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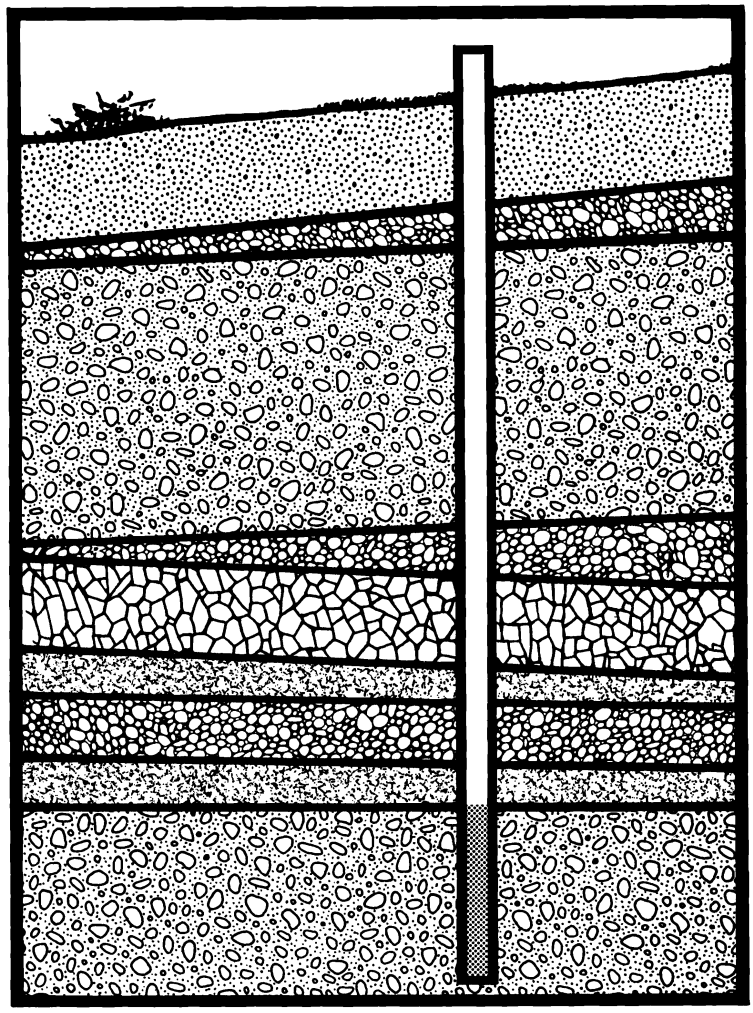
Radiological Status of The Ground Water Beneath The Hanford Site

January - December 1980



Prepared for the U.S. Department of Energy
under Contract DE-AC06-76 RLO 1830

Pacific Northwest Laboratory
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RADIOLOGICAL STATUS OF THE GROUND WATER BENEATH THE HANFORD SITE JANUARY-DECEMBER 1980

P. A. Eddy
J. S. Wilbur

April 1981

Prepared for
U.S. Department of Energy
Under contract DE-AC06-76RLO 1830

Pacific Northwest Laboratory
Richland, Washington 99352

SUMMARY

Operations at the Hanford Site since 1944 have resulted in the discharge to the ground of large volumes of process cooling water and low-level liquid radioactive waste. Radioactivity and chemical substances have been carried with these discharges and have reached the Hanford ground water. For many years wells have been used as ground-water sampling structures to gather data on the distribution and movement of these discharges as they interact with the unconfined ground water beneath the Hanford Site. During 1980, 317 such structures were sampled at various times for radionuclide and chemical contaminants. This report is one of a series prepared annually to document and evaluate the status of ground water on the Hanford Site.

Data collected during 1980 describe the movement of tritium and ruthenium-106 and the nonradioactive nitrate plume as well as their response to the influences of ground-water flow, ionic dispersion, and radioactive decay. The gross beta (^{106}Ru) plume continues to recede, with the exception of a beta source that is beginning to show up in the 300 Area.

The tritium plume continues to show increasing concentrations near the Columbia River. It is mapped as having reached the Columbia River, but contributions to the river cannot be distinguished from other sources at this time. This plume now shows much the same configuration as in 1977, 1978, and 1979. The size of the nitrate plume appears stable. Concentrations of nitrate in the vicinity of the 100-H Area continue to be high as a result of past leaks from the evaporation facility.

The results of a study to determine the ^{129}I distribution in the Hanford ground-water system indicate that the majority of contaminants are in the upper portions of the unconfined aquifer and are approaching the Columbia River. The study is nearing completion.

Impact of these ground-water discharges on the public is evaluated annually and reported in the "Environmental Surveillance at Hanford" report. The maximum dose resulting from the consumption of ground water is 0.5 mrem annually. This is from the drinking water at the FFTF.

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INTRODUCTION

Ground-water surveillance at the Hanford Site is a facet of the Comprehensive Environmental Monitoring Program. This program is designed to evaluate existing and potential pathways of exposure from site operations. The objectives of the ground-water monitoring program, conducted by Pacific Northwest Laboratory (PNL) for the U.S. Department of Energy (DOE), are to measure and report the concentration and distribution of radioactive and other chemical constituents in the ground water, to determine movement and transport of contaminants with time, and the impact of contamination on man's environs.

All routine ground-water samples for 1980 referred to in this report were taken by PNL's Environmental Evaluations Section of the Occupational and Environmental Protection Department. The samples were analyzed by PNL's Technical Analysis Section. The U.S. Geological Survey collected and comprehensively analyzed samples from specific wells. Program overview and coordination was provided by the Environmental Evaluations Section.

Data from other contractors (Rockwell Hanford Operations, United Nuclear Corporation, and Hanford Engineering Development Laboratory) were used to construct the maps in this report but were not included in the tabulation of data in the Appendix.

BACKGROUND

Since 1944, operations at the Hanford Site have resulted in the disposal of large volumes of low-level, liquid radioactive wastes and contaminated cooling water to the ground. Figure 1 shows the location and various plant operations of the Hanford Site. Most of the liquid wastes have been disposed of at or near the chemical separation areas (200 Areas) located on a plateau near the center of the site. Smaller amounts of wastes have been released at the reactor sites (100 Areas), located adjacent to the Columbia River, and at the laboratory and fuel fabrication area (300 Area). Only one reactor and its disposal facility (the 100-N Area) are currently in operation.

The disposal of liquid effluents to the ground has been greatly reduced at Hanford in the past several years, primarily because of the deactivation of all reactors except the N-Reactor, the cessation of reactor fuel processing, and the improved treatment of several waste streams.

DISPOSITION OF EFFLUENTS

Liquid effluents disposed to the ground percolate laterally and downward through 150 to 300 feet (50 to 100 m) of unconsolidated glaciofluvial and lacustrine sands, silts, and gravel that overlay the unconfined aquifer. As the wastes move through these sedimentary materials, adsorption and ion exchange take place between the minerals in the sediments and the substances in the liquid waste. Some of the longer-lived radionuclides such as strontium-90 (^{90}Sr), cesium-137 (^{137}Cs), and plutonium-239 (^{239}Pu) have favorable ion exchange characteristics and are effectively removed from the waste streams as the liquid percolates downward through the soil column. Other radionuclides, such as ruthenium-106 (^{106}Ru), cobalt-60 (^{60}Co), technetium-99 (^{99}tC), tritium (^{3}H), and nonradioactive nitrate (NO_3^-) have poor ion exchange characteristics and move through the soil column at varying rates until they eventually enter the ground water. Once they enter the unconfined aquifer, the contaminants move in a general down-gradient direction at a rate nearly equal to the velocity of the ground water. As the contaminants move with the ground water, their concentrations are further

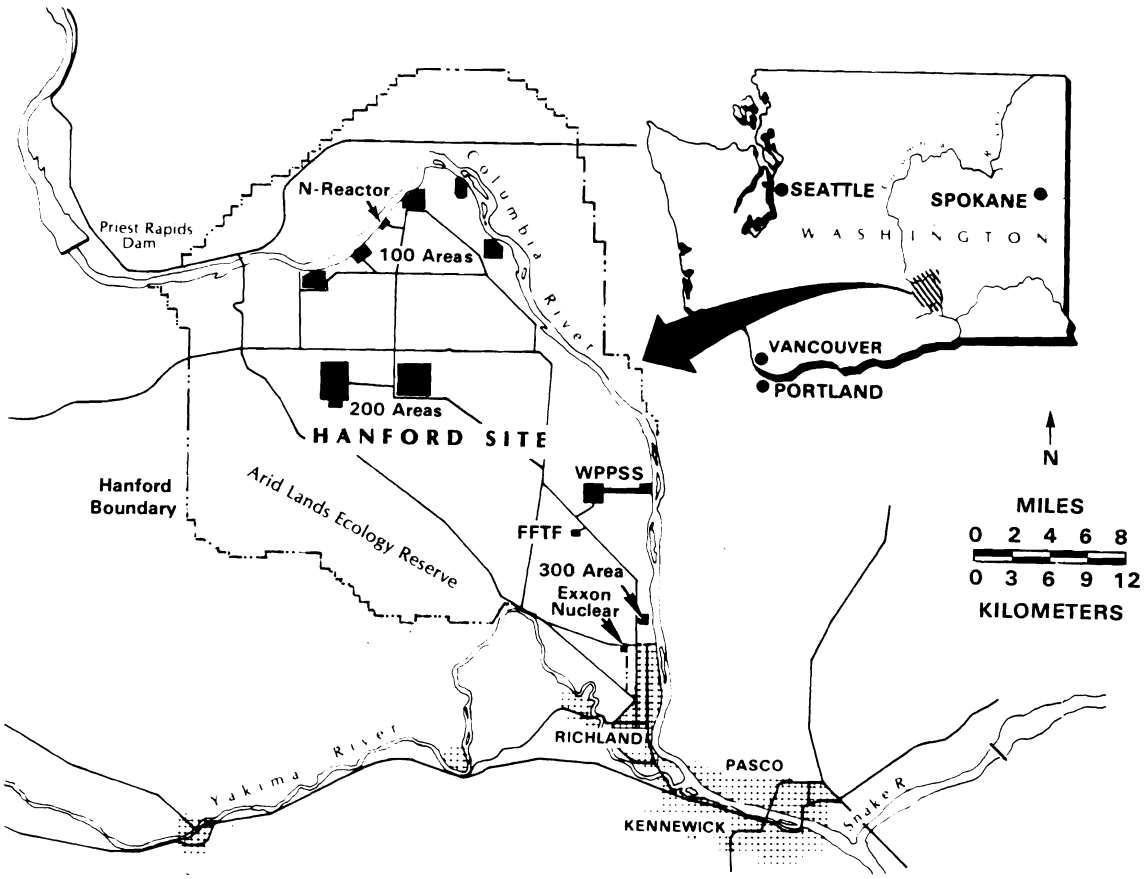


FIGURE 1. The Hanford Site

reduced by radioactive decay, ion exchange, diffusion, and hydrodynamic dispersion.

During the past thirty-seven years, the disposal of more than 6×10^{11} liters (169 billion gallons) of process cooling water and over 3×10^{10} liters (8 billion gallons) of other liquid has changed the water table configuration. Ground-water mounds, created by the discharge of water, now exists near each of the chemical processing areas and in the 100N reactor area. Generally, ground-water levels have changed continuously over the years, because of variations in the volume and location of waste water discharged to the ground. The movement of the ground water and its associated contaminants has also changed with time, reflecting the discharges of effluents.

MONITORING WELLS

Nearly 850 cased ground-water monitoring wells (McGhan and Damschen 1979) have been drilled since the beginning of the disposal operations at the Hanford Site (Figure 2). These structures provide a means for obtaining water samples and for conducting in-site investigations.

There are basically three aquifers monitored at the Hanford Site. The first or deepest is an aquifer in the basalt. When a well is drilled into this aquifer an artesian flow is generally encountered, which causes the water level in the well to rise. The second aquifer is encountered when wells are drilled into a semiconsolidated sedimentary material overlying the basalts. This second aquifer is artesian in places and unconfined in other locations. The third aquifer and probably the most important at the Hanford Site, is the unconfined aquifer. This unconfined aquifer overlies the artesian aquifers, and is associated with the unconsolidated material nearer the land surface. This aquifer appears to contain most of the contaminants and as such is monitored far more heavily than the deeper aquifers. Wells are generally drilled a few meters below the top of this aquifer and ground-water samples taken from the interval.

Most of the wells drilled at Hanford are multipurpose structures. That is, they are used to obtain geologic and hydrologic information before they become sampling structures. For a structure to be useful in monitoring, a well's casing should be perforated below the water table along its entire depth to allow water in the aquifer to flow in a direction normal to the well at all depths. However, since the heterogeneity of the sediments beneath the Hanford Site prevents this, each well structure on the site must be evaluated individually as a potential monitoring facility.

SAMPLING AND ANALYSIS

Well-water samples are obtained routinely throughout the Hanford Site. For the 1980 routine ground-water monitoring program 317 wells were sampled. From these, 1526 well-water samples were taken to provide 5120 analytical results for evaluating the effects of site operations on the ground water. (These figures do not include other contractors monitoring efforts at the

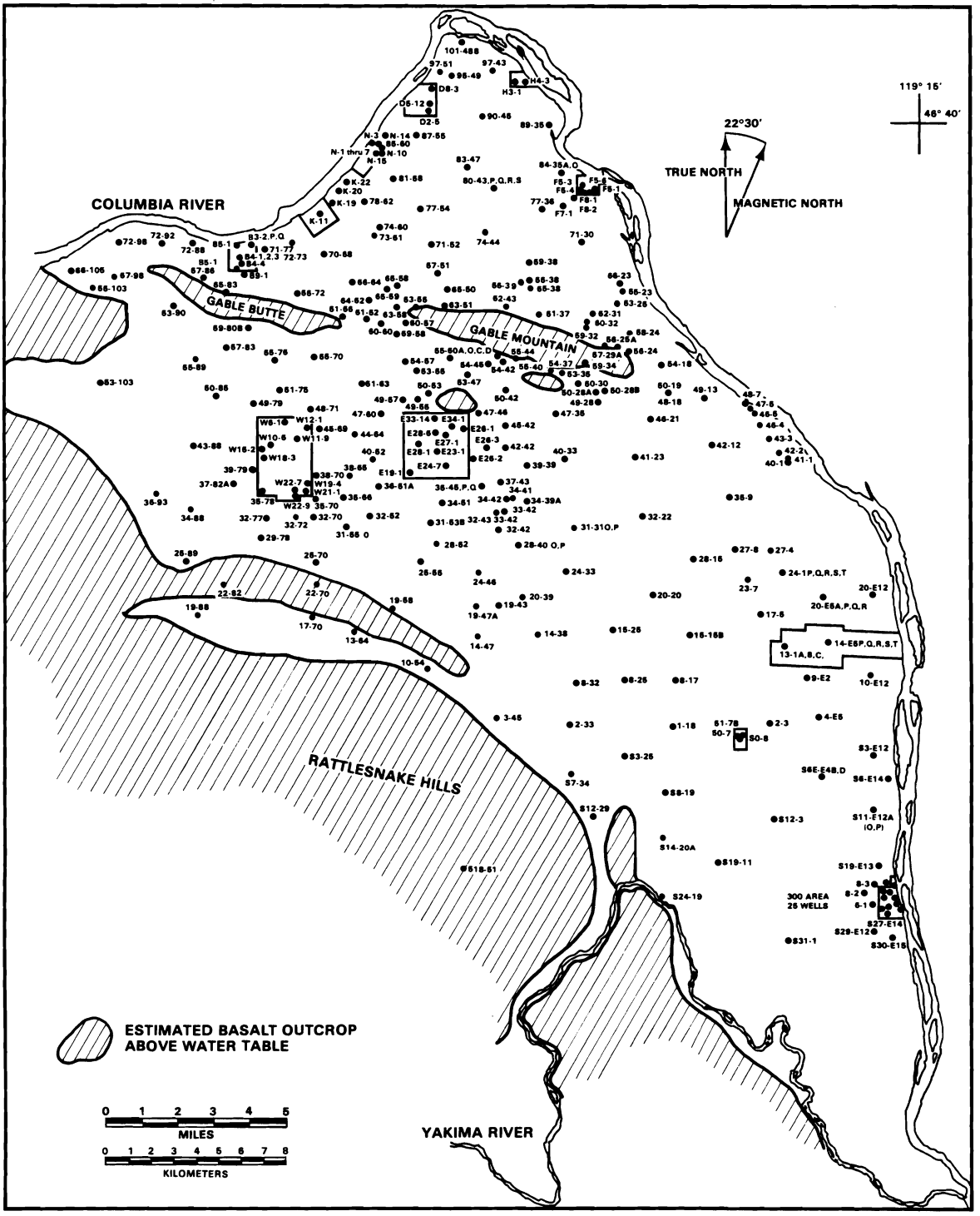


FIGURE 2. Locations of Selected Sampling Wells

Hanford Site.) The frequency of sampling is monthly, quarterly, semi-annually, or annually depending on well locations and constituents to be analyzed.

Some ground-water samples are collected just under the water surface of the unconfined aquifer by lowering a plastic bottle enclosed in a steel bailer. Where contamination appears the greatest concentration is usually observed at the surface of the water table (Eddy, et al., 1978).

Submersible sampling pumps have been installed in most key wells to obtain a more representative sample of the water in the aquifer adjacent to the well than is provided by a small-volume bailer sample. Since the submersible pumps are left in the wells this method prevents the possibility of cross contamination that may result from using a single bailer to sample several wells. At a few locations, where appropriate well structures are available, samples are obtained from the confined aquifers. Some small diameter wells and piezometer tubes are sampled by the airlift method (Trescott and Pinder, 1970).

Three substances are readily transported in ground water with little decrease in concentration from adsorption or ion exchange. The radionuclides are represented by gross beta measurements and are calculated as ruthenium (^{106}Ru) and tritium (^{3}H). The nonradioactive substance is the nitrate ion (NO_3^-). Therefore, these substances are used as primary tracers to monitor the movement of contaminated ground water. In addition, samples from selected wells are routinely analyzed at less frequent intervals for the radionuclides ^{90}Sr, ^{137}Cs, and ^{60}Co. Total alpha (as ^{239}Pu) emission is also determined. Selected samples are analyzed by gamma spectrometry to identify the mixture of radionuclides present. Standard radiometric and chemical methods are used to analyze the routine ground-water samples.

Other radionuclides, such as ^{129}I and ^{99}Tc, have been detected in the ground water beneath the Hanford Site. Although these radionuclides generally occur in very low concentrations, they make excellent tracers of ground-water contamination. Analyses for uranium (^{238}U), fluoride (F^-) and total chromium (Cr^{+6}) are also made on selected ground-water samples in and adjacent to the areas where these substances are present and may be reaching the ground water.

EVALUATION OF GROUND-WATER SURVEILLANCE DATA

Radionuclides concentrations in the ground water beneath Hanford are evaluated in terms of their respective Concentration Guides (CGs; U.S. Department of Energy, 1977). Radioactive materials are also compared with Drinking Water Regulations (DWR) promulgated by the Environmental Protection Agency (EPA 40 CFR 141) as adopted by the State of Washington. The comparison between the actual concentration and the guidelines provides a conservative method for evaluating the potential significance of most water-borne materials. The CGs used in this report are those that apply to uncontrolled areas. Table 1 shows the detection limit and applicable CGs or DWR for various chemicals analyzed under the routine ground-water monitoring program.

TABLE 1. Lower Analytical Detection Limit and Lowest Applicable Concentration Guides or Drinking Water Regulations

Analysis	Detection Limit (pCi/mℓ)	CGs
Gross Beta (as ^{106}Ru)	0.08	NA(a)
Total Alpha (as ^{239}Pu)	0.017	NA(a)
^{3}H	0.5	3,000.0
^{60}Co	0.02	30.0
^{90}Sr	0.03	0.3
^{106}Ru	0.06	10.0
^{125}Sb	0.06	100.0
^{129}I	1×10^{-8}	0.06
^{131}I	0.01	0.3
^{137}Cs	0.02	20.0
U (Natural)	3.4	20
	Detection Limit (mg/ℓ)	**DWR**
NO_3^-	0.5	45(b)
F^-	0.08	1.8
Cr^{6+}	0.01	0.05

(a) NA--Not Applicable. Significance of contaminations determined by specific radionuclide analysis.

(b) Calculated as (NO_3^-).

Each section of this report that deals with a major contaminant, contains a map showing the distribution of that contaminant. The isopleths on the maps show concentration zones rather than discrete contours because the data do not justify the additional detail. Some data from the 200 Areas were used to provide continuity in the maps although no data from waste disposal operations and resultant ground-water contamination in the 200 Areas are included in this report.

Appendix A contains tabular analytical data for 1980 on the average, maximum and minimum concentrations of the primary tracers (gross beta activity, tritium and nitrate ion). The data on the average concentrations of the primary tracers were used to generate the isopleth maps.

Table 2 shows the number of wells sampled, the number of samples taken, and the number of analyses made as part of the 1980 ground-water monitoring program for each area of the Hanford Site. The data shown in Appendices A (the primary tracers) and B (selected contaminants in ground water) were derived from analysis of these samples. The table does not list any special samples.

TABLE 2. Numerical Data on the Routine Ground-water Monitoring Program, 1980

Area	Number of Wells Sampled	Number of Samples Taken	Number of Analyses Made
100	35	163	441
200	21	84	336
300	26	230	1570
600	236	1049	2773
	318	1526	5120

GROSS BETA (β_t) CONCENTRATION IN THE UNCONFINED GROUND WATER

Figure 3 shows the concentration and distribution of gross beta (β_t) contamination in Hanford's unconfined ground water. Appendix A contains this primary tracer data for ground-water samples collected during 1980. The configurations of the β_t plumes are static with the plume's general size continuing to recede slightly since the last reporting period. The plumes continue to extend southeasterly from the 200-E Area for about 12.5 km. The increase shown in well 699-49-55 during FY-1979 has returned to the low level of previous years which indicated that the higher results were from laboratory error and not an actual increase in concentration of contamination (Figure 4).

Concentrations in the most southeasterly plume continue to be less than 1.0 pCi/mℓ. Concentrations higher than 1.0 pCi/mℓ were noted in two small plumes adjacent to the southeast corner of the 200-W Area. Figure 5 shows gross beta concentrations at well 699-34-42 that continue to be near the detection limit of 8×10^{-2} pCi/mℓ. The nature of the concentration history indicates that this well is located in an area where ground-water flow is minimal, or the concentration is decreasing as a result of dilution. The concentration history of well 699-38-70, shows a continuing supply of β_t-containing ground water with little dilution moving past this site as reflected in Figure 6.

Beta activity shown in Figure 6 results from the cyclical nature of Hanford's plants as they startup and shutdown their operations. The peak in β_t concentrations occurred in early 1971 at a level of about 1.5 pCi/mℓ. Well 699-26-15 (Figure 7) located near the extreme eastern edge of the gross beta plume where gross beta concentrations are expected to drop to very near or below the detectable levels in the near future.

Peaks in concentration histories can be used to determine travel times in the ground-water flow system. However, correlation of peaks and discharges is sometimes difficult because dispersion within the ground-water flow system tends to coalesce minor plumes from different release points and mask the true time of release.

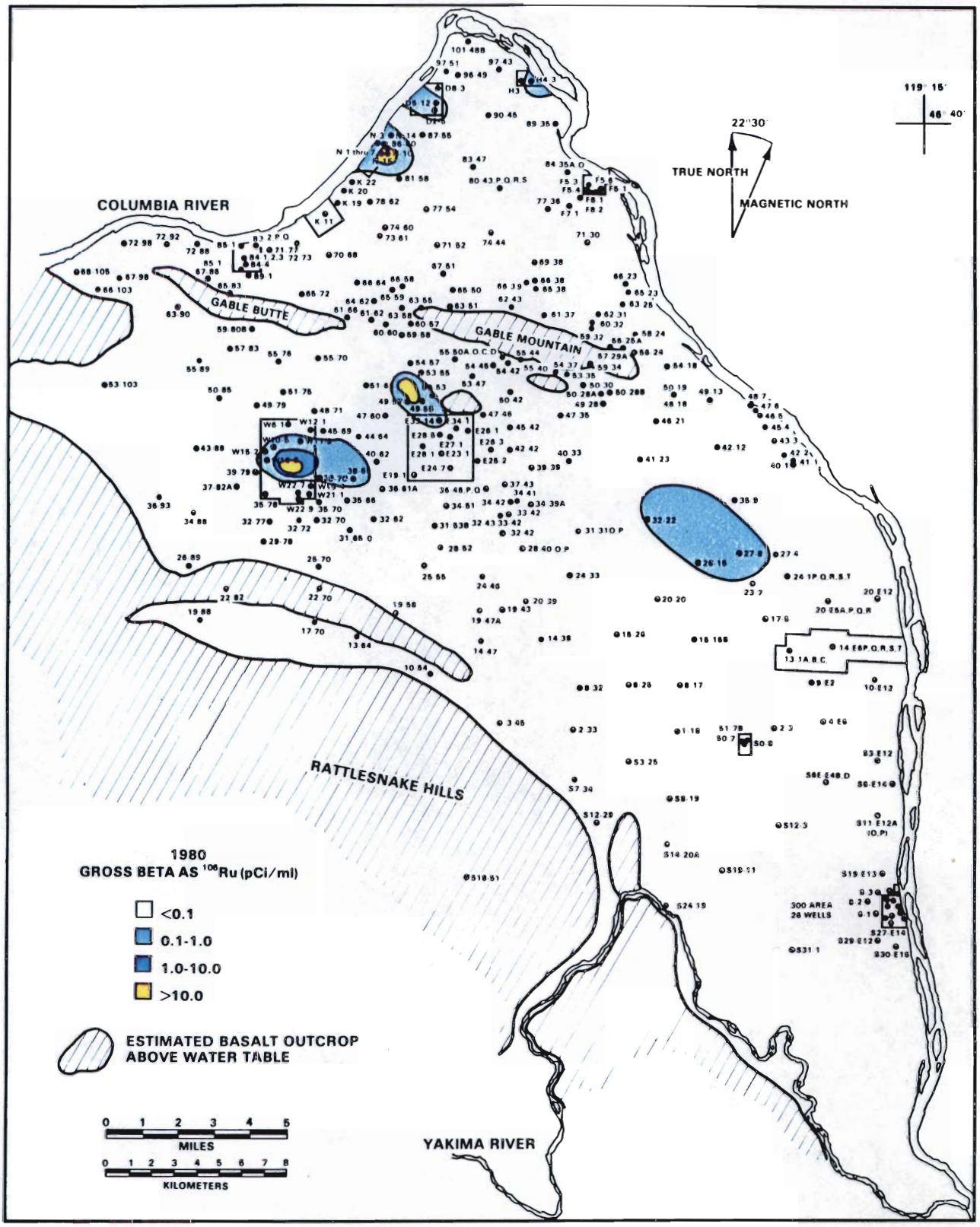
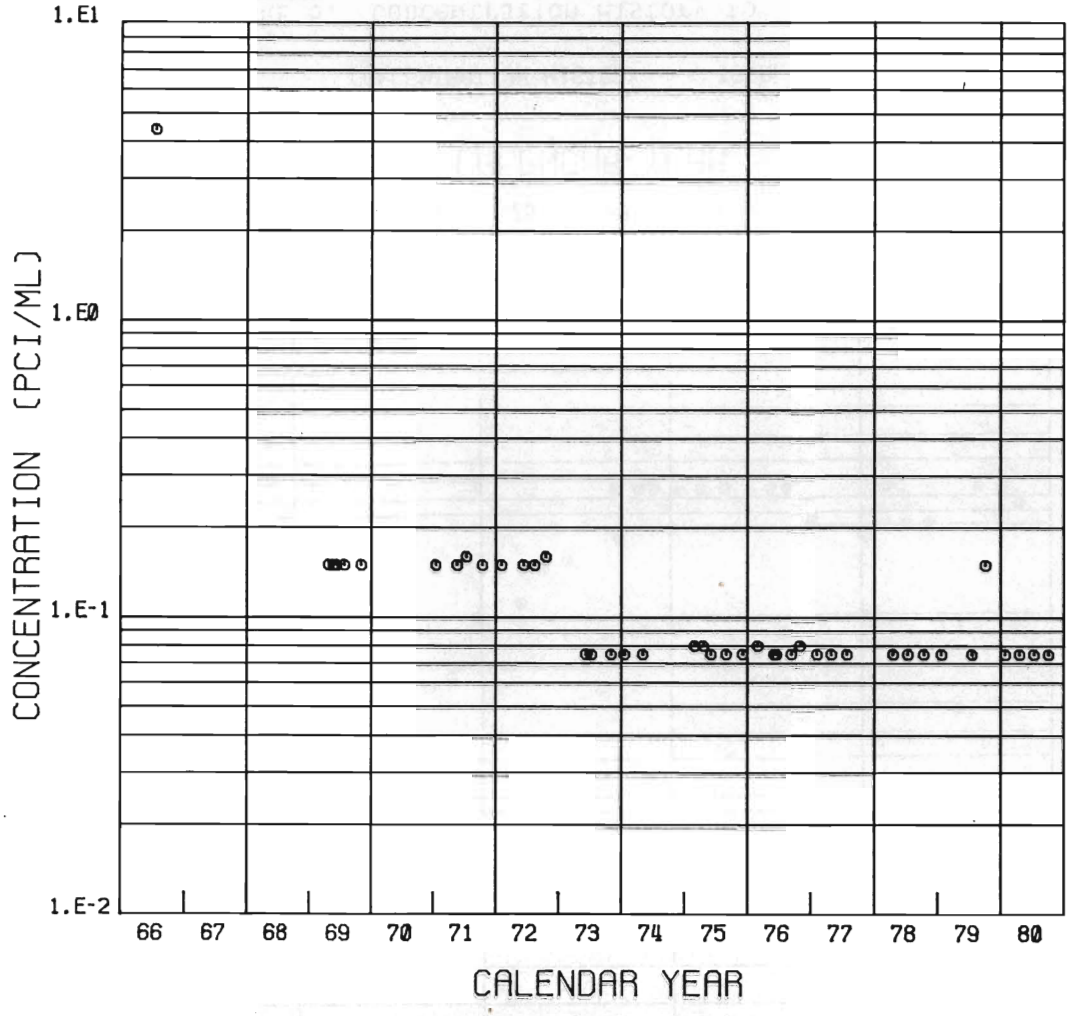
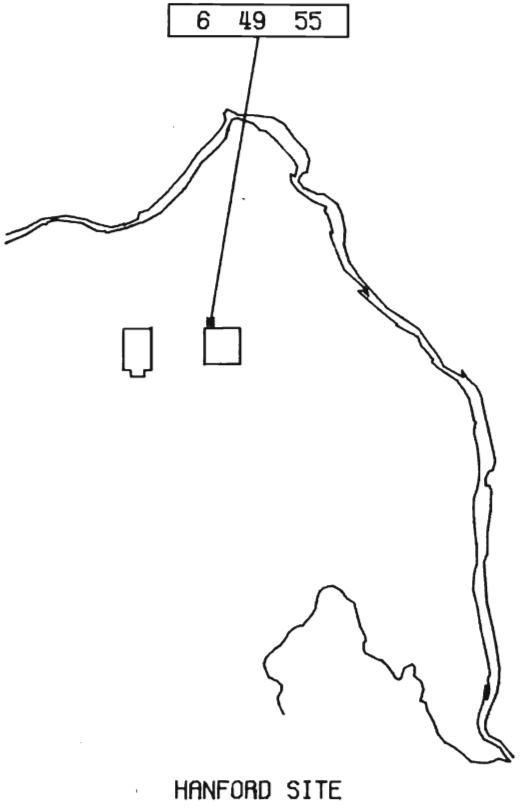


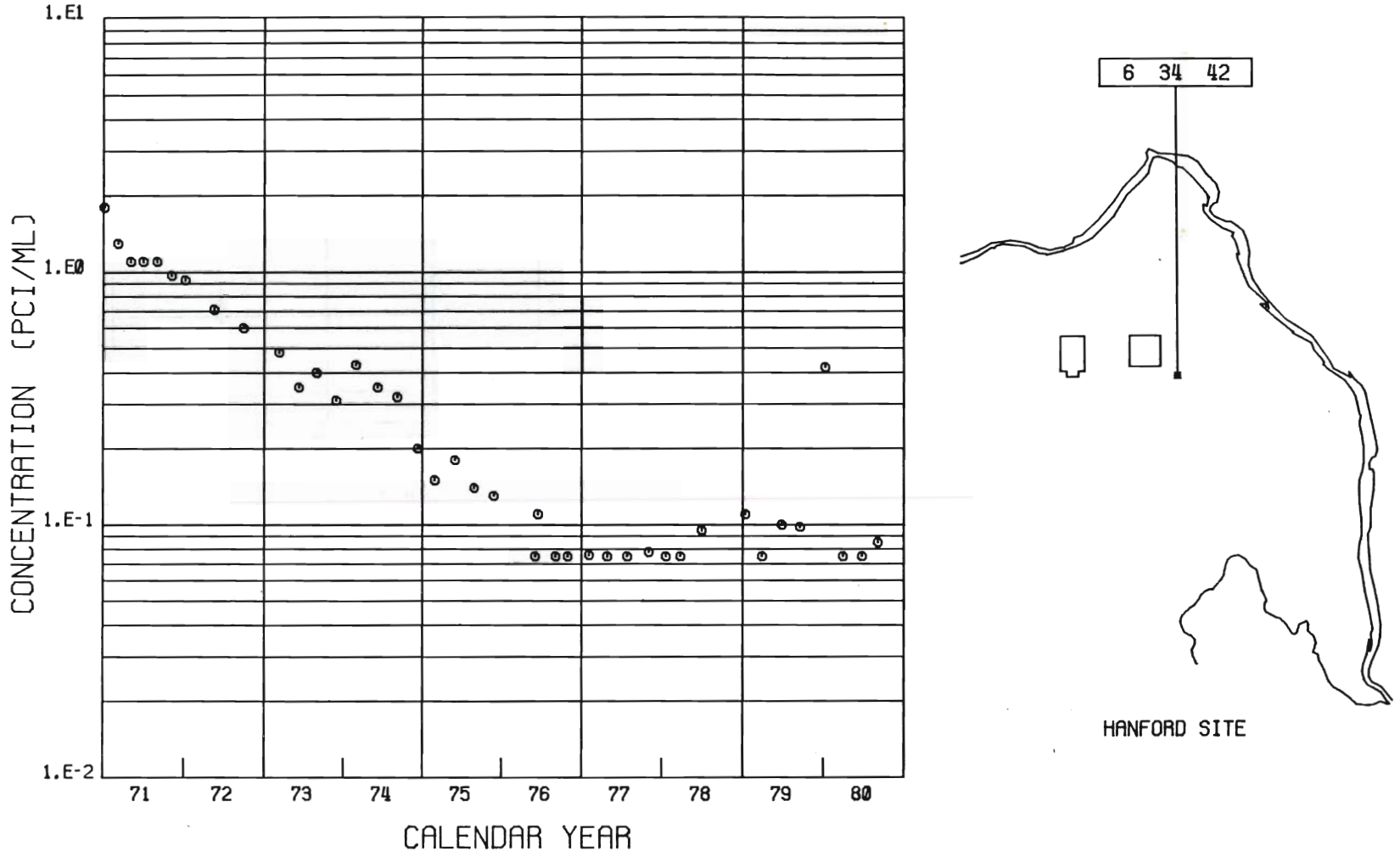
FIGURE 3. Gross Beta Distribution in Unconfined Ground Water





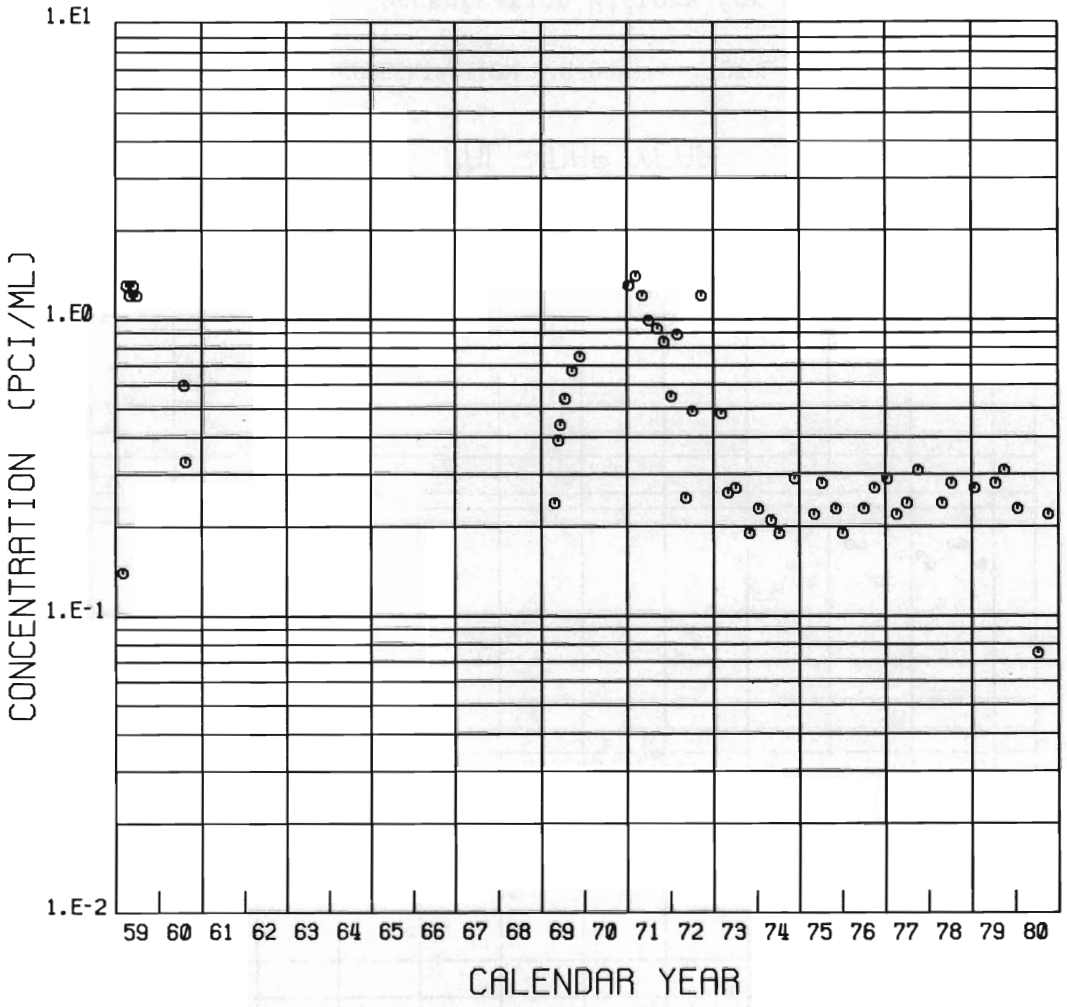
CONCENTRATION HISTORY --- TOTAL BETA

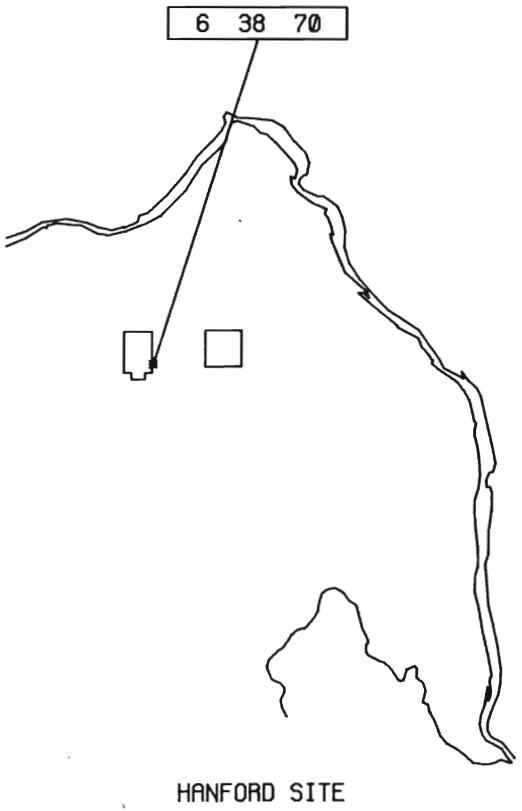
FIGURE 4. Concentration History for Gross Beta Activity in Well 699-49-55



CONCENTRATION HISTORY --- TOTAL BETA

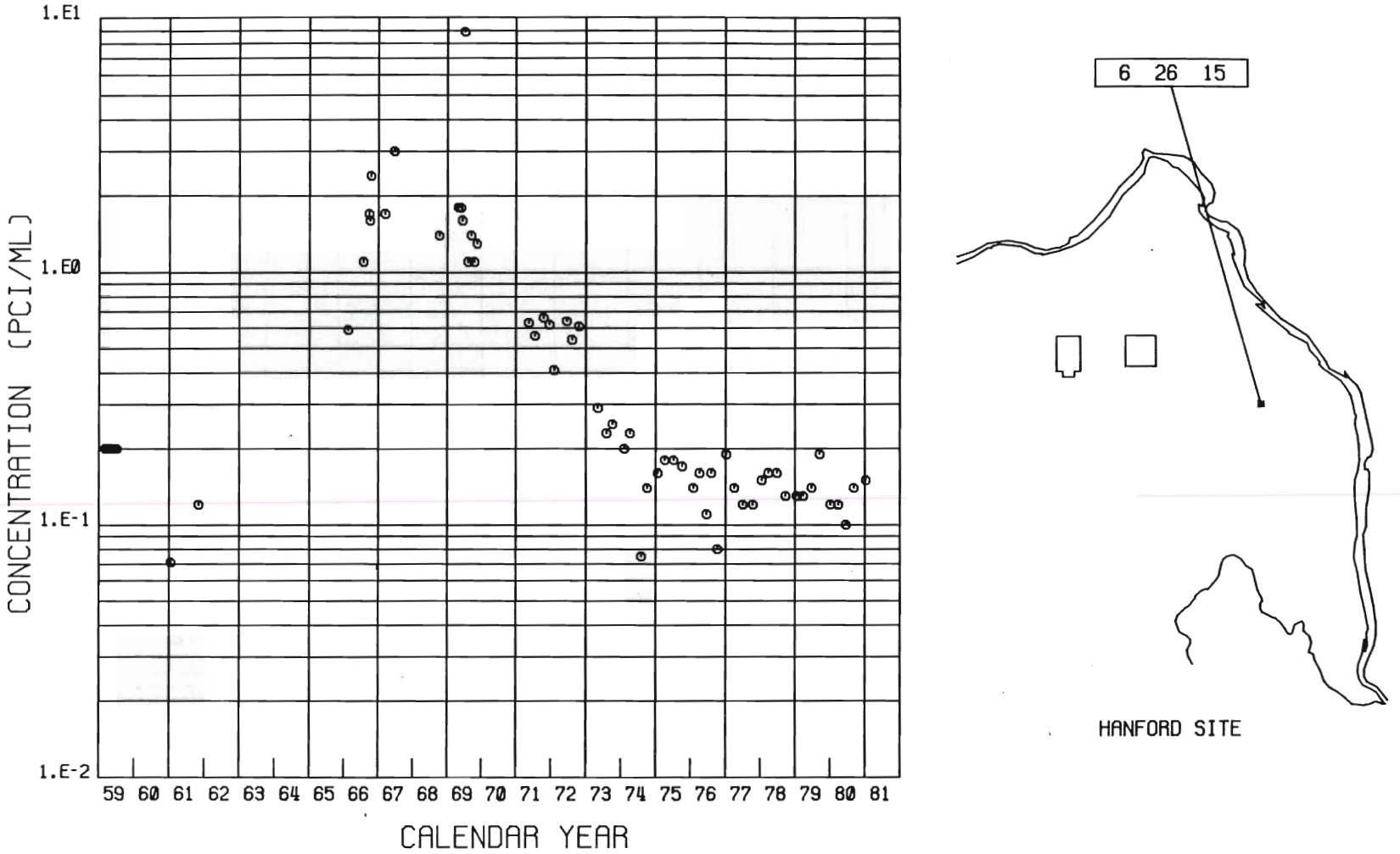
FIGURE 5. Concentration History for Gross Beta Activity in Well 699-34-42





CONCENTRATION HISTORY --- TOTAL BETA

FIGURE 6. Concentration History for Gross Beta Activity in Well 699-38-70



CONCENTRATION HISTORY --- TOTAL BETA

FIGURE 7. Concentration History for Gross Beta Activity in Well 699-26-15

In addition to the 200 Area plumes, β_t concentration of ground water is evident in the 100-B, 100-D and 100-H Areas, attributable to past operations at Hanford, in the 100-N Area from liquid waste disposal to the 1301-N trench; and in the 300 Areas, from the operation of waste disposal facilities.

DEFINITION OF GROSS BETA CONTRIBUTORS

A program to define the actual contributors to the gross beta plume was initiated in 1976. Well 699-34-42 (Figure 5) was selected for analysis because of its proximity to the 200-East Area plume. Initial analyses indicated the possible existence of minute concentrations of highly mobile radionuclides. In an effort to determine whether gross beta contributors could be detected away from the major plume, four wells were selected for comprehensive radiochemical analysis. Data from these four wells, (699-S11-E12A, 699-24-33, 699-38-65 and 699-61-62) are shown in Table 3. Figures 4-7 illustrate the changes in concentration of gross beta with time.

Additional data concerning ^{60}Co and ^{106}Ru were obtained during analysis for ^{129}I; these data are presented in a later section of this report. The low levels shown for these radionuclides were attainable only through special analytical techniques, and corroborate the data obtained to define the gross beta contributors.

The method used for detecting these gross beta contributions entails passing a large volume (1415 liters) of the ground-water sample through four 12-inch diameter fiberglass filters, two 1-inch-thick cation exchange resin beds, two 1-inch-thick anion exchange resin beds and three 1/4-inch activated aluminum oxide beds.

Analysis of the sample is accomplished by counting directly from the filters and the sorption beds. A duel-coincidence NaI (Tℓ) gamma-ray spectrometer and a Ge (Li) diode detector were used to measure the gamma-emitting radionuclides. The filters and sorption beds are then chemically stripped and individual radiochemical analyses conducted.

TABLE 3. Radionuclide Concentrations and Chemical Forms in Hanford Ground Water, 1980

Well No.	^{22}Na	^{54}Mn	^{60}Co	^{65}Zn	^{95}Zr	^{95}Nb	^{106}Ru	^{108m}Ag	^{110m}Ag	^{125}Sb	^{126}Sn	^{134}Cs	^{137}Cs	^{144}Ce	^{152}Eu	^{154}Eu	^{155}Eu	^{228}Th	^{226}Ra
699-E-12																			
Filters	<0.0122	<0.00885	0.0184	<0.0236	<0.0115	<0.00863	<0.0697	<0.00694	<0.0136	<0.0201	<0.00772	<0.00863	<0.00868	<0.0178	<0.0386	<0.0368	<0.00890	0.0536	0.118
1st Anion Bed	<0.00583	<0.00436	<0.00705	<0.0128	<0.00511	<0.00444	<0.0489	<0.00353	<0.00659	<0.0103	<0.00403	<0.00438	<0.00419	<0.00833	<0.0107	<0.0177	<0.00459	0.0167	0.0517
2nd Anion Bed	<0.00823	<0.0154	<0.00795	<0.0165	<0.00720	<0.00590	<0.0357	<0.00459	<0.00972	<0.0135	<0.00532	<0.00540	<0.00896	<0.0109	<0.0217	<0.0259	<0.00593	0.0183	0.0336
1st Cation Bed	<0.00382	<0.00293	<0.00381	<0.00742	<0.00691	<0.00276	<0.0323	<0.00222	<0.00419	<0.00651	<0.00249	<0.00309	<0.00272	<0.00481	<0.00608	<0.0108	<0.00515	0.0532	0.0285
2nd Cation Bed	<0.00450	<0.00489	<0.00477	<0.00751	<0.00371	<0.00339	<0.0233	<0.00234	<0.00447	<0.00685	<0.00275	<0.00300	<0.00292	<0.00508	<0.00630	<0.0121	<0.00282	0.0482	0.0164
1st Al_2O_3	<0.00283	<0.00212	<0.00511	<0.00548	<0.00376	<0.00206	<0.0165	<0.00167	<0.00296	<0.00484	<0.00182	<0.00201	<0.00202	<0.00361	<0.00442	<0.00770	<0.00233	0.0292	0.0117
2nd Al_2O_3	<0.00332	<0.00835	<0.00353	<0.00676	<0.00317	<0.00253	<0.0199	<0.00204	<0.00386	<0.00583	<0.00224	<0.00244	<0.00240	<0.00461	<0.00602	0.0229	<0.00256	0.00731	0.0148
699-24-33																			
Filters	<0.00937	<0.00702	0.0998	<0.0183	<0.00881	<0.00640	<0.0553	<0.00533	<0.0102	<0.0157	<0.00689	<0.0150	<0.00646	<0.0109	<0.0141	<0.0275	<0.00936	0.123	0.0653
1st Anion Bed	<0.00780	<0.0200	6.23	0.0951	<0.00999	<0.00772	0.0696	<0.00475	<0.0155	<0.0137	<0.00694	<0.00885	<0.00738	<0.0140	<0.0117	<0.0434	<0.00427	0.0556	0.0334
2nd Anion Bed	<0.00456	<0.00370	0.0909	<0.00950	<0.00430	<0.00339	<0.0277	<0.00264	<0.00528	<0.00801	<0.00289	<0.00558	<0.00329	<0.00573	<0.00713	<0.0177	<0.00312	0.0502	0.0454
1st Cation Bed	<0.00262	<0.00204	<0.00424	<0.00500	<0.00254	<0.00200	<0.0161	<0.00159	<0.00288	<0.00860	<0.00186	<0.00500	<0.00196	<0.00394	<0.00430	<0.00790	<0.00389	0.0531	0.0543
2nd Cation Bed	<0.00651	<0.00192	<0.00238	<0.00476	<0.00205	<0.00155	<0.0147	<0.00144	<0.00256	<0.00438	<0.00168	<0.00178	<0.00174	<0.00315	<0.00396	<0.00708	<0.00180	0.0487	0.0200
1st Al_2O_3	<0.00264	<0.00203	0.0109	<0.00601	<0.00241	<0.00194	<0.0168	<0.00163	<0.00304	<0.00475	<0.00274	<0.00202	<0.00195	<0.00358	<0.00449	<0.00775	<0.00199	0.0335	0.00919
2nd Al_2O_3	<0.00353	<0.00354	<0.00542	<0.00702	<0.00302	<0.00250	<0.0275	<0.00231	<0.00392	<0.00597	<0.00248	<0.00236	<0.00246	<0.00463	<0.00529	<0.0103	<0.00260	0.0132	0.0298
699-38-65																			
Filter	<0.0112	<0.00921	0.0304	<0.0228	<0.00993	<0.00774	<0.0617	<0.00634	<0.0159	<0.0182	<0.0126	<0.00765	<0.00780	<0.0142	<0.0170	<0.0316	<0.00782	0.0564	0.109
1st Anion Bed	<0.00418	<0.00367	0.179	<0.00963	<0.00465	<0.00347	<0.0448	<0.00256	<0.00534	<0.00747	<0.00297	<0.00521	<0.00316	<0.00551	<0.00678	<0.0146	<0.00300	0.0399	0.0267
2nd Anion Bed	<0.00897	<0.0102	0.00806	<0.0160	<0.00811	<0.00526	<0.0505	<0.00461	<0.00891	<0.0138	<0.00537	<0.00728	<0.00774	<0.0115	<0.0123	<0.0250	<0.00619	0.0127	0.0537
1st Cation Bed	<0.00485	<0.00384	<0.00518	<0.0102	<0.00482	<0.00366	<0.0290	<0.00297	<0.00576	<0.00857	<0.00340	0.00443	<0.00359	<0.00675	<0.00757	<0.0216	<0.00375	0.0233	0.0296
2nd Cation Bed	<0.00300	<0.00304	<0.00330	<0.00601	<0.00245	<0.00186	<0.0166	<0.00166	<0.00532	<0.00487	<0.00252	<0.00211	<0.00202	<0.00358	<0.00452	<0.00873	<0.00322	0.0360	0.0415
1st Al_2O_3	<0.00372	<0.00288	<0.00677	<0.00752	<0.00508	<0.00245	<0.0206	<0.00212	<0.00935	<0.00632	<0.00566	<0.00272	<0.00262	<0.00496	<0.00570	<0.0243	<0.00282	0.0167	0.0280
2nd Al_2O_3	<0.00270	<0.00192	<0.00259	<0.00522	<0.00239	<0.00173	<0.0184	<0.00158	<0.00300	<0.00460	<0.00173	0.00570	<0.00180	<0.00345	<0.00424	<0.0108	<0.00194	0.0323	0.00949
699-61-62																			
Filters	<0.0274	<0.00907	0.198	<0.0216	<0.00964	<0.00716	<0.0661	<0.00608	<0.0113	<0.0175	<0.00685	<0.00808	<0.00783	<0.0127	<0.0161	<0.0323	<0.0114	0.120	0.0468
1st Anion Bed	<0.0127	<0.0173	17.3	0.101	0.0245	<0.0152	0.107	<0.00845	<0.0292	<0.0248	<0.0124	<0.0176	<0.0132	<0.0138	<0.0207	<0.0798	<0.00771	0.0235	0.0217
2nd Anion Bed	<0.00532	<0.00402	0.172	<0.0117	<0.00516	<0.00399	<0.0373	<0.00409	<0.00643	<0.00892	<0.00363	<0.00406	<0.00467	<0.00829	<0.00850	<0.0183	<0.00400	0.0155	0.0400
1st Cation Bed	<0.00809	<0.00315	<0.00448	<0.00771	<0.00414	<0.00326	<0.0263	<0.00256	<0.00488	<0.00735	<0.00282	<0.00836	<0.00307	<0.00552	<0.00659	<0.0350	<0.00294	0.0540	0.0324
2nd Cation Bed	<0.00507	<0.00317	0.00946	<0.00846	<0.00398	<0.00356	<0.0266	<0.00365	<0.00513	<0.0168	<0.00284	<0.00336	<0.00323	<0.00544	<0.0179	<0.0128	<0.00307	0.0552	0.0155
1st Al_2O_3	<0.00320	<0.00254	<0.00460	<0.00691	<0.00439	<0.00340	<0.0175	<0.00463	<0.00370	<0.00540	<0.00243	<0.00242	<0.00225	<0.00779	<0.00630	<0.00911	<0.00233	0.0133	0.0398
2nd Al_2O_3	<0.00484	<0.00338	<0.00503	<0.00911	<0.00487	<0.00333	<0.0267	<0.00274	<0.00530	<0.00808	<0.00288	<0.00905	<0.00332	<0.00619	<0.00731	<0.0139	<0.00345	0.0216	0.0416

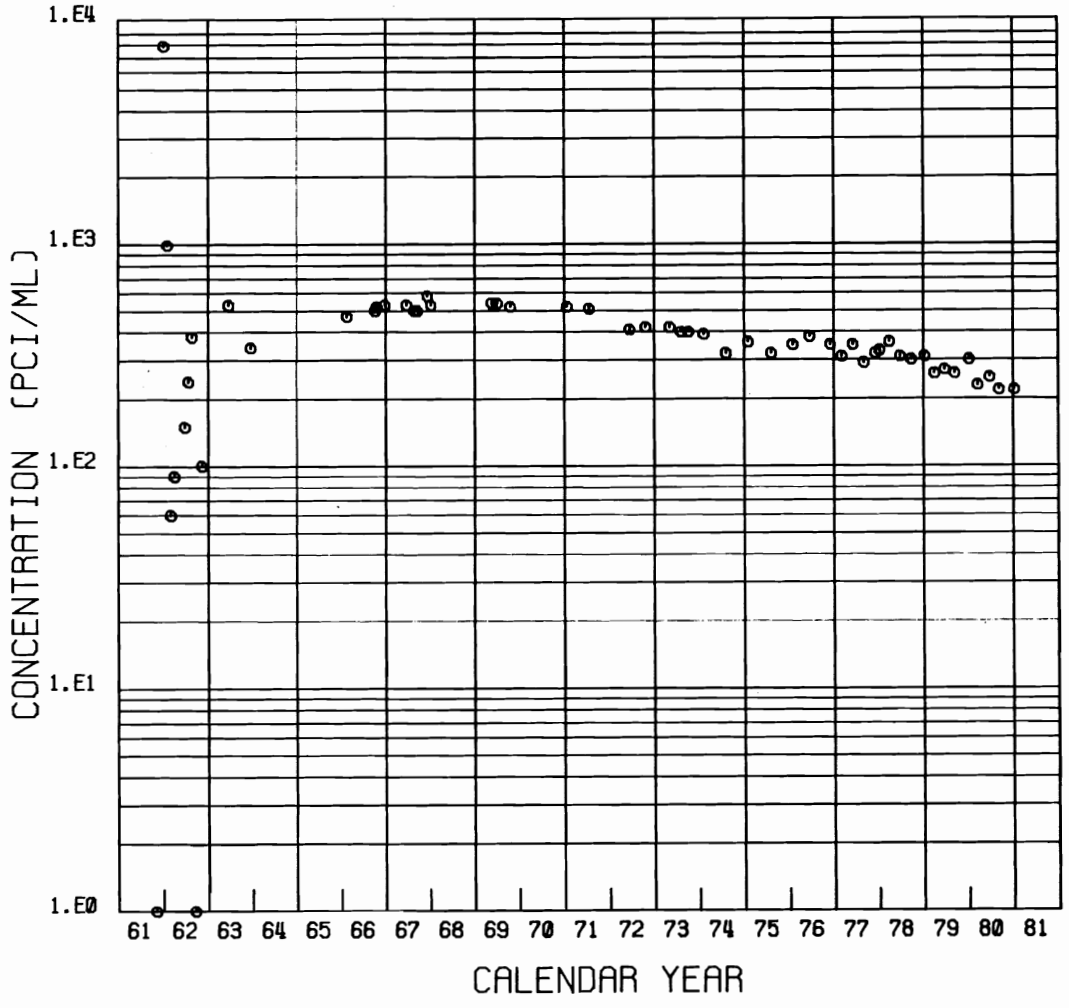
TRITIUM (^3H) CONCENTRATION IN THE UNCONFINED GROUND WATER

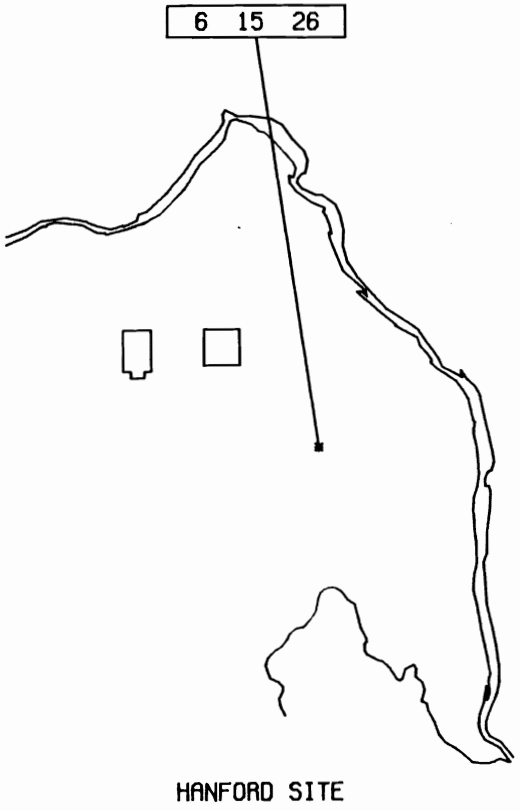
Because tritium (^3H) enters the ground-water system as part of the water molecule, it is carried along with the ground-water flow and remains almost unaffected by the geologic conditions that affect other radionuclides. Tritium, therefore, provides the most accurate and extensive overview of ground-water movement at the Hanford Site. Figure 8 shows the distribution of ^3H in the unconfined aquifer. Appendix A contains data concerning maximum, average, and minimum concentrations for samples collected in 1980.

The configuration of the ^3H plume has changed somewhat in the past year. Concentrations of ^3H in well 699-40-1, shown in Figure 8, have increased which indicates that the plume has reached the Columbia River.

Tritium concentrations in wells within the plume show different responses dependent upon the geohydrology of the locale being monitored. Figure 9 shows a concentration history for well 699-15-26. The apparent half life for ^3H in this well is about 10 years, slightly less than the actual half life. This rate of decay indicates that uncontaminated or at least less contaminated water is reaching this well. Figure 10, a graphic illustration of the concentration history for well 699-32-22 shows essentially the same results; however, ground water containing slightly higher concentrations of ^3H is indicated by the apparent half life, which is greater than 12.3 years. The concentration history of ^3H in well 699-26-15 (Figure 11) shows that, after peaking in 1969, concentrations of ^3H declined and reached an apparent equilibrium in about 1975. Ground-water flow in the vicinity of this well is such that concentrations are maintained near 1000 pCi/mℓ.

Figure 12 shows that the tritium concentration in well 699-9-E2 dropped through mid-1972, showed a gradual increase until 1978, and then declined to the present low level. Well 699-2-3 represented by Figure 13 shows a rising ^3H concentration since 1968. Although wells 699-9-E2 and 699-2-3 show different concentrations, both are used to monitor the southern portion of the ^3H plume. Well 699-9-E2 represents an area of low hydraulic conductivity, which retards the movement of ground water, and well 699-2-3 represents an area through which ground water moves at a more rapid rate.





CONCENTRATION HISTORY --- TRITIUM

FIGURE 9. Concentration History for Tritium in Well 699-15-26

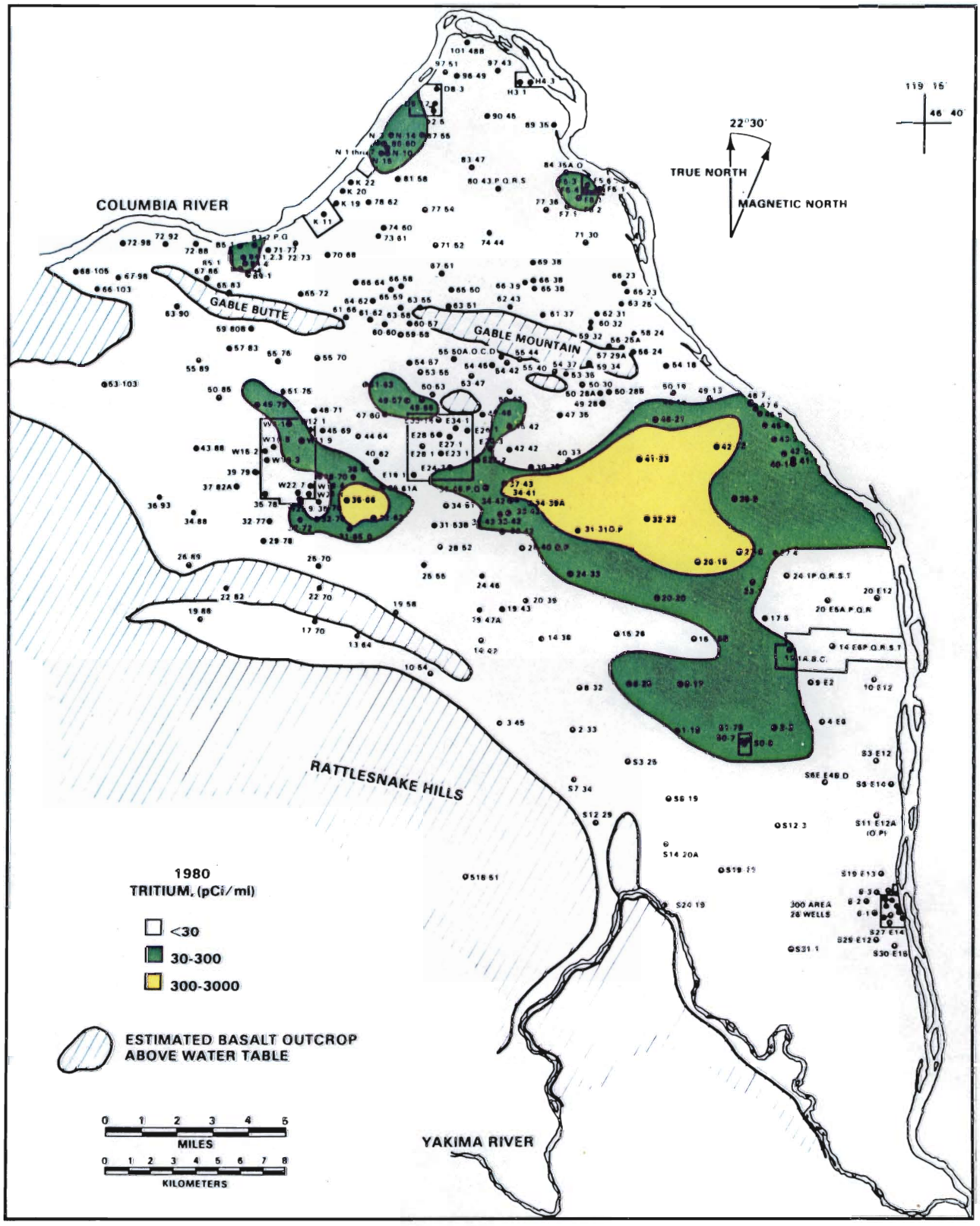
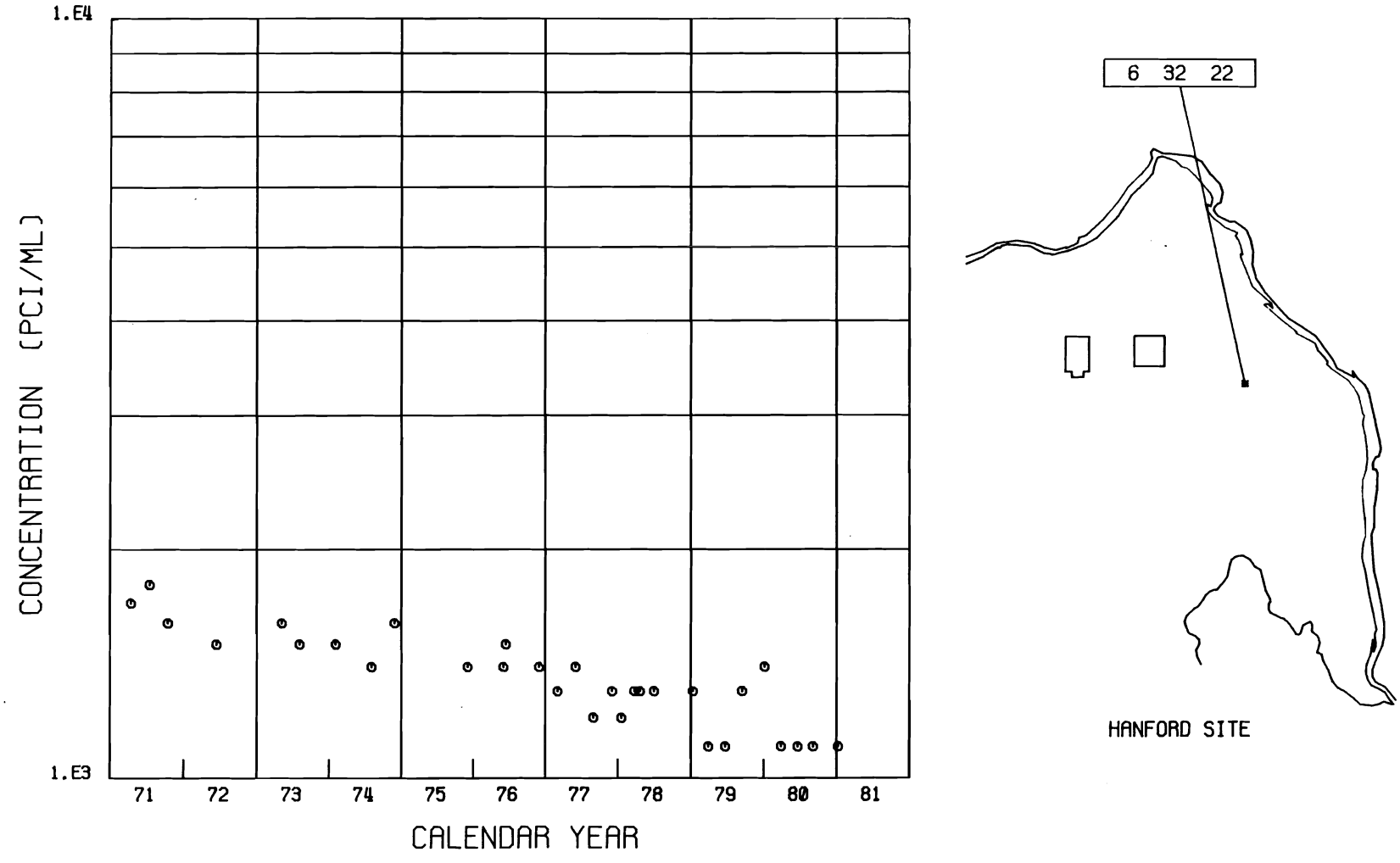
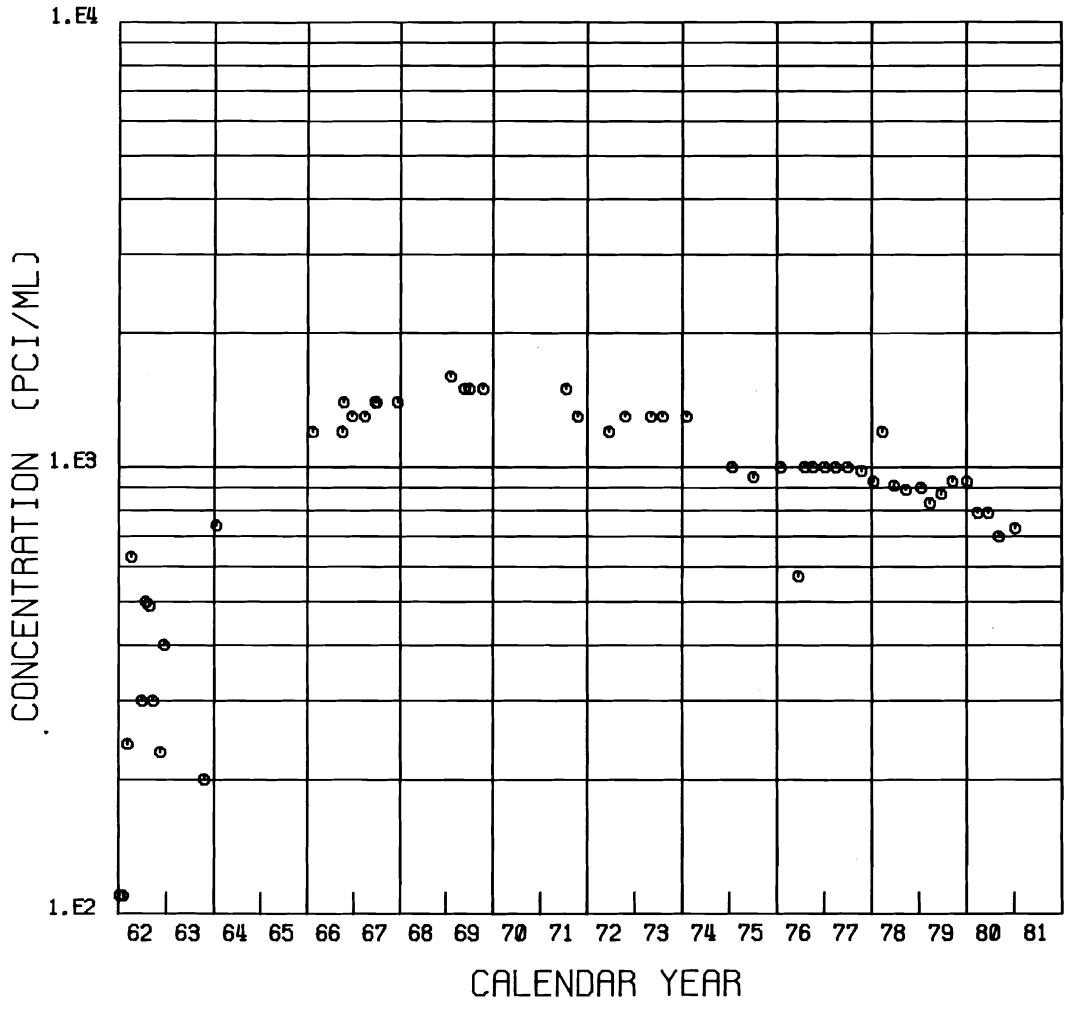


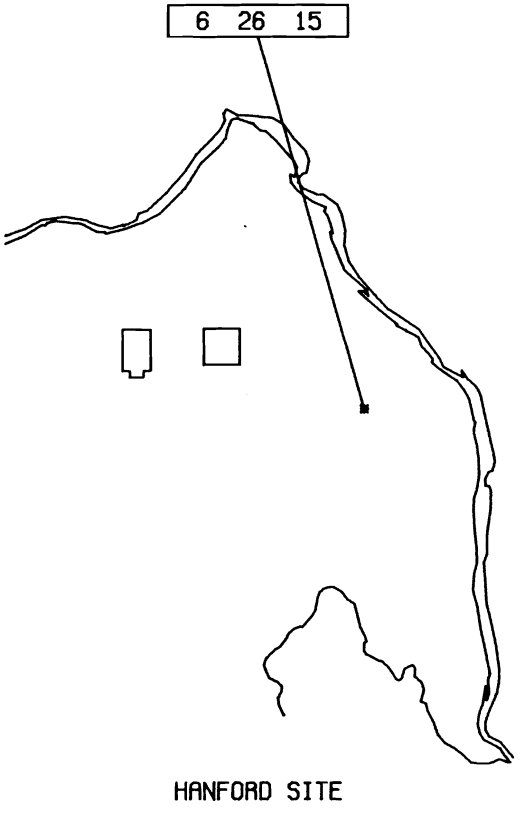
FIGURE 8. Tritium Distribution in Unconfined Ground Water



CONCENTRATION HISTORY --- TRITIUM

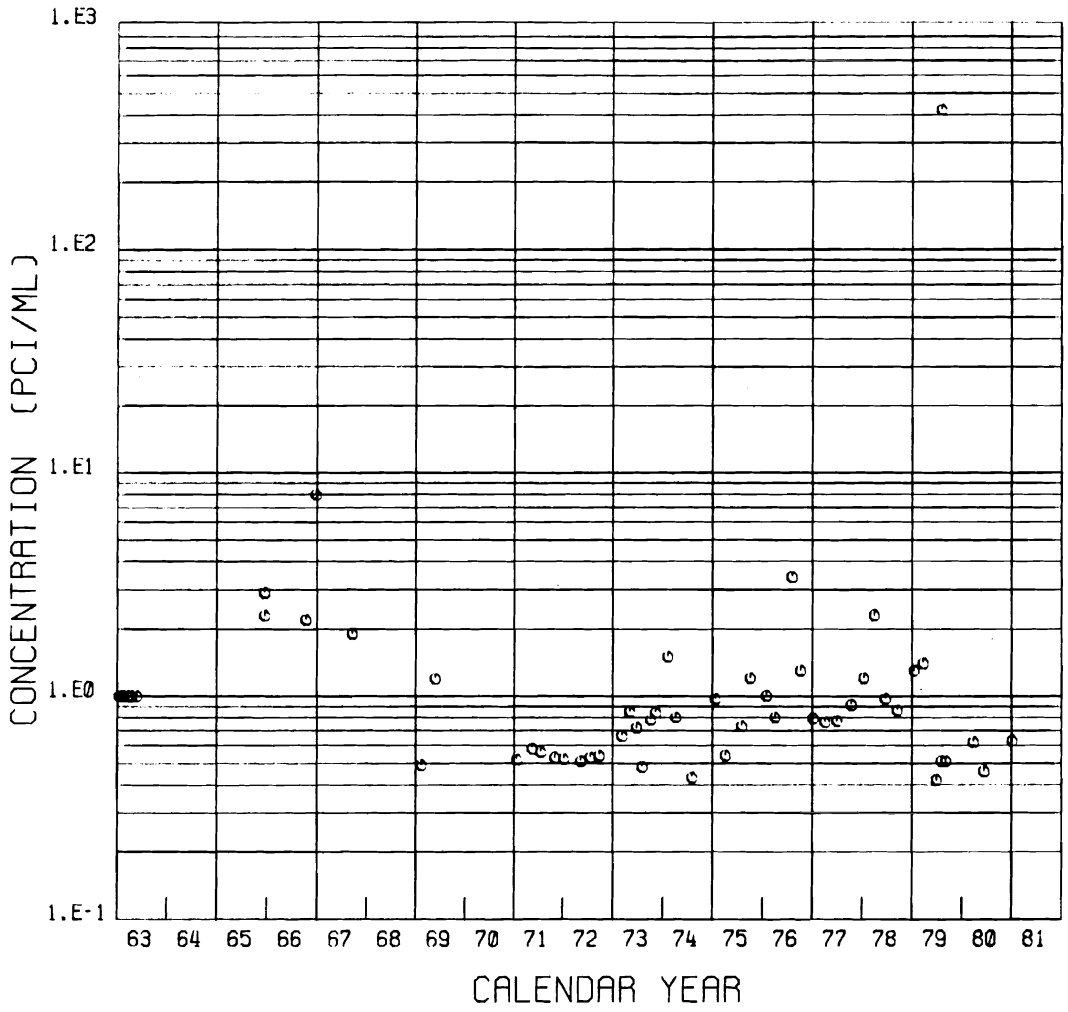
FIGURE 10. Concentration History for Tritium in Well 699-32-22

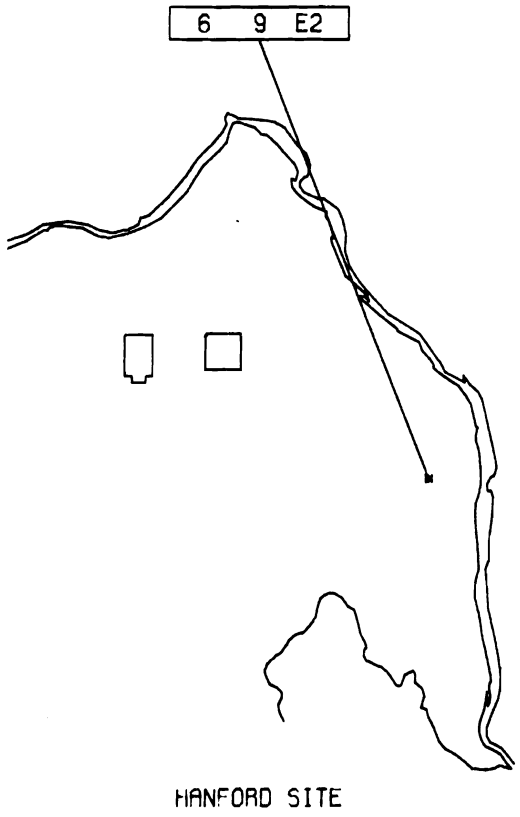




CONCENTRATION HISTORY --- TRITIUM

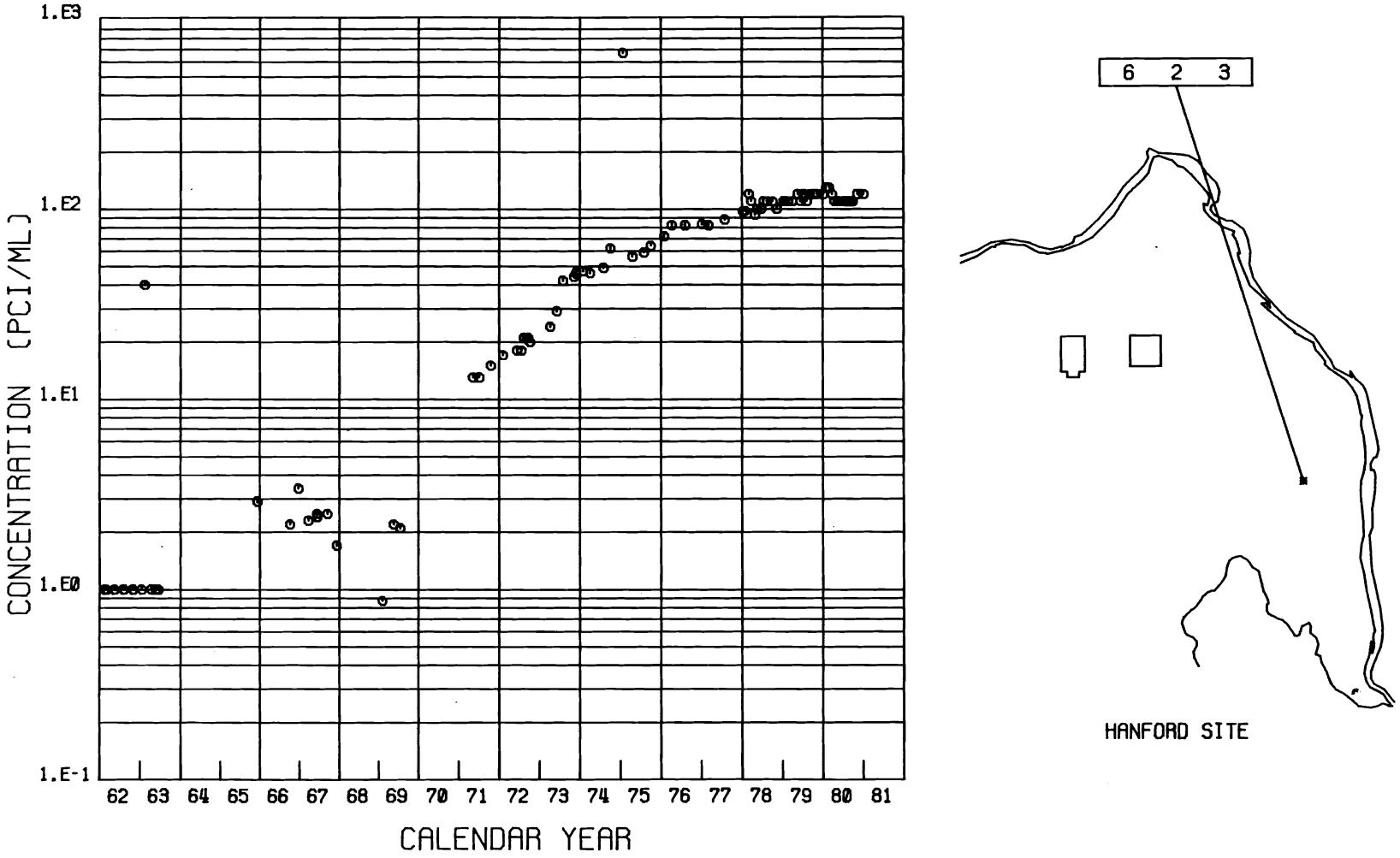
FIGURE 11. Concentration History for Tritium in Well 699-26-15





CONCENTRATION HISTORY --- TRITIUM

FIGURE 12. Concentration History for Tritium in Well 699-9-E2



CONCENTRATION HISTORY --- TRITIUM

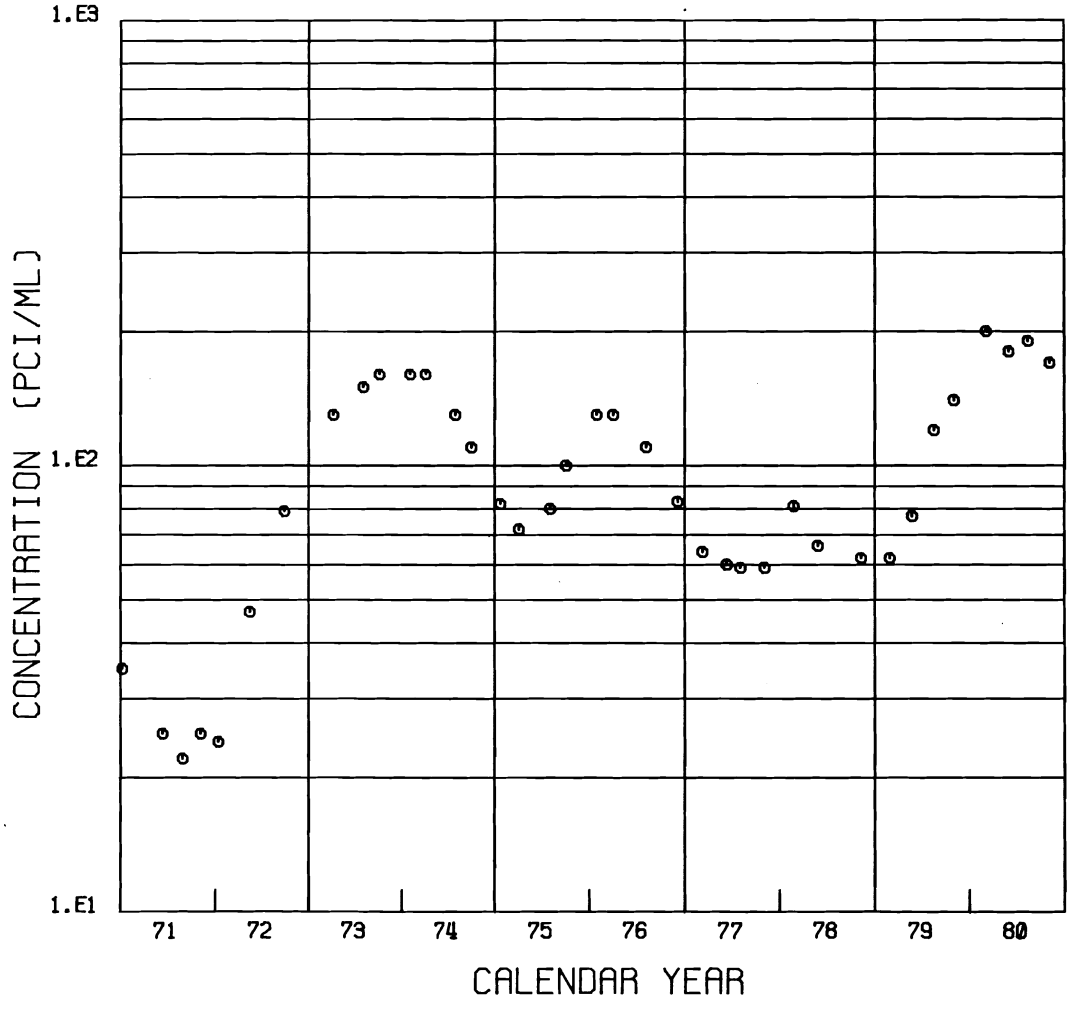
FIGURE 13. Concentration History for Tritium in Well 699-2-3

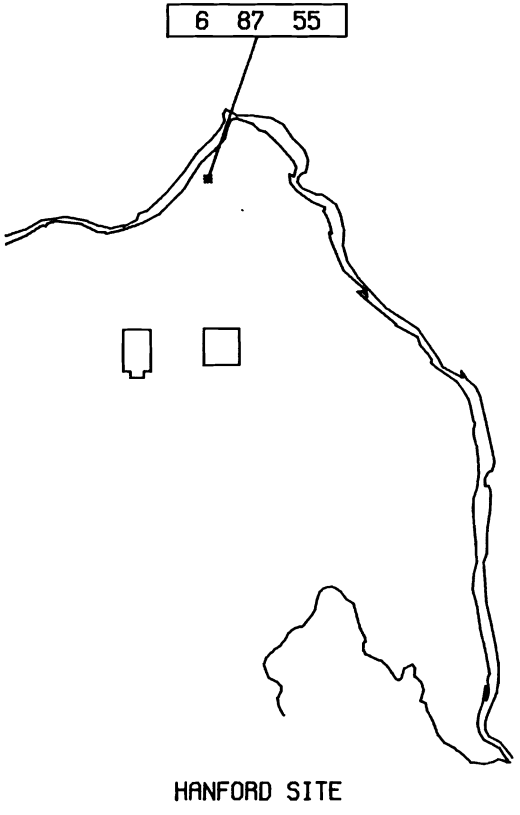
The combination of operational effects and hydrological events can be seen in Figure 14, which shows a concentration history for well 699-87-55. The graph, with its sinusoidal pattern illustrates a dynamic system which combines river flow, precipitation, reactor operations and geohydrology. This well is located about 1.8 km from N Reactor.

NITRATE (NO_3^-) CONCENTRATION IN THE UNCONFINED GROUND WATER

Figure 15 shows the concentration and distribution of nitrate (NO_3^-) in the ground water at Hanford. Appendix A contains data on the maximum, minimum and average concentrations. Data collected in 1980 indicate little areal change in the nitrate plume. Zones of elevated nitrate concentrations persist in the vicinity of the 200-E, 200-W, 100-D, 100-F, 100-H, 100-K, and 100-N Areas, and in the central portion of the main ground water plume.

The concentration histories for wells 199-H3-1 and 199-H4-3 graphically represented by Figure 16 and 17 show marked increases in the level of NO_3^- concentration. Well 199-H4-3 was drilled specifically to monitor a United Nuclear Corporation (UNC) solar evaporation facility. The facility consists of a concrete structure previously used as a retention basin for the 100-H Reactor. The basin is currently used as a concentrator for wastes generated by UNC fuel fabrication activities in the 300 Area. Wastes placed in the basin normally contain copper, sodium, nitrate, and sulphate, with small amounts of other constituents, such as chromium. The wastes do not contain radioactive materials other than trace amounts of uranium. The concentrated wastes eventually precipitate out of solution and form a recoverable crystalline coating on the bottom of the solar evaporation basin. An unknown quantity of this leaked from the pond through joints or fractures in the concrete basin and eventually reached the ground water. Mobilization of the brine was enhanced by water from a leaking valve in a fresh-water line servicing the facility. Upon realization of the problem, corrective action was initiated in 1979 which included sealing the leak in the basin and repairing the leaking valve.





CONCENTRATION HISTORY --- TRITIUM

FIGURE 14. Concentration History for Tritium in Well 699-87-55

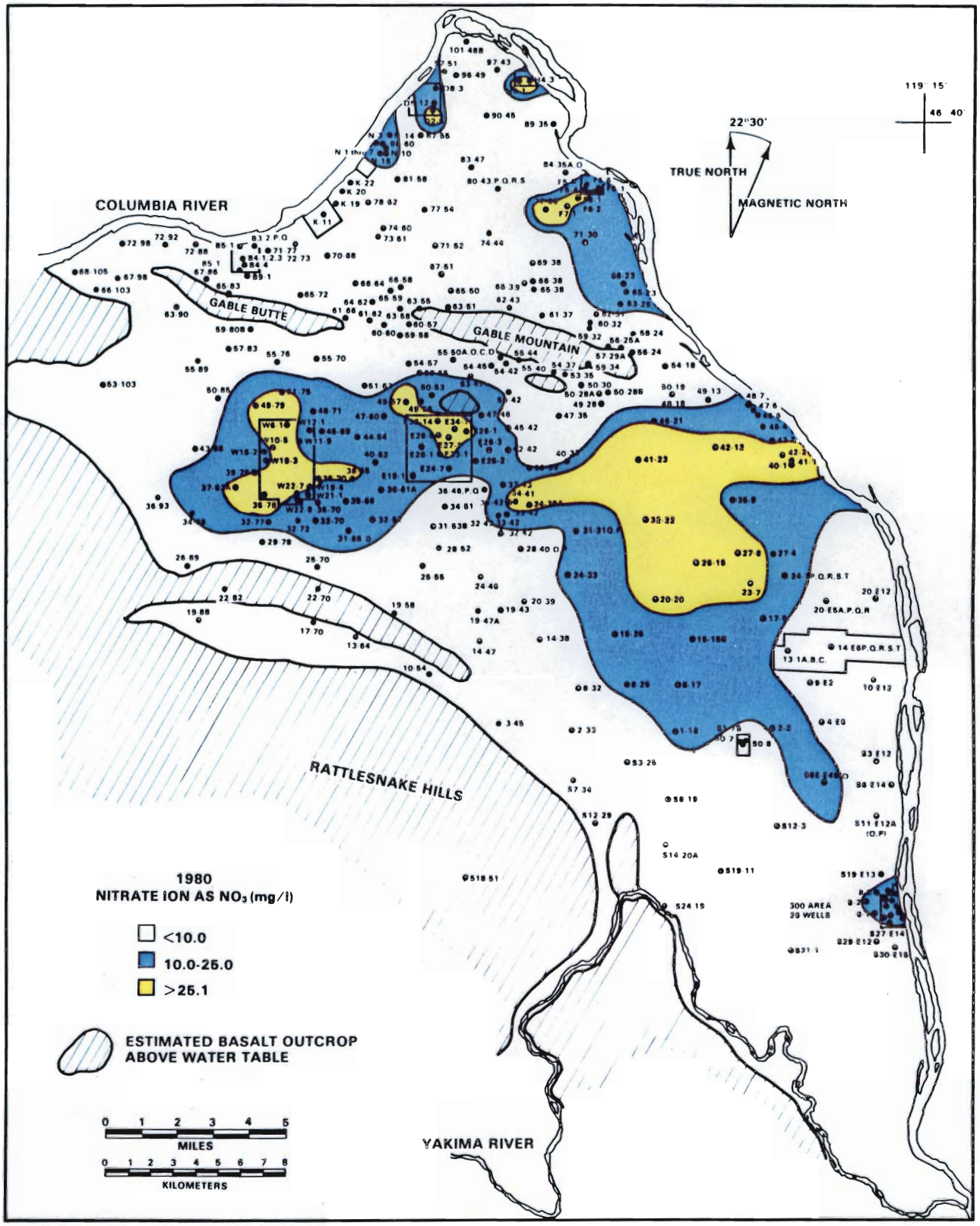


FIGURE 15. Nitrate Ion Distribution in Unconfined Ground Water

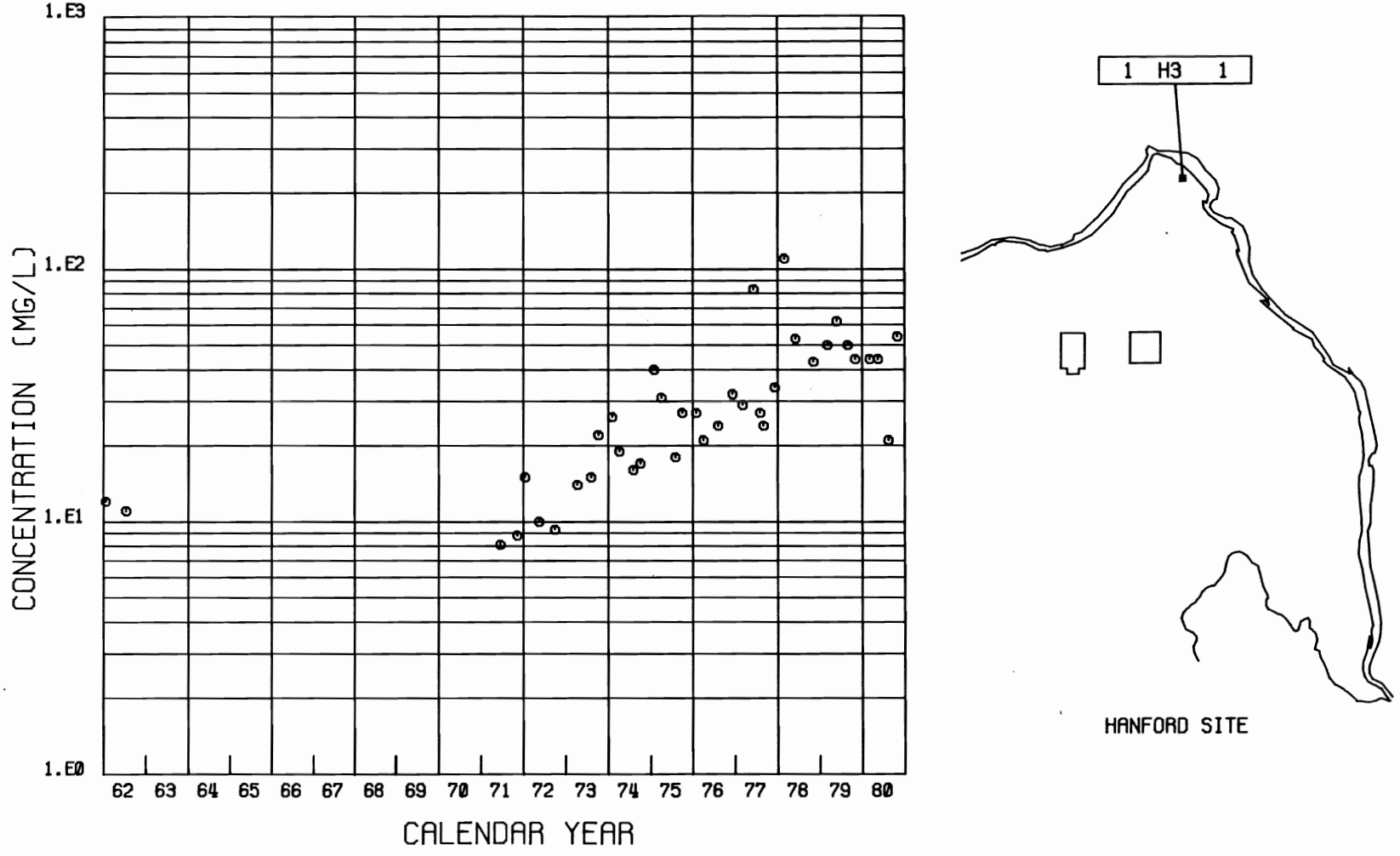
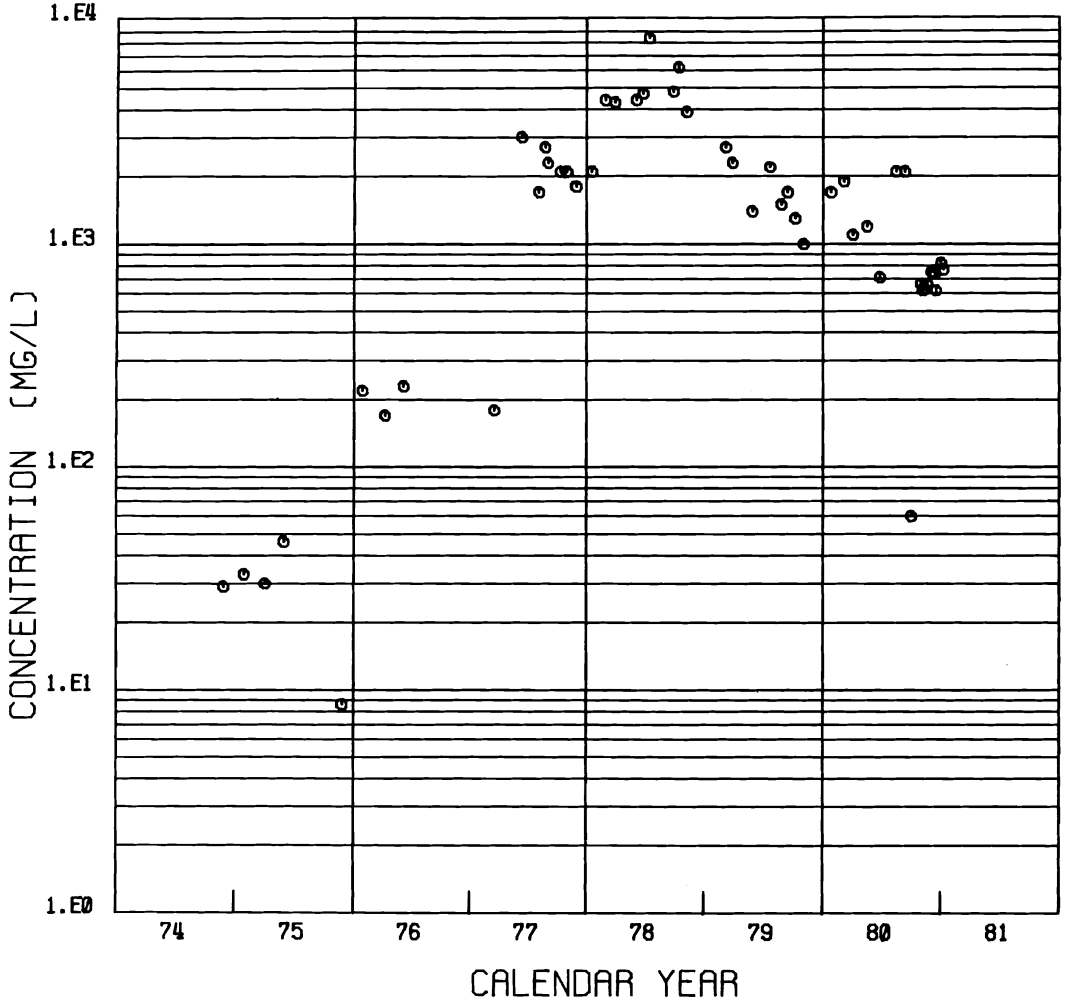
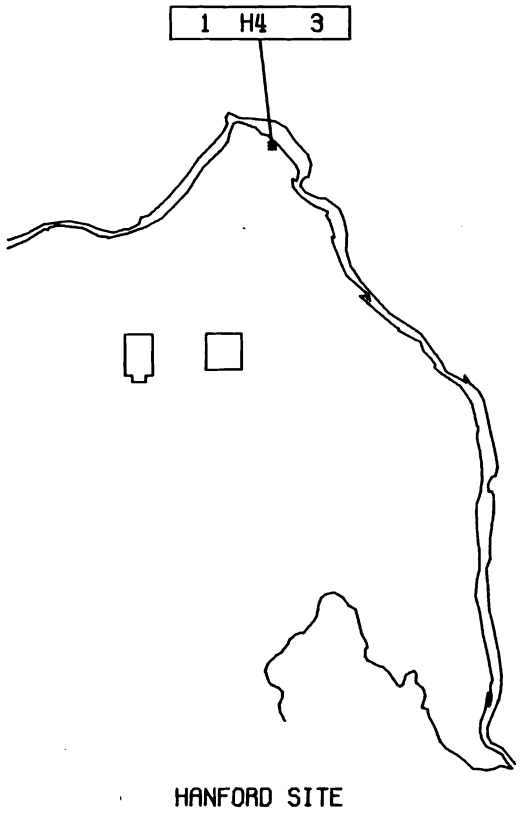


FIGURE 16. Concentration History for Nitrate in Well 199-H3-1

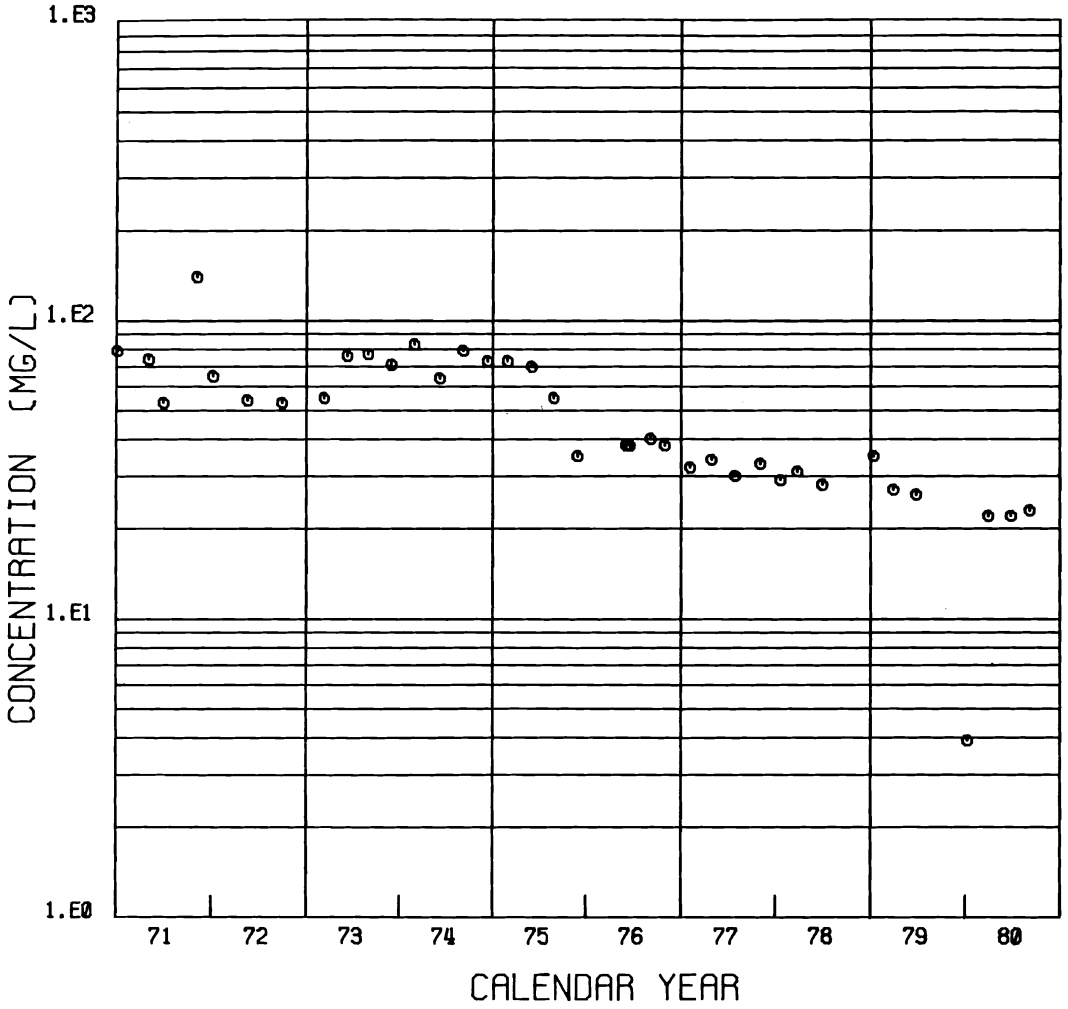


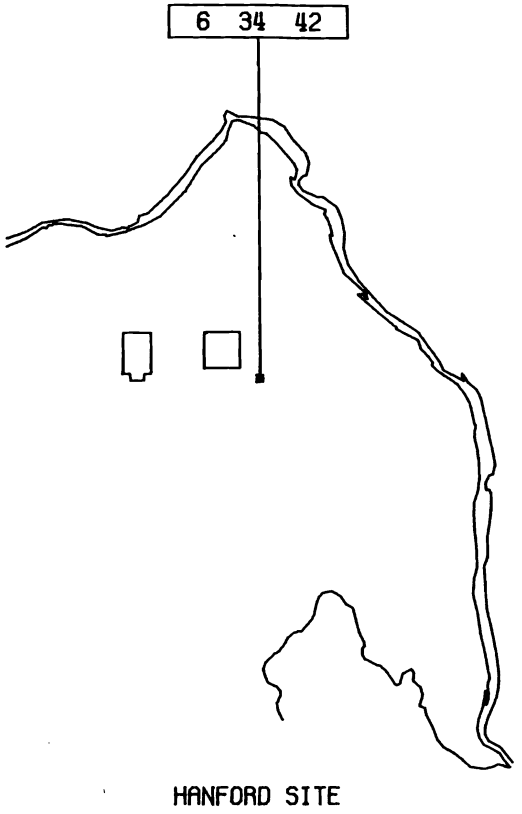


CONCENTRATION HISTORY --- NITRATE

FIGURE 17. Concentration History for Nitrate in Well 199-H4-3

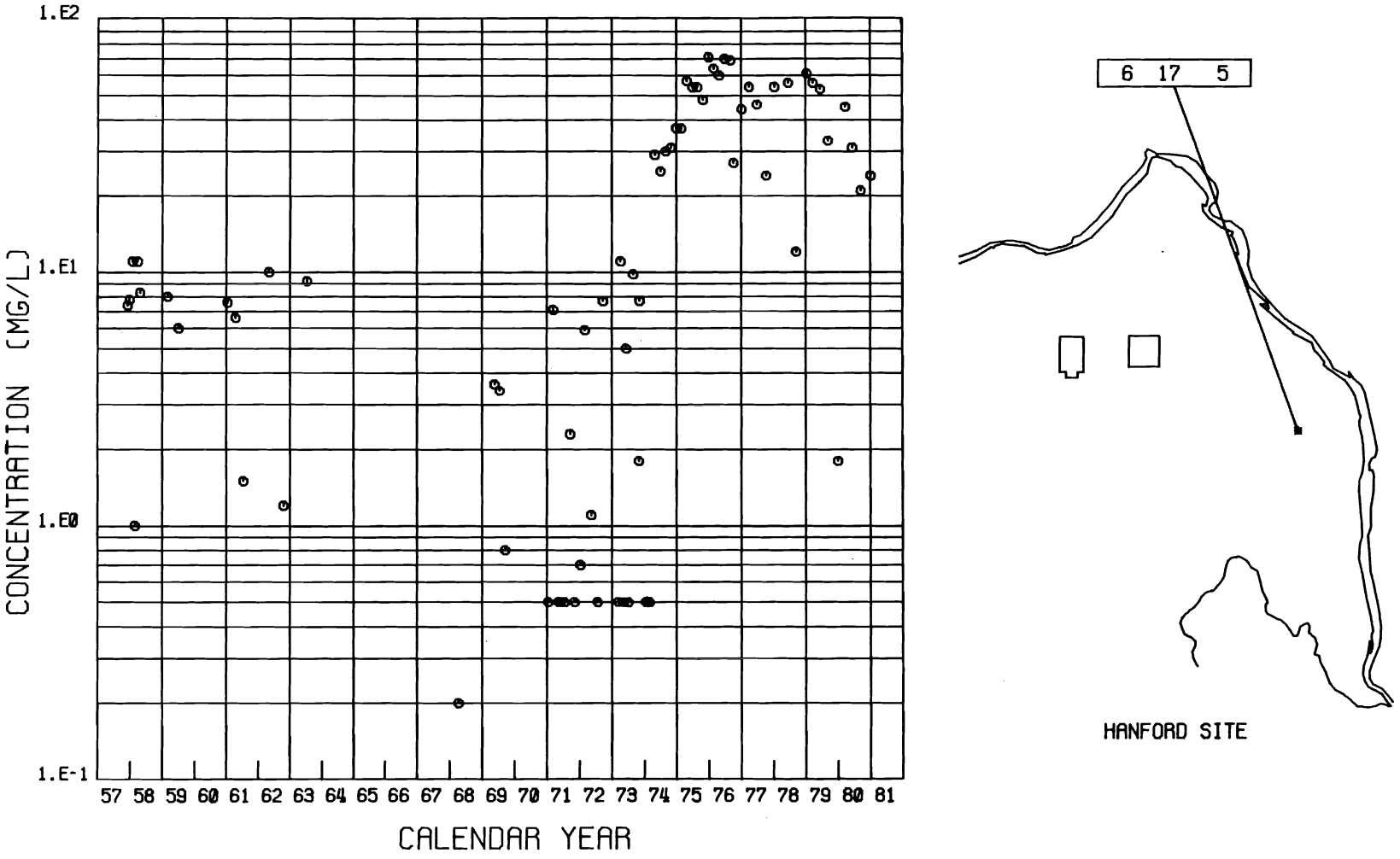
A decrease of nitrate concentration continues in well 699-34-42 (Figure 18), where a cyclical pattern reflects the operational history of the 200-E Area. The very definite trend of increasing nitrate concentration observed in well 699-17-5 (Figure 19), located north of the Washington Public Power Supply System projects, has reversed, and decreasing concentrations of nitrate are now being observed. Maintenance work on this well and the installation of a sampling pump have eliminated much of the data scatter. The graph indicates that the previous rapid increase in nitrate concentration at this site is caused by the movement or expansion of the plume's zone of high concentration within the central portion, and that the later decline in nitrate concentration is caused by the passage of the main plume from the site.





CONCENTRATION HISTORY --- NITRATE

FIGURE 18. Concentration History for Nitrate in Well 699-34-42



CONCENTRATION HISTORY --- NITRATE

FIGURE 19. Concentration History for Nitrate in Well 699-17-5

ADDITIONAL CONTAMINANTS IN THE GROUND WATER

Appendix B contains data from the routine analysis of materials other than the primary tracers. These materials include uranium, gross alpha emitters, and fluoride ions, all found primarily in the fuel fabrication or 300 Area. A special analysis was performed for iodine-129 (see next section). In addition, water samples from the unconfined aquifer were analyzed and the temperature distribution defined.

SPECIAL ANALYSES FOR IODINE-129

During 1979 and 1980, samples were collected from wells for iodine-129 (^{129}I) analysis. These wells were selected with a preference for those distant from a source of contamination so that the degree and direction of movement of this radionuclide could be ascertained. Existing data were complemented by the additional information.

Analyses were performed using neutron activation techniques (ASTM 1979). This analytical technique allows a detection level of approximately 1×10^{-5} picocuries per liter (1.7×10^{-5}% of the Concentration Guides). Table 4 shows the results of the analyses from 1976 through 1980.

Iodine-129 is of interest because of its long half life (10^7 years) and its mobility in the ground-water environment. Analyses made during 1975-1980 verify that ^{129}I follows the flow paths of the other major contaminants and that its levels of concentration are reduced by diffusion and dispersion within the ground-water flow system. Past studies have shown that the majority of the ^{129}I is contained in the upper portions of the aquifer (Eddy, et al., 1978).

TABLE 4. Contamination Results for Selected Wells

Well No.	Date	^{129}I (pCi/ℓ)	^{3}H (pCi/ℓ)	NO_3^- (ppm)
699-35-9	March 1980		120,000	16
699-39-1	September 1980		120,000	21
699-40-1	April 1977	0.12		
	March 1978		180,000	24.0
	March 1979	0.26	190,000	26.0
	July 1979	0.16	180,000	
	June 1980		220,000	28.0
699-41-1	May 1980	0.035	200,000	26.0
	September 1980		210,000	25.0
699-42-2	May 1980	0.11	170,000	23.0
	September 1980		180,000	23.0
699-42-12	March 1978	0.49	330,000	24.0
	March 1979	0.87	320,000	34.0
	July 1979	0.50	340,000	27.0
699-43-3	July 1979	0.16		
	March 1980		200,000	23.0
	September 1980		190,000	24.0
699-44-4				
699-45-4	July 1979	0.078		
	March 1980		110,000	17.0
	September 1979		100,000	13.0
699-46-4				
699-46-5	July 1979	0.067		
	March 1980		100,000	14.0
	September 1980		92,000	12.0
699-46-21	June 1977		13,000	6.9
	April 1978		20,000	8.8
	March 1979		25,000	13.0
	June 1980		33,000	12.0
699-47-6	July 1979	0.20		
	March 1980		170,000	19
	September 1980		190,000	21
699-48-7	June 1977		<1,200	2.7
	June 1978		2,100	1.9
	June 1979		2,300	2.6
	March 1980		860	2.9
	September 1980		<500	3.3
699-48-18	June 1977		<1,600	6.6
	June 1978		<1,000	5.3
	June 1979		<490	5.9
	March 1980		<540	4.6
	September 1980		<820	3.1
699-49-13	June 1977		<1,100	3.2
	June 1978		<840	3.1
	June 1979		790	3.2
	March 1980		570	2.9
	September 1980		<460	3.3

RADIOLOGICAL IMPACT

Ground-water transport of contaminants within the Hanford Site represents a potential pathway for exposure to radiation via water obtained from either 1) wells that tap the unconfined aquifer, or 2) the Columbia River, into which the unconfined aquifer discharges. The following discussion examines these potential pathways.

GROUND WATER

During 1980, drinking water for DOE facilities on the Hanford Site was obtained from the unconfined aquifer at the Fast Flux Test Facility (FFTF). The drinking water at FFTF contains elevated concentrations of ^{3}H from past effluent disposal in the 200 Areas (refer to Figure 8).

The impact on the total-body dose attributable to the ^{3}H in drinking water at FFTF (average 35,000 pCi/ℓ) is calculated to be 0.5 mrem per annum, based on an ingestion rate of 220 liters/year at 40 hrs/week. The 50-year dose commitment from ^{3}H is the same as the annual dose because of the relatively short biological half life of this radionuclide. This total-body dose is greater than the amount of 0.4 mrem reported last year. The increase is the result of changes in the ground-water withdrawal practices at the FFTF.

The concentrations of ^{3}H in FFTF drinking water are low compared to the guidelines in DOE Order 5480 and the calculated dose is 10% of the State of Washington drinking water standards.

COLUMBIA RIVER

Ground water entering the Columbia River from the Hanford Site is diluted by a factor of about 1000 because of the difference between the river and ground-water flow rates. During 1980, the average Columbia River flow rate at Hanford was reported by the U.S. Geological Survey as 102,000 cfs (2889 m^3/sec). The flow rate from the unconfined aquifer (Myers, 1978) was calculated to be about 100 cfs (2.8 m^3/sec).

Tritium (^{3}H) observed at the extreme outer boundaries of the contamination plume shown in Figure 8 indicate that the radionuclide would reach the river at a concentration between 30 and 300 pCi/m . Figure 20 provides a comparison of identical analyses performed on samples taken upstream and downstream from the Hanford Site. The figure shows that there is no apparent, statistically significant difference between upstream and downstream concentrations of ^{3}H. The Columbia River transports approximately 26,000 Ci/yr of ^{3}H attributable to worldwide fallout (annual flow of 1.5^{12} /yr x ~290 pCi/). Tritium discharges from N Reactor during 1980 contributed an additional 88 Ci/yr which is <0.01 of the total from worldwide fallout, (Greager, 1981). This contribution is not distinguishable from the variability resulting in fallout levels.

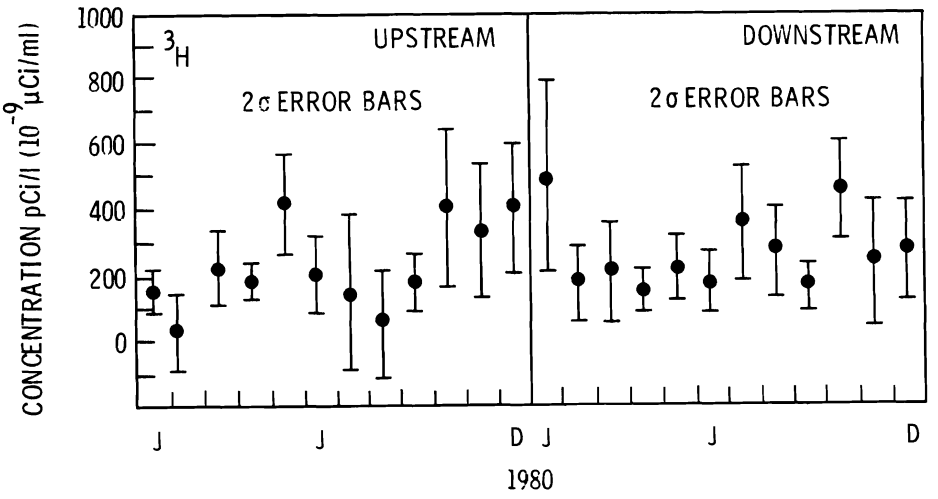


FIGURE 20. Upstream and Downstream Concentration of ^{3}H in Columbia River Water

QUALITY CONTROL

The PNL program for quality control measures was initiated in 1974 and includes all phases of the ground-water monitoring program. The extensive effort to insure that samples are representative of the unconfined aquifer system beneath the site includes: 1) well maintenance; 2) visual and geophysical inspection, and; 3) installation of sampling pumps. In addition, blind and duplicate samples are analyzed by the PNL Technical Analysis Laboratory. Analysis of ground-water samples by the U.S. Geological Survey has been continued. These programs have shown that data received as part of the routine monitoring program are within the analytical limits of accuracy. The historical analytical record for each well further confirms the representativeness of the data collected each year.

In addition to providing quality assurance, the program with the U.S. Geological Survey provides data on the chemistry of Hanford ground water. These data, including wet, chemical, and spectrographic analysis, represent background information that is useful in assessing trends on the effects of plant operations. The results of the analyses made in 1980 are shown in Appendix C. These data analyses indicate that the quality of the ground water beneath the Hanford Site is comparable to that of other ground waters found in eastern Washington.

At the laboratory level the documentation of laboratory instrument calibrations and all laboratory procedures is required. Documentation of field instrument calibration also is being implemented.

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APPENDIX A

GROSS BETA, TRITIUM AND NITRATE CONCENTRATIONS IN THE GROUND WATER (UNCONFINED AQUIFER)

APPENDIX A

Gross Beta, Tritium and Nitrate Concentrations in the Ground Water (Unconfined Aquifer)

WELL NO.				TOTAL BETA (PCI/ML)	TRITIUM (PCI/ML)	NITRATE (MG/L)
1	B3	1	MAX			
			AVE		1.50E+00*	
			MIN			
1	B3	2P	MAX			
			AVE		<6.00E-01*	<5.00E-01*
			MIN			
1	B3	2Q	MAX			
			AVE		<6.05E-01*	<5.00E-01*
			MIN			
1	B4	1	MAX			
			AVE		2.93E+01*	3.49E+00*
			MIN			
1	B4	2	MAX		3.70E+01	5.50E+00
			AVE		1.48E+01	4.65E+00
			MIN		3.50E+00	3.90E+00
1	B4	3	MAX		8.60E+01	8.00E+00
			AVE		4.60E+01	5.85E+00
			MIN		6.10E+00	4.10E+00
1	B4	4	MAX			
			AVE	7.80E-02*	1.45E+00*	3.30E+00*
			MIN			
1	B5	1	MAX			
			AVE		1.75E+00*	3.15E+00*
			MIN			
1	B9	1	MAX			
			AVE		8.65E-01*	8.40E+00*
			MIN			
1	D2	5	MAX		1.60E+01	8.90E+01
			AVE		1.22E+01	7.95E+01
			MIN		7.80E+00	6.90E+01
1	D5	12	MAX	1.70E+00	2.60E+00	1.60E+01
			AVE	3.06E-01	1.56E+00	1.38E+01
			MIN	<7.50E-02	<4.20E-01	1.00E+01

WELL NO.			TOTAL BETA (PCI/ML)	TRITIUM (PCI/ML)	NITRATE (MG/L)
		MAX		7.00E+00	2.00E+01
1	08	3	AVE	5.40E+00	1.01E+01
			MIN	4.80E+00	2.20E+00
		MAX		8.70E-01	7.10E+00
1	F5	1	AVE	7.03E-01	3.67E+00
			MIN	<5.60E-01	8.00E-01
		MAX			
1	F5	3	AVE	5.67E-01*	5.83E-01*
			MIN		
		MAX		4.40E+01	1.40E+01
1	F5	4	AVE	3.68E+01	6.75E+00
			MIN	3.30E+01	<5.00E-01
		MAX		1.70E+01	6.40E+01
1	F5	6	AVE	5.13E+00	1.64E+01
			MIN	<6.20E-01	<5.00E-01
		MAX		1.40E+00	7.20E+01
1	F7	1	AVE	1.05E+00	6.30E+01
			MIN	<7.60E-01	5.90E+01
		MAX		2.20E+01	7.60E+01
1	F8	1	AVE	1.55E+01	6.50E+01
			MIN	1.10E+01	5.90E+01
		MAX		1.40E+01	7.10E+01
1	F8	2	AVE	8.89E+00	4.81E+01
			MIN	6.69E-01	<5.00E-01
		MAX		1.00E+01	5.40E+01
1	H3	1	AVE	9.13E+00	4.08E+01
			MIN	8.70E+00	2.10E+01
		MAX	9.30E-01	5.40E+00	2.10E+03
1	H4	3	AVE	6.05E-01	5.56E+00	1.02E+03
			MIN	<7.50E-02	2.30E+00	6.00E+01
		MAX		2.00E+01	1.10E+01
1	K	11	AVE	1.25E+01	8.50E+00
			MIN	7.50E+00	6.40E+00

WELL NO.		TOTAL BETA (PCI/ML)	TRITIUM (PCI/ML)	NITRATE (MG/L)
1 K 19	MAX		3.80E+00	5.80E+00
	AVE		3.25E+00	5.00E+00
	MIN		2.80E+00	3.90E+00
1 K 20	MAX		3.10E+00	2.20E+00
	AVE		2.15E+00	1.93E+00
	MIN		1.60E+00	1.50E+00
1 K 22	MAX		1.70E+00	1.20E+00
	AVE		1.60E+00	7.90E-01
	MIN		1.40E+00	<5.00E-01
1 N 1	MAX			
	AVE		2.65E+01*	1.10E+01*
	MIN			
1 N 2	MAX		4.60E+01	1.40E+01
	AVE		2.40E+01	5.60E+00
	MIN		1.60E+01	1.80E+00
1 N 3	MAX	2.60E+00	3.80E+01	
	AVE	1.30E+00	2.35E+01	
	MIN	7.20E-01	1.40E+01	
1 N 4	MAX	2.60E-01	4.50E+01	9.20E+00
	AVE	2.08E-01	2.95E+01	6.05E+00
	MIN	1.40E-01	2.10E+01	4.20E+00
1 N 5	MAX		2.60E+01	2.00E+01
	AVE		2.18E+01	1.08E+01
	MIN		1.50E+01	2.90E+00
1 N 6	MAX	4.70E-01	4.00E+01	
	AVE	3.80E-01	2.78E+01	
	MIN	1.80E-01	2.20E+01	
1 N 7	MAX		2.70E+01	9.40E+00
	AVE		2.45E+01	2.72E+00
	MIN		2.10E+01	<5.00E-01
1 N 14	MAX	7.50E-01	4.00E+01	1.40E+01
	AVE	6.20E-01	2.63E+01	7.28E+00
	MIN	5.70E-01	1.50E+01	2.20E+00

WELL NO.				TOTAL BETA (PCI/ML)	TRITIUM (PCI/ML)	NITRATE (MG/L)
1	N	15	MAX	1.70E-01	4.40E+01	1.10E+01
			AVE	1.65E-01	3.12E+01	8.98E+00
			MIN	1.50E-01	2.60E+01	7.50E+00
2E	13	19	MAX			
			AVE	<7.52E-02*		
			MIN			
2E	13	20	MAX			
			AVE	<3.75E-02*		
			MIN			
2E	16	1	MAX	<7.50E-02		
			AVE	<5.63E-02		
			MIN	<1.17E-20		
2E	17	6	MAX	<7.50E-02		
			AVE	<4.50E-02		
			MIN	<9.33E-30		
2E	19	1	MAX			
			AVE	<7.50E-02*	8.15E-01*	6.25E+00*
			MIN			
2E	23	1	MAX	<7.50E-02	3.90E+01	2.20E+01
			AVE	<7.50E-02	2.79E+01	1.65E+01
			MIN	<7.50E-02	5.40E+00	1.30E+01
2E	23	2	MAX			
			AVE	4.67E-02*	2.23E+01*	6.05E+00*
			MIN			
2E	24	3	MAX			
			AVE	<1.31E-02*		5.00E-01*
			MIN			
2E	24	7	MAX	<7.50E-02	5.00E+00	1.60E+01
			AVE	<7.50E-02	2.53E+00	1.45E+01
			MIN	<7.50E-02	1.10E+00	1.30E+01
2E	24	8	MAX	<7.50E-02	2.57E+01	5.10E+00
			AVE	<1.88E-02	2.47E+01	3.43E+00
			MIN	<1.51E-20	2.39E+01	1.20E+00

WELL NO.				TOTAL BETA (PCI/ML)	TRITIUM (PCI/ML)	NITRATE (MG/L)
2E	24	13	MAX			
			AVE	8.75E-02*		
			MIN			
2E	25	17	MAX			
			AVE	1.65E-20*	3.46E+02*	
			MIN			
2E	25	18	MAX			
			AVE	5.23E-21*	7.38E+02*	
			MIN			
2E	25	19	MAX			
			AVE	1.33E-20*	6.80E+02*	
			MIN			
2E	25	20	MAX			
			AVE	1.18E-03*	5.70E+02*	
			MIN			
2E	26	4	MAX			
			AVE	<7.50E-02*	5.03E+01*	
			MIN			
2E	28	1	MAX			
			AVE	<7.50E-02*	1.13E+01*	<5.00E-01*
			MIN			
2E	28	21	MAX	<7.50E-02		
			AVE	<5.63E-02	8.40E+01*	
			MIN	4.35E-20		
2E	32	1	MAX			
			AVE	2.53E-02*	2.45E+01*	8.00E+01*
			MIN			
2E	33	10	MAX	7.50E-02	9.05E+00	3.50E+01
			AVE	5.63E-02	2.96E+00	2.53E+01
			MIN	5.97E-10	<5.40E-01	1.20E+01
2E	33	14	MAX	3.70E-01	<8.90E-01	4.20E+01
			AVE	1.49E-01	<6.68E-01	3.40E+01
			MIN	<7.50E-02	4.60E-01	2.00E+01

WELL NO.				TOTAL BETA (PCI/ML)	TRITIUM (PCI/ML)	NITRATE (MG/L)
			MAX	8.90E-02	2.00E+00	7.80E-01
2E	34	1	AVE	4.78E-02	1.04E+00	5.54E-01
			MIN	<2.34E-30	4.86E-01	4.00E-01
			MAX	<7.50E-02	4.40E+01	1.70E+02
2W	6	1	AVE	<7.50E-02	3.93E+01	1.58E+02
			MIN	<7.50E-02	3.70E+01	1.50E+02
			MAX	1.60E-01	5.30E+02	3.20E+02
2W	10	5	AVE	1.13E-01	1.50E+02	1.63E+02
			MIN	<7.50E-02	2.30E+01	1.00E+02
			MAX			
2W	10	8	AVE	9.50E-02*		
			MIN			
			MAX			
2W	11	13	AVE	1.18E-10*	5.73E+01*	4.20E+00*
			MIN			
			MAX			
2W	11	23	AVE	<7.50E-02*		
			MIN			
			MAX	<7.50E-02	<9.40E-01	1.60E+00
2W	18	3	AVE	<7.50E-02	<7.67E-01	1.45E+00
			MIN	<7.50E-02	4.70E-01	9.80E-01
			MAX	1.60E-01	2.60E+00	6.90E+00
2W	19	3	AVE	7.63E-02	9.69E-01	5.10E+00
			MIN	3.26E-20	5.60E-01	4.00E+00
			MAX			
2W	19	4	AVE	9.67E-02*	9.01E+02*	7.50E+00*
			MIN			
			MAX	1.40E-01	4.00E+03	
2W	21	1	AVE	1.09E-01	3.05E+03	7.33E+01*
			MIN	<7.50E-02	2.40E+03	
			MAX			
2W	22	5	AVE	<7.50E-02*		
			MIN			

WELL NO.				TOTAL BETA (PCI/ML)	TRITIUM (PCI/ML)	NITRATE (MG/L)
2W	22	6	MAX AVE MIN	<7.50E-02*		
2W	22	7	MAX AVE MIN	<7.50E-02*	1.57E+03*	<5.00E-01*
2W	22	9	MAX AVE MIN	7.70E-02 7.55E-02 <7.50E-02	1.23E+04 8.28E+03 3.30E+03	1.70E+01 4.63E+00 <5.00E-01
2W	22	10	MAX AVE MIN	<7.50E-02 <6.82E-02 <1.17E-20		
2W	22	12	MAX AVE MIN	<5.00E-02*	6.41E+02*	5.97E+00*
2W	22	15	MAX AVE MIN	<7.50E-02*		
2W	22	17	MAX AVE MIN	<7.50E-02*		
2W	22	18	MAX AVE MIN	<7.50E-02*		
2W	22	27	MAX AVE MIN	1.98E-20*	4.92E+00*	2.95E+00*
2W	22	31	MAX AVE MIN	4.20E+00*		
2W	23	1	MAX AVE MIN	<7.50E-02*		

WELL NO.				TOTAL BETA (PCI/ML)	TRITIUM (PCI/ML)	NITRATE (MG/L)
			MAX	<7.50E-02	2.70E+03	
2W	23	9	AVE	<6.15E-02	4.27E+02	
			MIN	2.02E-20	8.49E+01	
			MAX			
2W	23	11	AVE	1.47E-10*	2.25E+02*	
			MIN			
			MAX	<7.50E-02		9.80E+00
3	1	1	AVE	<7.50E-02		6.87E+00
			MIN	<7.50E-02		2.40E+00
			MAX	<7.50E-02		8.40E+00
3	1	2	AVE	<7.50E-02		7.65E+00
			MIN	<7.50E-02		6.40E+00
			MAX			
3	1	3	AVE	<7.50E-02*		8.40E+00*
			MIN			
			MAX			9.30E+00
3	1	4	AVE	<7.50E-02*		6.55E+00
			MIN			3.90E+00
			MAX	<7.50E-02	1.50E+00	
3	1	5	AVE	<7.51E-02	7.10E-01	
			MIN	<7.50E-02	<4.80E-01	
			MAX	<7.50E-02		1.20E+01
3	1	6	AVE	<7.50E-02		8.85E+00
			MIN	<7.50E-02		4.10E+00
			MAX	<7.50E-02		1.30E+01
3	2	1	AVE	<7.50E-02		9.26E+00
			MIN	<7.50E-02		1.00E+00
			MAX	<7.50E-02		2.70E+01
3	2	2	AVE	<7.50E-02		1.15E+01
			MIN	<7.50E-02		6.90E+00
			MAX	<7.50E-02		1.50E+01
3	2	3	AVE	<7.50E-02		1.00E+01
			MIN	<7.50E-02		5.80E+00

WELL NO.				TOTAL BETA (PCI/ML)	TRITIUM (PCI/ML)	NITRATE (MG/L)
			MAX	<7.50E-02		1.50E+01
3	3	1	AVE	<7.50E-02		9.04E+00
			MIN	<7.50E-02		5.00E+00
			MAX	<7.50E-02		1.10E+01
3	3	2	AVE	<7.50E-02		4.85E+00
			MIN	<7.50E-02		<5.00E-01
			MAX	<7.50E-02		1.10E+01
3	3	3	AVE	<7.50E-02		6.29E+00
			MIN	<7.50E-02		5.00E+00
			MAX	<7.50E-02		2.80E+01
3	3	9	AVE	<7.50E-02		1.51E+01
			MIN	<7.50E-02		2.30E+00
			MAX	<7.50E-02		1.60E+01
3	3	10	AVE	<7.50E-02		1.12E+01
			MIN	<7.50E-02		5.80E+00
			MAX	<7.50E-02		1.80E+01
3	3	11	AVE	<7.50E-02		9.76E+00
			MIN	<7.50E-02		3.90E+00
			MAX	<7.50E-02		9.30E+00
3	4	1	AVE	<7.50E-02		6.47E+00
			MIN	<7.50E-02		3.80E+00
			MAX	7.50E-02		1.70E+01
3	4	7	AVE	7.50E-02		1.07E+01
			MIN	7.50E-02		1.30E+00
			MAX	<7.50E-02		1.60E+01
3	4	9	AVE	<7.50E-02		1.34E+01
			MIN	<7.50E-02		1.00E+01
			MAX	<7.50E-02		1.60E+01
3	4	10	AVE	<7.50E-02		1.24E+01
			MIN	<7.50E-02		9.10E+00
			MAX	<7.50E-02		1.60E+01
3	5	1	AVE	<7.50E-02		1.48E+01
			MIN	<7.50E-02		1.40E+01

WELL NO.		TOTAL BETA (PCI/ML)	TRITIUM (PCI/ML)	NITRATE (MG/L)
	MAX	<7.50E-02		1.40E+01
3 6 1	AVE	<7.50E-02		1.12E+01
	MIN	<7.50E-02		5.60E+00
	MAX	<7.50E-02		7.60E+00
3 8 1	AVE	<7.50E-02		5.15E+00
	MIN	<7.50E-02		3.40E+00
	MAX			
3 8 2	AVE	<7.50E-02*		8.33E+00*
	MIN			
	MAX	<7.50E-02		5.30E+00
3 8 3	AVE	<7.50E-02		3.90E+00
	MIN	<7.50E-02		2.60E+00
	MAX	<7.50E-02		1.20E+01
3 8 4	AVE	<7.50E-02		7.38E+00
	MIN	<7.50E-02		6.00E+00
	MAX			
6 S31 1P	AVE		7.90E-01*	<5.00E-01*
	MIN			
	MAX			4.10E+01
6 S30E15A	AVE		<7.30E-01*	2.04E+01
	MIN			7.20E+00
	MAX			1.60E+01
6 S29 E12	AVE			1.26E+01
	MIN			1.10E+01
	MAX			1.30E+01
6 S27 E14	AVE			1.09E+01
	MIN			7.70E+00
	MAX			
6 S24 19	AVE			<5.00E-01*
	MIN			
	MAX			1.00E+01
6 S19 E13	AVE			9.74E+00
	MIN			8.90E+00

WELL NO.		TOTAL BETA (PCI/ML)	TRITIUM (PCI/ML)	NITRATE (MG/L)
6 S19 11	MAX			
	AVE			1.13E+01*
	MIN			
6 S18 51	MAX			6.80E+00
	AVE			2.08E+00
	MIN			<5.00E-01
6 S14 20	MAX			1.50E+00
	AVE			8.15E-01
	MIN			<5.00E-01
6 S12 3	MAX		<9.60E-01	5.40E+00
	AVE		<6.60E-01	4.25E+00
	MIN		<5.20E-01	2.50E+00
6 S12 29	MAX			8.40E+00
	AVE			7.47E+00
	MIN			6.40E+00
6 S11E12A	MAX		<8.00E-01	1.50E+01
	AVE		<5.90E-01	7.75E+00
	MIN		<3.80E-01	<5.00E-01
6 S11E12AP	MAX			
	AVE		<6.17E-01*	<5.00E-01*
	MIN			
6 S8 19	MAX		<1.10E+00	2.90E+00
	AVE		<7.73E-01	2.20E+00
	MIN		<6.20E-01	1.10E+00
6 S7 34	MAX		<6.90E-01	5.10E-01
	AVE		<6.23E-01	5.02E-01
	MIN		<5.80E-01	<5.00E-01
6 S6E14A	MAX		<8.30E-01	1.90E+00
	AVE		<6.62E-01	7.80E-01
	MIN		<3.90E-01	<5.00E-01
6 S6 E4B	MAX		1.90E+01	9.80E+00
	AVE		1.34E+01	6.28E+00
	MIN		<5.40E-01	<5.00E-01

WELL NO.				TOTAL BETA (PCI/ML)	TRITIUM (PCI/ML)	NITRATE (MG/L)
			MAX		3.10E+01	1.50E+01
6	S6	E4D	AVE		2.80E+01	1.30E+01
			MIN		2.50E+01	1.10E+01
			MAX		2.40E+00	<8.20E+02
6	S3	E12	AVE		1.07E+00	<1.67E+02
			MIN		4.80E-01	3.10E+00
			MAX		<8.80E-01	5.70E-01
6	S3	25	AVE		<7.65E-01	5.18E-01
			MIN		6.50E-01	<5.00E-01
			MAX			
6	S1	7B	AVE	<7.50E-02*	3.90E+01*	<5.00E-01*
			MIN			
			MAX			
6	S0	8	AVE	<7.50E-02*	6.23E+01*	8.03E+00*
			MIN			
			MAX			
6	S0	7	AVE	<7.50E-02*	2.23E+01*	1.37E+00*
			MIN			
			MAX		1.40E+02	1.90E+01
6	1	18	AVE		1.18E+02	1.60E+01
			MIN		1.10E+02	1.10E+01
			MAX	1.10E-01	1.30E+02	2.50E+01
6	2	3	AVE	8.38E-02	1.16E+02	2.09E+01
			MIN	<7.50E-02	1.10E+02	2.50E+00
			MAX		1.20E+00	1.20E+00
6	2	33A	AVE		7.70E-01	8.25E-01
			MIN		4.90E-01	<5.00E-01
			MAX			1.00E+01
6	3	45	AVE		<4.90E-01*	7.98E+00
			MIN			6.60E+00
			MAX		8.40E-01	5.90E+00
6	4	E6	AVE		5.42E-01	5.65E+00
			MIN		<4.10E-01	5.50E+00

WELL NO.			TOTAL BETA (PCI/ML)	TRITIUM (PCI/ML)	NITRATE (MG/L)
		MAX		2.10E+02	2.70E+01
6	8 17	AVE	<7.50E-02*	1.37E+02	2.38E+01
		MIN		1.80E+02	2.20E+01
		MAX	<7.50E-02	1.10E+02	1.90E+01
6	8 25	AVE	<7.50E-02	9.53E+01	1.78E+01
		MIN	<7.50E-02	8.70E+01	1.60E+01
		MAX		1.00E+00	8.00E+00
6	8 32	AVE		7.98E-01	3.28E+00
		MIN		<5.80E-01	<5.00E-01
		MAX			
6	9 E2	AVE		<5.40E-01*	5.70E-01*
		MIN			
		MAX		4.70E+00	1.40E+01
6	10 E12	AVE		3.90E+00	1.18E+01
		MIN		3.10E+00	9.80E+00
		MAX			
6	13 1A	AVE		2.97E+02*	8.90E+00*
		MIN			
		MAX		1.30E+00	<5.00E-01
6	13 1B	AVE		8.42E-01	<5.00E-01
		MIN		<6.20E-01	<5.00E-01
		MAX		<6.70E-01	<5.00E-01
6	13 1C	AVE		<5.53E-01	<5.00E-01
		MIN		<4.40E-01	<5.00E-01
		MAX		<8.30E-01	2.60E+01
6	13 64	AVE		<5.85E-01	6.98E+00
		MIN		<4.60E-01	5.00E-01
		MAX		<7.00E-01	<5.00E-01
6	14 E6P	AVE		<6.08E-01	<5.00E-01
		MIN		<4.20E-01	<5.00E-01
		MAX		<9.40E-01	<5.00E-01
6	14 E6Q	AVE		<6.60E-01	<5.00E-01
		MIN		<5.30E-01	<5.00E-01

WELL NO.		TOTAL BETA (PCI/ML)	TRITIUM (PCI/ML)	NITRATE (MG/L)
6 14 E6R	MAX		8.70E-01	<5.00E-01
	AVE		6.47E-01	<5.00E-01
	MIN		<5.40E-01	<5.00E-01
6 14 E6S	MAX			<5.00E-01
	AVE		<6.00E-01*	<5.00E-01
	MIN			<5.00E-01
6 14 E6T	MAX			
	AVE		2.17E+01*	1.07E+01*
	MIN			
6 14 38	MAX		<7.10E-01	6.30E-01
	AVE		<5.30E-01	5.33E-01
	MIN		<3.80E-01	<5.00E-01
6 14 47	MAX			
	AVE		6.70E-01*	3.53E+00*
	MIN			
6 15 15B	MAX	<7.50E-02	1.20E+01	1.70E+01
	AVE	<7.50E-02	3.76E+00	1.41E+01
	MIN	<7.50E-02	<5.50E-01	7.20E+00
6 15 26	MAX	<7.50E-02	3.00E+02	2.50E+01
	AVE	<7.50E-02	2.50E+02	2.35E+01
	MIN	<7.50E-02	2.20E+02	2.20E+01
6 17 5	MAX	<7.50E-02	<7.50E-01	4.50E+01
	AVE	<7.50E-02	<5.75E-01	2.47E+01
	MIN	<7.50E-02	<4.80E-01	1.80E+00
6 17 70	MAX		<6.90E-01	4.70E+01
	AVE		<5.62E-01	3.28E+01
	MIN		<4.10E-01	2.80E+01
6 19 43	MAX		<9.10E-01	9.70E+00
	AVE	<7.50E-02*	<6.63E-01	8.12E+00
	MIN		<4.70E-01	5.80E+00
6 19 47A	MAX			
	AVE		4.75E-01*	<5.00E-01*
	MIN			

WELL NO.		TOTAL BETA (PCI/ML)	TRITIUM (PCI/ML)	NITRATE (MG/L)
	MAX			<5.00E-01
6 19 58	AVE			<5.00E-01
	MIN			<5.00E-01
	MAX			
6 19 88	AVE			7.70E-01*
	MIN			
	MAX		1.60E+01	9.40E+00
6 20 E5A	AVE		1.45E+01	7.75E+00
	MIN		1.30E+01	3.20E+00
	MAX		<6.40E-01	
6 20 E5P	AVE		<6.15E-01	<5.00E-01*
	MIN		<5.80E-01	
	MAX		<8.20E-01	<5.00E-01
6 20 E5Q	AVE		<5.98E-01	<5.00E-01
	MIN		<4.00E-01	<5.00E-01
	MAX		<9.20E-01	9.80E+00
6 20 E5R	AVE		<6.58E-01	3.75E+00
	MIN		<4.10E-01	<5.00E-01
	MAX		<7.10E-01	<5.00E-01
6 20 E12	AVE		<5.83E-01	<5.00E-01
	MIN		<4.10E-01	<5.00E-01
	MAX		<8.80E-01	<5.00E-01
6 20 E12P	AVE		<7.45E-01	<5.00E-01
	MIN		<5.40E-01	<5.00E-01
	MAX	1.10E-01	6.50E+02	4.40E+01
6 20 20	AVE	8.40E-02	5.83E+02	4.08E+01
	MIN	<7.50E-02	5.50E+02	3.70E+01
	MAX		1.50E+00	<5.00E-01
6 20 39	AVE		8.18E-01	<5.00E-01
	MIN		<4.30E-01	<5.00E-01
	MAX		<9.30E-01	1.50E+01
6 20 82	AVE		<7.03E-01	1.09E+01
	MIN		<6.10E-01	1.40E+00

WELL NO.				TOTAL BETA (PCI/ML)	TRITIUM (PCI/ML)	NITRATE (MG/L)
			MAX		6.00E+00	
6	22	70	AVE		2.05E+00	7.63E+00*
			MIN		<6.60E-01	
			MAX		6.50E+01	4.20E+01
6	23	7	AVE		4.72E+01	3.22E+01
			MIN		5.10E+00	9.80E+00
			MAX		<6.90E-01	<5.00E-01
6	24	1P	AVE		<5.62E-01	<5.00E-01
			MIN		<4.40E-01	<5.00E-01
			MAX		<9.50E-01	<5.00E-01
6	24	1Q	AVE		<6.85E-01	<5.00E-01
			MIN		<5.20E-01	<5.00E-01
			MAX		5.80E+00	6.10E-01
6	24	1R	AVE		1.78E+00	5.28E-01
			MIN		<3.80E-01	<5.00E-01
			MAX		2.60E+01	1.30E+00
6	24	1S	AVE		6.93E+00	7.00E-01
			MIN		<3.90E-01	<5.00E-01
			MAX		5.80E+00	5.80E+00
6	24	1T	AVE		3.12E+00	1.84E+00
			MIN		<4.70E-01	<5.00E-01
			MAX	<7.50E-02	1.40E+02	1.60E+01
6	24	33	AVE	<7.50E-02	1.20E+02	1.43E+01
			MIN	<7.50E-02	9.10E+01	1.20E+01
			MAX			<5.00E-01
6	24	46	AVE		2.62E+00*	<5.00E-01
			MIN			<5.00E-01
			MAX			
6	25	55	AVE		<6.77E-01*	8.03E+00*
			MIN			
			MAX			
6	25	70	AVE		7.03E-01*	1.02E+01*
			MIN			

WELL NO.				TOTAL BETA (PCI/ML)	TRITIUM (PCI/ML)	NITRATE (MG/L)
			MAX	1.40E-01	9.30E+02	4.70E+01
6	26	15	AVE	1.20E-01	8.03E+02	4.50E+01
			MIN	1.00E-01	7.00E+02	4.30E+01
			MAX		7.20E+02	4.50E+01
6	27	4	AVE		1.16E+02	2.05E+01
			MIN		2.50E+01	1.50E+01
			MAX	1.60E-01	9.60E+02	
6	27	8	AVE	1.35E-01	8.43E+02	5.20E+01*
			MIN	1.10E-01	7.80E+02	
			MAX		2.60E+01	1.20E+01
6	28	40	AVE		1.73E+01	9.05E+00
			MIN		1.00E+01	7.20E+00
			MAX		2.00E+01	1.10E+01
6	28	40P	AVE		5.42E+00	3.78E+00
			MIN		<4.30E-01	<5.00E-01
			MAX			
6	28	52	AVE		<4.85E-01*	<5.00E-01*
			MIN			
			MAX		1.40E+00	3.40E+00
6	29	78	AVE		8.47E-01	3.03E+00
			MIN		<5.90E-01	2.60E+00
			MAX		6.60E+02	3.20E+01
6	31	31	AVE		5.45E+02	2.33E+01
			MIN		4.70E+02	3.30E+00
			MAX		4.90E+02	3.20E+01
6	31	31P	AVE		2.38E+02	1.40E+01
			MIN		5.50E-01	<5.00E-01
			MAX			
6	31	53B	AVE		<5.13E-01*	3.87E+00*
			MIN			
			MAX			
6	31	65	AVE		1.60E+03*	1.13E+00*
			MIN			

WELL NO.			TOTAL BETA (PCI/ML)	TRITIUM (PCI/ML)	NITRATE (MG/L)
		MAX	1.60E-01	1.40E+03	6.00E+01
6	32	22 AVE	1.48E-01	1.18E+03	5.80E+01
		MIN	1.30E-01	1.10E+03	5.60E+01
		MAX		3.40E+02	8.20E-01
6	32	42 AVE		2.85E+02	5.80E-01
		MIN		2.60E+02	<5.00E-01
		MAX		5.40E+01	1.40E+01
6	32	43 AVE		4.63E+01	1.25E+01
		MIN		3.90E+01	1.10E+01
		MAX		4.70E+03	
6	32	62 AVE		9.41E+02	2.37E+01*
		MIN		<6.10E-01	
		MAX	8.00E-02	4.70E+03	2.60E+01
6	32	70 AVE	7.63E-02	1.13E+03	1.61E+01
		MIN	<7.50E-02	2.30E+02	8.30E+00
		MAX		1.50E+02	3.30E+00
6	32	72 AVE	<3.07E-03*	1.36E+02	1.20E+00
		MIN		1.20E+02	<5.00E-01
		MAX	<7.50E-02	1.10E+00	6.60E+00
6	32	77 AVE	<7.50E-02	7.13E-01	4.45E+00
		MIN	<7.50E-02	4.80E-01	3.50E+00
		MAX	<7.50E-02	2.10E+02	1.80E+01
6	33	42 AVE	<7.50E-02	1.80E+02	1.63E+01
		MIN	<7.50E-02	1.60E+02	1.40E+01
		MAX	<7.50E-02	1.80E+01	1.90E+01
6	33	56 AVE	<7.50E-02	4.90E+00	9.68E+00
		MIN	<7.50E-02	<4.20E-01	5.60E+00
		MAX	1.20E-01	4.40E+02	3.90E+02
6	34	39A AVE	8.70E-02	3.43E+02	1.14E+02
		MIN	<7.50E-02	2.90E+02	2.10E+01
		MAX		3.70E+02	4.20E+01
6	34	41 AVE		3.08E+02	2.58E+01
		MIN		2.70E+02	1.80E+01

WELL NO.		TOTAL BETA (PCI/ML)	TRITIUM (PCI/ML)	NITRATE (MG/L)
	MAX	4.20E-01	3.40E+02	2.30E+01
6 34 42	AVE	1.64E-01	2.83E+02	1.77E+01
	MIN	<7.50E-02	2.40E+02	3.90E+00
	MAX	<7.50E-02	<5.60E-01	7.10E+00
6 34 51	AVE	<7.50E-02	<3.81E-01	6.33E+00
	MIN	<7.50E-02	<5.50E-02	4.90E+00
	MAX		5.60E-01	3.50E+01
6 34 68	AVE		5.43E-01	2.03E+01
	MIN		<5.20E-01	1.30E+01
	MAX	<7.50E-02	1.20E+02	2.20E+01
6 35 9	AVE	<7.50E-02	1.18E+02	1.88E+01
	MIN	<7.50E-02	1.10E+02	1.60E+01
	MAX	<7.50E-02	9.50E+02	1.90E+01
6 35 66	AVE	<7.50E-02	8.86E+02	1.70E+01
	MIN	<7.50E-02	8.40E+02	1.50E+01
	MAX			
6 35 70	AVE	<7.50E-02*	6.30E+03*	2.40E+01*
	MIN			
	MAX	<7.50E-02	<8.00E-01	7.00E-01
6 35 78	AVE	<6.00E-02	<6.10E-01	5.85E-01
	MIN	<9.47E-30	3.10E-01	<5.00E-01
	MAX		6.60E+02	<5.00E-01
6 36 46P	AVE		1.65E+02	<5.00E-01
	MIN		<4.60E-01	<5.00E-01
	MAX		<7.10E-01	<5.00E-01
6 36 46Q	AVE		<5.90E-01	<5.00E-01
	MIN		<4.60E-01	<5.00E-01
	MAX			
6 36 61A	AVE			2.67E+01*
	MIN			
	MAX		6.20E+00	1.30E+00
6 36 61B	AVE		2.08E+00	7.00E-01
	MIN		<5.40E-01	<5.00E-01

WELL NO.				TOTAL BETA (PCI/ML)	TRITIUM (PCI/ML)	NITRATE (MG/L)
6	36	93	MAX			
			AVE		<5.60E-01*	<5.00E-01*
			MIN			
6	37	43	MAX			
			AVE	1.02E-01*	6.45E+01*	9.80E+00*
			MIN			
6	37	82A	MAX		<6.80E-01	3.70E+01
			AVE		<6.15E-01	2.76E+01
			MIN		4.40E-01	3.40E+00
6	38	65	MAX		1.10E+02	8.80E+01
			AVE		9.85E+01	7.65E+01
			MIN		8.70E+01	6.20E+01
6	38	70	MAX		1.30E+01	
			AVE	1.75E-01*	8.80E+00	2.37E+02*
			MIN		5.50E+00	
6	39	39	MAX			
			AVE	<7.50E-02*	<5.63E-01*	<5.00E-01*
			MIN			
6	39	79	MAX			
			AVE	<7.50E-02*	7.55E-01*	5.30E-01*
			MIN			
6	40	1	MAX			
			AVE		2.13E+02*	2.80E+01*
			MIN			
6	40	33A	MAX		<7.90E-01	<5.00E-01
			AVE		<6.35E-01	<5.00E-01
			MIN		4.80E-01	<5.00E-01
6	40	62	MAX		9.80E+00	1.30E+01
			AVE		9.13E+00	7.18E+00
			MIN		8.30E+00	1.50E+00
6	41	1	MAX		2.30E+02	3.50E+01
			AVE		2.06E+02	2.80E+01
			MIN		1.80E+02	2.30E+01

WELL NO.				TOTAL BETA (PCI/ML)	TRITIUM (PCI/ML)	NITRATE (MG/L)
6	41	23	MAX	<7.50E-02	8.20E+02	4.00E+01
			AVE	<7.50E-02	7.23E+02	3.65E+01
			MIN	<7.50E-02	6.60E+02	3.00E+01
6	42	2	MAX		2.00E+02	2.90E+01
			AVE		1.78E+02	2.50E+01
			MIN		1.60E+02	2.30E+01
6	42	12A	MAX	1.40E-01	3.70E+02	3.00E+01
			AVE	9.13E-02	3.40E+02	2.90E+01
			MIN	<7.50E-02	3.10E+02	2.70E+01
6	42	42	MAX			
			AVE		<8.84E-02*	2.00E-01*
			MIN			
6	42	42D	MAX			
			AVE		1.20E+02*	1.40E+01*
			MIN			
6	43	3	MAX		2.40E+02	2.60E+01
			AVE		1.98E+02	2.32E+01
			MIN		1.80E+02	1.60E+01
6	43	42	MAX			
			AVE	<7.50E-02*	1.70E+02*	<5.00E-01*
			MIN			
6	43	88	MAX		<7.00E-01	<5.00E-01
			AVE		<6.60E-01	<5.00E-01
			MIN		<5.90E-01	<5.00E-01
6	44	64	MAX		1.10E+00	1.50E+01
			AVE		6.83E-01	1.26E+01
			MIN		<3.90E-01	8.30E+00
6	45	4	MAX		4.90E+02	1.70E+01
			AVE		1.26E+02	1.28E+01
			MIN		6.30E+01	4.40E+00
6	45	42	MAX	<7.50E-02	2.10E+02	5.90E+00
			AVE	<7.50E-02	1.80E+02	4.45E+00
			MIN	<7.50E-02	1.60E+02	2.70E+00

WELL NO.		TOTAL BETA (PCI/ML)	TRITIUM (PCI/ML)	NITRATE (MG/L)
	MAX		6.80E-01	2.30E+01
6 45 69	AVE	<7.50E-02*	5.75E-01	1.66E+01
	MIN		<4.50E-01	<5.00E-01
	MAX		1.90E+02	2.10E+01
6 46 5	AVE		1.19E+02	1.51E+01
	MIN		9.10E+01	1.20E+01
	MAX		3.30E+01	1.30E+01
6 46 21	AVE		3.18E+01	1.23E+01
	MIN		2.90E+01	1.20E+01
	MAX		1.90E+02	2.10E+01
6 47 6	AVE		1.46E+02	1.60E+01
	MIN		6.70E+01	7.30E+00
	MAX		9.00E-01	6.70E+00
6 47 35A	AVE		6.50E-01	2.44E+00
	MIN		<5.20E-01	<5.00E-01
	MAX		<6.20E-01	1.20E+01
6 47 46	AVE	<7.50E-02*	<5.65E-01	1.04E+01
	MIN		<4.90E-01	7.60E+00
	MAX	<7.50E-02	<5.70E-01	1.40E+01
6 47 60	AVE	<7.50E-02	<5.38E-01	1.12E+01
	MIN	<7.50E-02	<5.00E-01	7.00E+00
	MAX		7.10E+01	5.90E+00
6 48 7	AVE		1.83E+01	3.23E+00
	MIN		<5.00E-01	8.00E-01
	MAX		<1.10E+00	2.10E+00
6 48 24	AVE		<6.80E-01	2.00E+00
	MIN		<3.90E-01	1.80E+00
	MAX		<6.30E-01	1.70E+01
6 48 71	AVE		<5.70E-01	1.27E+01
	MIN		<5.10E-01	1.80E+00
	MAX		<5.90E-01	3.30E+00
6 49 13	AVE		<5.35E-01	3.03E+00
	MIN		<4.60E-01	2.60E+00

WELL NO.		TOTAL BETA (PCI/ML)	TRITIUM (PCI/ML)	NITRATE (MG/L)
6 49 28	MAX		9.10E-01	<5.00E-01
	AVE		7.10E-01	<5.00E-01
	MIN		<4.40E-01	<5.00E-01
6 49 55	MAX	<7.50E-02	<8.40E-01	3.20E+00
	AVE	<7.50E-02	<6.15E-01	2.75E+00
	MIN	<7.50E-02	<4.50E-01	1.80E+00
6 49 57	MAX	1.90E+00	1.30E+02	2.70E+02
	AVE	1.63E+00	1.09E+02	2.18E+02
	MIN	1.30E+00	9.10E+01	1.50E+02
6 49 79	MAX		<8.00E-01	3.60E+01
	AVE		<6.28E-01	3.30E+01
	MIN		<5.20E-01	3.00E+01
6 50 18	MAX		<8.20E-01	4.60E+00
	AVE		<6.30E-01	3.05E+00
	MIN		<5.40E-01	1.30E+00
6 50 28B	MAX		5.90E+00	1.70E+00
	AVE		2.22E+00	8.25E-01
	MIN		<4.40E-01	<5.00E-01
6 50 30	MAX		<7.80E-01	7.60E+00
	AVE		<6.45E-01	7.23E+00
	MIN		<4.60E-01	6.60E+00
6 50 42	MAX		1.80E+00	<5.00E-01
	AVE		1.40E+00	<5.00E-01
	MIN		8.00E-01	<5.00E-01
6 50 53	MAX	8.30E-02	<6.40E-01	2.30E+01
	AVE	7.70E-02	<5.78E-01	1.08E+01
	MIN	<7.50E-02	5.00E-01	6.30E-01
6 50 85	MAX		<8.10E-01	1.60E+01
	AVE		<7.30E-01	8.63E+00
	MIN		5.90E-01	<5.00E-01
6 51 63	MAX		<7.40E-01	6.20E+00
	AVE		<6.08E-01	4.63E+00
	MIN		<4.90E-01	3.10E+00

WELL NO.		TOTAL BETA (PCI/ML)	TRITIUM (PCI/ML)	NITRATE (MG/L)
6 51 75	MAX		<7.30E-01	3.10E+00
	AVE		<6.03E-01	1.30E+00
	MIN		<4.40E-01	<5.00E-01
6 53 35	MAX			
	AVE		<6.77E-01*	<5.00E-01*
	MIN			
6 53 47	MAX		1.30E+00	<5.00E-01
	AVE	<3.75E-02*	7.63E-01	<5.00E-01
	MIN		<4.10E-01	<5.00E-01
6 53 55A	MAX		<9.00E-01	<5.00E-01
	AVE	<3.75E-02*	<6.30E-01	<5.00E-01
	MIN		<5.00E-01	<5.00E-01
6 53 103	MAX			
	AVE		<5.80E-01*	<5.00E-01*
	MIN			
6 54 18	MAX			
	AVE			2.50E+00*
	MIN			
6 54 34	MAX		<9.00E-01	<5.00E-01
	AVE		<6.13E-01	<5.00E-01
	MIN		<4.10E-01	<5.00E-01
6 54 37A	MAX		7.20E-01	<5.00E-01
	AVE		6.13E-01	<5.00E-01
	MIN		<4.00E-01	<5.00E-01
6 54 42	MAX			<5.00E-01
	AVE		<5.77E-01*	<5.00E-01
	MIN			<5.00E-01
6 54 45	MAX		8.10E-01	<5.00E-01
	AVE		6.47E-01	<5.00E-01
	MIN		5.10E-01	<5.00E-01
6 54 57	MAX		3.40E+00	1.20E+00
	AVE		1.49E+00	6.75E-01
	MIN		4.80E-01	<5.00E-01

WELL NO.		TOTAL BETA (PCI/ML)	TRITIUM (PCI/ML)	NITRATE (MG/L)
6 55 40	MAX		<8.10E-01	<5.00E-01
	AVE		<6.03E-01	<5.00E-01
	MIN		<4.20E-01	<5.00E-01
6 55 44	MAX		<7.90E-01	<5.00E-01
	AVE		<6.58E-01	<5.00E-01
	MIN		5.20E-01	<5.00E-01
6 55 50A	MAX		1.50E+00	7.10E-01
	AVE		8.60E-01	5.53E-01
	MIN		4.60E-01	<5.00E-01
6 55 50C	MAX		8.30E-01	6.60E-01
	AVE		6.98E-01	5.40E-01
	MIN		4.90E-01	<5.00E-01
6 55 50D	MAX		9.10E-01	8.90E-01
	AVE		7.38E-01	6.75E-01
	MIN		4.70E-01	<5.00E-01
6 55 70	MAX		<7.30E-01	<5.00E-01
	AVE		<5.83E-01	<5.00E-01
	MIN		5.00E-01	<5.00E-01
6 55 76	MAX			1.00E+00
	AVE			6.25E-01
	MIN			<5.00E-01
6 55 89	MAX			2.80E+00
	AVE			1.73E+00
	MIN			8.20E-01
6 56 43	MAX		<8.80E-01	<5.00E-01
	AVE		<6.60E-01	<5.00E-01
	MIN		<5.70E-01	<5.00E-01
6 57 25A	MAX		<7.70E-01	2.20E+00
	AVE		<6.00E-01	2.05E+00
	MIN		<4.40E-01	1.90E+00
6 57 29	MAX		<6.70E-01	1.50E+00
	AVE		<5.72E-01	1.21E+00
	MIN		<5.00E-01	7.50E-01

WELL NO.		TOTAL BETA (PCI/ML)	TRITIUM (PCI/ML)	NITRATE (MG/L)
	MAX			1.90E+00
6 57 53	AVE			1.16E+00
	MIN			6.80E-01
	MAX		1.50E+00	1.60E+00
6 59 32	AVE		1.30E+00	1.40E+00
	MIN		1.10E+00	1.00E+00
	MAX		2.90E+00	6.30E-01
6 59 58	AVE		2.45E+00	5.48E-01
	MIN		1.80E+00	<5.00E-01
	MAX			8.90E+00
6 59 808	AVE		8.35E-01*	2.18E+00
	MIN			<5.00E-01
	MAX		1.30E+00	2.60E+00
6 60 32	AVE		1.00E+00	2.28E+00
	MIN		5.50E-01	2.10E+00
	MAX		1.60E+00	<5.00E-01
6 60 57	AVE		1.20E+00	<5.00E-01
	MIN		7.00E-01	<5.00E-01
	MAX		1.80E+00	4.50E+00
6 60 60	AVE		1.63E+00	3.17E+00
	MIN		1.50E+00	1.10E+00
	MAX			2.30E+00
6 61 37	AVE			1.58E+00
	MIN			1.20E+00
	MAX		<7.90E-01	9.20E-01
6 61 41	AVE		<5.67E-01	8.00E-01
	MIN		<4.10E-01	6.30E-01
	MAX		9.50E+00	6.40E+00
6 61 62	AVE		8.43E+00	5.55E+00
	MIN		7.80E+00	5.00E+00
	MAX			4.90E+00
6 62 31	AVE			4.25E+00
	MIN			3.80E+00

WELL NO.		TOTAL BETA (PCI/ML)	TRITIUM (PCI/ML)	NITRATE (MG/L)
	MAX		1.80E+00	1.60E+00
6 62 43F	AVE		1.45E+00	1.17E+00
	MIN		1.00E+00	8.70E-01
	MAX		<8.40E-01	1.50E+01
6 63 25A	AVE		<6.80E-01	1.33E+01
	MIN		<5.50E-01	1.00E+01
	MAX			
6 63 51	AVE		5.60E-01*	<5.00E-01*
	MIN			
	MAX		2.10E+00	<5.00E-01
6 63 55	AVE		1.60E+00	<5.00E-01
	MIN		9.80E-01	<5.00E-01
	MAX		1.40E+00	1.30E+00
6 63 58	AVE		1.28E+00	7.00E-01
	MIN		1.10E+00	<5.00E-01
	MAX			
6 63 90	AVE		<5.47E-01*	2.23E+00*
	MIN			
	MAX			
6 64 27	AVE		<4.10E-01*	1.45E+01*
	MIN			
	MAX		3.10E+00	1.30E+00
6 64 62	AVE		2.65E+00	1.13E+00
	MIN		2.20E+00	1.00E+00
	MAX			
6 65 38	AVE		2.00E+01*	<5.00E-01*
	MIN			
	MAX		2.00E+00	6.80E-01
6 65 50	AVE		1.55E+00	6.28E-01
	MIN		1.40E+00	5.40E-01
	MAX		2.20E+00	<5.00E-01
6 65 59	AVE		1.69E+00	<5.00E-01
	MIN		9.50E-01	<5.00E-01

WELL NO.			TOTAL BETA (PCI/ML)	TRITIUM (PCI/ML)	NITRATE (MG/L)
		MAX		2.20E+00	4.70E+00
6	65	72 AVE		1.78E+00	4.28E+00
		MIN		1.00E+00	4.10E+00
		MAX		1.60E+00	2.40E+00
6	65	83 AVE		1.43E+00	1.98E+00
		MIN		1.20E+00	1.50E+00
		MAX			<5.00E-01
6	66	38 AVE			<5.00E-01
		MIN			<5.00E-01
		MAX			
6	66	39 AVE			<5.00E-01*
		MIN			
		MAX		2.20E+00	9.80E-01
6	66	58 AVE		1.90E+00	6.60E-01
		MIN		1.50E+00	<5.00E-01
		MAX		2.40E+00	7.20E-01
6	66	64 AVE		1.98E+00	6.30E-01
		MIN		1.60E+00	5.10E-01
		MAX			
6	66	103 AVE		<5.60E-01*	<5.00E-01*
		MIN			
		MAX		1.80E+00	1.10E+00
6	67	51 AVE		1.55E+00	8.18E-01
		MIN		1.20E+00	6.10E-01
		MAX		1.60E+00	1.30E+00
6	67	86 AVE		1.30E+00	1.20E+00
		MIN		1.00E+00	1.10E+00
		MAX		2.20E+02	2.82E+01
6	67	98 AVE		4.44E+01	7.08E+00
		MIN		<4.20E-01	<5.00E-01
		MAX			
6	68	105 AVE		<5.20E-01*	8.00E-01*
		MIN			

WELL NO.				TOTAL BETA (PCI/ML)	TRITIUM (PCI/ML)	NITRATE (MG/L)
			MAX			9.00E+00
6	69	38	AVE		<6.33E-01*	2.63E+00
			MIN			<5.00E-01
			MAX			
6	70	68	AVE		1.40E+00*	8.20E-01*
			MIN			
			MAX			
6	71	30	AVE		<5.70E-01*	1.30E+01*
			MIN			
			MAX		1.80E+00	3.50E+00
6	71	52	AVE		1.47E+00	3.00E+00
			MIN		<4.80E-01	1.70E+00
			MAX			
6	71	77	AVE		1.26E+00*	1.00E+00*
			MIN			
			MAX			
6	72	73	AVE		1.25E+00*	8.25E-01*
			MIN			
			MAX		8.20E+00	4.40E+00
6	72	88	AVE		6.87E+00	2.50E+00
			MIN		5.10E+00	1.10E+00
			MAX			
6	72	92	AVE		5.50E+00*	2.30E+00*
			MIN			
			MAX			
6	73	61	AVE		<5.10E-01*	1.63E+00*
			MIN			
			MAX		<7.50E-01	4.50E+00
6	74	44	AVE		<6.10E-01	1.87E+00
			MIN		<4.60E-01	<5.00E-01
			MAX		<7.40E-01	1.60E+02
6	77	36	AVE		<5.88E-01	1.33E+02
			MIN		<4.40E-01	1.10E+02

WELL NO.		TOTAL BETA (PCI/ML)	TRITIUM (PCI/ML)	NITRATE (MG/L)
6 77 54	MAX			4.80E+00
	AVE			3.20E+00
	MIN			<5.00E-01
6 78 62	MAX			
	AVE			2.90E+00*
	MIN			
6 80 43P	MAX			
	AVE			<5.00E-01*
	MIN			
6 80 43Q	MAX			
	AVE			<5.00E-01*
	MIN			
6 80 43R	MAX			
	AVE			<5.00E-01*
	MIN			
6 80 43S	MAX			
	AVE			3.00E+00*
	MIN			
6 81 58	MAX		<7.60E-01	
	AVE		<6.20E-01	5.60E-01*
	MIN		4.70E-01	
6 83 47	MAX			
	AVE		5.40E-01*	
	MIN			
6 84 35A0	MAX			
	AVE		<8.00E-01*	3.80E+00*
	MIN			
6 87 42A	MAX			
	AVE	<7.50E-02*	1.40E+00*	<5.00E-01*
	MIN			
6 87 55	MAX		2.00E+02	1.10E+01
	AVE		1.85E+02	9.98E+00
	MIN		1.70E+02	9.40E+00

WELL NO.		TOTAL BETA (PCI/ML)	TRITIUM (PCI/ML)	NITRATE (MG/L)
6 89 35	MAX			5.70E+01
	AVE			1.78E+01
	MIN			3.70E+00
6 90 45	MAX			
	AVE		1.63E+01*	8.00E-01*
	MIN			
6 96 49	MAX		2.50E+01	7.00E+00
	AVE		2.35E+01	2.57E+00
	MIN		2.20E+01	5.60E-01
6 97 43	MAX		1.10E+01	4.70E+00
	AVE		9.68E+00	4.33E+00
	MIN		5.80E+00	3.60E+00
6 97 51A	MAX		2.20E+01	6.80E+00
	AVE		1.57E+01	5.73E+00
	MIN		<6.20E-01	4.30E+00
6 101 48B	MAX			
	AVE		<5.00E-01*	1.10E+00*
	MIN			

APPENDIX B

TOTAL ALPHA, STRONTIUM, CESIUM, COBALT, URANIUM, RUTHENIUM, CHROMIUM, AND FLUORIDE CONCENTRATIONS IN THE GROUND WATER (UNCONFINED AQUIFER)

APPENDIX B

Total Alpha, Strontium, Cesium, Cobalt, Uranium, Ruthenium, Chromium, and Floride Concentrations in the Ground Water (Unconfined Aquifer)

WELL NO. DATE	TOTAL ALPHA (PCI/ML)	STRONTIUM (PCI/ML)	CESIUM (PCI/ML)	COBALT (PCI/ML)	URANIUM (MG/L)	RUTHENIUM (PCI/ML)	CHROMIUM (MG/L)	FLUORIDE (MG/L)
1 B4 4								
28-MAY-80						1.40E-01		
1 H4 3								
08-JAN-80					8.90E-02		4.40E+00	1.00E-01
25-JAN-80					9.60E-02		3.20E+00	1.00E-01
04-MAR-80					1.37E-01		4.10E+00	<1.00E-01
31-MAR-80					7.50E-02		3.40E+00	1.00E-01
15-MAY-80					6.90E-02		1.70E+00	1.00E-01
24-JUN-80					4.60E-02		2.60E+00	2.00E-01
14-AUG-80					1.37E-01		4.30E+00	<1.00E-01
11-SEP-80					1.51E-01		2.50E+00	3.00E-01
30-SEP-80					<6.90E-03		1.20E-02	1.00E-01
29-OCT-80					6.00E-02		2.90E+00	2.00E-01
31-DEC-80					8.90E-02		3.90E+03	1.00E-01
1 K 11								
22-MAY-80						2.00E-01		
1 N 1								
18-NOV-80		4.40E-02		4.50E-02				
1 N 2								
05-MAR-80				1.40E-01				
30-MAY-80		2.59E+00		2.00E-01				
22-AUG-80				2.00E-01				
18-NOV-80		1.90E+00		1.70E-01				
1 N 3								
05-MAR-80				6.00E-02				
30-MAY-80		2.62E-01		7.90E-02				
22-AUG-80				1.30E-01				
18-NOV-80		3.00E-01		6.30E-02				

WELL NO. DATE	TOTAL ALPHA (PCI/ML)	STRONTIUM (PCI/ML)	CESIUM (PCI/ML)	COBALT (PCI/ML)	URANIUM (MG/L)	RUTHENIUM (PCI/ML)	CHROMIUM (MG/L)	FLUORIDE (MG/L)
1 N 4								
05-MAR-80				8.20E-02				
30-MAY-80		<2.30E-03		7.20E-02		1.90E-01		
22-AUG-80				8.00E-02				
18-NOV-80		3.20E-02		7.70E-02				
1 N 5								
05-MAR-80				1.30E-01				
30-MAY-80		1.10E-02		6.20E-02				
22-AUG-80				9.50E-02				
18-NOV-80		6.90E-02		6.20E-02				
1 N 6								
05-MAR-80				2.50E-02		2.50E-01		
30-MAY-80		2.30E-02		1.10E-01				
22-AUG-80				3.60E-01				
18-NOV-80		<3.90E-03		1.20E-01				
1 N 7								
05-MAR-80				5.50E-02				
30-MAY-80		9.00E-03						
22-AUG-80				3.70E-02				
18-NOV-80		3.20E-03		3.00E-02				
1 N 14								
05-MAR-80				1.30E-01				
30-MAY-80		1.30E-01		1.80E-01				
22-AUG-80				2.70E-01				
18-NOV-80		1.50E-01		2.50E-01				
1 N 15								
05-MAR-80				6.00E-02		2.60E-01		
30-MAY-80		2.10E-03		4.80E-02		2.40E-01		
22-AUG-80				5.30E-02				
18-NOV-80		8.50E-03		5.50E-02				
2E 17 1								
09-FEB-80			1.77E-04	8.69E-03		<1.04E-02		

WELL NO. DATE	TOTAL ALPHA (PCI/ML)	STRONTIUM (PCI/ML)	CESIUM (PCI/ML)	COBALT (PCI/ML)	URANIUM (MG/L)	RUTHENIUM (PCI/ML)	CHROMIUM (MG/L)	FLUORIDE (MG/L)
2E 17 1								
06-MAR-80		2.80E-03						
02-JUN-80		1.70E-02						
22-SEP-80		2.20E-03						
24-NOV-80		<4.50E-03	<1.67E-04	<5.86E-04		<5.35E-04		
16-DEC-80			<4.76E-04	7.07E-03		3.57E-02		
2E 17 2								
15-JAN-80	3.80E-02				2.10E-02			
11-FEB-80	4.40E-02				2.20E-02			
06-MAR-80	4.00E-02							
02-APR-80	3.60E-02							
29-APR-80	2.60E-02				1.40E-02			
02-JUN-80	3.30E-02				1.70E-02			
24-JUL-80	2.60E-02				1.40E-02			
22-AUG-80	2.90E-02				1.60E-02			
22-SEP-80	2.80E-02				1.60E-02			
22-OCT-80					1.68E-02			
2E 17 5								
15-JAN-80	<1.70E-02	2.90E-03	3.00E-02	4.60E-02				
02-APR-80	<1.70E-02	9.50E-03						
24-JUL-80	<1.70E-02	<2.70E-03						
22-OCT-80		<2.07E-03	2.17E-03	<9.24E-03		<7.56E-02		
24-NOV-80		<3.60E-03	<1.60E-03	2.43E-02		<2.41E-02		
2E 17 9								
15-JAN-80	<1.70E-02	4.80E-03	3.00E-02	4.70E-02				
02-APR-80	<1.70E-02	3.20E-03						
24-JUL-80	<1.70E-02	<3.60E-03						
22-OCT-80		7.57E-03	<2.14E-03	<4.52E-03		5.81E-03		
24-NOV-80		<4.95E-03	<1.04E-03	<7.08E-03		5.56E-03		
2E 19 1								
11-FEB-80				3.40E-02				
24-JUL-80			1.30E-01					
2E 23 1								
24-JUL-80			1.80E-02					

WELL NO. DATE	TOTAL ALPHA (PCI/ML)	STRONTIUM (PCI/ML)	CESIUM (PCI/ML)	COBALT (PCI/ML)	URANIUM (MG/L)	RUTHENIUM (PCI/ML)	CHROMIUM (MG/L)	FLUORIDE (MG/L)
2E 24 1								
06-MAR-80		<1.60E-03						
22-SEP-80		3.80E-03						
24-NOV-80		<8.56E-03						
2E 24 2								
06-MAR-80	<1.70E-02	4.50E-03		2.80E-02				
02-JUN-80	<1.70E-02	<1.90E-03						
22-SEP-80	<1.70E-02	<2.60E-03						
24-NOV-80		<1.80E-03	7.17E-06	<3.82E-03	2.7?E-03	<1.37E-02		
16-DEC-80		<6.31E-03	<6.16E-05	<2.35E-03	1.55E-03	<1.39E-02		
2E 24 3								
22-OCT-80			<9.75E-03	<7.86E-03		1.84E-02		
2E 24 7								
11-FEB-80				3.10E-02				
2E 24 8								
24-NOV-80			1.80E-03	<1.47E-02		<3.81E-02		
16-DEC-80			<1.21E-03	<9.03E-04		<2.06E-02		
2E 24 12								
15-JAN-80	4.90E-02				2.60E-02			
02-APR-80	5.10E-02							
24-JUL-80	3.90E-02							
22-OCT-80					3.25E-02			
24-NOV-80					3.90E-02			
2E 25 6								
15-JAN-80			4.70E-02	4.70E-02				
11-FEB-80				2.30E-02				
22-AUG-80				3.40E-02				
22-SEP-80				1.30E-02				
21-OCT-80			5.01E-04	<1.02E-02		8.38E-03		
24-NOV-80			1.92E-03	<2.69E-02		8.00E-04		

WELL NO, DATE	TOTAL ALPHA (PCI/ML)	STRONTIUM (PCI/ML)	CESIUM (PCI/ML)	COBALT (PCI/ML)	URANIUM (MG/L)	RUTHENIUM (PCI/ML)	CHROMIUM (MG/L)	FLUORIDE (MG/L)
2E 25 10								
06-MAR-80	<1.70E-02							
22-SEP-80	<1.70E-02				<6.90E-03			
2E 26 1								
11-FEB-80				2.00E-02				
24-JUL-80				1.50E-02		1.10E-01		
2E 26 3								
11-FEB-80				2.50E-02				
29-APR-80			1.80E-02					
21-OCT-80			2.51E-03	4.58E-02		4.18E-02		
2E 27 1								
11-FEB-80				4.60E-02				
29-APR-80				1.40E-02				
2E 27 5								
06-MAR-80				1.30E-02				
24-NOV-80			2.85E-03	<1.70E-02		<2.00E-01		
2E 28 1								
24-JUL-80				1.40E-02				
2E 28 12								
24-NOV-80			<6.52E-04	<2.87E-02		1.25E-02		
16-DEC-80			<1.14E-02	<1.60E-02		<3.05E-02		
2E 28 13								
24-NOV-80			2.24E-03	<1.20E-02		<6.97E-02		
16-DEC-80			<1.26E-02	<2.20E-02		3.28E-01		
2E 28 17								
11-FEB-80	2.90E-02				1.60E-02			
29-APR-80	2.70E-02				1.40E-02			
22-AUG-80	<1.70E-02				<6.90E-03			

WELL NO. DATE	TOTAL ALPHA (PCI/ML)	STRONTIUM (PCI/ML)	CESIUM (PCI/ML)	COBALT (PCI/ML)	URANIUM (MG/L)	RUTHENIUM (PCI/ML)	CHROMIUM (MG/L)	FLUORIDE (MG/L)
2E 28 17								
16-DEC-80					4.41E-02			
2E 28 18								
15-JAN-80		<3.40E-03	3.20E-02	4.00E-02				
02-APR-80		3.50E-03						
24-JUL-80		<1.80E-03						
22-OCT-80		<3.60E-04	<2.54E-04	<3.16E-05		<2.20E-01		
24-NOV-80			3.98E-04	<2.08E-02		<2.76E-02		
16-DEC-80		<8.11E-03	2.11E-04	<1.29E-02		<6.83E-02		
2E 28 21								
15-JAN-80		<1.60E-03	1.20E-01	6.20E-02				
02-APR-80		<3.10E-03						
24-JUL-80		<1.50E-03						
22-OCT-80		4.69E-03	<4.86E-03	<3.01E-03		<2.45E-01		
24-NOV-80			9.57E-03	<1.81E-02		2.69E-01		
16-DEC-80			<8.40E-03	<1.43E-02		<2.11E-01		
2E 33 1								
15-JAN-80		<2.10E-03	5.00E-02	1.20E-02				
11-FEB-80		2.20E-02		1.20E-01				
06-MAR-80		3.00E-03		6.60E-02				
02-APR-80		6.30E-03		6.30E-02		8.00E-02		
24-JUL-80		4.80E-03		5.80E-02		1.10E-01		
22-AUG-80		4.40E-03		6.80E-02				
22-SEP-80		<2.60E-03		8.50E-02				
22-OCT-80		<9.91E-04	<5.77E-03	3.32E-02		<1.70E-01		
16-DEC-80			2.40E-02	3.87E-02		<2.55E-01		
2E 33 3								
11-FEB-80		3.30E-03		1.50E+00				
16-DEC-80		2.21E-02	<3.97E-03	1.72E+00		<1.16E-02		
2E 33 5								
11-FEB-80				2.70E-01				
22-AUG-80				2.90E-01				
16-DEC-80			<1.01E-02	1.94E-01		<2.99E-01		

WELL NO. DATE	TOTAL ALPHA (PCI/ML)	STRONTIUM (PCI/ML)	CESIUM (PCI/ML)	COBALT (PCI/ML)	URANIUM (MG/L)	RUTHENIUM (PCI/ML)	CHROMIUM (MG/L)	FLUORIDE (MG/L)
2E 33 7								
11-FEB-80				1.10E+00				
22-AUG-80				1.50E+00				
16-DEC-80			4.47E-02	8.89E-01		3.33E-02		
2E 33 8								
11-FEB-80				3.80E-02				
16-DEC-80			3.68E-03	<1.50E-02		<1.30E-01		
2E 33 9								
11-FEB-80		3.40E-03	3.20E-02	3.70E-02				
02-APR-80		6.40E-03						
22-AUG-80		5.20E-03	2.40E-02					
22-SEP-80		<2.80E-03	3.30E-02	1.50E-02				
22-OCT-80		<9.01E-04	<1.27E-02	<9.57E-03		<6.02E-02		
2E 33 10								
16-DEC-80			<6.76E-03	8.33E-01		<1.05E-03		
2E 33 14								
11-FEB-80				3.30E-02				
22-OCT-80				9.80E-02				
2E 33 18								
29-APR-80		6.70E-03						
24-JUL-80		3.10E-03						
22-AUG-80		<2.00E-03						
22-SEP-80		<1.60E-03						
22-OCT-80		<2.70E-04	1.45E-03	<2.72E-02		2.44E-02		
16-DEC-80		<5.90E-03	<5.40E-03	<1.84E-04		<6.47E-02		
2E 33 20								
11-FEB-80	<1.70E-02							
29-APR-80	<1.70E-02							
22-AUG-80	<1.70E-02							

WELL NO. DATE	TOTAL ALPHA (PCI/ML)	STRONTIUM (PCI/ML)	CESIUM (PCI/ML)	COBALT (PCI/ML)	URANIUM (MG/L)	RUTHENIUM (PCI/ML)	CHROMIUM (MG/L)	FLUORIDE (MG/L)
2E 33 21								
29-APR-80				1.50E-02				
22-AUG-80				2.30E-02				
16-DEC-80			<2.79E-03	<9.31E-03		<3.03E-01		
2E 33 24								
15-JAN-80			3.70E-02	2.70E-01				
11-FEB-80				7.10E-01				
06-MAR-80				2.60E-01				
02-APR-80				1.40E-02				
29-APR-80				1.90E-01				
02-JUN-80				1.90E-01				
24-JUL-80				1.60E-01				
22-AUG-80				1.70E-01				
22-SEP-80				1.30E-01				
22-OCT-80			<7.89E-03	1.22E-01		<1.18E-01		
16-DEC-80			<1.48E-02	1.27E-01		<3.73E-02		
2E 33 26								
06-MAR-80				1.40E-01				
02-JUN-80				1.10E-01				
22-SEP-80				2.00E-01				
16-DEC-80			<1.09E-02	8.97E-02		<2.94E-01		
2E 34 1								
11-FEB-80				2.00E-02				
24-JUL-80			7.10E-02					
24-NOV-80			3.82E-04	<8.16E-03		6.50E-03		
16-DEC-80			<2.73E-03	<6.56E-03		<7.39E-02		
2W 6 1								
15-OCT-80				2.10E-02				
2W 10 4								
14-JAN-80				6.20E-02				
05-FEB-80			3.98E-03	4.08E-02		<1.24E-01		
01-APR-80				5.30E-02		8.90E-02		
15-OCT-80			3.17E-03	8.37E-02		5.43E-02		

WELL NO. DATE	TOTAL ALPHA (PCI/ML)	STRONTIUM (PCI/ML)	CESIUM (PCI/ML)	COBALT (PCI/ML)	URANIUM (MG/L)	RUTHENIUM (PCI/ML)	CHROMIUM (MG/L)	FLUORIDE (MG/L)
2W 10 5								
07-FEB-80				5.20E-02				
30-APR-80				3.50E-02				
22-JUL-80				2.70E-02				
15-OCT-80				2.60E-02				
2W 10 8								
07-MAR-80	<1.70E-02			5.80E-02				
03-JUN-80	<1.70E-02			6.10E-02				
23-SEP-80	1.70E-02			3.30E-02				
2W 10 9								
14-JAN-80	<1.70E-02			4.70E-02				
01-APR-80	<1.70E-02			2.50E-02				
22-JUL-80	<1.70E-02			2.80E-02				
15-OCT-80			<1.58E-02	<2.50E-02		1.77E-03		
2W 11 9								
15-OCT-80				1.20E-02				
2W 11 11								
14-JAN-80				2.90E-02				
01-APR-80						1.20E-01		
22-JUL-80				1.70E-02				
15-OCT-80			6.88E-04	<1.36E-02		1.16E-02		
2W 11 23								
07-MAR-80	<1.70E-02			3.60E-02				
03-JUN-80	<1.70E-02			2.10E-02				
23-SEP-80	<1.70E-02			1.80E-02				
2W 11 24								
14-JAN-80	<1.70E-02		3.50E-02	8.20E-02				
01-APR-80	<1.70E-02			4.30E-02				
22-JUL-80	<1.70E-02			4.60E-02				
15-OCT-80			<6.93E-03	3.17E-02		3.91E-02		

WELL NO. DATE	TOTAL ALPHA (PCI/ML)	STRONTIUM (PCI/ML)	CESIUM (PCI/ML)	COBALT (PCI/ML)	URANIUM (MG/L)	RUTHENIUM (PCI/ML)	CHROMIUM (MG/L)	FLUORIDE (MG/L)
2W 12 1								
30-APR-80				1.80E-02				
22-JUL-80				2.50E-02				
15-OCT-80				1.30E-02				
2W 14 2								
14-JAN-80	<1.70E-02			2.10E-02				
01-APR-80	<1.70E-02							
22-JUL-80	<1.70E-02							
15-OCT-80			1.32E-03	<2.48E-02		2.22E-02		
2W 15 3								
15-OCT-80			3.84E-03	4.97E-02		<8.84E-02		
2W 15 6								
01-APR-80	<1.70E-02							
22-JUL-80	<1.70E-02							
2W 15 7								
07-FEB-80				1.20E-01				
30-APR-80				1.10E-01				
26-AUG-80				1.10E-01				
15-NOV-80			<4.24E-03	7.88E-02		<1.22E-01		
2W 15 10								
14-JAN-80	<1.70E-02							
07-FEB-80	<1.70E-02							
01-APR-80	<1.70E-02							
30-APR-80	<1.70E-02							
03-JUN-80	<1.70E-02							
22-JUL-80	<1.70E-02							
26-AUG-80	<1.70E-02							
23-SEP-80	<1.70E-02							
2W 15 11								
14-JAN-80	<1.70E-02							
07-FEB-80	<1.70E-02							
07-MAR-80	<1.70E-02							

WELL NO. DATE	TOTAL ALPHA (PCI/ML)	STRONTIUM (PCI/ML)	CESIUM (PCI/ML)	COBALT (PCI/ML)	URANIUM (MG/L)	RUTHENIUM (PCI/ML)	CHROMIUM (MG/L)	FLUORIDE (MG/L)
2W 15 11								
01-APR-80	<1.70E-02							
30-APR-80	<1.70E-02							
03-JUN-80	<1.70E-02							
22-JUL-80	<1.70E-02							
26-AUG-80	<1.70E-02							
23-SEP-80	<1.70E-02							
2W 18 3								
22-JUL-80				1.50E-02				
2W 18 5								
07-FEB-80	<1.70E-02							
30-APR-80	<1.70E-02							
26-AUG-80	<1.70E-02							
2W 18 7								
07-FEB-80	<1.70E-02							
30-APR-80	<1.70E-02							
2W 18 12								
07-FEB-80	<1.70E-02							
30-APR-80	<1.70E-02							
26-AUG-80	<1.70E-02							
2W 19 2								
07-FEB-80					<6.90E-03			
30-APR-80					<6.90E-03			
26-AUG-80	<1.70E-02				<6.90E-03			
15-NOV-80					3.84E-03			
2W 19 3								
14-JAN-80	<1.70E-02	5.30E-02			1.60E-03			
07-FEB-80	<1.70E-02	6.28E-02			<6.90E-03			
07-MAR-80	<1.70E-02	1.30E-02						
01-APR-80	<1.70E-02			1.90E-02		9.60E-02		
30-APR-80	<1.70E-02	4.20E-03			<6.90E-03			
22-JUL-80	3.00E-02	<1.90E-03		1.30E-02				

WELL NO. DATE	TOTAL ALPHA (PCI/ML)	STRONTIUM (PCI/ML)	CESIUM (PCI/ML)	COBALT (PCI/ML)	URANIUM (MG/L)	RUTHENIUM (PCI/ML)	CHROMIUM (MG/L)	FLUORIDE (MG/L)
2W 19 3								
23-SEP-80	2.40E-02	9.80E-03						
15-NOV-80			<7.67E-04	<1.33E-03	1.30E-02	<3.15E-02		
2W 19 4								
22-JUL-80				3.30E-02				
2W 21 1								
07-FEB-80				4.60E-02				
30-APR-80				3.50E-02				
22-JUL-80				4.70E-02				
15-OCT-80				2.60E-02				
2W 22 1								
07-FEB-80	2.50E-02	1.40E+01						
04-JUN-80	<1.70E-02	4.13E+00						
26-AUG-80	<1.70E-02	4.04E+00		3.30E-02				
10-DEC-80		2.06E+00	<8.98E-04	<1.47E-03		<6.14E-03		
2W 22 2								
04-JUN-80	<1.70E-02	2.00E-02						
10-DEC-80		1.62E-02	3.21E-02	1.73E-04		1.72E-01		
2W 22 5								
04-JUN-80	<1.70E-02	5.80E-03						
2W 22 6								
04-JUN-80	<1.70E-02	<2.00E-03						
2W 22 7								
15-OCT-80				1.60E-02				
2W 22 9								
07-FEB-80				2.20E-02				
30-APR-80				2.20E-02				

WELL NO. DATE	TOTAL ALPHA (PCI/ML)	STRONTIUM (PCI/ML)	CESIUM (PCI/ML)	COBALT (PCI/ML)	URANIUM (MG/L)	RUTHENIUM (PCI/ML)	CHROMIUM (MG/L)	FLUORIDE (MG/L)
2W 22 10								
14-JAN-80	<1.70E-02	5.70E-03		1.40E-02				
07-FEB-80	<1.70E-02	1.00E-01						
07-MAR-80	<1.70E-02	1.00E-02						
01-APR-80	<1.70E-02	1.80E-02						
30-APR-80	<1.70E-02	3.90E-03						
03-JUN-80	<1.70E-02	6.00E-03						
04-JUN-80	<1.70E-02	<4.00E-03						
22-JUL-80	<1.70E-02	3.20E-02						
22-AUG-80		2.70E-03						
26-AUG-80	<1.70E-02							
23-SEP-80	<1.70E-02	6.00E-03						
15-OCT-80	<1.70E-02	6.50E-03						
10-DEC-80		<1.35E-03	<1.11E-03	<4.28E-03		3.64E-03		
2W 22 12								
07-MAR-80		<2.70E-03						
23-SEP-80		<1.90E-02						
10-DEC-80		2.00E-01						
2W 22 15								
04-JUN-80	<1.70E-02	5.40E-03						
2W 22 17								
04-JUN-80	<1.70E-02	2.80E-03						
2W 22 18								
04-JUN-80	<1.70E-02	5.80E-03						
2W 22 20								
07-FEB-80		6.30E-03						
30-APR-80		2.10E-03						
26-AUG-80		1.70E-02						
10-DEC-80		<5.86E-03						
2W 22 21								
07-FEB-80	2.70E-01	7.50E-03			1.51E-01			
26-AUG-80	6.10E-02	3.10E-03			3.10E-02			

WELL NO. DATE	TOTAL ALPHA (PCI/ML)	STRONTIUM (PCI/ML)	CESIUM (PCI/ML)	COBALT (PCI/ML)	URANIUM (MG/L)	RUTHENIUM (PCI/ML)	CHROMIUM (MG/L)	FLUORIDE (MG/L)
2W 22 21								
10-DEC-80		0.00E-01	<2.16E-05	<1.86E-04	1.04E-01	<3.07E-04		
2W 22 26								
07-FEB-80		5.20E-03						
26-AUG-80		<2.70E-03						
10-DEC-80		0.00E-01	<3.97E-03	2.66E-05		<8.09E-02		
2W 22 31								
04-JUN-80	<1.70E-02	2.61E+00				1.30E-01		
2W 23 4								
07-MAR-80	3.40E-02							
03-JUN-80	3.80E-02				2.10E-02			
23-SEP-80	2.90E-02							
10-DEC-80					3.38E-02			
2W 23 9								
14-JAN-80	<1.70E-02							
01-APR-80	2.80E-02					9.60E-02		
22-JUL-80	<1.70E-02							
15-OCT-80			<2.61E-03	<1.81E-02		1.88E-02		
10-DEC-80		0.00E-01	<1.63E-04	<5.58E-04		9.31E-05		
2W 23 10								
14-JAN-80		<2.80E-03		1.40E-02				
01-APR-80		8.90E-03						
22-JUL-80		3.20E-03						
15-OCT-80		<9.91E-04	2.50E-04	<2.82E-04		<1.60E-02		
10-DEC-80		<9.46E-03	<2.55E-05	<9.24E-05		<3.69E-04		
2W 23 11								
10-DEC-80			7.16E-06	<3.81E-03	9.12E-03	<1.35E-02		
2W 26 3								
07-MAR-80	<1.70E-02							
03-JUN-80	<1.70E-02							

WELL NO. DATE	TOTAL ALPHA (PCI/ML)	STRONTIUM (PCI/ML)	CESIUM (PCI/ML)	COBALT (PCI/ML)	URANIUM (MG/L)	RUTHENIUM (PCI/ML)	CHROMIUM (MG/L)	FLUORIDE (MG/L)
2W 26 3								
23-SEP-80	<1.70E-02							
3 1 1								
11-JAN-80				2.30E-02	1.70E-02		6.30E-03	5.00E-01
09-APR-80					1.70E-02		9.00E-03	3.00E-01
13-JUN-80					1.40E-02		9.00E-03	6.00E-01
11-SEP-80					1.90E-02		6.10E-03	4.00E-01
3 1 2								
11-JAN-80					1.00E-02		7.80E-03	4.00E-01
09-APR-80					1.90E-02		6.00E-03	3.00E-01
13-JUN-80					2.10E-02		1.20E-02	5.00E-01
10-SEP-80					2.50E-02		<3.00E-03	3.00E-01
3 1 3								
11-JAN-80				1.80E-02	1.00E-02		5.80E-03	4.00E-01
09-APR-80					6.00E-02		5.00E-03	3.20E-01
13-JUN-80					4.70E-02		5.50E-03	5.00E-01
3 1 4								
11-JAN-80					1.20E-02		7.50E-03	4.00E-01
09-APR-80					2.50E-02		1.40E-02	2.00E-01
13-JUN-80					1.50E-02		<3.00E-03	4.00E-01
11-SEP-80					1.50E-02		6.20E-03	4.00E-01
3 1 5								
03-JAN-80	<1.70E-02							
11-JAN-80					2.70E-02		5.40E-03	2.00E-01
30-JAN-80					2.50E-02		3.10E-03	3.00E-01
27-FEB-80	6.90E-02						5.00E-03	3.00E-01
09-APR-80					3.30E-02		1.50E-02	3.00E-01
23-APR-80							9.00E-03	5.00E-01
19-MAY-80					2.00E-02		4.30E-03	3.00E-01
13-JUN-80							7.40E-03	5.00E-01
16-JUL-80				1.40E-02	1.50E-02		<3.00E-03	3.00E-01
11-SEP-80					1.60E-02		<3.00E-03	2.00E-01
07-OCT-80					9.60E-03		3.00E-03	3.00E-01
05-NOV-80					1.70E-02		9.80E-03	2.00E-01

WELL NO. DATE	TOTAL ALPHA (PCI/ML)	STRONTIUM (PCI/ML)	CESIUM (PCI/ML)	COBALT (PCI/ML)	URANIUM (MG/L)	RUTHENIUM (PCI/ML)	CHROMIUM (MG/L)	FLUORIDE (MG/L)
3 1 6								
11-JAN-80							4.40E-03	3.00E-01
30-JAN-80					8.20E-03		5.60E-03	3.00E-01
27-FEB-80	2.00E-02						<3.00E-03	3.00E-01
09-APR-80					1.60E-02		6.00E-03	3.00E-01
23-APR-80					2.30E-02		1.20E-02	4.00E-01
19-MAY-80					2.70E-02		3.60E-03	4.00E-01
13-JUN-80				2.30E-02	1.60E-02	1.10E-01	5.40E-03	3.00E-01
16-JUL-80				1.80E-02	1.00E-02		<3.00E-03	4.00E-01
11-SEP-80					<6.90E-03		<3.00E-03	3.00E-01
07-OCT-80					<6.90E-03		3.00E-03	4.00E-01
05-NOV-80					<6.90E-03		7.90E-03	3.00E-01
3 2 1								
11-JAN-80					<6.90E-03		6.60E-03	4.00E-01
30-JAN-80				1.40E-02	<6.90E-03		5.80E-03	5.00E-01
27-FEB-80	<1.70E-02						<3.00E-03	4.00E-01
09-APR-80					<6.90E-03		<3.00E-03	3.00E-01
23-APR-80					<6.90E-03		3.60E-03	4.00E-01
19-MAY-80					<6.90E-03		9.30E-03	5.00E-01
25-JUN-80					<6.90E-03		<3.00E-03	5.00E-01
16-JUL-80					<6.90E-03		<3.00E-03	5.00E-01
13-AUG-80					1.00E-02		<3.00E-03	4.00E-01
10-SEP-80					<6.90E-03		<3.00E-03	4.00E-01
07-OCT-80				1.30E-02	9.60E-03		<3.00E-03	5.00E-01
05-NOV-80					1.00E-02		6.50E-03	4.00E-01
3 2 2								
11-JAN-80				2.30E-02	<6.90E-03	1.30E-01	6.30E-03	2.00E-01
30-JAN-80					8.20E-03		<3.00E-03	6.00E-01
27-FEB-80	3.00E-02						6.70E-03	4.00E-01
09-APR-80					1.20E-02		3.00E-03	2.00E-01
23-APR-80					8.90E-03		4.20E-03	5.00E-01
19-MAY-80					1.40E-02		7.40E-03	4.00E-01
25-JUN-80					1.90E-02		7.70E-03	6.00E-01
16-JUL-80					1.60E-02		<3.00E-03	3.00E-01
13-AUG-80					1.70E-02		6.00E-03	5.00E-01
10-SEP-80					1.60E-02		<3.00E-03	5.00E-01
07-OCT-80					1.10E-02		3.00E-03	7.00E-01
05-NOV-80					1.10E-02		7.40E-03	5.00E-01

WELL NO. DATE	TOTAL ALPHA (PCI/ML)	STRONTIUM (PCI/ML)	CESIUM (PCI/ML)	COBALT (PCI/ML)	URANIUM (MG/L)	RUTHENIUM (PCI/ML)	CHROMIUM (MG/L)	FLUORIDE (MG/L)
3 2 3								
11-JAN-80				1.20E-02	<6.90E-03		5.80E-03	4.00E-01
30-JAN-80					<6.90E-03		5.60E-03	3.00E-01
27-FEB-80	1.80E-02						<3.00E-03	3.00E-01
09-APR-80					<6.90E-03		5.00E-03	3.00E-01
23-APR-80					<6.90E-03		5.00E-03	3.00E-01
19-MAY-80					<6.90E-03		5.80E-03	3.00E-01
25-JUN-80					<6.90E-03		3.20E-03	4.00E-01
16-JUL-80					<6.90E-03		<3.00E-03	5.00E-01
13-AUG-80					<6.90E-03		4.00E-03	3.00E-01
10-SEP-80					<6.90E-03		<3.00E-03	3.00E-01
07-OCT-80					9.60E-03		3.60E-03	2.00E-01
05-NOV-80					<6.90E-03		4.40E-03	2.00E-01
3 3 1								
11-JAN-80					<6.90E-03		4.50E-03	4.00E-01
30-JAN-80				1.50E-02	1.10E-02		4.20E-03	4.00E-01
27-FEB-80	2.00E-02						<3.00E-03	3.00E-01
09-APR-80					1.10E-02		<3.00E-03	3.00E-01
23-APR-80					1.60E-02		4.30E-03	4.00E-01
19-MAY-80					1.70E-02		9.30E-03	4.00E-01
13-JUN-80					<6.90E-03		5.80E-03	5.00E-01
16-JUL-80					<6.90E-03		<3.00E-03	3.00E-01
13-AUG-80					<6.90E-03		<3.00E-03	3.00E-01
10-SEP-80					<6.90E-03		<3.00E-03	3.00E-01
07-OCT-80					1.80E-02		<3.00E-03	4.00E-01
05-NOV-80					1.50E-02		3.30E-03	4.00E-01
3 3 2								
11-JAN-80					<6.90E-03		5.60E-03	3.00E-01
30-JAN-80					1.60E-02		8.90E-03	2.00E-01
27-FEB-80	2.30E-02						<3.00E-03	3.00E-01
09-APR-80					1.10E-02		1.30E-02	3.00E-01
23-APR-80					<6.90E-03		3.40E-03	3.00E-01
19-MAY-80					1.40E-02		7.40E-03	3.00E-01
25-JUN-80					2.20E-02		1.00E-02	3.00E-01
16-JUL-80				3.60E-02	9.60E-03		<3.00E-03	3.00E-01
10-SEP-80				1.40E-02	<6.90E-03		3.00E-03	3.00E-01
07-OCT-80					<6.90E-03		3.00E-03	3.00E-01
05-NOV-80					1.10E-02		2.00E-02	3.00E-01

WELL NO. DATE	TOTAL ALPHA (PCI/ML)	STRONTIUM (PCI/ML)	CESIUM (PCI/ML)	COBALT (PCI/ML)	URANIUM (MG/L)	RUTHENIUM (PCI/ML)	CHROMIUM (MG/L)	FLUORIDE (MG/L)
3 3 3								
30-JAN-80				1.60E-02	8.20E-03		7.50E-03	1.00E-01
19-MAY-80					<6.90E-03		1.20E-02	3.00E-01
13-JUN-80					<6.90E-03		1.20E-02	3.00E-01
16-JUL-80					9.60E-03		9.60E-03	3.00E-01
11-SEP-80					1.20E-02		5.00E-03	3.00E-01
07-OCT-80		1.95E-02			1.10E-02		1.00E-02	3.00E-01
05-NOV-80					1.10E-02		8.20E-03	3.00E-01
3 3 9								
11-JAN-80		<2.30E-03			1.90E-02		4.70E-03	5.00E-01
30-JAN-80		<3.10E-03			1.20E-02		5.40E-03	6.00E-01
27-FEB-80	2.20E-02	<2.40E-03					<3.00E-03	4.00E-01
09-APR-80		<1.50E-03			1.40E-02		<3.00E-03	4.00E-01
23-APR-80		<1.70E-03			1.20E-02		<3.00E-03	5.00E-01
13-JUN-80		4.70E-03			2.60E-02		6.40E-03	7.00E-01
16-JUL-80		<3.40E-03		1.30E-02	1.70E-02		<3.00E-03	5.00E-01
13-AUG-80		3.30E-03			8.20E-03		8.00E-03	3.00E-01
10-SEP-80		2.50E-03			1.70E-02		<3.00E-03	4.00E-01
07-OCT-80		2.80E-03			2.30E-02		3.00E-03	3.00E-01
05-NOV-80		1.20E-02			1.90E-02		3.90E-03	4.00E-01
3 3 10								
11-JAN-80		<2.20E-03			1.40E-02		5.40E-03	5.00E-01
30-JAN-80		<3.40E-03			2.10E-02		4.20E-03	5.00E-01
27-FEB-80	1.70E-02	<3.60E-03					<3.00E-03	4.00E-01
09-APR-80		<3.10E-03			1.60E-02		<3.00E-03	4.00E-01
23-APR-80		3.20E-03			1.20E-02		<3.00E-03	7.00E-01
13-JUN-80		<3.20E-03			1.90E-02		5.30E-03	5.00E-01
16-JUL-80		5.30E-03		2.80E-02	1.80E-02		<3.00E-03	5.00E-01
13-AUG-80		6.90E-03			1.40E-02		5.00E-03	4.00E-01
10-SEP-80		<2.30E-03			3.10E-02		<3.00E-03	4.00E-01
07-OCT-80		<1.60E-03		2.50E-02	4.00E-02		<3.00E-03	5.00E-01
05-NOV-80		5.00E-03			4.00E-02		3.00E-03	4.00E-01
3 3 11								
11-JAN-80		4.90E-03			1.20E-02		4.20E-03	5.00E-01
30-JAN-80		4.80E-03			1.90E-02		6.30E-03	5.00E-01
27-FEB-80	3.70E-02	5.20E-03					<3.00E-03	3.00E-01
31-MAR-80		1.70E-02			1.85E-01		3.00E-03	4.00E-01
23-APR-80		5.50E-03			2.30E-02		<3.00E-03	5.00E-01

WELL NO. DATE	TOTAL ALPHA (PCI/ML)	STRONTIUM (PCI/ML)	CESIUM (PCI/ML)	COBALT (PCI/ML)	URANIUM (MG/L)	RUTHENIUM (PCI/ML)	CHROMIUM (MG/L)	FLUORIDE (MG/L)
3 3 11								
19-MAY-80					4.10E-02		3.00E-03	4.00E-01
13-JUN-80		4.60E-03			2.10E-02		5.60E-03	5.00E-01
16-JUL-80		<3.30E-03		2.10E-02	1.90E-02		<3.00E-03	4.00E-01
11-SEP-80		4.30E-03			2.30E-02		<3.00E-03	2.00E-01
07-OCT-80		6.80E-03			2.70E-02		<3.00E-03	4.00E-01
05-NOV-80		<2.20E-03			2.80E-02		8.70E-03	3.00E-01
3 4 1								
11-JAN-80					1.10E-02		1.00E-02	3.00E-01
30-JAN-80				1.50E-02	1.20E-02		9.50E-03	3.00E-01
27-FEB-80	2.10E-02			1.70E-02			1.00E-02	3.00E-01
31-MAR-80					4.00E-02		1.10E-02	3.00E-01
23-APR-80					8.90E-03		1.40E-02	4.00E-01
19-MAY-80					<6.90E-03		1.30E-02	3.00E-01
13-AUG-80					1.60E-02		1.60E-02	3.00E-01
13-NOV-80					1.40E-02		1.00E-02	2.90E-01
31-DEC-80					1.90E-02		8.90E+00	1.70E-01
3 4 7								
11-JAN-80					3.40E-02		1.00E-02	6.00E-01
30-JAN-80					2.90E-02		1.10E-02	6.00E-01
27-FEB-80	4.90E-02						6.40E-03	4.00E-01
09-APR-80					2.70E-02		8.00E-03	4.00E-01
23-APR-80					2.60E-02		6.30E-03	7.00E-01
19-MAY-80					2.30E-02		1.10E-02	6.00E-01
13-JUN-80					2.20E-02		6.30E-03	6.00E-01
16-JUL-80					3.10E-02		3.70E-03	5.00E-01
13-AUG-80					4.10E-02		8.00E-03	4.00E-01
10-SEP-80					2.90E-02		9.50E-03	4.00E-01
07-OCT-80					2.70E-02		1.00E-02	1.00E+00
05-NOV-80					2.70E-02		8.00E-03	4.00E-01
3 4 9								
11-JAN-80		<1.70E-03			1.00E-02		5.50E-03	5.00E-01
30-JAN-80		2.60E-03			1.70E-02		6.30E-03	5.00E-01
27-FEB-80	2.80E-02	<1.60E-03					<3.00E-03	3.00E-01
09-APR-80		<1.40E-03			2.70E-02		7.00E-03	4.00E-01
23-APR-80		2.00E-03			1.80E-02		9.40E-03	5.00E-01
13-JUN-80		<2.30E-03			1.80E-02		4.30E-03	4.00E-01
16-JUL-80		9.30E-03		1.30E-02	1.80E-02		<3.00E-03	4.00E-01

WELL NO. DATE	TOTAL ALPHA (PCI/ML)	STRONTIUM (PCI/ML)	CESIUM (PCI/ML)	COBALT (PCI/ML)	URANIUM (MG/L)	RUTHENIUM (PCI/ML)	CHROMIUM (MG/L)	FLUORIDE (MG/L)
3 4 9								
13-AUG-80		<4.00E-03			2.30E-02		<3.00E-03	3.00E-01
3 4 10								
30-JAN-80		4.10E-03			1.90E-02		7.50E-03	5.00E-01
09-APR-80		<2.30E-03			1.90E-02		7.00E-03	4.00E-01
23-APR-80		<2.10E-03			2.40E-02		5.80E-03	5.00E-01
13-JUN-80		2.00E-03			2.40E-02		5.10E-03	5.00E-01
13-AUG-80		5.40E-03			2.20E-02		1.50E-02	4.00E-01
10-SEP-80		4.10E-03			2.70E-02		<3.00E-03	4.00E-01
05-NOV-80		6.10E-03			2.90E-02		7.00E-03	2.00E-01
3 5 1								
11-JAN-80				1.50E-02	<6.90E-03		9.70E-03	2.00E-01
09-APR-80					<6.90E-03		8.00E-03	2.00E-01
13-JUN-80					<6.90E-03		5.30E-03	3.00E-01
10-SEP-80				1.30E-02	<6.90E-03		5.00E-03	2.00E-01
3 6 1								
11-JAN-80					<6.90E-03		8.60E-03	3.00E-01
31-MAR-80					<6.90E-03		<3.00E-03	2.00E-01
25-JUN-80					<6.90E-03		5.50E-03	2.00E-01
11-SEP-80					<6.90E-03		4.10E-03	2.00E-01
3 8 1								
11-JAN-80					<6.90E-03		5.60E-03	3.00E-01
31-MAR-80					<6.90E-03		5.00E-03	2.00E-01
25-JUN-80					<6.90E-03		1.20E-02	3.00E-01
11-SEP-80					<6.90E-03		1.10E-02	2.00E-01
3 8 2								
11-JAN-80					<6.90E-03		5.40E-03	2.00E-01
09-APR-80					<6.90E-03		8.00E-03	3.00E-01
25-JUN-80					<6.90E-03		<3.00E-03	2.00E-01
3 8 3								
11-JAN-80				1.20E-02	<6.90E-03		7.90E-03	3.00E-01
31-MAR-80					1.60E-02		<3.00E-03	3.00E-01

WELL NO. DATE	TOTAL ALPHA (PCI/ML)	STRONTIUM (PCI/ML)	CESIUM (PCI/ML)	COBALT (PCI/ML)	URANIUM (MG/L)	RUTHENIUM (PCI/ML)	CHROMIUM (MG/L)	FLUORIDE (MG/L)
3 8 3								
25-JUN-80					<6.90E-03		7.30E-03	3.00E-01
11-SEP-80					<6.90E-03		3.90E-03	3.00E-01
3 8 4								
30-JAN-80				2.00E-02	<6.90E-03		5.40E-03	3.00E-01
27-FEB-80	<1.70E-02						<3.00E-03	3.00E-01
31-MAR-80					<6.90E-03		4.00E-03	3.00E-01
23-APR-80					<6.90E-03		9.30E-03	4.00E-01
19-MAY-80					<6.90E-03		<3.00E-03	3.00E-01
25-JUN-80					<6.90E-03		7.40E-03	3.00E-01
16-JUL-80					<6.90E-03		<3.00E-03	3.00E-01
11-SEP-80					<6.90E-03		<3.00E-03	2.00E-01
07-OCT-80					<6.90E-03		<3.00E-03	3.00E-01
05-NOV-80					<6.90E-03			
6 S30E15A								
03-JAN-80	<1.70E-02						1.20E-02	2.00E-01
17-MAR-80					<6.90E-03		<3.00E-03	3.00E-01
09-JUN-80					6.90E-03			
18-SEP-80					<6.90E-03		3.30E-03	2.00E-01
31-DEC-80					<6.90E-03		5.90E+00	1.50E-01
6 S29 E12								
03-JAN-80	<1.70E-02							2.00E-01
17-MAR-80					<6.90E-03			2.00E-01
09-JUN-80					6.90E-03			3.00E-01
18-SEP-80					<6.90E-03			2.00E-01
31-DEC-80					<6.90E-03			2.20E-01
6 S27 E14								
08-JAN-80					<6.90E-03		7.80E-03	2.00E-01
30-JAN-80					<6.90E-03		6.60E-03	2.00E-01
27-FEB-80	<1.70E-02						<3.00E-03	2.00E-01
31-MAR-80					<6.90E-03		<3.00E-03	2.00E-01
23-APR-80					<6.90E-03		6.30E-03	2.00E-01
19-MAY-80					<6.90E-03		1.00E-02	2.00E-01
10-JUN-80					<6.90E-03		5.50E-03	2.00E-01
16-JUL-80					<6.90E-03		4.50E-03	2.00E-01
13-AUG-80					<6.90E-03		<3.00E-03	2.00E-01

WELL NO. DATE	TOTAL ALPHA (PCI/ML)	STRONTIUM (PCI/ML)	CESIUM (PCI/ML)	COBALT (PCI/ML)	URANIUM (MG/L)	RUTHENIUM (PCI/ML)	CHROMIUM (MG/L)	FLUORIDE (MG/L)
6 S27 E14								
10-SEP-80					<6.90E-03		3.00E-03	2.00E-01
13-NOV-80					<6.90E-03		5.80E-03	1.50E-01
31-DEC-80					<6.90E-03		6.10E+00	3.30E-01
6 S19 E13								
03-JAN-80								3.00E-01
18-MAR-80					<6.90E-03			3.00E-01
09-JUN-80					6.90E-03			3.00E-01
18-SEP-80					<6.90E-03			3.00E-01
31-DEC-80					<6.90E-03			2.60E-01
6 S18 51								
25-FEB-80								4.00E-01
15-MAY-80								6.50E+00
20-AUG-80							<3.00E-03	7.50E+00
28-OCT-80								9.30E+00
6 S6 E48								
10-JAN-80					<6.90E-03			
24-MAR-80					<6.90E-03			
09-JUN-80					<6.90E-03			
17-SEP-80					<6.90E-03			
6 S6 E40								
10-JAN-80					<6.90E-03			
24-MAR-80					<6.90E-03			
09-JUN-80					<6.90E-03			
17-SEP-80					<6.90E-03			
6 S0 8								
08-JAN-80				1.70E-02				
6 2 3								
24-MAR-80				2.20E-02				
10-JUN-80				1.20E-02	<6.90E-03			
13-AUG-80					<6.90E-03			

WELL NO. DATE	TOTAL ALPHA (PCI/ML)	STRONTIUM (PCI/ML)	CESIUM (PCI/ML)	COBALT (PCI/ML)	URANIUM (MG/L)	RUTHENIUM (PCI/ML)	CHROMIUM (MG/L)	FLUORIDE (MG/L)
6 8 17								
17-MAR-80				1.70E-02				
10-JUN-80				1.40E-02				
6 8 25								
19-JUN-80				1.20E-02				
03-SEP-80				1.60E-02				
6 9 E2								
03-JAN-80				6.30E-01				
6 13 18								
31-OCT-80				1.40E-02				
6 15 15B								
04-SEP-80				1.80E-02				
6 15 26								
17-MAR-80				1.40E-02				
19-JUN-80				1.50E-02				
6 19 88								
12-MAY-80								3.00E-01
6 20 E5A								
15-JAN-80			2.60E-02	4.30E-02				
6 20 29								
04-JAN-80				3.50E-02				
26-MAR-80				2.70E-02				
19-JUN-80				2.60E-02				
04-SEP-80				1.50E-02				
6 26 15								
03-JAN-80				5.30E-02				

WELL NO. DATE	TOTAL ALPHA (PCI/ML)	STRONTIUM (PCI/ML)	CESIUM (PCI/ML)	COBALT (PCI/ML)	URANIUM (MG/L)	RUTHENIUM (PCI/ML)	CHROMIUM (MG/L)	FLUORIDE (MG/L)
6 26 15								
24-MAR-80				6.00E-02				
12-JUN-80				3.40E-02				
04-SEP-80				2.80E-02				
6 27 8								
03-JAN-80				3.80E-02				
24-MAR-80				6.30E-02				
12-JUN-80				3.20E-02				
17-SEP-80				2.30E-02				
6 28 40								
17-JAN-80				1.60E-02				
6 28 40P								
17-JAN-80				1.50E-02				
6 31 31								
17-JAN-80				3.10E-02				
28-MAR-80				1.70E-02				
11-JUN-80				2.40E-02				
6 31 31P								
17-JAN-80				2.60E-02				
04-SEP-80				3.30E-02				
6 31 55R								
07-JAN-80	<1.70E-02							
20-MAY-80	<1.70E-02							
19-NOV-80					<6.90E-03			
6 32 22								
04-JAN-80				4.90E-02				
26-MAR-80				4.60E-02				
18-JUN-80			1.90E-02	2.50E-02				
04-SEP-80				4.70E-02				

WELL NO. DATE	TOTAL ALPHA (PCI/ML)	STRONTIUM (PCI/ML)	CESIUM (PCI/ML)	COBALT (PCI/ML)	URANIUM (MG/L)	RUTHENIUM (PCI/ML)	CHROMIUM (MG/L)	FLUORIDE (MG/L)
6 32 62								
23-JAN-80	<1.70E-02							
17-APR-80	<1.70E-02							
10-JUL-80	<1.70E-02							
07-OCT-80	<1.70E-02							
6 32 70								
23-JAN-80				2.90E-02				
17-APR-80				1.60E-02				
6 32 72								
23-JAN-80			3.10E-02	2.00E-02				
6 32 77								
08-OCT-80				2.50E-02				
6 33 42								
08-JAN-80				2.10E-02				
28-MAR-80				2.20E-02		1.20E-01		
6 33 56								
07-JAN-80	<1.70E-02							
26-MAR-80	<1.70E-02							
09-SEP-80	2.40E-02				1.20E-02			
6 34 39A								
08-JAN-80				2.50E-02				
24-JUN-80				3.60E-02				
04-SEP-80				1.50E-02				
6 34 41								
08-JAN-80				1.90E-02				
28-MAR-80				2.60E-02		1.20E-01		
24-JUN-80				1.50E-02				
04-SEP-80				2.70E-02				

WELL NO. DATE	TOTAL ALPHA (PCI/ML)	STRONTIUM (PCI/ML)	CESIUM (PCI/ML)	COBALT (PCI/ML)	URANIUM (MG/L)	RUTHENIUM (PCI/ML)	CHROMIUM (MG/L)	FLUORIDE (MG/L)
6 34 42								
08-JAN-80				2.40E-02				
28-MAR-80				1.50E-02				
04-SEP-80				2.40E-02				
6 35 9								
10-JAN-80				1.50E-02				
31-DEC-80				1.30E-02				
6 35 66								
23-JAN-80				3.20E-02				
6 35 70								
23-JAN-80				3.40E-02				
6 35 78								
24-JAN-80				1.60E-02				
07-OCT-80				1.40E-02				
06-DEC-80			<3.64E-04	<1.14E-02	2.13E-02	<1.02E-03		
6 36 46P								
17-JAN-80				1.60E-02				
6 36 46Q								
17-JAN-80				2.00E-02				
6 38 65								
11-NOV-80				2.40E-02				
6 38 70								
23-JAN-80				2.40E-02				
07-OCT-80				2.20E-02				
6 39 59								
31-OCT-80				1.40E-02				

WELL NO. DATE	TOTAL ALPHA (PCI/ML)	STRONTIUM (PCI/ML)	CESIUM (PCI/ML)	COBALT (PCI/ML)	URANIUM (MG/L)	RUTHENIUM (PCI/ML)	CHROMIUM (MG/L)	FLUORIDE (MG/L)
6 40 1								
10-JAN-80				1.70E-02				
6 41 23								
04-JAN-80				1.30E-02				
04-SEP-80				2.20E-02				
6 42 12A								
10-JAN-80				2.10E-02				
25-MAR-80				1.40E-02		9.80E-02		
12-JUN-80				1.90E-02				
6 44 64								
10-JUL-80				2.10E-02				
6 45 69								
24-JAN-80				2.40E-02				
11-NOV-80				1.40E-02				
6 47 46								
25-JAN-80				1.80E-02				
6 49 57								
25-JAN-80				4.70E-01				
17-APR-80				3.80E-01				
09-JUL-80				5.40E-01				
02-OCT-80				5.70E-01				
6 50 53								
25-JAN-80				2.50E-02				
17-APR-80				1.40E-02				
26-SEP-80				1.20E-02				
6 53 47								
18-SEP-80	1.70E-02	8.80E-03						
10-DEC-80		<1.17E-02	1.74E-03	1.37E-05		<2.59E-01		

WELL NO. DATE	TOTAL ALPHA (PCI/ML)	STRONTIUM (PCI/ML)	CESIUM (PCI/ML)	COBALT (PCI/ML)	URANIUM (MG/L)	RUTHENIUM (PCI/ML)	CHROMIUM (MG/L)	FLUORIDE (MG/L)
6 53 55A								
28-JAN-80			<2.57E-05	<9.86E-05		<5.18E-04		
18-SEP-80	1.7ME-02	1.80E-03						
10-DEC-80		0.00E-01	9.93E-04	2.40E-05		<2.68E-01		

APPENDIX C

CHEMICAL AND SPECTROGRAPHIC ANALYSES FROM VARIOUS WELLS SAMPLED

TABLE C.1. Chemical and Spectrographic Analyses from Various Wells Sampled

Constituents	Units	699-25-55	699-27-4	699-31-31	699-32-77	699-35-9	699-37-82A	699-40-1
Aluminum	µg/ℓ	500	500	500	500	500	500	300
Antimony	µg/ℓ	100	100	100	70	100	50	30
Arsenic	µg/ℓ	3	6	4	5	4	2	5
Barium	µg/ℓ	50	70	50	30	70	50	70
Beryllium	µg/ℓ	<1	<1	<1	<1	<1	<1	<1
Bicarbonate	mg/ℓ	179	160	133	130	160	14	150
Bismuth	µg/ℓ	<1,000	<1,000	<1,000	<1,000	<1,000	<1,000	<1,000
Boron	µg/ℓ	30	30	30	30	30	10	10
Bromide	mg/ℓ	0.1	0.1	0.1	0.0	0.1	0.1	0.1
Cadmium	µg/ℓ	50	5	5	3	3	1	3
Calcium	mg/ℓ	50	50	37	30	50	50	50
Carbon Dioxide	mg/ℓ				2.1	3.2	0.0	1.9
Carbonate	mg/ℓ						23	
Chloride	mg/ℓ	7	6.8	11	11	11	13	9.3
Chromium	µg/ℓ	70	70	70	<50	70	<50	<50
Chromium Hexavalent	µg/ℓ	0	0	0	0	5	0	0
Cobalt	µg/ℓ	10	10	7	<5	7	<5	<5
Color		5	5	5	5		5	5
Copper	µg/ℓ	<10	<10	<10	<10	<10	<10	<10
Cyanide	mg/ℓ	0.00	0.00	0.01	0.00	0.00	0.00	0.01
Fluoride	mg/ℓ	0.6	0.3	0.7	0.8	0.4	0.3	0.4
Gallium	µg/ℓ	100	100	100	<30	70	50	50
Germanium	µg/ℓ	300	100	100	100	100	<30	100
Hardness Noncarb	mg/ℓ	2	13	31	0	17	54	22
Hardness Total	mg/ℓ	150	140	140	87	150	100	150
Iodide	mg/ℓ	0.00	0.00	0.00	0.00	0.00	0.01	0.00
Iron	µg/ℓ	30	10	10	10	10	5	10
Iron Ferrous	µg/ℓ							
Lead	µg/ℓ	700	500	700	700	500	300	500
Lithium	µg/ℓ	10	10	10	<10	10	10	10
Magnesium	mg/ℓ	12	10	11	7	10	0.4	11
Manganese	µg/ℓ	7	10	5	3	3	<1	3
Molybdenum	µg/ℓ	30	10	30	30	30	10	10
Nickel	µg/ℓ	100	70	70	<50	70	<50	<50
Nitr NO_2 as in N Total	mg/ℓ	0.00	0.00	0.00	0.00	0.00	0.05	0.00
Nitr NO_3^- as in N Total	mg/ℓ	3.3	4.7	7.6	1.5	5.4	9.8	7.3
Nitr NO_3 as NO_3	mg/ℓ	15	21	34	<6.6	24	<43	<32
NO_2 + NO_3 as N Total	mg/ℓ	3.3	4.7	7.6	1.5	5.4	9.8	7.3
pH Field		8.0	8.0	8.0	8.0	7.9	10.7	8.1
Ph Lab		8.0	8.0	8.1	8.2	8.1	10.4	8.1
Pho Ortho Tot as P	mg/ℓ	0.05	0.03	0.04	0.08	0.04	0.01	0.03
Phosphorus Tot as P	mg/ℓ	0.04	0.02	0.03	0.06	0.02	0.01	0.03
Phosphorus Tot PO_4	mg/ℓ	0.15	0.09	0.12	0.25	0.12	0.03	0.09
Potassium	mg/ℓ	5.1	5.7	6.9	3.2	5.5	8	5.8
Residue Calc Sum	mg/ℓ	223	205	254	161	263	217	259
Residue Ton/Aft	mg/ℓ	0.32	0.29	0.40	0.24	0.35	0.33	0.37
Residue 180C	mg/ℓ	237	215	292	179	254	243	271
SAR		0.7	0.5	1.2	1.2	0.7	0.9	0.6
Selenium	µg/ℓ	3	1	2	1	2	10	2
Silica	mg/ℓ	50	30	50	50	33	30	30
Silver	µg/ℓ	30	30	10	<10	10	<10	<10
Sodium + Potassium	mg/ℓ	20	13	31	30	19	30	17
Sodium	mg/ℓ	10	10	30	25	10	22	10
Sodium Percent		22	16	32	37	21	30	20
Sp Conductance Fld			349		280	380	382	390
Sp Conductance Lab		392	354	435	285	394	387	389
Strontium	µg/ℓ	100	300	300	100	300	300	300
Sulfate	mg/ℓ	34	27	58	20	38	59	31
Tin	µg/ℓ	300	300	300	70	300	50	100
Titanium	µg/ℓ	7	<5	<5	<5	<5	<5	<5
Turbidity	NTU	3.0	24	4.1	0.50	1.3	7.4	1.0
Vandium	µg/ℓ	50	30	30	50	30	30	30
Water Temp	C°	18.1	17.5	19.4	16.6	17.5	18.0	17.3
Zinc	µg/ℓ	10	<5	<5	<5	<5	<5	<5
Zirconium	µg/ℓ	10	7	10	<5	7	<5	<5
Cesium-137	pCi/ℓ	<1	<1	<1	<1	<1	<1	<1
Cobalt-60	pCi/ℓ	<1	2	20	<1	5	<1	10
Gross-B,D,Cs-137	pCi/ℓ	4.8	12	37	3.3	14	7.6	21
Gross-B,D,Sr-90	pCi/ℓ	4.9	12	38	3.3	14	7.8	21
Gross Alpha U-Na	µg/ℓ	5.4	4.5	<4.9	<2.8	8.3	2.6	6.4
Potassium-40	pCi/ℓ	3.8	4.3	5.1	2.4	4.1	6.0	4.3
Strontium-90	pCi/ℓ	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
Tritium	pCi/ℓ	<200	52,000	530,000	340	120,000	<200	200,000

TABLE C.1 (continued)

Constituents	Units	699-41-23	699-42-42	699-50-42	699-51-63	699-55-76	699-55-89	699-57-25A
Aluminum	µg/ℓ	50	300	500	500	300	500	500
Antimony	µg/ℓ	70	70	100	100	70	70	100
Arsenic	µg/ℓ	0	5	0	4	2	1	14
Barium	µg/ℓ	50	70	30	30	30	50	30
Beryllium	µg/ℓ	<1	<1	<1	<1	<1	<1	<1
Bicarbonate	mg/ℓ	139	140	51	140	31	160	160
Bismuth	µg/ℓ	<1,000	<1,000	<1,000	<1,000	<1,000	<1,000	<1,000
Boron	µg/ℓ	30	30	30	10	30	10	30
Bromide	mg/ℓ	0.0	0.1	0.1	0.1	0.2	0.1	0.1
Cadmium	µg/ℓ	3	3	5	3	3	3	3
Calcium	mg/ℓ	42	50	17	32	34	33	30
Carbon Dioxide	mg/ℓ		2.2		2.2	0.0	2.0	
Carbonate	mg/ℓ					2		
Chloride	mg/ℓ	9.6	14	12	9.5	17	7.5	6.1
Chromium	µg/ℓ	50	50	70	50	<50	<50	<50
Chromium Hexavalent	µg/ℓ	0	1	0	0	0	0	0
Cobalt	µg/ℓ	7	7	10	7	5	<5	5
Color		5	5	30	5	5	5	10
Copper	µg/ℓ	<10	<10	<10	<10	<10	<10	<10
Cyanide	mg/ℓ	0.01	0.01	0.00	0.00	0.00	0.00	0.00
Fluoride	mg/ℓ	0.5	0.5	0.5	0.5	0.4	0.3	0.6
Gallium	µg/ℓ	70	70	100	70	70	30	50
Germanium	µg/ℓ	100	100	100	100	100	100	100
Hardness Noncarb	mg/ℓ	39	45	18	14	77	1	0
Hardness Total	mg/ℓ	150	160	60	130	110	130	89
Iodide	mg/ℓ	0.00	0.00	0.01	0.00	0.01	0.00	0.00
Iron	µg/ℓ	10	10	30	10	10	10	10
Iron Ferrous	µg/ℓ							
Lead	µg/ℓ	700	700	300	500	300	700	700
Lithium	µg/ℓ	10	10	10	10	10	10	10
Magnesium	mg/ℓ	12	14	5	12	5.2	12	7.1
Manganese	µg/ℓ	5	3	50	3	10	7	1
Molybdenum	µg/ℓ	30	10	30	30	30	10	30
Nickel	µg/ℓ	70	70	70	70	50	<50	50
Nitr NO_2 as in N Total	mg/ℓ	0.01	0.00	0.00	0.00	0.00	0.01	0.00
Nitr NO_3^2 as in N Total	mg/ℓ	9.0	8.1	0.02	1.6	0.13	0.54	0.74
Nitr NO_3 as NO_3	mg/ℓ	40	<36	0.09	<7.1	<0.58	<2.4	3.3
NO_2 + NO_3 as N^3Total	mg/ℓ	9.0	8.1	0.02	1.6	0.13	0.55	0.74
pH^2Field		8.0	8.0	7.7	8.0	9.1	8.1	8.1
Ph Lab		8.2	8.0	7.8	8.0	9.0	8.1	8.1
Pho Ortho Tot as P	mg/ℓ	0.03	0.03	0.01	0.03	0.01	0.01	0.05
Phosphorus Tot as P	mg/ℓ	0.03	0.02	0.00	0.04	0.01	0.01	0.05
Phosphorus Tot PO_4	mg/ℓ	0.09	0.09	0.03	0.09	0.03	0.03	0.15
Potassium	mg/ℓ	6.7	5.8	4.6	4.1	5.5	4.4	6.6
Residue Calc Sum	mg/ℓ	270	300	119	169	175	168	182
Residue Ton/Aft	mg/ℓ	0.42	0.40	0.17	0.25	0.27	0.28	0.28
Residue 180C	mg/ℓ	310	297	125	182	197	206	207
SAR		1.0	0.8	0.9	0.5	0.5	0.4	1.4
Selenium	µg/ℓ	2	3	0	1	0	0	1
Silica	mg/ℓ	30	39	10	30	10	50	50
Silver	µg/ℓ	10	10	30	10	10	<10	10
Sodium + Potassium	mg/ℓ	30	30	10	10	11	10	30
Sodium	mg/ℓ	29	24	16	12	10	10	31
Sodium Percent		28	24	35	16	17	14	41
Sp Conductance Fld		460	447	212	294	294	304	312
Sp Conductance Lab		454	457	215	308	298	308	321
Strontium	µg/ℓ	300	300	100	100	100	100	100
Sulfate	mg/ℓ	61	57	39	22	83	19	24
Tin	µg/ℓ	100	300	100	300	100	100	100
Titanium	µg/ℓ	<5	<5	<5	<5	<5	<5	<5
Turbidity	NTU	8.1	0.70	32	0.50	3.8	1.7	1.1
Vandium	µg/ℓ	30	30	10	30	10	30	30
Water Temp	C°	18.0	17.2	16.7	17.8	17.9	17.7	18.3
Zinc	µg/ℓ	10	<5	<5	<5	<5	<5	<5
Zirconium	µg/ℓ	7	7	10	7	7	<5	<5
Cesium-137	pCi/ℓ	<1	<1	<1	<1	<1	<1	<1
Cobalt-60	pCi/ℓ	9	10	<1	<1	<1	<1	<1
Gross-B,D,Cs-137	pCi/ℓ	38	32	4.0	3.5	4.7	4.5	6.9
Gross-B,D,Sr-90	pCi/ℓ	38	33	4.1	3.6	4.8	4.5	7.1
Gross Alpha U-Na	µg/ℓ	<4.6	<5.3	<1.7	<3.1	<2.5	<2.6	<3.5
Potasium 40	pCi/ℓ	5.0	4.3	3.4	3.1	4.1	3.3	4.9
Strontium-90	pCi/ℓ	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
Tritium	pCi/ℓ	700,000	330,000	1,300	<200	<200	<200	<200

TABLE C.1 (continued)

Constituents	Units	699-59-58	699-71-30	699-72-73	699-77-36	699-78-62	699-83-47
Aluminum	µg/ℓ	300	300	500	300	300	300
Antimony	µg/ℓ	100	70	100	70	70	70
Arsenic	µg/ℓ	10	6	3	7	3	6
Barium	µg/ℓ	30	50	30	70	30	50
Beryllium	µg/ℓ	<1	<1	<1	<1	<1	<1
Bicarbonate	mg/ℓ	140	240	145	280	140	140
Bismuth	µg/ℓ	<1,000	<1,000	<1,000	<1,000	<1,000	<1,000
Boron	µg/ℓ	30	30	30	100	10	10
Bromide	mg/ℓ	0.0	0.2	0.0	0.2	0.1	0.1
Cadmium	µg/ℓ	3	3	5	1	3	3
Calcium	mg/ℓ	30	56	32	70	35	31
Carbon Dioxide	mg/ℓ	1.4	6.1		7.1	1.8	1.8
Carbonate	mg/ℓ						
Chloride	mg/ℓ	5.9	16	5.1	12	4.3	4.3
Chromium	µg/ℓ	50	<50	70	<50	100	70
Chromium Hexavalent	µg/ℓ	0	1	0	0	110	5
Cobalt	µg/ℓ	7	5	10	<5	<5	<5
Color		5	0	5	5	5	5
Copper	µg/ℓ	<10	<10	<10	<10	<10	<10
Cyanide	mg/ℓ	0.00	0.00	0.00	0.02	0.00	0.00
Fluoride	mg/ℓ	1.4	0.5	0.4	0.7	0.5	0.5
Gallium	µg/ℓ	70	100	100	50	50	70
Germanium	µg/ℓ	100	100	100	300	100	100
Hardness Noncarb	mg/ℓ	0	1	4	22	12	8
Hardness Total	mg/ℓ	77	200	110	250	130	120
Iodide	mg/ℓ	0.00	0.00	0.00	0.00	0.00	0.00
Iron	µg/ℓ	30	10	10	7	5	<5
Iron Ferrous	µg/ℓ						
Lead	µg/ℓ	700	<30	700	500	500	500
Lithium	µg/ℓ	10	10	10	30	10	10
Magnesium	mg/ℓ	7	14	10	30	10	11
Manganese	µg/ℓ	1	3	10	<1	3	3
Molybdenum	µg/ℓ	30	10	30	10	10	30
Nickel	µg/ℓ	50	50	100	<50	<50	<50
Nitr NO_2 as in N Total	mg/ℓ	0.00	0.00	0.00	0.00	0.00	0.00
Nitr NO_3^- as in N Total	mg/ℓ	0.21	6.1	9.1	36	0.90	1.1
Nitr NO_3^- as NO_3	mg/ℓ	<0.93	<27	40	<160	<4	<4.9
NO_2 + NO_3 as N Total	mg/ℓ	0.21	6.1	9.1	36	0.90	1.1
pH Field		8.2	7.8	7.9	7.8	8.1	8.1
PH Lab		8.2	8.1	8.0	7.9	8.1	8.1
Pho Ortho Tot as P	mg/ℓ	0.05	0.05	0.07	0.04	0.03	0.04
Phosphorus Tot as P	mg/ℓ	0.05	0.05	0.04	0.04	0.05	0.03
Phosphorus Tot PO_4	mg/ℓ	0.15	0.15	0.21	0.12	0.09	0.12
Potassium	mg/ℓ	5.4	6.2	5.5	7.1	5.1	4.4
Residue Calc Sum	mg/ℓ	153	366	190	552	221	221
Residue Ton/Aft	mg/ℓ	0.24	0.51	0.25	0.79	0.31	0.31
Residue 180C	mg/ℓ	176	375	184	584	227	227
SAR		1.3	1.2	0.6	1.9	0.6	0.7
Selenium	µg/ℓ	0	2	0	1	1	2
Silica	mg/ℓ	50	32	30	34	31	32
Silver	µg/ℓ	10	10	30	<10	<10	<10
Sodium + Potassium	mg/ℓ	30	30	14	70	10	10
Sodium	mg/ℓ	27	39	10	69	15	18
Sodium Percent		41	29	20	37	20	23
Sp Conductance Fld		248	571	285	830	322	326
Sp Conductance Lab		266	569	287	862	342	344
Strontium	µg/ℓ	100	500	100	700	300	300
Sulfate	mg/ℓ	16	57	18	44	47	46
Tin	µg/ℓ	100	300	300	100	300	100
Titanium	µg/ℓ	<5	<5	<5	<5	<5	<5
Turbidity	NTU	0.60	2.6	14	0.70	0.90	9.1
Vandium	µg/ℓ	50	30	30	10	10	30
Water Temp	C°	17.6	16.7	18.7	16.6	16.5	17.1
Zinc	µg/ℓ	<5	<5	10	<5	70	<5
Zirconium	µg/ℓ	7	7	10	<5	<5	<5
Cesium-137	pCi/ℓ	<1	<1	<1	<1	<1	<1
Cobalt-60	pCi/ℓ	<1	<1	<1	<1	<1	<1
Gross-B,D,CS-137	pCi/ℓ	5.4	7.0	5.3	7.3	4.6	4.3
Gross-B,D,Sr-90	pCi/ℓ	5.5	7.0	5.4	7.3	4.6	4.3
Gross Alpha U-Na	µg/ℓ	<2.5	15	<2.9	17	4.5	4.7
Potasium 40	pCi/ℓ	4.0	4.6	4.1	5.3	3.8	3.3
Strontium-90	pCi/ℓ	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
Tritium	pCi/ℓ	2,400	<200	1,300	340	420	670

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