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Results of the Separations Area Ground-Water Monitoring Network for 1980

**M.J. Graham
W.R. Brown**

**Prepared for the United States
Department of Energy
Under Contract DE-AC06-77RL01030**

Rockwell International

**Rockwell Hanford Operations
Energy Systems Group
Richland, WA 99352**

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RHO-LD--165

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RHO-LD-165
Informal Report

RESULTS OF THE SEPARATIONS AREA GROUND-WATER
MONITORING NETWORK FOR 1980

M. J. Graham
W. R. Brown

Environmental Technologies Group
Environmental Analysis and Monitoring Department
Health, Safety and Environment Function

November 1981

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Rockwell Hanford Operations
Energy Systems Group
P.O. Box 800
Richland, Washington 99352

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Title: RESULTS OF THE SEPARATIONS AREA GROUND-
WATER MONITORING NETWORK FOR 1980

Issue Approval:

M. J. Graham
Author M. J. Graham
10/29/81
Date

W. H. Price
Issuing Manager W. H. Price
10/29/81
Date

G. F. Boothe
Concurring Approval G. F. Boothe
11/2/81
Date

W. P. Kunkel
Program Representative W. P. Kunkel
11/6/81
Date

W. F. Heine
Program Office W. F. Heine
11/6/81
Date

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INTRODUCTION

BACKGROUND

The U.S. Department of Energy (DOE) Hanford Site has served as an integrated nuclear facility since 1943. Rockwell Hanford Operations (Rockwell) is a prime contractor to DOE at the Hanford Site. Rockwell operates and maintains the irradiated uranium fuels processing facilities, plutonium separation facilities, and the major waste storage and disposal facilities which are located within the Separations Area (Figure 1).

As part of the waste management effort, a comprehensive unconfined ground-water monitoring network is established for the Separations Area (Graham, 1981). The Separations Area ground-water monitoring program satisfies DOE requirements that all onsite discharges be monitored. These requirements are stated in DOE Orders 5484.1 and 5480.1, Chapters XI and XII.

In addition to the Separations Area ground-water monitoring program, Pacific Northwest Laboratory (PNL) maintains the Hanford ground-water monitoring program. The purpose of the Hanford ground-water monitoring program is to estimate and evaluate the impact of unconfined ground-water contamination from the Hanford Site on the general public. Ground-water sampling and analyses for the two programs are coordinated and data are actively exchanged.

PURPOSE AND OBJECTIVES

The purpose of this report is to summarize and interpret the results of the Separations Area ground-water monitoring program for calendar year 1980.

The objectives of this monitoring program are:

- To establish and maintain an observation well network for monitoring water quality in compliance with DOE Orders and other applicable state and federal regulations

FIGURE 1. Separations Area Location Map.

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- To obtain representative radiological and chemical water-quality data near liquid waste disposal facilities in order to (1) assess the performance of these disposal sites; (2) determine the impact of liquid waste discharges on the quality of ground water; and (3) provide data for input to ground-water flow and transport predictive models
- To produce water-table maps to aid in determining the impact of discharges on the ground-water flow rates and directions of flow on the Hanford Site.

HYDROGEOLOGY

Occurrence

The unconfined aquifer is contained within the Ringold Formation, a Pliocene fluvial sedimentary unit with some lacustrine sediments, and the glaciofluvial sediments informally named the Hanford formation. The Ringold Formation is divided into four major textural units: the basal, lower, middle, and upper units (Tallman et al., 1979). Beneath the unconfined aquifer is a confined aquifer system consisting of sedimentary interbeds and/or interflow zones which occur between dense basalt flows or flow units. The bottom of the unconfined aquifer is the basalt surface or, in some areas, a clay zone in the Ringold Formation.

Aquifer Properties

Large differences in aquifer properties are evident between the Hanford formation and the middle member of the Ringold Formation, the major geologic units of the unconfined aquifer. Hydraulic conductivities range from 3 to 3,000 meters/day (9 to 30,000 feet/day); storage coefficients range from 0.02 to 0.07. The lower values are associated with the middle Ringold Formation; the higher values with the Hanford formation. There is a general increase in transmissivity from 200 West Area to 200 East Area. This is attributed to an increase in the saturated thickness caused by a drop in the surface of the basalt and the

extension of the unconfined aquifer into the more permeable glaciofluvial sediments. The aquifer is anisotropic, with horizontal to vertical hydraulic conductivity ratios of 13 to 16. The basal unit acts as a separate confined aquifer system in some areas.

Flow Dynamics

Artificial recharge to the Separations Area from liquid waste disposal is estimated at 10 times the natural recharge (Graham et al., 1981). This artificial recharge has created two ground-water mounds (Figure 2) under 216-U-10 and 216-B-3 Ponds (U-Pond and B-Pond). Flow lines are drawn perpendicular to the water-table contour, equipotential lines which indicate the direction of flow. Flow is predominantly west to east. Discharge out of the Separations Area is primarily southeast to the Columbia River. There is also discharge to the east and north between Gable Mountain and Gable Butte.

FIGURE 2. Separations Area Water-Table Map 1980.

SEPARATIONS AREA GROUND-WATER MONITORING PROGRAM

The monitoring program for assessing ground-water quality under low-level radioactive disposal facilities is based upon an understanding of the hydrology of this area. Knowledge of the ground-water flow system predicates well location, well completion, and sampling frequency.

WELL NETWORK

There are 107 water quality monitoring wells in the Separations Area ground-water monitoring network (Appendix A). The wells are predominantly 15 centimeters (6 inches) or 20 centimeters (8 inches) in diameter. Each well is being fitted with a 1/2-horsepower submersible pump. Most wells are completed in the upper portion of the aquifer; the distribution of contamination with depth is being investigated.

Two new monitoring wells were drilled in 1980 and are scheduled to be added to the network in 1981. Well 299-W18-15 (Figure 3) monitors the active U-Pond. Well 299-E28-23 (Figure 4) monitors the inactive 216-B-5 Reverse Well, and includes a gravel pack to retain the fine silts prevalent in the sediments of that area.

Ten existing wells were also added to the network in 1980. Wells 299-E25-17, -18, -19, and -20 monitor the active 216-A-37 Crib. Well 299-E28-13 monitors the active 216-B-55 Crib; Well 299-E34-1 monitors the active 215-B-63 Ditch. Four 600 Area wells formerly designated as PNL monitoring structures are now part of the Rockwell network. These wells and the active sites monitored by each well are as follows:

- 699-32-72 (216-S-19 Pond)
- 699-35-78 (U Pond)
- 699-53-47 (216-A-25 Pond)
- 699-53-55A (216-A-25 Pond).

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FIGURE 3. Diagram of Well 299-W18-15 Construction.

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FIGURE 4. Diagram of Well 299-E28-23 Construction.

SAMPLING

The following criteria are established for determining sampling frequencies.

- Wells monitoring active liquid waste disposal sites are sampled monthly.
- Wells monitoring inactive liquid waste disposal sites which contain contaminants that have a high potential of being remobilized are sampled monthly.
- Wells monitoring inactive liquid waste disposal sites which contain greater than 1 kilogram of transuranic wastes are sampled monthly.
- Wells (other than specified sites mentioned above) indicating contamination above background concentration levels are sampled bimonthly or quarterly depending upon the level of contamination and the stability of the concentration trend.
- Wells yielding samples indicating background contamination are sampled semiannually.

Standard field procedures are used to collect the ground-water samples. The samples are field prepared for subsequent analyses.

WATER-LEVEL MEASUREMENTS

The water-table elevation monitoring network and the confined aquifer water-level monitoring network are given in Appendix B. Data for the piezometer network are also given in Appendix B. All water-level measurements are taken to the nearest 0.01 foot with a steel tape. A map depicting water-level elevations is produced annually for the Hanford Site (in packet). Water-table maps and depth to water-table maps are produced semiannually for 200 East and 200 West Areas. In addition, a water-table map for the Separations Area is produced for this report (see Figure 2).

ANALYSES

The analytical schedules (see Appendix A) are based upon the inventory of the sites being monitored and the concentration histories of the wells. The samples are selectively analyzed for the following radionuclides: total alpha, total beta, ^{60}Co , ^{106}Ru , ^{137}Cs , ^{90}Sr , tritium, and uranium. Nitrate is also present in the process waste streams and is used routinely at Hanford to define contamination in the ground water. The analyses are performed by United States Testing Company and given in Procedural Manual UST-RL-PM-9-80.

DATA INTERPRETATION, REPORTING, AND STORAGE

Data are interpreted in a timely manner, usually the same day the results are obtained from the laboratory. The data are interpreted to assess the performance of the active liquid waste disposal facilities and to determine general contamination patterns. In assessing the performance of the disposal sites, the data are compared with the DOE concentration guides for water in an uncontrolled area. If the ground-water contamination from an active site exceeds 10% of the concentration guidelines given in Table II (see DOE Order 5480.1, Chapter XI) for the long-lived radionuclides (with the exception of tritium*), the disposal facility is removed from service. This standard of 10% is adopted to assure that the concentration guides are not exceeded by subsequent drainage after shutoff.

Contamination plumes are used to indicate general patterns of ground-water contamination, which is primarily the result of past disposal practices. Contamination plumes for the Hanford Site are given in Eddy and Wilbur (1981). Analysis of data from the ground-water monitoring network indicates that contamination levels in ground water migrating out of the Separations Area are below DOE concentration guidelines for water in an uncontrolled area.

*Tritium concentrations are allowed to reach Table II guidelines in the ground water because no further increase in concentration is expected after shutoff.

The data from the Separations Area ground-water monitoring network are stored on the Comprehensive Information Retrieval and Model Input Sequence (CIRMIS) computer data-base system. In addition to this annual report, quarterly reports are also issued. A summary of this report will be included in the annual environmental surveillance report for the Separations Area.

QUALITY ASSURANCE

Quality Assurance is an integral part of the Separations Area ground-water monitoring program. The quality assurance program consists of internal and external audits. For each aspect of the routine program, and every party involved in the program, internal audits are performed annually, as a series of independent audits or a single comprehensive audit. These audits address the following items:

- Documentation of well condition and maintenance
- Compliance with sampling and analytical procedures
- Precision and accuracy of analytical results
- Evidence of data review, interpretation, and response
- Evidence of internal audit reports.

The external audits, which are performed by the Rockwell Quality Assurance Function, address compliance with internal quality assurance programs.

RESULTS FROM 1980

Water-level measurements are given in Appendix C for wells in the unconfined aquifer. Water-quality data are given in Appendix D.

SITE-SPECIFIC RESULTS

Active Liquid-Waste Disposal Sites

There were seven active cribs, and four active ponds and associated active ditches in 1980 (Table 1). The 216-A-3 Crib and the 216-S-11 Ditch are not monitored because they receive minor discharges.

In 1980, concentrations of radionuclides (except tritium) in samples from the wells monitoring these active sites were below 10% of Table II guidelines. Tritium, in samples from wells monitoring 216-A-37 Crib, reached 33% of Table II guidelines and samples from a well monitoring 216-S-25 Crib exceeded Table II guidelines.

The 216-A-37 Crib received discharges of 242-A Evaporator steam condensate containing tritium in concentrations as high as 4,390 pCi/mL in 1980 (1.6 times Table II guidelines). Discharge of process condensate from the 242-S Evaporator to 216-S-25 Crib contained tritium concentrations as high as 3,930 pCi/mL. Tritium is incorporated into water molecules and is not adsorbed onto the sediments. Therefore, the tritium discharged to a crib will move under unsaturated flow to the ground water. The other long-lived radionuclides prevalent in the waste stream are strongly adsorbed (Routson et al., 1979) and thus do not reach the ground water readily.

TABLE 1. Active Disposal Sites, 1980.

<u>PONDS AND DITCHES</u>	
216-A-25	Gable Mountain Pond and Ditches
216-B-3	B-Pond and Ditches
216-B-63	B-Plant Trench
216-S-11	Redox Chemical Sewer Ditch
216-S-19	222-S Laboratory Pond
216-U-10	U-Pond and Ditches
<u>CRIBS AND SPECIFIC RETENTION</u>	
216-A-3	203-A Silica Gel Wastes
216-A-30	Purex Steam Condensate
216-A-37	242-A Process Condensate
216-B-55	B-Plant Steam Condensate
216-B-62	B-Plant Process Condensate
216-C-7	209-E Critical Mass Laboratory
216-S-25	242-S Process Condensate

The four wells monitoring 216-A-37 Crib (299-E25-17, -18, -19, and -20) were added to the monitoring network in 1980, and only one sample was collected from each well. Therefore, no trends for tritium concentrations have been established. Samples from the two wells (299-W23-9, -10) monitoring 216-S-25 Crib have been analyzed for tritium since 1974 (Figures 5 and 6). Tritium concentrations in Well 299-W23-10 reached a high early in 1980 in response to high tritium concentrations in the discharge to the 216-S-25 Crib in 1979 (Figure 7). This is a lag time of approximately 8 months. Tritium concentrations in the ground water are expected to rise in the early part of 1981 in response to the high (above 1,000 pCi/mL) tritium concentrations discharged to the crib in February, June, July, and August of 1980.

FIGURE 6. Well 299-W23-10 Tritium Concentration History Graph.

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FIGURE 7. Tritium Concentration in Discharge to Crib 216-S-25 and Well 299-W23-10.

Inactive Liquid-Waste Disposal Sites

With the exception of tritium, all of the contamination above 10% of Table II guidelines in the ground water under the Separations Area is the result of past disposal to sites which are no longer active. In 1980, there were two wells in the Separations Area ground-water monitoring network yielding samples which exceeded 10% of Table II values for ^{90}Sr : 299-W19-3, monitoring 216-U-1 and -2 Crib; and 299-W22-1, monitoring 216-S-1 and -2 Crib. The concentration histories for ^{90}Sr in these wells are shown in Figures 8 and 9.

The 216-U-1 and -2 Crib, active from 1951 to 1967, received decontamination waste from 224-U Plant. There is more than an order of magnitude scatter in the ^{90}Sr data from Well 299-W19-3 monitoring 216-U-1 and -2; therefore, no trend can be determined. The 216-S-1 and -2 Crib, active from 1952 to 1956, was characterized to determine present radionuclide distributions and environmental safety. The ^{90}Sr contamination in the saturated zone is attributed to a casing failure of a water well within the crib. The concentrations of ^{90}Sr in 299-W22-1 have averaged around 2×10^1 pCi/mL since 1971, exceeding Table II guidelines and Table I guidelines for a controlled area. However, the zone of contamination appears to be stable and highly localized.

No samples contained concentrations of ^{137}Cs , ^{60}Co , and ^{106}Ru above 10% of Table II limits. Only the one well, 299-W23-10, exceeded Table II limits for tritium.

The 45-mg/L Environmental Protection Agency (EPA) drinking water standard for nitrate (as NO_3^-) was exceeded in samples from seven wells in the Separations Area monitoring network (Table 2). Most of the concentrations followed a downward trend established since the facility being monitored was removed from service. However, the nitrate concentration history for Well 299-W15-4 (Figure 10) has been stable since the crib (216-T-19) was removed from service in 1976. Two wells located in the northwest corner of 200 East Area have nitrate concentration histories that indicate an upward trend in concentrations. This is attributed to the migration of contamination from other disposal sites into the area.

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FIGURE 8. Well 299-W19-3 ^{90}Sr Concentration History Graph.

FIGURE 9. Well 299-W22-1 ^{90}Sr Concentration History Graph.

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TABLE 2. Wells Yielding Samples Exceeding 45 mg/L Nitrate.

Well number	Site monitored	Nitrate (as NO ₃ ⁻) mg/L
2299-E17-9 Mean	216-A-36B	1.92×10^{2a}
299-E32-1 Mean	200 East Area	9.00×10^{1a}
Max		4.30×10^2
299-E33-9 Mean	241-BY-Tank Farm	2.76×10^2
Min		1.40×10^2
299-W14-2 - Mean	216-T-26, -27, -28	1.98×10^2
Max		7.90×10^2
299-W15-4 Mean	216-T-19	7.28×10^2
Min		6.50×10^2
Max		7.10×10^1
299-W15-6 Mean	216-Z-9	2.03×10^1
Min		1.90×10^1
Max		1.60×10^2
299-W19-2 Mean	216-U-8	8.26×10^1
Min		2.00×10^{-1}

^aThree values or less, no maximum or minimum calculated.

CONTAMINATION PLUMES

Contamination plumes are drawn for total beta, nitrate, and tritium (Figures 11, 12, and 13). These maps are constructed using the average concentrations of the constituents in samples taken in 1980 from wells in the Separations Area ground-water monitoring network. Data from the Hanford ground-water monitoring network for 1980 (Eddy and Wilbur, 1981) are also used.

FIGURE 10. Well 299-W15-4 Nitrate Concentration History Graph.

200 WEST AREA

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FIGURE 11. Gross Beta Plume Map - Separations Area.

FIGURE 12. Nitrate Plume Map - Separations Area.

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Total Beta Contamination

Total beta contamination is divided into three ranges: less than 0.1, 0.1 through 10, and greater than 10 pCi/mL (see Figure 11). Beta contamination is restricted to a few small areas. In 200 West Area, the sources of total beta contamination in the ground water are the 216-S, -U and -T Cribs; the highest beta activity is from the 216-S-1 and -2 Crib. In 200 East Area, there are total beta plumes from the 216-BY and 216-A Cribs. The plume from the 216-BY Cribs is elongated in the direction of ground-water flow to the northwest. The beta contamination in Well 699-34-42 southeast of 200 East Area is contamination from past disposal practices that has migrated away from its source.

Nitrate Contamination

The nitrate contamination plumes are divided into five concentration ranges: less than 5, 5 through 10, 11 through 20, 21 through 45, and greater than 45 mg/L (see Figure 12). The EPA drinking water standard for nitrate (as NO_3^-) is 45 mg/L. The nitrate in the unconfined aquifer originated from 216-S, -T, and -U Cribs in 200 West Area; and from 216-BY and 216-A Cribs in 200 East Area. This nitrate is thought to be primarily from nitric acid used to dissolve the claddings on fuel rods in the process plants. The EPA drinking water standard is exceeded in four areas: north 200 West Area, the southeast corner and east of 200 West Area, north of 200 East Area, and southeast of 200 East Area.

Tritium Contamination

Tritium contamination is divided into four ranges: less than 30, 30 through 300, 301 through 3,000, and greater than 3,000 pCi/mL (see Figure 13). The Table II guideline for tritium is 3,000 pCi/mL. In 200 West Area, the tritium plumes originate from the 216-S, -U, and -T Cribs. The tritium contamination has moved approximately 5 kilometers (3 miles) from the 216-S and 216-U Cribs in 35 years. This indicates a ground-water flow velocity of 0.4 meter/day (1.3 feet/day),

which is in general agreement with previous estimates (Graham et al., 1981). At that velocity, the tritium plume out of 200 West Area will reach 200 East Area in approximately 13 years (1993).

The tritium contamination in 200 East Area originates from the 216-BY and 216-A Cribs, and B-Pond. The tritium plumes from 200 East Area disposal sites have migrated farther than tritium from 200 West Area because the aquifer is located in the more transmissive Hanford formation sediments of the 200 East Area.

The only area exceeding Table II guidelines is a zone southeast of 200 West Area of approximately 0.8 square kilometer (0.5 square mile).

SUMMARY

There are 107 water quality monitoring wells in the Separations Area ground-water monitoring network. This represents an increase of 10 wells over last year's network. Two new monitoring wells were drilled in 1980 and are scheduled to be added to the network in 1981.

A water-level monitoring network in the confined and unconfined aquifers is also maintained. Water-table maps and depth-to-water-table maps are produced semiannually for 200 East and 200 West Areas; a water-table map for the Hanford Site is produced annually. In addition, a water-table map for the Separations Area is produced for this document.

Samples from the water quality monitoring wells are collected at intervals ranging from monthly to semiannually. These samples are analyzed selectively for total alpha, total beta, ^{60}Co , ^{106}Ru , ^{137}Cs , ^{90}Sr , tritium, uranium, and nitrate. Review of the 1980 results indicates little differences from the 1979 results. The Table II guideline for tritium of 3,000 pCi/mL was exceeded in Well 299-W23-10, which monitors the active 216-S-25 Crib. This guideline was exceeded in one sample; subsequent samples were below this guideline.

With the exception of tritium, all contamination above 10% of Table II guidelines in the ground water under the Separations Area is the result of past disposal to sites which are no longer active. The only samples with contamination in excess of guidelines were collected from Well 299-W22-1, monitoring the inactive 216-S-1 and -2 Crib. However, the zone of contamination appears to be stable and highly localized.

Analysis of contamination plumes within the Separations Area indicates that contamination levels in ground water migrating out of the Separations Area are below the DOE Table II guidelines.

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APPENDIX A

ROCKWELL GROUND-WATER MONITORING SCHEDULE FOR THE SEPARATIONS AREA

Well #	EMA NUMBER	SITE MONITORED	T _α	T _β	⁹⁰ Sr	¹³⁷ Cs	¹⁰⁶ Ru	⁶⁰ Co	³ H	NO ₃ ⁻	U
299-E13-5	2314	216-B-18		Q					Q		
299-E13-8	2334	216-B-21		Q		Q	S	Q			
299-E13-14	2340	216-B-29		Q							
299-E13-19	2352	216-B-28		Q							
299-E13-20	2361	Piezometer		Q							
299-E16-1	2373	Piezometer		Q							
299-E16-2	2372	216-A-30		M							
299-E17-1	2328	216-A-10		M	Q	Q	M	Q		M	
299-E17-2	2367	216-A-27	Q	Q						Q	
299-E17-5	2511	216-A-36B	Q	Q	Q	Q	S	Q		Q	
299-E17-6	2512	Piezometer		Q							
299-E17-8	2513	216-A-38		Q							
299-E17-9	2514	216-A-36B	Q	Q	Q	Q		Q		Q	
299-E23-2	2376	Piezometer		S					S	S	
299-E24-1	2317	216-A-5		Q	Q				Q		
299-E24-2	2329	216-A-10	M	M	M	M	M	M	M		M
299-E24-4	2326	216-A-9		Q							
299-E24-8	2355	216-C-7		M		M			M	M	
299-E24-12	2521	216-A-31	Q	Q							Q
299-E24-13	2883	241-A-TF		Q							
299-E25-2	2316	216-A-1		S					S	S	
299-E25-3	2318	216-A-6		Q							
299-E25-6	2343	216-A-8		M		M		M	M		

M - Monthly S - Semiannually
Q - Quarterly TF - Tank Farm

Well #	EMA NUMBER	SITE MONITORED	T _α	T _β	⁹⁰ Sr	¹³⁷ Cs	¹⁰⁶ Ru	⁶⁰ Co	³ H	NO ₃ ⁻	U
299-E25-9	2344	216-A-8		Q							
299-E25-10	2363	216-A-18,19,20	Q	Q		Q		Q			Q
299-E25-11	2370	216-A-30		Q							
299-E25-13	2523	241-AX-TF		Q							
299-E25-17		216-A-37		M					M		
299-E25-18		216-A-37		M					M		
299-E25-19		216-A-37		M					M		
299-E25-20		216-A-37		M					M		
299-E26-2	2364	216-A-24		Q							
299-E26-4	2362	216-A-24		Q					Q		
299-E27-5	2551	216-C-10		Q		Q		Q			
299-E28-12	2380	216-B-55		M		M		M	M		
299-E28-13	2324	216-B-55		M		M		M	M		
299-E28-16	2325	216-B-12		Q							
299-E28-17	2519	216-B-6,10A,1CB	Q								Q
299-E28-18	2524	216-B-62	M	M	M	M	S	M	M		
299-E28-21	2556	216-B-62	M	M	M	M		M	M		
299-E28-23		216-B-5	Q	Q	Q	Q			Q	Q	Q
299-E32-1	2358	Background		S					S	S	
299-E33-1	2301	216-B-43		Q		Q		Q			
299-E33-3	2303	216-B-44,45,46		Q	Q	Q		Q	Q		
299-E33-5	2308	216-B-47		Q		Q		Q			
299-E33-7	2305	216-B-48,49,50		Q		Q	S	Q			

Well #	EMA NUMBER	SITE MONITORED	T _α	T _β	⁹⁰ Sr	¹³⁷ Cs	¹⁰⁶ Ru	⁶⁰ Co	³ H	NO ₃ ⁻	U
299-E33-8	2300	216-B-Trenches		Q		Q		Q			
299-E33-9	2299	241-BY TF		Q	Q	Q	Q	Q	Q	Q	
299-E33-10	2306	216-B Trenches		Q		Q		Q	Q	Q	
299-E33-18	2309	216-B-7A,7B,8		Q	Q	Q		Q			
299-E33-20	2332	216-B-7A,7B,11A,11B	Q	Q							
299-E33-21	2353	216-B Trenches		Q		Q		Q			
299-E33-24	2520	216-B-57		Q		Q	S	Q			
299-E33-26	2382	216-B-61		Q		Q		Q			
299-E33-27	2527	241-BY-TF		Q		Q		Q	Q		
299-E34-1	2549	216-B-63		M		M		M	M		
299-W10-1	2892	216-T-5		Q							
299-W10-3		216-T-32	Q	Q							
299-W10-4	2886	216-T-36		Q		Q		Q			
299-W10-8	2996	241-T-TF	Q	Q			S	Q			
299-W10-9	3009	241-T-TF	Q	Q				Q			
299-W11-11	2887	216-T-18	Q	Q		Q	S	Q			
299-W11-13	2942	200 West		S					S	S	
299-W11-15	2961	216-T-34		Q							
299-W11-18	2963	216-T-35		Q							
299-W11-23	2616	241-T-TF	Q	Q			S	Q			
299-W11-24	3010	241-T-TF	Q	Q		Q	S	Q			
299-W14-2	2895	216-T-26,27,28	Q	Q			S	Q		Q	
299-W14-5	3007	241-TX-TF		Q					Q		

Well #	EMA NUMBER	SITE MONITORED	T α	T β	⁹⁰ Sr	¹³⁷ Cs	¹⁰⁶ Ru	⁶⁰ Co	³ H	NO ₃ ⁻	U
299-W14-6	3008	241-TX-TF		Q							
299-W15-3	2894	241-TY-TF		Q		Q	S	Q			
299-W15-4	2896	216-T-19		Q					Q	Q	
299-W15-5	2922	216-Z-11	S	S					S	S	
299-W15-6	2934	216-Z-9	Q	Q						Q	
299-W15-7	2960	216-Z-7	Q	Q		Q		Q			
299-W15-10	2609	216-Z-16	Q	Q							
299-W15-11	2610	216-Z-16	Q	Q							
299-W18-5	2933	216-Z-12	Q	Q							
299-W18-7	2952	216-Z-1,1A,2,3	Q	Q							
299-W18-9	2965	216-Z-18	Q	Q						Q	
299-W18-12	2967	216-Z-18	Q	Q							
299-W19-2	2928	216-U-18		Q					Q	Q	Q
299-W19-3	2991	216-U-1,2	Q	Q		Q	Q	Q	Q	Q	Q
299-W19-5	2968	216-S-23		Q					Q	Q	
299-W22-1	2919	216-S-1	Q	Q	Q	Q		Q	Q		
299-W22-2		216-S-1,2	Q	Q	Q	Q		Q	Q		
299-W22-12	2912	216-S-7		Q	Q				Q	Q	
299-W22-16	2909	216-S-2	Q	Q	Q	Q		Q			Q
299-W22-20	2926	216-S-20		Q	Q				Q		
299-W22-21	2931	216-S-13	Q	Q	Q	Q		Q		Q	Q
299-W22-22	2939	216-U-12		Q							Q
299-W22-24	2941	Piezometer		S					S	S	

A-7//A-8 blank

Well #	EMA NUMBER	SITE MONITORED	T _α	T _β	⁹⁰ Sr	¹³⁷ Cs	¹⁰⁶ Ru	⁶⁰ Co	³ H	NO ₃ ⁻	U
299-W22-26	2954	216-S-9		Q	Q	Q		Q	Q		
299-W22-27	2955	Piezometer		S					S	S	
299-W22-30		216-S-1,2	Q	Q	Q	Q		Q	Q		
299-W23-1	2898	216-S-3		Q							
299-W23-2	2910	241-SX-TF		Q							
299-W23-3	2911	241-SX-TF		Q							
299-W23-4	2925	216-S-21	Q	Q					Q	Q	Q
299-W23-9	2993	216-S-25	M	M	M	M		M	M		
299-W23-10	2994	216-S-25		M	M	M			M		
299-W23-11	2995	216-U-10	M	M		M	M	M	M		M
299-W23-13		216-U-10	M	M		M	M	M	M		M
299-W26-3	2917	216-S-6	Q	Q					Q	Q	
699-32-72	4491	216-S-19	M	M							
699-35-78	4445	216-U-10	M	M		M	M	M	M		M
699-53-47	4774	216-A-25	M	M	M	M					
699-53-55A	4563	216-A-25	M	M	M	M					

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APPENDIX B

WATER-LEVEL MONITORING WELL NETWORKS

Rockwell Confined Aquifer Water-Level
Monitoring Network

Well Number	Aquifer
699-S16-24 (DB-7)	Mabton
699-2-E-14 (DB-1)	Mabton
699-15-E13 (DB-2)	Mabton
699-17-47 (DB-13)	Mabton
699-35-27 (DB-4)	Mabton
699-42-42 (DB-8)	Rattlesnake Ridge
699-47-50	Rattlesnake Ridge
699-49-86A (DC-5)	Grand Ronde
699-49-86B (DC-4)	Grand Ronde
699-50-45	Rattlesnake Ridge
699-50-48	Rattlesnake Ridge
699-50-112 (Enyeart)	Priest Rapids 1
699-51-36A (DB-10)	Mabton
699-52-46	Rattlesnake Ridge
699-52-48	Rattlesnake Ridge
699-52-52 (DB-5)	Mabton
699-52-111 (Ford)	Priest Rapids 1
699-52-115 (O'Brien)	Priest Rapids 1
699-53-50	Rattlesnake Ridge
699-53-103 (McGee)	Priest Rapids 1 & 2
699-59-58	Mabton
699-61-55	Mabton
699-62-57	Mabton

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Rockwell Unconfined Water-Level Measurement Network

200 East Area

299-E13-3	299-E19-1	299-E25-3	299-E26-4	299-E28-12	299-E33-12
299-E13-10	299-E23-1	299-E25-4	299-E27-1	299-E28-18	299-E33-14
299-E13-12	299-E24-1	299-E25-9	299-E27-3	299-E32-1	299-E33-17
299-E13-13	299-E24-4	299-E25-11	299-E28-7	299-E33-7	299-E33-21
299-E16-1	299-E24-7	299-E26-1	299-E28-8	299-E33-8	299-E34-1
299-E17-1					

200 West Area

299-W6-1	299-W11-7	299-W11-23	299-W15-5	299-W19-4	299-W22-23
299-W10-2	299-W11-9	299-W12-1	299-W18-2	299-W21-1	299-W22-35
299-W10-5	299-W11-10	299-W14-1	299-W18-3	299-W22-7	299-W23-4
299-W10-8	299-W11-12	299-W15-2	299-W19-1	299-W22-17	299-W23-6
299-W11-2	299-W11-13	299-W15-4	299-W19-3	299-W22-22	299-W23-11

600 Area

699-14-E6T	699-33-42	699-35-66	699-50-19	699-60-60	699-69-45(0)
699-14-38	699-S31-1	699-35-70	699-50-28B	699-61-37	699-70-23
699-14-47	699-S30-F15A	699-35-78	699-50-30	699-61-41	699-70-68
699-15-15A	699-S29-E12	699-36-40R	699-50-42	699-61-62	699-71-30
699-15-26	699-S27-E14	699-36-61A	699-50-53	699-61-66	699-71-52
699-17-5	699-S19-E13	699-36-93(0)	699-50-85	699-62-31	699-71-77
699-17-70	699-S19-E11	699-37-43	699-51-63	699-62-43A	699-72-73
699-19-43	699-S18-E2	699-37-82A	699-51-75	699-62-43F	699-72-88
699-19-47A	699-S14-20	699-38-65	699-53-35	699-63-25A	699-72-92(0)
699-20-E5T	699-S12-3	699-38-70	699-53-47	699-63-51	699-74-44
699-20-E12	699-S12-29	699-39-39	699-53-55B	699-63-58	699-74-48
699-20-20	699-S11-E12A	699-39-79(0)	699-54-17A	699-63-90	699-73-61
699-20-39	699-S8-19	699-40-1	699-54-19	699-63-92	699-77-36
699-20-82	699-S7-34	699-40-33	699-54-34	699-64-27	699-77-54
699-20-11T	699-S6-E14A	699-40-62	699-54-57	699-64-62	699-78-62
699-24-33	699-S6-40	699-41-23	699-55-21	699-65-22	699-80-43S

Rockwell Unconfined Water-Level Measurement Network

600 Area Cont.

699-24-46	699-S3-E12	699-42-12A	699-55-40	699-65-38	699-81-38
699-25-25	699-S3-25	699-43-42	699-55-44	699-65-50	699-81-58
699-25-70	699-2-3	699-43-89	699-55-50C	699-65-59	699-82-45A
699-26-15	699-3-45	699-44-64	699-55-60B	699-65-72	699-83-32
699-27-8	699-8-17	699-45-42	600-55-70	699-65-83	699-83-47
699-28-40	699-8-25	699-45-69	699-55-76	699-65-95	699-84-35A
699-28-52	699-8-32	699-46-21	699-55-89	699-66-23	699-86-42
699-29-78	699-9-E2	699-47-35B	699-55-95	699-66-38(0)	699-87-55
699-31-31	699-10-E12	699-47-46	699-55-25	699-66-39	699-89-35
699-31-53B	699-10-54	699-47-60	699-56-43	699-66-58	699-90-34
699-31-65	699-11-45A	699-48-7	699-57-29B	699-66-64	699-89-45
699-32-22	699-33-56	699-48-18	699-57-83	699-66-91	699-91-37
699-32-42	699-34-39A	699-48-71	699-58-24	699-66-103	699-92-49
699-32-43	699-34-41	699-49-13	699-59-32	699-67-51	699-97-43
699-32-62	699-34-42	699-49-28	699-59-58	699-67-86	699-99-42
699-32-70	699-34-51	699-49-55	699-59-80B	699-67-98	
699-32-72	699-34-88	699-49-57	699-60-32	699-68-105	
699-32-77	699-35-9	699-49-79	699-60-57	699-69-38	

100 Area

199 B4-1

199 D2-5

199 F5-1

199 H3-1

199 K-11

Piezometer Network Well-Completion Information (Sheet 1 of 3).

Well	Casing elevation (ft above m.s.l.)	Aquifer	Perforation depth top/bottom (ft)
699-2-33A	536.37	Glaciofluvial	130 to 180
P	536.65	Lower Ringold	350 to 370
Q	536.63	Lower and Middle Ringold	300 to 320
699-10-E12	430.86	Glaciofluvial	
P	430.86	Basal Ringold	
Q	430.86	Glaciofluvial	
699-S12-29	487.68	Middle Ringold	83 to 175
P	487.68	Elephant Mountain Basalt	186 to 190
Q	487.68	Lower Ringold	152 to 157
699-14-E6P	458.44	Basalt	490 to 500
Q	457.91	Basalt	441 to 451
R	458.14	Basal Ringold	377 to 387
S	457.77	Middle Ringold	284 to 294
T	458.38	Glaciofluvial	111 to 121
699-14-38	514.89	Middle Ringold	110 to 409
P	514.89	Basal Ringold	415 to 420
Q	514.89	Middle Ringold	175 to 180
699-15-15A	547.14	Glaciofluvial	140 to 190
P	547.14	Middle Ringold	205 to 215
699-20-E5 (Individual Structure)			
P	467.04	Basal Ringold	445 to 455
Q	466.89	Lower Ringold	408 to 418
R	467.47	Middle Ringold	297 to 307
S	466.58	Middle Ringold	210 to 220
T	467.69	Glaciofluvial	113 to 123

Piezometer Network Well-Completion Information (Sheet 2 of 3).

Well	Casing elevation (ft above m.s.l.)	Aquifer	Perforation depth top/bottom (ft)
699-24-1 (Individual Structure)			
P	474.55	Lower Ringold	446 to 456
Q	475.29	Middle Ringold	327 to 337
R	476.03	Middle Ringold	304 to 314
S	476.27	Middle Ringold	211 to 221
T	475.54	Glaciofluvial	124 to 134
699-20-39	539.98	Lower and Middle Ringold	130 to 490
P	539.98	Basal Ringold	608 to 618
699-22-70	614.96	Rattlesnake Ridge and Glaciofluvial	cased to 230
P	614.96	Pomona Basalt	315 to 320
Q	614.96	Rattlesnake Ridge Interbed	260 to 265
699-28-40	559.44	Middle Ringold	150 to 320
P	559.44	Lower Ringold	452 to 462
Q	559.44	Lower Ringold	340 to 350
699-31-31	529.32	Middle Ringold	135 to 270
P	529.32	Basal Ringold	590 to 600
Q	529.32	Lower Ringold	360 to 370
699-32-62	707.09	Middle Ringold	275 to 340
P	707.09	Middle Ringold	490 to 495
Q	707.09	Middle Ringold	365 to 370
699-32-72	668.16	Middle and Upper Ringold	210 to 415
P	668.16	Lower Ringold	465 to 470
699-38-65	753.33	Middle Ringold	220 to 440
P	753.33	Middle Ringold	500 to 510

piezometer Network Well-Completion Information (Sheet 3 of 3).

Well	Casing elevation (ft above m.s.l.)	Aquifer	Perforation depth top/bottom (ft)
699-50-42	466.84		53 to 64
P	466.84		110 to 115
699-50-85	739.35	Middle Ringold	285 to 335
P	739.35	Lower Ringold	520 to 525
699-51-75	641.51	Middle Ringold	190 to 235
P	641.51	Middle Ringold	370 to 375
699-53-55A	575.60	Middle Ringold	165 to 270
P	575.60	Pomona Basalt	330 to 335
699-55-70	569.03	Middle Ringold	136 to 180
P	569.03	Middle Ringold	190 to 195
699-60-60	512.03	Middle Ringold	100 to 110
P	512.03	Middle Ringold	120 to 125
699-67-51	524.49	Middle Ringold	100 to 170
P	524.29	Middle Ringold	230 to 235
Q	524.59	Middle Ringold	184 to 194
699-96-49	419.29	Glaciofluvial	28 to 60
P	419.29	Middle Ringold	79 to 89

NOTE: Letter denotes piezometer tube in well.

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APPENDIX C

WATER-LEVEL MEASUREMENT DATA FOR 1980

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Well	Casing elevation (ft above m.s.l.)	Depth to water (ft)	Water level elevation (ft above m.s.l.)
699-S31-1	460.11	85.19	374.92
699-S30-E15A	400.39	58.19	342.20
699-S29-E12	387.97	42.83	345.14
699-S27-E14	399.77	57.74	342.03
699-S19-E13	394.55	51.18	343.37
699-S19-E11	483.74	96.49	387.25
699-S18-E2	434.85	77.08	357.77
699-S14-20	493.01	92.60	400.41
699-S12-3	435.52	57.35	378.17
699-S12-29	487.68	83.09	404.59
699-S11-E12A ^a	365.87	17.45	
699-S8-19	503.81	109.32	394.49
699-S7-34	527.12	120.98	406.14
699-S6-E14A	378.29	28.90	349.39
699-S6-E4D	430.47	59.97	370.50
699-S3-E12	397.90	44.80	353.10
699-S3-25	523.40	125.89	397.42
699-2-3	477.14	89.80	387.34
699-3-45	504.54	95.07	409.47
699-8-17	522.44	125.93	396.51
699-8-25	509.30	111.53	397.77
699-8-32	544.39	174.97	369.42
699-9-E2	418.09	47.04	371.05
699-10-E12	430.86	74.85	356.01
699-10-54	516.40	105.07	411.33
699-11-45A	578.58	169.10	409.48
699-14-E6T	458.38	93.64	364.74
699-14-38	514.89	112.10	402.79
699-14-47	587.23	177.36	409.87
699-15-15A	547.14	150.53	396.61
699-15-26	523.83	124.58	399.25
699-17-5	433.19	47.68	385.51

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Well	Casing elevation (ft above m.s.l.)	Depth to water (ft)	Water level elevation (ft above m.s.l.)
699-17-70	563.18	89.82	473.36
699-19-43	551.58	149.43	402.15
699-19-47A ^b	617.18		
699-20-E5T	467.49	97.56	369.93
699-20-E12	437.25	80.73	356.52
699-20-20	505.58	106.13	399.45
699-20-39	539.98	138.55	401.43
699-20-82 ^c	614.31		
699-24-1T	475.54	101.10	374.44
699-24-33	524.22	122.95	401.27
699-24-46	591.47	188.03	403.44
699-25-55	676.55	264.55	412.00
699-25-70	629.58	177.15	452.43
699-26-15	442.64	45.75	396.89
699-27-8	465.67	73.39	392.28
699-28-40	559.44	157.62	401.82
699-28-52	684.67	275.49	409.18
699-29-78	647.05	176.04	471.01
699-31-31	529.32	128.04	401.28
699-31-53B	707.86	304.72	403.14
699-31-65 ^d	683.09		
699-32-22	517.55	118.35	399.20
699-32-42	517.42	119.09	398.33
699-32-43	516.62	114.69	401.93
699-32-62	707.09	276.87	430.22
699-32-70	666.61	210.01	456.60
699-32-72	668.16	209.40	458.76
699-32-77	653.74	183.31	470.43
699-33-42	516.00	114.00	402.00
699-33-56	717.03	313.90	403.13
699-34-39A	537.07	135.17	401.90
699-34-41	570.89	168.89	402.00

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Well	Casing elevation (ft above m.s.l.)	Depth to water (ft)	Water level elevation (ft above m.s.l.)
699-34-42	540.20	138.31	401.89
699-34-51	736.76	334.38	402.38
699-34-88	633.09	158.36	474.73
699-35-9	499.83	116.22	383.61
699-35-66	725.65	283.69	441.96
699-35-70 ^e	693.72	237.66	456.06
699-35-78	660.65	182.86	477.79
699-36-46R	705.13	302.09	403.04
699-36-61A	748.11	339.48	408.63
699-36-93(0)	645.03	170.80	474.23
699-37-43	690.17	287.74	402.43
699-37-82A	636.75	162.19	474.56
699-38-65	753.33	320.41	432.92
699-38-70	710.67	252.74	457.93
699-39-39	536.66	129.32	407.34
699-39-79(0)	674.27	196.17	478.10
699-40-1	437.77	74.58	363.19
699-40-33	518.05	110.65	407.40
699-40-62	747.78	342.12	405.66
699-41-23	466.50	70.10	396.40
699-42-12A	514.27	140.02	374.25
699-43-42	564.48	145.92	418.56
699-43-89	644.15	175.06	469.09
699-44-64	725.57	318.82	406.75
699-45-42	577.33	163.62	413.71
699-45-69	725.46	276.30	449.16
699-46-21	522.02	132.73	389.29
699-47-35B	476.65	68.46	408.19
699-47-46	580.14	176.65	403.49
699-47-60	649.85	247.30	402.55
699-48-7 (HAN6)	384.72	28.17	356.55

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Well	Casing elevation (ft above m.s.l.)	Depth to water (ft)	Water level elevation (ft above m.s.l.)
699-48-18 (HAN24)	424.98	63.45	361.53
699-48-71	688.15	241.47	446.68
699-49-13 (HAN19)	412.72	51.88	360.84
699-49-28	535.41	143.26	392.15
699-49-55	530.14	127.72	402.42
699-49-57	552.81	150.39	402.42
699-49-79	688.59	230.36	458.23
699-50-19 (HAN27)	411.08	50.05	361.03
699-50-28B	537.30	145.47	391.83
699-50-30	528.84	136.59	392.25
699-50-42	466.84	58.80	408.04
699-50-53	556.30	153.85	402.45
699-50-85	739.35	282.72	456.63
699-51-63	571.84	167.05	404.79
699-51-75	641.51	191.41	450.10
699-53-35	530.99	137.03	393.96
699-53-47	438.28	27.20	411.08
699-53-55B	576.13	174.17	401.96
699-54-17A ^f	404.35		
699-54-19 (HAN8)	383.60	22.47	361.13
699-54-34	550.24	143.51	406.73
699-54-57	577.78	172.44	405.34
699-55-21	395.96	37.80	358.16
699-55-40	543.13	135.89	407.24
699-55-44	519.67	125.60	394.07
699-55-50C	444.43	41.88	402.55
699-55-60B	573.68	171.43	402.25
699-55-70	569.04	137.95	431.09
699-55-76	583.50	139.67	443.83

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Well	Casing elevation (ft above m.s.l.)	Depth to water (ft)	Water level elevation (ft above m.s.l.)
699-55-89	617.69	163.77	453.92
699-55-95	777.04	311.50	465.54
699-57-25	414.61	53.49	361.12
699-56-43	540.42	133.30	407.12
699-57-29B	416.18	54.99	361.19
699-57-83	578.22	146.29	431.93
699-58-24	418.80	57.71	361.09
699-59-32	424.29	62.98	361.31
699-59-58	497.77	95.54	402.23
699-59-80B	583.25	160.45	422.80
699-60-32	425.30	64.05	361.25
699-60-57	496.64	62.28	428.36
699-60-60	512.03	111.70	400.33
699-61-37	442.94	61.54	381.40
699-61-41	428.92	33.23	395.69
699-61-62	497.51	95.64	401.87
699-61-66	522.18	121.26	400.92
699-62-31	434.12	72.91	361.21
699-62-43A	432.30	36.40	395.90
699-62-43F	423.34	31.00	392.34
699-63-25A	395.15	34.13	361.02
699-63-51	424.54	25.37	399.17
699-63-58	491.90	91.36	400.54
699-63-90	509.73	113.53	396.20
699-63-92	497.40	100.39	397.01
699-64-27	414.29	53.09	361.20
699-64-62	500.25	100.03	400.22
699-65-22	391.10	31.04	360.06
699-65-38	433.58	32.51	401.07
699-65-50	467.06	67.92	399.14
699-65-59A	506.96	107.37	399.59
699-65-72	540.28	142.40	397.88

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Well	Casing elevation (ft above m.s.l.)	Depth to water (ft)	Water level elevation (ft above m.s.l.)
699-65-83	485.63	90.75	367.88
699-65-95	452.26	55.88	396.38
699-66-23	389.01	28.20	360.81
699-66-38(0)	436.46	33.50	402.96
699-66-39	453.70	47.97	406.73
699-66-58	503.33	105.96	397.37
699-66-64	505.92	106.39	399.53
699-66-91	467.75	70.22	397.53
699-66-103	463.01	65.67	397.34
699-67-51	524.60	125.25	399.35
699-67-86	472.39	76.40	395.99
699-67-98	455.47	59.52	395.95
699-68-105	451.85	56.10	395.75
699-69-38	422.93	20.62	402.31
699-69-45(0)	487.18	88.40	398.70
699-70-23	391.71	29.56	362.15
699-70-68	526.22	127.93	398.29
699-71-30	400.68	29.70	370.98
699-71-52	523.00	124.50	398.50
699-71-77	472.28	77.25	395.03
699-72-73	482.57	86.75	395.82
699-72-88	437.37	39.04	398.33
699-72-92(0)	452.48	55.15	397.33
699-74-44	445.18	48.93	396.25
699-74-48	487.18	91.23	395.95
699-73-61	531.53	132.96	398.57
699-77-36	412.28	35.75	376.53
699-77-54	480.59	83.66	396.93
699-78-62	469.88	74.73	395.15
699-80-43S	412.52	24.77	387.75
699-81-38	406.47	27.11	379.36
699-81-58	413.73	43.40	370.33

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Well	Casing elevation (ft above m.s.l.)	Depth to water (ft)	Water level elevation (ft above m.s.l.)
699-82-45A	413.73	26.10	387.63
699-83-32	407.58	38.07	369.51
699-83-47	435.27	46.44	388.83
699-84-35A	400.05	25.90	374.15
699-86-42	409.92	25.33	384.59
699-87-55	458.63	70.55	388.08
699-89-35	397.46	26.90	370.56
699-90-34	392.39	22.21	390.18
699-90-45	422.15	37.50	384.65
699-91-37	422.93	50.56	372.37
699-92-49	432.09	49.06	383.03
699-97-43	421.81	43.12	378.69
699-99-42 ^b	412.88		
299-E13-3	741.48	338.52	402.91
299-E13-10	733.75	333.19	400.56
299-E13-12	731.34	330.24	401.10
299-E13-14	742.85	339.66	403.19
299-E16-2 ^g	680.56		
299-E17-1	718.88	316.61	402.27
299-E19-1	736.00	332.48	403.52
299-E23-1	709.65	307.02	402.63
299-E23-2(0)	721.00	318.60	402.40
299-E24-4	697.00	294.32	402.68
299-E24-7	716.32	313.67	402.65
299-E25-3	691.81	289.13	402.05
299-E25-4	659.39	255.24	404.15
299-E25-9	655.16	252.17	402.99
299-E25-11 ^g	681.51		
299-E26-1	617.25	214.40	402.85
299-E26-4	645.50	242.47	403.03
299-E27-1	681.05	278.29	402.76
299-E27-3(0)	683.53	280.85	402.68

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Well	Casing elevation (ft above m.s.l.)	Depth to water (ft)	Water level elevation (ft above m.s.l.)
299-E28-7	685.91	284.09	401.82
299-E28-8	668.58	265.98	402.60
299-E28-18	692.58	289.98	402.60
299-E32-1	656.17	253.67	402.50
299-E33-7	$625.99 + 0.55^h$	224.34	402.20
299-E33-8	648.04	245.43	402.61
299-E33-12	623.60	219.58	404.02
299-E33-14	622.12	219.48	402.64
299-E33-17	631.66	229.10	402.56
299-E33-21	663.43	260.87	402.50
299-E34-1	629.42	226.80	402.62
299-W10-2	674.33	204.67	469.66
299-W10-5	672.31	201.14	471.17
299-W10-8	680.33	211.90	468.43
299-W11-2(0)	714.74	249.68	465.06
299-W11-7	709.11	242.22	466.89
299-W11-9	722.94	261.18	461.76
299-W11-10	728.89	270.04	458.85
299-W11-12	679.58	210.44	469.14
299-W11-13(0)	692.27	223.15	469.12
299-W11-23	686.12	217.71	468.41
299-W12-1	726.46	273.33	453.13
299-W14-1 ⁱ	665.83		
299-W15-2	690.71	217.80	472.91
299-W15-4	662.00	187.02	474.98
299-W15-5(0)	670.95	193.44	477.51
299-W19-1(0)	674.04	193.56	480.48
299-W19-3	695.12	221.86	473.26
299-W19-4	715.52	251.02	464.50
299-W21-1	699.26	239.08	460.18
299-W22-7	687.41	220.67	466.74
299-W22-17	$672.00 + 0.10^h$	197.70	474.40

Well	Casing elevation (ft above m.s.l.)	Depth to water (ft)	Water level elevation (ft above m.s.l.)
299-W22-22	690.38	224.44	465.94
299-W22-33	675.00 + 0.38 ^h	204.82	470.56
299-W22-35	681.00 + 0.07 ^h	204.85	476.22
299-W23-4	662.82	182.14	480.68
299-W23-11	664.14	185.59	478.55
199-B4-1	461.70	64.74	396.96
199-D2-5	460.86	73.63	387.23
199-F5-1	406.56	36.74	369.82
199-H3-1	421.98	45.78	376.20
199-K-11	467.00	74.36	392.64
399-8-1	394.87	52.08	342.79

^aThe flowing zone is confined.

^bDry.

^cObstructed.

^dObstruction at 221 feet.

^eWet.

^fCould not locate.

^gNo reading - too much condensation.

^hCasing elevations need these official corrections.

ⁱDry or obstructed.

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APPENDIX D

ROCKWELL GROUND-WATER MONITORING NETWORK - 1980 RESULTS

Well number	Site monitored	Total alpha (pCi/mL)	Total beta (pCi/mL)	^3H (pCi/mL)	^{90}Sr (pCi/mL)	^{137}Cs (pCi/mL)	^{106}Ru (pCi/mL)	^{60}Co (pCi/mL)	NO_3^- (p/m)	U (mg/L)
Table II Limits		NA ^a	NA ^a	3.00E+03	3.00E-01	2.00E+01	1.00E+01	3.00E+01	4.5E+01	
2E-13-5 Maximum Mean Minimum	216-B-18		<7.50E-02 ^b	<5.50E-01						
2E-13-8 Maximum Mean Minimum	216-B-21		<7.50E-02 ^b							
2E-13-14 Maximum Mean Minimum	216-B-29		<7.50E-02 <5.68E-02 <2.24E-03							
2E-13-19 Maximum Mean Minimum	216-B-28		<7.50E-02 ^b							
2E-13-20 Maximum Mean Minimum	B-C cribs		<4.21E-02 ^b							
2E-16-1 Maximum Mean Minimum	216-A-30		<7.50E-02 <5.99E-02 <1.46E-02							
2E-16-2 Maximum Mean Minimum	216-A-30		<7.50E-02 <4.70E-02 <3.53E-03							
2E-17-1 Maximum Mean Minimum	216-A-10		7.90E-02 7.02E-02 5.18E-02		7.33E-03 ^b				6.80E+00 ^b	

Well number	Site monitored	Total alpha (pCi/mL)	Total beta (pCi/mL)	^3H (pCi/mL)	^{90}Sr (pCi/mL)	^{137}Cs (pCi/mL)	^{106}Ru (pCi/mL)	^{60}Co (pCi/mL)	NO_3^- (p/m)	U (mg/L)
Table II Limits		NA ^a	NA ^a	3.00E-03	3.00E-01	2.00E+01	1.00E+01	3.00E+01	4.5E+01	
2E-17-2	216-A-27									
Maximum		4.40E-02	<7.50E-02						7.30E+00 ^b	2.20E-02
Mean		3.33E-02	<7.20E-02							1.71E-02
Minimum		2.60E-02	5.58E-02							1.40E-02
2E-17-5	216-A-36B									
Maximum			1.37E-01							
Mean		<1.70E-02 ^b	7.82E-02	3.70E-02 ^b	5.03E-03 ^b	1.61E-02 ^b		2.76E-02 ^b	3.20E+01 ^b	
Minimum			2.91E-02							
2E-17-6	216-A-36									
Maximum			<7.50E-02							
Mean			<5.29E-02							
Minimum			<1.17E-02							
2E-17-8	216-A-38									
Maximum			<7.50E-02							
Mean			<6.63E-02							
Minimum			4.89E-02							
2E-17-9	216-A-36B									
Maximum			<7.50E-02							
Mean		<1.70E-02 ^b	<6.75E-02	1.80E-01 ^b	3.87E-03 ^b	1.11E-02 ^b		1.95E-02 ^b	1.92E+02 ^b	
Minimum			4.64E-02							
E-23-2	200E									
Maximum										
Mean			6.80E-02 ^b	3.70E+00 ^b					6.05E+00 ^b	
Minimum										
E-24-1	216-A-5									
Maximum										
Mean			<5.76E-02 ^b	4.70E+02 ^b	2.70E-03 ^b					
Minimum										
E-24-2	216-A-10									
Maximum			<7.50E-02							
Mean		<1.70E-02 ^b	<6.93E-02	5.53E+02 ^b		3.00E-03		2.80E-02		2.72E-03 ^b
Minimum			5.20E-02							
E-24-4	216-A-9									
Maximum			<7.50E-02							
Mean			<5.20E-02							
Minimum			<2.90E-02							

Well number	Site monitored	Total alpha (pCi/mL)	Total beta (pCi/mL)	^3H (pCi/mL)	^{90}Sr (pCi/mL)	^{137}Cs (pCi/mL)	^{106}Ru (pCi/mL)	^{60}Co (pCi/mL)	NO_3^- (p/m)	U (mg/L)
Table II Limits		NA ^a	NA ^a	3.00E+03	3.00E-01	2.00E+01	1.00E+01	3.00E+01	4.5E+01	
E-24-8 Maximum Mean Minimum	216-C-5		<4.70E-02 ^b	2.45E+01 ^b		1.80E-03 ^b		<1.47E+02 ^b	2.10E+00 ^b	
E-24-12 Maximum Mean Minimum	216-A-31	4.63E-02 ^b	3.20E-01 1.43E-01 <7.50E-02							3.25E-02 ^b
E-24-13 Maximum Mean Minimum	241-A-TF		8.75E-02 ^b							
E-25-3 Maximum Mean Minimum	216-A-6		<7.50E-02							
E-25-6 Maximum Mean Minimum	216-A-8		<7.50E-02 <6.96E-02 <2.09E-02	7.20E+02 5.18E+02 1.20E+01		1.65E-02 ^b		4.70E-02 2.57E-02 <1.02E-02		
E-25-9 Maximum Mean Minimum	216-A-8		<7.50E-02 <5.65E-02 <9.42E-04						8.50E+00 ^b	
E-25-10 Maximum Mean Minimum		<1.70E-02 ^b	<7.50E-02 ^b							<6.90E-03 ^b
E-25-11 Maximum Mean Minimum	216-A-30		<7.50E-02 ^b							
E-25-13 Maximum Mean Minimum	216-AX-TF		<7.50E-02 ^b							

Well number	Site monitored	Total alpha (pCi/mL)	Total beta (pCi/mL)	^3H (pCi/mL)	^{90}Sr (pCi/mL)	^{137}Cs (pCi/mL)	^{106}Ru (pCi/mL)	^{60}Co (pCi/mL)	NO_3^- (p/m)	U (mg/L)
Table II Limits		NA ^a	NA ^a	3.00E+03	3.00E-01	2.00E+01	1.00E+01	3.00E+01	4.5E+01	
E-25-17 Maximum Mean Minimum	216-A-37		3.09E-02 ^b	1.64E+02 ^b						
E-25-18 Maximum Mean Minimum	216-A-37		1.61E-02 ^b	8.53E+02 ^b						
E-25-19 Maximum Mean Minimum	216-A-37		2.49E-02 ^b	9.96E+02 ^b						
E-25-20 Maximum Mean Minimum	216-A-37		<4.73E-03 ^b	5.81E+02 ^b						
E-26-2 Maximum Mean Minimum	216-A-24		<7.50E-02 ^b							
E-26-4 Maximum Mean Minimum	216-A-24		<7.50E-02 ^b	6.03E+01 ^b						
E-27-5 Maximum Mean Minimum	216-C-10		<7.50E-02 <5.91E-02 <1.15E-02			2.85E-03 ^b		<1.50E-02 ^b		
E-28-12 Maximum Mean Minimum	216-B-55		<7.50E-02 <7.06E-02 3.06E-02	1.40E+02 1.13E+02 9.30E+01		<6.52E-04 ^b		<2.87E-02 ^b		
E-28-13 Maximum Mean Minimum	216-B-55					2.24E-03 ^b		<1.20E-02 ^b		

Well number	Site monitored	Total alpha (pCi/mL)	Total beta (pCi/mL)	^3H (pCi/mL)	^{90}Sr (pCi/mL)	^{137}Cs (pCi/mL)	^{106}Ru (pCi/mL)	^{60}Co (pCi/mL)	NO_3^- (p/m)	U (mg/L)
Table II Limits		NA ^a	NA ^a	3.00E+03	3.00E-01	2.00E+01	1.00E+01	3.00E+01	4.5E+01	
E-28-16 Maximum Mean Minimum	216-B-12	2.43E-02 ^b	<7.50E-02							1.23E-02 ^b
E-28-17 Maximum Mean Minimum	216-B-10A, B									
E-28-18 Maximum Mean Minimum	216-B-62		8.80E-02 7.90E-02 7.50E-02		2.90E-03 ^b	1.09E-02		2.03E-02 ^b		
2E-28-21 Maximum Mean Minimum	216-B-62		<7.50E-02 <7.36E-02 6.07E-02		<2.07E-03 ^b	4.48E-02 ^b		3.25E-02 ^b		
2E-32-1 Maximum Mean Minimum	200E		5.91E-02 ^b	2.99E+01 ^b					9.00E+01 ^b	
2E-33-1 Maximum Mean Minimum	216-B-43		3.20E-01 2.38E-01 1.30E-01		2.20E-02 5.77E-03 9.91E-04	2.79E-02 ^b		1.20E-01 6.32E-02 1.20E-02		
E-33-3 Maximum Mean Minimum	216-B-44, 45, 46		1.40E+00	5.80E+01	3.30E-03 ^b			1.50E+00 ^b		
2E-33-5 Maximum Mean Minimum	216-B-47		<8.00E-01 ^b					2.80E-01 ^b		

Well number	Site monitored	Total alpha (pCi/mL)	Total beta (pCi/mL)	^3H (pCi/mL)	^{90}Sr (pCi/mL)	^{137}Cs (pCi/mL)	^{106}Ru (pCi/mL)	^{60}Co (pCi/mL)	NO_3^- (p/m)	U (mg/L)
Table II Limits		NA ^a	NA ^a	3.00E+03	3.00E-01	2.00E+01	1.00E+01	3.00E+01	4.5E+01	
2E-33-7	216-B-48, 49, 50		2.70E+00 ^b					1.30E+00 ^b		
Maximum										
Mean										
Minimum										
2E-33-8	216-B-41		<7.50E-02 ^b					3.80E-02 ^b		
Maximum										
Mean										
Minimum										
2E-33-9	241-BY-TF		4.01E-01		6.40E-03	3.30E-C2		2.05E-02 ^b		4.30E+02
Maximum			2.66E-01		3.74E-03	2.54E-C2				2.76E+02
Mean			2.00E-01		9.01E-04	<1.27E-C2				1.40E+02
Minimum										
E-33-10	216-B-35		<7.50E-02 ^b	9.23E-01 ^b					2.97E+01	
Maximum										
Mean										
Minimum										
2E-33-18	216-B-7A, 8		8.70E-02		6.70E-03			<2.72E-02 ^b		
Maximum			7.32E-02		2.73E-03	1.45E-C3 ^b				
Mean			5.20E-02		<2.70E-03					
Minimum										
2E-33-20	216-B-7A, 8, 11A, 8									
Maximum		<1.70E-02 ^b								
Mean										
Minimum										
2E-33-21	216-B-36		<7.50E-02 ^b					1.90E-02 ^b		
Maximum										
Mean										
Minimum										
2E-33-24	216-B-5		6.00E-01					7.10E-01		
Maximum			3.66E-01			2.24E-02 ^b		2.22E-01		
Mean			<7.50E-02					1.40E-02		
Minimum										

Well number	Site monitored	Total alpha (pCi/mL)	Total beta (pCi/mL)	^3H (pCi/mL)	^{90}Sr (pCi/mL)	^{137}Cs (pCi/mL)	^{106}Ru (pCi/mL)	^{60}Co (pCi/mL)	NO_3^- (p/m)	U (mg/L)
Table II Limits		NA ^a	NA ^a	3.00E+03	3.00E-01	2.00E+01	1.00E+01	3.00E+01	4.5E+01	
2E-33-26 Maximum Mean Minimum	216-B-61		5.63E-01 ^b					1.50E-01 ^b		
2E-33-27 Maximum Mean Minimum	216-BY-TF		3.80E+00 2.70E+00 1.80E+00							
2E-34-1 Maximum Mean Minimum			7.97E-02 ^b	1.26E+00 ^b		7.10E-02 ^b		2.00E-02 ^b	5.93E-01 ^b	
2W-10-1 Maximum Mean Minimum	216-T-5		<6.10E-02 ^b							
2W-10-4 Maximum Mean Minimum	216-T-36		1.64E-01 1.20E-01 7.50E-02			3.17E-03 ^b		6.62E-02 ^b		
2W-10-8 Maximum Mean Minimum	241-T-TF		1.70E-02 ^b	9.50E-02 ^b				5.07E-02 ^b		
2W-10-9 Maximum Mean Minimum	241-T-TF	<1.70E-02 ^b	1.10E-01 9.75E-02 8.00E-02			<1.58E-02		4.70E-02 3.12E-02 <2.50E-02		
2W-11-11 Maximum Mean Minimum	216-T-18		1.31E-01 9.10E-02 <7.50E-02			6.88E-04 ^b		1.99E-02 ^b		
2W-11-13 Maximum Mean Minimum	200W		1.48E-01 ^b	6.73E+01 ^b					4.20E+00	

Well number	Site monitored	Total alpha (pCi/mL)	Total beta (pCi/mL)	^3H (pCi/mL)	^{90}Sr (pCi/mL)	^{137}Cs (pCi/mL)	^{106}Ru (pCi/mL)	^{60}Co (pCi/mL)	NO_3^- (p/m)	U (mg/L)
Table II Limits		NA ^c	NA ^a	3.00E+03	3.00E-01	2.00E+01	1.00E+01	3.00E+01	4.5E+01	
2W-11-15 Maximum Mean Minimum	216-T-34		7.50E-02 6.01E-02 1.54E-02							
2W-11-18 Maximum Mean Minimum	216-T-35		1.01E-01 7.81E-02 1.23E-02							
2W-11-23 Maximum Mean Minimum	241-T-TF	<1.70E-02 ^b	<7.50E-02 ^b					2.50E-02 ^b		
2W-11-24 Maximum Mean Minimum	241-T-TF	<1.70E-02 ^b	1.50E-01 1.30E-01 1.20E-01			2.10E-02 ^b		8.20E-02 5.07E-02 3.17E-02		
2W-14-2 Maximum Mean Minimum	216-T-26, 27, 28	<1.70E-02 ^b	1.19E-01 1.04E-01 7.50E-02	1.90E-01 ^b		1.30E-03 ^b		<2.29E-02 ^b	1.98E+02 ^b	
2W-14-5 Maximum Mean Minimum	241-TX-TF		<7.50E-02 6.14E-02 2.07E-02	1.60E+01 1.31E+01 1.05E+01						
2W-14-6 Maximum Mean Minimum	241-TX-TF		<7.50E-02 6.18E-02 2.22E-02							
2W-15-3 Maximum Mean Minimum	241-TY-TF		9.45E-02 ^b			3.84E-03 ^b		4.97E-02 ^b		
2W-15-4 Maximum Mean Minimum	216-T-19		<7.50E-02 4.96E-02 2.37E-03	1.80E+03 1.36E+03 1.03E+03					7.90E+02 7.28E+02 6.50E+02	

Well number	Site monitored	Total alpha (pCi/mL)	Total beta (pCi/mL)	^3H (pCi/mL)	^{90}Sr (pCi/mL)	^{137}Cs (pCi/mL)	^{106}Ru (pCi/mL)	^{60}Co (pCi/mL)	NO_3^- (p/M)	U (mg/L)
Table II Limits		NA ^a	NA ^a	3.00E+03	3.00E-01	2.00E+01	1.00E+01	3.00E+01	4.5E+01	
2W-15-5 Maximum Mean Minimum	216-Z-11		<2.19E-02 ^b	7.35E-01 ^b					2.60E+01 ^b	
2W-15-6 Maximum Mean Minimum	216-Z-9	<1.70E-02 ^b	<5.31E-02 ^b						7.10E+01 2.03E+01 1.90E+00	
2W-15-7 Maximum Mean Minimum	216-Z-7		1.01E-01 ^b			<4.24E-03 ^b		1.20E-01 1.05E-01 7.88E-02		
2W-15-10 Maximum Mean Minimum	216-Z-16	<1.70E-02 <1.70E-02 <1.70E-02	<7.53E-02 <6.89E-02 <2.03E-02							
2W-15-11 Maximum Mean Minimum	216-Z-16	<1.70E-02 <1.70E-02 <1.70E-02	8.12E-02 7.35E-03 5.34E-02							
2W-18-5 Maximum Mean Minimum	216-Z-12	<1.70E-02 ^b	<7.50E-02 <5.90E-02 <1.09E-02							
2W-18-7 Maximum Mean Minimum	216-Z-1, 1A, 2, 3	<1.70E-02 ^b	<5.46E-02 ^b							
2W-18-12 Maximum Mean Minimum	216-Z-18	<1.70E-02 ^b	<7.50E-02 <6.01E-02 <1.54E-02							

Well number	Site monitored	Total alpha (pCi/mL)	Total beta (pCi/mL)	^3H (pCi/mL)	^{90}Sr (pCi/mL)	^{137}Cs (pCi/mL)	^{106}Ru (pCi/mL)	^{60}Co (pCi/mL)	NO_3^- (p/m)	U (mg/L)
Table II Limits		NA ^a	NA ^a	3.00E+03	3.00E-01	2.00E+01	1.00E+01	3.00E+01	4.5E+01	
2W-19-2 Maximum Mean Minimum	216-U-18	<1.70E-02 ^b	8.60E-02 5.99E-02 <3.58E-03	5.20E+01 ^b					1.60E+02 8.26E+01 2.00E-01	<6.90E-03 <6.13E-03 3.84E-03
2W-19-3 Maximum Mean Minimum	216-U-1, 2	3.00E-02 1.99E-02 <1.70E-02	1.60E-01 8.13E-02 4.08E-02	2.60E+00 9.69E-01 5.60E-01	6.28E-02 2.70E-02 <1.90E-03	<7.67E-04 ^b		1.11E-02 ^b	6.90E+00 5.10E+00 4.00E+00	1.30E-02 7.10E-03 1.60E-03
2W-19-5 Maximum Mean Minimum	216-S-23		<7.50E-02 <5.95E-02 <1.30E-02	5.80E-01 ^b					2.50E+00 1.77E+00 <1.00E-01	
2W-22-1 Maximum Mean Minimum	216-S-1	1.97E-02 ^b	1.23E+01 ^b	5.75E+02 ^b	7.39E+00 ^b			3.30E-02 ^b		
2W-22-2 Maximum Mean Minimum	216-S-1, 2	<1.70E-02 ^b	1.70E-01 ^b		2.00E-02 ^b					
2W-22-12 Maximum Mean Minimum	216-S-7		<7.50E-02 ^b	6.00E+02 ^b	<1.05E-02 ^b				6.70E+00 ^b	
2W-22-20 Maximum Mean Minimum	216-S-20		1.10E-01 ^b		8.47E-03 ^b					
2W-22-21 Maximum Mean Minimum	216-S-13	1.66E-01 ^b	9.45E-02 ^b		5.30E-03 ^b				4.60E+00 ^b	9.10E-02

Well number	Site monitored	Total alpha (pCi/mL)	Total beta (pCi/mL)	^3H (pCi/mL)	^{90}Sr (pCi/mL)	^{137}Cs (pCi/mL)	^{106}Ru (pCi/mL)	^{60}Co (pCi/mL)	NO_3^- (p/m)	U (mg/L)
Table II Limits		NA ^a	NA ^a	3.00E+03	3.00E-01	2.00E+01	1.00E+01	3.00E+01	4.5E+01	
2W-22-22 Maximum Mean Minimum	216-U-12		<7.50E-02 ^b							
2W-22-26 Maximum Mean Minimum	216-S-9		<7.50E-02 ^b	5.65E+02 ^b	3.95E-03 ^b					
2W-22-27 Maximum Mean Minimum	216-S-9		<1.73E-02 ^b	9.35E+00 ^b					3.80E+00 ^b	
2W-23-1 Maximum Mean Minimum	216-S-3		<7.50E-02 ^b							
2W-23-2 Maximum Mean Minimum	241-SX-TF		7.65E-02 ^b							
2W-23-3 Maximum Mean Minimum	241-SX-TF		<7.50E-02 ^b							
2W-23-4 Maximum Mean Minimum	216-S-21	3.37E-02 ^b	<7.50E-02 ^b	3.03E+00 ^b					5.67E-01 ^b	2.10E-02
2W-23-9 Maximum Mean Minimum	216-S-25	2.07E-02 ^b	<7.50E-02 <6.63E-02 1.46E-02	2.70E+03 4.65E+02 1.20E+02		<2.61E-03 ^b		<1.81E-02 ^b		
2W-23-10 Maximum Mean Minimum	216-S-25		<7.50E-02 <6.85E-02 1.62E-02	3.10E+03 1.02E+03 9.90E-01	4.97E-03 ^b	2.50E-04 ^b		7.14E-03 ^b		

Well number	Site monitored	Total alpha (pCi/mL)	Total beta (pCi/mL)	³ H (pCi/mL)	⁹⁰ Sr (pCi/mL)	¹³⁷ Cs (pCi/mL)	¹⁰⁶ Ru (pCi/mL)	⁶⁰ Co (pCi/mL)	NO ₃ ⁻ (p/m)	U (mg/L)	
Table II Limits		NA ^a	NA ^a	3.00E+03	3.00E-01	2.00E+01	1.00E+01	3.00E+01	4.5E+01		
2W-26-3 Maximum Mean Minimum	216-S-6	<1.70E-02 ^b	7.50E-02 ^b	<5.83E-01 ^b					6.30E-01 ^b		
699-32-72 Maximum Mean Minimum	216-S-19		<3.07E-03 ^b	1.50E+02 1.86E+02 1.20E+02					3.30E+00 1.20E+00 <5.00E-01		
699-35-78 Maximum Mean Minimum	216-U-10			<7.50E-02 <6.00E-02 <9.47E-03	<8.00E-01 <6.10E-01 3.10E-01				7.00E-01 5.85E-01 <5.00E-01		
699-53-47 Maximum Mean Minimum	216-A-25		<3.75E-02 ^b	1.30E+00 7.63E-01 <4.10E-01					<5.00E-01 <5.00E-01 <5.00E-01		
699-53-55A Maximum Mean Minimum	216-A-25	<3.75E-02 ^b		<9.00E-01 <6.30E-01 <5.00E-01					<5.00E-01 <5.00E-01 <5.00E-01		

^aNot applicable; significance of contamination determined by specific radionuclide.

^bThree values or less, no maximum or minimum calculated.

HANFORD SITE WATER TABLE MAP

DECEMBER, 1980

WATER TABLE CONTOURS IN
FEET ABOVE MEAN SEA LEVEL;
DASHED WHERE LOCATION IS INFERRED

WELLS USED IN PREPARATION OF MAP

PONDS WITH WATER SURFACE
ELEVATION (FT-MSL)

BASALT OUTCROPPING ABOVE
WATER TABLE, INFERRED

SCALE 1:62500
1 1/2 0 2 3
MILES

1 1/2 0 1 2 3
KILOMETERS

GN MIN
1° 43' 21" N
31 MILS 373 MILS

UTM GRID AND 1951 MAGNETIC NORTH
DECLINATION AT CENTER OF SHEET
(HANFORD SHEET)

BASE MAPS ARE PORTIONS OF HANFORD,
COYOTE RAPIDS, RICHLAND AND CORRAL
CANYON 15' QUADRANGLES PUBLISHED
BY U.S. DEPT. OF INTERIOR, GEOLOGICAL
SURVEY.

This Hanford Site Water-Table Map is prepared by the Hydrological Sciences Unit of the Health, Safety, and Environment Function, for the monitoring of ground-water levels in wells within the Hanford Site as part of the Surveillance and Maintenance Program. Ground-water level measurements are taken in July and December of each year.

The purpose of the program is to provide data for the Rockwell Hanford Operations ground-water management models. The data obtained are used to assess the impact of waste discharges on the unconfined ground-water regimen and to monitor the temporal and spatial variations of the ground-water mounds underlying the 200 Areas.

Measurements obtained from approximately 300 wells and piezometers provide data used in contouring the Hanford water-table map. All wells are completed in the unconfined aquifer. Of these the majority monitor the uppermost portion of the aquifer.

This map issue for measurements taken in December, 1980, consists of the tenth revision of Sheet H-2-38396 and the sixth revision of Sheets H-2-38397, H-2-38398, H-2-38399 and H-2-38877. Sheet H-2-38396 depicts the water table for the Hanford Site south and west of the Columbia River. The water table as represented by the contours has not significantly changed since the last map issue of July, 1980. Temporal water table fluctuation along the Columbia River reflects surface-water ground water interaction.

In order to better represent actual ground-water flow conditions, the extent that basalt outcrops above the water table (shown as cross-hatched areas) has been included on this map.

The four additional sheets in the series depict the water table and depth to water in the 200 East and 200 West Areas. The water table in these locations is fairly stable with most levels fluctuating less than one foot. This stability can be attributed to fairly constant recharge rates from 200 Area Disposal Facilities.

Water-table measurements will be taken again in July, 1981. A report based on those measurements will follow.

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