

NUCLEAR DYNAMICS

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August 31, 1978

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U.S. NUCLEAR REG.
COMMISSION
NATURAL SECTION

Mr. L. C. Rouse, Chief
Attention: Dr. R. Cooperstein
Fuel Processing and Fabrication Branch
Division of Fuel Cycle and Material Safety
U. S. Nuclear Regulatory Commission
Washington, D.C. 20555

Subject: Source Material License No. SUA-1331, Sundance Project, Crook
County, Wyoming. Docket No. 40-8663

Dear Sir:

Pursuant to your letter of April 14, 1978, authorizing our Source
Material License No. SUA-1331 we are enclosing the first quarterly
report as required by License Condition No. 29.

For your reference and convenience, a brief summary of the quarterly
report follows this letter.

We are forwarding copies of this report to the Wyoming Department
of Environmental Quality offices at Cheyenne and Sheridan, Wyoming,
and also a copy is being mailed to the Region IV, Office of Inspection
and Enforcement, U. S. Nuclear Regulatory Commission, in Arlington,
Texas.

Thank you for your continued interest in our project.

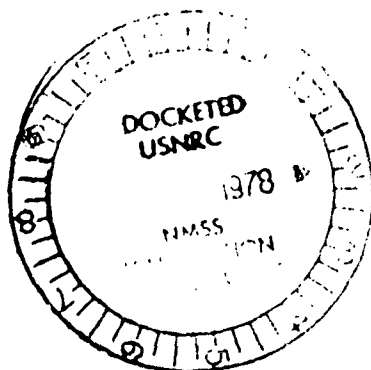
Very truly yours,

Albert F. Stoick

Albert F. Stoick
Manager, Nubeth Joint Venture

AFS:tls

Enclosure



FEE EXEMPT
info only

Regulatory Docket File

10727

August 16, 1978

TO: Albert F. Stoick, Manager, Nubeth Joint Venture

FROM: John A. Baltz, Chief Metallurgist

SUBJECT: Quarterly Report, Summary of Water Quality Program. Source Material License No. SUA-1331, Docket No. 40-8663

Commencing April 6, 1978, a water sampling and analysis program was initiated relative to obtaining baseline water data. Accumulation and evaluation of the collected data has been completed. Our report on the Water Quality Program for Phase I operations is enclosed with this letter summary.

Purpose of the program was to obtain baseline water data to (1) define and establish the pre-mining water quality baseline for our "five-spot" solution mining project, (2) determine upper excursion limits to be used for monitoring purposes during the proposed pilot operation, and (3) establish criteria for the post-mining program wherein water quality of all affected aquifers will be returned to a proposed set of restoration target values.

Field layout of the proposed "five-spot" uranium solution mining pilot test is shown in Attachment 1. Baseline water data was collected from one well in the aquifer overlying the ore zone aquifer, and eight wells in the ore zone aquifer (designated "A" and "B" zone aquifers, respectively). In addition, concurrent data was obtained from a proposed process water well (789V) since this source will furnish water for plant, buffer, and restoration operations. The designated wells in the baseline sampling program are shown in Attachment 2.

Baseline sampling was conducted at two (2) week intervals for a period of two (2) months. A final sampling was conducted one (1) month later. A total of five (5) samples were collected. All sample collection and preservation techniques are documented in the attached report. The full suite of analysis (31 individual chemical parameters) was performed on each sample collected during the baseline program.

From the analysis data, a pre-mining mean baseline was calculated for each specific element. Mean baseline for the "A" zone aquifer is shown in Attachment 3. Mean baseline for the "B" zone aquifer is shown in Attachment 4.

Attachment 5 shows the upper control limits (UCL) for excursion indicators to be used for Phase I operations as determined from baseline water quality data. Radium 226, Arsenic, and Selenium were not included as excursion indicators; however, collected samples from the monitor wells will be analyzed for these additional parameters as part of the monitoring procedures. Sampling schedules during the mining and restoration phases, reporting of data, and corrective action procedures in the event of an excursion condition are detailed in the attached report.

The range of target value concentrations considered acceptable for "B" aquifer restoration following Phase I mining operations is shown in Attachment 6. To further determine aquifer stability following restoration, additional samples from all the "B" aquifer wells originally employed in the baseline program will be taken on a monthly basis for at least three (3) months to confirm stable conditions.

Mr. Albert F. Stoick
August 16, 1978
Page 2
Docket No. 40-8663

Finally, the attached report documents the results of monthly and quarterly samplings of private wells located within a 3 mile radius of the test site. The monthly schedule for sampling these wells remains in effect.

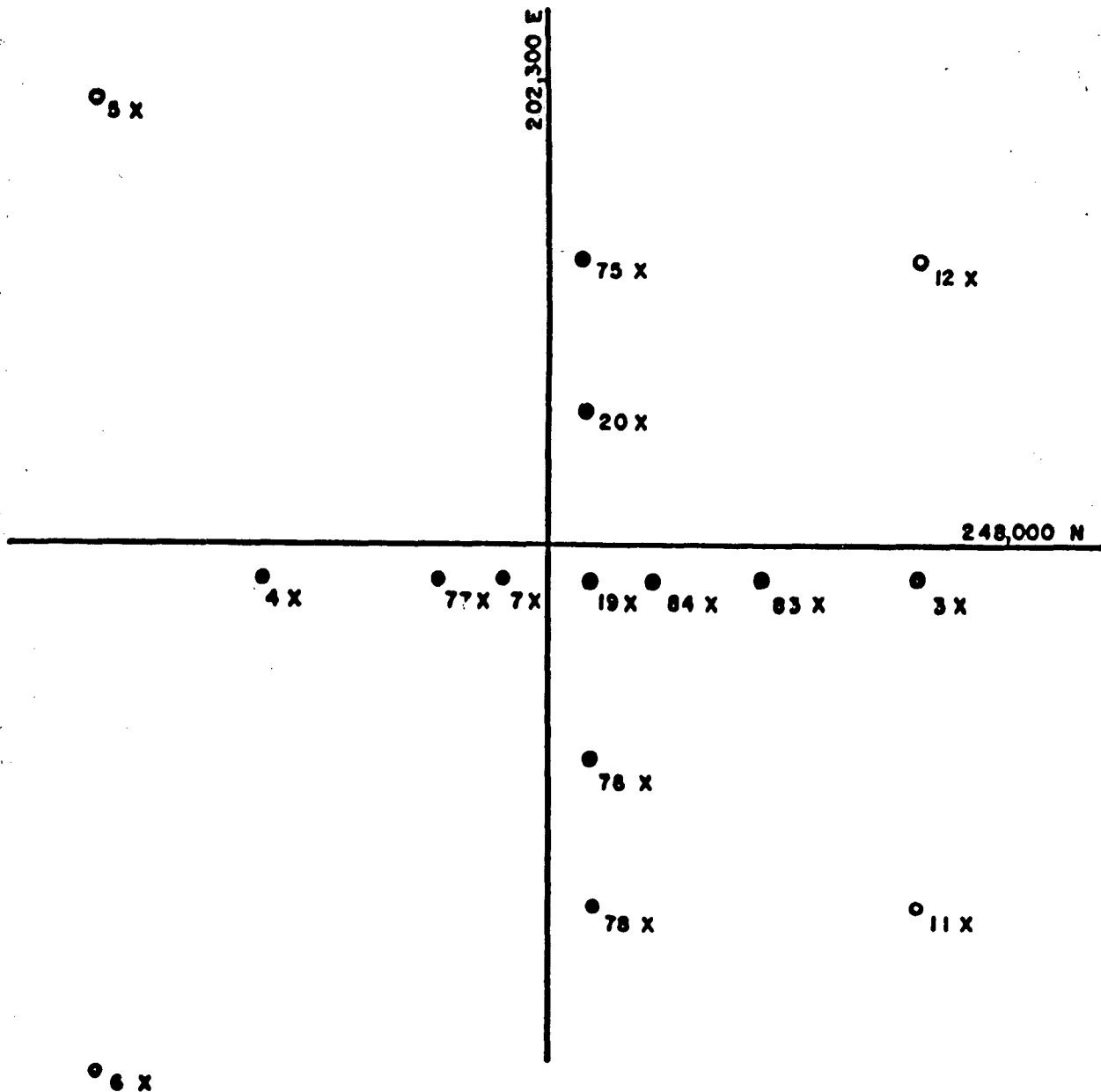
Presently, we are collecting the pre-mining samples required for at least 2 (two) weeks prior to the initiation of the solution mining operation from at least nine (9) of the fifteen (15) wells in the Phase I study.

The program for the coming quarter will commence with a circulation period in which formation water (no chemicals added) will be pumped out of the recovery well into a surge tank and re-injected into the four injection wells. This will be done continuously for approximately three weeks. Water flow rates and static head levels at the above wells and the surrounding buffer and monitor wells will be recorded systematically to establish hydrological characteristics of the 5-spot area. Water samples will be taken regularly at the recovery well head discharge and at the east injection well head. The purpose is to analyze principally for uranium, dissolved oxygen, and bi-carbonate, the concentrations of which could vary as a result of simple aeration of the water. This circulation period may be maintained for approximately three weeks.

Following immediately, the buffer well will be activated and sodium bi-carbonate/carbonate will be injected and circulated until the desired concentration level is attained as indicated by appropriate systematic sampling. This may require another three weeks. At the end of this time hydrogen peroxide injection will be initiated and the leaching period will commence. Leaching will extend through the end of the quarter.

cc: Region IV, Office of Inspection and Enforcement
U. S. Nuclear Regulatory Commission
611 Ryan Plaza Drive Suite 100
Arlington, Texas 76012

"FIVE SPOT" WELL FIELD



SCALE: 1" = 40'

mdb

Attachment 1

- RECOVERY WELL
- INJECTION WELL
- BUFFER WELL
- SAMPLING WELL
- MONITOR WELL / ORE ZONE
- MONITOR WELL / ZONE "A"

Baseline Sample Wells

| <u>Well</u> | <u>Designation</u> | <u>Aquifer</u> |
|-------------|------------------------|----------------|
| 3X | East Buffer Well | "B" |
| 4X | West Buffer Well | "B" |
| 5X | Northwest Monitor Well | "B" |
| 6X | Southwest Monitor Well | "B" |
| 7X | Monitor Well | "A" |
| 11X | Southeast Monitor Well | "B" |
| 12X | Northeast Monitor Well | "B" |
| 19X | Recovery Well | "B" |
| 20X | Injection Well | "B" |
| 789V | Process/Buffer Water | "B" |

Attachment 2

PCAN BASLINE

PA ZONE AQUIFER

(Well 71)

| Parameter | Units | Mean | Highest Individual Value Reported |
|-----------------------------------------|----------|----------|-----------------------------------|
| pH | — | 8.68 | 8.80 |
| Conductivity (25°C) | µmhos/cm | 2300 | 2317 |
| Sodium | mg/l | 572 | 643 |
| TDS (180°C) | mg/l | 1498 | 1530 |
| Arsenic | mg/l | 0.011 | 0.032 |
| Selenium | mg/l | <0.005 | — |
| NO ₃ /NO ₂ (as N) | mg/l | 0.03 | 0.06 |
| Boron | mg/l | <0.10 | — |
| Boron | mg/l | 0.6 | 0.7 |
| Cadmium | mg/l | 0.004 | 0.007 |
| Chromium | mg/l | <0.01 | — |
| Copper | mg/l | 0.010 | 0.025 |
| Iron | mg/l | 0.074 | 0.17 |
| Lead | mg/l | 0.037 | 0.070 |
| Manganese | mg/l | 0.014 | 0.019 |
| Mercury | mg/l | 0.00003 | 0.00004 |
| Nickel | mg/l | 0.016 | 0.027 |
| Zinc | mg/l | 0.016 | 0.025 |
| Molybdenum | mg/l | <0.005 | — |
| Calcium | mg/l | 6 | 11 |
| Magnesium | mg/l | 2.7 | 3.0 |
| Chloride | mg/l | 6 | 11 |
| Potassium | mg/l | 3.9 | 5.0 |
| Sulfate (as SO ₄) | mg/l | 567 | 620 |
| Carbonate (as CO ₃) | mg/l | 17 | 23 |
| Bicarbonate (as HCO ₃) | mg/l | 653 | 682 |
| Ammonia (as N) | mg/l | 0.53 | 0.70 |
| Vanadium | mg/l | <0.005 | — |
| Silver | mg/l | <0.005 | — |
| Uranium (as U) | mg/l | 0.004 | 0.008 |
| Radium 226 | pCi/l | 0.26±0.3 | 0.30±0.4 |
| Gross α | pCi/l | 1.4±3.4 | 3.9±3.9 |
| Gross β | pCi/l | 3.7±19 | 15±72 |

PCAN BASLINE - PA Zone Aquifer

Attachment 3

PCAN BASCLINE

"B" ZONE AQUIFER

(Volls - 3X, 4X, 5X, 6X, 11X,
12X, 19X, 20X, 789V)

| Parameter | Units | Mean - All Volls | Highest - Individual Mean | Voll |
|-----------------------------------------|----------|---------------------|------------------------------|------|
| pH | — | 8.77 | 9.12 | 5X |
| Conductivity (25°C) | µmhos/cm | 2456 | 2635 | 11X |
| Sodium | mg/l | 672 | 886 | 11X |
| TDS (180°C) | mg/l | 1629 | 1764 | 11X |
| Arsenic | mg/l | 0.011 | 0.014 | 789V |
| Selenium | mg/l | 0.003 | 0.007 | 789V |
| NO ₃ /NO ₂ (as N) | mg/l | 0.06 | 0.08 | 12X |
| Barium | mg/l | <0.01 | — | — |
| Boron | mg/l | 0.52 | 0.58 | 20X |
| Cadmium | mg/l | 0.005(3) | 0.005(5) | 4X |
| Chromium | mg/l | <0.01 | — | — |
| Copper | mg/l | <0.01 | — | — |
| Iron | mg/l | 0.090 | 0.133 | 6X |
| Lead | mg/l | 0.040 | 0.043 | 6X |
| Manganese | mg/l | 0.012 | 0.015 | 6X |
| Mercury | mg/l | <0.00004 | — | — |
| Nickel | mg/l | 0.017 | 0.022 | 4X |
| Zinc | mg/l | 0.011 | 0.013 | 3X |
| Molybdenum | mg/l | <0.005 | — | — |
| Calcium | mg/l | 6.2 | 8.1 | 4X |
| Magnesium | mg/l | 2.7 | 3.1 | 11X |
| Chloride | mg/l | 10 | 13 | 3X |
| Potassium | mg/l | 5.2 | 7.9 | 5X |
| Sulfate (as SO ₄) | mg/l | 716 | 810 | 6X |
| Carbonate (as CO ₃) | mg/l | 22 | 45 | 5X |
| Bicarbonate (as HCO ₃) | mg/l | 592 | 707 | 20X |
| Ammonia (as N) | mg/l | 0.73 | 0.99 | 12X |
| Vanadium | mg/l | <0.005 | — | — |
| Silver | mg/l | <0.005 | — | — |
| Uranium (as U) | mg/l | 0.073 | 0.119 | 19X |
| Radium 226 | pCi/l | 22±3 | 85±8 | 19X |
| Gross α | pCi/l | 98±12 | 209±19 | 3X |
| Gross β | pCi/l | 97±22 | 243±32 | 19X |

PCAN BASCLINE - "B" Zone Aquifer

Excursions Indicators
Monitor Wells(1)

| <u>Indicator</u> | <u>Upper Control Limit(2)</u> | <u>Pre-Mining Mean Baseline</u> |
|-------------------------------------|-------------------------------|---------------------------------|
| TDS, 180°C | 1955 mg/l | 1629 mg/l |
| Conductivity, 25°C | 2947 umhos/cm | 2456 umhos/cm |
| pH | 10.77 | 8.77 |
| Uranium (as U) | 1.07 mg/l | 0.073 mg/l |
| Sodium (as Na) | 746 mg/l | 622 mg/l |
| Carbonate (as CO ₃ =) | 26 mg/l | 22 mg/l |
| Bicarbonate (as HCO ₃ -) | 710 mg/l | 592 mg/l |
| Chloride (as Cl ⁻) | 12 mg/l | 10 mg/l |

(1) Monitor Wells 5X, 6X, 11X, 12X - "B" Aquifer

(2) Upper Control Limit exceeded = excursion

Attachment 5

RESTORATION TARGET VALUES

"B" ZONE AQUIFER

(Units - 3X, 4X, 5X, 6X, 11X,
12X, 19X, 20X)

| Parameter | Units | Restoration | | Pre-Mining | Pre-Mining |
|-----------------------------------------|----------|------------------------------|------------------------------|----------------------|------------------|
| | | Upper Limit (1) All Units | Lower Limit (1) All Units | Buffer Water Mean | Baseline Mean |
| pH | -- | 9.33 | 7.50 | 0.69 | 0.77 |
| Conductivity (25°C) | µmhos/cm | 2898. | 1 | 2531 | 2456 |
| Sodium | mg/l | 730 | 0(2) | 653 | 622 |
| TDS (180°C) | mg/l | 1940 | | 1703 | 1629 |
| Arsenic | mg/l | 0.015 | | 0.014 | 0.011 |
| Selenium | mg/l | 0.008 | | 0.007 | 0.003 |
| NO ₃ /NO ₂ (as N) | mg/l | 0.09 | | 0.05 | 0.06 |
| Barium | mg/l | 0.01 | | <0.01 | <0.01 |
| Boron | mg/l | 0.64 | | 0.45 | 0.52 |
| Cadmium | mg/l | 0.0060 | | 0.0050 | 0.0053 |
| Chromium | mg/l | 0.01 | | <0.01 | <0.01 |
| Copper | mg/l | 0.01 | | <0.01 | <0.01 |
| Iron | mg/l | 0.14 | | 0.081 | 0.090 |
| Lead | mg/l | 0.053 | | 0.047 | 0.040 |
| Manganese | mg/l | 0.017 | | 0.012 | 0.012 |
| Mercury | mg/l | 0.00005 | | <0.00004 | <0.00004 |
| Nickel | mg/l | 0.024 | | 0.014 | 0.012 |
| Zinc | mg/l | 0.024 | | 0.022 | 0.011 |
| Molybdenum | mg/l | 0.005 | | <0.005 | <0.005 |
| Calcium | mg/l | 9 | | 3.9 | 6.2 |
| Magnesium | mg/l | 3.4 | | 2.4 | 2.7 |
| Chloride | mg/l | 14.3 | | 12 | 10 |
| Potassium | mg/l | 0.7 | | 6.2 | 5.2 |
| Sulfate (as SO ₄) | mg/l | 891 | | 783 | 718 |
| Carbonate (as CO ₃) | mg/l | 33 | | 15 | 22 |
| Bicarbonate (as HCO ₃) | mg/l | 660 | | 541 | 592 |
| Ammonia (as N) | mg/l | 1.09 | | 0.66 | 0.73 |
| Vanadium | mg/l | 0.010 | | <0.005 | <0.005 |
| Silver | mg/l | 0.005 | | <0.005 | <0.005 |
| Uranium (as U) | mg/l | 0.22 | | 0.056 | 0.073 |
| Radium 226 | pCi/l | 94±8 | | 19±4 | 22±3 |
| Gross α | pCi/l | 230±20 | | 71±11 | 98±12 |
| Gross β | pCi/l | 267±35 | | 94±22 | 97±22 |

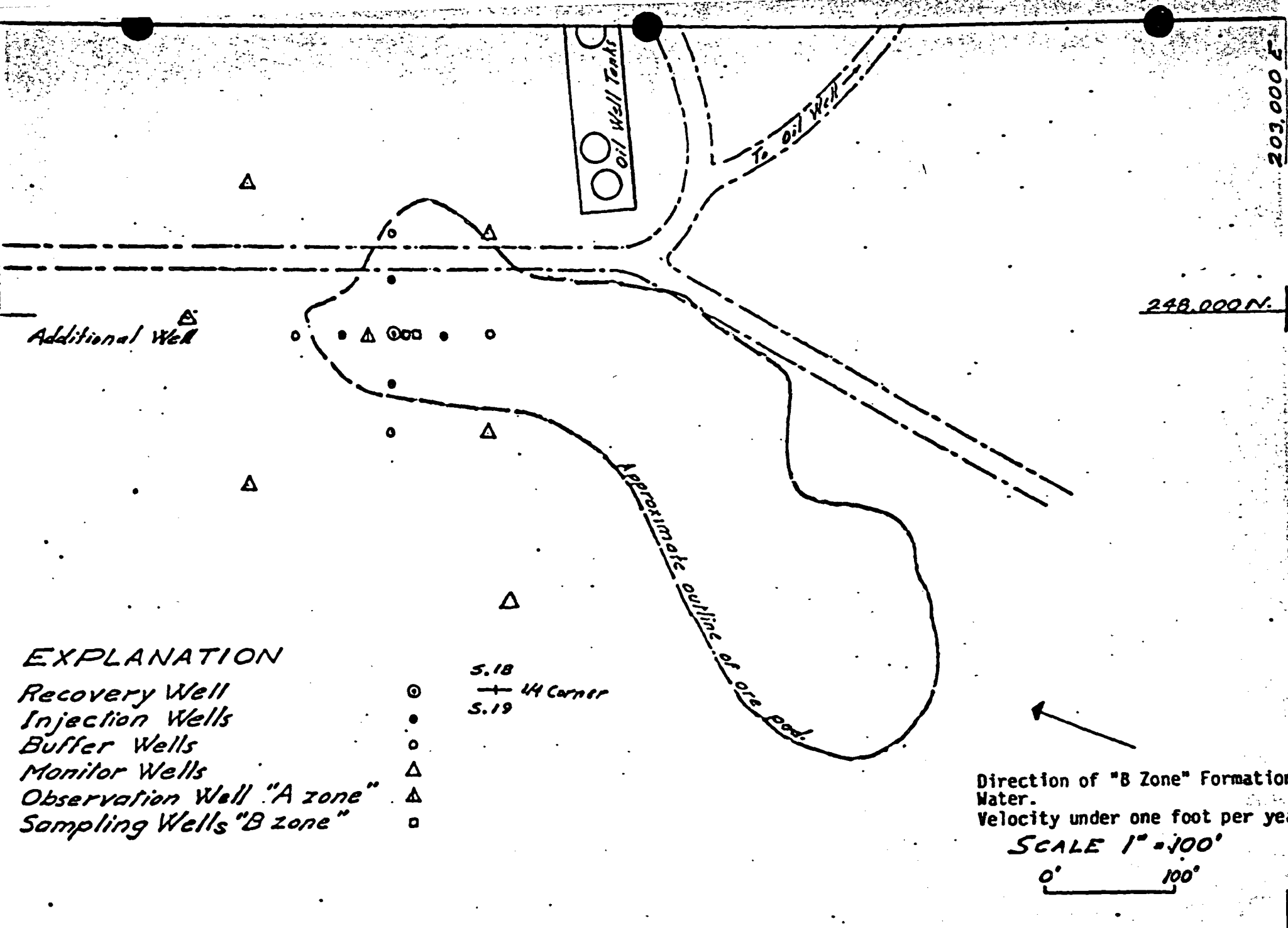
(1) Units 3X, 4X, 5X, 6X, 11X, 12X, 19X, 20X

(2) 0 = limit of detection

RESTORATION TARGET VALUES - "B" Zone Aquifer

203,000 E

248,000 N.



EXPLANATION

- Recovery Well
- Injection Wells
- Buffer Wells
- Monitor Wells
- Observation Well "A zone"
- Sampling Wells "B zone"

S. 18
 S. 19
 1/4 Corner

Additional enclosure per request
 Dr. Ray Cooperstein.

Figure 6aaa Phase I - Well Field

Docket No. 40-8663

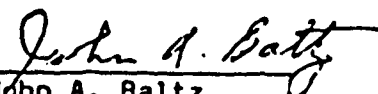
SUNDANCE PROJECT

Nuclear Dynamics - Nubeth
Joint Venture


Water Quality Program
Baseline - Monitor - Restoration
Phase I Operations

August 7, 1978

Prepared By:


John A. Baltz
Chief Metallurgist

Approved By:


A. F. Stoick
Manager, Joint Venture

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Water Quality Program
Baseline - Monitor - Restoration

Program Scope

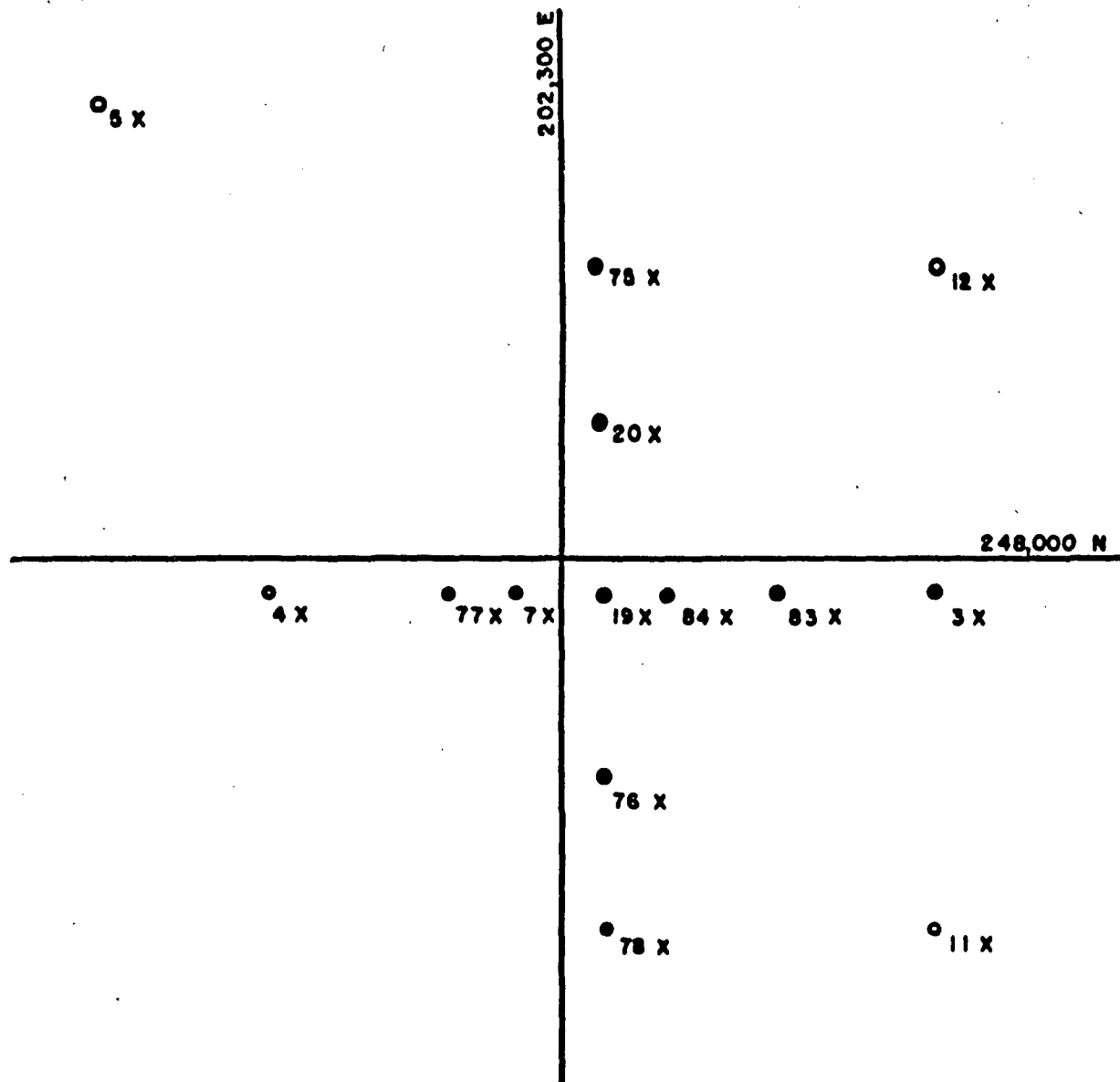
On April 6, 1978, a water sampling and analysis program was initiated relative to obtaining baseline water data to (1) define and establish the pre-mining water quality baseline for the proposed "five spot" solution mining project, (2) determine upper excursion limits to be used for monitoring purposes during the proposed pilot operation, and (3) establish criteria for the post-mining program wherein water quality of all affected aquifers will be returned to a proposed set of restoration target values.

Baseline Sample Wells

The proposed "five spot" uranium solution mining pilot test consists of a fifteen (15) well field arranged for injection, recovery, buffer, and monitoring functions. Field layout shown in Figure 1.

Baseline water data was collected from one well in the aquifer overlying the production zone aquifer, and eight wells in the production zone aquifer (designated "A" and "B" zone aquifers, respectively). In addition, concurrent data was obtained from a proposed process water well since this source will furnish water for plant, buffer, and restoration operations. This well, 789V, is located approximately 700

"FIVE SPOT" WELL FIELD



SCALE: 1" = 40'

mdb

- RECOVERY WELL
- INJECTION WELL
- BUFFER WELL
- SAMPLING WELL
- MONITOR WELL / ORE ZONE
- MONITOR WELL / ZONE "A"

feet from the test field, and is screened in the "B" zone aquifer. The designated wells in the baseline sampling program are shown in Table 1.

TABLE 1
Baseline Sample Wells

| <u>Well</u> | <u>Designation</u> | <u>Aquifer</u> |
|-------------|------------------------|----------------|
| 3X | East Buffer Well | "B" |
| 4X | West Buffer Well | "B" |
| 5X | Northwest Monitor Well | "B" |
| 6X | Southwest Monitor Well | "B" |
| 7X | Monitor Well | "A" |
| 11X | Southeast Monitor Well | "B" |
| 12X | Northeast Monitor Well | "B" |
| 19X | Recovery Well | "B" |
| 20X | Injection Well | "B" |
| 789V | Process/Buffer Water | "B" |

Sample Schedule

Baseline sampling was conducted at two (2) week intervals for a period of two (2) months. A final sampling was conducted one (1) month later. A total of five (5) samples were collected and actual sampling dates were as follows:

| | | |
|-----------------|---|----------------|
| First Sampling | - | 4/6 - 4/9/78 |
| Second Sampling | - | 4/17 - 4/20/78 |
| Third Sampling | - | 5/1 - 5/4/78 |
| Fourth Sampling | - | 5/15 - 5/18/78 |
| Fifth Sampling | - | 6/12 - 6/15/78 |

Sample Collection Procedure

All well baseline sampling was conducted by a two step procedure designed to determine and compare chemical

variations, if any, which could result from prolonged pumping.

Sample collection from individual wells was accomplished by means of a portable submersible pump delivering approximately 5 gallons per minute flow at the nominally operated pump depth of 230 feet. The sampling assembly consisting of a centrifugal pump, electrical cable, safety line, and 1 inch flexible hose was mounted as an intergal unit on a hydraulically operated rotary drum for raising and lowering into individual wells. The entire device was truck mounted for transport between various points.

All collected samples were field Millipore filtered and all reported analysis data represents dissolved concentrations only. To affect Millipore filtration, a 0.45 micron membrane filter in combination with a glass fiber prefilter was utilized. By means of by-pass valving, pump effluents were directed through a Millipore filter holder device at the appropriate sampling times.

As a first step to sampling, water level in the well was determined by electrical sounder measurement. From this measurement, plus known well depth and casing diameter, the casing volume of water contained in the ambient well prior to pumping was calculated. During pumping of the well, the parameters of time, flow rate, and cumulative volumes pumped were continually recorded. Frequent samples (nominally every 20 minutes of pumping time) were taken for temperature, conductivity, and pH measurements. After one (1) to two (2) casing volumes were pumped, effluent

samples were Millipore filtered, selectively preserved, and submitted for analysis of the proposed excursion indicators.⁽¹⁾ Pumping was then continued until steady state conductivity readings were obtained (usually 2.5 - 3.5 casing volumes displaced) wherein a second set of effluent samples were Millipore filtered, selectively preserved, and submitted for analysis of baseline parameters. For reporting purposes in the Tables of Data, samples taken between 1 and 2 casing volumes are designated Sample (1), and samples taken at stabilized conductivity readings are designated Sample (2). Complete well measurements, water levels, casing volumes plus field measurements of conductivity, pH, temperature, and plots of conductivity versus cumulative gallons pumped are contained in the Water Quality Program Appendix section to this application.

A flow schematic of the 2-step sampling procedure, attendant preservation techniques used, and the analysis parameters are shown in Figure 2.

(1) Specifically: pH, conductivity, total dissolved solids, sodium, carbonate, bicarbonate, and uranium. Arsenic, selenium, and radium 226 were also included but are not proposed as excursion indicators.

BASELINE SAMPLE COLLECTION

Two Step Sample Procedure

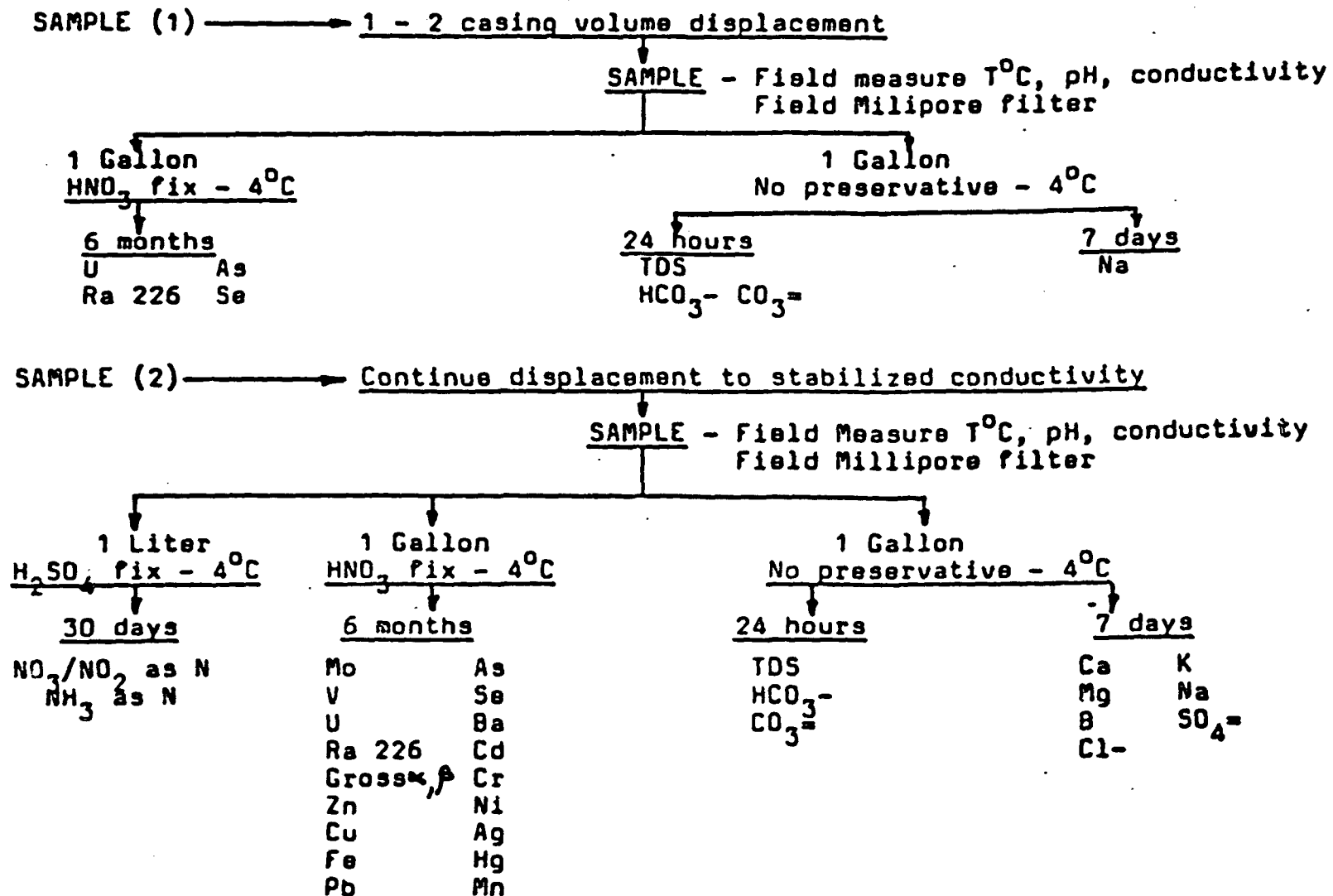


Figure 2

Sample Collection and Preservation Techniques

State of Wyoming guidelines for sample collection and preservation of water samples were utilized throughout the baseline analysis program.⁽¹⁾

Polyethylene bottles and caps were used exclusively to contain collected water samples. Bottles and caps were precleaned in the laboratory prior to transport to the field. Containers for non-acidified samples were Alconox detergent cleaned followed by thorough rinsing with tap and distilled water. Containers for acid preserved samples were detergent cleaned and tap water rinsed, further cleaned with 1:1 HCl solution, and final rinsed with tap and distilled water.

Acid preservatives were added to the bottles prior to field collection of the sample. For sulfuric acid preservations, additions were 5 ml per liter of 1:1 H_2SO_4 . For nitric acid preservations, additions were 20 ml per gallon of 1:1 HNO_3 . Ice chests containing an ice-water mixture were utilized to cool collected samples in the field plus subsequent transport to the laboratory for chemical analysis.

All collected samples in the baseline analysis program were field filtered through 0.45 micron membrane filters directly into appropriate containers, thoroughly mixed, then immediately cooled in ice chests. The effluent sample hose from the Millipore filter device was never allowed to hang into or touch the interior surfaces of the prepared sample containers. All sample containers were immediately identified by tagging in the field. All data concerning sample collection and field

(1) Reference: Guideline No. 4 Supportive Handout, "Sample Collection and Preservation Techniques", State of Wyoming, Department of Environmental Quality, Land Quality Division. Issued December 12, 1977.

measurements were recorded into a field notebook. Field data recorded for each production well sampling included date, well number, well depth, water level, casing ID, calculated casing volumes, pumping rates, cumulative gallons per minute flowed, temperature, pH, and conductivity measurements. A schedule of samples collected and visual observations of water effluents respective to clarity and suspended solids, if any, were also recorded during the pumping program.

The specific preservation techniques employed in the baseline sampling program are shown in Table 2.

TABLE 2
Preservation Schedule

| Chemical Constituent | Preservative Schedule | Holding |
|-------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------|-----------------------------------|
| TDS, HCO_3^- , $\text{CO}_3^{=}$, Ca, Mg, B , Cl^- , K, Na, SO_4 | Cool 4°C Cool 4°C | 24 hours 7 days |
| $\text{NO}_3^-/\text{NO}_2^-$ as N NH_3 as 2N | 5 ml/liter 1:1 H_2SO_4 Cool 4°C | 30 days |
| Mo, V, U, R-226 Gross α & β , Zn, Cu, Fe, Pb, As, Se, Ba, Cd, Cr, Ni, Ag, Hg, Mn | 20 ml/gallon 1:1 HNO_3 | 6 months (except Hg - 13 days) |

Field Measurement - Conductivity

All conductivity measurements were performed to standard procedures. (1) Calibration and cell constants were determined on a daily basis in the laboratory using standard 0.01M KCl solution.

All conductivity values are reported in $\mu\text{hos/cm}$ corrected to 25°C

(1) Reference: Rand, M.C., Greenberg, A.E. Taras, M.J. (Editors), 1975, "Standard Methods for the Examination of Water and Waste Water", 14th edition; American Public Health Association, Washington, D.C., Method 205.

Field Measurement - pH

All pH measurements were performed according to standard procedures. (1)

pH meter calibrations were made using standard 7.00 and 10.00 buffer solutions at temperatures approximately the same as the collected water samples. All sample readings were temperature compensated. Temperature measurements performed in conjunction with pH determinations were by means of calibrated thermometer.

(1) Reference: Rand, M.C., Greenberg, A.E., Taras, M.J. (Editors), 1975, "Standard Methods for the Examination of Water and Waste Water", 14th edition; American Public Health Association, Washington, D.C., Method 400.

Field Measurement - Temperature

All temperature measurements of collected water sampled were made by calibrated thermometer or by thermistor temperature sensor as part of the combination conductivity/temperature probe and instrumentation utilized in field measurement and data collection. Comparison of the probe thermistor versus calibrated thermometer indicated no correction was required in the temperature ranges of interest.

Temperature measurements of baseline water samples were made on the effluent discharge from the sampling pump system. These temperature measurements were taken simultaneously with conductivity readings for purposes of correction of conductivity to 25.0°C. Ambient temperatures and weather conditions above ground at the time of sampling were observed to produce slight variations in the temperature ranges recorded at the point of sampling (varying between sample periods), and should not be interpreted as indicative of fluctuations below ground within the particular aquifer being sampled.

The best measurement of temperature in the "B" zone aquifer was obtained during a 24 hour pumpdown test with flow at 10 GPM. Steady state temperature readings during this test were recorded at 13.0°C. (5/23/78)

All temperature figures reported in the tables of data may not absolutely reflect the underground aquifer temperature but are precise in their use relative to conductivity measurement and correction of readings to 25.0°C.

Chemical Analysis

All chemical and radiometric analysis on collected water samples were performed by CDM/Acculabs, Inc., 11485 West 48th Avenue, Wheat Ridge, Colorado 80033.

Tables 3, 4, 5, 6, 7, and 8 shows the analysis results for all chemical parameters incorporated into the Water Quality Program relative to the aquifer overlying the production zone aquifer ("A" zone, Well 7X), and the production "B" zone aquifer (Wells 3X, 4X, 5X, 6X, 11X, 12X, 19X, 20X, and 789V). For the fifth and final sampling of the baseline program, an abbreviated list of chemical assays was performed by eliminating those elements⁽¹⁾ for which non-detectable or constant values had been previously reported from the earlier sampling periods.

(1) Specifically: Barium, boron, cadmium, lead, chromium, vanadium, and molybdenum were eliminated from analysis of the final baseline sampling.

TABLE OF ASSAYS

Samples Taken 4/6 - 6/9/78

Sample (1) = 1-2 casing volumes displaced
(2) = displacement to static conductivity

| Determination | Units | 3X | | 4X | | 5X | | 6X | | 7X | | 11X | | 12X | | 19X | | 20X | |
|-----------------------------------------|-------|--------|----------|--------|----------|---------|----------|---------|---------|---------|----------|---------|----------|---------|----------|--------|----------|---------|----------|
| | | (1) | (2) | (1) | (2) | (1) | (2) | (1) | (2) | (1) | (2) | (1) | (2) | (1) | (2) | (1) | (2) | (1) | (2) |
| Sodium | mg/l | 632 | 617 | 686 | 614 | 566 | 592 | 646 | 634 | 586 | 592 | 635 | 654 | 614 | 603 | 617 | 614 | 519 | 511 |
| TDS (180°C) | mg/l | 1580 | 1680 | 1630 | 1670 | 1490 | 1600 | 1770 | 1740 | 1510 | 1530 | 1730 | 1750 | 1140 | 1620 | 1690 | 1680 | 1288 | 1270 |
| Arsenic | mg/l | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | 0.003 | 0.002 | 0.003 | <0.002 | 0.003 | <0.002 | 0.003 | <0.002 | <0.002 | <0.002 |
| Selenium | mg/l | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 |
| NO ₃ /NO ₂ (as N) | mg/l | | <0.05 | | <0.05 | | <0.05 | | <0.05 | | <0.05 | | <0.05 | | <0.05 | | <0.05 | | <0.05 |
| Barium | mg/l | | <0.01 | | <0.01 | | <0.01 | | <0.01 | | <0.01 | | <0.01 | | <0.01 | | <0.01 | | <0.01 |
| Boron | mg/l | | 0.5 | | 0.6 | | 0.5 | | 0.4 | | 0.6 | | 0.5 | | 0.4 | | 0.5 | | 0.6 |
| Cadmium | mg/l | | <0.005 | | <0.005 | | <0.005 | | <0.005 | | <0.005 | | <0.005 | | <0.005 | | <0.005 | | <0.005 |
| Chromium | mg/l | | <0.01 | | <0.01 | | <0.01 | | <0.01 | | <0.01 | | <0.01 | | <0.01 | | <0.01 | | <0.01 |
| Copper | mg/l | | 0.01 | | <0.01 | | 0.01 | | <0.01 | | 0.01 | | 0.01 | | <0.01 | | <0.01 | | 0.01 |
| Iron | mg/l | | 0.08 | | 0.05 | | 0.09 | | 0.11 | | 0.17 | | 0.08 | | 0.11 | | 0.10 | | 0.10 |
| Lead | mg/l | | <0.05 | | 0.06 | | 0.07 | | 0.06 | | 0.07 | | <0.05 | | <0.05 | | <0.05 | | 0.06 |
| Manganese | mg/l | | 0.01 | | 0.01 | | 0.007 | | 0.01 | | 0.01 | | 0.01 | | 0.01 | | 0.01 | | 0.007 |
| Mercury | mg/l | | <0.00002 | | <0.00002 | | <0.00002 | | 0.00002 | | <0.00002 | | <0.00002 | | <0.00002 | | <0.00002 | | <0.00002 |
| Nickel | mg/l | | 0.02 | | 0.02 | | 0.01 | | 0.02 | | 0.02 | | 0.02 | | 0.02 | | 0.02 | | 0.02 |
| Zinc | mg/l | | 0.006 | | <0.005 | | 0.02 | | 0.02 | | 0.02 | | 0.01 | | 0.009 | | 0.009 | | 0.01 |
| Molybdenum | mg/l | | 0.002 | | 0.004 | | 0.003 | | <0.002 | | <0.002 | | <0.002 | | 0.003 | | 0.002 | | 0.002 |
| Calcium | mg/l | | 12 | | 15 | | 11 | | 14 | | 11 | | 15 | | 12 | | 14 | | 9.2 |
| Magnesium | mg/l | | 2.9 | | 3.0 | | 2.4 | | 3.3 | | 3.0 | | 3.4 | | 2.9 | | 3.2 | | 2.9 |
| Chloride | mg/l | | 13 | | 7.2 | | 11 | | 11 | | 11 | | 14 | | 13 | | 13 | | 2 |
| Potassium | mg/l | | 5.2 | | 12 | | 7.5 | | 5.0 | | 5.0 | | 4.9 | | 5.0 | | 4.6 | | 5.9 |
| Sulfate (as SO ₄) | mg/l | | 720 | | 830 | | 720 | | 760 | | 600 | | 760 | | 640 | | 680 | | 390 |
| Carbonate (as CO ₃) | mg/l | 18 | 13 | 32 | 28 | 80 | 37 | 33 | 23 | 13 | 23 | 28 | 18 | 18 | 13 | 13 | 4.6 | 41 | 37 |
| Bicarbonate (as HCO ₃) | mg/l | 582 | 554 | 584 | 566 | 408 | 536 | 551 | 567 | 582 | 609 | 562 | 578 | 572 | 582 | 559 | 566 | 650 | 644 |
| Ammonia (as N) | mg/l | | 0.60 | | 0.65 | | 0.37 | | 0.81 | | 0.39 | | 0.80 | | 0.74 | | 0.62 | | 0.79 |
| Vanadium | mg/l | | <0.005 | | <0.005 | | <0.005 | | <0.005 | | <0.005 | | <0.005 | | <0.005 | | <0.005 | | <0.005 |
| Silver | mg/l | | <0.005 | | <0.005 | | <0.005 | | <0.005 | | <0.005 | | <0.005 | | <0.005 | | <0.005 | | <0.005 |
| Strontium (as U) | mg/l | 0.068 | 0.071 | 0.085 | 0.080 | 0.075 | 0.10 | 0.14 | 0.075 | 0.017 | 0.008 | 0.072 | 0.079 | 0.046 | 0.073 | 0.080 | 0.38 | 0.009 | 0.006 |
| Fe 226 | pCi/l | 5727 | 7328 | 1324 | 1634 | 0.320.9 | 0.320.9 | 0.620.4 | 0.621.0 | 0.320.4 | 0.520.4 | 1.221.2 | 1.421.2 | 2.120.8 | 2.320.8 | 6928 | 9729 | 0.420.4 | 0.620.4 |
| Gross α | pCi/l | | 290220 | | 180215 | | 120211 | | 152213 | | 128216 | | 0.023.4 | | 112215 | | 72212 | | 318270 |
| Gross β | pCi/l | | 280230 | | 140230 | | 57222 | | 67221 | | 54228 | | 0226 | | 57222 | | 0226 | | 380230 |

TABLE 3 ASSAY RESULTS -

Wells 3X, 4X, 5X, 6X, 7X, 11X, 12X, 19X, 20X

TABLE OF ASSAYS

Samples Taken 4/17 - 4/20/78

Sample (1) = 1-2 casing volumes displaced
(2) = displacement to stable conductivity

| Determination | Units | 31 | | 41 | | 51 | | 61 | | 71 | | 111 | | 121 | | 181 | | 201 | |
|-----------------------------------------|-------|--------|----------|---------|----------|---------|----------|---------|----------|---------|---------|---------|----------|---------|----------|--------|----------|---------|----------|
| | | (1) | (2) | (1) | (2) | (1) | (2) | (1) | (2) | (1) | (2) | (1) | (2) | (1) | (2) | (1) | (2) | (1) | (2) |
| Sodium | mg/l | 583 | 611 | 587 | 597 | 543 | 586 | 590 | 588 | 543 | 564 | 594 | 657 | 561 | 599 | 569 | 603 | 486 | 534 |
| TDS (180°C) | mg/l | 1680 | 1690 | 1700 | 1680 | 1530 | 1520 | 1800 | 1800 | 1460 | 1520 | 1730 | 1790 | 1510 | 1600 | 1640 | 1710 | 1330 | 1370 |
| Arsenic | mg/l | 0.015 | 0.013 | 0.006 | 0.006 | 0.004 | 0.006 | 0.012 | 0.014 | 0.004 | 0.004 | 0.004 | 0.003 | 0.005 | 0.005 | 0.012 | 0.017 | 0.01 | 0.013 |
| Selenium | mg/l | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 |
| NO ₃ /NO ₂ (as N) | mg/l | | <0.05 | | <0.05 | | <0.05 | | <0.05 | | <0.05 | | <0.05 | | <0.05 | | <0.05 | | <0.05 |
| Borane | mg/l | | <0.1 | | <0.1 | | <0.1 | | <0.1 | | <0.1 | | <0.1 | | <0.1 | | <0.1 | | <0.1 |
| Boron | mg/l | | 0.6 | | 0.5 | | 0.5 | | 0.5 | | 0.6 | | 0.6 | | 0.4 | | 0.2 | | 0.5 |
| Cadmium | mg/l | | 0.005 | | 0.005 | | 0.004 | | 0.004 | | 0.004 | | 0.005 | | 0.005 | | 0.005 | | 0.005 |
| Chromium | mg/l | | <0.01 | | <0.01 | | <0.01 | | <0.01 | | <0.01 | | <0.01 | | <0.01 | | <0.01 | | <0.01 |
| Copper | mg/l | | 0.009 | | 0.022 | | 0.016 | | 0.009 | | 0.023 | | 0.019 | | 0.009 | | 0.009 | | 0.013 |
| Iron | mg/l | | 0.036 | | 0.044 | | 0.036 | | 0.061 | | 0.057 | | 0.076 | | 0.056 | | 0.051 | | 0.051 |
| Lead | mg/l | | <0.05 | | 0.06 | | 0.06 | | 0.06 | | 0.06 | | 0.06 | | 0.06 | | 0.06 | | <0.05 |
| Manganese | mg/l | | 0.015 | | 0.015 | | 0.011 | | 0.017 | | 0.019 | | 0.017 | | 0.017 | | 0.021 | | 0.015 |
| Mercury | mg/l | | <0.00004 | | <0.00004 | | <0.00004 | | <0.00004 | | 0.00004 | | <0.00004 | | <0.00004 | | <0.00004 | | <0.00004 |
| Nickel | mg/l | | 0.031 | | 0.036 | | 0.031 | | 0.031 | | 0.027 | | 0.027 | | 0.022 | | 0.027 | | 0.031 |
| Zinc | mg/l | | 0.005 | | 0.006 | | 0.008 | | 0.009 | | 0.011 | | 0.009 | | 0.009 | | 0.011 | | 0.011 |
| Polychlorine | mg/l | | 0.005 | | 0.006 | | <0.005 | | <0.005 | | <0.005 | | <0.005 | | 0.006 | | 0.006 | | <0.005 |
| Calcium | mg/l | | 5.04 | | 5.00 | | 1.78 | | 5.49 | | 4.74 | | 5.63 | | 5.13 | | 5.00 | | 4.52 |
| Magnesium | mg/l | | 2.7 | | 2.6 | | 1.4 | | 2.8 | | 2.6 | | 3.0 | | 2.6 | | 2.8 | | 2.7 |
| Chloride | mg/l | | 12 | | 10 | | 6 | | 11 | | 5 | | 12 | | 12 | | 12 | | 6 |
| Potassium | mg/l | | 4.58 | | 7.94 | | 7.94 | | 4.06 | | 3.84 | | 4.06 | | 3.99 | | 3.78 | | 4.89 |
| Sulfate (as SO ₄) | mg/l | | 870 | | 870 | | 820 | | 970 | | 620 | | 970 | | 870 | | 870 | | 520 |
| Carbonate (as CO ₃) | mg/l | 13 | 18 | 23 | 28 | 68 | 46 | 23 | 23 | 4.6 | 9.1 | 18 | 18 | 23 | 13 | 9.2 | 9.2 | 37 | 37 |
| Bicarbonate (as HCO ₃) | mg/l | 578 | 582 | 572 | 572 | 497 | 554 | 590 | 582 | 673 | 682 | 615 | 587 | 587 | 606 | 597 | 580 | 687 | 710 |
| Ammonia (as N) | mg/l | | 0.68 | | 1.13 | | 0.63 | | 0.65 | | 0.31 | | 0.77 | | 0.68 | | 0.60 | | 0.43 |
| Vanadium | mg/l | | <0.005 | | <0.005 | | <0.005 | | <0.005 | | <0.005 | | <0.005 | | <0.005 | | 0.005 | | <0.005 |
| Silver | mg/l | | 0.008 | | 0.008 | | 0.008 | | 0.008 | | 0.005 | | 0.008 | | 0.011 | | 0.008 | | 0.011 |
| Uranium (as U) | mg/l | 0.062 | 0.059 | 0.077 | 0.067 | 0.049 | 0.077 | 0.062 | 0.080 | <0.002 | 0.005 | 0.067 | 0.065 | 0.070 | 0.049 | 0.072 | 0.069 | 0.002 | 0.002 |
| As 226 | pCi/l | 6527 | 6017 | 8.5±3.0 | 13.2±3.5 | 0.6±0.5 | 0.170±4 | 3.7±0.5 | 0.5±0.5 | 0.0±0.4 | 0.3±0.5 | 1.7±0.7 | 1.3±0.4 | 2.0±0.8 | 3.0±0.9 | 64±8 | 69±8 | 0.0±0.3 | 0.2±0.5 |
| Gross α | pCi/l | | 138±18 | | 115±15 | | 108±14 | | 111±15 | | 3.9±3.9 | | 61±11 | | 74±12 | | 106±15 | | 2.6±3.3 |
| Gross β | pCi/l | | 170±30 | | 93±28 | | 83±28 | | 66±29 | | 0276 | | 39±27 | | 0125 | | 290±30 | | 0177 |

TABLE 4 ASSAY RESULTS -

Wells #32, 42, 52, 62, 72, 112, 121, 191, 201

Samples Taken 5/1 - 5/4/78

TABLE OF ANALYSIS

Sample (1) = 1-2 casing volume displaced
(2) = displacement of stabilized conductivity

| Concentration | Units | 34 | | 41 | | 51 | | 61 | | 71 | | 111 | | 121 | | 151 | | 161 | |
|-----------------------------------------|-------|--------|---------|--------|---------|--------|---------|--------|---------|--------|---------|--------|---------|--------|---------|--------|---------|--------|---------|
| | | (1) | (2) | (1) | (2) | (1) | (2) | (1) | (2) | (1) | (2) | (1) | (2) | (1) | (2) | (1) | (2) | (1) | (2) |
| Sodium | mg/l | 573 | 621 | 569 | 618 | 532 | 544 | 543 | 599 | 535 | 544 | 592 | 621 | 565 | 592 | 573 | 598 | 483 | 481 |
| TDS (180°C) | mg/l | 1630 | 1680 | 1680 | 1640 | 1480 | 1558 | 1740 | 1760 | 1500 | 1480 | 1760 | 1760 | 1620 | 1620 | 1660 | 1740 | 1300 | 1230 |
| Arsenic | mg/l | 0.017 | 0.013 | 0.011 | 0.012 | 0.019 | 0.024 | 0.008 | 0.012 | 0.004 | 0.004 | 0.012 | 0.016 | 0.009 | 0.003 | 0.012 | 0.014 | 0.012 | 0.008 |
| Selenium | mg/l | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 |
| NO ₃ /NH ₂ (as N) | mg/l | | 0.05 | | <0.05 | | <0.05 | | <0.05 | | 0.06 | | <0.05 | | <0.05 | | <0.05 | | 0.06 |
| Barium | mg/l | | <0.10 | | <0.10 | | <0.10 | | <0.10 | | <0.10 | | <0.10 | | <0.10 | | <0.10 | | <0.10 |
| Boron | mg/l | | 0.5 | | 0.5 | | 0.5 | | 0.6 | | 0.6 | | 0.5 | | 0.6 | | 0.6 | | 0.085 |
| Cadmium | mg/l | | <0.005 | | 0.006 | | 0.005 | | 0.006 | | 0.005 | | 0.005 | | 0.006 | | 0.006 | | 0.005 |
| Chromium | mg/l | | <0.01 | | <0.01 | | <0.01 | | <0.01 | | <0.01 | | <0.01 | | <0.01 | | <0.01 | | <0.01 |
| Copper | mg/l | | <0.01 | | <0.01 | | <0.01 | | <0.01 | | <0.01 | | <0.01 | | <0.01 | | <0.01 | | <0.01 |
| Iron | mg/l | | 0.09 | | 0.16 | | 0.04 | | 0.28 | | 0.8 | | 0.12 | | 0.16 | | 0.16 | | 0.29 |
| Lead | mg/l | | 0.02 | | 0.02 | | 0.03 | | 0.03 | | 0.04 | | 0.02 | | 0.03 | | 0.03 | | 0.03 |
| Manganese | mg/l | | 0.01 | | 0.01 | | 0.005 | | 0.02 | | 0.018 | | 0.01 | | 0.015 | | 0.02 | | 0.01 |
| Mercury | mg/l | | 0.00015 | | 0.00004 | | 0.00006 | | 0.00008 | | 0.00004 | | 0.00005 | | 0.00005 | | 0.00004 | | 0.00004 |
| Nickel | mg/l | | 0.02 | | 0.02 | | 0.01 | | 0.02 | | 0.01 | | 0.02 | | 0.02 | | 0.02 | | 0.02 |
| Zinc | mg/l | | 0.03 | | 0.022 | | 0.014 | | 0.02 | | 0.025 | | 0.02 | | 0.019 | | 0.02 | | 0.02 |
| Polychlorinated | mg/l | | <0.005 | | <0.005 | | <0.005 | | <0.005 | | <0.005 | | <0.005 | | <0.005 | | <0.005 | | <0.005 |
| Calcium | mg/l | | 5.6 | | 5.6 | | 1.8 | | 6.0 | | 4.8 | | 5.9 | | 5.5 | | 5.5 | | 6.0 |
| Magnesium | mg/l | | 2.8 | | 2.7 | | 1.5 | | 2.9 | | 2.6 | | 3.0 | | 2.6 | | 2.9 | | 2.6 |
| Chloride | mg/l | | 13 | | 12 | | 4.1 | | 13 | | 4.1 | | 9.7 | | 12 | | 12 | | 7.8 |
| Potassium | mg/l | | 4.23 | | 6.85 | | 10.4 | | 4.23 | | 3.51 | | 3.94 | | 4.38 | | 3.73 | | 4.73 |
| Sulfate (as SO ₄) | mg/l | | 644 | | 644 | | 526 | | 674 | | 667 | | 704 | | 585 | | 704 | | 547 |
| Carbonate (as CO ₃) | mg/l | 17 | 17 | 52 | 29 | 74 | 57 | 23 | 23 | 23 | 17 | 23 | 17 | 23 | 28 | 17 | 17 | 29 | 29 |
| Bicarbonate (as HCO ₃) | mg/l | 352 | 352 | 306 | 346 | 335 | 335 | 380 | 374 | 636 | 632 | 540 | 586 | 569 | 580 | 352 | 369 | 785 | 693 |
| Ammonia (as N) | mg/l | | 0.9 | | 0.8 | | 1.1 | | 1.0 | | 0.7 | | 0.7 | | 1.1 | | 0.3 | | 0.48 |
| Vanadium | mg/l | | <0.005 | | <0.005 | | <0.005 | | <0.005 | | <0.005 | | <0.005 | | <0.005 | | <0.005 | | <0.005 |
| Silver | mg/l | | <0.005 | | <0.005 | | <0.005 | | <0.005 | | <0.005 | | <0.005 | | <0.005 | | <0.005 | | <0.005 |
| Uranium (as U) | mg/l | 0.062 | 0.068 | 0.10 | 0.086 | 0.079 | 0.088 | 0.082 | 0.18 | 0.086 | 0.082 | 0.085 | 0.079 | 0.086 | 0.084 | 0.075 | 0.089 | 0.082 | 0.083 |
| As 226 | pCi/l | 7528 | 6727 | 1524 | 1824 | 8320.4 | 8320.3 | 8420.4 | 8420.9 | 8320.4 | 8320.3 | 7821.5 | 8320.8 | 8321.2 | 1621.3 | 8321.3 | 1621.3 | 8320.4 | 8320.5 |
| Gross α | pCi/l | | 340325 | | 160328 | | 7839 | | 125311 | | 2823.8 | | 82313 | | 8839 | | 160325 | | 160325 |
| Gross β | pCi/l | | 340330 | | 155275 | | 77273 | | 84274 | | 15272 | | 75274 | | 71223 | | 380330 | | 8321 |

TABLE 1

5334V PC3875 -

Wells #32, 41, 51, 61, 71, 111, 121, 151, 161

Sample Taken 2/15 - 5/18/78

TABLE OF ANALYSIS

Sample (1) - 1-2 casing volume displaced
(2) - displacement to stabilized conductivity

| Determination | Units | S1 | | A1 | | S1 | | A1 | | 71 | | 111 | | 121 | | 191 | | 221 | |
|-----------------------------------------|-------|-------|----------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|-------|---------|---------|---------|
| | | (1) | (2) | (1) | (2) | (1) | (2) | (1) | (2) | (1) | (2) | (1) | (2) | (1) | (2) | (1) | (2) | (1) | (2) |
| Sodium | mg/l | 636 | 640 | 647 | 636 | 595 | 603 | 643 | 669 | 595 | 595 | 644 | 644 | 618 | 610 | 629 | 621 | 621 | 614 |
| TDS (180°C) | mg/l | 1670 | 1680 | 1680 | 1660 | 1506 | 1520 | 1760 | 1730 | 1500 | 1500 | 1500 | 1790 | 1560 | 1600 | 1660 | 1710 | 1300 | 1320 |
| Arsenic | mg/l | 0.014 | 0.008 | 0.018 | 0.018 | 0.011 | 0.009 | 0.009 | 0.012 | 0.014 | 0.013 | 0.008 | 0.008 | 0.002 | 0.003 | 0.007 | 0.008 | 0.004 | 0.003 |
| Selenium | mg/l | 0.008 | 0.005 | 0.018 | 0.009 | 0.015 | 0.007 | 0.009 | 0.009 | 0.009 | 0.005 | 0.018 | 0.011 | 0.012 | 0.009 | 0.018 | 0.009 | 0.003 | 0.003 |
| NO ₃ /NO ₂ (as N) | mg/l | | | | | | | | | | | | | | | | | | |
| Boron | mg/l | | <0.10 | | 0.10 | | 0.10 | | 0.10 | | 0.10 | | 0.10 | | 0.10 | | 0.10 | | 0.10 |
| Barium | mg/l | | 0.6 | | 0.6 | | 0.6 | | 0.6 | | 0.7 | | 0.6 | | 0.6 | | 0.5 | | 0.6 |
| Cadmium | mg/l | | 0.004 | | 0.004 | | 0.007 | | 0.004 | | 0.007 | | 0.007 | | 0.005 | | 0.005 | | 0.005 |
| Chromium | mg/l | | <0.01 | | 0.01 | | 0.01 | | 0.01 | | 0.01 | | 0.01 | | 0.01 | | 0.01 | | 0.01 |
| Copper | mg/l | | <0.01 | | 0.01 | | 0.012 | | 0.012 | | 0.012 | | 0.012 | | 0.01 | | 0.03 | | 0.005 |
| Iron | mg/l | | 0.037 | | 0.071 | | 0.085 | | 0.133 | | 0.843 | | 0.194 | | 0.081 | | 0.090 | | 0.066 |
| Lead | mg/l | | <0.01 | | 0.031 | | 0.01 | | 0.04 | | 0.01 | | 0.01 | | 0.01 | | 0.01 | | 0.01 |
| Manganese | mg/l | | 0.013 | | 0.013 | | 0.008 | | 0.018 | | 0.018 | | 0.018 | | 0.018 | | 0.015 | | 0.013 |
| Molybdenum | mg/l | | <0.00003 | | 0.00003 | | 0.00003 | | 0.00003 | | 0.00003 | | 0.00003 | | 0.00003 | | 0.00003 | | 0.00003 |
| Nickel | mg/l | | 0.016 | | 0.016 | | 0.010 | | 0.016 | | 0.016 | | 0.016 | | 0.010 | | 0.041 | | 0.018 |
| Zinc | mg/l | | 0.012 | | 0.012 | | 0.014 | | 0.010 | | 0.017 | | 0.017 | | 0.012 | | 0.012 | | 0.012 |
| Polythene | mg/l | | 0.005 | | 0.005 | | 0.005 | | 0.005 | | 0.005 | | 0.005 | | 0.005 | | 0.005 | | 0.005 |
| Calcium | mg/l | | 10.6 | | 18.2 | | 1.02 | | 3.81 | | 2.86 | | 3.91 | | 3.38 | | 4.72 | | 2.34 |
| Magnesium | mg/l | | 2.6 | | 2.7 | | 1.4 | | 3.0 | | 2.5 | | 3.0 | | 2.5 | | 2.9 | | 2.6 |
| Chloride | mg/l | | 12 | | 9 | | 4 | | 9 | | 4 | | 9 | | 9 | | 12 | | 8 |
| Potassium | mg/l | | 3.94 | | 3.99 | | 8.70 | | 3.44 | | 3.38 | | 3.38 | | 3.73 | | 3.33 | | 4.01 |
| Sulfate (as SO ₄) | mg/l | | 850 | | 850 | | 700 | | 850 | | 800 | | 800 | | 800 | | 800 | | 730 |
| Carbonate (as CO ₃) | mg/l | 12 | 12 | 29 | 17 | 86 | 46 | 17 | 17 | 23 | 17 | 14 | 14 | 17 | 14 | 12 | 12 | 20 | 20 |
| Bicarbonate (as HCO ₃) | mg/l | 626 | 603 | 598 | 592 | 575 | 586 | 615 | 633 | 656 | 674 | 645 | 634 | 634 | 620 | 603 | 569 | 745 | 742 |
| Ammonia (as N) | mg/l | | 0.74 | | 0.80 | | 0.70 | | 0.74 | | 0.70 | | 0.74 | | 0.71 | | 0.63 | | 0.37 |
| Vanadium | mg/l | | <0.005 | | 0.005 | | 0.005 | | 0.005 | | 0.005 | | 0.005 | | 0.005 | | 0.005 | | 0.005 |
| Silver | mg/l | | 0.009 | | 0.009 | | 0.006 | | 0.009 | | 0.005 | | 0.005 | | 0.005 | | 0.005 | | 0.005 |
| Strontium (as Sr) | mg/l | 0.064 | 0.089 | 0.12 | 0.12 | 0.074 | 0.087 | 0.099 | 0.098 | 0.002 | 0.006 | 0.007 | 0.008 | 0.054 | 0.059 | 0.077 | 0.077 | 0.002 | 0.002 |
| Be 226 | pCi/l | 7526 | 10929 | 9,923.4 | 1824 | 0.440.4 | 0.440.4 | 2,820.7 | 0.720.5 | 0.820.5 | 0.120.7 | 0.721.4 | 1,440.6 | 2,820.5 | 1,921.2 | 9227 | 7728 | 0.008.3 | 3,821.8 |
| Cross α | pCi/l | | 200220 | | 210220 | | 72211 | | 75212 | | 0.122.7 | | 6029 | | 99210 | | 250220 | | 3,823.4 |
| Cross β | pCi/l | | 110230 | | 85230 | | 56227 | | 24226 | | 1226 | | 86228 | | 21210 | | 205230 | | 12226 |

• Unable to Run - Interference

TABLE 5

ASSAY RESULTS -

Wells #31, 41, 51, 61, 71, 111, 121, 191, 201

TABLE OF ASSAYS

Samples Taken 6/12 - 6/15/78

Sample (1) - 1-2 casing volume displaced
(2) - displacement to stabilized conductivity

| Determination | Units | 31 | | 41 | | 51 | | 61 | | 71 | | 111 | | 121 | | 131 | | 141 | |
|-----------------------------------------|-------|--------|-------|----------|-------|---------|-------|-----------|-------|-----------|-------|-----------|-------|-----------|-------|-----------|-------|-----------|-------|
| | | (1) | (2) | (1) | (2) | (1) | (2) | (1) | (2) | (1) | (2) | (1) | (2) | (1) | (2) | (1) | (2) | (1) | (2) |
| Sodium | mg/l | 744 | 696 | 700 | 708 | 675 | 708 | 732 | 732 | 651 | 643 | 726 | 734 | 643 | 639 | 643 | 671 | 643 | 538 |
| TDS (180°C) | mg/l | 1640 | 1640 | 1610 | 1650 | 1550 | 1620 | 1680 | 1700 | 1480 | 1460 | 1780 | 1730 | 1510 | 1540 | 1540 | 1530 | 1300 | 1280 |
| Arsenic | mg/l | 0.010 | 0.023 | 0.043 | 0.032 | 0.046 | 0.027 | 0.028 | 0.021 | 0.036 | 0.032 | 0.030 | 0.036 | 0.013 | 0.011 | 0.020 | 0.014 | 0.023 | 0.016 |
| Selenium | mg/l | 0.012 | 0.014 | 0.012 | 0.007 | 0.014 | 0.016 | 0.010 | 0.012 | 0.010 | 0.005 | 0.005 | 0.009 | 0.005 | 0.005 | 0.013 | 0.009 | 0.008 | 0.022 |
| NO ₃ /NO ₂ (as N) | mg/l | | 0.06 | | 0.05 | | 0.05 | | 0.05 | | 0.05 | | 0.05 | | 0.06 | | 0.06 | | 0.05 |
| Borine | mg/l | | — | | — | | — | | — | | — | | — | | — | | — | | — |
| Boron | mg/l | | — | | — | | — | | — | | — | | — | | — | | — | | — |
| Cadmium | mg/l | | — | | — | | — | | — | | — | | — | | — | | — | | — |
| Chromium | mg/l | | — | | — | | — | | — | | — | | — | | — | | — | | — |
| Copper | mg/l | <0.01 | | 0.01 | | <0.01 | | <0.01 | | <0.01 | | <0.01 | | <0.01 | | <0.01 | | <0.01 | |
| Iron | mg/l | 0.13 | | 0.04 | | <0.01 | | 0.08 | | 0.03 | | 0.04 | | 0.04 | | 0.12 | | 0.05 | |
| Lead | mg/l | | — | | — | | — | | — | | — | | — | | — | | — | | — |
| Manganese | mg/l | 0.009 | | 0.004 | | <0.002 | | 0.011 | | 0.007 | | 0.008 | | 0.007 | | 0.016 | | 0.009 | |
| Mercury | mg/l | 0.0001 | | <0.00001 | | 0.00001 | | 0.001 | | 0.00001 | | 0.00004 | | <0.00001 | | 0.00005 | | 0.00001 | |
| Nickel | mg/l | 0.02 | | 0.02 | | 0.02 | | 0.02 | | 0.01 | | 0.02 | | 0.01 | | <0.01 | | <0.01 | |
| Zinc | mg/l | 0.041 | | 0.023 | | 0.014 | | 0.009 | | 0.009 | | 0.014 | | 0.004 | | 0.009 | | 0.009 | |
| Molybdenum | mg/l | | — | | — | | — | | — | | — | | — | | — | | — | | — |
| Calcium | mg/l | 5.1 | | 5.0 | | 1.97 | | 6.89 | | 4.68 | | 6.37 | | 5.27 | | 5.70 | | 4.48 | |
| Magnesium | mg/l | 2.77 | | 2.55 | | 1.87 | | 3.86 | | 2.59 | | 3.05 | | 2.51 | | 2.45 | | 2.67 | |
| Chloride | mg/l | 14 | | 12 | | 10 | | 12 | | 7 | | 8 | | 10 | | 18 | | 7 | |
| Potassium | mg/l | 3.93 | | 2.58 | | 7.00 | | 4.88 | | 3.93 | | 4.34 | | 4.51 | | 3.53 | | 4.36 | |
| Sulfate (as SO ₄) | mg/l | 750 | | 750 | | 700 | | 800 | | 550 | | 800 | | 700 | | 750 | | 608 | |
| Carbonate (as CO ₃) | mg/l | 17 | | 51 | | 34 | | 23 | | 17 | | 34 | | 23 | | 57 | | 23 | |
| Bicarbonate (as HCO ₃) | mg/l | 592 | | 587 | | 576 | | 586 | | 604 | | 676 | | 609 | | 554 | | 613 | |
| Ammonia (as N) | mg/l | 0.72 | | 0.80 | | 0.80 | | 0.83 | | 0.57 | | 1.0 | | 1.7 | | 0.83 | | 0.37 | |
| Vanadium | mg/l | | — | | — | | — | | — | | — | | — | | — | | — | | — |
| Silver | mg/l | <0.005 | | <0.005 | | <0.005 | | <0.005 | | <0.005 | | <0.005 | | <0.005 | | <0.005 | | <0.005 | |
| Uranium (as U) | mg/l | 0.072 | | 0.068 | | 0.090 | | 0.092 | | 0.095 | | 0.098 | | 0.082 | | 0.070 | | 0.075 | |
| No. 226 | pCi/l | 76±8 | | 12±3 | | 16±3 | | 0.420±0.4 | | 0.720±0.5 | | 0.920±0.7 | | 0.120±0.3 | | 0.420±0.4 | | 1.421±0.2 | |
| Cross α | pCi/l | 58±13 | | 61±13 | | 24±9 | | 32±12 | | 0.323±0.7 | | 92±13 | | 46±7 | | 81±15 | | 0.82±0.1 | |
| Cross β | pCi/l | 190±40 | | 0±41 | | 0±42 | | 44±43 | | 0±40 | | 68±17 | | 167±17 | | 29±42 | | 0±19 | |

TABLE 2

ASSAY RESULTS -

Wells #34, 41, 51, 61, 71, 111, 121, 131, 201

TABLE OF ASSAYS

Sample (1) = 1-2 casing volumes displaced
 (2) = displacement to stabilized conductivity

| Date Sampled | | 5-12-78 | | 5-26-78 | | 6-13-78 | |
|-----------------------------------------|-------|---------|---------|---------|---------|---------|---------|
| | | 789V | | 789V | | 789V | |
| Determination | Unit | (1) | (2) | (1) | (2) | (1) | (2) |
| Sodium | mg/l | 603 | 610 | 643 | 651 | 687 | 700 |
| TDS (180°C) | mg/l | 1650 | 1690 | 1720 | 1700 | 1690 | 1720 |
| Arsenic | mg/l | 0.005 | 0.006 | 0.016 | 0.014 | 0.022 | 0.021 |
| Selenium | mg/l | 0.008 | 0.010 | 0.006 | 0.005 | 0.008 | 0.006 |
| NO ₃ /NO ₂ (as N) | mg/l | | * | | 0.05 | | 0.05 |
| Barium | mg/l | | 0.10 | | 0.10 | | — |
| Boron | mg/l | | 0.5 | | 0.4 | | — |
| Cadmium | mg/l | | 0.006 | | 0.004 | | — |
| Chromium | mg/l | | 0.01 | | 0.026 | | — |
| Copper | mg/l | | 0.01 | | 0.007 | | 0.01 |
| Iron | mg/l | | 0.071 | | 0.113 | | 0.06 |
| Lead | mg/l | | 0.01 | | 0.047 | | — |
| Manganese | mg/l | | 0.015 | | 0.011 | | 0.011 |
| Mercury | mg/l | | 0.00002 | | 0.00002 | | 0.00001 |
| Nickel | mg/l | | 0.013 | | 0.029 | | 0.01 |
| Zinc | mg/l | | 0.016 | | 0.046 | | 0.004 |
| Molybdenum | mg/l | | 0.005 | | 0.005 | | — |
| Calcium | mg/l | | 2.89 | | 3.65 | | 3.97 |
| Magnesium | mg/l | | 2.1 | | 2.43 | | 2.56 |
| Chloride | mg/l | | 12 | | 10 | | 14 |
| Potassium | mg/l | | 6.20 | | 6.72 | | 5.84 |
| Sulfate (as SO ₄) | mg/l | | 800 | | 700 | | 850 |
| Carbonate (as CO ₃) | mg/l | 29 | 17 | 11 | 11 | 17 | 17 |
| Bicarbonate (as HCO ₃) | mg/l | 514 | 541 | 535 | 540 | 547 | 547 |
| Ammonia (as N) | mg/l | | 0.56 | | 0.72 | | 0.69 |
| Vanadium | mg/l | | 0.005 | | 0.010 | | — |
| Silver | mg/l | | 0.005 | | 0.005 | | 0.005 |
| Uranium (as U) | mg/l | 0.064 | 0.062 | 0.061 | 0.047 | 0.057 | 0.059 |
| Ra 226 | pCi/l | 7.5±2.6 | 9.7±3.1 | 22±5 | 26±5 | 19±4 | 21±4 |
| Gross A | pCi/l | | 89±13 | | 86±12 | | 37±9 |
| Gross B | pCi/l | | 59±27 | | 55±22 | | 167±18 |

* Unable to Run - Interference

TABLE 8 ASSAY RESULTS - Buffer Water Well - 789V

Mean Baseline - "A" and "B" Aquifers

To establish a pre-mining mean baseline for each specific element analyzed within the "A" and "B" zone aquifers, an arithmetic average was calculated from all analysis values obtained from the five (5) samplings.

For the "A" zone aquifer wherein only a single well (7X) was incorporated into the sampling program, the calculated mean value and the highest individual value obtained for each specific parameter are shown in Table 9.

For the "B" zone aquifer (Wells 3X, 4X, 5X, 6X, 11X, 12X, 19X, 20X, and 789V), the calculated mean value, the highest individual well mean, and the well wherein the highest mean occurred for each specific parameter are shown in Table 10.

Analysis results from samplings of Well 789V were included in calculations respective to the "B" aquifer means for the following reasons:

- (1) This well will provide the water source for the plant & buffer circuits (mining operations), and ultimately will furnish the source of untreated water to be used in affecting restoration of the "B" aquifer (post-mining operations).
- (2) The well is screened in the "B" aquifer and provides an additional data point to further characterize "B" formation water quality.
- (3) The quality of Well 789V will have a direct influence on monitor well excursion indicators within the proposed program concept of buffer containment of leachate solutions.
- (4) The level of excursion indicator elements naturally occurring in the buffer water at any given time must be considered in calculations involving establishment and control of upper limits for excursion indicators.

- (5) Similarly, the quality of Well 789V water can directly affect at any given time the restoration target values respective to the entire "B" aquifer should analysis change drastically from the mean values established in the pre-mining baseline program.

Therefore, during the mining phase, Well 789V water for plant and leach field operations will be analyzed on a daily basis for excursion indicators (pH, TDS, conductivity, sodium, uranium, bicarbonate, carbonate, and chloride) to detect trends and changes which will ultimately affect monitor well analysis thereby providing some comparison data between buffer well input and monitor well composition. The daily samples will be composited on a biweekly* basis for a single determination of radium 226, arsenic, and selenium. Since prolonged pumping of this well during mining operations may affect solution chemistry, a full suite analysis will be run prior to restoration (or any other intervals deemed necessary) to determine whether major changes from the pre-mining mean have occurred and to assess possible effects on target restoration values. This scheduled monitoring of Well 789V buffer and restoration water will be incorporated into plant operations with a sample point for analysis established for water entering the plant and prior to storage in the process water surge tank.

* Biweekly defined in this report as every 2 weeks.

MEAN BASILINE

"A" ZONE AQUIFER

(Well 7X)

| Parameter | Units | Mean | Highest Individual Value Reported |
|-----------------------------------------|----------|----------|-----------------------------------|
| pH | — | 8.60 | 8.80 |
| Conductivity (25°C) | µmhos/cm | 2300 | 2317 |
| Sodium | mg/l | 592 | 643 |
| TDS (180°C) | mg/l | 1498 | 1530 |
| Arsenic | mg/l | 0.011 | 0.032 |
| Selenium | mg/l | <0.005 | — |
| NO ₃ /NO ₂ (as N) | mg/l | 0.03 | 0.06 |
| Borism | mg/l | <0.10 | — |
| Boron | mg/l | 0.6 | 0.7 |
| Cadmium | mg/l | 0.004 | 0.007 |
| Chromium | mg/l | <0.01 | — |
| Copper | mg/l | 0.010 | 0.025 |
| Iron | mg/l | 0.074 | 0.17 |
| Lead | mg/l | 0.037 | 0.070 |
| Manganese | mg/l | 0.014 | 0.019 |
| Mercury | mg/l | 0.00003 | 0.00004 |
| Nickel | mg/l | 0.016 | 0.027 |
| Zinc | mg/l | 0.016 | 0.025 |
| Molybdenum | mg/l | <0.005 | — |
| Calcium | mg/l | 8 | 11 |
| Magnesium | mg/l | 2.7 | 3.0 |
| Chloride | mg/l | 8 | 11 |
| Potassium | mg/l | 3.9 | 5.0 |
| Sulfate (as SO ₄) | mg/l | 567 | 620 |
| Carbonate (as CO ₃) | mg/l | 17 | 23 |
| Bicarbonate (as HCO ₃) | mg/l | 653 | 682 |
| Ammonia (as N) | mg/l | 0.53 | 0.70 |
| Vanadium | mg/l | <0.005 | — |
| Silver | mg/l | <0.005 | — |
| Uranium (as U) | mg/l | 0.004 | 0.008 |
| Radium 226 | pCi/l | 0.26±0.3 | 0.50±0.4 |
| Gross α | pCi/l | 1.4±3.4 | 3.9±3.9 |
| Gross β | pCi/l | 3.7±19 | 13±22 |

TABLE 2 MEAN BASILINE - "A" Zone Aquifer

PEAN BASIN

20° ZONE AQUIFER

| (Wells - 3X, 4X, 5X, 6X, 11X, 12X, 19X, 20X, 789V) | | Mean - | Highest | |
|-------------------------------------------------------|----------|-----------|-----------------|------|
| Parameter | Units | All Wells | Individual Mean | Well |
| pH | — | 8.77 | 9.12 | 5X |
| Conductivity (25°C) | umhos/cm | 2456 | 2635 | 11X |
| Sodium | mg/l | 622 | 666 | 11X |
| TDS (180°C) | mg/l | 1829 | 1764 | 11X |
| Arsenic | mg/l | 0.011 | 0.014 | 789V |
| Selenium | mg/l | 0.003 | 0.007 | 789V |
| NO ₃ /NO ₂ (as N) | mg/l | 0.06 | 0.08 | 12X |
| Barium | mg/l | <0.01 | — | — |
| Boron | mg/l | 0.52 | 0.58 | 20X |
| Cadmium | mg/l | 0.003(3) | 0.003(3) | 4X |
| Chromium | mg/l | <0.01 | — | — |
| Copper | mg/l | <0.01 | — | — |
| Iron | mg/l | 0.090 | 0.133 | 6X |
| Lead | mg/l | 0.040 | 0.043 | 6X |
| Manganese | mg/l | 0.012 | 0.015 | 6X |
| Mercury | mg/l | <0.00004 | — | — |
| Nickel | mg/l | 0.017 | 0.022 | 4X |
| Zinc | mg/l | 0.011 | 0.013 | 3X |
| Molybdenum | mg/l | <0.005 | — | — |
| Calcium | mg/l | 6.2 | 8.1 | 4X |
| Magnesium | mg/l | 2.7 | 3.1 | 11X |
| Chloride | mg/l | 10 | 13 | 3X |
| Potassium | mg/l | 5.2 | 7.9 | 5X |
| Sulfate (as SO ₄) | mg/l | 716 | 810 | 6X |
| Carbonate (as CO ₃) | mg/l | 22 | 45 | 5X |
| Bicarbonate (as HCO ₃) | mg/l | 592 | 707 | 20X |
| Ammonia (as N) | mg/l | 0.73 | 0.99 | 12X |
| Vanadium | mg/l | <0.005 | — | — |
| Silver | mg/l | <0.005 | — | — |
| Uranium (as U) | mg/l | 0.073 | 0.119 | 19X |
| Radium 226 | pCi/l | 2223 | 8328 | 19X |
| Gross α | pCi/l | 98212 | 209219 | 3X |
| Gross β | pCi/l | 97922 | 243432 | 19X |

TABLE 10 PEAN BASIN - 20° Zone Aquifer

Calculations

Figures 3 to 35 inclusive present a tabulation & graphical analysis of the sample data for each individual element respective to mean baseline, upper control limits (UCL) for proposed excursion indicators, and upper limit restoration target values.

For any specific element, the arithmetic average for each well in the "B" zone aquifer was tabulated. The mean baseline for the "B" aquifer was calculated from the individual well averages and is defined as the arithmetic mean of wells 3X, 4X, 5X, 6X, 11X, 12X, 19X, 20X, and 789V. The individual mean for the buffer water (Well 789V) and subsequently restoration water (789V) is also indicated on the graph.

The upper control limit (UCL) for excursion indicators along with the basis of calculation are shown on the appropriate graphs. The excursion indicators and method of calculation of UCL are shown in Table 11.

TABLE 11
EXCURSION INDICATORS
MONITOR WELLS

| <u>Parameter</u> | <u>UCL (1) Calculation</u> |
|------------------|----------------------------|
| TDS | Mean Baseline + 20% |
| Conductivity | Mean Baseline + 20% |
| pH | Mean Baseline + 2 pH units |
| Uranium | Mean Baseline + 1 mg/l |
| Sodium | Mean Baseline + 20% |
| Carbonate | Mean Baseline + 20% |
| Bicarbonate | Mean Baseline + 20% |
| Chloride | Mean Baseline + 20% |

(1) Upper Control Limit

For restoration, the upper limit target values along with the basis of calculation are shown for each specific element on the appropriate graph. The upper limit - restoration shown on the graph is defined as that value not to exceed the highest individual well mean value + 10%

Figures 3 to 35 inclusive and the elements represented are indexed as follows:

| Element | Figure | Element | Figure |
|-----------------------------------------|--------|----------------------------------|--------|
| pH | 3 | Nickel | 19 |
| Conductivity | 4 | Zinc | 20 |
| Sodium | 5 | Molybdenum | 21 |
| TDS | 6 | Calcium | 22 |
| Arsenic | 7 | Magnesium | 23 |
| Selenium | 8 | Chloride | 24 |
| NO ₃ /NO ₂ (as N) | 9 | Potassium | 25 |
| Barium | 10 | Sulfate (SO ₄ =) | 26 |
| Boron | 11 | Carbonate (CO ₃ =) | 27 |
| Cadmium | 12 | Bicarbonate (HCO ₃ -) | 28 |
| Chromium | 13 | Ammonia (as N) | 29 |
| Copper | 14 | Vanadium | 30 |
| Iron | 15 | Silver | 31 |
| Lead | 16 | Uranium | 32 |
| Manganese | 17 | Radium 226 | 33 |
| Mercury | 18 | Gross α | 34 |
| | | Gross β | 35 |

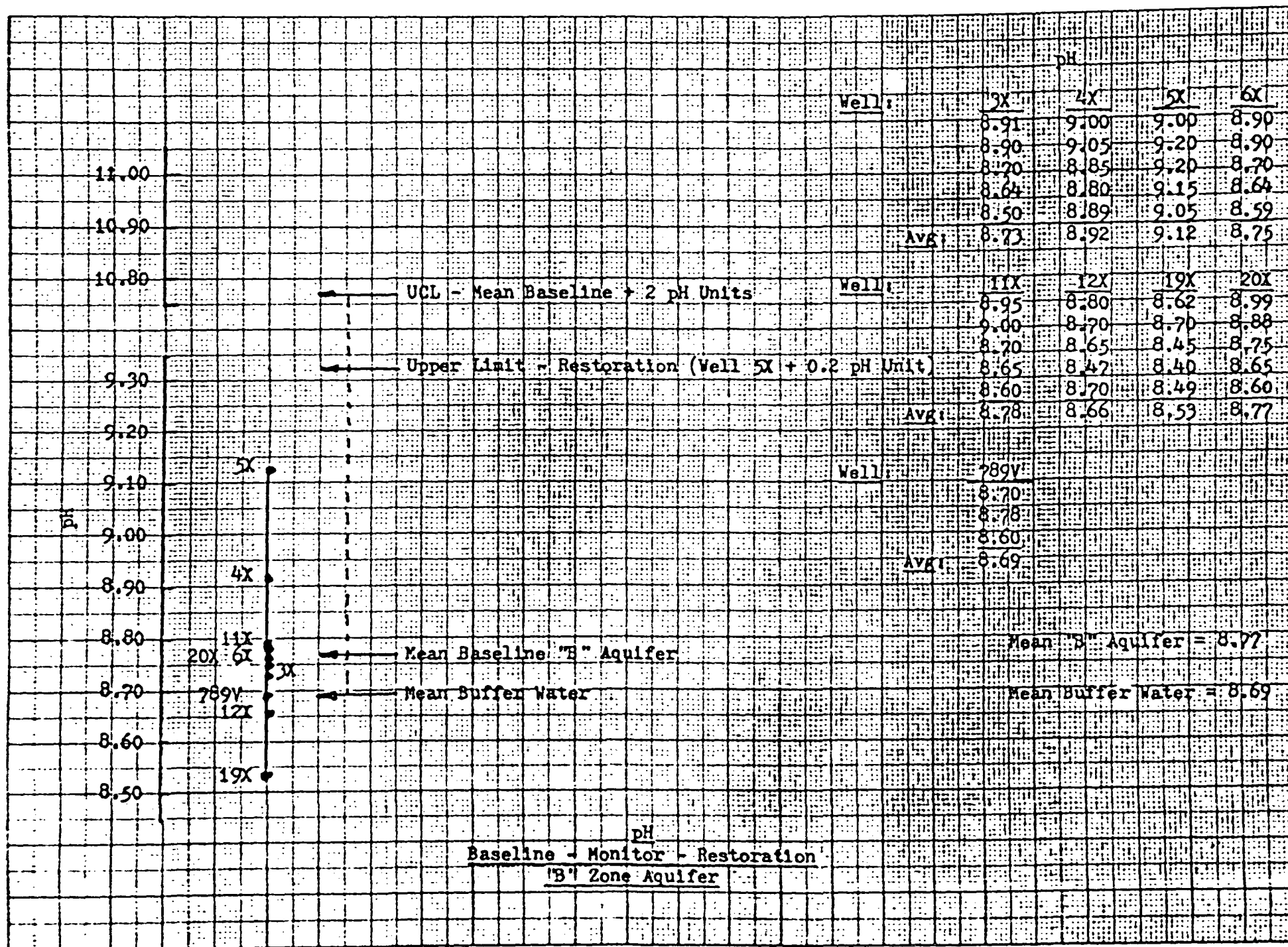


Figure -37-

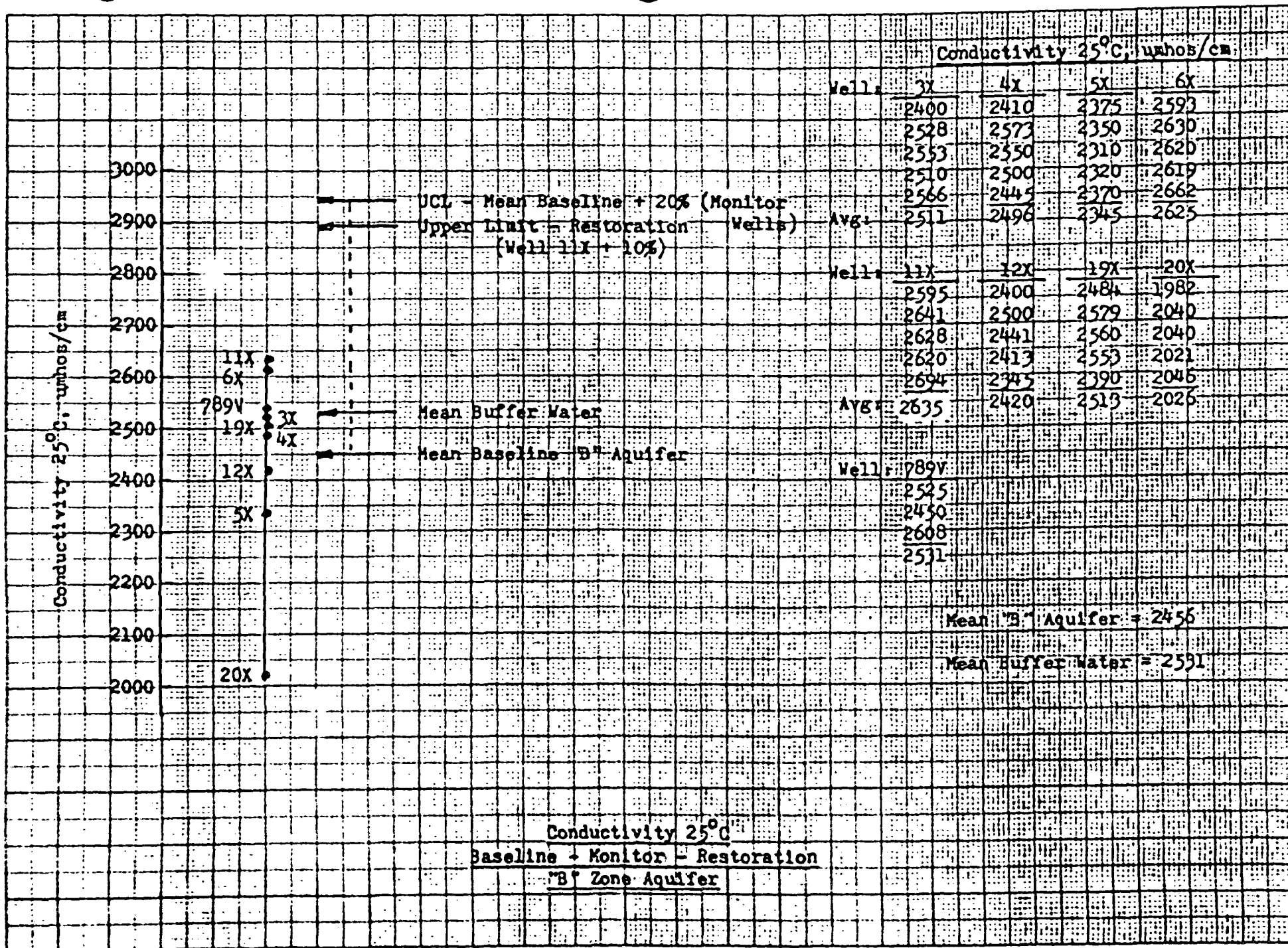


Figure 38-

Sodium, mg/l

760
740
720
700
680
660
640
620
600
580
560
540
520
500

11X
6X
789V
3X
4X
19X
12X
5X
20X

UCL - Mean Baseline + 20% (Monitor Wells)
Upper Limit - Restoration (Well 11X + 10%)

Mean Buffer Water

Mean Baseline "B" Aquifer

| Well: | Sodium, mg/l | | | |
|-------|--------------|-----|-----|-----|
| | 3X | 4X | 5X | 6X |
| | 617 | 614 | 592 | 654 |
| | 611 | 597 | 586 | 588 |
| | 621 | 610 | 544 | 599 |
| | 640 | 636 | 603 | 699 |
| | 696 | 700 | 708 | 732 |
| Avg: | 637 | 631 | 607 | 654 |

| Well: | 11X | 12X | 19X | 20X |
|-------|-----|-----|-----|-----|
| | 654 | 603 | 614 | 511 |
| | 657 | 599 | 603 | 534 |
| | 621 | 592 | 588 | 481 |
| | 666 | 610 | 621 | 514 |
| | 734 | 659 | 671 | 538 |
| Avg: | 666 | 613 | 619 | 516 |

| Well | 789V |
|------|------|
| | 610 |
| | 651 |
| | 700 |
| Avg: | 653 |

Mean "B" Aquifer = 622

Mean-Buffer-Water = 653

Sodium
Baseline - Monitor- Restoration
"B" Zone Aquifer

Total Dissolved Solids (180°C), mg/l

2000
1950
1900
1850
1800
1750
1700
1650
1600
1550
1500
1450
1400
1350
1300
1250

11X
6X
789V
3X
19X
4X
12X
5X
20X

UCL - Mean Baseline + 20% (Monitor Wells)
Upper Limit - Restoration (Well 11X + 10%)

Mean Buffer Water

Mean Baseline "B" Aquifer

| Total Dissolved Solids, mg/l | | | | |
|------------------------------|------|------|------|------|
| Well: | 3X | 4X | 5X | 6X |
| | 1680 | 1670 | 1600 | 1740 |
| | 1690 | 1680 | 1520 | 1800 |
| | 1680 | 1640 | 1550 | 1760 |
| | 1680 | 1660 | 1520 | 1730 |
| | 1640 | 1650 | 1620 | 1700 |
| Avg: | 1674 | 1660 | 1562 | 1746 |

| Well: | 11X | 12X | 19X | 20X |
|-------|------|------|------|------|
| | 1750 | 1620 | 1680 | 1270 |
| | 1790 | 1600 | 1710 | 1370 |
| | 1760 | 1620 | 1710 | 1230 |
| | 1790 | 1600 | 1710 | 1320 |
| | 1730 | 1540 | 1550 | 1230 |
| Avg: | 1764 | 1596 | 1672 | 1284 |

| Well: | 789V |
|-------|------|
| | 1690 |
| | 1700 |
| | 1720 |
| Avg: | 1703 |

Mean "B" Aquifer = 1629
Mean Buffer Water = 1703

Total Dissolved Solids
Baseline - Monitor - Restoration
"B" Zone Aquifer

Figure 6

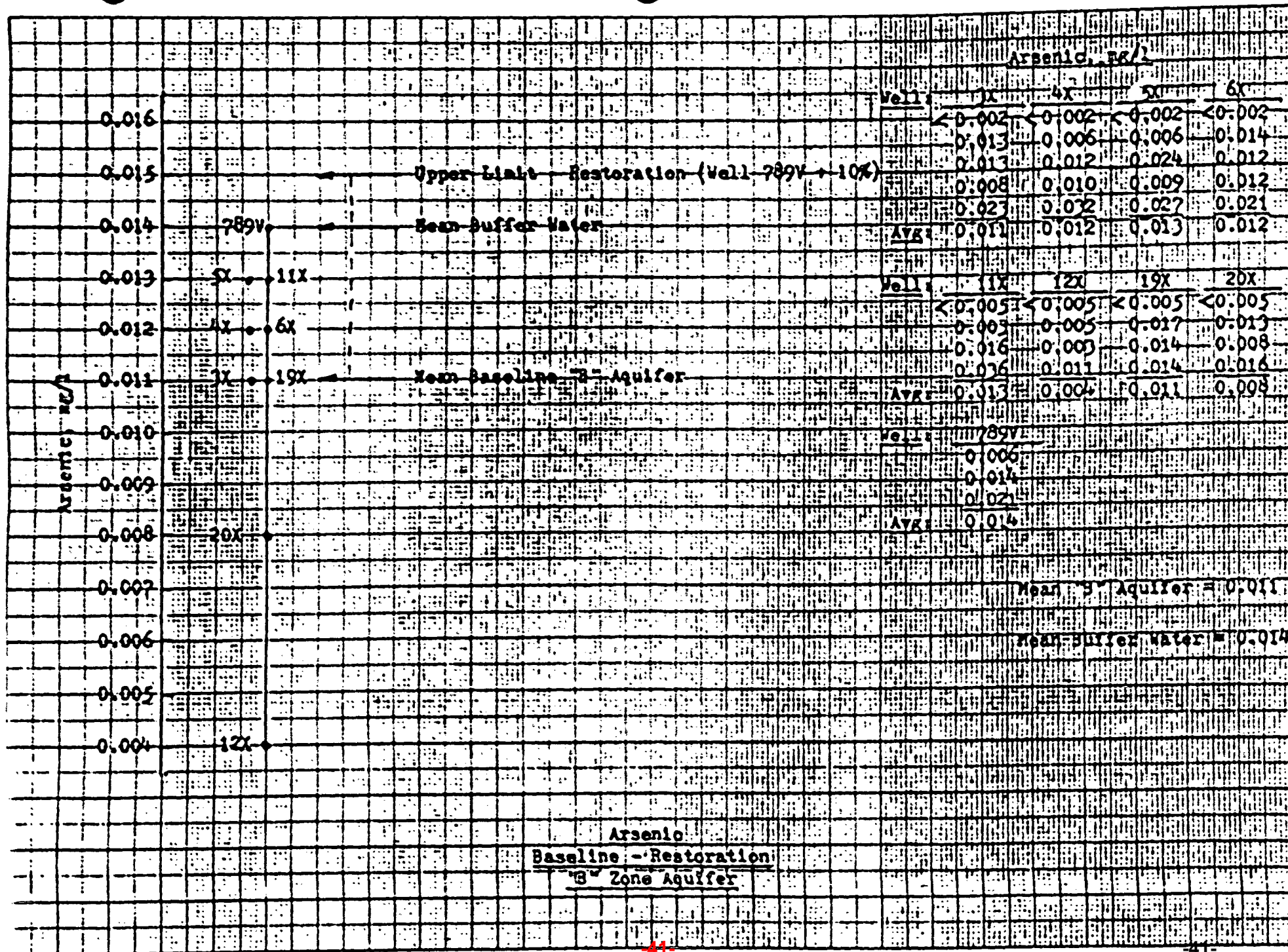
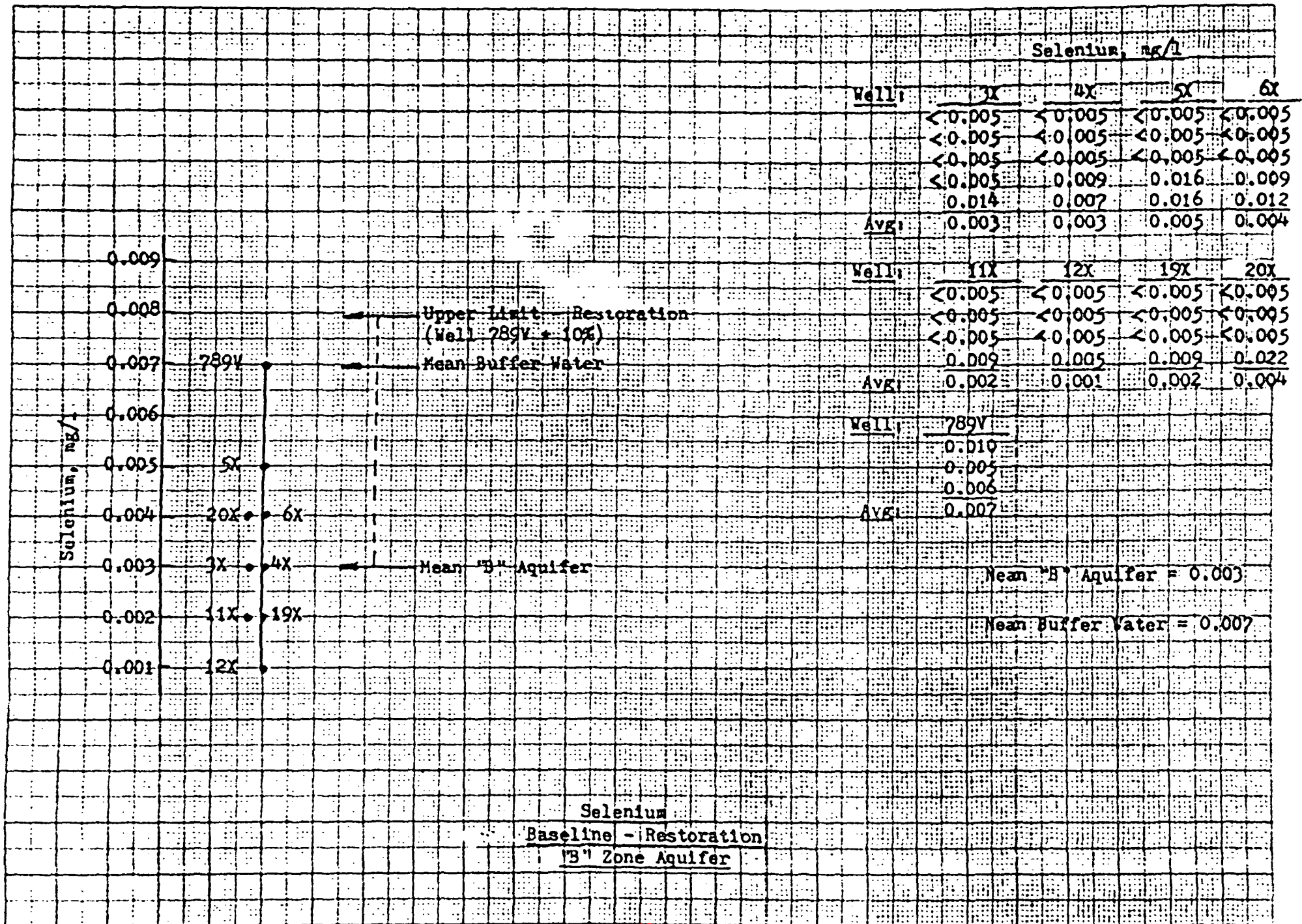


Figure 7



NO_3/NO_2 (as N), mg/l

 0.09
 0.08
 0.07
 0.06
 0.05

 12X
 3X 789V
 20X 19X
 6X 11X

 Upper Limit Restoration
 (Well 12X + 10%)

Mean Baseline "B" Aquifer

Mean Buffer Water

 NO_3/NO_2 (as N), mg/l

| Well: | 3X | 4X | 5X | 6X |
|-------|------|------|------|------|
| | 0.05 | 0.05 | 0.05 | 0.05 |
| | 0.05 | 0.05 | 0.05 | 0.05 |
| | 0.05 | 0.05 | 0.05 | 0.05 |
| | 0.06 | 0.05 | 0.05 | 0.05 |
| Avg: | 0.06 | 0.05 | 0.05 | 0.05 |

| Well: | 11X | 12X | 19X | 20X |
|-------|------|------|------|------|
| | 0.05 | 0.05 | 0.05 | 0.05 |
| | 0.05 | 0.05 | 0.05 | 0.05 |
| | 0.05 | 0.05 | 0.05 | 0.06 |
| | 0.05 | 0.08 | 0.06 | 0.05 |
| Avg: | 0.05 | 0.08 | 0.06 | 0.06 |

| Well: | 789V |
|-------|------|
| | 0.05 |
| | 0.05 |
| Avg: | 0.05 |

Mean "B" Aquifer = 0.05

Mean Buffer Water = 0.05

 NO_3/NO_2 (as N)
 Baseline & Restoration
 "B" Zone Aquifer

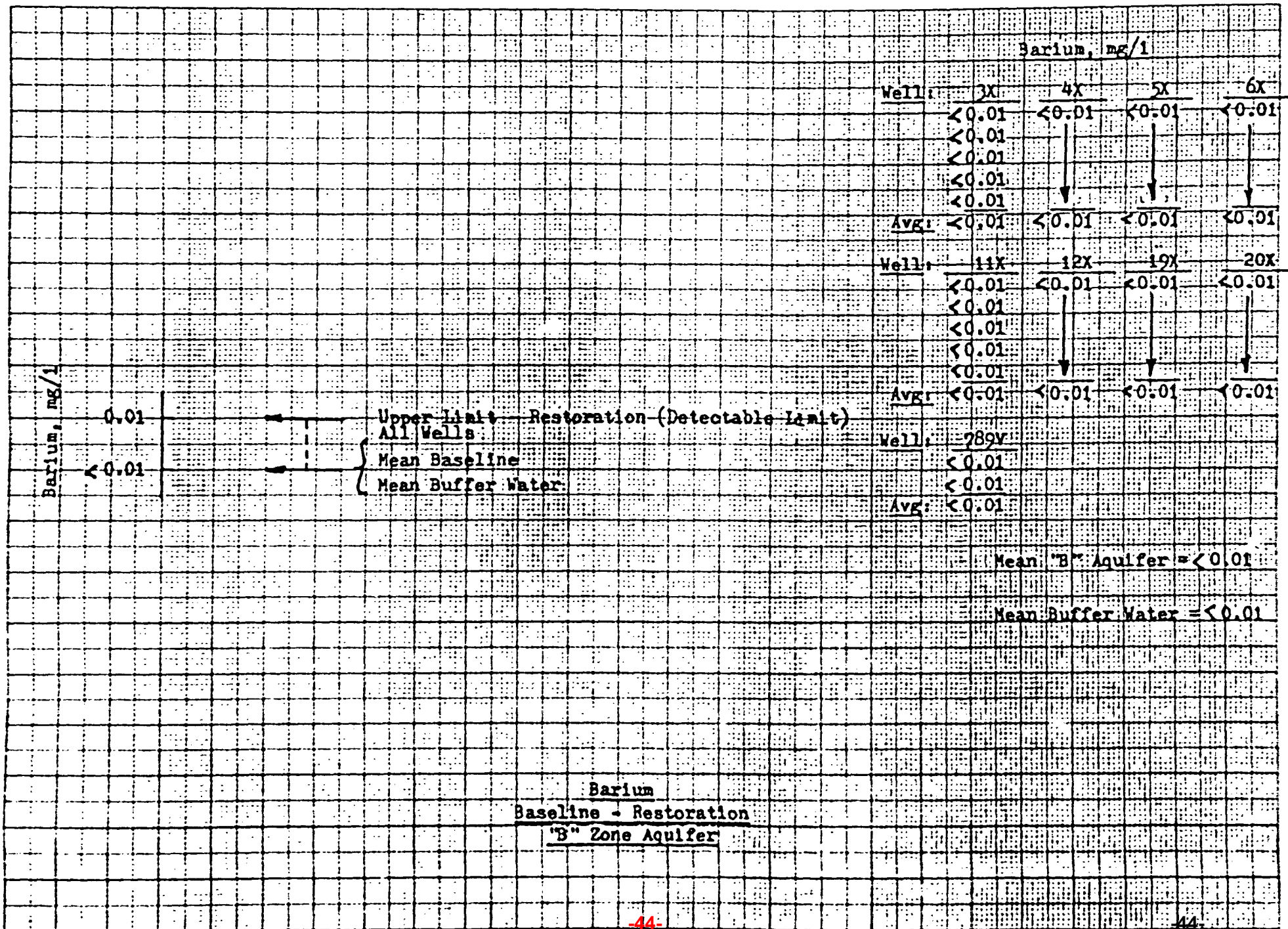
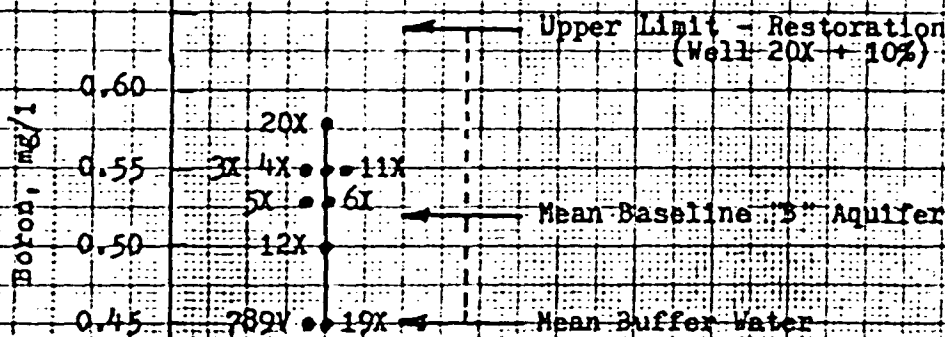


Figure 10



| Boron, mg/l | | | | |
|-------------|------|------|------|------|
| Well: | 3X | 4X | 5X | 6X |
| | 0.5 | 0.6 | 0.5 | 0.4 |
| | 0.6 | 0.5 | 0.5 | 0.5 |
| | 0.5 | 0.5 | 0.5 | 0.6 |
| Avg: | 0.6 | 0.6 | 0.6 | 0.6 |
| | 0.55 | 0.55 | 0.53 | 0.53 |

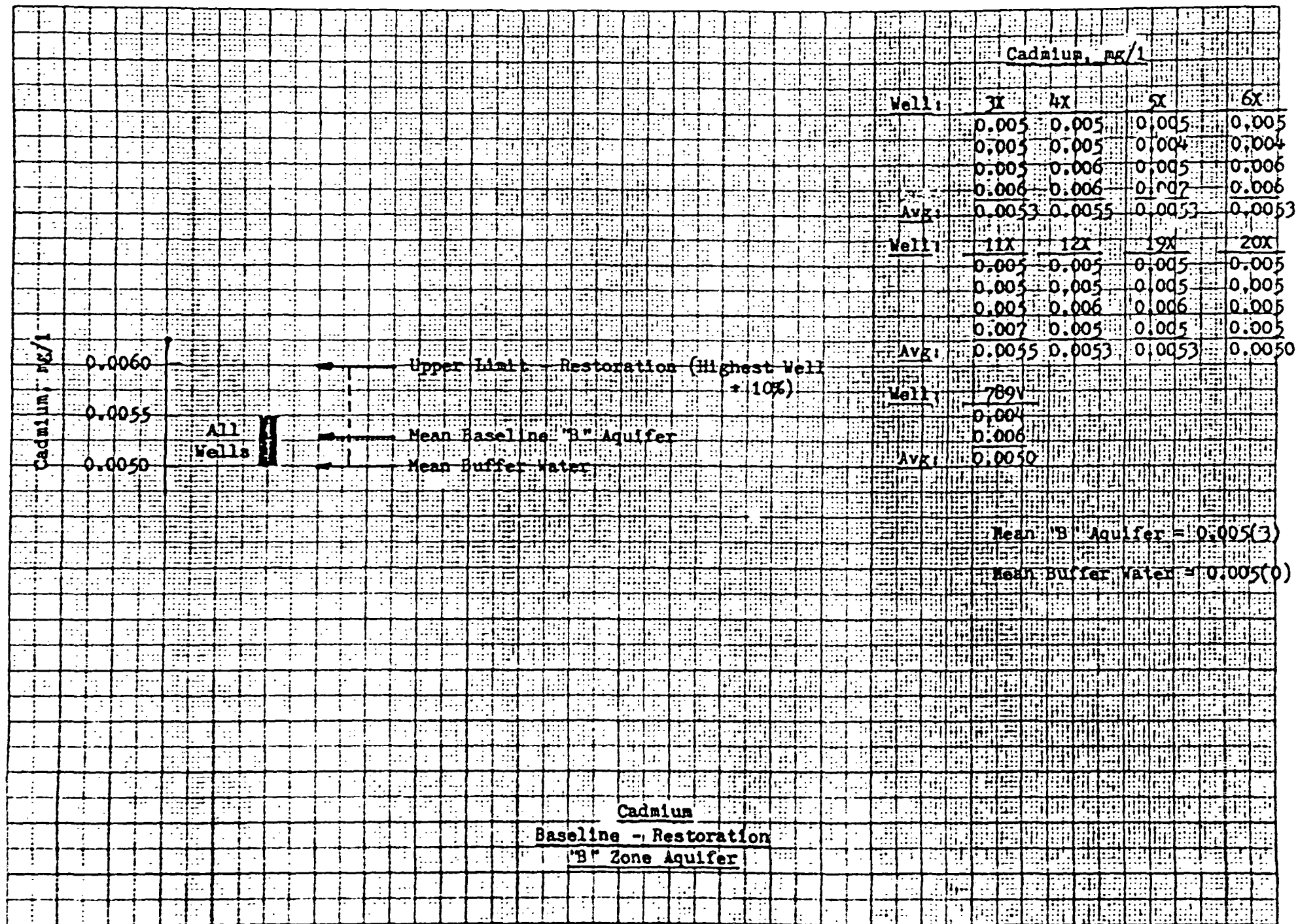
| Well: | 11X | 12X | 19X | 20X |
|-------|------|------|------|------|
| | 0.5 | 0.4 | 0.5 | 0.6 |
| | 0.6 | 0.4 | 0.2 | 0.5 |
| | 0.5 | 0.6 | 0.6 | 0.6 |
| | 0.6 | 0.6 | 0.5 | 0.6 |
| Avg: | 0.55 | 0.50 | 0.45 | 0.58 |

| Well: | 789V |
|-------|------|
| | 0.5 |
| | 0.4 |
| Avg: | 0.45 |

Mean B Zone Aquifer = 0.5(2)

Mean Buffer Water = 0.4(5)

Boron
Baseline - Restoration
B Zone Aquifer



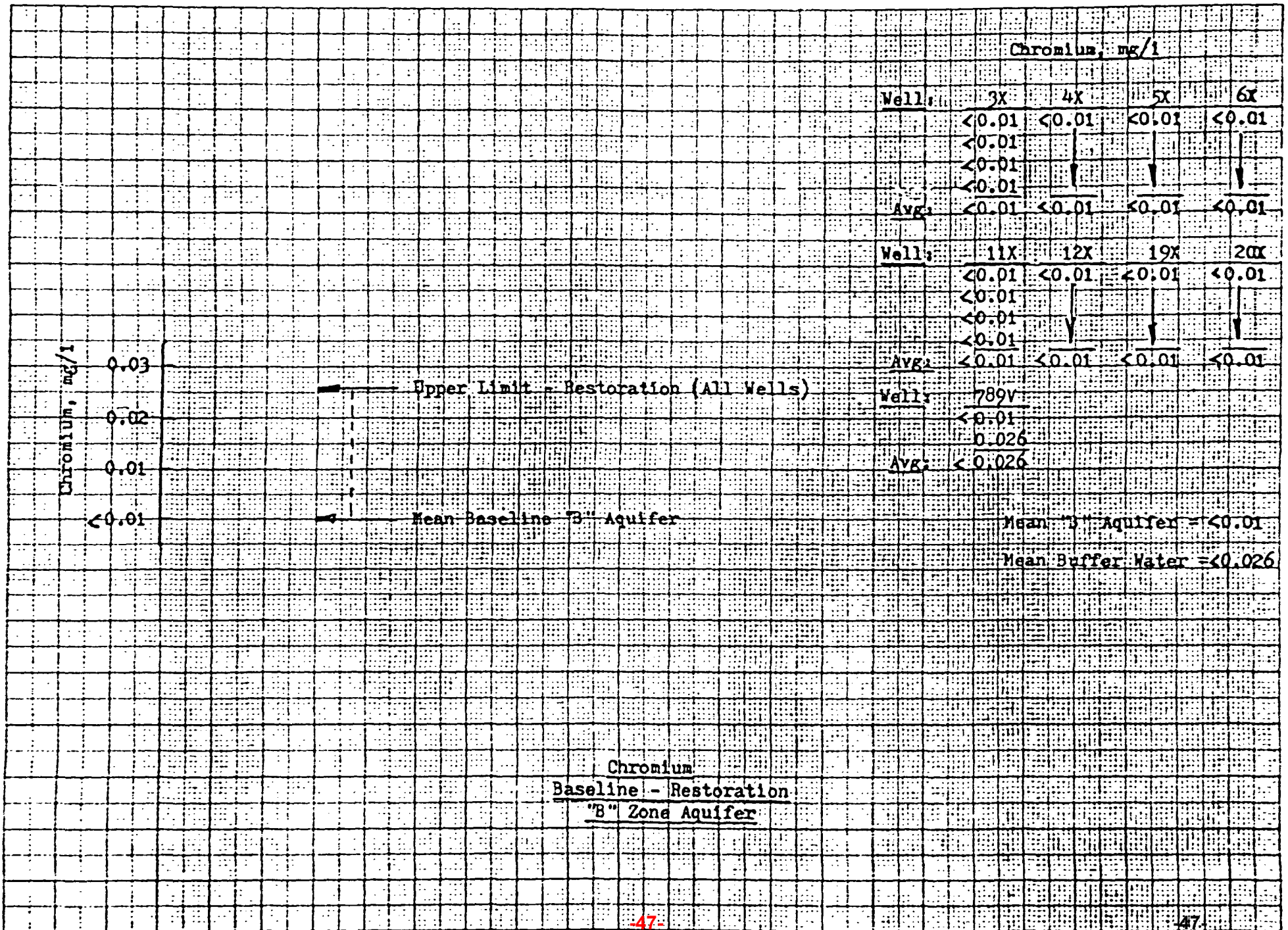


Figure 13

Copper, mg/l

0.01
 < 0.01

Upper Limit - Restoration (Detectable Limit)
 Mean Baseline "B" Aquifer
 Mean Buffer Water

Copper, mg/l

| Well: | 3X | 4X | 5X | 6X |
|-------|--------|--------|--------|--------|
| | 0.01 | < 0.01 | 0.01 | < 0.01 |
| | 0.009 | 0.022 | 0.016 | 0.009 |
| | < 0.01 | < 0.01 | < 0.01 | < 0.01 |
| | < 0.01 | < 0.01 | 0.012 | 0.012 |
| | < 0.01 | < 0.01 | 0.01 | < 0.01 |
| Avg: | < 0.01 | < 0.01 | < 0.01 | < 0.01 |

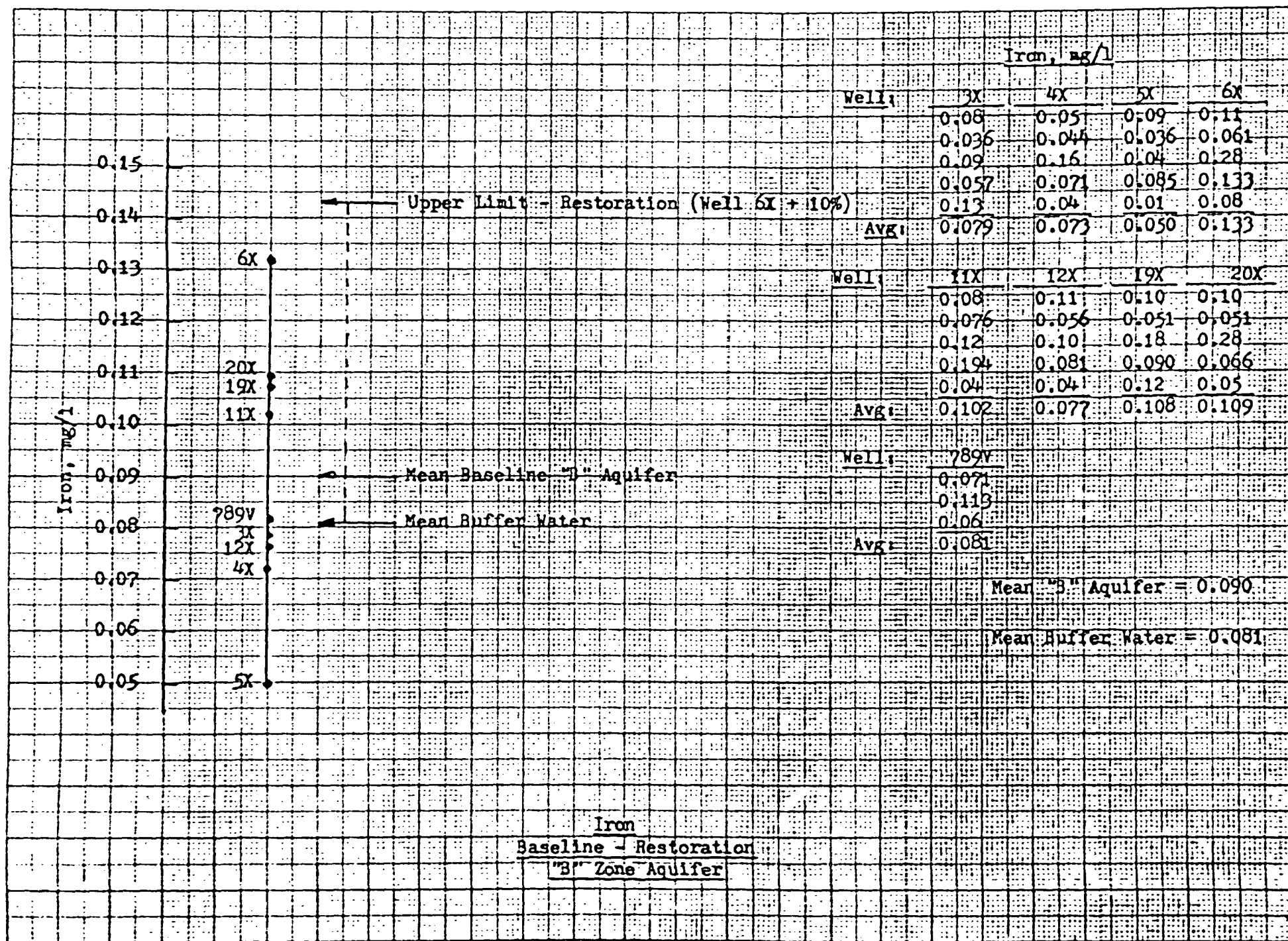
| Well: | 11X | 12X | 19X | 20X |
|-------|--------|--------|--------|--------|
| | 0.01 | < 0.01 | < 0.01 | < 0.01 |
| | 0.019 | 0.009 | 0.009 | 0.013 |
| | < 0.01 | < 0.01 | < 0.01 | < 0.01 |
| | < 0.01 | < 0.01 | < 0.01 | < 0.01 |
| Avg: | < 0.01 | < 0.01 | < 0.01 | < 0.01 |

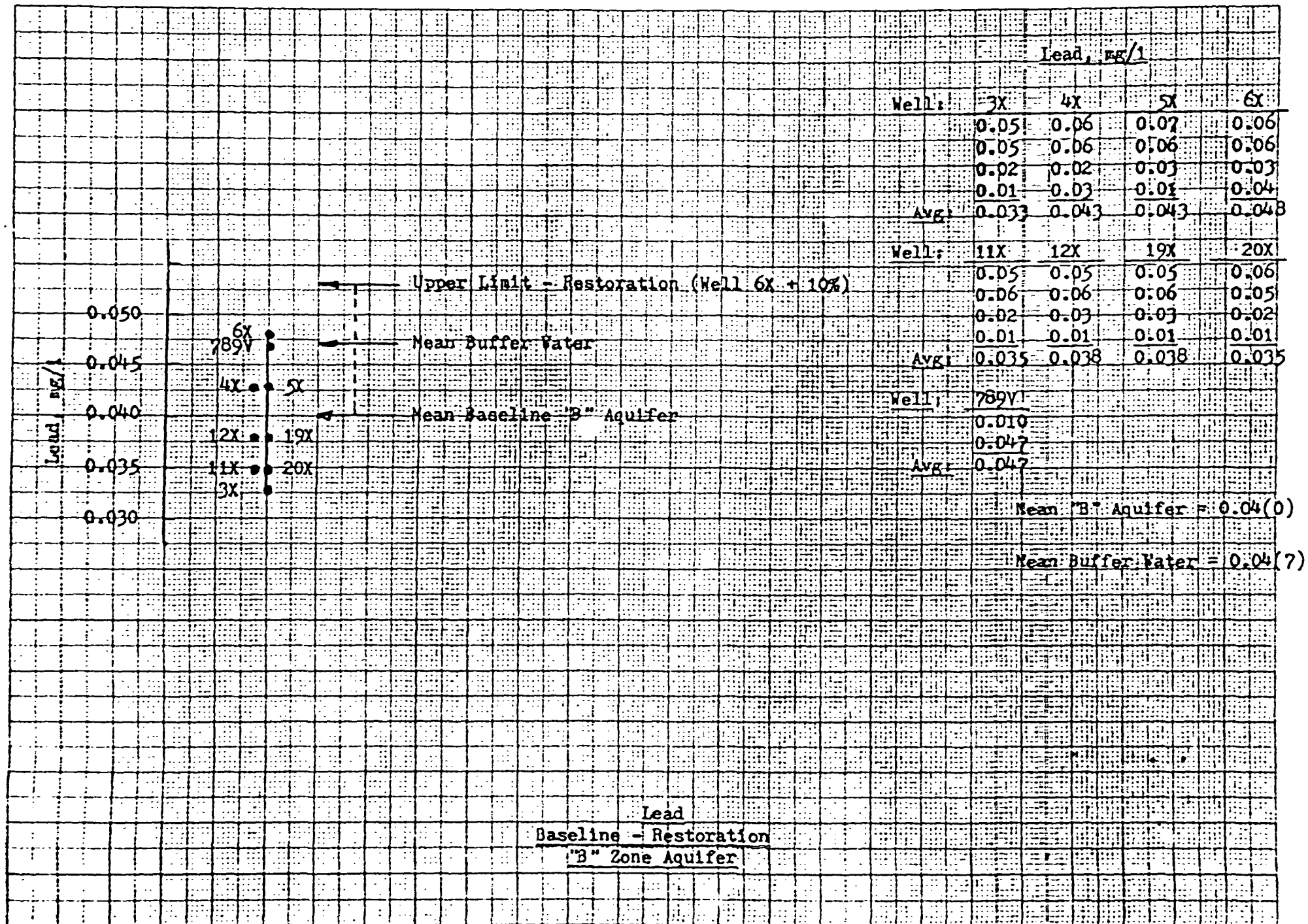
| Well: | 789V |
|-------|--------|
| | < 0.01 |
| | 0.007 |
| | < 0.01 |
| Avg: | < 0.01 |

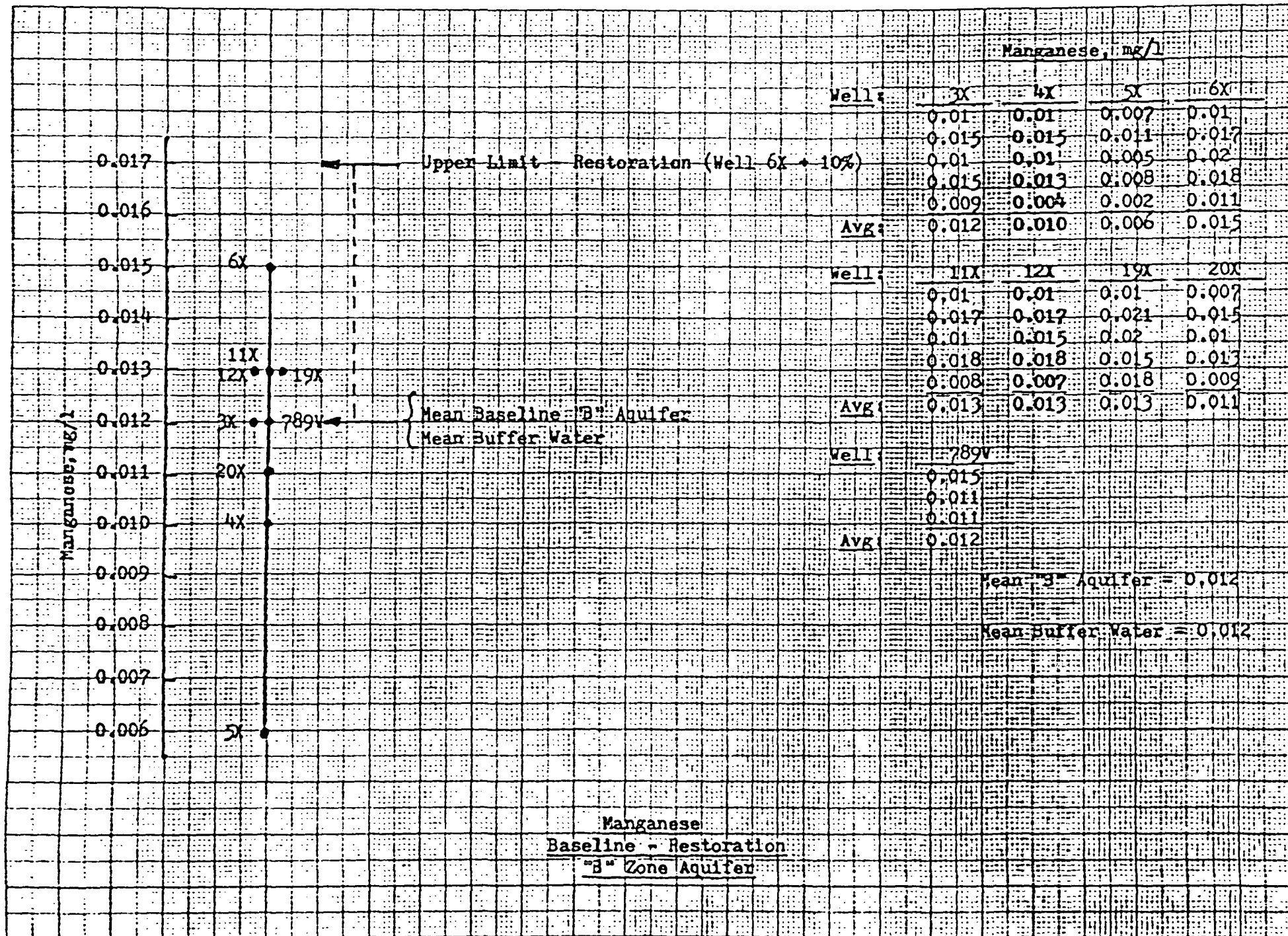
Mean "B" Aquifer = < 0.01

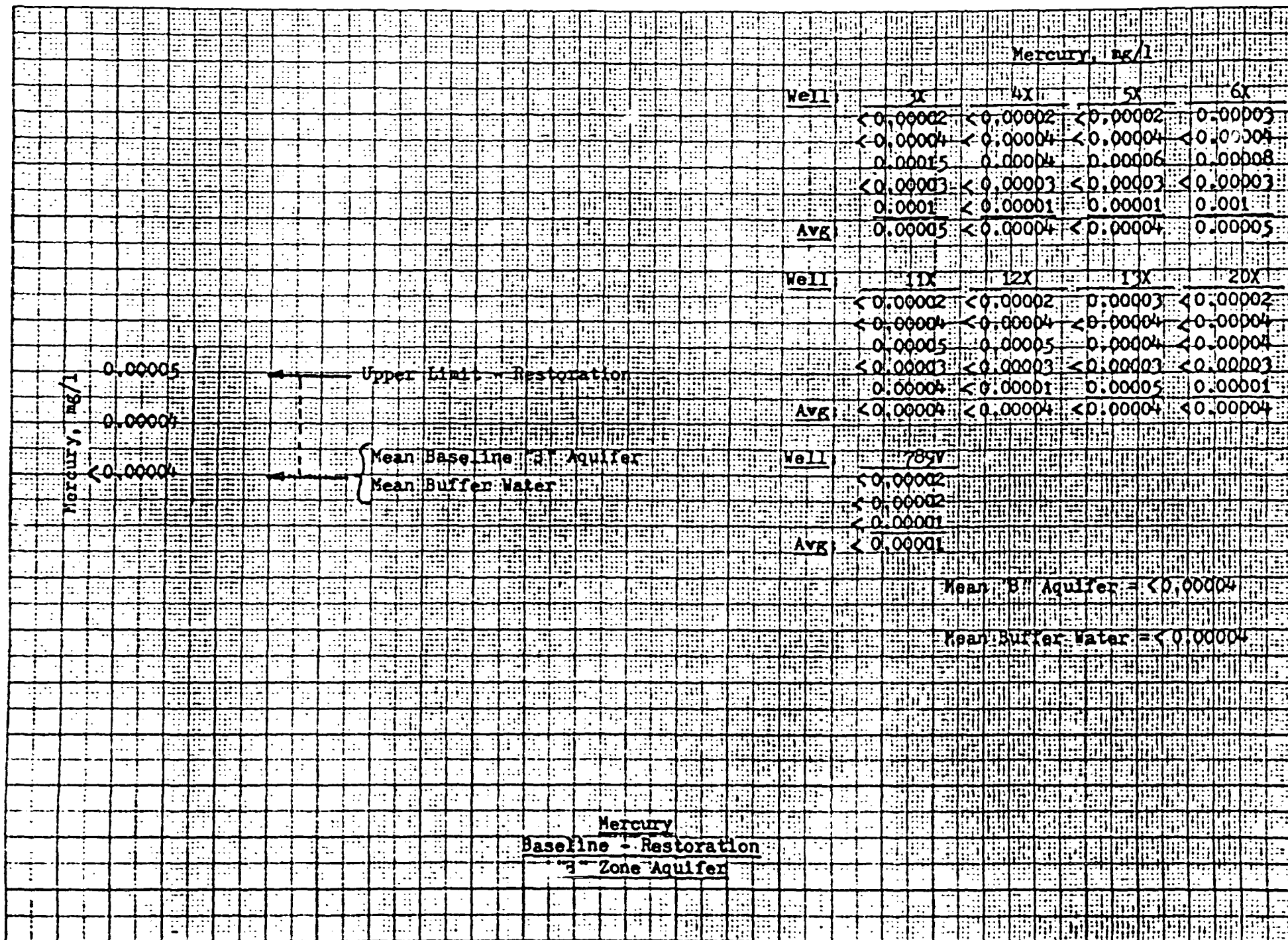
Mean Buffer Water = < 0.01

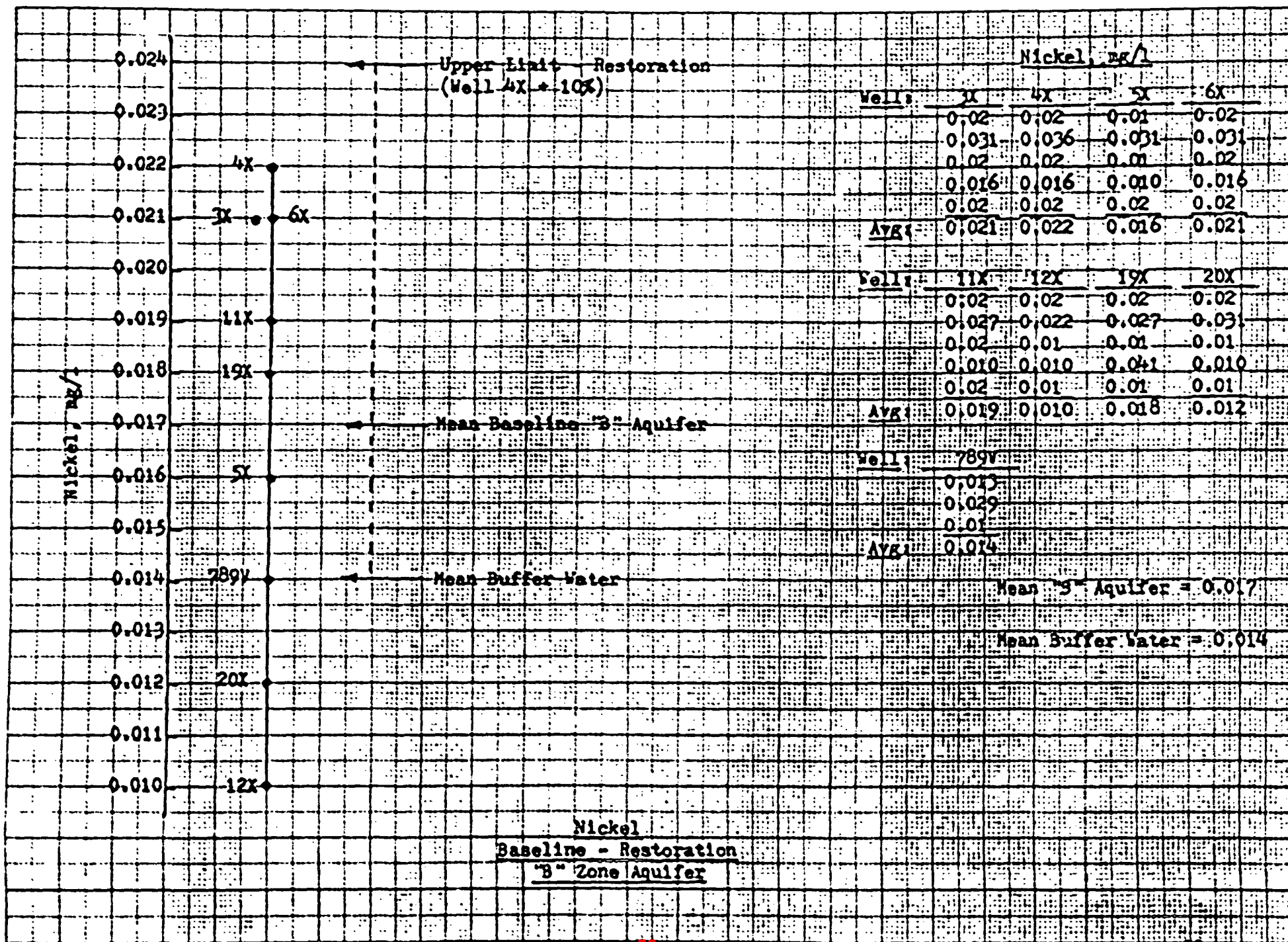
Copper
 Baseline - Restoration
 "B" Zone Aquifer

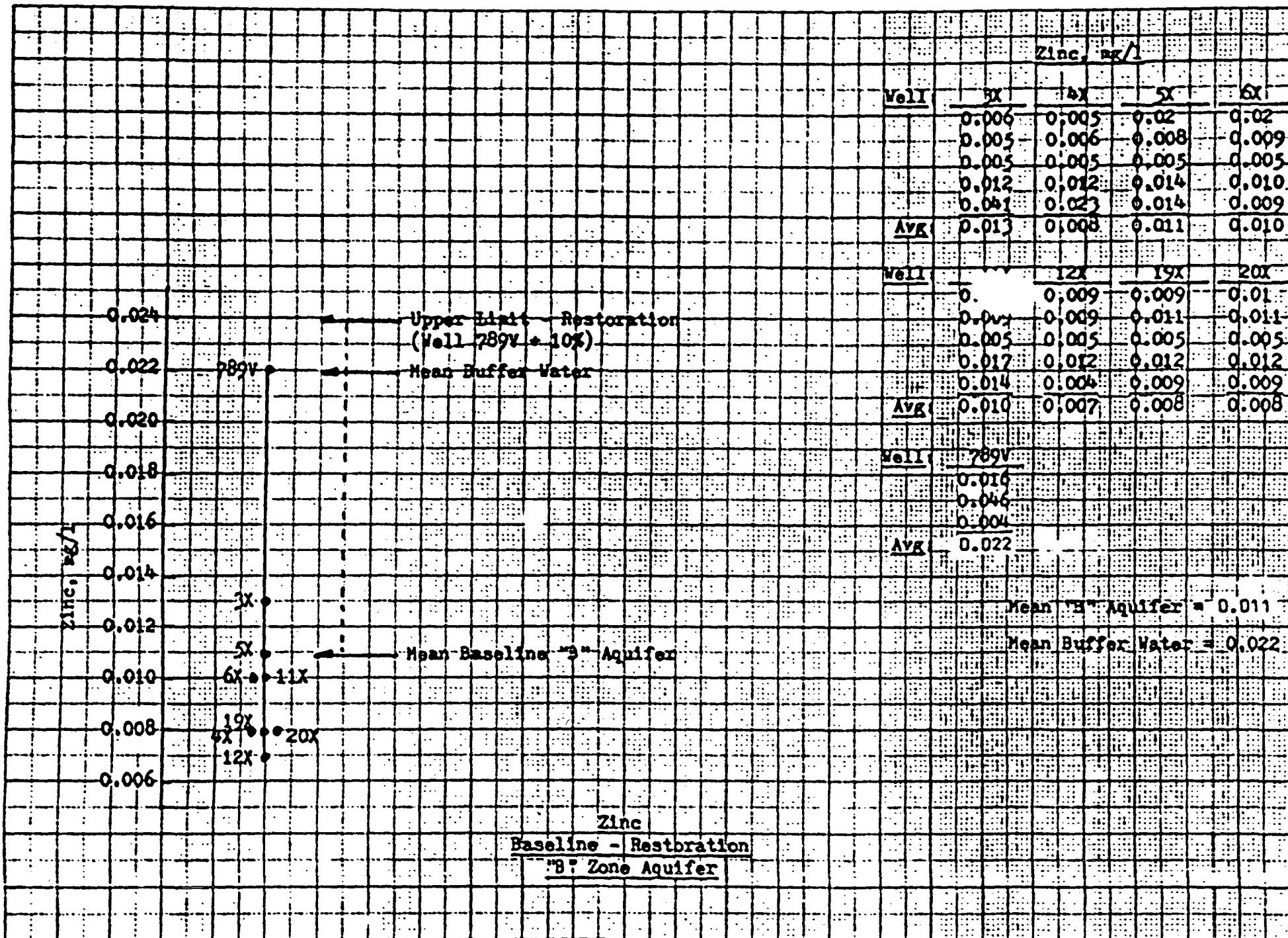












-54-
Figure 20

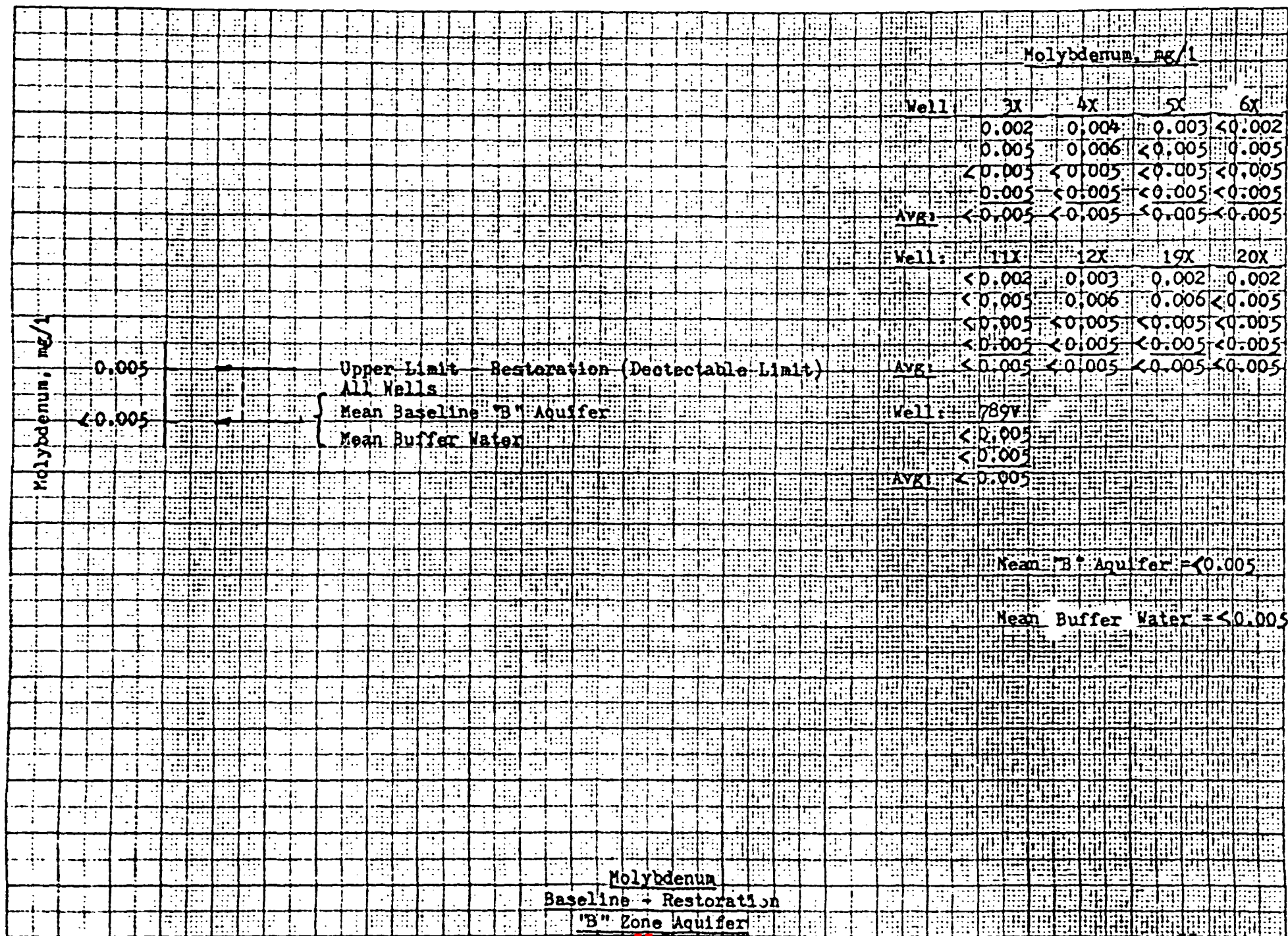


Figure 21

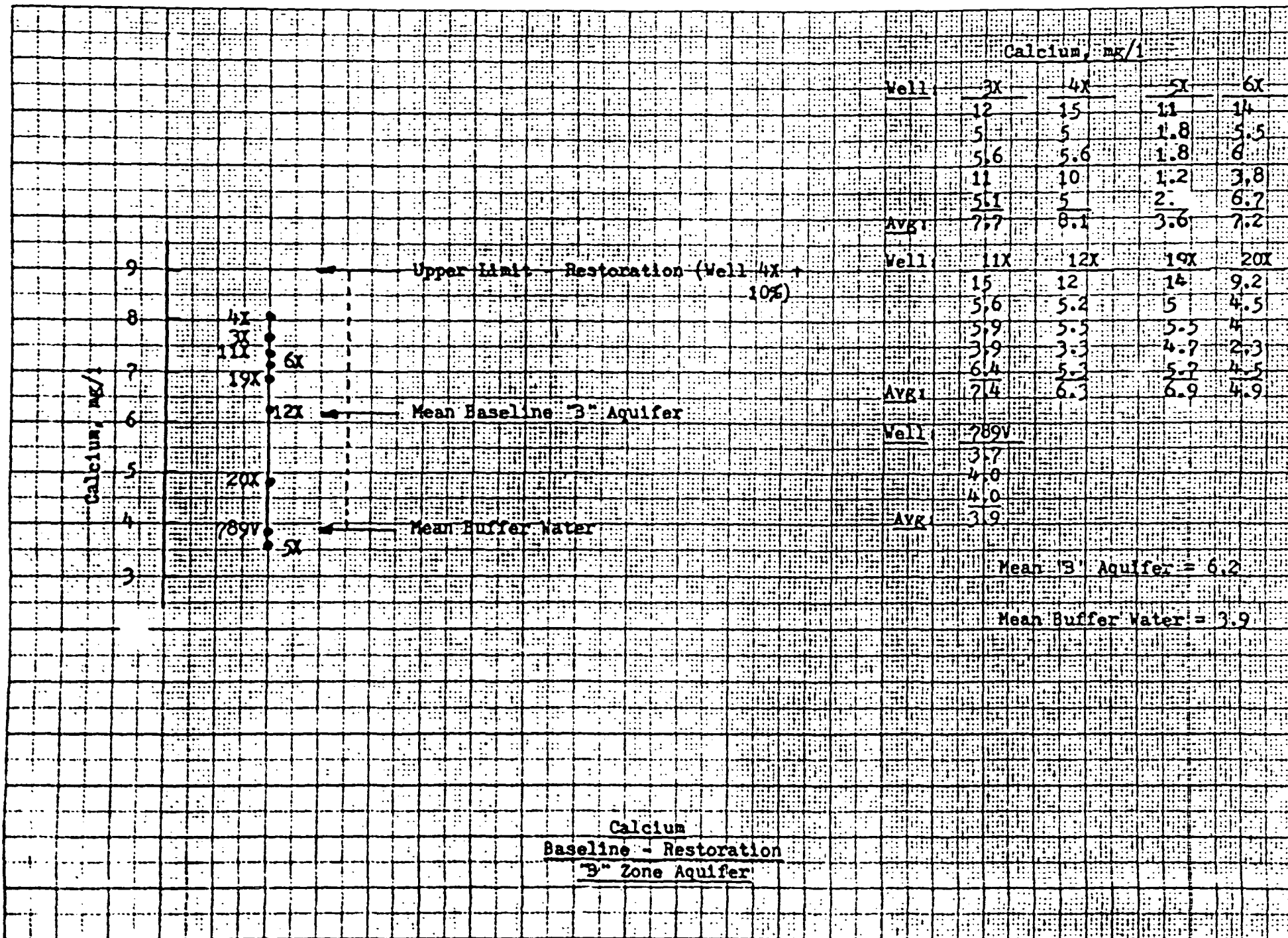
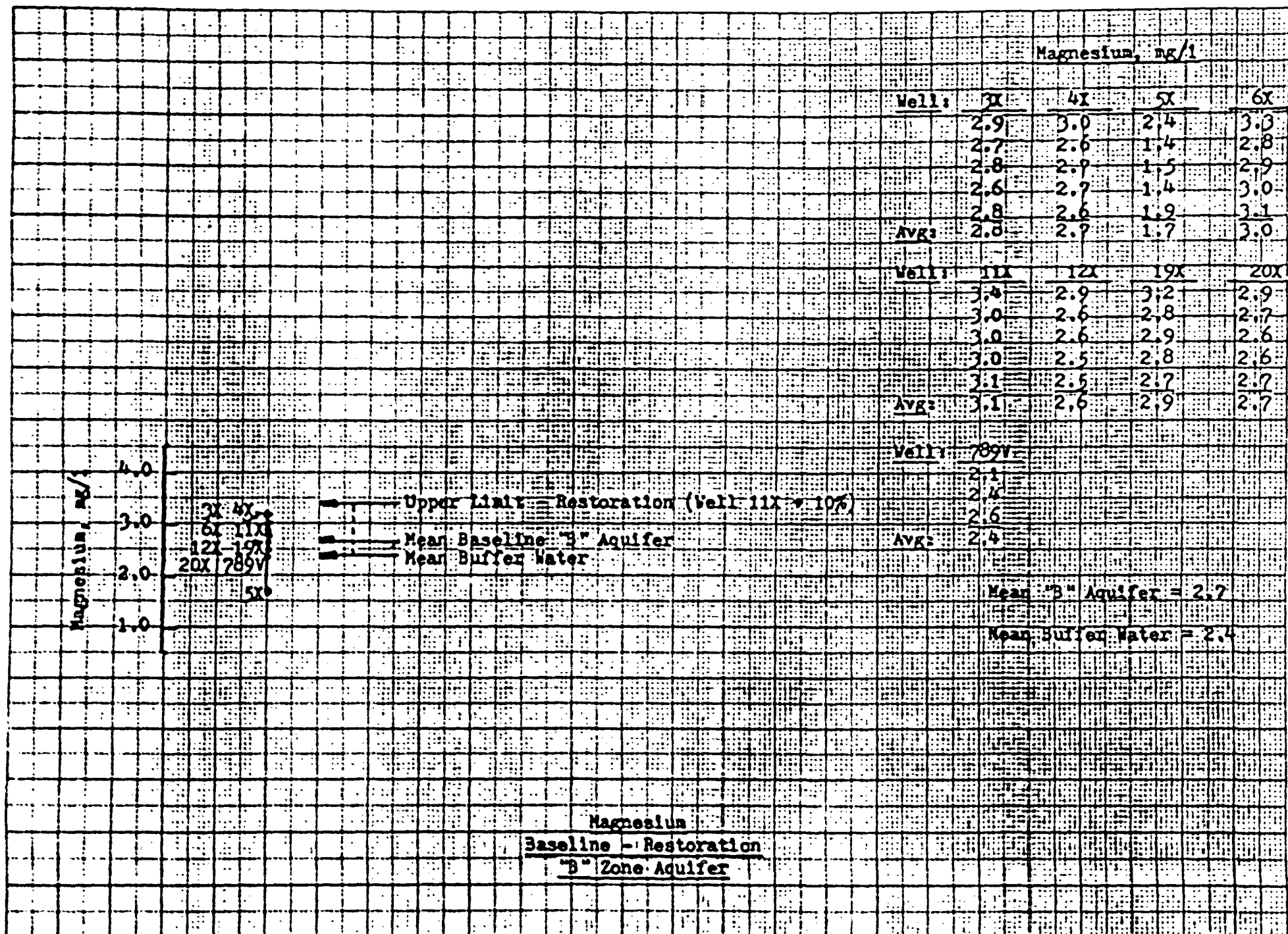


Figure 56-22



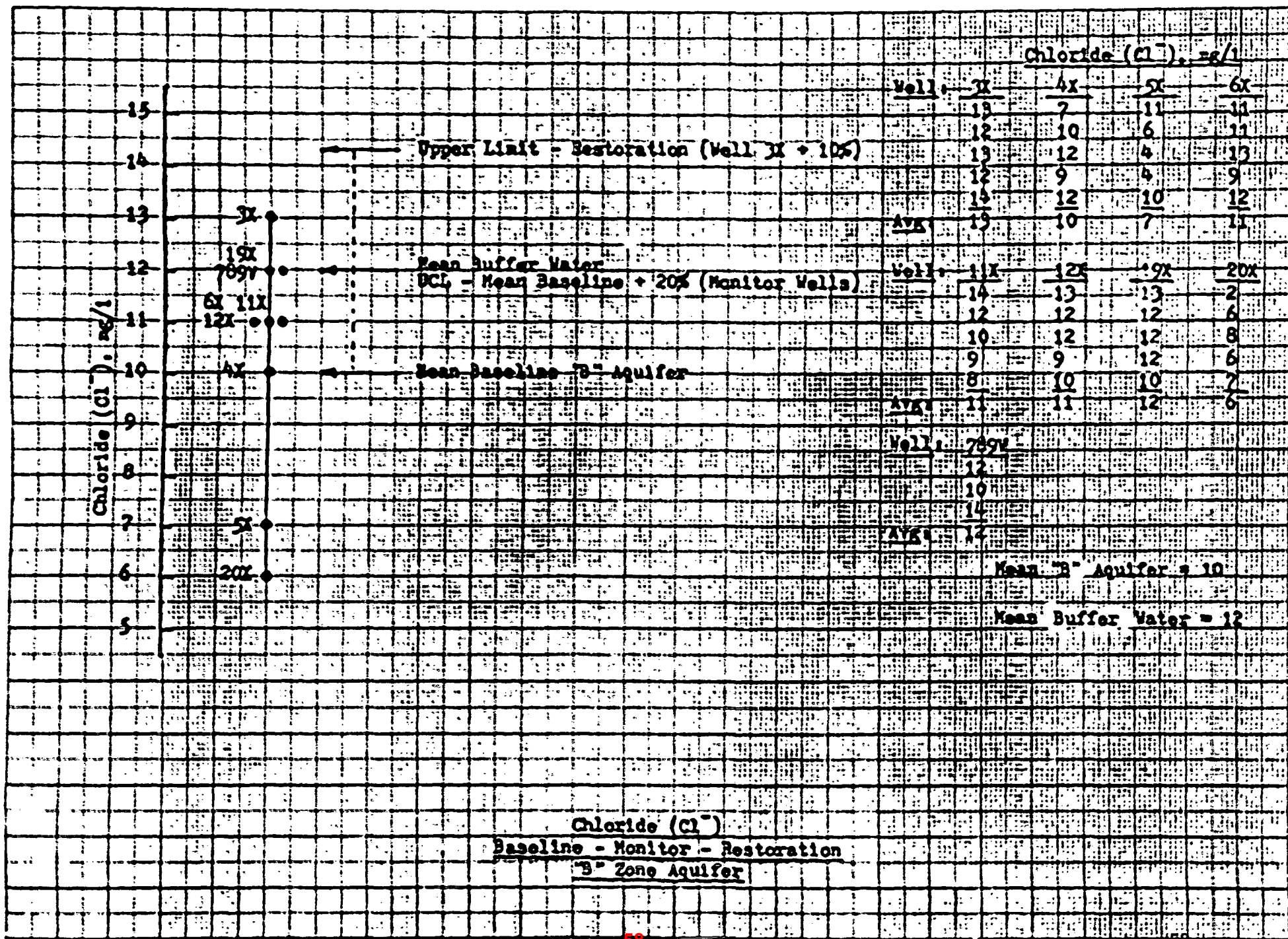


Figure 24

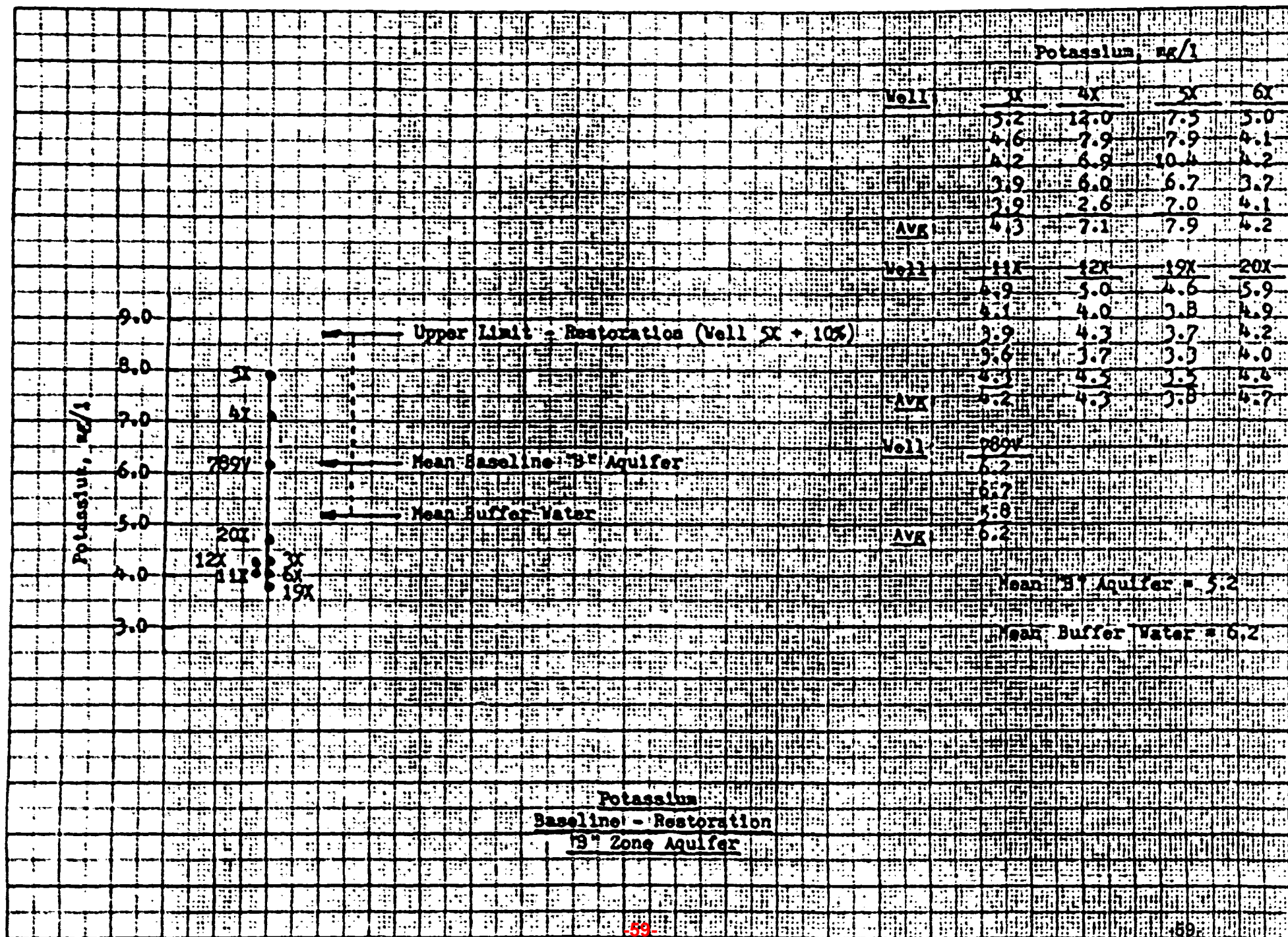
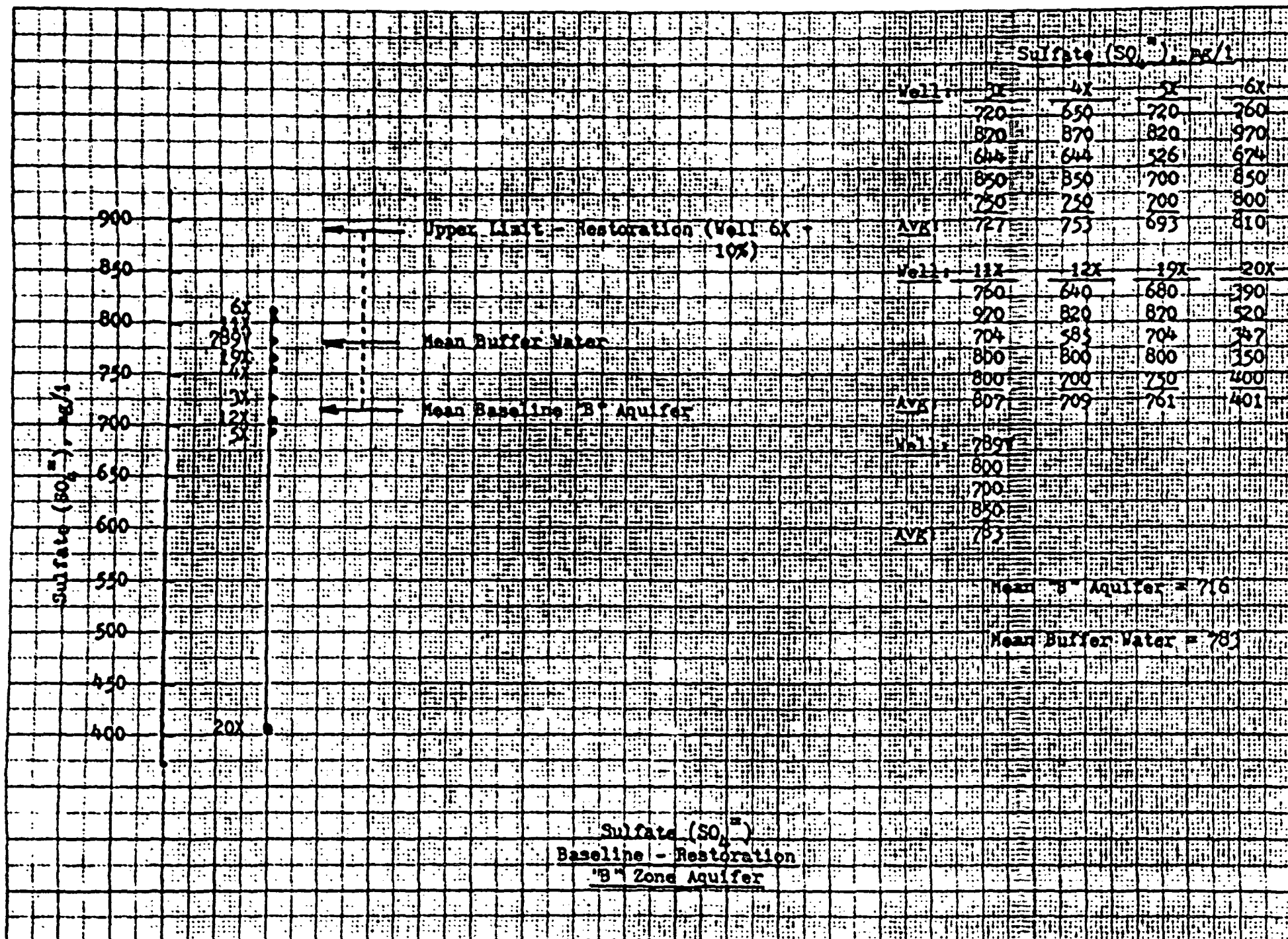
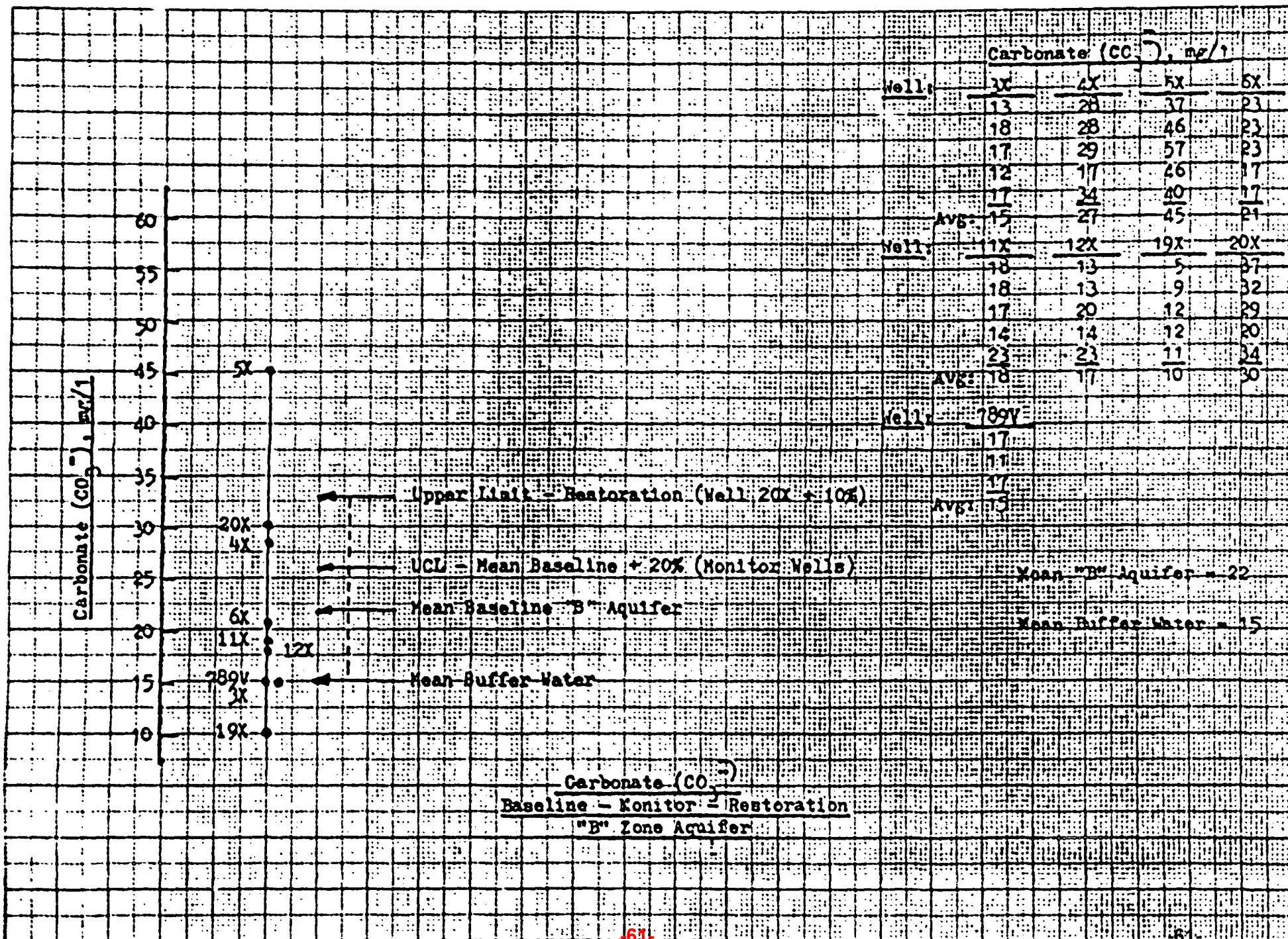
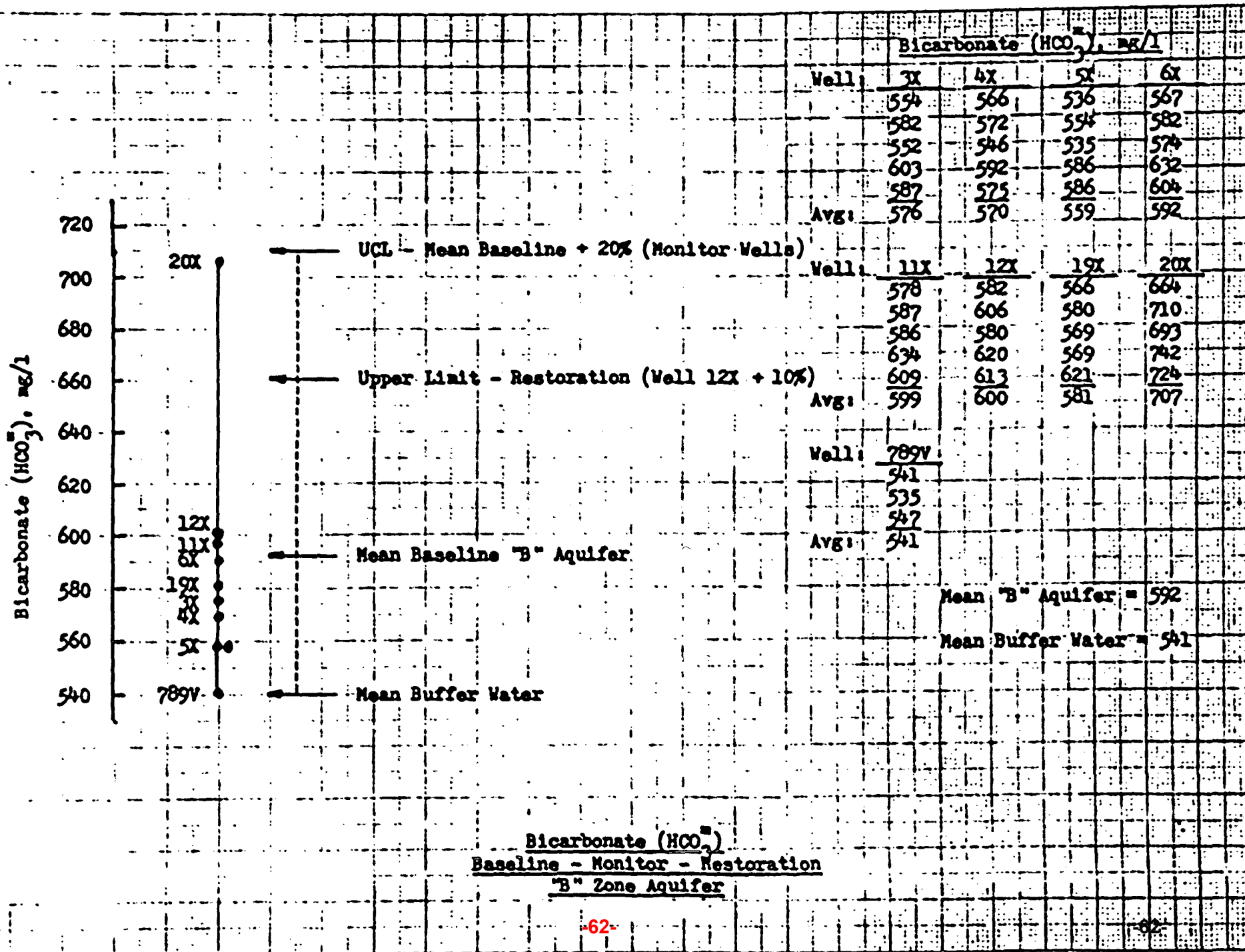


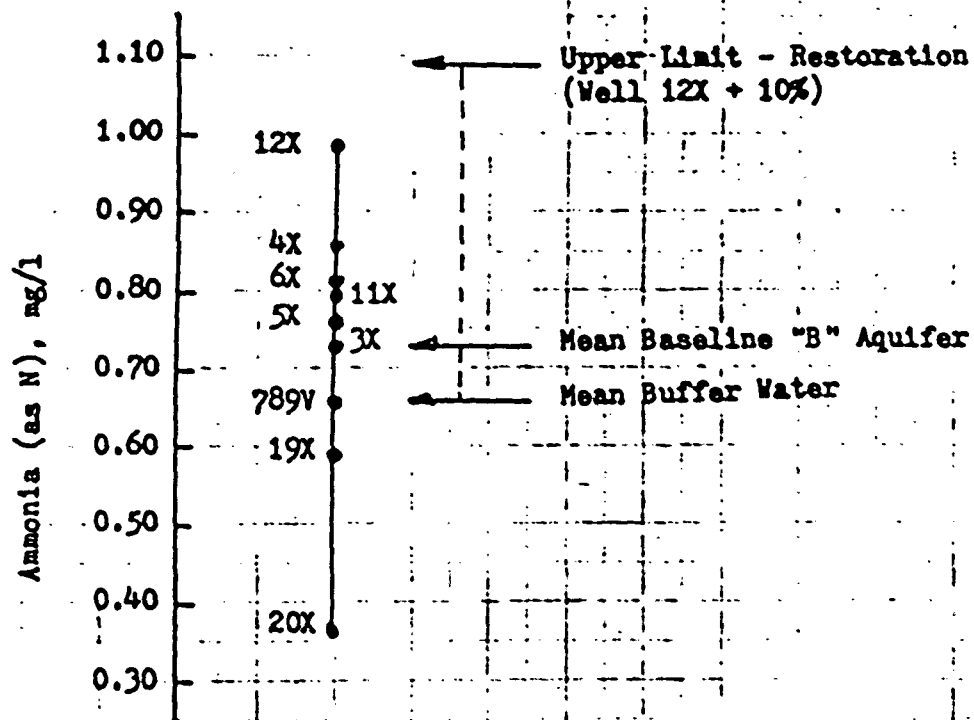
Figure 25





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| Ammonia (as N), mg/l | | | | |
|----------------------|------|------|------|------|
| Well: | 3X | 4X | 5X | 6X |
| | 0.65 | 0.65 | 0.57 | 0.81 |
| | 0.68 | 1.13 | 0.63 | 0.65 |
| | 0.90 | 0.90 | 1.10 | 1.00 |
| | 0.74 | 0.80 | 0.70 | 0.74 |
| | 0.72 | 0.80 | 0.80 | 0.83 |
| Avg: | 0.73 | 0.86 | 0.76 | 0.81 |

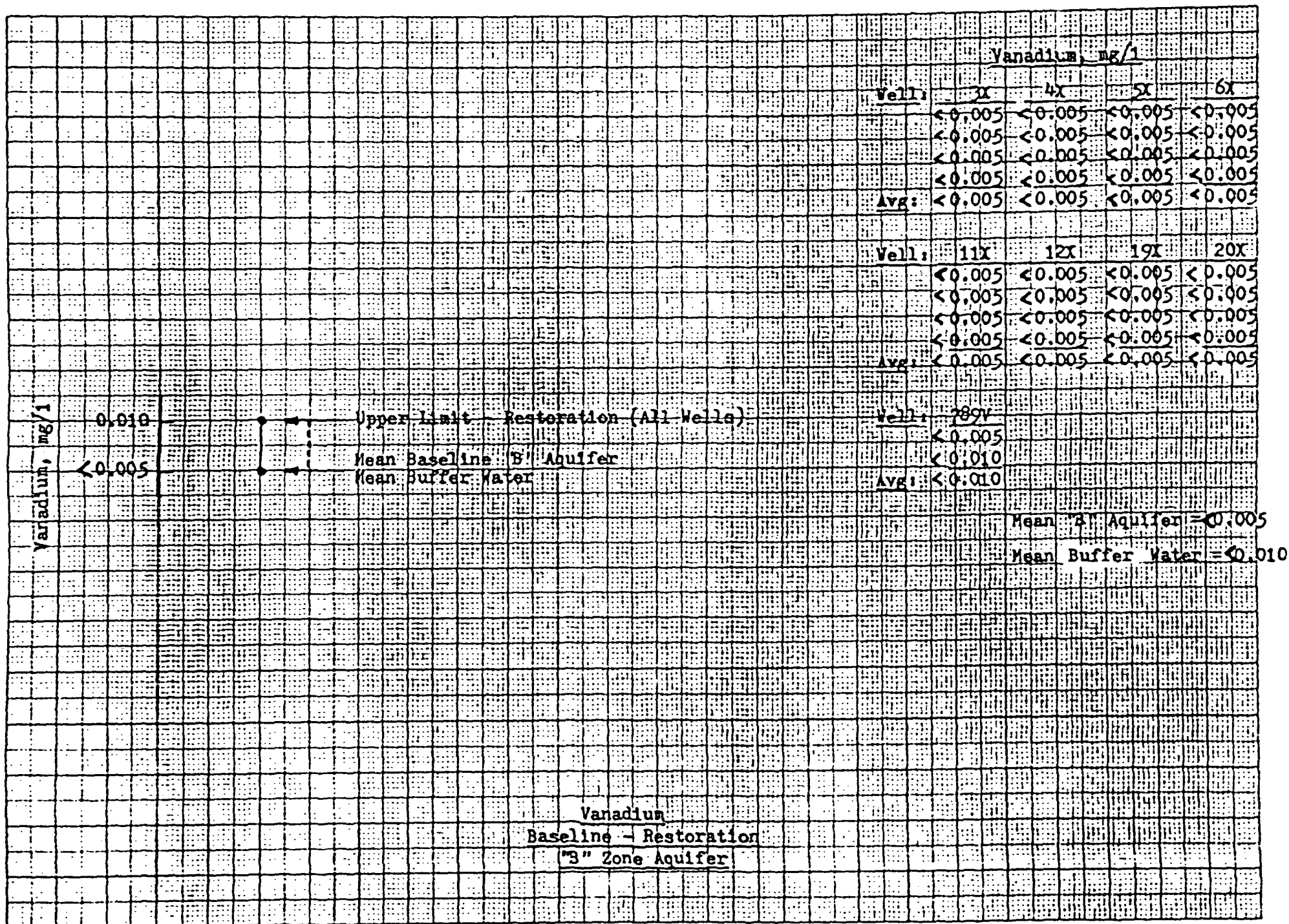
| Well: | 11X | 12X | 19X | 20X |
|-------|------|------|------|------|
| | 0.80 | 0.74 | 0.60 | 0.29 |
| | 0.77 | 0.68 | 0.60 | 0.43 |
| | 0.70 | 1.10 | 0.30 | 0.40 |
| | 0.74 | 0.71 | 0.62 | 0.37 |
| | 1.00 | 1.70 | 0.83 | 0.37 |
| Avg: | 0.80 | 0.99 | 0.59 | 0.37 |

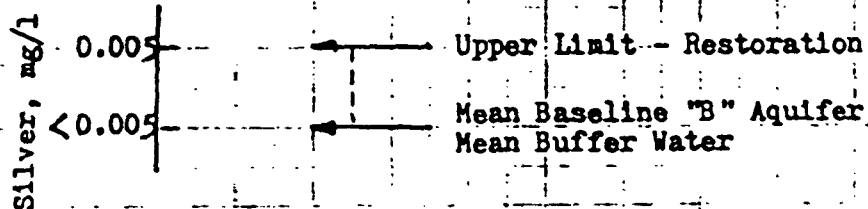
| Well: | 789V |
|-------|------|
| | 0.56 |
| | 0.72 |
| | 0.69 |
| Avg: | 0.66 |

Mean "B" Aquifer = 0.73

Mean Buffer Water = 0.66

Ammonia (as N)
Baseline - Restoration
"B" Zone Aquifer





| Silver, mg/l | | | | |
|--------------|--------|--------|--------|--------|
| Well: | 3X | 4X | 5X | 6X |
| | <0.005 | <0.005 | <0.005 | <0.005 |
| | 0.008 | 0.008 | 0.008 | 0.008 |
| | <0.005 | <0.005 | <0.005 | <0.005 |
| | 0.009 | 0.009 | 0.006 | 0.009 |
| | <0.005 | <0.005 | <0.005 | <0.005 |
| Avg: | <0.005 | <0.005 | <0.005 | <0.005 |
| Well: | 11X | 12X | 19X | 20X |
| | <0.005 | <0.005 | <0.005 | <0.005 |
| | 0.008 | 0.011 | 0.008 | 0.011 |
| | <0.005 | <0.005 | <0.005 | <0.005 |
| | <0.005 | <0.005 | <0.005 | <0.005 |
| | <0.005 | <0.005 | <0.005 | <0.005 |
| Avg: | <0.005 | <0.005 | <0.005 | <0.005 |
| Well: | 789V | | | |
| | <0.005 | | | |
| | <0.005 | | | |
| | <0.005 | | | |
| Avg: | <0.005 | | | |

Mean "B" Aquifer = <0.005

Mean Buffer Water = <0.005

Silver
Baseline - Restoration
"B" Zone Aquifer

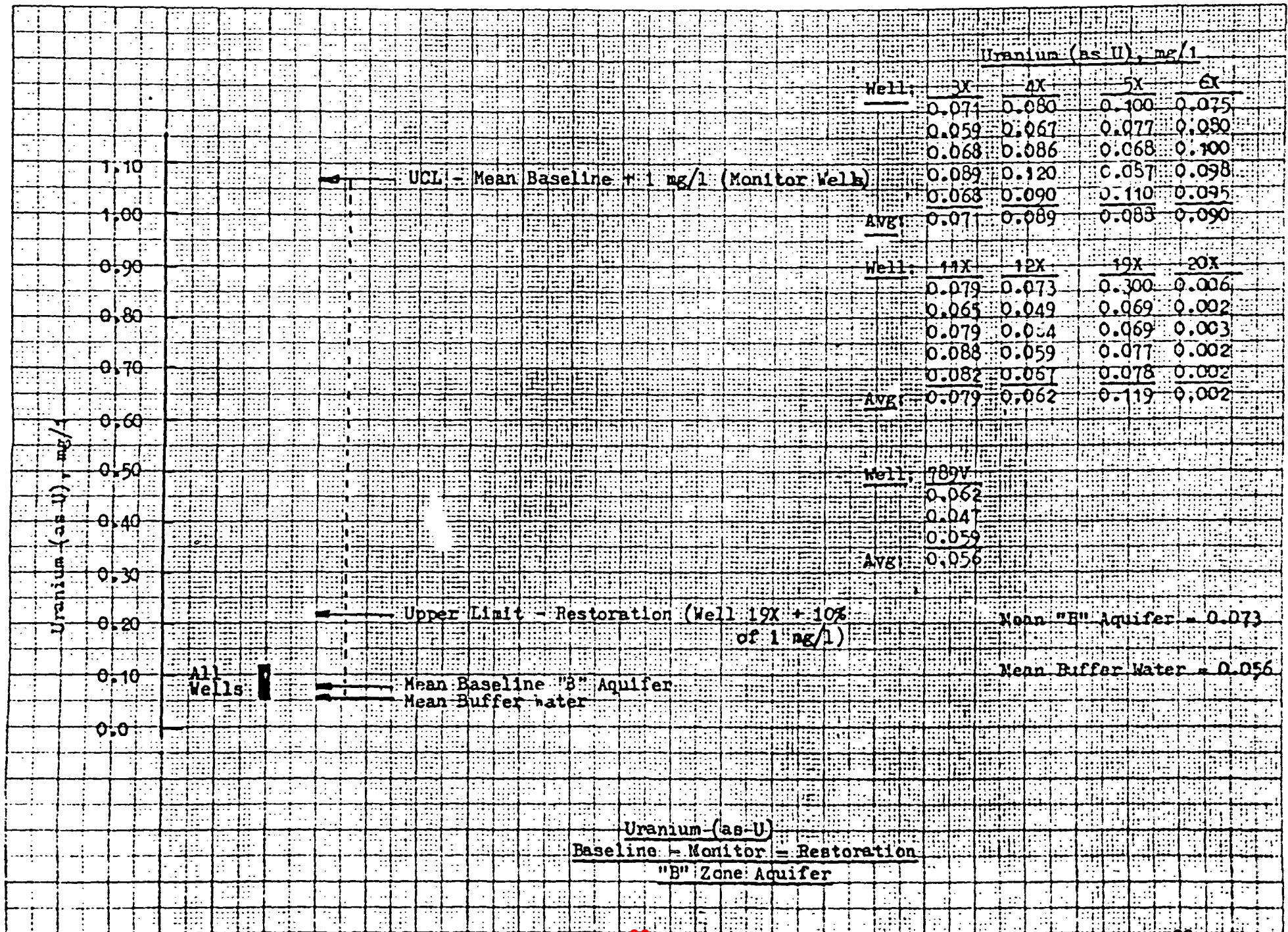


Figure 32

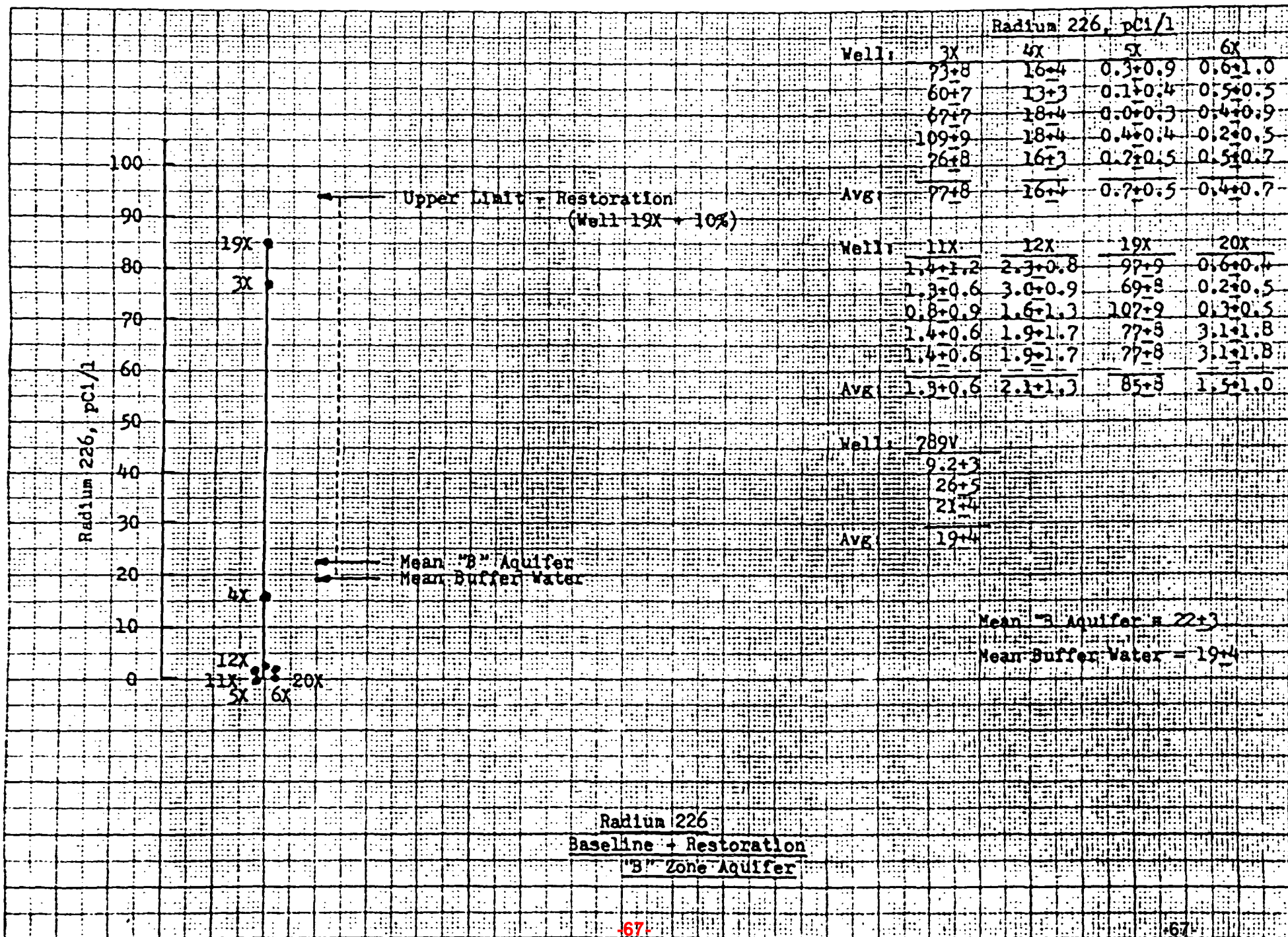
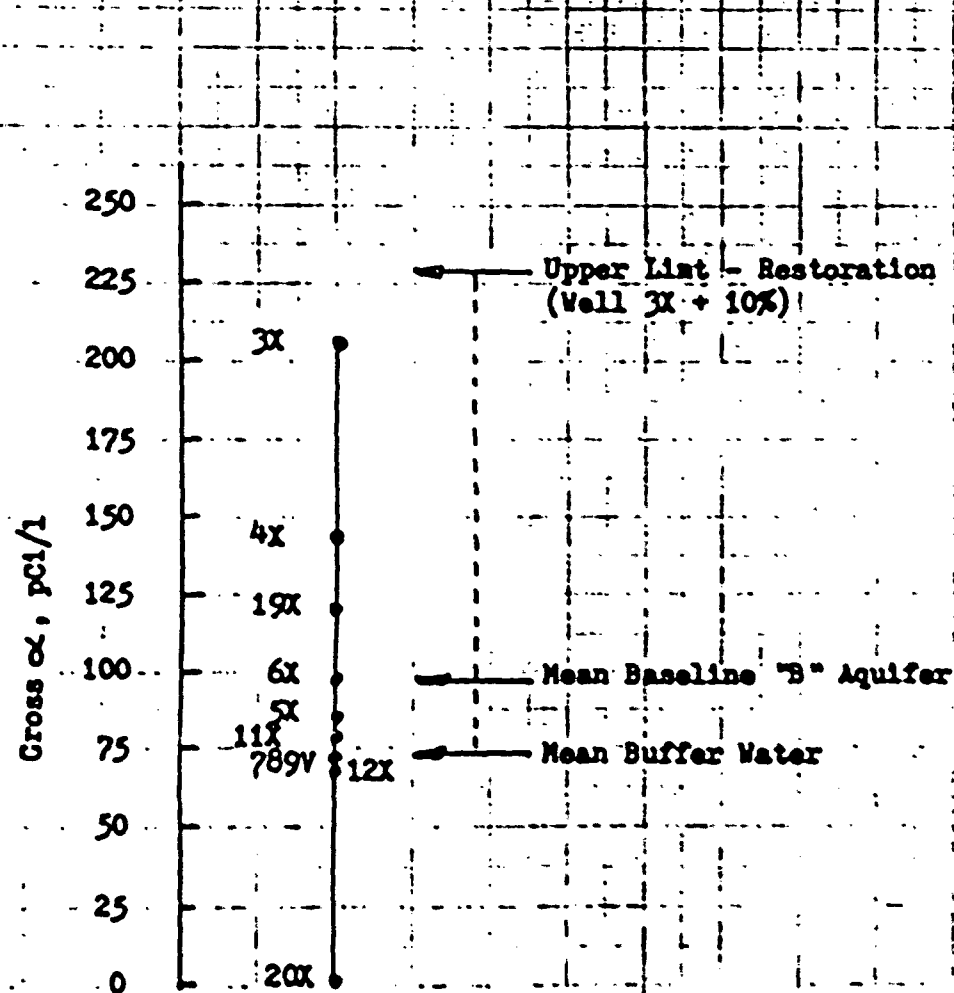


Figure 33



| Gross α , pCi/l | | | | |
|------------------------|--------|--------|--------|--------|
| Well: | 3X | 4X | 5X | 6X |
| | 290+20 | 180+15 | 157+13 | 128+16 |
| | 158+18 | 115+15 | 108+14 | 111+15 |
| | 340+25 | 160+20 | 78+9 | 125+11 |
| | 200+20 | 210+20 | 72+11 | 75+12 |
| | 58+13 | 61+13 | 24+9 | 52+12 |
| AVG: | 209+19 | 145+17 | 88+11 | 98+13 |
| Well: | 11X | 12X | 19X | 20X |
| | 112+15 | 72+12 | 310+20 | 8+3 |
| | 61+11 | 74+12 | 106+15 | 3+3 |
| | 82+13 | 80+9 | 145+15 | 6+3 |
| | 40+9 | 59+10 | 250+20 | 4+3 |
| | 93+13 | 48+7 | 81+15 | 1+2 |
| AVG: | 78+12 | 67+10 | 123+13 | 4+3 |
| Well: | 789V | | | |
| | 89+13 | | | |
| | 86+12 | | | |
| | 37+9 | | | |
| AVG: | 71+11 | | | |

Mean "B" Aquifer = 98+12

Mean Buffer Water = 71+11

Gross α
Baseline - Restoration
"B" Zone Aquifer

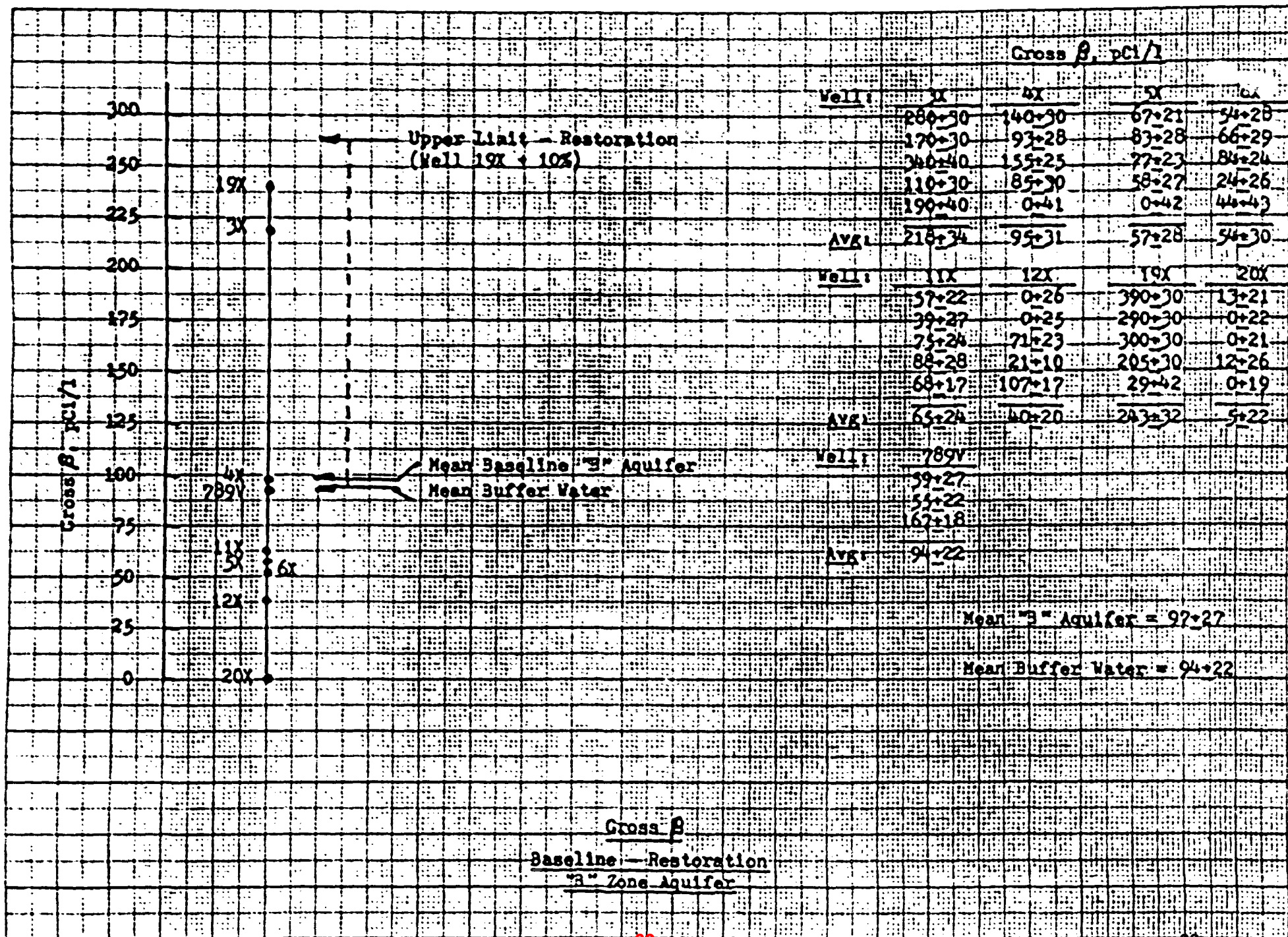


Figure 35

Phase I. Sampling Frequencies

Phase I operational (mining) and restoration sampling frequencies are shown in Table 12. The indicated frequencies are considered minimum requirements and additional samplings will be employed as needed to fully characterize and document the activities of the Phase I R & D program.

TABLE 12

| <u>Wells</u> | <u>Tentative Sampling Frequencies</u> | |
|-------------------------------------------|----------------------------------------|---------------------------------------------------------------------------------------------------------------------------|
| | <u>Operational</u> | <u>Restoration</u> |
| Recovery well one well | One average value per day | Once per 8 hours declining to 1 per day or less as dictated by plot of results obtained. |
| Leachant Injection four wells | One average value per day | When untreated water is injected in sweep: one per day |
| Buffer Injection four wells | Once a week | Same as during operations. When activated, each well will be sampled once every two weeks, as monitors. |
| Sampling Well B zone one well | Once a week | Once a week to start, declining as dictated by plot of results obtained. |
| Observation A zone one well | Once a week | Once a week to start, declining as dictated by plot of results obtained. |
| Monitor 2 close wells 2 outer wells | Once a week Once every two weeks | Once every two weeks. Once every two weeks declining to once a month as dictated by plot of results obtained. |
| <hr/> | | |
| 15 Wells Total | | |

MONITORING

Upper control limits (UCL) for excursion indicators to be used for Phase I operations as determined from baseline water quality data are shown in Table 13.

TABLE 13
Excursions Indicators
Monitor Wells(1)

| <u>Indicator</u> | <u>Upper Control Limit(2)</u> | <u>Pre-Mining Mean Baseline</u> |
|-------------------------------------------------|-------------------------------|---------------------------------|
| TDS, 180°C | 1955 mg/l | 1629 mg/l |
| Conductivity, 25°C | 2947 umhos/cm | 2456 umhos/cm |
| pH | 10.77 | 8.77 |
| Uranium (as U) | 1.07 mg/l | 0.073 mg/l |
| Sodium (as Na) | 746 mg/l | 622 mg/l |
| Carbonate (as CO ₃ =) | 26 mg/l | 22 mg/l |
| Bicarbonate (as HCO ₃ ⁻) | 710 mg/l | 592 mg/l |
| Chloride (as Cl ⁻) | 12 mg/l | 10 mg/l |

(1) Monitor Wells 5X, 6X, 11X, 12X - "B" Aquifer

(2) Upper Control Limit exceeded = excursion

Radium 226, arsenic, and selenium are not proposed as excursion indicators; however, collected samples from the monitor wells will be analyzed for these parameters as part of the monitoring procedure.

Monitor well sampling shall be at least biweekly using procedures employed in the pre-mining baseline water quality program and described elsewhere in this report. As determined from the pre-mining baseline sampling, conductivity data plots show that by the time 1.5 - 2.0 casing volumes have been displaced from the wells conductivity values are essentially stabilized. Chemical comparisons between samplings at 1.5 - 2.0 casing volumes pumped versus prolonged pumping (2.5 - 3.5

casing volumes) also indicate very little change in the solution concentrations of the proposed excursion indicators. During operations, monitor wells will therefore be pumped to displace 1.5 - 2.0 casing volumes before sampling.

In addition to the biweekly analysis for excursion indicators listed in Table 13 (plus Ra 226, As, & Se), monitor wells shall be analyzed quarterly for the full suite of values. All monitoring well data (biweekly analysis, head levels, full suite quarterly analysis) shall be forwarded to The Wyoming Department of Environmental Quality, Land Quality Division every 90 days. The quarterly report shall contain:

- (1) The total quantity of recovery fluid injected during the reporting period.
- (2) The total quantity of recovery fluid produced during the reporting period.
- (3) The mechanism for determining Items 1 and 2.
- (4) A graphical representation for all excursion parameter values plotted against time for all monitor wells sampled during the reporting period.
- (5) A graphical representation of all head levels for monitoring wells sampled during the reporting period.

The procedure used to detect an excursion shall be as follows: When an upper control limit value is exceeded, samples from the monitor well (s) affected shall be taken and analyzed daily. A leach solution excursion is identified when the condition holds or becomes aggravated for seven (7) consecutive days, at which time corrective action shall be initiated. Samples for excursion analysis will be assigned top priority in the laboratory and all analysis of the seven consecutive samplings shall be completed by the eighth day following identification of an excursion condition. The analytical methods and expected accuracy to be utilized in determining an excursion condition are shown in Table 14.

TABLE 14Excursion Indicator Analysis

| Parameter | Analytical Method | Accuracy, % of Reported Value |
|--------------|---------------------------|-------------------------------|
| Conductivity | Wheatstone Bridge | ± 1 |
| TDS | Evaporation - Gravimetric | ± 5 |
| pH | Meter | ± 0.1 unit |
| Uranium | Fluorometric | $\pm 5-10$ |
| Sodium | AA | ± 10 |
| Bicarbonate | Titrimetric | ± 5 |
| Carbonate | Titrimetric | ± 5 |
| Chloride | Titrimetric | $\pm 10-15$ |

Written notice shall be provided confirming an excursion describing the condition, the corrective action taken and the results obtained (report filed within 30 days). If the corrective action is ongoing at the time the report is filed, a final report shall be submitted describing end results of the corrective action.

Corrective action will consist of the following steps:

1) Buffer water flow rate into the related buffer well or wells shall be increased by an amount or amounts which are dependent on the circumstances.

2) If step 1) is not effective, then the flow rate of leachate into the injection well or wells affected shall be reduced, which will result in an increased bleed off from the leaching circuit.

In both 1) and 2) above it is expected that computer capability will be helpful in approximating the changes in flows required.

Restoration

The range of concentrations considered acceptable for "B" aquifer restoration following Phase I mining operations as determined from baseline water quality data are shown in Table 15. The upper limit target value for restoration was calculated for each element and is defined as that value not to exceed the highest individual well mean baseline value + 10%.

For specific elements that were not detected in the pre-mining baseline program, upper limit restoration values were calculated as the detectable limit. A lower limit of zero is shown for all elements. However, in actual practice, the bottom limit can be no lower than the analysis value for the untreated "B" formation water (from Well 789V) used to effect restoration. No water quality standards apply to restoration of the "B" zone aquifer.

Well sampling procedures during restoration shall be identical to those employed for the pre-mining water quality program. The "B" aquifer shall be considered restored when the wells sampled in the pre-mining program exhibit analysis values for each parameter of less than the established restoration upper limit.

To further determine aquifer stability, additional samples from all the "B" aquifer wells originally employed in the baseline program shall be taken on a monthly basis for at least three months to confirm stable conditions. The monitor excursion parameters plus radium 226, arsenic, and selenium shall be followed in this series of samplings. Values obtained for each element shall not exceed the restoration upper limit for the aquifer to be considered stable.

RESTORATION TARGET VALUES

"B" ZONE AQUIFER

(Wells - 3X, 4X, 5X, 6X, 11X,
12X, 19X, 20X)

| Parameter | Units | Restoration | | Pre-Mining Buffer Water Mean | Pre-Mining Baseline Mean |
|-----------------------------------------|-------|------------------------------|------------------------------|------------------------------------|--------------------------------|
| | | Upper Limit (1) All Wells | Lower Limit (1) All Wells | | |
| pH | -- | 9.33 | 7.50 | 8.69 | 8.77 |
| Conductivity (25°C) umhos/cm | | 2898. | 1 | 2531 | 2456 |
| Sodium | mg/l | 730 | 0(2) | 653 | 622 |
| TDS (180°C) | mg/l | 1940 | | 1703 | 1629 |
| Arsenic | mg/l | 0.015 | | 0.014 | 0.011 |
| Selenium | mg/l | 0.008 | | 0.007 | 0.003 |
| NO ₃ /NO ₂ (as N) | mg/l | 0.09 | | 0.05 | 0.06 |
| Barium | mg/l | 0.01 | | <0.01 | <0.01 |
| Boron | mg/l | 0.64 | | 0.45 | 0.52 |
| Cadmium | mg/l | 0.0060 | | 0.0050 | 0.0053 |
| Chromium | mg/l | 0.01 | | <0.01 | <0.01 |
| Copper | mg/l | 0.01 | | <0.01 | <0.01 |
| Iron | mg/l | 0.14 | | 0.081 | 0.090 |
| Lead | mg/l | 0.053 | | 0.047 | 0.040 |
| Manganese | mg/l | 0.017 | | 0.012 | 0.012 |
| Mercury | mg/l | 0.00005 | | <0.00004 | <0.00004 |
| Nickel | mg/l | 0.024 | | 0.014 | 0.012 |
| Zinc | mg/l | 0.024 | | 0.022 | 0.011 |
| Molybdenum | mg/l | 0.005 | | <0.005 | <0.005 |
| Calcium | mg/l | 9 | | 3.9 | 6.2 |
| Magnesium | mg/l | 3.4 | | 2.4 | 2.7 |
| Chloride | mg/l | 14.3 | | 12 | 10 |
| Potassium | mg/l | 8.7 | | 6.2 | 5.2 |
| Sulfate (as SO ₄) | mg/l | 891 | | 783 | 716 |
| Carbonate (as CO ₃) | mg/l | 33 | | 15 | 22 |
| Bicarbonate (as HCO ₃) | mg/l | 660 | | 541 | 592 |
| Ammonia (as N) | mg/l | 1.09 | | 0.66 | 0.73 |
| Vanadium | mg/l | 0.010 | | <0.005 | <0.005 |
| Silver | mg/l | 0.005 | | <0.005 | <0.005 |
| Uranium (as U) | mg/l | 0.22 | | 0.056 | 0.073 |
| Radium 226 | pCi/l | 94±8 | | 19±4 | 22±3 |
| Gross α | pCi/l | 230±20 | | 71±11 | 98±12 |
| Gross β | pCi/l | 267±35 | | 94±22 | 97±22 |

(1) Wells 3X, 4X, 5X, 6X, 11X, 12X, 19X, 20X

(2) 0 = limit of detection

TABLE 15 RESTORATION TARGET VALUES - "B" Zone Aquifer

Sampling Program - Private Wells

In addition to the production well baseline program, surface waters and private well sources within a three mile radius of the test site were sampled as required by the Nuclear Regulatory Commission Source Material License.⁽¹⁾ Wells in this sampling program are shown in Table 16.

TABLE 16

Private Wells

| <u>Well</u> | <u>Description</u> |
|--------------------|---------------------------------------------|
| 101 | Oshoto Reservoir - Dip Sample |
| 102 | Harry Berger Pasture - Windmill (Hand Pump) |
| 109 | Harry Berger Pasture - Electric Pump |
| 110 | Oshoto Reservoir - Dip Sample |
| 104 ⁽²⁾ | Grace Reynold's House Well - Windmill |
| 119 | Burch Ranch Pasture - Electric Pump |
| 125 | Allan's Pasture - Windmill |

Additional location data and descriptions for these water samples are shown in Table 17 and are marked with an asterisk.

The schedule for these wells require sampling on a monthly basis with analysis of certain specific parameters monthly and a comprehensive analysis on a quarterly basis. A flow schematic of the sampling procedure, attendant preservation techniques used, and the analysis parameters are shown in Figure 36. Results of monthly and quarterly samplings are shown in Tables 18, 19, and 20.

- (1) Reference: Source Material License Application Sundance Project, Crook County, Wyoming. Docket 40-8663. Letter, A. F. Stoick to L. C. Rouse, dated February 8, 1978. Answer number 2.
- (2) Per Reference (1), Well 117 (see Table 17) was originally designated in the list of private wells to be sampled. At the start of the private well program, Well 117 was found to be mechanically inoperable. Well 104 in close proximity was therefore substituted in lieu of Well 117.

WATER SAMPLES WITHIN A THREE-MILE
RADIUS OF THE TEST SITE

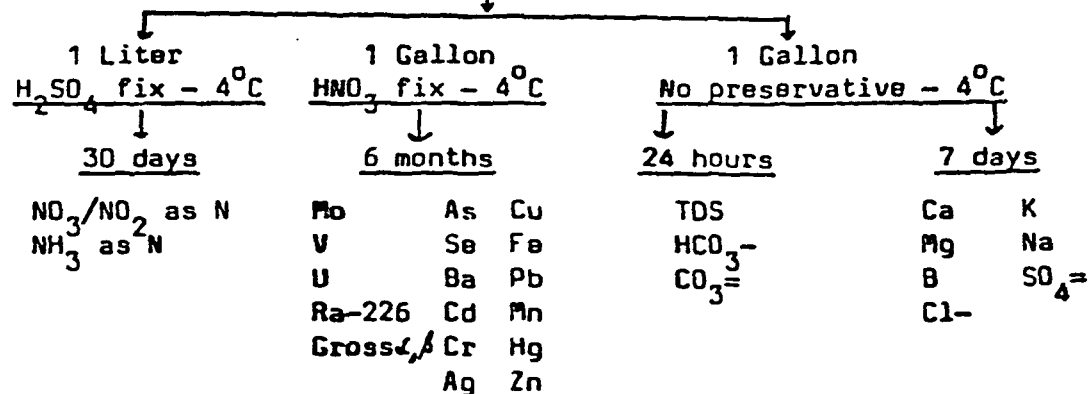
| <u>WELL NO.</u> | <u>PROPERTY</u> | <u>WYOMING COORDINATES (APPROX.)</u> | <u>SEC.-TWP.-RGE.</u> | <u>TYPE OF WELL</u> | <u>DEPTH</u> | <u>WELL BOTTOM FORMATION</u> |
|---------------------|---------------------------------|----------------------------------------------|-----------------------|-----------------------------|-----------------|----------------------------------|
| 100 | Elmo Wesley House, Oshoto, Wyo. | 1428900 N. 559700 E. | 8-53 N.-67 W. | House/Elec. Pump | 185'-200' | Fox Hills (?) |
| * 101 | Oshoto Reservoir | 1426700 N. 556100 E. | 18-53 N.-67 W. | Reservoir | | Alluvium |
| * 102 | Harry Berger, Windmill | 1425000 N. 558500 E. | 17-53 N.-67 W. | Windmill/Pasture | 180'-200' | Fox Hills |
| 103 | Elmo Wesley, Windmill | 1428000 N. 557800 E. | 18-53 N.-67 W. | Windmill/Pasture | 130' | Fox Hills |
| * 104 | Grace Reynolds House Well | 1413500 N. 552600 E. | 25-53 N.-68 W. | House/Windmill | 285' | Lance (?) |
| 105 | Elmo Wesley Pasture Well | 1430500 N. 558000 E. | 7-53 N.-67 W. | Elec. Pump N.W. of House | 130' | Lance (?) |
| 106 | Ray Robinson House Well | 1422800 N. 559300 E. | 20-53 N.-67 W. | Elec. Pump(?) / House | | Fox Hills (?) |
| 108 | Elmo Wesley Well-Pasture | 1426200 N. 559900 E. | 17-53 N.-67 W. | Elec. Pump | ±200' | Fox Hills |
| * 109 | Harry Berger Well-Pasture | 1428400 N. 560000 E. | 18-53 N.-67 W. | Elec. Pump | Shallow Unknown | Fox Hills |
| * 110 | Oshoto Reservoir | 1426700 N. 556100 E. | 18-53 N.-67 W. | Reservoir at Dam | | Alluvium |
| 111 | Gene Berger Ranch | 1433700 N. 560400 E. | 8-53 N.-67 W. | Elec. Pump | Shallow Unknown | Fox Hills |
| 112 | Well in Pasture | 1433800 N. 559490 E. | 5-53 N.-67 W. | Elec. Pump | Shallow Unknown | Fox Hills |
| 113 | Well in Pasture | 1438500 N. 557700 E. | 6-53 N.-67 W. | Windmill | Shallow Unknown | Lance |
| 117 | Reynolds Windmill | 1419800 N. 553800 E. | 19-53 N.-67 W. | Windmill | Shallow Unknown | Lance |
| * 119 | Burch Ranch Well in Pasture | 1437200 N. 549900 E. | 1-53 N.-68 W. | Elec. Pump | ±100' | Lance |
| 120 | Burch Ranch Windmill-Pasture | 1435100 N. 552700 E. | 1-53 N.-68 W. | Windmill | ±100' | Lance |
| 122 | Jim Hahn Ranch House | 1425000 N. 545100 E. | 14-53 N.-68 W. | Elec. Pump/House | Shallow Unknown | Lance |
| 123 | Jim Hahn Windmill | 1425000 N. 545100 E. | 14-53 N.-68 W. | Windmill/Barn | Shallow Unknown | Lance |
| * 125 | Windmill | 1422470 N. 551090 E. | 24-53 N.-68 W. | Windmill | Shallow Unknown | Lance |
| 126 | Well in Pasture | 1417072 N. 557217 E. | 30-53 N.-67 W. | Elec. Pump | 120' | Lance |

Table 17

SAMPLING PLAN - PRIVATE WELLS

Displacement - Minimum 15 Minute Pump Period

↓
SAMPLE - Field Measure T°C
 - Lab Measure pH, Conductivity
 - Lab Millipore Filter



Monthly Assays

Na
 TDS
 U
 As
 Se
 Ra-226
 Conductivity
 pH
 HCO_3^-
 $CO_3^{=}$

Quarterly Assays

Monthly plus:
 NO_3/NO_2 as N
 NH_3 as N
 Ba
 Cd
 Cu
 Cr
 Gross α, β
 Fe
 Ag
 Pb
 Mn
 Hg
 Ni
 Zn
 Mo
 V
 Ca
 Mg
 Cl-
 K
 $SU_4^{=}$

TABLE OF ASSAYS

| Determination | Units | 101 | 102 | 109 | 110 | 104 | 119 | 125 |
|---------------------------|------------------|---------|----------|----------|----------|----------|----------|----------|
| Conductivity | (μ ahos/cm) | 436 | 3485 | 1743 | 634 | 1162 | 836 | 804 |
| Sodium | mg/l | 53 | 811 | 270 | 117 | 288 | 72 | 87 |
| TDS (180°C) | mg/l | 254 | 2580 | 1160 | 371 | 734 | 471 | 468 |
| Arsenic | mg/l | <0.003 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 |
| Selenium | mg/l | <0.005 | <0.005 | <0.005 | <0.005 | 0.019 | <0.005 | <0.005 |
| pH | — | 8.20 | 8.21 | 8.06 | 8.46 | 8.66 | 7.96 | 8.04 |
| Nitrate (as N) | mg/l | <0.05 | <0.05 | 0.29 | 0.06 | 0.20 | <0.05 | 0.06 |
| Nitrate (as N) | mg/l | <0.05 | <0.05 | 0.15 | <0.05 | <0.05 | <0.05 | <0.05 |
| Barium | mg/l | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 |
| Cadmium | mg/l | <0.005 | 0.006 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 |
| Chromium | mg/l | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 |
| Copper | mg/l | <0.01 | <0.01 | <0.01 | <0.01 | 0.01 | <0.01 | <0.01 |
| Iron | mg/l | 0.09 | 0.12 | 0.15 | 0.08 | 0.15 | 0.17 | 0.18 |
| Lead | mg/l | <0.05 | 0.07 | <0.05 | <0.05 | <0.05 | <0.05 | 0.07 |
| Manganese | mg/l | <0.002 | 0.03 | 0.07 | <0.002 | 0.007 | 0.18 | 0.01 |
| Mercury | mg/l | 0.0003 | <0.00002 | <0.00002 | <0.00002 | <0.00002 | <0.00002 | <0.00002 |
| Nickel | mg/l | 0.03 | 0.04 | 0.03 | <0.01 | 0.02 | 0.01 | 0.02 |
| Zinc | mg/l | 0.01 | 0.86 | 0.07 | 0.006 | 0.04 | 0.10 | 0.10 |
| Molybdenum | mg/l | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 |
| Calcium | mg/l | 38 | 33 | 66 | 21 | 3.1 | 79 | 72 |
| Magnesium | mg/l | 12 | 14 | 63 | 11 | 1.2 | 39 | 25 |
| Chloride | mg/l | 4.1 | 8.0 | 6.4 | 4.9 | 6.4 | <2 | 4.9 |
| Potassium | mg/l | 5.8 | 11 | 24 | 5.2 | 3.5 | 5.7 | 4.9 |
| Sulfate (as SO_4) | mg/l | 39 | 1190 | 470 | 43 | 156 | 76 | 68 |
| Carbonate (as CO_3) | mg/l | 0 | 0 | 0 | 4.5 | 0 | 0 | 0 |
| Bicarbonate (as HCO_3) | mg/l | 229 | 952 | 595 | 321 | 567 | 451 | 421 |
| Ammonia (as N) | mg/l | <0.1 | 0.43 | 0.18 | 0.15 | <0.1 | 0.20 | <0.1 |
| Silver | mg/l | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 |
| Uranium (as U) | mg/l | 0.005 | <0.002 | 0.003 | 0.003 | 0.010 | 0.004 | 0.033 |
| Re-226 | pCi/l | 0.2±0.4 | 0.1±0.3 | 0.2±0.4 | 0.0±0.3 | 0.0±0.3 | 0.2±0.4 | 0.0±0.3 |
| Gross α | pCi/l | 3.0±1.8 | 0.0±2.8 | 2.4±2.1 | 2.1±1.7 | 11.1±3.1 | 3.0±2.5 | 15±4 |
| Gross β | pCi/l | 27±10 | 0±24 | 8±17 | 29±10 | 21±13 | 17±10 | 0±10 |

ASSAY RESULTS - Private Wells #101, 102, 109, 110, 104, 119, 125

Sampled 4/4/78

TABLE 18

TABLE 19 ASSAYS

| Determination | Units | 101 | 102 | 109 | 110 | 104 | 119 | 125 |
|-----------------------------|------------------|---------|---------|---------|---------|---------|---------|---------|
| Conductivity | (μ mhos/cm) | 651 | 3703 | 1492 | 716 | 1167 | 741 | 767 |
| Sodium | mg/l | 73 | 876 | 196 | 137 | 255 | 32 | 81 |
| TDS (180°C) | mg/l | 413 | 2620 | 998 | 450 | 685 | 435 | 462 |
| Arsenic | mg/l | <0.002 | 0.006 | 0.010 | 0.011 | 0.008 | <0.002 | 0.002 |
| Selenium | mg/l | <0.005 | 0.008 | <0.005 | <0.005 | 0.029 | <0.005 | <0.005 |
| pH | — | 8.50 | 8.30 | 8.02 | 8.60 | 8.84 | 7.99 | 8.20 |
| Nitrate (as N) | mg/l | | | | | | | |
| Nitrate (as N) | mg/l | | | | | | | |
| Barium | mg/l | | | | | | | |
| Cadmium | mg/l | | | | | | | |
| Chromium | mg/l | | | | | | | |
| Copper | mg/l | | | | | | | |
| Iron | mg/l | | | | | | | |
| Lead | mg/l | | | | | | | |
| Manganese | mg/l | | | | | | | |
| Mercury | mg/l | | | | | | | |
| Nickel | mg/l | | | | | | | |
| Zinc | mg/l | | | | | | | |
| Molybdenum | mg/l | | | | | | | |
| Calcium | mg/l | | | | | | | |
| Magnesium | mg/l | | | | | | | |
| Chloride | mg/l | | | | | | | |
| Potassium | mg/l | | | | | | | |
| Sulfate (as SO_4^{2-}) | mg/l | | | | | | | |
| Carbonate (as CO_3^{2-}) | mg/l | 6 | 0 | 0 | 6 | 23 | 0 | 0 |
| Bicarbonate (as HCO_3^-) | mg/l | 303 | 986 | 541 | 416 | 525 | 449 | 537 |
| Ammonia (as N) | mg/l | | | | | | | |
| Silver | mg/l | | | | | | | |
| Uranium (as U) | mg/l | 0.010 | 0.003 | 0.011 | 0.006 | 0.010 | <0.002 | 0.029 |
| Ra-226 | pCi/l | 0.1±0.2 | 0.1±0.3 | 0.4±0.4 | 0.1±0.3 | 0.7±0.9 | 0.0±0.2 | 0.1±0.3 |
| Gross α | pCi/l | — | | | | | | |
| Gross β | pCi/l | — | | | | | | |

ASSAY RESULTS - Private Wells #101, 102, 109, 110, 104, 119, 125 Sampled 5/12/78

TABLE 19

TABLE OF ASSAYS

| Determination | Units | 101 | 102 | 109 | 110 | 104 | 119 | 125 |
|-----------------------------|------------------|---------|---------|---------|---------|---------|---------|---------|
| Conductivity | (μ mhos/cm) | 744 | 4023 | 1660 | 678 | 1364 | 818 | 742 |
| Sodium | mg/l | 162 | 1090 | 239 | 121 | 384 | 33 | 117 |
| TDS (180°C) | mg/l | 428 | 2840 | 1040 | 371 | 810 | 443 | 441 |
| Arsenic | mg/l | 0.016 | 0.012 | 0.006 | 0.011 | 0.021 | 0.007 | 0.004 |
| Selenium | mg/l | <0.005 | 0.006 | <0.005 | <0.005 | 0.010 | <0.005 | <0.005 |
| pH - | — | 9.28 | 8.10 | 7.82 | 9.30 | 8.68 | 7.94 | 8.23 |
| Nitrate (as N) | mg/l | — | — | — | — | — | — | — |
| Nitrate (as N) | mg/l | — | — | — | — | — | — | — |
| Barium | mg/l | — | — | — | — | — | — | — |
| Cadmium | mg/l | — | — | — | — | — | — | — |
| Chromium | mg/l | — | — | — | — | — | — | — |
| Copper | mg/l | — | — | — | — | — | — | — |
| Iron | mg/l | — | — | — | — | — | — | — |
| Lead | mg/l | — | — | — | — | — | — | — |
| Manganese | mg/l | — | — | — | — | — | — | — |
| Mercury | mg/l | — | — | — | — | — | — | — |
| Nickel | mg/l | — | — | — | — | — | — | — |
| Zinc | mg/l | — | — | — | — | — | — | — |
| Molybdenum | mg/l | — | — | — | — | — | — | — |
| Calcium | mg/l | — | — | — | — | — | — | — |
| Magnesium | mg/l | — | — | — | — | — | — | — |
| Chloride | mg/l | — | — | — | — | — | — | — |
| Potassium | mg/l | — | — | — | — | — | — | — |
| Sulfate (as SO_4^{2-}) | mg/l | — | — | — | — | — | — | — |
| Carbonate (as CO_3^{2-}) | mg/l | 37 | 0 | 0 | 48 | 23 | 0 | 0 |
| Bicarbonate (as HCO_3^-) | mg/l | 234 | 986 | 529 | 363 | 580 | 438 | 10 |
| Ammonia (as N) | mg/l | — | — | — | — | — | — | — |
| Silver | mg/l | — | — | — | — | — | — | — |
| Uranium (as U) | mg/l | 0.006 | 0.006 | 0.012 | 0.009 | 0.002 | <0.002 | <0.002 |
| Ra-226 | pCi/l | 0.1±0.1 | 0.3±0.4 | 0.3±0.3 | 0.6±0.4 | 0.6±0.4 | 0.2±0.2 | 0.3±0.3 |
| Gross α | pCi/l | — | — | — | — | — | — | — |
| Gross β | pCi/l | — | — | — | — | — | — | — |

ASSAY RESULTS - Private Wells #101, 102, 109, 110, 104, 119, 125 Sampled 6/14/78

TABLE 20

APPENDIX
WATER QUALITY PROGRAM
BASELINE-MONITOR-RESTORATION

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Section II. Comparison Graphs - TDS vs Conductivity

Page No.

Well - Sampled:

789V

5/12/78

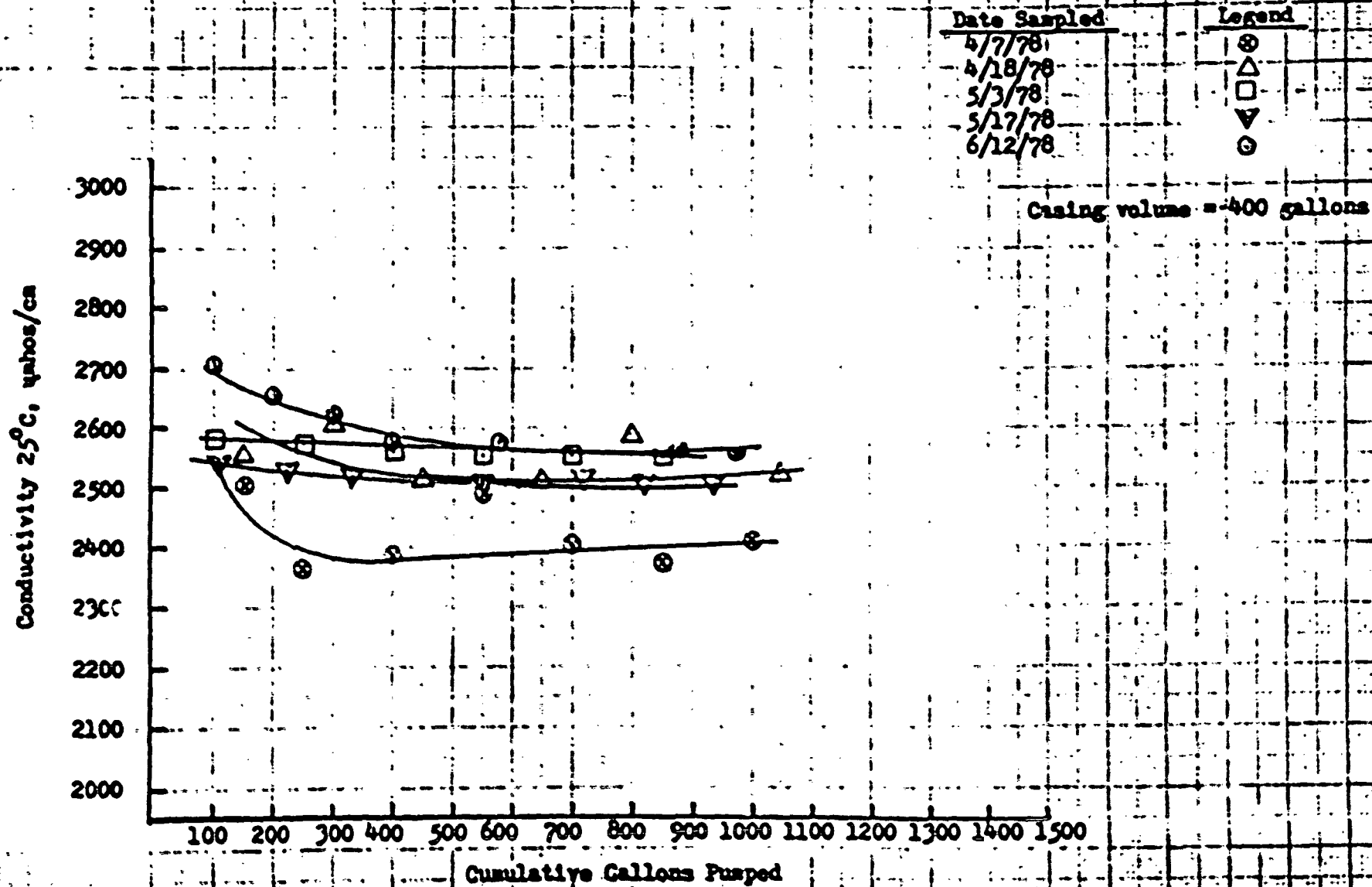
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5/26/78

6/13/78

WELL 3X - EAST BUFFER WELL

CONDUCTIVITY VS CUMULATIVE GALLONS PUMPED



WELL 3X - EAST BUFFER WELL
TABLE OF FIELD MEASUREMENTS

Date Sampled: 4/7/78
Casing ID: 5 inches
Well Depth: 541 feet
Water Level: 162 feet
Casing Volume: 387 gallons
Pump Depth: 265 feet

| Time Minutes | Flow GPM | Cumulative Gallons | Temp °C | Conductivity 25°C | pH | Remarks |
|-----------------|-------------|-----------------------|------------|----------------------|------|------------|
| 30 | 5.0 ↓ | 150 | 11.1 | 2504 | 9.40 | |
| 50 | | 250 | 11.1 | 2364 | 9.47 | |
| 80 | | 400 | 11.5 | 2386 | 9.20 | |
| 110 | | 550 | 11.3 | 2490 | 9.00 | Sample (1) |
| 140 | | 700 | 11.3 | 2406 | 8.98 | |
| 170 | | 850 | 11.1 | 2379 | 8.92 | |
| 200 | | 1000 | 11.0 | 2412 | 8.91 | Sample (2) |

NOTES: Sample (1) @ 1.42 casing volumes pumped.
Sample (2) @ 2.58 casing volumes pumped.

WELL 3X - EAST BUFFER WELL
TABLE OF FIELD MEASUREMENTS

Date Sampled: 4/18/78
Casing ID: 5 inches
Well Depth: 541 feet
Water Level: 162 feet
Casing Volume: 387 gallons
Pump Depth: 265 feet

| Time Minutes | Flow GPM | Cumulative Gallons | Temp °C | Conductivity G @ 25°C | pH | Remarks |
|-----------------|-------------|-----------------------|------------|--------------------------|------|------------|
| 30 | 5.0 ↓ | 150 | 9.9 | 2557 | 9.30 | |
| 60 | | 300 | 10.2 | 2608 | 9.10 | |
| 90 | | 450 | 10.5 | 2528 | 9.05 | |
| 130 | | 650 | 10.5 | 2528 | 8.90 | Sample (1) |
| 160 | | 800 | 10.5 | 2586 | 8.90 | |
| 210 | | 1050 | 10.5 | 2528 | 8.90 | Sample (2) |

NOTES: Sample (1) @ 1.7 casing volumes pumped.
Sample (2) @ 2.7 casing volumes pumped.

WELL 3X - EAST BUFFER WELL
TABLE OF FIELD MEASUREMENTS

Date Sampled: 5/3/78
Casing ID: 5 inches
Well Depth: 541 feet
Water Level: 149 feet
Casing Volume: 400 gallons
Pump Depth: 230 feet

| Time Minutes | Flow GPM | Cumulative Gallons | Temp °C | Conductivity G @ 25°C | pH | Remarks |
|-----------------|-------------|-----------------------|------------|--------------------------|------|-------------------|
| 20 | 5.0 ↓ | 100 | 10.0 | 2583 | 9.05 | |
| 50 | | 250 | 10.5 | 2575 | 8.85 | |
| 80 | | 400 | 10.9 | 2560 | 8.80 | Effluent Cloudy |
| 110 | | 550 | 11.0 | 2553 | 8.75 | |
| 120 | | 600 | -- | -- | -- | Sample (1) |
| 140 | | 700 | 11.0 | 2553 | 8.70 | Effluent Clearing |
| 170 | | 850 | 11.0 | 2553 | 8.70 | |
| 180 | | 900 | -- | -- | -- | Sample (2) |

NOTES: Sample (1) @ 1.5 casing volumes pumped.
Sample (2) @ 2.25 casing volumes pumped.

WELL 3X - EAST BUFFER WELL
TABLE OF FIELD MEASUREMENTS

Date Sampled: 5/17/78
Casing ID: 5 inches
Well Depth: 541 feet
Water Level: 149 feet
Casing Volume: 400 gallons
Pump Depth: 230 feet

| Time Minutes | Flow GPM | Cumulative Gallons | Temp °C | Conductivity G @ 25°C | pH | Remarks |
|-----------------|-------------|-----------------------|------------|--------------------------|------|------------|
| 20 | 5.5 ↓ | 110 | 10.0 | 2547 | 9.10 | |
| 40 | | 220 | 10.2 | 2538 | 8.99 | |
| 60 | | 330 | 10.5 | 2524 | 8.99 | |
| 80 | | 440 | 10.7 | 2517 | 8.82 | |
| 100 | | 550 | 10.7 | 2517 | 8.70 | |
| 120 | | 660 | -- | -- | -- | Sample (1) |
| 130 | | 715 | 10.8 | 2510 | 8.65 | |
| 150 | | 825 | 10.8 | 2503 | 8.63 | |
| 170 | | 935 | 10.8 | 2510 | 8.64 | Sample (2) |

NOTES: Sample (1) @ 1.65 casing volumes pumped.
Sample (2) @ 2.34 casing volumes pumped.

WELL 3X - EAST BUFFER WELL
TABLE OF FIELD MEASUREMENTS

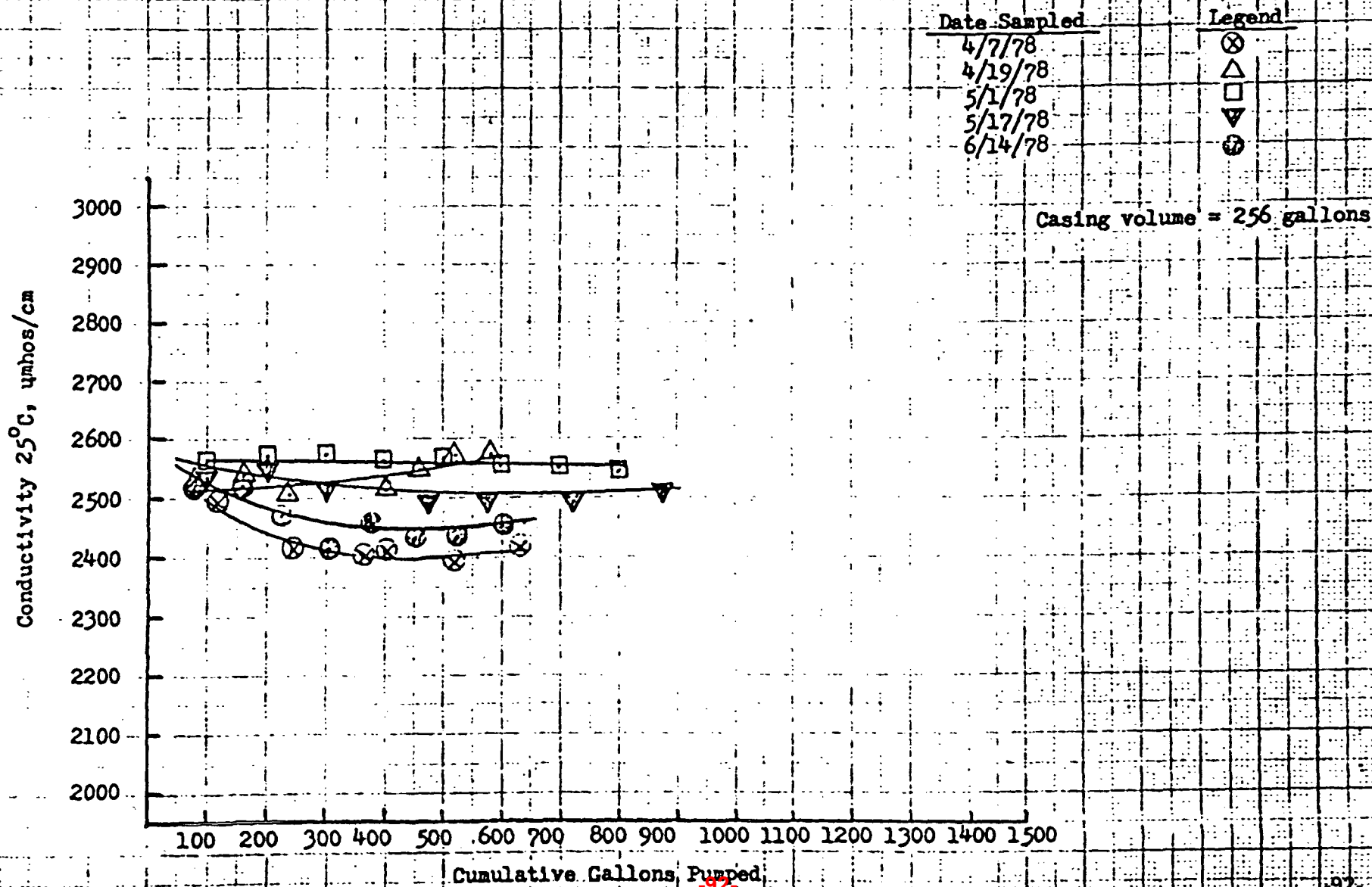
Date Sampled: 6/12/78
Casing ID: 5 inches
Well Depth: 541 feet
Water Level: 148 feet
Casing Volume: 400 gallons
Pump Depth: 230 feet

| Time Minutes | Flow GPM | Cumulative Gallons | Temp °C | Conductivity G @ 25°C | pH | Remarks |
|-----------------|-------------|-----------------------|------------|--------------------------|------|------------|
| 20 | 5.0 ↓ | 100 | 11.2 | 2712 | 9.25 | Clear |
| 40 | | 200 | 11.6 | 2656 | 9.15 | |
| 60 | | 300 | 11.8 | 2628 | 9.05 | |
| 80 | | 400 | 12.1 | 2580 | 8.60 | |
| 100 | | 500 | 12.2 | 2570 | 8.70 | |
| 120 | | 600 | -- | -- | -- | Sample (1) |
| 135 | | 675 | 12.2 | 2573 | 8.60 | |
| 155 | | 775 | 12.2 | 2573 | 8.58 | Clear |
| 175 | | 875 | 12.3 | 2566 | 8.55 | |
| 195 | | 975 | 12.3 | 2566 | 8.50 | |
| 210 | | 1050 | -- | -- | -- | Sample (2) |

NOTES: Sample (1) @ 1.50 casing volumes pumped.
Sample (2) @ 2.34 casing volumes pumped.

WELL 4X — WEST BUFFER WELL

CONDUCTIVITY VS CUMULATIVE GALLONS PUMPED



WELL 4X - WEST BUFFER WELL
TABLE OF FIELD MEASUREMENTS

Date Sampled: 4/7/78
Casing ID: 4 inches
Well Depth: 533 feet
Water Level: 140 feet
Casing Volume: 256 gallons
Pump Depth: 220 feet

| Time Minutes | Flow GPM | Cumulative Gallons | Temp °C | Conductivity G @ 25°C | pH | Remarks |
|-----------------|-------------|-----------------------|------------|--------------------------|------|------------|
| 25 | 4.6 | 115 | 9.6 | 2496 | -- | |
| 50 | 5.0 | 240 | 11.0 | 2413 | 9.42 | |
| 60 | 4.0 | 280 | -- | -- | -- | |
| 80 | ↓ | 360 | 11.1 | 2406 | 9.18 | |
| 90 | | 400 | 11.0 | 2413 | 9.00 | Sample (1) |
| 120 | | 520 | 11.0 | 2399 | 9.00 | |
| 150 | | 630 | 11.0 | 2420 | 9.00 | Sample (2) |

NOTES: Sample (1) @ 1.56 casing volumes pumped.
Sample (2) @ 2.46 casing volumes pumped.

WELL 4X - WEST BUFFER WELL
TABLE OF FIELD MEASUREMENTS

Date Sampled: 4/19/78
Casing ID: 4 inches
Well Depth: 533 feet
Water Level: 140 feet
Casing Volume: 256 gallons
Pump Depth: 265 feet

| Time Minutes | Flow GPM | Cumulative Gallons | Temp °C | Conductivity G @ 25°C | pH | Remarks |
|-----------------|-------------|-----------------------|------------|--------------------------|------|------------|
| 20 | 4.0 ↓ | 80 | 11.0 | 2536 | 9.30 | |
| 40 | | 160 | 11.5 | 2543 | 9.60 | |
| 60 | | 240 | 11.5 | 2501 | 9.65 | |
| 80 | | 320 | -- | -- | -- | |
| 100 | | 400 | 11.5 | 2515 | 9.50 | Sample (1) |
| 115 | | 460 | 11.2 | 2550 | 9.20 | |
| 130 | | 520 | 10.9 | 2571 | 9.10 | |
| 145 | | 580 | 10.8 | 2578 | 9.05 | Sample (2) |

NOTES: Sample (1) @ 1.56 casing volumes pumped.
Sample (2) @ 2.26 casing volumes pumped.

WELL 4X - WEST BUFFER WELL
TABLE OF FIELD MEASUREMENTS

Date Sampled: 5/1/78
Casing ID: 4 inches
Well Depth: 533 feet
Water Level: 141 feet
Casing Volume: 256 gallons
Pump Depth: 230 feet

| Time Minutes | Flow GPM | Cumulative Gallons | Temp °C | Conductivity G @ 25°C | pH | Remarks |
|-----------------|-------------|-----------------------|------------|--------------------------|------|------------|
| 20 | 5.0 ↓ | 100 | 10.5 | 2560 | 9.15 | |
| 40 | | 200 | 10.9 | 2574 | 9.45 | |
| 60 | | 300 | | 2574 | 9.40 | |
| 80 | | 400 | | 2560 | 9.10 | |
| 90 | | 450 | | -- | -- | Sample (1) |
| 100 | | 500 | | 2560 | 8.90 | |
| 120 | | 600 | | 2553 | 8.90 | |
| 140 | | 700 | | 2553 | 8.75 | |
| 160 | | 800 | | 2546 | 8.85 | |
| 175 | | 875 | | -- | -- | Sample (2) |

NOTES: Sample (1) @ 1.75 casing volumes pumped.
Sample (2) @ 3.4 casing volumes pumped.

WELL 4X - WEST BUFFER WELL
TABLE OF FIELD MEASUREMENTS

Date Sampled: 5/17/78
Casing ID: 4 inches
Well Depth: 533 feet
Water Level: 141 feet
Casing Volume: 256 gallons
Pump Depth: 230 feet

| Time Minutes | Flow GPM | Cumulative Gallons | Temp °C | Conductivity G @ 25°C | pH | Remarks |
|-----------------|-------------|-----------------------|------------|--------------------------|------|------------|
| 20 | 5.0 ↓ | 100 | 10.7 | 2537 | 9.38 | |
| 40 | | 200 | 11.0 | 2544 | 9.61 | |
| 60 | | 300 | 11.0 | 2509 | 9.17 | |
| 80 | | 400 | -- | -- | -- | Sample (1) |
| 95 | | 475 | 11.1 | 2495 | 8.90 | |
| 115 | | 575 | 11.0 | 2496 | 8.85 | |
| 145 | | 725 | 11.0 | 2496 | 8.82 | |
| 175 | | 875 | 11.2 | 2503 | 8.80 | Sample (2) |

NOTES: Sample (1) @ 1.56 casing volumes pumped.
Sample (2) @ 3.4 casing volumes pumped.

WELL 4X - WEST BUFFER WELL
TABLE OF FIELD MEASUREMENTS

Date Sampled: 6/14/78
Casing ID: 4 inches
Well Depth: 533 feet
Water Level: 142 feet
Casing Volume: 256 gallons
Pump Depth: 230 feet

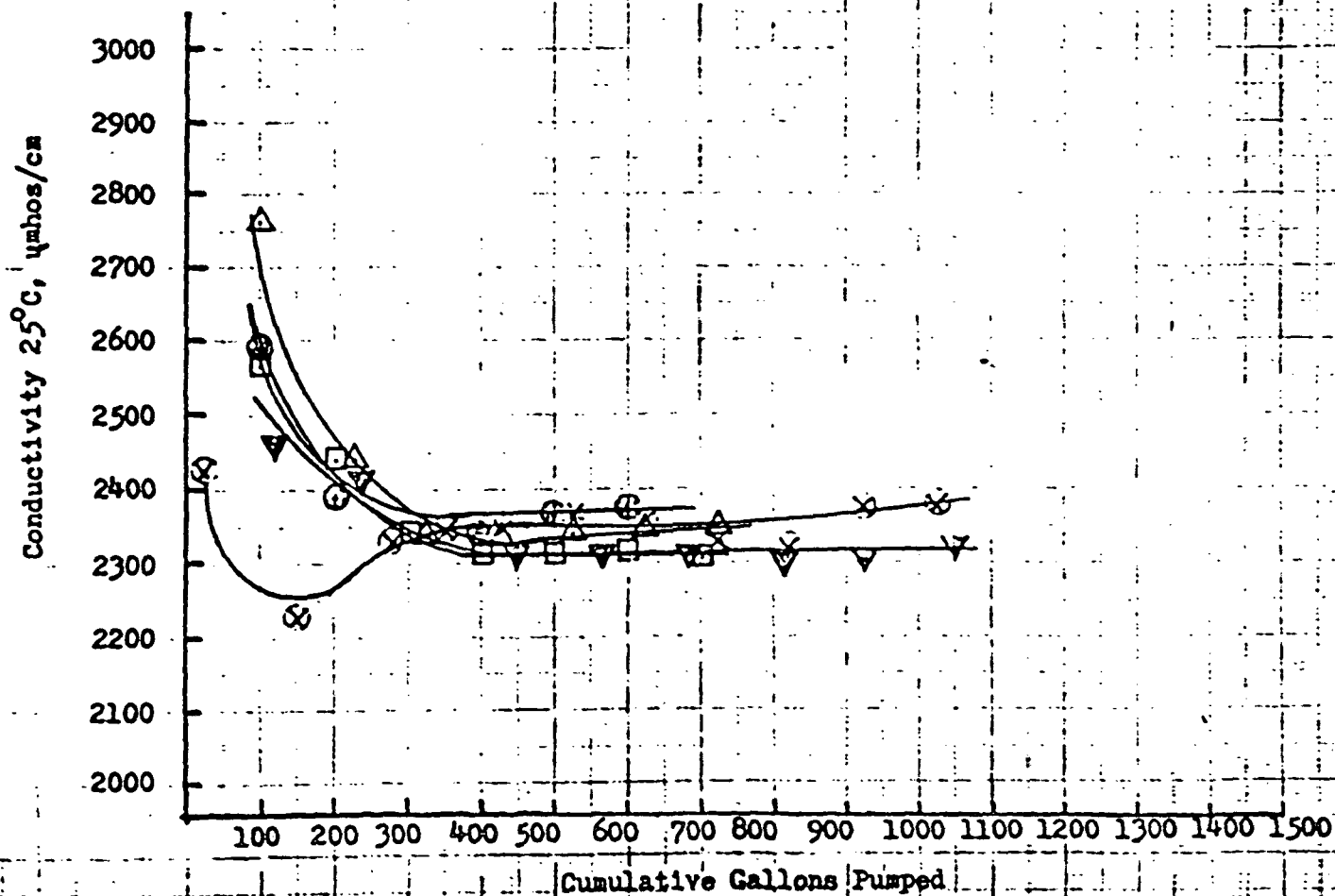
| Time Minutes | Flow GPM | Cumulative Gallons | Temp °C | Conductivity G @ 25°C | pH | Remarks |
|-----------------|-------------|-----------------------|------------|--------------------------|------|------------|
| 20 | 3.75 ↓ | 75 | 12.7 | 2522 | 9.49 | Clear |
| 40 | | 150 | 12.9 | 2529 | 9.65 | |
| 60 | | 225 | 13.0 | 2470 | 9.68 | |
| 80 | | 300 | 13.0 | 2405 | 9.30 | |
| 100 | | 375 | 13.0 | 2457 | 9.10 | |
| 110 | | 410 | -- | -- | -- | Sample (1) |
| 120 | | 450 | 13.5 | 2438 | 8.97 | |
| 140 | | 525 | 13.4 | 2438 | 8.90 | Clear |
| 160 | | 600 | 13.3 | 2450 | 8.89 | |
| 180 | | 675 | -- | -- | -- | Sample (2) |

NOTES: Sample (1) @ 1.59 casing volumes pumped.
Sample (2) @ 2.63 casing volumes pumped.

WELL 5X - NORTHWEST MONITOR WELL
CONDUCTIVITY VS CUMULATIVE GALLONS PUMPED

| Date Sampled | Legend |
|--------------|--------|
| 4/6/78 | ⊗ |
| 4/20/78 | △ |
| 5/2/78 | □ |
| 5/18/78 | ▽ |
| 6/14/78 | ⊕ |

Casing volume = 267 gallons



WELL 5X - NORTHWEST MONITOR WELL
TABLE OF FIELD MEASUREMENTS

Date Sampled: 4/6/78
 Casing ID: 4 inch
 Well Depth: 552 feet
 Water Level: 142 feet
 Casing Volume: 267 gallons
 Pump Depth: 220 feet

| Time Minutes | Flow GPM | Cumulative Gallons | Temp °C | Conductivity G @ 25°C | pH | Remarks |
|-----------------|-------------|-----------------------|------------|--------------------------|------|-----------------|
| 5 | 5.0 | 25 | 12.5 | 2424 | 10.0 | |
| 30 | | 150 | 11.8 | 2223 | -- | |
| 55 | | 275 | 12.0 | 2320 | 9.50 | Effluent Cloudy |
| 70 | | 350 | 12.1 | 2341 | -- | |
| 85 | | 425 | 12.0 | 2348 | 9.30 | Sample (1) |
| 105 | | 525 | 12.0 | 2375 | 9.25 | |
| 125 | | 625 | 12.1 | 2355 | -- | |
| 145 | | 725 | 12.0 | 2327 | 9.05 | |
| 165 | | 825 | 12.0 | 2324 | 9.03 | |
| 185 | | 925 | 12.0 | 2375 | 9.00 | Effluent Cloudy |
| 205 | | 1025 | 12.0 | 2375 | 9.00 | Sample (2) |

NOTES: Sample (1) @ 1.6 casing volumes pumped.
 Sample (2) @ 3.8 casing volumes pumped.
 Sample (1) pH measured by CDM Accu Labs = 9.20

WELL 5X - NORTHWEST MONITOR WELL

TABLE OF FIELD MEASUREMENTS

Date Sampled: 4/20/78
Casing ID: 4 inch
Well Depth: 552 feet
Water Level: 142 feet
Casing Volume: 267 gallons
Pump Depth: 265 feet

| Time Minutes | Flow GPM | Cumulative Gallons | Temp °C | Conductivity G @ 25°C | pH | Remarks |
|-----------------|-------------|-----------------------|------------|--------------------------|-------|-----------------|
| 20 | 5.0 ↓ | 100 | 10.0 | 2761 | 10.35 | |
| 45 | | 225 | 10.5 | 2442 | 9.55 | Cloudy Effluent |
| 65 | | 325 | 10.5 | 2342 | 9.38 | |
| 85 | | 425 | 10.5 | 2342 | 9.30 | |
| 105 | | 525 | 10.8 | 2342 | 9.25 | Clearing |
| 120 | | 600 | -- | -- | -- | Sample (1) |
| 125 | | 625 | 10.8 | 2350 | 9.25 | |
| 145 | | 725 | 10.8 | 2350 | 9.20 | Clear Effluent |
| 160 | | 800 | -- | -- | -- | Sample (2) |

NOTES: Sample (1) @ 2.2 casing volumes pumped.
Sample (2) @ 3.0 casing volumes pumped.

WELL 5X - NORTHWEST MONITOR WELLTABLE OF FIELD MEASUREMENTS

Date Sampled: 5/2/78
Casing ID: 4 inches
Well Depth: 552 feet
Water Level: 143 feet
Casing Volume: 267 gallons
Pump Depth: 230 feet

| Time Minutes | Flow GPM | Cumulative Gallons | Temp °C | Conductivity G @ 25°C | pH | Remarks |
|-----------------|-------------|-----------------------|------------|--------------------------|------|-----------------|
| 20 | 5.0 ↓ | 100 | 10.9 | 2567 | 9.95 | |
| 40 | | 200 | 11.0 | 2441 | 9.55 | Slightly Cloudy |
| 60 | | 300 | 11.2 | 2344 | 9.35 | |
| 80 | | 400 | 11.2 | 2316 | 9.30 | |
| 90 | | 450 | -- | -- | -- | Sample (1) |
| 100 | | 500 | 11.2 | 2316 | 9.30 | |
| 120 | | 600 | 11.2 | 2316 | 9.25 | |
| 140 | | 700 | 11.3 | 2309 | 9.20 | |
| 150 | | 750 | -- | -- | -- | Sample (2) |

NOTES: Sample (1) @ 1.68 casing volumes pumped.
Sample (2) @ 2.80 casing volumes pumped.

WELL 5X - NORTHWEST MONITOR WELL

TABLE OF FIELD MEASUREMENTS

Date Sampled: 5/18/78
Casing ID: 4 inches
Well Depth: 552 feet
Water Level: 142 feet
Casing Volume: 268 gallons
Pump Depth: 230 feet

| Time Minutes | Flow GPM | Cumulative Gallons | Temp °C | Conductivity G @ 25°C | pH | Remarks |
|-----------------|-------------|-----------------------|------------|--------------------------|------|-----------------|
| 20 | 6.0 | 120 | 10.4 | 2454 | 10.0 | Clear |
| 40 | ↓ | 240 | 10.8 | 2406 | 9.56 | Slightly Cloudy |
| 60 | ↓ | 360 | 10.9 | 2344 | 9.39 | Cloudy |
| 70 | 3.0 | 390 | -- | -- | -- | Sample (1) |
| 90 | 3.0 | 450 | 11.0 | 2310 | 9.25 | |
| 110 | 6.0 | 570 | 11.0 | 2310 | 9.29 | Cloudy |
| 130 | ↓ | 690 | 11.0 | 2303 | 9.25 | " |
| 150 | ↓ | 810 | 11.0 | 2296 | 9.20 | " |
| 170 | ↓ | 930 | 11.0 | 2303 | 9.15 | Clearing |
| 190 | ↓ | 1050 | 11.0 | 2324 | 9.15 | Sample (2) |

NOTES: Sample (1) @ 1.46 casing volumes pumped.
Sample (2) @ 3.9 casing volumes pumped.

WELL 5X - NORTHWEST MONITOR WELL

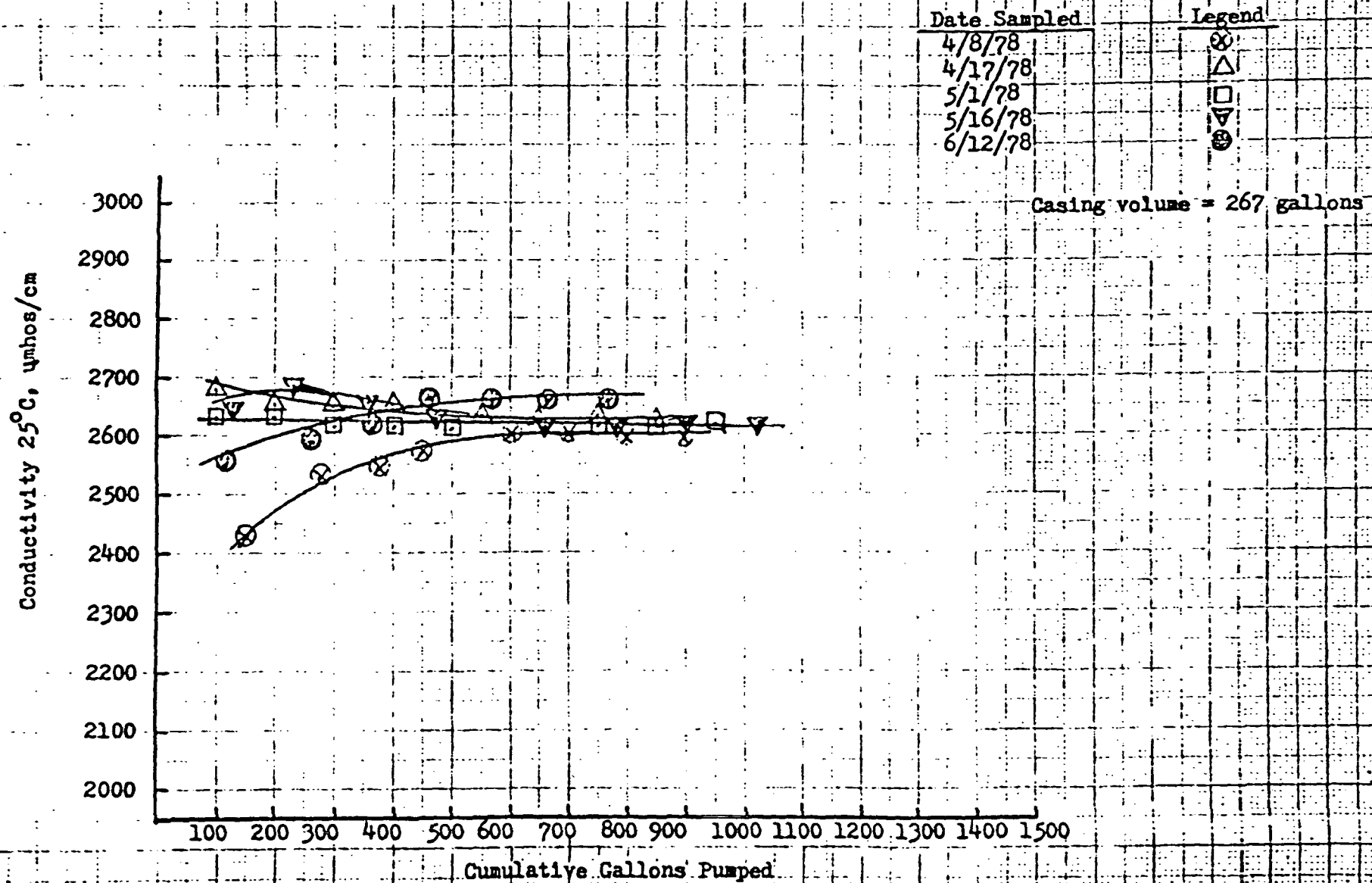
TABLE OF FIELD MEASUREMENTS

Date Sampled: 6/14/78
Casing ID: 4 inches
Well Depth: 552 feet
Water Level: 142 feet
Casing Volume: 268 gallons
Pump Depth: 230 feet

| Time Minutes | Flow GPM | Cumulative Gallons | Temp °C | Conductivity G @ 25°C | pH | Remarks |
|-----------------|-------------|-----------------------|------------|--------------------------|------|------------|
| 20 | 5.0 ↓ | 100 | 12.1 | 2583 | 10.0 | Clear |
| 40 | | 200 | 12.3 | 2397 | 9.60 | |
| 60 | | 300 | 12.5 | 2344 | 9.30 | |
| 80 | | 400 | 12.9 | 2333 | 9.15 | |
| 90 | | 450 | -- | -- | -- | Sample (1) |
| 100 | | 500 | 13.1 | 2360 | 9.10 | |
| 120 | | 600 | 13.3 | 2373 | 9.05 | |
| 140 | | 700 | -- | -- | -- | Sample (2) |

NOTES: Sample (1) @ 1.68 casing volumes pumped.
Sample (2) @ 2.6 casing volumes pumped.

WELL 6X - SOUTHWEST MONITOR WELL
CONDUCTIVITY VS CUMULATIVE GALLONS PUMPED



WELL 6X - SOUTHWEST MONITOR WELL

TABLE OF FIELD MEASUREMENTS

Date Sampled: 4/8/78
Casing ID: 4 inch
Well Depth: 550 feet
Water Level: 141 feet
Casing Volume: 267 gallons
Pump Depth: 265 feet

| Time Minutes | Flow GPM | Cumulative Gallons | Temp °C | Conductivity G @ 25°C | pH | Remarks |
|-----------------|-------------|-----------------------|------------|--------------------------|------|------------|
| 30 | 5.0 ↓ | 150 | 12.0 | 2429 | -- | |
| 55 | | 275 | 11.7 | 2532 | 9.20 | |
| 75 | | 375 | 11.9 | 2546 | 9.05 | |
| 90 | | 450 | 11.9 | 2573 | 9.00 | Sample (1) |
| 120 | | 600 | 11.9 | 2600 | 8.93 | |
| 140 | | 700 | 11.9 | 2600 | 8.90 | |
| 160 | | 800 | 12.0 | 2593 | 8.90 | |
| 180 | | 900 | 12.0 | 2593 | 8.90 | Sample (2) |

NOTES: Sample (1) @ 1.68 casing volumes pumped.
Sample (2) @ 3.37 casing volumes pumped.

WELL 6X - SOUTHWEST MONITOR WELL
TABLE OF FIELD MEASUREMENTS

Date Sampled: 4/17/78
 Casing ID: 4 inches
 Well Depth: 550 feet
 Water Level: 141 feet
 Casing Volume: 267 gallons
 Pump Depth: 265 feet

| Time Minutes | Flow GPM | Cumulative Gallons | Temp °C | Conductivity G @ 25°C | pH | Remarks |
|-----------------|-------------|-----------------------|------------|--------------------------|------|----------------|
| 20 | 5.0 | 100 | 10.2 | 2680 | 9.08 | |
| 40 | ↓ | 200 | 10.5 | 2658 | 9.35 | Dirty Effluent |
| 60 | | 300 | 10.5 | 2658 | 9.05 | Clearing |
| 80 | | 400 | 10.5 | 2658 | 9.00 | " |
| 110 | | 550 | 10.8 | 2635 | 8.95 | Sample (1) |
| 130 | | 650 | 10.9 | 2628 | 8.95 | |
| 150 | | 750 | 10.8 | 2635 | 8.85 | Clean Effluent |
| 170 | | 850 | 10.9 | 2628 | 8.90 | Sample (2) |

NOTES: Sample (1) @ 2.05 casing volumes pumped.
 Sample (2) @ 3.2 casing volumes pumped.

WELL 6X - SOUTHWEST MONITOR WELL
TABLE OF FIELD MEASUREMENTS

Date Sampled: 5/1/78
 Casing ID: 4 inches
 Well Depth: 550 feet
 Water Level: 140 feet
 Casing Volume: 267 gallons
 Pump Depth: 230 feet

| Time Minutes | Flow GPM | Cumulative Gallons | Temp °C | Conductivity G @ 25°C | pH | Remarks |
|-----------------|-------------|-----------------------|------------|--------------------------|------|----------------|
| 20 | 5.0 | 100 | 11.0 | 2637 | 8.80 | |
| 40 | ↓ | 200 | 11.2 | 2637 | -- | Muddy Effluent |
| 60 | | 300 | 11.3 | 2615 | 8.85 | |
| 80 | | 400 | 11.3 | 2615 | 8.70 | |
| 100 | | 500 | 11.3 | 2615 | ↓ | Clean Effluent |
| 120 | | 600 | 11.3 | 2608 | | Sample (1) |
| 150 | | 750 | 11.2 | 2617 | | |
| 170 | | 850 | 11.2 | 2617 | | |
| 190 | | 950 | 11.1 | 2623 | | Sample (2) |

NOTES: Sample (1) @ 2.2 casing volumes pumped.
 Sample (2) @ 3.6 casing volumes pumped.

WELL 6X - SOUTHWEST MONITOR WELLTABLE OF FIELD MEASUREMENTS

Date Sampled: 5/16/78
Casing ID: 4 inches
Well Depth: 550 feet
Water Level: 140 feet
Casing Volume: 268 gallons
Pump Depth: 230 feet

| Time Minutes | Flow GPM | Cumulative Gallons | Temp °C | Conductivity G @ 25°C | pH | Remarks |
|-----------------|-------------|-----------------------|------------|--------------------------|------|-----------------|
| 20 | 6.0 ↓ | 120 | 11.0 | 2633 | 9.15 | Clear |
| 40 | | 240 | 11.2 | 2680 | 9.10 | |
| 60 | | 360 | 11.1 | 2659 | 8.74 | |
| 80 | | 480 | 11.3 | 2625 | 8.70 | Slightly Cloudy |
| 90 | | 540 | -- | -- | -- | Sample (1) |
| 110 | | 660 | 11.2 | 2613 | 8.68 | |
| 130 | | 780 | 11.2 | 2619 | 8.68 | Clearing |
| 150 | | 900 | 11.2 | 2619 | 8.68 | |
| 170 | | 1020 | 11.2 | 2619 | 8.64 | Clear |
| 185 | | 1110 | -- | -- | -- | Sample (2) |

NOTES: Sample (1) @ 2.0 casing volumes pumped.
Sample (2) @ 4.1 casing volumes pumped. ..

WELL 6X - SOUTHWEST MONITOR WELL

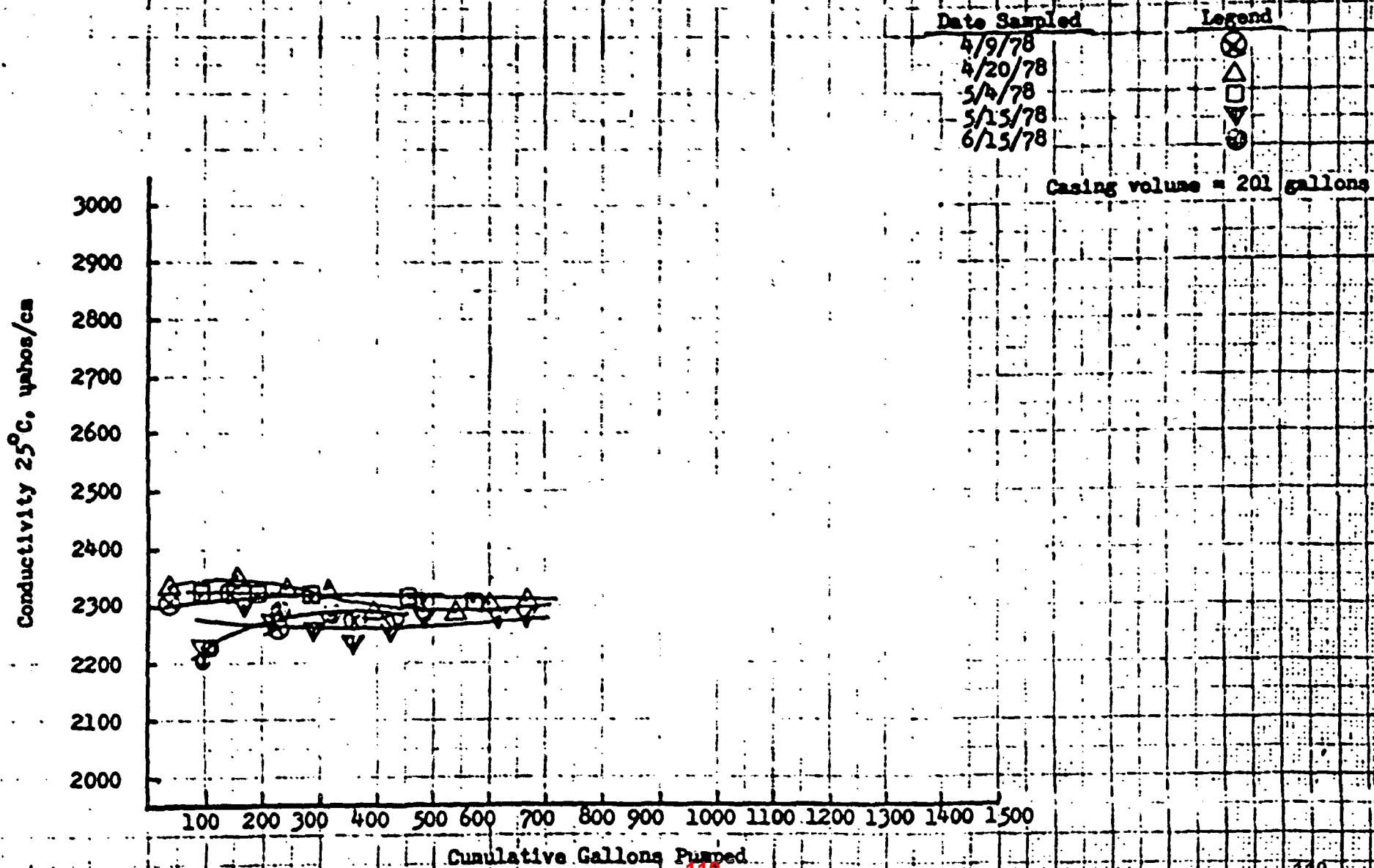
TABLE OF FIELD MEASUREMENTS

Date Sampled: 6/12/78
Casing ID: 4 inches
Well Depth: 550 feet
Water Level: 139.3 feet
Casing Volume: 268 gallons
Pump Depth: 230 feet

| Time Minutes | Flow GPM | Cumulative Gallons | Temp °C | Conductivity G @ 25°C | pH | Remarks |
|-----------------|-------------|-----------------------|------------|--------------------------|------|------------|
| 20 | 6.0 | 120 | 11.0 | 2555 | 9.16 | Clear |
| 40 | 6.0 | 240 | -- | -- | -- | Cloudy |
| 55 | 5.0 | 265 | 11.3 | 2595 | 8.94 | Clearing |
| 75 | ↓ | 365 | 11.8 | 2618 | 8.70 | |
| 95 | | 405 | -- | -- | -- | Sample (1) |
| 108 | | 465 | 11.9 | 2662 | 8.67 | |
| 115 | | 565 | 11.9 | 2662 | 8.63 | Clear |
| 135 | | 665 | 11.9 | 2662 | 8.61 | |
| 155 | | 765 | 11.9 | 2662 | 8.59 | |
| 165 | | 815 | -- | -- | -- | Sample (2) |

NOTES: Sample (1) @ 1.51 casing volumes pumped.
Sample (2) @ 3.0 casing volumes pumped.

WELL 7A - MONITOR WELL PA² ZONE
CONDUCTIVITY VS CUMULATIVE GALLONS PUMPED



WELL 7X - MONITOR WELL - "A" ZONE

TABLE OF FIELD MEASUREMENTS

Date Sampled: 4/9/78
Casing ID: 4 inches
Well Depth: 445 feet
Water Level: 137 feet
Casing Volume: 201 gallons
Pump Depth: 265 feet

| Time Minutes | Flow GPM | Cumulative Gallons | Temp °C | Conductivity G @ 25°C | pH | Remarks |
|-----------------|-------------|-----------------------|------------|--------------------------|------|------------|
| 15 | 4.0 | 50 | 10.1 | 2302 | 9.50 | |
| 35 | 4.0 | 140 | 10.2 | 2325 | 9.40 | |
| 55 | 4.0 | 220 | 10.1 | 2251 | 9.25 | |
| 75 | 3.3 | 286 | -- | -- | -- | |
| 95 | ↓ | 352 | 10.2 | 2282 | 8.80 | Sample (1) |
| 115 | ↓ | 428 | -- | -- | -- | |
| 130 | ↓ | 478 | 10.2 | 2304 | 8.80 | Sample (2) |

NOTES: Effluents are muddy - high suspended solids
Pump continues to break suction

Sample (1) @ 1.75 casing volumes pumped.
Sample (2) @ 2.38 casing volumes pumped.

WELL 7X - MONITOR WELL - "A" ZONE

TABLE OF FIELD MEASUREMENTS

Date Sampled: 4/20/78
Casing ID: 4 inches
Well Depth: 445 feet
Water Level: 137 feet
Casing Volume: 201 gallons
Pump Depth: 265 feet

| Time Minutes | Flow GPM | Cumulative Gallons | Temp °C | Conductivity G @ 25°C | pH | Remarks |
|-----------------|-------------|-----------------------|------------|--------------------------|------|-----------------|
| 20 | 4.0 | 80 | 10.8 | 2336 | 8.65 | |
| 40 | | 160 | 11.4 | 2351 | 9.35 | |
| 60 | | 240 | 11.6 | 2285 | 8.50 | Cloudy - Solids |
| 80 | | 320 | 11.6 | 2285 | 8.45 | |
| 95 | | 380 | 11.5 | 2292 | 8.45 | Cloudy - Solids |
| 110 | | 440 | -- | -- | -- | Sample (1) |
| 120 | | 480 | 11.4 | 2298 | 8.45 | |
| 140 | 3.0 | 540 | 11.4 | 2298 | 8.45 | |
| 160 | 3.0 | 600 | 11.2 | 2310 | 8.45 | Cloudy - Solids |
| 180 | 3.0 | 660 | 11.1 | 2317 | 8.45 | Sample (2) |

NOTES: Sample (1) @ 2.2 casing volumes pumped.
Sample (2) @ 3.3 casing volumes pumped.

WELL 7X - MONITOR WELL - "A" ZONE

TABLE OF FIELD MEASUREMENTS

Date Sampled: 5/4/78
Casing ID: 4 inches
Well Depth: 445 feet
Water Level: 138 feet
Casing Volume: 200 gallons
Pump Depth: 250 feet

| Time Minutes | Flow GPM | Cumulative Gallons | Temp °C | Conductivity G @ 25°C | pH | Remarks |
|-----------------|-------------|-----------------------|------------|--------------------------|------|------------|
| 30 | 3.0 ↓ | 90 | 9.7 | 2329 | 9.00 | |
| 65 | | 195 | 9.7 | 2329 | 8.85 | |
| 95 | | 285 | 9.9 | 2315 | 8.50 | |
| 110 | | 330 | -- | -- | -- | Sample (1) |
| 125 | | 375 | 10.0 | 2309 | 8.50 | |
| 155 | | 465 | 10.1 | 2316 | 8.50 | |
| 185 | | 555 | 10.1 | 2316 | 8.50 | Sample (2) |

NOTES: Sample (1) @ 1.67 casing volumes pumped.
Sample (2) @ 2.78 casing volumes pumped.

WELL 7X - MONITOR WELL - "A" ZONE
TABLE OF FIELD MEASUREMENTS

Date Sampled: 5/15/78
 Casing ID: 4 inches
 Well Depth: 445 feet
 Water Level: 137 feet
 Casing Volume: 201 gallons
 Pump Depth: 240 feet

| Time Minutes | Flow GPM | Cumulative Gallons | Temp °C | Conductivity G @ 25°C | pH | Remarks |
|-----------------|-------------|-----------------------|------------|--------------------------|------|-----------------|
| 20 | 5.0 | 100 | 11.9 | 2231 | 8.75 | Clear |
| 40 | 3.2 | 164 | 12.2 | 2301 | 9.12 | |
| 60 | | 228 | 12.5 | 2269 | 8.68 | Slightly Dirty |
| 80 | | 292 | 12.6 | 2256 | 8.49 | Dirty |
| 95 | | 340 | -- | -- | -- | Sample (1) |
| 100 | | 356 | 12.8 | 2232 | 8.46 | |
| 120 | | 420 | 12.7 | 2264 | 8.45 | Cloudy |
| 140 | | 484 | 13.0 | 2278 | 8.45 | |
| 160 | | 548 | 13.0 | 2296 | 8.45 | Slightly Cloudy |
| 180 | | 612 | 13.2 | 2287 | 8.45 | |
| 200 | | 676 | 13.2 | 2287 | 8.45 | Clearing |
| 2:0 | | 708 | -- | -- | -- | Sample (2) |

NOTES: Sample (1) @ 1.7 casing volumes pumped.
 Sample (2) @ 3.5 casing volumes pumped.

WELL 7X - MONITOR WELL - "A" ZONE

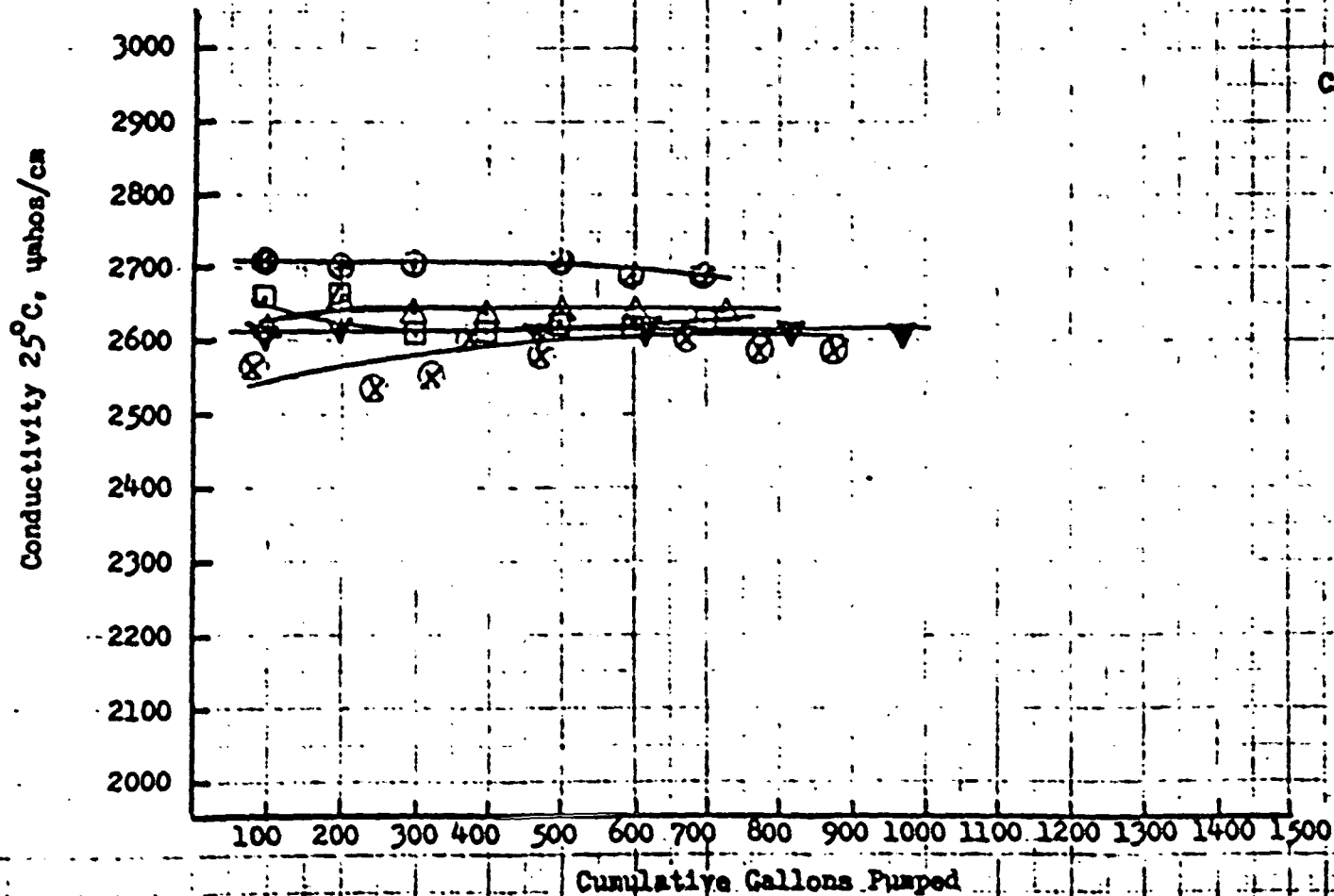
TABLE OF FIELD MEASUREMENTS

Date Sampled: 6/15/78
Casing ID: 4 inches
Well Depth: 445 feet
Water Level: 147 feet
Casing Volume: 195 gallons
Pump Depth: 240 feet

| Time Minutes | Flow GPM | Cumulative Gallons | Temp °C | Conductivity 6 @ 25°C | pH | Remarks |
|-----------------|-------------|-----------------------|------------|--------------------------|------|-------------|
| 20 | 5.0 ↓ | 100 | 11.2 | 2226 | 9.09 | Clear |
| 25 | | 125 | 11.7 | 2277 | 9.12 | Clear |
| 45 | | 225 | 11.7 | 2284 | 8.85 | Cloudy |
| 60 | | 300 | -- | -- | -- | Sample (1) |
| 65 | | 325 | 11.7 | 2284 | 8.50 | Very Cloudy |
| 85 | | 425 | 11.8 | 2278 | 8.50 | Clearing |
| 100 | | 500 | -- | -- | -- | Sample (2) |

NOTES: Sample (1) @ 1.54 casing volumes pumped.
Sample (2) @ 2.56 casing volumes pumped.

WELL 11X - SOUTHEAST MONITOR WELL
CONDUCTIVITY VS CUMULATIVE GALLONS PUMPED



Date Sampled

4/8/78

4/19/78

5/3/78

5/17/78

6/12/78

Legend

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Casing volume = 263 gallons

WELL 11X - SOUTHEAST MONITOR WELL

TABLE OF FIELD MEASUREMENTS

Date Sampled: 4/8/78
Casing ID: 4 inches
Well Depth: 550 feet
Water Level: 147 feet
Casing Volume: 263 gallons
Pump Depth: 265 feet

| Time Minutes | Flow GPM | Cumulative Gallons | Temp °C | Conductivity G @ 25°C | pH | Remarks |
|-----------------|-------------|-----------------------|------------|--------------------------|------|------------|
| 15 | 5.0 ↓ | 75 | 10.2 | 2568 | -- | |
| 50 | | 250 | 11.0 | 2539 | -- | |
| 65 | | 325 | 11.0 | 2553 | 9.00 | |
| 75 | | 375 | 11.0 | 2609 | 9.00 | |
| 95 | | 475 | 11.2 | 2581 | 8.96 | Sample (1) |
| 115 | | 575 | 11.1 | 2588 | -- | |
| 135 | | 675 | 11.1 | 2602 | 8.95 | |
| 155 | | 775 | 11.2 | 2595 | 8.95 | |
| 175 | | 875 | 11.2 | 2595 | 8.95 | Sample (2) |

NOTES: Sample (1) @ 1.8 casing volumes pumped.
Sample (2) @ 3.3 casing volumes pumped.

WELL 11X - SOUTHEAST MONITOR WELL

TABLE OF FIELD MEASUREMENTS

Date Sampled: 4/19/78
Casing ID: 4 inches
Well Depth: 550 feet
Water Level: 147 feet
Casing Volume: 263 gallons
Pump Depth: 265 feet

| Time Minutes | Flow GPM | Cumulative Gallons | Temp °C | Conductivity G @ 25°C | pH | Remarks |
|-----------------|-------------|-----------------------|------------|--------------------------|------|------------|
| 20 | 5.0 ↓ | 100 | 10.8 | 2635 | 9.20 | |
| 40 | | 200 | 11.3 | 2655 | 9.15 | |
| 60 | | 300 | 11.5 | 2641 | 9.15 | |
| 80 | | 400 | 11.5 | 2641 | 9.00 | |
| 100 | | 500 | 11.5 | 2641 | 9.00 | Sample (1) |
| 120 | | 600 | 11.5 | 2641 | 9.00 | |
| 145 | | 725 | 11.5 | 2641 | 9.00 | Sample (2) |

NOTES: Sample (1) @ 1.9 casing volumes pumped.
Sample (2) @ 2.76 casing volumes pumped.

WELL 11X - SOUTHEAST MONITOR WELL

TABLE OF FIELD MEASUREMENTS

Date Sampled: 5/3/78
Casing ID: 4 inches
Well Depth: 550 feet
Water Level: 146.5 feet
Casing Volume: 263.5 gallons
Pump Depth: 230 feet

| Time Minutes | Flow GPM | Cumulative Gallons | Temp °C | Conductivity G @ 25°C | pH | Remarks |
|-----------------|-------------|-----------------------|------------|--------------------------|------|------------|
| 20 | 5.0 | 100 | 11.0 | 2651 | 8.95 | |
| 40 | ↓ | 200 | 11.1 | 2658 | 9.55 | |
| 60 | | 300 | 11.3 | 2615 | 8.95 | |
| 80 | | 400 | 11.3 | 2615 | 8.80 | |
| 90 | | 450 | -- | -- | -- | Sample (1) |
| 100 | | 500 | 11.2 | 2623 | 8.70 | |
| 120 | | 600 | 11.0 | 2623 | 8.70 | |
| 140 | ↓ | 700 | 11.0 | 2623 | 8.70 | |
| 150 | | 750 | -- | -- | -- | Sample (2) |

NOTES: Sample (1) @ 1.7 casing volumes pumped.
Sample (2) @ 2.8 casing volumes pumped.

WELL 11X - SOUTHEAST MONITOR WELL

TABLE OF FIELD MEASUREMENTS

Date Sampled: 5/17/78
Casing ID: 4 inches
Well Depth: 550 feet
Water Level: 146 feet
Casing Volume: 264 gallons
Pump Depth: 230 feet

| Time Minutes | Flow GPM | Cumulative Gallons | Temp °C | Conductivity G @ 25°C | pH | Remarks |
|-----------------|-------------|-----------------------|------------|--------------------------|------|------------|
| 20 | 6.0 ↓ | 120 | 10.2 | 2601 | 8.81 | Clear |
| 40 | | 240 | 10.7 | 2628 | 9.30 | |
| 60 | | 360 | 10.8 | 2627 | 8.72 | Clear |
| 80 | | 480 | 10.9 | 2620 | 8.69 | Sample (1) |
| 110 | | 660 | 10.9 | 2620 | 8.67 | |
| 140 | | 840 | 10.9 | 2620 | 8.66 | Clear |
| 160 | | 960 | 10.9 | 2620 | 8.65 | |
| 170 | | 1020 | -- | -- | -- | Sample (2) |

NOTES: Sample (1) @ 1.8 casing volumes pumped.
Sample (2) @ 3.9 casing volumes pumped.

WELL 11X - SOUTHEAST MONITOR WELL

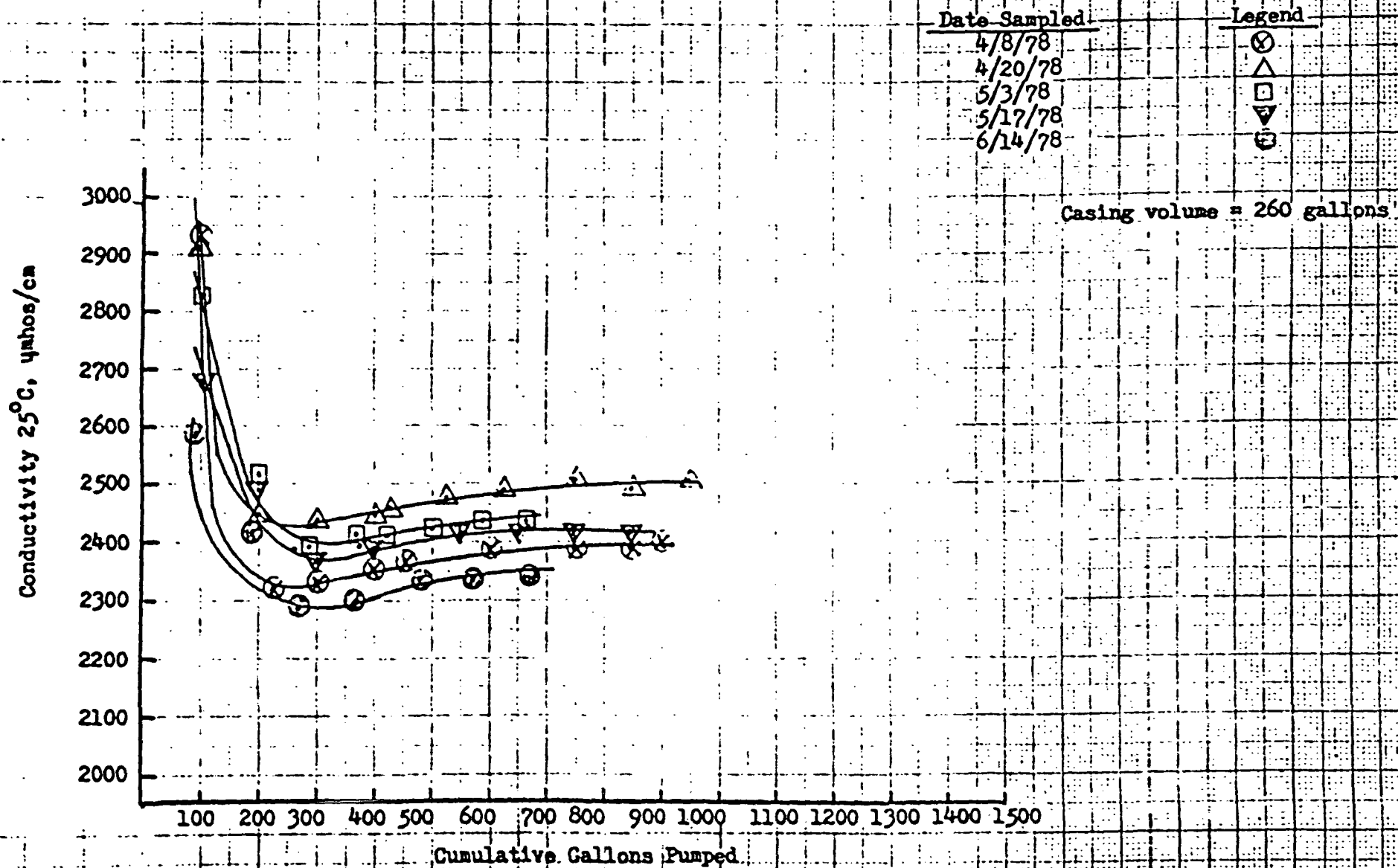
TABLE OF FIELD MEASUREMENTS

Date Sampled: 6/12/78
Casing ID: 4 inches
Well Depth: 550 feet
Water Level: 145.5 feet
Casing Volume: 264 gallons
Pump Depth: 230 feet

| Time Minutes | Flow GPM | Cumulative Gallons | Temp °C | Conductivity G @ 25°C | pH | Remarks |
|-----------------|-------------|-----------------------|------------|--------------------------|------|------------|
| 20 | 5.0 ↓ | 100 | 11.5 | 2716 | 9.10 | Clear |
| 40 | | 200 | 12.0 | 2701 | 9.32 | |
| 60 | | 300 | | 2708 | 8.80 | |
| 80 | | 400 | | 2708 | 8.70 | |
| 85 | | 425 | | -- | -- | Sample (1) |
| 100 | | 500 | | 2708 | 8.65 | |
| 120 | | 600 | | 2694 | 8.60 | Clear |
| 140 | | 700 | | 2694 | 8.60 | |
| 160 | | 800 | | -- | -- | Sample (2) |

NOTES: Sample (1) @ 1.61 casing volumes pumped.
Sample (2) @ 3.03 casing volumes pumped.

WELL 12X - NORTHEAST MONITOR WELL
 CONDUCTIVITY VS CUMULATIVE GALLONS PUMPED



WELL 12X - NORTHEAST MONITOR WELL
TABLE OF FIELD MEASUREMENTS

Date Sampled: 4/8/78
 Casing ID: 4 inches
 Well Depth: 550 feet
 Water Level: 149 feet
 Casing Volume: 259 gallons
 Pump Depth: 265 feet

| Time Minutes | Flow GPM | Cumulative Gallons | Temp °C | Conductivity G @ 25°C | pH | Remarks |
|-----------------|-------------|-----------------------|------------|--------------------------|------|------------|
| 20 | 5.0 | 100 | 11.3 | 2949 | 11.1 | |
| 45 | ↓ | 225 | 12.0 | 2334 | 9.50 | |
| 60 | | 300 | 11.9 | 2340 | 9.15 | |
| 80 | | 400 | 12.0 | 2354 | 8.90 | |
| 90 | | 450 | 11.9 | 2374 | 8.90 | Sample (1) |
| 120 | | 600 | 11.9 | 2395 | 8.86 | |
| 150 | | 750 | 11.9 | 2395 | 8.80 | |
| 170 | | 850 | 11.9 | 2395 | 8.80 | |
| 180 | ↓ | 900 | 11.8 | 2401 | 8.80 | Sample (2) |

NOTES: Sample (1) @ 1.7 casing volumes pumped.
 Sample (2) @ 3.5 casing volumes pumped.

WELL 12X - NORTHEAST MONITOR WELL

TABLE OF FIELD MEASUREMENTS

Date Sampled: 4/20/73
Casing ID: 4 inches
Well Depth: 550 feet
Water Level: 149 feet
Casing Volume: 259 gallons
Pump Depth: 265 feet

| Time Minutes | Flow GPM | Cumulative Gallons | Temp °C | Conductivity G @ 25°C | pH | Remarks |
|-----------------|-------------|-----------------------|------------|--------------------------|------|-------------------------|
| 20 | 5.0 | 100 | 10.2 | 2912 | 10.9 | |
| 40 | | 200 | 10.8 | 2450 | 9.20 | |
| 60 | | 300 | 11.0 | 2443 | 8.85 | |
| 80 | | 400 | 11.0 | 2450 | 8.75 | Sample (1) |
| 85 | | 425 | 11.0 | 2460 | 8.72 | |
| 105 | | 525 | 11.0 | 2479 | 8.70 | |
| 125 | | 625 | 11.0 | 2493 | 8.65 | Slightly Dirty Effluent |
| 150 | | 750 | 11.2 | 2501 | 8.70 | Clearing |
| 170 | | 850 | 11.6 | 2494 | 8.70 | |
| 190 | | 950 | 11.7 | 2501 | 8.70 | Sample (2) |

NOTES: Sample (1) @ 1.5 casing volumes pumped.
Sample (2) @ 3.7 casing volumes pumped.

WELL 12X - NORTHEAST MONITOR WELL
TABLE OF FIELD MEASUREMENTS

Date Sampled: 5/3/78
Casing ID: 4 inches
Well Depth: 550 feet
Water Level: 150.5 feet
Casing Volume: 261 gallons
Pump Depth: 230 feet

| Time Minutes | Flow GPM | Cumulative Gallons | Temp °C | Conductivity G @ 25°C | pH | Remarks |
|-----------------|-------------|-----------------------|------------|--------------------------|------|--------------------------|
| 20 | 5.0 | 100 | 10.3 | 2833 | 10.9 | |
| 40 | 5.0 | 200 | 10.6 | 2525 | 9.45 | |
| 60 | 4.0 | 280 | 10.8 | 2398 | 8.85 | Slightly Cloudy Effluent |
| 80 | ↓ | 360 | 10.9 | 2419 | 8.75 | |
| 100 | | 420 | 11.0 | 2412 | 8.75 | Clearing |
| 110 | | 460 | -- | -- | -- | Sample (1) |
| 120 | | 500 | 11.0 | 2427 | 8.65 | Clean Effluent |
| 140 | | 580 | 11.0 | 2441 | 8.60 | |
| 160 | | 660 | 11.0 | 2441 | 8.65 | |
| 165 | | 680 | -- | -- | -- | Sample (2) |

NOTES: Sample (1) @ 1.76 casing volumes pumped.
Sample (2) @ 2.60 casing volumes pumped.

WELL 12X - NORTHEAST MONITOR WELL
TABLE OF FIELD MEASUREMENTS

Date Sampled: 5/17/78
Casing ID: 4 inches
Well Depth: 550 feet
Water Level: 150 feet
Casing Volume: 261 gallons
Pump Depth: 230 feet

| Time Minutes | Flow GPM | Cumulative Gallons | Temp °C | Conductivity G @ 25°C | pH | Remarks |
|-----------------|-------------|-----------------------|------------|--------------------------|-------|------------|
| 20 | 5.0 ↓ | 100 | 10.1 | 2679 | 10.33 | |
| 40 | | 200 | 10.5 | 2496 | 9.50 | |
| 60 | | 300 | 10.7 | 2371 | 8.90 | |
| 80 | | 400 | 10.7 | 2399 | 8.73 | |
| 90 | | 450 | -- | -- | -- | Sample (1) |
| 110 | | 550 | 10.7 | 2413 | 8.72 | |
| 130 | | 650 | 10.7 | 2413 | 8.50 | |
| 150 | | 750 | 10.7 | 2413 | 8.50 | |
| 170 | | 850 | 10.7 | 2413 | 8.47 | Sample (2) |

NOTES: Sample (1) @ 1.7 casing volumes pumped.
Sample (2) @ 3.3 casing volumes pumped.

WELL 12X - NORTHEAST MONITOR WELL
TABLE OF FIELD MEASUREMENTS

Date Sampled: 6/14/78
Casing ID: 4 inches
Well Depth: 550 feet
Water Level: 149 feet
Casing Volume: 261 gallons
Pump Depth: 230 feet

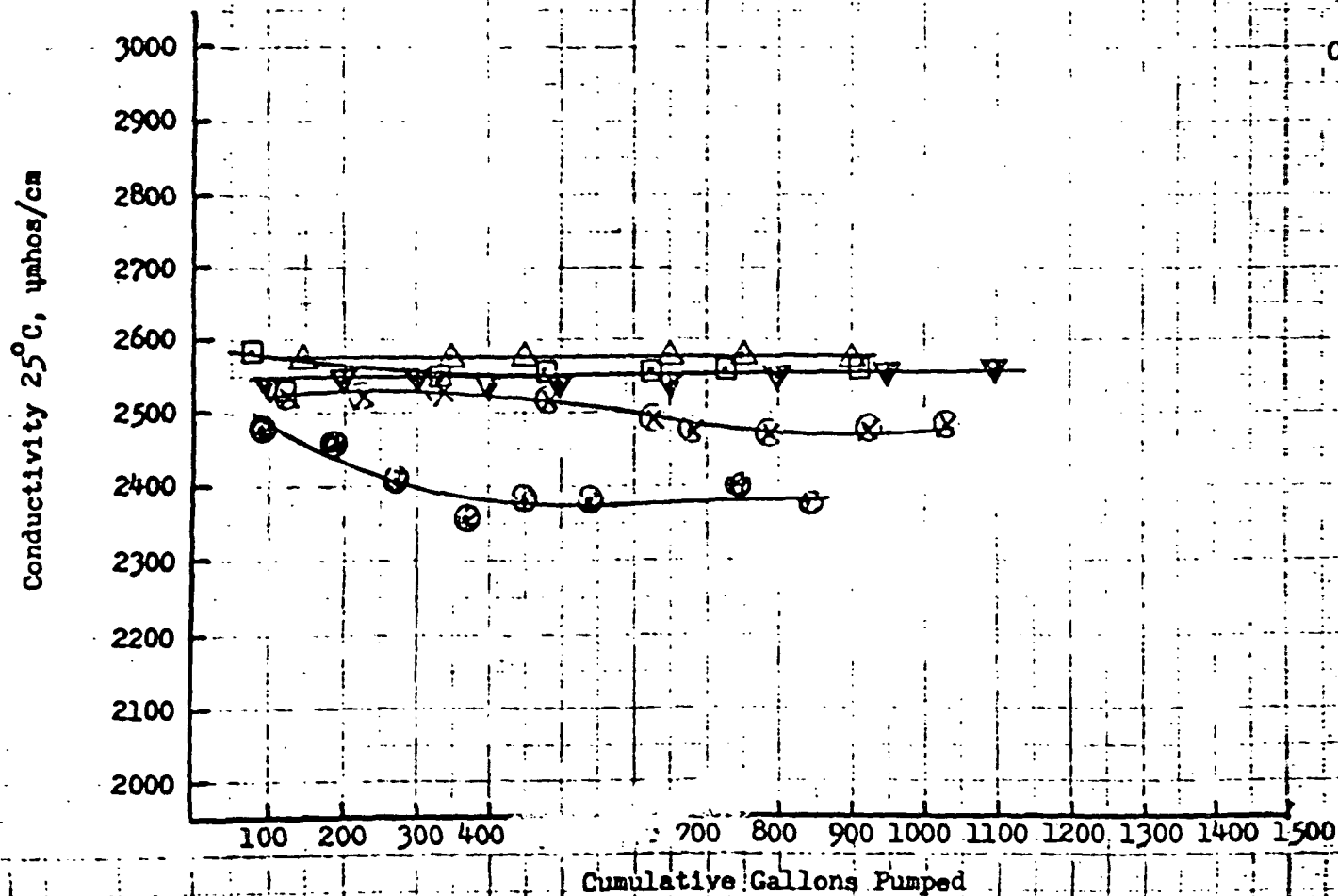
| Time Minutes | Flow GPM | Cumulative Gallons | Temp °C | Conductivity G @ 25°C | pH | Remarks |
|-----------------|-------------|-----------------------|------------|--------------------------|-------|------------|
| 20 | 4.5 | 90 | 11.9 | 2597 | 10.85 | Clear |
| 40 | ↓ | 180 | 12.2 | 2430 | 9.83 | |
| 60 | | 270 | 12.5 | 2292 | 9.04 | Cloudy |
| 80 | | 360 | 12.8 | 2300 | 8.86 | |
| 95 | ↓ | 425 | -- | -- | -- | Sample (1) |
| 115 | 3.0 | 485 | 12.7 | 2345 | 8.80 | |
| 135 | 4.5 | 575 | 12.9 | 2346 | 8.70 | Cloudy |
| 155 | ↓ | 665 | 13.0 | 2340 | 8.70 | |
| 175 | ↓ | 755 | -- | -- | -- | Sample (2) |

NOTES: Sample (1) @ 1.62 casing volumes pumped.
Sample (2) @ 2.88 casing volumes pumped.

WELL 19X - RECOVERY WELL
CONDUCTIVITY VS CUMULATIVE GALLONS PUMPED

| Date Sampled | Legend |
|--------------|--------|
| 4/7/78 | ⊗ |
| 4/18/78 | △ |
| 5/2/78 | □ |
| 5/15/78 | ▽ |
| 6/15/78 | ⊙ |

Casing volume = 400 gallons



WELL 19X - RECOVERY WELLTABLE OF FIELD MEASUREMENTS

Date Sampled: 4/7/78
Casing ID: 5 inches
Well Depth: 538 feet
Water Level: 155 feet
Casing Volume: 390 gallons
Pump Depth: 265 feet

| Time Minutes | Flow GPM | Cumulative Gallons | Temp °C | Conductivity G @ 25°C | pH | Remarks |
|-----------------|-------------|-----------------------|------------|--------------------------|------|-----------------|
| 25 | 5.0 | 125 | 11.0 | 2525 | -- | |
| 45 | ↓ | 225 | 11.0 | 2525 | 8.62 | |
| 70 | 4.8 | 336 | 11.3 | 2532 | -- | Mud in Effluent |
| 100 | ↓ | 480 | 11.6 | 2511 | 8.63 | |
| 130 | ↓ | 624 | 11.9 | 2491 | 8.63 | Clearing |
| 140 | ↓ | 672 | 12.0 | 2484 | 8.63 | Sample (1) |
| 160 | ↓ | 768 | 12.0 | 2477 | 8.62 | |
| 190 | ↓ | 912 | 12.0 | 2484 | -- | |
| 210 | ↓ | 1008 | 12.0 | 2484 | 8.62 | Sample (2) |

NOTES: Sample (1) @ 1.7 casing volumes pumped.
Sample (2) @ 2.6 casing volumes pumped.

WELL 19X - RECOVERY WELL
TABLE OF FIELD MEASUREMENTS

Date Sampled: 4/18/78
Casing ID: 5 inches
Well Depth: 538 feet
Water Level: 155 feet
Casing Volume: 390 gallons
Pump Depth: 265 feet

| Time Minutes | Flow GPM | Cumulative Gallons | Temp °C | Conductivity G @ 25°C | pH | Remarks |
|-----------------|-------------|-----------------------|------------|--------------------------|------|-------------------------|
| 30 | 5.0 | 150 | 10.2 | 2579 | 8.73 | Slightly Dirty Effluent |
| 60 | ↓ | 300 | ↓ | ↓ | 8.75 | |
| 90 | ↓ | 450 | ↓ | ↓ | 8.70 | |
| 120 | ↓ | 600 | ↓ | ↓ | ↓ | Sample (1) |
| 150 | ↓ | 750 | ↓ | ↓ | ↓ | Sample (2) |
| 180 | ↓ | 900 | ↓ | ↓ | ↓ | |

NOTES: Sample (1) @ 1.5 casing volumes pumped.
Sample (2) @ 2.3 casing volumes pumped.

WELL 19X - RECOVERY WELL

TABLE OF FIELD MEASUREMENTS

Date Sampled: 5/2/78
Casing ID: 5 inches
Well Depth: 538 feet
Water Level: 145 feet
Casing Volume: 400 gallons
Pump Depth: 230 feet

| Time Minutes | Flow GPM | Cumulative Gallons | Temp °C | Conductivity G @ 25°C | pH | Remarks |
|-----------------|-------------|-----------------------|------------|--------------------------|------|------------|
| 15 | 5.0 ↓ | 75 | 10.8 | 2582 | 8.60 | |
| 35 | | 175 | 11.1 | 2532 | 8.50 | |
| 65 | | 325 | 11.3 | 2546 | 8.45 | |
| 95 | | 475 | 11.5 | 2560 | 8.40 | |
| 125 | | 625 | 11.5 | 2560 | 8.40 | Sample (1) |
| 155 | | 775 | 11.3 | 2560 | 8.45 | |
| 185 | | 925 | 11.2 | 2553 | 8.45 | Sample (2) |

NOTES: Sample (1) @ 1.56 casing volumes pumped.
Sample (2) @ 2.3 casing volumes pumped.

WELL 19X - RECOVERY WELL

TABLE OF FIELD MEASUREMENTS

Date Sampled: 5/15/78
Casing ID: 5 inches
Well Depth: 538 feet
Water Level: 144 feet
Casing Volume: 400 gallons
Pump Depth: 230 feet

| Time Minutes | Flow GPM | Cumulative Gallons | Temp °C | Conductivity G @ 25°C | pH | Remarks |
|-----------------|-------------|-----------------------|------------|--------------------------|------|------------|
| 20 | 5.0 ↓ | 100 | 12.7 | 2547 | 8.49 | Clear |
| 40 | | 200 | 13.0 | 2549 | 8.45 | |
| 60 | | 300 | 13.0 | 2553 | 8.45 | |
| 80 | | 400 | 13.1 | 2546 | 8.40 | Cloudy |
| 100 | | 500 | 13.0 | 2553 | 8.40 | |
| 120 | | 600 | -- | -- | -- | Sample (1) |
| 130 | | 650 | 13.0 | 2553 | 8.40 | |
| 160 | | 800 | 13.0 | 2553 | 8.40 | Clearing |
| 190 | | 950 | 13.0 | 2553 | 8.40 | Clear |
| 220 | | 1100 | 13.0 | 2553 | 8.40 | Sample (2) |

NOTES: Sample (1) @ 1.5 casing volumes pumped.
Sample (2) @ 2.75 casing volumes pumped.

WELL 19X - RECOVERY WELL
TABLE OF FIELD MEASUREMENTS

Date Sampled: 6/15/78
Casing ID: 5 inches
Well Depth: 538 feet
Water Level: 145 feet
Casing Volume: 400 gallons
Pump Depth: 230 feet

| Time Minutes | Flow GPM | Cumulative Gallons | Temp °C | Conductivity G @ 25°C | pH | Remarks |
|-----------------|-------------|-----------------------|------------|--------------------------|------|------------|
| 20 | 4.5 ↓ | 90 | 11.2 | 2481 | 8.50 | Cloudy (1) |
| 40 | | 180 | 11.5 | 2453 | 8.45 | Dirty |
| 60 | | 270 | 11.8 | 2406 | 8.40 | ↓ |
| 80 | | 360 | 12.0 | 2353 | 8.45 | |
| 100 | | 450 | 12.4 | 2381 | 8.45 | |
| 120 | | 540 | 12.4 | 2381 | 8.40 | |
| 140 | | 630 | -- | -- | -- | Sample (1) |
| 150 | | 653 | 12.2 | 2394 | 8.47 | Dirty |
| 170 | | 743 | 12.2 | 2407 | 8.47 | Dirty |
| 190 | | 833 | 12.8 | 2375 | 8.49 | Clearing |
| 210 | ↓ | 923 | -- | -- | -- | Sample (2) |

NOTES: (1) Effluent heavily contaminated with suspended rust
from steel pipe suspended in well for approximately 1 month.

Sample (1) @ 1.57 casing volumes pumped.
Sample (2) @ 2.30 casing volumes pumped.

WELL 20X - NORTH-INJECTION WELL
CONDUCTIVITY VS CUMULATIVE GALLONS PUMPED

Date Sampled

4/6/78

4/17/78

5/2/78

5/16/78

6/13/78

Legend

⊗

△

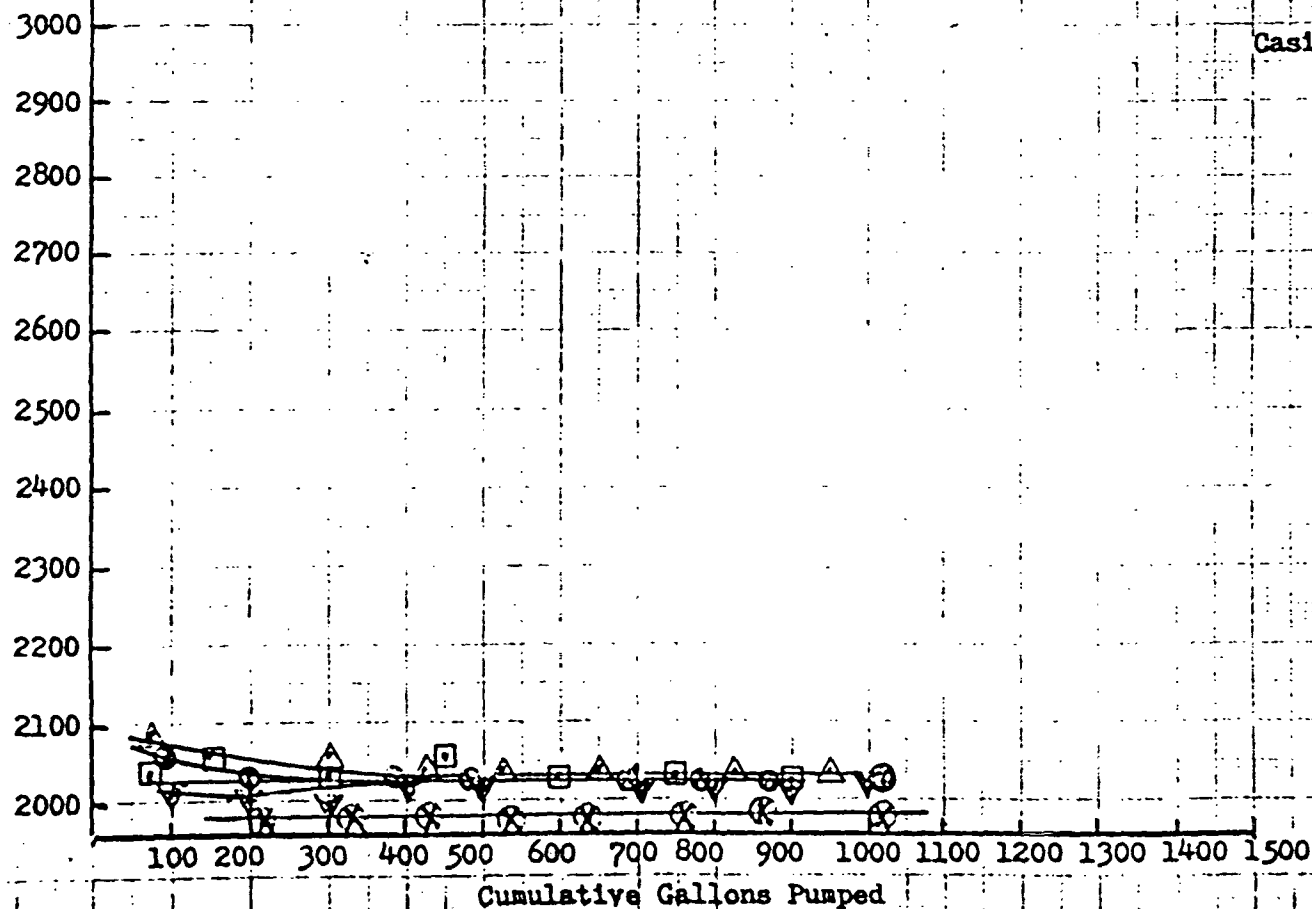
□

▽

⊙

Casing volume = 402 gallons

Conductivity 25°C, $\mu\text{mhos/cm}$



WELL 20X - NORTH INJECTION WELL
TABLE OF FIELD MEASUREMENTS

Date Sampled: 4/6/78
 Casing ID: 5 inches
 Well Depth: 538 feet
 Water Level: 136 feet
 Casing Volume: 402 gallons
 Pump Depth: 220 feet

| Time Minutes | Flow GPM | Cumulative Gallons | Temp °C | Conductivity G @ 25°C | pH | Remarks |
|-----------------|-------------|-----------------------|------------|--------------------------|------|------------|
| 20 | 5.4 ↓ | 108 | 11.4 | 1873 | 8.96 | |
| 40 | | 216 | 11.2 | 1953 | 8.96 | |
| 60 | | 324 | 11.3 | 1962 | -- | |
| 80 | | 432 | 11.4 | 1963 | 8.96 | |
| 100 | | 540 | 11.4 | 1963 | 8.99 | Sample (1) |
| 120 | | 648 | 11.4 | 1963 | 8.99 | |
| 140 | | 756 | 11.5 | 1965 | -- | |
| 160 | | 864 | 11.3 | 1982 | 9.00 | |
| 180 | | 972 | 11.3 | 1982 | 8.99 | Sample (2) |
| 190 | | 1026 | 11.3 | 1982 | 8.99 | |

NOTES: Sample (1) @ 1.3 casing volumes pumped.
 Sample (2) @ 2.55 casing volumes pumped.

WELL 20X - NORTH INJECTION WELL

TABLE OF FIELD MEASUREMENTS

Date Sampled: 4/17/78
Casing ID: 5 inches
Well Depth: 538 feet
Water Level: 142 feet
Casing Volume: 404 gallons
Pump Depth: 265 feet

| Time Minutes | Flow GPM | Cumulative Gallons | Temp °C | Conductivity G @ 25°C | pH | Remarks |
|-----------------|-------------|-----------------------|------------|--------------------------|------|------------|
| 15 | 5.0 ↓ | 75 | 9.1 | 2094 | 8.88 | |
| 40 | | 200 | 10.0 | 2040 | -- | |
| 60 | | 300 | 9.7 | 2057 | 8.85 | |
| 85 | | 425 | 10.0 | 2040 | 8.88 | |
| 105 | | 525 | 10.4 | 2040 | 8.88 | |
| 130 | | 650 | 10.4 | 2040 | 8.88 | Sample (1) |
| 165 | | 825 | 10.4 | 2040 | 8.88 | |
| 190 | | 950 | 10.4 | 2040 | 8.88 | Sample (2) |

NOTES: Sample (1) @ 1.6 casing volumes pumped.
Sample (2) @ 2.35 casing volumes pumped.

WELL 20X - NORTH INJECTION WELL

TABLE OF FIELD MEASUREMENTS

Date Sampled: 5/2/78
Casing ID: 5 inches
Well Depth: 538 feet
Water Level: 141 feet
Casing Volume: 405 gallons
Pump Depth: 230 feet

| Time Minutes | Flow GPM | Cumulative Gallons | Temp °C | Conductivity G @ 25°C | pH | Remarks |
|-----------------|------------------|-----------------------|------------|--------------------------|------|------------|
| 10 | 5.0 ⁺ | 50 | -- | -- | -- | |
| 15 | 5.0 | 75 | 9.9 | 2040 | 8.90 | |
| 30 | ↓ | 150 | 9.9 | 2062 | 8.75 | |
| 60 | | 300 | 10.3 | 2046 | 8.75 | |
| 90 | | 450 | 10.5 | 2063 | 8.75 | |
| 120 | | 600 | 10.8 | 2045 | 8.75 | |
| 130 | | 650 | -- | -- | -- | Sample (1) |
| 150 | | 750 | 10.8 | 2045 | 8.75 | |
| 180 | | 900 | 11.0 | 2034 | 8.75 | |
| 190 | ↓ | 950 | -- | -- | -- | Sample (2) |

NOTES: Sample (1) @ 1.6 casing volumes pumped.
Sample (2) @ 2.3 casing volumes pumped.

WELL 20X - NORTH INJECTION WELL

TABLE OF FIELD MEASUREMENTS

Date Sampled: 5/16/78
Casing ID: 5 inches
Well Depth: 538 feet
Water Level: 143 feet
Casing Volume: 403 gallons
Pump Depth: 230 feet

| Time Minutes | Flow GPM | Cumulative Gallons | Temp °C | Conductivity G @ 25°C | pH | Remarks |
|-----------------|-------------|-----------------------|------------|--------------------------|------|------------|
| 20 | 5.0 ↓ | 100 | 10.7 | 2010 | 8.67 | Clear |
| 40 | | 200 | 10.8 | 2005 | 8.67 | |
| 60 | | 300 | 10.9 | 1999 | 8.65 | |
| 80 | | 400 | 11.0 | 2041 | 8.68 | |
| 100 | | 500 | 11.2 | 2030 | 8.65 | |
| 120 | | 600 | 11.2 | 2037 | 8.65 | Clear |
| 125 | | 625 | -- | -- | -- | Sample (1) |
| 140 | | 700 | 11.5 | 2027 | 8.65 | |
| 160 | | 800 | 11.5 | 2021 | 8.67 | Clear |
| 180 | | 900 | 11.5 | 2021 | 8.65 | |
| 200 | | 1000 | 11.5 | 2021 | 8.65 | Sample (2) |

NOTES: Sample (1) @ 1.6 casing volumes pumped.
Sample (2) @ 2.5 casing volumes pumped.

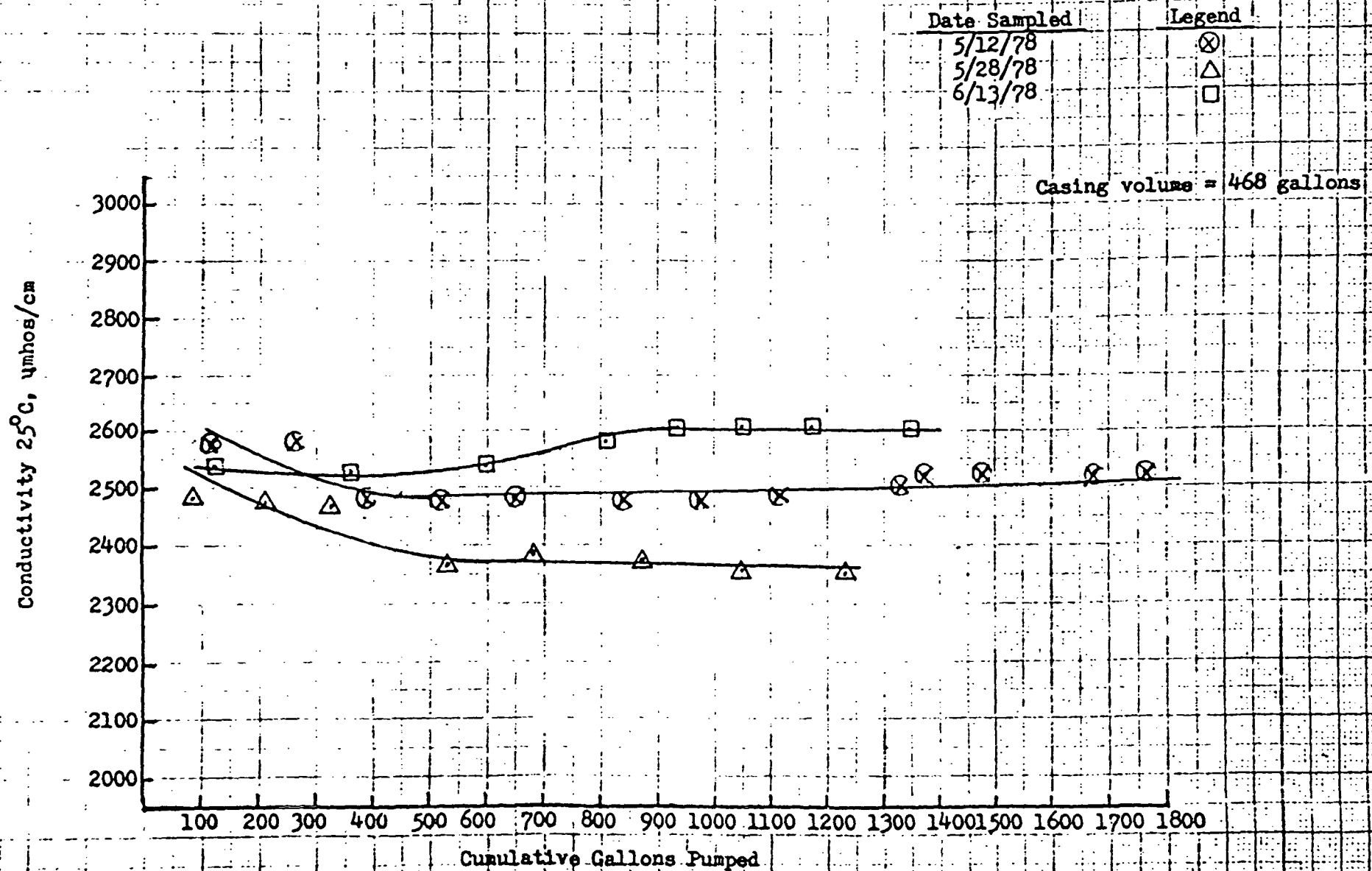
WELL 20X - NORTH INJECTION WELL
TABLE OF FIELD MEASUREMENTS

Date Sampled: 6/13/77
 Casing ID: 5 inches
 Well Depth: 538 feet
 Water Level: 139 feet
 Casing Volume: 403 gallons
 Pump Depth: 230 feet

| Time Minutes | Flow GPM | Cumulative Gallons | Temp °C | Conductivity G @ 25°C | pH | Remarks |
|-----------------|-------------|-----------------------|------------|--------------------------|------|------------|
| 20 | 5.0 ↓ | 100 | 12.2 | 2058 | 8.59 | Clear |
| 40 | | 200 | 12.5 | 2016 | 8.58 | |
| 60 | | 300 | 12.9 | 2046 | 8.61 | |
| 80 | | 400 | 12.9 | 2033 | 8.62 | Clear |
| 100 | | 500 | 13.3 | 2023 | 8.62 | |
| 120 | | 600 | 13.3 | 2038 | 8.63 | |
| 125 | | 625 | -- | -- | -- | Sample (1) |
| 140 | | 700 | 13.1 | 2049 | 8.65 | |
| 160 | | 800 | 13.1 | 2036 | 8.65 | Clear |
| 180 | | 900 | 13.3 | 2044 | 8.65 | |
| 200 | | 1000 | 13.0 | 2049 | 8.60 | |
| 210 | | -- | -- | -- | -- | Sample (2) |

NOTES: Sample (1) @ 1.54 casing volumes pumped.
 Sample (2) @ 2.46 casing volumes pumped.

WELL 789V - PROCESS WATER WELL
CONDUCTIVITY VS CUMULATIVE GALLONS PUMPED



WELL 789V - PROCESS WATER WELL
TABLE OF FIELD MEASUREMENTS

Date Sampled: 5/12/78
 Casing ID: 5 inch
 Well Depth: 580 feet
 Water Level: 112.3 feet
 Casing Volume: 468 gallons
 Pump Depth: 230 feet

| Time Minutes | Flow GPM | Cumulative Gallons | Temp °C | Conductivity G @ 25°C | pH | Remarks |
|-----------------|-------------|-----------------------|------------|--------------------------|------|------------|
| 20 | 6.5 ↓ | 130 | 9.8 | 2583 | 9.60 | |
| 40 | | 260 | 10.2 | 2582 | 9.55 | |
| 60 | | 390 | 10.5 | 2475 | 9.10 | |
| 80 | | 520 | 10.5 | 2475 | 9.00 | |
| 100 | | 650 | 10.9 | 2489 | 8.92 | |
| 115 | | 747 | -- | -- | -- | Sample (1) |
| 130 | | 845 | 11.0 | 2476 | 8.89 | |
| 150 | | 975 | ↓ | 2476 | 8.85 | |
| 170 | | 1105 | | 2490 | 8.83 | |
| 190 | | 1235 | | 2504 | 8.78 | |
| 210 | | 1365 | | 2525 | 8.74 | |
| 230 | | 1495 | | 2525 | 8.70 | |
| 250 | | 1625 | | 2525 | 8.70 | |
| 270 | | 1755 | | 2525 | 8.70 | Sample (2) |

NOTES: Sample (1) @ 1.59 casing volumes pumped.
 Sample (2) @ 3.8 casing volumes pumped.

WELL 789V - PROCESS WATER WELL

TABLE OF FIELD MEASUREMENTS

Date Sampled: 5/26/78
Casing ID: 5 inch
Well Depth: 580 feet
Water Level: 113 feet
Casing Volume: 467 gallons
Pump Depth: 230 feet

| Time Minutes | Flow GPM | Cumulative Gallons | Temp °C | Conductivity G @ 25°C | pH | Remarks |
|-----------------|-------------|-----------------------|------------|--------------------------|------|------------|
| 15 | 6.0 ↓ | 90 | 10.6 | 2489 | 9.05 | |
| 35 | | 210 | 11.0 | 2481 | 9.02 | Clean |
| 55 | | 330 | 11.2 | 2475 | 9.02 | |
| 85 | | 510 | 11.4 | 2461 | 8.90 | |
| 115 | | 690 | 11.2 | 2489 | 8.80 | Sample (1) |
| 145 | | 870 | 11.6 | 2475 | 8.80 | |
| 175 | | 1050 | 11.8 | 2459 | 8.78 | Clean |
| 205 | | 1230 | 11.8 | 2453 | 8.78 | Sample (2) |

NOTES: Sample (1) @ 1.45 casing volumes pumped.
Sample (2) @ 2.7 casing volumes pumped.

WELL 789V - PROCESS WATER WELL

TABLE OF FIELD MEASUREMENTS

Date Sampled: 6/13/78
 Casing ID: 5 inch
 Well Depth: 580 feet
 Water Level: 112 feet
 Casing Volume: 468 gallons
 Pump Depth: 230 feet

| Time Minutes | Flow GPM | Cumulative Gallons | Temp °C | Conductivity G @ 25°C | pH | Remarks |
|-----------------|-------------|-----------------------|------------|--------------------------|------|------------|
| 0 | 6.0 | -- | | | | |
| 20 | ↓ | 120 | 13.0 | 2548 | 8.92 | Clear |
| 40 | ↓ | 240 | 13.1 | 2730 | 9.10 | ↓ |
| 60 | ↓ | 360 | 13.0 | 2457 | 8.87 | |
| 80 | ↓ | 480 | 12.3 | 2530 | 8.80 | |
| 100 | ↓ | 600 | 12.3 | 2542 | 8.73 | |
| 120 | ↓ | 720 | -- | -- | -- | ↓ |
| 135 | 3.0 | 765 | -- | -- | -- | Sample (1) |
| 155 | 3.0 | 810 | 12.7 | 2587 | 8.60 | Clear |
| 175 | 6.0 | 930 | 12.6 | 2608 | 8.60 | ↓ |
| 195 | ↓ | 1050 | 12.7 | 2508 | 8.60 | |
| 215 | ↓ | 1170 | 12.7 | 2608 | 8.59 | ↓ |
| 245 | ↓ | 1350 | 12.7 | 2608 | 8.60 | |
| 265 | ↓ | 1470 | -- | -- | -- | Sample (2) |

NOTES: Sample (1) @ 1.63 casing volumes pumped.
 Sample (2) @ 3.1 casing volumes pumped.

TOTAL DISSOLVED SOLIDS VS CONDUCTIVITY

Samples taken 4/6 - 4/9/78

Total Dissolved Solids (180°C), mg/l

2000
1500
1000

Slope = 0.66

19X
4X
5X
7X
11X
12X
3X
6X
20X

(1) Cond 25°C (2) TDS (180°C)

Well:

| | | |
|-----|------|------|
| 3X | 2400 | 1680 |
| 4X | 2412 | 1670 |
| 5X | 2375 | 1600 |
| 6X | 2593 | 1740 |
| 7X | 2304 | 1513 |
| 11X | 2595 | 1750 |
| 12X | 2401 | 1620 |
| 19X | 2484 | 1680 |
| 20X | 1982 | 1270 |

(1) By NDI - Sample (2)
Field Measurement

(2) By CDM - Sample (2)

Conductivity 25°C, umhos/cm

1000

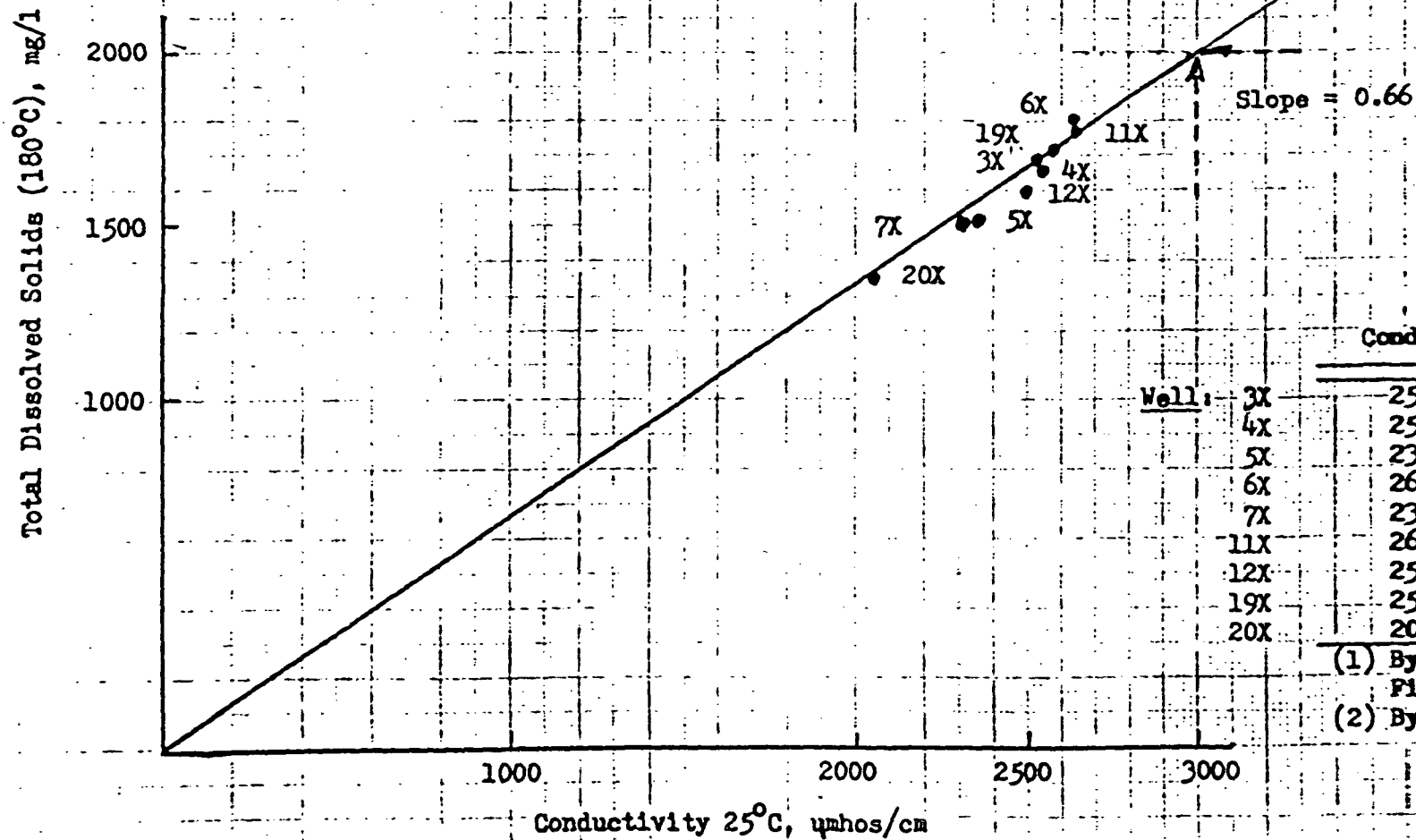
2000

2500

3000

TOTAL DISSOLVED SOLIDS VS CONDUCTIVITY

Samples taken 4/17 - 4/20/78



| Well: | (1) | | (2) | |
|-------|-----------|--|-------------|--|
| | Cond 25°C | | TDS (180°C) | |
| 3X | 2528 | | 1690 | |
| 4X | 2575 | | 1680 | |
| 5X | 2350 | | 1520 | |
| 6X | 2625 | | 1800 | |
| 7X | 2315 | | 1520 | |
| 11X | 2641 | | 1790 | |
| 12X | 2500 | | 1600 | |
| 19X | 2579 | | 1710 | |
| 20X | 2040 | | 1370 | |

(1) By NDI - Sample (2)
Field Measurement
(2) By CDM - Sample (2)

TOTAL DISSOLVED SOLIDS VS CONDUCTIVITY

Samples taken 5/1 - 5/4/78

Total Dissolved Solids (180°C), mg/l

2000
1500
1000

Slope = 0.66

20X

5X

12X

19X

6X

4X

12X

7X

Well:

3X
4X
5X
6X
7X
11X
12X
19X
20X

(1) Cond 25°C (2) TDS (180°C)

| | |
|------|------|
| 2553 | 1680 |
| 2553 | 1640 |
| 2316 | 1550 |
| 2620 | 1760 |
| 2316 | 1480 |
| 2623 | 1760 |
| 2441 | 1620 |
| 2560 | 1710 |
| 2040 | 1230 |

(1) By NDI - Sample (2)
Field Measurement
(2) By CDM - Sample (2)

Conductivity 25°C, μ mhos/cm

1000 2000 2500 3000

TOTAL DISSOLVED SOLIDS VS CONDUCTIVITY

Samples taken 5/15 - 5/18/78

Total Dissolved Solids (180°C), mg/l

2000

1500

1000

Slope = 0.66

20X

7X

5X

12X

19X

4X

11X

6X

Well:

3X

4X

5X

6X

7X

11X

12X

19X

20X

Cond 25°C (1)

TDS (180°C) (2)

2510

1680

2500

1660

2310

1520

2619

1730

2287

1500

2620

1790

2413

1600

2553

1710

2021

1320

(1) By NDI - Sample (2)

Field Measurement

(2) By CDM - Sample (2)

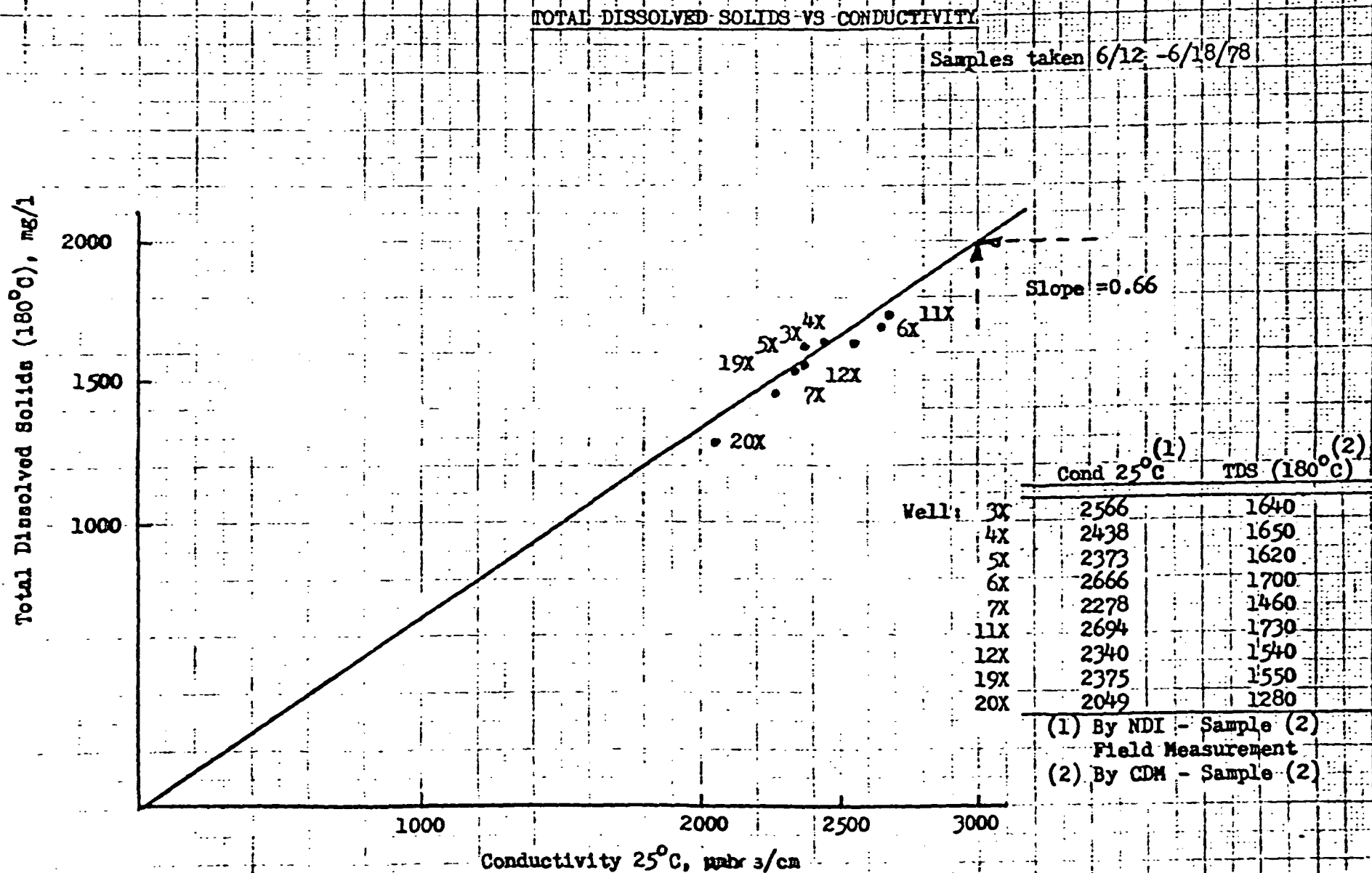
1000

2000

2500

3000

Conductivity 25°C, μ mhos/cm



TOTAL DISSOLVED SOLIDS VS CONDUCTIVITY

Well 789V

Process Water/Buffer

Samples taken: 5/12/78
5/26/78
6/13/78

Total Dissolved Solids (180°C), mg/l

2000

1500

1000

Slope = 0.66

Cond 25°C (1) TDS (180°C) (2)

Well: 789V

5/12
5/26
6/13

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| | |
|------|------|
| 2525 | 1690 |
| 2453 | 1700 |
| 2608 | 1720 |

(1) By NDI - Sample (2)
Field Measurement
(2) By CDM - Sample (2)

1000

2000

2500

3000

Conductivity 25°C, μ mhos/cm