9	0.0	0.	0.	0.	0.0	0.0	0.
3-DOMESTIC	91178	7.1	93.	5100.	0.	505.	42.6	1770.	3.8	0.0	0.	0.	0.	0.0	0.0	0.
3-DOMESTIC	82178	7.5	0.	5400.	0.	555.	66.8	1700.	6.0	0.0	0.	0.	0.	0.0	0.0	0.
3-DOMESTIC	80778	7.1	0.	5600.	0.	590.	62.5	1600.	6.1	0.0	0.	0.	0.	0.0	0.0	0.
3-DOMESTIC	73178	7.1	0.	5600.	0.	604.	55.6	1650.	6.0	0.0	0.	0.	0.	0.0	0.0	0.
3-DOMESTIC	72678	7.2	0.	2200.	0.	205.	91.4	565.	5.4	0.0	0.	0.	0.	0.0	0.0	104.
3-DOMESTIC	72478	7.2	0.	5700.	0.	560.	51.5	1600.	5.5	0.0	0.	0.	0.	0.0	0.0	0.
3-DOMESTIC	71778	7.3	0.	5700.	0.	590.	46.2	1675.	6.1	0.0	0.	0.	0.	0.0	0.0	0.
3-DOMESTIC	71078	7.7	0.	5250.	0.	670.	0.0	1750.	5.7	0.0	0.	0.	0.	0.0	0.0	0.
3-DOMESTIC	70378	7.4	0.	6350.	0.	670.	29.3	1750.	0.0	0.0	0.	0.	0.	0.0	0.0	0.

**NOTE: 0 INDICATES NO DETERMINATION
CONCENTRATIONS IN MG/L
TEMPERATURE IN DEGREES F

LAB-RR

WELL NAME	CATE	PH	TEMP	CUND	TDS	HARD	HCO3	CL	F	SO4	NA	CA	K	LI	SR	SI
3-DCMESTIC	62678	7.3	0.	6000.	0.	790.	26.8	1800.	6.8	0.0	0.	0.	0.	0.0	0.0	0.
3-DCMESTIC	61278	7.5	0.	6750.	0.	840.	0.0	1900.	6.6	0.0	0.	0.	0.	0.0	0.0	0.
3-DCMESTIC	53078	7.2	0.	6750.	0.	870.	54.2	2000.	6.5	0.0	0.	0.	0.	0.0	0.0	0.
3-DCMESTIC	52278	7.8	0.	6750.	0.	862.	79.8	1935.	6.6	0.0	0.	0.	0.	0.0	0.0	0.
3-DCMESTIC	51578	7.7	0.	6750.	0.	848.	56.6	2000.	5.3	0.0	0.	0.	0.	0.0	0.0	0.
3-DCMESTIC	50878	7.4	0.	6600.	0.	860.	10.6	2000.	5.0	0.0	0.	0.	0.	0.0	0.0	0.
3-DGMESTIC	50178	7.3	0.	6450.	0.	885.	59.8	2050.	4.5	0.0	0.	0.	0.	0.0	0.0	0.

**NOTE: 0 INDICATES NO DETERMINATION
CONCENTRATIONS IN MG/L
TEMPERATURE IN DEGREES F

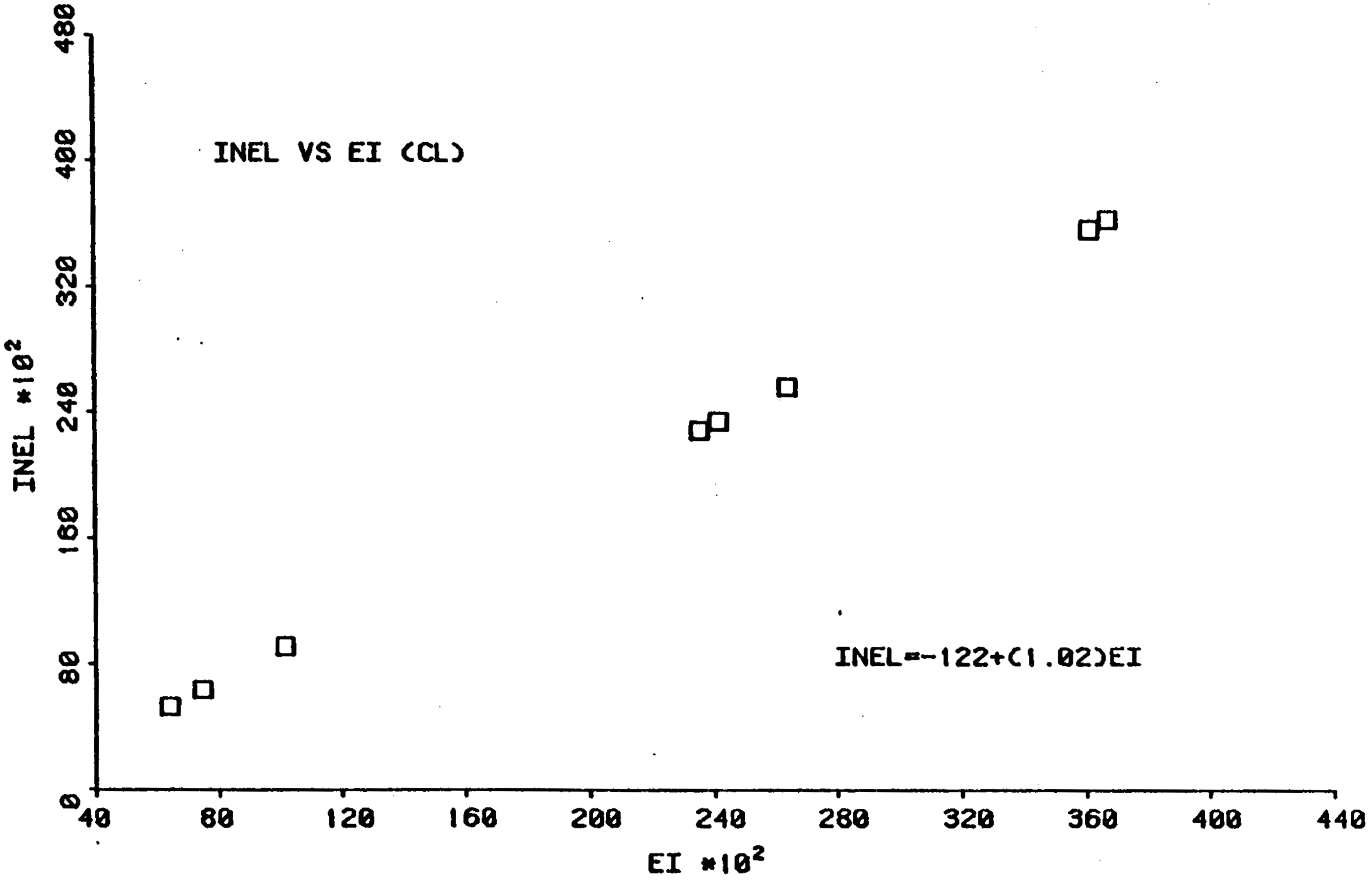
LAB-EI

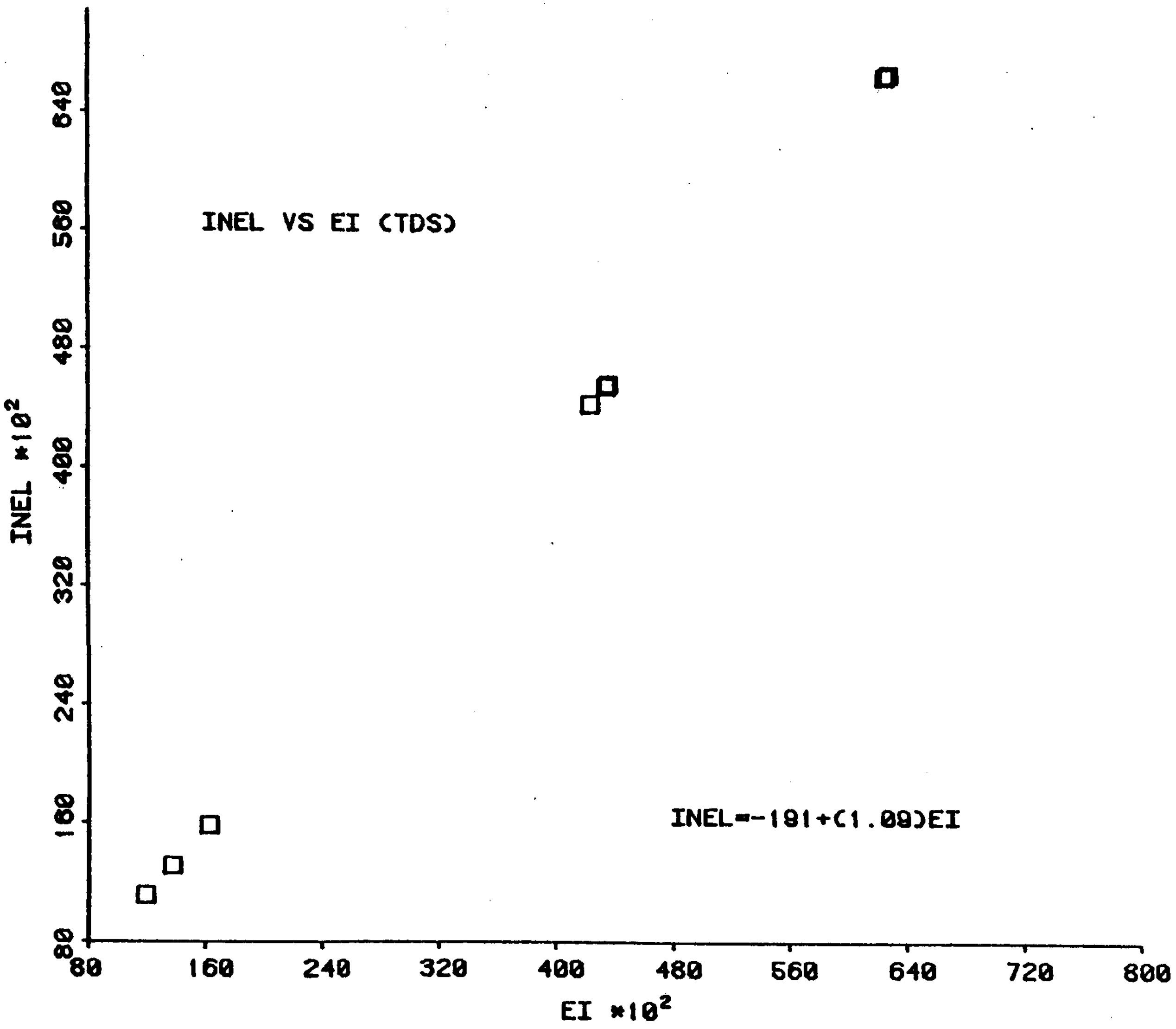
WELL NAME	DATE	PH	TEMP	COND	TDS	HARD	HCO3	CL	F	SO4	NA	CA	K	LI	SR	SI
MW-1	31778	9.1	0.	12250.	6320.	0.	14.0	3544.	0.0	72.0	2204.	171.	36.	3.8	0.0	0.
MW-1	33078	8.3	0.	12250.	6360.	0.	22.0	3644.	2.5	59.0	2140.	166.	30.	3.7	0.0	0.
MW-1	33078	7.7	0.	12400.	6379.	0.	23.0	3554.	2.4	62.0	2233.	167.	31.	3.8	0.0	32.
MW-1	63078	8.0	0.	10000.	6359.	0.	36.0	3544.	2.8	67.2	1839.	214.	31.	3.9	0.0	38.
MW-1	63078	8.0	0.	10250.	6329.	0.	28.0	3544.	2.8	73.2	1959.	217.	31.	3.9	0.0	40.
MW-1	72078	8.2	0.	10500.	6288.	0.	25.0	3484.	2.4	75.6	1720.	181.	30.	3.4	0.0	25.
MW-1	121278	7.9	0.	7750.	6270.	0.	25.0	3680.	0.0	65.6	2220.	215.	30.	3.7	0.0	38.
MW-1	20579	7.6	0.	7750.	6297.	0.	24.0	4078.	4.5	69.0	1840.	208.	29.	4.8	0.0	36.
MW-2	21578	7.6	0.	6400.	3204.	91.	31.0	1662.	4.3	57.0	2378.	99.	26.	2.5	0.0	0.
MW-2	121278	7.6	0.	4400.	3190.	0.	26.0	1740.	5.6	56.7	1000.	125.	25.	2.5	0.0	0.
MW-2	20579	7.5	0.	4500.	3218.	0.	27.0	2087.	8.0	57.0	1130.	122.	25.	3.2	0.0	0.
MW-3	121278	7.8	0.	5500.	4350.	0.	55.0	2420.	5.1	52.2	1280.	177.	54.	2.8	0.0	0.
MW-3	20679	7.6	0.	5500.	4334.	0.	36.0	2837.	7.6	53.0	1190.	150.	57.	3.3	0.0	0.
MW-3	50779	7.5	0.	6200.	4360.	0.	47.0	2460.	5.4	60.0	1400.	155.	65.	3.0	0.0	0.
MW-4	80378	7.7	0.	8000.	3614.	0.	50.0	2290.	7.7	31.3	1370.	1740.	27.	3.7	0.0	0.
MW-4	121278	8.1	0.	5750.	4370.	0.	41.0	2420.	4.8	51.1	1400.	217.	25.	3.2	0.0	0.
MW-4	20679	7.9	0.	5750.	4497.	0.	27.0	2986.	7.2	57.0	1230.	156.	29.	3.7	0.0	0.
MW-5	121278	8.0	0.	2000.	1240.	0.	168.0	610.	0.5	40.0	190.	169.	17.	1.7	0.0	0.
MW-5	20679	7.8	0.	2000.	1229.	0.	101.0	717.	0.7	27.0	230.	107.	14.	0.0	0.0	0.
MW-6	53078	8.2	0.	6450.	5083.	0.	40.0	2443.	3.9	64.0	1250.	230.	58.	2.7	0.0	0.
MW-6	121278	10.7	0.	5600.	4240.	0.	0.0	2360.	3.4	62.2	1280.	180.	53.	2.4	0.0	0.
MW-6	20679	7.9	0.	6500.	4822.	0.	42.0	3315.	5.9	78.0	1280.	205.	58.	3.3	0.0	0.
MW-6	50779	7.3	0.	6900.	4970.	0.	44.0	2770.	4.7	74.0	1610.	207.	69.	3.1	0.0	0.
MW-7	121278	8.0	0.	2250.	1380.	0.	107.0	640.	1.3	31.7	350.	110.	12.	1.5	0.0	0.
MW-7	20679	7.8	0.	2250.	1289.	0.	104.0	781.	1.2	34.0	250.	96.	14.	0.4	0.0	0.

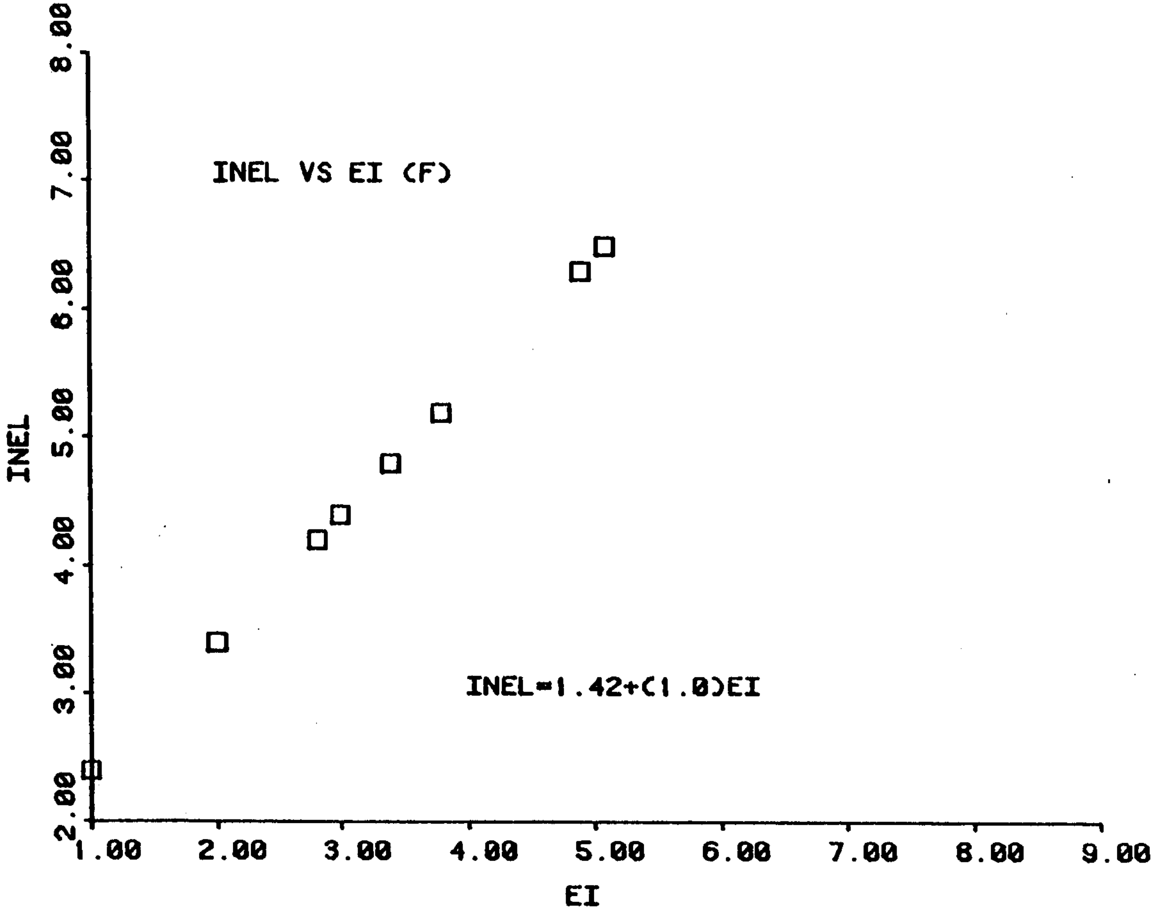
**NOTE: 0 INDICATES NO DETERMINATION
CONCENTRATIONS IN MG/L
TEMPERATURE IN DEGREES F

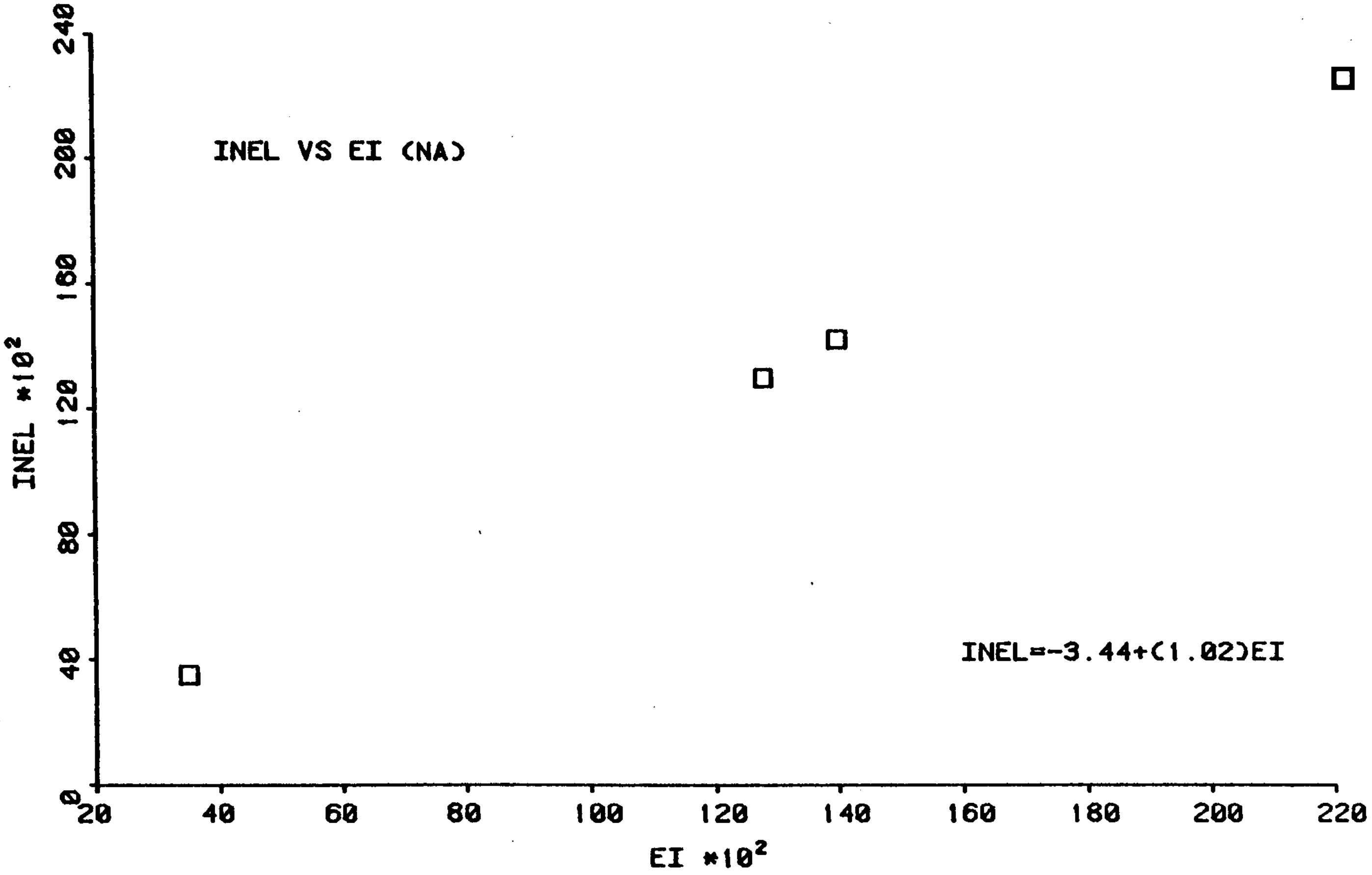
APPENDIX B

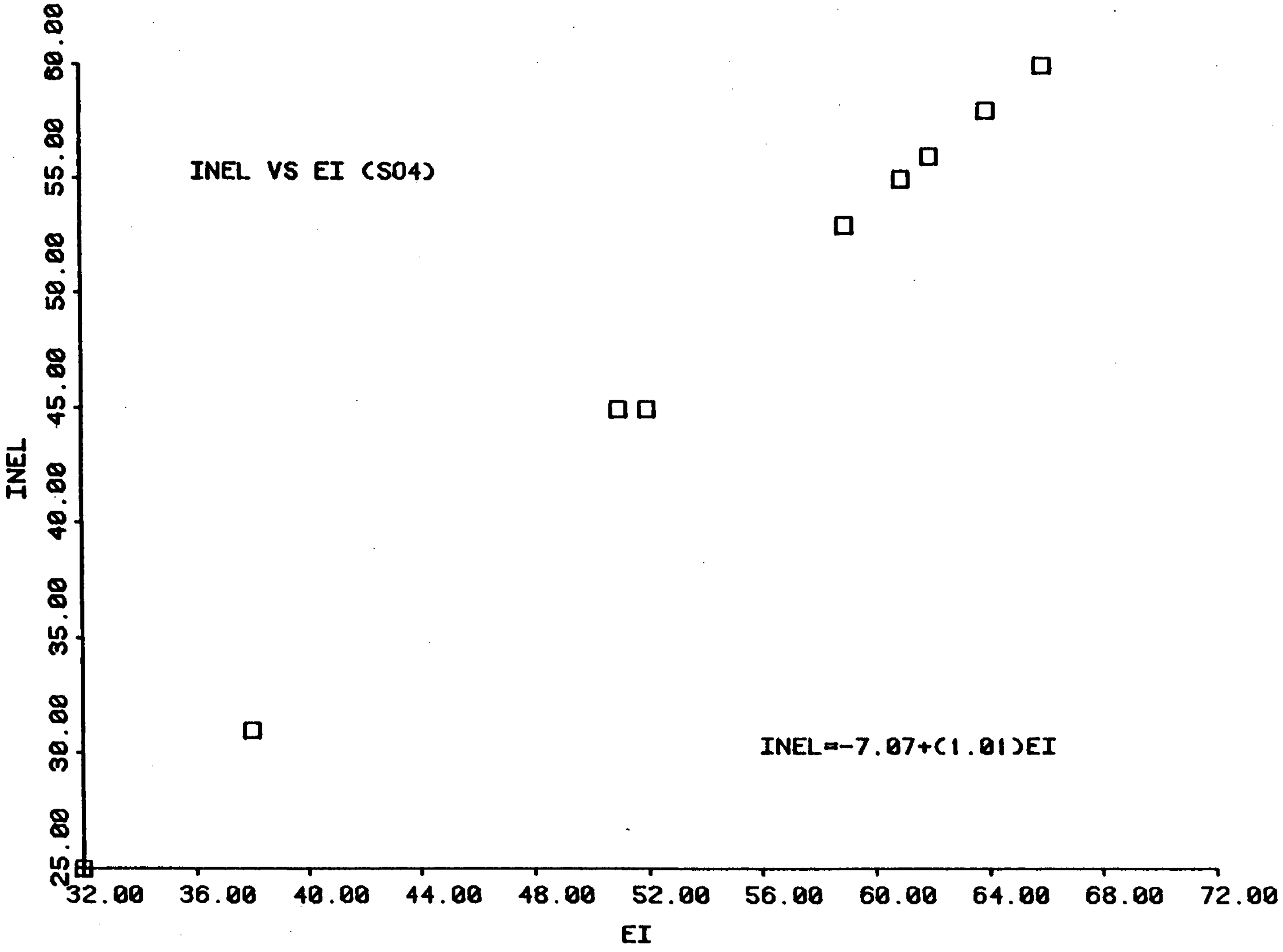
Regressions Used to Adjust Data

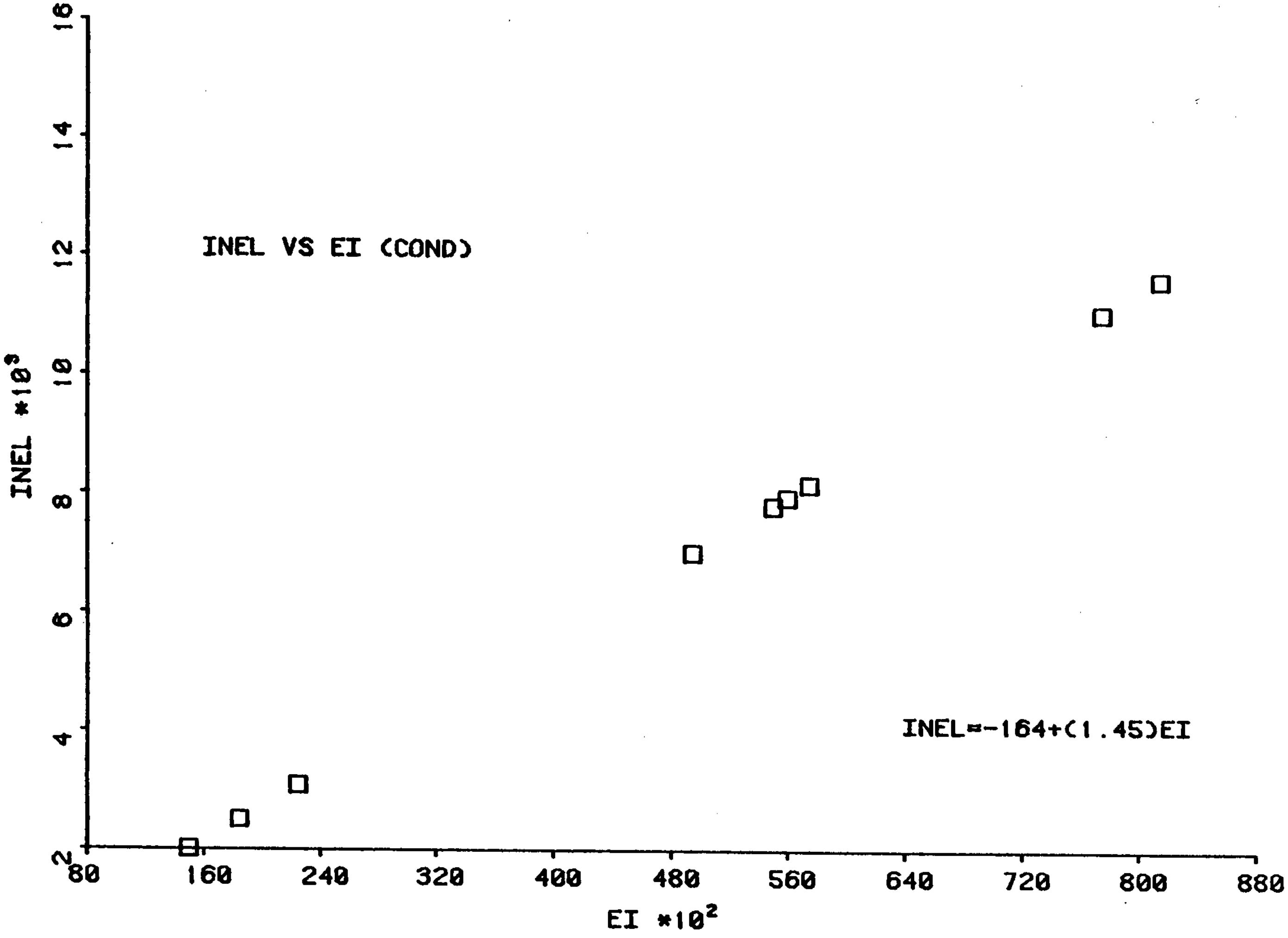

INEL VS EI (CL)
INEL=-122+(1.02)EI
INEL *10²
EI *10²
0
80
160
240
320
400
480
40
80
120
160
200
240
280
320
360
400
440

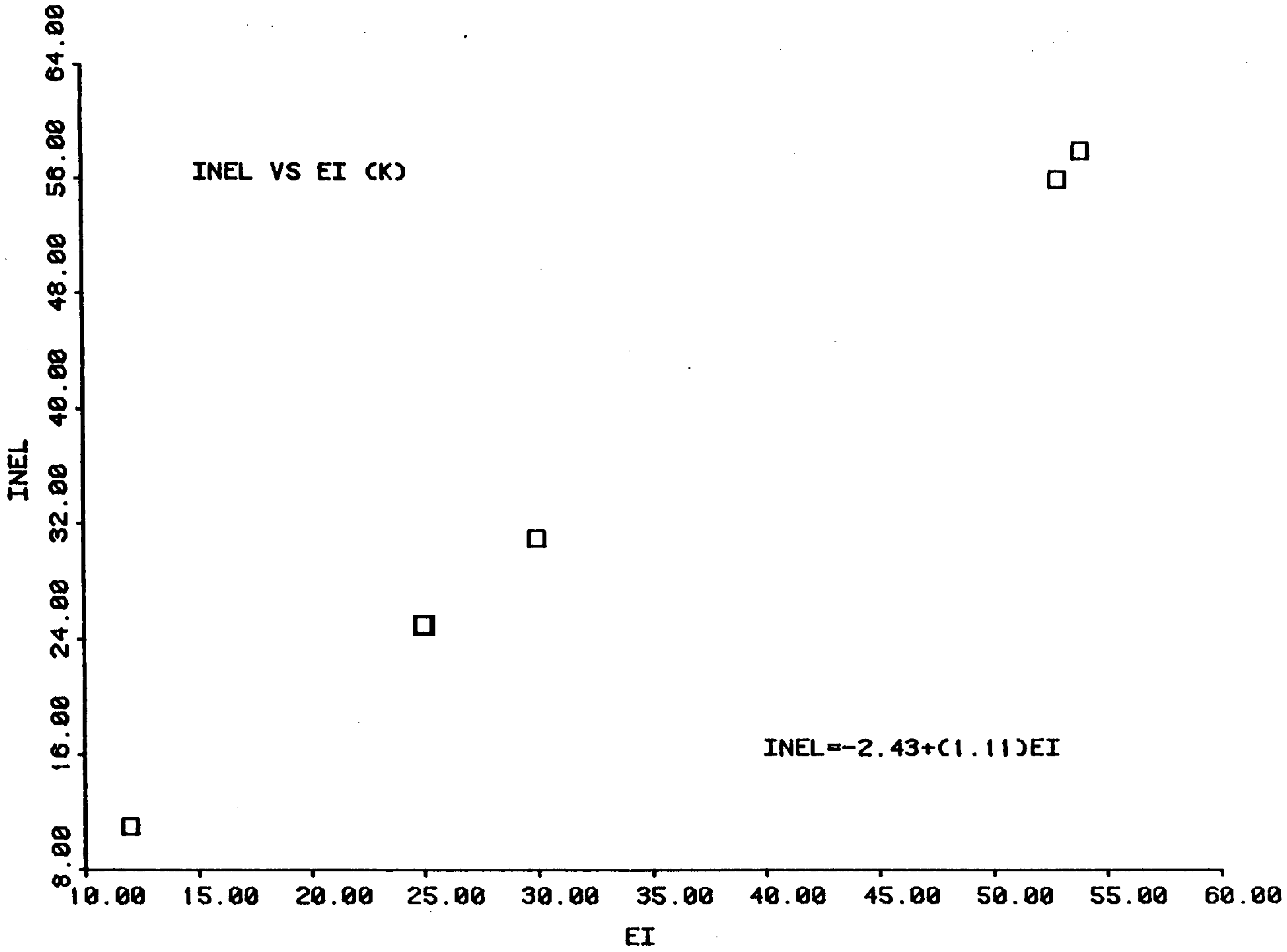

INEL VS EI (TDS)
INEL=-191+(1.09)EI
INEL *10²
EI *10²
80
160
240
320
400
480
560
640
720
800
80
160
240
320
400
480
560
640

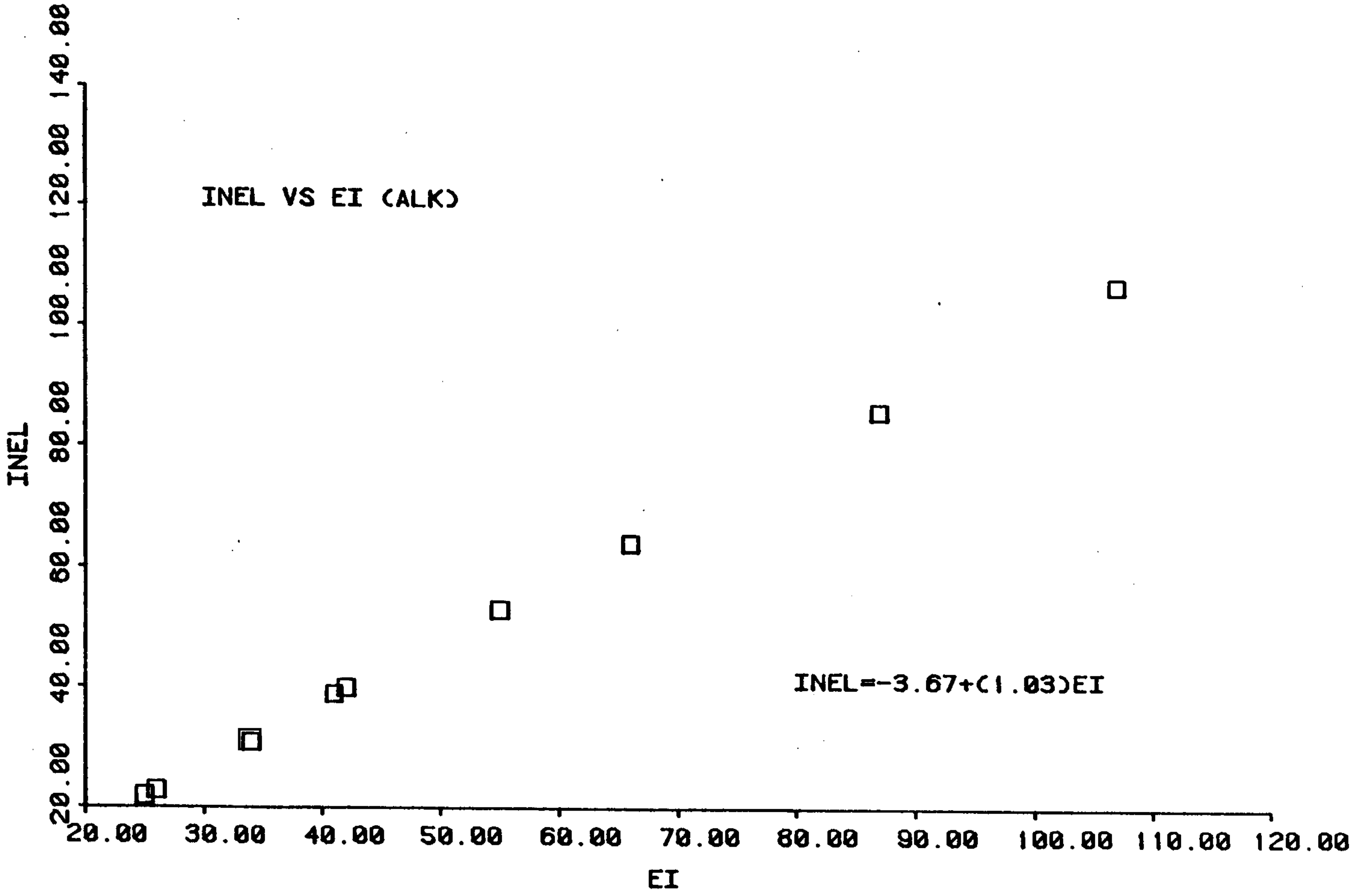

INEL VS EI (F)
INEL=1.42+(1.0)EI
INEL
EI
2.00
3.00
4.00
5.00
6.00
7.00
8.00
1.00
2.00
3.00
4.00
5.00
6.00
7.00
8.00
9.00

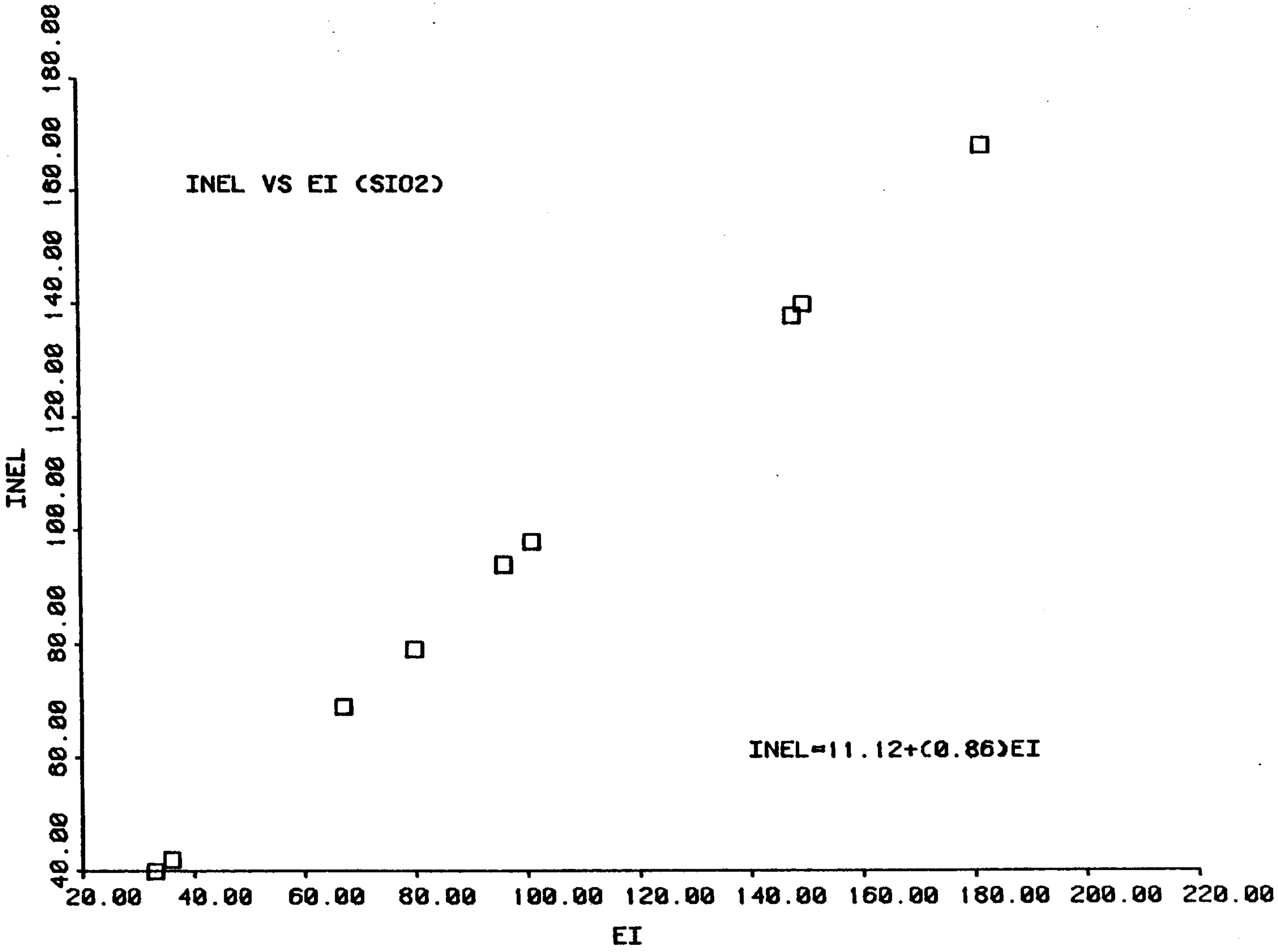

INEL VS EI (NA)
INEL=-3.44+(1.02)EI
INEL *10^2
EI *10^2
0
40
80
120
160
200
240
20
40
60
80
100
120
140
160
180
200
220

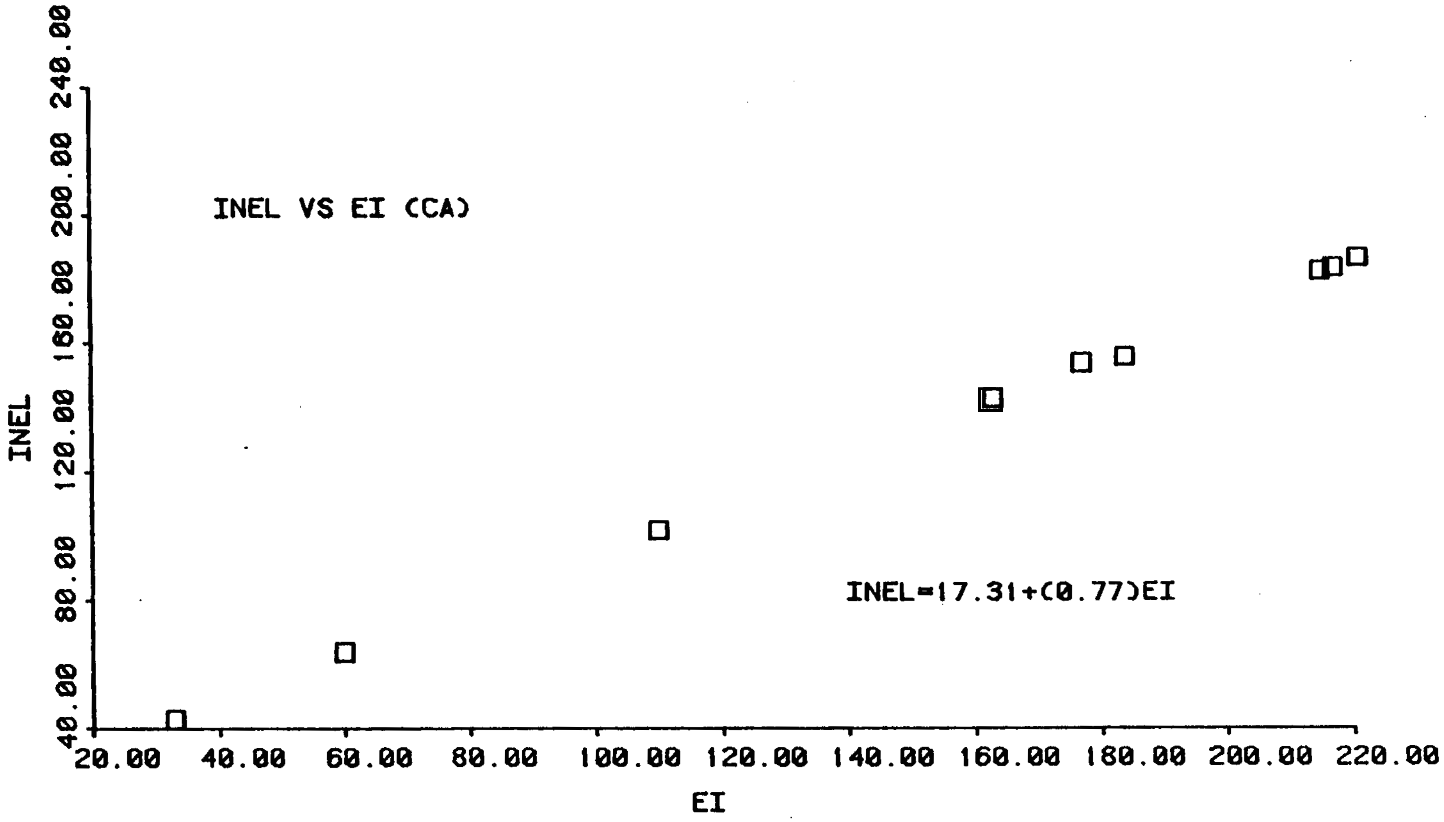

INEL VS EI (SO4)
INEL=-7.07+(1.01)EI
INEL
EI
25.00
30.00
35.00
40.00
45.00
50.00
55.00
60.00
32.00
36.00
40.00
44.00
48.00
52.00
56.00
60.00
64.00
68.00
72.00

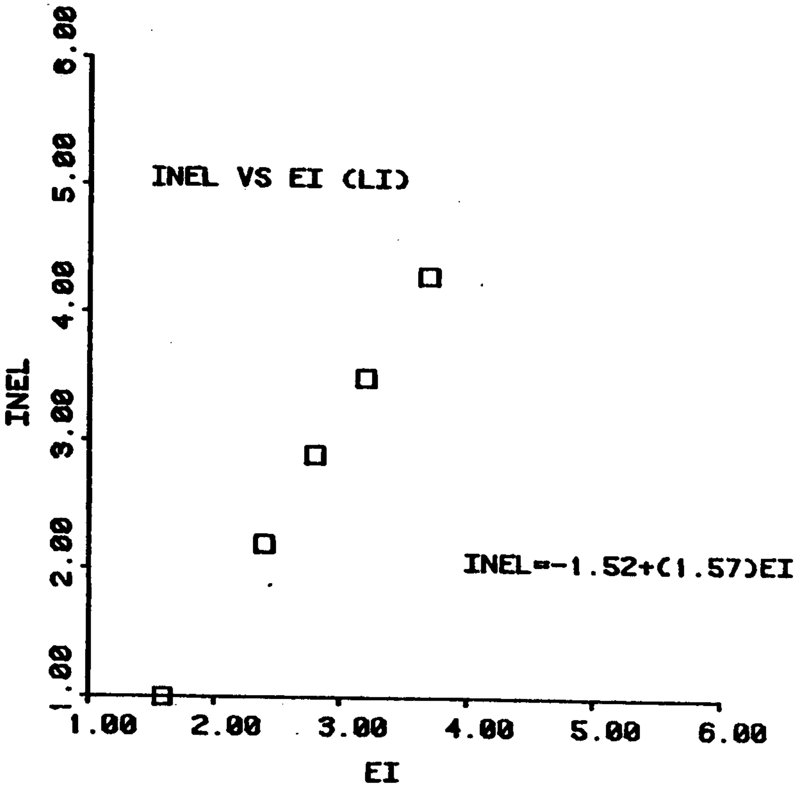

INEL VS EI (COND)
INEL=-164+(1.45)EI
INEL *10³
2
4
6
8
10
12
14
16
EI *10²
80
160
240
320
400
480
560
640
720
800
880

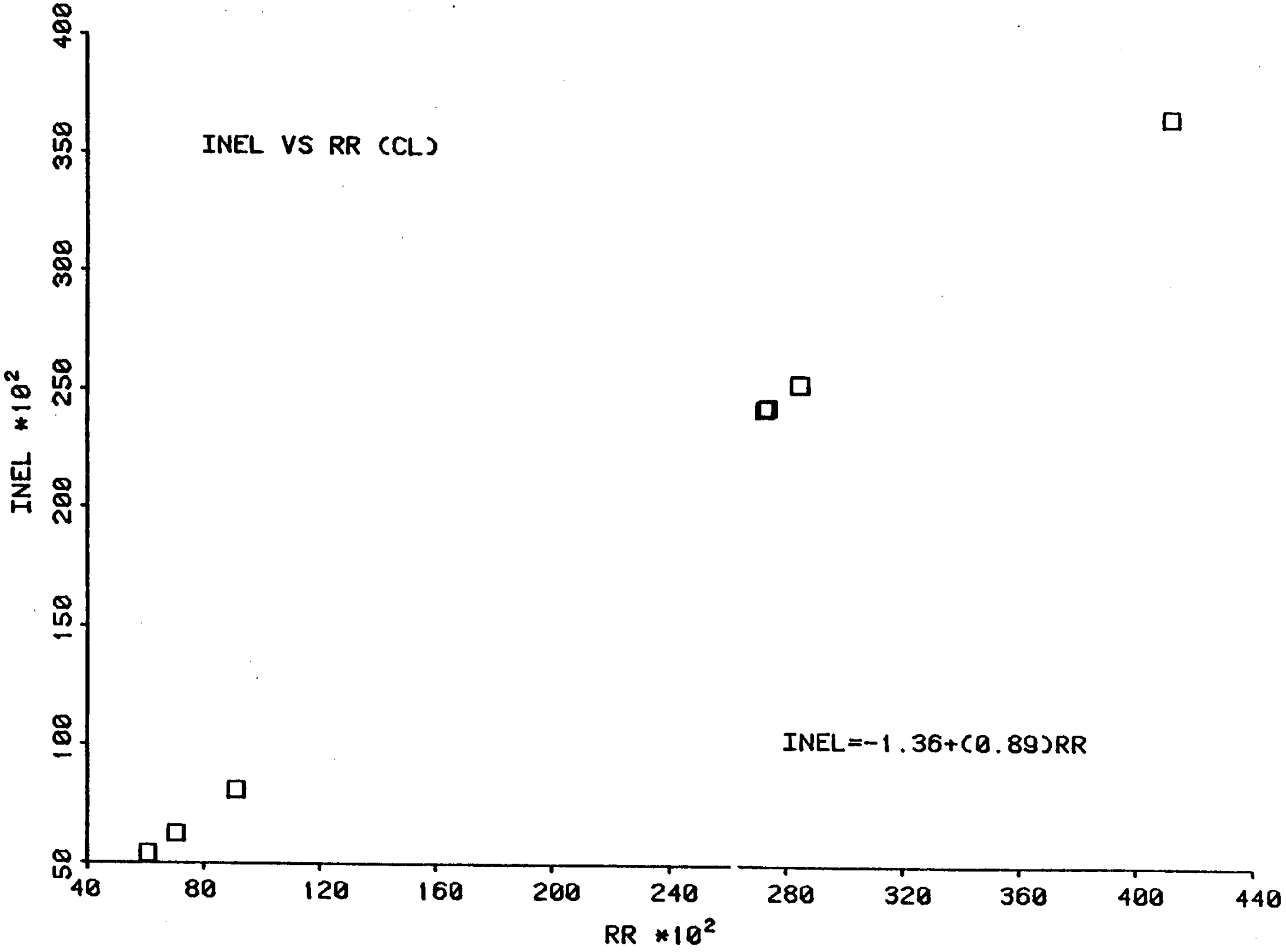

INEL VS EI (K)
INEL=-2.43+(1.11)EI
INEL
EI
8.00
16.00
24.00
32.00
40.00
48.00
56.00
64.00
10.00
15.00
20.00
25.00
30.00
35.00
40.00
45.00
50.00
55.00
60.00

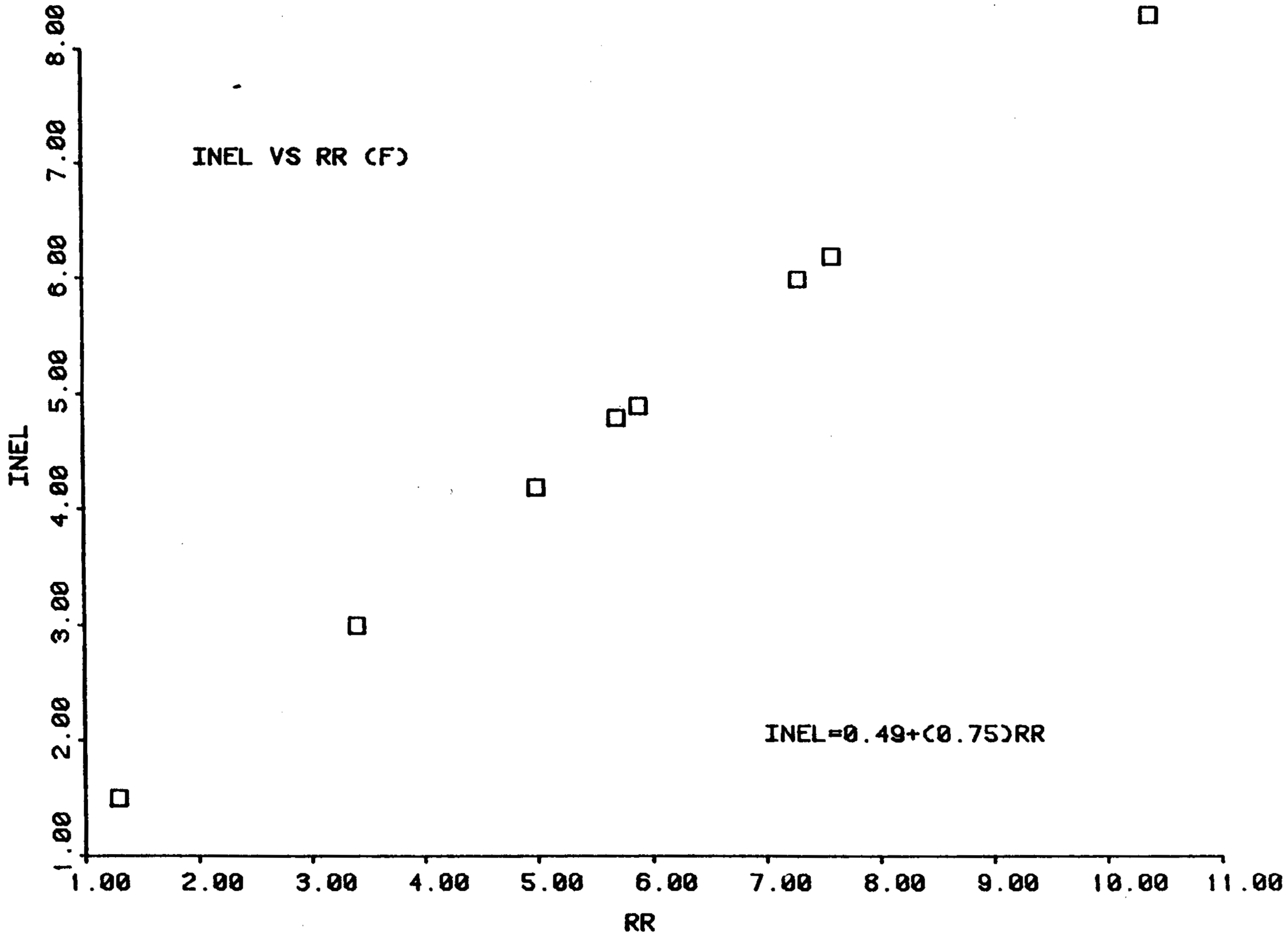

INEL VS EI (ALK)
INEL=-3.67+(1.03)EI
INEL
EI
20.00
40.00
60.00
80.00
100.00
120.00
140.00
20.00
30.00
40.00
50.00
60.00
70.00
80.00
90.00
100.00
110.00
120.00

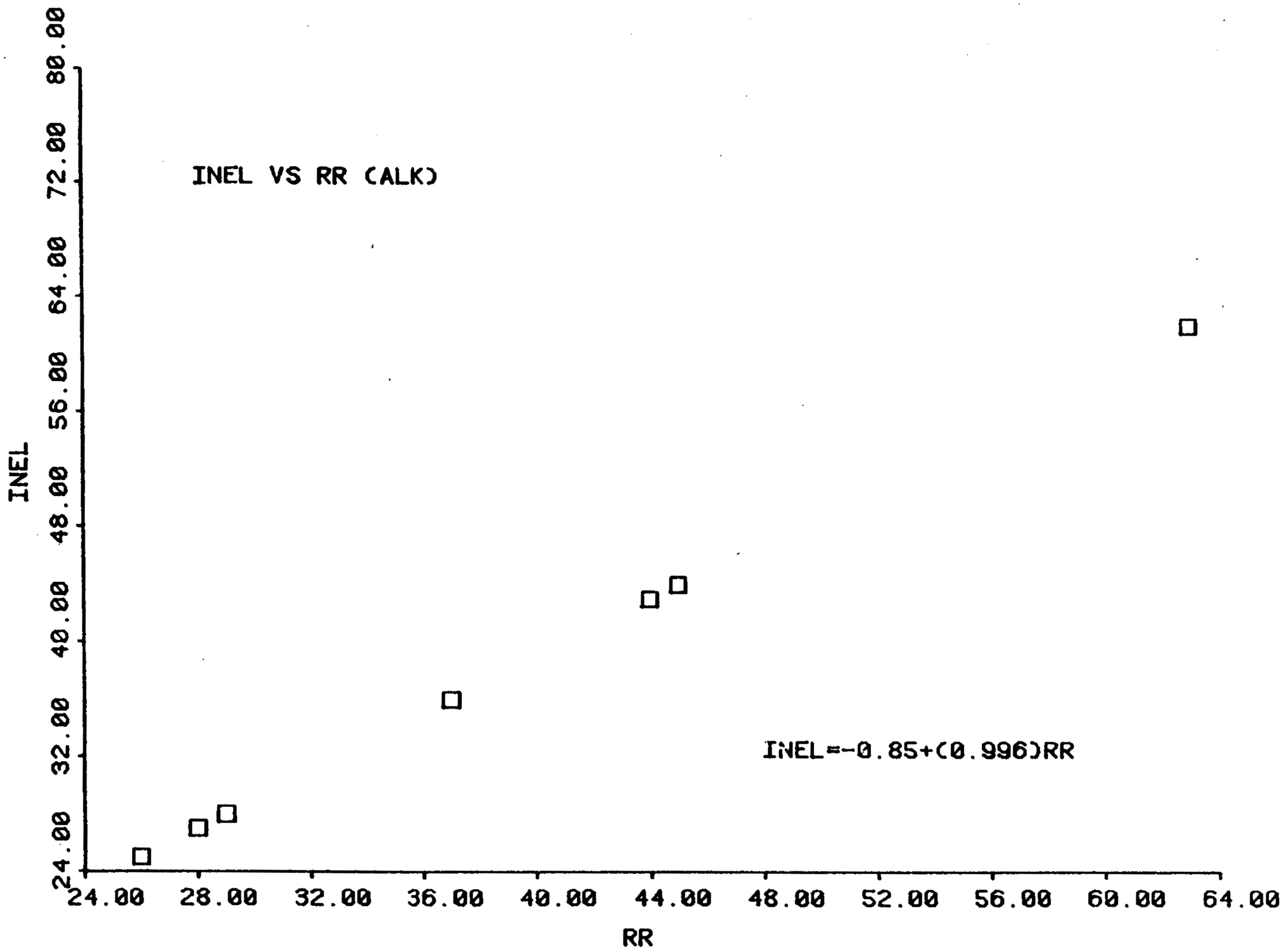

INEL VS EI (SIO2)
INEL
EI
INEL=11.12+(0.86)EI
40.00
60.00
80.00
100.00
120.00
140.00
160.00
180.00
20.00
40.00
60.00
80.00
100.00
120.00
140.00
160.00
180.00
200.00
220.00

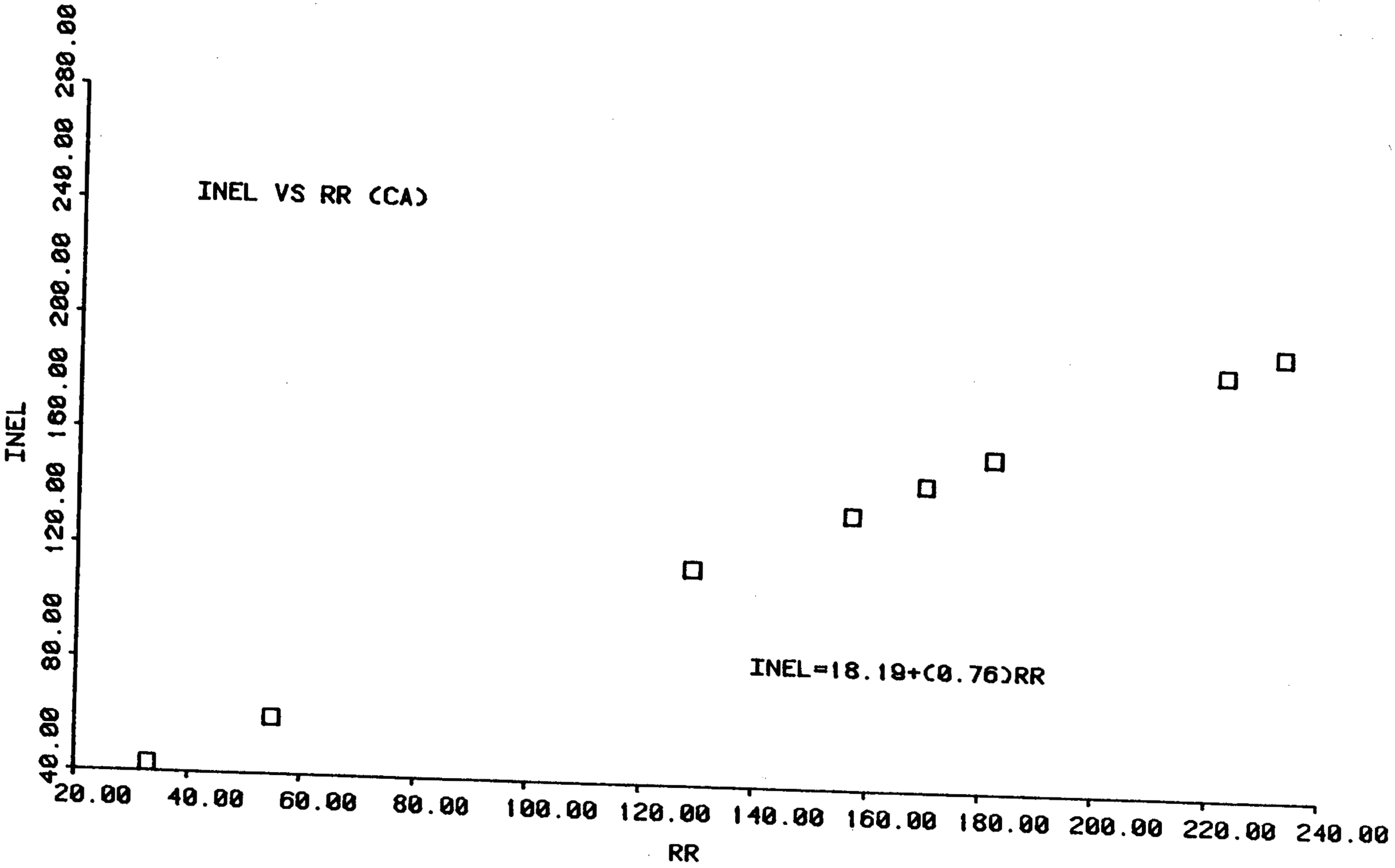

INEL VS EI (CA)
INEL=17.31+(0.77)EI
INEL
40.00
80.00
120.00
160.00
200.00
240.00
EI
20.00
40.00
60.00
80.00
100.00
120.00
140.00
160.00
180.00
200.00
220.00

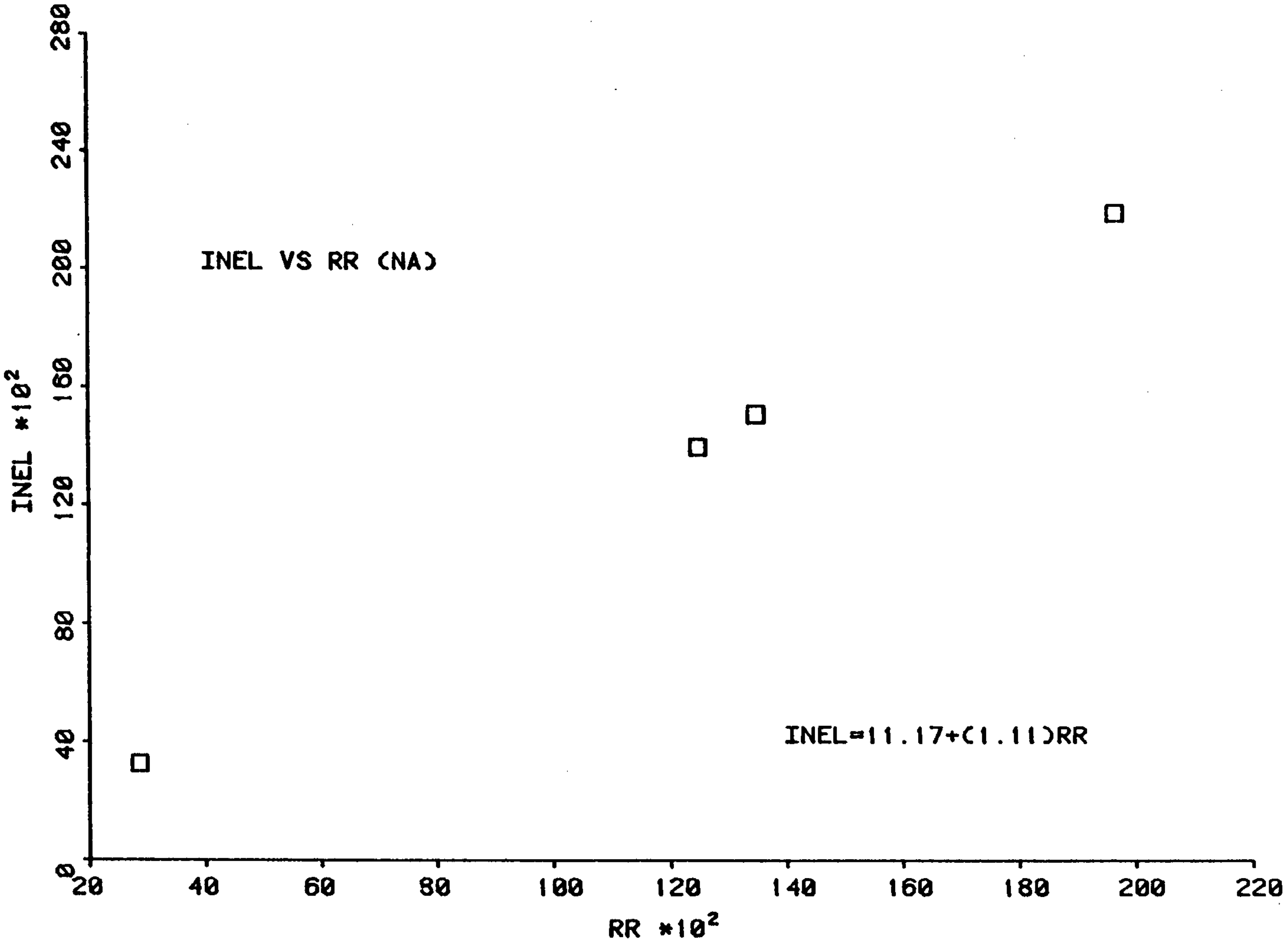

INEL VS EI (LI)
INEL=-1.52+(1.57)EI
INEL
EI
1.00
2.00
3.00
4.00
5.00
6.00
1.00
2.00
3.00
4.00
5.00
6.00

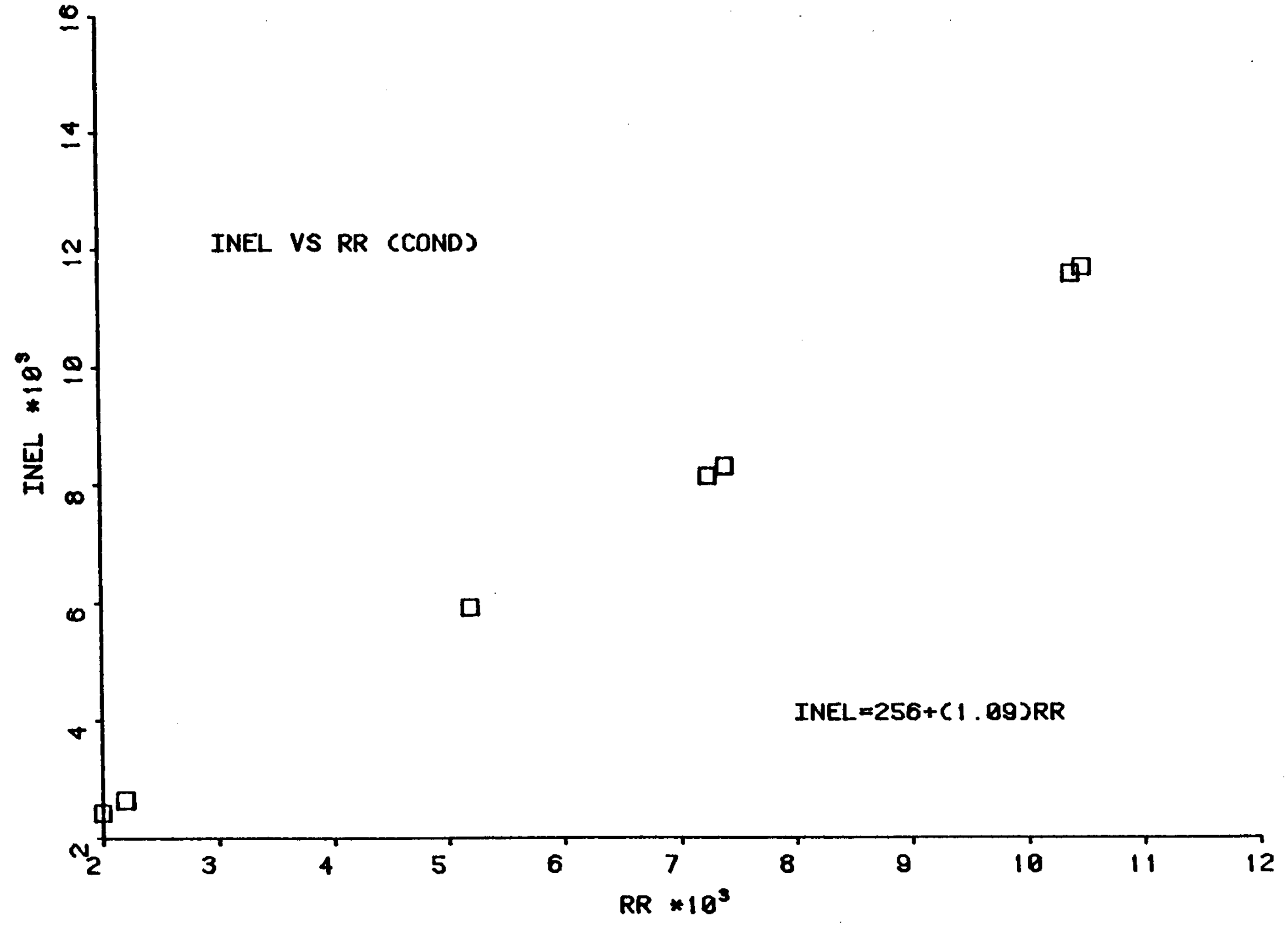

INEL VS RR (CL)
INEL=-1.36+(0.89)RR
INEL *10^2
50
100
150
200
250
300
350
400
RR *10^2
40
80
120
160
200
240
280
320
360
400
440

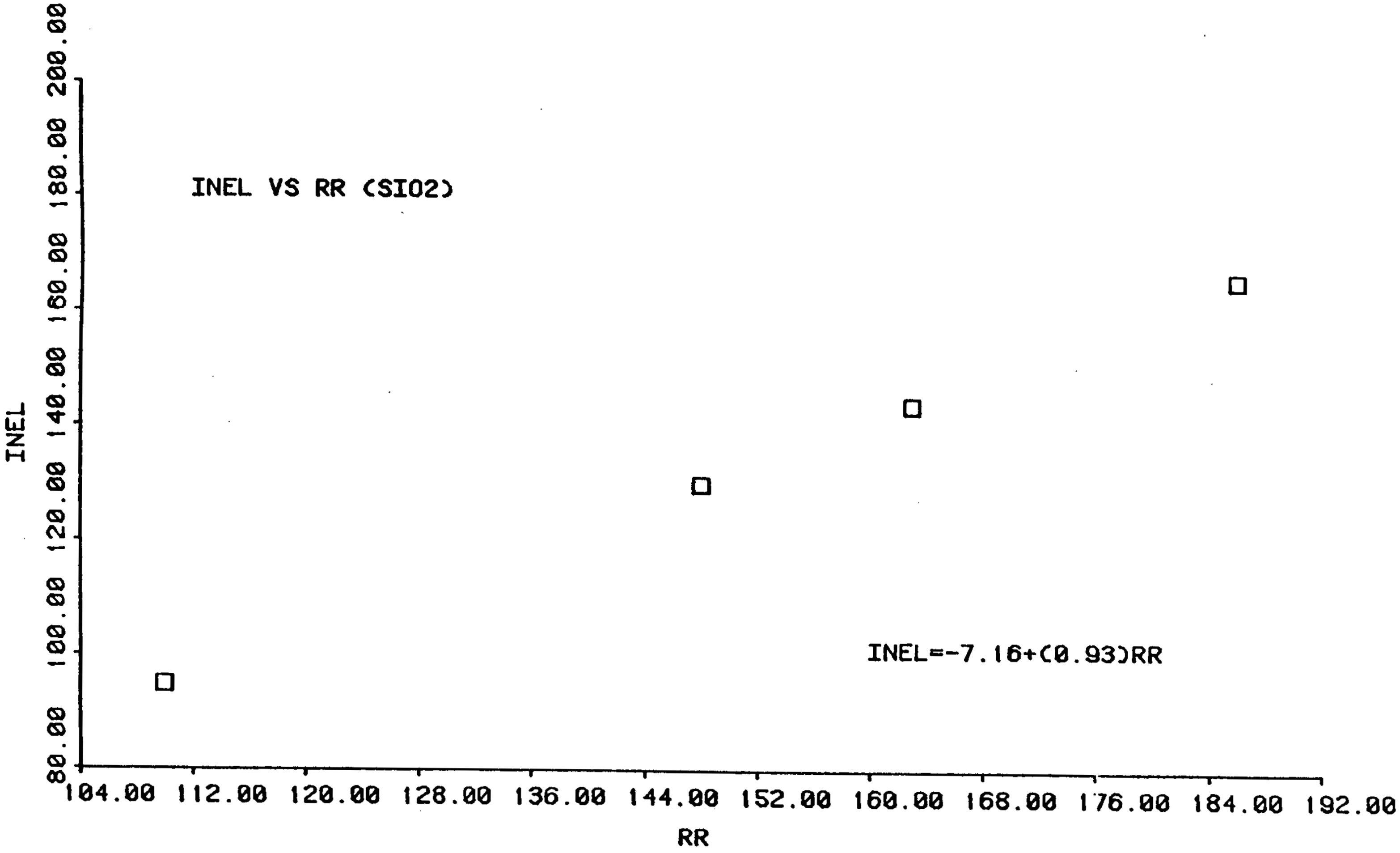

INEL VS RR (F)
INEL=0.49+(0.75)RR
INEL
RR
1.00
2.00
3.00
4.00
5.00
6.00
7.00
8.00
9.00
10.00
11.00


INEL VS RR (ALK)
INEL=-0.85+(0.996)RR
INEL
80.00
72.00
64.00
56.00
48.00
40.00
32.00
24.00
RR
24.00
28.00
32.00
36.00
40.00
44.00
48.00
52.00
56.00
60.00
64.00


INEL VS RR (CA)
INEL=18.19+(0.76)RR
INEL
RR
40.00
80.00
120.00
160.00
200.00
240.00
280.00
20.00
40.00
60.00
80.00
100.00
120.00
140.00
160.00
180.00
200.00
220.00
240.00


INEL VS RR (NA)
INEL=11.17+(1.11)RR
INEL *10^2
RR *10^2
0
40
80
120
160
200
240
280
20
40
60
80
100
120
140
160
180
200
220


INEL VS RR (COND)
INEL=256+(1.09)RR
INEL *10³
RR *10³
2
4
6
8
10
12
14
16
2
3
4
5
6
7
8
9
10
11
12


INEL VS RR (SIO2)
INEL=-7.16+(0.93)RR
INEL
RR
80.00
100.00
120.00
140.00
160.00
180.00
200.00
104.00
112.00
120.00
128.00
136.00
144.00
152.00
160.00
168.00
176.00
184.00
192.00

APPENDIX C

Adjusted Data Base

LAB-INEL

WELL NAME	DATE	PH	TEMP	COND	TDS	HARD	HCO3	CL	F	SO4	NA	CA	K	LI	SR	SI
RRGE-1	111278	0.0	0.	2980.	1656.	0.	33.2	830.	5.6	45.0	466.	56.	34.	1.6	1.4	64.
RRGE-1	111278	0.0	0.	3000.	1658.	0.	34.6	834.	5.8	35.8	472.	50.	32.	1.6	1.4	64.
RRGE-2	32177	0.0	271.	2900.	0.	0.	41.4	665.	10.0	0.0	412.	44.	34.	1.2	0.9	70.
RRGE-2	11579	7.3	0.	2400.	2660.	0.	34.9	659.	6.8	52.8	449.	34.	36.	1.1	1.2	120.
RRGE-2	11579	7.5	0.	2400.	2660.	0.	41.6	645.	6.5	56.1	426.	36.	36.	1.1	1.2	110.
RRGE-2	11579	7.3	0.	2390.	2840.	0.	83.3	654.	6.8	47.6	428.	34.	36.	1.2	1.2	120.
RRGE-2	41279	0.0	0.	2520.	1296.	0.	74.8	680.	8.5	56.0	416.	46.	38.	1.2	1.4	76.
RRGE-2	41279	0.0	0.	2510.	1288.	0.	72.8	676.	9.0	54.0	466.	46.	38.	1.2	1.8	72.
RRGE-3	20177	0.0	280.	0.	4160.	0.	30.4	2124.	4.4	65.0	1178.	182.	102.	2.2	0.0	38.
RRGE-3	20177	0.0	280.	0.	4160.	0.	33.2	2168.	4.8	64.2	1182.	198.	96.	2.2	0.0	84.
RRGE-3	61077	0.0	296.	8960.	4740.	0.	25.6	2220.	4.6	66.0	1228.	186.	102.	3.2	5.0	102.
RRGE-3	61077	0.0	286.	8960.	4780.	0.	25.6	2240.	4.8	66.0	1254.	200.	94.	3.4	5.4	88.
RRGE-3	72177	0.0	280.	0.	4460.	0.	26.0	2280.	5.1	67.2	1330.	202.	110.	3.4	5.0	76.
RRGE-3	72177	0.0	290.	9740.	4660.	0.	0.0	0.	0.0	0.0	0.	0.	0.	0.0	0.0	0.
RRGE-3	72177	0.0	290.	0.	4600.	0.	26.0	2280.	5.3	68.6	1348.	200.	106.	3.6	5.4	60.
RRGE-3	72177	0.0	290.	7466.	4520.	0.	0.0	0.	0.0	0.0	0.	0.	0.	0.0	0.0	0.
RRGE-3	72177	0.0	290.	0.	4840.	0.	26.8	2340.	5.2	67.0	1360.	204.	106.	3.6	5.2	68.
RRGE-3	72177	0.0	290.	9960.	4480.	0.	0.0	0.	0.0	0.0	0.	0.	0.	0.0	0.0	0.
RRGE-3	72177	0.0	290.	0.	4380.	0.	23.6	2300.	4.9	56.2	1282.	196.	98.	3.4	5.0	68.
RRGE-3	111278	0.0	0.	8000.	4300.	0.	25.8	2152.	3.7	44.6	1240.	258.	102.	2.4	5.2	76.
RRGE-3	111278	0.0	0.	8000.	4360.	0.	25.8	2080.	3.7	42.4	1250.	246.	104.	2.4	5.2	78.
RRGE-3	12079	0.0	0.	8806.	4123.	0.	39.4	2261.	4.9	60.9	1194.	175.	105.	3.2	0.0	91.
RRGE-3	12079	0.0	0.	8866.	4096.	0.	36.1	2266.	4.9	60.1	1178.	178.	105.	3.2	0.0	75.
RRGE-4	52777	0.0	0.	4760.	2120.	0.	58.0	906.	8.4	0.0	0.	0.	0.	0.0	0.0	0.
RRGE-4	52777	8.0	0.	4150.	2050.	0.	52.4	892.	7.8	0.0	0.	0.	0.	0.0	0.0	0.
RRGE-4	110877	0.0	232.	7620.	4626.	0.	25.4	0.	0.0	78.0	0.	142.	0.	0.0	0.0	50.
RRGE-4	110877	0.0	232.	7620.	4744.	0.	23.2	0.	0.0	78.0	0.	144.	0.	0.0	6.6	48.
RRGE-4	110877	7.4	232.	7330.	4448.	0.	23.9	2510.	4.5	61.0	1560.	160.	28.	3.4	6.4	45.
RRGE-4	110877	7.4	232.	7220.	4498.	0.	24.3	2640.	4.5	61.2	1490.	140.	28.	2.8	6.3	51.
RRGE-5	53179	6.9	0.	2690.	1660.	0.	28.9	800.	7.2	0.0	484.	41.	31.	1.4	1.2	57.
RRGE-6	111278	0.0	0.	11600.	6420.	0.	61.6	3576.	5.7	66.4	2020.	214.	32.	5.0	8.0	44.
RRGE-6	111278	0.0	0.	11600.	6340.	0.	62.4	3696.	5.8	53.0	2020.	184.	32.	5.2	8.0	44.
RRGE-7	80778	0.0	0.	12000.	7440.	0.	21.4	4170.	4.8	0.0	2200.	350.	0.	0.0	0.0	37.
RRGE-7	80778	0.0	0.	12000.	0.	0.	30.8	4000.	5.1	0.1	2000.	280.	0.	0.0	0.0	41.
MW-1	121378	7.8	0.	11350.	6590.	0.	24.5	3670.	2.1	67.0	2270.	210.	28.	4.1	7.0	37.
MW-1	20679	7.7	0.	11300.	6650.	0.	25.0	4110.	6.7	84.0	2270.	190.	30.	4.1	6.3	63.
MW-2	20679	7.4	0.	5700.	3360.	0.	27.0	1970.	2.4	57.6	1030.	120.	26.	2.7	3.5	69.
MW-3	20778	0.0	0.	0.	0.	0.	0.0	2194.	2.0	167.0	1050.	330.	35.	0.0	3.2	35.
MW-3	20778	0.0	0.	0.	0.	0.	0.0	2133.	3.3	165.0	1000.	330.	35.	0.0	3.2	33.
MW-3	121378	7.5	0.	7700.	4920.	0.	45.8	2400.	5.6	67.5	1350.	170.	54.	3.1	1.8	43.
MW-4	121378	7.7	0.	7800.	4520.	0.	29.7	2610.	5.6	19.8	1450.	160.	23.	3.3	0.8	38.
MW-4	20779	7.8	0.	7800.	4840.	0.	30.6	2770.	5.6	53.4	1520.	150.	31.	3.3	1.4	67.
MW-5	20779	7.6	0.	2000.	1520.	0.	102.0	610.	0.5	22.0	279.	98.	13.	0.3	1.1	1.
MW-6	121378	10.6	0.	7600.	4270.	0.	15.0	2340.	4.1	62.7	1170.	170.	62.	2.8	1.4	14.
MW-6	20779	7.7	0.	8700.	5430.	0.	44.3	2930.	4.9	73.1	1570.	230.	56.	3.1	1.3	85.
MW-7	121378	7.8	0.	2300.	1300.	0.	101.5	650.	1.0	24.8	375.	94.	14.	0.6	0.8	20.
MW-7	20779	7.8	0.	2310.	1370.	0.	110.0	690.	0.9	32.0	333.	99.	14.	0.6	1.0	17.
BLM	32778	0.0	0.	0.	1810.	0.	39.0	930.	5.8	54.3	580.	50.	25.	1.5	1.4	34.
BLM	20679	7.8	0.	3200.	1930.	0.	40.2	950.	5.3	64.9	577.	44.	21.	1.4	1.5	68.

**NOTE: 0 INDICATES NO DETERMINATION
CONCENTRATIONS IN MG/L
TEMPERATURE IN DEGREES F

LAB-IDWR

WELL NAME	DATE	PH	TEMP	COND	TDS	HARD	HCO3	CL	F	SO4	NA	CA	K	LI	SR	SI
16S-24E 12CCA1	82275	7.2	54.	1180.	0.	0.	363.7	160.	0.3	43.6	106.	108.	5.	0.0	0.0	44.
16S-24E 12CCA1	51476	7.2	53.	875.	0.	0.	263.3	129.	1.3	49.0	62.	91.	5.	0.1	0.0	35.
15S-24E 27DAA1	60777	7.1	58.	990.	0.	0.	162.3	213.	0.4	65.3	59.	106.	6.	0.0	0.0	55.
15S-24E 27DAA1	82275	7.1	55.	1130.	0.	0.	182.4	197.	0.4	86.4	71.	107.	6.	0.0	0.0	46.
15S-24E 27DAA1	51476	7.2	52.	970.	0.	0.	329.4	73.	4.3	148.8	126.	57.	3.	0.1	0.0	36.
15S-24E 27DAA1	82676	7.6	58.	1140.	0.	0.	171.4	223.	0.3	91.2	66.	115.	6.	0.0	0.0	52.
15S-25E 33CCD1	82676	7.8	53.	1850.	0.	0.	256.2	392.	0.1	153.6	145.	180.	6.	0.0	0.0	41.
15S-25E 33CCD1	82275	7.0	54.	1460.	0.	0.	232.5	280.	0.2	88.8	90.	153.	9.	0.0	0.0	[illegible]
15S-26E 24DCC1	82676	7.9	89.	2510.	0.	0.	159.0	652.	2.5	50.9	342.	97.	13.	0.8	0.0	63.
15S-26E 24DCC1	53179	7.5	88.	3300.	0.	0.	156.8	911.	2.4	76.8	428.	161.	17.	0.9	0.0	51.
15S-26E 24DCC1	82478	7.6	89.	2880.	0.	0.	151.9	787.	2.3	62.4	368.	139.	15.	0.3	0.0	54.
15S-26E 26CAB1	82275	7.9	75.	3900.	0.	0.	148.9	1109.	5.1	66.3	731.	57.	14.	1.6	0.0	66.
15S-26E 26CAB1	72778	8.1	77.	3750.	0.	0.	125.1	1085.	5.7	51.9	695.	103.	12.	0.4	0.0	53.
15S-26E 26CAB1	62678	7.4	64.	1700.	0.	0.	225.1	440.	2.9	57.6	335.	28.	7.	0.6	0.0	46.
15S-26E 26CAB1	53179	8.1	73.	3730.	0.	0.	127.5	1071.	6.0	55.7	697.	43.	12.	1.5	0.0	49.
15S-26E 26CAB1	60777	7.9	76.	3900.	0.	0.	124.4	1095.	5.0	60.5	690.	50.	13.	1.4	0.0	68.
15S-26E 23DDC1	60777	7.5	57.	1070.	0.	0.	245.2	208.	0.8	81.6	96.	102.	7.	0.1	0.0	40.
15S-26E 23DDC1	62678	7.3	55.	925.	0.	0.	254.4	172.	0.7	65.3	89.	73.	5.	0.2	0.0	30.
15S-26E 23DDC1	72778	7.8	55.	1125.	0.	0.	252.0	199.	0.8	72.0	91.	103.	7.	0.0	0.0	37.
15S-26E 23DDC1	53179	7.5	52.	1051.	0.	0.	252.0	181.	0.8	64.4	87.	99.	6.	0.0	0.0	31.
15S-26E 23DDC1	51476	7.3	61.	1290.	0.	0.	215.3	315.	0.9	58.6	152.	106.	9.	0.3	0.0	35.
15S-26E 23DDC1	82275	7.3	59.	1150.	0.	0.	241.0	195.	1.1	65.3	105.	97.	8.	0.1	0.0	40.
15S-26E 23DDC1	82478	7.2	57.	1160.	0.	0.	242.9	203.	0.9	71.1	90.	101.	7.	0.0	0.0	40.
15S-26E 23DDD1	62678	7.0	105.	3600.	0.	0.	139.1	1097.	4.1	57.6	649.	62.	18.	1.7	0.0	52.
15S-26E 23DDD1	53179	7.5	104.	3890.	0.	0.	141.6	1095.	4.5	103.8	641.	104.	18.	0.7	0.0	55.
15S-26E 23DDD1	72778	7.4	108.	3900.	0.	0.	136.7	1152.	4.6	56.7	635.	95.	18.	0.5	0.0	62.
15S-26E 23DDD1	82478	7.4	108.	3930.	0.	0.	132.4	1127.	4.7	52.8	643.	99.	18.	1.5	0.0	77.
15S-26E 23DDD1	82275	7.1	102.	3750.	0.	0.	138.5	1051.	3.8	55.7	608.	111.	20.	1.5	0.0	59.
15S-26E 23DDD1	60777	7.3	90.	2800.	0.	0.	204.3	731.	2.1	74.9	398.	118.	13.	0.8	0.0	60.
15S-26E 23DDD	90277	7.2	103.	3400.	0.	0.	154.3	1007.	3.9	62.4	578.	62.	17.	1.3	0.0	57.
15S-26E 23DDD	82676	7.8	108.	4000.	0.	0.	131.8	1166.	4.4	93.8	653.	94.	18.	1.6	0.0	71.
15S-26E 25ABB1	72778	7.7	89.	2800.	0.	0.	155.6	824.	2.4	69.2	375.	148.	15.	0.9	0.0	43.
15S-26E 25ABB1	60777	7.5	89.	2600.	0.	0.	153.7	673.	2.3	48.0	350.	103.	14.	0.6	0.0	66.
15S-26E 24BAD1	51476	7.3	89.	3000.	0.	0.	176.9	721.	2.3	55.7	417.	89.	16.	0.9	0.0	54.
15S-26E 24BAD1	82275	7.2	72.	2400.	0.	0.	198.9	640.	1.9	59.5	368.	103.	15.	0.8	0.0	50.
15S-26E 24BAD1	82676	7.6	80.	2550.	0.	0.	194.6	679.	2.1	58.6	369.	106.	13.	0.9	0.0	51.
15S-26E 24BAD1	60777	7.3	80.	2600.	0.	0.	197.0	651.	1.9	61.4	371.	102.	13.	0.8	0.0	59.
15S-26E 24BAD1	72778	8.0	84.	2500.	0.	0.	205.0	684.	2.1	62.4	373.	105.	13.	0.8	0.0	36.
15S-26E 24BAD1	82478	7.6	82.	2610.	0.	0.	199.5	682.	2.0	61.4	366.	107.	13.	0.8	0.0	51.
15S-26E 24BAD1	53179	7.2	59.	2530.	0.	0.	271.5	631.	1.2	86.5	317.	154.	11.	0.5	0.0	37.
15S-26E 24BCB1	53179	7.6	73.	2460.	0.	0.	195.9	617.	5.6	61.5	407.	60.	11.	0.9	0.0	50.
15S-26E 24BCB1	82275	7.9	75.	2480.	0.	0.	186.7	646.	4.6	59.7	430.	61.	13.	1.0	0.0	60.
15S-26E 24BCB1	62678	7.4	74.	2200.	0.	0.	199.5	639.	4.4	64.3	406.	52.	11.	0.9	0.0	57.
15S-26E 24BCB1	60777	7.7	64.	3000.	0.	0.	291.0	770.	2.7	71.0	420.	133.	14.	0.9	0.0	65.
15S-26E 24BCB1	82676	8.0	61.	2400.	0.	0.	212.3	601.	2.3	57.6	319.	113.	11.	0.6	0.0	52.
15S-26E 6DDD1	72778	7.3	54.	1630.	0.	0.	237.4	377.	0.8	58.6	176.	112.	5.	0.3	0.0	38.
15S-26E 6ABC1	72778	7.7	53.	1960.	0.	0.	255.1	450.	1.4	68.2	210.	126.	9.	0.4	0.0	40.
15S-26E 25BDC1	72778	7.5	90.	2200.	0.	0.	132.4	650.	2.8	94.1	363.	75.	19.	0.9	0.0	52.
15S-26E 19CCC1	72778	7.3	68.	2700.	0.	0.	193.4	731.	2.2	78.8	375.	122.	18.	0.8	0.0	42.
15S-26E 18CAC1	72778	7.6	61.	1850.	0.	0.	201.4	440.	0.4	45.1	178.	119.	6.	0.3	0.0	39.

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TEMPERATURE IN DEGREES F

LAJ-IDWR

WELL NAME		DATE	PH	TEMP	COND	TDS	HARD	HCO3	CL	F	SO4	NA	CA	K	LI	SR	SI
15S-26E	1ABCC1	72778	7.5	0.	1360.	0.	0.	142.2	338.	0.5	30.7	112.	101.	12.	0.2	0.0	74.
15S-26E	17BCB1	72778	7.4	54.	2300.	0.	0.	264.8	565.	1.1	89.3	277.	144.	12.	0.5	0.0	17.
15S-26E	8CBC1	72778	7.9	55.	1050.	0.	0.	205.0	233.	0.3	47.1	79.	95.	6.	0.0	0.0	46.
15S-26E	20CBC1	72778	7.5	53.	1150.	0.	0.	160.5	260.	0.2	34.1	90.	94.	3.	0.0	0.0	30.
15S-26E	24CAD1	72778	7.9	82.	2100.	0.	0.	219.1	554.	1.5	69.2	266.	122.	13.	0.6	0.0	36.
15S-26E	24CAD1	60777	7.8	83.	2200.	0.	0.	214.7	563.	1.5	68.2	291.	120.	13.	0.7	0.0	56.
15S-26E	24CAD1	53179	7.8	82.	2220.	0.	0.	218.5	535.	1.6	69.2	284.	116.	13.	0.6	0.0	41.
15S-26E	24CAD1	82275	7.3	82.	2200.	0.	0.	211.7	560.	1.5	49.6	295.	126.	14.	0.7	0.0	50.
15S-26E	24CAD1	62678	7.3	83.	2000.	0.	0.	221.4	547.	1.5	77.3	295.	91.	13.	0.7	0.0	38.
15S-26E	24BAD	90277	7.7	77.	2500.	0.	0.	201.9	677.	2.0	62.4	371.	107.	13.	0.8	0.0	43.
15S-26E	24BAB1	62678	7.2	80.	2250.	0.	0.	202.5	635.	1.9	63.4	367.	74.	13.	0.8	0.0	38.
15S-26E	24DCC	90277	7.4	89.	2500.	0.	0.	159.2	676.	2.4	52.8	344.	107.	14.	0.2	0.0	50.
15S-26E	27DCC	82676	8.1	59.	1450.	0.	0.	245.2	321.	2.4	60.5	220.	60.	9.	0.4	0.0	52.
15S-26E	27DCC	90277	7.5	60.	1430.	0.	0.	249.5	323.	2.6	60.5	237.	55.	8.	0.3	0.0	44.
15S-26E	27DCC1	53179	7.7	60.	1480.	0.	0.	248.4	316.	2.7	62.4	223.	60.	7.	0.3	0.0	42.
15S-26E	27DCC1	60777	7.9	61.	1310.	0.	0.	250.7	295.	2.3	62.4	214.	58.	8.	0.3	0.0	54.
15S-26E	27DCC1	82275	7.7	59.	1400.	0.	0.	248.3	309.	2.4	55.3	233.	59.	9.	0.4	0.0	55.
15S-26E	27DCC1	51476	7.6	59.	1450.	0.	0.	250.7	302.	2.3	64.3	220.	62.	9.	0.4	0.0	52.
15S-26E	27DCC1	62678	7.3	59.	1380.	0.	0.	248.3	322.	2.6	61.4	235.	43.	8.	0.3	0.0	52.
15S-26E	23ABD1	51476	7.7	84.	4700.	0.	0.	133.0	1280.	5.1	115.2	777.	99.	25.	1.6	0.0	68.
15S-26E	23ABD1	72778	7.5	83.	4200.	0.	0.	142.2	1277.	5.3	100.9	723.	98.	20.	0.7	0.0	51.
15S-26E	23ABD1	53179	7.8	85.	4160.	0.	0.	141.6	1173.	5.6	0.0	740.	87.	19.	0.3	0.0	56.
15S-26E	23ABD1	82478	7.6	84.	4370.	0.	0.	137.3	1279.	4.9	96.0	755.	99.	19.	1.8	0.0	69.
15S-26E	23ABD1	60777	7.7	84.	4400.	0.	0.	131.1	1257.	5.1	92.2	777.	92.	20.	1.7	0.0	78.
15S-26E	23ABD1	62678	7.4	83.	4000.	0.	0.	135.4	1232.	4.8	94.1	769.	72.	18.	1.9	0.0	65.
15S-26E	23ABD1	82275	0.0	84.	4500.	0.	0.	123.3	1321.	4.9	90.3	809.	107.	23.	2.0	0.0	65.
15S-26E	23ABD	90277	7.6	84.	4300.	0.	0.	130.5	1251.	5.1	97.0	736.	96.	20.	1.8	0.0	57.
15S-26E	23ABD	82676	7.9	86.	4700.	0.	0.	124.4	1287.	5.2	94.1	796.	100.	20.	2.0	0.0	66.
15S-26E	25BDA1	72778	7.2	91.	5700.	0.	0.	71.4	1828.	3.3	178.8	899.	222.	38.	2.0	0.0	59.
15S-26E	7DBC1	72778	7.3	50.	1890.	0.	0.	295.3	409.	0.7	74.9	156.	163.	9.	0.2	0.0	35.
15S-27E	8DBC1	82478	7.4	55.	1110.	0.	0.	197.7	234.	0.3	40.3	76.	97.	5.	0.0	0.0	59.
15S-27E	8DBC1	62678	7.6	55.	970.	0.	0.	193.3	224.	0.2	44.6	76.	72.	6.	0.0	0.0	50.
15S-27E	8CBC1	82275	0.0	50.	0.	0.	0.	344.1	305.	0.5	29.6	201.	98.	4.	0.1	0.0	30.
15S-27E	8DBC1	53179	7.6	55.	1069.	0.	0.	198.3	228.	0.3	46.1	79.	93.	6.	0.0	0.0	45.
15S-27E	8DBC1	60777	7.5	56.	1030.	0.	0.	202.5	236.	0.3	48.0	77.	94.	6.	0.0	0.0	57.
15S-27E	8DBC	90277	7.5	55.	1100.	0.	0.	205.0	244.	0.2	47.0	82.	99.	6.	0.0	0.0	39.
15S-27E	20CBC1	62678	7.5	51.	990.	0.	0.	158.6	257.	0.2	31.7	97.	32.	4.	0.0	0.0	31.
15S-27E	20CBC1	82275	7.4	52.	1160.	0.	0.	159.3	264.	0.2	30.7	100.	98.	4.	0.0	0.0	32.
15S-27E	20CBC1	51476	7.5	52.	1400.	0.	0.	170.2	375.	0.2	31.2	115.	118.	4.	0.1	0.0	28.
15S-27E	20CBC1	60777	7.4	53.	1030.	0.	0.	156.8	264.	0.2	31.2	91.	91.	4.	0.0	0.0	37.
14S-27E	32BDD2	90277	7.2	53.	2150.	0.	0.	270.8	535.	0.2	83.5	155.	184.	9.	0.1	0.0	43.
15S-27E	19CCC1	82275	7.2	66.	2900.	0.	0.	197.7	739.	2.7	74.9	400.	130.	20.	0.9	0.0	58.
15S-27E	19CCC1	53179	7.8	66.	2780.	0.	0.	193.4	755.	2.3	75.9	394.	123.	19.	0.8	0.0	47.
15S-27E	19CCC1	51476	7.4	63.	3200.	0.	0.	198.9	777.	2.2	89.3	415.	131.	21.	0.8	0.0	60.
15S-27E	19CCC1	62678	7.1	67.	2600.	0.	0.	195.2	753.	2.1	78.7	399.	94.	18.	0.9	0.0	45.
15S-27E	18CAC1	82675	7.9	56.	2750.	0.	0.	276.3	687.	0.6	75.4	262.	201.	11.	0.5	0.0	45.
15S-27E	18CAC1	51476	7.2	45.	1170.	0.	0.	269.6	202.	0.9	59.5	116.	92.	7.	0.2	0.0	33.
15S-27E	18CAC1	82275	7.3	59.	1870.	0.	0.	190.4	462.	0.5	48.0	192.	124.	7.	0.3	0.0	43.
15S-27E	18CAC1	62678	7.4	60.	1590.	0.	0.	195.2	447.	0.5	42.2	187.	90.	6.	0.3	0.0	38.
15S-27E	18CAC1	53179	7.8	60.	1715.	0.	0.	194.0	432.	0.5	46.1	183.	114.	5.	0.3	0.0	39.

**NOTE: O INDICATES NO DETERMINATION
CONCENTRATIONS IN MG/L
TEMPERATURE IN DEGREES F

LAB-IDWR

WELL NAME	DATE	PH	TEMP	COND	TDS	HARD	HCO3	CL	F	SO4	NA	CA	K	LI	SP	SI
15S-27E 6ABC1	62678	7.7	54.	1740.	0.	0.	237.9	458.	1.3	66.2	232.	93.	9.	0.4	0.0	36.
15S-27E 6ABC1	82275	7.0	52.	1960.	0.	0.	227.0	459.	1.4	49.1	232.	122.	11.	0.5	0.0	49.
15S-27E 6ABC1	82478	7.3	54.	1960.	0.	0.	242.3	469.	1.4	63.4	223.	126.	9.	0.4	0.0	48.
15S-27E 6ABC1	53179	7.6	53.182800.		0.	0.	247.1	454.	1.4	61.5	235.	122.	10.	0.4	0.0	38.
15S-27E 6DDDD1	60777	7.3	56.	1440.	0.	0.	230.6	351.	0.8	57.6	173.	105.	9.	0.3	0.0	53.
15S-27E 6DDDD1	82275	7.5	53.	1570.	0.	0.	233.7	352.	0.9	43.3	178.	109.	9.	0.3	0.0	43.
15S-27E 6DDD1	82478	7.2	55.	1660.	0.	0.	229.4	374.	0.8	54.8	173.	113.	8.	0.3	0.0	47.
15S-27E 6DDD1	51476	7.1	53.	1610.	0.	0.	240.9	359.	0.9	59.5	174.	112.	9.	0.3	0.0	45.
15S-27E 6DDD1	53179	7.3	54.	1560.	0.	0.	236.8	369.	0.9	57.6	184.	109.	8.	0.3	0.0	34.
15S-27E 6DDD1	62678	7.3	54.	1420.	0.	0.	236.1	362.	0.8	58.6	177.	83.	9.	0.3	0.0	35.
15S-27E 7DBC1	53179	7.3	51.	1670.	0.	0.	281.3	418.	0.8	71.7	174.	157.	9.	0.3	0.0	34.
15S-27E 7DBC1	62678	7.3	51.	1490.	0.	0.	295.8	345.	0.6	71.0	154.	110.	9.	0.2	0.0	33.
15S-27E 7DBC1	82275	7.2	50.	1720.	0.	0.	282.5	351.	0.7	43.4	152.	146.	10.	0.2	0.0	43.
15S-27E 7CBC1	82478	7.1	51.	1870.	0.	0.	284.3	420.	0.6	70.1	160.	165.	9.	0.2	0.0	46.
15S-27E 7DBC1	60777	7.1	51.	1750.	0.	0.	275.1	400.	0.7	76.8	180.	162.	10.	0.3	0.0	48.
15S-27E 17BCB1	53179	7.7	52.	2310.	0.	0.	258.7	574.	1.1	88.4	292.	151.	12.	0.5	0.0	36.
15S-27E 17BCA1	62678	7.3	53.	2100.	0.	0.	258.6	547.	1.0	85.5	275.	111.	11.	0.5	0.0	42.
15S-27E 17BCA1	51476	7.2	51.	2500.	0.	0.	332.4	520.	0.9	115.2	266.	166.	11.	0.5	0.0	34.
15S-27E 17BCA1	82275	7.2	50.	2400.	0.	0.	327.1	542.	1.0	46.2	280.	167.	12.	0.4	0.0	46.
15S-27E 17BCB	90277	7.5	51.	2200.	0.	0.	286.1	554.	1.0	94.1	266.	151.	11.	0.5	0.0	60.
14S-27E 32BDD1	82478	7.2	50.	4750.	0.	0.	341.1	1266.	0.6	321.8	575.	287.	278.	0.3	0.0	44.
14S-27E 32BDD1	82275	6.9	52.	2250.	0.	0.	278.3	525.	0.7	111.4	193.	206.	10.	0.2	0.0	49.
14S-27E 32BDD1	60777	7.3	52.	5300.	0.	0.	352.0	1402.	0.6	408.0	378.	542.	13.	0.2	0.0	51.
14S-27E 32BDD1	90277	7.3	50.	3500.	0.	0.	300.7	966.	0.5	193.9	255.	363.	10.	0.2	0.0	38.
14S-27E 32CBC	90277	7.3	52.	1420.	0.	0.	258.0	317.	0.8	63.4	144.	118.	8.	0.2	0.0	53.
14S-27E 32CBC1	62678	7.4	52.	1100.	0.	0.	231.2	261.	0.9	45.1	141.	67.	7.	0.3	0.0	32.
14S-27E 32CBD	90277	7.6	54.	990.	0.	0.	185.4	229.	0.9	28.8	139.	51.	5.	0.3	0.0	38.
13S-27E 22DBA1	82478	7.9	66.	577.	0.	0.	156.2	91.	0.5	19.2	22.	55.	9.	0.0	0.0	70.
13S-27E 22BAA1	82478	7.2	57.	3490.	0.	0.	109.2	1046.	0.2	41.3	43.	399.	14.	0.0	0.0	55.
14S-27E 32CBC1	72778	7.4	52.	1325.	0.	0.	215.4	301.	1.0	42.3	147.	85.	7.	0.3	0.0	33.
14S-27E 32CBC1	53179	7.3	52.	1299.	0.	0.	210.5	293.	1.0	44.2	155.	84.	7.	0.3	0.0	34.
15S-27E 9CCC1	82478	7.3	66.	2920.	0.	0.	193.4	774.	2.1	74.9	396.	130.	19.	0.9	0.0	62.
15S-27E 7CBC	82676	7.7	50.	1550.	0.	0.	289.8	317.	0.7	69.1	145.	136.	8.	0.1	0.0	45.
15S-27E 18BCC	90277	7.6	71.	1300.	0.	0.	144.6	345.	0.4	29.8	118.	99.	12.	0.2	0.0	53.
15S-27E 18BCC	82676	8.0	71.	1340.	0.	0.	138.5	354.	0.5	32.2	120.	100.	11.	0.1	0.0	67.
15S-27E 29BCC1	82275	7.3	50.	2200.	0.	0.	170.2	393.	0.2	29.8	121.	155.	4.	0.0	0.0	30.
15S-27E 29BCC1	82478	7.3	53.	1240.	0.	0.	162.3	288.	0.2	47.1	90.	113.	3.	0.0	0.0	35.
15S-27E 29BCC1	60777	7.3	52.	1250.	0.	0.	162.9	323.	0.2	61.4	98.	118.	3.	0.0	0.0	32.
15S-27E 29BCC1	62678	7.4	54.	1020.	0.	0.	159.8	261.	0.0	45.1	93.	77.	3.	0.0	0.0	25.
15S-27E 18CAC	60777	7.8	60.	1730.	0.	0.	191.5	470.	0.5	48.0	188.	123.	7.	0.3	0.0	50.
15S-27E 19CCC	90277	7.3	66.	2800.	0.	0.	201.9	790.	2.2	88.3	410.	129.	19.	0.9	0.0	32.
15S-27E 18BCC1	53179	7.7	71.	1481.	0.	0.	144.6	369.	0.5	34.6	134.	105.	11.	0.2	0.0	58.
15S-27E 18BCC1	60777	7.4	72.	1370.	0.	0.	144.6	378.	0.4	31.7	134.	105.	12.	0.1	0.0	75.
15S-27E 18BCC1	82275	7.3	72.	1250.	0.	0.	146.4	333.	0.5	28.8	121.	98.	13.	0.2	0.0	69.
15S-27E 18BCC1	62678	7.6	72.	1280.	0.	0.	144.6	362.	0.4	31.2	127.	79.	12.	0.2	0.0	58.
15S-27E 8BCC1	82478	7.6	72.	1390.	0.	0.	141.6	348.	0.5	27.9	114.	102.	11.	0.2	0.0	67.
MW-1	72778	7.7	158.	11000.	0.	0.	34.2	3709.	3.1	74.9	2006.	208.	32.	4.0	0.0	64.
PLM	72778	7.7	202.	3000.	0.	0.	55.5	888.	7.8	57.6	552.	52.	21.	0.4	0.0	76.
USGS-3	82478	7.9	74.	6070.	0.	0.	58.0	1897.	4.3	62.4	1397.	60.	16.	0.6	0.0	69.
CROOK	72778	8.1	206.	5800.	0.	0.	47.0	1865.	6.2	55.7	1017.	128.	32.	2.6	0.0	73.

**NOTE: O INDICATES NO DETERMINATION
CONCENTRATIONS IN MG/L
TEMPERATURE IN DEGREES F

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                                                             LAB-IDWR
  WELL NAME        DATE      PH     TEMP  COND      TDS      HARD   HCO3   CL        F     SO4    NA       CA      K       LI      SR      SI

1-DCMESTIC         72778     7.6     86.  2200.      0.        0.  127.5   594.     4.4   51.9   854.     56.     11.     0.7     0.0     45.

**NOTF: O INDICATES NO DETERMINATION
        CCNCENTRATIONS IN MG/L
        TEMPERATURE IN DEGREES F
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LAB-USGS

WELL NAME	DATE	PH	TEMP	COND	TDS	HARD	HCO3	CL	F	SO4	NA	CA	K	LI	SR	SI
USGS-1	90574	7.8	81.	8910.	0.	610.	83.0	3600.	4.0	47.0	2000.	240.	270.	1.0	1.4	85.
USGS-1	90674	7.8	81.	7360.	0.	590.	93.0	2800.	3.2	49.0	1500.	230.	200.	0.9	1.8	85.
USGS-1	90674	7.9	84.	7760.	0.	590.	83.0	2800.	3.1	45.0	1500.	230.	210.	0.9	1.7	94.
USGS-1	90774	7.8	84.	10900.	0.	790.	70.0	3500.	3.2	43.0	1800.	310.	270.	1.1	2.3	82.
USGS-1	120574	7.8	78.	9980.	0.	760.	58.0	3900.	3.9	45.0	2000.	300.	270.	1.3	1.8	89.
USGS-1	120674	7.6	64.	2920.	0.	420.	131.0	890.	0.8	31.0	400.	140.	40.	0.3	0.9	60.
USGS-2	101774	7.8	86.	1960.	0.	160.	179.0	470.	2.3	78.0	330.	51.	14.	0.0	0.0	41.
USGS-2	11475	7.7	86.	1950.	0.	100.	176.0	570.	2.8	32.0	370.	35.	34.	6.6	0.3	86.
USGS-3	120674	8.1	179.	6610.	0.	140.	63.0	2000.	5.0	52.0	1300.	56.	14.	1.8	2.0	56.
USGS-3	11375	8.2	173.	6600.	0.	140.	73.0	2100.	5.1	51.0	1300.	56.	13.	0.4	2.1	51.
USGS-3	33175	0.0	111.	5100.	0.	140.	69.0	1700.	5.2	49.0	1100.	55.	11.	1.6	1.4	39.
USGS-3	40175	6.3	133.	5000.	0.	150.	54.0	1800.	4.9	0.0	1200.	59.	13.	1.7	1.2	48.
USGS-4	32875	6.8	104.	1540.	0.	180.	138.0	380.	4.4	44.0	240.	58.	13.	0.7	0.3	37.

**NOTE: 0 INDICATES NO DETERMINATION
CONCENTRATIONS IN MG/L
TEMPERATURE IN DEGREES F

LAB-RR

WELL NAME	DATE	PH	TEMP	COND	TDS	HARD	HCO3	CL	F	SO4	NA	CA	K	LI	SR	SI
RRGE-1	21979	8.3	0.	3526.	0.	64.	35.2	794.	5.0	0.0	605.	0.	0.	0.0	0.0	0.
RRGE-1	82878	8.3	201.	3526.	0.	125.	37.9	723.	0.0	0.0	0.	0.	0.	0.0	0.0	0.
RRGE-1	21279	8.3	0.	3526.	0.	130.	36.0	857.	5.1	0.0	617.	0.	0.	0.0	0.0	0.
RRGE-1	20579	8.2	0.	3417.	0.	152.	41.1	889.	4.9	0.0	581.	0.	0.	0.0	0.0	0.
RRGE-1	12979	8.3	0.	3308.	0.	148.	35.9	951.	4.9	0.0	552.	0.	0.	0.0	0.0	0.
RRGE-1	12279	8.3	0.	3199.	0.	150.	40.1	848.	4.9	0.0	558.	0.	0.	0.0	0.0	0.
RRGE-1	122578	8.3	0.	3199.	0.	136.	40.3	898.	4.2	0.0	688.	0.	0.	0.0	0.0	0.
RRGE-1	51479	7.8	0.	2436.	0.	84.	42.0	572.	5.4	0.0	420.	0.	0.	0.0	0.0	0.
RRGE-1	50779	7.7	0.	2436.	0.	120.	47.3	553.	5.5	0.0	425.	0.	0.	0.0	0.0	0.
RRGE-1	43079	7.6	0.	3526.	0.	132.	38.3	648.	4.2	0.0	549.	0.	0.	0.0	0.0	0.
RRGE-1	42379	8.2	0.	3199.	0.	140.	34.8	813.	4.9	0.0	572.	0.	0.	0.0	0.0	0.
RRGE-1	41679	8.4	0.	3199.	0.	136.	56.4	833.	4.8	0.0	575.	0.	0.	0.0	0.0	0.
RRGE-1	40979	8.1	0.	3199.	0.	130.	36.2	831.	5.0	0.0	608.	0.	0.	0.0	0.0	0.
RRGE-1	121878	8.5	0.	3417.	0.	158.	42.0	889.	5.3	0.0	572.	0.	0.	0.0	0.0	0.
RRGE-1	121178	8.4	0.	3308.	0.	153.	46.5	850.	5.2	0.0	602.	0.	0.	0.0	0.0	0.
RRGE-1	120478	8.2	0.	3417.	0.	144.	43.0	749.	4.7	0.0	651.	0.	0.	0.0	0.0	0.
RRGE-1	112778	8.1	194.	3417.	0.	140.	39.7	821.	5.1	0.0	0.	0.	0.	0.0	0.0	0.
RRGE-1	102378	8.3	199.	4507.	0.	150.	37.8	758.	4.2	0.0	0.	0.	0.	0.0	0.0	0.
RRGE-1	101678	8.3	196.	3635.	0.	142.	36.8	775.	4.9	0.0	0.	0.	0.	0.0	0.0	0.
RRGE-1	100978	8.1	190.	3308.	0.	119.	44.9	660.	3.9	0.0	0.	0.	0.	0.0	0.0	0.
RRGE-1	100278	8.9	203.	3417.	0.	148.	48.7	753.	5.0	0.0	0.	0.	0.	0.0	0.0	0.
RRGE-1	92178	8.5	196.	3308.	0.	150.	30.7	657.	5.2	0.0	0.	0.	0.	0.0	0.0	0.
RRGE-1	91178	7.9	194.	3526.	0.	130.	37.2	786.	5.0	0.0	0.	0.	0.	0.0	0.0	0.
RRGE-1	82178	8.5	0.	4125.	0.	145.	34.1	793.	0.0	0.0	0.	0.	0.	0.0	0.0	0.
RRGE-1	80778	8.5	0.	3308.	0.	150.	42.1	675.	5.4	0.0	0.	0.	0.	0.0	0.0	0.
RRGE-1	73178	8.6	0.	3308.	0.	125.	35.0	666.	5.0	0.0	0.	0.	0.	0.0	0.0	0.
RRGE-1	72478	8.5	0.	3417.	0.	100.	39.3	698.	5.8	0.0	0.	0.	0.	0.0	0.0	0.
RRGE-1	71778	8.4	0.	3417.	0.	110.	30.7	711.	4.9	0.0	0.	0.	0.	0.0	0.0	0.
RRGE-1	71078	8.2	0.	3798.	0.	117.	0.0	711.	4.7	0.0	0.	0.	0.	0.0	0.0	0.
RRGE-1	70378	6.3	0.	3962.	0.	110.	20.6	711.	0.0	0.0	0.	0.	0.	0.0	0.0	0.
RRGE-1	62678	8.3	0.	3471.	0.	130.	18.5	666.	5.1	0.0	0.	0.	0.	0.0	0.0	0.
RRGE-1	61978	8.4	0.	3090.	0.	110.	0.0	711.	4.9	0.0	0.	0.	0.	0.0	0.0	0.
RRGE-1	61278	8.4	0.	3526.	0.	120.	0.0	671.	5.2	0.0	0.	0.	0.	0.0	0.0	0.
RRGE-1	60578	0.0	0.	3526.	0.	115.	0.0	760.	5.3	0.0	0.	0.	0.	0.0	0.0	0.
RRGE-1	53078	8.5	0.	3308.	0.	115.	33.7	644.	5.6	0.0	0.	0.	0.	0.0	0.0	0.
RRGE-1	52278	7.7	0.	3417.	0.	112.	42.4	666.	5.6	0.0	0.	0.	0.	0.0	0.0	0.
RRGE-1	51578	6.9	0.	3526.	0.	110.	38.8	666.	4.8	0.0	0.	0.	0.	0.0	0.0	0.
RRGE-1	50878	7.8	0.	3308.	0.	120.	19.2	626.	4.9	0.0	0.	0.	0.	0.0	0.0	0.
RRGE-1	50178	8.4	0.	3308.	0.	110.	43.5	711.	3.7	0.0	0.	0.	0.	0.0	0.0	0.
RRGE-2	21279	8.4	0.	2981.	0.	100.	49.6	790.	5.9	0.0	472.	0.	0.	0.0	0.0	0.
RRGE-2	20579	8.5	0.	2654.	0.	88.	39.6	644.	6.3	0.0	434.	0.	0.	0.0	0.0	0.
RRGE-2	12279	8.9	0.	2763.	0.	122.	66.8	663.	5.9	0.0	473.	0.	0.	0.0	0.0	0.
RRGE-2	52979	7.9	0.	2672.	0.	100.	38.7	641.	5.5	0.0	475.	0.	0.	0.0	0.0	0.
RRGE-2	51479	7.6	0.	2436.	0.	114.	40.3	605.	5.1	0.0	469.	0.	0.	0.0	0.0	0.
RRGE-2	40979	7.1	0.	2872.	0.	102.	0.0	647.	5.5	0.0	493.	0.	0.	0.0	0.0	0.
RRGE-2	121878	7.6	165.	2218.	0.	88.	41.6	503.	7.0	0.0	357.	0.	0.	0.0	0.0	0.
RRGE-2	121178	7.6	170.	2327.	0.	82.	44.5	455.	7.0	0.0	368.	0.	0.	0.0	0.0	0.
RRGE-2	120478	7.5	171.	2196.	0.	90.	41.2	501.	6.8	0.0	344.	0.	0.	0.0	0.0	0.
RRGE-2	112778	8.8	189.	2763.	0.	104.	35.2	686.	6.4	0.0	0.	0.	0.	0.0	0.0	0.
RRGE-2	60578	0.0	0.	2872.	0.	85.	0.0	533.	5.6	0.0	0.	0.	0.	0.0	0.0	0.

**NOTE: 0 INDICATES NO DETERMINATION
CONCENTRATIONS IN MG/L
TEMPERATURE IN DEGREES F

LAJ-RR

WELL NAME	DATE	PH	TEMP	COND	TDS	HARD	HCO3	CL	F	SO4	NA	CA	K	LI	SR	SI
RRGE-2	53078	7.5	0.	2654.	0.	75.	44.2	488.	6.5	0.0	0.	0.	0.	0.0	0.0	0.
RRGE-2	21979	8.8	0.	3308.	0.	100.	35.0	638.	5.7	0.0	442.	0.	0.	0.0	0.0	0.
RRGE-3	21979	7.9	0.	8867.	0.	224.	25.2	3247.	3.1	0.0	1221.	0.	0.	0.0	0.0	0.
RRGE-3	21279	6.8	0.	8758.	0.	540.	24.8	2767.	3.2	0.0	1287.	0.	0.	0.0	0.0	0.
RRGE-3	20579	7.0	0.	7559.	0.	554.	25.1	2802.	3.2	0.0	1276.	0.	0.	0.0	0.0	0.
RRGE-3	12979	6.9	0.	3308.	0.	558.	25.3	2419.	3.3	0.0	1221.	0.	0.	0.0	0.0	0.
RRGE-3	12279	7.1	0.	7777.	0.	564.	46.5	2259.	3.3	0.0	1331.	0.	0.	0.0	0.0	0.
RRGE-3	122578	6.9	158.	7777.	0.	566.	26.3	2419.	2.9	0.0	1529.	0.	0.	0.0	0.0	0.
RRGE-3	121878	6.8	171.	7668.	0.	560.	24.5	2437.	3.4	0.0	1276.	0.	0.	0.0	0.0	0.
RRGE-3	121178	7.0	171.	7559.	0.	472.	25.3	1948.	3.4	0.0	1353.	0.	0.	0.0	0.0	0.
RRGE-3	120478	6.7	162.	7668.	0.	568.	24.4	2224.	3.4	0.0	1320.	0.	0.	0.0	0.0	0.
RRGE-3	112778	7.4	167.	7668.	0.	568.	25.5	2028.	3.5	0.0	0.	0.	0.	0.0	0.0	0.
RRGE-3	100978	8.2	0.	8976.	0.	584.	24.8	2277.	3.4	0.0	0.	0.	0.	0.0	0.0	0.
RRGE-3	62678	8.1	0.	9521.	0.	525.	25.1	2357.	4.3	0.0	0.	0.	0.	0.0	0.0	0.
RRGE-3	61978	7.3	0.	9630.	0.	565.	0.0	2402.	4.2	0.0	0.	0.	0.	0.0	0.0	0.
RRGE-3	61278	7.3	0.	10066.	0.	565.	0.0	2402.	4.4	0.0	0.	0.	0.	0.0	0.0	0.
RRGE-3	60578	0.0	0.	9630.	0.	550.	0.0	2468.	4.4	0.0	0.	0.	0.	0.0	0.0	0.
RRGE-3	53078	7.9	0.	12137.	0.	595.	32.2	2940.	5.0	0.0	0.	0.	0.	0.0	0.0	0.
RRGE-3	50179	7.0	0.	3689.	0.	551.	0.0	2010.	3.7	0.0	0.	0.	0.	0.0	0.0	0.
RRGP-4	21979	7.0	0.	4725.	0.	212.	37.0	1485.	4.1	0.0	776.	0.	0.	0.0	0.0	0.
RRGP-4	21279	7.2	0.	4834.	0.	224.	31.4	1521.	4.0	0.0	843.	0.	0.	0.0	0.0	0.
RRGP-4	20579	7.1	0.	5052.	0.	204.	31.4	1618.	4.1	0.0	646.	0.	0.	0.0	0.0	0.
RRGP-4	12979	7.2	0.	4125.	0.	213.	33.3	1583.	4.2	0.0	789.	0.	0.	0.0	0.0	0.
RRGP-4	12279	7.2	0.	4616.	0.	220.	30.5	1556.	4.1	0.0	826.	0.	0.	0.0	0.0	0.
RRGP-4	122578	7.5	0.	4616.	0.	196.	32.8	1387.	3.6	0.0	977.	0.	0.	0.0	0.0	0.
RRGP-4	121878	7.4	180.	4616.	0.	204.	30.7	1440.	4.5	0.0	792.	0.	0.	0.0	0.0	0.
RRGP-4	121178	7.3	135.	1782.	0.	222.	34.7	1245.	4.3	0.0	812.	0.	0.	0.0	0.0	0.
RRGP-4	120478	7.3	140.	4943.	0.	230.	32.6	1245.	4.0	0.0	897.	0.	0.	0.0	0.0	0.
RRGP-4	112778	7.0	0.	5052.	0.	224.	34.1	1485.	4.3	0.0	0.	0.	0.	0.0	0.0	0.
RRGP-4	102378	8.8	0.	5706.	0.	254.	62.4	1165.	4.5	0.0	0.	0.	0.	0.0	0.0	0.
RRGP-4	101678	8.9	0.	0.	0.	238.	61.0	1325.	4.4	0.0	0.	0.	0.	0.0	0.0	0.
RRGP-4	92578	8.1	0.	8322.	0.	404.	24.8	2304.	3.9	0.0	0.	0.	0.	0.0	0.0	0.
RRGE-4	50878	8.0	0.	2981.	0.	81.	8.6	577.	5.4	0.0	0.	0.	0.	0.0	0.0	0.
RRGP-5	60578	0.0	0.	4289.	0.	120.	0.0	866.	5.1	0.0	0.	0.	0.	0.0	0.0	0.
RRGP-5	61278	8.3	0.	3308.	0.	160.	0.0	644.	7.2	0.0	0.	0.	0.	0.0	0.0	0.
RRGP-5	61978	8.1	0.	2599.	0.	100.	0.0	800.	5.4	0.0	0.	0.	0.	0.0	0.0	0.
RRGP-5	70378	8.1	0.	4616.	0.	110.	29.9	889.	0.0	0.0	0.	0.	0.	0.0	0.0	0.
RRGP-5	120478	7.5	154.	3308.	0.	439.	42.9	2491.	5.1	0.0	494.	0.	0.	0.0	0.0	0.
RRGP-5	121178	7.5	135.	2981.	0.	132.	51.9	652.	5.3	0.0	511.	0.	0.	0.0	0.0	0.
RRGP-5	21979	7.3	0.	3090.	0.	114.	42.3	758.	5.0	0.0	485.	0.	0.	0.0	0.0	0.
RRGP-5	12979	7.3	0.	2981.	0.	102.	42.1	877.	5.2	0.0	471.	0.	0.	0.0	0.0	0.
RRGP-5	12279	7.5	0.	3090.	0.	156.	49.2	755.	4.9	0.0	467.	0.	0.	0.0	0.0	0.
RRGP-5	122578	7.6	156.	2872.	0.	136.	43.8	726.	5.5	0.0	472.	0.	0.	0.0	0.0	0.
RRGP-5	52879	7.2	0.	2872.	0.	114.	69.2	728.	4.5	0.0	530.	0.	0.	0.0	0.0	0.
RRGP-5	51479	7.4	0.	2872.	0.	110.	48.4	745.	4.9	0.0	537.	0.	0.	0.0	0.0	0.
RRGP-5	50779	8.6	0.	2872.	0.	130.	37.9	712.	4.8	0.0	506.	0.	0.	0.0	0.0	0.
RRGP-5	43079	8.0	0.	2872.	0.	130.	37.4	670.	4.9	0.0	479.	0.	0.	0.0	0.0	0.
RRGP-5	42379	6.9	0.	2872.	0.	120.	37.2	657.	4.8	0.0	476.	0.	0.	0.0	0.0	0.
RRGP-5	121878	7.5	154.	3035.	0.	142.	42.7	823.	5.4	0.0	497.	0.	0.	0.0	0.0	0.
RRGI-6	51578	7.4	0.	10938.	0.	410.	48.1	2709.	4.1	0.0	0.	0.	0.	0.0	0.0	0.

**NOTE: 0 INDICATES NO DETERMINATION
CONCENTRATIONS IN MG/L
TEMPERATURE IN DEGREES F

LAB-ER

WELL NAME	DATE	PH	TEMP	COND	TDS	HARD	HCO3	CL	F	SO4	NA	CA	K	LI	SR	SI
RRGI-6	53078	7.3	0.	11701.	0.	393.	57.7	2802.	5.3	0.0	0.	0.	0.	0.0	0.0	0.
RRGI-6	61278	7.3	0.	12137.	0.	427.	0.0	2936.	5.1	0.0	0.	0.	0.	0.0	0.0	0.
RRGI-6	112778	7.6	162.	11919.	0.	436.	57.4	3532.	4.8	0.0	0.	0.	0.	0.0	0.0	0.
RRGI-6	120478	7.1	158.	11374.	0.	438.	48.2	3390.	4.5	0.0	2431.	0.	0.	0.0	0.0	0.
RRGI-6	121178	7.1	171.	11374.	0.	420.	62.3	3496.	4.8	0.0	2431.	0.	0.	0.0	0.0	0.
RRGI-6	121878	7.3	171.	11483.	0.	442.	57.3	3737.	4.8	0.0	2343.	0.	0.	0.0	0.0	0.
RRGI-6	12279	8.5	0.	2763.	0.	134.	73.6	693.	5.9	0.0	423.	0.	0.	0.0	0.0	0.
RRGI-6	12979	7.8	0.	2654.	0.	138.	43.3	762.	5.8	0.0	375.	0.	0.	0.0	0.0	0.
BLM	21979	7.7	0.	3635.	0.	156.	36.5	995.	5.1	0.0	606.	0.	0.	0.0	0.0	0.
BLM	12979	7.8	0.	3308.	0.	160.	38.8	1031.	4.7	0.0	588.	0.	0.	0.0	0.0	0.
BLM	122578	0.0	199.	4071.	0.	156.	35.8	915.	5.0	0.0	601.	0.	0.	0.0	0.0	0.
BLM	52879	7.6	0.	3417.	0.	146.	39.7	881.	4.5	0.0	614.	0.	0.	0.0	0.0	0.
BLM	51479	7.3	0.	3090.	0.	0.	39.3	852.	5.3	0.0	660.	0.	0.	0.0	0.0	0.
BLM	51479	8.0	0.	3090.	0.	142.	34.8	865.	4.9	0.0	660.	0.	0.	0.0	0.0	0.
BLM	50779	7.5	0.	3308.	0.	164.	37.9	862.	4.5	0.0	614.	0.	0.	0.0	0.0	0.
BLM	43079	7.6	0.	3308.	0.	130.	36.6	810.	4.3	0.0	583.	0.	0.	0.0	0.0	0.
BLM	42379	7.7	0.	3308.	0.	132.	36.5	841.	4.6	0.0	710.	0.	0.	0.0	0.0	0.
BLM	41679	7.6	0.	3417.	0.	138.	35.5	889.	4.6	0.0	599.	0.	0.	0.0	0.0	0.
BLM	40979	7.8	0.	3417.	0.	124.	43.0	768.	4.7	0.0	656.	0.	0.	0.0	0.0	0.
BLM	121878	8.0	196.	3744.	0.	140.	36.5	637.	4.9	0.0	656.	0.	0.	0.0	0.0	0.
BLM	121178	7.8	196.	3526.	0.	162.	39.8	817.	4.8	0.0	722.	0.	0.	0.0	0.0	0.
BLM	120478	7.8	190.	3853.	0.	172.	36.7	2936.	4.8	0.0	561.	0.	0.	0.0	0.0	0.
BLM	112778	7.8	198.	3962.	0.	168.	36.6	924.	5.0	0.0	0.	0.	0.	0.0	0.0	0.
BLM	102379	8.0	200.	3962.	0.	142.	37.2	92.	4.4	0.0	0.	0.	0.	0.0	0.0	0.
BLM	101678	8.0	199.	3962.	0.	154.	38.3	867.	4.5	0.0	0.	0.	0.	0.0	0.0	0.
BLM	100978	7.8	199.	4071.	0.	154.	34.3	783.	4.3	0.0	0.	0.	0.	0.0	0.0	0.
BLM	100278	8.0	196.	3853.	0.	146.	37.8	813.	4.8	0.0	0.	0.	0.	0.0	0.0	0.
BLM	92578	7.8	196.	3635.	0.	140.	35.0	836.	4.8	0.0	0.	0.	0.	0.0	0.0	0.
BLM	92178	7.7	193.	3744.	0.	160.	38.6	775.	4.9	0.0	0.	0.	0.	0.0	0.0	0.
BLM	91178	7.3	194.	6796.	0.	130.	33.3	497.	4.9	0.0	0.	0.	0.	0.0	0.0	0.
BLM	82178	7.3	0.	3853.	0.	135.	37.4	798.	5.2	0.0	0.	0.	0.	0.0	0.0	0.
BLM	80778	7.1	0.	3417.	0.	170.	40.3	720.	5.0	0.0	0.	0.	0.	0.0	0.0	0.
BLM	73178	7.4	0.	3635.	0.	305.	36.7	711.	5.1	0.0	0.	0.	0.	0.0	0.0	0.
BLM	72678	7.3	0.	3417.	0.	121.	34.1	720.	4.9	0.0	0.	0.	0.	0.0	0.0	113.
BLM	72478	7.3	0.	3526.	0.	120.	35.6	733.	5.1	0.0	0.	0.	0.	0.0	0.0	0.
BLM	71778	7.2	0.	3526.	0.	120.	33.4	711.	5.2	0.0	0.	0.	0.	0.0	0.0	0.
BLM	71078	7.5	0.	4016.	0.	120.	0.0	760.	4.5	0.0	0.	0.	0.	0.0	0.0	0.
BLM	70378	7.7	0.	3635.	0.	135.	21.7	755.	0.0	0.0	0.	0.	0.	0.0	0.0	0.
BLM	62678	7.4	0.	3417.	0.	120.	11.4	711.	5.1	0.0	0.	0.	0.	0.0	0.0	0.
BLM	61978	7.7	0.	3090.	0.	125.	0.0	720.	4.9	0.0	0.	0.	0.	0.0	0.0	0.
BLM	61278	8.1	0.	3580.	0.	152.	0.0	768.	6.0	0.0	0.	0.	0.	0.0	0.0	0.
BLM	53078	7.8	0.	3798.	0.	120.	34.5	755.	5.7	0.0	0.	0.	0.	0.0	0.0	0.
BLM	51578	7.6	0.	3798.	0.	123.	36.0	755.	4.7	0.0	0.	0.	0.	0.0	0.0	0.
BLM	50878	7.8	0.	3744.	0.	115.	7.5	755.	4.3	0.0	0.	0.	0.	0.0	0.0	0.
BLM	50178	7.6	0.	3635.	0.	115.	41.4	795.	4.2	0.0	0.	0.	0.	0.0	0.0	0.
CROOK	82878	7.8	82.	3253.	0.	310.	25.7	1702.	0.0	0.0	0.	0.	0.	0.0	0.0	0.
CROOK	52879	8.1	0.	5706.	0.	328.	33.4	1859.	3.8	0.0	1199.	0.	0.	0.0	0.0	0.
CROOK	51479	8.4	0.	5488.	0.	308.	26.7	1814.	4.3	0.0	1254.	0.	0.	0.0	0.0	0.
CROOK	51479	8.3	0.	5597.	0.	312.	30.1	1583.	3.6	0.0	1155.	0.	0.	0.0	0.0	0.
CROOK	50779	8.0	0.	5706.	0.	320.	31.4	1770.	3.7	0.0	1188.	0.	0.	0.0	0.0	0.

**NOTE: 0 INDICATES NO DETERMINATION
CONCENTRATIONS IN MG/L
TEMPERATURE IN DEGREES F

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                                                          LAB-RR
WELL NAME      DATE   PH   TEMP   COND  TDS   HARD  HCO3    CL      F   SO4     NA     CA   K    LI    SR    SI

CROOK         43079  7.5     0.   2654.  0.   318.  32.1  1707.   3.5   0.0  1177.     0.   0.  0.0   0.0    0.
CROOK         42379  7.8     0.   5706.  0.   326.  29.9  1734.   3.7   0.0  1133.     0.   0.  0.0   0.0    0.
CROOK         41679  8.1     0.   5706.  0.   318.  27.7  1814.   3.9   0.0  1133.     0.   0.  0.0   0.0    0.
CROOK         40979  7.5     0.   5597.  0.   298.  31.9  1618.   3.8   0.0  1166.     0.   0.  0.0   0.0    0.
CROOK         21979  7.8     0.   6251.  0.   318.  30.9  1974.   5.8   0.0  1048.     0.   0.  0.0   0.0    0.
CROOK        121878  8.1   171.   5161.  0.   296.  49.2  1369.   3.9   0.0  1033.     0.   0.  0.0   0.0    0.
CROOK        121178  7.8   171.   6360.  0.   296.  51.5  1565.   3.8   0.0   978.     0.   0.  0.0   0.0    0.
CROOK        120478  7.4   171.   5379.  0.   322.  50.7  1565.   3.7   0.0   881.     0.   0.  0.0   0.0    0.
CROOK        112778  7.5   174.   5815.  0.   306.  49.8  1574.   3.8   0.0     0.     0.   0.  0.0   0.0    0.
CROOK        100978  8.3   203.   6469.  0.   318.  27.3  1405.   3.5   0.0     0.     0.   0.  0.0   0.0    0.
CROOK        100278  8.3   201.   6523.  0.   316.  32.5  1547.   3.9   0.0     0.     0.   0.  0.0   0.0    0.
CROOK         92578  8.0   190.   6469.  0.   310.  35.2  1725.   4.0   0.0     0.     0.   0.  0.0   0.0    0.
CROOK         92178  7.5   165.   6360.  0.   335.  28.7  1467.   4.0   0.0     0.     0.   0.  0.0   0.0    0.
CROOK         91178  7.5   198.   6796.  0.   310.  26.6  2010.   4.1   0.0     0.     0.   0.  0.0   0.0    0.
CROOK         82178  8.0     0.   6796.  0.   315.  18.5  1709.   4.7   0.0     0.     0.   0.  0.0   0.0    0.
CROOK         80778  7.9     0.   6523.  0.   305.  27.6  1601.   4.8   0.0     0.     0.   0.  0.0   0.0    0.
CROOK         73178  7.8     0.   6469.  0.   290.  25.3  1512.   4.9   0.0     0.     0.   0.  0.0   0.0    0.
CROOK         72478  7.8     0.   6414.  0.   305.  26.3  1534.   4.8   0.0     0.     0.   0.  0.0   0.0    0.
CROOK         71778  8.0     0.   6687.  0.   270.  24.6  1601.   4.8   0.0     0.     0.   0.  0.0   0.0    0.
CROOK         71078  7.9     0.   7014.  0.   285.   0.0  1556.   4.3   0.0     0.     0.   0.  0.0   0.0    0.
CROOK         70378  8.3     0.   7014.  0.   290.  17.3  1556.   0.0   0.0     0.     0.   0.  0.0   0.0    0.
CROOK         62678  7.8     0.   6469.  0.   305.   7.3  1556.   5.0   0.0     0.     0.   0.  0.0   0.0    0.
CROOK         61978  8.2     0.   6087.  0.   302.   0.0  1601.   4.6   0.0     0.     0.   0.  0.0   0.0    0.
CROOK         61278  8.2     0.   6578.  0.   320.   0.0  1516.   4.6   0.0     0.     0.   0.  0.0   0.0    0.
CROOK         53078  7.9     0.   6687.  0.   271.  25.9  1561.   5.5   0.0     0.     0.   0.  0.0   0.0    0.
CROOK         52278  7.4     0.   6578.  0.   295.  32.7  1556.   5.1   0.0     0.     0.   0.  0.0   0.0    0.
CROOK         51578  7.2     0.   6414.  0.   310.  29.1  1596.   4.3   0.0     0.     0.   0.  0.0   0.0    0.
CROOK         50878  8.1     0.   6469.  0.   302.   4.5  1472.   4.3   0.0     0.     0.   0.  0.0   0.0    0.
CROOK         50178  8.1     0.   6523.  0.   285.  32.5  1561.   3.7   0.0     0.     0.   0.  0.0   0.0    0.
MW-1         122578  7.8   162.  11810.  0.   526.  21.1  3701.   2.5   0.0  2145.     0.   0.  0.0   0.0    0.
MW-1          21979  7.7     0.  11374.  0.   548.  23.2  3959.   2.2   0.0  2057.     0.   0.  0.0   0.0    0.
MW-1         121178  8.1   163.  11592.  0.   558.  25.8  3674.   2.4   0.0  2178.   755.   0.  0.0   0.0    0.
MW-1         120478  7.6   163.  12028.  0.   546.  21.3  3826.   2.5   0.0  2101.     0.   0.  0.0   0.0    0.
MW-1         112778  7.5   165.  11701.  0.   524.  25.9  3532.   2.5   0.0     0.     0.   0.  0.0   0.0    0.
MW-1         102378  7.8   147.  12246.  0.   526.  22.2  3114.   2.2   0.0     0.     0.   0.  0.0   0.0    0.
MW-1         101678  7.8   142.  11919.  0.   526.  22.1  3149.   2.2   0.0     0.     0.   0.  0.0   0.0    0.
MW-1         100978  7.7   104.  12137.  0.   518.  21.7  3069.   2.2   0.0     0.     0.   0.  0.0   0.0    0.
MW-1         100278  8.1   156.  11701.  0.   530.  24.4  3096.   2.1   0.0     0.     0.   0.  0.0   0.0    0.
MW-1          92578  7.9   165.  12028.  0.   530.  19.9  3327.   2.1   0.0     0.     0.   0.  0.0   0.0    0.
MW-1          92178  7.3   147.  11592.  0.   505.  24.2  3220.   2.2   0.0     0.     0.   0.  0.0   0.0    0.
MW-1          91178  7.1   139.  12464.  0.   520.  12.1  3594.   2.2   0.0     0.     0.   0.  0.0   0.0    0.
MW-1          82178  7.3     0.  11919.  0.   540.  26.4  3381.   0.0   0.0     0.     0.   0.  0.0   0.0    0.
MW-1          80778  7.2     0.  12246.  0.   590.  17.9  3114.   3.9   0.0     0.     0.   0.  0.0   0.0    0.
MW-1          73178  7.2     0.  12028.  0.   490.  24.7  3114.   3.9   0.0     0.     0.   0.  0.0   0.0    0.
MW-1          72678  7.1     0.  12464.  0.   470.  19.7  3091.   3.8   0.0     0.     0.   0.  0.0   0.0  110.
MW-1          72478  7.7     0.  11646.  0.   490.  22.3  3114.   3.3   0.0     0.     0.   0.  0.0   0.0    0.
MW-1          71778  7.3     0.  12464.  0.   460.  19.8  3203.   4.1   0.0     0.     0.   0.  0.0   0.0    0.
MW-1          71078  8.1     0.  12682.  0.   490.   0.0  3114.   3.8   0.0     0.     0.   0.  0.0   0.0    0.
MW-1          70378  7.7     0.  12464.  0.   480.  12.0  3114.   0.0   0.0     0.     0.   0.  0.0   0.0    0.
MW-1          62678  7.8     0.  12137.  0.   470.   9.8  3167.   0.0   0.0     0.     0.   0.  0.0   0.0    0.

**NOTE: 0 INDICATES NO DETERMINATION
        CONCENTRATIONS IN MG/L
        TEMPFRATURE IN DEGREES F
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LAB-RR

WELL NAME	DATE	PH	TEMP	COND	TDS	HARD	HCO3	CL	F	SO4	NA	CA	K	LI	SR	SI
MW-1	53078	7.9	0.	12409.	0.	482.	22.0	3114.	4.6	0.0	0.	0.	0.	0.0	0.0	0.
MW-1	52278	7.3	0.	12246.	0.	470.	20.9	3114.	4.2	0.0	0.	0.	0.	0.0	0.0	0.
MW-1	51578	7.1	0.	12246.	0.	495.	22.7	3158.	3.7	0.0	0.	0.	0.	0.0	0.0	0.
MW-1	50878	8.1	0.	12246.	0.	479.	4.0	3203.	3.7	0.0	0.	0.	0.	0.0	0.0	0.
MW-1	50178	8.5	0.	12137.	0.	490.	34.1	3180.	3.4	0.0	0.	0.	0.	0.0	0.0	0.
MW-2	21279	7.4	0.	6033.	0.	344.	24.2	1761.	3.8	0.0	1122.	0.	0.	0.0	0.0	0.
MW-2	122578	7.8	189.	6469.	0.	350.	24.4	1814.	4.0	0.0	1070.	0.	0.	0.0	0.0	0.
MW-2	121178	7.6	189.	6142.	0.	344.	26.3	1779.	4.0	0.0	1023.	0.	0.	0.0	0.0	0.
MW-3	50779	8.1	0.	7014.	0.	400.	31.0	2224.	3.4	0.0	1540.	0.	0.	0.0	0.0	0.
MW-3	121178	7.5	0.	5924.	0.	456.	41.8	2428.	3.7	0.0	1386.	0.	0.	0.0	0.0	0.
MW-3	72678	7.1	0.	6360.	0.	572.	46.2	1418.	3.7	0.0	0.	0.	0.	0.0	0.0	122.
MW-4	121178	8.0	0.	8322.	0.	392.	27.1	2535.	3.9	0.0	1496.	0.	0.	0.0	0.0	0.
MW-6	50779	7.6	0.	7886.	0.	532.	37.0	2517.	2.9	0.0	1727.	0.	0.	0.0	0.0	0.
MW-5	121178	7.6	0.	2425.	0.	342.	98.5	567.	0.9	0.0	254.	0.	0.	0.0	0.0	0.
MW-7	121178	7.6	0.	2654.	0.	322.	96.1	628.	1.2	0.0	327.	0.	0.	0.0	0.0	0.
USGS-3	52879	7.6	0.	6033.	0.	154.	41.8	1894.	3.1	0.0	1210.	0.	0.	0.0	0.0	0.
USGS-3	52179	8.0	0.	5433.	0.	152.	40.2	1850.	3.4	0.0	1375.	0.	0.	0.0	0.0	0.
USGS-3	51479	7.7	0.	5924.	0.	174.	42.8	1850.	3.7	0.0	1254.	0.	0.	0.0	0.0	0.
USGS-3	50779	7.7	0.	5706.	0.	172.	39.3	1779.	3.1	0.0	1243.	0.	0.	0.0	0.0	0.
USGS-3	43079	7.9	0.	5706.	0.	176.	41.4	1814.	2.9	0.0	1232.	0.	0.	0.0	0.0	0.
USGS-3	42379	7.8	0.	5706.	0.	150.	41.4	1814.	3.1	0.0	1221.	0.	0.	0.0	0.0	0.
USGS-3	41679	7.7	0.	5488.	0.	162.	39.2	1841.	3.2	0.0	1221.	0.	0.	0.0	0.0	0.
USGS-3	40979	7.9	0.	5924.	0.	152.	45.2	1725.	3.2	0.0	1188.	0.	0.	0.0	0.0	0.
USGS-3	21979	7.3	0.	6360.	0.	172.	44.8	2001.	3.2	0.0	1155.	0.	0.	0.0	0.0	0.
UDY	82878	7.4	82.	3253.	0.	402.	139.2	597.	0.0	0.0	0.	0.	0.	0.0	0.0	0.
UDY	51479	7.5	0.	2436.	0.	300.	0.0	619.	1.7	0.0	435.	0.	0.	0.0	0.0	0.
UDY	50779	7.5	0.	2872.	0.	282.	154.0	578.	1.7	0.0	415.	0.	0.	0.0	0.0	0.
UDY	42379	7.8	91.	2981.	0.	254.	134.6	704.	1.9	0.0	458.	0.	0.	0.0	0.0	0.
UDY	92578	7.6	79.	3308.	0.	316.	143.4	728.	1.7	0.0	0.	0.	0.	0.0	0.0	0.
UDY	92178	7.5	77.	2981.	0.	370.	143.9	214.	1.7	0.0	0.	0.	0.	0.0	0.0	0.
UDY	91178	7.4	79.	1673.	0.	328.	145.9	234.	1.7	0.0	0.	0.	0.	0.0	0.0	0.
UDY	82178	7.9	0.	3199.	0.	310.	155.6	599.	3.5	0.0	0.	0.	0.	0.0	0.0	0.
UDY	80778	7.3	0.	2926.	0.	291.	111.5	577.	3.6	0.0	0.	0.	0.	0.0	0.0	0.
UDY	73178	7.4	0.	2872.	0.	310.	145.8	533.	3.6	0.0	0.	0.	0.	0.0	0.0	0.
UDY	72678	7.5	0.	2926.	0.	295.	142.2	528.	3.4	0.0	0.	0.	0.	0.0	0.0	82.
UDY	72478	7.2	0.	2981.	0.	300.	145.5	533.	3.6	0.0	0.	0.	0.	0.0	0.0	0.
UDY	71778	7.4	0.	2981.	0.	300.	137.2	577.	3.7	0.0	0.	0.	0.	0.0	0.0	0.
UDY	71078	8.0	0.	3308.	0.	280.	0.0	671.	3.6	0.0	0.	0.	0.	0.0	0.0	0.
UDY	70378	7.6	0.	3199.	0.	285.	86.4	555.	0.0	0.0	0.	0.	0.	0.0	0.0	0.
UDY	62679	7.0	0.	2981.	0.	315.	99.6	555.	3.7	0.0	0.	0.	0.	0.0	0.0	0.
UDY	61978	7.4	0.	2436.	0.	272.	0.0	533.	3.7	0.0	0.	0.	0.	0.0	0.0	0.
UDY	61278	7.5	0.	3090.	0.	270.	0.0	510.	3.8	0.0	0.	0.	0.	0.0	0.0	0.
UDY	53078	7.3	0.	2981.	0.	262.	144.8	537.	4.2	0.0	0.	0.	0.	0.0	0.0	0.
UDY	50878	7.6	0.	3308.	0.	242.	26.8	617.	3.5	0.0	0.	0.	0.	0.0	0.0	0.
UDY	50178	7.0	0.	4180.	0.	298.	17.4	889.	1.5	0.0	0.	0.	0.	0.0	0.0	0.
MILLER-1	72678	7.5	0.	1782.	0.	230.	161.8	266.	3.7	0.0	0.	0.	0.	0.0	0.0	64.
CROCK HOT	72678	7.6	0.	6578.	0.	288.	24.4	1512.	4.5	0.0	0.	0.	0.	0.0	0.0	118.
CROOK DOM.	72678	7.2	0.	1237.	0.	300.	179.5	132.	1.0	0.0	0.	0.	0.	0.0	0.0	72.
PEWITT	72678	7.3	104.	4507.	0.	191.	126.9	933.	5.3	0.0	0.	0.	0.	0.0	0.0	0.
STEWART-1	72678	7.6	0.	2763.	0.	145.	131.5	497.	4.2	0.0	0.	0.	0.	0.0	0.0	92.

●*NOTE: 0 INDICATES NO DETERMINATION
CONCENTRATIONS IN MG/L
TEMPERATURE IN DEGREES F

LAB-RR

WELL NAME	DATE	PH	TEMP	COND	TDS	HARD	HCO3	CL	F	SO4	NA	CA	K	LI	SP	SI
STEWART-2	72678	7.1	0.	2436.	0.	337.	153.6	426.	1.2	0.0	0.	0.	0.	0.0	0.0	82.
STEWART-3	72678	7.2	0.	3253.	0.	400.	107.4	626.	1.5	0.0	0.	0.	0.	0.0	0.0	85.
DAR-1	72678	7.4	0.	4834.	0.	235.	93.8	955.	4.3	0.0	0.	0.	0.	0.0	0.0	100.
DAR-2	72678	7.7	0.	4180.	0.	104.	83.3	884.	4.4	0.0	0.	0.	0.	0.0	0.0	102.
1-DOMESTIC	82878	7.1	77.	2763.	0.	206.	85.8	519.	0.0	0.0	0.	0.	0.	0.0	0.0	0.
1-DOMESTIC	21279	8.5	0.	3526.	0.	158.	42.8	995.	5.1	0.0	552.	0.	0.	0.0	0.0	0.
1-DOMESTIC	20579	8.3	0.	2981.	0.	158.	92.9	720.	2.9	0.0	454.	0.	0.	0.0	0.0	0.
1-DOMESTIC	12279	7.8	0.	2654.	0.	200.	86.0	672.	3.0	0.0	448.	0.	0.	0.0	0.0	0.
1-DOMESTIC	122578	0.0	57.	2545.	0.	188.	89.1	577.	3.3	0.0	396.	0.	0.	0.0	0.0	0.
1-DOMESTIC	52879	7.5	0.	2654.	0.	178.	89.7	550.	2.9	0.0	412.	0.	0.	0.0	0.0	0.
1-DOMESTIC	43079	7.8	0.	2436.	0.	194.	89.0	598.	2.7	0.0	396.	0.	0.	0.0	0.0	0.
1-DOMESTIC	41679	7.7	0.	2436.	0.	170.	85.7	575.	3.0	0.0	385.	0.	0.	0.0	0.0	0.
1-DOMESTIC	21979	7.8	0.	2763.	0.	80.	96.3	572.	3.0	0.0	395.	0.	0.	0.0	0.0	0.
1-DOMESTIC	121878	7.6	57.	2981.	0.	206.	87.4	598.	3.6	0.0	420.	0.	0.	0.0	0.0	0.
1-DOMESTIC	121178	7.6	57.	2872.	0.	200.	90.6	612.	3.3	0.0	394.	0.	0.	0.0	0.0	0.
1-DOMESTIC	120479	7.6	50.	2872.	0.	218.	87.2	635.	3.1	0.0	363.	0.	0.	0.0	0.0	0.
1-DOMESTIC	112778	7.8	66.	2872.	0.	214.	90.3	607.	3.3	0.0	0.	0.	0.	0.0	1.0	0.
1-DOMESTIC	102378	7.8	70.	2654.	0.	196.	91.8	535.	3.0	0.0	0.	0.	0.	0.0	0.0	0.
1-DOMESTIC	101678	8.1	90.	2153.	0.	192.	96.3	585.	3.3	0.0	0.	0.	0.	0.0	0.0	0.
1-DOMESTIC	100978	7.8	77.	2545.	0.	190.	87.3	606.	3.1	0.0	0.	0.	0.	0.0	0.0	0.
1-DOMESTIC	100278	7.9	70.	2436.	0.	190.	97.3	571.	3.1	0.0	0.	0.	0.	0.0	0.0	0.
1-DOMESTIC	92578	7.7	70.	2763.	0.	187.	89.1	461.	3.0	0.0	0.	0.	0.	0.0	0.0	0.
1-DOMESTIC	92178	7.7	75.	2545.	0.	185.	85.9	512.	3.1	0.0	0.	0.	0.	0.0	0.0	0.
1-DOMESTIC	91178	7.4	75.	2708.	0.	155.	83.0	608.	3.1	0.0	0.	0.	0.	0.0	0.0	0.
1-DOMESTIC	82778	7.8	0.	2654.	0.	195.	90.9	518.	4.2	0.0	0.	0.	0.	0.0	0.0	0.
1-DOMESTIC	80778	7.6	0.	2436.	0.	120.	89.4	657.	4.4	0.0	0.	0.	0.	0.0	0.0	0.
1-DOMESTIC	73178	7.5	0.	2327.	0.	500.	82.4	444.	4.2	0.0	0.	0.	0.	0.0	0.0	0.
1-DOMESTIC	72678	7.3	0.	2436.	0.	160.	84.3	453.	4.0	0.0	0.	0.	0.	0.0	0.0	92.
1-DOMESTIC	72478	7.4	0.	2436.	0.	100.	84.5	466.	4.5	0.0	0.	0.	0.	0.0	0.0	0.
1-DOMESTIC	71778	8.9	0.	2545.	0.	110.	117.9	444.	4.3	0.0	0.	0.	0.	0.0	0.0	0.
1-DOMESTIC	70378	8.1	0.	2763.	0.	170.	54.7	444.	0.0	0.0	0.	0.	0.	0.0	0.0	0.
1-DOMESTIC	62678	8.5	0.	2436.	0.	140.	63.2	444.	4.2	0.0	0.	0.	0.	0.0	0.0	0.
1-DOMESTIC	61978	7.6	0.	2218.	0.	150.	0.0	488.	4.2	0.0	0.	0.	0.	0.0	0.0	0.
3-DOMESTIC	82878	7.5	195.	4180.	0.	163.	34.6	812.	0.0	0.0	0.	0.	0.	0.0	0.0	0.
3-DOMESTIC	112778	7.4	91.	5706.	0.	569.	57.6	1485.	2.8	0.0	0.	0.	0.	0.0	0.0	0.
3-DOMESTIC	102378	7.6	93.	5597.	0.	554.	54.4	1334.	2.6	0.0	0.	0.	0.	0.0	0.0	0.
3-DOMESTIC	101678	8.0	94.	5706.	0.	432.	56.0	1316.	2.7	0.0	0.	0.	0.	0.0	0.0	0.
3-DOMESTIC	100978	7.6	95.	5815.	0.	522.	46.5	1271.	2.6	0.0	0.	0.	0.	0.0	0.0	0.
3-DOMESTIC	100278	7.6	91.	5488.	0.	600.	58.4	1325.	4.6	0.0	0.	0.	0.	0.0	0.0	0.
3-DOMESTIC	92578	7.4	91.	5815.	0.	750.	71.8	1182.	2.0	0.0	0.	0.	0.	0.0	0.0	0.
3-DOMESTIC	92178	7.3	92.	5706.	0.	500.	49.6	1280.	2.7	0.0	0.	0.	0.	0.0	0.0	0.
3-DOMESTIC	91178	7.1	93.	5815.	0.	505.	40.5	1574.	2.7	0.0	0.	0.	0.	0.0	0.0	0.
3-DOMESTIC	82178	7.5	0.	6142.	0.	555.	63.9	1512.	3.9	0.0	0.	0.	0.	0.0	0.0	0.
3-DOMESTIC	80778	7.1	0.	6360.	0.	590.	59.8	1423.	4.0	0.0	0.	0.	0.	0.0	0.0	0.
3-DOMESTIC	73178	7.1	0.	6360.	0.	604.	53.1	1467.	3.9	0.0	0.	0.	0.	0.0	0.0	0.
3-DOMESTIC	72678	7.2	0.	2654.	0.	205.	87.8	519.	3.5	0.0	0.	0.	0.	0.0	0.0	104.
3-DOMESTIC	72478	7.2	0.	6469.	0.	560.	49.1	1423.	3.6	0.0	0.	0.	0.	0.0	0.0	0.
3-DOMESTIC	71778	7.3	0.	6469.	0.	590.	44.0	1489.	4.0	0.0	0.	0.	0.	0.0	0.0	0.
3-DOMESTIC	71078	7.7	0.	5978.	0.	670.	0.0	1556.	3.8	0.0	0.	0.	0.	0.0	0.0	0.
3-DOMESTIC	70378	7.4	0.	7177.	0.	670.	27.6	1556.	0.0	0.0	0.	0.	0.	0.0	0.0	0.

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**NOTE: 0 INDICATES NO DETERMINATION
        CONCENTRATIONS IN MG/L
        TEMPERATURE IN DEGREES F
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                                                                                LAB-RR
 WELL NAME          DATE       PH       TEMP  COND       TDS       HARD     HCO3    CL         F       SO4      NA         CA        K        LI       SP       SI

3-DOMESTIC          62678      7.3        0.  6796.        0.       790.     25.1  1601.       4.4     0.0      0.         0.        0.       0.0      0.0      0.
3-DOMESTIC          61278      7.4        0.  7613.        0.       840.      0.0  1690.       4.3     0.0      0.         0.        0.       0.0      0.0      0.
3-DOMESTIC          53078      7.2        0.  7613.        0.       870.     51.7  1779.       4.2     0.0      0.         0.        0.       0.0      0.0      0.
3-DOMESTIC          52278      7.8        0.  7613.        0.       862.     76.5  1721.       4.3     0.0      0.         0.        0.       0.0      0.0      0.
3-DOMESTIC          51578      7.7        0.  7613.        0.       848.     54.1  1779.       3.5     0.0      0.         0.        0.       0.0      0.0      0.
3-DOMESTIC          50878      7.4        0.  7450.        0.       860.      9.6  1779.       3.4     0.0      0.         0.        0.       0.0      0.0      0.
3-DOMESTIC          50178      7.3        0.  7286.        0.       885.     57.2  1823.       3.0     0.0      0.         0.        0.       0.0      0.0      0.

**NOTE: 0 INDICATES NO DETERMINATION
        CONCENTRATIONS IN MG/L
        TEMPERATURE IN DEGREES F
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LAB-EI

WELL NAME	DATE	PH	TEMP	CGND	TDS	HARD	HCO3	CL	F	SO4	NA	CA	K	LI	SP	SI
MW-1	31778	9.1	0.	17598.	6698.	0.	10.7	3493.	0.0	65.6	2245.	149.	38.	4.4	0.0	0.
MW-1	33078	8.3	0.	17598.	6741.	0.	19.0	3595.	3.9	52.5	2179.	145.	31.	4.4	0.0	0.
MW-1	33078	7.7	0.	17816.	6762.	0.	20.0	3544.	3.8	55.5	2274.	146.	31.	4.4	0.0	32.
MW-1	63078	8.0	0.	14698.	6708.	0.	25.2	3493.	4.2	66.9	1995.	184.	32.	4.6	0.0	40.
MW-1	121278	7.9	0.	11073.	6643.	0.	22.1	3632.	0.0	59.2	2261.	183.	31.	4.3	0.0	38.
MW-2	121278	7.6	0.	6216.	3286.	0.	23.1	1653.	7.0	50.2	1017.	114.	25.	2.4	0.0	0.
MW-2	20579	7.5	0.	6361.	3317.	0.	24.1	2007.	9.4	50.5	1149.	111.	26.	3.6	0.0	0.
MW-3	121278	7.8	0.	7811.	4550.	0.	53.0	2346.	6.5	45.7	1302.	154.	57.	2.8	0.0	0.
MW-3	50779	7.5	0.	6826.	4561.	0.	44.7	2387.	6.8	53.5	1425.	137.	70.	3.2	0.0	0.
MW-4	80378	7.7	0.	11436.	3748.	0.	47.8	2214.	9.1	24.5	1394.	1357.	27.	4.3	0.0	0.
MW-4	121278	6.1	0.	8173.	4572.	0.	38.6	2346.	6.3	44.5	1425.	184.	25.	3.6	0.0	0.
MW-5	121278	8.0	0.	2736.	1161.	0.	169.4	500.	1.9	33.3	190.	147.	17.	1.2	0.0	0.
MW-5	20679	7.8	0.	2736.	1149.	0.	100.4	609.	2.1	20.2	231.	100.	13.	0.0	0.0	0.
MW-6	53078	8.2	0.	9188.	5349.	0.	37.5	2370.	5.3	57.6	1272.	194.	62.	2.7	0.0	0.
MW-6	121278	10.7	0.	7956.	4431.	0.	0.0	2285.	4.9	55.8	1302.	156.	57.	2.3	0.0	0.
MW-6	50779	7.3	0.	5841.	5226.	0.	41.6	2703.	6.1	67.7	1639.	177.	74.	3.3	0.0	0.

**NOTE: 0 INDICATES NO DETERMINATION
CONCENTRATIONS IN MG/L
TEMPERATURE IN DEGREES F