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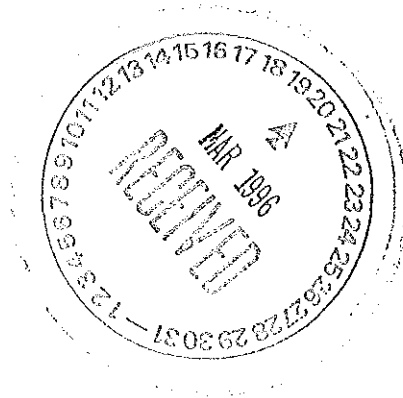
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REV. 1

**SUPPLEMENT TO THE
BASELINE RISK ASSESSMENT
OF GROUND WATER CONTAMINATION
AT THE URANIUM MILL TAILINGS SITE
NEAR SHIPROCK, NEW MEXICO
APRIL 1994**

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**SUPPLEMENT TO THE BASELINE RISK ASSESSMENT OF
GROUND WATER CONTAMINATION AT THE
URANIUM MILL TAILINGS SITE NEAR SHIPROCK, NEW MEXICO**

April 1994

**Prepared for
U.S. Department of Energy
Environmental Restoration Division
UMTRA Project Team
Albuquerque, New Mexico**

**Prepared by
Jacobs Engineering Group Inc.
Albuquerque, New Mexico**

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SUPPLEMENT 1

**HUMAN HEALTH RISK ASSESSMENT METHODOLOGY
FOR THE UMTRA GROUND WATER PROJECT**

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DOE/AL/62350-170
REV. 0

HUMAN HEALTH RISK ASSESSMENT METHODOLOGY FOR THE UMTRA GROUND WATER PROJECT

November 1994

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**HUMAN HEALTH RISK ASSESSMENT
METHODOLOGY FOR THE
UMTRA GROUND WATER PROJECT**

November 1994

**Prepared for
U.S. Department of Energy
UMTRA Project Office
Albuquerque, New Mexico**

**Prepared by
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ABSTRACT

This document presents the method used to evaluate human health risks associated with ground water contamination at inactive uranium processing sites. The intent of these evaluations is to provide the public and remedial action decision-makers with information about the health risks that might be expected at each site in a manner that is easily understood. The method 1) develops probabilistic distributions for exposure variables where sufficient data exist, 2) simulates predicted exposure distributions using Monte Carlo techniques, and 3) develops toxicity ranges that reflect human data when available, animal data if human data are insufficient, regulatory levels, and uncertainties. Risk interpretation is based on comparison of the potential exposure distributions with the derived toxicity ranges. Graphic presentations are an essential element of the semiquantitative interpretation and are expected to increase understanding by the public and decision-makers.

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LIST OF ACRONYMS

<u>Acronym</u>	<u>Definition</u>
ACL	alternate concentration limit
ANOVA	analysis of variance
DOE	U.S. Department of Energy
EPA	U.S. Environmental Protection Agency
ESADDI	estimated safe and adequate daily dietary intake
IRIS	Integrated Risk Information System
MCL	maximum concentration limit
NEPA	National Environmental Policy Act
PEIS	programmatic environmental impact statement
QA	quality assurance
QC	quality control
RDA	recommended dietary allowance
RMSE	root mean squared error
SOWP	site observational work plan
UMTRA	Uranium Mill Tailings Remedial Action
UMTRCA	Uranium Mill Tailings Radiation Control Act

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1.0 BACKGROUND

RISK ASSESSMENT APPLICATIONS ON THE UMTRA GROUND WATER PROJECT

Risk assessment is a tool that aids remedial action decision-making on the Uranium Mill Tailings Remedial Action (UMTRA) Ground Water Project. Although the Uranium Mill Tailings Radiation Control Act (UMTRCA) specifies maximum concentration limits (MCL) for some contaminants and background concentrations for others, risk-based decision making will nonetheless be implemented on the Project for the following reasons:

- Compliance with the National Environmental Policy Act (NEPA) requires any potential public health or environmental impacts of contaminants to be addressed.
- Background concentrations may be needlessly restrictive for contaminants for which MCLs have not been derived.
- Multiple contaminants may be additive, synergistic, potentiating, or antagonistic with respect to toxicity.
- For sites where poor background water quality precludes the use of ground water for drinking, less stringent risk-based standards may be applicable for ground water uses other than drinking.
- Risk-based alternate concentration limits (ACL) may be sought at sites where there is no potential point of exposure for a distance from the site.

The methodology presented here will be used to prepare multiple site-specific documents. The Ground Water Project's programmatic environmental impact statement (PEIS) (DOE, 1994) presents the framework for determining remedial action strategies. The PEIS also describes the manner in which risk assessment will be applied to various steps of the remedial action decision-making process. Because risk assessment plays a part in the decision-making strategy, this risk assessment methodology is documented in the PEIS.

The first risk assessments to be done on the UMTRA Project are the baseline risk assessments. These risk assessments are baseline in that they describe preremedial ground water conditions at the site and are usually based on preliminary or limited data. The baseline risk assessments are conducted concurrently with the completion of the PEIS. Data gaps identified in the baseline risk assessments will be addressed in site observational work plans (SOWP). Upon completion of site characterization as identified in the SOWP, a remedial action strategy will be proposed in a site-specific NEPA document (for example, an environmental assessment or environmental impact statement). For these NEPA documents, risks will be further evaluated using this risk assessment methodology but incorporating additional data. Additionally, risks posed by any proposed remedial action will be evaluated. Finally, applicable site standards will be proposed in the NEPA documents, which may

include UMTRCA MCLs, background levels, and/or risk-based ACLs or supplemental standards.

Although the format of this methodology is oriented toward the preparation of stand-alone baseline risk assessments, it is also intended for use in subsequent risk assessment applications. Additionally, results derived using this method are designed for easy incorporation into public presentations.

DEVELOPMENT OF THE RISK ASSESSMENT METHODOLOGY

The assessment of risk to public health by potential exposure to environmental contaminants is typically conducted according to the method developed by the U.S. Environmental Protection Agency (EPA) for the Superfund program (EPA, 1989). The EPA method involves determining a point estimate for excess cancer risk from current or potential carcinogenic exposures and a hazard quotient (ratio of the exposure intake to an acceptable intake) for noncarcinogenic exposures. This method is a useful screening tool for comparing diverse sites on a relatively equivalent basis. The UMTRA Project, however, comprises 24 sites with contaminants of concern and pathways that are largely the same. By implementing a more detailed and comprehensive methodology, potential health effects from ground water contamination can be evaluated more accurately.

In general, a risk assessment consists of four components:

- Data evaluation.
- Exposure assessment.
- Toxicity assessment.
- Risk characterization.

This framework was used as the basis for the UMTRA Ground Water Project risk assessment methodology. Within this framework, the application of probabilistic methods to exposure assessment and methods to improve the characterization of uncertainties and toxicity were explored. Based on extensive review of current literature on risk assessment methodologies and discussions with regulatory agencies, scientists, and professionals in the field, it was determined that, while probabilistic methods offered a means of incorporating variability into assessments, data often are too limited to allow the development of valid distributions. The increased variability and potential sources of confusion that can be introduced by distributions based on inadequate data can outweigh the possible benefits.

This report summarizes the probabilistic and toxicity range approach. The format follows the section structure used in the baseline risk assessments for the UMTRA Project. That structure is shown by the bold-face headings contained in each section of this document. The

data used in each section are described along with the methodology used to evaluate and interpret those data. Note that the methodology described in this document may not be appropriate at all sites; for example, site-specific contaminant characterization may not be sufficient. In these cases, standard Superfund point estimates of exposure may be used.

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2.0 METHODOLOGY

Citizens' Summary

Although the citizens' summary is at the front of the risk assessment, it often is the last section to be written. It summarizes, in terms understandable to the general public, the document's basic purpose and the methodology used to produce it. Also summarized are the exposure pathways evaluated and the results in terms of the primary contaminants of concern for human health and environmental risk and their potential adverse effects. The citizens' summary concludes with a brief description of planned site activities and the impact of the baseline risk assessment on those activities.

Section 1.0 INTRODUCTION

This section describes the purpose of the risk assessment, the status of the site with respect to surface and ground water activities, and the overall approach to risk assessment. The concept of probabilistic risk assessment, if appropriate for a given site, is introduced here. The EPA's basic framework for evaluating risk at Superfund sites is followed. At sites with sufficient available data, probabilistic distributions are used to evaluate exposure and to incorporate known, properly characterized sources of variability. The toxicity of specific contaminants is graphically summarized in ranges. Risk is evaluated by combining these two aspects in a semiquantitative graphical presentation.

Section 2.0 SITE DESCRIPTION

The history of uranium milling operations and subsequent land use at the site is presented in this section. This history includes relevant background information such as geographical location and climate. A hydrogeological summary of ground water occurrence and movement in the site region is presented that defines all relevant aquifers and gives the locations of monitor wells. Surface water occurrence and movement is described, land use in the region is summarized, and ground water use by area residents is specified. A recent survey of ground water use is included with any regional drinking water supply information that may alter either the use of ground water or the source of residents' drinking water (for example, plans for new municipal wells or the alteration of central distribution systems to service additional regions).

Section 3.0 EXTENT OF CONTAMINATION

In this section, chemical analysis data from ground water wells are used to develop a geochemical characterization of background and site ground water quality. The horizontal and vertical extent of contamination is estimated to the extent possible. The selection of wells and water sampling dates for use in the characterization is defended for each water-bearing unit discussed. This section typically contains tables summarizing recent ground water quality data from background, on-site, and/or downgradient wells. Using defensible

statistical inferential methods and knowledge of the site, contaminants are identified by comparing on-site water quality to background levels. A subset of these contaminants will represent the contaminants of potential concern to human health. The methodologies used for evaluating data and determining contaminants of potential concern are discussed more fully below. For each contaminant of potential concern, Section 3.0 discusses probable speciation, mechanisms controlling transport, and mechanisms controlling attenuation in the aquifer matrices.

Depending on the site, Section 3.0 may include anything from a brief to an extensive discussion of surface water quality.

Methodology for data evaluation

To evaluate the level of risk associated with a particular site, site-related ground water contaminants and their concentrations must be identified. The goal, as defined by the EPA, is to calculate a reasonable maximum exposure. When feasible (for example, when there are no geographic restrictions) monitor wells from the most contaminated part of the plume should be evaluated.

UMTRA Project risk assessments use the entire history of water quality measurements collected by the U.S. Department of Energy (DOE) to find the probable location of the worst current ground water contamination. This determination comes from a technical review by site hydrologists and geochemists of data from wells on and near the site. Occasionally, data from other sources such as the Bureau of Reclamation are considered for use in this evaluation if the quality of sample collection and analysis activities can be assessed and the results are compatible with UMTRA Project quality assurance (QA) requirements. These data are used to assess the presence of contamination in a well.

Because of differences in geochemistry across the site, and because more than one source of contamination may have existed, there is often no single well or group of wells with the highest average concentration of every site-related constituent. In such cases, plume water quality for a constituent is quantified from the well or wells consistently exhibiting the highest levels of that contaminant. In essence, this creates a hypothetical reasonable-maximum-case well that typifies the worst water quality near the center of the plume. Although this may seem excessively conservative, well coverage at a site is often not sufficient to rule out the possibility that water quality somewhere under the site could be worse than that represented by the hypothetically worst-case wells.

Background water quality levels are sought from among the wells upgradient or crossgradient from the site. It is important that the selected wells are not suspected of having been affected by site activities. Location, well completion logs, hydrologic properties such as water levels, and several sampling rounds showing stable concentrations of major constituents are used to justify the choice of background wells. Since background water quality is likely

to vary geographically and temporally, more than one well and more than one sampling round are used to quantify background levels whenever possible.

Water quality data from several sampling rounds of the hypothetically worst case wells are compared to measurements from background wells to determine whether the average concentrations measured in plume waters are higher than background levels. A list of site-related contaminants can then be developed for further evaluation.

The selected statistical comparison method should have adequate power to detect important differences in background and plume water quality while controlling the probability of a false positive result at a reasonably low specified level. Selecting a statistical method requires the consideration of many site-specific factors. For example, the amount of data, its analytical quality, and the frequency of nondetects in the water quality database may impact the choice of statistical method. Rank-based procedures, such as the Mann-Whitney test, are selected for use on small data sets, data sets of suspect analytical quality, or data sets with a high percentage of nondetects.

Some sites also have additional significant sources of variability (for example, a pronounced sampling-date effect, time trends in concentration levels, or heterogeneous background water quality) that, if improperly accounted for, may invalidate the statistical results. These cases require a more complicated linear model. The normal-based analysis of variance (ANOVA) procedure is used when the assumptions of normality and equality of variance can be justified. A logarithmic transformation of the concentration data often improves the quality of the statistical analysis. The risk assessment text describes the statistical tools used to distinguish site-related contaminants from background levels.

Determination of contaminants of potential concern

Constituents identified statistically as exceeding background levels are subsequently screened for their potential to cause adverse health effects. A constituent may be eliminated from further consideration if levels found in plume waters are in the nutritional range when added to expected dietary intakes or if the constituent is known to have very low toxicity as described below. Constituents that are not eliminated in the screening process are considered throughout the risk assessment.

Many inorganic contaminants associated with the UMTRA Project sites are essential nutrients. Table 2.1 lists those contaminants with the applicable nutritional guidelines. Depending on the constituent, nutritional guidelines include the recommended dietary allowance (RDA), the estimated safe and adequate daily dietary intake (ESADDI), and the minimum daily requirement. RDAs are federal standards that reflect the best estimate of the intake level required to meet the nutritional needs of nearly all healthy people. RDAs are recommendations, not requirements, and they include generous safety margins both above and below the range of intake that is considered safe. RDAs have been established for calcium, iodine, iron, magnesium, phosphorous, selenium, and zinc. Minimum daily intake

Table 2.1 Nutritional criteria for frequently detected contaminants at UMTRA Project sites

	Age (yr)	Weight (kg)	Ca ^a (mg)	Mg ^a (mg)	Fe ^a (mg)	Zn ^a (mg)	Se ^a (µg)
Infants	0-0.5	6	400	40	6	5	10
	0.5-1	9	600	60	10	5	15
Children	1-3	13	800	80	10	10	20
	4-6	20	800	120	10	10	20
	7-10	28	800	170	10	10	30
Males	11-14	45	1200	270	12	15	40
	15-18	66	1200	400	12	15	50
	19-24	72	1200	350	10	15	70
	25-50	79	800	350	10	15	70
	51+	77	800	350	10	15	70
Females	11-14	46	1200	280	15	12	45
	15-18	55	1200	300	15	12	50
	19-24	58	1200	280	15	12	55
	25-50	63	800	280	15	12	55
	51+	65	800	280	10	12	55
Pregnant			1200	300	30	15	65
Lactating			1200	340-355	15	16-19	75
Dietary range			700-1300 (male mean)	349 mg/day	9-35 mg/day	5.5-15 mg/day	83-129 µg/day
			750-1000 (female mean)				
			mg/day				

^aFrom National Research Council (1989), expressed as average daily intakes over time.

Table 2.1 Nutritional criteria for frequently detected contaminants at UMTRA Project sites (Concluded)

	Age (yr)	Weight (kg)	Cu ^b (mg)	Mn ^b (mg)	F ^b (mg)	Cr ^b (µg)	Mo ^b (µg)
Infants	0-0.5	6	0.4-0.6	0.3-0.6	0.1-0.5	10-40	15-30
	0.5-1	9	0.6-0.7	0.6-1.0	0.2-1.0	20-60	20-40
Children and adolescents	1-3	13	0.7-1.0	1.0-1.5	0.5-1.5	20-80	25-50
	4-6	20	1.0-1.5	1.5-2.0	1.0-2.5	30-120	30-75
	7-10	28	1.0-2.0	2.0-3.0	1.0-2.5	50-200	50-150
	11+	45	1.5-2.5	2.0-5.0	1.5-2.5	50-200	75-250
Adults			1.5-3.0	2.0-5.0	1.5-2.5	50-200	
					1.5-4.0		
Dietary range			0.45-1.2 mg/day	1.1-2.8 mg/day	0.23-1.8 mg/day	25-33 µg/day	120-240 µg/day

^bFrom National Research Council (1989), expressed as ranges of recommended intake, because limited information is available on which to base allowances.

	Age (yr)	Weight (kg)	Na ^c (mg/day)	Cl ^c (mg/day)	K ^c (mg/day)
Months	0-5	4.5	120	180	500
	6-11	8.9	200	300	700
Years	1	11.0	225	350	1000
	2-5	16.0	300	500	1400
	6-9	25.0	400	600	1600
	10-18	50.0	500	750	2000
	> 18	70.0	500	750	2000
Pregnant			569		
Lactating			635		
Dietary range			1800-5000 mg/day	6000 mg/day	2500 mg/day

^cFrom National Research Council (1989), minimum requirements of healthy persons.

kg - kilogram
mg - milligram
µg - microgram
yr - year

Ca - calcium.
Mg - magnesium.
Na - sodium.
Cl - chloride.
K - potassium.
Fe - iron.

Zn - zinc.
Se - selenium.
Cu - copper.
Mn - manganese.
F - fluoride.
Cr - chromium.
Mo - molybdenum.

requirements have been established for sodium, chloride, and potassium. ESADDIs have been established for minerals for which there are data sufficient to estimate a range of requirements but insufficient to establish RDAs. These minerals include chromium, copper, fluoride, manganese, and molybdenum. The upper limit of the ESADDIs should not be habitually exceeded since the toxic level for many of the trace elements may be only slightly greater than the usual intake levels.

Several additional factors must be considered when contaminants of potential concern are screened on a nutritional basis. First, what level of a nutrient does the diet typically provide and what increment to this amount can be tolerated without adverse effects? Some nutrients, such as calcium, can be tolerated at levels several times their nutritional criteria. For others, such as molybdenum, the margin between nutritional allowance and toxicity is relatively small. When evaluating toxicity in comparison to dietary values, it is also important to consider whether the nutrient has a greater bioavailability (and potentially greater toxicity) in water than in food. Additional considerations in screening nutrient metal contaminants include 1) whether the contaminant is likely to interact additively or synergistically with, or to enhance the effects of, other contaminants, and 2) whether the contaminant could biomagnify in the food chain to the extent that food pathways contribute more than the levels estimated for drinking water intakes. With all of these factors, the confidence level of the toxicity data must also be considered.

Contaminants other than nutrients may be eliminated from the list of contaminants of potential concern because of their low toxicity and because levels detected at the site would not be associated with adverse effects. Some of these contaminants may have EPA-derived acceptable intake levels (reference doses). To account for the potential additive effects of contaminants, a contaminant with a reference dose can generally be screened out if drinking water ingestion would result in intakes of less than one-tenth the reference dose. As in screening nutrient contaminants of potential concern, the following factors must be considered in the low toxicity screening: additional dietary intake; margin of safety below toxicity and the severity of the potential toxicity; bioavailability; biomagnification; additive, synergistic, or potentiating interactions with other contaminants; and uncertainty in the toxicity data.

Section 4.0 EXPOSURE ASSESSMENT

Pathways

Pathways of concern for contaminated ground water at UMTRA Project sites are summarized in the generic conceptual model shown in Figure 2.1. Exposure through inhalation pathways is not evaluated because UMTRA Project ground water contaminants are primarily nonvolatile contaminants (i.e., metals, nitrate, and sulfate). Although inhalation of mists could result from showers or irrigation, it is considered negligible compared to water ingestion. However, further evaluation of this exposure route may be warranted under some conditions. Similarly, irrigation could cause contaminant buildup in soil that may be of concern in some scenarios.

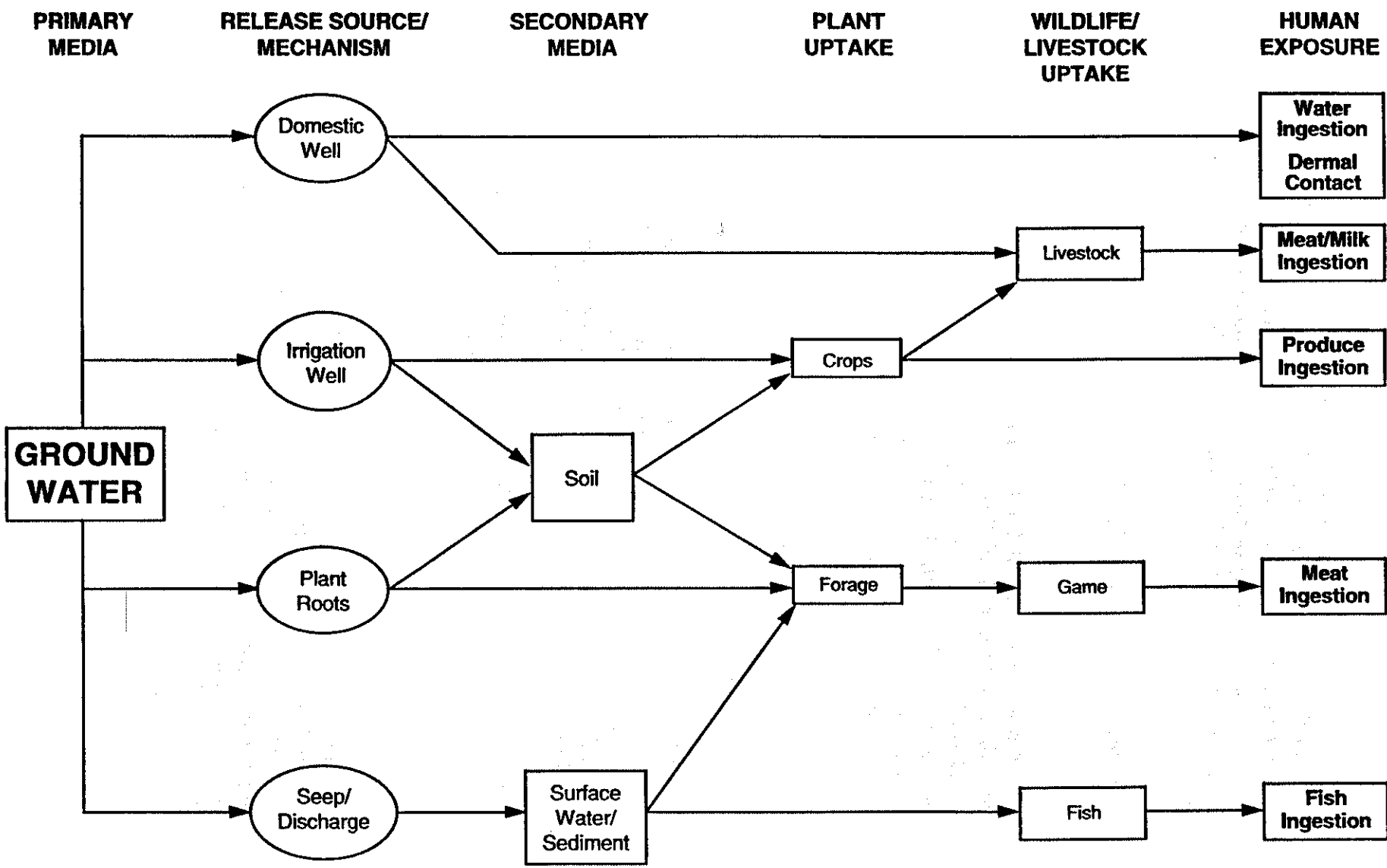


FIGURE 2.1
GENERIC CONCEPTUAL MODEL

Typically, drinking water ingestion is the ground water exposure route that leads to the greatest contaminant intake. That route includes direct consumption as well as ingestion of water used in food preparation and cooking. Other potential ground water exposure routes include dermal absorption while bathing or swimming, ingestion of produce irrigated with ground water, and ingestion of meat and milk from livestock that have consumed ground water. Dermal absorption is estimated in the following equation:

$$\text{Exposure dose (mg/kg-day)} = \frac{C_w \times SA \times P_c \times C_f \times ET \times EF \times ED}{BW \times AT}$$

Where:

- C_w = Concentration in water (milligrams per liter [mg/L]).
- S_A = Skin surface area (19,400 square centimeters [cm²]).
- P_c = Dermal permeability constant (0.001 cm per hour).
- C_f = Conversion factor (0.001 liters per cubic centimeter [L/cm³]).
- E_T = Exposure time (0.2 hour per day).
- E_F = Exposure frequency (days per year).
- E_D = Exposure duration (year).
- B_W = Body weight (70 kilograms [kg]).
- A_T = Averaging time (exposure duration x 365 days per year for noncarcinogens, and 70 years x 365 days per year for chemical carcinogens).

Since there are no chemical-specific dermal absorption factors (dermal permeability constants), it is assumed that contaminants are absorbed across intact skin at the same rate as water. Because metals generally are poorly absorbed across intact skin, this assumption is likely to overestimate the potential contribution from the dermal exposure route. When this estimate is compared to the standard intake of drinking water (2 liters [L] per day for a person of 70-kg body weight) for the same exposure duration assumptions, this exposure route is estimated to contribute 0.2 percent of the dose associated with drinking water. Since the assumptions for this dermal calculation are believed to overestimate exposure, and since this route provides less than a 1 percent incremental contribution to dose, this pathway is not evaluated further in the baseline risk assessments unless site-specific factors indicate the evaluation to be appropriate.

Since some metals biomagnify in plants, the irrigated-produce ingestion exposure route may contribute significantly to exposure. This exposure route, however, cannot be meaningfully evaluated based on current data, and plant uptake studies are therefore being conducted for the UMTRA Ground Water Project. This exposure route analysis is deferred until results of these studies are available. For most sites, the baseline risk assessment is conducted without these results, which are presented in the site-specific NEPA document. Since meat/milk ingestion is also dependent on these results, these exposure route analyses (where applicable) are also deferred.

Exposure algorithms

The dominant human pathway for ground water toxicity is likely to be drinking contaminated ground water. Exposures are evaluated separately for noncarcinogenic and carcinogenic effects of contaminants. A contaminant may have only noncarcinogenic effects (for example, molybdenum) or noncarcinogenic and carcinogenic effects (for example, arsenic). Additionally, carcinogenic effects for chemical carcinogens and radionuclide carcinogens are calculated separately.

$$\text{Exposure dose (mg/kg-day)} = \frac{C_w \times IR \times EF \times ED}{BW \times AT}$$

Where:

- C_w = Concentration in water (mg/L).
- IR = Ingestion rate (liters per day).
- EF = Exposure frequency (days per year).
- ED = Exposure duration (years).
- BW = Body weight (kg).
- AT = Averaging time (exposure duration x 365 days per year for noncarcinogens, and 70 years x 365 days per year for chemical carcinogens).

Toxicity of noncarcinogenic contaminants in drinking water depends primarily on the average intake of a contaminant per kilogram of body weight per day. These intakes can be calculated for short-term or long-term exposures. The same algorithm is used to calculate carcinogenic risk from chemical (nonradionuclide) carcinogens. Although carcinogenicity is considered cumulative over a lifetime, the exposure for chemical carcinogens is calculated in milligrams per kilogram per day (mg/kg-day). This is because EPA-derived cancer slope factors (risk per mg/kg-day) for chemical carcinogens correlate estimated daily intakes averaged over a lifetime (measure in mg/kg-day) to incremental cancer risk.

Risk from radioactive contaminants present in the ground water depends on total exposure over time rather than on average daily exposure. In addition, the body weight factor is relatively insignificant in determining carcinogenic risk. Exposure to a carcinogenic radionuclide is therefore quantified as total exposure to radioactivity throughout an individual's exposure duration:

$$\text{Exposure (pCi/lifetime)} = C_w \times IR \times ED \times EF$$

Where:

- C_w = Concentration in water (picocuries per liter [pCi/L]).
- IR = Ingestion rate (liters per day).
- ED = Exposure duration (years).
- EF = Exposure frequency (days per year).

The variables specified above can encompass a wide range of possible values. Ground water conditions are dynamic, and people naturally vary in body weight, consumption habits, and their length of residency within an affected area. Consequently, health risks associated with ground water consumption will also vary among members of the population. To adequately describe a population's range of potential exposures, probability distributions are developed for the exposure variables when sufficient data exist.

Development of concentration distributions

Where sufficient site data exist, probability distributions are used to describe ground water concentrations in the contaminated (plume) area. A probability distribution provides a range of concentrations over the exposure period that may reasonably occur in ground water taken from the area of a site that is presumably most contaminated. The distribution also provides a measure of the relative likelihood of the various values in that range. Probability distributions include the minimum, maximum, and average observed concentrations. They also measure the likelihood of encountering water at various levels of contamination throughout the range of ground water contamination concentrations for that area of the plume. Development of a contaminant concentration distribution involves the following steps:

1. One or more wells are identified that show comparable levels of contamination consistently higher than all other monitor wells screening the same aquifer.
2. Extending back from the present, a time interval is determined for which it is appropriate to include data (for example, the interval during which contaminant levels in these wells have remained relatively stable, quality assurance/quality control (QA/QC) of data was conducted, and detection limits are acceptable).
3. All independent measurements taken from the wells during this time interval are pooled into a single data set. Data are graphically displayed using histograms and/or box plots.
4. A theoretical probability distribution is selected that mimics the basic shape of the sample data. The mean and standard deviation of the theoretical distribution are set equal to the mean and standard deviation of the sample data.
5. The theoretical distribution is truncated in the right tail at the 99th percentile to set an upper limit on the level of realistic potential contamination. This level of truncation is somewhat arbitrary, but in practice it has resulted in an upper limit approximately 5 to 10 percent above the highest observed level of a contaminant in the sample data.

This procedure assumes that variation in historical data can be used to predict near-future variation in concentrations at the sites. This assumption is questionable when historical data show an obvious upward or downward trend over time. In these cases, linear regression methods are used to predict the current level of the contaminant and to estimate the amount

of random variation around the trend line (the root mean squared error [RMSE]). The probability distribution is then centered on the predicted current concentration of the contaminant, with standard deviation set equal to the RMSE. Figure 2.2 shows an example of a concentration distribution for molybdenum.

The probability distributions used for UMTRA Project risk assessments describe random variation in water quality within a relatively small geographical area and during relatively short time intervals; typically, the time interval between sampling events is 1 year or less. The distributions are therefore optimized for assessment of acute to subchronic exposure. This is generally appropriate since the concentrations of several contaminants at some UMTRA Project sites are at levels associated with acute toxicity.

Development of other exposure factors

Body weight and average daily water intake distributions, by age group, are based on data from large national surveys. Extensive national data on weights and ages of men and women were collected by the National Health and Nutrition Survey between 1976 and 1980. These data were used to develop lognormal probability distributions for body weight by age and separately by gender. The distributions for each gender were then combined using census data on the national ratio of men to women within each age group. Body weight distributions for the three age groups are shown in Figure 2.3.

Lognormal probability distributions, by age, were also used to describe variation in area residents' average daily intake of tap water. These distributions were developed from data the U.S. Department of Agriculture collected during a 1977-1978 nationwide food consumption survey (Roseberry and Burmaster, 1992). The survey recorded total tap water consumption during a 3-day period for 26,081 survey participants. Distributions for body weight and ingestion rates for 0- to 1-year-olds, 1- to 10-year-olds, and 11- to 65-year-olds were developed. This age grouping was selected because intake-to-body-weight ratios are similar and toxicokinetics are typically comparable within these groups. These ingestion rate distributions are shown in Figure 2.4. Although these two variables are treated as independent variables in the exposure distributions, there likely is a correlation between weight and water ingestion rates.

Use of distributions based on national data requires an assumption that the distributions of body weight and water ingestion as well as the ratio of men to women among residents in the vicinity of an UMTRA Project site are comparable to those for the nation as a whole. The assumption is probably reasonable for body weight and gender ratios. Since many sites are in the arid west, however, site-specific ingestion rates might vary considerably from the national average.

The exposure frequency (days per year) and the exposure duration (years) are also likely to vary from individual to individual within a community. Part-time residency and vacation patterns among full-time residents affect the exposure frequency. Variance in exposure

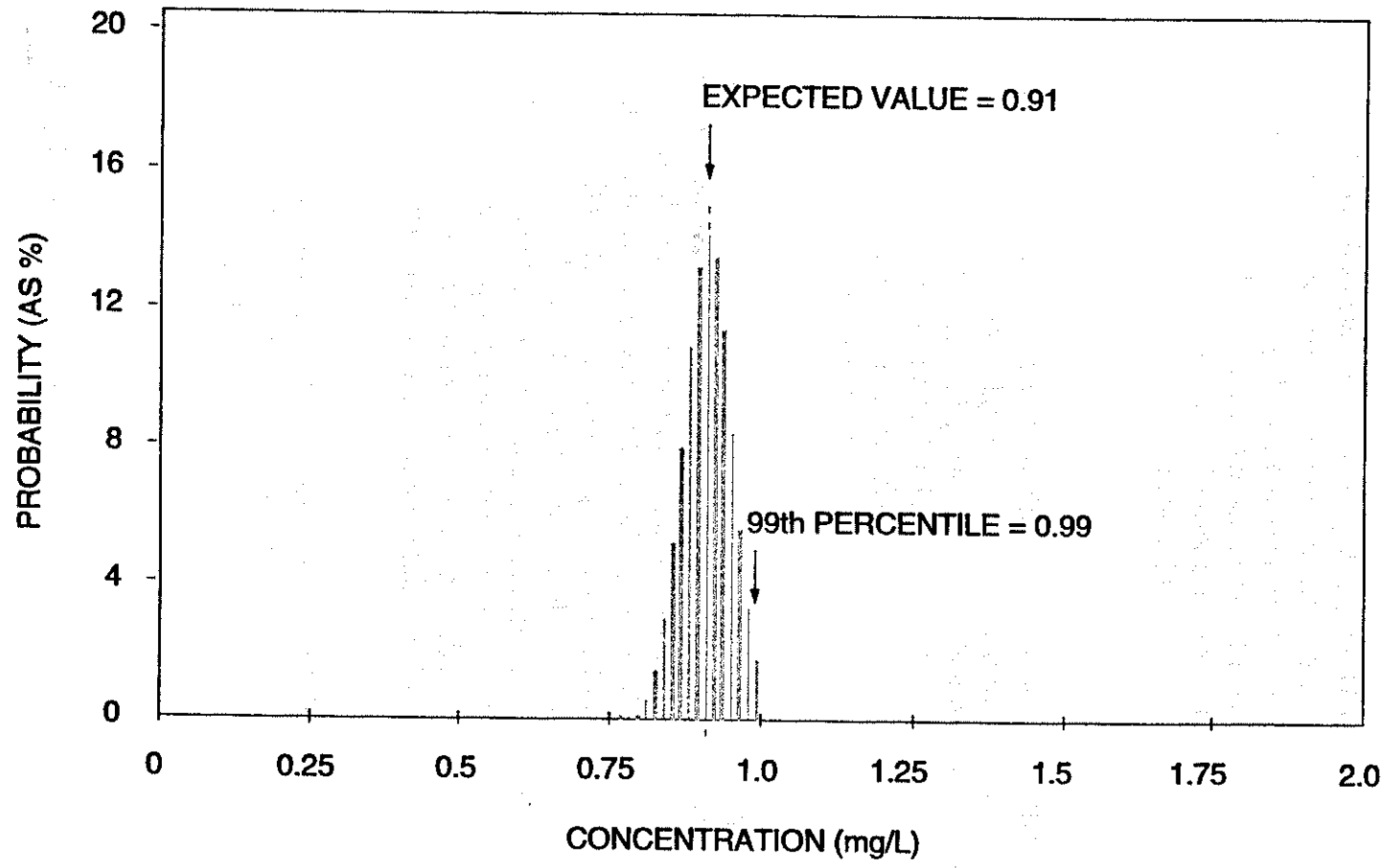


FIGURE 2.2
PROBABILITY DISTRIBUTION OF MOLYBDENUM CONCENTRATIONS

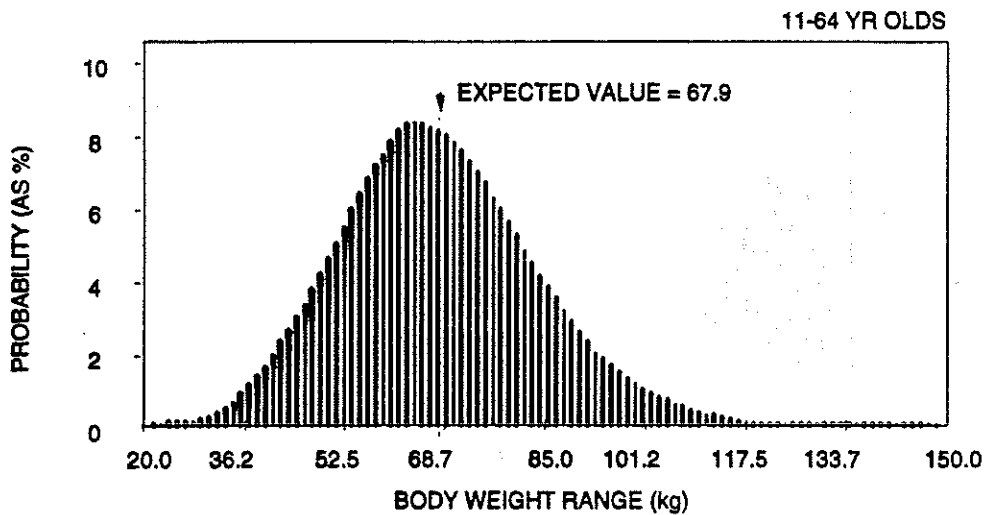
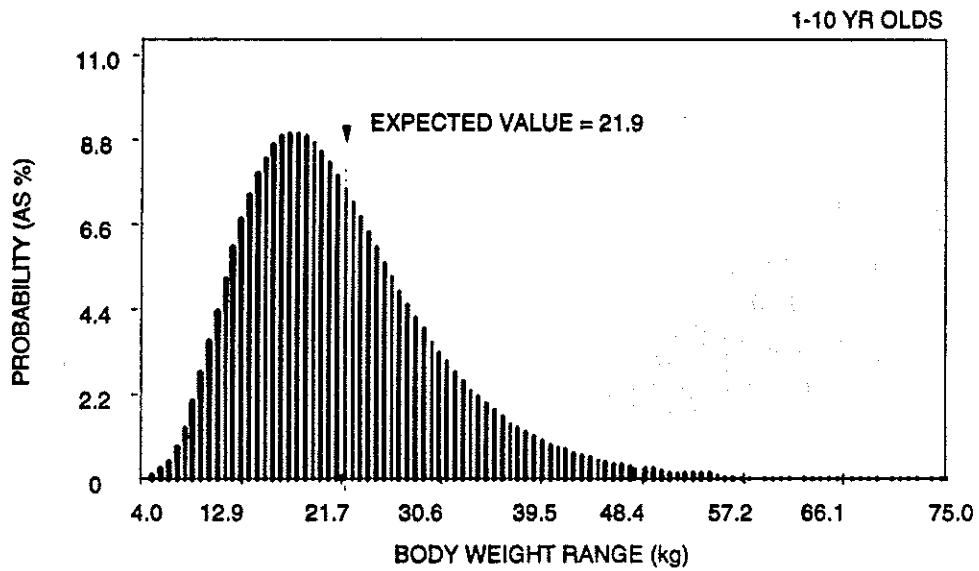
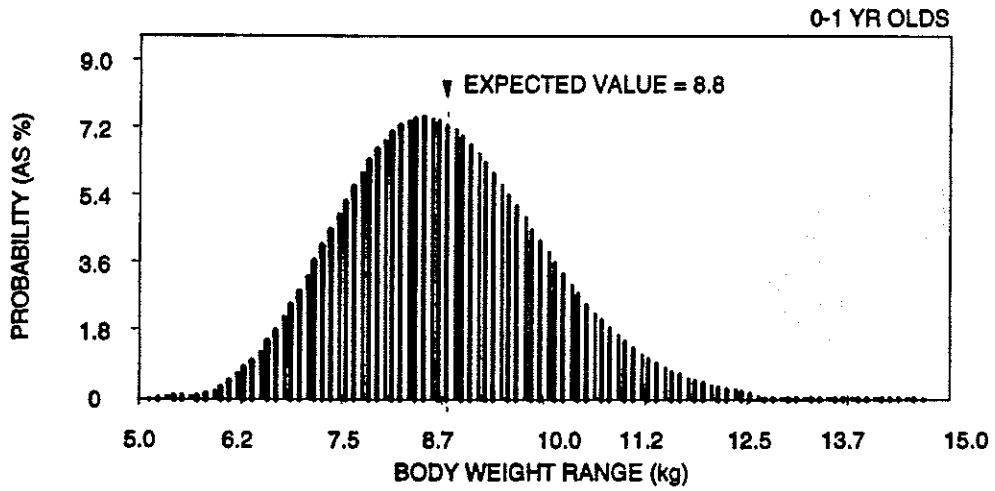


FIGURE 2.3
PROBABILITY DISTRIBUTIONS FOR BODY WEIGHT

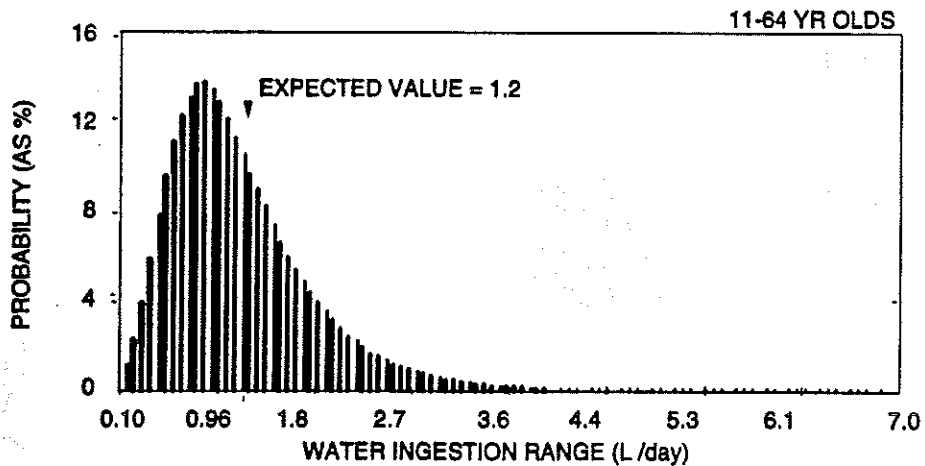
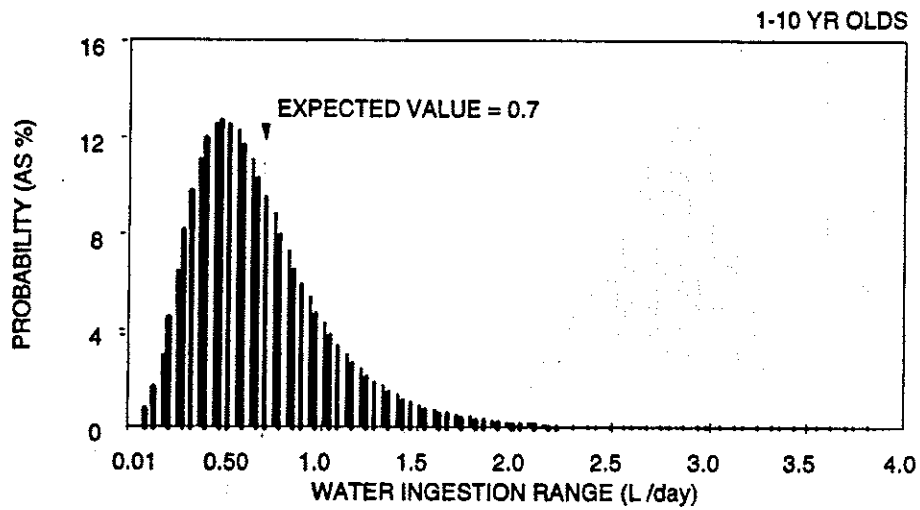
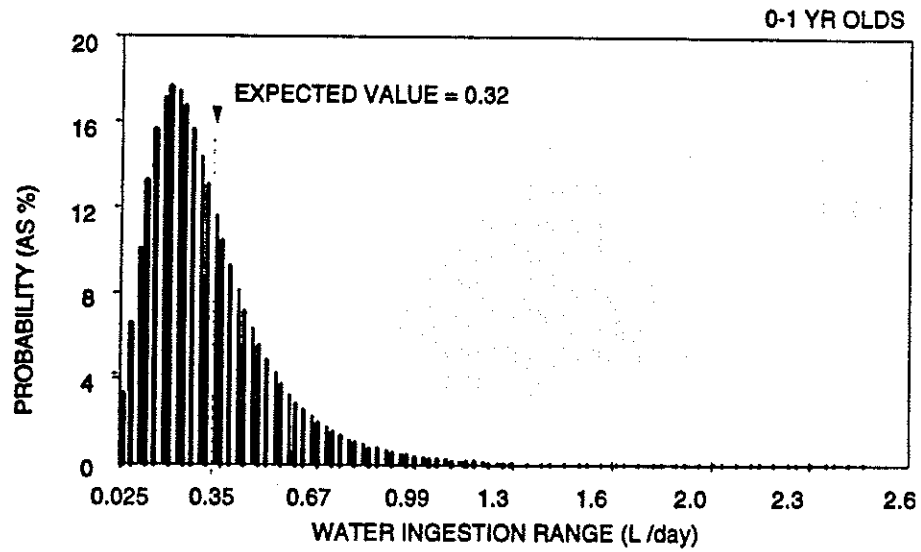


FIGURE 2.4
PROBABILITY DISTRIBUTIONS FOR TAP WATER INGESTION RATES

duration results principally from the movement of residents in and out of the community. These variables are clearly site-specific, and national averages may be inappropriate for the specific communities in the vicinity of UMTRA Project processing sites. Many of the sites are rural or near small towns where residency is stable. The population of such sites may reasonably be considered lifetime residents. The Native American populations in the vicinity of five UMTRA Project sites (Mexican Hat, Utah; Monument Valley, Arizona; Shiprock, New Mexico; Riverton, Wyoming; and Tuba City, Arizona), the farming region in the vicinity of the Belfield/Bowman, North Dakota, and Falls City, Texas, sites, and some of the rural/ranching communities probably follow this general pattern.

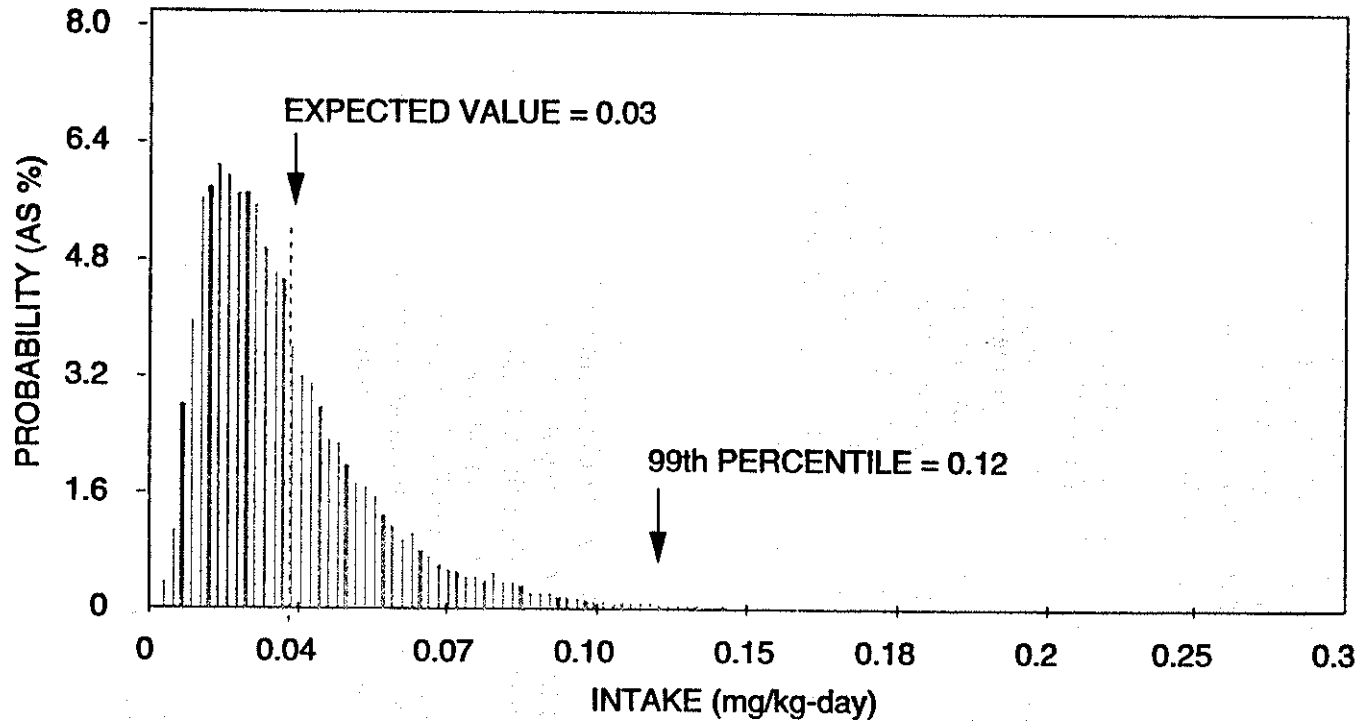
Because exposure frequency and exposure duration data are not available in sufficient detail to allow construction of site-specific distributions, assumed default values are used for these two variables. Since exposure frequency and exposure duration essentially cancel out with averaging time in calculations for noncarcinogens, these factors are primarily of concern for estimating lifetime cancer risks and do not affect acute or chronic toxicity interpretations. However, for radionuclide carcinogens, the exposure frequency default value used is 350 days per year, which allows for a two-week vacation or absence from the residence. For estimating lifetime cancer risks, exposure duration defaults are 30 years for towns with a strong economic base; 50 years for farm, ranch, or rural communities; and 70 years for Native American populations or other sites where the population has a history of permanent residency.

Simulated exposure distributions

Distributions of potential exposures are calculated using Monte Carlo simulations. These simulations repeatedly select numerical values for each of the input variables (contaminant concentrations, body weight, and ingestion rates), insert the selected values into the equations described above, and calculate the resulting exposure. For each iteration of this process, numerical values are selected according to the probability distributions for the input variable; numbers with a higher probability of occurrence in the distribution are therefore chosen more frequently. This process is repeated 10,000 times, and the exposure values resulting from these iterations are displayed in a histogram representing the range of calculated exposures. Ten thousand iterations produce a smooth distribution in a short amount of computer time and provide reliable estimates of the mean and extreme percentiles. These simulations indicate the relative likelihood of various exposure levels occurring at a site. From this distribution, percentile values can be determined that indicate the percentage of exposures expected to fall above or below a given reference point. Figure 2.5 shows an example of this intake distribution.

Section 5.0 TOXICITY ASSESSMENT

The toxicity assessment is one of the weakest aspects of the widely used standard risk assessment methodology. The UMTRA Project methodology is designed to strengthen this part of the assessment. In the standard method, the noncarcinogenic evaluation results in the calculation of a hazard quotient, which is the ratio of estimated intake to the reference dose



- || NUTRITIONAL INTAKE LEVELS
- || DIETARY INTAKE LEVELS
- ▲ ORAL REFERENCE DOSE (0.005 mg/kg-day)
- NO OBSERVED EFFECT LEVEL
- MILD TOXICITY (INCREASED COPPER EXCRETION AND URIC ACID SYNTHESIS) ----- GOUT

NOTE: 30% OF THE PREDICTED EXPOSURES IN CHILDREN WOULD BE ASSOCIATED WITH MILD TOXICITY.

FIGURE 2.5
HEALTH EFFECTS OF POTENTIAL MOLYBDENUM EXPOSURE RANGES FOR CHILDREN

or acceptable intake. This quotient is of limited use because, when the ratio exceeds 1, the quotient conveys no information regarding the type or severity of potential adverse effects. An additional limitation of the use of this ratio is that the reference dose often includes a substantial factor to account for uncertainty in the toxicity data. These factors can range from 1 to 1000, which can make hazard quotients for various contaminants difficult to compare. Perhaps the most significant drawback to the hazard quotient/index approach is that these numbers have little meaning to the public and to decision-makers. The presentation of toxicity information using the UMTRA Project risk assessment method attempts to avoid those shortcomings.

The Integrated Risk Information System (IRIS) database (EPA, 1993) forms the basis of the toxicity profiles for the contaminants of concern. This source is supplemented by 1) the Agency for Toxic Substances and Disease Registry toxicological profiles; 2) the *Handbook on the Toxicology of Metals* (Friberg et al., 1986); and 3) current literature searches to supplement evaluations with additional recent data when only limited data are available from the primary source material. Human data are preferred, but animal toxicity data are included if human data are insufficient to determine a given contaminant toxic effect or particular exposure range. In addition, toxicity data obtained from drinking water exposures are weighted more heavily than data from other routes of exposure because for many of the contaminants of concern in ground water, bioavailability of the contaminant in water versus food can play an important role in the toxicity. Additionally, chemical speciation of the contaminants under the site-specific ground water conditions is considered with respect to the ability of chemical form to alter potential toxicity.

To allow comparison across studies and with other databases, toxicity data reported in the literature surveyed are converted to milligrams intake per kilogram body weight per day based on the following conversion factors as appropriate:

Adults: 2 L of water ingestion per day; 70 kg body weight.
Children: 0.7 L of water ingestion per day; 22 kg body weight.
Infants: 0.64 L of water ingestion per day; 4 kg body weight.

The conversion factors for adults are the EPA default values (EPA, 1989) and are very similar to the expected values from the UMTRA probability distributions (ingestion = 1.8 L per day; weight = 68 kg). For children, EPA does not specify default values for the 1- to 10-year range; therefore, the expected values from the modeled distributions are used.

The expected values from the probability distributions for infants vary significantly from the EPA default values used in IRIS. The amount of domestic drinking water consumption can vary dramatically in this group because some infants are fed exclusively on canned liquid formula or breast milk while others consume more water from reconstituted liquid concentrate or powdered formula. The simulated distribution takes all infants into account and therefore results in a much lower average ingestion rate (0.32 L per day) than the default value. In addition, the EPA value defines infants as less than 4 months old, while the

simulated distributions define infants as less than 1 year old. Because the data used on infants in IRIS came primarily from the younger age group, the EPA default values were used for conversion. However, the distribution reflects the entire infant population likely to occur at UMTRA Project sites. Infants drinking only formula reconstituted with tap water would therefore belong at the upper end of the exposure distribution. These ingestion values could exceed the expected value by as much as 300 percent, but would still fall within the exposure distribution.

The toxicity values obtained in the above manner are graphed as ranges. For each contaminant, dietary and/or nutritional information is incorporated into these figures with any available regulatory values, such as EPA oral reference doses. An attempt is made to focus on the range of exposures at UMTRA Project sites by incorporating mild, severe, acute, and chronic toxic effects. Since toxicity data for most contaminants are incomplete, uncertainties are characterized on the figures by dotted lines. Animal data are represented on the toxicity range graphs by widely spaced dotted lines. Uncertainty about the beginning or ending points of toxic effects associated with particular exposure ranges is represented by closely spaced dots. Any potential interactions of the various contaminants present at a site are discussed qualitatively at the end of the toxicity section of the document.

Section 6.0 HUMAN HEALTH RISK EVALUATION

The toxicity ranges developed in the previous section are graphically superimposed on the simulated exposure distributions and presented with semiquantitative interpretations of adverse health effects that might be anticipated for the potential range of exposures. Combining the distributions presented in Figures 2.2, 2.3, and 2.4, Figure 2.5 presents the potential exposure of children to molybdenum that results from the Monte Carlo simulation. Children are used in this example because they represent the group with the greatest exposure per body weight.

The ranges of exposure resulting in specific nutritional or toxic effects are shown below the respective intake distribution graphs. Dashed lines or dots show where a toxic effect is suggested but not well established.

Potential exposures to molybdenum at the site presented in Figure 2.5 indicate that nearly all potential exposures exceed the EPA reference dose of 0.005 mg/kg-day. Approximately 30 percent of the potential exposure distribution falls above the level where mild toxicity would be expected. The additional contribution expected from background dietary intake, plus the small contribution (1 to 5 percent) anticipated from other sources, would result in a greater percentage of the distribution falling within the range of toxicity. That toxicity is largely manifested as increased copper excretion leading to copper deficiency. Intakes in the uppermost tail of the distribution might be expected to result in gout-like symptoms.

Because the simulations cover only the drinking water exposure route, additional intakes from previously screened alternate exposure pathways can be compared to toxicity ranges.

That comparison helps determine whether these intake levels would be associated with adverse health effects either when combined with the drinking water intake or when the sole exposure source is from the alternate pathway. This information is revisited to determine the expected toxicity when any of these pathways occur independently of the drinking water ingestion route or when there is a significant incremental increase to the simulated exposures.

Because cancer is a single-effect endpoint estimated for a cumulative lifetime exposure, and because cancer risks are regulated separately under the National Contingency Plan, a somewhat different approach to probability distribution is required for carcinogens. Carcinogenic risks associated with radiological exposure from ground water ingestion can be simulated if site data exist to create a meaningful distribution for concentration over time and for exposure duration. Because exposure to these contaminants is estimated over a lifetime, this simulation is performed for the adult population. This exposure is measured in picocuries per lifetime because the carcinogenic risk of radionuclides is related to its radiological properties. The carcinogenic potential of exposures in this range are calculated using oral slope factors from the Health Effects Assessment Summary Tables (EPA, 1992).

Section 7.0 ECOLOGICAL AND LIVESTOCK RISK EVALUATION

Although this section is included in the baseline risk assessments, the methodology used in this evaluation is not covered here. A brief summary of the method is included in Appendix B of the draft PEIS (DOE, 1994).

Section 8.0 INTERPRETATION AND RECOMMENDATIONS

This section includes a summary of the risk assessment results, which includes a thorough explanation of the assessment's limitations. Typical uncertainties and limitations are summarized as follows:

- Fluctuations and trends in contaminant concentrations.
- Use of ground water data from filtered samples.
- Completeness of ground water data (for example, has the most contaminated part of the plume been located? Were analyses performed for all relevant contaminants?).
- Use of data not specific to sites to derive exposure parameters.
- Eliminating exposure pathways at the screening stage based on poorly defined uptake parameters.
- Limitations in available toxicity data.
- Limitations in the data available to evaluate contaminant interactions.

This section also summarizes the UMTRCA ground water criteria and any other relevant health advisories or standards. If the site presents an imminent risk to public health, risk mitigation measures are described. This generally involves characterization of potential interim institutional controls that may be pursued to prevent access to contaminated ground water while the site undergoes further study and/or remediation.

Recommendations comprise the last component of this section. Recommendations include interim institutional controls, if appropriate, as well as any further site characterization necessary to better evaluate risks for remedial action decisions.

3.0 RISK ASSESSMENT SUPPLEMENT

Supplemental information, bound under separate cover, should be available with the risk assessment document to allow presentation of 1) the detailed methodology used in document preparation; 2) the complete database used to evaluate site-specific contamination; and 3) any remaining uncertainties not covered in sufficient depth in the general document. The supplement should include the following:

- A copy of this document describing the human health risk assessment methodology for the UMTRA Ground Water Project.
- A printout of data tables showing all data, filtered and unfiltered, and well completion information used to determine ground water contamination at the site. Results of any statistical tests used in the evaluation should also be included in tabular form.
- Statistical summary report, including the results of statistical tests, spreadsheets, and assumptions used.
- Geochemical and hydrologic modeling reports, including printouts, assumptions, and spreadsheets.
- Spreadsheets documenting the screening of exposure pathways.
- Supporting documentation for the evaluation of ecological risks.
- A discussion of any uncertainties specific to the site. Generic uncertainties common to all UMTRA Project risk assessments are discussed in the risk assessment itself. Possible topics include incomplete characterization of domestic water use, background water quality, and potential wetland areas. This part of the supplement allows the authors to discuss areas of concern and any mechanisms by which uncertainties in the document could be reduced.

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4.0 FILES TO DOCUMENT CONTROL

All calculations and spread sheets, memos, or meeting minutes that summarize discussions affecting the content/direction of the risk assessment, and any other relevant documentation should be filed in document control. This should enable external parties to trace the evolution of decisions affecting the evaluation of site-related risks. Calculations should be signed by the individuals who performed and who checked the numerical values prior to document submission. The calculation sets should include @RISK spreadsheets. Spreadsheets should be included both in the formula and site-specific numeric forms. All site-specific correspondence from the public, regulators, or other consultants should also be included in the document control file.

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5.0 RISK ASSESSMENT LIMITATIONS

The procedures described here represent a methodology that incorporates probability distributions for exposure with superimposed toxicity range information and criteria. Additional work can be directed toward a better characterization and reduction of uncertainties and extension of the potential applications of this method.

For many UMTRA Project sites, an extensive evaluation of just the drinking water pathway may be sufficient. However, the analysis of other pathways may become increasingly important for remedial action decision-making at other UMTRA Project sites because at some sites drinking is not a potential use of the ground water. At these sites, in particular, meaningful risk assessment is necessary because risk-based levels other than MCLs may need to be developed from other pathways (for example, naturally poor water quality or yield may mean that while people do not drink the water, it may still be used for livestock or for bathing).

The following areas are identified for further development, with the eventual goal of providing risk analyses that support site-specific remedial action decisions more firmly.

DATA EVALUATION

- Because most of the historical data are for filtered samples, concentration probability distributions for contaminants are almost always based on filtered water quality data. However, exposures are likely to be to unfiltered ground water. More work is needed to assess the impact of filtering for the constituents most often associated with uranium milling processes.
- Risk assessment could use fate and transport theory and presence of existing time trends in concentration to improve projections of future concentration in the ground water. This may be important for carcinogens because they are calculated for long-term chronic exposure.
- More thought should be given to relevant sources of variability in data when developing and interpreting contaminant concentration probability distributions. For example, random ups and downs in contaminant concentrations tend to average out in the long run. As a result, the concentration distributions used to evaluate chronic exposure may be different from those used for assessing single dose or acute toxicity.

EXPOSURE ASSESSMENT

- Joint probability distributions are needed to reflect the positive correlation between ingestion rate and body weight, especially for infants and children. The use of joint probability distributions would reduce the variability in average daily intake distributions.

- A separate distribution should be included to quantify water ingestion rates of infants fed exclusively on reconstituted formula.
- Probabilistic assessment of exposure could be extended to other pathways if realistic distributions were available for such variables as meat and milk transfer coefficients, site-specific plant uptake values, and produce, meat, and milk ingestion rates.
- Additional information is needed to develop site-specific exposure frequency and exposure duration distributions.
- A more detailed evaluation of ground water contaminant concentration trends with time is needed to determine the significance of carcinogenic exposures.

TOXICITY ASSESSMENT

- Additional toxicity data available from other sources should be incorporated for completeness.
- Combined toxicity and contaminant interactions could be presented graphically if quantitative interpretation of a net result of interaction were possible with available toxicity data.
- Site contaminants may pose special risks to certain sensitive subpopulations such as diabetics, the elderly, pregnant women, alcoholics, or individuals with prior exposures to site contaminants (for example, occupational exposures). Identification and discussion of these problems should receive additional attention.
- Further improvement in representation of toxicity data and uncertainties could be explored.
- When available, plant uptake data should be incorporated.

Many of these limitations will be addressed by the SOWP and other ongoing studies that will be completed prior to remedial action decision making.

6.0 METHODOLOGY CONCLUSIONS

Risk assessment methodologies were reviewed from the literature and in discussions with regulatory agencies, scientists, and professionals in the field. Based on the UMTRA Project experience and this research, there is consensus that current risk assessment methodologies are imperfect in many respects. Many risk assessors believe that incorporation of probabilistic analysis would resolve some of the problems. Work with UMTRA data indicates that while probabilistic methods offer a means of incorporating variability into assessments, in many cases data are insufficient to allow valid distributions to be developed. Distributions based on inadequate data can introduce additional uncertainty and potential sources of confusion into the process rather than increasing the value of the assessment.

The major areas where data are insufficient for constructing probability distributions are those involving toxicity assessment: human data are often unavailable, accurate dose reconstructions are not always possible, and extrapolations from animal data to humans are often questionable. However, databases needed to assess many aspects of *exposure* are often adequate to allow probability distributions to be constructed with a high degree of confidence. As such, this approach incorporates probability distributions for all variables where adequate databases are available for the exposure assessment.

To convey as much information as possible to the public and to decision-makers, the baseline risk assessments present a semiquantitative interpretation of toxicity and potential health risk. Available toxicity data from the literature are translated into a graphic form that is superimposed on the exposure ranges. Toxicity ranges can be defined from existing human data on nutritional and/or dietary intakes, through a full range of toxic effects from minor to severe. These can be supplemented with animal data if human data do not exist and if the animal data are notated accordingly. As such, the reader can see how much overlap exists between ranges of exposure where adverse health effects had been reported and the potential exposures that might result from use of ground water at the UMTRA Project sites. The reader can also gain a better understanding of the severity of the potential effect.

Although all human health risk assessments are limited by the database available, managing risk will be facilitated by providing the public and decision-makers with a graphic representation that improves their ability to make informed decisions based on relative toxicity, likelihood of effect, and severity of effect. Although no safety factors are directly incorporated in the present baseline risk assessment methodology, decision-makers and the public are given information that should allow such concerns to be addressed based on realistic site-specific assumptions. This will enable the UMTRA Project to make better decisions that adequately protect public health and to effectively communicate those decisions to the public.

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7.0 LIST OF CONTRIBUTORS

The following individuals contributed to the preparation of this document.

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M. Flowers, J. Lewis, K. Smith, B. Malczewska-Toth	Authors
J. Gibb, L. Pinkel, R. Saar	Document review
L. Keith (HTI)	Text processing
J. Gates	Graphic design
J. Torline, V. Beck	Technical editing

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SUPPLEMENT 2

**DERIVATION OF INGESTION RATE
AND BODY WEIGHT DISTRIBUTIONS**

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DERIVATION OF INGESTION RATE AND BODY WEIGHT DISTRIBUTIONS FOR USE IN BASELINE RISK ASSESSMENTS OF UMTRA PROJECT SITES

1.0 Introduction

Individual residents within a potentially exposed population can be expected to vary with respect to tap water consumption habits and body weight. Consequently health risks associated with consumption of contaminated groundwater at UMTRA Project sites will vary among members of this population. To adequately describe the range of potential risks to the population, naturally occurring variability in daily tap water intake and body weight were incorporated into risk assessments through probability distributions. Probability distributions provide a range of reasonable values for a variable and a measure of the relative likelihood of all the values within the range. The probability distributions used for the UMTRA risk assessments were derived from survey data on tap water consumption and body weights within the United States population.

The original source of the tap water information was the 1977-1978 Nationwide Food Consumption Survey of the U.S. Department of Agriculture. The 26,081 participants in the survey recorded all foods and beverages consumed during a three day period. Ershow and Cantor (1989) converted the tap water intake data from this survey into units of grams per day (equivalent to milliliters per day) and published histograms summarizing daily tap water consumption by infants (0-1 years), children (1-10 years), teenagers (11-20 years), adults (21-64) and seniors (65 years and older). Roseberry and Burmaster (1992) fit lognormal distributions to the histograms provided by Ershow and Cantor and published estimates of the mean and standard deviation of the natural logarithm of daily tap water intake $\ln(\text{intake})$ for each age group.

The original source of the body weight data is not known. The Environmental Protection Agency (EPA) Exposure Factors Handbook (1989) presents several percentiles of the distribution of body weight in kilograms (kg) for each year of age up to 17 years, and for the adult age categories 18-24, 25-34, 35-44, 45-54, 55-64 and 65-74 years. Male and female body weight percentiles were tabled separately.

Risk assessments of UMTRA Project sites evaluate potential risks for three age categories: infants (0-1 years), children (1-10 years), and adults (11-64 years), males and females combined. Teens were combined with adults for assessment of risk because the two age groups are expected to exhibit similar toxicological responsiveness to contaminants and because the ratio of their ingestion rate and body weight distributions are fairly comparable. Therefore, the information contained in the sources described above required additional processing to render probability distributions relevant to a mixed population of males and females within these broad age categories. The procedures followed to produce the final probability distributions used for risk assessment are described in the following sections of this report.

2.0 Tap water ingestion rate distributions

The lognormal probability distributions developed by Roseberry and Burmaster (1992) for daily tap water consumption among infants (0-1 years), children (1-10 years), teens (11-19 years), and adults (20-64 years) were modified for use in UMTRA Project risk assessments as follows:

- Units of measurement were converted from the natural logarithm of milliliters per day to liters per day (L/day), since the liter is the volumetric unit used to quantify contaminant concentrations in groundwater.
- Distributions were truncated at the lower 0.01th and at the upper 99.99th percentiles.
- A combined age group of 11-64 was created from information provided on tap water intake distributions for teens and adults, plus the relative percentages of teens and adults in the U.S. population.

These modifications are presented in detail in sections 2.1-2.3. Final distributions of water ingestion rates (L/day) are lognormal with the characteristics below.

Age group (yrs)	Mean	Standard deviation	Lower limit	Upper limit
	(L/day)			
less than 1	0.32	0.22	0.027	2.6
1 - 10	0.70	0.37	0.10	3.9
11 - 19	0.91	0.52	0.11	5.7
20 - 64	1.26	0.66	0.18	6.9

Note: The probability distribution of the water ingestion rate by individuals between 11 and 64 years of age is a mixture of the teen distribution (with probability 0.179) and the adult 20-64 distribution (with probability 0.821). These probabilities reflect the relative population sizes of these two age groups.

2.1 Units of measurement were converted from ln(mL/day) to L/day

Roseberry and Burmaster (1992) used lognormal distributions to describe variation in daily tap water intake among the U.S. population. Table I of their article presents the mean μ and standard deviation σ of the *normal* distribution produced by taking the natural logarithm of the intake values. The unit of measurement for these parameter

estimates are $\ln(\text{mL/day})$. The mean and standard deviation of the *lognormal* distributions are not simply the antilogs of μ and σ , but are computed as follows:

$$\begin{aligned} \text{mean} &= \exp(\mu + \sigma^2/2) \\ (\text{mL/day}) & \end{aligned}$$

$$\begin{aligned} \text{standard} & \\ \text{deviation} &= \text{sqrt}[\exp(2\mu + 2\sigma^2) - \text{mean}^2] \\ (\text{mL/day}) & \end{aligned}$$

Conversion from units of mL/day to L/day is accomplished by division by 1000.

Example:

For the age group 0-1 yrs, tap water intake parameters provided by Roseberry and Burmaster are $\mu = 5.587$ and $\sigma = 0.615$. Therefore,

$$\begin{aligned} \text{mean} &= \exp(5.587 + 0.615^2/2) \\ (\text{mL/day}) &= \exp(5.587 + 0.189) \\ &= \exp(5.776) \\ &= 322 \text{ mL/day or } 0.322 \text{ L/day} \end{aligned}$$

$$\begin{aligned} \text{standard} & \\ \text{deviation} &= \text{sqrt}[\exp(2*5.587 + 2*0.615^2) - \text{mean}^2] \\ (\text{mL/day}) &= \text{sqrt}[\exp(11.930) - 322^2] \\ &= \text{sqrt}[151820 - 103684] \\ &= \text{sqrt}[48136] \\ &= 219 \text{ mL/day or } 0.219 \text{ L/day} \end{aligned}$$

2.2 Distributions were truncated at the lower 0.01th and the upper 99.99th percentiles

The distributions of ingestion rate were truncated in order to place a reasonable lower and upper limit on the average daily tap water consumption by individuals within a potentially exposed population. For example, it is physically impossible for an individual to consume an average of 1000 liters of water per day, yet 1000 liters lies within the mathematical range of a lognormal distribution. The lowest 0.01th percent and uppermost 99.99th percent of the theoretical distributions were removed from consideration. The truncation is approximately equivalent to removing the largest and the smallest ingestion rate value produced by 10,000 Monte Carlo simulations. The small fraction of unrealistic values removed by truncation might otherwise impact the average value as well as the extreme tails of the simulated ingestion rate distribution.

For normal distributions, the 0.01th and 99.99th percentiles are, respectively, 3.719 standard deviations smaller or larger than the mean. Thus, the lower and upper limits

were determined for normally distributed $\ln(\text{intake})$, exponentiated, and converted from mL/day to L/day by division of the limits by 1000.

$$\begin{aligned} \text{lower limit} &= \exp(\mu - 3.719\sigma) \\ (\text{mL/day}) & \end{aligned}$$

$$\begin{aligned} \text{upper limit} &= \exp(\mu + 3.719\sigma) \\ (\text{mL/day}) & \end{aligned}$$

Example:

For the age group 0-1 yrs, tap water intake parameters provided by Roseberry and Burmaster are $\mu = 5.587$ and $\sigma = 0.615$. Therefore,

$$\begin{aligned} \text{lower} &= \exp(5.587 - 3.719 * 0.615) \\ \text{limit} &= \exp(5.587 - 2.287) \\ &= \exp(3.300) \\ &= 27 \text{ mL/day or } 0.027 \text{ L/day} \end{aligned}$$

$$\begin{aligned} \text{upper} &= \exp(5.587 + 3.719 * 0.615) \\ \text{limit} &= \exp(5.587 + 2.287) \\ &= \exp(7.874) \\ &= 2630 \text{ mL/day or } 2.63 \text{ L/day} \end{aligned}$$

2.3 Ingestion rate distribution created for the combined age group 11-64 years

Roseberry and Burmaster (1992) published separate lognormal distributions for the water ingestion rate by teens (11-19) and adults (20-64). A single distribution representing the combined age group 11-64 years was simulated as a random mixture of these two distributions.

Based on results of a 1988 national census, as summarized by Roseberry and Burmaster, teens 11-19 year olds make up 12.8 percent of the national population, whereas adults between 20 and 64 years old comprise 58.7 percent of the total. Combined, the two age groups represent $12.8 + 58.7 = 71.5$ percent of the total national population. Therefore, teenagers make up $(0.128/0.715) * 100$ or 17.9 percent of the combined subpopulation of individuals 11-64 years of age. The remaining 82.1 percent of the subpopulation are adults.

To simulate the ingestion rate of a randomly selected individual from the combined subpopulation, one first generates an observation from a binary random variable X, that is, a random variable that can assume only two possible values, zero and one. The probability that X assumes the value of zero is 0.179, (representing selection of a teenager from the combined subpopulation). The other possible outcome for X is one, which occurs with probability 0.821 and represents selection of an adult 20-64 years of age from the combined subpopulation. The outcome of the binary random variable

X then directs the simulation program to generate a random ingestion rate according to the appropriate distribution.

Let X = 0 with probability 0.179
1 with probability 0.821

Then if X = 0 generate a random ingestion rate from the lognormal distribution for age group 11-19.
1 generate a random ingestion rate from the lognormal distribution for age group 20-64.

3.0 Body weight distributions

Probability distributions for body weight in kilograms (kg) were developed from the percentile information provided in the EPA Exposure Factors Handbook (1989). This handbook reports percentiles separately for males and females for every year of life up to age 17, then for adult age groups 18-24, 25-34, 35-44, 45-54 and 55-64. Several steps were required to convert the EPA data into theoretical probability distributions for age groups 0-1 years, 1-10 years, and 11-64 years, males and females combined.

- Graphical tools were used to confirm the adequacy of lognormal distributions to fit the EPA percentile data on body weights. The mean and standard deviation of the natural logarithm of body weight [ln(body weight)] were estimated for each gender and age.
- The mean and standard deviation of ln(body weight) for a population composed of both males and females of several ages was estimated from the individual means and standard deviations of the EPA subgroups included within the population using standard formulae from probability theory and general assumptions concerning the size of each EPA subgroup within the U.S. population.
- The probability distributions for ln(body weight) of infants, children, teens and adults, males and females combined, were assumed to be normal. The adequacy of a normal distribution to approximate a mixture of several normal distributions was evaluated through simulation.
- The assumed normal distributions for ln(body weight) were converted to lognormal distributions for body weight (kg) and the distributions were truncated at the lower 0.01th and upper 99.99th percentiles.
- A combined age group of 11-64 was created from information provided on body weight distributions for teens and adults, plus the relative percentages of teens and adults in the U.S. population.

These steps are discussed in sections 3.1-3.4. The final distributions for body weight (kg) are lognormal with the characteristics below.

Age group (yrs)	Mean	Standard deviation	Lower limit	Upper limit
	(kg)			
Less than 1	8.8	1.3	5.1	15
1 - 10	22	91	4.6	90
11 - 17	54	14	20	130
18 - 64	68	14	31	150

Note: The probability distribution of the body weight among individuals 11 and 64 years of age is a mixture of the teen distribution (with probability 0.179) and the adults (with probability 0.821). These probabilities approximately reflect the relative population sizes of the two age groups.

3.1 Adequacy of normal distribution as a fit to EPA percentile data on log body weight

The EPA Exposure Factors Handbook (1989) provided estimates of the 5th, 10th, 15th, 25th, 50th, 75th, 85th, 90th and 95th percentiles of body weight. For this discussion, the letter X will represent the random variable Body Weight (kg) within an age and sex subpopulation and x_p represents the EPA estimate of the p*100th percentile of X. If the natural logarithm of X (ln X) is normally distributed within the subpopulation, with mean μ and standard deviation σ , then the following logic is true.

$$\text{If: } \text{Prob}(X \leq x_p) \approx p$$

$$\text{Then: } \text{Prob}(\ln X \leq \ln x_p) \approx p$$

$$\Phi((\ln x_p - \mu)/\sigma) \approx p$$

$$(\ln x_p - \mu)/\sigma \approx \Phi^{-1}(p)$$

$$\ln x_p \approx \mu + \sigma \Phi^{-1}(p)$$

where $\Phi(\cdot)$ and $\Phi^{-1}(\cdot)$ are the normal cumulative distribution function and its inverse function, respectively.

This implies that an x-y plot of all the data pairs [$\Phi^{-1}(p)$, $\ln x_p$] provided by EPA should fall approximately on a straight line. Furthermore, the y-intercept is an estimate of μ and the slope is an estimate of σ .

These x-y plots were made using the EPA percentiles for body weight in each different age groups and for both males and females. The linearity of the plots was striking in all cases and the assumption of normality of ln(log body weight) was deemed reasonable. The equation of the line through the data was estimated using ordinary least squares. The coefficient of determination (R^2) for these regression lines ranged from 96 to 99 percent, indicating that the least squares line fit the data well. Table 3.1 summarizes the resulting estimates of the mean and standard deviation of the distribution of ln(body weight) for each age and gender. Also included in Table 3.1 is the estimated size of each individual age/gender class within the U.S. population (National Center for Health Statistics 1987). The relative proportion column in Table 3.1 is explained in section 3.2.

3.2 Estimation of the mean and standard deviation of the distribution of the natural logarithm of body weight for infants, children, teenagers, and adults.

Males and females were combined, as were several of the EPA age categories, for risk assessment purposes. The mean and standard deviation of these larger groupings can be estimated from the subgroup means and standard deviations if the relative proportion of each of the subgroups is known (or assumed).

Table 3.1

Estimates of the mean (μ) and standard deviation (σ) of the natural logarithm of body weight (in units of \ln kg) by age and gender, approximate size and relative proportion of the individual age/gender groups within the larger categories of infants, children, teenagers and adults in the United States

Class	Age	Sex	Estimated			
			μ	σ	Population size (millions)	Relative proportion
Infants	<1	M	2.21	0.133	0.8	0.50
		F	2.12	0.138	0.8	0.50
Total:						1.00
Children	1	M	2.44	0.124	1.6	0.05
		F	2.36	0.129	1.5	0.05
	2	M	2.58	0.120	1.5	0.05
		F	2.54	0.117	1.5	0.05
	3	M	2.73	0.114	1.5	0.05
		F	2.68	0.139	1.5	0.05
	4	M	2.85	0.126	1.6	0.05
		F	2.82	0.134	1.5	0.05
	5	M	2.97	0.131	1.6	0.05
		F	2.96	0.160	1.5	0.05
	6	M	3.12	0.151	1.7	0.05
		F	3.08	0.171	1.7	0.05
	7	M	3.20	0.154	1.8	0.05
		F	3.18	0.174	1.7	0.05
	8	M	3.32	0.177	1.8	0.05
		F	3.30	0.153	1.5	0.05
	9	M	3.41	0.164	1.7	0.05
		F	3.45	0.208	1.9	0.05
	10	M	3.58	0.195	1.8	0.05
		F	3.56	0.198	1.7	0.05
Total:						1.00
Teenagers	11	M	3.67	0.240	1.8	0.07
		F	3.69	0.220	1.8	0.07
	12	M	3.77	0.222	1.6	0.07
		F	3.81	0.218	1.7	0.07
	13	M	3.87	0.225	2.1	0.07
		F	3.91	0.218	1.9	0.07
	14	M	4.00	0.177	2.2	0.07
		F	3.98	0.187	2.1	0.07
	15	M	4.09	0.158	2.1	0.07
		F	3.99	0.148	2.1	0.07

Table 3.1 continued

Class	Age	Sex	... Estimated ...			
			μ	σ	Population size (millions)	Relative proportion
Teenagers (cont'd)	16	M	4.19	0.165	2.1	0.07
		F	4.05	0.166	2.2	0.07
	17	M	4.18	0.167	2.1	0.07
		F	4.07	0.160	1.8	0.07
Total:						1.00
Adults	18-24	M	4.28	0.165	13.3	0.10
		F	4.08	0.171	14.2	0.11
	25-34	M	4.34	0.165	15.9	0.12
		F	4.14	0.208	16.9	0.14
	35-44	M	4.37	0.167	11.4	0.09
		F	4.18	0.210	12.3	0.10
	45-54	M	4.37	0.168	11.1	0.08
		F	4.18	0.212	11.9	0.09
	55-64	M	4.34	0.159	9.6	0.08
		F	4.19	0.208	10.7	0.08
Total:						1.00

Assume a combined group consists of K subgroups. Designate the mean and standard deviation of the kth subgroup as μ_k and σ_k , and assume that the relative proportion of the kth subgroup is π_k , such that the sum of the π_k over all K of the subgroups equals one.

The mean of the combined group is

$$\mu_{\text{comb}} = \sum \mu_k * \pi_k.$$

The standard deviation of the combined group is

$$\sigma_{\text{comb}} = \text{sqr}t [\sum \sigma_k^2 * \pi_k + \sum (\mu_k - \mu_{\text{comb}})^2 * \pi_k]$$

If the means, standard deviations, and relative proportions of the subgroups are replaced by estimates, the results are estimates of the mean and standard deviation of the combined groups.

Table 3.1 provides estimates of the individual means and standard deviations of the subgroups that need to be combined for risk assessment purposes into the broad categories of infants, children, teenagers, and adults. In addition, Table 1 shows the 1976-1980 census estimates of the size of the individual subgroups within the U.S. population as reported in National Center for Health Statistics (1987). The relative proportions of males and females are roughly comparable from infancy through age 17. Therefore, a 50:50 ratio of males to females was assumed for infants, children, and teenagers. There were apparently slightly more older children than younger children in the late 1970s. However, the differences are subtle and may not hold true in the late 1990s. Therefore, the relative proportions of children of any age or sex between 1 and 10 were assumed to be equal, and since there are 20 subgroups (2 sexes * 10 ages) the common value is 1/20 or 0.05. Similarly, the relative proportions of teenagers of any sex or age between 11 and 17 were all set equal to 1/14 = .07.

Starting with the adult 18-24 age groups, there are estimated to be fewer males than females in the U.S. population. The age distribution of adults also show a predictable decline in numbers with increasing age. Since these age-related trends have a scientific basis and are unlikely to change dramatically in the next few years, the relative proportions π_k were selected to incorporate these gender and age differences. Between ages 18 and 64, the male to female ratio was assumed to be 48:52. The relative proportions of adults in the age categories 18-24, 25-34, ..., 55-64 were equated with the observed relative frequencies of these age groups in the 1976-80 census. For example, the estimated total population size of the 18-64 age group is 127.3 million, of which 13.3 + 14.2 = 27.5 million were 18-24 years old. Thus, the observed relative frequency of the 18-24 year age group was 27.5/127.3 = 0.216. Adjustments for the sex differential produced estimated relative proportions of 0.48*0.216=0.10 for men and 0.52*0.216=0.11 for women in the 18-24 age group. Calculations of the estimated relative proportions of the remaining adult age groups were similar.

The estimated means, standard deviations, and relative proportions were used in the formulae above to estimate the mean and standard deviation of ln(body weight) in the

broad age categories of infants, children, teenagers, and adults. Figure 3.1 provides an example of the computations for the adult 18-64 age category and summarizes the results for the broad age categories.

3.3 Mixtures of distributions replaced by single distributions for infants, children, teenagers, and adults.

The distributions of the natural logarithm of body weights among infants, children, teenagers, and adults are random mixtures of the separate normal distributions describing the body weights of males and females at each distinctive age. Theoretically such a mixture will not be normally distributed. Therefore, monte carlo simulations were done to evaluate the severity of the departures from normality of the mixture distributions.

One iteration of the simulation for children, for example, would randomly "select" a child at random and determine its age and gender according to the relative proportions listed in Table 1. One random measurement of $\ln(\text{body weight})$ would then be generated according to the appropriate probability distribution. This two step process was repeated 1200 times, resulting in a mixture of simulated $\ln(\text{weights})$ for boys and girls of various ages. A histogram of the simulated data is shown in Figure 3.2. The simulated mixture distribution is symmetrical, bell-shaped, and well described by a normal distribution except for the extreme tails (below the 1st percent and above the 99th percentile). The simulated percentiles for the distribution of $\ln(\text{body weight})$ among children are compared to a theoretical normal percentile at the bottom of Figure 3.2.

From the simulation exercise, it was determined that a single normal distribution could replace the mixture of twenty distributions in describing variation in $\ln(\text{body weight})$ among children. The same results were obtained for infants, teenagers, and adults. For this reason, normal distributions were selected to describe the distribution of $\ln(\text{body weight})$ for risk assessment purposes. The means and standard deviations of these distributions are those presented at the bottom of Figure 3.1.

3.4 Last steps

The final three steps to prepare the distributions for use in monte carlo simulations are identical to those followed for preparation of the water ingestion rate distributions. These steps are described in detail in sections 2.1-2.3.

It should be noted that the EPA body weight tables included 18 and 19 year olds among other young adults up to age 24, whereas the drinking water ingestion age categories categorized 18 and 19 years along with younger teenagers. It was assumed that the difference in definition of a small subset of the population would not impact the distributions in a major way.

Figure 3.1

Calculation of the estimated mean and standard deviation of the natural logarithm of body weight for adults ages 18-64 (units are ln kg)

Age	Sex	... Estimates of ...			$\mu_k \cdot \pi_k$	$\sigma_k^2 \cdot \pi_k$	$(\mu_k - \mu_{comb})^2 \cdot \pi_k$
		μ_k	σ_k	π_k			
		(from Table 3.1)					
18-24	M	4.28	0.165	0.10	0.428	0.0027	0.0006
	F	4.08	0.171	0.11	0.449	0.0032	0.0016
25-34	M	4.34	0.165	0.12	0.521	0.0033	0.0024
	F	4.14	0.208	0.14	0.580	0.0061	0.0005
35-44	M	4.37	0.167	0.09	0.393	0.0025	0.0026
	F	4.18	0.210	0.10	0.418	0.0044	0.0000
45-54	M	4.37	0.168	0.08	0.350	0.0023	0.0023
	F	4.18	0.212	0.09	0.376	0.0040	0.0000
55-64	M	4.34	0.159	0.08	0.347	0.0020	0.0016
	F	4.19	0.208	0.08	0.335	0.0035	0.0000
SUM:					4.20	0.0340	0.0116

Estimated mean of
ln(body weight) for
adults 18-64 = $\mu_{comb} = 4.20$

Estimated standard
deviation of ln(body weight)
for adults 18-64 = $\sigma_{comb} = \text{sqrt}(0.0340 + 0.0116)$
= 0.21

Estimated mean and standard deviation of the natural logarithm of body weight for the broad age categories used for risk assessment at UMTRA Project sites, calculations as illustrated above (units are ln kg)

Age group	Mean	Standard deviation
less than 1	2.17	0.14
1 - 10	3.01	0.40
11 - 17	3.95	0.25
18 - 64	4.20	0.21

Figure 3.2

Results of 1200 iterations of the mixture distribution for the natural logarithm of body weight of children ages 1 - 10 (units are ln kg)

Histogram of simulated data of ln(body weight) for children N = 1200 replications

Note: Each * represents 5 observations

In(body wt)	Count	
2.0-2.2	15	***
2.2-2.4	54	*****
2.4-2.6	166	*****
2.6-2.8	187	*****
2.8-3.0	166	*****
3.0-3.2	208	*****
3.2-3.4	186	*****
3.4-3.6	145	*****
3.6-3.8	54	*****
3.8-4.0	18	****
4.0-4.2	1	*

Comparison of the simulated distribution to a normal distribution with the same mean and standard deviation

	Percentiles										
	0.5	1	5	10	25	50	75	90	95	99	99.5
Simulated	2.1	2.2	2.4	2.5	2.7	3.0	3.3	3.5	3.6	3.8	3.9
Normal	2.0	2.1	2.3	2.5	2.7	3.0	3.3	3.5	3.7	3.9	4.0

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SUPPLEMENT 3
HYDROLOGIC CALCULATIONS

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CALCULATION COVER SHEET

CALC NO. SHP-03-96-14-06 DISCIPLINE Hydrogeology NO. OF SHEETS 21
₋₀₀

PROJECT: UMTRA

SITE: Shiprock

FEATURE: Calculation of Hydraulic Gradient in the Floodplain Aquifer and Average Ground Water Discharge to the San Juan River

SOURCES OF DATA: Water table elevations measured in floodplain monitor wells

SOURCES OF FORMULAE & REFERENCES:

Freeze, R.A. and J. A. Cherry, 1979, Groundwater, Prentice-Hall, Inc., Englewood Cliffs, New Jersey.

PRELIMINARY CALC. FINAL CALC. SUPERSEDES CALC. NO. _____

		Brian Smith	3/19/96	George White	3/19/96	Christie Blair	3/19/96
REV. NO.	REVISION	CALCULATION BY	DATE	CHECKED BY	DATE	APPROVED BY	DATE

A. PURPOSE

To estimate the rate of discharge of ground water from the floodplain aquifer to the San Juan River.

B. METHOD AND PROCEDURES

Darcy's Law is used to determine the rate of discharge of ground water through a porous medium with a given cross-sectional area. The equation to determine the rate of discharge is:

$$Q = KiA$$

where

Q = rate of discharge
K = hydraulic conductivity
i = hydraulic gradient
A = area of discharge

C. MATERIAL PROPERTIES

A hydraulic conductivity of 30 ft/day for the alluvium that makes up the floodplain aquifer was selected in the Baseline Risk Assessment of Ground Water Contamination at the Uranium Mill Tailings Site Near Shiprock, New Mexico (DOE, 1994). The likely area of discharge from the floodplain to the river was estimated in the risk assessment to be 8 ft thick by 2500 ft along the bank of the river.

D. CALCULATION AND ANALYSIS

Determination of hydraulic gradient

The distance between monitor wells 608 and 734 on the floodplain is about 4000 ft. The difference in ground water elevations between the two wells is about 7 ft. Therefore the hydraulic gradient (i), which has no dimensions, is:

$$7 \text{ ft}/4000 \text{ ft} = 0.002$$

Determination of rate of discharge

$$Q = KiA = 30 \text{ ft/day} \times 0.002 \times (8 \text{ ft} \times 2500 \text{ ft}) = 1200 \text{ ft}^3/\text{day}$$

$$\text{or } Q = 0.014 \text{ ft}^3/\text{sec}$$

**SUPPLEMENT 4
GROUND WATER QUALITY DATA BY LOCATION**

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DOMESTIC WELL SHP-01-0634
 SAMPLED ONE TIME 9/19/86

Parid	Sampid	PARVQ	value	Parflag	DLimit	Uncert
AG	0002	<	0.01	RX		0.01
AG	0003	<	0.01	RX		0.01
AG	0004	<	0.01	RX		0.01
AG	0005	<	0.01	RX		0.01
AL	0001		0.2	RX		0.1
AL	0002		0.2	RX		0.1
AL	0003		0.2	RX		0.1
AL	0004		0.2	RX		0.1
AL	0005		0.2	RX		0.1
ALK	N001		372.0	RX		
ALK	N002		372.0	RX		
ALK	N003		372.0	RX		
ALK	N004		372.0	RX		
ALK	N005		372.0	RX		
AS	0001	<	0.01	RX		0.01
AS	0002	<	0.01	RX		0.01
AS	0003	<	0.01	RX		0.01
AS	0004	<	0.01	RX		0.01
AS	0005	<	0.01	RX		0.01
B	0001	<	0.1	RX		0.1
B	0002	<	0.1	RX		0.1
B	0003	<	0.1	RX		0.1
B	0004	<	0.1	RX		0.1
B	0005	<	0.1	RX		0.1
BA	0001	<	0.1	RX		0.1
BA	0002	<	0.1	RX		0.1
BA	0003	<	0.1	RX		0.1
BA	0004	<	0.1	RX		0.1
BA	0005	<	0.1	RX		0.1
CA	0001		100.0	RX		0.01
CA	0002		130.0	RX		0.01
CA	0003		130.0	RX		0.01
CA	0004		130.0	RX		0.01
CA	0005		130.0	RX		0.01
CD	0001	<	0.001	RX		0.001
CD	0002	<	0.001	RX		0.001
CD	0003	<	0.001	RX		0.001
CD	0004	<	0.001	RX		0.001
CD	0005	<	0.001	RX		0.001
CL	0001		10.0	RX		1.
CL	0002		10.0	RX		1.
CL	0003		10.0	RX		1.
CL	0004		10.0	RX		1.
CL	0005		10.0	RX		1.
CN	0001	<	0.01	RX		0.01
CN	0002	<	0.01	RX		0.01
CN	0003	<	0.01	RX		0.01
CN	0004	<	0.01	RX		0.01
CN	0005	<	0.01	RX		0.01

Parid	Sampid	PARVQ	value	Parflag	DLimit	Uncert
CO	0001	<	0.05	RX		0.05
CO	0002	<	0.05	RX		0.05
CO	0003	<	0.05	RX		0.05
CO	0004	<	0.05	RX		0.05
CO	0005	<	0.05	RX		0.05
CR	0001		0.05	RX		0.01
CR	0002		0.03	RX		0.01
CR	0003		0.03	RX		0.01
CR	0004		0.03	RX		0.01
CR	0005		0.03	RX		0.01
CU	0001	<	0.02	RX		0.02
CU	0002	<	0.02	RX		0.02
CU	0003	<	0.02	RX		0.02
CU	0004	<	0.02	RX		0.02
CU	0005	<	0.02	RX		0.02
EC	N001		900.0	RX		
EC	N002		900.0	RX		
EC	N003		900.0	RX		
EC	N004		900.0	RX		
EC	N005		900.0	RX		
F	0001		0.6	RX		0.1
F	0002		0.7	RX		0.1
F	0003		0.6	RX		0.1
F	0004		0.6	RX		0.1
F	0005		0.6	RX		0.1
FE	0001		0.07	RX		0.03
FE	0002		0.07	RX		0.03
FE	0003		0.07	RX		0.03
FE	0004		0.07	RX		0.03
FE	0005		0.07	RX		0.03
HG	0001	<	0.000	RX		0.000
HG	0002	<	0.000	RX		0.000
HG	0003	<	0.000	RX		0.000
HG	0004	<	0.000	RX		0.000
HG	0005	<	0.000	RX		0.000
K	0001		3.25	RX		0.01
K	0002		3.25	RX		0.01
K	0003		3.25	RX		0.01
K	0004		3.25	RX		0.01
K	0005		3.25	RX		0.01
MG	0001		31.0	RX		0.001
MG	0002		31.0	RX		0.001
MG	0003		31.0	RX		0.001
MG	0004		31.0	RX		0.001
MG	0005		31.0	RX		0.001
MN	0001		0.02	RX		0.01
MN	0002		0.02	RX		0.01
MN	0003		0.02	RX		0.01
MN	0004		0.02	RX		0.01
MN	0005		0.02	RX		0.01

Parid	Sampid	PARVQ	value	Parflag	DLimit	Uncert
MO	0001		0.09	RX		0.01
MO	0002		0.09	RX		0.01
MO	0003		0.09	RX		0.01
MO	0004		0.09	RX		0.01
MO	0005		0.09	RX		0.01
NA	0001		125.	RX		0.002
NA	0002		66.0	RX		0.002
NA	0003		66.0	RX		0.002
NA	0004		66.0	RX		0.002
NA	0005		66.0	RX		0.002
NH4	0001	<	0.1	RX		0.1
NH4	0002	<	0.1	RX		0.1
NH4	0003	<	0.1	RX		0.1
NH4	0004	<	0.1	RX		0.1
NH4	0005	<	0.1	RX		0.1
NI	0001	<	0.04	RX		0.04
NI	0002	<	0.04	RX		0.04
NI	0003	<	0.04	RX		0.04
NI	0004	<	0.04	RX		0.04
NI	0005	<	0.04	RX		0.04
NO2	0001	<	0.1	RX		0.1
NO2	0002	<	0.1	RX		0.1
NO2	0003	<	0.1	RX		0.1
NO2	0004	<	0.1	RX		0.1
NO2	0005	<	0.1	RX		0.1
NO3	0001		5.0	RX		1.
NO3	0002		5.0	RX		1.
NO3	0003		5.0	RX		1.
NO3	0004		5.0	RX		1.
NO3	0005		5.0	RX		1.
PB	0001		0.01	RX		0.01
PB	0002		0.01	RX		0.01
PB	0003		0.01	RX		0.01
PB	0004		0.01	RX		0.01
PB	0005		0.01	RX		0.01
PB0	0001		0.1	RX	1.5	1.6
PB0	0002		0.7	RX	1.5	1.0
PB0	0003		0.0	RX	1.5	1.0
PB0	0004		0.0	RX	1.5	1.0
PB0	0005		0.0	RX	1.5	0.9
PH	N001		7.02	RX		
PH	N002		7.02	RX		
PH	N003		7.02	RX		
PH	N004		7.02	RX		1.
PH	N005		7.02	RX		
PO0	0001		0.0	RX	1.	0.6
PO0	0002		0.0	RX	1.	0.6
PO0	0003		0.0	RX	1.	0.6
PO0	0004		0.0	RX	1.	0.5
PO0	0005		0.0	RX	1.	0.6

Parid	Sampid	PARVQ	value	Parflag	DLimit	Uncert
PO4	0001	<	0.1	RX		0.1
PO4	0002	<	0.1	RX		0.1
PO4	0003	<	0.1	RX		0.1
PO4	0004	<	0.1	RX		0.1
PO4	0005	<	0.1	RX		0.1
R6L	0001		0.4	RX	1.	0.5
R6L	0002		0.2	RX	1.	0.3
R6L	0003		0.2	RX	1.	0.3
R6L	0004		0.2	RX	1.	0.3
R6L	0005		0.0	RX	1.	0.2
RA8	0001		0.2	RX	1.	0.8
RA8	0002		0.0	RX	1.	1.0
RA8	0003		0.0	RX	1.	1.0
RA8	0004		0.2	RX	1.	0.8
RA8	0005		0.3	RX	1.	0.9
S	0001	<	0.1	RX		0.1
S	0002	<	0.1	RX		0.1
S	0003	<	0.1	RX		0.1
S	0004	<	0.1	RX		0.1
S	0005	<	0.1	RX		0.1
SB	0001	<	0.003	RX		0.003
SB	0002	<	0.003	RX		0.003
SB	0003	<	0.003	RX		0.003
SB	0004	<	0.003	RX		0.003
SB	0005	<	0.003	RX		0.003
SE	0001	<	0.005	RX		0.005
SE	0002	<	0.005	RX		0.005
SE	0003	<	0.005	RX		0.005
SE	0004	<	0.005	RX		0.005
SE	0005	<	0.005	RX		0.005
SIO	0001		12.	RX		2.
SIO	0002		13.	RX		2.
SIO	0003		13.	RX		2.
SIO	0004		13.	RX		2.
SIO	0005		13.	RX		2.
SN	0001	<	0.005	RX		0.005
SN	0002	<	0.005	RX		0.005
SN	0003	<	0.005	RX		0.005
SN	0004	<	0.005	RX		0.005
SN	0005	<	0.005	RX		0.005
SO4	0001		256.0	RX		0.1
SO4	0002		256.0	RX		0.1
SO4	0003		256.0	RX		0.1
SO4	0004		259.0	RX		0.1
SO4	0005		259.0	RX		0.1
SR	0001		1.6	RX		0.1
SR	0002		1.6	RX		0.1
SR	0003		1.6	RX		0.1
SR	0004		1.6	RX		0.1
SR	0005		1.6	RX		0.1

Parid	Sampid	PARVQ	value	Parflag	DLimit	Uncert
TOL	0001		0.7	RX	1.	0.7
TOL	0002		0.2	RX	1.	0.5
TOL	0003		0.0	RX	1.	0.5
TOL	0004		0.3	RX	1.	0.6
TOL	0005		0.0	RX	1.	0.5
TDS	0001		799.0	RX	10.	
TDS	0002		797.0	RX	10.	
TDS	0003		813.0	RX	10.	
TDS	0004		809.0	RX	10.	
TDS	0005		817.0	RX	10.	
TMP	N001		18.0	RX		
TMP	N002		18.0	RX		
TMP	N003		18.0	RX		
TMP	N004		18.0	RX		
TMP	N005		18.0	RX		
TOC	0001		103.	RX	1.	
TOC	0002		104.	RX	1.	
TOC	0003		108.	RX	1.	
TOC	0004		103.	RX	1.	
TOC	0005		103.	RX	1.	
U	0001		0.010	RX	0.003	
U	0002		0.010	RX	0.003	
U	0003		0.010	RX	0.003	
U	0004		0.011	RX	0.003	
U	0005		0.011	RX	0.003	
V	0001		0.23	RX	0.01	
V	0002		0.23	RX	0.01	
V	0003		0.23	RX	0.01	
V	0004		0.23	RX	0.01	
V	0005		0.23	RX	0.01	
ZN	0001		0.150	RX	0.005	
ZN	0002		0.150	RX	0.005	
ZN	0003		0.150	RX	0.005	
ZN	0004		0.150	RX	0.005	
ZN	0005		0.150	RX	0.005	

DOMESTIC WELL SHP-01-0635
 SAMPLED ONE TIME 9/19/86

Parid	Sampid	PARVQ	value	Parflag	DLimit	Uncert
AG	0001	<	0.01	RX	0.01	
AL	0001		0.2	RX	0.1	
ALK	N001		382.0	RX		
AS	0001	<	0.01	RX	0.01	
B	0001	<	0.1	RX	0.1	
BA	0001		0.1	RX	0.1	
CA	0001		294.0	RX	0.01	
CD	0001	<	0.001	RX	0.001	
CL	0001		48.0	RX	1.	
CN	0001	<	0.01	RX	0.01	
CO	0001		0.08	RX	0.05	
CR	0001		0.03	RX	0.01	
CU	0001		0.02	RX	0.02	
EC	N001		2250.0	RX		
F	0001		0.6	RX	0.1	
FE	0001		6.83	RX	0.03	
HG	0001	<	0.000	RX	0.000	
K	0001		8.54	RX	0.01	
MG	0001		150.0	RX	0.001	
MN	0001		1.10	RX	0.01	
MO	0001		0.06	RX	0.01	
NA	0001		220.0	RX	0.002	
NH4	0001	<	0.1	RX	0.1	
NI	0001	<	0.04	RX	0.04	
NO2	0001	<	0.1	RX	0.1	
NO3	0001		4.0	RX	1.	
PB	0001	<	0.01	RX	0.01	
PB0	0001		0.0	RX	1.5	1.0
PH	N001		7.10	RX		
POO	0001		0.0	RX	1.	0.6

Parid	Sampid	PARVQ	value	Parflag	DLimit	Uncert
PO4	0001	<	0.1	RX	0.1	
R6L	0001		0.0	RX	1.	0.2
RA8	0001		0.0	RX	1.	0.8
S	0001	<	0.1	RX	0.1	
SB	0001	<	0.003	RX	0.003	
SE	0001	<	0.005	RX	0.005	
SIO	0001		11.	RX	2.	
SN	0001	<	0.005	RX	0.005	
SO4	0001		1480.0	RX	0.1	
SR	0001		3.9	RX	0.1	
TOL	0001		0.4	RX	1.	0.6
TDS	0001		2650.0	RX	10.	
TMP	N001		19.0	RX		
TOC	0001		107.	RX	1.	
U	0001		0.017	RX	0.003	
V	0001		0.20	RX	0.01	
ZN	0001		0.017	RX	0.005	

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP02 SHIPROCK (TAILINGS AREA)
 LOCATION: 0600
 NORTH COORDINATE: UNKNOWN
 EAST COORDINATE: UNKNOWN
 10/11/88 TO 04/26/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: URANIUM MILL TAILINGS (TA)
 HYDRAULIC FLOW RELATIONSHIP: ON-SITE (O)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
ALKALINITY	10/11/88	0001	MG/L CaCO3		1542.		-	-
	04/19/89	0001		1489.	-	-		
	06/04/90	0001		1427.	-	-		
	10/12/90	0001		1605.	-	-		
	05/15/91	0001		1625.	-	-		
	09/18/92	0001		1599	-	-		
	02/22/93	0001		1591	-	-		
ALUMINUM	04/19/89	0001	MG/L	<	0.1		0.1	-
	06/04/90	0001		<	0.1		0.1	-
	10/12/90	0001		<	0.05		0.05	-
	05/15/91	0001		<	0.05		0.05	-
	09/18/92	0001		<	0.87	*IN	0.87	-
AMMONIUM	10/11/88	0001	MG/L		280.		0.1	-
	04/19/89	0001		120.		0.1	-	
	06/04/90	0001		178.		0.1	-	
	10/12/90	0001		193.		0.1	-	
	05/15/91	0001		108.		0.1	-	
	02/22/93	0001		171		0.1	-	
ANTIMONY	10/11/88	0001	MG/L		0.098		0.003	-
	04/19/89	0001		0.106		0.003	-	
	06/04/90	0001		0.060		0.003	-	
	10/12/90	0001		<	0.02		0.02	-
	05/15/91	0001		<	0.015	I	0.015	-
	09/18/92	0001		0.007	NW	0.0015	-	
ARSENIC	10/11/88	0001	MG/L		0.09		0.01	-
	04/19/89	0001		0.03		0.01	-	
	06/04/90	0001		<	0.01		0.01	-
	10/12/90	0001		<	0.1		0.1	-
	05/15/91	0001		<	0.05	I	0.05	-
	09/18/92	0001		<	0.015	IN	0.015	-
	02/22/93	0001		<	0.005	W	0.005	-
ARSENIC (TOTAL)	02/22/93	N001	MG/L	<	0.05	I	0.05	-
BARIUM	10/11/88	0001	MG/L	<	0.1		0.1	-
	04/19/89	0001		<	0.1		0.1	-
	06/04/90	0001		<	0.1		0.1	-
	10/12/90	0001		0.01		0.01	-	
	05/15/91	0001		0.01		0.01	-	
	09/18/92	0001		0.016	N	0.0029	-	
BERYLLIUM	04/19/89	0001	MG/L	<	0.01		0.01	-
	06/04/90	0001		<	0.01		0.01	-
	10/12/90	0001		<	0.005		0.005	-
	05/15/91	0001		<	0.005		0.005	-
BORON	04/19/89	0001	MG/L		1.1		0.1	-
	06/04/90	0001		1.1		0.1	-	
	10/12/90	0001		1.08		0.05	-	
	05/15/91	0001		1.06		0.05	-	
BROMIDE	04/19/89	0001	MG/L	<	0.1		0.1	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:

0001 - FILTERED SAMPLE (.45 MICRONS)

N001 - UNFILTERED SAMPLE

OTHER PARAMETER VALUE FLAGS:

* - DUPLICATE ANALYSIS NOT WITHIN CONTROL LIMITS

I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION

N - SPIKE SAMPLE RECOVERY NOT WITHIN CONTROL LIMITS

W - POST-DIGEST SPIKE OUT OF CNTR LIM WHILE SAMP ABS < 50% SPIKE

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP02 SHIPROCK (TAILINGS AREA)
 LOCATION: 0600
 NORTH COORDINATE: UNKNOWN
 EAST COORDINATE: UNKNOWN
 10/11/88 TO 04/26/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: URANIUM MILL TAILINGS (TA)
 HYDRAULIC FLOW RELATIONSHIP: ON-SITE (O)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
CADMIUM	10/11/88	0001	MG/L		0.002		0.001	-
	04/19/89	0001		0.011		0.001	-	
	06/04/90	0001		0.001		0.001	-	
	10/12/90	0001		<	0.005		0.005	-
	05/15/91	0001		<	0.005	I	0.005	-
	09/18/92	0001			0.001	+	0.00013	-
	02/22/93	0001		<	0.001	S	0.001	-
CADMIUM (TOTAL)	02/22/93	N001	MG/L		0.007		0.001	-
CALCIUM	10/11/88	0001	MG/L		378.		0.01	-
	04/19/89	0001		357.		0.01	-	
	06/04/90	0001		366.		0.01	-	
	10/12/90	0001		355.		0.01	-	
	05/15/91	0001		368.		0.5	-	
	09/18/92	0001		470		0.0050	-	
	02/22/93	0001		362		0.5	-	
CALCIUM (TOTAL)	02/22/93	N001	MG/L		477		0.5	-
CHLORIDE	10/11/88	0001	MG/L		380.		1.	-
	04/19/89	0001		680.		1.	-	
	06/04/90	0001		79.		1.	-	
	10/12/90	0001		411.		1.	-	
	05/15/91	0001		600.		1.	-	
	09/18/92	0001		420	N	0.50	-	
	02/22/93	0001		324		0.5	-	
CHLORIDE (TOTAL)	02/22/93	N001	MG/L		394		0.5	-
CHROMIUM	10/11/88	0001	MG/L		0.16		0.01	-
	04/19/89	0001		<	0.01		0.01	-
	06/04/90	0001		<	0.01		0.01	-
	10/12/90	0001		<	0.01		0.01	-
	05/15/91	0001		<	0.01		0.01	-
	09/18/92	0001		<	0.027	IN	0.027	-
	02/22/93	0001		<	0.01		0.01	-
CHROMIUM (TOTAL)	02/22/93	N001	MG/L		0.05		0.01	-
COBALT	10/11/88	0001	MG/L	<	0.05		0.05	-
	04/19/89	0001		<	0.05		0.05	-
	06/04/90	0001		<	0.05		0.05	-
	10/12/90	0001		<	0.03		0.03	-
	05/15/91	0001		<	0.03		0.03	-
	09/18/92	0001		<	0.027	I	0.027	-
COPPER	10/11/88	0001	MG/L		0.03		0.02	-
	04/19/89	0001			0.02		0.02	-
	06/04/90	0001		<	0.02		0.02	-
	10/12/90	0001			0.02		0.01	-
	05/15/91	0001		<	0.01		0.01	-
	09/18/92	0001		<	0.021	I	0.021	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID COOES:

0001 - FILTERED SAMPLE (.45 MICRONS)

N001 - UNFILTERED SAMPLE

OTHER PARAMETER VALUE FLAGS:

+ - CORRELATION COEFFICIENT FOR MSA < 0.995

I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION

N - SPIKE SAMPLE RECOVERY NOT WITHIN CONTROL LIMITS

S - REPORTED VALUE DETERMINED USING METHOD OF STD ADDITION (MSA)

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP02 SHIPROCK (TAILINGS AREA)
 LOCATION: 0600
 NORTH COORDINATE: UNKNOWN
 EAST COORDINATE: UNKNOWN
 10/11/88 TO 04/26/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: URANIUM MILL TAILINGS (TA)
 HYDRAULIC FLOW RELATIONSHIP: ON-SITE (O)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
CYANIDE	04/19/89	0001	MG/L	<	0.01		0.01	-
FLUORIDE	10/11/88	0001	MG/L		0.4		0.1	-
	04/19/89	0001			0.5		0.1	-
	06/04/90	0001			0.5		0.1	-
	10/12/90	0001			0.4		0.1	-
	05/15/91	0001			0.5		0.1	-
GROSS ALPHA	10/11/88	0001	PCI/L		1100.		0.2	200.
	04/19/89	0001			1000.		0.2	200.
	09/18/92	0001			1600.		285	457
	02/22/93	0001			718.		159.	181.
GROSS ALPHA (TOTAL)	02/22/93	N001	PCI/L		823.		167.	190.
GROSS BETA	10/11/88	0001	PCI/L		380.		1.	70.
	04/19/89	0001			600.		1.	70.
	09/18/92	0001			400.		264	186
	02/22/93	0001			379.		121.	94.7
GROSS BETA (TOTAL)	02/22/93	N001	PCI/L		313.		140.	101.
IRON	10/11/88	0001	MG/L		0.11		0.03	-
	04/19/89	0001			0.08		0.03	-
	06/04/90	0001			0.13		0.03	-
	10/12/90	0001		<	0.03		0.03	-
	05/15/91	0001		<	0.03		0.03	-
	09/18/92	0001		<	0.018	I	0.018	-
LEAD	10/11/88	0001	MG/L		0.02		0.01	-
	04/19/89	0001			0.01		0.01	-
	06/04/90	0001		<	0.01		0.01	-
	10/12/90	0001		<	0.05		0.05	-
	05/15/91	0001		<	0.05	I	0.05	-
	09/18/92	0001		<	0.015	INW	0.015	-
	02/22/93	0001		<	0.03	I	0.03	-
LEAD (TOTAL)	02/22/93	N001	MG/L		0.095	*N	0.003	-
LEAD-210	04/19/89	0001	PCI/L		1.4		1.5	1.0
	02/22/93	0001			2.9		2.3	1.4
LEAD-210 (TOTAL)	02/22/93	N001	PCI/L		8.0		2.3	1.6
MAGNESIUM	10/11/88	0001	MG/L		857.		0.001	-
	04/19/89	0001			543.		0.001	-
	06/04/90	0001			750.		0.001	-
	10/12/90	0001			675.		0.001	-
	05/15/91	0001			650.		2.	-
	09/18/92	0001			830		0.011	-
	02/22/93	0001			802		0.1	-
MAGNESIUM (TOTAL)	02/22/93	N001	MG/L		643		0.1	-
MANGANESE	04/19/89	0001	MG/L		0.62		0.01	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:

0001 - FILTERED SAMPLE (.45 MICRONS)

N001 - UNFILTERED SAMPLE

OTHER PARAMETER VALUE FLAGS:

* - DUPLICATE ANALYSIS NOT WITHIN CONTROL LIMITS

I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION

N - SPIKE SAMPLE RECOVERY NOT WITHIN CONTROL LIMITS

W - POST-DIGEST SPIKE OUT OF CNTR LIM WHILE SAMP ABS < 50% SPIKE

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP02 SHIPROCK (TAILINGS AREA)
 LOCATION: 0600
 NORTH COORDINATE: UNKNOWN
 EAST COORDINATE: UNKNOWN
 10/11/88 TO 04/26/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: URANIUM MILL TAILINGS (TA)
 HYDRAULIC FLOW RELATIONSHIP: ON-SITE (O)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
MANGANESE	06/04/90	0001	MG/L		0.95		0.01	-
	10/12/90	0001		0.92		0.01	-	
	05/15/91	0001		0.69		0.01	-	
	09/18/92	0001		1.4		0.0064	-	
	02/22/93	0001		1.21		0.01	-	
MANGANESE (TOTAL)	02/22/93	N001	MG/L		1.24		0.01	-
MERCURY	10/11/88	0001	MG/L		0.0005		0.0002	-
	04/19/89	0001		<	0.0002		0.0002	-
	06/04/90	0001		<	0.0002		0.0002	-
	10/12/90	0001		<	0.0002		0.0002	-
	05/15/91	0001		<	0.0002		0.0002	-
	09/18/92	0001		<	0.00010		0.00010	-
MOLYBDENUM	10/11/88	0001	MG/L		0.18		0.01	-
	04/19/89	0001			0.03		0.01	-
	06/04/90	0001		<	0.01		0.01	-
	10/12/90	0001		<	0.01		0.01	-
	05/15/91	0001		<	0.01		0.01	-
	09/18/92	0001		<	0.025	I	0.025	-
02/22/93	0001	<	0.01		0.01	-		
MOLYBDENUM (TOTAL)	02/22/93	N001	MG/L		0.01		0.01	-
NICKEL	04/19/89	0001	MG/L	<	0.04		0.04	-
	06/04/90	0001		<	0.04		0.04	-
	10/12/90	0001		<	0.04		0.04	-
	05/15/91	0001		<	0.04		0.04	-
	09/18/92	0001		<	0.061	I	0.061	-
NITRATE	10/11/88	0001	MG/L		840.		1.	-
	04/19/89	0001			470.		1.	-
	06/04/90	0001			945.		1.	-
	10/12/90	0001			385.		1.	-
	05/15/91	0001			332.		1.	-
	09/18/92	0001			700	J	0.044	-
02/22/93	0001		446		1	-		
NITRITE AND NITRATE	10/11/88	0001	MG/L		190.		1.	-
PH	10/11/88	0001	SU		7.25		-	-
	04/19/89	0001			6.78		-	-
	06/04/90	0001			6.70		-	-
	10/12/90	0001			6.55		-	-
	05/15/91	0001			6.71		-	-
	09/18/92	0001			6.65		-	-
02/22/93	0001		6.70		-	-		
PHOSPHATE	10/11/88	0001	MG/L	<	0.1		0.1	-
	04/19/89	0001		<	0.1		0.1	-
	06/04/90	0001		<	0.1		0.1	-
	10/12/90	0001			0.1		0.1	-
	05/15/91	0001			0.1		0.1	-
	02/22/93	0001			4.2		0.1	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID COOES:

0001 - FILTERED SAMPLE (.45 MICRONS)

N001 - UNFILTERED SAMPLE

OTHER PARAMETER VALUE FLAGS:

I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION

J - ESTIMATED VALUE

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP02 SHIPROCK (TAILINGS AREA)
 LOCATION: 0600
 NORTH COORDINATE: UNKNOWN
 EAST COORDINATE: UNKNOWN
 10/11/88 TO 04/26/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: URANIUM MILL TAILINGS (TA)
 HYDRAULIC FLOW RELATIONSHIP: ON-SITE (O)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
POLONIUM-210	04/19/89	0001	PC1/L		1.7		1.	0.6
	02/22/93	0001		0.8	N	0.7	0.5	
POLONIUM-210 (TOTAL)	02/22/93	N001	PC1/L		0.1	N	0.7	0.4
POTASSIUM	10/11/88	0001	MG/L		103.		0.01	-
	04/19/89	0001		61.8		0.01	-	
	06/04/90	0001		76.5		0.01	-	
	10/12/90	0001		56.		0.01	-	
	05/15/91	0001		45.		5.	-	
	09/18/92	0001		86	E	0.20	-	
	02/22/93	0001		81.4		0.1	-	
POTASSIUM (TOTAL)	02/22/93	N001	MG/L		68.1		0.1	-
RADIUM-226	10/11/88	0001	PC1/L		0.2		1.	0.2
	04/19/89	0001		0.3		1.	0.3	
	06/04/90	0001		0.9		1.	0.4	
	10/12/90	0001		1.2		1.	0.5	
	05/15/91	0001		1.4		1.	0.5	
	09/18/92	0001		0.91		.056	.151	
	02/22/93	0001		1.6		0.4	0.5	
RADIUM-226 (TOTAL)	02/22/93	N001	PC1/L		5.6		0.4	0.8
RADIUM-228	10/11/88	0001	PC1/L		2.7		1.	1.0
	04/19/89	0001		3.2		1.	1.0	
	06/04/90	0001		4.1		1.	0.9	
	10/12/90	0001		2.7		1.	3.4	
	05/15/91	0001		9.0		1.	3.3	
	09/18/92	0001		3.7		1.5	.925	
	02/22/93	0001		4.2		3.6	2.4	
SELENIUM	10/11/88	0001	MG/L		0.652		0.005	-
	04/19/89	0001		0.128		0.005	-	
	06/04/90	0001		0.091		0.005	-	
	10/12/90	0001		0.070		0.005	-	
	05/15/91	0001		<	0.005		0.005	-
	09/18/92	0001		<	0.015	*INW	0.015	-
	02/22/93	0001		<	0.05	*I	0.05	-
SELENIUM (TOTAL)	02/22/93	N001	MG/L	<	0.05	IN	0.05	-
SILICA - SiO2	04/19/89	0001	MG/L		11.		2.	-
	06/04/90	0001		13.		2.	-	
	10/12/90	0001		11.2		0.1	-	
	05/15/91	0001		11.6		0.1	-	
SILVER	10/11/88	0001	MG/L		0.01		0.01	-
	04/19/89	0001		<	0.01		0.01	-
	06/04/90	0001		<	0.01		0.01	-
	10/12/90	0001		<	0.01		0.01	-
	05/15/91	0001		<	0.01		0.01	-
SODIUM	10/11/88	0001	MG/L		3270.		0.002	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)
 N001 - UNFILTERED SAMPLE

OTHER PARAMETER VALUE FLAGS:

- * - DUPLICATE ANALYSIS NOT WITHIN CONTROL LIMITS
- E - ESTIMATED VALUE BECAUSE OF INTERFERENCE, SEE CASE NARRATIVE
- I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION
- N - SPIKE SAMPLE RECOVERY NOT WITHIN CONTROL LIMITS
- W - POST-DIGEST SPIKE OUT OF CNTR LIM WHILE SAMP ABS < 50% SPIKE

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP02 SHIPROCK (TAILINGS AREA)
 LOCATION: 0600
 NORTH COORDINATE: UNKNOWN
 EAST COORDINATE: UNKNOWN
 10/11/88 TO 04/26/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: URANIUM MILL TAILINGS (TA)
 HYDRAULIC FLOW RELATIONSHIP: ON-SITE (O)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
SODIUM	04/19/89	0001	MG/L		4066.		0.002	-
	06/04/90	0001		3730.	0.002	-		
	10/12/90	0001		3380.	0.002	-		
	05/15/91	0001		4090.	20.	-		
	09/18/92	0001		3300	0.011	-		
	02/22/93	0001		2880	1	-		
	SODIUM (TOTAL)	02/22/93		N001	MG/L		3450	
SPECIFIC CONDUCTANCE	10/11/88	0001	UMHO/CM		13000.		-	-
	04/19/89	0001		11500.	-	-		
	06/04/90	0001		12500.	-	-		
	10/12/90	0001		13100.	-	-		
	05/15/91	0001		14590.	-	-		
	09/18/92	0001		1354	-	-		
	02/22/93	0001		12750	-	-		
STRONTIUM	10/11/88	0001	MG/L		9.4		0.1	-
	04/19/89	0001		6.2	0.1	-		
	06/04/90	0001		8.52	0.1	-		
	10/12/90	0001		8.95	0.01	-		
	05/15/91	0001		8.21	0.01	-		
	09/18/92	0001		8.9	0.010	-		
	02/22/93	0001		8.84	0.01	-		
STRONTIUM (TOTAL)	02/22/93	N001	MG/L		9.37		0.01	-
SULFATE	10/11/88	0001	MG/L		9250.		0.1	-
	04/19/89	0001		11100.	0.1	-		
	06/04/90	0001		9780.	0.1	-		
	10/12/90	0001		9840.	0.1	-		
	05/15/91	0001		10200.	10.	-		
	09/18/92	0001		9900	10.0	-		
	02/22/93	0001		9200	1	-		
SULFATE (TOTAL)	02/22/93	N001	MG/L		9640		1	-
SULFIDE	04/19/89	0001	MG/L	<	0.1		0.1	-
TEMPERATURE	10/11/88	0001	C - DEGREE		17.5		-	-
	04/19/89	0001		15.	-	-		
	06/04/90	0001		16.5	-	-		
	10/12/90	0001		17.0	-	-		
	05/15/91	0001		15.1	-	-		
	09/18/92	0001		15.6	-	-		
	02/22/93	0001		14.1	-	-		
THALLIUM	04/19/89	0001	MG/L		0.02		0.01	-
	06/04/90	0001		<	0.01	0.01	-	
	10/12/90	0001		<	0.05	0.05	-	
	05/15/91	0001		<	0.05	0.05	-	
THORIUM-230	10/11/88	0001	PCI/L		0.3		1.	1.2
	04/19/89	0001		0.0	1.	0.7		
	02/22/93	0001		0.1	0.2	0.2		

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)
 N001 - UNFILTERED SAMPLE

OTHER PARAMETER VALUE FLAGS:
 I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION
 N - SPIKE SAMPLE RECOVERY NOT WITHIN CONTROL LIMITS

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP02 SHIPROCK (TAILINGS AREA)
 LOCATION: 0600
 NORTH COORDINATE: UNKNOWN
 EAST COORDINATE: UNKNOWN
 10/11/88 TO 04/26/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: URANIUM MILL TAILINGS (TA)
 HYDRAULIC FLOW RELATIONSHIP: ON-SITE (O)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
THORIUM-230 (TOTAL)	02/22/93	N001	PCI/L		6.2		0.2	1.3
TIN	04/19/89	0001	MG/L		0.098		0.005	
	06/04/90	0001		<	0.005		0.005	
	10/12/90	0001		<	0.05		0.05	
	05/15/91	0001		<	0.025	I	0.025	
TOTAL DISSOLVED SOLIDS	10/11/88	0001	MG/L		15900.		10.	
	04/19/89	0001			17900.		10.	
	06/04/90	0001			15400.		10.	
	10/12/90	0001			15800.		10.	
	05/15/91	0001			16500.		10.	
	09/18/92	0001			16000	H	10.0	
02/22/93	0001			15100		10		
TOTAL DISSOLVED SOLIDS (TOTAL)	02/22/93	N001	MG/L		15700		10	
TOTAL ORGANIC CARBON	04/19/89	0001	MG/L		314.		1.	
URANIUM	10/11/88	0001	MG/L		1.57		0.003	-
	04/19/89	0001			1.48		0.003	-
	06/04/90	0001			1.06		0.003	-
	10/12/90	0001			1.44		0.001	-
	05/15/91	0001			1.31		0.001	-
	09/18/92	0001			1.2		.001	-
	02/22/93	0001			1.39		0.001	-
URANIUM (TOTAL)	02/22/93	N001	MG/L		1.35		0.001	-
VANADIUM	10/11/88	0001	MG/L		0.08		0.01	-
	04/19/89	0001			0.06		0.01	-
	06/04/90	0001		<	0.01		0.01	-
	10/12/90	0001		<	0.01		0.01	-
	05/15/91	0001		<	0.01		0.01	-
ZINC	10/11/88	0001	MG/L		0.091		0.005	-
	04/19/89	0001			0.014		0.005	-
	06/04/90	0001		<	0.005		0.005	-
	10/12/90	0001		<	0.005		0.005	-
	05/15/91	0001		<	0.005		0.005	-
	09/18/92	0001			0.034	E	0.0010	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:

0001 - FILTERED SAMPLE (.45 MICRONS)

N001 - UNFILTERED SAMPLE

OTHER PARAMETER VALUE FLAGS:

E - ESTIMATED VALUE BECAUSE OF INTERFERENCE, SEE CASE NARRATIVE

H - HOLD TIME EXPIRED, VALUE SUSPECT

I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHPO2 SHIPROCK (TAILINGS AREA)
 LOCATION: 0601
 NORTH COORDINATE: UNKNOWN
 EAST COORDINATE: UNKNOWN
 10/11/88 TO 04/26/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: URANIUM MILL TAILINGS (TA)
 HYDRAULIC FLOW RELATIONSHIP: ON-SITE (O)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
ALKALINITY	10/11/88	0002	MG/L CaCO3		382.		-	-
	04/19/89	0001			294.		-	-
	06/04/90	0001			452.		-	-
	10/12/90	0001			408.		-	-
ALUMINUM	04/19/89	0001	MG/L		0.3		0.1	-
	06/04/90	0001		<	0.1		0.1	-
	10/12/90	0001			0.12		0.05	-
AMMONIUM	10/11/88	0002	MG/L		2920.		0.1	-
	04/19/89	0001			2400.		0.1	-
	06/04/90	0001			1840.		0.1	-
	10/12/90	0001			1570.		0.1	-
ANTIMONY	10/11/88	0002	MG/L		0.037		0.003	-
	04/19/89	0001			0.010		0.003	-
	06/04/90	0001			0.007		0.003	-
	10/12/90	0001		<	0.02	I	0.02	-
ARSENIC	10/11/88	0002	MG/L		0.06		0.01	-
	04/19/89	0001			0.02		0.01	-
	06/04/90	0001			0.02		0.01	-
	10/12/90	0001		<	0.05	I	0.05	-
BARIUM	10/11/88	0002	MG/L	<	0.1		0.1	-
	04/19/89	0001		<	0.1		0.1	-
	06/04/90	0001		<	0.1		0.1	-
	10/12/90	0001			0.01		0.01	-
BERYLLIUM	04/19/89	0001	MG/L	<	0.01		0.01	-
	06/04/90	0001		<	0.01		0.01	-
	10/12/90	0001		<	0.005		0.005	-
BORON	04/19/89	0001	MG/L		0.2		0.1	-
	06/04/90	0001			0.3		0.1	-
	10/12/90	0001			0.27		0.05	-
BROMIDE	04/19/89	0001	MG/L		0.1		0.1	-
CADMIUM	10/11/88	0002	MG/L		0.180		0.001	-
	04/19/89	0001			0.111		0.001	-
	06/04/90	0001			0.060		0.001	-
	10/12/90	0001			0.048		0.001	-
CALCIUM	10/11/88	0002	MG/L		380.		0.01	-
	04/19/89	0001			468.		0.01	-
	06/04/90	0001			404.		0.01	-
	10/12/90	0001			395.		0.01	-
CHLORIDE	10/11/88	0002	MG/L		570.		1.	-
	04/19/89	0001			440.		1.	-
	06/04/90	0001			384.		1.	-
	10/12/90	0001			286.		1.	-
CHROMIUM	10/11/88	0002	MG/L		0.24		0.01	-
	04/19/89	0001		<	0.01		0.01	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

OTHER PARAMETER VALUE FLAGS:
 I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)
 0002 - FILTERED REPLICATE SAMPLE (.45 MICRONS)

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP02 SHIPROCK (TAILINGS AREA)
 LOCATION: 0601
 NORTH COORDINATE: UNKNOWN
 EAST COORDINATE: UNKNOWN
 10/11/88 TO 04/26/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: URANIUM MILL TAILINGS (TA)
 HYDRAULIC FLOW RELATIONSHIP: ON-SITE (O)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
CHROMIUM	06/04/90	0001	MG/L	<	0.01		0.01	-
	10/12/90	0001		<	0.01		0.01	-
COBALT	10/11/88	0002	MG/L		0.29		0.05	-
	04/19/89	0001			0.13		0.05	-
	06/04/90	0001			0.12		0.05	-
	10/12/90	0001			0.07		0.03	-
COPPER	10/11/88	0002	MG/L		0.14		0.02	-
	04/19/89	0001			0.10		0.02	-
	06/04/90	0001			0.05		0.02	-
	10/12/90	0001			0.04		0.01	-
CYANIDE	04/19/89	0001	MG/L	<	0.01		0.01	-
FLUORIDE	10/11/88	0002	MG/L		1.9		0.1	-
	04/19/89	0001			1.4		0.1	-
	06/04/90	0001			1.3		0.1	-
	10/12/90	0001			1.6		0.1	-
GROSS ALPHA	10/11/88	0002	PCI/L		80.		0.2	130.
	04/19/89	0001			400.		0.2	130.
GROSS BETA	10/11/88	0002	PCI/L		230.		1.	60.
	04/19/89	0001			260.		1.	70.
IRON	10/11/88	0002	MG/L		0.95		0.03	-
	04/19/89	0001			0.28		0.03	-
	06/04/90	0001			0.16		0.03	-
	10/12/90	0001		<	0.03		0.03	-
LEAD	10/11/88	0002	MG/L	<	0.01		0.01	-
	04/19/89	0001		<	0.01		0.01	-
	06/04/90	0001		<	0.01		0.01	-
	10/12/90	0001		<	0.05	I	0.05	-
LEAD-210	04/19/89	0001	PCI/L		0.0		1.5	0.8
MAGNESIUM	10/11/88	0002	MG/L		1960.		0.001	-
	04/19/89	0001			1510.		0.001	-
	06/04/90	0001			1240.		0.001	-
	10/12/90	0001			466.		0.001	-
MANGANESE	04/19/89	0001	MG/L		39.8		0.01	-
	06/04/90	0001			33.8		0.01	-
	10/12/90	0001			28.0		0.01	-
MERCURY	10/11/88	0002	MG/L		0.0002		0.0002	-
	04/19/89	0001		<	0.0002		0.0002	-
	06/04/90	0001		<	0.0002		0.0002	-
	10/12/90	0001			0.0014		0.0002	-
MOLYBDENUM	10/11/88	0002	MG/L		0.34		0.01	-
	04/19/89	0001		<	0.01		0.01	-
	06/04/90	0001		<	0.01		0.01	-
	10/12/90	0001		<	0.01		0.01	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

OTHER PARAMETER VALUE FLAGS:
 I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)
 0002 - FILTERED REPLICATE SAMPLE (.45 MICRONS)

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP02 SHIPROCK (TAILINGS AREA)
 LOCATION: 0601
 NORTH COORDINATE: UNKNOWN
 EAST COORDINATE: UNKNOWN
 10/11/88 TO 04/26/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: URANIUM MILL TAILINGS (TA)
 HYDRAULIC FLOW RELATIONSHIP: ON-SITE (O)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
NICKEL	04/19/89	0001	MG/L		0.40		0.04	-
	06/04/90	0001		0.34		0.04	-	
	10/12/90	0001		0.17		0.04	-	
NITRATE	10/11/88	0002	MG/L		1990.		1.	-
	04/19/89	0001		3300.		1.	-	
	06/04/90	0001		2320.		1.	-	
	10/12/90	0001		2090.		1.	-	
NITRITE AND NITRATE	10/11/88	0002	MG/L		450.		1.	-
PH	10/11/88	0002	SU		6.43		-	-
	04/19/89	0001		6.22		-	-	
	06/04/90	0001		6.45		-	-	
	10/12/90	0001		6.53		-	-	
PHOSPHATE	10/11/88	0002	MG/L	<	0.1		0.1	-
	04/19/89	0001		0.2		0.1	-	
	06/04/90	0001		<	0.1		0.1	-
	10/12/90	0001		0.4		0.1	-	
POLONIUM-210	04/19/89	0001	PCI/L		0.4		1.	0.4
POTASSIUM	10/11/88	0002	MG/L		195.		0.01	-
	04/19/89	0001		163.		0.01	-	
	06/04/90	0001		127.		0.01	-	
	10/12/90	0001		71.		0.01	-	
RADIUM-226	10/11/88	0002	PCI/L		0.5		1.	0.2
	04/19/89	0001		0.4		1.	0.2	
	06/04/90	0001		1.1		1.	0.4	
	10/12/90	0001		0.5		1.	0.3	
RADIUM-228	10/11/88	0002	PCI/L		2.0		1.	1.0
	04/19/89	0001		3.0		1.	0.9	
	06/04/90	0001		2.0		1.	0.8	
	10/12/90	0001		0.0		1.	2.2	
SELENIUM	10/11/88	0002	MG/L		0.684		0.005	-
	04/19/89	0001		0.070		0.005	-	
	06/04/90	0001		0.037		0.005	-	
	10/12/90	0001		0.125		0.005	-	
SILICA - SiO2	04/19/89	0001	MG/L		15.		2.	-
	06/04/90	0001		10.		2.	-	
	10/12/90	0001		7.8		0.1	-	
SILVER	10/11/88	0002	MG/L		0.03		0.01	-
	04/19/89	0001		<	0.01		0.01	-
	06/04/90	0001		<	0.01		0.01	-
	10/12/90	0001		<	0.01		0.01	-
SODIUM	10/11/88	0002	MG/L		1530.		0.002	-
	04/19/89	0001		1100.		0.002	-	
	06/04/90	0001		1120.		0.002	-	
	10/12/90	0001		552.		0.002	-	
SPECIFIC CONDUCTANCE	10/11/88	0002	UMHO/CM		20000.		-	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)
 0002 - FILTERED REPLICATE SAMPLE (.45 MICRONS)

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP02 SHIPROCK (TAILINGS AREA)
 LOCATION: 0601
 NORTH COORDINATE: UNKNOWN
 EAST COORDINATE: UNKNOWN
 10/11/88 TO 04/26/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: URANIUM MILL TAILINGS (TA)
 HYDRAULIC FLOW RELATIONSHIP: ON-SITE (O)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
SPECIFIC CONDUCTANCE	04/19/89	0001	UMHO/CM		9250.		-	-
	06/04/90	0001		15000.	-	-		
	10/12/90	0001		13400.	-	-		
STRONTIUM	10/11/88	0002	MG/L		3.5		0.1	-
	04/19/89	0001		2.7	0.1	-		
	06/04/90	0001		2.34	0.1	-		
	10/12/90	0001		2.02	0.01	-		
SULFATE	10/11/88	0002	MG/L		17500.		0.1	-
	04/19/89	0001		13900.	0.1	-		
	06/04/90	0001		11800.	0.1	-		
	10/12/90	0001		8450.	0.1	-		
SULFIDE	04/19/89	0001	MG/L	<	0.1		0.1	-
TEMPERATURE	10/11/88	0002	C - DEGREE		15.		-	-
	04/19/89	0001		15.	-	-		
	06/04/90	0001		18.	-	-		
	10/12/90	0001		15.0	-	-		
THALLIUM	04/19/89	0001	MG/L		0.05		0.01	-
	06/04/90	0001		0.03	0.01	-		
	10/12/90	0001		< 0.05	I	0.05	-	
THORIUM-230	10/11/88	0002	PCI/L		0.0		1.	0.4
	04/19/89	0001		0.1	1.	0.4		
TIN	04/19/89	0001	MG/L		0.019		0.005	-
	06/04/90	0001		<	0.005		0.005	-
	10/12/90	0001		<	0.05	I	0.05	-
TOTAL DISSOLVED SOLIDS	10/11/88	0002	MG/L		25300.		10.	-
	04/19/89	0001		19800.	10.	-		
	06/04/90	0001		14700.	10.	-		
	10/12/90	0001		11600.	10.	-		
TOTAL ORGANIC CARBON	04/19/89	0001	MG/L		93.5		1.	-
URANIUM	10/11/88	0002	MG/L		0.0262		0.003	-
	04/19/89	0001		0.0268	0.003	-		
	06/04/90	0001		0.030	0.003	-		
	10/12/90	0001		0.026	0.001	-		
VANADIUM	10/11/88	0002	MG/L		0.20		0.01	-
	04/19/89	0001		0.15	0.01	-		
	06/04/90	0001		0.04	0.01	-		
	10/12/90	0001		0.03	0.01	-		
ZINC	10/11/88	0002	MG/L		0.599		0.005	-
	04/19/89	0001		0.435	0.005	-		
	06/04/90	0001		0.291	0.005	-		
	10/12/90	0001		0.163	0.005	-		

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

OTHER PARAMETER VALUE FLAGS:
 I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)
 0002 - FILTERED REPLICATE SAMPLE (.45 MICRONS)

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0602
 NORTH COORDINATE: 10140.0 FT
 EAST COORDINATE: 10850.0 FT
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: DOWN GRADIENT (D)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
ALKALINITY	09/18/87	0001	MG/L CaCO3		231.		-	-
ALUMINUM	09/18/87	0001	MG/L		0.29		0.1	-
AMMONIUM	09/18/87	0001	MG/L		41.3		0.1	-
ANTIMONY	09/18/87	0001	MG/L		0.116		0.003	-
ARSENIC	09/18/87	0001	MG/L		0.008	J	0.01	-
BARIUM	09/18/87	0001	MG/L		0.02	J	0.1	-
BORON	09/18/87	0001	MG/L		0.48		0.1	-
BROMIDE	09/18/87	0001	MG/L		0.1		0.01	-
CADMIUM	09/18/87	0001	MG/L	<	0.005		0.005	-
CALCIUM	09/18/87	0001	MG/L		520.		0.01	-
CHLORIDE	09/18/87	0001	MG/L		44.	HJ	1.	-
CHROMIUM	09/18/87	0001	MG/L	<	0.01		0.01	-
COBALT	09/18/87	0001	MG/L	<	0.01	J	0.05	-
COPPER	09/18/87	0001	MG/L	<	0.01	J	0.02	-
FLUORIDE	09/18/87	0001	MG/L		0.46		0.1	-
GROSS ALPHA	09/18/87	0001	PCI/L		200.		0.2	40.
GROSS BETA	09/18/87	0001	PCI/L		200.		1.	30.
IRON	09/18/87	0001	MG/L		2.09	R	0.03	-
LEAD	09/18/87	0001	MG/L		0.01		0.01	-
MAGNESIUM	09/18/87	0001	MG/L		295.		0.001	-
MANGANESE	09/18/87	0001	MG/L		2.36		0.01	-
MERCURY	09/18/87	0001	MG/L		0.0003		0.0002	-
MOLYBDENUM	09/18/87	0001	MG/L	<	0.01		0.01	-
NICKEL	09/18/87	0001	MG/L	<	0.01	J	0.04	-
NITRATE	09/18/87	0001	MG/L		110.	HJ	1.	-
NITRITE	09/18/87	0001	MG/L	<	0.1		0.1	-
PH	09/18/87	0001	SU		6.92		-	-
PHOSPHATE	09/18/87	0001	MG/L		0.46	H	0.1	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)

OTHER PARAMETER VALUE FLAGS:
 H - HOLD TIME EXPIRED, VALUE SUSPECT
 J - ESTIMATED VALUE
 R - UNUSABLE DATA POINT

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0602
 NORTH COORDINATE: 10140.0 FT
 EAST COORDINATE: 10850.0 FT
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: DOWN GRADIENT (D)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
POLONIUM-210	09/18/87	0001	PCI/L		0.2		1.	0.7
POTASSIUM	09/18/87	0001	MG/L		45.1	J	0.01	-
RADIUM-226	09/18/87	0001	PCI/L		0.0		1.	0.1
RADIUM-228	09/18/87	0001	PCI/L		1.5		1.	1.6
SELENIUM	09/18/87	0001	MG/L		0.178		0.005	-
SILICA - SiO2	09/18/87	0001	MG/L		17.8		2.	-
SODIUM	09/18/87	0001	MG/L		351.		0.002	-
SPECIFIC CONDUCTANCE	09/18/87	0001	UMHO/CM		2700.		-	-
STRONTIUM	09/18/87	0001	MG/L		4.50		0.1	-
SULFATE	09/18/87	0001	MG/L		2880.		0.1	-
SULFIDE	09/18/87	0001	MG/L	<	0.1		0.1	-
TEMPERATURE	09/18/87	0001	C - DEGREE		24.0		-	-
THORIUM-230	09/18/87	0001	PCI/L		0.4		1.	0.8
TIN	09/18/87	0001	MG/L		0.020		0.005	-
TOTAL DISSOLVED SOLIDS	09/18/87	0001	MG/L		4830.		10.	-
TOTAL ORGANIC CARBON	09/18/87	0001	MG/L		73.5		1.	-
URANIUM	09/18/87	0001	MG/L		0.348		0.003	-
VANADIUM	09/18/87	0001	MG/L		0.07		0.01	-
ZINC	09/18/87	0001	MG/L		0.347		0.005	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)

OTHER PARAMETER VALUE FLAGS:
 J - ESTIMATED VALUE

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP02 SHIPROCK (TAILINGS AREA)
 LOCATION: 0602
 NORTH COORDINATE: UNKNOWN
 EAST COORDINATE: UNKNOWN
 10/11/88 TO 04/26/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: URANIUM MILL TAILINGS (TA)
 HYDRAULIC FLOW RELATIONSHIP: ON-SITE (O)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
ALKALINITY	10/11/88	0001	MG/L CaCO3		2293.		-	-
	04/19/89	0001		2254.	-	-		
	06/04/90	0001		2140.	-	-		
	10/11/90	0001		2231.	-	-		
	05/15/91	0001		2259.	-	-		
	09/18/92	0001		2181	-	-		
	02/22/93	0001		2238	-	-		
ALUMINUM	04/19/89	0001	MG/L	<	0.1		0.1	-
	06/04/90	0001		<	0.1		0.1	-
	10/11/90	0001		<	0.1	I	0.1	-
	05/15/91	0001		<	0.2	I	0.2	-
	09/18/92	0001		<	0.87	*IN	0.87	-
AMMONIUM	10/11/88	0001	MG/L		600.		0.1	-
	04/19/89	0001		670.	-	-		
	06/04/90	0001		0.613	-	-		
	10/11/90	0001		386.	-	-		
	05/15/91	0001		534.	-	-		
AMMONIUM (TOTAL)	02/22/93	N001	MG/L		607	N	0.1	-
ANTIMONY	10/11/88	0001	MG/L		0.043		0.003	-
	04/19/89	0001		0.035	-	-		
	06/04/90	0001		0.028	-	-		
	10/11/90	0001		<	0.02	I	0.02	-
	05/15/91	0001		<	0.015	I	0.015	-
	09/18/92	0001		<	0.0075	INW	0.0075	-
ARSENIC	10/11/88	0001	MG/L		0.31		0.01	-
	04/19/89	0001		0.05	-	-		
	06/04/90	0001		0.02	-	-		
	10/11/90	0001		<	0.1	I	0.1	-
	05/15/91	0001		<	0.05	I	0.05	-
	09/18/92	0001		<	0.015	INW	0.015	-
	02/22/93	0001		<	0.05	I	0.05	-
ARSENIC (TOTAL)	02/22/93	N001	MG/L	<	0.05	I	0.05	-
BARIUM	10/11/88	0001	MG/L	<	0.1		0.1	-
	04/19/89	0001		<	0.1		0.1	-
	06/04/90	0001		<	0.1		0.1	-
	10/11/90	0001		<	0.01		0.01	-
	05/15/91	0001		<	0.05	I	0.05	-
	09/18/92	0001		<	0.016	N	0.0029	-
BERYLLIUM	04/19/89	0001	MG/L	<	0.01		0.01	-
	06/04/90	0001		<	0.01		0.01	-
	10/11/90	0001		<	0.01	I	0.01	-
	05/15/91	0001		<	0.03	I	0.03	-
BORON	04/19/89	0001	MG/L		0.7		0.1	-
	06/04/90	0001		0.7	-	-		
	10/11/90	0001		0.71	-	-		

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:

0001 - FILTERED SAMPLE (.45 MICRONS)

N001 - UNFILTERED SAMPLE

OTHER PARAMETER VALUE FLAGS:

* - DUPLICATE ANALYSIS NOT WITHIN CONTROL LIMITS

I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION

N - SPIKE SAMPLE RECOVERY NOT WITHIN CONTROL LIMITS

W - POST-DIGEST SPIKE OUT OF CNTR LIM WHILE SAMP ABS < 50% SPIKE

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP02 SHIPROCK (TAILINGS AREA)
 LOCATION: 0602
 NORTH COORDINATE: UNKNOWN
 EAST COORDINATE: UNKNOWN
 10/11/88 TO 04/26/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: URANIUM MILL TAILINGS (TA)
 HYDRAULIC FLOW RELATIONSHIP: ON-SITE (O)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
BORON	05/15/91	0001	MG/L		0.8		0.2	-
BROMIDE	04/19/89	0001	MG/L	<	0.1		0.1	-
CADMIUM	10/11/88	0001	MG/L		0.008		0.001	-
	04/19/89	0001			0.013		0.001	-
	06/04/90	0001		<	0.001		0.001	-
	10/11/90	0001		<	0.005	I	0.005	-
	05/15/91	0001		<	0.001		0.001	-
	09/18/92	0001			0.0007		0.00013	-
	02/22/93	0001		<	0.002	IS	0.002	-
CADMIUM (TOTAL)	02/22/93	N001	MG/L	<	0.01	I	0.01	-
CALCIUM	10/11/88	0001	MG/L		354.		0.01	-
	04/19/89	0001			416.		0.01	-
	06/04/90	0001			354.		0.01	-
	10/11/90	0001			357.		0.01	-
	05/15/91	0001			480.		2.	-
	09/18/92	0001			500		0.0050	-
	02/22/93	0001			427		0.5	-
CALCIUM (TOTAL)	02/22/93	N001	MG/L		387		0.5	-
CHLORIDE	10/11/88	0001	MG/L		790.		1.	-
	04/19/89	0001			717.		1.	-
	06/04/90	0001			820.		1.	-
	10/11/90	0001			780.		1.	-
	05/15/91	0001			900.		1.	-
	09/18/92	0001			610	N	0.50	-
	02/22/93	0001			862		0.5	-
CHLORIDE (TOTAL)	02/22/93	N001	MG/L		787		0.5	-
CHROMIUM	10/11/88	0001	MG/L		0.24		0.01	-
	04/19/89	0001		<	0.01		0.01	-
	06/04/90	0001		<	0.01		0.01	-
	10/11/90	0001		<	0.02	I	0.02	-
	05/15/91	0001		<	0.05	I	0.05	-
	09/18/92	0001		<	0.027	IN	0.027	-
	02/22/93	0001		<	0.1	I	0.1	-
CHROMIUM (TOTAL)	02/22/93	N001	MG/L	<	0.01		0.01	-
COBALT	10/11/88	0001	MG/L		0.12		0.05	-
	04/19/89	0001		<	0.05		0.05	-
	06/04/90	0001		<	0.05		0.05	-
	10/11/90	0001		<	0.06	I	0.06	-
	05/15/91	0001		<	0.1	I	0.1	-
	09/18/92	0001			0.027		0.0053	-
COPPER	10/11/88	0001	MG/L		0.03		0.02	-
	04/19/89	0001			0.02		0.02	-
	06/04/90	0001		<	0.02		0.02	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)
 N001 - UNFILTERED SAMPLE

OTHER PARAMETER VALUE FLAGS:
 I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION
 N - SPIKE SAMPLE RECOVERY NOT WITHIN CONTROL LIMITS
 S - REPORTED VALUE DETERMINED USING METHOD OF STD ADDITION (MSA)

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP02 SHIPROCK (TAILINGS AREA)
 LOCATION: 0602
 NORTH COORDINATE: UNKNOWN
 EAST COORDINATE: UNKNOWN
 10/11/88 TO 04/26/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: URANIUM MILL TAILINGS (TA)
 HYDRAULIC FLOW RELATIONSHIP: ON-SITE (O)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
COPPER	10/11/90	0001	MG/L	<	0.02	I	0.02	-
	05/15/91	0001		<	0.05	I	0.05	-
	09/18/92	0001		<	0.021	I	0.021	-
CYANIDE	04/19/89	0001	MG/L	<	0.01		0.01	-
FLUORIDE	10/11/88	0001	MG/L		0.3		0.1	-
	04/19/89	0001			0.4		0.1	-
	06/04/90	0001			0.2		0.1	-
	10/11/90	0001			0.5		0.1	-
	05/15/91	0001			0.4		0.1	-
GROSS ALPHA	10/11/88	0001	PCI/L		1200.		0.2	200.
	04/19/89	0001			1200.		0.2	200.
	09/18/92	0001			120.		38.5	48.9
	02/22/93	0001			583.		173.	177.
GROSS ALPHA (TOTAL)	02/22/93	N001	PCI/L		480.		184.	169.
GROSS BETA	10/11/88	0001	PCI/L		550.		1.	80.
	04/19/89	0001			500.		1.	100.
	09/18/92	0001			57.		37	26
	02/22/93	0001			706.		138.	121.
GROSS BETA (TOTAL)	02/22/93	N001	PCI/L		379.		150.	110.
IRON	10/11/88	0001	MG/L		0.21		0.03	-
	04/19/89	0001			0.19		0.03	-
	06/04/90	0001			0.20		0.03	-
	10/11/90	0001		<	0.06	I	0.06	-
	05/15/91	0001		<	0.1	I	0.1	-
	09/18/92	0001		<	0.018	I	0.018	-
LEAD	10/11/88	0001	MG/L		0.02		0.01	-
	04/19/89	0001			0.02		0.01	-
	06/04/90	0001		<	0.01		0.01	-
	10/11/90	0001		<	0.05	I	0.05	-
	05/15/91	0001		<	0.05	I	0.05	-
	09/18/92	0001		<	0.015	EIN	0.015	-
	02/22/93	0001		<	0.03	I	0.03	-
LEAD (TOTAL)	02/22/93	N001	MG/L	<	0.03	*IN	0.03	-
LEAD-210	04/19/89	0001	PCI/L		1.5		1.5	1.0
	02/22/93	0001			3.2		2.3	1.5
LEAD-210 (TOTAL)	02/22/93	N001	PCI/L		1.3		2.3	1.4
MAGNESIUM	10/11/88	0001	MG/L		2940.		0.001	-
	04/19/89	0001			2800.		0.001	-
	06/04/90	0001			2680.		0.001	-
	10/11/90	0001			1820.		0.001	-
	05/15/91	0001			2830.		10.	-
	09/18/92	0001			2800		0.011	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:

0001 - FILTERED SAMPLE (.45 MICRONS)

N001 - UNFILTERED SAMPLE

OTHER PARAMETER VALUE FLAGS:

* - DUPLICATE ANALYSIS NOT WITHIN CONTROL LIMITS

E - ESTIMATED VALUE BECAUSE OF INTERFERENCE, SEE CASE NARRATIVE

I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION

N - SPIKE SAMPLE RECOVERY NOT WITHIN CONTROL LIMITS

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP02 SHIPROCK (TAILINGS AREA)
 LOCATION: 0602
 NORTH COORDINATE: UNKNOWN
 EAST COORDINATE: UNKNOWN
 10/11/88 TO 04/26/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: URANIUM MILL TAILINGS (TA)
 HYDRAULIC FLOW RELATIONSHIP: ON-SITE (O)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
MAGNESIUM	02/22/93	0001	MG/L		2670		0.1	-
MAGNESIUM (TOTAL)	02/22/93	N001	MG/L		2610		0.1	-
MANGANESE	04/19/89	0001	MG/L		1.70		0.01	-
	06/04/90	0001		1.63	0.01	-		
	10/11/90	0001		1.28	0.01	-		
	05/15/91	0001		1.90	0.05	-		
	09/18/92	0001		2.4	0.0064	-		
	02/22/93	0001		2.10	0.01	-		
MANGANESE (TOTAL)	02/22/93	N001	MG/L		1.90		0.01	-
MERCURY	10/11/88	0001	MG/L		0.0002		0.0002	-
	04/19/89	0001		<	0.0002		0.0002	-
	06/04/90	0001		<	0.0002		0.0002	-
	10/11/90	0001		<	0.0002		0.0002	-
	05/15/91	0001		<	0.0002		0.0002	-
	09/18/92	0001		<	0.00010		0.00010	-
MOLYBDENUM	10/11/88	0001	MG/L		0.45		0.01	-
	04/19/89	0001			0.07		0.01	-
	06/04/90	0001			0.11		0.01	-
	10/11/90	0001		<	0.02	I	0.02	-
	05/15/91	0001		<	0.05	I	0.05	-
	09/18/92	0001		<	0.025	I	0.025	-
02/22/93	0001	<	0.1	I	0.1	-		
MOLYBDENUM (TOTAL)	02/22/93	N001	MG/L		0.01		0.01	-
NICKEL	04/19/89	0001	MG/L		0.07		0.04	-
	06/04/90	0001			0.10		0.04	-
	10/11/90	0001		<	0.08	I	0.08	-
	05/15/91	0001		<	0.2	I	0.2	-
	09/18/92	0001		<	0.061	I	0.061	-
NITRATE	10/11/88	0001	MG/L		55.		1.	-
	04/19/89	0001			140.		1.	-
	06/04/90	0001			87.		1.	-
	10/11/90	0001			65.		1.	-
	05/15/91	0001			134.		1.	-
	09/18/92	0001			80	J	0.044	-
NITRATE (TOTAL)	02/22/93	N001	MG/L		35.6		1	-
NITRITE AND NITRATE	10/11/88	0001	MG/L		12.		1.	-
PH	10/11/88	0001	SU		6.61		-	-
	04/19/89	0001			7.18		-	-
	06/04/90	0001			6.44		-	-
	10/11/90	0001			6.53		-	-
	05/15/91	0001			6.60		-	-
	09/18/92	0001			6.39		-	-
02/22/93	0001		6.55		-	-		
PHOSPHATE	10/11/88	0001	MG/L	<	0.1		0.1	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)
 N001 - UNFILTERED SAMPLE

OTHER PARAMETER VALUE FLAGS:
 I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION
 J - ESTIMATED VALUE

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP02 SHIPROCK (TAILINGS AREA)
 LOCATION: 0602
 NORTH COORDINATE: UNKNOWN
 EAST COORDINATE: UNKNOWN
 10/11/88 TO 04/26/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: URANIUM MILL TAILINGS (TA)
 HYDRAULIC FLOW RELATIONSHIP: ON-SITE (O)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
PHOSPHATE	04/19/89	0001	MG/L	<	0.1		0.1	-
	06/04/90	0001			0.6		0.1	-
	10/11/90	0001			0.1		0.1	-
	05/15/91	0001			0.2		0.1	-
PHOSPHATE (TOTAL)	02/22/93	N001	MG/L		0.49		0.1	-
POLONIUM-210	04/19/89	0001	PCI/L		3.1		1.	1.0
	02/22/93	0001			0.0	N	0.7	0.3
POLONIUM-210 (TOTAL)	02/22/93	N001	PCI/L		0.4	N	0.7	0.5
POTASSIUM	10/11/88	0001	MG/L		266.		0.01	-
	04/19/89	0001			248.		0.01	-
	06/04/90	0001			215.		0.01	-
	10/11/90	0001			161.		0.01	-
	05/15/91	0001			190.		20.	-
	09/18/92	0001			230	E	0.20	-
	02/22/93	0001			200		0.1	-
POTASSIUM (TOTAL)	02/22/93	N001	MG/L		200		0.1	-
RADIUM-226	10/11/88	0001	PCI/L		0.9		1.	0.4
	04/19/89	0001			2.9		1.	0.8
	06/04/90	0001			4.1		1.	0.8
	10/11/90	0001			4.9		1.	0.8
	05/15/91	0001			4.8		1.	1.0
	09/18/92	0001			3.7		.0582	.299
	02/22/93	0001			5.2		0.4	0.8
RADIUM-226 (TOTAL)	02/22/93	N001	PCI/L		6.7		0.4	0.9
RADIUM-228	10/11/88	0001	PCI/L		9.5		1.	2.0
	04/19/89	0001			9.4		1.	1.2
	06/04/90	0001			10.		1.	1.
	10/11/90	0001			5.8		1.	2.5
	05/15/91	0001			17.5		1.	4.7
	09/18/92	0001			8.3		1.23	.93
	02/22/93	0001			9.9		3.6	2.8
SELENIUM	10/11/88	0001	MG/L		0.796		0.005	-
	04/19/89	0001			0.142		0.005	-
	06/04/90	0001			0.163		0.005	-
	10/11/90	0001			< 0.05	I	0.05	-
	05/15/91	0001			< 0.05	I	0.05	-
	09/18/92	0001			0.005	+NW	0.0015	-
	02/22/93	0001			< 0.05	*I	0.05	-
SELENIUM (TOTAL)	02/22/93	N001	MG/L	<	0.05	IN	0.05	-
SILICA - SiO2	04/19/89	0001	MG/L		9.0		2.	-
	06/04/90	0001			10.		2.	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:

0001 - FILTERED SAMPLE (.45 MICRONS)

N001 - UNFILTERED SAMPLE

OTHER PARAMETER VALUE FLAGS:

* - DUPLICATE ANALYSIS NOT WITHIN CONTROL LIMITS

+ - CORRELATION COEFFICIENT FOR HSA < 0.995

E - ESTIMATED VALUE BECAUSE OF INTERFERENCE, SEE CASE NARRATIVE

I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION

N - SPIKE SAMPLE RECOVERY NOT WITHIN CONTROL LIMITS

W - POST-DIGEST SPIKE OUT OF CNTR LIM WHILE SAMP ABS < 50% SPIKE

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP02 SHIPROCK (TAILINGS AREA)
 LOCATION: 0602
 NORTH COORDINATE: UNKNOWN
 EAST COORDINATE: UNKNOWN
 10/11/88 TO 04/26/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: URANIUM MILL TAILINGS (TA)
 HYDRAULIC FLOW RELATIONSHIP: ON-SITE (O)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
SILICA - SiO2	10/11/90	0001	MG/L		7.8		0.1	-
	05/15/91	0001			10.5		0.5	-
SILVER	10/11/88	0001	MG/L		0.02		0.01	-
	04/19/89	0001		<	0.01		0.01	-
	06/04/90	0001		<	0.01		0.01	-
	10/11/90	0001		<	0.02	I	0.02	-
	05/15/91	0001		<	0.05	I	0.05	-
SODIUM	10/11/88	0001	MG/L		3160.		0.002	-
	04/19/89	0001			2750.		0.002	-
	06/04/90	0001			3230.		0.002	-
	10/11/90	0001			2120.		0.002	-
	05/15/91	0001			3070.		20.	-
	09/18/92	0001			3200		0.011	-
	02/22/93	0001			2920		1	-
SODIUM (TOTAL)	02/22/93	N001	MG/L		2850		1	-
SPECIFIC CONDUCTANCE	10/11/88	0001	UMHO/CM		16750.		-	-
	04/19/89	0001			13000.		-	-
	06/04/90	0001			17500.		-	-
	10/11/90	0001			17000.		-	-
	05/15/91	0001			19510.		-	-
	09/18/92	0001			18210		-	-
	02/22/93	0001			17750		-	-
STRONTIUM	10/11/88	0001	MG/L		15.6		0.1	-
	04/19/89	0001			11.0		0.1	-
	06/04/90	0001			11.2		0.1	-
	10/11/90	0001			7.84		0.01	-
	05/15/91	0001			12.2		0.05	-
	09/18/92	0001			11	N	0.010	-
	02/22/93	0001			12.7		0.01	-
STRONTIUM (TOTAL)	02/22/93	N001	MG/L		12.2		0.01	-
SULFATE	10/11/88	0001	MG/L		18100.		0.1	-
	04/19/89	0001			17600.		0.1	-
	06/04/90	0001			16800.		0.1	-
	10/11/90	0001			16700.		0.1	-
	05/15/91	0001			16800.		10.	-
	09/18/92	0001			18000	N	10.0	-
	02/22/93	0001			16900		1	-
SULFATE (TOTAL)	02/22/93	N001	MG/L		17900		1	-
SULFIDE	04/19/89	0001	MG/L	<	0.1		0.1	-
TEMPERATURE	10/11/88	0001	C - DEGREE		16.0		-	-
	04/19/89	0001			17.		-	-
	06/04/90	0001			16.5		-	-
	10/11/90	0001			16.2		-	-
	05/15/91	0001			15.5		-	-
	09/18/92	0001			15.9		-	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

OTHER PARAMETER VALUE FLAGS:
 I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION
 N - SPIKE SAMPLE RECOVERY NOT WITHIN CONTROL LIMITS

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)
 N001 - UNFILTERED SAMPLE

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP02 SHIPROCK (TAILINGS AREA)
 LOCATION: 0602
 NORTH COORDINATE: UNKNOWN
 EAST COORDINATE: UNKNOWN
 10/11/88 TO 04/26/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: URANIUM MILL TAILINGS (TA)
 HYDRAULIC FLOW RELATIONSHIP: ON-SITE (O)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
TEMPERATURE	02/22/93	0001	C - DEGREE		15.6		-	-
THALLIUM	04/19/89	0001	MG/L		0.03		0.01	-
	06/04/90	0001			0.02		0.01	-
	10/11/90	0001		<	0.05	I	0.05	-
	05/15/91	0001		<	0.05	I	0.05	-
THORIUM-230	10/11/88	0001	PCI/L		0.0		1.	0.9
	04/19/89	0001			0.0		1.	0.9
	02/22/93	0001			0.3		0.4	0.3
THORIUM-230 (TOTAL)	02/22/93	N001	PCI/L		1.1		0.3	0.6
TIN	04/19/89	0001	MG/L		0.027		0.005	-
	06/04/90	0001		<	0.005		0.005	-
	10/11/90	0001		<	0.1	I	0.1	-
	05/15/91	0001		<	0.025	I	0.025	-
TOTAL DISSOLVED SOLIDS	10/11/88	0001	MG/L		27800.		10.	-
	04/19/89	0001			28300.		10.	-
	06/04/90	0001			25500.		10.	-
	10/11/90	0001			25400.		10.	-
	05/15/91	0001			25300.		10.	-
	09/18/92	0001			26000	H	10.0	-
	02/22/93	0001			27800		10	-
TOTAL DISSOLVED SOLIDS (TOTAL)	02/22/93	N001	MG/L		27400		10	-
TOTAL ORGANIC CARBON	04/19/89	0001	MG/L		417.		1.	-
URANIUM	10/11/88	0001	MG/L		1.15		0.003	-
	04/19/89	0001			1.37		0.003	-
	06/04/90	0001			0.971		0.003	-
	10/11/90	0001			0.975		0.001	-
	05/15/91	0001			1.02		0.001	-
	09/18/92	0001			0.88		.01	-
	02/22/93	0001			0.809		0.001	-
URANIUM (TOTAL)	02/22/93	N001	MG/L		0.823		0.001	-
VANADIUM	10/11/88	0001	MG/L		0.17		0.01	-
	04/19/89	0001			0.17		0.01	-
	06/04/90	0001			0.04		0.01	-
	10/11/90	0001		<	0.02	I	0.02	-
	05/15/91	0001		<	0.05	I	0.05	-
	09/18/92	0001			0.39	E	0.0019	-
ZINC	10/11/88	0001	MG/L		0.048		0.005	-
	04/19/89	0001			0.015		0.005	-
	06/04/90	0001		<	0.005		0.005	-
	10/11/90	0001		<	0.05	I	0.05	-
	05/15/91	0001		<	0.1	I	0.1	-
	09/18/92	0001			0.029	E	0.0010	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:

0001 - FILTERED SAMPLE (.45 MICRONS)

N001 - UNFILTERED SAMPLE

OTHER PARAMETER VALUE FLAGS:

E - ESTIMATED VALUE BECAUSE OF INTERFERENCE, SEE CASE NARRATIVE

H - HOLD TIME EXPIRED, VALUE SUSPECT

I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0603
 NORTH COORDINATE: 10300.0 FT
 EAST COORDINATE: 10200.0 FT
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: DOWN GRADIENT (D)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
ALKALINITY	09/03/87	0001	MG/L CAC03		1791.	J	-	-
	04/06/89	0001			749.		-	-
	06/04/90	0001			310.		-	-
ALUMINUM	09/03/87	0001	MG/L		0.59		0.1	-
	04/06/89	0001		<	0.1		0.1	-
	06/04/90	0001		<	0.1		0.1	-
AMMONIUM	09/03/87	0001	MG/L		0.1	H	0.1	-
	04/06/89	0001		<	0.1		0.1	-
	06/04/90	0001			3780.		0.1	-
ANTIMONY	09/03/87	0001	MG/L		0.068		0.003	-
	04/06/89	0001			0.071		0.003	-
	06/04/90	0001			0.025		0.003	-
ARSENIC	09/03/87	0001	MG/L		0.082		0.01	-
	04/06/89	0001			0.02		0.01	-
	06/04/90	0001			0.02		0.01	-
BARIUM	09/03/87	0001	MG/L		0.01	J	0.1	-
	04/06/89	0001		<	0.1		0.1	-
	06/04/90	0001		<	0.1		0.1	-
BERYLLIUM	04/06/89	0001	MG/L	<	0.01		0.01	-
	06/04/90	0001		<	0.01		0.01	-
BORON	09/03/87	0001	MG/L		1.12		0.1	-
	04/06/89	0001			0.6		0.1	-
	06/04/90	0001		<	0.1		0.1	-
BROMIDE	09/03/87	0001	MG/L		0.6		0.01	-
	04/06/89	0001			0.3		0.1	-
CADMIUM	09/03/87	0001	MG/L	<	0.005		0.005	-
	04/06/89	0001			0.020		0.001	-
	06/04/90	0001			0.057		0.001	-
CALCIUM	09/03/87	0001	MG/L		519.		0.01	-
	04/06/89	0001			369.		0.01	-
	06/04/90	0001			367.		0.01	-
CHLORIDE	09/03/87	0001	MG/L		1060.	HJ	1.	-
	04/06/89	0001			880.		1.	-
	06/04/90	0001			731.		1.	-
CHROMIUM	09/03/87	0001	MG/L	<	0.01		0.01	-
	04/06/89	0001		<	0.01		0.01	-
	06/04/90	0001		<	0.01		0.01	-
COBALT	09/03/87	0001	MG/L	<	0.01	J	0.05	-
	04/06/89	0001		<	0.05		0.05	-
	06/04/90	0001		<	0.05		0.05	-
COPPER	09/03/87	0001	MG/L		0.06		0.02	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)

OTHER PARAMETER VALUE FLAGS:
 H - HOLD TIME EXPIRED, VALUE SUSPECT
 J - ESTIMATED VALUE

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0603
 NORTH COORDINATE: 10300.0 FT
 EAST COORDINATE: 10200.0 FT
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: DOWN GRADIENT (D)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
COPPER	04/06/89	0001	MG/L		0.05		0.02	-
	06/04/90	0001		<	0.02		0.02	-
CYANIDE	04/06/89	0001	MG/L	<	0.01		0.01	-
FLUORIDE	09/03/87	0001	MG/L		0.65		0.1	-
	04/06/89	0001			0.7		0.1	-
	06/04/90	0001			0.1		0.1	-
GROSS ALPHA	09/03/87	0001	PCI/L		2300.		0.2	300.
	04/06/89	0001			1600.		0.2	300.
GROSS BETA	09/03/87	0001	PCI/L		1300.		1.	100.
	04/06/89	0001			730.		1.	110.
IRON	09/03/87	0001	MG/L		0.51		0.03	-
	04/06/89	0001			0.45		0.03	-
	06/04/90	0001			0.20		0.03	-
LEAD	09/03/87	0001	MG/L		0.03		0.01	-
	04/06/89	0001			0.02		0.01	-
	06/04/90	0001		<	0.01		0.01	-
LEAD-210	04/06/89	0001	PCI/L		6.1		1.5	1.4
MAGNESIUM	09/03/87	0001	MG/L		2487.		0.001	-
	04/06/89	0001			1650.		0.001	-
	06/04/90	0001			2690.		0.001	-
MANGANESE	09/03/87	0001	MG/L		5.73		0.01	-
	04/06/89	0001			1.27		0.01	-
	06/04/90	0001			68.8		0.01	-
MERCURY	09/03/87	0001	MG/L	<	0.0002		0.0002	-
	04/06/89	0001		<	0.0002		0.0002	-
	06/04/90	0001		<	0.0002		0.0002	-
MOLYBDENUM	09/03/87	0001	MG/L		0.03		0.01	-
	04/06/89	0001		<	0.01		0.01	-
	06/04/90	0001			0.10		0.01	-
NICKEL	09/03/87	0001	MG/L		0.02	J	0.04	-
	04/06/89	0001		<	0.04		0.04	-
	06/04/90	0001			0.04		0.04	-
NITRATE	09/03/87	0001	MG/L		120.	HJ	1.	-
	04/06/89	0001			5.3	H	1.	-
	06/04/90	0001			106.		1.	-
NITRITE	09/03/87	0001	MG/L	<	0.1		0.1	-
PH	09/03/87	0001	SU		7.47		-	-
	04/06/89	0001			7.74		-	-
	06/04/90	0001			6.29		-	-
PHOSPHATE	09/03/87	0001	MG/L		1.65	H	0.1	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)

OTHER PARAMETER VALUE FLAGS:
 H - HOLD TIME EXPIRED, VALUE SUSPECT
 J - ESTIMATED VALUE

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0603
 NORTH COORDINATE: 10300.0 FT
 EAST COORDINATE: 10200.0 FT
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: DOWN GRADIENT (D)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
PHOSPHATE	04/06/89	0001	MG/L	<	0.1		0.1	-
	06/04/90	0001			0.6		0.1	-
POLONIUM-210	09/03/87	0001	PCI/L		2.2		1.	1.7
	04/06/89	0001			0.9		1.	0.7
POTASSIUM	09/03/87	0001	MG/L		99.5	J	0.01	-
	04/06/89	0001			89.9		0.01	-
	06/04/90	0001			353.		0.01	-
RADIUM-226	09/03/87	0001	PCI/L		0.0		1.	0.1
	04/06/89	0001			0.1		1.	0.2
	06/04/90	0001			2.7		1.	0.6
RADIUM-228	09/03/87	0001	PCI/L		0.3		1.	0.8
	04/06/89	0001			0.9		1.	0.9
	06/04/90	0001			3.3		1.	1.9
SELENIUM	09/03/87	0001	MG/L		0.002	J	0.005	-
	04/06/89	0001			0.452		0.005	-
	06/04/90	0001			0.185		0.005	-
SILICA - SIO2	09/03/87	0001	MG/L		13.0		2.	-
	04/06/89	0001			9.0		2.	-
	06/04/90	0001			3.		2.	-
SILVER	04/06/89	0001	MG/L	<	0.01		0.01	-
	06/04/90	0001			0.01		0.01	-
SODIUM	09/03/87	0001	MG/L		7393.		0.002	-
	04/06/89	0001			4970.		0.002	-
	06/04/90	0001			2070.		0.002	-
SPECIFIC CONDUCTANCE	09/03/87	0001	UMHO/CM		16000.		-	-
	04/06/89	0001			9500.		-	-
	06/04/90	0001			25000.		-	-
STRONTIUM	09/03/87	0001	MG/L		25.0		0.1	-
	04/06/89	0001			13.9		0.1	-
	06/04/90	0001			4.09		0.1	-
SULFATE	09/03/87	0001	MG/L		23300.	H	0.1	-
	04/06/89	0001			16000.		0.1	-
	06/04/90	0001			15000.		0.1	-
SULFIDE	09/03/87	0001	MG/L	<	0.1		0.1	-
	04/06/89	0001			0.1		0.1	-
TEMPERATURE	09/03/87	0001	C - DEGREE		23.0		-	-
	04/06/89	0001			11.5		-	-
	06/04/90	0001			16.0		-	-
THALLIUM	04/06/89	0001	MG/L		0.02		0.01	-
	06/04/90	0001			0.04		0.01	-
THORIUM-230	09/03/87	0001	PCI/L		0.2		1.	1.1

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)

OTHER PARAMETER VALUE FLAGS:
 H - HOLD TIME EXPIRED, VALUE SUSPECT
 J - ESTIMATED VALUE

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0603
 NORTH COORDINATE: 10300.0 FT
 EAST COORDINATE: 10200.0 FT
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: DOWN GRADIENT (D)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
THORIUM-230	04/06/89	0001	PCI/L		0.0		1.	0.7
TIN	09/03/87	0001	MG/L		0.075		0.005	-
	04/06/89	0001			0.069		0.005	-
	06/04/90	0001		<	0.005		0.005	-
TOTAL DISSOLVED SOLIDS	09/03/87	0001	MG/L		38000.		10.	-
	04/06/89	0001			27200.	HJ	10.	-
	06/04/90	0001			32700.		10.	-
TOTAL ORGANIC CARBON	09/03/87	0001	MG/L		234.		1.	-
	04/06/89	0001			199.		1.	-
URANIUM	09/03/87	0001	MG/L		3.93		0.003	-
	04/06/89	0001			2.33		0.003	-
	06/04/90	0001			0.017		0.003	-
VANADIUM	09/03/87	0001	MG/L		0.17		0.01	-
	04/06/89	0001			0.13		0.01	-
	06/04/90	0001			0.18		0.01	-
ZINC	09/03/87	0001	MG/L		0.662		0.005	-
	04/06/89	0001			0.204		0.005	-
	06/04/90	0001			0.053		0.005	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:

0001 - FILTERED SAMPLE (.45 MICRONS)

OTHER PARAMETER VALUE FLAGS:

H - HOLD TIME EXPIRED, VALUE SUSPECT

J - ESTIMATED VALUE

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0604
 NORTH COORDINATE: 10720.0 FT
 EAST COORDINATE: 9750.0 FT
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: DOWN GRADIENT (D)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
ALKALINITY	09/03/87	0001	MG/L CACO3		339.		-	-
ALUMINIUM	09/03/87	0001	MG/L		0.31		0.1	-
AMMONIUM	09/03/87	0001	MG/L	<	0.1	H	0.1	-
ANTIMONY	09/03/87	0001	MG/L		0.068		0.003	-
ARSENIC	09/03/87	0001	MG/L		0.017		0.01	-
BARIUM	09/03/87	0001	MG/L		0.02	J	0.1	-
BORON	09/03/87	0001	MG/L		0.47		0.1	-
BROMIDE	09/03/87	0001	MG/L	<	0.1		0.1	-
CADMIUM	09/03/87	0001	MG/L	<	0.005		0.005	-
CALCIUM	09/03/87	0001	MG/L		390.		0.01	-
CHLORIDE	09/03/87	0001	MG/L		170.	HJ	1.	-
CHROMIUM	09/03/87	0001	MG/L	<	0.01		0.01	-
COBALT	09/03/87	0001	MG/L	<	0.01	J	0.05	-
COPPER	09/03/87	0001	MG/L		0.02		0.02	-
FLUORIDE	09/03/87	0001	MG/L		1.15		0.1	-
GROSS ALPHA	09/03/87	0001	PCI/L		320.		0.2	70.
GROSS BETA	09/03/87	0001	PCI/L		190.		1.	40.
IRON	09/03/87	0001	MG/L		0.32		0.03	-
LEAD	09/03/87	0001	MG/L		0.03		0.01	-
MAGNESIUM	09/03/87	0001	MG/L		344.		0.001	-
MANGANESE	09/03/87	0001	MG/L		1.91		0.01	-
MERCURY	09/03/87	0001	MG/L	<	0.0002		0.0002	-
MOLYBDENUM	09/03/87	0001	MG/L	<	0.01		0.01	-
NICKEL	09/03/87	0001	MG/L	<	0.01	J	0.04	-
NITRATE	09/03/87	0001	MG/L		95.	HJ	1.	-
NITRITE	09/03/87	0001	MG/L	<	0.1		0.1	-
PH	09/03/87	0001	SU		7.45		-	-
PHOSPHATE	09/03/87	0001	MG/L		0.92	H	0.1	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)

OTHER PARAMETER VALUE FLAGS:
 H - HOLD TIME EXPIRED, VALUE SUSPECT
 J - ESTIMATED VALUE

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0604
 NORTH COORDINATE: 10720.0 FT
 EAST COORDINATE: 9750.0 FT
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: DOWN GRADIENT (D)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
POLONIUM-210	09/03/87	0001	PCI/L		0.0		1.	0.6
POTASSIUM	09/03/87	0001	MG/L		25.4	J	0.01	-
RADIUM-226	09/03/87	0001	PCI/L		0.0		1.	0.1
RADIUM-228	09/03/87	0001	PCI/L		0.1		1.	0.9
SELENIUM	09/03/87	0001	MG/L		0.184		0.005	-
SILICA - SiO2	09/03/87	0001	MG/L		12.9		2.	-
SODIUM	09/03/87	0001	MG/L		1616.		0.002	-
SPECIFIC CONDUCTANCE	09/03/87	0001	UMHO/CM		3700.		-	-
STRONTIUM	09/03/87	0001	MG/L		8.35		0.1	-
SULFATE	09/03/87	0001	MG/L		5096.		0.1	-
SULFIDE	09/03/87	0001	MG/L	<	0.1		0.1	-
TEMPERATURE	09/03/87	0001	C - DEGREE		18.5		-	-
THORIUM-230	09/03/87	0001	PCI/L		0.0		1.	0.5
TIN	09/03/87	0001	MG/L		0.037		0.005	-
TOTAL DISSOLVED SOLIDS	09/03/87	0001	MG/L		858.		10.	-
TOTAL ORGANIC CARBON	09/03/87	0001	MG/L		103.		1.	-
URANIUM	09/03/87	0001	MG/L		0.411		0.003	-
VANADIUM	09/03/87	0001	MG/L		0.07		0.01	-
ZINC	09/03/87	0001	MG/L		0.386		0.005	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)

OTHER PARAMETER VALUE FLAGS:
 J - ESTIMATED VALUE

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0607
 NORTH COORDINATE: 10160.0 FT
 EAST COORDINATE: 10350.0 FT
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: DOWN GRADIENT (D)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
ALKALINITY	09/01/87	0001	MG/L CaCO3		1660.		-	-
ALUMINUM	09/01/87	0001	MG/L		0.53		0.1	-
AMMONIUM	09/01/87	0001	MG/L		11.2	H	0.1	-
ANTIMONY	09/01/87	0001	MG/L		0.039		0.003	-
ARSENIC	09/01/87	0001	MG/L		0.032		0.01	-
BARIUM	09/01/87	0001	MG/L		0.01	J	0.1	-
BORON	09/01/87	0001	MG/L		1.13		0.1	-
BROMIDE	09/01/87	0001	MG/L		0.5		0.01	-
CADMIUM	09/01/87	0001	MG/L	<	0.005		0.005	-
CALCIUM	09/01/87	0001	MG/L		510.		0.01	-
CHLORIDE	09/01/87	0001	MG/L		800.	HJ	1.	-
CHROMIUM	09/01/87	0001	MG/L	<	0.01		0.01	-
COBALT	09/01/87	0001	MG/L	<	0.01	J	0.05	-
COPPER	09/01/87	0001	MG/L		0.05		0.02	-
FLUORIDE	09/01/87	0001	MG/L		0.34		0.1	-
GROSS ALPHA	09/01/87	0001	PCI/L		1600.		0.2	300.
GROSS BETA	09/01/87	0001	PCI/L		780.		1.	130.
IRON	09/01/87	0001	MG/L		0.03		0.03	-
LEAD	09/01/87	0001	MG/L		0.05		0.01	-
MAGNESIUM	09/01/87	0001	MG/L		1849.		0.001	-
MANGANESE	09/01/87	0001	MG/L		3.10		0.01	-
MERCURY	09/01/87	0001	MG/L	<	0.0002		0.0002	-
MOLYBDENUM	09/01/87	0001	MG/L	<	0.01		0.01	-
NICKEL	09/01/87	0001	MG/L		0.04		0.04	-
NITRATE	09/01/87	0001	MG/L		840.	HJ	1.	-
NITRITE	09/01/87	0001	MG/L	<	0.1		0.1	-
PH	09/01/87	0001	SU		7.09		-	-
PHOSPHATE	09/01/87	0001	MG/L		1.32	H	0.1	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)

OTHER PARAMETER VALUE FLAGS:
 H - HOLD TIME EXPIRED, VALUE SUSPECT
 J - ESTIMATED VALUE

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0607
 NORTH COORDINATE: 10160.0 FT
 EAST COORDINATE: 10350.0 FT
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: DOWN GRADIENT (D)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
POLONIUM-210	09/01/87	0001	PCI/L		0.3		1.	1.3
POTASSIUM	09/01/87	0001	MG/L		82.4	J	0.01	-
RADIUM-226	09/01/87	0001	PCI/L		0.1		1.	0.1
RADIUM-228	09/01/87	0001	PCI/L		1.2		1.	0.8
SELENIUM	09/01/87	0001	MG/L		0.434	J	0.005	-
SILICA - SI02	09/01/87	0001	MG/L		14.9		2.	-
SODIUM	09/01/87	0001	MG/L		3563.		0.002	-
SPECIFIC CONDUCTANCE	09/01/87	0001	UMHO/CM		10050.		-	-
STRONTIUM	09/01/87	0001	MG/L		15.0		0.1	-
SULFATE	09/01/87	0001	MG/L		12800.		0.1	-
SULFIDE	09/01/87	0001	MG/L	<	0.1		0.1	-
TEMPERATURE	09/01/87	0001	C - DEGREE		21.5		-	-
THORIUM-230	09/01/87	0001	PCI/L		0.2		1.	1.0
TIN	09/01/87	0001	MG/L		0.040		0.005	-
TOTAL DISSOLVED SOLIDS	09/01/87	0001	MG/L		24000.		10.	-
TOTAL ORGANIC CARBON	09/01/87	0001	MG/L		387.		1.	-
URANIUM	09/01/87	0001	MG/L		1.96		0.003	-
VANADIUM	09/01/87	0001	MG/L		0.15		0.01	-
ZINC	09/01/87	0001	MG/L		1.363		0.005	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)

OTHER PARAMETER VALUE FLAGS:
 J - ESTIMATED VALUE

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0608
 NORTH COORDINATE: 8642.0 FT
 EAST COORDINATE: 11819.1 FT
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: DOWN GRADIENT (D)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
ALKALINITY	09/22/87	0001	MG/L CaCO3		1001.		-	-
	04/03/89	0001		1138.	-	-		
	06/01/90	0001		1178.	-	-		
	10/07/90	0001		1199.	-	-		
	05/14/91	0001		1292.	-	-		
	09/17/92	0001		1144	-	-		
	02/21/93	0001		1075	-	-		
	04/24/93	N001		1127	-	-		
ALUMINUM	09/22/87	0001	MG/L		0.61		0.1	-
	04/03/89	0001		<	0.1		0.1	-
	06/01/90	0001		<	0.1		0.1	-
	10/07/90	0001		<	0.1	I	0.1	-
	05/14/91	0001		<	0.2	I	0.2	-
AMMONIUM	09/22/87	0001	MG/L		516.		0.1	-
	04/03/89	0001		460.		0.1	-	
	06/01/90	0001		520.		0.1	-	
	10/07/90	0001		443.	H	0.1	-	
	05/14/91	0001		532.		0.1	-	
	04/24/93	N001		542		0.1	-	
ANTIMONY	09/22/87	0001	MG/L		0.129		0.003	-
	04/03/89	0001		0.037		0.003	-	
	06/01/90	0001		0.005		0.003	-	
	10/07/90	0001		<	0.02	I	0.02	-
	05/14/91	0001		<	0.015	I	0.015	-
	09/17/92	0001		0.005	MN	0.0015	-	
	04/24/93	0001		<	0.003		0.003	-
ANTIMONY (TOTAL)	04/24/93	N001	MG/L	<	0.003		0.003	-
ARSENIC	09/22/87	0001	MG/L		0.038		0.01	-
	04/03/89	0001		0.03		0.01	-	
	06/01/90	0001		0.03		0.01	-	
	10/07/90	0001		<	0.05	I	0.05	-
	05/14/91	0001		<	0.03	I	0.03	-
	09/17/92	0001		<	0.015	IN	0.015	-
	02/21/93	0001		<	0.005	W	0.005	-
	04/24/93	0001		<	0.01	I	0.005	-
ARSENIC (TOTAL)	02/21/93	N001	MG/L	<	0.005	W	0.005	-
	04/24/93	N001	MG/L	<	0.005	W	0.005	-
BARIUM	09/22/87	0001	MG/L		0.03	J	0.1	-
	04/03/89	0001		<	0.1		0.1	-
	06/01/90	0001		<	0.1		0.1	-
	10/07/90	0001			0.02		0.01	-
	05/14/91	0001		<	0.05	I	0.05	-
BERYLLIUM	04/03/89	0001	MG/L	<	0.01		0.01	-
	06/01/90	0001		<	0.01		0.01	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:

0001 - FILTERED SAMPLE (.45 MICRONS)

N001 - UNFILTERED SAMPLE

OTHER PARAMETER VALUE FLAGS:

H - HOLD TIME EXPIRED, VALUE SUSPECT

I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION

J - ESTIMATED VALUE

M - DUPLICATE INJECTION PRECISION NOT MET (HGA)

N - SPIKE SAMPLE RECOVERY NOT WITHIN CONTROL LIMITS

W - POST-DIGEST SPIKE OUT OF CNTR LIM WHILE SAMP ABS < 50% SPIKE

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0608
 NORTH COORDINATE: 8642.0 FT
 EAST COORDINATE: 11819.1 FT
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: DOWN GRADIENT (D)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
BERYLLIUM	10/07/90	0001	MG/L	<	0.01	I	0.01	-
	05/14/91	0001		<	0.03	I	0.03	-
BORON	09/22/87	0001	MG/L		0.71		0.1	-
	04/03/89	0001			0.4		0.1	-
	06/01/90	0001			0.5		0.1	-
	10/07/90	0001			0.62		0.05	-
	05/14/91	0001			0.6		0.2	-
BROMIDE	09/22/87	0001	MG/L		0.1		0.01	-
	04/03/89	0001		<	0.1		0.1	-
CADMIUM	09/22/87	0001	MG/L	<	0.005		0.005	-
	04/03/89	0001			0.018		0.001	-
	06/01/90	0001		<	0.001		0.001	-
	10/07/90	0001			0.001		0.001	-
	05/14/91	0001		<	0.005	I	0.005	-
	09/17/92	0001			0.0014	S	0.00003	-
	02/21/93	0001			0.001	S	0.001	-
	04/24/93	0001		<	0.001		0.001	-
CADMIUM (TOTAL)	02/21/93	N001	MG/L	<	0.01	IW	0.01	-
	04/24/93	N001			0.005		0.001	-
CALCIUM	09/22/87	0001	MG/L		510.		0.01	-
	04/03/89	0001			449.		0.01	-
	06/01/90	0001			482.		0.01	-
	10/07/90	0001			460.		0.01	-
	05/14/91	0001			496.		2.	-
	09/17/92	0001			520		0.0050	-
	02/21/93	0001			400		0.5	-
	04/24/93	0001			459		0.5	-
CALCIUM (TOTAL)	02/21/93	N001	MG/L		448		0.5	-
	04/24/93	N001			485		0.5	-
CHLORIDE	09/22/87	0001	MG/L		510.	HJ	1.	-
	04/03/89	0001			490.		1.	-
	06/01/90	0001			420.		1.	-
	10/07/90	0001			398.	H	1.	-
	05/14/91	0001			500.		1.	-
	09/17/92	0001			380	N	0.50	-
	04/24/93	N001			406		0.5	-
CHLORIDE (TOTAL)	02/21/93	N001	MG/L		449		0.5	-
CHROMIUM	09/22/87	0001	MG/L	<	0.01		0.01	-
	04/03/89	0001		<	0.01		0.01	-
	06/01/90	0001		<	0.01		0.01	-
	10/07/90	0001		<	0.02	I	0.02	-
	05/14/91	0001		<	0.05	I	0.05	-
	02/21/93	0001		<	0.01		0.01	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)
 N001 - UNFILTERED SAMPLE

OTHER PARAMETER VALUE FLAGS:

- H - HOLD TIME EXPIRED, VALUE SUSPECT
- I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION
- J - ESTIMATED VALUE
- N - SPIKE SAMPLE RECOVERY NOT WITHIN CONTROL LIMITS
- S - REPORTED VALUE DETERMINED USING METHOD OF STD ADDITION (MSA)
- W - POST-DIGEST SPIKE OUT OF CNTR LIM WHILE SAMP ABS < 50% SPIKE

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0608
 NORTH COORDINATE: 8642.0 FT
 EAST COORDINATE: 11819.1 FT
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: DOWN GRADIENT (D)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
CHROMIUM	04/24/93	0001	MG/L	<	0.1	I	0.01	-
CHROMIUM (TOTAL)	02/21/93	N001	MG/L	<	0.05	I	0.05	-
	04/24/93	N001		<	0.05	I	0.01	-
COBALT	09/22/87	0001	MG/L	<	0.01	J	0.05	-
	04/03/89	0001		<	0.05		0.05	-
	06/01/90	0001		<	0.05		0.05	-
	10/07/90	0001		<	0.06	I	0.06	-
	05/14/91	0001		<	0.1	I	0.1	-
	04/24/93	0001		<	0.1	I	0.05	-
COBALT (TOTAL)	04/24/93	N001	MG/L	<	0.05		0.05	-
COPPER	09/22/87	0001	MG/L		0.03		0.02	-
	04/03/89	0001			0.03		0.02	-
	06/01/90	0001		<	0.02		0.02	-
	10/07/90	0001		<	0.02	I	0.02	-
	05/14/91	0001		<	0.05	I	0.05	-
	04/24/93	0001		<	0.1	I	0.02	-
COPPER (TOTAL)	04/24/93	N001	MG/L	<	0.05	I	0.02	-
CYANIDE	04/03/89	0001	MG/L	<	0.01		0.01	-
DISSOLVED OXYGEN	04/24/93	N001	MG/L		0.2		-	-
FLUORIDE	09/22/87	0001	MG/L		0.51		0.1	-
	04/03/89	0001			0.4		0.1	-
	06/01/90	0001			0.5		0.1	-
	10/07/90	0001			1.2		0.1	-
	05/14/91	0001			0.9	I	0.1	-
GROSS ALPHA	09/22/87	0001	PCI/L		2000.		0.2	300.
	04/03/89	0001			1600.		0.2	300.
	09/17/92	0001			1400.		258	389
	02/21/93	0001			830.		197.	208.
	04/24/93	0001			513.		143.	144.
GROSS ALPHA (TOTAL)	02/21/93	N001	PCI/L		1030.		196.	223.
	04/24/93	N001			920.		236.	230.
GROSS BETA	09/22/87	0001	PCI/L		1100.		1.	100.
	04/03/89	0001			1200.		1.	100.
	09/17/92	0001			410.		256	183
	02/21/93	0001			609.		157.	126.
	04/24/93	0001			162.		132.	86.5
GROSS BETA (TOTAL)	02/21/93	N001	PCI/L		507.		150.	117.
	04/24/93	N001			455.		186.	132.
IRON	09/22/87	0001	MG/L	<	0.01	J	0.03	-
	04/03/89	0001			0.16		0.03	-
	06/01/90	0001			0.19		0.03	-
	10/07/90	0001		<	0.06	I	0.06	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID COOES:
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OTHER PARAMETER VALUE FLAGS:
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 J - ESTIMATED VALUE

GROUNDWATER QUALITY DATA BY LOCATION
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 SITE: SHP01 SHIPROCK
 LOCATION: 0608
 NORTH COORDINATE: 8642.0 FT
 EAST COORDINATE: 11819.1 FT
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: DOWN GRADIENT (D)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
IRON	05/14/91	0001	MG/L	<	0.1	I	0.1	-
	09/17/92	0001		<	0.018	I	0.018	-
	04/24/93	0001		<	0.2	I	0.03	-
IRON (TOTAL)	04/24/93	N001	MG/L	<	0.1	I	0.03	-
LEAD	09/22/87	0001	MG/L		0.03		0.01	-
	04/03/89	0001		<	0.01		0.01	-
	06/01/90	0001		<	0.01		0.01	-
	10/07/90	0001		<	0.05	I	0.05	-
	05/14/91	0001		<	0.05	I	0.05	-
	02/21/93	0001		<	0.03	I	0.03	-
	04/24/93	0001		<	0.003		0.003	-
LEAD (TOTAL)	02/21/93	N001	MG/L	<	0.03	INW	0.03	-
	04/24/93	N001		<	0.003		0.003	-
LEAD-210	04/03/89	0001	PCI/L		1.2		1.5	1.2
	02/21/93	0001			1.3		1.7	1.1
LEAD-210 (TOTAL)	02/21/93	N001	PCI/L		1.7		1.7	1.1
MAGNESIUM	09/22/87	0001	MG/L		2319.		0.001	-
	04/03/89	0001			2350.		0.001	-
	06/01/90	0001			2330.		0.001	-
	10/07/90	0001			2620.		0.001	-
	05/14/91	0001			2440.		2.	-
	09/17/92	0001			2400		0.011	-
	02/21/93	0001			2580		0.1	-
MAGNESIUM (TOTAL)	02/21/93	N001	MG/L		2370		0.1	-
MANGANESE	09/22/87	0001	MG/L		6.62		0.01	-
	04/03/89	0001			7.16		0.01	-
	06/01/90	0001			7.17		0.01	-
	10/07/90	0001			9.22		0.01	-
	05/14/91	0001			9.05		0.05	-
	09/17/92	0001			9.4		0.0064	-
	02/21/93	0001			7.39		0.01	-
	04/24/93	0001			9.5		0.01	-
MANGANESE (TOTAL)	02/21/93	N001	MG/L		8.19		0.01	-
	04/24/93	N001			9.85		0.01	-
MERCURY	09/22/87	0001	MG/L	<	0.0002		0.0002	-
	04/03/89	0001		<	0.0002		0.0002	-
	06/01/90	0001		<	0.0002		0.0002	-
	10/07/90	0001		<	0.0002		0.0002	-
	05/14/91	0001		<	0.0002		0.0002	-
MOLYBDENUM	09/22/87	0001	MG/L		0.01		0.01	-
	04/03/89	0001		<	0.01		0.01	-
	06/01/90	0001		<	0.01		0.01	-
	10/07/90	0001		<	0.02	I	0.02	-
	05/14/91	0001		<	0.05	I	0.05	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

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OTHER PARAMETER VALUE FLAGS:
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GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0608
 NORTH COORDINATE: 8642.0 FT
 EAST COORDINATE: 11819.1 FT
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: DOWN GRADIENT (D)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
MOLYBDENUM	09/17/92	0001	MG/L		0.043		0.0049	-
	02/21/93	0001		<	0.01		0.01	-
	04/24/93	0001		<	0.1	I	0.01	-
MOLYBDENUM (TOTAL)	02/21/93	N001	MG/L	<	0.05	I	0.05	-
	04/24/93	N001		<	0.05	I	0.01	-
NICKEL	09/22/87	0001	MG/L		0.05		0.04	-
	04/03/89	0001			0.06		0.04	-
	06/01/90	0001			0.07		0.04	-
	10/07/90	0001		<	0.08	I	0.08	-
	05/14/91	0001		<	0.2	I	0.2	-
	09/17/92	0001		<	0.061	I	0.061	-
NITRATE	09/22/87	0001	MG/L		365.	HJ	1.	-
	04/03/89	0001			3900.		1.	-
	06/01/90	0001			3460.		1.	-
	10/07/90	0001			3110.	H	1.	-
	05/14/91	0001			2510.		1.	-
	09/17/92	0001			4900	J	0.044	-
	04/24/93	N001			2860		1	-
NITRITE	09/22/87	0001	MG/L	<	0.1		0.1	-
PH	09/22/87	0001	SU		6.72		-	-
	04/03/89	0001			6.88		-	-
	06/01/90	0001			6.03		-	-
	10/07/90	0001			6.7		-	-
	05/14/91	0001			6.61		-	-
	09/17/92	0001			6.59		-	-
	02/21/93	0001			6.68		-	-
04/24/93	N001			6.52		-	-	
PHOSPHATE	09/22/87	0001	MG/L		1.30	H	0.1	-
	04/03/89	0001		<	0.1		0.1	-
	06/01/90	0001		<	0.1	J	0.1	-
	10/07/90	0001			0.1		0.1	-
	05/14/91	0001			0.1		0.1	-
	04/24/93	N001			0.1		0.1	-
POLONIUM-210	09/22/87	0001	PCI/L		1.1		1.	1.5
	04/03/89	0001			1.1		1.	0.7
	02/21/93	0001			0.0		1.9	1.1
POLONIUM-210 (TOTAL)	02/21/93	N001	PCI/L		3.9		1.9	1.4
POTASSIUM	09/22/87	0001	MG/L		150.	J	0.01	-
	04/03/89	0001			185.		0.01	-
	06/01/90	0001			191.		0.01	-
	10/07/90	0001			166.		0.01	-
	05/14/91	0001			170.		20.	-
	09/17/92	0001			200	E	0.20	-
	02/21/93	0001			166		0.1	-
POTASSIUM (TOTAL)	02/21/93	N001	MG/L		166		0.1	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
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OTHER PARAMETER VALUE FLAGS:
 E - ESTIMATED VALUE BECAUSE OF INTERFERENCE, SEE CASE NARRATIVE
 H - HOLD TIME EXPIRED, VALUE SUSPECT
 I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION
 J - ESTIMATED VALUE

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0608
 NORTH COORDINATE: 8642.0 FT
 EAST COORDINATE: 11819.1 FT
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: DOWN GRADIENT (D)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
RADIUM-226	09/22/87	0001	PCI/L		0.0		1.	0.1
	04/03/89	0001		0.0	1.	0.2		
	06/01/90	0001		0.2	1.	0.2		
	10/07/90	0001		0.1	1.	0.2		
	05/14/91	0001		0.3	1.	0.3		
	09/17/92	0001		0.25	.0527	.0611		
	02/21/93	0001		2.5	0.7	0.8		
RADIUM-226 (TOTAL)	02/21/93	N001	PCI/L		1.9		0.7	0.8
RADIUM-228	09/22/87	0001	PCI/L		0.2		1.	0.9
	04/03/89	0001		0.2	1.	0.8		
	06/01/90	0001		1.3	1.	0.8		
	10/07/90	0001		0.3	1.	2.2		
	05/14/91	0001		8.4	J	3.1		
	09/17/92	0001		2.0	1.54	.858		
	02/21/93	0001		0.5	2.5	1.5		
REDOX POTENTIAL	04/24/93	N001	mVOLTS		502		-	-
SELENIUM	09/22/87	0001	MG/L		0.250		0.005	-
	04/03/89	0001		0.108	N	0.005	-	
	06/01/90	0001		0.075		0.005	-	
	10/07/90	0001		<	0.03	I	0.03	-
	05/14/91	0001			0.035		0.005	-
	09/17/92	0001			0.017	*EN	0.0015	-
	02/21/93	0001		<	0.05	*IW	0.05	-
04/24/93	0001		0.01	W	0.005	-		
SELENIUM (TOTAL)	02/21/93	N001	MG/L		0.037	S	0.005	-
	04/24/93	N001			0.008	W	0.005	-
SILICA - SiO2	09/22/87	0001	MG/L		11.7		2.	-
	04/03/89	0001		9.0	2.	-		
	06/01/90	0001		11.	2.	-		
	10/07/90	0001		14.4	0.1	-		
	05/14/91	0001		13.0	0.5	-		
SILVER	04/03/89	0001	MG/L	<	0.01		0.01	-
	06/01/90	0001		<	0.01		0.01	-
	10/07/90	0001		<	0.02	I	0.02	-
	05/14/91	0001		<	0.05	I	0.05	-
SODIUM	09/22/87	0001	MG/L		2642.		0.002	-
	04/03/89	0001		2410.	0.002	-		
	06/01/90	0001		2630.	0.002	-		
	10/07/90	0001		2630.	0.002	-		
	05/14/91	0001		2270.	20.	-		
	09/17/92	0001		2600	0.011	-		
	02/21/93	0001		2540	1	-		
04/24/93	0001	2050	0.1	-				

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
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OTHER PARAMETER VALUE FLAGS:

- * - DUPLICATE ANALYSIS NOT WITHIN CONTROL LIMITS
- E - ESTIMATED VALUE BECAUSE OF INTERFERENCE, SEE CASE NARRATIVE
- I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION
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GROUNDWATER QUALITY DATA BY LOCATION
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 SITE: SHP01 SHIPROCK
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 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: DOWN GRADIENT (D)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
SODIUM (TOTAL)	02/21/93	N001	MG/L		2360		1	-
	04/24/93	N001			2160		0.1	-
SPECIFIC CONDUCTANCE	09/22/87	0001	UMHO/CM		7000.		-	-
	04/03/89	0001			8500.		-	-
	06/01/90	0001			13000.		-	-
	10/07/90	0001			17900.		-	-
	05/14/91	0001			15510.		-	-
	09/17/92	0001			19500.		-	-
	02/21/93	0001			10480		-	-
	04/24/93	N001		11100		-	-	
STRONTIUM	09/22/87	0001	MG/L		15.8		0.1	-
	04/03/89	0001			14.1		0.1	-
	06/01/90	0001			14.1		0.1	-
	10/07/90	0001			13.1		0.01	-
	05/14/91	0001			12.2		0.05	-
	09/17/92	0001			12	N	0.010	-
	02/21/93	0001			11.1		0.01	-
	04/24/93	0001		12		0.01	-	
STRONTIUM (TOTAL)	02/21/93	N001	MG/L		11.8		0.01	-
	04/24/93	N001			12.7		0.01	-
SULFATE	09/22/87	0001	MG/L		15400.		0.1	-
	04/03/89	0001			13400.	H	0.1	-
	06/01/90	0001			12100.	HJ	0.1	-
	10/07/90	0001			14300.		0.1	-
	05/14/91	0001			12900.		10.	-
	09/17/92	0001			14000	N	10.0	-
	04/24/93	N001			14900		1	-
SULFATE (TOTAL)	02/21/93	N001	MG/L		14100		1	-
SULFIDE	09/22/87	0001	MG/L	<	0.1		0.1	-
	04/03/89	0001		<	0.1		0.1	-
TEMPERATURE	09/22/87	0001	C - DEGREE		22.0		-	-
	04/03/89	0001			11.		-	-
	06/01/90	0001			16.		-	-
	10/07/90	0001			22.		-	-
	05/14/91	0001			13.7		-	-
	09/17/92	0001			21.8		-	-
	02/21/93	0001			7.5		-	-
	04/24/93	N001		12.2		-	-	
THALLIUM	04/03/89	0001	MG/L		0.02		0.01	-
	06/01/90	0001		<	0.01		0.01	-
	10/07/90	0001		<	0.05	I	0.05	-
	05/14/91	0001		<	0.05	I	0.05	-
THORIUM-230	09/22/87	0001	PCI/L		1.9		1.	1.6
	04/03/89	0001			0.1		1.	0.6

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 DATA EVALUATED FOR THE BLRA
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FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: DOWN GRADIENT (D)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
THORIUM-230	02/21/93	0001	PCI/L		0.2		0.4	0.3
THORIUM-230 (TOTAL)	02/21/93	N001	PCI/L		0.4		0.5	0.4
TIN	09/22/87	0001	MG/L		0.035		0.005	-
	04/03/89	0001			0.046		0.005	-
	06/01/90	0001		<	0.005		0.005	-
	10/07/90	0001		<	0.1	I	0.1	-
	05/14/91	0001		<	0.025	I	0.025	-
TOTAL DISSOLVED SOLIDS	09/22/87	0001	MG/L		26000.		10.	-
	04/03/89	0001			26500.	HJ	10.	-
	06/01/90	0001			23300.		10.	-
	10/07/90	0001			24400.	H	10.	-
	05/14/91	0001			22000.		10.	-
	09/17/92	0001			23000	H	10.0	-
	04/24/93	N001			21800	H	10	-
TOTAL DISSOLVED SOLIDS (TOTAL)	02/21/93	N001	MG/L		24600		10	-
TOTAL ORGANIC CARBON	09/22/87	0001	MG/L		285.		1.	-
	04/03/89	0001			298.		1.	-
	04/24/93	N001			19		1	-
TURBIDITY	04/24/93	N001	NTU		19		-	-
URANIUM	09/22/87	0001	MG/L		3.30		0.003	-
	04/03/89	0001			3.73		0.003	-
	06/01/90	0001			3.25		0.003	-
	10/07/90	0001			2.71		0.001	-
	05/14/91	0001			2.54		0.001	-
	09/17/92	0001			2.4		.002	-
	02/21/93	0001			2.41		0.001	-
	04/24/93	0001			2.22		0.001	-
	URANIUM (TOTAL)	02/21/93		N001	MG/L		2.72	
04/24/93		N001			2.60		0.001	-
VANADIUM	09/22/87	0001	MG/L		0.17		0.01	-
	04/03/89	0001			0.16		0.01	-
	06/01/90	0001		<	0.01		0.01	-
	10/07/90	0001		<	0.02	I	0.02	-
	05/14/91	0001		<	0.05	I	0.05	-
	04/24/93	0001		<	0.1	I	0.01	-
VANADIUM (TOTAL)	04/24/93	N001	MG/L	<	0.05	I	0.01	-
ZINC	09/22/87	0001	MG/L		0.125		0.005	-
	04/03/89	0001			0.133		0.005	-
	06/01/90	0001			0.062		0.005	-
	10/07/90	0001			0.09		0.005	-
	05/14/91	0001			0.13		0.03	-
	09/17/92	0001			0.17	E	0.0010	-
	04/24/93	0001			0.22		0.005	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)
 N001 - UNFILTERED SAMPLE

OTHER PARAMETER VALUE FLAGS:

E - ESTIMATED VALUE BECAUSE OF INTERFERENCE, SEE CASE NARRATIVE
 H - HOLD TIME EXPIRED, VALUE SUSPECT
 I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION
 J - ESTIMATED VALUE

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0608
 NORTH COORDINATE: 8642.0 FT
 EAST COORDINATE: 11819.1 FT
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: DOWN GRADIENT (D)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
ZINC (TOTAL)	04/24/93	N001	MG/L		0.26		0.005	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
 N001 - UNFILTERED SAMPLE

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0609
 NORTH COORDINATE: 8656.6 FT
 EAST COORDINATE: 11812.4 FT
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: DOWN GRADIENT (D)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
ALKALINITY	09/21/87	0001	MG/L CaCO3		1039.		-	-
ALUMINUM	09/21/87	0001	MG/L		0.73		0.1	-
AMMONIUM	09/21/87	0001	MG/L		568.		0.1	-
ANTIMONY	09/21/87	0001	MG/L		0.055		0.003	-
ARSENIC	09/21/87	0001	MG/L		0.034		0.01	-
BARIUM	09/21/87	0001	MG/L		0.04	J	0.1	-
BORON	09/21/87	0001	MG/L		0.75		0.1	-
BROMIDE	09/21/87	0001	MG/L		0.1		0.01	-
CADMIUM	09/21/87	0001	MG/L	<	0.005		0.005	-
CALCIUM	09/21/87	0001	MG/L		504.		0.01	-
CHLORIDE	09/21/87	0001	MG/L		520.	HJ	1.	-
CHROMIUM	09/21/87	0001	MG/L	<	0.01		0.01	-
COBALT	09/21/87	0001	MG/L	<	0.01	J	0.05	-
COPPER	09/21/87	0001	MG/L		0.05		0.02	-
FLUORIDE	09/21/87	0001	MG/L		0.49		0.1	-
GROSS ALPHA	09/21/87	0001	PCI/L		2200.		0.2	300.
GROSS BETA	09/21/87	0001	PCI/L		990.		1.	120.
IRON	09/21/87	0001	MG/L	<	0.01	J	0.03	-
LEAD	09/21/87	0001	MG/L		0.03		0.01	-
MAGNESIUM	09/21/87	0001	MG/L		2479.		0.001	-
MANGANESE	09/21/87	0001	MG/L		8.04		0.01	-
MERCURY	09/21/87	0001	MG/L	<	0.0002		0.0002	-
MOLYBDENUM	09/21/87	0001	MG/L		0.01		0.01	-
NICKEL	09/21/87	0001	MG/L		0.05		0.04	-
NITRATE	09/21/87	0001	MG/L		4000.	HJ	1.	-
NITRITE	09/21/87	0001	MG/L	<	0.1		0.1	-
PH	09/21/87	0001	SU		6.77		-	-
PHOSPHATE	09/21/87	0001	MG/L		1.47	H	0.1	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)

OTHER PARAMETER VALUE FLAGS:
 H - HOLD TIME EXPIRED, VALUE SUSPECT
 J - ESTIMATED VALUE

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0609
 NORTH COORDINATE: 8656.6 FT
 EAST COORDINATE: 11812.4 FT
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: DOWN GRADIENT (D)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
POLONIUM-210	09/21/87	0001	PCI/L		0.6		1.	1.4
POTASSIUM	09/21/87	0001	MG/L		166.	J	0.01	-
RADIUM-226	09/21/87	0001	PCI/L		0.0		1.	0.1
RADIUM-228	09/21/87	0001	PCI/L		0.0		1.	1.0
SELENIUM	09/21/87	0001	MG/L		0.228		0.005	-
SILICA - SIO2	09/21/87	0001	MG/L		13.0		2.	-
SODIUM	09/21/87	0001	MG/L		2637.		0.002	-
SPECIFIC CONDUCTANCE	09/21/87	0001	UMHO/CM		5690.		-	-
STRONTIUM	09/21/87	0001	MG/L		15.0		0.1	-
SULFATE	09/21/87	0001	MG/L		13400.		0.1	-
SULFIDE	09/21/87	0001	MG/L	<	0.1		0.1	-
TEMPERATURE	09/21/87	0001	C - DEGREE		22.9		-	-
THORIUM-230	09/21/87	0001	PCI/L		0.6		1.	1.1
TIN	09/21/87	0001	MG/L		0.030		0.005	-
TOTAL DISSOLVED SOLIDS	09/21/87	0001	MG/L		26800.	H	10.	-
TOTAL ORGANIC CARBON	09/21/87	0001	MG/L		317.		1.	-
URANIUM	09/21/87	0001	MG/L		3.04		0.003	-
VANADIUM	09/21/87	0001	MG/L		0.20		0.01	-
ZINC	09/21/87	0001	MG/L		0.211		0.005	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)

OTHER PARAMETER VALUE FLAGS:
 H - HOLD TIME EXPIRED, VALUE SUSPECT
 J - ESTIMATED VALUE

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0610
 NORTH COORDINATE: 8893.0 FT
 EAST COORDINATE: 11440.6 FT
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: DOWN GRADIENT (D)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
ALKALINITY	09/21/87	0001	MG/L CaCO3		471.		-	-
	04/03/89	0001			624.		-	-
	06/01/90	0001			675.		-	-
	10/07/90	0001			674.	L	-	-
	05/14/91	0001			756.		-	-
	09/17/92	0001			494		-	-
	02/21/93	0001			643		-	-
ALUMINUM	09/21/87	0001	MG/L		0.77		0.1	-
	04/03/89	0001		<	0.1		0.1	-
	06/01/90	0001		<	0.1		0.1	-
	10/07/90	0001		<	0.05	L	0.05	-
	05/14/91	0001		<	0.05		0.05	-
AMMONIUM	09/21/87	0001	MG/L		37.4		0.1	-
	04/03/89	0001			82.		0.1	-
	06/01/90	0001			143.		0.1	-
	10/07/90	0001			173.	HL	0.1	-
	05/14/91	0001			133.		0.1	-
ANTIMONY	09/21/87	0001	MG/L		0.103		0.003	-
	04/03/89	0001			0.009		0.003	-
	06/01/90	0001		<	0.1		0.1	-
	10/07/90	0001		<	0.02	IL	0.02	-
	05/14/91	0001		<	0.015	I	0.015	-
	09/17/92	0001			0.007	NW	0.0015	-
ARSENIC	09/21/87	0001	MG/L		0.028		0.01	-
	04/03/89	0001			0.02		0.01	-
	06/01/90	0001			0.02		0.01	-
	10/07/90	0001		<	0.05	IL	0.05	-
	05/14/91	0001		<	0.05	I	0.05	-
	09/17/92	0001		<	0.015	IN	0.015	-
	02/21/93	0001		<	0.005	W	0.005	-
ARSENIC (TOTAL)	02/21/93	N001	MG/L	<	0.005	W	0.005	-
BARIUM	09/21/87	0001	MG/L		0.03	J	0.1	-
	04/03/89	0001		<	0.1		0.1	-
	06/01/90	0001		<	0.1		0.1	-
	10/07/90	0001			0.02	L	0.01	-
	05/14/91	0001			0.01		0.01	-
BERYLLIUM	04/03/89	0001	MG/L	<	0.01		0.01	-
	06/01/90	0001		<	0.01		0.01	-
	10/07/90	0001		<	0.005	L	0.005	-
	05/14/91	0001		<	0.005		0.005	-
BORON	09/21/87	0001	MG/L		0.75		0.1	-
	04/03/89	0001			0.4		0.1	-
	06/01/90	0001			0.5		0.1	-
	10/07/90	0001			0.62	L	0.05	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)
 N001 - UNFILTERED SAMPLE

OTHER PARAMETER VALUE FLAGS:
 H - HOLD TIME EXPIRED, VALUE SUSPECT
 I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION
 J - ESTIMATED VALUE
 L - LESS THAN THREE BORE VOLUMES REMOVED BEFORE SAMPLING
 N - SPIKE SAMPLE RECOVERY NOT WITHIN CONTROL LIMITS
 W - POST-DIGEST SPIKE OUT OF CNTR LIM WHILE SAMP ABS < 50% SPIKE

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0610
 NORTH COORDINATE: 8893.0 FT
 EAST COORDINATE: 11440.6 FT
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: DOWN GRADIENT (D)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
BORON	05/14/91	0001	MG/L		0.50		0.05	-
BROMIDE	09/21/87	0001	MG/L	<	0.1		0.1	-
	04/03/89	0001		<	0.1		0.1	-
CADMIUM	09/21/87	0001	MG/L	<	0.005		0.005	-
	04/03/89	0001			0.007		0.001	-
	06/01/90	0001		<	0.001		0.001	-
	10/07/90	0001		<	0.001	L	0.001	-
	05/14/91	0001		<	0.001	W	0.001	-
	09/17/92	0001			0.0011	S	0.00003	-
	02/21/93	0001		<	0.001	S	0.001	-
CADMIUM (TOTAL)	02/21/93	N001	MG/L	<	0.005	1W	0.005	-
CALCIUM	09/21/87	0001	MG/L		507.		0.01	-
	04/03/89	0001			461.		0.01	-
	06/01/90	0001			505.		0.01	-
	10/07/90	0001			467.	L	0.01	-
	05/14/91	0001			487.		0.5	-
	09/17/92	0001			510		0.0050	-
	02/21/93	0001			417		0.5	-
CALCIUM (TOTAL)	02/21/93	N001	MG/L		405		0.5	-
CHLORIDE	09/21/87	0001	MG/L		300.	HJ	1.	-
	04/03/89	0001			340.		1.	-
	06/01/90	0001			353.		1.	-
	10/07/90	0001			291.	HL	1.	-
	05/14/91	0001			400.		1.	-
	09/17/92	0001			240	N	0.50	-
CHLORIDE (TOTAL)	02/21/93	N001	MG/L		307		0.5	-
CHROMIUM	09/21/87	0001	MG/L	<	0.01		0.01	-
	04/03/89	0001		<	0.01		0.01	-
	06/01/90	0001		<	0.01		0.01	-
	10/07/90	0001		<	0.01	L	0.01	-
	05/14/91	0001		<	0.01		0.01	-
	02/21/93	0001		<	0.01		0.01	-
CHROMIUM (TOTAL)	02/21/93	N001	MG/L	<	0.01		0.01	-
COBALT	09/21/87	0001	MG/L	<	0.01	J	0.05	-
	04/03/89	0001		<	0.05		0.05	-
	06/01/90	0001		<	0.05		0.05	-
	10/07/90	0001		<	0.03	L	0.03	-
	05/14/91	0001		<	0.03		0.03	-
COPPER	09/21/87	0001	MG/L		0.05		0.02	-
	04/03/89	0001			0.02		0.02	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)
 N001 - UNFILTERED SAMPLE

OTHER PARAMETER VALUE FLAGS:
 H - HOLD TIME EXPIRED, VALUE SUSPECT
 I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION
 J - ESTIMATED VALUE
 L - LESS THAN THREE BORE VOLUMES REMOVED BEFORE SAMPLING
 N - SPIKE SAMPLE RECOVERY NOT WITHIN CONTROL LIMITS
 S - REPORTED VALUE DETERMINED USING METHOD OF STD ADDITION (MSA)
 W - POST-DIGEST SPIKE OUT OF CNTR LIM WHILE SAMP ABS < 50% SPIKE

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0610
 NORTH COORDINATE: 8893.0 FT
 EAST COORDINATE: 11440.6 FT
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: DOWN GRADIENT (D)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
COPPER	06/01/90	0001	MG/L	<	0.02		0.02	-
	10/07/90	0001		<	0.01	L	0.01	-
	05/14/91	0001		<	0.01		0.01	-
CYANIDE	04/03/89	0001	MG/L	<	0.01		0.01	-
DISSOLVED OXYGEN	02/21/93	0001	MG/L		1.0		-	-
FLUORIDE	09/21/87	0001	MG/L		0.59		0.1	-
	04/03/89	0001			0.5		0.1	-
	06/01/90	0001			0.6		0.1	-
	10/07/90	0001			1.0	L	0.1	-
	05/14/91	0001			0.9		0.1	-
GROSS ALPHA	09/21/87	0001	PCI/L		870.		0.2	140.
	04/03/89	0001			780.		0.2	190.
	09/17/92	0001			580.		168	212
	02/21/93	0001			1010.		181.	211.
GROSS ALPHA (TOTAL)	02/21/93	N001	PCI/L		1050.		175.	209.
GROSS BETA	09/21/87	0001	PCI/L		540.		1.	80.
	04/03/89	0001			710.		1.	80.
	09/17/92	0001			330.		145	107
	02/21/93	0001			686.		201.	156.
GROSS BETA (TOTAL)	02/21/93	N001	PCI/L		431.		132.	102.
IRON	09/21/87	0001	MG/L	<	0.01	J	0.03	-
	04/03/89	0001			0.14		0.03	-
	06/01/90	0001			0.16		0.03	-
	10/07/90	0001		<	0.03	L	0.03	-
	05/14/91	0001		<	0.03		0.03	-
	09/17/92	0001		<	0.018	I	0.018	-
LEAD	09/21/87	0001	MG/L		0.01		0.01	-
	04/03/89	0001		<	0.01		0.01	-
	06/01/90	0001		<	0.01		0.01	-
	10/07/90	0001		<	0.01	L	0.01	-
	05/14/91	0001		<	0.03	I	0.03	-
	02/21/93	0001		<	0.03	I	0.03	-
LEAD (TOTAL)	02/21/93	N001	MG/L	<	0.03	IN	0.03	-
LEAD-210	04/03/89	0001	PCI/L		0.3		1.5	0.6
MAGNESIUM	09/21/87	0001	MG/L		1173.		0.001	-
	04/03/89	0001			1300.		0.001	-
	06/01/90	0001			1510.		0.001	-
	10/07/90	0001			1550.	L	0.001	-
	05/14/91	0001			1680.		2.	-
	09/17/92	0001			1300.		0.011	-
	02/21/93	0001			1510		0.1	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)
 N001 - UNFILTERED SAMPLE

OTHER PARAMETER VALUE FLAGS:
 I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION
 J - ESTIMATED VALUE
 L - LESS THAN THREE BORE VOLUMES REMOVED BEFORE SAMPLING
 N - SPIKE SAMPLE RECOVERY NOT WITHIN CONTROL LIMITS

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0610
 NORTH COORDINATE: 8893.0 FT
 EAST COORDINATE: 11440.6 FT
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: DOWN GRADIENT (D)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
MAGNESIUM (TOTAL)	02/21/93	N001	MG/L		1420		0.1	
MANGANESE	09/21/87	0001	MG/L		2.27		0.01	
	04/03/89	0001			2.42		0.01	
	06/01/90	0001			2.53		0.01	
	10/07/90	0001			2.78	L	0.01	
	05/14/91	0001			2.90		0.01	
	09/17/92	0001			3.3		0.0064	
	02/21/93	0001			2.85		0.01	
MANGANESE (TOTAL)	02/21/93	N001	MG/L		2.65		0.01	
MERCURY	09/21/87	0001	MG/L		0.0002		0.0002	
	04/03/89	0001		<	0.0002		0.0002	
	06/01/90	0001		<	0.0002		0.0002	
	10/07/90	0001		<	0.0002	L	0.0002	
	05/14/91	0001		<	0.0002		0.0002	
MOLYBDENUM	09/21/87	0001	MG/L		0.02		0.01	
	04/03/89	0001		<	0.01		0.01	
	06/01/90	0001		<	0.01		0.01	
	10/07/90	0001		<	0.01	L	0.01	
	05/14/91	0001			0.02		0.01	
	09/17/92	0001		<	0.025	I	0.025	
	02/21/93	0001		<	0.01		0.01	
MOLYBDENUM (TOTAL)	02/21/93	N001	MG/L		0.02		0.01	
NICKEL	09/21/87	0001	MG/L		0.01	J	0.04	
	04/03/89	0001		<	0.04		0.04	
	06/01/90	0001		<	0.04		0.04	
	10/07/90	0001			0.04	L	0.04	
	05/14/91	0001			0.04		0.04	
	09/17/92	0001		<	0.061	I	0.061	
NITRATE	09/21/87	0001	MG/L		1770.	HJ	1.	
	04/03/89	0001			2700.		1.	
	06/01/90	0001			2270.		1.	
	10/07/90	0001			1740.	HL	1.	
	05/14/91	0001			1820.		1.	
	09/17/92	0001			2100	J	0.044	
NITRITE	09/21/87	0001	MG/L	<	0.1		0.1	
PH	09/21/87	0001	SU		6.91			
	04/03/89	0001			6.98			
	06/01/90	0001			6.89			
	10/07/90	0001			6.78	L		
	05/14/91	0001			6.67			
	09/17/92	0001			6.73			
	02/21/93	0001			6.90			
PHOSPHATE	09/21/87	0001	MG/L		1.12	H	0.1	

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)
 N001 - UNFILTERED SAMPLE

OTHER PARAMETER VALUE FLAGS:

H - HOLD TIME EXPIRED, VALUE SUSPECT
 I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION
 J - ESTIMATED VALUE
 L - LESS THAN THREE BORE VOLUMES REMOVED BEFORE SAMPLING

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0610
 NORTH COORDINATE: 8893.0 FT
 EAST COORDINATE: 11440.6 FT
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: DOWN GRADIENT (D)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY	
PHOSPHATE	04/03/89	0001	MG/L	<	0.1		0.1	-	
	06/01/90	0001		<	0.1	J	0.1	-	
	10/07/90	0001			0.2	L	0.1	-	
	05/14/91	0001			0.1		0.1	-	
POLONIUM-210	09/21/87	0001	PCI/L		0.6		1.	0.7	
	04/03/89	0001			0.4		1.	0.4	
POTASSIUM	09/21/87	0001	MG/L		93.6	J	0.01	-	
	04/03/89	0001			127.		0.01	-	
	06/01/90	0001			152.		0.01	-	
	10/07/90	0001			126.	L	0.01	-	
	05/14/91	0001			113.		5.	-	
	09/17/92	0001			120	E	0.20	-	
	02/21/93	0001			99.8		0.1	-	
POTASSIUM (TOTAL)	02/21/93	N001	MG/L		96.1		0.1	-	
RADIUM-226	09/21/87	0001	PCI/L		0.1		1.	0.2	
	04/03/89	0001			0.0		1.	0.1	
	06/01/90	0001			0.2		1.	0.2	
	10/07/90	0001			0.0	L	1.	0.2	
	05/14/91	0001			0.2		1.	0.3	
	09/17/92	0001			0.20		.0726	.0653	
	02/21/93	0001			1.2		0.7	0.6	
RADIUM-226 (TOTAL)	02/21/93	N001	PCI/L		1.4		0.7	0.7	
RADIUM-228	09/21/87	0001	PCI/L		0.4		1.	1.2	
	04/03/89	0001			0.6		1.	0.8	
	06/01/90	0001			1.3		1.	0.8	
	10/07/90	0001			0.0	L	1.	3.0	
	05/14/91	0001			3.6	J	1.	2.8	
	09/17/92	0001			1.6		1.77	.963	
	02/21/93	0001			1.5		2.5	1.6	
REDOX POTENTIAL	02/21/93	0001	mVOLTS		517.4		-	-	
SELENIUM	09/21/87	0001	MG/L		0.158		0.005	-	
	04/03/89	0001			0.070	N	0.005	-	
	06/01/90	0001			0.067		0.005	-	
	10/07/90	0001			<	0.03	1L	0.03	-
	05/14/91	0001				0.050		0.005	-
	09/17/92	0001				0.052	*EN	0.0015	-
	02/21/93	0001				0.098	*S	0.005	-
SELENIUM (TOTAL)	02/21/93	N001	MG/L		0.064	S	0.005	-	
SILICA - SiO2	09/21/87	0001	MG/L		14.1		2.	-	
	04/03/89	0001			10.		2.	-	

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)
 N001 - UNFILTERED SAMPLE

OTHER PARAMETER VALUE FLAGS:

- * - DUPLICATE ANALYSIS NOT WITHIN CONTROL LIMITS
- E - ESTIMATED VALUE BECAUSE OF INTERFERENCE, SEE CASE NARRATIVE
- I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION
- J - ESTIMATED VALUE
- L - LESS THAN THREE BORE VOLUMES REMOVED BEFORE SAMPLING
- N - SPIKE SAMPLE RECOVERY NOT WITHIN CONTROL LIMITS
- S - REPORTED VALUE DETERMINED USING METHOD OF STD ADDITION (MSA)

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0610
 NORTH COORDINATE: 8893.0 FT
 EAST COORDINATE: 11440.6 FT
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: DOWN GRADIENT (D)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
SILICA - SiO2	06/01/90	0001	MG/L		12.		2.	-
	10/07/90	0001			14.0	L	0.1	-
	05/14/91	0001			12.2		0.1	-
SILVER	04/03/89	0001	MG/L	<	0.01		0.01	-
	06/01/90	0001		<	0.01		0.01	-
	10/07/90	0001		<	0.01	L	0.01	-
	05/14/91	0001		<	0.01		0.01	-
SODIUM	09/21/87	0001	MG/L		1576.		0.002	-
	04/03/89	0001			1590.		0.002	-
	06/01/90	0001			2040.		0.002	-
	10/07/90	0001			2100.	L	0.002	-
	05/14/91	0001			2100.		20.	-
	09/17/92	0001			1800		0.011	-
02/21/93	0001		1900		1	-		
SODIUM (TOTAL)	02/21/93	N001	MG/L		1810		1	-
SPECIFIC CONDUCTANCE	09/21/87	0001	UMHO/CM		4900.		-	-
	04/03/89	0001			6250.		-	-
	06/01/90	0001			11000.		-	-
	10/07/90	0001			12200.	L	-	-
	05/14/91	0001			10600.		-	-
	09/17/92	0001			13300		-	-
02/21/93	0001		9410		-	-		
STRONTIUM	09/21/87	0001	MG/L		9.55		0.1	-
	04/03/89	0001			10.0		1.	-
	06/01/90	0001			10.4		0.1	-
	10/07/90	0001			10.7	L	0.01	-
	05/14/91	0001			9.55		0.01	-
	09/17/92	0001			8.3	N	0.010	-
02/21/93	0001		8.83		0.01	-		
STRONTIUM (TOTAL)	02/21/93	N001	MG/L		8.00		0.01	-
SULFATE	09/21/87	0001	MG/L		7070.		0.1	-
	04/03/89	0001			7800.	H	0.1	-
	06/01/90	0001			9960.	HJ	0.1	-
	10/07/90	0001			8740.	L	0.1	-
	05/14/91	0001			9600.		10.	-
	09/17/92	0001			8400	N	10.0	-
SULFATE (TOTAL)	02/21/93	N001	MG/L		9840		1	-
SULFIDE	09/21/87	0001	MG/L	<	0.1		0.1	-
	04/03/89	0001		<	0.1		0.1	-
TEMPERATURE	09/21/87	0001	C - DEGREE		23.5		-	-
	04/03/89	0001			12.		-	-
	06/01/90	0001			18.		-	-
	10/07/90	0001			23.	L	-	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:

0001 - FILTERED SAMPLE (.45 MICRONS)

N001 - UNFILTERED SAMPLE

OTHER PARAMETER VALUE FLAGS:

H - HOLD TIME EXPIRED, VALUE SUSPECT

J - ESTIMATED VALUE

L - LESS THAN THREE BORE VOLUMES REMOVED BEFORE SAMPLING

N - SPIKE SAMPLE RECOVERY NOT WITHIN CONTROL LIMITS

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0610
 NORTH COORDINATE: 8893.0 FT
 EAST COORDINATE: 11440.6 FT
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: DOWN GRADIENT (D)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
TEMPERATURE	05/14/91	0001	C - DEGREE		15.3		-	-
	09/17/92	0001			23.7		-	-
	02/21/93	0001			8.2		-	-
THALLIUM	04/03/89	0001	MG/L		0.02		0.01	-
	06/01/90	0001		<	0.01		0.01	-
	10/07/90	0001		<	0.05	IL	0.05	-
	05/14/91	0001		<	0.05	I	0.05	-
THORIUM-230	09/21/87	0001	PCI/L		0.1		1.	0.7
	04/03/89	0001			0.0		1.	0.5
TIN	09/21/87	0001	MG/L		0.018		0.005	-
	04/03/89	0001			0.036		0.005	-
	06/01/90	0001		<	0.005		0.005	-
	10/07/90	0001		<	0.05	IL	0.05	-
	05/14/91	0001		<	0.025	I	0.025	-
TOTAL DISSOLVED SOLIDS	09/21/87	0001	MG/L		15500.		10.	-
	04/03/89	0001			16200.	HJ	10.	-
	06/01/90	0001			16700.		10.	-
	10/07/90	0001			15300.	HL	10.	-
	05/14/91	0001			17000.		10.	-
	09/17/92	0001			14000	H	10.0	-
TOTAL DISSOLVED SOLIDS (TOTAL)	02/21/93	N001	MG/L		16300		10	-
TOTAL ORGANIC CARBON	09/21/87	0001	MG/L		147.		1.	-
	04/03/89	0001			190.		1.	-
URANIUM	09/21/87	0001	MG/L		0.920		0.003	-
	04/03/89	0001			1.92		0.003	-
	06/01/90	0001			1.88		0.003	-
	10/07/90	0001			1.57	L	0.001	-
	05/14/91	0001			1.65		0.001	-
	09/17/92	0001			0.92		.001	-
	02/21/93	0001			1.87		0.001	-
URANIUM (TOTAL)	02/21/93	N001	MG/L		2.00		0.001	-
VANADIUM	09/21/87	0001	MG/L		0.17		0.01	-
	04/03/89	0001			0.11		0.01	-
	06/01/90	0001		<	0.01		0.01	-
	10/07/90	0001		<	0.01	L	0.01	-
	05/14/91	0001		<	0.01		0.01	-
ZINC	09/21/87	0001	MG/L		0.054		0.005	-
	04/03/89	0001			0.070		0.005	-
	06/01/90	0001			0.023		0.005	-
	10/07/90	0001			0.032	L	0.005	-
	05/14/91	0001			0.038		0.005	-
	09/17/92	0001			0.091	E	0.0010	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)
 N001 - UNFILTERED SAMPLE

OTHER PARAMETER VALUE FLAGS:

- E - ESTIMATED VALUE BECAUSE OF INTERFERENCE, SEE CASE NARRATIVE
- H - HOLD TIME EXPIRED, VALUE SUSPECT
- I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION
- J - ESTIMATED VALUE
- L - LESS THAN THREE BORE VOLUMES REMOVED BEFORE SAMPLING

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0611
 NORTH COORDINATE: 8899.2 FT
 EAST COORDINATE: 11429.7 FT
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: DOWN GRADIENT (D)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
ALKALINITY	09/19/87	0001	MG/L CaCO3		591.		-	-
ALUMINUM	09/19/87	0001	MG/L		0.34		0.1	-
AMMONIUM	09/19/87	0001	MG/L		21.9		0.1	-
ANTIMONY	09/19/87	0001	MG/L		0.084		0.003	-
ARSENIC	09/19/87	0001	MG/L		0.028		0.01	-
BARIUM	09/19/87	0001	MG/L		0.02	J	0.1	-
BORON	09/19/87	0001	MG/L		0.81		0.1	-
BROMIDE	09/19/87	0001	MG/L		0.1		0.01	-
CADMIUM	09/19/87	0001	MG/L	<	0.005	J	0.005	-
CALCIUM	09/19/87	0001	MG/L		464.		0.01	-
CHLORIDE	09/19/87	0001	MG/L		416.		1.	-
CHROMIUM	09/19/87	0001	MG/L	<	0.01		0.01	-
COBALT	09/19/87	0001	MG/L	<	0.01	J	0.05	-
COPPER	09/19/87	0001	MG/L	<	0.01	J	0.02	-
FLUORIDE	09/19/87	0001	MG/L		0.57		0.1	-
GROSS ALPHA	09/19/87	0001	PC1/L		770.		0.2	120.
GROSS BETA	09/19/87	0001	PC1/L		630.		1.	60.
IRON	09/19/87	0001	MG/L		0.08		0.03	-
LEAD	09/19/87	0001	MG/L		0.02		0.01	-
MAGNESIUM	09/19/87	0001	MG/L		722.		0.001	-
MANGANESE	09/19/87	0001	MG/L		1.72		0.01	-
MERCURY	09/19/87	0001	MG/L	<	0.0002		0.0002	-
MOLYBDENUM	09/19/87	0001	MG/L	<	0.01		0.01	-
NICKEL	09/19/87	0001	MG/L		0.02	J	0.04	-
NITRATE	09/19/87	0001	MG/L		1110.		1.	-
NITRITE	09/19/87	0001	MG/L	<	0.1		0.1	-
PH	09/19/87	0001	SU		6.90		-	-
PHOSPHATE	09/19/87	0001	MG/L		0.65	H	0.1	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)

OTHER PARAMETER VALUE FLAGS:
 H - HOLD TIME EXPIRED, VALUE SUSPECT
 J - ESTIMATED VALUE

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0611
 NORTH COORDINATE: 8899.2 FT
 EAST COORDINATE: 11429.7 FT
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: DOWN GRADIENT (D)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
POLONIUM-210	09/19/87	0001	PCI/L		0.2		1.	0.6
POTASSIUM	09/19/87	0001	MG/L		56.4	J	0.01	-
RADIUM-226	09/19/87	0001	PCI/L		0.0		1.	0.1
RADIUM-228	09/19/87	0001	PCI/L		0.0		1.	1.3
SELENIUM	09/19/87	0001	MG/L		0.222	N	0.005	-
SILICA - SIO2	09/19/87	0001	MG/L		14.5		2.	-
SODIUM	09/19/87	0001	MG/L		1979.		0.002	-
SPECIFIC CONDUCTANCE	09/19/87	0001	UMHO/CM		4910.		-	-
STRONTIUM	09/19/87	0001	MG/L		12.0		0.1	-
SULFATE	09/19/87	0001	MG/L		6950.		0.1	-
SULFIDE	09/19/87	0001	MG/L	<	0.1		0.1	-
TEMPERATURE	09/19/87	0001	C - DEGREE		23.0		-	-
THORIUM-230	09/19/87	0001	PCI/L		1.0		1.	1.0
TIN	09/19/87	0001	MG/L		0.045		0.005	-
TOTAL DISSOLVED SOLIDS	09/19/87	0001	MG/L		12300.		10.	-
TOTAL ORGANIC CARBON	09/19/87	0001	MG/L		175.		1.	-
URANIUM	09/19/87	0001	MG/L		0.719		0.003	-
VANADIUM	09/19/87	0001	MG/L		0.10		0.01	-
ZINC	09/19/87	0001	MG/L		0.013		0.005	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)

OTHER PARAMETER VALUE FLAGS:

J - ESTIMATED VALUE

N - SPIKE SAMPLE RECOVERY NOT WITHIN CONTROL LIMITS

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0612
 NORTH COORDINATE: 9192.1 FT
 EAST COORDINATE: 11665.7 FT
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: DOWN GRADIENT (D)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
ALKALINITY	09/19/87	0001	MG/L CaCO3		273.		-	-
	04/03/89	0001			201.		-	-
	02/25/93	0001			333		-	-
ALUMINUM	09/19/87	0001	MG/L		0.14		0.1	-
	04/03/89	0001		<	0.1		0.1	-
AMMONIUM	09/19/87	0001	MG/L		16.8		0.1	-
	04/03/89	0001		<	0.1		0.1	-
AMMONIUM (TOTAL)	02/25/93	N001	MG/L	<	0.1	N	0.1	-
ANTIMONY	09/19/87	0001	MG/L		0.042		0.003	-
	04/03/89	0001			0.004		0.003	-
ARSENIC	09/19/87	0001	MG/L		0.004	J	0.01	-
	04/03/89	0001		<	0.01		0.01	-
	02/25/93	0001		<	0.005	W	0.005	-
ARSENIC (TOTAL)	02/25/93	N001	MG/L	<	0.005		0.005	-
BARIUM	09/19/87	0001	MG/L		0.04	J	0.1	-
	04/03/89	0001		<	0.1		0.1	-
BERYLLIUM	04/03/89	0001	MG/L	<	0.01		0.01	-
BORON	09/19/87	0001	MG/L		0.19		0.1	-
	04/03/89	0001		<	0.1		0.1	-
BROMIDE	09/19/87	0001	MG/L		0.1		0.1	-
	04/03/89	0001		<	0.1		0.1	-
CADMIUM	09/19/87	0001	MG/L		0.005	J	0.005	-
	04/03/89	0001		<	0.001		0.001	-
	02/25/93	0001		<	0.001		0.001	-
CADMIUM (TOTAL)	02/25/93	N001	MG/L	<	0.001		0.001	-
CALCIUM	09/19/87	0001	MG/L		208.		0.01	-
	04/03/89	0001			194.		0.01	-
	02/25/93	0001			317		0.5	-
CALCIUM (TOTAL)	02/25/93	N001	MG/L		327		0.5	-
CHLORIDE	09/19/87	0001	MG/L		47.8		1.	-
	04/03/89	0001			27.		1.	-
CHLORIDE (TOTAL)	02/25/93	N001	MG/L		57.5		0.5	-
CHROMIUM	09/19/87	0001	MG/L	<	0.01		0.01	-
	04/03/89	0001		<	0.01		0.01	-
	02/25/93	0001		<	0.01		0.01	-
CHROMIUM (TOTAL)	02/25/93	N001	MG/L	<	0.01		0.01	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)
 N001 - UNFILTERED SAMPLE

OTHER PARAMETER VALUE FLAGS:

J - ESTIMATED VALUE
 N - SPIKE SAMPLE RECOVERY NOT WITHIN CONTROL LIMITS
 W - POST-DIGEST SPIKE OUT OF CNTR LIM WHILE SAMP ABS < 50% SPIKE

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0612
 NORTH COORDINATE: 9192.1 FT
 EAST COORDINATE: 11665.7 FT
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: DOWN GRADIENT (D)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
COBALT	09/19/87	0001	MG/L	<	0.01	J	0.05	-
	04/03/89	0001		<	0.05		0.05	-
COPPER	09/19/87	0001	MG/L	<	0.01	J	0.02	-
	04/03/89	0001		<	0.02		0.02	-
CYANIDE	04/03/89	0001	MG/L	<	0.01		0.01	-
DISSOLVED OXYGEN	02/25/93	0001	MG/L		0.0		-	-
FLUORIDE	09/19/87	0001	MG/L		0.74		0.1	-
	04/03/89	0001			0.7		0.1	-
GROSS ALPHA	09/19/87	0001	PCI/L		110.		0.2	20.
	04/03/89	0001			160.		0.2	20.
	02/25/93	0001			228.		27.4	39.4
GROSS ALPHA (TOTAL)	02/25/93	N001	PCI/L		171.		25.9	32.8
GROSS BETA	09/19/87	0001	PCI/L		110.		1.	10.
	04/03/89	0001			82.		1.	7.
	02/25/93	0001			83.0		20.8	17.1
GROSS BETA (TOTAL)	02/25/93	N001	PCI/L		47.6		21.1	15.2
IRON	09/19/87	0001	MG/L	<	0.01	J	0.03	-
	04/03/89	0001			0.08		0.03	-
LEAD	09/19/87	0001	MG/L	<	0.01		0.01	-
	04/03/89	0001		<	0.01		0.01	-
	02/25/93	0001		<	0.003		0.003	-
LEAD (TOTAL)	02/25/93	N001	MG/L	<	0.003	*N	0.003	-
LEAD-210	04/03/89	0001	PCI/L		0.6		1.5	0.7
	02/25/93	0001			0.7		2.3	1.4
LEAD-210 (TOTAL)	02/25/93	N001	PCI/L		1.3		2.3	1.4
MAGNESIUM	09/19/87	0001	MG/L		75.6		0.001	-
	04/03/89	0001			75.0		0.001	-
	02/25/93	0001			150		0.1	-
MAGNESIUM (TOTAL)	02/25/93	N001	MG/L		147		0.1	-
MANGANESE	09/19/87	0001	MG/L		3.50		0.01	-
	04/03/89	0001			0.41		0.01	-
	02/25/93	0001			0.04		0.01	-
MANGANESE (TOTAL)	02/25/93	N001	MG/L		0.06		0.01	-
MERCURY	09/19/87	0001	MG/L	<	0.0002		0.0002	-
	04/03/89	0001		<	0.0002		0.0002	-
MOLYBDENUM	09/19/87	0001	MG/L		0.03		0.01	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)
 N001 - UNFILTERED SAMPLE

OTHER PARAMETER VALUE FLAGS:
 * - DUPLICATE ANALYSIS NOT WITHIN CONTROL LIMITS
 J - ESTIMATED VALUE
 N - SPIKE SAMPLE RECOVERY NOT WITHIN CONTROL LIMITS

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0612
 NORTH COORDINATE: 9192.1 FT
 EAST COORDINATE: 11665.7 FT
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: DOWN GRADIENT (D)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
MOLYBDENUM	04/03/89	0001	MG/L	<	0.01		0.01	-
	02/25/93	0001		<	0.01		0.01	-
MOLYBDENUM (TOTAL)	02/25/93	N001	MG/L		0.01		0.01	-
NICKEL	09/19/87	0001	MG/L	<	0.01	J	0.04	-
	04/03/89	0001		<	0.04		0.04	-
NITRATE	09/19/87	0001	MG/L	<	0.1	J	1.	-
	04/03/89	0001			51.		1.	-
NITRATE (TOTAL)	02/25/93	N001	MG/L		38.9		1	-
NITRITE	09/19/87	0001	MG/L	<	0.1		0.1	-
PH	09/19/87	0001	SU		7.02		-	-
	04/03/89	0001			7.23		-	-
	02/25/93	0001			7.19		-	-
PHOSPHATE	09/19/87	0001	MG/L		0.34	H	0.1	-
	04/03/89	0001		<	0.1		0.1	-
PHOSPHATE (TOTAL)	02/25/93	N001	MG/L	<	0.1		0.1	-
POLONIUM-210	09/19/87	0001	PCI/L		1.0		1.	0.7
	04/03/89	0001			1.1		1.	0.5
	02/25/93	0001			0.0	N	0.7	0.4
POLONIUM-210 (TOTAL)	02/25/93	N001	PCI/L		0.4	N	0.7	0.5
POTASSIUM	09/19/87	0001	MG/L		20.2	J	0.01	-
	04/03/89	0001			11.3		0.01	-
	02/25/93	0001			10.0		0.1	-
POTASSIUM (TOTAL)	02/25/93	N001	MG/L		10.8		0.1	-
RADIUM-226	09/19/87	0001	PCI/L		0.0		1.	0.1
	04/03/89	0001			0.1		1.	0.1
	02/25/93	0001			0.1		0.4	0.3
RADIUM-226 (TOTAL)	02/25/93	N001	PCI/L		0.2		0.4	0.3
RADIUM-228	09/19/87	0001	PCI/L		0.5		1.	0.9
	04/03/89	0001			0.0		1.	0.8
	02/25/93	0001			0.0		4.0	2.3
REDOX POTENTIAL	02/25/93	0001	mVOLTS		474.1		-	-
SELENIUM	09/19/87	0001	MG/L		0.020		0.005	-
	04/03/89	0001			0.076	N	0.005	-
	02/25/93	0001			0.055	*S	0.005	-
SELENIUM (TOTAL)	02/25/93	N001	MG/L		0.043	NS	0.005	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)
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OTHER PARAMETER VALUE FLAGS:

- * - DUPLICATE ANALYSIS NOT WITHIN CONTROL LIMITS
- H - HOLD TIME EXPIRED, VALUE SUSPECT
- J - ESTIMATED VALUE
- N - SPIKE SAMPLE RECOVERY NOT WITHIN CONTROL LIMITS
- S - REPORTED VALUE DETERMINED USING METHOD OF STD ADDITION (MSA)

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0612
 NORTH COORDINATE: 9192.1 FT
 EAST COORDINATE: 11665.7 FT
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: DOWN GRADIENT (D)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
SILICA - SIO2	09/19/87	0001	MG/L		16.8		2.	-
	04/03/89	0001			13.		2.	-
SILVER	04/03/89	0001	MG/L	<	0.01		0.01	-
SODIUM	09/19/87	0001	MG/L		235.		0.002	-
	04/03/89	0001			133.		0.002	-
	02/25/93	0001			268		1	-
SODIUM (TOTAL)	02/25/93	N001	MG/L		262		1	-
SPECIFIC CONDUCTANCE	09/19/87	0001	UMHO/CM		1800.		-	-
	04/03/89	0001			1175.		-	-
	02/25/93	0001			2180		-	-
STRONTIUM	09/19/87	0001	MG/L		2.10		0.1	-
	04/03/89	0001			1.7		0.1	-
	02/25/93	0001			2.84		0.01	-
STRONTIUM (TOTAL)	02/25/93	N001	MG/L		2.92		0.01	-
SULFATE	09/19/87	0001	MG/L		1150.		0.1	-
	04/03/89	0001			746.	H	0.1	-
SULFATE (TOTAL)	02/25/93	N001	MG/L		1560		1	-
SULFIDE	09/19/87	0001	MG/L	<	0.1		0.1	-
	04/03/89	0001		<	0.1		0.1	-
TEMPERATURE	09/19/87	0001	C - DEGREE		22.5		-	-
	04/03/89	0001			13.		-	-
	02/25/93	0001			8.6		-	-
THALLIUM	04/03/89	0001	MG/L	<	0.01		0.01	-
THORIUM-230	09/19/87	0001	PCI/L		0.0		1.	0.3
	04/03/89	0001			0.0		1.	0.2
	02/25/93	0001			0.2		0.4	0.2
THORIUM-230 (TOTAL)	02/25/93	N001	PCI/L		0.2		0.3	0.2
TIN	09/19/87	0001	MG/L		0.018		0.005	-
	04/03/89	0001			0.011		0.005	-
TOTAL DISSOLVED SOLIDS	09/19/87	0001	MG/L		2000.		10.	-
	04/03/89	0001			1520.	HJ	10.	-
TOTAL DISSOLVED SOLIDS (TOTAL)	02/25/93	N001	MG/L		2760		10	-
TOTAL ORGANIC CARBON	09/19/87	0001	MG/L		79.0		1.	-
	04/03/89	0001			56.3		1.	-
URANIUM	09/19/87	0001	MG/L		0.165		0.003	-
	04/03/89	0001			0.263		0.003	-
	02/25/93	0001			0.411		0.001	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)
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OTHER PARAMETER VALUE FLAGS:
 H - HOLD TIME EXPIRED, VALUE SUSPECT
 J - ESTIMATED VALUE

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0612
 NORTH COORDINATE: 9192.1 FT
 EAST COORDINATE: 11665.7 FT
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: DOWN GRADIENT (D)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
URANIUM (TOTAL)	02/25/93	N001	MG/L		0.435		0.001	-
VANADIUM	09/19/87	0001	MG/L		0.04		0.01	-
	04/03/89	0001			0.02		0.01	-
ZINC	09/19/87	0001	MG/L	<	0.005		0.005	-
	04/03/89	0001			0.011		0.005	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)
 N001 - UNFILTERED SAMPLE

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0613
 NORTH COORDINATE: 9196.3 FT
 EAST COORDINATE: 11047.9 FT
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: DOWN GRADIENT (D)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
ALKALINITY	09/18/87	0001	MG/L CaCO3		440.		-	-
ALUMINUM	09/18/87	0001	MG/L		0.43		0.1	-
AMMONIUM	09/18/87	0001	MG/L		90.3		0.1	-
ANTIMONY	09/18/87	0001	MG/L		0.103		0.003	-
ARSENIC	09/18/87	0001	MG/L		0.019		0.01	-
BARIUM	09/18/87	0001	MG/L		0.02	J	0.1	-
BORON	09/18/87	0001	MG/L		0.65		0.1	-
BROMIDE	09/18/87	0001	MG/L		0.2		0.01	-
CADMIUM	09/18/87	0001	MG/L	<	0.005	J	0.005	-
CALCIUM	09/18/87	0001	MG/L		516.		0.01	-
CHLORIDE	09/18/87	0001	MG/L		230.		1.	-
CHROMIUM	09/18/87	0001	MG/L	<	0.01		0.01	-
COBALT	09/18/87	0001	MG/L	<	0.01	J	0.05	-
COPPER	09/18/87	0001	MG/L		0.02		0.02	-
FLUORIDE	09/18/87	0001	MG/L		0.60		0.1	-
GROSS ALPHA	09/18/87	0001	PCI/L		980.		0.2	110.
GROSS BETA	09/18/87	0001	PCI/L		640.		1.	40.
IRON	09/18/87	0001	MG/L	<	0.01	J	0.03	-
LEAD	09/18/87	0001	MG/L		0.03		0.01	-
MAGNESIUM	09/18/87	0001	MG/L		1021.		0.001	-
MANGANESE	09/18/87	0001	MG/L		4.82		0.01	-
MERCURY	09/18/87	0001	MG/L	<	0.0002		0.0002	-
MOLYBDENUM	09/18/87	0001	MG/L	<	0.01		0.01	-
NICKEL	09/18/87	0001	MG/L		0.01	J	0.04	-
NITRATE	09/18/87	0001	MG/L		1060.		1.	-
NITRITE	09/18/87	0001	MG/L	<	0.1		0.1	-
PH	09/18/87	0001	SU		6.94		-	-
PHOSPHATE	09/18/87	0001	MG/L		0.98	H	0.1	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)

OTHER PARAMETER VALUE FLAGS:
 H - HOLD TIME EXPIRED, VALUE SUSPECT
 J - ESTIMATED VALUE

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0613
 NORTH COORDINATE: 9196.3 FT
 EAST COORDINATE: 11047.9 FT
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: DOWN GRADIENT (D)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
POLONIUM-210	09/18/87	0001	PCI/L		0.9		1.	0.7
POTASSIUM	09/18/87	0001	MG/L		71.5	J	0.01	-
RADIUM-226	09/18/87	0001	PCI/L		0.1		1.	0.2
RADIUM-228	09/18/87	0001	PCI/L		0.5		1.	1.0
SELENIUM	09/18/87	0001	MG/L		0.203		0.005	-
SILICA - SIO2	09/18/87	0001	MG/L		14.7		2.	-
SODIUM	09/18/87	0001	MG/L		1164.		0.002	-
SPECIFIC CONDUCTANCE	09/18/87	0001	UMHO/CM		4320.		-	-
STRONTIUM	09/18/87	0001	MG/L		8.70		0.1	-
SULFATE	09/18/87	0001	MG/L		6930.		0.1	-
SULFIDE	09/18/87	0001	MG/L	<	0.1		0.1	-
TEMPERATURE	09/18/87	0001	C - DEGREE		22.0		-	-
THORIUM-230	09/18/87	0001	PCI/L		1.2		1.	1.1
TIN	09/18/87	0001	MG/L		0.049		0.005	-
TOTAL DISSOLVED SOLIDS	09/18/87	0001	MG/L		11900.		10.	-
TOTAL ORGANIC CARBON	09/18/87	0001	MG/L		125.		1.	-
URANIUM	09/18/87	0001	MG/L		0.801		0.003	-
VANADIUM	09/18/87	0001	MG/L		0.13		0.01	-
ZINC	09/18/87	0001	MG/L		0.102		0.005	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)

OTHER PARAMETER VALUE FLAGS:
 J - ESTIMATED VALUE

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0614
 NORTH COORDINATE: 9189.4 FT
 EAST COORDINATE: 11058.0 FT
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: DOWN GRADIENT (D)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
ALKALINITY	09/18/87	0001	MG/L CACO3		426.		-	-
	10/11/88	0001		406.	-	-		
	04/03/89	0001		406.	-	-		
	06/01/90	0001		493.	-	-		
	10/07/90	0001		565.	-	-		
	05/14/91	0001		525.	-	-		
	09/17/92	0001		668	-	-		
	02/21/93	0001		638	-	-		
ALUMINUM	09/18/87	0001	MG/L		0.41		0.1	-
	04/03/89	0001		<	0.1		0.1	-
	06/01/90	0001		<	0.1		0.1	-
	10/07/90	0001		<	0.05		0.05	-
	05/14/91	0001		<	0.05		0.05	-
AMMONIUM	09/18/87	0001	MG/L		64.5		0.1	-
	10/11/88	0001		56.		0.1	-	
	04/03/89	0001		57.		0.1	-	
	06/01/90	0001		74.2		0.1	-	
	10/07/90	0001		75.7	H	0.1	-	
	05/14/91	0001		53.1		0.1	-	
ANTIMONY	09/18/87	0001	MG/L		0.068		0.003	-
	10/11/88	0001		0.027		0.003	-	
	04/03/89	0001		0.007		0.003	-	
	06/01/90	0001		<	0.003		0.003	-
	10/07/90	0001		<	0.02	I	0.02	-
	05/14/91	0001		<	0.015	I	0.015	-
	09/17/92	0001		0.005	NW	0.0015	-	
ARSENIC	09/18/87	0001	MG/L		0.016		0.01	-
	10/11/88	0001		0.05		0.01	-	
	04/03/89	0001		<	0.01		0.01	-
	06/01/90	0001		<	0.01		0.01	-
	10/07/90	0001		<	0.05	I	0.05	-
	05/14/91	0001		<	0.03	I	0.03	-
	09/17/92	0001		<	0.015	IN	0.015	-
	02/21/93	0001		<	0.005	W	0.005	-
ARSENIC (TOTAL)	02/21/93	N001	MG/L	<	0.005	W	0.005	-
BARIUM	09/18/87	0001	MG/L		0.03	J	0.1	-
	10/11/88	0001		<	0.1		0.1	-
	04/03/89	0001		<	0.1		0.1	-
	06/01/90	0001		<	0.1		0.1	-
	10/07/90	0001		0.02		0.01	-	
	05/14/91	0001		0.01		0.01	-	
BERYLLIUM	04/03/89	0001	MG/L	<	0.01		0.01	-
	06/01/90	0001		<	0.01		0.01	-
	10/07/90	0001		<	0.005		0.005	-
	05/14/91	0001		<	0.005		0.005	-
BORON	09/18/87	0001	MG/L		0.69		0.1	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)
 N001 - UNFILTERED SAMPLE

OTHER PARAMETER VALUE FLAGS:
 H - HOLD TIME EXPIRED, VALUE SUSPECT
 I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION
 J - ESTIMATED VALUE
 N - SPIKE SAMPLE RECOVERY NOT WITHIN CONTROL LIMITS
 W - POST-DIGEST SPIKE OUT OF CNTR LIM WHILE SAMP ABS < 50% SPIKE

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0614
 NORTH COORDINATE: 9189.4 FT
 EAST COORDINATE: 11058.0 FT
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: DOWN GRADIENT (D)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
BORON	04/03/89	0001	MG/L		0.3		0.1	-
	06/01/90	0001		0.4	0.1	-		
	10/07/90	0001		0.46	0.05	-		
	05/14/91	0001		0.33	0.05	-		
BROMIDE	09/18/87	0001	MG/L	<	0.1		0.1	-
	04/03/89	0001		<	0.1		0.1	-
CADMIUM	09/18/87	0001	MG/L	<	0.005	J	0.005	-
	10/11/88	0001		<	0.002		0.001	-
	04/03/89	0001		<	0.008		0.001	-
	06/01/90	0001		<	0.001		0.001	-
	10/07/90	0001		<	0.001		0.001	-
	05/14/91	0001		<	0.001	W	0.001	-
	09/17/92	0001		<	0.0007	S	0.00003	-
	02/21/93	0001		<	0.001		0.001	-
CADMIUM (TOTAL)	02/21/93	N001	MG/L	<	0.005	I	0.005	-
CALCIUM	09/18/87	0001	MG/L		478.		0.01	-
	10/11/88	0001			407.		0.01	-
	04/03/89	0001			428.		0.01	-
	06/01/90	0001			520.		0.01	-
	10/07/90	0001			581.		0.01	-
	05/14/91	0001			535.		2.	-
	09/17/92	0001			530		0.0050	-
	02/21/93	0001			426		0.5	-
CALCIUM (TOTAL)	02/21/93	N001	MG/L		377		0.5	-
CHLORIDE	09/18/87	0001	MG/L		205.		1.	-
	10/11/88	0001			240.		1.	-
	04/03/89	0001			250.		1.	-
	06/01/90	0001			260.		1.	-
	10/07/90	0001			300.	H	1.	-
	05/14/91	0001			400.		1.	-
09/17/92	0001		350	N	0.50	-		
CHLORIDE (TOTAL)	02/21/93	N001	MG/L		370		0.5	-
CHROMIUM	09/18/87	0001	MG/L	<	0.01		0.01	-
	10/11/88	0001		<	0.20		0.01	-
	04/03/89	0001		<	0.01		0.01	-
	06/01/90	0001		<	0.01		0.01	-
	10/07/90	0001		<	0.01		0.01	-
	05/14/91	0001		<	0.01		0.01	-
02/21/93	0001	<	0.01		0.01	-		
CHROMIUM (TOTAL)	02/21/93	N001	MG/L	<	0.01		0.01	-
COBALT	09/18/87	0001	MG/L	<	0.01	J	0.05	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)
 N001 - UNFILTERED SAMPLE

OTHER PARAMETER VALUE FLAGS:
 H - HOLD TIME EXPIRED, VALUE SUSPECT
 I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION
 J - ESTIMATED VALUE
 N - SPIKE SAMPLE RECOVERY NOT WITHIN CONTROL LIMITS
 S - REPORTED VALUE DETERMINED USING METHOD OF STD ADDITION (MSA)
 W - POST-DIGEST SPIKE OUT OF CNTR LIM WHILE SAMP ABS < 50% SPIKE

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0614
 NORTH COORDINATE: 9189.4 FT
 EAST COORDINATE: 11058.0 FT
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: DOWN GRADIENT (D)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
COBALT	10/11/88	0001	MG/L		0.06		0.05	-
	04/03/89	0001		<	0.05		0.05	-
	06/01/90	0001		<	0.05		0.05	-
	10/07/90	0001		<	0.03		0.03	-
	05/14/91	0001		<	0.03		0.03	-
COPPER	09/18/87	0001	MG/L		0.01	J	0.02	-
	10/11/88	0001			0.03		0.02	-
	04/03/89	0001		<	0.02		0.02	-
	06/01/90	0001		<	0.02		0.02	-
	10/07/90	0001			0.01		0.01	-
05/14/91	0001	<	0.01		0.01	-		
CYANIDE	04/03/89	0001	MG/L	<	0.01		0.01	-
DISSOLVED OXYGEN	02/21/93	0001	MG/L		0.0		-	-
FLUORIDE	09/18/87	0001	MG/L		0.53		0.1	-
	10/11/88	0001			0.6		0.1	-
	04/03/89	0001			0.5		0.1	-
	06/01/90	0001			0.5		0.1	-
	10/07/90	0001			0.8		0.1	-
05/14/91	0001		0.9		0.1	-		
GROSS ALPHA	09/18/87	0001	PCI/L		920.		0.2	110.
	10/11/88	0001			620.		0.2	150.
	04/03/89	0001			650.		0.2	160.
	09/17/92	0001			1200.		191	316
	02/21/93	0001			843.		182.	198.
GROSS ALPHA (TOTAL)	02/21/93	N001	PCI/L		1140.		183.	223.
GROSS BETA	09/18/87	0001	PCI/L		650.		1.	40.
	10/11/88	0001			280.		1.	60.
	04/03/89	0001			430.		1.	70.
	09/17/92	0001			370.		144	111
	02/21/93	0001			622.		137.	114.
GROSS BETA (TOTAL)	02/21/93	N001	PCI/L		558.		136.	110.
IRON	09/18/87	0001	MG/L		0.01	J	0.03	-
	10/11/88	0001			0.15		0.03	-
	04/03/89	0001			0.12		0.03	-
	06/01/90	0001			0.16		0.03	-
	10/07/90	0001		<	0.03		0.03	-
	05/14/91	0001		<	0.03		0.03	-
09/17/92	0001	<	0.018	I	0.018	-		
LEAD	09/18/87	0001	MG/L		0.01		0.01	-
	10/11/88	0001		<	0.01		0.01	-
	04/03/89	0001		<	0.01		0.01	-
	06/01/90	0001		<	0.01		0.01	-
	10/07/90	0001		<	0.01		0.01	-
	05/14/91	0001		<	0.03	I	0.03	-
02/21/93	0001	<	0.03	I	0.03	-		

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

OTHER PARAMETER VALUE FLAGS:
 I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION
 J - ESTIMATED VALUE

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)
 N001 - UNFILTERED SAMPLE

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0614
 NORTH COORDINATE: 9189.4 FT
 EAST COORDINATE: 11058.0 FT
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: DOWN GRADIENT (D)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
LEAD (TOTAL)	02/21/93	N001	MG/L	<	0.03	INW	0.03	-
LEAD-210	04/03/89	0001	PCI/L		0.1		1.5	0.6
MAGNESIUM	09/18/87	0001	MG/L		962.		0.001	-
	10/11/88	0001			1136.		0.001	-
	04/03/89	0001			974.		0.001	-
	06/01/90	0001			1140.		0.001	-
	10/07/90	0001			1420.		0.001	-
	05/14/91	0001			1550.		2.	-
	09/17/92	0001			1800.		0.011	-
	02/21/93	0001			1720.		0.1	-
MAGNESIUM (TOTAL)	02/21/93	N001	MG/L		1640		0.1	-
MANGANESE	09/18/87	0001	MG/L		4.17		0.01	-
	04/03/89	0001			3.51		0.01	-
	06/01/90	0001			4.53		0.01	-
	10/07/90	0001			6.0		0.01	-
	05/14/91	0001			4.83		0.01	-
	09/17/92	0001			6.4		0.0064	-
	02/21/93	0001			4.72		0.01	-
MANGANESE (TOTAL)	02/21/93	N001	MG/L		4.47		0.01	-
MERCURY	09/18/87	0001	MG/L	<	0.0002		0.0002	-
	10/11/88	0001			0.0003		0.0002	-
	04/03/89	0001		<	0.0002		0.0002	-
	06/01/90	0001		<	0.0002		0.0002	-
	10/07/90	0001		<	0.0002		0.0002	-
	05/14/91	0001		<	0.0002		0.0002	-
MOLYBDENUM	09/18/87	0001	MG/L		0.02		0.01	-
	10/11/88	0001			0.23		0.01	-
	04/03/89	0001		<	0.01		0.01	-
	06/01/90	0001		<	0.01		0.01	-
	10/07/90	0001			0.01		0.01	-
	05/14/91	0001			0.01		0.01	-
	09/17/92	0001			0.043		0.0049	-
	02/21/93	0001		<	0.01		0.01	-
MOLYBDENUM (TOTAL)	02/21/93	N001	MG/L		0.02		0.01	-
NICKEL	09/18/87	0001	MG/L		0.03	J	0.04	-
	04/03/89	0001		<	0.04		0.04	-
	06/01/90	0001		<	0.04		0.04	-
	10/07/90	0001		<	0.04		0.04	-
	05/14/91	0001		<	0.04		0.04	-
	09/17/92	0001		<	0.061	I	0.061	-
NITRATE	09/18/87	0001	MG/L		886.		1.	-
	10/11/88	0001			1120.		1.	-
	04/03/89	0001			1200.		1.	-
	06/01/90	0001			1600.		1.	-
	10/07/90	0001			1490.	H	1.	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)
 N001 - UNFILTERED SAMPLE

OTHER PARAMETER VALUE FLAGS:

- H - HOLD TIME EXPIRED, VALUE SUSPECT
- I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION
- J - ESTIMATED VALUE
- N - SPIKE SAMPLE RECOVERY NOT WITHIN CONTROL LIMITS
- W - POST-DIGEST SPIKE OUT OF CNTR LIM WHILE SAMP ABS < 50% SPIKE

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0617
 NORTH COORDINATE: 10140.6 FT
 EAST COORDINATE: 10862.4 FT
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: DOWN GRADIENT (D)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
PHOSPHATE	04/04/89	0001	MG/L	<	0.1		0.1	-
	06/01/90	0001		<	0.1	J	0.1	-
	10/09/90	0001			0.1		0.1	-
	05/13/91	0001			0.1		0.1	-
PHOSPHATE (TOTAL)	02/22/93	N001	MG/L	<	0.1		0.1	-
POLONIUM-210	09/18/87	0001	PCI/L		0.9		1.	0.7
	04/04/89	0001			0.2		1.	0.4
POTASSIUM	09/18/87	0001	MG/L		54.4	J	0.01	-
	04/04/89	0001			57.1		0.01	-
	06/01/90	0001			56.8		0.01	-
	10/09/90	0001			43.		0.01	-
	05/13/91	0001			52.		5.	-
	09/16/92	0001			83	E	0.20	-
	02/22/93	0001			62.4		0.1	-
POTASSIUM (TOTAL)	02/22/93	N001	MG/L		69.5		0.1	-
RADIUM-226	09/18/87	0001	PCI/L		0.1		1.	0.2
	04/04/89	0001			0.0		1.	0.1
	06/01/90	0001			0.1		1.	0.2
	10/09/90	0001			0.2		1.	0.2
	05/13/91	0001			0.2		1.	0.2
	09/16/92	0001			0.23		.0783	.0702
	02/22/93	0001			0.4		0.6	0.4
RADIUM-226 (TOTAL)	02/22/93	N001	PCI/L		0.4		0.6	0.4
RADIUM-228	09/18/87	0001	PCI/L		0.8		1.	1.6
	04/04/89	0001			0.8		1.	1.0
	06/01/90	0001			0.6		1.	0.8
	10/09/90	0001			0.0		1.	3.6
	05/13/91	0001			0.4	J	1.	1.9
	09/16/92	0001			0.88		1.79	.941
	02/22/93	0001			0.5		4.0	2.4
REDOX POTENTIAL	02/22/93	0001	mVOLTS		528.0		-	-
SELENIUM	09/18/87	0001	MG/L		0.077		0.005	-
	04/04/89	0001			0.037	N	0.005	-
	06/01/90	0001			0.027		0.005	-
	10/09/90	0001		<	0.03	I	0.03	-
	05/13/91	0001		<	0.03	I	0.03	-
	09/16/92	0001			0.067	*+N	0.0015	-
	02/22/93	0001			0.068	*	0.005	-
SELENIUM (TOTAL)	02/22/93	N001	MG/L		0.074	NS	0.005	-
SILICA - SiO2	09/18/87	0001	MG/L		17.1		2.	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)
 N001 - UNFILTERED SAMPLE

OTHER PARAMETER VALUE FLAGS:

- * - DUPLICATE ANALYSIS NOT WITHIN CONTROL LIMITS
- + - CORRELATION COEFFICIENT FOR MSA < 0.995
- E - ESTIMATED VALUE BECAUSE OF INTERFERENCE, SEE CASE NARRATIVE
- I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION
- J - ESTIMATED VALUE
- N - SPIKE SAMPLE RECOVERY NOT WITHIN CONTROL LIMITS
- S - REPORTED VALUE DETERMINED USING METHOD OF STD ADDITION (MSA)

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0617
 NORTH COORDINATE: 10140.6 FT
 EAST COORDINATE: 10862.4 FT
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: DOWN GRADIENT (D)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
SILICA - SIO2	04/04/89	0001	MG/L		14.		2.	-
	06/01/90	0001		14.		2.	-	
	10/09/90	0001		12.8		0.1	-	
	05/13/91	0001		13.5		0.1	-	
SILVER	04/04/89	0001	MG/L	<	0.01		0.01	-
	06/01/90	0001		<	0.01		0.01	-
	10/09/90	0001		<	0.01		0.01	-
	05/13/91	0001		<	0.01		0.01	-
SODIUM	09/18/87	0001	MG/L		630.		0.002	-
	04/04/89	0001		615.		0.002	-	
	06/01/90	0001		754.		0.002	-	
	10/09/90	0001		850.		5.	-	
	05/13/91	0001		1260.		20.	-	
	09/16/92	0001		1900		0.011	-	
	02/22/93	0001		1360		1	-	
SODIUM (TOTAL)	02/22/93	N001	MG/L		1590		1	-
SPECIFIC CONDUCTANCE	09/18/87	0001	UMHO/CM		3420.		-	-
	04/04/89	0001		3800.		-	-	
	06/01/90	0001		5000.		-	-	
	10/09/90	0001		6800.		-	-	
	05/13/91	0001		8990.		-	-	
	09/16/92	0001		8920		-	-	
	02/22/93	0001		7940		-	-	
STRONTIUM	09/18/87	0001	MG/L		5.90		0.1	-
	04/04/89	0001		5.3		0.1	-	
	06/01/90	0001		5.22		0.1	-	
	10/09/90	0001		4.07		0.01	-	
	05/13/91	0001		6.22	WJ	0.01	-	
	09/16/92	0001		7.7	N	0.010	-	
	02/22/93	0001		6.83		0.01	-	
STRONTIUM (TOTAL)	02/22/93	N001	MG/L		8.28		0.01	-
SULFATE	09/18/87	0001	MG/L		4650.		0.1	-
	04/04/89	0001		4140.	H	0.1	-	
	06/01/90	0001		4150.	HJ	0.1	-	
	10/09/90	0001		4820.		0.1	-	
	05/13/91	0001		6250.	H	10.	-	
	09/16/92	0001		7300	N	10.0	-	
SULFATE (TOTAL)	02/22/93	N001	MG/L		7120		1	-
SULFIDE	09/18/87	0001	MG/L	<	0.1		0.1	-
	04/04/89	0001		<	0.1		0.1	-
TEMPERATURE	09/18/87	0001	C - DEGREE		22.0		-	-
	04/04/89	0001		13.		-	-	
	06/01/90	0001		16.0		-	-	
	10/09/90	0001		20.5		-	-	

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:

0001 - FILTERED SAMPLE (.45 MICRONS)

N001 - UNFILTERED SAMPLE

OTHER PARAMETER VALUE FLAGS:

H - HOLD TIME EXPIRED, VALUE SUSPECT

J - ESTIMATED VALUE

N - SPIKE SAMPLE RECOVERY NOT WITHIN CONTROL LIMITS

W - POST-DIGEST SPIKE OUT OF CNTR LIM WHILE SAMP ABS < 50% SPIKE

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0618
 NORTH COORDINATE: 10138.1 FT
 EAST COORDINATE: 10849.3 FT
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: DOWN GRADIENT (D)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
MANGANESE	09/18/87	0001	MG/L		5.97		0.01	-
MERCURY	09/18/87 10/11/88	0001 0001	MG/L	<	0.0002 0.0002		0.0002 0.0002	- -
MOLYBDENUM	09/18/87 10/11/88	0001 0001	MG/L	<	0.01 0.10		0.01 0.01	- -
NICKEL	09/18/87	0001	MG/L	<	0.01	J	0.04	-
NITRATE	09/18/87 10/11/88	0001 0001	MG/L		42.0 27.		1. 1.	- -
NITRITE	09/18/87	0001	MG/L	<	0.1		0.1	-
NITRITE AND NITRATE	10/11/88	0001	MG/L		6.1		1.	-
PH	09/18/87 10/11/88	0001 0001	SU		6.89 6.83		- -	- -
PHOSPHATE	09/18/87 10/11/88	0001 0001	MG/L	<	0.69 0.1	H	0.1 0.1	- -
POLONIUM-210	09/18/87	0001	PCI/L		0.9		1.	0.7
POTASSIUM	09/18/87 10/11/88	0001 0001	MG/L		49.0 62.6	J	0.01 0.01	- -
RADIUM-226	09/18/87 10/11/88	0001 0001	PCI/L		0.0 0.0		1. 1.	0.1 0.1
RADIUM-228	09/18/87 10/11/88	0001 0001	PCI/L		1.1 0.7		1. 1.	0.9 0.8
SELENIUM	09/18/87 10/11/88	0001 0001	MG/L		0.064 0.069		0.005 0.005	- -
SILICA - SiO2	09/18/87	0001	MG/L		17.2		2.	-
SILVER	10/11/88	0001	MG/L		0.02		0.01	-
SODIUM	09/18/87 10/11/88	0001 0001	MG/L		550. 524.		0.002 0.002	- -
SPECIFIC CONDUCTANCE	09/18/87 10/11/88	0001 0001	UMHO/CM		3190. 4900.		- -	- -
STRONTIUM	09/18/87 10/11/88	0001 0001	MG/L		5.30 4.5		0.1 0.1	- -
SULFATE	09/18/87 10/11/88	0001 0001	MG/L		4270. 3960.		0.1 0.1	- -
SULFIDE	09/18/87	0001	MG/L	<	0.1		0.1	-
TEMPERATURE	09/18/87	0001	C - DEGREE		20.8		-	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)

OTHER PARAMETER VALUE FLAGS:
 H - HOLD TIME EXPIRED, VALUE SUSPECT
 J - ESTIMATED VALUE

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0618
 NORTH COORDINATE: 10138.1 FT
 EAST COORDINATE: 10849.3 FT
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: DOWN GRADIENT (D)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
TEMPERATURE	10/11/88	0001	C - DEGREE		20.0		-	-
THORIUM-230	09/18/87	0001	PCI/L		0.3		1.	0.8
	10/11/88	0001			0.3		1.	0.5
TIN	09/18/87	0001	MG/L		0.033		0.005	-
TOTAL DISSOLVED SOLIDS	09/18/87	0001	MG/L		9340.		10.	-
	10/11/88	0001			5930.		10.	-
TOTAL ORGANIC CARBON	09/18/87	0001	MG/L		100.		1.	-
URANIUM	09/18/87	0001	MG/L		0.415		0.003	-
	10/11/88	0001			0.424		0.003	-
VANADIUM	09/18/87	0001	MG/L		0.16		0.01	-
	10/11/88	0001			0.07		0.01	-
ZINC	09/18/87	0001	MG/L	<	0.005		0.005	-
	10/11/88	0001			0.016		0.005	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0617
 NORTH COORDINATE: 10140.6 FT
 EAST COORDINATE: 10862.4 FT
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: DOWN GRADIENT (D)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
TEMPERATURE	05/13/91	0001	C - DEGREE		14.2		-	-
	09/16/92	0001			21.2		-	-
	02/22/93	0001			10.7		-	-
THALLIUM	04/04/89	0001	MG/L	<	0.01		0.01	-
	06/01/90	0001		<	0.01		0.01	-
	10/09/90	0001		<	0.01		0.01	-
	05/13/91	0001		<	0.05	I	0.05	-
THORIUM-230	09/18/87	0001	PCI/L		0.0		1.	0.9
	04/04/89	0001			0.0		1.	0.3
TIN	09/18/87	0001	MG/L		0.036		0.005	-
	04/04/89	0001			0.007		0.005	-
	06/01/90	0001		<	0.005		0.005	-
	10/09/90	0001		<	0.05	I	0.05	-
	05/13/91	0001		<	0.05	I	0.05	-
TOTAL DISSOLVED SOLIDS	09/18/87	0001	MG/L		21300.	HJ	10.	-
	04/04/89	0001			6890.	HJ	10.	-
	06/01/90	0001			6610.		10.	-
	10/09/90	0001			6900.	H	10.	-
	05/13/91	0001			10890.		10.	-
	09/16/92	0001			13000	H	10.0	-
TOTAL DISSOLVED SOLIDS (TOTAL)	02/22/93	N001	MG/L		12300		10	-
TOTAL ORGANIC CARBON	09/18/87	0001	MG/L		120.		1.	-
	04/04/89	0001			82.6		1.	-
URANIUM	09/18/87	0001	MG/L		0.355		0.003	-
	04/04/89	0001			0.373		0.003	-
	06/01/90	0001			0.327		0.003	-
	10/09/90	0001			0.466		0.001	-
	05/13/91	0001			1.53		0.001	-
	09/16/92	0001			1.07	H	0.001	-
	02/22/93	0001			0.832		0.001	-
URANIUM (TOTAL)	02/22/93	N001	MG/L		0.849		0.001	-
VANADIUM	09/18/87	0001	MG/L		0.12		0.01	-
	04/04/89	0001			0.07		0.01	-
	06/01/90	0001		<	0.01		0.01	-
	10/09/90	0001		<	0.01		0.01	-
	05/13/91	0001		<	0.01		0.01	-
ZINC	09/18/87	0001	MG/L		0.009		0.005	-
	04/04/89	0001			0.009		0.005	-
	06/01/90	0001		<	0.005		0.005	-
	10/09/90	0001		<	0.01	I	0.01	-
	05/13/91	0001		<	0.03	I	0.03	-
	09/16/92	0001			0.018	E	0.0010	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)
 N001 - UNFILTERED SAMPLE

OTHER PARAMETER VALUE FLAGS:
 E - ESTIMATED VALUE BECAUSE OF INTERFERENCE, SEE CASE NARRATIVE
 H - HOLD TIME EXPIRED, VALUE SUSPECT
 I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION
 J - ESTIMATED VALUE

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0618
 NORTH COORDINATE: 10138.1 FT
 EAST COORDINATE: 10849.3 FT
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: DOWN GRADIENT (D)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
ALKALINITY	09/18/87 10/11/88	0001 0001	MG/L CaCO3		344. 340.		- -	- -
ALUMINUM	09/18/87	0001	MG/L		0.74		0.1	-
AMMONIUM	09/18/87 10/11/88	0001 0001	MG/L		124. 110.		0.1 0.1	- -
ANTIMONY	09/18/87 10/11/88	0001 0001	MG/L		0.042 0.010		0.003 0.003	- -
ARSENIC	09/18/87 10/11/88	0001 0001	MG/L		0.006 0.03	J	0.01 0.01	- -
BARIUM	09/18/87 10/11/88	0001 0001	MG/L	<	0.03 0.1	J	0.1 0.1	- -
BORON	09/18/87	0001	MG/L		0.65		0.1	-
BROMIDE	09/18/87	0001	MG/L	<	0.1		0.1	-
CADMIUM	09/18/87 10/11/88	0001 0001	MG/L	<	0.005 0.001	J	0.005 0.001	- -
CALCIUM	09/18/87 10/11/88	0001 0001	MG/L		474. 446.		0.01 0.01	- -
CHLORIDE	09/18/87 10/11/88	0001 0001	MG/L		63.9 85.		1. 1.	- -
CHROMIUM	09/18/87 10/11/88	0001 0001	MG/L	<	0.01 0.15		0.01 0.01	- -
COBALT	09/18/87 10/11/88	0001 0001	MG/L	< <	0.01 0.05	J	0.05 0.05	- -
COPPER	09/18/87 10/11/88	0001 0001	MG/L	<	0.06 0.02		0.02 0.02	- -
FLUORIDE	09/18/87 10/11/88	0001 0001	MG/L		0.23 0.2		0.1 0.1	- -
GROSS ALPHA	09/18/87 10/11/88	0001 0001	PCI/L		350. 240.		0.2 0.2	50. 50.
GROSS BETA	09/18/87 10/11/88	0001 0001	PCI/L		270. 130.		1. 1.	30. 20.
IRON	09/18/87 10/11/88	0001 0001	MG/L	<	0.01 0.11	J	0.03 0.03	- -
LEAD	09/18/87 10/11/88	0001 0001	MG/L	<	0.01 0.01		0.01 0.01	- -
MAGNESIUM	09/18/87 10/11/88	0001 0001	MG/L		461. 424.		0.001 0.001	- -

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)

OTHER PARAMETER VALUE FLAGS:
 J - ESTIMATED VALUE

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0619
 NORTH COORDINATE: 10524.1 FT
 EAST COORDINATE: 10501.5 FT
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: DOWN GRADIENT (D)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
ALKALINITY	09/19/87	0001	MG/L CaCO3		778.		-	-
	04/05/89	0001			1210.		-	-
	06/01/90	0001			1141.		-	-
	10/09/90	0001			1060.		5.	-
	05/13/91	0001			861.		-	-
	09/16/92	0001			690		-	-
	02/23/93	0001			643		-	-
ALUMINUM	09/19/87	0001	MG/L		1.15		0.1	-
	04/05/89	0001		<	0.1		0.1	-
	06/01/90	0001		<	0.1		0.1	-
	10/09/90	0001		<	0.05		0.05	-
	05/13/91	0001		<	0.05		0.05	-
AMMONIUM	09/19/87	0001	MG/L		83.9		0.1	-
	04/05/89	0001			81.		0.1	-
	06/01/90	0001			28.8		0.1	-
	10/09/90	0001			273.		0.1	-
	05/13/91	0001			14.4		0.1	-
AMMONIUM (TOTAL)	02/23/93	N001	MG/L		7 N		0.1	-
ANTIMONY	09/19/87	0001	MG/L		0.084		0.003	-
	04/05/89	0001			0.042		0.003	-
	06/01/90	0001			0.003		0.003	-
	10/09/90	0001		<	0.02	I	0.02	-
	05/13/91	0001		<	0.015	I	0.015	-
	09/16/92	0001			0.002	NW	0.0015	-
ARSENIC	09/19/87	0001	MG/L		0.053		0.01	-
	04/05/89	0001			0.05		0.01	-
	06/01/90	0001			0.04		0.01	-
	10/09/90	0001		<	0.05	I	0.05	-
	05/13/91	0001		<	0.03	I	0.03	-
	09/16/92	0001		<	0.015	IN	0.015	-
	02/23/93	0001		<	0.005	W	0.005	-
ARSENIC (TOTAL)	02/23/93	N001	MG/L	<	0.005 W		0.005	-
BARIUM	09/19/87	0001	MG/L		0.03	J	0.1	-
	04/05/89	0001		<	0.1		0.1	-
	06/01/90	0001		<	0.1		0.1	-
	10/09/90	0001		<	0.01		0.01	-
	05/13/91	0001		<	0.01		0.01	-
BERYLLIUM	04/05/89	0001	MG/L	<	0.01		0.01	-
	06/01/90	0001		<	0.01		0.01	-
	10/09/90	0001		<	0.005		0.005	-
	05/13/91	0001		<	0.005		0.005	-
BORON	09/19/87	0001	MG/L		1.49		0.1	-
	04/05/89	0001			0.9		0.1	-
	06/01/90	0001			1.0		0.1	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)
 N001 - UNFILTERED SAMPLE

OTHER PARAMETER VALUE FLAGS:
 I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION
 J - ESTIMATED VALUE
 N - SPIKE SAMPLE RECOVERY NOT WITHIN CONTROL LIMITS
 W - POST-DIGEST SPIKE OUT OF CNTR LIM WHILE SAMP ABS < 50% SPIKE

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0619
 NORTH COORDINATE: 10524.1 FT
 EAST COORDINATE: 10501.5 FT
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: DOWN GRADIENT (D)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
BORON	10/09/90	0001	MG/L		0.59		0.05	-
	05/13/91	0001			0.75		0.05	-
BROMIDE	09/19/87	0001	MG/L		0.1		0.01	-
	04/05/89	0001			0.1		0.1	-
CADMIUM	09/19/87	0001	MG/L	<	0.005	J	0.005	-
	04/05/89	0001			0.020		0.001	-
	06/01/90	0001		<	0.001		0.001	-
	10/09/90	0001		<	0.001		0.001	-
	05/13/91	0001		<	0.001		0.001	-
	09/16/92	0001		<	0.0003	S	0.00003	-
02/23/93	0001	<	0.001	S	0.001	-		
CADMIUM (TOTAL)	02/23/93	N001	MG/L		0.001		0.001	-
CALCIUM	09/19/87	0001	MG/L		490.		0.01	-
	04/05/89	0001			429.		0.01	-
	06/01/90	0001			416.		0.01	-
	10/09/90	0001			461.		0.01	-
	05/13/91	0001			401.		0.5	-
	09/16/92	0001			470		0.0050	-
02/23/93	0001		348		0.5	-		
CALCIUM (TOTAL)	02/23/93	N001	MG/L		365		0.5	-
CHLORIDE	09/19/87	0001	MG/L		552.		1.	-
	04/05/89	0001			800.		1.	-
	06/01/90	0001			763.		1.	-
	10/09/90	0001			630.	H	1.	-
	05/13/91	0001			1300.		1.	-
	09/16/92	0001			400	N	0.50	-
CHLORIDE (TOTAL)	02/23/93	N001	MG/L		415		0.5	-
CHROMIUM	09/19/87	0001	MG/L	<	0.01		0.01	-
	04/05/89	0001		<	0.01		0.01	-
	06/01/90	0001		<	0.01		0.01	-
	10/09/90	0001		<	0.01		0.01	-
	05/13/91	0001		<	0.01		0.01	-
	02/23/93	0001		<	0.01		0.01	-
CHROMIUM (TOTAL)	02/23/93	N001	MG/L	<	0.01		0.01	-
COBALT	09/19/87	0001	MG/L		0.01	J	0.05	-
	04/05/89	0001		<	0.05		0.05	-
	06/01/90	0001		<	0.05		0.05	-
	10/09/90	0001		<	0.03		0.03	-
	05/13/91	0001		<	0.03		0.03	-
COPPER	09/19/87	0001	MG/L		0.10		0.02	-
	04/05/89	0001			0.04		0.02	-
	06/01/90	0001		<	0.02		0.02	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)
 N001 - UNFILTERED SAMPLE

OTHER PARAMETER VALUE FLAGS:
 H - HOLD TIME EXPIRED, VALUE SUSPECT
 J - ESTIMATED VALUE
 N - SPIKE SAMPLE RECOVERY NOT WITHIN CONTROL LIMITS
 S - REPORTED VALUE DETERMINED USING METHOD OF STD ADDITION (MSA)

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0619
 NORTH COORDINATE: 10524.1 FT
 EAST COORDINATE: 10501.5 FT
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: DOWN GRADIENT (D)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
COPPER	10/09/90	0001	MG/L	<	0.01		0.01	-
	05/13/91	0001		<	0.01		0.01	-
CYANIDE	04/05/89	0001	MG/L	<	0.01		0.01	-
DISSOLVED OXYGEN	02/23/93	0001	MG/L		0.0		-	-
FLUORIDE	09/19/87	0001	MG/L		0.38		0.1	-
	04/05/89	0001			0.3		0.1	-
	06/01/90	0001			0.3		0.1	-
	10/09/90	0001			0.5		0.1	-
	05/13/91	0001			0.7		0.1	-
GROSS ALPHA	09/19/87	0001	PCI/L		1700.		0.2	300.
	04/05/89	0001			2700.		0.2	300.
	09/16/92	0001			790.		197	265
	02/23/93	0001			794.		156.	185.
GROSS ALPHA (TOTAL)	02/23/93	N001	PCI/L		506.		168.	162.
GROSS BETA	09/19/87	0001	PCI/L		1100.		1.	100.
	04/05/89	0001			1100.		1.	100.
	09/16/92	0001			200.		145	99.7
	02/23/93	0001			288.		120.	88.8
GROSS BETA (TOTAL)	02/23/93	N001	PCI/L		294.		135.	96.7
IRON	09/19/87	0001	MG/L	<	0.01	J	0.03	-
	04/05/89	0001			0.17		0.03	-
	06/01/90	0001			0.18		0.03	-
	10/09/90	0001		<	0.03		0.03	-
	05/13/91	0001		<	0.03		0.03	-
	09/16/92	0001		<	0.018	I	0.018	-
LEAD	09/19/87	0001	MG/L		0.03		0.01	-
	04/05/89	0001			0.02		0.01	-
	06/01/90	0001		<	0.01		0.01	-
	10/09/90	0001		<	0.01		0.01	-
	05/13/91	0001		<	0.03	I	0.03	-
	02/23/93	0001		<	0.03	I	0.03	-
LEAD (TOTAL)	02/23/93	N001	MG/L	<	0.03	*IN	0.03	-
LEAD-210	04/05/89	0001	PCI/L		1.8		1.5	0.7
MAGNESIUM	09/19/87	0001	MG/L		1859.		0.001	-
	04/05/89	0001			2210.		0.001	-
	06/01/90	0001			2090.		0.001	-
	10/09/90	0001			1610.		0.01	-
	05/13/91	0001			1620.		2.	-
	09/16/92	0001			1300		0.011	-
	02/23/93	0001			1100		0.1	-
MAGNESIUM (TOTAL)	02/23/93	N001	MG/L		1060		0.1	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)
 N001 - UNFILTERED SAMPLE

OTHER PARAMETER VALUE FLAGS:
 * - DUPLICATE ANALYSIS NOT WITHIN CONTROL LIMITS
 I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION
 J - ESTIMATED VALUE
 N - SPIKE SAMPLE RECOVERY NOT WITHIN CONTROL LIMITS

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0619
 NORTH COORDINATE: 10524.1 FT
 EAST COORDINATE: 10501.5 FT
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: DOWN GRADIENT (D)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
MANGANESE	09/19/87	0001	MG/L		8.33		0.01	-
	04/05/89	0001		8.65	0.01	-		
	06/01/90	0001		6.72	0.01	-		
	10/09/90	0001		3.67	0.01	-		
	05/13/91	0001		5.13	0.01	-		
	09/16/92	0001		5.5	0.0064	-		
	02/23/93	0001		3.93	0.01	-		
MANGANESE (TOTAL)	02/23/93	N001	MG/L		4.16		0.01	-
MERCURY	09/19/87	0001	MG/L	<	0.0002		0.0002	-
	04/05/89	0001		<	0.0002		0.0002	-
	06/01/90	0001		<	0.0002		0.0002	-
	10/09/90	0001		<	0.0002		0.0002	-
	05/13/91	0001		<	0.0002		0.0002	-
MOLYBDENUM	09/19/87	0001	MG/L	<	0.01		0.01	-
	04/05/89	0001		<	0.01		0.01	-
	06/01/90	0001		<	0.01		0.01	-
	10/09/90	0001		<	0.01		0.01	-
	05/13/91	0001			0.01		0.01	-
	09/16/92	0001		<	0.025	I	0.025	-
	02/23/93	0001			0.01		0.01	-
MOLYBDENUM (TOTAL)	02/23/93	N001	MG/L	<	0.01		0.01	-
NICKEL	09/19/87	0001	MG/L		0.01	J	0.04	-
	04/05/89	0001		<	0.04		0.04	-
	06/01/90	0001			0.05		0.04	-
	10/09/90	0001		<	0.04		0.04	-
	05/13/91	0001		<	0.04		0.04	-
	09/16/92	0001		<	0.061	I	0.061	-
NITRATE	09/19/87	0001	MG/L		1550.		1.	-
	04/05/89	0001			1600.		1.	-
	06/01/90	0001			10.		1.	-
	10/09/90	0001			389.		1.	-
	05/13/91	0001			377.		1.	-
	09/16/92	0001			320	J	0.044	-
NITRATE (TOTAL)	02/23/93	N001	MG/L		200		1	-
NITRITE	09/19/87	0001	MG/L	<	0.1		0.1	-
PH	09/19/87	0001	SU		6.96		-	-
	04/05/89	0001			6.94		-	-
	06/01/90	0001			6.99		-	-
	10/09/90	0001			6.65		-	-
	05/13/91	0001			6.91		-	-
	09/16/92	0001			6.98		-	-
	02/23/93	0001			6.99		-	-
PHOSPHATE	09/19/87	0001	MG/L		1.22	HN	0.1	-
	04/05/89	0001		<	0.1		0.1	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)
 N001 - UNFILTERED SAMPLE

OTHER PARAMETER VALUE FLAGS:

H - HOLD TIME EXPIRED, VALUE SUSPECT
 I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION
 J - ESTIMATED VALUE
 N - SPIKE SAMPLE RECOVERY NOT WITHIN CONTROL LIMITS

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0619
 NORTH COORDINATE: 10524.1 FT
 EAST COORDINATE: 10501.5 FT
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: DOWN GRADIENT (D)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
PHOSPHATE	06/01/90	0001	MG/L		0.6	J	0.1	-
	10/09/90	0001			0.2		0.1	-
	05/13/91	0001			0.1		0.1	-
PHOSPHATE (TOTAL)	02/23/93	N001	MG/L		0.14		0.1	-
POLONIUM-210	09/19/87	0001	PCI/L		1.3		1.	1.1
	04/05/89	0001			0.6		1.	0.6
POTASSIUM	09/19/87	0001	MG/L		109.	J	0.01	-
	04/05/89	0001			148.		0.01	-
	06/01/90	0001			125.		0.01	-
	10/09/90	0001			52.		0.01	-
	05/13/91	0001			73.		5.	-
	09/16/92	0001			91	E	0.20	-
	02/23/93	0001			65.7		0.1	-
POTASSIUM (TOTAL)	02/23/93	N001	MG/L		68.3		0.1	-
RADIUM-226	09/19/87	0001	PCI/L		0.0		1.	0.1
	04/05/89	0001			0.0		1.	0.2
	06/01/90	0001			0.4		1.	0.2
	10/09/90	0001			0.2		1.	0.2
	05/13/91	0001			0.4		1.	0.3
	09/16/92	0001			0.26		.0402	.0633
	02/23/93	0001			0.4		0.6	0.4
RADIUM-226 (TOTAL)	02/23/93	N001	PCI/L		0.8		0.6	0.5
RADIUM-228	09/19/87	0001	PCI/L		1.0		1.	1.0
	04/05/89	0001			0.8		1.	0.9
	06/01/90	0001			2.0		1.	0.9
	10/09/90	0001			0.0		1.	3.6
	05/13/91	0001			0.0	J	1.	1.8
	09/16/92	0001			1.6		1.65	.898
	02/23/93	0001			2.4		3.6	2.3
REDOX POTENTIAL	02/23/93	0001	mVOLTS		472.9		-	-
SELENIUM	09/19/87	0001	MG/L		0.372		0.005	-
	04/05/89	0001			0.456		0.005	-
	06/01/90	0001			0.144		0.005	-
	10/09/90	0001			0.105		0.005	-
	05/13/91	0001		<	0.03	I	0.03	-
	09/16/92	0001			0.046	*EN	0.0015	-
	02/23/93	0001			0.103	**	0.005	-
SELENIUM (TOTAL)	02/23/93	N001	MG/L		0.062	N	0.005	-
SILICA - SIO2	09/19/87	0001	MG/L		14.7		2.	-
	04/05/89	0001			12.		2.	-
	06/01/90	0001			11.		2.	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:

0001 - FILTERED SAMPLE (.45 MICRONS)
 N001 - UNFILTERED SAMPLE

OTHER PARAMETER VALUE FLAGS:

- * - DUPLICATE ANALYSIS NOT WITHIN CONTROL LIMITS
- + - CORRELATION COEFFICIENT FOR MSA < 0.995
- E - ESTIMATED VALUE BECAUSE OF INTERFERENCE, SEE CASE NARRATIVE
- I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION
- J - ESTIMATED VALUE
- N - SPIKE SAMPLE RECOVERY NOT WITHIN CONTROL LIMITS

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0619
 NORTH COORDINATE: 10524.1 FT
 EAST COORDINATE: 10501.5 FT
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: DOWN GRADIENT (D)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
SILICA - SiO2	10/09/90	0001	MG/L		11.2		0.1	-
	05/13/91	0001			12.4		0.1	-
SILVER	04/05/89	0001	MG/L	<	0.01		0.01	-
	06/01/90	0001		<	0.01		0.01	-
	10/09/90	0001		<	0.01		0.01	-
	05/13/91	0001		<	0.01		0.01	-
SODIUM	09/19/87	0001	MG/L		3025.		0.002	-
	04/05/89	0001			3540.		0.002	-
	06/01/90	0001			3800.		0.002	-
	10/09/90	0001			3190.		5.	-
	05/13/91	0001			3210.		20.	-
	09/16/92	0001			3100		0.011	-
	02/23/93	0001			2570		1	-
SODIUM (TOTAL)	02/23/93	N001	MG/L		2510		1	-
SPECIFIC CONDUCTANCE	09/19/87	0001	UMHO/CM		5700.		-	-
	04/05/89	0001			12500.		-	-
	06/01/90	0001			12000.		-	-
	10/09/90	0001			14100.		-	-
	05/13/91	0001			15750.		-	-
	09/16/92	0001			13870		-	-
	02/23/93	0001			11400		-	-
STRONTIUM	09/19/87	0001	MG/L		9.65		0.1	-
	04/05/89	0001			10.8		0.1	-
	06/01/90	0001			9.79		0.1	-
	10/09/90	0001			4.91		0.01	-
	05/13/91	0001			7.77		0.01	-
	09/16/92	0001			7.6	N	0.010	-
	02/23/93	0001			6.41		0.01	-
STRONTIUM (TOTAL)	02/23/93	N001	MG/L		6.87		0.01	-
SULFATE	09/19/87	0001	MG/L		12100.		0.1	-
	04/05/89	0001			15000.	H	0.1	-
	06/01/90	0001			15800.	HJ	0.1	-
	10/09/90	0001			12300.		0.1	-
	05/13/91	0001			12200.	H	10.	-
	09/16/92	0001			11000	N	10.0	-
SULFATE (TOTAL)	02/23/93	N001	MG/L		9840		1	-
SULFIDE	09/19/87	0001	MG/L	<	0.1		0.1	-
	04/05/89	0001		<	0.1		0.1	-
TEMPERATURE	09/19/87	0001	C - DEGREE		20.1		-	-
	04/05/89	0001			13.5		-	-
	06/01/90	0001			15.		-	-
	10/09/90	0001			20.0		-	-
	05/13/91	0001			13.7		-	-
	09/16/92	0001			19.1		-	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)
 N001 - UNFILTERED SAMPLE

OTHER PARAMETER VALUE FLAGS:
 H - HOLD TIME EXPIRED, VALUE SUSPECT
 J - ESTIMATED VALUE
 N - SPIKE SAMPLE RECOVERY NOT WITHIN CONTROL LIMITS

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0619
 NORTH COORDINATE: 10524.1 FT
 EAST COORDINATE: 10501.5 FT
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: DOWN GRADIENT (D)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
TEMPERATURE	02/23/93	0001	C - DEGREE		12.7		-	-
THALLIUM	04/05/89	0001	MG/L		0.02		0.01	-
	06/01/90	0001		<	0.01		0.01	-
	10/09/90	0001		<	0.05	I	0.05	-
	05/13/91	0001		<	0.05	I	0.05	-
THORIUM-230	09/19/87	0001	PCI/L		2.1		1.	1.6
	04/05/89	0001			0.3		1.	0.8
TIN	09/19/87	0001	MG/L		0.051		0.005	-
	04/05/89	0001			0.038		0.005	-
	06/01/90	0001		<	0.005		0.005	-
	10/09/90	0001		<	0.05	I	0.05	-
	05/13/91	0001		<	0.05	I	0.05	-
TOTAL DISSOLVED SOLIDS	09/19/87	0001	MG/L		22900.		10.	-
	04/05/89	0001			26300.	HJ	10.	-
	06/01/90	0001			25100.		10.	-
	10/09/90	0001			18900.	H	10.	-
	05/13/91	0001			18700.		10.	-
	09/16/92	0001			17000	H	10.0	-
TOTAL DISSOLVED SOLIDS (TOTAL)	02/23/93	N001	MG/L		15500		10	-
TOTAL ORGANIC CARBON	09/19/87	0001	MG/L		210.		1.	-
	04/05/89	0001			29.3		1.	-
URANIUM	09/19/87	0001	MG/L		2.34		0.003	-
	04/05/89	0001			3.14		0.003	-
	06/01/90	0001			2.31		0.003	-
	10/09/90	0001			1.99		0.001	-
	05/13/91	0001			1.95		0.001	-
	09/16/92	0001			0.90		.001	-
	02/23/93	0001			1.08		0.001	-
	URANIUM (TOTAL)	02/23/93		N001	MG/L		1.20	
VANADIUM	09/19/87	0001	MG/L		0.27		0.01	-
	04/05/89	0001			0.16		0.01	-
	06/01/90	0001		<	0.01		0.01	-
	10/09/90	0001		<	0.01		0.01	-
	05/13/91	0001		<	0.01		0.01	-
ZINC	09/19/87	0001	MG/L		0.078		0.005	-
	04/05/89	0001			0.108		0.005	-
	06/01/90	0001			0.034		0.005	-
	10/09/90	0001		<	0.03	I	0.03	-
	05/13/91	0001			0.019		0.005	-
	09/16/92	0001			0.057	E	0.0010	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:

0001 - FILTERED SAMPLE (.45 MICRONS)

N001 - UNFILTERED SAMPLE

OTHER PARAMETER VALUE FLAGS:

E - ESTIMATED VALUE BECAUSE OF INTERFERENCE, SEE CASE NARRATIVE

H - HOLD TIME EXPIRED, VALUE SUSPECT

I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION

J - ESTIMATED VALUE

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0620
 NORTH COORDINATE: 10162.2 FT
 EAST COORDINATE: 10344.0 FT
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: DOWN GRADIENT (D)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
ALKALINITY	08/30/87	0001	MG/L CaCO3		1405.	L	-	-
	04/05/89	0001			1168.		-	-
	06/01/90	0001			939.		-	-
	05/13/91	0001			727.		-	-
	09/17/92	0001			807		-	-
	02/21/93	0001			789		-	-
	04/24/93	N001			885		-	-
ALUMINUM	08/30/87	0001	MG/L		0.51	L	0.1	-
	04/05/89	0001		<	0.1		0.1	-
	06/01/90	0001		<	0.1		0.1	-
	05/13/91	0001		<	0.05		0.05	-
AMMONIUM	08/30/87	0001	MG/L		11.2	HL	0.1	-
	04/05/89	0001			2.6		0.1	-
	06/01/90	0001			1.2		0.1	-
	05/13/91	0001			1.1		0.1	-
	04/24/93	N001			2.3		0.1	-
ANTIMONY	08/30/87	0001	MG/L		0.205	NL	0.003	-
	04/05/89	0001			0.026		0.003	-
	06/01/90	0001		<	0.003		0.003	-
	05/13/91	0001		<	0.015	I	0.015	-
	09/17/92	0001		<	0.0015	J	0.0020	-
	04/24/93	0001		<	0.003		0.003	-
ANTIMONY (TOTAL)	04/24/93	N001	MG/L	<	0.003		0.003	-
ARSENIC	08/30/87	0001	MG/L		0.049	L	0.01	-
	04/05/89	0001			0.01		0.01	-
	06/01/90	0001			0.01		0.01	-
	05/13/91	0001		<	0.05	I	0.05	-
	09/17/92	0001		<	0.015	N	0.015	-
	02/21/93	0001		<	0.005	W	0.005	-
	04/24/93	0001		<	0.01	I	0.005	-
	ARSENIC (TOTAL)	02/21/93		N001	MG/L	<	0.005	W
	04/24/93	N001		<	0.005	W	0.005	-
BARIUM	08/30/87	0001	MG/L		0.01	JL	0.1	-
	04/05/89	0001		<	0.1		0.1	-
	06/01/90	0001		<	0.1		0.1	-
	05/13/91	0001		<	0.01		0.01	-
BERYLLIUM	04/05/89	0001	MG/L	<	0.01		0.01	-
	06/01/90	0001		<	0.01		0.01	-
	05/13/91	0001		<	0.005		0.005	-
BORON	08/30/87	0001	MG/L		1.09	L	0.1	-
	04/05/89	0001			0.8		0.1	-
	06/01/90	0001			0.7		0.1	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)
 N001 - UNFILTERED SAMPLE

OTHER PARAMETER VALUE FLAGS:

- H - HOLD TIME EXPIRED, VALUE SUSPECT
- I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION
- J - ESTIMATED VALUE
- L - LESS THAN THREE BORE VOLUMES REMOVED BEFORE SAMPLING
- N - SPIKE SAMPLE RECOVERY NOT WITHIN CONTROL LIMITS
- W - POST-DIGEST SPIKE OUT OF CNTR LIM WHILE SAMP ABS < 50% SPIKE

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0620
 NORTH COORDINATE: 10162.2 FT
 EAST COORDINATE: 10344.0 FT
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: DOWN GRADIENT (D)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
BORON	05/13/91	0001	MG/L		0.55		0.05	-
BROMIDE	08/30/87 04/05/89	0001 0001	MG/L	<	0.1 0.1	L	0.1 0.1	- -
CADMIUM	08/30/87 04/05/89 06/01/90 05/13/91 09/17/92 02/21/93 04/24/93	0001 0001 0001 0001 0001 0001 0001	MG/L	< < < < < <	0.005 0.015 0.001 0.001 0.0006 0.001 0.001	L S	0.005 0.001 0.001 0.001 0.00003 0.001 0.001	- - - - - - -
CADMIUM (TOTAL)	02/21/93 04/24/93	N001 N001	MG/L	<	0.005 0.002	I	0.005 0.001	- -
CALCIUM	08/30/87 04/05/89 06/01/90 05/13/91 09/17/92 02/21/93 04/24/93	0001 0001 0001 0001 0001 0001 0001	MG/L		519. 374. 376. 345. 490 376 474	L	0.01 0.01 0.01 0.5 0.0050 0.5 0.5	- - - - - - -
CALCIUM (TOTAL)	02/21/93 04/24/93	N001 N001	MG/L		353 484		0.5 0.5	- -
CHLORIDE	08/30/87 04/05/89 06/01/90 05/13/91 09/17/92 04/24/93	0001 0001 0001 0001 0001 N001	MG/L		719. 640. 491. 313. 360 475	HL N	1. 1. 1. 1. 0.50 0.5	- - - - - -
CHLORIDE (TOTAL)	02/21/93	N001	MG/L		393		0.5	-
CHROMIUM	08/30/87 04/05/89 06/01/90 05/13/91 02/21/93 04/24/93	0001 0001 0001 0001 0001 0001	MG/L	< < < < < <	0.01 0.01 0.01 0.01 0.01 0.05	L I	0.01 0.01 0.01 0.01 0.01 0.01	- - - - - -
CHROMIUM (TOTAL)	02/21/93 04/24/93	N001 N001	MG/L	< <	0.01 0.02	I	0.01 0.01	- -
COBALT	08/30/87 04/05/89 06/01/90 05/13/91 04/24/93	0001 0001 0001 0001 0001	MG/L	< < < < <	0.02 0.05 5.05 0.03 0.05	JL	0.05 0.05 0.05 0.03 0.05	- - - - -

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)
 N001 - UNFILTERED SAMPLE

OTHER PARAMETER VALUE FLAGS:
 H - HOLD TIME EXPIRED, VALUE SUSPECT
 I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION
 J - ESTIMATED VALUE
 L - LESS THAN THREE BORE VOLUMES REMOVED BEFORE SAMPLING
 N - SPIKE SAMPLE RECOVERY NOT WITHIN CONTROL LIMITS
 S - REPORTED VALUE DETERMINED USING METHOD OF STD ADDITION (MSA)

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0620
 NORTH COORDINATE: 10162.2 FT
 EAST COORDINATE: 10344.0 FT
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: DOWN GRADIENT (D)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
COBALT (TOTAL)	04/24/93	N001	MG/L	<	0.05		0.05	-
COPPER	08/30/87	0001	MG/L		0.05	L	0.02	-
	04/05/89	0001			0.03		0.02	-
	06/01/90	0001		<	0.02		0.02	-
	05/13/91	0001		<	0.01		0.01	-
	04/24/93	0001		<	0.05	I	0.02	-
COPPER (TOTAL)	04/24/93	N001	MG/L	<	0.02		0.02	-
CYANIDE	04/05/89	0001	MG/L	<	0.01		0.01	-
DISSOLVED OXYGEN	04/24/93	N001	MG/L		0.3		-	-
FLUORIDE	08/30/87	0001	MG/L		0.20	L	0.1	-
	04/05/89	0001			0.3		0.1	-
	06/01/90	0001			0.3		0.1	-
	05/13/91	0001			0.6		0.1	-
GROSS ALPHA	08/30/87	0001	PCI/L		1600.	L	0.2	300.
	04/05/89	0001			920.		0.2	190.
	09/17/92	0001			430.		120	163
	02/21/93	0001			487.		165.	155.
	04/24/93	0001			452		107	123
GROSS ALPHA (TOTAL)	02/21/93	N001	PCI/L		366.		166.	144.
	04/24/93	N001			442.		179.	153.
GROSS BETA	08/30/87	0001	PCI/L		1100.	L	1.	200.
	04/05/89	0001			610.		1.	70.
	09/17/92	0001			130.		151	97.1
	02/21/93	0001			175.		130.	87.7
	04/24/93	0001			63.0		61.0	39.3
GROSS BETA (TOTAL)	02/21/93	N001	PCI/L		328.		131.	96.3
	04/24/93	N001			104.		142.	89.3
IRON	08/30/87	0001	MG/L	<	0.01	JL	0.03	-
	04/05/89	0001			0.14		0.03	-
	06/01/90	0001			0.15		0.03	-
	05/13/91	0001		<	0.03		0.03	-
	09/17/92	0001			0.031		0.0035	-
	04/24/93	0001		<	0.1	I	0.03	-
IRON (TOTAL)	04/24/93	N001	MG/L	<	0.03		0.03	-
LEAD	08/30/87	0001	MG/L		0.04	L	0.01	-
	04/05/89	0001		<	0.01		0.01	-
	06/01/90	0001		<	0.01		0.01	-
	05/13/91	0001		<	0.03	I	0.03	-
	02/21/93	0001		<	0.003	W	0.003	-
	04/24/93	0001		<	0.003		0.003	-
LEAD (TOTAL)	02/21/93	N001	MG/L	<	0.03	IN	0.03	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)
 N001 - UNFILTERED SAMPLE

OTHER PARAMETER VALUE FLAGS:

- I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION
- J - ESTIMATED VALUE
- L - LESS THAN THREE BORE VOLUMES REMOVED BEFORE SAMPLING
- N - SPIKE SAMPLE RECOVERY NOT WITHIN CONTROL LIMITS
- W - POST-DIGEST SPIKE OUT OF CNTR LIM WHILE SAMP ABS < 50% SPIKE

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0620
 NORTH COORDINATE: 10162.2 FT
 EAST COORDINATE: 10344.0 FT
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: DOWN GRADIENT (D)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
LEAD (TOTAL)	04/24/93	N001	MG/L	<	0.003		0.003	-
LEAD-210	04/05/89	0001	PCI/L		0.3		1.5	1.3
MAGNESIUM	08/30/87	0001	MG/L		1980.	L	0.001	-
	04/05/89	0001		1480.		0.001	-	
	06/01/90	0001		1060.		0.001	-	
	05/13/91	0001		890.		2.	-	
	09/17/92	0001		980		0.011	-	
	02/21/93	0001		884		0.1	-	
MAGNESIUM (TOTAL)	02/21/93	N001	MG/L		860		0.1	-
MANGANESE	08/30/87	0001	MG/L		6.53	L	0.01	-
	04/05/89	0001		3.45		0.01	-	
	06/01/90	0001		2.46		0.01	-	
	05/13/91	0001		1.98		0.01	-	
	09/17/92	0001		3.3		0.0064	-	
	02/21/93	0001		2.17		0.01	-	
	04/24/93	0001		2.9		0.01	-	
MANGANESE (TOTAL)	02/21/93	N001	MG/L		2.09		0.01	-
	04/24/93	N001		2.91		0.01	-	
MERCURY	08/30/87	0001	MG/L		0.0003	L	0.0002	-
	04/05/89	0001		<	0.0002		0.0002	-
	06/01/90	0001		<	0.0002		0.0002	-
	05/13/91	0001		<	0.0002		0.0002	-
MOLYBDENUM	08/30/87	0001	MG/L		0.05	L	0.01	-
	04/05/89	0001		<	0.01		0.01	-
	06/01/90	0001		<	0.01		0.01	-
	05/13/91	0001			0.01		0.01	-
	09/17/92	0001		<	0.025	I	0.025	-
	02/21/93	0001		<	0.01		0.01	-
	04/24/93	0001		<	0.05	I	0.01	-
MOLYBDENUM (TOTAL)	02/21/93	N001	MG/L		0.01		0.01	-
	04/24/93	N001		<	0.02	I	0.01	-
NICKEL	08/30/87	0001	MG/L		0.06	L	0.04	-
	04/05/89	0001		0.07		0.04	-	
	06/01/90	0001		0.06		0.04	-	
	05/13/91	0001		<	0.04		0.04	-
	09/17/92	0001		<	0.061	I	0.061	-
NITRATE	08/30/87	0001	MG/L		12.0	HJL	1.	-
	04/05/89	0001		330.		1.	-	
	06/01/90	0001		216.		1.	-	
	05/13/91	0001		110.		1.	-	
	09/17/92	0001		230	J	0.044	-	
	04/24/93	N001		222		1	-	
NITRITE	08/30/87	0001	MG/L	<	0.1	L	0.1	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:

0001 - FILTERED SAMPLE (.45 MICRONS)

N001 - UNFILTERED SAMPLE

OTHER PARAMETER VALUE FLAGS:

H - HOLD TIME EXPIRED, VALUE SUSPECT

I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION

J - ESTIMATED VALUE

L - LESS THAN THREE BORE VOLUMES REMOVED BEFORE SAMPLING

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0620
 NORTH COORDINATE: 10162.2 FT
 EAST COORDINATE: 10344.0 FT
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: DOWN GRADIENT (D)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
PH	08/30/87	0001	SU		6.77	L	-	-
	04/05/89	0001			6.87		-	-
	06/01/90	0001			6.87		-	-
	05/13/91	0001			6.89		-	-
	09/17/92	0001			6.79		-	-
	02/21/93	0001			6.87		-	-
	04/24/93	N001			6.69		-	-
PHOSPHATE	08/30/87	0001	MG/L		0.62	HL	0.1	-
	04/05/89	0001		<	0.1		0.1	-
	06/01/90	0001		<	0.1	J	0.1	-
	05/13/91	0001			0.1		0.1	-
	04/24/93	N001			0.1		0.1	-
POLONIUM-210	08/30/87	0001	PCI/L		1.4	L	1.	1.5
	04/05/89	0001			0.9		1.	0.7
POTASSIUM	08/30/87	0001	MG/L		81.5	L	0.01	-
	04/05/89	0001			71.4		0.01	-
	06/01/90	0001			57.5		0.01	-
	05/13/91	0001			38.		5.	-
	09/17/92	0001			54	E	0.20	-
	02/21/93	0001			43.0		0.1	-
POTASSIUM (TOTAL)	02/21/93	N001	MG/L		42.7		0.1	-
RADIUM-226	08/30/87	0001	PCI/L		0.0	L	1.	0.1
	04/05/89	0001			0.0		1.	0.2
	06/01/90	0001			0.5		1.	0.3
	05/13/91	0001			0.2		1.	0.2
	09/17/92	0001			0.21		.0462	.0556
	02/21/93	0001			1.4		0.7	0.7
RADIUM-226 (TOTAL)	02/21/93	N001	PCI/L		1.3		0.7	0.7
RADIUM-228	08/30/87	0001	PCI/L		0.9	JL	1.	1.3
	04/05/89	0001			0.0		1.	0.9
	06/01/90	0001			1.2		1.	0.9
	05/13/91	0001			0.0	J	1.	1.8
	09/17/92	0001			1.9		1.72	.947
	02/21/93	0001			1.0		2.5	1.6
REDOX POTENTIAL	02/21/93	0001	mVOLTS		521.4		-	-
	04/24/93	N001			479		-	-
SELENIUM	08/30/87	0001	MG/L		0.361	L	0.005	-
	04/05/89	0001			0.318		0.005	-
	06/01/90	0001			0.075		0.005	-
	05/13/91	0001			0.150		0.03	-
	09/17/92	0001			0.066	*EN	0.0015	-
	02/21/93	0001			0.088	*	0.005	-
	04/24/93	0001			0.13	S	0.005	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)
 N001 - UNFILTERED SAMPLE

OTHER PARAMETER VALUE FLAGS:

- * - DUPLICATE ANALYSIS NOT WITHIN CONTROL LIMITS
- E - ESTIMATED VALUE BECAUSE OF INTERFERENCE, SEE CASE NARRATIVE
- H - HOLD TIME EXPIRED, VALUE SUSPECT
- J - ESTIMATED VALUE
- L - LESS THAN THREE BORE VOLUMES REMOVED BEFORE SAMPLING
- N - SPIKE SAMPLE RECOVERY NOT WITHIN CONTROL LIMITS
- S - REPORTED VALUE DETERMINED USING METHOD OF STD ADDITION (MSA)

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0620
 NORTH COORDINATE: 10162.2 FT
 EAST COORDINATE: 10344.0 FT
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: DOWN GRADIENT (D)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
SELENIUM (TOTAL)	02/21/93	N001	MG/L		0.151	S	0.005	-
	04/24/93	N001			0.138	S	0.005	-
SILICA - SiO2	08/30/87	0001	MG/L		12.3	L	2.	-
	04/05/89	0001			11.		2.	-
	06/01/90	0001			12.		2.	-
	05/13/91	0001			11.1		0.1	-
SILVER	04/05/89	0001	MG/L	<	0.01		0.01	-
	06/01/90	0001		<	0.01		0.01	-
	05/13/91	0001		<	0.01		0.01	-
SODIUM	08/30/87	0001	MG/L		3584.	L	0.002	-
	04/05/89	0001			2490.		0.002	-
	06/01/90	0001			2220.		0.002	-
	05/13/91	0001			2040.		20.	-
	09/17/92	0001			2200		0.011	-
	02/21/93	0001			2050		1	-
	04/24/93	0001			2190		0.1	-
SODIUM (TOTAL)	02/21/93	N001	MG/L		2040		1	-
	04/24/93	N001			2200		0.1	-
SPECIFIC CONDUCTANCE	08/30/87	0001	UMHO/CM		9500.	L	-	-
	04/05/89	0001			7500.		-	-
	06/01/90	0001			8000.		-	-
	05/13/91	0001			8920.		-	-
	09/17/92	0001			8660		-	-
	02/21/93	0001			6270		-	-
	04/24/93	N001			9220		-	-
STRONTIUM	08/30/87	0001	MG/L		14.0	L	0.1	-
	04/05/89	0001			9.3		0.1	-
	06/01/90	0001			8.04		0.1	-
	05/13/91	0001			6.57		0.01	-
	09/17/92	0001			7.7	N	0.010	-
	02/21/93	0001			7.90		0.01	-
	04/24/93	0001			10		0.01	-
STRONTIUM (TOTAL)	02/21/93	N001	MG/L		7.31		0.01	-
	04/24/93	N001			10.2		0.01	-
SULFATE	08/30/87	0001	MG/L		14500.	L	0.1	-
	04/05/89	0001			10500.	H	0.1	-
	06/01/90	0001			8010.	HJ	0.1	-
	05/13/91	0001			6950.	H	10.	-
	09/17/92	0001			8000	N	10.0	-
	04/24/93	N001			10600		1	-
SULFATE (TOTAL)	02/21/93	N001	MG/L		8110		1	-
SULFIDE	08/30/87	0001	MG/L	<	0.1	L	0.1	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:

0001 - FILTERED SAMPLE (.45 MICRONS)

N001 - UNFILTERED SAMPLE

OTHER PARAMETER VALUE FLAGS:

H - HOLD TIME EXPIRED, VALUE SUSPECT

J - ESTIMATED VALUE

L - LESS THAN THREE BORE VOLUMES REMOVED BEFORE SAMPLING

N - SPIKE SAMPLE RECOVERY NOT WITHIN CONTROL LIMITS

S - REPORTED VALUE DETERMINED USING METHOD OF STD ADDITION (MSA)

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0620
 NORTH COORDINATE: 10162.2 FT
 EAST COORDINATE: 10344.0 FT
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: DOWN GRADIENT (D)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
SULFIDE	04/05/89	0001	MG/L	<	0.1		0.1	-
TEMPERATURE	08/30/87	0001	C - DEGREE		16.0	L	-	-
	04/05/89	0001			10.		-	-
	06/01/90	0001			12.5		-	-
	05/13/91	0001			11.5		-	-
	09/17/92	0001			16.3		-	-
	02/21/93	0001			10.0		-	-
	04/24/93	N001			10.9		-	-
THALLIUM	04/05/89	0001	MG/L		0.02		0.01	-
	06/01/90	0001		<	0.01		0.01	-
	05/13/91	0001		<	0.05	I	0.05	-
THORIUM-230	08/30/87	0001	PCI/L		0.2	L	1.	1.1
	04/05/89	0001			0.0		1.	0.7
TIN	08/30/87	0001	MG/L		1.03	L	0.005	-
	04/05/89	0001			0.051		0.005	-
	06/01/90	0001		<	0.005		0.005	-
	05/13/91	0001		<	0.05	I	0.05	-
TOTAL DISSOLVED SOLIDS	08/30/87	0001	MG/L		24100.	L	10.	-
	04/05/89	0001			17300.	HJ	10.	-
	06/01/90	0001			13400.		10.	-
	05/13/91	0001			11900.		10.	-
	09/17/92	0001			13000	H	10.0	-
	04/24/93	N001			14600	H	10	-
TOTAL DISSOLVED SOLIDS (TOTAL)	02/21/93	N001	MG/L		12600		10	-
TOTAL ORGANIC CARBON	08/30/87	0001	MG/L		345.	L	1.	-
	04/05/89	0001			40.1		1.	-
	04/24/93	N001			16		1	-
TURBIDITY	04/24/93	N001	NTU		11		-	-
URANIUM	08/30/87	0001	MG/L		2.11	L	0.003	-
	04/05/89	0001			1.60		0.003	-
	06/01/90	0001			1.11		0.003	-
	05/13/91	0001			0.890		0.001	-
	09/17/92	0001			0.73		.001	-
	02/21/93	0001			1.09		0.001	-
	04/24/93	0001			1.10		0.001	-
URANIUM (TOTAL)	02/21/93	N001	MG/L		0.976		0.001	-
	04/24/93	N001			1.07		0.001	-
VANADIUM	08/30/87	0001	MG/L		0.16	L	0.01	-
	04/05/89	0001			0.12		0.01	-
	06/01/90	0001		<	0.01		0.01	-
	05/13/91	0001		<	0.01		0.01	-
	04/24/93	0001		<	0.05	I	0.01	-
VANADIUM (TOTAL)	04/24/93	N001	MG/L	<	0.02	I	0.01	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)
 N001 - UNFILTERED SAMPLE

OTHER PARAMETER VALUE FLAGS:

H - HOLD TIME EXPIRED, VALUE SUSPECT
 I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION
 J - ESTIMATED VALUE
 L - LESS THAN THREE BORE VOLUMES REMOVED BEFORE SAMPLING

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0620
 NORTH COORDINATE: 10162.2 FT
 EAST COORDINATE: 10344.0 FT
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: DOWN GRADIENT (D)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PARAMETER		DETECTION LIMIT	PARAMETER UNCERTAINTY
				VALUE	FLAGS		
ZINC	08/30/87	0001	MG/L	0.038	L	0.005	-
	04/05/89	0001		0.054		0.005	-
	06/01/90	0001		0.023		0.005	-
	05/13/91	0001		0.008		0.005	-
	09/17/92	0001		0.086	E	0.0010	-
	04/24/93	0001		0.05		0.005	-
ZINC (TOTAL)	04/24/93	N001	MG/L	0.08		0.005	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)
 N001 - UNFILTERED SAMPLE

OTHER PARAMETER VALUE FLAGS:
 E - ESTIMATED VALUE BECAUSE OF INTERFERENCE, SEE CASE NARRATIVE
 L - LESS THAN THREE BORE VOLUMES REMOVED BEFORE SAMPLING

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0621
 NORTH COORDINATE: 10161.7 FT
 EAST COORDINATE: 10353.9 FT
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: DOWN GRADIENT (D)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
ALKALINITY	09/01/87	0001	MG/L CaCO3		1370.		-	-
ALUMINUM	09/01/87	0001	MG/L		0.52		0.1	-
AMMONIUM	09/01/87	0001	MG/L		9.0	H	0.1	-
ANTIMONY	09/01/87	0001	MG/L		0.205		0.003	-
ARSENIC	09/01/87	0001	MG/L		0.061		0.01	-
BARIUM	09/01/87	0001	MG/L		0.01	J	0.1	-
BORON	09/01/87	0001	MG/L		1.08		0.1	-
BROMIDE	09/01/87	0001	MG/L		0.2	J	0.1	-
CADMIUM	09/01/87	0001	MG/L	<	0.005		0.005	-
CALCIUM	09/01/87	0001	MG/L		547.		0.01	-
CHLORIDE	09/01/87	0001	MG/L		732.	H	1.	-
CHROMIUM	09/01/87	0001	MG/L	<	0.01		0.01	-
COBALT	09/01/87	0001	MG/L		0.02	J	0.05	-
COPPER	09/01/87	0001	MG/L		0.04		0.02	-
FLUORIDE	09/01/87	0001	MG/L		0.20		0.1	-
GROSS ALPHA	09/01/87	0001	PCI/L		2000.		0.2	300.
GROSS BETA	09/01/87	0001	PCI/L		1100.		1.	200.
IRON	09/01/87	0001	MG/L	<	0.01	J	0.03	-
LEAD	09/01/87	0001	MG/L		0.03		0.01	-
MAGNESIUM	09/01/87	0001	MG/L		2142.		0.001	-
MANGANESE	09/01/87	0001	MG/L		7.04		0.01	-
MERCURY	09/01/87	0001	MG/L		0.0003		0.0002	-
MOLYBDENUM	09/01/87	0001	MG/L		0.02		0.01	-
NICKEL	09/01/87	0001	MG/L		0.05		0.04	-
NITRATE	09/01/87	0001	MG/L		1200.	HJ	1.	-
NITRITE	09/01/87	0001	MG/L	<	0.1		0.1	-
PH	09/01/87	0001	SU		6.83		-	-
PHOSPHATE	09/01/87	0001	MG/L		0.51	H	0.1	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)

OTHER PARAMETER VALUE FLAGS:
 H - HOLD TIME EXPIRED, VALUE SUSPECT
 J - ESTIMATED VALUE

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0621
 NORTH COORDINATE: 10161.7 FT
 EAST COORDINATE: 10353.9 FT
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: DOWN GRADIENT (D)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
POLONIUM-210	09/01/87	0001	PCI/L		0.8		1.	1.4
POTASSIUM	09/01/87	0001	MG/L		88.5		0.01	-
RADIUM-226	09/01/87	0001	PCI/L		0.0		1.	0.1
RADIUM-228	09/01/87	0001	PCI/L		0.7	J	1.	1.4
SELENIUM	09/01/87	0001	MG/L		0.329		0.005	-
SILICA - SIO2	09/01/87	0001	MG/L		12.3		2.	-
SODIUM	09/01/87	0001	MG/L		3738.		0.002	-
SPECIFIC CONDUCTANCE	09/01/87	0001	UMHO/CM		10800.		-	-
STRONTIUM	09/01/87	0001	MG/L		14.5		0.1	-
SULFATE	09/01/87	0001	MG/L		14700.		0.1	-
SULFIDE	09/01/87	0001	MG/L	<	0.1		0.1	-
TEMPERATURE	09/01/87	0001	C - DEGREE		16.4		-	-
THORIUM-230	09/01/87	0001	PCI/L		4.0		1.	2.1
TIN	09/01/87	0001	MG/L		1.34		0.005	-
TOTAL DISSOLVED SOLIDS	09/01/87	0001	MG/L		25000.		10.	-
TOTAL ORGANIC CARBON	09/01/87	0001	MG/L		344.		1.	-
URANIUM	09/01/87	0001	MG/L		2.19		0.003	-
VANADIUM	09/01/87	0001	MG/L		0.16		0.01	-
ZINC	09/01/87	0001	MG/L		0.066		0.005	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)

OTHER PARAMETER VALUE FLAGS:
 J - ESTIMATED VALUE

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0622
 NORTH COORDINATE: 10160.5 FT
 EAST COORDINATE: 10364.8 FT
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: DOWN GRADIENT (D)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
ALKALINITY	09/01/87	0001	MG/L CaCO3		1666.		-	-
ALUMINUM	09/01/87	0001	MG/L		0.54		0.1	-
AMMONIUM	09/01/87	0001	MG/L		10.3	H	0.1	-
ANTIMONY	09/01/87	0001	MG/L		0.226		0.003	-
ARSENIC	09/01/87	0001	MG/L		0.059		0.01	-
BARIUM	09/01/87	0001	MG/L		0.02	J	0.1	-
BORON	09/01/87	0001	MG/L		1.21		0.1	-
BROMIDE	09/01/87	0001	MG/L		0.3	J	0.1	-
CADMIUM	09/01/87	0001	MG/L	<	0.005		0.005	-
CALCIUM	09/01/87	0001	MG/L		591.		0.01	-
CHLORIDE	09/01/87	0001	MG/L		817.	H	1.	-
CHROMIUM	09/01/87	0001	MG/L	<	0.01		0.01	-
COBALT	09/01/87	0001	MG/L	<	0.01	J	0.05	-
COPPER	09/01/87	0001	MG/L		0.07		0.02	-
FLUORIDE	09/01/87	0001	MG/L		0.25		0.1	-
GROSS ALPHA	09/01/87	0001	PCI/L		1900.		0.2	300.
GROSS BETA	09/01/87	0001	PCI/L		1300.		1.	200.
IRON	09/01/87	0001	MG/L	<	0.01	J	0.03	-
LEAD	09/01/87	0001	MG/L		0.03		0.01	-
MAGNESIUM	09/01/87	0001	MG/L		2305.		0.001	-
MANGANESE	09/01/87	0001	MG/L		4.37		0.01	-
MERCURY	09/01/87	0001	MG/L		0.0003		0.0002	-
MOLYBDENUM	09/01/87	0001	MG/L		0.08		0.01	-
NICKEL	09/01/87	0001	MG/L		0.06		0.04	-
NITRATE	09/01/87	0001	MG/L		660.	HJ	1.	-
NITRITE	09/01/87	0001	MG/L	<	0.1		0.1	-
PH	09/01/87	0001	SU		6.80		-	-
PHOSPHATE	09/01/87	0001	MG/L		0.74	H	0.1	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)

OTHER PARAMETER VALUE FLAGS:
 H - HOLD TIME EXPIRED, VALUE SUSPECT
 J - ESTIMATED VALUE

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0622
 NORTH COORDINATE: 10160.5 FT
 EAST COORDINATE: 10364.8 FT
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: DOWN GRADIENT (D)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
POTASSIUM	09/01/87	0001	MG/L		92.0		0.01	-
RADIUM-226	09/01/87	0001	PCI/L		0.1		1.	0.1
RADIUM-228	09/01/87	0001	PCI/L		1.7	J	1.	1.6
SELENIUM	09/01/87	0001	MG/L		0.395		0.005	-
SILICA - SIO2	09/01/87	0001	MG/L		16.1		2.	-
SODIUM	09/01/87	0001	MG/L		3756.		0.002	-
SPECIFIC CONDUCTANCE	09/01/87	0001	UMHO/CM		9000.		-	-
STRONTIUM	09/01/87	0001	MG/L		15.5		0.1	-
SULFATE	09/01/87	0001	MG/L		14900.		0.1	-
SULFIDE	09/01/87	0001	MG/L	<	0.1		0.1	-
TEMPERATURE	09/01/87	0001	C - DEGREE		18.5		-	-
THORIUM-230	09/01/87	0001	PCI/L		4.2		1.	2.2
TIN	09/01/87	0001	MG/L		1.18		0.005	-
TOTAL DISSOLVED SOLIDS	09/01/87	0001	MG/L		26000.		10.	-
TOTAL ORGANIC CARBON	09/01/87	0001	MG/L		53.2		1.	-
URANIUM	09/01/87	0001	MG/L		3.07		0.003	-
VANADIUM	09/01/87	0001	MG/L		0.17		0.01	-
ZINC	09/01/87	0001	MG/L		0.740		0.005	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)

OTHER PARAMETER VALUE FLAGS:
 J - ESTIMATED VALUE

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0623
 NORTH COORDINATE: 10610.8 FT
 EAST COORDINATE: 10355.8 FT
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: DOWN GRADIENT (D)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
ALKALINITY	09/01/87	0001	MG/L CaCO3		995.		-	-
ALUMINUM	09/01/87	0001	MG/L		0.49		0.1	-
AMMONIUM	09/01/87	0001	MG/L		47.7	H	0.1	-
ANTIMONY	09/01/87	0001	MG/L		0.188		0.003	-
ARSENIC	09/01/87	0001	MG/L		0.064		0.01	-
BARIUM	09/01/87	0001	MG/L		0.02	J	0.1	-
BORON	09/01/87	0001	MG/L		1.12		0.1	-
BROMIDE	09/01/87	0001	MG/L		0.2	J	0.01	-
CADMIUM	09/01/87	0001	MG/L	<	0.005		0.005	-
CALCIUM	09/01/87	0001	MG/L		535.		0.01	-
CHLORIDE	09/01/87	0001	MG/L		634.	H	1.	-
CHROMIUM	09/01/87	0001	MG/L	<	0.01		0.01	-
COBALT	09/01/87	0001	MG/L		0.01	J	0.05	-
COPPER	09/01/87	0001	MG/L		0.03		0.02	-
FLUORIDE	09/01/87	0001	MG/L		0.24		0.1	-
GROSS ALPHA	09/01/87	0001	PCI/L		1600.		0.2	300.
GROSS BETA	09/01/87	0001	PCI/L		960.		1.	150.
IRON	09/01/87	0001	MG/L	<	0.01	J	0.03	-
LEAD	09/01/87	0001	MG/L		0.03		0.01	-
MAGNESIUM	09/01/87	0001	MG/L		1709.		0.001	-
MANGANESE	09/01/87	0001	MG/L		7.98		0.01	-
MERCURY	09/01/87	0001	MG/L		0.0002		0.0002	-
MOLYBDENUM	09/01/87	0001	MG/L	<	0.01		0.01	-
NICKEL	09/01/87	0001	MG/L		0.03	J	0.04	-
NITRATE	09/01/87	0001	MG/L		1770.	HJ	1.	-
NITRITE	09/01/87	0001	MG/L	<	0.1		0.1	-
PH	09/01/87	0001	SU		6.83		-	-
PHOSPHATE	09/01/87	0001	MG/L		0.67	H	0.1	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)

OTHER PARAMETER VALUE FLAGS:
 H - HOLD TIME EXPIRED, VALUE SUSPECT
 J - ESTIMATED VALUE

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0623
 NORTH COORDINATE: 10610.8 FT
 EAST COORDINATE: 10355.8 FT
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (A1)
 HYDRAULIC FLOW RELATIONSHIP: DOWN GRADIENT (D)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
POLONIUM-210	09/01/87	0001	PCI/L		2.4		1.	1.7
POTASSIUM	09/01/87	0001	MG/L		105.		0.01	-
RADIUM-226	09/01/87	0001	PCI/L		0.2		1.	0.2
RADIUM-228	09/01/87	0001	PCI/L		2.1	J	1.	1.8
SELENIUM	09/01/87	0001	MG/L		0.700		0.005	-
SILICA - SiO2	09/01/87	0001	MG/L		16.3		2.	-
SODIUM	09/01/87	0001	MG/L		3348.		0.002	-
SPECIFIC CONDUCTANCE	09/01/87	0001	UMHO/CM		11500.		-	-
STRONTIUM	09/01/87	0001	MG/L		12.0		0.1	-
SULFATE	09/01/87	0001	MG/L		12400.		0.1	-
SULFIDE	09/01/87	0001	MG/L	<	0.1		0.1	-
TEMPERATURE	09/01/87	0001	C - DEGREE		20.5		-	-
THORIUM-230	09/01/87	0001	PCI/L		0.2		1.	1.1
TIN	09/01/87	0001	MG/L		1.03		0.005	-
TOTAL DISSOLVED SOLIDS	09/01/87	0001	MG/L		22400.		10.	-
TOTAL ORGANIC CARBON	09/01/87	0001	MG/L		256.		1.	-
URANIUM	09/01/87	0001	MG/L		1.67		0.003	-
VANADIUM	09/01/87	0001	MG/L		0.15		0.01	-
ZINC	09/01/87	0001	MG/L		0.013		0.005	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)

OTHER PARAMETER VALUE FLAGS:
 J - ESTIMATED VALUE

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0624
 NORTH COORDINATE: 10598.4 FT
 EAST COORDINATE: 10352.1 FT
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: DOWN GRADIENT (D)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
ALKALINITY	09/01/87	0001	MG/L CaCO3		960.		-	-
	04/04/89	0001			1374.		-	-
	10/09/90	0001			723.		-	-
	05/13/91	0001			495.		-	-
	09/16/92	0001			436		-	-
ALUMINIUM	09/01/87	0001	MG/L		0.51		0.1	-
	04/04/89	0001		<	0.1		0.1	-
	10/09/90	0001		<	0.05		0.05	-
	05/13/91	0001		<	0.05		0.05	-
AMMONIUM	09/01/87	0001	MG/L		71.	H	0.1	-
	04/04/89	0001			27.		0.1	-
	10/09/90	0001			10.4		0.1	-
	05/13/91	0001			6.4		0.1	-
ANTIMONY	09/01/87	0001	MG/L		0.162		0.003	-
	04/04/89	0001			0.036		0.003	-
	10/09/90	0001		<	0.02	I	0.02	-
	05/13/91	0001		<	0.015	I	0.015	-
	09/16/92	0001			0.002	NW	0.0015	-
ARSENIC	09/01/87	0001	MG/L		0.056		0.01	-
	04/04/89	0001			0.02		0.01	-
	10/09/90	0001		<	0.05	I	0.05	-
	05/13/91	0001			0.03		0.01	-
	09/16/92	0001		<	0.015	IN	0.015	-
BARIUM	09/01/87	0001	MG/L		0.02	J	0.1	-
	04/04/89	0001		<	0.1		0.1	-
	10/09/90	0001			0.01		0.01	-
	05/13/91	0001			0.01		0.01	-
BERYLLIUM	04/04/89	0001	MG/L	<	0.01		0.01	-
	10/09/90	0001		<	0.005		0.005	-
	05/13/91	0001		<	0.005		0.005	-
BORON	09/01/87	0001	MG/L		1.05		0.1	-
	04/04/89	0001			0.9		0.1	-
	10/09/90	0001			0.70		0.05	-
	05/13/91	0001			0.54		0.05	-
BROMIDE	09/01/87	0001	MG/L	<	0.1	J	0.1	-
	04/04/89	0001			0.2		0.1	-
CADMIUM	09/01/87	0001	MG/L	<	0.005		0.005	-
	04/04/89	0001			0.013		0.001	-
	10/09/90	0001		<	0.001		0.001	-
	05/13/91	0001		<	0.001		0.001	-
	09/16/92	0001			0.0004	S	0.00003	-
CALCIUM	09/01/87	0001	MG/L		556.		0.01	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)

OTHER PARAMETER VALUE FLAGS:

- H - HOLD TIME EXPIRED, VALUE SUSPECT
- I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION
- J - ESTIMATED VALUE
- N - SPIKE SAMPLE RECOVERY NOT WITHIN CONTROL LIMITS
- S - REPORTED VALUE DETERMINED USING METHOD OF STD ADDITION (MSA)
- W - POST-DIGEST SPIKE OUT OF CNTR LIM WHILE SAMP ABS < 50% SPIKE

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0624
 NORTH COORDINATE: 10598.4 FT
 EAST COORDINATE: 10352.1 FT
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: DOWN GRADIENT (D)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
CALCIUM	04/04/89	0001	MG/L		382.		0.01	-
	10/09/90	0001		403.		0.01	-	
	05/13/91	0001		438.		0.5	-	
	09/16/92	0001		500		0.0050	-	
CHLORIDE	09/01/87	0001	MG/L		658.	H	1.	-
	04/04/89	0001		730.		1.	-	
	10/09/90	0001		390.	H	1.	-	
	05/13/91	0001		197.		1.	-	
	09/16/92	0001		180	N	0.50	-	
CHROMIUM	09/01/87	0001	MG/L	<	0.01		0.01	-
	04/04/89	0001		<	0.01		0.01	-
	10/09/90	0001		<	0.01		0.01	-
	05/13/91	0001		<	0.01		0.01	-
COBALT	09/01/87	0001	MG/L	<	0.01	J	0.05	-
	04/04/89	0001		<	0.05		0.05	-
	10/09/90	0001		<	0.03		0.03	-
	05/13/91	0001		<	0.03		0.03	-
COPPER	09/01/87	0001	MG/L		0.02		0.02	-
	04/04/89	0001			0.03		0.02	-
	10/09/90	0001			0.01		0.01	-
	05/13/91	0001		<	0.01		0.01	-
CYANIDE	04/04/89	0001	MG/L	<	0.01		0.01	-
FLUORIDE	09/01/87	0001	MG/L		0.20		0.1	-
	04/04/89	0001			0.3		0.1	-
	10/09/90	0001			0.4		0.1	-
	05/13/91	0001			0.5		0.1	-
GROSS ALPHA	09/01/87	0001	PCI/L		1500.		0.2	300.
	04/04/89	0001			2200.		0.2	300.
	09/16/92	0001			160.		85.3	88.1
GROSS BETA	09/01/87	0001	PCI/L		1100.		1.	100.
	04/04/89	0001			840.		1.	110.
	09/16/92	0001			130.		76.1	53.1
IRON	09/01/87	0001	MG/L	<	0.01	J	0.03	-
	04/04/89	0001			1.01		0.03	-
	10/09/90	0001		<	0.03		0.03	-
	05/13/91	0001		<	0.03		0.03	-
	09/16/92	0001			0.021		0.0035	-
LEAD	09/01/87	0001	MG/L		0.03		0.01	-
	04/04/89	0001			0.02		0.01	-
	10/09/90	0001		<	0.01		0.01	-
	05/13/91	0001		<	0.03	I	0.03	-
LEAD-210	04/04/89	0001	PCI/L		0.9		1.5	1.3

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)

OTHER PARAMETER VALUE FLAGS:
 H - HOLD TIME EXPIRED, VALUE SUSPECT
 I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION
 J - ESTIMATED VALUE
 N - SPIKE SAMPLE RECOVERY NOT WITHIN CONTROL LIMITS

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0624
 NORTH COORDINATE: 10598.4 FT
 EAST COORDINATE: 10352.1 FT
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: DOWN GRADIENT (D)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
MAGNESIUM	09/01/87	0001	MG/L		1853.		0.001	-
	04/04/89	0001		1930.		0.001	-	
	10/09/90	0001		1040.		0.001	-	
	05/13/91	0001		730.		2.	-	
	09/16/92	0001		560		0.011	-	
MANGANESE	09/01/87	0001	MG/L		8.11		0.01	-
	04/04/89	0001		7.44		0.01	-	
	10/09/90	0001		6.10		0.01	-	
	05/13/91	0001		4.16		0.01	-	
	09/16/92	0001		4.5		0.0064	-	
MERCURY	09/01/87	0001	MG/L		0.0002		0.0002	-
	04/04/89	0001		<	0.0002		0.0002	-
	10/09/90	0001		<	0.0002		0.0002	-
	05/13/91	0001		<	0.0002		0.0002	-
MOLYBDENUM	09/01/87	0001	MG/L	<	0.01		0.01	-
	04/04/89	0001		<	0.01		0.01	-
	10/09/90	0001			0.01		0.01	-
	05/13/91	0001			0.01		0.01	-
	09/16/92	0001		<	0.025	I	0.025	-
NICKEL	09/01/87	0001	MG/L		0.02	J	0.04	-
	04/04/89	0001		<	0.04		0.04	-
	10/09/90	0001		<	0.04		0.04	-
	05/13/91	0001		<	0.04		0.04	-
	09/16/92	0001		<	0.061	I	0.061	-
NITRATE	09/01/87	0001	MG/L		2220.	HJ	1.	-
	04/04/89	0001			950.		1.	-
	10/09/90	0001			283.		1.	-
	05/13/91	0001			77.0		1.	-
	09/16/92	0001			110	J	0.044	-
NITRITE	09/01/87	0001	MG/L	<	0.1		0.1	-
PH	09/01/87	0001	SU		6.82		-	-
	04/04/89	0001			6.93		-	-
	10/09/90	0001			6.85		-	-
	05/13/91	0001			6.97		-	-
	09/16/92	0001			6.92		-	-
PHOSPHATE	09/01/87	0001	MG/L		0.64	H	0.1	-
	04/04/89	0001		<	0.1		0.1	-
	10/09/90	0001			0.1		0.1	-
	05/13/91	0001			0.1		0.1	-
POLONIUM-210	09/01/87	0001	PCI/L		1.1		1.	1.4
	04/04/89	0001			0.9		1.	0.7
POTASSIUM	09/01/87	0001	MG/L		97.5		0.01	-
	04/04/89	0001			113.		0.01	-
	10/09/90	0001			61.		0.01	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)

OTHER PARAMETER VALUE FLAGS:
 H - HOLD TIME EXPIRED, VALUE SUSPECT
 I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION
 J - ESTIMATED VALUE

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0624
 NORTH COORDINATE: 10598.4 FT
 EAST COORDINATE: 10352.1 FT
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: DOWN GRADIENT (D)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
POTASSIUM	05/13/91	0001	MG/L		45.		5.	-
	09/16/92	0001		48	E	0.20	-	
RADIUM-226	09/01/87	0001	PCI/L		0.0		1.	0.1
	04/04/89	0001		0.0		1.	0.1	
	10/09/90	0001		0.0		1.	0.2	
	05/13/91	0001		0.0		1.	0.1	
	09/16/92	0001		0.078		.0749	.052	
RADIUM-228	09/01/87	0001	PCI/L		1.3	J	1.	0.9
	04/04/89	0001		0.2		1.	0.8	
	10/09/90	0001		1.9		1.	3.4	
	05/13/91	0001		2.6	J	1.	2.0	
	09/16/92	0001		2.1		2.58	1.39	
SELENIUM	09/01/87	0001	MG/L		0.976		0.005	-
	04/04/89	0001		0.381		0.005	-	
	10/09/90	0001		0.065		0.005	-	
	05/13/91	0001		0.060		0.005	-	
	09/16/92	0001		0.012	*EN	0.0015	-	
SILICA - SiO2	09/01/87	0001	MG/L		15.8		2.	-
	04/04/89	0001		14.		2.	-	
	10/09/90	0001		15.6		0.1	-	
	05/13/91	0001		13.9		0.1	-	
SILVER	04/04/89	0001	MG/L	<	0.01		0.01	-
	10/09/90	0001		<	0.01		0.01	-
	05/13/91	0001		<	0.01		0.01	-
SODIUM	09/01/87	0001	MG/L		3532.		0.002	-
	04/04/89	0001		3210.		0.002	-	
	10/09/90	0001		2270.		0.002	-	
	05/13/91	0001		1840.		20.	-	
	09/16/92	0001		1700		0.011	-	
SPECIFIC CONDUCTANCE	09/01/87	0001	UMHO/CM		10200.		-	-
	04/04/89	0001		11000.		-	-	
	10/09/90	0001		10400.		-	-	
	05/13/91	0001		9550.		-	-	
	09/16/92	0001		8000		-	-	
STRONTIUM	09/01/87	0001	MG/L		13.0		0.1	-
	04/04/89	0001		10.0		0.1	-	
	10/09/90	0001		8.55		0.01	-	
	05/13/91	0001		6.20		0.01	-	
	09/16/92	0001		5.7	N	0.010	-	
SULFATE	09/01/87	0001	MG/L		12700.		0.1	-
	04/04/89	0001		13400.	H	0.1	-	
	10/09/90	0001		8870.		0.1	-	
	05/13/91	0001		6860.	H	10.	-	
	09/16/92	0001		6000	N	10.0	-	

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)

OTHER PARAMETER VALUE FLAGS:

- * - DUPLICATE ANALYSIS NOT WITHIN CONTROL LIMITS
- E - ESTIMATED VALUE BECAUSE OF INTERFERENCE, SEE CASE NARRATIVE
- H - HOLD TIME EXPIRED, VALUE SUSPECT
- J - ESTIMATED VALUE
- N - SPIKE SAMPLE RECOVERY NOT WITHIN CONTROL LIMITS

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0624
 NORTH COORDINATE: 10598.4 FT
 EAST COORDINATE: 10352.1 FT
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: DOWN GRADIENT (D)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
SULFIDE	09/01/87	0001	MG/L		0.1		0.1	-
	04/04/89	0001		<	0.1		0.1	-
TEMPERATURE	09/01/87	0001	C - DEGREE		18.8		-	-
	04/04/89	0001			13.		-	-
	10/09/90	0001			18.5		-	-
	05/13/91	0001			13.4		-	-
	09/16/92	0001			18.2		-	-
THALLIUM	04/04/89	0001	MG/L		0.01		0.01	-
	10/09/90	0001		<	0.05	I	0.05	-
	05/13/91	0001		<	0.05	I	0.05	-
THORIUM-230	09/01/87	0001	PCI/L		1.1		1.	1.4
	04/04/89	0001			0.0		1.	0.7
TIN	09/01/87	0001	MG/L		1.32		0.005	-
	04/04/89	0001			0.041		0.005	-
	10/09/90	0001		<	0.05	I	0.05	-
	05/13/91	0001		<	0.05	I	0.05	-
	09/16/92	0001		<	0.015	INW	0.015	-
TOTAL DISSOLVED SOLIDS	09/01/87	0001	MG/L		23700.		10.	-
	04/04/89	0001			22700.	HJ	10.	-
	10/09/90	0001			13600.	H	10.	-
	05/13/91	0001			10940.		10.	-
	09/16/92	0001			9000	H	10.0	-
TOTAL ORGANIC CARBON	09/01/87	0001	MG/L		268.		1.	-
	04/04/89	0001			34.5		1.	-
URANIUM	09/01/87	0001	MG/L		1.84		0.003	-
	04/04/89	0001			2.57		0.003	-
	10/09/90	0001			1.02		0.001	-
	05/13/91	0001			0.589		0.001	-
	09/16/92	0001			0.47		.001	-
VANADIUM	09/01/87	0001	MG/L		0.15		0.01	-
	04/04/89	0001			0.14		0.01	-
	10/09/90	0001		<	0.01		0.01	-
	05/13/91	0001		<	0.01		0.01	-
ZINC	09/01/87	0001	MG/L	<	0.005		0.005	-
	04/04/89	0001		<	0.005		0.005	-
	10/09/90	0001		<	0.03	I	0.03	-
	05/13/91	0001		<	0.03	I	0.03	-
	09/16/92	0001			0.011	E	0.0010	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)

OTHER PARAMETER VALUE FLAGS:
 E - ESTIMATED VALUE BECAUSE OF INTERFERENCE, SEE CASE NARRATIVE
 H - HOLD TIME EXPIRED, VALUE SUSPECT
 I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION
 J - ESTIMATED VALUE
 N - SPIKE SAMPLE RECOVERY NOT WITHIN CONTROL LIMITS
 W - POST-DIGEST SPIKE OUT OF CNTR LIM WHILE SAMP ABS < 50% SPIKE

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0625
 NORTH COORDINATE: 10586.5 FT
 EAST COORDINATE: 10348.9 FT
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: DOWN GRADIENT (D)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
ALKALINITY	09/03/87	0001	MG/L CaCO3		1091.		-	-
ALUMINUM	09/03/87	0001	MG/L		0.50		0.1	-
AMMONIUM	09/03/87	0001	MG/L		42.6	H	0.1	-
ANTIMONY	09/03/87	0001	MG/L		0.174		0.003	-
ARSENIC	09/03/87	0001	MG/L		0.052		0.01	-
BARIUM	09/03/87	0001	MG/L		0.02	J	0.1	-
BORON	09/03/87	0001	MG/L		1.10		0.1	-
BROMIDE	09/03/87	0001	MG/L	<	0.1	J	0.1	-
CADMIUM	09/03/87	0001	MG/L	<	0.005		0.005	-
CALCIUM	09/03/87	0001	MG/L		543.		0.01	-
CHLORIDE	09/03/87	0001	MG/L		646.	H	1.	-
CHROMIUM	09/03/87	0001	MG/L	<	0.01		0.01	-
COBALT	09/03/87	0001	MG/L		0.01	J	0.05	-
COPPER	09/03/87	0001	MG/L		0.04		0.02	-
FLUORIDE	09/03/87	0001	MG/L		0.27		0.1	-
GROSS ALPHA	09/03/87	0001	PCI/L		1500.		0.2	300.
GROSS BETA	09/03/87	0001	PCI/L		1200.		1.	100.
IRON	09/03/87	0001	MG/L	<	0.01	J	0.03	-
LEAD	09/03/87	0001	MG/L		0.03		0.01	-
MAGNESIUM	09/03/87	0001	MG/L		1736.		0.001	-
MANGANESE	09/03/87	0001	MG/L		7.40		0.01	-
MERCURY	09/03/87	0001	MG/L		0.0002		0.0002	-
MOLYBDENUM	09/03/87	0001	MG/L	<	0.01		0.01	-
NICKEL	09/03/87	0001	MG/L		0.02	J	0.04	-
NITRATE	09/03/87	0001	MG/L		1620.	HJ	1.	-
NITRITE	09/03/87	0001	MG/L	<	0.1		0.1	-
PH	09/03/87	0001	SU		6.86		-	-
PHOSPHATE	09/03/87	0001	MG/L		0.79	H	0.1	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)

OTHER PARAMETER VALUE FLAGS:
 H - HOLD TIME EXPIRED, VALUE SUSPECT
 J - ESTIMATED VALUE

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0625
 NORTH COORDINATE: 10586.5 FT
 EAST COORDINATE: 10348.9 FT
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: DOWN GRADIENT (D)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
POLONIUM-210	09/03/87	0001	PCI/L		2.0		1.	1.6
POTASSIUM	09/03/87	0001	MG/L		100.		0.01	-
RADIUM-226	09/03/87	0001	PCI/L		0.0		1.	0.1
RADIUM-228	09/03/87	0001	PCI/L		1.1	J	1.	1.1
SELENIUM	09/03/87	0001	MG/L		0.764		0.005	-
SILICA - SIO2	09/03/87	0001	MG/L		17.0		2.	-
SODIUM	09/03/87	0001	MG/L		3325.		0.002	-
SPECIFIC CONDUCTANCE	09/03/87	0001	UMHO/CM		11200.		-	-
STRONTIUM	09/03/87	0001	MG/L		12.0		0.1	-
SULFATE	09/03/87	0001	MG/L		12300.		0.1	-
SULFIDE	09/03/87	0001	MG/L		0.1		0.1	-
TEMPERATURE	09/03/87	0001	C - DEGREE		22.0		-	-
THORIUM-230	09/03/87	0001	PCI/L		2.0		1.	1.7
TIN	09/03/87	0001	MG/L		1.39		0.005	-
TOTAL DISSOLVED SOLIDS	09/03/87	0001	MG/L		22600.		10.	-
TOTAL ORGANIC CARBON	09/03/87	0001	MG/L		62.7		1.	-
URANIUM	09/03/87	0001	MG/L		2.11		0.003	-
VANADIUM	09/03/87	0001	MG/L		0.15		0.01	-
ZINC	09/03/87	0001	MG/L		0.010		0.005	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)

OTHER PARAMETER VALUE FLAGS:
 J - ESTIMATED VALUE

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0626
 NORTH COORDINATE: 10524.9 FT
 EAST COORDINATE: 10040.7 FT
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: DOWN GRADIENT (D)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
ALKALINITY	09/01/87	0001	MG/L CaCO3		829.			
	04/05/89	0001		403.				
	06/04/90	0001		320.				
	10/11/90	0001		301.				
	05/12/91	0001		425.				
	09/19/92	0001		280				
	02/22/93	0001		321				
ALUMINUM	09/01/87	0001	MG/L		0.36		0.1	
	04/05/89	0001		<	0.1		0.1	
	06/04/90	0001		<	0.1		0.1	
	10/11/90	0001		<	0.05		0.05	
	05/12/91	0001		<	0.05		0.05	
AMMONIUM	09/01/87	0001	MG/L	<	0.1		0.1	
	04/05/89	0001		<	0.1		0.1	
	06/04/90	0001		<	0.1		0.1	
	10/11/90	0001			0.2		0.1	
	05/12/91	0001			0.2		0.1	
ANTIMONY	09/01/87	0001	MG/L		0.084		0.003	
	04/05/89	0001			0.022		0.003	
	06/04/90	0001			0.025		0.003	
	10/11/90	0001		<	0.02	I	0.02	
	05/12/91	0001		<	0.015	I	0.015	
	09/19/92	0001			0.008	NW	0.0015	
ARSENIC	09/01/87	0001	MG/L		0.033		0.01	
	04/05/89	0001			0.01		0.01	
	06/04/90	0001		<	0.01		0.01	
	10/11/90	0001		<	0.05	I	0.05	
	05/12/91	0001		<	0.05	I	0.05	
	09/19/92	0001		<	0.015	IN	0.015	
	02/22/93	0001		<	0.005		0.005	
ARSENIC (TOTAL)	02/22/93	N001	MG/L	<	0.005	W	0.005	
BARIUM	09/01/87	0001	MG/L		0.01	J	0.1	
	04/05/89	0001		<	0.1		0.1	
	06/04/90	0001		<	0.1		0.1	
	10/11/90	0001			0.02		0.01	
	05/12/91	0001			0.01		0.01	
BERYLLIUM	04/05/89	0001	MG/L	<	0.01		0.01	
	06/04/90	0001		<	0.01		0.01	
	10/11/90	0001		<	0.005		0.005	
	05/12/91	0001		<	0.005		0.005	
BORON	09/01/87	0001	MG/L		0.79		0.1	
	04/05/89	0001			0.4		0.1	
	06/04/90	0001			0.4		0.1	
	10/11/90	0001			0.36		0.05	
	05/12/91	0001			0.41		0.05	
BROMIDE	09/01/87	0001	MG/L		0.1	J	0.1	

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)
 N001 - UNFILTERED SAMPLE

OTHER PARAMETER VALUE FLAGS:
 I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION
 J - ESTIMATED VALUE
 N - SPIKE SAMPLE RECOVERY NOT WITHIN CONTROL LIMITS
 W - POST-DIGEST SPIKE OUT OF CNTR LIM WHILE SAMP ABS < 50% SPIKE

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0626
 NORTH COORDINATE: 10524.9 FT
 EAST COORDINATE: 10040.7 FT
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: DOWN GRADIENT (D)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
BROMIDE	04/05/89	0001	MG/L	<	0.1		0.1	-
CADMIUM	09/01/87	0001	MG/L	<	0.005		0.005	-
	04/05/89	0001			0.003		0.001	-
	06/04/90	0001		<	0.001		0.001	-
	10/11/90	0001		<	0.001		0.001	-
	05/12/91	0001		<	0.001		0.001	-
	09/19/92	0001			0.0002		0.00003	-
	02/22/93	0001		<	0.001		0.001	-
CADMIUM (TOTAL)	02/22/93	N001	MG/L		0.002		0.001	-
CALCIUM	09/01/87	0001	MG/L		428.		0.01	-
	04/05/89	0001			326.		0.01	-
	06/04/90	0001			279.		0.01	-
	10/11/90	0001			274.		0.01	-
	05/12/91	0001			268.		0.5	-
	09/19/92	0001			210		0.0050	-
	02/22/93	0001			229		0.5	-
CALCIUM (TOTAL)	02/22/93	N001	MG/L		220		0.5	-
CHLORIDE	09/01/87	0001	MG/L		395.		1.	-
	04/05/89	0001			220.		1.	-
	06/04/90	0001			124.		1.	-
	10/11/90	0001			119.		1.	-
	05/12/91	0001			181.		1.	-
	09/19/92	0001			66	N	0.50	-
CHLORIDE (TOTAL)	02/22/93	N001	MG/L		83.9		0.5	-
CHROMIUM	09/01/87	0001	MG/L	<	0.01		0.01	-
	04/05/89	0001		<	0.01		0.01	-
	06/04/90	0001		<	0.01		0.01	-
	10/11/90	0001		<	0.01		0.01	-
	05/12/91	0001		<	0.01		0.01	-
	02/22/93	0001		<	0.01		0.01	-
CHROMIUM (TOTAL)	02/22/93	N001	MG/L	<	0.01		0.01	-
COBALT	09/01/87	0001	MG/L		0.02	J	0.05	-
	04/05/89	0001		<	0.05		0.05	-
	06/04/90	0001		<	0.05		0.05	-
	10/11/90	0001		<	0.03		0.03	-
	05/12/91	0001		<	0.03		0.03	-
COPPER	09/01/87	0001	MG/L		0.03		0.02	-
	04/05/89	0001			0.02		0.02	-
	06/04/90	0001		<	0.02		0.02	-
	10/11/90	0001		<	0.01		0.01	-
	05/12/91	0001		<	0.01		0.01	-
CYANIDE	04/05/89	0001	MG/L	<	0.01		0.01	-
FLUORIDE	09/01/87	0001	MG/L		0.56		0.1	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)
 N001 - UNFILTERED SAMPLE

OTHER PARAMETER VALUE FLAGS:

J - ESTIMATED VALUE

N - SPIKE SAMPLE RECOVERY NOT WITHIN CONTROL LIMITS

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0626
 NORTH COORDINATE: 10524.9 FT
 EAST COORDINATE: 10040.7 FT
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: DOWN GRADIENT (D)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
FLUORIDE	04/05/89	0001	MG/L		0.7		0.1	-
	06/04/90	0001		0.9	0.1	-		
	10/11/90	0001		1.0	0.1	-		
	05/12/91	0001		1.4	0.1	-		
GROSS ALPHA	09/01/87	0001	PCI/L		650.		0.2	160.
	04/05/89	0001		270.	0.2	90.		
	09/19/92	0001		160.	39.7	56.6		
	02/22/93	0001		83.6	53.7	44.1		
GROSS ALPHA (TOTAL)	02/22/93	N001	PCI/L		49.1		55.4	40.0
GROSS BETA	09/01/87	0001	PCI/L		470.		1.	80.
	04/05/89	0001		240.	1.	50.		
	09/19/92	0001		49.	38	26		
	02/22/93	0001		71.1	40.3	28.4		
GROSS BETA (TOTAL)	02/22/93	N001	PCI/L		115.		45.7	33.6
IRON	09/01/87	0001	MG/L	<	0.01	J	0.03	-
	04/05/89	0001		0.10	0.03	-		
	06/04/90	0001		0.09	0.03	-		
	10/11/90	0001		<	0.03	0.03	-	
	05/12/91	0001		<	0.03	0.03	-	
	09/19/92	0001		<	0.018	I	0.018	-
LEAD	09/01/87	0001	MG/L		0.03		0.01	-
	04/05/89	0001		<	0.01	0.01	-	
	06/04/90	0001		<	0.01	0.01	-	
	10/11/90	0001		<	0.01	0.01	-	
	05/12/91	0001		<	0.03	I	0.03	-
	02/22/93	0001		<	0.003	W	0.003	-
LEAD (TOTAL)	02/22/93	N001	MG/L	<	0.003	*N	0.003	-
LEAD-210	04/05/89	0001	PCI/L		0.8		1.5	0.6
MAGNESIUM	09/01/87	0001	MG/L		906.		0.001	-
	04/05/89	0001		527.	0.001	-		
	06/04/90	0001		327.	0.001	-		
	10/11/90	0001		268.	0.001	-		
	05/12/91	0001		384.	0.5	-		
	09/19/92	0001		150	0.011	-		
	02/22/93	0001		162	0.1	-		
MAGNESIUM (TOTAL)	02/22/93	N001	MG/L		151		0.1	-
MANGANESE	09/01/87	0001	MG/L		4.01		0.01	-
	04/05/89	0001		2.08	0.01	-		
	06/04/90	0001		1.86	0.01	-		
	10/11/90	0001		1.54	0.01	-		
	05/12/91	0001		1.94	0.01	-		
	09/19/92	0001		1.3	0.0064	-		

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:

0001 - FILTERED SAMPLE (.45 MICRONS)

N001 - UNFILTERED SAMPLE

OTHER PARAMETER VALUE FLAGS:

* - DUPLICATE ANALYSIS NOT WITHIN CONTROL LIMITS

I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION

J - ESTIMATED VALUE

N - SPIKE SAMPLE RECOVERY NOT WITHIN CONTROL LIMITS

W - POST-DIGEST SPIKE OUT OF CNTR LIM WHILE SAMP ABS < 50% SPIKE

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0626
 NORTH COORDINATE: 10524.9 FT
 EAST COORDINATE: 10040.7 FT
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: DOWN GRADIENT (D)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
MANGANESE	02/22/93	0001	MG/L		0.92		0.01	-
MANGANESE (TOTAL)	02/22/93	N001	MG/L		1.04		0.01	-
MERCURY	09/01/87	0001	MG/L		0.0002		0.0002	-
	04/05/89	0001		<	0.0002		0.0002	-
	06/04/90	0001		<	0.0002		0.0002	-
	10/11/90	0001		<	0.0002		0.0002	-
	05/12/91	0001		<	0.0002		0.0002	-
MOLYBDENUM	09/01/87	0001	MG/L	<	0.01		0.01	-
	04/05/89	0001		<	0.01		0.01	-
	06/04/90	0001			0.02		0.01	-
	10/11/90	0001			0.02		0.01	-
	05/12/91	0001			0.02		0.01	-
	09/19/92	0001			0.043		0.0049	-
	02/22/93	0001		<	0.01		0.01	-
MOLYBDENUM (TOTAL)	02/22/93	N001	MG/L	<	0.01		0.01	-
NICKEL	09/01/87	0001	MG/L		0.03	J	0.04	-
	04/05/89	0001		<	0.04		0.04	-
	06/04/90	0001		<	0.04		0.04	-
	10/11/90	0001		<	0.04		0.04	-
	05/12/91	0001		<	0.04		0.04	-
	09/19/92	0001		<	0.061	I	0.061	-
NITRATE	09/01/87	0001	MG/L		190.	HJ	1.	-
	04/05/89	0001			23.		1.	-
	06/04/90	0001			2.		1.	-
	10/11/90	0001		<	1.0		1.	-
	05/12/91	0001			3.1		1.	-
	09/19/92	0001			0.68	J	0.044	-
NITRITE	09/01/87	0001	MG/L	<	0.1		0.1	-
PH	09/01/87	0001	SU		7.02		-	-
	04/05/89	0001			7.21		-	-
	06/04/90	0001			7.30		-	-
	10/11/90	0001			7.29		-	-
	05/12/91	0001			7.26		-	-
	09/19/92	0001			7.29		-	-
	02/22/93	0001			7.38		-	-
PHOSPHATE	09/01/87	0001	MG/L		0.61	H	0.1	-
	04/05/89	0001		<	0.1		0.1	-
	06/04/90	0001		<	0.1		0.1	-
	10/11/90	0001			0.1		0.1	-
	05/12/91	0001			0.1		0.1	-
POLONIUM-210	09/01/87	0001	PCI/L		0.6		1.	1.3
	04/05/89	0001			0.2		1.	0.4
POTASSIUM	09/01/87	0001	MG/L		40.0		0.01	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:

0001 - FILTERED SAMPLE (.45 MICRONS)

N001 - UNFILTERED SAMPLE

OTHER PARAMETER VALUE FLAGS:

H - HOLD TIME EXPIRED, VALUE SUSPECT

I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION

J - ESTIMATED VALUE

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0626
 NORTH COORDINATE: 10524.9 FT
 EAST COORDINATE: 10040.7 FT
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: DOWN GRADIENT (D)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
POTASSIUM	04/05/89	0001	MG/L		35.3		0.01	-
	06/04/90	0001		27.0		0.01	-	
	10/11/90	0001		23.		0.01	-	
	05/12/91	0001		23.		5.	-	
	09/19/92	0001		23	E	0.20	-	
	02/22/93	0001		18.9		0.1	-	
POTASSIUM (TOTAL)	02/22/93	N001	MG/L		18.8		0.1	-
RADIUM-226	09/01/87	0001	PCI/L		0.1		1.	0.1
	04/05/89	0001		0.1		1.	0.2	
	06/04/90	0001		0.1		1.	0.1	
	10/11/90	0001		0.2		1.	0.2	
	05/12/91	0001		0.2		1.	0.2	
	09/19/92	0001		0.084		.0646	.0567	
02/22/93	0001	0.2		0.6	0.4			
RADIUM-226 (TOTAL)	02/22/93	N001	PCI/L		0.0		0.6	0.3
RADIUM-228	09/01/87	0001	PCI/L		1.0	J	1.	1.2
	04/05/89	0001		0.3		1.	0.9	
	06/04/90	0001		0.6		1.	0.8	
	10/11/90	0001		0.2		1.	2.3	
	05/12/91	0001		14.1	J	1.	2.7	
	09/19/92	0001		0.47		1.17	.63	
02/22/93	0001	0.0		3.6	2.1			
REDOX POTENTIAL	02/22/93	0001	mVOLTS		495.4		-	-
SELENIUM	09/01/87	0001	MG/L		0.225		0.005	-
	04/05/89	0001		0.072		0.005	-	
	06/04/90	0001		0.042		0.005	-	
	10/11/90	0001		<	0.03	I	0.03	-
	05/12/91	0001		0.030		0.005	-	
	09/19/92	0001		0.017	*NW	0.0015	-	
02/22/93	0001	0.017	*S	0.005	-			
SELENIUM (TOTAL)	02/22/93	N001	MG/L		0.007	NS	0.005	-
SILICA - SiO2	09/01/87	0001	MG/L		13.4		2.	-
	04/05/89	0001		11.		2.	-	
	06/04/90	0001		11.		2.	-	
	10/11/90	0001		11.9		0.1	-	
	05/12/91	0001		9.9		0.1	-	
SILVER	04/05/89	0001	MG/L	<	0.01		0.01	-
	06/04/90	0001		<	0.01		0.01	-
	10/11/90	0001		<	0.01		0.01	-
	05/12/91	0001		<	0.01		0.01	-
SODIUM	09/01/87	0001	MG/L		2574.		0.002	-
	04/05/89	0001			1510.		0.002	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT.

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)
 N001 - UNFILTERED SAMPLE

OTHER PARAMETER VALUE FLAGS:

- * - DUPLICATE ANALYSIS NOT WITHIN CONTROL LIMITS
- E - ESTIMATED VALUE BECAUSE OF INTERFERENCE, SEE CASE NARRATIVE
- I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION
- J - ESTIMATED VALUE
- N - SPIKE SAMPLE RECOVERY NOT WITHIN CONTROL LIMITS
- S - REPORTED VALUE DETERMINED USING METHOD OF STD ADDITION (MSA)
- W - POST-DIGEST SPIKE OUT OF CNTR LIM WHILE SAMP ABS < 50% SPIKE

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0626
 NORTH COORDINATE: 10524.9 FT
 EAST COORDINATE: 10040.7 FT
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: DOWN GRADIENT (D)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
SODIUM	06/04/90	0001	MG/L		1540.		0.002	-
	10/11/90	0001		1320.	0.002	-		
	05/12/91	0001		2130.	20.	-		
	09/19/92	0001		1100	0.011	-		
	02/22/93	0001		1060	1	-		
SODIUM (TOTAL)	02/22/93	N001	MG/L		1040		1	-
SPECIFIC CONDUCTANCE	09/01/87	0001	UMHO/CM		4520.		-	-
	04/05/89	0001		4650.	-	-		
	06/04/90	0001		4550.	-	-		
	10/11/90	0001		5200.	-	-		
	05/12/91	0001		8940.	-	-		
	09/19/92	0001		4610	-	-		
	02/22/93	0001		3220	-	-		
STRONTIUM	09/01/87	0001	MG/L		13.0		0.1	-
	04/05/89	0001		7.2	0.1	-		
	06/04/90	0001		6.39	0.1	-		
	10/11/90	0001		6.85	0.01	-		
	05/12/91	0001		6.36	0.01	-		
	09/19/92	0001		4.3	N	0.010	-	
	02/22/93	0001		5.25	0.01	-		
STRONTIUM (TOTAL)	02/22/93	N001	MG/L		5.23		0.01	-
SULFATE	09/01/87	0001	MG/L		8690.		0.1	-
	04/05/89	0001		5520.	H	0.1	-	
	06/04/90	0001		4290.		0.1	-	
	10/11/90	0001		3980.		0.1	-	
	05/12/91	0001		5480.	H	10.	-	
	09/19/92	0001		2900	N	10.0	-	
SULFATE (TOTAL)	02/22/93	N001	MG/L		3150		1	-
SULFIDE	09/01/87	0001	MG/L	<	0.1		0.1	-
	04/05/89	0001		<	0.1		0.1	-
TEMPERATURE	09/01/87	0001	C - DEGREE		17.5		-	-
	04/05/89	0001		11.	-	-		
	06/04/90	0001		13.5	-	-		
	10/11/90	0001		18.0	-	-		
	05/12/91	0001		11.1	-	-		
	09/19/92	0001		17.7	-	-		
	02/22/93	0001		10.0	-	-		
THALLIUM	04/05/89	0001	MG/L		0.01		0.01	-
	06/04/90	0001		<	0.01		0.01	-
	10/11/90	0001		<	0.05	I	0.05	-
	05/12/91	0001		<	0.05	I	0.05	-
THORIUM-230	09/01/87	0001	PCI/L		0.0		1.	0.6
	04/05/89	0001		0.1	1.	0.5		
TIN	09/01/87	0001	MG/L		0.934		0.005	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)
 N001 - UNFILTERED SAMPLE

OTHER PARAMETER VALUE FLAGS:

H - HOLD TIME EXPIRED, VALUE SUSPECT
 I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION
 N - SPIKE SAMPLE RECOVERY NOT WITHIN CONTROL LIMITS

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0626
 NORTH COORDINATE: 10524.9 FT
 EAST COORDINATE: 10040.7 FT
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: DOWN GRADIENT (D)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
TIN	04/05/89	0001	MG/L		0.016		0.005	-
	06/04/90	0001		<	0.005		0.005	-
	10/11/90	0001		<	0.05	I	0.05	-
	05/12/91	0001		<	0.05	I	0.05	-
TOTAL DISSOLVED SOLIDS	09/01/87	0001	MG/L		14100.		10.	-
	04/05/89	0001			8650.	HJ	10.	-
	06/04/90	0001			6630.		10.	-
	10/11/90	0001			6180.	H	10.	-
	05/12/91	0001			8720.		10.	-
	09/19/92	0001			4300	H	10.0	-
TOTAL DISSOLVED SOLIDS (TOTAL)	02/22/93	N001	MG/L		5030		10	-
TOTAL ORGANIC CARBON	09/01/87	0001	MG/L		227.		1.	-
	04/05/89	0001			116.		1.	-
URANIUM	09/01/87	0001	MG/L		1.22		0.003	-
	04/05/89	0001			0.560		0.003	-
	06/04/90	0001			0.227		0.003	-
	10/11/90	0001			0.264		0.001	-
	05/12/91	0001			0.522		0.001	-
	09/19/92	0001			0.15		.001	-
	02/22/93	0001			0.175		0.001	-
URANIUM (TOTAL)	02/22/93	N001	MG/L		0.174		0.001	-
VANADIUM	09/01/87	0001	MG/L		0.11		0.01	-
	04/05/89	0001			0.08		0.01	-
	06/04/90	0001			0.02		0.01	-
	10/11/90	0001		<	0.01		0.01	-
	05/12/91	0001		<	0.01		0.01	-
ZINC	09/01/87	0001	MG/L		0.094		0.005	-
	04/05/89	0001			0.073		0.005	-
	06/04/90	0001			0.053		0.005	-
	10/11/90	0001			0.039		0.005	-
	05/12/91	0001			0.069		0.005	-
	09/19/92	0001			0.030	E	0.0010	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:

0001 - FILTERED SAMPLE (.45 MICRONS)

N001 - UNFILTERED SAMPLE

OTHER PARAMETER VALUE FLAGS:

E - ESTIMATED VALUE BECAUSE OF INTERFERENCE, SEE CASE NARRATIVE

H - HOLD TIME EXPIRED, VALUE SUSPECT

I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION

J - ESTIMATED VALUE

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0627
 NORTH COORDINATE: 10725.9 FT
 EAST COORDINATE: 9749.2 FT
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: DOWN GRADIENT (D)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
ALKALINITY	09/16/87	0001	MG/L CaCO3		330.	L	-	-
ALUMINUM	09/16/87	0001	MG/L		0.32	L	0.1	-
AMMONIUM	09/16/87	0001	MG/L	<	0.1	L	0.1	-
ANTIMONY	09/16/87	0001	MG/L		0.026	L	0.003	-
ARSENIC	09/16/87	0001	MG/L		0.016	L	0.01	-
BARIUM	09/16/87	0001	MG/L		0.02	JL	0.1	-
BORON	09/16/87	0001	MG/L		0.49	L	0.1	-
BROMIDE	09/16/87	0001	MG/L	<	0.1	JL	0.1	-
CADMIUM	09/16/87	0001	MG/L	<	0.005	L	0.005	-
CALCIUM	09/16/87	0001	MG/L		410.	L	0.01	-
CHLORIDE	09/16/87	0001	MG/L		157.	L	1.	-
CHROMIUM	09/16/87	0001	MG/L	<	0.01	L	0.01	-
COBALT	09/16/87	0001	MG/L	<	0.01	JL	0.05	-
COPPER	09/16/87	0001	MG/L		0.02	L	0.02	-
FLUORIDE	09/16/87	0001	MG/L		0.56	L	0.1	-
GROSS ALPHA	09/16/87	0001	PCI/L		420.	L	0.2	90.
GROSS BETA	09/16/87	0001	PCI/L		230.	L	1.	60.
IRON	09/16/87	0001	MG/L	<	0.01	JL	0.03	-
LEAD	09/16/87	0001	MG/L		0.01	L	0.01	-
MAGNESIUM	09/16/87	0001	MG/L		436.	L	0.001	-
MANGANESE	09/16/87	0001	MG/L		3.11	L	0.01	-
MERCURY	09/16/87	0001	MG/L	<	0.0002	L	0.0002	-
MOLYBDENUM	09/16/87	0001	MG/L		0.01	L	0.01	-
NICKEL	09/16/87	0001	MG/L		0.01	JL	0.04	-
NITRATE	09/16/87	0001	MG/L		75.0	HJL	1.	-
NITRITE	09/16/87	0001	MG/L	<	0.1	L	0.1	-
PH	09/16/87	0001	SU		7.15	L	-	-
PHOSPHATE	09/16/87	0001	MG/L		0.53	HL	0.1	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)

OTHER PARAMETER VALUE FLAGS:

- H - HOLD TIME EXPIRED, VALUE SUSPECT
- J - ESTIMATED VALUE
- L - LESS THAN THREE BORE VOLUMES REMOVED BEFORE SAMPLING

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0627
 NORTH COORDINATE: 10725.9 FT
 EAST COORDINATE: 9749.2 FT
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: DOWN GRADIENT (D)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
POLONIUM-210	09/16/87	0001	PCI/L		0.1	L	1.	1.3
POTASSIUM	09/16/87	0001	MG/L		26.0	L	0.01	-
RADIUM-226	09/16/87	0001	PCI/L		0.1	L	1.	0.1
RADIUM-228	09/16/87	0001	PCI/L		0.3	JL	1.	1.3
SELENIUM	09/16/87	0001	MG/L		0.176	L	0.005	-
SILICA - SiO2	09/16/87	0001	MG/L		11.4	L	2.	-
SODIUM	09/16/87	0001	MG/L		1683.	L	0.002	-
SPECIFIC CONDUCTANCE	09/16/87	0001	UMHO/CM		3690.	L	-	-
STRONTIUM	09/16/87	0001	MG/L		9.25	L	0.1	-
SULFATE	09/16/87	0001	MG/L		5480.	L	0.1	-
SULFIDE	09/16/87	0001	MG/L	<	0.1	L	0.1	-
TEMPERATURE	09/16/87	0001	C - DEGREE		16.2	L	-	-
THORIUM-230	09/16/87	0001	PCI/L		0.3	L	1.	0.8
TIN	09/16/87	0001	MG/L		0.615	L	0.005	-
TOTAL DISSOLVED SOLIDS	09/16/87	0001	MG/L		8630.	L	10.	-
TOTAL ORGANIC CARBON	09/16/87	0001	MG/L		86.6	L	1.	-
URANIUM	09/16/87	0001	MG/L		0.388	L	0.003	-
VANADIUM	09/16/87	0001	MG/L		0.08	L	0.01	-
ZINC	09/16/87	0001	MG/L		0.039	L	0.005	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)

OTHER PARAMETER VALUE FLAGS:

J - ESTIMATED VALUE

L - LESS THAN THREE BORE VOLUMES REMOVED BEFORE SAMPLING

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0628
 NORTH COORDINATE: 10716.5 FT
 EAST COORDINATE: 9758.9 FT
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: DOWN GRADIENT (D)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
ALKALINITY	09/16/87	0001	MG/L CaCO3		399.		-	-
	04/05/89	0001		277.	-	-		
	06/04/90	0001		243.	-	-		
	10/11/90	0001		293.	-	-		
	05/12/91	0001		446.	-	-		
	09/16/92	0001		211	-	-		
	02/23/93	0001		381	-	-		
ALUMINUM	09/16/87	0001	MG/L		0.33		0.1	-
	04/05/89	0001		<	0.1		0.1	-
	06/04/90	0001		<	0.1		0.1	-
	10/11/90	0001		<	0.05		0.05	-
	05/12/91	0001		<	0.05		0.05	-
AMMONIUM	09/16/87	0001	MG/L	<	0.1		0.1	-
	04/05/89	0001		<	0.1		0.1	-
	06/04/90	0001		<	0.1		0.1	-
	10/11/90	0001			0.2		0.1	-
	05/12/91	0001			0.2		0.1	-
AMMONIUM (TOTAL)	02/23/93	N001	MG/L	<	0.1	N	0.1	-
ANTIMONY	09/16/87	0001	MG/L		0.009		0.003	-
	04/05/89	0001			0.028		0.003	-
	06/04/90	0001			0.038		0.003	-
	10/11/90	0001		<	0.02		0.02	-
	05/12/91	0001		<	0.015	I	0.015	-
	09/16/92	0001			0.003	NW	0.0015	-
ARSENIC	09/16/87	0001	MG/L		0.020		0.01	-
	04/05/89	0001		<	0.01		0.01	-
	06/04/90	0001		<	0.01		0.01	-
	10/11/90	0001		<	0.05		0.05	-
	05/12/91	0001		<	0.05	I	0.05	-
	09/16/92	0001		<	0.0015	J	0.0020	-
	02/23/93	0001		<	0.005		0.005	-
ARSENIC (TOTAL)	02/23/93	N001	MG/L	<	0.005	W	0.005	-
BARIUM	09/16/87	0001	MG/L		0.01	J	0.1	-
	04/05/89	0001		<	0.1		0.1	-
	06/04/90	0001		<	0.1		0.1	-
	10/11/90	0001			0.02		0.01	-
	05/12/91	0001			0.01		0.01	-
BERYLLIUM	04/05/89	0001	MG/L	<	0.01		0.01	-
	06/04/90	0001		<	0.01		0.01	-
	10/11/90	0001		<	0.005		0.005	-
	05/12/91	0001		<	0.005		0.005	-
BORON	09/16/87	0001	MG/L		0.51		0.1	-
	04/05/89	0001			0.2		0.1	-
	06/04/90	0001			0.3		0.1	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)
 N001 - UNFILTERED SAMPLE

OTHER PARAMETER VALUE FLAGS:

I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION
 J - ESTIMATED VALUE
 N - SPIKE SAMPLE RECOVERY NOT WITHIN CONTROL LIMITS
 W - POST-DIGEST SPIKE OUT OF CNTR LIM WHILE SAMP ABS < 50% SPIKE

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0628
 NORTH COORDINATE: 10716.5 FT
 EAST COORDINATE: 9758.9 FT
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: DOWN GRADIENT (D)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
BORON	10/11/90	0001	MG/L		0.30		0.05	-
	05/12/91	0001			0.33		0.05	-
BROMIDE	09/16/87	0001	MG/L	<	0.1	J	0.1	-
	04/05/89	0001		<	0.1		0.1	-
CADMIUM	09/16/87	0001	MG/L	<	0.005		0.005	-
	04/05/89	0001		<	0.002		0.001	-
	06/04/90	0001		<	0.001		0.001	-
	10/11/90	0001		<	0.001		0.001	-
	05/12/91	0001		<	0.001		0.001	-
	09/16/92	0001		<	0.00003		0.00003	-
	02/23/93	0001	<	0.001		0.001	-	
CADMIUM (TOTAL)	02/23/93	N001	MG/L	<	0.002	IS	0.002	-
CALCIUM	09/16/87	0001	MG/L		418.		0.01	-
	04/05/89	0001			400.		0.01	-
	06/04/90	0001			475.		0.01	-
	10/11/90	0001			444.		0.01	-
	05/12/91	0001			400.		0.5	-
	09/16/92	0001			250		0.0050	-
	02/23/93	0001			374		0.5	-
CALCIUM (TOTAL)	02/23/93	N001	MG/L		383		0.5	-
CHLORIDE	09/16/87	0001	MG/L		193.		1.	-
	04/05/89	0001			130.		1.	-
	06/04/90	0001			110.		1.	-
	10/11/90	0001			137.		1.	-
	05/12/91	0001			161.		1.	-
	09/16/92	0001			280	N	0.50	-
CHLORIDE (TOTAL)	02/23/93	N001	MG/L		129		0.5	-
CHROMIUM	09/16/87	0001	MG/L	<	0.01		0.01	-
	04/05/89	0001		<	0.01		0.01	-
	06/04/90	0001		<	0.01		0.01	-
	10/11/90	0001		<	0.01		0.01	-
	05/12/91	0001		<	0.01		0.01	-
	02/23/93	0001		<	0.01		0.01	-
CHROMIUM (TOTAL)	02/23/93	N001	MG/L	<	0.01		0.01	-
COBALT	09/16/87	0001	MG/L	<	0.01	J	0.05	-
	04/05/89	0001		<	0.05		0.05	-
	06/04/90	0001		<	0.05		0.05	-
	10/11/90	0001		<	0.03		0.03	-
	05/12/91	0001		<	0.03		0.03	-
COPPER	09/16/87	0001	MG/L		0.02		0.02	-
	04/05/89	0001			0.02		0.02	-
	06/04/90	0001		<	0.02		0.02	-
	10/11/90	0001		<	0.01		0.01	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

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 N - SPIKE SAMPLE RECOVERY NOT WITHIN CONTROL LIMITS
 S - REPORTED VALUE DETERMINED USING METHOD OF STD ADDITION (MSA)

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0628
 NORTH COORDINATE: 10716.5 FT
 EAST COORDINATE: 9758.9 FT
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: DOWN GRADIENT (D)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
COPPER	05/12/91	0001	MG/L	<	0.01		0.01	-
CYANIDE	04/05/89	0001	MG/L	<	0.01		0.01	-
DISSOLVED OXYGEN	02/23/93	0001	MG/L		0.0		-	-
FLUORIDE	09/16/87	0001	MG/L		0.58		0.1	-
	04/05/89	0001		1.0	0.1	-		
	06/04/90	0001		1.0	0.1	-		
	10/11/90	0001		1.2	0.1	-		
	05/12/91	0001		1.8	0.1	-		
GROSS ALPHA	09/16/87	0001	PCI/L		300.		0.2	80.
	04/05/89	0001		230.	0.2	60.		
	09/16/92	0001		42.	41.5	33		
	02/23/93	0001		123.	53.4	48.6		
GROSS ALPHA (TOTAL)	02/23/93	N001	PCI/L		126.		85.4	68.0
GROSS BETA	09/16/87	0001	PCI/L		230.		1.	60.
	04/05/89	0001		130.	1.	20.		
	09/16/92	0001		17.	41.5	24.6		
	02/23/93	0001		77.3	43.3	30.6		
GROSS BETA (TOTAL)	02/23/93	N001	PCI/L		104.		66.0	45.2
IRON	09/16/87	0001	MG/L	<	0.01	J	0.03	-
	04/05/89	0001		0.08	0.03	-		
	06/04/90	0001		0.09	0.03	-		
	10/11/90	0001		0.11	0.03	-		
	05/12/91	0001		0.23	0.03	-		
	09/16/92	0001		0.50	0.0035	-		
LEAD	09/16/87	0001	MG/L		0.01		0.01	-
	04/05/89	0001		<	0.01		0.01	-
	06/04/90	0001		<	0.01		0.01	-
	10/11/90	0001		<	0.01		0.01	-
	05/12/91	0001		<	0.03	I	0.03	-
	02/23/93	0001		<	0.003	W	0.003	-
LEAD (TOTAL)	02/23/93	N001	MG/L	<	0.003	*N	0.003	-
LEAD-210	04/05/89	0001	PCI/L		0.0		1.5	0.5
MAGNESIUM	09/16/87	0001	MG/L		493.		0.001	-
	04/05/89	0001		232.	0.001	-		
	06/04/90	0001		174.	0.001	-		
	10/11/90	0001		163.	0.001	-		
	05/12/91	0001		216.	0.5	-		
	09/16/92	0001		63	0.011	-		
	02/23/93	0001		132	0.1	-		
MAGNESIUM (TOTAL)	02/23/93	N001	MG/L		130		0.1	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

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OTHER PARAMETER VALUE FLAGS:

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- I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION
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 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: DOWN GRADIENT (D)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
MANGANESE	09/16/87	0001	MG/L		3.05		0.01	-
	04/05/89	0001			1.31		0.01	-
	06/04/90	0001			1.89		0.01	-
	10/11/90	0001			2.85		0.01	-
	05/12/91	0001			4.18		0.01	-
	09/16/92	0001			2.7		0.0064	-
	02/23/93	0001			5.04		0.01	-
MANGANESE (TOTAL)	02/23/93	N001	MG/L		5.36		0.01	-
MERCURY	09/16/87	0001	MG/L		0.0002		0.0002	-
	04/05/89	0001		<	0.0002		0.0002	-
	06/04/90	0001		<	0.0002		0.0002	-
	10/11/90	0001		<	0.0002		0.0002	-
	05/12/91	0001		<	0.0002		0.0002	-
MOLYBDENUM	09/16/87	0001	MG/L	<	0.01		0.01	-
	04/05/89	0001			0.01		0.01	-
	06/04/90	0001			0.03		0.01	-
	10/11/90	0001			0.04		0.01	-
	05/12/91	0001			0.02		0.01	-
	09/16/92	0001			0.048		0.0049	-
	02/23/93	0001			0.02		0.01	-
MOLYBDENUM (TOTAL)	02/23/93	N001	MG/L		0.02		0.01	-
NICKEL	09/16/87	0001	MG/L		0.02	J	0.04	-
	04/05/89	0001		<	0.04		0.04	-
	06/04/90	0001		<	0.04		0.04	-
	10/11/90	0001		<	0.04		0.04	-
	05/12/91	0001		<	0.04		0.04	-
	09/16/92	0001		<	0.061	I	0.061	-
NITRATE	09/16/87	0001	MG/L		105.	HJ	1.	-
	04/05/89	0001			38.		1.	-
	06/04/90	0001			6.		1.	-
	10/11/90	0001			4.		1.	-
	05/12/91	0001			6.1		1.	-
	09/16/92	0001			1.5	J	0.044	-
NITRATE (TOTAL)	02/23/93	N001	MG/L	<	1		1	-
NITRITE	09/16/87	0001	MG/L	<	0.1		0.1	-
PH	09/16/87	0001	SU		7.16		-	-
	04/05/89	0001			7.35		-	-
	06/04/90	0001			7.41		-	-
	10/11/90	0001			7.23		-	-
	05/12/91	0001			7.09		-	-
	09/16/92	0001			7.29		-	-
	02/23/93	0001			7.09		-	-
PHOSPHATE	09/16/87	0001	MG/L		0.55	H	0.1	-
	04/05/89	0001		<	0.1		0.1	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
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OTHER PARAMETER VALUE FLAGS:
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 I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION
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GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0628
 NORTH COORDINATE: 10716.5 FT
 EAST COORDINATE: 9758.9 FT
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: DOWN GRADIENT (D)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY	
PHOSPHATE	06/04/90	0001	MG/L	<	0.1		0.1	-	
	10/11/90	0001			0.1		0.1	-	
	05/12/91	0001			0.1		0.1	-	
PHOSPHATE (TOTAL)	02/23/93	N001	MG/L	<	0.1		0.1	-	
POLONIUM-210	09/16/87	0001	PCI/L		0.0		1.	1.1	
	04/05/89	0001			0.4		1.	0.4	
POTASSIUM	09/16/87	0001	MG/L		27.0		0.01	-	
	04/05/89	0001			21.5		0.01	-	
	06/04/90	0001			20.5		0.01	-	
	10/11/90	0001			19.		0.01	-	
	05/12/91	0001			16.		5.	-	
	09/16/92	0001			14	E	0.20	-	
	02/23/93	0001			13.9		0.1	-	
POTASSIUM (TOTAL)	02/23/93	N001	MG/L		14.9		0.1	-	
RADIUM-226	09/16/87	0001	PCI/L		0.0		1.	0.1	
	04/05/89	0001			0.0		1.	0.1	
	06/04/90	0001			0.3		1.	0.2	
	10/11/90	0001			0.0		1.	0.1	
	05/12/91	0001			0.2		1.	0.2	
	09/16/92	0001			0.073		.0578	.0422	
	02/23/93	0001			0.1		0.6	0.4	
RADIUM-226 (TOTAL)	02/23/93	N001	PCI/L		0.3		0.6	0.4	
RADIUM-228	09/16/87	0001	PCI/L		0.0	J	1.	1.2	
	04/05/89	0001			0.0		1.	0.9	
	06/04/90	0001			0.4		1.	0.7	
	10/11/90	0001			7.0		1.	2.5	
	05/12/91	0001			14.1	J	1.	2.7	
	09/16/92	0001			0.79		1.59	.84	
	02/23/93	0001			0.2		3.6	2.1	
REDOX POTENTIAL	02/23/93	0001	mVOLTS		357.8		-	-	
SELENIUM	09/16/87	0001	MG/L		0.204		0.005	-	
	04/05/89	0001			0.066		0.005	-	
	06/04/90	0001			0.086		0.005	-	
	10/11/90	0001			0.065		0.005	-	
	05/12/91	0001			<	0.05	I	0.05	-
	09/16/92	0001			<	0.0075	J	0.0080	-
	02/23/93	0001			<	0.05	*I	0.05	-
SELENIUM (TOTAL)	02/23/93	N001	MG/L	<	0.05	IN	0.05	-	
SILICA - SiO2	09/16/87	0001	MG/L		11.8		2.	-	
	04/05/89	0001			11.		2.	-	
	06/04/90	0001			12.		2.	-	

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:

0001 - FILTERED SAMPLE (.45 MICRONS)
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OTHER PARAMETER VALUE FLAGS:

* - DUPLICATE ANALYSIS NOT WITHIN CONTROL LIMITS
 E - ESTIMATED VALUE BECAUSE OF INTERFERENCE, SEE CASE NARRATIVE
 I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION
 J - ESTIMATED VALUE
 N - SPIKE SAMPLE RECOVERY NOT WITHIN CONTROL LIMITS

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0628
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 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: DOWN GRADIENT (D)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
SILICA - SIO2	10/11/90	0001	MG/L		13.3		0.1	-
	05/12/91	0001			11.6		0.1	-
SILVER	04/05/89	0001	MG/L	<	0.01		0.01	-
	06/04/90	0001		<	0.01		0.01	-
	10/11/90	0001		<	0.01		0.01	-
	05/12/91	0001		<	0.01		0.01	-
SODIUM	09/16/87	0001	MG/L		1889.		0.002	-
	04/05/89	0001			1310.		0.002	-
	06/04/90	0001			1450.		0.002	-
	10/11/90	0001			1410.		0.002	-
	05/12/91	0001			1870.		20.	-
	09/16/92	0001			1100		0.011	-
	02/23/93	0001			1520		1	-
SODIUM (TOTAL)	02/23/93	N001	MG/L		1480		1	-
SPECIFIC CONDUCTANCE	09/16/87	0001	UMHO/CM		3910.		-	-
	04/05/89	0001			4000.		-	-
	06/04/90	0001			4000.		-	-
	10/11/90	0001			5300.		-	-
	05/12/91	0001			7340.		-	-
	09/16/92	0001			4370		-	-
	02/23/93	0001			5150		-	-
STRONTIUM	09/16/87	0001	MG/L		9.75		0.1	-
	04/05/89	0001			5.6		0.1	-
	06/04/90	0001			7.02		0.1	-
	10/11/90	0001			8.65		0.01	-
	05/12/91	0001			7.16		0.01	-
	09/16/92	0001			4.1	N	0.010	-
	02/23/93	0001			8.19		0.01	-
STRONTIUM (TOTAL)	02/23/93	N001	MG/L		8.90		0.01	-
SULFATE	09/16/87	0001	MG/L		6260.		0.1	-
	04/05/89	0001			4460.	H	0.1	-
	06/04/90	0001			4050.	HJ	0.1	-
	10/11/90	0001			4450.		0.1	-
	05/12/91	0001			5310.	H	10.	-
	09/16/92	0001			2600	N	10.0	-
SULFATE (TOTAL)	02/23/93	N001	MG/L		4280		1	-
SULFIDE	09/16/87	0001	MG/L	<	0.1		0.1	-
	04/05/89	0001		<	0.1		0.1	-
TEMPERATURE	09/16/87	0001	C - DEGREE		17.5		-	-
	04/05/89	0001			9.0		-	-
	06/04/90	0001			13.0		-	-
	10/11/90	0001			17.0		-	-
	05/12/91	0001			9.6		-	-
	09/16/92	0001			17.2		-	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

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FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: DOWN GRADIENT (D)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
TEMPERATURE	02/23/93	0001	C - DEGREE		7.4		-	-
THALLIUM	04/05/89	0001	MG/L		0.02		0.01	-
	06/04/90	0001		<	0.01		0.01	-
	10/11/90	0001		<	0.05		0.05	-
	05/12/91	0001		<	0.05	I	0.05	-
THORIUM-230	09/16/87	0001	PCI/L		0.1		1.	0.8
	04/05/89	0001			0.0		1.	0.3
TIN	09/16/87	0001	MG/L		0.592		0.005	-
	04/05/89	0001			0.022		0.005	-
	06/04/90	0001		<	0.005		0.005	-
	10/11/90	0001		<	0.05		0.05	-
	05/12/91	0001		<	0.025	I	0.025	-
TOTAL DISSOLVED SOLIDS	09/16/87	0001	MG/L		9720.		10.	-
	04/05/89	0001			6750.	HJ	10.	-
	06/04/90	0001			6200.		10.	-
	10/11/90	0001			6880.	H	10.	-
	05/12/91	0001			8320.		10.	-
	09/16/92	0001			4200	H	10.0	-
TOTAL DISSOLVED SOLIDS (TOTAL)	02/23/93	N001	MG/L		6800		10	-
TOTAL ORGANIC CARBON	09/16/87	0001	MG/L		112.		1.	-
	04/05/89	0001			72.5		1.	-
URANIUM	09/16/87	0001	MG/L		0.405		0.003	-
	04/05/89	0001			0.314		0.003	-
	06/04/90	0001			0.196		0.003	-
	10/11/90	0001			0.229		0.001	-
	05/12/91	0001			0.322		0.001	-
	09/16/92	0001			0.056		.0002	-
	02/23/93	0001			0.188		0.001	-
	URANIUM (TOTAL)	02/23/93		N001	MG/L		0.182	
VANADIUM	09/16/87	0001	MG/L		0.08		0.01	-
	04/05/89	0001			0.06		0.01	-
	06/04/90	0001			0.02		0.01	-
	10/11/90	0001		<	0.01		0.01	-
	05/12/91	0001		<	0.01		0.01	-
ZINC	09/16/87	0001	MG/L		0.028		0.005	-
	04/05/89	0001			0.032		0.005	-
	06/04/90	0001			0.022		0.005	-
	10/11/90	0001			0.012		0.005	-
	05/12/91	0001			0.015		0.005	-
	09/16/92	0001			0.020	E	0.0010	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

OTHER PARAMETER VALUE FLAGS:

- E - ESTIMATED VALUE BECAUSE OF INTERFERENCE, SEE CASE NARRATIVE
- H - HOLD TIME EXPIRED, VALUE SUSPECT
- I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION
- J - ESTIMATED VALUE

SAMPLE ID CODES:

- 0001 - FILTERED SAMPLE (.45 MICRONS)
- N001 - UNFILTERED SAMPLE

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0629
 NORTH COORDINATE: 10558.8 FT
 EAST COORDINATE: 9477.7 FT
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: DOWN GRADIENT (D)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
ALKALINITY	08/30/87	0001	MG/L CaCO3		125.		-	-
	04/18/89	0001			116.		-	-
ALUMINUM	08/30/87	0001	MG/L		0.30		0.1	-
	04/18/89	0001		<	0.1		0.1	-
AMMONIUM	08/30/87	0001	MG/L		2.5	H	0.1	-
	04/18/89	0001		<	0.1		0.1	-
ANTIMONY	08/30/87	0001	MG/L		0.016		0.003	-
	04/18/89	0001			0.006		0.003	-
ARSENIC	08/30/87	0001	MG/L		0.005	J	0.01	-
	04/18/89	0001		<	0.01		0.01	-
BARIUM	08/30/87	0001	MG/L		0.02	J	0.1	-
	04/18/89	0001		<	0.1		0.1	-
BERYLLIUM	04/18/89	0001	MG/L		0.01	J	0.01	-
BORON	08/30/87	0001	MG/L		0.34		0.1	-
	04/18/89	0001			0.2		0.1	-
BROMIDE	08/30/87	0001	MG/L		0.1		0.1	-
	04/18/89	0001		<	0.1		0.1	-
CADMIUM	08/30/87	0001	MG/L		0.005		0.005	-
	04/18/89	0001		<	0.003		0.001	-
CALCIUM	08/30/87	0001	MG/L		395.		0.01	-
	04/18/89	0001			431.		0.01	-
CHLORIDE	08/30/87	0001	MG/L		72.	HJ	1.	-
	04/18/89	0001			65.		1.	-
CHROMIUM	08/30/87	0001	MG/L		0.01		0.01	-
	04/18/89	0001		<	0.01		0.01	-
COBALT	08/30/87	0001	MG/L		0.01	J	0.05	-
	04/18/89	0001		<	0.05		0.05	-
COPPER	08/30/87	0001	MG/L		0.01	J	0.02	-
	04/18/89	0001		<	0.02		0.02	-
CYANIDE	04/18/89	0001	MG/L		0.01		0.01	-
FLUORIDE	08/30/87	0001	MG/L		1.4		0.1	-
	04/18/89	0001			1.4		0.1	-
GROSS ALPHA	08/30/87	0001	PCI/L		68.		0.2	21.
	04/18/89	0001			39.		0.2	26.
GROSS BETA	08/30/87	0001	PCI/L		52.		1.	17.
	04/18/89	0001			35.		1.	14.
IRON	08/30/87	0001	MG/L		0.01	J	0.03	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)

OTHER PARAMETER VALUE FLAGS:
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GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0629
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 EAST COORDINATE: 9477.7 FT
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: DOWN GRADIENT (D)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
IRON	04/18/89	0001	MG/L		0.07		0.03	-
LEAD	08/30/87 04/18/89	0001 0001	MG/L	< <	0.01 0.01		0.01 0.01	- -
LEAD-210	08/30/87 04/18/89	0001 0001	PCI/L		0.7 0.5		1.5 1.5	0.9 0.6
MAGNESIUM	08/30/87 04/18/89	0001 0001	MG/L		83.7 80.7		0.001 0.001	- -
MANGANESE	08/30/87 04/18/89	0001 0001	MG/L		0.39 0.18		0.01 0.01	- -
MERCURY	08/30/87 04/18/89	0001 0001	MG/L	<	0.0002 0.0002		0.0002 0.0002	- -
MOLYBDENUM	08/30/87 04/18/89	0001 0001	MG/L		0.02 0.01		0.01 0.01	- -
NICKEL	08/30/87 04/18/89	0001 0001	MG/L	< <	0.01 0.04	J	0.04 0.04	- -
NITRATE	08/30/87 04/18/89	0001 0001	MG/L		86.8 60.	H	1. 1.	- -
NITRITE	08/30/87	0001	MG/L	<	0.1		0.1	-
PH	08/30/87 04/18/89	0001 0001	SU		7.40 7.44		- -	- -
PHOSPHATE	08/30/87 04/18/89	0001 0001	MG/L	<	0.27 0.1	H	0.1 0.1	- -
POLONIUM-210	08/30/87 04/18/89	0001 0001	PCI/L		0.0 0.6		1. 1.	0.7 0.4
POTASSIUM	08/30/87 04/18/89	0001 0001	MG/L		17.7 13.7		0.01 0.01	- -
RADIUM-226	08/30/87 04/18/89	0001 0001	PCI/L		0.0 0.0		1. 1.	0.1 0.1
RADIUM-228	08/30/87 04/18/89	0001 0001	PCI/L		0.1 0.2		1. 1.	1.5 0.9
SELENIUM	08/30/87 04/18/89	0001 0001	MG/L		0.104 0.047	N	0.005 0.005	- -
SILICA - SiO2	08/30/87 04/18/89	0001 0001	MG/L		12.5 11.		2. 2.	- -
SODIUM	08/30/87 04/18/89	0001 0001	MG/L		1021. 882.		0.002 0.002	- -

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

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OTHER PARAMETER VALUE FLAGS:
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 J - ESTIMATED VALUE
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GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0629
 NORTH COORDINATE: 10558.8 FT
 EAST COORDINATE: 9477.7 FT
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: DOWN GRADIENT (D)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
SPECIFIC CONDUCTANCE	08/30/87	0001	UMHO/CM		3750.		-	-
	04/18/89	0001			3300.		-	-
STRONTIUM	08/30/87	0001	MG/L		6.30		0.1	-
	04/18/89	0001			4.3		0.1	-
SULFATE	08/30/87	0001	MG/L		3300.		0.1	-
	04/18/89	0001			3240.	H	0.1	-
SULFIDE	08/30/87	0001	MG/L	<	0.1		0.1	-
	04/18/89	0001		<	0.1		0.1	-
TEMPERATURE	08/30/87	0001	C - DEGREE		21.2		-	-
	04/18/89	0001			14.5		-	-
THALLIUM	04/18/89	0001	MG/L		0.01	J	0.01	-
THORIUM-230	08/30/87	0001	PCI/L		0.1		1.	0.7
	04/18/89	0001			0.0		1.	0.3
TIN	08/30/87	0001	MG/L		0.239		0.005	-
	04/18/89	0001			0.016		0.005	-
TOTAL DISSOLVED SOLIDS	08/30/87	0001	MG/L		5090.		10.	-
	04/18/89	0001			4790.	HJ	10.	-
TOTAL ORGANIC CARBON	08/30/87	0001	MG/L		35.8		1.	-
	04/18/89	0001			31.8		1.	-
URANIUM	08/30/87	0001	MG/L		0.0316		0.003	-
	04/18/89	0001			0.0299		0.003	-
VANADIUM	08/30/87	0001	MG/L		0.08		0.01	-
	04/18/89	0001			0.05		0.01	-
ZINC	08/30/87	0001	MG/L		0.029		0.005	-
	04/18/89	0001			0.033		0.005	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)

OTHER PARAMETER VALUE FLAGS:
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 J - ESTIMATED VALUE

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0630
 NORTH COORDINATE: 10547.5 FT
 EAST COORDINATE: 9482.5 FT
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: DOWN GRADIENT (D)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
ALKALINITY	08/30/87	0001	MG/L CaCO3		124.		-	-
	06/04/90	0001		130.	-	-		
	10/10/90	0001		218.	5.	-		
	05/12/91	0001		194.	-	-		
	09/18/92	0001		518	-	-		
	02/20/93	0001		499	-	-		
	04/23/93	N001		412	-	-		
	ALUMINUM	08/30/87		0001	MG/L		0.51	
06/04/90		0001	<	0.1			0.1	-
10/10/90		0001	<	0.05			0.05	-
05/12/91		0001	<	0.05			0.05	-
AMMONIUM	08/30/87	0001	MG/L		2.5	H	0.1	-
	06/04/90	0001		<	0.1		0.1	-
	10/10/90	0001			0.1		0.1	-
	05/12/91	0001		<	0.1		0.1	-
	04/23/93	N001			0.3		0.1	-
ANTIMONY	08/30/87	0001	MG/L		0.009		0.003	-
	06/04/90	0001			0.026		0.003	-
	10/10/90	0001		<	0.02	I	0.02	-
	05/12/91	0001		<	0.015	IW	0.015	-
	09/18/92	0001		<	0.0015	NW	0.0015	-
	04/23/93	0001		<	0.003		0.003	-
ANTIMONY (TOTAL)	04/23/93	N001	MG/L	<	0.003		0.003	-
ARSENIC	08/30/87	0001	MG/L		0.005	J	0.01	-
	06/04/90	0001			0.02		0.01	-
	10/10/90	0001		<	0.05	I	0.05	-
	05/12/91	0001		<	0.03	I	0.03	-
	09/18/92	0001		<	0.015	IN	0.015	-
	02/20/93	0001		<	0.005	W	0.005	-
	04/23/93	0001		<	0.01	I	0.005	-
	ARSENIC (TOTAL)	02/20/93		N001	MG/L	<	0.005	W
04/23/93		N001		<	0.005	W	0.005	-
BARIUM	08/30/87	0001	MG/L		0.03	J	0.1	-
	06/04/90	0001		<	0.1		0.1	-
	10/10/90	0001			0.01		0.01	-
	05/12/91	0001			0.01		0.01	-
BERYLLIUM	06/04/90	0001	MG/L	<	0.01		0.01	-
	10/10/90	0001		<	0.005		0.005	-
	05/12/91	0001		<	0.005		0.005	-
BORON	08/30/87	0001	MG/L		0.36		0.1	-
	06/04/90	0001			0.2		0.1	-
	10/10/90	0001			0.24		0.05	-
	05/12/91	0001			0.19		0.05	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:

0001 - FILTERED SAMPLE (.45 MICRONS)

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OTHER PARAMETER VALUE FLAGS:

H - HOLD TIME EXPIRED, VALUE SUSPECT

I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION

J - ESTIMATED VALUE

N - SPIKE SAMPLE RECOVERY NOT WITHIN CONTROL LIMITS

W - POST-DIGEST SPIKE OUT OF CNTR LIM WHILE SAMP ABS < 50% SPIKE

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0630
 NORTH COORDINATE: 10547.5 FT
 EAST COORDINATE: 9482.5 FT
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: DOWN GRADIENT (D)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
BROMIDE	08/30/87	0001	MG/L	<	0.1		0.1	-
CADMIUM	08/30/87	0001	MG/L	<	0.005		0.005	-
	06/04/90	0001		<	0.001		0.001	-
	10/10/90	0001		<	0.001		0.001	-
	05/12/91	0001		<	0.001		0.001	-
	09/18/92	0001		<	0.0003		0.00003	-
	02/20/93	0001		<	0.001	W	0.001	-
	04/23/93	0001		<	0.001		0.001	-
CADMIUM (TOTAL)	02/20/93	N001	MG/L	<	0.002	I	0.002	-
	04/23/93	N001		<	0.001		0.001	-
CALCIUM	08/30/87	0001	MG/L		416.		0.01	-
	06/04/90	0001			392.		0.01	-
	10/10/90	0001			400.		0.01	-
	05/12/91	0001			257.		0.5	-
	09/18/92	0001			480		0.0050	-
	02/20/93	0001			390		0.5	-
	04/23/93	0001			327		0.5	-
CALCIUM (TOTAL)	02/20/93	N001	MG/L		401		0.5	-
	04/23/93	N001			348		0.5	-
CHLORIDE	08/30/87	0001	MG/L		73.	HJ	1.	-
	06/04/90	0001			78.		1.	-
	10/10/90	0001			87.	H	1.	-
	05/12/91	0001			67.		1.	-
	09/18/92	0001			140	N	0.50	-
	04/23/93	N001			179		0.5	-
CHLORIDE (TOTAL)	02/20/93	N001	MG/L		199		0.5	-
CHROMIUM	08/30/87	0001	MG/L	<	0.01		0.01	-
	06/04/90	0001		<	0.01		0.01	-
	10/10/90	0001		<	0.01		0.01	-
	05/12/91	0001		<	0.01		0.01	-
	02/20/93	0001		<	0.01		0.01	-
	04/23/93	0001		<	0.01		0.01	-
CHROMIUM (TOTAL)	02/20/93	N001	MG/L	<	0.01		0.01	-
	04/23/93	N001		<	0.01		0.01	-
COBALT	08/30/87	0001	MG/L	<	0.01	J	0.05	-
	06/04/90	0001		<	0.05		0.05	-
	10/10/90	0001		<	0.03		0.03	-
	05/12/91	0001		<	0.03		0.03	-
	04/23/93	0001		<	0.05		0.05	-
COBALT (TOTAL)	04/23/93	N001	MG/L	<	0.05		0.05	-
COPPER	08/30/87	0001	MG/L		0.05		0.02	-
	06/04/90	0001		<	0.02		0.02	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:

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OTHER PARAMETER VALUE FLAGS:

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GROUNDWATER QUALITY DATA BY LOCATION
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 SITE: SHP01 SHIPROCK
 LOCATION: 0630
 NORTH COORDINATE: 10547.5 FT
 EAST COORDINATE: 9482.5 FT
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: DOWN GRADIENT (D)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
COPPER	10/10/90	0001	MG/L	<	0.01		0.01	-
	05/12/91	0001		<	0.01		0.01	-
	04/23/93	0001		<	0.02		0.02	-
COPPER (TOTAL)	04/23/93	N001	MG/L	<	0.02		0.02	-
DISSOLVED OXYGEN	02/20/93	0001	MG/L		0.1		-	-
	04/23/93	N001			0.0		-	-
FLUORIDE	08/30/87	0001	MG/L		1.4		0.1	-
	06/04/90	0001			1.5		0.1	-
	10/10/90	0001			1.8		0.1	-
	05/12/91	0001			1.8		0.1	-
GROSS ALPHA	08/30/87	0001	PCI/L		37.		0.2	18.
	09/18/92	0001			480.		164	192
	02/20/93	0001			230.		90.9	81.8
	04/23/93	0001			144		51.6	51.4
GROSS ALPHA (TOTAL)	02/20/93	N001	PCI/L		236.		91.6	82.8
	04/23/93	N001			133.		72.7	57.9
GROSS BETA	08/30/87	0001	PCI/L		29.		1.	18.
	09/18/92	0001			40.		170	101
	02/20/93	0001			128.		66.6	46.9
	04/23/93	0001			16.0		30.1	18.7
GROSS BETA (TOTAL)	02/20/93	N001	PCI/L		102.		67.0	45.7
	04/23/93	N001			12.8		58.3	35.3
IRON	08/30/87	0001	MG/L	<	0.01	J	0.03	-
	06/04/90	0001			0.08		0.03	-
	10/10/90	0001		<	0.03		0.03	-
	05/12/91	0001		<	0.03		0.03	-
	09/18/92	0001		<	0.018	I	0.018	-
	04/23/93	0001		<	0.03		0.03	-
IRON (TOTAL)	04/23/93	N001	MG/L	<	0.03		0.03	-
LEAD	08/30/87	0001	MG/L	<	0.01		0.01	-
	06/04/90	0001		<	0.01		0.01	-
	10/10/90	0001		<	0.01		0.01	-
	05/12/91	0001		<	0.03	I	0.03	-
	02/20/93	0001		<	0.003	W	0.003	-
	04/23/93	0001		<	0.003		0.003	-
LEAD (TOTAL)	02/20/93	N001	MG/L	<	0.03	IN	0.03	-
	04/23/93	N001		<	0.003		0.003	-
LEAD-210	08/30/87	0001	PCI/L		1.5		1.5	1.0
LEAD-210 (TOTAL)	04/23/93	N001	PCI/L		0.5		8.7	5.2
MAGNESIUM	08/30/87	0001	MG/L		91.7		0.001	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:

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GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0630
 NORTH COORDINATE: 10547.5 FT
 EAST COORDINATE: 9482.5 FT
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: DOWN GRADIENT (D)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
MAGNESIUM	06/04/90	0001	MG/L		95.2		0.001	-
	10/10/90	0001		82.2		0.01	-	
	05/12/91	0001		64.8	J	0.5	-	
	09/18/92	0001		210		0.011	-	
	02/20/93	0001		256		0.1	-	
MAGNESIUM (TOTAL)	02/20/93	N001	MG/L		264		0.1	-
MANGANESE	08/30/87	0001	MG/L		0.32		0.01	-
	06/04/90	0001		0.11		0.01	-	
	10/10/90	0001		0.20		0.01	-	
	05/12/91	0001		0.26		0.01	-	
	09/18/92	0001		0.92		0.0064	-	
	02/20/93	0001		0.78		0.01	-	
04/23/93	0001	0.69		0.01	-			
MANGANESE (TOTAL)	02/20/93	N001	MG/L		0.94		0.01	-
	04/23/93	N001		0.73		0.01	-	
MERCURY	08/30/87	0001	MG/L		0.0002		0.0002	-
	06/04/90	0001		<	0.0002		0.0002	-
	10/10/90	0001		<	0.0002		0.0002	-
	05/12/91	0001		<	0.0002		0.0002	-
MOLYBDENUM	08/30/87	0001	MG/L		0.04		0.01	-
	06/04/90	0001			0.02		0.01	-
	10/10/90	0001			0.01		0.01	-
	05/12/91	0001			0.02		0.01	-
	09/18/92	0001		<	0.025	I	0.025	-
	02/20/93	0001		<	0.01		0.01	-
04/23/93	0001		0.01		0.01	-		
MOLYBDENUM (TOTAL)	02/20/93	N001	MG/L		0.01		0.01	-
	04/23/93	N001			0.01		0.01	-
NICKEL	08/30/87	0001	MG/L	<	0.01	J	0.04	-
	06/04/90	0001		<	0.04		0.04	-
	10/10/90	0001		<	0.04		0.04	-
	05/12/91	0001		<	0.04		0.04	-
	09/18/92	0001		<	0.061	I	0.061	-
NITRATE	08/30/87	0001	MG/L		97.5	H	1.	-
	06/04/90	0001			51.		1.	-
	10/10/90	0001			31.		1.	-
	05/12/91	0001			265.		1.	-
	09/18/92	0001			100	J	0.044	-
	04/23/93	N001			93		1	-
NITRITE	08/30/87	0001	MG/L	<	0.1		0.1	-
PH	08/30/87	0001	SU		7.32		-	-
	06/04/90	0001			7.41		-	-
	10/10/90	0001			7.24		-	-
	05/12/91	0001			7.40		-	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)
 N001 - UNFILTERED SAMPLE

OTHER PARAMETER VALUE FLAGS:
 H - HOLD TIME EXPIRED, VALUE SUSPECT
 I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION
 J - ESTIMATED VALUE

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0630
 NORTH COORDINATE: 10547.5 FT
 EAST COORDINATE: 9482.5 FT
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: DOWN GRADIENT (D)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
PH	09/18/92	0001	SU		7.03		-	-
	02/20/93	0001			7.09		-	-
	04/23/93	N001			7.06		-	-
PHOSPHATE	08/30/87	0001	MG/L		0.46	H	0.1	-
	06/04/90	0001		<	0.1		0.1	-
	10/10/90	0001			0.1		0.1	-
	05/12/91	0001			0.1		0.1	-
	04/23/93	N001			0.1		0.1	-
POLONIUM-210	08/30/87	0001	PCI/L		0.0		1.	0.7
POLONIUM-210 (TOTAL)	04/23/93	N001	PCI/L		0.0		5.2	3.1
POTASSIUM	08/30/87	0001	MG/L		17.8		0.01	
	06/04/90	0001			11.8		0.01	
	10/10/90	0001			11.		0.01	
	05/12/91	0001			8.		5.	
	09/18/92	0001			19	E	0.20	
	02/20/93	0001			13.9		0.1	
POTASSIUM (TOTAL)	02/20/93	N001	MG/L		141		0.1	
RADIUM-226	08/30/87	0001	PCI/L		0.1		1.	0.2
	06/04/90	0001			0.1		1.	0.2
	10/10/90	0001			0.1		1.	0.2
	05/12/91	0001			0.0		1.	0.1
	09/18/92	0001			0.080		.0701	.0583
	02/20/93	0001			0.9		0.7	0.6
RADIUM-226 (TOTAL)	02/20/93	N001	PCI/L		0.6		0.7	0.5
	04/23/93	N001	PCI/L		0.9		1.6	1.1
RADIUM-228	08/30/87	0001	PCI/L		0.6		1.	1.8
	06/04/90	0001			0.8		1.	0.8
	10/10/90	0001			3.0		1.	2.5
	05/12/91	0001			14.1	J	1.	2.7
	09/18/92	0001			1.2		1.22	.683
	02/20/93	0001			0.4		3.5	2.1
REDOX POTENTIAL	02/20/93	0001	mVOLTS		467.7			
	04/23/93	N001			461			
SELENIUM	08/30/87	0001	MG/L		0.110		0.005	
	06/04/90	0001			0.049		0.005	
	10/10/90	0001			0.070		0.005	
	05/12/91	0001			0.050	W	0.05	
	09/18/92	0001			0.11	*NSW	0.0015	
	02/20/93	0001			0.196	*S	0.005	
	04/23/93	0001			0.12	S	0.005	
SELENIUM (TOTAL)	02/20/93	N001	MG/L		0.149		0.005	

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)
 N001 - UNFILTERED SAMPLE

OTHER PARAMETER VALUE FLAGS:

- * - DUPLICATE ANALYSIS NOT WITHIN CONTROL LIMITS
- E - ESTIMATED VALUE BECAUSE OF INTERFERENCE, SEE CASE NARRATIVE
- H - HOLD TIME EXPIRED, VALUE SUSPECT
- J - ESTIMATED VALUE
- N - SPIKE SAMPLE RECOVERY NOT WITHIN CONTROL LIMITS
- S - REPORTED VALUE DETERMINED USING METHOD OF STD ADDITION (MSA)
- W - POST-DIGEST SPIKE OUT OF CNTR LIM WHILE SAMP ABS < 50% SPIKE

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0630
 NORTH COORDINATE: 10547.5 FT
 EAST COORDINATE: 9482.5 FT
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: DOWN GRADIENT (D)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
SELENIUM (TOTAL)	04/23/93	N001	MG/L		0.1	S	0.005	-
SILICA - SiO2	08/30/87	0001	MG/L		12.0		2.	-
	06/04/90	0001			12.		2.	-
	10/10/90	0001			13.1		0.1	-
	05/12/91	0001			10.5		0.1	-
SILVER	06/04/90	0001	MG/L	<	0.01		0.01	-
	10/10/90	0001		<	0.01		0.01	-
	05/12/91	0001		<	0.01		0.01	-
SODIUM	08/30/87	0001	MG/L		1021.		0.002	-
	06/04/90	0001			1090.		0.002	-
	10/10/90	0001			1060.		5.	-
	05/12/91	0001			873.		5.	-
	09/18/92	0001			1400		0.011	-
	02/20/93	0001			1380		1	-
	04/23/93	0001			1120		0.1	-
SODIUM (TOTAL)	02/20/93	N001	MG/L		1440		1	-
	04/23/93	N001			1270		0.1	-
SPECIFIC CONDUCTANCE	08/30/87	0001	UMHO/CM		3300.		-	-
	06/04/90	0001			3850.		-	-
	10/10/90	0001			4610.		-	-
	05/12/91	0001			4730.		-	-
	09/18/92	0001			6750		-	-
	02/20/93	0001			5150		-	-
	04/23/93	N001			4200		-	-
STRONTIUM	08/30/87	0001	MG/L		6.35		0.1	-
	06/04/90	0001			6.85		0.1	-
	10/10/90	0001			6.40		0.01	-
	05/12/91	0001			5.00		0.01	-
	09/18/92	0001			13	N	0.010	-
	02/20/93	0001			14.4		0.01	-
	04/23/93	0001			11.3		0.01	-
STRONTIUM (TOTAL)	02/20/93	N001	MG/L		14.3		0.01	-
	04/23/93	N001			12.6		0.01	-
SULFATE	08/30/87	0001	MG/L		3320.		0.1	-
	06/04/90	0001			3220.		0.1	-
	10/10/90	0001			3030.		0.1	-
	05/12/91	0001			2580.	H	10.	-
	09/18/92	0001			4000	N	10.0	-
	04/23/93	N001			4860		1	-
SULFATE (TOTAL)	02/20/93	N001	MG/L		4770		1	-
SULFIDE	08/30/87	0001	MG/L	<	0.1		0.1	-
TEMPERATURE	08/30/87	0001	C - DEGREE		21.5		-	-
	06/04/90	0001			16.0		-	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

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OTHER PARAMETER VALUE FLAGS:
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 N - SPIKE SAMPLE RECOVERY NOT WITHIN CONTROL LIMITS
 S - REPORTED VALUE DETERMINED USING METHOD OF STD ADDITION (MSA)

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0630
 NORTH COORDINATE: 10547.5 FT
 EAST COORDINATE: 9482.5 FT
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: DOWN GRADIENT (D)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
TEMPERATURE	10/10/90	0001	C - DEGREE		21.1		-	-
	05/12/91	0001		12.1	-	-		
	09/18/92	0001		26.8	-	-		
	02/20/93	0001		9.3	-	-		
	04/23/93	N001		12.2	-	-		
THALLIUM	06/04/90	0001	MG/L	<	0.01		0.01	-
	10/10/90	0001		<	0.05	I	0.05	-
	05/12/91	0001		<	0.05	I	0.05	-
THORIUM-230	08/30/87	0001	PCI/L		0.0		1.	0.5
THORIUM-230 (TOTAL)	04/23/93	N001	PCI/L		0.8		0.5	0.5
TIN	08/30/87	0001	MG/L		0.237		0.005	
	06/04/90	0001		<	0.005		0.005	
	10/10/90	0001		<	0.05	I	0.05	
	05/12/91	0001		<	0.025	I	0.025	
TOTAL DISSOLVED SOLIDS	08/30/87	0001	MG/L		5160.		10.	
	06/04/90	0001			4860.		10.	
	10/10/90	0001			4670.	H	10.	
	05/12/91	0001			4040.		10.	
	09/18/92	0001			6500	H	10.0	
	04/23/93	N001			6570	H	10	
TOTAL DISSOLVED SOLIDS (TOTAL)	02/20/93	N001	MG/L		7410		10	
TOTAL ORGANIC CARBON	08/30/87	0001	MG/L		36.7		1.	
	04/23/93	N001			6		1	
TURBIDITY	04/23/93	N001	NTU		5			
URANIUM	08/30/87	0001	MG/L		0.0307		0.003	
	06/04/90	0001			0.037		0.003	
	10/10/90	0001			0.093		0.001	
	05/12/91	0001			0.076		0.001	
	09/18/92	0001			0.36		.0002	
	02/20/93	0001			0.538		0.001	
	04/23/93	0001			0.337		0.001	
	URANIUM (TOTAL)	02/20/93		N001	MG/L		0.557	
	04/23/93	N001			0.287		0.001	
VANADIUM	08/30/87	0001	MG/L		0.12		0.01	
	06/04/90	0001			0.03		0.01	
	10/10/90	0001			0.02		0.01	
	05/12/91	0001			0.01		0.01	
	09/18/92	0001			0.18	E	0.0019	
	04/23/93	0001			0.02		0.01	
VANADIUM (TOTAL)	04/23/93	N001	MG/L		0.02		0.01	
ZINC	08/30/87	0001	MG/L		0.025		0.005	

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
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 N001 - UNFILTERED SAMPLE

OTHER PARAMETER VALUE FLAGS:
 E - ESTIMATED VALUE BECAUSE OF INTERFERENCE. SEE CASE NARRATIVE
 H - HOLD TIME EXPIRED, VALUE SUSPECT
 I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION

GROUNDWATER QUALITY DATA BY
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0630
 NORTH COORDINATE: 10547.5 FT
 EAST COORDINATE: 9482.5 FT
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: DOWN GRADIENT (D)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
ZINC	06/04/90	0001	MG/L		0.039		0.005	
	10/10/90	0001		0.029		0.005		
	05/12/91	0001		0.033		0.005		
	09/18/92	0001		0.12	E	0.0010		
	04/23/93	0001		0.089		0.005		
ZINC (TOTAL)	04/23/93	N001	MG/L		0.1		0.005	

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
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 N001 - UNFILTERED SAMPLE

OTHER PARAMETER VALUE FLAGS:

E - ESTIMATED VALUE BECAUSE OF INTERFERENCE, SEE CASE NARRATIVE

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0648
 NORTH COORDINATE: UNKNOWN
 EAST COORDINATE: UNKNOWN
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: DAKOTA SANDSTONE (KD)
 HYDRAULIC FLOW RELATIONSHIP: UNKNOWN (N)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
ALKALINITY	03/17/87	0001	MG/L CaCO3		81.		-	-
	05/16/87	0001		65.		-	-	
	09/20/87	0001		66.		-	-	
	04/25/93	N001		60		-	-	
ALUMINIUM	03/17/87	0001	MG/L	<	0.1		0.1	-
	05/16/87	0001			0.08	J	0.1	-
	09/20/87	0001			0.09	J	0.1	-
AMMONIUM	03/17/87	0001	MG/L		0.4		0.1	-
	05/16/87	0001			0.5	H	0.1	-
	09/20/87	0001			0.4		0.1	-
	04/25/93	N001			0.6		0.1	-
ANTIMONY	03/17/87	0001	MG/L	<	0.003		0.003	-
	05/16/87	0001			0.035	J	0.003	-
	09/20/87	0001			0.042	J	0.003	-
	04/25/93	0001		<	0.003		0.003	-
ANTIMONY (TOTAL)	04/25/93	N001	MG/L	<	0.003		0.003	-
ARSENIC	03/17/87	0001	MG/L		0.003	J	0.01	-
	05/16/87	0001		<	0.001	J	0.01	-
	09/20/87	0001			0.016		0.01	-
	04/25/93	0001		<	0.005	W	0.005	-
ARSENIC (TOTAL)	04/25/93	N001	MG/L	<	0.005	W	0.005	-
BARIUM	03/17/87	0001	MG/L	<	0.1		0.1	-
	05/16/87	0001			0.01	J	0.1	-
	09/20/87	0001			0.02	J	0.1	-
BORON	03/17/87	0001	MG/L		0.25		0.1	-
	05/16/87	0001			0.14		0.1	-
	09/20/87	0001			0.15		0.1	-
BROMIDE	09/20/87	0001	MG/L	<	0.1		0.1	-
CADMIUM	03/17/87	0001	MG/L	<	0.001		0.001	-
	05/16/87	0001			0.008		0.001	-
	09/20/87	0001		<	0.005		0.005	-
	04/25/93	0001		<	0.001		0.001	-
CADMIUM (TOTAL)	04/25/93	N001	MG/L		0.001		0.001	-
CALCIUM	03/17/87	0001	MG/L		105.		0.01	-
	05/16/87	0001			111.		0.01	-
	09/20/87	0001			107.		0.01	-
	04/25/93	0001			116		0.5	-
CALCIUM (TOTAL)	04/25/93	N001	MG/L		111		0.5	-
CHLORIDE	03/17/87	0001	MG/L		36.6		1.	-
	05/16/87	0001			56.8		1.	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)
 N001 - UNFILTERED SAMPLE

OTHER PARAMETER VALUE FLAGS:

H - HOLD TIME EXPIRED, VALUE SUSPECT
 J - ESTIMATED VALUE
 W - POST-DIGEST SPIKE OUT OF CNTR LIM WHILE SAMP ABS < 50% SPIKE

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0648
 NORTH COORDINATE: UNKNOWN
 EAST COORDINATE: UNKNOWN
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: DAKOTA SANDSTONE (KD)
 HYDRAULIC FLOW RELATIONSHIP: UNKNOWN (N)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
CHLORIDE	09/20/87	0001	MG/L		59.0		1.	-
	04/25/93	N001			53.5		0.5	-
CHROMIUM	03/17/87	0001	MG/L		0.02		0.01	-
	05/16/87	0001			0.06		0.01	-
	09/20/87	0001		<	0.01		0.01	-
	04/25/93	0001		<	0.01		0.01	-
CHROMIUM (TOTAL)	04/25/93	N001	MG/L	<	0.01		0.01	-
COBALT	03/17/87	0001	MG/L		0.06		0.05	-
	05/16/87	0001		<	0.01	J	0.05	-
	09/20/87	0001		<	0.01	J	0.05	-
	04/25/93	0001		<	0.05		0.05	-
COBALT (TOTAL)	04/25/93	N001	MG/L	<	0.05		0.05	-
COPPER	03/17/87	0001	MG/L		0.01	J	0.02	-
	05/16/87	0001		<	0.01	J	0.02	-
	09/20/87	0001		<	0.01	J	0.02	-
	04/25/93	0001		<	0.02		0.02	-
COPPER (TOTAL)	04/25/93	N001	MG/L	<	0.02		0.02	-
FLUORIDE	03/17/87	0001	MG/L		2.11		0.1	-
	05/16/87	0001			2.12		0.1	-
	09/20/87	0001			1.80		0.1	-
GROSS ALPHA	09/20/87	0001	PCI/L		1.		0.2	11.
	04/25/93	0001			251.		97.0	88.5
GROSS ALPHA (TOTAL)	04/25/93	N001	PCI/L		1.7		42.3	25.3
GROSS BETA	09/20/87	0001	PCI/L		35.		1.	13.
	04/25/93	0001			180.		86.6	59.9
GROSS BETA (TOTAL)	04/25/93	N001	PCI/L		5.0		31.9	19.2
IRON	03/17/87	0001	MG/L		0.05		0.03	-
	05/16/87	0001			0.12		0.03	-
	09/20/87	0001			0.02	J	0.03	-
	04/25/93	0001			0.12		0.03	-
IRON (TOTAL)	04/25/93	N001	MG/L		0.16		0.03	-
LEAD	03/17/87	0001	MG/L	<	0.001	J	0.01	-
	05/16/87	0001			0.05		0.01	-
	09/20/87	0001		<	0.01		0.01	-
	04/25/93	0001		<	0.003		0.003	-
LEAD (TOTAL)	04/25/93	N001	MG/L	<	0.003		0.003	-
LEAD-210	03/17/87	0001	PCI/L		0.0		1.5	1.4
	05/16/87	0001			0.1		1.5	1.2
	09/20/87	0001			0.7		1.5	0.9
LEAD-210 (TOTAL)	04/25/93	N001	PCI/L		0.0		2.2	1.3

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

OTHER PARAMETER VALUE FLAGS:
 J - ESTIMATED VALUE

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)
 N001 - UNFILTERED SAMPLE

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0648
 NORTH COORDINATE: UNKNOWN
 EAST COORDINATE: UNKNOWN
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: DAKOTA SANDSTONE (KD)
 HYDRAULIC FLOW RELATIONSHIP: UNKNOWN (N)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
MAGNESIUM	03/17/87	0001	MG/L		13.6		0.001	-
	05/16/87	0001		13.5		0.001	-	
	09/20/87	0001		13.4		0.001	-	
MANGANESE	03/17/87	0001	MG/L		0.10		0.01	-
	05/16/87	0001		0.10		0.01	-	
	09/20/87	0001		0.09		0.01	-	
	04/25/93	0001		0.09		0.01	-	
MANGANESE (TOTAL)	04/25/93	N001	MG/L		0.09		0.01	-
MERCURY	09/20/87	0001	MG/L		0.0006		0.0002	-
MOLYBDENUM	03/17/87	0001	MG/L	<	0.1		0.1	-
	05/16/87	0001		<	0.01		0.01	-
	09/20/87	0001			0.03		0.01	-
	04/25/93	0001		<	0.01		0.01	-
MOLYBDENUM (TOTAL)	04/25/93	N001	MG/L	<	0.01		0.01	-
NICKEL	03/17/87	0001	MG/L		0.07		0.04	-
	05/16/87	0001		<	0.01	J	0.04	-
	09/20/87	0001		<	0.01	J	0.04	-
NITRATE	03/17/87	0001	MG/L	<	0.1	J	1.	-
	05/16/87	0001			0.4	HJ	1.	-
	09/20/87	0001		<	0.1	J	1.	-
	04/25/93	N001			1		1	-
NITRITE	03/17/87	0001	MG/L	<	0.1		0.1	-
	05/16/87	0001		<	0.1		0.1	-
	09/20/87	0001		<	0.1		0.1	-
PH	03/17/87	0001	SU		7.95		-	-
	05/16/87	0001		8.11		-	-	
	09/20/87	0001		8.11		-	-	
	04/25/93	N001		8.01		-	-	
PHOSPHATE	03/17/87	0001	MG/L		0.15		0.1	-
	05/16/87	0001			0.61	H	0.1	-
	09/20/87	0001		<	0.1	H	0.1	-
	04/25/93	N001		<	0.1		0.1	-
POLONIUM-210	03/17/87	0001	PCI/L		0.3		1.	0.3
	05/16/87	0001			0.0		1.	0.4
	09/20/87	0001			0.1		1.	0.6
POLONIUM-210 (TOTAL)	04/25/93	N001	PCI/L		0.0		0.6	0.3
POTASSIUM	03/17/87	0001	MG/L		7.72		0.01	-
	05/16/87	0001			7.79		0.01	-
	09/20/87	0001			7.34		0.01	-
RADIUM-226	03/17/87	0001	PCI/L		0.6		1.	0.3
	05/16/87	0001			0.3		1.	0.2

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)
 N001 - UNFILTERED SAMPLE

OTHER PARAMETER VALUE FLAGS:
 H - HOLD TIME EXPIRED, VALUE SUSPECT
 J - ESTIMATED VALUE

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0648
 NORTH COORDINATE: UNKNOWN
 EAST COORDINATE: UNKNOWN
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: DAKOTA SANDSTONE (KD)
 HYDRAULIC FLOW RELATIONSHIP: UNKNOWN (N)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
RADIUM-226	09/20/87	0001	PCI/L		0.3		1.	0.2
RADIUM-226 (TOTAL)	04/25/93	N001	PCI/L		1.9		0.4	0.5
RADIUM-228	03/17/87	0001	PCI/L		1.0		1.	0.9
	05/16/87	0001			1.2		1.	1.3
	09/20/87	0001			1.0		1.	3.0
SELENIUM	03/17/87	0001	MG/L	<	0.002	J	0.005	-
	05/16/87	0001		<	0.001	J	0.005	-
	09/20/87	0001			0.046		0.005	-
	04/25/93	0001		<	0.01	I	0.005	-
SELENIUM (TOTAL)	04/25/93	N001	MG/L	<	0.005	W	0.005	-
SILICA - SiO2	03/17/87	0001	MG/L		15.1		2.	-
	05/16/87	0001			19.5		2.	-
	09/20/87	0001			14.4		2.	-
SODIUM	03/17/87	0001	MG/L		879.		0.002	-
	05/16/87	0001			917.		0.002	-
	09/20/87	0001			842.		0.002	-
	04/25/93	0001			802		0.1	-
SODIUM (TOTAL)	04/25/93	N001	MG/L		832		0.1	-
SPECIFIC CONDUCTANCE	03/17/87	0001	UMHO/CM		3050.		-	-
	05/16/87	0001			3325.		-	-
	09/20/87	0001			2900.		-	-
	04/25/93	N001			4460		-	-
STRONTIUM	03/17/87	0001	MG/L		11.4		0.1	-
	05/16/87	0001			7.50		0.1	-
	09/20/87	0001			10.9		0.1	-
	04/25/93	0001			11.9		0.01	-
STRONTIUM (TOTAL)	04/25/93	N001	MG/L		12.2		0.01	-
SULFATE	03/17/87	0001	MG/L		2050.		0.1	-
	05/16/87	0001			2100.		0.1	-
	09/20/87	0001			1960.		0.1	-
	04/25/93	N001			2340		1	-
SULFIDE	09/20/87	0001	MG/L	<	0.1		0.1	-
TEMPERATURE	03/17/87	0001	C - DEGREE		30.		-	-
	05/16/87	0001			31.0		-	-
	09/20/87	0001			30.0		-	-
	04/25/93	N001			29.7		-	-
THORIUM-230	03/17/87	0001	PCI/L		0.0		1.	0.4
	05/16/87	0001			0.0		1.	0.4
	09/20/87	0001			0.1		1.	0.4
THORIUM-230 (TOTAL)	04/25/93	N001	PCI/L		0.3		0.2	0.2

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

OTHER PARAMETER VALUE FLAGS:
 I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION
 J - ESTIMATED VALUE
 W - POST-DIGEST SPIKE OUT OF CNTR LIM WHILE SAMP ABS < 50% SPIKE

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)
 N001 - UNFILTERED SAMPLE

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0648
 NORTH COORDINATE: UNKNOWN
 EAST COORDINATE: UNKNOWN
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: DAKOTA SANDSTONE (KD)
 HYDRAULIC FLOW RELATIONSHIP: UNKNOWN (N)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
TIN	03/17/87	0001	MG/L		0.009		0.005	-
	05/16/87	0001		<	0.005		0.005	-
	09/20/87	0001			0.020		0.005	-
TOTAL DISSOLVED SOLIDS	03/17/87	0001	MG/L		3110.		10.	-
	05/16/87	0001			3100.	H	10.	-
	09/20/87	0001			3100.		10.	-
	04/25/93	N001			3090	H	10	-
TOTAL ORGANIC CARBON	03/17/87	0001	MG/L		11.5		1.	
	05/16/87	0001			41.1		1.	
	09/20/87	0001			14.2		1.	
	04/25/93	N001		<	1		1	
URANIUM	03/17/87	0001	MG/L	<	0.0003	J	0.003	-
	05/16/87	0001		<	0.0003	J	0.003	-
	09/20/87	0001		<	0.0003	J	0.003	-
	04/25/93	0001		<	0.001		0.001	-
URANIUM (TOTAL)	04/25/93	N001	MG/L	<	0.001		0.001	-
VANADIUM	03/17/87	0001	MG/L	<	0.2		0.2	-
	05/16/87	0001		<	0.01		0.01	-
	09/20/87	0001		<	0.02		0.01	-
	04/25/93	0001		<	0.01		0.01	-
VANADIUM (TOTAL)	04/25/93	N001	MG/L	<	0.01		0.01	-
ZINC	03/17/87	0001	MG/L	<	0.005		0.005	-
	05/16/87	0001		<	0.005		0.005	-
	09/20/87	0001		<	0.005		0.005	-
	04/25/93	0001		<	0.005		0.005	-
ZINC (TOTAL)	04/25/93	N001	MG/L	<	0.005		0.005	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)
 N001 - UNFILTERED SAMPLE

OTHER PARAMETER VALUE FLAGS:
 H - HOLD TIME EXPIRED, VALUE SUSPECT
 J - ESTIMATED VALUE

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP02 SHIPROCK (TAILINGS AREA)
 LOCATION: 0725 RESERVED FOR PAUL MARTINEZ
 NORTH COORDINATE: UNKNOWN
 EAST COORDINATE: UNKNOWN
 10/11/88 TO 04/26/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: NO RECOVERY OF DATA FOR CLASSIFYING (NR)
 HYDRAULIC FLOW RELATIONSHIP: UNKNOWN (N)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
ALKALINITY	04/22/93	N001	MG/L CaCO3		250		-	-
AMMONIUM	04/22/93	N001	MG/L		0.3		0.1	-
ANTIMONY	04/22/93	0001	MG/L	<	0.003		0.003	-
ANTIMONY (TOTAL)	04/22/93	N001	MG/L	<	0.003		0.003	-
ARSENIC	04/22/93	0001	MG/L	<	0.005	W	0.005	-
ARSENIC (TOTAL)	04/22/93	N001	MG/L	<	0.005	W	0.005	-
CADMIUM	04/22/93	0001	MG/L	<	0.001		0.001	-
CADMIUM (TOTAL)	04/22/93	N001	MG/L		0.002		0.001	-
CALCIUM	04/22/93	0001	MG/L		379		0.5	-
CALCIUM (TOTAL)	04/22/93	N001	MG/L		392		0.5	-
CHLORIDE	04/22/93	N001	MG/L		218		0.5	-
CHROMIUM	04/22/93	0001	MG/L	<	0.01		0.01	-
CHROMIUM (TOTAL)	04/22/93	N001	MG/L	<	0.01		0.01	-
COBALT	04/22/93	0001	MG/L	<	0.05		0.05	-
COBALT (TOTAL)	04/22/93	N001	MG/L	<	0.05		0.05	-
COPPER	04/22/93	0001	MG/L	<	0.02		0.02	-
COPPER (TOTAL)	04/22/93	N001	MG/L	<	0.02		0.02	-
DISSOLVED OXYGEN	04/22/93	N001	MG/L		1.8		-	-
GROSS ALPHA	04/22/93	0001	PCI/L		212.		68.4	66.3
GROSS ALPHA (TOTAL)	04/22/93	N001	PCI/L		225.		67.1	66.7
GROSS BETA	04/22/93	0001	PCI/L		37.5		67.5	41.8
GROSS BETA (TOTAL)	04/22/93	N001	PCI/L		4.8		69.7	41.7
IRON	04/22/93	0001	MG/L	<	0.03		0.03	-
IRON (TOTAL)	04/22/93	N001	MG/L	<	0.03		0.03	-
LEAD	04/22/93	0001	MG/L	<	0.003		0.003	-
LEAD (TOTAL)	04/22/93	N001	MG/L	<	0.003		0.003	-
LEAD-210 (TOTAL)	04/22/93	N001	PCI/L		0.0		2.2	1.3
MANGANESE	04/22/93	0001	MG/L	<	0.01		0.01	-
MANGANESE (TOTAL)	04/22/93	N001	MG/L	<	0.01		0.01	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)
 N001 - UNFILTERED SAMPLE

OTHER PARAMETER VALUE FLAGS:
 W - POST-DIGEST SPIKE OUT OF CNTR LIM WHILE SAMP ABS < 50% SPIKE

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP02 SHIPROCK (TAILINGS AREA)
 LOCATION: 0725 RESERVED FOR PAUL MARTINEZ
 NORTH COORDINATE: UNKNOWN
 EAST COORDINATE: UNKNOWN
 10/11/88 TO 04/26/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: NO RECOVERY OF DATA FOR CLASSIFYING (NR)
 HYDRAULIC FLOW RELATIONSHIP: UNKNOWN (N)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
MOLYBDENUM	04/22/93	0001	MG/L		0.01		0.01	-
MOLYBDENUM (TOTAL)	04/22/93	N001	MG/L		0.01		0.01	-
NITRATE	04/22/93	N001	MG/L		197		1	-
PH	04/22/93	N001	SU		6.99		-	-
PHOSPHATE	04/22/93	N001	MG/L		0.1		0.1	-
POLONIUM-210 (TOTAL)	04/22/93	N001	PCI/L		0.2		0.6	0.2
RADIUM-226 (TOTAL)	04/22/93	N001	PCI/L		0.3		0.4	0.3
REDOX POTENTIAL	04/22/93	N001	mVOLTS		479		-	-
SELENIUM	04/22/93	0001	MG/L		0.077		0.005	-
SELENIUM (TOTAL)	04/22/93	N001	MG/L		0.078		0.005	-
SODIUM	04/22/93	0001	MG/L		1130		0.1	-
SODIUM (TOTAL)	04/22/93	N001	MG/L		1210		0.1	-
SPECIFIC CONDUCTANCE	04/22/93	N001	UMHO/CM		4640		-	-
STRONTIUM	04/22/93	0001	MG/L		10.2		0.01	-
STRONTIUM (TOTAL)	04/22/93	N001	MG/L		10.9		0.01	-
SULFATE	04/22/93	N001	MG/L		4810		1	-
TEMPERATURE	04/22/93	N001	C - DEGREE		12.6		-	-
THORIUM-230 (TOTAL)	04/22/93	N001	PCI/L		0.4		0.4	0.3
TOTAL DISSOLVED SOLIDS	04/22/93	N001	MG/L		6220	H	10	-
TOTAL ORGANIC CARBON	04/22/93	N001	MG/L		7		1	-
TURBIDITY	04/22/93	N001	NTU		3.0		-	-
URANIUM	04/22/93	0001	MG/L		0.496		0.001	-
URANIUM (TOTAL)	04/22/93	N001	MG/L		0.503		0.001	-
VANADIUM	04/22/93	0001	MG/L		0.02		0.01	-
VANADIUM (TOTAL)	04/22/93	N001	MG/L		0.03		0.01	-
ZINC	04/22/93	0001	MG/L	<	0.005		0.005	-
ZINC (TOTAL)	04/22/93	N001	MG/L	<	0.005		0.005	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

OTHER PARAMETER VALUE FLAGS:
 H - HOLD TIME EXPIRED, VALUE SUSPECT

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)
 N001 - UNFILTERED SAMPLE

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP02 SHIPROCK (TAILINGS AREA)
 LOCATION: 0726 RESERVED FOR PAUL MARTINEZ
 NORTH COORDINATE: UNKNOWN
 EAST COORDINATE: UNKNOWN
 10/11/88 TO 04/26/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: NO RECOVERY OF DATA FOR CLASSIFYING (NR)
 HYDRAULIC FLOW RELATIONSHIP: UNKNOWN (N)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
ALKALINITY	04/26/93	N001	MG/L CaCO3		376		-	-
AMMONIUM	04/26/93	N001	MG/L		0.7		0.1	-
ANTIMONY	04/26/93	0001	MG/L	<	0.003		0.003	-
ANTIMONY (TOTAL)	04/26/93	N001	MG/L	<	0.003		0.003	-
ARSENIC	04/26/93	0001	MG/L	<	0.005	W	0.005	-
ARSENIC (TOTAL)	04/26/93	N001	MG/L	<	0.005	W	0.005	-
CADMIUM	04/26/93	0001	MG/L	<	0.001		0.001	-
CADMIUM (TOTAL)	04/26/93	N001	MG/L		0.003		0.001	-
CALCIUM	04/26/93	0001	MG/L		337		0.5	-
CALCIUM (TOTAL)	04/26/93	N001	MG/L		470		0.5	-
CHLORIDE	04/26/93	N001	MG/L		96.6		0.5	-
CHROMIUM	04/26/93	0001	MG/L	<	0.01		0.01	-
CHROMIUM (TOTAL)	04/26/93	N001	MG/L	<	0.05	I	0.01	-
COBALT	04/26/93	0001	MG/L	<	0.05		0.05	-
COBALT (TOTAL)	04/26/93	N001	MG/L	<	0.05		0.05	-
COPPER	04/26/93	0001	MG/L	<	0.02		0.02	-
COPPER (TOTAL)	04/26/93	N001	MG/L	<	0.05	I	0.02	-
GROSS ALPHA	04/26/93	0001	PCI/L		0.0		110.	63.9
GROSS ALPHA (TOTAL)	04/26/93	N001	PCI/L		0.0		115.	62.9
GROSS BETA	04/26/93	0001	PCI/L		33.0		95.9	58.5
GROSS BETA (TOTAL)	04/26/93	N001	PCI/L		0.0		100.	58.1
IRON	04/26/93	0001	MG/L	<	0.03		0.03	-
IRON (TOTAL)	04/26/93	N001	MG/L		10.4		0.03	-
LEAD	04/26/93	0001	MG/L	<	0.003		0.003	-
LEAD (TOTAL)	04/26/93	N001	MG/L		0.009		0.003	-
LEAD-210 (TOTAL)	04/26/93	N001	PCI/L		0.9		2.0	1.2
MANGANESE	04/26/93	0001	MG/L		0.23		0.01	-
MANGANESE (TOTAL)	04/26/93	N001	MG/L		0.42		0.01	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)
 N001 - UNFILTERED SAMPLE

OTHER PARAMETER VALUE FLAGS:

I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION
 W - POST-DIGEST SPIKE OUT OF CNTR LIM WHILE SAMP ABS < 50% SPIKE

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP02 SHIPROCK (TAILINGS AREA)
 LOCATION: 0726 RESERVED FOR PAUL MARTINEZ
 NORTH COORDINATE: UNKNOWN
 EAST COORDINATE: UNKNOWN
 10/11/88 TO 04/26/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: NO RECOVERY OF DATA FOR CLASSIFYING (NR)
 HYDRAULIC FLOW RELATIONSHIP: UNKNOWN (N)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
MOLYBDENUM	04/26/93	0001	MG/L	<	0.01		0.01	-
MOLYBDENUM (TOTAL)	04/26/93	N001	MG/L		0.05		0.01	-
NITRATE	04/26/93	N001	MG/L		26		1	-
PH	04/26/93	N001	SU		6.92		-	-
PHOSPHATE	04/26/93	N001	MG/L		1		0.1	-
POLONIUM-210 (TOTAL)	04/26/93	N001	PCI/L		1.3		1.2	0.8
RADIUM-226 (TOTAL)	04/26/93	N001	PCI/L		2.9		0.9	0.8
SELENIUM	04/26/93	0001	MG/L	<	0.01	I	0.005	-
SELENIUM (TOTAL)	04/26/93	N001	MG/L		0.01		0.005	-
SODIUM	04/26/93	0001	MG/L		1330		0.1	-
SODIUM (TOTAL)	04/26/93	N001	MG/L		1910		0.1	-
SPECIFIC CONDUCTANCE	04/26/93	N001	UMHO/CM		7560		-	-
STRONTIUM	04/26/93	0001	MG/L		4.94		0.01	-
STRONTIUM (TOTAL)	04/26/93	N001	MG/L		7.07		0.01	-
SULFATE	04/26/93	N001	MG/L		6840		1	-
TEMPERATURE	04/26/93	N001	C - DEGREE		15.4		-	-
THORIUM-230 (TOTAL)	04/26/93	N001	PCI/L		0.5		0.2	0.3
TOTAL DISSOLVED SOLIDS	04/26/93	N001	MG/L		9270	H	10	-
TOTAL ORGANIC CARBON	04/26/93	N001	MG/L		12		1	-
URANIUM	04/26/93	0001	MG/L		0.022		0.001	-
URANIUM (TOTAL)	04/26/93	N001	MG/L		0.024		0.001	-
VANADIUM	04/26/93	0001	MG/L	<	0.01		0.01	-
VANADIUM (TOTAL)	04/26/93	N001	MG/L		0.05		0.01	-
ZINC	04/26/93	0001	MG/L	<	0.005		0.005	-
ZINC (TOTAL)	04/26/93	N001	MG/L		0.04		0.005	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:

0001 - FILTERED SAMPLE (.45 MICRONS)

N001 - UNFILTERED SAMPLE

OTHER PARAMETER VALUE FLAGS:

H - HOLD TIME EXPIRED, VALUE SUSPECT

I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP02 SHIPROCK (TAILINGS AREA)
 LOCATION: 0727 RESERVED FOR PAUL MARTINEZ
 NORTH COORDINATE: UNKNOWN
 EAST COORDINATE: UNKNOWN
 10/11/88 TO 04/26/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: NO RECOVERY OF DATA FOR CLASSIFYING (NR)
 HYDRAULIC FLOW RELATIONSHIP: UNKNOWN (N)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
ALKALINITY	04/26/93	N001	MG/L CaCO3		1709		-	-
AMMONIUM	04/26/93	N001	MG/L		1.7		0.1	-
ANTIMONY	04/26/93	0001	MG/L	<	0.003		0.003	-
ANTIMONY (TOTAL)	04/26/93	N001	MG/L	<	0.003		0.003	-
ARSENIC	04/26/93	0001	MG/L	<	0.005	W	0.005	-
ARSENIC (TOTAL)	04/26/93	N001	MG/L	<	0.01	I	0.005	-
CADMIUM	04/26/93	0001	MG/L		0.001		0.001	-
CADMIUM (TOTAL)	04/26/93	N001	MG/L		0.006		0.001	-
CALCIUM	04/26/93	0001	MG/L		457		0.5	-
CALCIUM (TOTAL)	04/26/93	N001	MG/L		498		0.5	-
CHLORIDE	04/26/93	N001	MG/L		491		0.5	-
CHROMIUM	04/26/93	0001	MG/L	<	0.1	I	0.01	-
CHROMIUM (TOTAL)	04/26/93	N001	MG/L	<	0.05	I	0.01	-
COBALT	04/26/93	0001	MG/L	<	0.1	I	0.05	-
COBALT (TOTAL)	04/26/93	N001	MG/L	<	0.05		0.05	-
COPPER	04/26/93	0001	MG/L	<	0.1	I	0.02	-
COPPER (TOTAL)	04/26/93	N001	MG/L	<	0.05	I	0.02	-
DISSOLVED OXYGEN	04/26/93	N001	MG/L		0.7		-	-
GROSS ALPHA	04/26/93	0001	PCI/L		190.		231.	161.
GROSS ALPHA (TOTAL)	04/26/93	N001	PCI/L		50.2		243.	151.
GROSS BETA	04/26/93	0001	PCI/L		149.		208.	130.
GROSS BETA (TOTAL)	04/26/93	N001	PCI/L		897.		216.	165.
IRON	04/26/93	0001	MG/L	<	0.2	I	0.03	-
IRON (TOTAL)	04/26/93	N001	MG/L		3.13		0.03	-
LEAD	04/26/93	0001	MG/L	<	0.003		0.003	-
LEAD (TOTAL)	04/26/93	N001	MG/L		0.003		0.003	-
LEAD-210 (TOTAL)	04/26/93	N001	PCI/L		0.0		2.0	1.2
MANGANESE	04/26/93	0001	MG/L		1.5		0.01	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)
 N001 - UNFILTERED SAMPLE

OTHER PARAMETER VALUE FLAGS:
 I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION
 W - POST-DIGEST SPIKE OUT OF CNTR LIM WHILE SAMP ABS < 50% SPIKE

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP02 SHIPROCK (TAILINGS AREA)
 LOCATION: 0727 RESERVED FOR PAUL MARTINEZ
 NORTH COORDINATE: UNKNOWN
 EAST COORDINATE: UNKNOWN
 10/11/88 TO 04/26/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: NO RECOVERY OF DATA FOR CLASSIFYING (NR)
 HYDRAULIC FLOW RELATIONSHIP: UNKNOWN (N)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
MANGANESE (TOTAL)	04/26/93	N001	MG/L		1.61		0.01	
MOLYBDENUM	04/26/93	0001	MG/L	<	0.1	I	0.01	
MOLYBDENUM (TOTAL)	04/26/93	N001	MG/L	<	0.05	I	0.01	-
NITRATE	04/26/93	N001	MG/L		2310		1	
PH	04/26/93	N001	SU		6.31			
PHOSPHATE	04/26/93	N001	MG/L		0.7		0.1	
POLONIUM-210 (TOTAL)	04/26/93	N001	PCI/L		0.0		1.2	0.7
RADIUM-226 (TOTAL)	04/26/93	N001	PCI/L		3.6		0.9	0.8
REDOX POTENTIAL	04/26/93	N001	mVOLTS		461			
SELENIUM	04/26/93	0001	MG/L	<	0.01	I	0.005	-
SELENIUM (TOTAL)	04/26/93	N001	MG/L	<	0.005	W	0.005	
SODIUM	04/26/93	0001	MG/L		3030		0.1	
SODIUM (TOTAL)	04/26/93	N001	MG/L		3090		0.1	
SPECIFIC CONDUCTANCE	04/26/93	N001	UMHO/CM		14680			
STRONTIUM	04/26/93	0001	MG/L		14.7		0.01	
STRONTIUM (TOTAL)	04/26/93	N001	MG/L		15.7		0.01	-
SULFATE	04/26/93	N001	MG/L		18100		1	
TEMPERATURE	04/26/93	N001	C - DEGREE		14.6			
THORIUM-230 (TOTAL)	04/26/93	N001	PCI/L		0.5		0.4	0.3
TOTAL DISSOLVED SOLIDS	04/26/93	N001	MG/L		23900	H	10	
TOTAL ORGANIC CARBON	04/26/93	N001	MG/L		27		1	
TURBIDITY	04/26/93	N001	NTU		93			
URANIUM	04/26/93	0001	MG/L		0.496		0.001	
URANIUM (TOTAL)	04/26/93	N001	MG/L		0.546		0.001	
VANADIUM	04/26/93	0001	MG/L	<	0.1	I	0.01	
VANADIUM (TOTAL)	04/26/93	N001	MG/L	<	0.05	I	0.01	
ZINC	04/26/93	0001	MG/L	<	0.05	I	0.005	
ZINC (TOTAL)	04/26/93	N001	MG/L		0.02		0.005	

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)
 N001 - UNFILTERED SAMPLE

OTHER PARAMETER VALUE FLAGS:

H - HOLD TIME EXPIRED, VALUE SUSPECT

I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION

W - POST-DIGEST SPIKE OUT OF CNTR LIM WHILE SAMP ABS < 50% SPIKE

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP02 SHIPROCK (TAILINGS AREA)
 LOCATION: 0727 RESERVED FOR PAUL MARTINEZ
 NORTH COORDINATE: UNKNOWN
 EAST COORDINATE: UNKNOWN
 10/11/88 TO 04/26/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: NO RECOVERY OF DATA FOR CLASSIFYING (NR)
 HYDRAULIC FLOW RELATIONSHIP: UNKNOWN (N)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
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PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT SAMPLE ID CODES:

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GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP02 SHIPROCK (TAILINGS AREA)
 LOCATION: 0728 RESERVED FOR PAUL MARTINEZ
 NORTH COORDINATE: UNKNOWN
 EAST COORDINATE: UNKNOWN
 10/11/88 TO 04/26/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: NO RECOVERY OF DATA FOR CLASSIFYING (NR)
 HYDRAULIC FLOW RELATIONSHIP: UNKNOWN (N)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
ALKALINITY	04/25/93	N001	MG/L CaCO3		416		-	-
AMMONIUM	04/25/93	N001	MG/L		218		0.1	-
ANTIMONY	04/25/93	0001	MG/L	<	0.003		0.003	-
ANTIMONY (TOTAL)	04/25/93	N001	MG/L	<	0.003		0.003	-
ARSENIC	04/25/93	0001	MG/L	<	0.005	W	0.005	-
ARSENIC (TOTAL)	04/25/93	N001	MG/L	<	0.005	W	0.005	-
CADMIUM	04/25/93	0001	MG/L	<	0.001		0.001	-
CADMIUM (TOTAL)	04/25/93	N001	MG/L		0.001		0.001	-
CALCIUM	04/25/93	0001	MG/L		541		0.5	-
CALCIUM (TOTAL)	04/25/93	N001	MG/L		514		0.5	-
CHLORIDE	04/25/93	N001	MG/L		52.4		0.5	-
CHROMIUM	04/25/93	0001	MG/L	<	0.01		0.01	-
CHROMIUM (TOTAL)	04/25/93	N001	MG/L	<	0.01		0.01	-
COBALT	04/25/93	0001	MG/L	<	0.05		0.05	-
COBALT (TOTAL)	04/25/93	N001	MG/L	<	0.05		0.05	-
COPPER	04/25/93	0001	MG/L	<	0.02		0.02	-
COPPER (TOTAL)	04/25/93	N001	MG/L	<	0.02		0.02	-
GROSS ALPHA	04/25/93	0001	PCI/L		69.2		96.2	67.1
GROSS ALPHA (TOTAL)	04/25/93	N001	PCI/L		251.		98.7	89.5
GROSS BETA	04/25/93	0001	PCI/L		157.		88.1	59.8
GROSS BETA (TOTAL)	04/25/93	N001	PCI/L		141.		85.8	57.7
IRON	04/25/93	0001	MG/L	<	0.03		0.03	-
IRON (TOTAL)	04/25/93	N001	MG/L		4.89		0.03	-
LEAD	04/25/93	0001	MG/L	<	0.003		0.003	-
LEAD (TOTAL)	04/25/93	N001	MG/L	<	0.003		0.003	-
LEAD-210 (TOTAL)	04/25/93	N001	PCI/L		0.2		2.2	1.3
MANGANESE	04/25/93	0001	MG/L		0.36		0.01	-
MANGANESE (TOTAL)	04/25/93	N001	MG/L		0.39		0.01	-
MOLYBDENUM	04/25/93	0001	MG/L	<	0.01		0.01	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)
 N001 - UNFILTERED SAMPLE

OTHER PARAMETER VALUE FLAGS:

W - POST-DIGEST SPIKE OUT OF CNTR LIM WHILE SAMP ABS < 50% SPIKE

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP02 SHIPROCK (TAILINGS AREA)
 LOCATION: 0728 RESERVED FOR PAUL MARTINEZ
 NORTH COORDINATE: UNKNOWN
 EAST COORDINATE: UNKNOWN
 10/11/88 TO 04/26/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: NO RECOVERY OF DATA FOR CLASSIFYING (NR)
 HYDRAULIC FLOW RELATIONSHIP: UNKNOWN (N)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
MOLYBDENUM (TOTAL)	04/25/93	N001	MG/L		0.01		0.01	-
NITRATE	04/25/93	N001	MG/L		2220		1	-
PH	04/25/93	N001	SU		6.68		-	-
PHOSPHATE	04/25/93	N001	MG/L		1		0.1	-
POLONIUM-210 (TOTAL)	04/25/93	N001	PCI/L		0.0		0.6	0.3
RADIUM-226 (TOTAL)	04/25/93	N001	PCI/L		6.4		0.4	0.9
SELENIUM	04/25/93	0001	MG/L		0.072	S	0.005	-
SELENIUM (TOTAL)	04/25/93	N001	MG/L		0.051		0.005	-
SODIUM	04/25/93	0001	MG/L		534		0.1	-
SODIUM (TOTAL)	04/25/93	N001	MG/L		527		0.1	-
SPECIFIC CONDUCTANCE	04/25/93	N001	UMHO/CM		6930		-	-
STRONTIUM	04/25/93	0001	MG/L		7.41		0.01	-
STRONTIUM (TOTAL)	04/25/93	N001	MG/L		7.24		0.01	-
SULFATE	04/25/93	N001	MG/L		4370		1	-
TEMPERATURE	04/25/93	N001	C - DEGREE		14.6		-	-
THORIUM-230 (TOTAL)	04/25/93	N001	PCI/L		0.5		0.2	0.4
TOTAL DISSOLVED SOLIDS	04/25/93	N001	MG/L		8660	H	10	-
TOTAL ORGANIC CARBON	04/25/93	N001	MG/L		6		1	-
URANIUM	04/25/93	0001	MG/L		0.336		0.001	-
URANIUM (TOTAL)	04/25/93	N001	MG/L		0.362		0.001	-
VANADIUM	04/25/93	0001	MG/L	<	0.01		0.01	-
VANADIUM (TOTAL)	04/25/93	N001	MG/L		0.03		0.01	-
ZINC	04/25/93	0001	MG/L		0.012		0.005	-
ZINC (TOTAL)	04/25/93	N001	MG/L		0.05		0.005	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)
 N001 - UNFILTERED SAMPLE

OTHER PARAMETER VALUE FLAGS:
 H - HOLD TIME EXPIRED, VALUE SUSPECT
 S - REPORTED VALUE DETERMINED USING METHOD OF STD ADDITION (MSA)

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP02 SHIPROCK (TAILINGS AREA)
 LOCATION: 0731 RESERVED FOR PAUL MARTINEZ
 NORTH COORDINATE: UNKNOWN
 EAST COORDINATE: UNKNOWN
 10/11/88 TO 04/26/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: NO RECOVERY OF DATA FOR CLASSIFYING (NR)
 HYDRAULIC FLOW RELATIONSHIP: UNKNOWN (N)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
ALKALINITY	04/25/93	N001	MG/L CAC03		344		-	-
AMMONIUM	04/25/93	N001	MG/L		73		0.1	-
ANTIMONY	04/25/93	0001	MG/L	<	0.003		0.003	-
ANTIMONY (TOTAL)	04/25/93	N001	MG/L	<	0.003		0.003	-
ARSENIC	04/25/93	0001	MG/L	<	0.005	W	0.005	-
ARSENIC (TOTAL)	04/25/93	N001	MG/L	<	0.005	W	0.005	-
CADMIUM	04/25/93	0001	MG/L	<	0.001		0.001	-
CADMIUM (TOTAL)	04/25/93	N001	MG/L		0.002		0.001	-
CALCIUM	04/25/93	0001	MG/L		433		0.5	-
CALCIUM (TOTAL)	04/25/93	N001	MG/L		481		0.5	-
CHLORIDE	04/25/93	N001	MG/L		444		0.5	-
CHROMIUM	04/25/93	0001	MG/L	<	0.01		0.01	-
CHROMIUM (TOTAL)	04/25/93	N001	MG/L		0.02		0.01	-
COBALT	04/25/93	0001	MG/L	<	0.05		0.05	-
COBALT (TOTAL)	04/25/93	N001	MG/L	<	0.05		0.05	-
COPPER	04/25/93	0001	MG/L	<	0.02		0.02	-
COPPER (TOTAL)	04/25/93	N001	MG/L	<	0.02		0.02	-
GROSS ALPHA	04/25/93	0001	PCI/L		224.		66.6	65.7
GROSS ALPHA (TOTAL)	04/25/93	N001	PCI/L		9.4		97.4	59.4
GROSS BETA	04/25/93	0001	PCI/L		53.2		60.7	38.7
GROSS BETA (TOTAL)	04/25/93	N001	PCI/L		86.1		90.2	57.8
IRON	04/25/93	0001	MG/L	<	0.03		0.03	-
IRON (TOTAL)	04/25/93	N001	MG/L		10.1		0.03	-
LEAD	04/25/93	0001	MG/L	<	0.003		0.003	-
LEAD (TOTAL)	04/25/93	N001	MG/L		0.007		0.003	-
LEAD-210 (TOTAL)	04/25/93	N001	PCI/L		0.0		2.2	1.3
MANGANESE	04/25/93	0001	MG/L		0.38		0.01	-
MANGANESE (TOTAL)	04/25/93	N001	MG/L		0.47		0.01	-
MOLYBDENUM	04/25/93	0001	MG/L		0.01		0.01	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)
 N001 - UNFILTERED SAMPLE

OTHER PARAMETER VALUE FLAGS:
 W - POST-DIGEST SPIKE OUT OF CNTR LIM WHILE SAMP ABS < 50% SPIKE

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP02 SHIPROCK (TAILINGS AREA)
 LOCATION: 0731 RESERVED FOR PAUL MARTINEZ
 NORTH COORDINATE: UNKNOWN
 EAST COORDINATE: UNKNOWN
 10/11/88 TO 04/26/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: NO RECOVERY OF DATA FOR CLASSIFYING (NR)
 HYDRAULIC FLOW RELATIONSHIP: UNKNOWN (N)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
MOLYBDENUM (TOTAL)	04/25/93	N001	MG/L		0.01		0.01	-
NITRATE	04/25/93	N001	MG/L		738		1	-
PH	04/25/93	N001	SU		7.08		-	-
PHOSPHATE	04/25/93	N001	MG/L		1.5		0.1	-
POLONIUM-210 (TOTAL)	04/25/93	N001	PCI/L		1.3		0.6	0.6
RADIUM-226 (TOTAL)	04/25/93	N001	PCI/L		3.6		0.4	0.7
SELENIUM	04/25/93	0001	MG/L		0.25	S	0.005	-
SELENIUM (TOTAL)	04/25/93	N001	MG/L		0.192		0.005	-
SODIUM	04/25/93	0001	MG/L		934		0.1	-
SODIUM (TOTAL)	04/25/93	N001	MG/L		1080		0.1	-
SPECIFIC CONDUCTANCE	04/25/93	N001	UMHO/CM		6990		-	-
STRONTIUM	04/25/93	0001	MG/L		7.05		0.01	-
STRONTIUM (TOTAL)	04/25/93	N001	MG/L		8.14		0.01	-
SULFATE	04/25/93	N001	MG/L		4780		1	-
TEMPERATURE	04/25/93	N001	C - DEGREE		14.7		-	-
THORIUM-230 (TOTAL)	04/25/93	N001	PCI/L		0.8		0.4	0.4
TOTAL DISSOLVED SOLIDS	04/25/93	N001	MG/L		8590	H	10	-
TOTAL ORGANIC CARBON	04/25/93	N001	MG/L		6		1	-
URANIUM	04/25/93	0001	MG/L		0.038		0.001	-
URANIUM (TOTAL)	04/25/93	N001	MG/L		0.046		0.001	-
VANADIUM	04/25/93	0001	MG/L	<	0.01		0.01	-
VANADIUM (TOTAL)	04/25/93	N001	MG/L		0.04		0.01	-
ZINC	04/25/93	0001	MG/L		0.159		0.005	-
ZINC (TOTAL)	04/25/93	N001	MG/L		0.05		0.005	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)
 N001 - UNFILTERED SAMPLE

OTHER PARAMETER VALUE FLAGS:
 H - HOLD TIME EXPIRED, VALUE SUSPECT
 S - REPORTED VALUE DETERMINED USING METHOD OF STD ADDITION (MSA)

DATA FILE NAME: \DART\SHPO2\GHW10001.DAT

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0732 RESERVED FOR PAUL MARTINEZ
 NORTH COORDINATE: UNKNOWN
 EAST COORDINATE: UNKNOWN
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: UNKNOWN (N)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
ALKALINITY	04/22/93	N001	MG/L CaCO3		234		-	-
AMMONIUM	04/22/93	N001	MG/L		2.3		0.1	-
ANTIMONY	04/22/93	0001	MG/L	<	0.003		0.003	-
ANTIMONY (TOTAL)	04/22/93	N001	MG/L	<	0.003		0.003	-
ARSENIC	04/22/93	0001	MG/L	<	0.005	W	0.005	-
ARSENIC (TOTAL)	04/22/93	N001	MG/L	<	0.005	W	0.005	-
CADMIUM	04/22/93	0001	MG/L	<	0.001		0.001	-
CADMIUM (TOTAL)	04/22/93	N001	MG/L		0.002		0.001	-
CALCIUM	04/22/93	0001	MG/L		181		0.5	-
CALCIUM (TOTAL)	04/22/93	N001	MG/L		182		0.5	-
CHLORIDE	04/22/93	N001	MG/L		65		0.5	-
CHROMIUM	04/22/93	0001	MG/L	<	0.01		0.01	-
CHROMIUM (TOTAL)	04/22/93	N001	MG/L	<	0.01		0.01	-
COBALT	04/22/93	0001	MG/L	<	0.05		0.05	-
COBALT (TOTAL)	04/22/93	N001	MG/L	<	0.05		0.05	-
COPPER	04/22/93	0001	MG/L	<	0.02		0.02	-
COPPER (TOTAL)	04/22/93	N001	MG/L	<	0.02		0.02	-
DISSOLVED OXYGEN	04/22/93	N001	MG/L		0.1		-	-
GROSS ALPHA	04/22/93	0001	PCI/L		32.2		28.4	21.4
GROSS ALPHA (TOTAL)	04/22/93	N001	PCI/L		39.2		27.5	21.7
GROSS BETA	04/22/93	0001	PCI/L		1.6		29.7	17.7
GROSS BETA (TOTAL)	04/22/93	N001	PCI/L		0.0		29.6	17.4
IRON	04/22/93	0001	MG/L	<	0.03		0.03	-
IRON (TOTAL)	04/22/93	N001	MG/L	<	0.03		0.03	-
LEAD	04/22/93	0001	MG/L	<	0.003		0.003	-
LEAD (TOTAL)	04/22/93	N001	MG/L	<	0.003		0.003	-
LEAD-210 (TOTAL)	04/22/93	N001	PCI/L		0.0		2.2	1.3
MANGANESE	04/22/93	0001	MG/L		1.28		0.01	-
MANGANESE (TOTAL)	04/22/93	N001	MG/L		1.32		0.01	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)
 N001 - UNFILTERED SAMPLE

OTHER PARAMETER VALUE FLAGS:

W - POST-DIGEST SPIKE OUT OF CNTR LIM WHILE SAMP ABS < 50% SPIKE

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0732 RESERVED FOR PAUL MARTINEZ
 NORTH COORDINATE: UNKNOWN
 EAST COORDINATE: UNKNOWN
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: UNKNOWN (N)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
MOLYBDENUM	04/22/93	0001	MG/L	<	0.01		0.01	-
MOLYBDENUM (TOTAL)	04/22/93	N001	MG/L	<	0.01		0.01	-
NITRATE	04/22/93	N001	MG/L		310		1	-
PH	04/22/93	N001	SU		7.31		-	-
PHOSPHATE	04/22/93	N001	MG/L		0.1		0.1	-
POLONIUM-210 (TOTAL)	04/22/93	N001	PCI/L		0.0		0.6	0.4
RADIUM-226 (TOTAL)	04/22/93	N001	PCI/L		0.2		0.4	0.3
REDOX POTENTIAL	04/22/93	N001	mVOLTS		470		-	-
SELENIUM	04/22/93	0001	MG/L		0.007		0.005	-
SELENIUM (TOTAL)	04/22/93	N001	MG/L		0.005	S	0.005	-
SODIUM	04/22/93	0001	MG/L		331		0.1	-
SODIUM (TOTAL)	04/22/93	N001	MG/L		345		0.1	-
SPECIFIC CONDUCTANCE	04/22/93	N001	UMHO/CM		2410		-	-
STRONTIUM	04/22/93	0001	MG/L		2.66		0.01	-
STRONTIUM (TOTAL)	04/22/93	N001	MG/L		2.78		0.01	-
SULFATE	04/22/93	N001	MG/L		1630		1	-
TEMPERATURE	04/22/93	N001	C - DEGREE		12.6		-	-
THORIUM-230 (TOTAL)	04/22/93	N001	PCI/L		0.2		0.2	0.2
TOTAL DISSOLVED SOLIDS	04/22/93	N001	MG/L		2630	H	10	-
TOTAL ORGANIC CARBON	04/22/93	N001	MG/L		4		1	-
TURBIDITY	04/22/93	N001	NTU		2.0		-	-
URANIUM	04/22/93	0001	MG/L		0.015		0.001	-
URANIUM (TOTAL)	04/22/93	N001	MG/L		0.018		0.001	-
VANADIUM	04/22/93	0001	MG/L	<	0.01		0.01	-
VANADIUM (TOTAL)	04/22/93	N001	MG/L	<	0.01		0.01	-
ZINC	04/22/93	0001	MG/L	<	0.005		0.005	-
ZINC (TOTAL)	04/22/93	N001	MG/L	<	0.005		0.005	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

OTHER PARAMETER VALUE FLAGS:
 H - HOLD TIME EXPIRED, VALUE SUSPECT
 S - REPORTED VALUE DETERMINED USING METHOD OF STD ADDITION (MSA)

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)
 N001 - UNFILTERED SAMPLE

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0733 RESERVED FOR PAUL MARTINEZ
 NORTH COORDINATE: UNKNOWN
 EAST COORDINATE: UNKNOWN
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: UNKNOWN (N)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
ALKALINITY	04/27/93	N001	MG/L CAC03		448		-	-
AMMONIUM	04/27/93	N001	MG/L		0.8		0.1	-
ANTIMONY	04/24/93	0001	MG/L	<	0.003		0.003	-
ANTIMONY (TOTAL)	04/27/93	N001	MG/L	<	0.003		0.003	-
ARSENIC	04/24/93	0001	MG/L	<	0.005	W	0.005	-
ARSENIC (TOTAL)	04/27/93	N001	MG/L	<	0.005	W	0.005	-
CADMIUM	04/24/93	0001	MG/L	<	0.001		0.001	-
CADMIUM (TOTAL)	04/27/93	N001	MG/L	<	0.001		0.001	-
CALCIUM	04/24/93	0001	MG/L		353		0.5	-
CALCIUM (TOTAL)	04/27/93	N001	MG/L		405		0.5	-
CHLORIDE	04/27/93	N001	MG/L		181		0.5	-
CHROMIUM	04/24/93	0001	MG/L	<	0.01		0.01	-
CHROMIUM (TOTAL)	04/27/93	N001	MG/L	<	0.01		0.01	-
COBALT	04/24/93	0001	MG/L	<	0.05		0.05	-
COBALT (TOTAL)	04/27/93	N001	MG/L	<	0.05		0.05	-
COPPER	04/24/93	0001	MG/L	<	0.02		0.02	-
COPPER (TOTAL)	04/27/93	N001	MG/L	<	0.02		0.02	-
DISSOLVED OXYGEN	04/27/93	N001	MG/L		0.0		-	-
GROSS ALPHA	04/27/93	0001	PCI/L		0.0		56.6	31.4
GROSS ALPHA (TOTAL)	04/27/93	N001	PCI/L		9.6		58.3	35.9
GROSS BETA	04/27/93	0001	PCI/L		37.2		49.9	31.4
GROSS BETA (TOTAL)	04/27/93	N001	PCI/L		0.0		51.2	30.0
IRON	04/24/93	0001	MG/L		1.61		0.03	-
IRON (TOTAL)	04/27/93	N001	MG/L		2.36		0.03	-
LEAD	04/24/93	0001	MG/L	<	0.003		0.003	-
LEAD (TOTAL)	04/27/93	N001	MG/L	<	0.003		0.003	-
LEAD-210 (TOTAL)	04/27/93	N001	PCI/L		0.0		2.0	1.1
MANGANESE	04/24/93	0001	MG/L		3.99		0.01	-
MANGANESE (TOTAL)	04/27/93	N001	MG/L		4.65		0.01	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

OTHER PARAMETER VALUE FLAGS:

W - POST-DIGEST SPIKE OUT OF CNTR LIM WHILE SAMP ABS < 50% SPIKE

SAMPLE ID CODES:

0001 - FILTERED SAMPLE (.45 MICRONS)

N001 - UNFILTERED SAMPLE

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0733 RESERVED FOR PAUL MARTINEZ
 NORTH COORDINATE: UNKNOWN
 EAST COORDINATE: UNKNOWN
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: UNKNOWN (N)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
MOLYBDENUM	04/24/93	0001	MG/L	<	0.01		0.01	-
MOLYBDENUM (TOTAL)	04/27/93	N001	MG/L	<	0.01		0.01	-
NITRATE	04/27/93	N001	MG/L	<	1		1	-
PH	04/27/93	N001	SU		6.97		-	-
PHOSPHATE	04/27/93	N001	MG/L		0.1		0.1	-
POLONIUM-210 (TOTAL)	04/27/93	N001	PCI/L		0.0		1.4	0.8
RADIUM-226 (TOTAL)	04/27/93	N001	PCI/L		0.0		0.9	0.5
REDOX POTENTIAL	04/27/93	N001	mVOLTS		522		-	-
SELENIUM	04/24/93	0001	MG/L	<	0.005	W	0.005	-
SELENIUM (TOTAL)	04/27/93	N001	MG/L	<	0.005	S	0.005	-
SODIUM	04/24/93	0001	MG/L		489		0.1	-
SODIUM (TOTAL)	04/27/93	N001	MG/L		599		0.1	-
SPECIFIC CONDUCTANCE	04/27/93	N001	UMHO/CM		3930		-	-
STRONTIUM	04/24/93	0001	MG/L		4.61		0.01	-
STRONTIUM (TOTAL)	04/27/93	N001	MG/L		5.68		0.01	-
SULFATE	04/27/93	N001	MG/L		3420		1	-
TEMPERATURE	04/27/93	N001	C - DEGREE		11.9		-	-
THORIUM-230 (TOTAL)	04/27/93	N001	PCI/L		0.7		0.3	0.4
TOTAL DISSOLVED SOLIDS	04/27/93	N001	MG/L		5150	H	10	-
TOTAL ORGANIC CARBON	04/27/93	N001	MG/L		6		1	-
TURBIDITY	04/27/93	N001	NTU		4		-	-
URANIUM	04/27/93	0001	MG/L		0.023		0.001	-
URANIUM (TOTAL)	04/27/93	N001	MG/L		0.027		0.001	-
VANADIUM	04/24/93	0001	MG/L	<	0.01		0.01	-
VANADIUM (TOTAL)	04/27/93	N001	MG/L	<	0.01		0.01	-
ZINC	04/24/93	0001	MG/L	<	0.005		0.005	-
ZINC (TOTAL)	04/27/93	N001	MG/L		0.01		0.005	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)
 N001 - UNFILTERED SAMPLE

OTHER PARAMETER VALUE FLAGS:
 H - HOLD TIME EXPIRED, VALUE SUSPECT
 S - REPORTED VALUE DETERMINED USING METHOD OF STD ADDITION (MSA)
 W - POST-DIGEST SPIKE OUT OF CNTR LIM WHILE SAMP ABS < 50% SPIKE

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0734 RESERVED FOR PAUL MARTINEZ
 NORTH COORDINATE: UNKNOWN
 EAST COORDINATE: UNKNOWN
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: UNKNOWN (N)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
ALKALINITY	04/23/93	N001	MG/L CaCO3		406		-	-
AMMONIUM	04/23/93	N001	MG/L		0.4		0.1	-
ANTIMONY	04/23/93	0001	MG/L	<	0.003		0.003	-
ANTIMONY (TOTAL)	04/23/93	N001	MG/L	<	0.003		0.003	-
ARSENIC	04/23/93	0001	MG/L	<	0.01	I	0.005	-
ARSENIC (TOTAL)	04/23/93	N001	MG/L	<	0.005	W	0.005	-
CADMIUM	04/23/93	0001	MG/L	<	0.001		0.001	-
CADMIUM (TOTAL)	04/23/93	N001	MG/L	<	0.001		0.001	-
CALCIUM	04/23/93	0001	MG/L		116		0.5	-
CALCIUM (TOTAL)	04/23/93	N001	MG/L		111		0.5	-
CHLORIDE	04/23/93	N001	MG/L		272		0.5	-
CHROMIUM	04/23/93	0001	MG/L	<	0.1	I	0.01	-
CHROMIUM (TOTAL)	04/23/93	N001	MG/L	<	0.01		0.01	-
COBALT	04/23/93	0001	MG/L	<	0.1	I	0.05	-
COBALT (TOTAL)	04/23/93	N001	MG/L	<	0.05		0.05	-
COPPER	04/23/93	0001	MG/L	<	0.1	I	0.02	-
COPPER (TOTAL)	04/23/93	N001	MG/L	<	0.02		0.02	-
DISSOLVED OXYGEN	04/23/93	N001	MG/L		0.1		-	-
GROSS ALPHA	04/23/93	0001	PCI/L		176.		136.	105.
GROSS ALPHA (TOTAL)	04/23/93	N001	PCI/L		222.		66.0	65.1
GROSS BETA	04/23/93	0001	PCI/L		171.		127.	83.7
GROSS BETA (TOTAL)	04/23/93	N001	PCI/L		39.3		62.7	39.2
IRON	04/23/93	0001	MG/L		0.6		0.03	-
IRON (TOTAL)	04/23/93	N001	MG/L		0.48		0.03	-
LEAD	04/23/93	0001	MG/L	<	0.003		0.003	-
LEAD (TOTAL)	04/23/93	N001	MG/L	<	0.003		0.003	-
LEAD-210 (TOTAL)	04/23/93	N001	PCI/L		0.0		2.2	1.3
MANGANESE	04/23/93	0001	MG/L		1.4		0.01	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)
 N001 - UNFILTERED SAMPLE

OTHER PARAMETER VALUE FLAGS:

I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION
 W - POST-DIGEST SPIKE OUT OF CNTR LIM WHILE SAMP ABS < 50% SPIKE

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0734 RESERVED FOR PAUL MARTINEZ
 NORTH COORDINATE: UNKNOWN
 EAST COORDINATE: UNKNOWN
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: UNKNOWN (N)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
MANGANESE (TOTAL)	04/23/93	N001	MG/L		1.34		0.01	-
MOLYBDENUM	04/23/93	0001	MG/L	<	0.1	I	0.01	-
MOLYBDENUM (TOTAL)	04/23/93	N001	MG/L		0.03		0.01	-
NITRATE	04/23/93	N001	MG/L		1		1	-
PH	04/23/93	N001	SU		7.39		-	-
PHOSPHATE	04/23/93	N001	MG/L		0.2		0.1	-
POLONIUM-210 (TOTAL)	04/23/93	N001	PCI/L		0.0		0.6	0.4
RADIUM-226 (TOTAL)	04/23/93	N001	PCI/L		0.9		0.4	0.4
REDOX POTENTIAL	04/23/93	N001	mVOLTS		240		-	-
SELENIUM	04/23/93	0001	MG/L		0.033	W	0.005	-
SELENIUM (TOTAL)	04/23/93	N001	MG/L		0.035		0.005	-
SODIUM	04/23/93	0001	MG/L		1640		0.1	-
SODIUM (TOTAL)	04/23/93	N001	MG/L		1520		0.1	-
SPECIFIC CONDUCTANCE	04/23/93	N001	UMHO/CM		4450		-	-
STRONTIUM	04/23/93	0001	MG/L		3.2		0.01	-
STRONTIUM (TOTAL)	04/23/93	N001	MG/L		3.11		0.01	-
SULFATE	04/23/93	N001	MG/L		3900		1	-
TEMPERATURE	04/23/93	N001	C - DEGREE		11.4		-	-
THORIUM-230 (TOTAL)	04/23/93	N001	PCI/L		0.3		0.3	0.2
TOTAL DISSOLVED SOLIDS	04/23/93	N001	MG/L		5310	H	10	-
TOTAL ORGANIC CARBON	04/23/93	N001	MG/L		16		1	-
TURBIDITY	04/23/93	N001	NTU		9		-	-
URANIUM	04/23/93	0001	MG/L		0.152		0.001	-
URANIUM (TOTAL)	04/23/93	N001	MG/L		0.520		0.001	-
VANADIUM	04/23/93	0001	MG/L	<	0.1	I	0.01	-
VANADIUM (TOTAL)	04/23/93	N001	MG/L	<	0.01		0.01	-
ZINC	04/23/93	0001	MG/L	<	0.05	I	0.005	-
ZINC (TOTAL)	04/23/93	N001	MG/L		0.02		0.005	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)
 N001 - UNFILTERED SAMPLE

OTHER PARAMETER VALUE FLAGS:

H - HOLD TIME EXPIRED, VALUE SUSPECT
 I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION
 W - POST-DIGEST SPIKE OUT OF CNTR LIM WHILE SAMP ABS < 50% SPIKE

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0734 RESERVED FOR PAUL MARTINEZ
 NORTH COORDINATE: UNKNOWN
 EAST COORDINATE: UNKNOWN
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: UNKNOWN (N)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
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PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT SAMPLE ID CODES:

0734
 RESERVED FOR PAUL MARTINEZ
 NORTH COORDINATE: UNKNOWN
 EAST COORDINATE: UNKNOWN
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0735 RESERVED FOR PAUL MARTINEZ
 NORTH COORDINATE: UNKNOWN
 EAST COORDINATE: UNKNOWN
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: UNKNOWN (N)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
ALKALINITY	04/24/93	N001	MG/L CaCO3		548		-	-
AMMONIUM	04/24/93	N001	MG/L		0.4		0.1	-
ANTIMONY	04/24/93	0001	MG/L	<	0.003		0.003	-
ANTIMONY (TOTAL)	04/24/93	N001	MG/L	<	0.003		0.003	-
ARSENIC	04/24/93	0001	MG/L	<	0.01	I	0.005	-
ARSENIC (TOTAL)	04/24/93	N001	MG/L	<	0.005	W	0.005	-
CADMIUM	04/24/93	0001	MG/L	<	0.001		0.001	-
CADMIUM (TOTAL)	04/24/93	N001	MG/L		0.001		0.001	-
CALCIUM	04/24/93	0001	MG/L		463		0.5	-
CALCIUM (TOTAL)	04/24/93	N001	MG/L		509		0.5	-
CHLORIDE	04/24/93	N001	MG/L		419		0.5	-
CHROMIUM	04/24/93	0001	MG/L	<	0.05	I	0.01	-
CHROMIUM (TOTAL)	04/24/93	N001	MG/L	<	0.02	I	0.01	-
COBALT	04/24/93	0001	MG/L	<	0.05		0.05	-
COBALT (TOTAL)	04/24/93	N001	MG/L	<	0.05		0.05	-
COPPER	04/24/93	0001	MG/L	<	0.05	I	0.02	-
COPPER (TOTAL)	04/24/93	N001	MG/L	<	0.02		0.02	-
DISSOLVED OXYGEN	04/24/93	N001	MG/L		0.0		-	-
GROSS ALPHA	04/24/93	0001	PCI/L		208.		145.	114.
GROSS ALPHA (TOTAL)	04/24/93	N001	PCI/L		103.		143.	99.9
GROSS BETA	04/24/93	0001	PCI/L		174.		128.	84.2
GROSS BETA (TOTAL)	04/24/93	N001	PCI/L		34.8		131.	79.5
IRON	04/24/93	0001	MG/L	<	0.1	I	0.03	-
IRON (TOTAL)	04/24/93	N001	MG/L	<	0.03		0.03	-
LEAD	04/24/93	0001	MG/L	<	0.003		0.003	-
LEAD (TOTAL)	04/24/93	N001	MG/L		0.006		0.003	-
LEAD-210 (TOTAL)	04/24/93	N001	PCI/L		0.0		202.	1.3
MANGANESE	04/24/93	0001	MG/L		4.6		0.01	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)
 N001 - UNFILTERED SAMPLE

OTHER PARAMETER VALUE FLAGS:

I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION
 W - POST-DIGEST SPIKE OUT OF CNTR LIM WHILE SAMP ABS < 50% SPIKE

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0735 RESERVED FOR PAUL MARTINEZ
 NORTH COORDINATE: UNKNOWN
 EAST COORDINATE: UNKNOWN
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: UNKNOWN (N)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
MANGANESE (TOTAL)	04/24/93	N001	MG/L		5.08		0.01	-
MOLYBDENUM	04/24/93	0001	MG/L	<	0.05	I	0.01	-
MOLYBDENUM (TOTAL)	04/24/93	N001	MG/L		0.02		0.01	-
NITRATE	04/24/93	N001	MG/L		2360		1	-
PH	04/24/93	N001	SU		6.89		-	-
PHOSPHATE	04/24/93	N001	MG/L		0.1		0.1	-
POLONIUM-210 (TOTAL)	04/24/93	N001	PCI/L		0.3		0.6	0.4
RADIUM-226 (TOTAL)	04/24/93	N001	PCI/L		1.8		0.4	0.5
REDOX POTENTIAL	04/24/93	N001	mVOLTS		488		-	-
SELENIUM	04/24/93	0001	MG/L		0.16	S	0.005	-
SELENIUM (TOTAL)	04/24/93	N001	MG/L		0.159	S	0.005	-
SODIUM	04/24/93	0001	MG/L		2040		0.1	-
SODIUM (TOTAL)	04/24/93	N001	MG/L		2250		0.1	-
SPECIFIC CONDUCTANCE	04/24/93	N001	UMHO/CM		8250		-	-
STRONTIUM	04/24/93	0001	MG/L		8.9		0.01	-
STRONTIUM (TOTAL)	04/24/93	N001	MG/L		9.98		0.01	-
SULFATE	04/24/93	N001	MG/L		7610		1	-
TEMPERATURE	04/24/93	N001	C - DEGREE		9.9		-	-
THORIUM-230 (TOTAL)	04/24/93	N001	PCI/L		0.5		0.5	0.4
TOTAL DISSOLVED SOLIDS	04/24/93	N001	MG/L		13700	H	10	-
TOTAL ORGANIC CARBON	04/24/93	N001	MG/L		11		1	-
TURBIDITY	04/24/93	N001	NTU		2		-	-
URANIUM	04/24/93	0001	MG/L		0.138		0.001	-
URANIUM (TOTAL)	04/24/93	N001	MG/L		0.146		0.001	-
VANADIUM	04/24/93	0001	MG/L	<	0.05	I	0.01	-
VANADIUM (TOTAL)	04/24/93	N001	MG/L	<	0.02	I	0.01	-
ZINC	04/24/93	0001	MG/L		0.08		0.005	-
ZINC (TOTAL)	04/24/93	N001	MG/L		0.12		0.005	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)
 N001 - UNFILTERED SAMPLE

OTHER PARAMETER VALUE FLAGS:
 H - HOLD TIME EXPIRED, VALUE SUSPECT
 I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION
 S - REPORTED VALUE DETERMINED USING METHOD OF STD ADDITION (MSA)

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0735 RESERVED FOR PAUL MARTINEZ
 NORTH COORDINATE: UNKNOWN
 EAST COORDINATE: UNKNOWN
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: UNKNOWN (N)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
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PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT SAMPLE ID CODES:

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0736 RESERVED FOR PAUL MARTINEZ
 NORTH COORDINATE: UNKNOWN
 EAST COORDINATE: UNKNOWN
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: UNKNOWN (N)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
ALKALINITY	04/23/93	N001	MG/L CaCO3		881		-	-
AMMONIUM	04/23/93	N001	MG/L		2.6		0.1	-
ANTIMONY	04/23/93	0001	MG/L	<	0.003		0.003	-
ANTIMONY (TOTAL)	04/23/93	N001	MG/L	<	0.003		0.003	-
ARSENIC	04/23/93	0001	MG/L	<	0.01	I	0.005	-
ARSENIC (TOTAL)	04/23/93	N001	MG/L	<	0.01	IW	0.005	-
CADMIUM	04/23/93	0001	MG/L	<	0.001		0.001	-
CADMIUM (TOTAL)	04/23/93	N001	MG/L		0.004		0.001	-
CALCIUM	04/23/93	0001	MG/L		412		0.5	-
CALCIUM (TOTAL)	04/23/93	N001	MG/L		439		0.5	-
CHLORIDE	04/23/93	N001	MG/L		655		0.5	-
CHROMIUM	04/23/93	0001	MG/L	<	0.1	I	0.01	-
CHROMIUM (TOTAL)	04/23/93	N001	MG/L	<	0.05	I	0.01	-
COBALT	04/23/93	0001	MG/L	<	0.1	I	0.05	-
COBALT (TOTAL)	04/23/93	N001	MG/L	<	0.05		0.05	-
COPPER	04/23/93	0001	MG/L	<	0.1	I	0.02	-
COPPER (TOTAL)	04/23/93	N001	MG/L	<	0.05	I	0.02	-
DISSOLVED OXYGEN	04/23/93	N001	MG/L		0.8		-	-
GROSS ALPHA	04/23/93	0001	PCI/L		971.		2.2	225.
GROSS ALPHA (TOTAL)	04/23/93	N001	PCI/L		458.		208.	181.
GROSS BETA	04/23/93	0001	PCI/L		425.		181.	127.
GROSS BETA (TOTAL)	04/23/93	N001	PCI/L		248.		191.	126.
IRON	04/23/93	0001	MG/L	<	0.2	I	0.03	-
IRON (TOTAL)	04/23/93	N001	MG/L	<	0.1	I	0.03	-
LEAD	04/23/93	0001	MG/L	<	0.003		0.003	-
LEAD (TOTAL)	04/23/93	N001	MG/L	<	0.003		0.003	-
LEAD-210 (TOTAL)	04/23/93	N001	PCI/L		0.0		2.2	1.3
MANGANESE	04/23/93	0001	MG/L		1.6		0.01	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)
 N001 - UNFILTERED SAMPLE

OTHER PARAMETER VALUE FLAGS:

I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION
 W - POST-DIGEST SPIKE OUT OF CNTR LIM WHILE SAMP ABS < 50% SPIKE

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0736 RESERVED FOR PAUL MARTINEZ
 NORTH COORDINATE: UNKNOWN
 EAST COORDINATE: UNKNOWN
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: UNKNOWN (N)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
MANGANESE (TOTAL)	04/23/93	N001	MG/L		1.65		0.01	-
MOLYBDENUM	04/23/93	0001	MG/L	<	0.1	I	0.01	-
MOLYBDENUM (TOTAL)	04/23/93	N001	MG/L		0.06		0.01	-
NITRATE	04/23/93	N001	MG/L		175		1	-
PH	04/23/93	N001	SU		7.24		-	-
PHOSPHATE	04/23/93	N001	MG/L		0.2		0.1	-
POLONIUM-210 (TOTAL)	04/23/93	N001	PCI/L		0.0		0.6	0.4
RADIUM-226 (TOTAL)	04/23/93	N001	PCI/L		0.7		0.4	0.4
REDOX POTENTIAL	04/23/93	N001	mVOLTS		483		-	-
SELENIUM	04/23/93	0001	MG/L	<	0.005	W	0.005	-
SELENIUM (TOTAL)	04/23/93	N001	MG/L	<	0.005	W	0.005	-
SODIUM	04/23/93	0001	MG/L		4090		0.1	-
SODIUM (TOTAL)	04/23/93	N001	MG/L		4300		0.1	-
SPECIFIC CONDUCTANCE	04/23/93	N001	UMHO/CM		14980		-	-
STRONTIUM	04/23/93	0001	MG/L		10.4		0.01	-
STRONTIUM (TOTAL)	04/23/93	N001	MG/L		11.1		0.01	-
SULFATE	04/23/93	N001	MG/L		20800		1	-
TEMPERATURE	04/23/93	N001	C - DEGREE		13.7		-	-
THORIUM-230 (TOTAL)	04/23/93	N001	PCI/L		0.4		0.4	0.3
TOTAL DISSOLVED SOLIDS	04/23/93	N001	MG/L		23800	H	10	-
TOTAL ORGANIC CARBON	04/23/93	N001	MG/L		20		1	-
TURBIDITY	04/23/93	N001	NTU		10		-	-
URANIUM	04/23/93	0001	MG/L		1.33		0.001	-
URANIUM (TOTAL)	04/23/93	N001	MG/L		1.41		0.001	-
VANADIUM	04/23/93	0001	MG/L	<	0.1	I	0.01	-
VANADIUM (TOTAL)	04/23/93	N001	MG/L	<	0.05	I	0.01	-
ZINC	04/23/93	0001	MG/L		0.12		0.005	-
ZINC (TOTAL)	04/23/93	N001	MG/L		0.18		0.005	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)
 N001 - UNFILTERED SAMPLE

OTHER PARAMETER VALUE FLAGS:

H - HOLD TIME EXPIRED, VALUE SUSPECT
 I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION
 W - POST-DIGEST SPIKE OUT OF CNTR LIM WHILE SAMP ABS < 50% SPIKE

GROUNDWATER QUALITY DATA BY LOCATION
DATA EVALUATED FOR THE BLRA
SITE: SHP01 SHIPROCK
LOCATION: 0736 RESERVED FOR PAUL MARTINEZ
NORTH COORDINATE: UNKNOWN
EAST COORDINATE: UNKNOWN
03/17/87 TO 04/27/93
REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
HYDRAULIC FLOW RELATIONSHIP: UNKNOWN (N)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
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PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT SAMPLE ID CODES:

DATA FILE NAME: \DART\SHPO1\GWQ10000.DAT

SUPPLEMENT 5
SURFACE WATER QUALITY DATA BY LOCATION

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SURFACE WATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0546 RESERVED FOR PHIDDLEBROOKS
 NORTH COORDINATE: UNKNOWN
 EAST COORDINATE: UNKNOWN
 09/17/86 TO 02/25/93
 REPORT DATE: 04/20/95

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
ALKALINITY	02/25/93	N001	MG/L CaCO3		121		-	-
AMMONIUM (TOTAL)	02/25/93	N001	MG/L	<	0.1		0.1	-
ARSENIC (TOTAL)	02/25/93	N001	MG/L		0.007		0.005	-
CADMIUM (TOTAL)	02/25/93	N001	MG/L	<	0.001		0.001	-
CALCIUM (TOTAL)	02/25/93	N001	MG/L		76.8		0.5	-
CHLORIDE (TOTAL)	02/25/93	N001	MG/L		8.3		0.5	-
CHROMIUM (TOTAL)	02/25/93	N001	MG/L		0.03		0.01	-
IRON (TOTAL)	02/25/93	N001	MG/L		46.7		0.03	-
LEAD (TOTAL)	02/25/93	N001	MG/L		0.026	N	0.003	-
LEAD-210 (TOTAL)	02/25/93	N001	PCI/L		3.3		2.3	1.5
MANGANESE (TOTAL)	02/25/93	N001	MG/L		1.23		0.01	-
MOLYBDENUM (TOTAL)	02/25/93	N001	MG/L	<	0.01		0.01	-
NITRATE (TOTAL)	02/25/93	N001	MG/L	<	1		1	-
PH	02/25/93	N001	SU		8.11		-	-
PHOSPHATE (TOTAL)	02/25/93	N001	MG/L		1.4		0.1	-
POLONIUM-210 (TOTAL)	02/25/93	N001	PCI/L		0.0	N	0.7	0.4
RADIUM-226 (TOTAL)	02/25/93	N001	PCI/L		1.3		0.4	0.5
SELENIUM (TOTAL)	02/25/93	N001	MG/L	<	0.05	I	0.05	-
SODIUM (TOTAL)	02/25/93	N001	MG/L		35		1	-
SPECIFIC CONDUCTANCE	02/25/93	N001	UMHO/CM		299		-	-
STRONTIUM (TOTAL)	02/25/93	N001	MG/L		0.85		0.01	-
SULFATE (TOTAL)	02/25/93	N001	MG/L		116		1	-
TEMPERATURE	02/25/93	N001	C - DEGREE		4.8		-	-
THORIUM-230 (TOTAL)	02/25/93	N001	PCI/L		0.3		0.5	0.3
TOTAL DISSOLVED SOLIDS (TOTAL)	02/25/93	N001	MG/L		315		10	-
TOTAL ORGANIC CARBON	02/25/93	N001	MG/L		8.4		1	-
URANIUM (TOTAL)	02/25/93	N001	MG/L	<	0.001		0.001	-
VANADIUM (TOTAL)	02/25/93	N001	MG/L		0.09		0.01	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
 N001 - UNFILTERED SAMPLE

OTHER PARAMETER VALUE FLAGS:
 I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION
 N - SPIKE SAMPLE RECOVERY NOT WITHIN CONTROL LIMITS

SURFACE WATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0546 RESERVED FOR PHIDDLEBROOKS
 NORTH COORDINATE: UNKNOWN
 EAST COORDINATE: UNKNOWN
 09/17/86 TO 02/25/93
 REPORT DATE: 04/20/95

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
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PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT SAMPLE ID CODES:

SURFACE WATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0547 RESERVED FOR PHIDDLEBROOKS
 NORTH COORDINATE: UNKNOWN
 EAST COORDINATE: UNKNOWN
 09/17/86 TO 02/25/93
 REPORT DATE: 04/20/95

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
ALKALINITY	02/23/93	N001	MG/L CAC03		152		-	-
AMMONIUM (TOTAL)	02/23/93	N001	MG/L	<	0.1		0.1	-
ARSENIC (TOTAL)	02/23/93	N001	MG/L		0.014	S	0.005	-
CADMIUM (TOTAL)	02/23/93	N001	MG/L	<	0.001		0.001	-
CALCIUM (TOTAL)	02/23/93	N001	MG/L		90.6		0.5	-
CHLORIDE (TOTAL)	02/23/93	N001	MG/L		14		0.5	-
CHROMIUM (TOTAL)	02/23/93	N001	MG/L		0.06		0.01	-
IRON (TOTAL)	02/23/93	N001	MG/L		61.3		0.03	-
LEAD (TOTAL)	02/23/93	N001	MG/L		0.029	N	0.003	-
LEAD-210 (TOTAL)	02/23/93	N001	PCI/L		2.6		2.3	1.4
MANGANESE (TOTAL)	02/23/93	N001	MG/L		1.00		0.01	-
MOLYBDENUM (TOTAL)	02/23/93	N001	MG/L	<	0.01		0.01	-
NITRATE (TOTAL)	02/23/93	N001	MG/L		2.4		1	-
PH	02/23/93	N001	SU		8.09		-	-
PHOSPHATE (TOTAL)	02/23/93	N001	MG/L		0.94		0.1	-
POLONIUM-210 (TOTAL)	02/23/93	N001	PCI/L		0.6	N	0.7	0.5
RADIUM-226 (TOTAL)	02/23/93	N001	PCI/L		2.4		0.4	0.6
SELENIUM (TOTAL)	02/23/93	N001	MG/L	<	0.05	I	0.05	-
SODIUM (TOTAL)	02/23/93	N001	MG/L		62		1	-
SPECIFIC CONDUCTANCE	02/23/93	N001	UMHO/CM		417		-	-
STRONTIUM (TOTAL)	02/23/93	N001	MG/L		1.18		0.01	-
SULFATE (TOTAL)	02/23/93	N001	MG/L		202		1	-
TEMPERATURE	02/23/93	N001	C - DEGREE		6.3		-	-
THORIUM-230 (TOTAL)	02/23/93	N001	PCI/L		0.2		0.4	0.2
TOTAL DISSOLVED SOLIDS (TOTAL)	02/23/93	N001	MG/L		525		10	-
TOTAL ORGANIC CARBON	02/23/93	N001	MG/L		9.6		1	-
URANIUM (TOTAL)	02/23/93	N001	MG/L		0.003		0.001	-
VANADIUM (TOTAL)	02/23/93	N001	MG/L		0.13		0.01	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
 N001 - UNFILTERED SAMPLE

OTHER PARAMETER VALUE FLAGS:

- I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION
- N - SPIKE SAMPLE RECOVERY NOT WITHIN CONTROL LIMITS
- S - REPORTED VALUE DETERMINED USING METHOD OF STD ADDITION (MSA)

SURFACE WATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0548 RESERVED FOR PMIDDLEBROOKS
 NORTH COORDINATE: UNKNOWN
 EAST COORDINATE: UNKNOWN
 09/17/86 TO 02/25/93
 REPORT DATE: 04/20/95

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
ALKALINITY	02/23/93	N001	MG/L CaCO3		148		-	-
AMMONIUM (TOTAL)	02/23/93	N001	MG/L	<	0.1		0.1	-
	02/23/93	N003		<	0.1		0.1	-
ARSENIC (TOTAL)	02/23/93	N001	MG/L		0.012	S	0.005	-
	02/23/93	N003			0.012		0.005	-
CADMIUM (TOTAL)	02/23/93	N001	MG/L	<	0.001		0.001	-
	02/23/93	N003		<	0.001		0.001	-
CALCIUM (TOTAL)	02/23/93	N001	MG/L		94.8		0.5	-
	02/23/93	N003			92.7		0.5	-
CHLORIDE (TOTAL)	02/23/93	N001	MG/L		12.8		0.5	-
	02/23/93	N003			13.6		0.5	-
CHROMIUM (TOTAL)	02/23/93	N001	MG/L		0.06		0.01	-
	02/23/93	N003			0.07		0.01	-
IRON (TOTAL)	02/23/93	N001	MG/L		64.0		0.03	-
	02/23/93	N003			68.8		0.03	-
LEAD (TOTAL)	02/23/93	N001	MG/L		0.029	NW	0.003	-
	02/23/93	N003			0.032	N	0.003	-
LEAD-210 (TOTAL)	02/23/93	N001	PCI/L		1.0		2.3	1.4
	02/23/93	N003			1.7		2.3	1.4
MANGANESE (TOTAL)	02/23/93	N001	MG/L		1.17		0.01	-
	02/23/93	N003			1.14		0.01	-
MOLYBDENUM (TOTAL)	02/23/93	N001	MG/L	<	0.01		0.01	-
	02/23/93	N003		<	0.01		0.01	-
NITRATE (TOTAL)	02/23/93	N001	MG/L		1.5		1	-
	02/23/93	N003			1.4		1	-
PH	02/23/93	N001	SU		8.08		-	-
PHOSPHATE (TOTAL)	02/23/93	N001	MG/L		1.6		0.1	-
	02/23/93	N003			1.2		0.1	-
POLONIUM-210 (TOTAL)	02/23/93	N001	PCI/L		0.4	N	0.7	0.5
	02/23/93	N003			1.1	N	0.7	0.6
RADIUM-226 (TOTAL)	02/23/93	N001	PCI/L		1.5		0.4	0.5
	02/23/93	N003			1.7		0.4	0.5
SELENIUM (TOTAL)	02/23/93	N001	MG/L	<	0.05	I	0.05	-
	02/23/93	N003		<	0.05	I	0.05	-
SODIUM (TOTAL)	02/23/93	N001	MG/L		58		1	-
	02/23/93	N003			56		1	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:

N001 - UNFILTERED SAMPLE

N003 - UNFILTERED REPLICATE SAMPLE

OTHER PARAMETER VALUE FLAGS:

I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION

N - SPIKE SAMPLE RECOVERY NOT WITHIN CONTROL LIMITS

S - REPORTED VALUE DETERMINED USING METHOD OF STD ADDITION (MSA)

W - POST-DIGEST SPIKE OUT OF CNTR LIM WHILE SAMP ABS < 50% SPIKE

SURFACE WATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0548 RESERVED FOR PHIDDLEBROOKS
 NORTH COORDINATE: UNKNOWN
 EAST COORDINATE: UNKNOWN
 09/17/86 TO 02/25/93
 REPORT DATE: 04/20/95

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
SPECIFIC CONDUCTANCE	02/23/93	N001	UMHO/CM		443		-	-
STRONTIUM (TOTAL)	02/23/93	N001	MG/L		1.18		0.01	-
	02/23/93	N003			1.15		0.01	-
SULFATE (TOTAL)	02/23/93	N001	MG/L		192		1	-
	02/23/93	N003			192		1	-
TEMPERATURE	02/23/93	N001	C - DEGREE		6.4		-	-
THORIUM-230 (TOTAL)	02/23/93	N001	PCI/L		0.1		0.6	0.2
	02/23/93	N003			0.1		0.4	0.2
TOTAL DISSOLVED SOLIDS (TOTAL)	02/23/93	N001	MG/L		485		10	-
	02/23/93	N003			502		10	-
TOTAL ORGANIC CARBON	02/23/93	N001	MG/L		11.6		1	-
	02/23/93	N003			9.7		1	-
URANIUM (TOTAL)	02/23/93	N001	MG/L		0.001		0.001	-
	02/23/93	N003			0.001		0.001	-
VANADIUM (TOTAL)	02/23/93	N001	MG/L		0.13		0.01	-
	02/23/93	N003			0.14		0.01	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
 N001 - UNFILTERED SAMPLE
 N003 - UNFILTERED REPLICATE SAMPLE

SURFACE WATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0549 RESERVED FOR PHIDDLEBROOKS
 NORTH COORDINATE: UNKNOWN
 EAST COORDINATE: UNKNOWN
 09/17/86 TO 02/25/93
 REPORT DATE: 04/20/95

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
ALKALINITY	02/25/93	N001	MG/L CaCO3		127		-	-
AMMONIUM (TOTAL)	02/25/93	N001	MG/L	<	0.1		0.1	-
ARSENIC (TOTAL)	02/25/93	N001	MG/L		0.008		0.005	-
CADMIUM (TOTAL)	02/25/93	N001	MG/L	<	0.001		0.001	-
CALCIUM (TOTAL)	02/25/93	N001	MG/L		69.3		0.5	-
CHLORIDE (TOTAL)	02/25/93	N001	MG/L		8.4		0.5	-
CHROMIUM (TOTAL)	02/25/93	N001	MG/L		0.03		0.01	-
IRON (TOTAL)	02/25/93	N001	MG/L		40.0		0.03	-
LEAD (TOTAL)	02/25/93	N001	MG/L		0.024	N	0.003	-
LEAD-210 (TOTAL)	02/25/93	N001	PCI/L		2.6		2.3	1.4
MANGANESE (TOTAL)	02/25/93	N001	MG/L		0.88		0.01	-
MOLYBDENUM (TOTAL)	02/25/93	N001	MG/L	<	0.01		0.01	-
NITRATE (TOTAL)	02/25/93	N001	MG/L		1.1		1	-
PH	02/25/93	N001	SU		8.18		-	-
PHOSPHATE (TOTAL)	02/25/93	N001	MG/L		1.1		0.1	-
POLONIUM-210 (TOTAL)	02/25/93	N001	PCI/L		0.2	N	0.7	0.4
RADIUM-226 (TOTAL)	02/25/93	N001	PCI/L		1.9		0.4	0.5
SELENIUM (TOTAL)	02/25/93	N001	MG/L	<	0.05	I	0.05	-
SODIUM (TOTAL)	02/25/93	N001	MG/L		36		1	-
SPECIFIC CONDUCTANCE	02/25/93	N001	UMHO/CM		307		-	-
STRONTIUM (TOTAL)	02/25/93	N001	MG/L		0.80		0.01	-
SULFATE (TOTAL)	02/25/93	N001	MG/L		121		1	-
TEMPERATURE	02/25/93	N001	C - DEGREE		4.5		-	-
THORIUM-230 (TOTAL)	02/25/93	N001	PCI/L		0.2		0.4	0.3
TOTAL DISSOLVED SOLIDS (TOTAL)	02/25/93	N001	MG/L		361		10	-
TOTAL ORGANIC CARBON	02/25/93	N001	MG/L		9.8		1	-
URANIUM (TOTAL)	02/25/93	N001	MG/L		0.001		0.001	-
VANADIUM (TOTAL)	02/25/93	N001	MG/L		0.08		0.01	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
 N001 - UNFILTERED SAMPLE

OTHER PARAMETER VALUE FLAGS:

I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION
 N - SPIKE SAMPLE RECOVERY NOT WITHIN CONTROL LIMITS

SURFACE WATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0549 RESERVED FOR PMIDDLEBROOKS
 NORTH COORDINATE: UNKNOWN
 EAST COORDINATE: UNKNOWN
 09/17/86 TO 02/25/93
 REPORT DATE: 04/20/95

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
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PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT SAMPLE ID CODES:

SURFACE WATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0550
 NORTH COORDINATE: UNKNOWN
 EAST COORDINATE: UNKNOWN
 09/17/86 TO 02/25/93
 REPORT DATE: 04/20/95

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
ALKALINITY	03/19/87	0001	MG/L CaCO3		121.		-	-
	05/14/87	0001		91.		-	-	
	09/06/87	0001		126.		-	-	
	09/06/87	0002		126.		-	-	
	09/06/87	0003		126.		-	-	
	09/06/87	0004		126.		-	-	
	09/06/87	0005		126.		-	-	
	10/07/88	0001		142.		-	-	
	04/20/89	0001		105.		-	-	
	04/20/89	0002		105.		-	-	
	04/20/89	0003		105.		-	-	
	04/20/89	0004		105.		-	-	
	04/20/89	0005		105.		-	-	
02/23/93	N001	145		-	-			
ALUMINUM	03/19/87	0001	MG/L		0.1		0.1	-
	05/14/87	0001		0.05	J	0.1	-	
	09/06/87	0001		0.07	J	0.1	-	
	09/06/87	0002		0.06	J	0.1	-	
	09/06/87	0003		0.06	J	0.1	-	
	09/06/87	0004		0.05	J	0.1	-	
	09/06/87	0005		0.06	J	0.1	-	
	04/20/89	0001		<	0.1		0.1	-
	04/20/89	0002		<	0.1		0.1	-
	04/20/89	0003		<	0.1		0.1	-
	04/20/89	0004		<	0.1		0.1	-
	04/20/89	0005		<	0.1		0.1	-
	AMMONIUM	03/19/87		0001	MG/L	<	0.1	
05/14/87		0001	<	0.1			0.1	-
09/06/87		0001	<	0.1			0.1	-
09/06/87		0002	<	0.1			0.1	-
09/06/87		0003	<	0.1			0.1	-
09/06/87		0004	<	0.1			0.1	-
09/06/87		0005	<	0.1			0.1	-
10/07/88		0001	<	0.1			0.1	-
04/20/89		0001		0.3			0.1	-
04/20/89		0002		0.3			0.1	-
04/20/89		0003		0.3			0.1	-
04/20/89		0004		0.3			0.1	-
04/20/89		0005	<	0.1			0.1	-
AMMONIUM (TOTAL)	02/23/93	N001	MG/L	<	0.1		0.1	-
ANTIMONY	03/19/87	0001	MG/L		0.007		0.003	-
	05/14/87	0001			0.015		0.003	-
	09/06/87	0001		<	0.003		0.003	-
	09/06/87	0002			0.003		0.003	-
	09/06/87	0003		<	0.003		0.003	-
	09/06/87	0004			0.007		0.003	-
	09/06/87	0005			0.003		0.003	-
	10/07/88	0001		<	0.003		0.003	-
	04/20/89	0001		<	0.003		0.003	-
	04/20/89	0002		<	0.003		0.003	-
	04/20/89	0003		<	0.003		0.003	-
	04/20/89	0004		<	0.003		0.003	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

OTHER PARAMETER VALUE FLAGS:
 J - ESTIMATED VALUE

SAMPLE ID CODES:

0001 - FILTERED SAMPLE (.45 MICRONS)
 0002 - FILTERED REPLICATE SAMPLE (.45 MICRONS)
 0003 - FILTERED REPLICATE SAMPLE (.45 MICRONS)
 0004 - FILTERED REPLICATE SAMPLE (.45 MICRONS)
 N001 - UNFILTERED SAMPLE

SURFACE WATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0550
 NORTH COORDINATE: UNKNOWN
 EAST COORDINATE: UNKNOWN
 09/17/86 TO 02/25/93
 REPORT DATE: 04/20/95

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY		
ANTIMONY	04/20/89	0005	MG/L	<	0.003		0.003	-		
ARSENIC	03/19/87	0001	MG/L		0.003	J	0.01	-		
	05/14/87	0001		<	0.001	J	0.01	-		
	09/06/87	0001			0.003	J	0.01	-		
	09/06/87	0002			0.002	J	0.01	-		
	09/06/87	0003			0.002	J	0.01	-		
	09/06/87	0004			0.003	J	0.01	-		
	09/06/87	0005			0.002	J	0.01	-		
	10/07/88	0001			0.02		0.01	-		
	04/20/89	0001		<	0.01		0.01	-		
	04/20/89	0002		<	0.01		0.01	-		
	04/20/89	0003		<	0.01		0.01	-		
	04/20/89	0004		<	0.01		0.01	-		
	04/20/89	0005		<	0.01		0.01	-		
	ARSENIC (TOTAL)	02/23/93		N001	MG/L		0.010		0.005	-
BARIUM	03/19/87	0001	MG/L	<	0.1		0.1	-		
	05/14/87	0001			0.06	J	0.1	-		
	09/06/87	0001			0.09	J	0.1	-		
	09/06/87	0002			0.09	J	0.1	-		
	09/06/87	0003			0.09	J	0.1	-		
	09/06/87	0004			0.09	J	0.1	-		
	09/06/87	0005			0.09	J	0.1	-		
	10/07/88	0001		<	0.1		0.1	-		
	04/20/89	0001		<	0.1		0.1	-		
	04/20/89	0002		<	0.1		0.1	-		
	04/20/89	0003		<	0.1		0.1	-		
	04/20/89	0004		<	0.1		0.1	-		
	04/20/89	0005		<	0.1		0.1	-		
	BERYLLIUM	04/20/89		0001	MG/L	<	0.01		0.01	-
04/20/89		0002	<	0.01			0.01	-		
04/20/89		0003	<	0.01			0.01	-		
04/20/89		0004	<	0.01			0.01	-		
04/20/89		0005	<	0.01			0.01	-		
BORON	03/19/87	0001	MG/L		0.06	J	0.1	-		
	05/14/87	0001			0.06	J	0.1	-		
	09/06/87	0001			0.05	J	0.1	-		
	09/06/87	0002			0.05	J	0.1	-		
	09/06/87	0003			0.05	J	0.1	-		
	09/06/87	0004			0.05	J	0.1	-		
	09/06/87	0005			0.06	J	0.1	-		
	04/20/89	0001		<	0.1		0.1	-		
	04/20/89	0002		<	0.1		0.1	-		
	04/20/89	0003		<	0.1		0.1	-		
	04/20/89	0004		<	0.1		0.1	-		
	04/20/89	0005		<	0.1		0.1	-		
	BROMIDE	09/06/87		0001	MG/L	<	0.1		0.1	-
		09/06/87		0002		<	0.1		0.1	-
09/06/87		0003	<	0.1			0.1	-		

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

OTHER PARAMETER VALUE FLAGS:
 J - ESTIMATED VALUE

SAMPLE ID CODES:

- 0001 - FILTERED SAMPLE (.45 MICRONS)
- 0002 - FILTERED REPLICATE SAMPLE (.45 MICRONS)
- 0003 - FILTERED REPLICATE SAMPLE (.45 MICRONS)
- 0004 - FILTERED REPLICATE SAMPLE (.45 MICRONS)
- N001 - UNFILTERED SAMPLE

SURFACE WATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0550
 NORTH COORDINATE: UNKNOWN
 EAST COORDINATE: UNKNOWN
 09/17/86 TO 02/25/93
 REPORT DATE: 04/20/95

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
BROMIDE	09/06/87	0004	MG/L	<	0.1		0.1	-
	09/06/87	0005		<	0.1		0.1	-
	04/20/89	0001		<	0.1		0.1	-
	04/20/89	0002		<	0.1		0.1	-
	04/20/89	0003		<	0.1		0.1	-
	04/20/89	0004		<	0.1		0.1	-
	04/20/89	0005		<	0.1		0.1	-
CADMIUM	03/19/87	0001	MG/L	<	0.001		0.001	-
	05/14/87	0001		<	0.003		0.001	-
	09/06/87	0001		<	0.005		0.005	-
	09/06/87	0002		<	0.005		0.005	-
	09/06/87	0003		<	0.005		0.005	-
	09/06/87	0004		<	0.005		0.005	-
	09/06/87	0005		<	0.005		0.005	-
	10/07/88	0001		<	0.001		0.001	-
	04/20/89	0001		<	0.001		0.001	-
	04/20/89	0002		<	0.001		0.001	-
	04/20/89	0003		<	0.001		0.001	-
	04/20/89	0004		<	0.001		0.001	-
	04/20/89	0005		<	0.001		0.001	-
	CADMIUM (TOTAL)	02/23/93		N001	MG/L	<	0.001	
CALCIUM	03/19/87	0001	MG/L		46.9		0.01	-
	05/14/87	0001			40.2		0.01	-
	09/06/87	0001			62.7		0.01	-
	09/06/87	0002			63.6		0.01	-
	09/06/87	0003			64.6		0.01	-
	09/06/87	0004			64.8		0.01	-
	09/06/87	0005			64.4		0.01	-
	10/07/88	0001			88.0		0.01	-
	04/20/89	0001			57.0		0.01	-
	04/20/89	0002			53.1		0.01	-
	04/20/89	0003			50.3		0.01	-
	04/20/89	0004			49.1		0.01	-
	04/20/89	0005			49.8		0.01	-
	CALCIUM (TOTAL)	02/23/93		N001	MG/L		90.1	
CHLORIDE	03/19/87	0001	MG/L		6.1		1.	-
	05/14/87	0001			4.9		1.	-
	09/06/87	0001			11.8		1.	-
	09/06/87	0002			11.8		1.	-
	09/06/87	0003			11.8		1.	-
	09/06/87	0004			1.89		1.	-
	09/06/87	0005			11.8		1.	-
	10/07/88	0001			16.		1.	-
	04/20/89	0001			7.4		1.	-
	04/20/89	0002			6.1		1.	-
	04/20/89	0003			6.1		1.	-
	04/20/89	0004			4.7		1.	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)
 0002 - FILTERED REPLICATE SAMPLE (.45 MICRONS)
 0003 - FILTERED REPLICATE SAMPLE (.45 MICRONS)
 0004 - FILTERED REPLICATE SAMPLE (.45 MICRONS)
 N001 - UNFILTERED SAMPLE

SURFACE WATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0550
 NORTH COORDINATE: UNKNOWN
 EAST COORDINATE: UNKNOWN
 09/17/86 TO 02/25/93
 REPORT DATE: 04/20/95

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
CHLORIDE	04/20/89	0005	MG/L		4.7		1.	-
CHLORIDE (TOTAL)	02/23/93	N001	MG/L		14.1		0.5	-
CHROMIUM	03/19/87	0001	MG/L		0.01		0.01	-
	05/14/87	0001			0.02		0.01	-
	09/06/87	0001		<	0.01		0.01	-
	09/06/87	0002		<	0.01		0.01	-
	09/06/87	0003		<	0.01		0.01	-
	09/06/87	0004		<	0.01		0.01	-
	09/06/87	0005		<	0.01		0.01	-
	10/07/88	0001			0.03		0.01	-
	04/20/89	0001		<	0.01		0.01	-
	04/20/89	0002		<	0.01		0.01	-
	04/20/89	0003		<	0.01		0.01	-
	04/20/89	0004		<	0.01		0.01	-
	04/20/89	0005		<	0.01		0.01	-
CHROMIUM (TOTAL)	02/23/93	N001	MG/L		0.05		0.01	-
COBALT	03/19/87	0001	MG/L	<	0.05		0.05	-
	05/14/87	0001		<	0.01	J	0.05	-
	09/06/87	0001		<	0.01	J	0.05	-
	09/06/87	0002		<	0.01	J	0.05	-
	09/06/87	0003		<	0.01	J	0.05	-
	09/06/87	0004		<	0.01	J	0.05	-
	09/06/87	0005		<	0.01	J	0.05	-
	10/07/88	0001		<	0.05		0.05	-
	04/20/89	0001		<	0.05		0.05	-
	04/20/89	0002		<	0.05		0.05	-
	04/20/89	0003		<	0.05		0.05	-
	04/20/89	0004		<	0.05		0.05	-
	04/20/89	0005		<	0.05		0.05	-
COPPER	03/19/87	0001	MG/L		0.03		0.02	-
	05/14/87	0001		<	0.01	J	0.02	-
	09/06/87	0001		<	0.01	J	0.02	-
	09/06/87	0002		<	0.01	J	0.02	-
	09/06/87	0003		<	0.01	J	0.02	-
	09/06/87	0004		<	0.01	J	0.02	-
	09/06/87	0005		<	0.01	J	0.02	-
	10/07/88	0001		<	0.02		0.02	-
	04/20/89	0001		<	0.02		0.02	-
	04/20/89	0002		<	0.02		0.02	-
	04/20/89	0003		<	0.02		0.02	-
	04/20/89	0004		<	0.02		0.02	-
	04/20/89	0005		<	0.02		0.02	-
CYANIDE	04/20/89	0001	MG/L	<	0.01		0.01	-
	04/20/89	0002		<	0.01		0.01	-
	04/20/89	0003		<	0.01		0.01	-
	04/20/89	0004		<	0.01		0.01	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

OTHER PARAMETER VALUE FLAGS:
 J - ESTIMATED VALUE

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)
 0002 - FILTERED REPLICATE SAMPLE (.45 MICRONS)
 0003 - FILTERED REPLICATE SAMPLE (.45 MICRONS)
 0004 - FILTERED REPLICATE SAMPLE (.45 MICRONS)
 N001 - UNFILTERED SAMPLE

SURFACE WATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0550
 NORTH COORDINATE: UNKNOWN
 EAST COORDINATE: UNKNOWN
 09/17/86 TO 02/25/93
 REPORT DATE: 04/20/95

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
CYANIDE	04/20/89	0005	MG/L	<	0.01		0.01	-
FLUORIDE	03/19/87	0001	MG/L		0.21		0.1	-
	05/14/87	0001		0.20	0.1	-		
	09/06/87	0001		0.24	0.1	-		
	09/06/87	0002		0.25	0.1	-		
	09/06/87	0003		0.25	0.1	-		
	09/06/87	0004		0.25	0.1	-		
	09/06/87	0005		0.25	0.1	-		
	10/07/88	0001		0.3	0.1	-		
	04/20/89	0001		0.3	0.1	-		
	04/20/89	0002		0.3	0.1	-		
	04/20/89	0003		0.2	0.1	-		
	04/20/89	0004		0.2	0.1	-		
	04/20/89	0005		0.2	0.1	-		
	GROSS ALPHA	09/06/87		0001	PCI/L		1.3	
09/06/87		0002	0.0	0.2		2.2		
09/06/87		0003	0.0	0.2		2.2		
09/06/87		0004	0.0	0.2		2.2		
09/06/87		0005	1.4	0.2		3.2		
10/07/88		0001	4.0	0.2		3.6		
04/20/89		0001	3.3	0.2		2.2		
04/20/89		0002	4.2	0.2		2.2		
04/20/89		0003	0.7	0.2		1.8		
04/20/89		0004	5.5	0.2		2.3		
04/20/89		0005	2.4	0.2		2.0		
GROSS BETA	09/06/87	0001	PCI/L		3.6		1.	3.4
	09/06/87	0002		3.8	1.	2.6		
	09/06/87	0003		3.8	1.	2.6		
	09/06/87	0004		4.3	1.	3.1		
	09/06/87	0005		2.5	1.	3.0		
	10/07/88	0001		6.1	1.	1.8		
	04/20/89	0001		3.4	1.	1.3		
	04/20/89	0002		3.4	1.	1.3		
	04/20/89	0003		1.8	1.	1.3		
	04/20/89	0004		6.1	1.	1.4		
	04/20/89	0005		3.1	1.	1.3		
IRON	03/19/87	0001	MG/L		0.05		0.03	-
	05/14/87	0001		0.02		0.03	-	
	09/06/87	0001		<	0.01	J	0.03	-
	09/06/87	0002		<	0.01	J	0.03	-
	09/06/87	0003		<	0.01	J	0.03	-
	09/06/87	0004		<	0.01	J	0.03	-
	09/06/87	0005		<	0.01	J	0.03	-
	10/07/88	0001		<	0.03		0.03	-
	04/20/89	0001		<	0.03		0.03	-
	04/20/89	0002		<	0.03		0.03	-
	04/20/89	0003		<	0.03		0.03	-
	04/20/89	0004		<	0.03		0.03	-
	04/20/89	0005		<	0.03		0.03	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

OTHER PARAMETER VALUE FLAGS:
 J - ESTIMATED VALUE

SAMPLE ID CODES:

- 0001 - FILTERED SAMPLE (.45 MICRONS)
- 0002 - FILTERED REPLICATE SAMPLE (.45 MICRONS)
- 0003 - FILTERED REPLICATE SAMPLE (.45 MICRONS)
- 0004 - FILTERED REPLICATE SAMPLE (.45 MICRONS)

SURFACE WATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0550
 NORTH COORDINATE: UNKNOWN
 EAST COORDINATE: UNKNOWN
 09/17/86 TO 02/25/93
 REPORT DATE: 04/20/95

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY		
IRON (TOTAL)	02/23/93	N001	MG/L		58.6		0.03	-		
LEAD	03/19/87	0001	MG/L	<	0.001	J	0.01	-		
	05/14/87	0001			0.02		0.01	-		
	09/06/87	0001		<	0.01		0.01	-		
	09/06/87	0002		<	0.01		0.01	-		
	09/06/87	0003		<	0.01		0.01	-		
	09/06/87	0004		<	0.01		0.01	-		
	09/06/87	0005		<	0.01		0.01	-		
	10/07/88	0001			0.02		0.01	-		
	04/20/89	0001		<	0.01		0.01	-		
	04/20/89	0002		<	0.01		0.01	-		
	04/20/89	0003		<	0.01		0.01	-		
	04/20/89	0004		<	0.01		0.01	-		
	04/20/89	0005		<	0.01		0.01	-		
	LEAD (TOTAL)	02/23/93		N001	MG/L		0.031	N	0.003	-
LEAD-210	03/19/87	0001	PCI/L		0.0		1.5	1.4		
	05/14/87	0001			0.0		1.5	1.2		
	09/06/87	0001			0.4		1.5	1.1		
	09/06/87	0002			0.3		1.5	0.9		
	09/06/87	0003			0.8		1.5	0.9		
	09/06/87	0004			1.1		1.5	0.6		
	09/06/87	0005			0.7		1.5	1.0		
	04/20/89	0001			0.0		1.5	0.6		
	04/20/89	0002			0.7		1.5	0.6		
	04/20/89	0003			0.2		1.5	0.6		
	04/20/89	0004			0.1		1.5	0.6		
	04/20/89	0005			0.3		1.5	0.6		
	LEAD-210 (TOTAL)	02/23/93		N001	PCI/L		1.8		2.3	1.4
	MAGNESIUM	03/19/87		0001	MG/L		12.2		0.001	-
05/14/87		0001		7.33			0.001	-		
09/06/87		0001		11.9			0.001	-		
09/06/87		0002		11.9			0.001	-		
09/06/87		0003		12.1			0.001	-		
09/06/87		0004		12.2			0.001	-		
09/06/87		0005		12.2			0.001	-		
10/07/88		0001		15.9			0.001	-		
04/20/89		0001		9.60			0.001	-		
04/20/89		0002		8.92			0.001	-		
04/20/89		0003		8.71			0.001	-		
04/20/89		0004		8.56			0.001	-		
04/20/89		0005		8.70			0.001	-		
MANGANESE		03/19/87	0001	MG/L			0.01		0.01	-
	05/14/87	0001	<		0.01		0.01	-		
	09/06/87	0001			0.02		0.01	-		
	09/06/87	0002			0.02		0.01	-		
	09/06/87	0003			0.02		0.01	-		

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

OTHER PARAMETER VALUE FLAGS:

J - ESTIMATED VALUE

N - SPIKE SAMPLE RECOVERY NOT WITHIN CONTROL LIMITS

SAMPLE ID CODES:

0001 - FILTERED SAMPLE (.45 MICRONS)

0002 - FILTERED REPLICATE SAMPLE (.45 MICRONS)

0003 - FILTERED REPLICATE SAMPLE (.45 MICRONS)

0004 - FILTERED REPLICATE SAMPLE (.45 MICRONS)

N001 - UNFILTERED SAMPLE

SURFACE WATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0550
 NORTH COORDINATE: UNKNOWN
 EAST COORDINATE: UNKNOWN
 09/17/86 TO 02/25/93
 REPORT DATE: 04/20/95

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
MANGANESE	09/06/87	0004	MG/L		0.02		0.01	
	09/06/87	0005		0.02				
	04/20/89	0001		0.01				
	04/20/89	0002		0.01				
	04/20/89	0003		0.01				
	04/20/89	0004		0.01				
04/20/89	0005	0.01						
MANGANESE (TOTAL)	02/23/93	N001	MG/L		1.07		0.01	
MERCURY	09/06/87	0001	MG/L	<	0.0002		0.0002	
	09/06/87	0002		<	0.0002			
	09/06/87	0003		<	0.0002			
	09/06/87	0004			0.0002			
	09/06/87	0005			0.0003			
	10/07/88	0001		<	0.0002			
	04/20/89	0001		<	0.0002			
	04/20/89	0002		<	0.0002			
	04/20/89	0003		<	0.0002			
	04/20/89	0004		<	0.0002			
	04/20/89	0004		<	0.0002			
	04/20/89	0005		<	0.0002			
MOLYBDENUM	03/19/87	0001	MG/L	<	0.1		0.1	
	05/14/87	0001		<	0.01			
	09/06/87	0001			0.01			
	09/06/87	0002			0.04			
	09/06/87	0003			0.01			
	09/06/87	0004			0.04			
	09/06/87	0005		<	0.01			
	10/07/88	0001		<	0.01			
	04/20/89	0001		<	0.01			
	04/20/89	0002		<	0.01			
	04/20/89	0003		<	0.01			
	04/20/89	0004		<	0.01			
	04/20/89	0004		<	0.01			
	04/20/89	0005		<	0.01			
MOLYBDENUM (TOTAL)	02/23/93	N001	MG/L	<	0.01		0.01	
NICKEL	03/19/87	0001	MG/L		0.02	J	0.04	
	05/14/87	0001		<	0.01	J		
	09/06/87	0001		<	0.01	J		
	09/06/87	0002		<	0.01	J		
	09/06/87	0003		<	0.01	J		
	09/06/87	0004		<	0.01	J		
	09/06/87	0005		<	0.01	J		
	04/20/89	0001		<	0.04			
	04/20/89	0002		<	0.04			
	04/20/89	0003		<	0.04			
	04/20/89	0004		<	0.04			
	04/20/89	0005		<	0.04			
NITRATE	03/19/87	0001	MG/L		10.1		1.	

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

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SURFACE WATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0550
 NORTH COORDINATE: UNKNOWN
 EAST COORDINATE: UNKNOWN
 09/17/86 TO 02/25/93
 REPORT DATE: 04/20/95

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY		
NITRATE	05/14/87	0001	MG/L		1.8		1.	-		
	09/06/87	0001			0.4	J	1.	-		
	09/06/87	0002		<	0.1	J	1.	-		
	09/06/87	0003			0.4	J	1.	-		
	09/06/87	0004		<	0.1	J	1.	-		
	09/06/87	0005		<	0.1	J	1.	-		
	10/07/88	0001			2.6		1.	-		
	04/20/89	0001			1.7		1.	-		
	04/20/89	0002			1.7		1.	-		
	04/20/89	0003			1.8		1.	-		
	04/20/89	0004			1.5		1.	-		
	04/20/89	0005			1.8		1.	-		
	NITRATE (TOTAL)	02/23/93		N001	MG/L		1.5		1	-
	NITRITE	03/19/87		0001	MG/L	<	0.1		0.1	-
05/14/87		0001	<	0.1			0.1	-		
09/06/87		0001	<	0.1			0.1	-		
09/06/87		0002	<	0.1			0.1	-		
09/06/87		0003	<	0.1			0.1	-		
09/06/87		0004	<	0.1			0.1	-		
09/06/87		0005	<	0.1			0.1	-		
NITRITE AND NITRATE		10/07/88	0001	MG/L		<	1.0		1.	-
PH	03/19/87	0001	SU		7.97		-	-		
	05/14/87	0001			8.17		-	-		
	09/06/87	0001			8.59		-	-		
	09/06/87	0002			8.59		-	-		
	09/06/87	0003			8.59		-	-		
	09/06/87	0004			8.59		-	-		
	09/06/87	0005			8.59		-	-		
	10/07/88	0001			8.03		-	-		
	04/20/89	0001			8.31		-	-		
	04/20/89	0002			8.31		-	-		
	04/20/89	0003			8.31		-	-		
	04/20/89	0004			8.31		-	-		
	04/20/89	0005			8.31		-	-		
	02/23/93	N001			8.05		-	-		
PHOSPHATE	03/19/87	0001	MG/L		0.30		0.1	-		
	05/14/87	0001			0.30		0.1	-		
	09/06/87	0001		<	0.1		0.1	-		
	09/06/87	0002		<	0.1		0.1	-		
	09/06/87	0003		<	0.1		0.1	-		
	09/06/87	0004		<	0.1		0.1	-		
	09/06/87	0005		<	0.1		0.1	-		
	10/07/88	0001		<	0.1		0.1	-		
	04/20/89	0001		<	0.1		0.1	-		
	04/20/89	0002		<	0.1		0.1	-		
	04/20/89	0003		<	0.1		0.1	-		
	04/20/89	0004		<	0.1		0.1	-		

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

OTHER PARAMETER VALUE FLAGS:
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SAMPLE ID CODES:
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 0004 - FILTERED REPLICATE SAMPLE (.45 MICRONS)
 N001 - UNFILTERED SAMPLE

SURFACE WATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0550
 NORTH COORDINATE: UNKNOWN
 EAST COORDINATE: UNKNOWN
 09/17/86 TO 02/25/93
 REPORT DATE: 04/20/95

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY		
PHOSPHATE	04/20/89	0005	MG/L	<	0.1		0.1	-		
PHOSPHATE (TOTAL)	02/23/93	N001	MG/L		1.6		0.1	-		
POLONIUM-210	03/19/87	0001	PCI/L		0.0		1.	0.4		
	05/14/87	0001			0.4		1.	0.6		
	09/06/87	0001			0.0		1.	0.5		
	09/06/87	0002			0.0		1.	0.6		
	09/06/87	0003			0.0		1.	0.6		
	09/06/87	0004			0.0		1.	0.6		
	09/06/87	0005			0.1		1.	0.6		
	04/20/89	0001			0.3		1.	0.4		
	04/20/89	0002			0.3		1.	0.4		
	04/20/89	0003			0.0		1.	0.4		
	04/20/89	0004			0.0		1.	0.4		
	04/20/89	0005			0.0		1.	0.3		
	POLONIUM-210 (TOTAL)	02/23/93		N001	PCI/L		0.0	N	0.7	0.4
POTASSIUM	03/19/87	0001	MG/L		2.68		0.01	-		
	05/14/87	0001			2.04		0.01	-		
	09/06/87	0001			1.87		0.01	-		
	09/06/87	0002			1.83		0.01	-		
	09/06/87	0003			1.95		0.01	-		
	09/06/87	0004			1.89		0.01	-		
	09/06/87	0005			2.14		0.01	-		
	10/07/88	0001			2.5		0.01	-		
	04/20/89	0001			1.6		0.01	-		
	04/20/89	0002			1.9		0.01	-		
	04/20/89	0003			1.4		0.01	-		
	04/20/89	0004			1.4		0.01	-		
	04/20/89	0005			1.3		0.01	-		
	RADIUM-226	03/19/87		0001	PCI/L		0.3		1.	0.3
		05/14/87		0001			0.1		1.	0.2
09/06/87		0001		0.0			1.	0.1		
09/06/87		0002		0.0			1.	0.1		
09/06/87		0003		0.0			1.	0.1		
09/06/87		0004		0.1			1.	0.2		
09/06/87		0005		0.0			1.	0.1		
10/07/88		0001		0.3			1.	0.2		
RADIUM-226 (TOTAL)		02/23/93	N001	PCI/L			1.8		0.4	0.5
RADIUM-228	03/19/87	0001	PCI/L		0.6		1.	0.8		
	05/14/87	0001			0.0		1.	1.2		
	09/06/87	0001			0.5		1.	0.7		
	09/06/87	0002			0.8		1.	3.3		
	09/06/87	0003			1.1		1.	1.0		
	09/06/87	0004			0.0		1.	1.1		
	09/06/87	0005			0.3		1.	1.2		
	10/07/88	0001			0.2		1.	0.7		

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

OTHER PARAMETER VALUE FLAGS:
 N - SPIKE SAMPLE RECOVERY NOT WITHIN CONTROL LIMITS

SAMPLE ID CODES:

- 0001 - FILTERED SAMPLE (.45 MICRONS)
- 0002 - FILTERED REPLICATE SAMPLE (.45 MICRONS)
- 0003 - FILTERED REPLICATE SAMPLE (.45 MICRONS)
- 0004 - FILTERED REPLICATE SAMPLE (.45 MICRONS)
- N001 - UNFILTERED SAMPLE

SURFACE WATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0550
 NORTH COORDINATE: UNKNOWN
 EAST COORDINATE: UNKNOWN
 09/17/86 TO 02/25/93
 REPORT DATE: 04/20/95

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY		
RADIUM-228	04/20/89	0001	PCI/L		0.0		1.	0.7		
	04/20/89	0002		0.2	1.	0.7				
	04/20/89	0003		0.0	1.	0.7				
	04/20/89	0004		0.5	1.	0.8				
	04/20/89	0005		0.1	1.	0.8				
SELENIUM	03/19/87	0001	MG/L	<	0.002	J	0.005	-		
	05/14/87	0001		0.001	J	0.005	-			
	09/06/87	0001		0.002	J	0.005	-			
	09/06/87	0002		0.003	J	0.005	-			
	09/06/87	0003		0.003	J	0.005	-			
	09/06/87	0004		0.002	J	0.005	-			
	09/06/87	0005		0.003	J	0.005	-			
	10/07/88	0001		0.019		0.005	-			
	04/20/89	0001		<	0.005	0.005	-			
	04/20/89	0002		<	0.005	0.005	-			
	04/20/89	0003		<	0.005	0.005	-			
	04/20/89	0004		<	0.005	0.005	-			
	04/20/89	0005		<	0.005	0.005	-			
	SELENIUM (TOTAL)	02/23/93		N001	MG/L	<	0.05	I	0.05	-
	SILICA - SiO2	03/19/87		0001	MG/L		8.8		2.	-
05/14/87		0001	11.0	2.		-				
09/06/87		0001	8.00	2.		-				
09/06/87		0002	8.17	2.		-				
09/06/87		0003	8.28	2.		-				
09/06/87		0004	8.34	2.		-				
09/06/87		0005	8.26	2.		-				
04/20/89		0001	7.	2.		-				
04/20/89		0002	7.	2.		-				
04/20/89		0003	7.	2.		-				
04/20/89		0004	7.	2.		-				
04/20/89		0005	7.	2.		-				
SILVER		10/07/88	0001	MG/L		<	0.01		0.01	-
	04/20/89	0001	<		0.01	0.01	-			
	04/20/89	0002	<		0.01	0.01	-			
	04/20/89	0003	<		0.01	0.01	-			
	04/20/89	0004	<		0.01	0.01	-			
04/20/89	0005	<	0.01	0.01	-					
SODIUM	03/19/87	0001	MG/L		33.5		0.002	-		
	05/14/87	0001		19.1	0.002	-				
	09/06/87	0001		39.5	0.002	-				
	09/06/87	0002		31.8	0.002	-				
	09/06/87	0003		31.6	0.002	-				
	09/06/87	0004		31.7	0.002	-				
	09/06/87	0005		36.8	0.002	-				
	10/07/88	0001		46.9	0.002	-				
	04/20/89	0001		21.0	0.002	-				
	04/20/89	0002		21.2	0.002	-				

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

OTHER PARAMETER VALUE FLAGS:

I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION
 J - ESTIMATED VALUE

SAMPLE ID CODES:

0001 - FILTERED SAMPLE (.45 MICRONS)
 0002 - FILTERED REPLICATE SAMPLE (.45 MICRONS)
 0003 - FILTERED REPLICATE SAMPLE (.45 MICRONS)
 0004 - FILTERED REPLICATE SAMPLE (.45 MICRONS)
 N001 - UNFILTERED SAMPLE

SURFACE WATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0550
 NORTH COORDINATE: UNKNOWN
 EAST COORDINATE: UNKNOWN
 09/17/86 TO 02/25/93
 REPORT DATE: 04/20/95

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
SODIUM	04/20/89	0003	MG/L		19.6		0.002	-
	04/20/89	0004			19.2		0.002	-
	04/20/89	0005			19.6		0.002	-
SODIUM (TOTAL)	02/23/93	N001	MG/L		56		1	-
SPECIFIC CONDUCTANCE	03/19/87	0001	UMHO/CM		255.		-	-
	05/14/87	0001			200.		-	-
	09/06/87	0001			450.		-	-
	09/06/87	0002			450.		-	-
	09/06/87	0003			450.		-	-
	09/06/87	0004			450.		-	-
	09/06/87	0005			450.		-	-
	10/07/88	0001			480.		-	-
	04/20/89	0001			270.		-	-
	04/20/89	0002			270.		-	-
	04/20/89	0003			270.		-	-
	04/20/89	0004			270.		-	-
	04/20/89	0005			270.		-	-
	02/23/93	N001			439		-	-
STRONTIUM	03/19/87	0001	MG/L		0.68		0.1	-
	05/14/87	0001			0.54		0.1	-
	09/06/87	0001			0.865		0.1	-
	09/06/87	0002			0.845		0.1	-
	09/06/87	0003			0.840		0.1	-
	09/06/87	0004			0.850		0.1	-
	09/06/87	0005			0.885		0.1	-
	10/07/88	0001			0.9		0.1	-
	04/20/89	0001			0.5		0.1	-
	04/20/89	0002			0.4		0.1	-
	04/20/89	0003			0.4		0.1	-
	04/20/89	0004			0.5		0.1	-
	04/20/89	0005			0.5		0.1	-
	STRONTIUM (TOTAL)	02/23/93			N001	MG/L		1.14
SULFATE	03/19/87	0001	MG/L		120.		0.1	-
	05/14/87	0001			75.		0.1	-
	09/06/87	0001			150.		0.1	-
	09/06/87	0002			138.		0.1	-
	09/06/87	0003			139.		0.1	-
	09/06/87	0004			141.		0.1	-
	09/06/87	0005			150.		0.1	-
	10/07/88	0001			221.		0.1	-
	04/20/89	0001			98.		0.1	-
	04/20/89	0002			97.		0.1	-
	04/20/89	0003			99.0		0.1	-
	04/20/89	0004			98.		0.1	-
	04/20/89	0005			99.0		0.1	-
	SULFATE (TOTAL)	02/23/93			N001	MG/L		205

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:

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- 0004 - FILTERED REPLICATE SAMPLE (.45 MICRONS)
- N001 - UNFILTERED SAMPLE

SURFACE WATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0550
 NORTH COORDINATE: UNKNOWN
 EAST COORDINATE: UNKNOWN
 09/17/86 TO 02/25/93
 REPORT DATE: 04/20/95

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
SULFIDE	09/06/87	0001	MG/L	<	0.1		0.1	-
	09/06/87	0002		<	0.1		0.1	-
	09/06/87	0003		<	0.1		0.1	-
	09/06/87	0004		<	0.1		0.1	-
	09/06/87	0005		<	0.1		0.1	-
	04/20/89	0001		<	0.1		0.1	-
	04/20/89	0002		<	0.1		0.1	-
	04/20/89	0003		<	0.1		0.1	-
	04/20/89	0004		<	0.1		0.1	-
	04/20/89	0005		<	0.1		0.1	-
TEMPERATURE	03/19/87	0001	C - DEGREE		9.5		-	-
	05/14/87	0001			12.5		-	-
	09/06/87	0001			22.5		-	-
	09/06/87	0002			22.5		-	-
	09/06/87	0003			22.5		-	-
	09/06/87	0004			22.5		-	-
	09/06/87	0005			22.5		-	-
	10/07/88	0001			17.0		-	-
	04/20/89	0001			15.		-	-
	04/20/89	0002			15.		-	-
	04/20/89	0003			15.		-	-
	04/20/89	0004			15.		-	-
	04/20/89	0005			15.		-	-
	02/23/93	N001			6.3		-	-
THALLIUM	04/20/89	0001	MG/L	<	0.01		0.01	-
	04/20/89	0002		<	0.01		0.01	-
	04/20/89	0003		<	0.01		0.01	-
	04/20/89	0004		<	0.01		0.01	-
	04/20/89	0005		<	0.01		0.01	-
THORIUM-230	03/19/87	0001	PCI/L		0.8		1.	0.9
	05/14/87	0001			0.2		1.	0.6
	09/06/87	0001			0.0		1.	0.4
	09/06/87	0002			0.4		1.	0.5
	09/06/87	0003			0.0		1.	0.3
	09/06/87	0004			0.0		1.	0.3
	09/06/87	0005			0.0		1.	0.4
	10/07/88	0001			0.3		1.	0.4
	04/20/89	0001			0.0		1.	0.3
	04/20/89	0002			0.1		1.	0.4
	04/20/89	0003			0.0		1.	0.3
	04/20/89	0004			0.0		1.	0.3
	04/20/89	0005			0.0		1.	0.2
	THORIUM-230 (TOTAL)	02/23/93		N001	PCI/L		0.6	
TIN	03/19/87	0001	MG/L	<	0.005		0.005	-
	05/14/87	0001		<	0.005		0.005	-
	09/06/87	0001		<	0.003	J	0.005	-
	09/06/87	0002		<	0.003	J	0.005	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

OTHER PARAMETER VALUE FLAGS:
 J - ESTIMATED VALUE

SAMPLE ID CODES:

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- 0004 - FILTERED REPLICATE SAMPLE (.45 MICRONS)
- N001 - UNFILTERED SAMPLE

SURFACE WATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0550
 NORTH COORDINATE: UNKNOWN
 EAST COORDINATE: UNKNOWN
 09/17/86 TO 02/25/93
 REPORT DATE: 04/20/95

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY	
TIN	09/06/87	0003	MG/L	<	0.003	J	0.005	-	
	09/06/87	0004		<	0.003	J		0.005	-
	09/06/87	0005		<	0.003	J		0.005	-
	04/20/89	0001		<	0.005			0.005	-
	04/20/89	0002		<	0.005			0.005	-
	04/20/89	0003		<	0.005			0.005	-
	04/20/89	0004		<	0.005			0.005	-
	04/20/89	0005		<	0.005			0.005	-
TOTAL DISSOLVED SOLIDS	03/19/87	0001	MG/L		303.		10.	-	
	05/14/87	0001			226.			10.	-
	09/06/87	0001			394.			10.	-
	09/06/87	0002			379.			10.	-
	09/06/87	0003			374.			10.	-
	09/06/87	0004			384.			10.	-
	09/06/87	0005			395.			10.	-
	10/07/88	0001			507.			10.	-
	04/20/89	0001			304.			10.	-
	04/20/89	0002			289.			10.	-
	04/20/89	0003			272.			10.	-
	04/20/89	0004			284.			10.	-
	04/20/89	0005			268.			10.	-
TOTAL DISSOLVED SOLIDS (TOTAL)	02/23/93	N001	MG/L		477		10	-	
TOTAL ORGANIC CARBON	03/19/87	0001	MG/L		24.8		1.	-	
	05/14/87	0001			27.3			1.	-
	09/06/87	0001			30.3			1.	-
	09/06/87	0002			35.5			1.	-
	09/06/87	0003			31.7			1.	-
	09/06/87	0004			36.2			1.	-
	09/06/87	0005			32.9			1.	-
	04/20/89	0001			25.3			1.	-
	04/20/89	0002			26.0			1.	-
	04/20/89	0003			14.4			1.	-
	04/20/89	0004			27.0			1.	-
	04/20/89	0005			28.6			1.	-
	02/23/93	N001			5			1	-
URANIUM	03/19/87	0001	MG/L		0.0010	J	0.003	-	
	05/14/87	0001		<	0.0003	J		0.003	-
	09/06/87	0001			0.0012	J		0.003	-
	09/06/87	0002			0.0016	J		0.003	-
	09/06/87	0003			0.0012	J		0.003	-
	09/06/87	0004			0.0010	J		0.003	-
	09/06/87	0005			0.0010	J		0.003	-
	10/07/88	0001			0.0031			0.003	-
	04/20/89	0001			0.0013	J		0.003	-
	04/20/89	0002			0.0014	J		0.003	-
	04/20/89	0003			0.0012	J		0.003	-
	04/20/89	0004			0.0012	J		0.003	-
	04/20/89	0005			0.0015	J		0.003	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

OTHER PARAMETER VALUE FLAGS:
 J - ESTIMATED VALUE

SAMPLE ID CODES:

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- 0004 - FILTERED REPLICATE SAMPLE (.45 MICRONS)
- N001 - UNFILTERED SAMPLE

SURFACE WATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0550
 NORTH COORDINATE: UNKNOWN
 EAST COORDINATE: UNKNOWN
 09/17/86 TO 02/25/93
 REPORT DATE: 04/20/95

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
URANIUM (TOTAL)	02/23/93	N001	MG/L		0.001		0.001	-
VANADIUM	03/19/87	0001	MG/L	<	0.2		0.2	-
	05/14/87	0001		<	0.01		0.01	-
	09/06/87	0001			0.01		0.01	-
	09/06/87	0002		<	0.01		0.01	-
	09/06/87	0003			0.01		0.01	-
	09/06/87	0004			0.01		0.01	-
	09/06/87	0005			0.01		0.01	-
	10/07/88	0001			0.01		0.01	-
	04/20/89	0001			0.02		0.01	-
	04/20/89	0002			0.02		0.01	-
	04/20/89	0003			0.02		0.01	-
	04/20/89	0004			0.02		0.01	-
	04/20/89	0005			0.02		0.01	-
	VANADIUM (TOTAL)	02/23/93		N001	MG/L		0.12	
ZINC	03/19/87	0001	MG/L		0.007		0.005	-
	05/14/87	0001		<	0.005		0.005	-
	09/06/87	0001		<	0.005		0.005	-
	09/06/87	0002		<	0.005		0.005	-
	09/06/87	0003		<	0.005		0.005	-
	09/06/87	0004		<	0.005		0.005	-
	09/06/87	0005		<	0.005		0.005	-
	10/07/88	0001		<	0.005		0.005	-
	04/20/89	0001		<	0.005		0.005	-
	04/20/89	0002		<	0.005		0.005	-
	04/20/89	0003		<	0.005		0.005	-
	04/20/89	0004		<	0.005		0.005	-
	04/20/89	0005		<	0.005		0.005	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:

- 0001 - FILTERED SAMPLE (.45 MICRONS)
- 0002 - FILTERED REPLICATE SAMPLE (.45 MICRONS)
- 0003 - FILTERED REPLICATE SAMPLE (.45 MICRONS)
- 0004 - FILTERED REPLICATE SAMPLE (.45 MICRONS)
- N001 - UNFILTERED SAMPLE

SURFACE WATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0551
 NORTH COORDINATE: UNKNOWN
 EAST COORDINATE: UNKNOWN
 09/17/86 TO 02/25/93
 REPORT DATE: 04/20/95

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
ALKALINITY	03/19/87	0001	MG/L CaCO3		123.		-	-
	05/17/87	0001		88.	-	-		
	09/06/87	0001		123.	-	-		
	10/07/88	0001		121.	-	-		
	04/20/89	0001		204.	-	-		
	02/24/93	N001		142	-	-		
ALUMINIUM	03/19/87	0001	MG/L		0.2		0.1	-
	05/17/87	0001		0.13		0.1	-	
	09/06/87	0001		0.08	J	0.1	-	
	04/20/89	0001		< 0.1		0.1	-	
AMMONIUM	03/19/87	0001	MG/L	<	0.1		0.1	-
	05/17/87	0001		<	0.1		0.1	-
	09/06/87	0001		<	0.1		0.1	-
	10/07/88	0001		<	0.1		0.1	-
	04/20/89	0001		<	0.3		0.1	-
AMMONIUM (TOTAL)	02/24/93	N001	MG/L	<	0.1		0.1	-
ANTIMONY	03/19/87	0001	MG/L		0.008		0.003	-
	05/17/87	0001		0.018		0.003	-	
	09/06/87	0001		< 0.003		0.003	-	
	10/07/88	0001		< 0.003		0.003	-	
	04/20/89	0001		0.008		0.003	-	
ARSENIC	03/19/87	0001	MG/L		0.004	J	0.01	-
	05/17/87	0001		<	0.001	J	0.01	-
	09/06/87	0001			0.003	J	0.01	-
	10/07/88	0001			0.01		0.01	-
	04/20/89	0001			0.03		0.01	-
ARSENIC (TOTAL)	02/24/93	N001	MG/L		0.010		0.005	-
BARIUM	03/19/87	0001	MG/L		0.1		0.1	-
	05/17/87	0001		0.06	J	0.1	-	
	09/06/87	0001		0.09	J	0.1	-	
	10/07/88	0001		<	0.1		0.1	-
	04/20/89	0001		<	0.1		0.1	-
BERYLLIUM	04/20/89	0001	MG/L	<	0.01		0.01	-
BORON	03/19/87	0001	MG/L		0.10		0.1	-
	05/17/87	0001		0.02	J	0.1	-	
	09/06/87	0001		0.05	J	0.1	-	
	04/20/89	0001		0.3		0.1	-	
BROMIDE	09/06/87	0001	MG/L	<	0.1		0.1	-
	04/20/89	0001		<	0.1		0.1	-
CADMIUM	03/19/87	0001	MG/L	<	0.001		0.001	-
	05/17/87	0001		0.004		0.001	-	
	09/06/87	0001		<	0.005		0.005	-
	10/07/88	0001		<	0.001		0.001	-
	04/20/89	0001			0.002		0.001	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

OTHER PARAMETER VALUE FLAGS:
 J - ESTIMATED VALUE

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)
 N001 - UNFILTERED SAMPLE

SURFACE WATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0551
 NORTH COORDINATE: UNKNOWN
 EAST COORDINATE: UNKNOWN
 09/17/86 TO 02/25/93
 REPORT DATE: 04/20/95

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
CADMIUM (TOTAL)	02/24/93	N001	MG/L	<	0.001		0.001	-
CALCIUM	03/19/87	0001	MG/L		40.9		0.01	-
	05/17/87	0001		39.8	0.01	-		
	09/06/87	0001		64.3	0.01	-		
	10/07/88	0001		70.4	0.01	-		
	04/20/89	0001		433.	0.01	-		
CALCIUM (TOTAL)	02/24/93	N001	MG/L		89.9		0.5	-
CHLORIDE	03/19/87	0001	MG/L		6.1		1.	-
	05/17/87	0001		4.1	1.	-		
	09/06/87	0001		11.8	1.	-		
	10/07/88	0001		13.	1.	-		
	04/20/89	0001		94.	1.	-		
CHLORIDE (TOTAL)	02/24/93	N001	MG/L		12.5		0.5	-
CHROMIUM	03/19/87	0001	MG/L	<	0.01		0.01	-
	05/17/87	0001		0.02	0.01	-		
	09/06/87	0001		<	0.01	0.01	-	
	10/07/88	0001		0.03	0.01	-		
	04/20/89	0001		<	0.01	0.01	-	
CHROMIUM (TOTAL)	02/24/93	N001	MG/L		0.04		0.01	-
COBALT	03/19/87	0001	MG/L	<	0.05		0.05	-
	05/17/87	0001		<	0.01	J	0.05	-
	09/06/87	0001		<	0.01	J	0.05	-
	10/07/88	0001		<	0.05		0.05	-
	04/20/89	0001		<	0.05		0.05	-
COPPER	03/19/87	0001	MG/L		0.04		0.02	-
	05/17/87	0001		<	0.01	J	0.02	-
	09/06/87	0001		<	0.01	J	0.02	-
	10/07/88	0001		<	0.02		0.02	-
	04/20/89	0001			0.02		0.02	-
CYANIDE	04/20/89	0001	MG/L	<	0.01		0.01	-
FLUORIDE	03/19/87	0001	MG/L		0.21		0.1	-
	05/17/87	0001		0.19	0.1	-		
	09/06/87	0001		0.24	0.1	-		
	10/07/88	0001		0.3	0.1	-		
	04/20/89	0001		1.0	0.1	-		
GROSS ALPHA	09/06/87	0001	PCI/L		1.3		0.2	2.9
	10/07/88	0001		5.0	0.2	3.3		
	04/20/89	0001		58.	0.2	34.		
GROSS BETA	09/06/87	0001	PCI/L		4.6		1.	3.3
	10/07/88	0001		6.2	1.	1.8		
	04/20/89	0001		53.	1.	18.		
IRON	03/19/87	0001	MG/L		0.03		0.03	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:

0001 - FILTERED SAMPLE (.45 MICRONS)

N001 - UNFILTERED SAMPLE

OTHER PARAMETER VALUE FLAGS:

J - ESTIMATED VALUE

SURFACE WATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0551
 NORTH COORDINATE: UNKNOWN
 EAST COORDINATE: UNKNOWN
 09/17/86 TO 02/25/93
 REPORT DATE: 04/20/95

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY	
IRON	05/17/87	0001	MG/L		0.05		0.03	-	
	09/06/87	0001			0.02	J		0.03	-
	10/07/88	0001		<	0.03			0.03	-
	04/20/89	0001			0.15			0.03	-
IRON (TOTAL)	02/24/93	N001	MG/L		50.2		0.03	-	
LEAD	03/19/87	0001	MG/L	<	0.001	J	0.01	-	
	05/17/87	0001			0.02			0.01	-
	09/06/87	0001		<	0.01			0.01	-
	10/07/88	0001		<	0.01			0.01	-
	04/20/89	0001			0.02			0.01	-
LEAD (TOTAL)	02/24/93	N001	MG/L		0.029	N	0.003	-	
LEAD-210	03/19/87	0001	PCI/L		0.4		1.5	1.8	
	05/17/87	0001			0.0			1.5	1.0
	09/06/87	0001			0.9			1.5	1.3
	04/20/89	0001			0.8			1.5	0.7
LEAD-210 (TOTAL)	02/24/93	N001	PCI/L		1.7		2.3	1.4	
MAGNESIUM	03/19/87	0001	MG/L		13.3		0.001	-	
	05/17/87	0001			7.73			0.001	-
	09/06/87	0001			12.5			0.001	-
	10/07/88	0001			13.1			0.001	-
	04/20/89	0001			198.			0.001	-
MANGANESE	03/19/87	0001	MG/L		0.02		0.01	-	
	05/17/87	0001			0.02			0.01	-
	09/06/87	0001			0.02			0.01	-
	04/20/89	0001			0.86			0.01	-
MANGANESE (TOTAL)	02/24/93	N001	MG/L		1.13		0.01	-	
MERCURY	09/06/87	0001	MG/L	<	0.0002		0.0002	-	
	10/07/88	0001		<	0.0002			0.0002	-
	04/20/89	0001		<	0.0002			0.0002	-
MOLYBDENUM	03/19/87	0001	MG/L	<	0.1		0.1	-	
	05/17/87	0001		<	0.01			0.01	-
	09/06/87	0001		<	0.01			0.01	-
	10/07/88	0001		<	0.01			0.01	-
	04/20/89	0001			0.01			0.01	-
MOLYBDENUM (TOTAL)	02/24/93	N001	MG/L	<	0.01		0.01	-	
NICKEL	03/19/87	0001	MG/L		0.03	J	0.04	-	
	05/17/87	0001		<	0.01	J		0.04	-
	09/06/87	0001		<	0.01	J		0.04	-
	04/20/89	0001		<	0.04			0.04	-
NITRATE	03/19/87	0001	MG/L	<	0.1	J	1.	-	
	05/17/87	0001			0.8	J		1.	-
	09/06/87	0001			0.4	J		1.	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

OTHER PARAMETER VALUE FLAGS:

J - ESTIMATED VALUE

N - SPIKE SAMPLE RECOVERY NOT WITHIN CONTROL LIMITS

SAMPLE ID CODES:

0001 - FILTERED SAMPLE (.45 MICRONS)

N001 - UNFILTERED SAMPLE

SURFACE WATER QUALITY DATA BY LOCATION
DATA EVALUATED FOR THE BLRA
SITE: SHP01 SHIPROCK
LOCATION: 0551
NORTH COORDINATE: UNKNOWN
EAST COORDINATE: UNKNOWN
09/17/86 TO 02/25/93
REPORT DATE: 04/20/95

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
NITRATE	10/07/88	0001	MG/L		2.6		1.	-
	04/20/89	0001			51.		1.	-
NITRATE (TOTAL)	02/24/93	N001	MG/L		1.7		1	-
NITRITE	03/19/87	0001	MG/L	<	0.1		0.1	-
	05/17/87	0001		<	0.1		0.1	-
	09/06/87	0001		<	0.1		0.1	-
NITRITE AND NITRATE	10/07/88	0001	MG/L	<	1.0		1.	-
PH	03/19/87	0001	SU		8.24		-	-
	05/17/87	0001			8.08		-	-
	09/06/87	0001			8.40		-	-
	10/07/88	0001			7.75		-	-
	04/20/89	0001			8.16		-	-
	02/24/93	N001			8.13		-	-
PHOSPHATE	03/19/87	0001	MG/L		0.30		0.1	-
	05/17/87	0001			0.31		0.1	-
	09/06/87	0001		<	0.1		0.1	-
	10/07/88	0001		<	0.1		0.1	-
	04/20/89	0001		<	0.1		0.1	-
PHOSPHATE (TOTAL)	02/24/93	N001	MG/L		1.1		0.1	-
POLONIUM-210	03/19/87	0001	PCI/L		0.0		1.	0.2
	05/17/87	0001			0.0		1.	0.4
	09/06/87	0001			0.2		1.	0.7
	04/20/89	0001			0.4		1.	0.4
POLONIUM-210 (TOTAL)	02/24/93	N001	PCI/L		0.4		0.7	0.5
POTASSIUM	03/19/87	0001	MG/L		2.69		0.01,	-
	05/17/87	0001			1.79		0.01	-
	09/06/87	0001			1.84		0.01	-
	10/07/88	0001			2.7		0.01	-
	04/20/89	0001			17.2		0.01	-
RADIUM-226	03/19/87	0001	PCI/L		0.1		1.	0.2
	05/17/87	0001			0.0		1.	0.1
	09/06/87	0001			0.0		1.	0.2
	10/07/88	0001			0.1		1.	0.1
RADIUM-226 (TOTAL)	02/24/93	N001	PCI/L		1.7		0.4	0.5
RADIUM-228	03/19/87	0001	PCI/L		0.0		1.	0.9
	05/17/87	0001			0.0		1.	1.0
	09/06/87	0001			0.0		1.	0.7
	10/07/88	0001			0.0		1.	0.7
	04/20/89	0001			0.0		1.	0.7
SELENIUM	03/19/87	0001	MG/L	<	0.002	J	0.005	-
	05/17/87	0001		<	0.001	J	0.005	-
	09/06/87	0001			0.003	J	0.005	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
0001 - FILTERED SAMPLE (.45 MICRONS)
N001 - UNFILTERED SAMPLE

OTHER PARAMETER VALUE FLAGS:
J - ESTIMATED VALUE

SURFACE WATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0551
 NORTH COORDINATE: UNKNOWN
 EAST COORDINATE: UNKNOWN
 09/17/86 TO 02/25/93
 REPORT DATE: 04/20/95

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
SELENIUM	10/07/88	0001	MG/L		0.015		0.005	-
	04/20/89	0001			0.038		0.005	-
SELENIUM (TOTAL)	02/24/93	N001	MG/L	<	0.05	I	0.05	-
SILICA - SiO2	03/19/87	0001	MG/L		8.9		2.	-
	05/17/87	0001			10.2		2.	-
	09/06/87	0001			7.94		2.	-
	04/20/89	0001			6.		2.	-
SILVER	10/07/88	0001	MG/L	<	0.01		0.01	-
	04/20/89	0001		<	0.01		0.01	-
SODIUM	03/19/87	0001	MG/L		41.6		0.002	-
	05/17/87	0001			16.8		0.002	-
	09/06/87	0001			42.7		0.002	-
	10/07/88	0001			44.2		0.002	-
	04/20/89	0001			1040.		0.002	-
SODIUM (TOTAL)	02/24/93	N001	MG/L		55		1	-
SPECIFIC CONDUCTANCE	03/19/87	0001	UMHO/CM		330.		-	-
	05/17/87	0001			190.		-	-
	09/06/87	0001			269.		-	-
	10/07/88	0001			390.		-	-
	04/20/89	0001			4200.		-	-
	02/24/93	N001			398		-	-
STRONTIUM	03/19/87	0001	MG/L		0.66		0.1	-
	05/17/87	0001			0.48		0.1	-
	09/06/87	0001			0.865		0.1	-
	10/07/88	0001			0.9		0.1	-
	04/20/89	0001			4.5		0.1	-
STRONTIUM (TOTAL)	02/24/93	N001	MG/L		1.10		0.01	-
SULFATE	03/19/87	0001	MG/L		131.		0.1	-
	05/17/87	0001			71.		0.1	-
	09/06/87	0001			163.		0.1	-
	10/07/88	0001			172.		0.1	-
	04/20/89	0001			4000.		0.1	-
SULFATE (TOTAL)	02/24/93	N001	MG/L		187		1	-
SULFIDE	09/06/87	0001	MG/L	<	0.1		0.1	-
	04/20/89	0001		<	0.1		0.1	-
TEMPERATURE	03/19/87	0001	C - DEGREE		9.0		-	-
	05/17/87	0001			12.0		-	-
	09/06/87	0001			21.2		-	-
	10/07/88	0001			14.0		-	-
	04/20/89	0001			22.		-	-
	02/24/93	N001		4.3		-	-	
THALLIUM	04/20/89	0001	MG/L		0.01		0.01	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

OTHER PARAMETER VALUE FLAGS:
 I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)
 N001 - UNFILTERED SAMPLE

SURFACE WATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0551
 NORTH COORDINATE: UNKNOWN
 EAST COORDINATE: UNKNOWN
 09/17/86 TO 02/25/93
 REPORT DATE: 04/20/95

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
THORIUM-230	03/19/87	0001	PCI/L		0.4		1.	0.8
	05/17/87	0001		0.1	1.	0.6		
	09/06/87	0001		0.0	1.	0.4		
	10/07/88	0001		0.1	1.	0.4		
	04/20/89	0001		0.1	1.	0.4		
THORIUM-230 (TOTAL)	02/24/93	N001	PCI/L		0.2		0.3	0.2
TIN	03/19/87	0001	MG/L	<	0.005		0.005	-
	05/17/87	0001		<	0.005		0.005	-
	09/06/87	0001		<	0.003	J	0.005	-
	04/20/89	0001		<	0.005		0.005	-
TOTAL DISSOLVED SOLIDS	03/19/87	0001	MG/L		323.		10.	-
	05/17/87	0001		221.	10.	-		
	09/06/87	0001		397.	10.	-		
	10/07/88	0001		421.	10.	-		
	04/20/89	0001		6060.	10.	-		
TOTAL DISSOLVED SOLIDS (TOTAL)	02/24/93	N001	MG/L		456		10	-
TOTAL ORGANIC CARBON	03/19/87	0001	MG/L		18.8		1.	-
	05/17/87	0001		29.6	1.	-		
	09/06/87	0001		35.7	1.	-		
	04/20/89	0001		51.5	1.	-		
	02/24/93	N001		5.2	1	-		
URANIUM	03/19/87	0001	MG/L		0.0025	J	0.003	-
	05/17/87	0001		<	0.0003	J	0.003	-
	09/06/87	0001			0.0015	J	0.003	-
	10/07/88	0001			0.0023	J	0.003	-
	04/20/89	0001			0.0482		0.003	-
URANIUM (TOTAL)	02/24/93	N001	MG/L		0.001		0.001	-
VANADIUM	03/19/87	0001	MG/L	<	0.2		0.2	-
	05/17/87	0001		<	0.01		0.01	-
	09/06/87	0001			0.01		0.01	-
	10/07/88	0001			0.01		0.01	-
	04/20/89	0001			0.06		0.01	-
VANADIUM (TOTAL)	02/24/93	N001	MG/L		0.10		0.01	-
ZINC	03/19/87	0001	MG/L		0.008		0.005	-
	05/17/87	0001		<	0.005		0.005	-
	09/06/87	0001		<	0.005		0.005	-
	10/07/88	0001			0.16		0.005	-
	04/20/89	0001			0.010		0.005	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

OTHER PARAMETER VALUE FLAGS:
 J - ESTIMATED VALUE

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)
 N001 - UNFILTERED SAMPLE

SURFACE WATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0552
 NORTH COORDINATE: UNKNOWN
 EAST COORDINATE: UNKNOWN
 09/17/86 TO 02/25/93
 REPORT DATE: 04/20/95

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
ALKALINITY	03/19/87	0001	MG/L CaCO3		116.		-	-
	05/17/87	0001			101.		-	-
	09/21/87	0001			129.		-	-
	10/07/88	0001			86.		-	-
	04/22/89	0001			59.	J	-	-
	02/25/93	N001			119		-	-
ALUMINUM	03/19/87	0001	MG/L		0.2		0.1	-
	05/17/87	0001			0.06	J	0.1	-
	09/21/87	0001			0.07	J	0.1	-
	04/22/89	0001		<	0.1	J	0.1	-
AMMONIUM	03/19/87	0001	MG/L	<	0.1		0.1	-
	05/17/87	0001		<	0.1		0.1	-
	09/21/87	0001		<	0.1		0.1	-
	10/07/88	0001		<	0.1		0.1	-
	04/22/89	0001		<	0.3	J	0.1	-
AMMONIUM (TOTAL)	02/25/93	N001	MG/L	<	0.1		0.1	-
ANTIMONY	03/19/87	0001	MG/L	<	0.003		0.003	-
	05/17/87	0001			0.021		0.003	-
	09/21/87	0001			0.004		0.003	-
	10/07/88	0001		<	0.003		0.003	-
	04/22/89	0001		<	0.003	J	0.003	-
ARSENIC	03/19/87	0001	MG/L		0.004	J	0.01	-
	05/17/87	0001		<	0.001	J	0.01	-
	09/21/87	0001			0.002	J	0.01	-
	10/07/88	0001			0.01		0.01	-
	04/22/89	0001		<	0.01	J	0.01	-
ARSENIC (TOTAL)	02/25/93	N001	MG/L		0.007		0.005	-
BARIUM	03/19/87	0001	MG/L	<	0.1		0.1	-
	05/17/87	0001			0.06	J	0.1	-
	09/21/87	0001			0.07	J	0.1	-
	10/07/88	0001		<	0.1		0.1	-
	04/22/89	0001		<	0.1	J	0.1	-
BERYLLIUM	04/22/89	0001	MG/L	<	0.01	J	0.01	-
BORON	03/19/87	0001	MG/L		0.08	J	0.1	-
	05/17/87	0001			0.02	J	0.1	-
	09/21/87	0001			0.05	J	0.1	-
	04/22/89	0001		<	0.1	J	0.1	-
BROMIDE	09/21/87	0001	MG/L	<	0.1		0.1	-
	04/22/89	0001		<	0.1	J	0.1	-
CADMIUM	03/19/87	0001	MG/L	<	0.001		0.001	-
	05/17/87	0001			0.006		0.001	-
	09/21/87	0001		<	0.005		0.005	-
	10/07/88	0001		<	0.001		0.001	-
	04/22/89	0001		<	0.001	J	0.001	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

OTHER PARAMETER VALUE FLAGS:
 J - ESTIMATED VALUE

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)
 N001 - UNFILTERED SAMPLE

SURFACE WATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0552
 NORTH COORDINATE: UNKNOWN
 EAST COORDINATE: UNKNOWN
 09/17/86 TO 02/25/93
 REPORT DATE: 04/20/95

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
CADMIUM (TOTAL)	02/25/93	N001	MG/L	<	0.001		0.001	-
CALCIUM	03/19/87	0001	MG/L		47.2		0.01	-
	05/17/87	0001		40.4	0.01	-		
	09/21/87	0001		62.6	0.01	-		
	10/07/88	0001		71.2	0.01	-		
	04/22/89	0001		55.1	0.01	J	-	
CALCIUM (TOTAL)	02/25/93	N001	MG/L		72.6		0.5	-
CHLORIDE	03/19/87	0001	MG/L		3.9		1.	-
	05/17/87	0001		4.0	1.	-		
	09/21/87	0001		10.6	1.	-		
	10/07/88	0001		13.	1.	-		
	04/22/89	0001		6.1	1.	J	-	
CHLORIDE (TOTAL)	02/25/93	N001	MG/L		8.3		0.5	-
CHROMIUM	03/19/87	0001	MG/L	<	0.01		0.01	-
	05/17/87	0001		<	0.02		0.01	-
	09/21/87	0001		<	0.01		0.01	-
	10/07/88	0001		<	0.03		0.01	-
	04/22/89	0001		<	0.01	J	0.01	-
CHROMIUM (TOTAL)	02/25/93	N001	MG/L		0.03		0.01	-
COBALT	03/19/87	0001	MG/L	<	0.05		0.05	-
	05/17/87	0001		<	0.01	J	0.05	-
	09/21/87	0001		<	0.01	J	0.05	-
	10/07/88	0001		<	0.05		0.05	-
	04/22/89	0001		<	0.05	J	0.05	-
COPPER	03/19/87	0001	MG/L		0.01	J	0.02	-
	05/17/87	0001		<	0.01	J	0.02	-
	09/21/87	0001		<	0.01	J	0.02	-
	10/07/88	0001		<	0.02		0.02	-
	04/22/89	0001		<	0.02	J	0.02	-
CYANIDE	04/22/89	0001	MG/L	<	0.01	J	0.01	-
FLUORIDE	03/19/87	0001	MG/L		0.21		0.1	-
	05/17/87	0001		0.18	0.1	-		
	09/21/87	0001		0.25	0.1	-		
	10/07/88	0001		0.3	0.1	-		
	04/22/89	0001		0.3	0.1	J	-	
GROSS ALPHA	09/21/87	0001	PCI/L		0.9		0.2	2.7
	10/07/88	0001		3.0	0.2	3.1		
	04/22/89	0001		2.5	0.2	J	2.0	
GROSS BETA	09/21/87	0001	PCI/L		2.0		1.	3.1
	10/07/88	0001		7.6	1.	1.7		
	04/22/89	0001		1.9	1.	J	1.3	
IRON	03/19/87	0001	MG/L		0.05		0.03	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

OTHER PARAMETER VALUE FLAGS:
 J - ESTIMATED VALUE

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)
 N001 - UNFILTERED SAMPLE

SURFACE WATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0552
 NORTH COORDINATE: UNKNOWN
 EAST COORDINATE: UNKNOWN
 09/17/86 TO 02/25/93
 REPORT DATE: 04/20/95

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
IRON	05/17/87	0001	MG/L		0.03		0.03	-
	09/21/87	0001		<	0.01	J	0.03	-
	10/07/88	0001			0.03		0.03	-
	04/22/89	0001		<	0.03	J	0.03	-
IRON (TOTAL)	02/25/93	N001	MG/L		41.7		0.03	-
LEAD	03/19/87	0001	MG/L	<	0.001	J	0.01	-
	05/17/87	0001			0.02		0.01	-
	09/21/87	0001		<	0.01		0.01	-
	10/07/88	0001		<	0.01		0.01	-
	04/22/89	0001		<	0.01	J	0.01	-
LEAD (TOTAL)	02/25/93	N001	MG/L		0.024	N	0.003	-
LEAD-210	03/19/87	0001	PCI/L		0.0		1.5	1.4
	05/17/87	0001			0.2		1.5	1.2
	04/22/89	0001			0.0	J	1.5	0.6
LEAD-210 (TOTAL)	02/25/93	N001	PCI/L		2.1		2.3	1.4
MAGNESIUM	03/19/87	0001	MG/L		12.7		0.001	-
	05/17/87	0001			7.61		0.001	-
	09/21/87	0001			12.0		0.001	-
	10/07/88	0001			12.7		0.001	-
	04/22/89	0001			9.70	J	0.001	-
MANGANESE	03/19/87	0001	MG/L		0.02		0.01	-
	05/17/87	0001		<	0.01		0.01	-
	09/21/87	0001			0.03		0.01	-
	04/22/89	0001			0.02	J	0.01	-
MANGANESE (TOTAL)	02/25/93	N001	MG/L		1.03		0.01	-
MERCURY	09/21/87	0001	MG/L		0.0006		0.0002	-
	10/07/88	0001		<	0.0002		0.0002	-
	04/22/89	0001		<	0.0002	J	0.0002	-
MOLYBDENUM	03/19/87	0001	MG/L	<	0.1		0.1	-
	05/17/87	0001		<	0.01		0.01	-
	09/21/87	0001		<	0.01		0.01	-
	10/07/88	0001		<	0.01		0.01	-
	04/22/89	0001		<	0.01	J	0.01	-
MOLYBDENUM (TOTAL)	02/25/93	N001	MG/L	<	0.01		0.01	-
NICKEL	03/19/87	0001	MG/L		0.01	J	0.04	-
	05/17/87	0001		<	0.01	J	0.04	-
	09/21/87	0001			0.01	J	0.04	-
	04/22/89	0001		<	0.04	J	0.04	-
NITRATE	03/19/87	0001	MG/L	<	0.1	J	1.	-
	05/17/87	0001			0.4	J	1.	-
	09/21/87	0001		<	0.1	J	1.	-
	10/07/88	0001			1.4		1.	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)
 N001 - UNFILTERED SAMPLE

OTHER PARAMETER VALUE FLAGS:

J - ESTIMATED VALUE

N - SPIKE SAMPLE RECOVERY NOT WITHIN CONTROL LIMITS

SURFACE WATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0552
 NORTH COORDINATE: UNKNOWN
 EAST COORDINATE: UNKNOWN
 09/17/86 TO 02/25/93
 REPORT DATE: 04/20/95

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
NITRATE	04/22/89	0001	MG/L		1.9	J	1.	-
NITRATE (TOTAL)	02/25/93	N001	MG/L	<	1		1	-
NITRITE	03/19/87	0001	MG/L	<	0.1		0.1	-
	05/17/87	0001		<	0.1		0.1	-
	09/21/87	0001		<	0.1		0.1	-
NITRITE AND NITRATE	10/07/88	0001	MG/L	<	1.0		1.	-
PH	03/19/87	0001	SU		7.94		-	-
	05/17/87	0001			8.22		-	-
	09/21/87	0001			8.55		-	-
	10/07/88	0001			7.73		-	-
	04/22/89	0001			8.28		-	-
	02/25/93	N001			7.98		-	-
PHOSPHATE	03/19/87	0001	MG/L		0.30		0.1	-
	05/17/87	0001			0.30		0.1	-
	09/21/87	0001		<	0.1		0.1	-
	10/07/88	0001		<	0.1		0.1	-
	04/22/89	0001		<	0.1	J	0.1	-
PHOSPHATE (TOTAL)	02/25/93	N001	MG/L		0.97		0.1	-
POLONIUM-210	03/19/87	0001	PCI/L		0.0		1.	0.4
	05/17/87	0001			0.0		1.	0.5
	04/22/89	0001			0.0	J	1.	0.3
POLONIUM-210 (TOTAL)	02/25/93	N001	PCI/L		0.3	N	0.7	0.4
POTASSIUM	03/19/87	0001	MG/L		2.60		0.01	-
	05/17/87	0001			1.90		0.01	-
	09/21/87	0001			1.72		0.01	-
	10/07/88	0001			2.2		0.01	-
	04/22/89	0001			1.7	J	0.01	-
RADIUM-226	03/19/87	0001	PCI/L		0.1		1.	0.2
	05/17/87	0001			0.0		1.	0.1
	10/07/88	0001			0.1		1.	0.1
RADIUM-226 (TOTAL)	02/25/93	N001	PCI/L		2.5		0.4	0.6
RADIUM-228	03/19/87	0001	PCI/L		0.0		1.	1.1
	05/17/87	0001			0.9		1.	4.8
	10/07/88	0001			0.5		1.	0.8
	04/22/89	0001			0.0	J	1.	0.7
SELENIUM	03/19/87	0001	MG/L	<	0.002	J	0.005	-
	05/17/87	0001		<	0.001	J	0.005	-
	09/21/87	0001			0.002	J	0.005	-
	10/07/88	0001			0.013		0.005	-
	04/22/89	0001		<	0.005	J	0.005	-
SELENIUM (TOTAL)	02/25/93	N001	MG/L	<	0.05	I	0.05	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)
 N001 - UNFILTERED SAMPLE

OTHER PARAMETER VALUE FLAGS:
 I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION
 J - ESTIMATED VALUE
 N - SPIKE SAMPLE RECOVERY NOT WITHIN CONTROL LIMITS

SURFACE WATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0552
 NORTH COORDINATE: UNKNOWN
 EAST COORDINATE: UNKNOWN
 09/17/86 TO 02/25/93
 REPORT DATE: 04/20/95

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
SILICA - SiO2	03/19/87	0001	MG/L		8.9		2.	-
	05/17/87	0001		11.1		2.	-	
	09/21/87	0001		7.25		2.	-	
	04/22/89	0001		7.	J	2.	-	
SILVER	10/07/88	0001	MG/L	<	0.01		0.01	-
	04/22/89	0001		<	0.01	J	0.01	-
SODIUM	03/19/87	0001	MG/L		31.1		0.002	-
	05/17/87	0001		17.2		0.002	-	
	09/21/87	0001		39.2		0.002	-	
	10/07/88	0001		41.1		0.002	-	
	04/22/89	0001		22.5	J	0.002	-	
SODIUM (TOTAL)	02/25/93	N001	MG/L		36		1	-
SPECIFIC CONDUCTANCE	03/19/87	0001	UMHO/CM		430.		-	-
	05/17/87	0001		185.		-	-	
	09/21/87	0001		338.		-	-	
	10/07/88	0001		410.		-	-	
	04/22/89	0001		225.		-	-	
	02/25/93	N001		304		-	-	
STRONTIUM	03/19/87	0001	MG/L		0.74		0.1	-
	05/17/87	0001		0.47		0.1	-	
	09/21/87	0001		0.870		0.1	-	
	10/07/88	0001		0.9		0.1	-	
	04/22/89	0001		0.5	J	0.1	-	
STRONTIUM (TOTAL)	02/25/93	N001	MG/L		0.82		0.01	-
SULFATE	03/19/87	0001	MG/L		125.		0.1	-
	05/17/87	0001		67.		0.1	-	
	09/21/87	0001		150.		0.1	-	
	10/07/88	0001		179.		0.1	-	
	04/22/89	0001		89.	J	0.1	-	
SULFATE (TOTAL)	02/25/93	N001	MG/L		121		1	-
SULFIDE	09/21/87	0001	MG/L	<	0.1		0.1	-
	04/22/89	0001		<	0.1	J	0.1	-
TEMPERATURE	03/19/87	0001	C - DEGREE		8.		-	-
	05/17/87	0001		12.0		-	-	
	09/21/87	0001		16.1		-	-	
	10/07/88	0001		14.5		-	-	
	04/22/89	0001		13.		-	-	
	02/25/93	N001		5.1		-	-	
THALLIUM	04/22/89	0001	MG/L	<	0.01	J	0.01	-
THORIUM-230	03/19/87	0001	PCI/L		0.0		1.	0.5
	05/17/87	0001		0.1		1.	0.6	
	10/07/88	0001		0.0		1.	0.3	
	04/22/89	0001		0.0	J	1.	0.3	

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

OTHER PARAMETER VALUE FLAGS:
 J - ESTIMATED VALUE

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)
 N001 - UNFILTERED SAMPLE

SURFACE WATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0552
 NORTH COORDINATE: UNKNOWN
 EAST COORDINATE: UNKNOWN
 09/17/86 TO 02/25/93
 REPORT DATE: 04/20/95

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
THORIUM-230 (TOTAL)	02/25/93	N001	PCI/L		0.1		0.6	0.2
TIN	03/19/87	0001	MG/L	<	0.005		0.005	-
	05/17/87	0001		<	0.005		0.005	-
	04/22/89	0001		<	0.005	J	0.005	-
TOTAL DISSOLVED SOLIDS	03/19/87	0001	MG/L		312.		10.	-
	05/17/87	0001			207.		10.	-
	09/21/87	0001			388.		10.	-
	10/07/88	0001			414.		10.	-
	04/22/89	0001			296.	J	10.	-
TOTAL DISSOLVED SOLIDS (TOTAL)	02/25/93	N001	MG/L		331		10	-
TOTAL ORGANIC CARBON	03/19/87	0001	MG/L		30.7		1.	-
	05/17/87	0001			26.7		1.	-
	04/22/89	0001			21.0	J	1.	-
	02/25/93	N001			6.4		1	-
URANIUM	03/19/87	0001	MG/L		0.0012	J	0.003	-
	05/17/87	0001		<	0.0003	J	0.003	-
	09/21/87	0001			0.0012	J	0.003	-
	10/07/88	0001			0.0020	J	0.003	-
	04/22/89	0001			0.0011	J	0.003	-
URANIUM (TOTAL)	02/25/93	N001	MG/L		0.001		0.001	-
VANADIUM	03/19/87	0001	MG/L	<	0.2		0.2	-
	05/17/87	0001		<	0.01		0.01	-
	09/21/87	0001			0.01		0.01	-
	10/07/88	0001			0.01		0.01	-
	04/22/89	0001			0.02	J	0.01	-
VANADIUM (TOTAL)	02/25/93	N001	MG/L		0.09		0.01	-
ZINC	03/19/87	0001	MG/L	<	0.005		0.005	-
	05/17/87	0001		<	0.005		0.005	-
	09/21/87	0001		<	0.005		0.005	-
	10/07/88	0001		<	0.005		0.005	-
	04/22/89	0001		<	0.005	J	0.005	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:

0001 - FILTERED SAMPLE (.45 MICRONS)

N001 - UNFILTERED SAMPLE

OTHER PARAMETER VALUE FLAGS:

J - ESTIMATED VALUE

SURFACE WATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0553
 NORTH COORDINATE: UNKNOWN
 EAST COORDINATE: UNKNOWN
 09/17/86 TO 02/25/93
 REPORT DATE: 04/20/95

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
ALKALINITY	03/17/87	0001	MG/L CaCO3		102.		-	-
	05/17/87	0001		98.	-	-		
	09/20/87	0001		130.	-	-		
	10/09/88	0001		118.	-	-		
	04/04/89	0001		119.	-	-		
	02/23/93	N001		147	-	-		
ALUMINUM	03/17/87	0001	MG/L	<	0.1		0.1	-
	05/17/87	0001			0.05	J	0.1	-
	09/20/87	0001			0.10		0.1	-
	04/04/89	0001		<	0.1		0.1	-
AMMONIUM	03/17/87	0001	MG/L	<	0.1		0.1	-
	05/17/87	0001		<	0.1		0.1	-
	09/20/87	0001		<	0.1		0.1	-
	10/09/88	0001		<	0.1		0.1	-
	04/04/89	0001		<	0.1		0.1	-
AMMONIUM (TOTAL)	02/23/93	N001	MG/L	<	0.1		0.1	-
ANTIMONY	03/17/87	0001	MG/L	<	0.003		0.003	-
	05/17/87	0001			0.020		0.003	-
	09/20/87	0001		<	0.003		0.003	-
	10/09/88	0001		<	0.003		0.003	-
	04/04/89	0001			0.003		0.003	-
ARSENIC	03/17/87	0001	MG/L		0.002	J	0.01	-
	05/17/87	0001			0.001	J	0.01	-
	09/20/87	0001			0.002	J	0.01	-
	10/09/88	0001			0.01		0.01	-
	04/04/89	0001		<	0.01		0.01	-
ARSENIC (TOTAL)	02/23/93	N001	MG/L		0.014	S	0.005	-
BARIUM	03/17/87	0001	MG/L		0.2		0.1	-
	05/17/87	0001			0.05	J	0.1	-
	09/20/87	0001			0.08	J	0.1	-
	10/09/88	0001		<	0.1		0.1	-
	04/04/89	0001		<	0.1		0.1	-
BERYLLIUM	04/04/89	0001	MG/L	<	0.01		0.01	-
BORON	03/17/87	0001	MG/L		0.10		0.1	-
	05/17/87	0001			0.05	J	0.1	-
	09/20/87	0001			0.06	J	0.1	-
	04/04/89	0001		<	0.1		0.1	-
BROMIDE	09/20/87	0001	MG/L	<	0.1		0.1	-
	04/04/89	0001		<	0.1		0.1	-
CADMIUM	03/17/87	0001	MG/L	<	0.001		0.001	-
	05/17/87	0001			0.006		0.001	-
	09/20/87	0001		<	0.005		0.005	-
	10/09/88	0001		<	0.001		0.001	-
	04/04/89	0001		<	0.001		0.001	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:

0001 - FILTERED SAMPLE (.45 MICRONS)

N001 - UNFILTERED SAMPLE

OTHER PARAMETER VALUE FLAGS:

J - ESTIMATED VALUE

S - REPORTED VALUE DETERMINED USING METHOD OF STD ADDITION (MSA)

SURFACE WATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0553
 NORTH COORDINATE: UNKNOWN
 EAST COORDINATE: UNKNOWN
 09/17/86 TO 02/25/93
 REPORT DATE: 04/20/95

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
CADMIUM (TOTAL)	02/23/93	N001	MG/L	<	0.001		0.001	-
CALCIUM	03/17/87	0001	MG/L		45.9		0.01	-
	05/17/87	0001		39.9	0.01	-		
	09/20/87	0001		63.0	0.01	-		
	10/09/88	0001		70.1	0.01	-		
	04/04/89	0001		58.8	0.01	-		
CALCIUM (TOTAL)	02/23/93	N001	MG/L		97.5		0.5	-
CHLORIDE	03/17/87	0001	MG/L		5.0		1.	-
	05/17/87	0001		3.8	1.	-		
	09/20/87	0001		11.8	1.	-		
	10/09/88	0001		13.	1.	-		
	04/04/89	0001		10.	1.	-		
CHLORIDE (TOTAL)	02/23/93	N001	MG/L		13.9		0.5	-
CHROMIUM	03/17/87	0001	MG/L		0.01		0.01	-
	05/17/87	0001		0.02	0.01	-		
	09/20/87	0001		< 0.01	0.01	-		
	10/09/88	0001		0.03	0.01	-		
	04/04/89	0001		< 0.01	0.01	-		
CHROMIUM (TOTAL)	02/23/93	N001	MG/L		0.07		0.01	-
COBALT	03/17/87	0001	MG/L	<	0.05		0.05	-
	05/17/87	0001		<	0.01	J	0.05	-
	09/20/87	0001		<	0.01	J	0.05	-
	10/09/88	0001		<	0.05		0.05	-
	04/04/89	0001		<	0.05		0.05	-
COPPER	03/17/87	0001	MG/L		0.01	J	0.02	-
	05/17/87	0001		<	0.01	J	0.02	-
	09/20/87	0001		<	0.01	J	0.02	-
	10/09/88	0001		<	0.02		0.02	-
	04/04/89	0001		<	0.02		0.02	-
CYANIDE	04/04/89	0001	MG/L	<	0.01		0.01	-
FLUORIDE	03/17/87	0001	MG/L		0.21		0.1	-
	05/17/87	0001		0.19	0.1	-		
	09/20/87	0001		0.25	0.1	-		
	10/09/88	0001		0.3	0.1	-		
	04/04/89	0001		0.3	0.1	-		
GROSS ALPHA	09/20/87	0001	PCI/L		3.7		0.2	3.1
	10/09/88	0001		0.5	0.2	2.7		
	04/04/89	0001		1.0	0.2	2.3		
GROSS BETA	09/20/87	0001	PCI/L		19.		1.	4.
	10/09/88	0001		6.5	1.	1.7		
	04/04/89	0001		3.8	1.	1.4		
IRON	03/17/87	0001	MG/L		0.05		0.03	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:

0001 - FILTERED SAMPLE (.45 MICRONS)

N001 - UNFILTERED SAMPLE

OTHER PARAMETER VALUE FLAGS:

J - ESTIMATED VALUE

SURFACE WATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0553
 NORTH COORDINATE: UNKNOWN
 EAST COORDINATE: UNKNOWN
 09/17/86 TO 02/25/93
 REPORT DATE: 04/20/95

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY	
IRON	05/17/87	0001	MG/L		0.02	J	0.03	-	
	09/20/87	0001			0.02	J		0.03	-
	10/09/88	0001		<	0.03			0.03	-
	04/04/89	0001			0.04			0.03	-
IRON (TOTAL)	02/23/93	N001	MG/L		69.9		0.03	-	
LEAD	03/17/87	0001	MG/L	<	0.001	J	0.01	-	
	05/17/87	0001			0.02			0.01	-
	09/20/87	0001		<	0.01			0.01	-
	10/09/88	0001		<	0.01			0.01	-
	04/04/89	0001		<	0.01			0.01	-
LEAD (TOTAL)	02/23/93	N001	MG/L		0.038	N	0.003	-	
LEAD-210	03/17/87	0001	PCI/L		0.0		1.5	1.4	
	05/17/87	0001			0.2			1.5	1.0
	04/04/89	0001			1.0			1.5	0.7
LEAD-210 (TOTAL)	02/23/93	N001	PCI/L		1.7		2.3	1.4	
MAGNESIUM	03/17/87	0001	MG/L		12.4		0.001	-	
	05/17/87	0001			7.45			0.001	-
	09/20/87	0001			12.2			0.001	-
	10/09/88	0001			13.7			0.001	-
	04/04/89	0001			12.9			0.001	-
MANGANESE	03/17/87	0001	MG/L		0.01		0.01	-	
	05/17/87	0001			0.01			0.01	-
	09/20/87	0001			0.02			0.01	-
	04/04/89	0001			0.01			0.01	-
MANGANESE (TOTAL)	02/23/93	N001	MG/L		1.23		0.01	-	
MERCURY	09/20/87	0001	MG/L	<	0.0002		0.0002	-	
	10/09/88	0001		<	0.0002			0.0002	-
	04/04/89	0001		<	0.0002			0.0002	-
MOLYBDENUM	03/17/87	0001	MG/L	<	0.1		0.1	-	
	05/17/87	0001		<	0.01			0.01	-
	09/20/87	0001		<	0.01			0.01	-
	10/09/88	0001		<	0.01			0.01	-
	04/04/89	0001		<	0.01			0.01	-
MOLYBDENUM (TOTAL)	02/23/93	N001	MG/L	<	0.01		0.01	-	
NICKEL	03/17/87	0001	MG/L		0.02	J	0.04	-	
	05/17/87	0001		<	0.01	J		0.04	-
	09/20/87	0001		<	0.01	J		0.04	-
	04/04/89	0001		<	0.04			0.04	-
NITRATE	03/17/87	0001	MG/L	<	0.1	J	1.	-	
	05/17/87	0001			0.4	J		1.	-
	09/20/87	0001		<	0.1	J		1.	-
	10/09/88	0001			1.4			1.	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)
 N001 - UNFILTERED SAMPLE

OTHER PARAMETER VALUE FLAGS:

J - ESTIMATED VALUE

N - SPIKE SAMPLE RECOVERY NOT WITHIN CONTROL LIMITS

SURFACE WATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0553
 NORTH COORDINATE: UNKNOWN
 EAST COORDINATE: UNKNOWN
 09/17/86 TO 02/25/93
 REPORT DATE: 04/20/95

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
NITRATE	04/04/89	0001	MG/L		2.1		1.	-
NITRATE (TOTAL)	02/23/93	N001	MG/L		1.7		1	-
NITRITE	03/17/87	0001	MG/L	<	0.1		0.1	-
	05/17/87	0001		<	0.1		0.1	-
	09/20/87	0001		<	0.1		0.1	-
NITRITE AND NITRATE	10/09/88	0001	MG/L	<	1.0		1.	-
PH	03/17/87	0001	SU		8.34		-	-
	05/17/87	0001			8.21		-	-
	09/20/87	0001			8.68		-	-
	10/09/88	0001			7.74		-	-
	04/04/89	0001			8.43		-	-
	02/23/93	N001			8.19		-	-
PHOSPHATE	03/17/87	0001	MG/L		0.25		0.1	-
	05/17/87	0001			0.26		0.1	-
	09/20/87	0001		<	0.1		0.1	-
	10/09/88	0001			0.1		0.1	-
	04/04/89	0001		<	0.1		0.1	-
PHOSPHATE (TOTAL)	02/23/93	N001	MG/L		1		0.1	-
POLONIUM-210	03/17/87	0001	PCI/L		0.0		1.	0.4
	05/17/87	0001			0.7		1.	0.6
	04/04/89	0001			0.9		1.	0.5
POLONIUM-210 (TOTAL)	02/23/93	N001	PCI/L		0.0	N	0.7	0.4
POTASSIUM	03/17/87	0001	MG/L		2.60		0.01	-
	05/17/87	0001			1.9		0.01	-
	09/20/87	0001			1.95		0.01	-
	10/09/88	0001			2.9		0.01	-
	04/04/89	0001			2.11		0.01	-
RADIUM-226	03/17/87	0001	PCI/L		0.0		1.	0.2
	05/17/87	0001			0.0		1.	0.1
	10/09/88	0001			0.1		1.	0.1
	04/04/89	0001			0.2		1.	0.2
RADIUM-226 (TOTAL)	02/23/93	N001	PCI/L		1.6		0.4	0.5
RADIUM-228	03/17/87	0001	PCI/L		0.0		1.	1.2
	05/17/87	0001			0.0		1.	5.1
	10/09/88	0001			0.0		1.	0.7
	04/04/89	0001			0.0		1.	1.0
SELENIUM	03/17/87	0001	MG/L	<	0.002	J	0.005	-
	05/17/87	0001		<	0.001	J	0.005	-
	09/20/87	0001			0.003	J	0.005	-
	10/09/88	0001			0.013		0.005	-
	04/04/89	0001		<	0.005		0.005	-
SELENIUM (TOTAL)	02/23/93	N001	MG/L	<	0.05	I	0.05	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

OTHER PARAMETER VALUE FLAGS:

I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION

J - ESTIMATED VALUE

N - SPIKE SAMPLE RECOVERY NOT WITHIN CONTROL LIMITS

SAMPLE ID CODES:

0001 - FILTERED SAMPLE (.45 MICRONS)

N001 - UNFILTERED SAMPLE

SURFACE WATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0553
 NORTH COORDINATE: UNKNOWN
 EAST COORDINATE: UNKNOWN
 09/17/86 TO 02/25/93
 REPORT DATE: 04/20/95

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
SILICA - SIO2	03/17/87	0001	MG/L		8.8		2.	-
	05/17/87	0001		10.8		2.	-	
	09/20/87	0001		7.36		2.	-	
	04/04/89	0001		8.		2.	-	
SILVER	10/09/88	0001	MG/L	<	0.01		0.01	-
	04/04/89	0001		<	0.01		0.01	-
SODIUM	03/17/87	0001	MG/L		29.9		0.002	-
	05/17/87	0001		16.4		0.002	-	
	09/20/87	0001		42.7		0.002	-	
	10/09/88	0001		46.7		0.002	-	
	04/04/89	0001		32.1		0.002	-	
SODIUM (TOTAL)	02/23/93	N001	MG/L		62		1	-
SPECIFIC CONDUCTANCE	03/17/87	0001	UMHO/CM		270.		-	-
	05/17/87	0001		180.		-	-	
	09/20/87	0001		356.		-	-	
	10/09/88	0001		395.		-	-	
	04/04/89	0001		270.		-	-	
	02/23/93	N001		452		-	-	
STRONTIUM	03/17/87	0001	MG/L		0.73		0.1	-
	05/17/87	0001		0.45		0.1	-	
	09/20/87	0001		0.870		0.1	-	
	10/09/88	0001		0.9		0.1	-	
	04/04/89	0001		0.6		0.1	-	
STRONTIUM (TOTAL)	02/23/93	N001	MG/L		1.24		0.01	-
SULFATE	03/17/87	0001	MG/L		124.		0.1	-
	05/17/87	0001		70.		0.1	-	
	09/20/87	0001		156.		0.1	-	
	10/09/88	0001		179.		0.1	-	
	04/04/89	0001		125.		0.1	-	
SULFATE (TOTAL)	02/23/93	N001	MG/L		202		1	-
SULFIDE	09/20/87	0001	MG/L	<	0.1		0.1	-
	04/04/89	0001		<	0.1		0.1	-
TEMPERATURE	03/17/87	0001	C - DEGREE		7.		-	-
	05/17/87	0001		10.0		-	-	
	09/20/87	0001		15.7		-	-	
	10/09/88	0001		13.5		-	-	
	04/04/89	0001		11.		-	-	
	02/23/93	N001		6.2		-	-	
THALLIUM	04/04/89	0001	MG/L	<	0.01		0.01	-
THORIUM-230	03/17/87	0001	PCI/L		0.3		1.	0.8
	05/17/87	0001		0.1		1.	0.6	
	10/09/88	0001		0.0		1.	0.2	
	04/04/89	0001		0.0		1.	0.3	

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)
 N001 - UNFILTERED SAMPLE

SURFACE WATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0553
 NORTH COORDINATE: UNKNOWN
 EAST COORDINATE: UNKNOWN
 09/17/86 TO 02/25/93
 REPORT DATE: 04/20/95

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
THORIUM-230 (TOTAL)	02/23/93	N001	PC1/L		0.2		0.3	0.2
TIN	03/17/87	0001	MG/L	<	0.005		0.005	-
	05/17/87	0001		<	0.005		0.005	-
	04/04/89	0001		<	0.005		0.005	-
TOTAL DISSOLVED SOLIDS	03/17/87	0001	MG/L		328.		10.	-
	05/17/87	0001			214.		10.	-
	09/20/87	0001			399.		10.	-
	10/09/88	0001			414.		10.	-
	04/04/89	0001			330.		10.	-
TOTAL DISSOLVED SOLIDS (TOTAL)	02/23/93	N001	MG/L		520		10	-
TOTAL ORGANIC CARBON	03/17/87	0001	MG/L		33.7		1.	-
	05/17/87	0001			29.4		1.	-
	04/04/89	0001			20.4		1.	-
	02/23/93	N001			14		1	-
URANIUM	03/17/87	0001	MG/L		0.0005	J	0.003	-
	05/17/87	0001		<	0.0003	J	0.003	-
	09/20/87	0001			0.0013	J	0.003	-
	10/09/88	0001			0.0023	J	0.003	-
	04/04/89	0001			0.0015	J	0.003	-
URANIUM (TOTAL)	02/23/93	N001	MG/L		0.002		0.001	-
VANADIUM	03/17/87	0001	MG/L	<	0.2		0.2	-
	05/17/87	0001		<	0.01		0.01	-
	09/20/87	0001			0.01		0.01	-
	10/09/88	0001			0.01		0.01	-
	04/04/89	0001		<	0.01		0.01	-
VANADIUM (TOTAL)	02/23/93	N001	MG/L		0.14		0.01	-
ZINC	03/17/87	0001	MG/L	<	0.005		0.005	-
	05/17/87	0001		<	0.005		0.005	-
	09/20/87	0001		<	0.005		0.005	-
	10/09/88	0001			0.008		0.005	-
	04/04/89	0001			0.017		0.005	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)
 N001 - UNFILTERED SAMPLE

OTHER PARAMETER VALUE FLAGS:
 J - ESTIMATED VALUE

SURFACE WATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0554
 NORTH COORDINATE: UNKNOWN
 EAST COORDINATE: UNKNOWN
 09/17/86 TO 02/25/93
 REPORT DATE: 04/20/95

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
ALKALINITY	03/19/87	0001	MG/L CaCO3		113.		-	-
	05/16/87	0001		98.	-	-		
	09/04/87	0001		123.	-	-		
	10/07/88	0001		114.	-	-		
	10/07/88	0002		114.	-	-		
	10/07/88	0003		114.	-	-		
	10/07/88	0004		114.	-	-		
	10/07/88	0005		114.	-	-		
	04/22/89	0001		95.	-	-		
	02/25/93	N001		114	-	-		
ALUMINUM	03/19/87	0001	MG/L		0.1		0.1	-
	05/16/87	0001		0.06	J	0.1	-	
	09/04/87	0001		0.08	J	0.1	-	
	04/22/89	0001		<	0.1		0.1	-
AMMONIUM	03/19/87	0001	MG/L	<	0.1		0.1	-
	05/16/87	0001		<	0.1		0.1	-
	09/04/87	0001		<	0.1		0.1	-
	10/07/88	0001		<	0.1		0.1	-
	10/07/88	0002		<	0.1		0.1	-
	10/07/88	0003		<	0.1		0.1	-
	10/07/88	0004		<	0.1		0.1	-
	10/07/88	0005		<	0.1		0.1	-
	04/22/89	0001		<	0.1		0.1	-
	AMMONIUM (TOTAL)	02/25/93		N001	MG/L	<	0.1	
ANTIMONY	03/19/87	0001	MG/L	<	0.003		0.003	-
	05/16/87	0001		0.016		0.003	-	
	09/04/87	0001		0.004		0.003	-	
	10/07/88	0001		<	0.003		0.003	-
	10/07/88	0002		<	0.003		0.003	-
	10/07/88	0003		<	0.003		0.003	-
	10/07/88	0004		<	0.003		0.003	-
	10/07/88	0005		<	0.003		0.003	-
	04/22/89	0001		<	0.003		0.003	-
	ARSENIC	03/19/87		0001	MG/L		0.002	J
05/16/87		0001	<	0.001		J	0.01	-
09/04/87		0001	0.003	J		0.01	-	
10/07/88		0001	0.01			0.01	-	
10/07/88		0002	<	0.01			0.01	-
10/07/88		0003	0.01			0.01	-	
10/07/88		0004	0.01			0.01	-	
10/07/88		0005	0.01			0.01	-	
04/22/89		0001	<	0.01			0.01	-
ARSENIC (TOTAL)		02/25/93	N001	MG/L			0.008	
BARIUM	03/19/87	0001	MG/L		0.2		0.1	-
	05/16/87	0001		0.06	J	0.1	-	

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

OTHER PARAMETER VALUE FLAGS:
 J - ESTIMATED VALUE

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)
 0002 - FILTERED REPLICATE SAMPLE (.45 MICRONS)
 0003 - FILTERED REPLICATE SAMPLE (.45 MICRONS)
 0004 - FILTERED REPLICATE SAMPLE (.45 MICRONS)
 N001 - UNFILTERED SAMPLE

SURFACE WATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0554
 NORTH COORDINATE: UNKNOWN
 EAST COORDINATE: UNKNOWN
 09/17/86 TO 02/25/93
 REPORT DATE: 04/20/95

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
BARIUM	09/04/87	0001	MG/L		0.09	J	0.1	-
	10/07/88	0001		<	0.1			
	10/07/88	0002		<	0.1			
	10/07/88	0003		<	0.1			
	10/07/88	0004		<	0.1			
	10/07/88	0005		<	0.1			
	04/22/89	0001	<	0.1				
BERYLLIUM	04/22/89	0001	MG/L	<	0.01		0.01	-
BORON	03/19/87	0001	MG/L		0.06	J	0.1	-
	05/16/87	0001			0.01	J		
	09/04/87	0001			0.06	J		
	04/22/89	0001		<	0.1			
BROMIDE	09/04/87	0001	MG/L	<	0.1		0.1	-
	04/22/89	0001		<	0.1			
CADMIUM	03/19/87	0001	MG/L	<	0.001		0.001	-
	05/16/87	0001			0.005			
	09/04/87	0001		<	0.005			
	10/07/88	0001		<	0.001			
	10/07/88	0002		<	0.001			
	10/07/88	0003		<	0.001			
	10/07/88	0004		<	0.001			
	10/07/88	0005		<	0.001			
	04/22/89	0001		<	0.001			
CADMIUM (TOTAL)	02/25/93	N001	MG/L	<	0.001	W	0.001	-
CALCIUM	03/19/87	0001	MG/L		46.2		0.01	-
	05/16/87	0001			40.0			
	09/04/87	0001			63.0			
	10/07/88	0001			69.1			
	10/07/88	0002			69.4			
	10/07/88	0003			69.7			
	10/07/88	0004			69.0			
	10/07/88	0005			72.9			
	04/22/89	0001			50.0			
CALCIUM (TOTAL)	02/25/93	N001	MG/L		73.3		0.5	-
CHLORIDE	03/19/87	0001	MG/L		5.0		1.	-
	05/16/87	0001			3.4			
	09/04/87	0001			13.0			
	10/07/88	0001			13.			
	10/07/88	0002			13.			
	10/07/88	0003			13.			
	10/07/88	0004			13.			
	10/07/88	0005			13.			
	04/22/89	0001			6.1			
CHLORIDE (TOTAL)	02/25/93	N001	MG/L		8.1		0.5	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

OTHER PARAMETER VALUE FLAGS:

J - ESTIMATED VALUE

W - POST-DIGEST SPIKE OUT OF CNTR LIM WHILE SAMP ABS < 50% SPIKE

SAMPLE ID CODES:

0001 - FILTERED SAMPLE (.45 MICRONS)

0002 - FILTERED REPLICATE SAMPLE (.45 MICRONS)

0003 - FILTERED REPLICATE SAMPLE (.45 MICRONS)

0004 - FILTERED REPLICATE SAMPLE (.45 MICRONS)

N001 - UNFILTERED SAMPLE

SURFACE WATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0554
 NORTH COORDINATE: UNKNOWN
 EAST COORDINATE: UNKNOWN
 09/17/86 TO 02/25/93
 REPORT DATE: 04/20/95

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
CHROMIUM	03/19/87	0001	MG/L	<	0.01		0.01	-
	05/16/87	0001			0.02		0.01	-
	09/04/87	0001		<	0.01		0.01	-
	10/07/88	0001			0.03		0.01	-
	10/07/88	0002			0.03		0.01	-
	10/07/88	0003			0.03		0.01	-
	10/07/88	0004			0.03		0.01	-
	10/07/88	0005			0.03		0.01	-
	04/22/89	0001		<	0.01		0.01	-
CHROMIUM (TOTAL)	02/25/93	N001	MG/L		0.03		0.01	-
COBALT	03/19/87	0001	MG/L	<	0.05		0.05	-
	05/16/87	0001		<	0.01	J	0.05	-
	09/04/87	0001		<	0.01	J	0.05	-
	10/07/88	0001		<	0.05		0.05	-
	10/07/88	0002		<	0.05		0.05	-
	10/07/88	0003		<	0.05		0.05	-
	10/07/88	0004		<	0.05		0.05	-
	10/07/88	0005		<	0.05		0.05	-
	04/22/89	0001		<	0.05		0.05	-
COPPER	03/19/87	0001	MG/L	<	0.01	J	0.02	-
	05/16/87	0001		<	0.01	J	0.02	-
	09/04/87	0001		<	0.01	J	0.02	-
	10/07/88	0001		<	0.02		0.02	-
	10/07/88	0002		<	0.02		0.02	-
	10/07/88	0003		<	0.02		0.02	-
	10/07/88	0004		<	0.02		0.02	-
	10/07/88	0005		<	0.02		0.02	-
	04/22/89	0001		<	0.02		0.02	-
CYANIDE	04/22/89	0001	MG/L	<	0.01		0.01	-
FLUORIDE	03/19/87	0001	MG/L		0.22		0.1	-
	05/16/87	0001			0.19		0.1	-
	09/04/87	0001			0.25		0.1	-
	10/07/88	0001			0.3		0.1	-
	10/07/88	0002			0.3		0.1	-
	10/07/88	0003			0.3		0.1	-
	10/07/88	0004			0.3		0.1	-
	10/07/88	0005			0.3		0.1	-
	04/22/89	0001			0.3		0.1	-
GROSS ALPHA	09/04/87	0001	PCI/L		0.8		0.2	2.9
	10/07/88	0001			4.0		0.2	3.0
	10/07/88	0002			8.0		0.2	3.5
	10/07/88	0003			3.4		0.2	2.9
	10/07/88	0004			7.7		0.2	3.6
	10/07/88	0005			4.2		0.2	3.0
04/22/89	0001		2.1		0.2	1.9		
GROSS BETA	09/04/87	0001	PCI/L		5.7		1.	3.4

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

OTHER PARAMETER VALUE FLAGS:
 J - ESTIMATED VALUE

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)
 0002 - FILTERED REPLICATE SAMPLE (.45 MICRONS)
 0003 - FILTERED REPLICATE SAMPLE (.45 MICRONS)
 0004 - FILTERED REPLICATE SAMPLE (.45 MICRONS)
 N001 - UNFILTERED SAMPLE

SURFACE WATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0554
 NORTH COORDINATE: UNKNOWN
 EAST COORDINATE: UNKNOWN
 09/17/86 TO 02/25/93
 REPORT DATE: 04/20/95

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
GROSS BETA	10/07/88	0001	PCI/L		6.7		1.	1.6
	10/07/88	0002		7.1	1.	1.6		
	10/07/88	0003		4.8	1.	1.5		
	10/07/88	0004		8.9	1.	1.9		
	10/07/88	0005		6.8	1.	1.6		
	04/22/89	0001		2.7	1.	1.3		
IRON	03/19/87	0001	MG/L	<	0.03		0.03	-
	05/16/87	0001			0.04		0.03	-
	09/04/87	0001		<	0.01	J	0.03	-
	10/07/88	0001		<	0.03		0.03	-
	10/07/88	0002		<	0.03		0.03	-
	10/07/88	0003		<	0.03		0.03	-
	10/07/88	0004		<	0.03		0.03	-
	10/07/88	0005		<	0.03		0.03	-
	04/22/89	0001		<	0.03		0.03	-
	IRON (TOTAL)	02/25/93		N001	MG/L		43.9	
LEAD	03/19/87	0001	MG/L	<	0.001	J	0.01	-
	05/16/87	0001			0.02		0.01	-
	09/04/87	0001		<	0.01		0.01	-
	10/07/88	0001			0.01		0.01	-
	10/07/88	0002		<	0.01		0.01	-
	10/07/88	0003		<	0.01		0.01	-
	10/07/88	0004			0.01		0.01	-
	10/07/88	0005			0.01		0.01	-
	04/22/89	0001		<	0.01		0.01	-
	LEAD (TOTAL)	02/25/93		N001	MG/L		0.025	N
LEAD-210	03/19/87	0001	PCI/L		0.0		1.5	2.2
	05/16/87	0001		1.4	1.5	1.2		
	09/04/87	0001		0.0	1.5	1.2		
	04/22/89	0001		0.0	1.5	0.6		
LEAD-210 (TOTAL)	02/25/93	N001	PCI/L		2.6		2.3	1.4
MAGNESIUM	03/19/87	0001	MG/L		12.4		0.001	-
	05/16/87	0001		7.48	0.001	-		
	09/04/87	0001		11.7	0.001	-		
	10/07/88	0001		12.1	0.001	-		
	10/07/88	0002		12.2	0.001	-		
	10/07/88	0003		13.0	0.001	-		
	10/07/88	0004		13.1	0.001	-		
	10/07/88	0005		12.6	0.001	-		
	04/22/89	0001		8.46	0.001	-		
	MANGANESE	03/19/87		0001	MG/L		0.02	
05/16/87		0001	0.01	0.01		-		
09/04/87		0001	0.02	0.01		-		
04/22/89		0001	0.02	0.01		-		

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

OTHER PARAMETER VALUE FLAGS:
 J - ESTIMATED VALUE

N - SPIKE SAMPLE RECOVERY NOT WITHIN CONTROL LIMITS

SAMPLE ID CODES:

0001 - FILTERED SAMPLE (.45 MICRONS)

0002 - FILTERED REPLICATE SAMPLE (.45 MICRONS)

0003 - FILTERED REPLICATE SAMPLE (.45 MICRONS)

0004 - FILTERED REPLICATE SAMPLE (.45 MICRONS)

N001 - UNFILTERED SAMPLE

SURFACE WATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0554
 NORTH COORDINATE: UNKNOWN
 EAST COORDINATE: UNKNOWN
 09/17/86 TO 02/25/93
 REPORT DATE: 04/20/95

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
MANGANESE (TOTAL)	02/25/93	N001	MG/L		1.12		0.01	
MERCURY	09/04/87	0001	MG/L	<	0.0002		0.0002	
	10/07/88	0001		<	0.0002		0.0002	
	10/07/88	0002		<	0.0002		0.0002	
	10/07/88	0003		<	0.0002		0.0002	
	10/07/88	0004		<	0.0002		0.0002	
	10/07/88	0005		<	0.0002		0.0002	
	04/22/89	0001	<	0.0002		0.0002		
MOLYBDENUM	03/19/87	0001	MG/L	<	0.1		0.1	
	05/16/87	0001		<	0.01		0.01	
	09/04/87	0001		<	0.01		0.01	
	10/07/88	0001		<	0.01		0.01	
	10/07/88	0002		<	0.01		0.01	
	10/07/88	0003		<	0.01		0.01	
	10/07/88	0004		<	0.01		0.01	
	10/07/88	0005		<	0.01		0.01	
	04/22/89	0001		<	0.01		0.01	
MOLYBDENUM (TOTAL)	02/25/93	N001	MG/L	<	0.01		0.01	
NICKEL	03/19/87	0001	MG/L		0.02	J	0.04	
	05/16/87	0001		<	0.01	J	0.04	
	09/04/87	0001		<	0.01	J	0.04	
	04/22/89	0001		<	0.04		0.04	
NITRATE	03/19/87	0001	MG/L	<	0.1	J	1.	
	05/16/87	0001			0.8	J	1.	
	09/04/87	0001		<	0.1	J	1.	
	10/07/88	0001		<	1.0		1.	
	10/07/88	0002		<	1.0		1.	
	10/07/88	0003		<	1.0		1.	
	10/07/88	0004		<	1.0		1.	
	10/07/88	0005		<	1.0		1.	
	04/22/89	0001			3.4		1.	
NITRATE (TOTAL)	02/25/93	N001	MG/L	<	1		1	
NITRITE	03/19/87	0001	MG/L	<	0.1		0.1	
	05/16/87	0001		<	0.1		0.1	
	09/04/87	0001		<	0.1		0.1	
NITRITE AND NITRATE	10/07/88	0001	MG/L	<	1.0		1.	
	10/07/88	0002		<	1.0		1.	
	10/07/88	0003		<	1.0		1.	
	10/07/88	0004		<	1.0		1.	
	10/07/88	0005		<	1.0		1.	
PH	03/19/87	0001	SU		8.07			
	05/16/87	0001			8.22			
	09/04/87	0001			8.54			

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

OTHER PARAMETER VALUE FLAGS:
 J - ESTIMATED VALUE

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- 0004 - FILTERED REPLICATE SAMPLE (.45 MICRONS)
- N001 - UNFILTERED SAMPLE

SURFACE WATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0554
 NORTH COORDINATE: UNKNOWN
 EAST COORDINATE: UNKNOWN
 09/17/86 TO 02/25/93
 REPORT DATE: 04/20/95

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
PH	10/07/88	0001	SU		7.83		-	-
	10/07/88	0002			7.83		-	-
	10/07/88	0003			7.83		-	-
	10/07/88	0004			7.83		-	-
	10/07/88	0005			7.83		-	-
	04/22/89	0001			8.24		-	-
	02/25/93	N001			8.14		-	-
PHOSPHATE	03/19/87	0001	MG/L		0.30		0.1	-
	05/16/87	0001			0.31		0.1	-
	09/04/87	0001		<	0.1		0.1	-
	10/07/88	0001			0.1		0.1	-
	10/07/88	0002			0.1		0.1	-
	10/07/88	0003			0.1		0.1	-
	10/07/88	0004		<	0.1		0.1	-
	10/07/88	0005			0.1		0.1	-
	04/22/89	0001		<	0.1		0.1	-
	PHOSPHATE (TOTAL)	02/25/93		N001	MG/L		1.1	
POLONIUM-210	03/19/87	0001	PCI/L		0.0		1.	0.3
	05/16/87	0001			0.0		1.	0.5
	09/04/87	0001			0.0		1.	0.6
	04/22/89	0001			0.0		1.	0.3
POLONIUM-210 (TOTAL)	02/25/93	N001	PCI/L		0.0	N	0.7	0.4
POTASSIUM	03/19/87	0001	MG/L		2.46		0.01	-
	05/16/87	0001			1.70		0.01	-
	09/04/87	0001			2.00		0.01	-
	10/07/88	0001			2.3		0.01	-
	10/07/88	0002			2.5		0.01	-
	10/07/88	0003			2.9		0.01	-
	10/07/88	0004			2.8		0.01	-
	10/07/88	0005			2.2		0.01	-
	04/22/89	0001			1.5		0.01	-
	RADIUM-226	03/19/87		0001	PCI/L		0.0	
05/16/87		0001		0.0			1.	0.1
09/04/87		0001		0.0			1.	0.1
10/07/88		0001		0.2			1.	0.2
10/07/88		0002		0.1			1.	0.1
10/07/88		0003		0.2			1.	0.2
10/07/88		0004		0.0			1.	0.1
10/07/88		0005		0.0			1.	0.1
RADIUM-226 (TOTAL)	02/25/93	N001	PCI/L		2.9		0.4	0.6
RADIUM-228	03/19/87	0001	PCI/L		0.0		1.	0.9
	05/16/87	0001			0.0		1.	0.8
	09/04/87	0001			0.0		1.	0.9
	10/07/88	0001			0.5		1.	0.7

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

OTHER PARAMETER VALUE FLAGS:

N - SPIKE SAMPLE RECOVERY NOT WITHIN CONTROL LIMITS

SAMPLE ID CODES:

0001 - FILTERED SAMPLE (.45 MICRONS)

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0003 - FILTERED REPLICATE SAMPLE (.45 MICRONS)

0004 - FILTERED REPLICATE SAMPLE (.45 MICRONS)

N001 - UNFILTERED SAMPLE

SURFACE WATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0554
 NORTH COORDINATE: UNKNOWN
 EAST COORDINATE: UNKNOWN
 09/17/86 TO 02/25/93
 REPORT DATE: 04/20/95

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
RADIUM-228	10/07/88	0002	PCI/L		0.4		1.	0.8
	10/07/88	0003		0.2	1.	0.8		
	10/07/88	0004		0.6	1.	0.8		
	10/07/88	0005		0.8	1.	0.8		
	04/22/89	0001		0.0	1.	0.7		
SELENIUM	03/19/87	0001	MG/L	<	0.002	J	0.005	-
	05/16/87	0001		<	0.001	J	0.005	-
	09/04/87	0001			0.003	J	0.005	-
	10/07/88	0001			0.013		0.005	-
	10/07/88	0002			0.007		0.005	-
	10/07/88	0003			0.010		0.005	-
	10/07/88	0004			0.009		0.005	-
	10/07/88	0005			0.005		0.005	-
	04/22/89	0001		<	0.005		0.005	-
	SELENIUM (TOTAL)	02/25/93		N001	MG/L	<	0.05	I
SILICA - SiO2	03/19/87	0001	MG/L		7.2		2.	-
	05/16/87	0001			10.8		2.	-
	09/04/87	0001			8.07		2.	-
	04/22/89	0001			7.		2.	-
SILVER	10/07/88	0001	MG/L	<	0.01		0.01	-
	10/07/88	0002		<	0.01		0.01	-
	10/07/88	0003		<	0.01		0.01	-
	10/07/88	0004		<	0.01		0.01	-
	10/07/88	0005		<	0.01		0.01	-
	04/22/89	0001		<	0.01		0.01	-
SODIUM	03/19/87	0001	MG/L		29.7		0.002	-
	05/16/87	0001			19.8		0.002	-
	09/04/87	0001			44.9		0.002	-
	10/07/88	0001			38.7		0.002	-
	10/07/88	0002			41.5		0.002	-
	10/07/88	0003			44.4		0.002	-
	10/07/88	0004			44.9		0.002	-
	10/07/88	0005			40.2		0.002	-
	04/22/89	0001			19.5		0.002	-
SODIUM (TOTAL)	02/25/93	N001	MG/L		35		1	-
SPECIFIC CONDUCTANCE	03/19/87	0001	UMHO/CM		290.		-	-
	05/16/87	0001			185.		-	-
	09/04/87	0001			470.		-	-
	10/07/88	0001			425.		-	-
	10/07/88	0002			425.		-	-
	10/07/88	0003			425.		-	-
	10/07/88	0004			425.		-	-
	10/07/88	0005			425.		-	-
	04/22/89	0001			200.		-	-
	02/25/93	N001			303		-	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

OTHER PARAMETER VALUE FLAGS:

I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION
 J - ESTIMATED VALUE

SAMPLE ID CODES:

0001 - FILTERED SAMPLE (.45 MICRONS)
 0002 - FILTERED REPLICATE SAMPLE (.45 MICRONS)
 0003 - FILTERED REPLICATE SAMPLE (.45 MICRONS)
 0004 - FILTERED REPLICATE SAMPLE (.45 MICRONS)
 N001 - UNFILTERED SAMPLE

SURFACE WATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0554
 NORTH COORDINATE: UNKNOWN
 EAST COORDINATE: UNKNOWN
 09/17/86 TO 02/25/93
 REPORT DATE: 04/20/95

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
STRONTIUM	03/19/87	0001	MG/L		0.71		0.1	
	05/16/87	0001		0.46	0.1			
	09/04/87	0001		0.870	0.1			
	10/07/88	0001		0.8	0.1			
	10/07/88	0002		0.9	0.1			
	10/07/88	0003		0.9	0.1			
	10/07/88	0004		0.9	0.1			
	10/07/88	0005		0.9	0.1			
	04/22/89	0001		0.5	0.1			
	STRONTIUM (TOTAL)	02/25/93		N001	MG/L		0.83	
SULFATE	03/19/87	0001	MG/L		124.		0.1	
	05/16/87	0001		71.	0.1			
	09/04/87	0001		160.	0.1			
	10/07/88	0001		170.	0.1			
	10/07/88	0002		162.	0.1			
	10/07/88	0003		173.	0.1			
	10/07/88	0004		175.	0.1			
	10/07/88	0005		168.	0.1			
	04/22/89	0001		94.	0.1			
	SULFATE (TOTAL)	02/25/93		N001	MG/L		118	
SULFIDE	09/04/87	0001	MG/L	<	0.1		0.1	
	04/22/89	0001		<	0.1		0.1	
TEMPERATURE	03/19/87	0001	C - DEGREE		8.			
	05/16/87	0001		11.5				
	09/04/87	0001		23.0				
	10/07/88	0001		16.0				
	10/07/88	0002		16.				
	10/07/88	0003		16.				
	10/07/88	0004		16.				
	10/07/88	0005		16.				
	04/22/89	0001		13.				
	02/25/93	N001		4.9				
THALLIUM	04/22/89	0001	MG/L	<	0.01		0.01	-
THORIUM-230	03/19/87	0001	PCI/L		0.4		1.	0.7
	05/16/87	0001		0.0	1.	0.4		
	09/04/87	0001		0.0	1.	0.3		
	10/07/88	0001		0.5	1.	0.5		
	10/07/88	0002		0.0	1.	0.3		
	10/07/88	0003		0.6	1.	0.5		
	10/07/88	0004		0.5	1.	0.5		
	10/07/88	0005		1.1	1.	0.6		
	04/22/89	0001		0.0	1.	0.3		
	THORIUM-230 (TOTAL)	02/25/93		N001	PCI/L		0.2	
TIN	03/19/87	0001	MG/L	<	0.005		0.005	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

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- 0004 - FILTERED REPLICATE SAMPLE (.45 MICRONS)
- N001 - UNFILTERED SAMPLE

SURFACE WATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0554
 NORTH COORDINATE: UNKNOWN
 EAST COORDINATE: UNKNOWN
 09/17/86 TO 02/25/93
 REPORT DATE: 04/20/95

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
TIN	05/16/87	0001	MG/L	<	0.005		0.005	-
	09/04/87	0001		<	0.003	J	0.005	-
	04/22/89	0001		<	0.005		0.005	-
TOTAL DISSOLVED SOLIDS	03/19/87	0001	MG/L		305.		10.	-
	05/16/87	0001			229.		10.	-
	09/04/87	0001			393.		10.	-
	10/07/88	0001			409.		10.	-
	10/07/88	0002			400.		10.	-
	10/07/88	0003			370.		10.	-
	10/07/88	0004			417.		10.	-
	10/07/88	0005			409.		10.	-
	04/22/89	0001		282.		10.	-	
TOTAL DISSOLVED SOLIDS (TOTAL)	02/25/93	N001	MG/L		335		10	-
TOTAL ORGANIC CARBON	03/19/87	0001	MG/L		29.0		1.	-
	05/16/87	0001			25.5		1.	-
	09/04/87	0001			37.1		1.	-
	04/22/89	0001			24.2		1.	-
	02/25/93	N001			10.6		1	-
URANIUM	03/19/87	0001	MG/L		0.0010	J	0.003	-
	05/16/87	0001			0.0003	J	0.003	-
	09/04/87	0001			0.0011	J	0.003	-
	10/07/88	0001			0.0023	J	0.003	-
	10/07/88	0002			0.0023	J	0.003	-
	10/07/88	0003			0.0023	J	0.003	-
	10/07/88	0004			0.0026	J	0.003	-
	10/07/88	0005			0.0023	J	0.003	-
	04/22/89	0001			0.0011	J	0.003	-
URANIUM (TOTAL)	02/25/93	N001	MG/L		0.002		0.001	-
VANADIUM	03/19/87	0001	MG/L	<	0.2		0.2	-
	05/16/87	0001		<	0.01		0.01	-
	09/04/87	0001			0.01		0.01	-
	10/07/88	0001			0.01		0.01	-
	10/07/88	0002			0.01		0.01	-
	10/07/88	0003			0.01		0.01	-
	10/07/88	0004			0.01		0.01	-
	10/07/88	0005			0.01		0.01	-
	04/22/89	0001			0.01		0.01	-
VANADIUM (TOTAL)	02/25/93	N001	MG/L		0.09		0.01	-
ZINC	03/19/87	0001	MG/L	<	0.005		0.005	-
	05/16/87	0001		<	0.005		0.005	-
	09/04/87	0001		<	0.005		0.005	-
	10/07/88	0001			0.011		0.005	-
	10/07/88	0002			0.005		0.005	-
	10/07/88	0003			<	0.005		0.005

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

OTHER PARAMETER VALUE FLAGS:
 J - ESTIMATED VALUE

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)
 0002 - FILTERED REPLICATE SAMPLE (.45 MICRONS)
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 0004 - FILTERED REPLICATE SAMPLE (.45 MICRONS)
 N001 - UNFILTERED SAMPLE

SURFACE WATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0554
 NORTH COORDINATE: UNKNOWN
 EAST COORDINATE: UNKNOWN
 09/17/86 TO 02/25/93
 REPORT DATE: 04/20/95

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
ZINC	10/07/88	0004	MG/L		0.007		0.005	-
	10/07/88	0005		<	0.005		0.005	-
	04/22/89	0001		<	0.005		0.005	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
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SURFACE WATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0555
 NORTH COORDINATE: UNKNOWN
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 09/17/86 TO 02/25/93
 REPORT DATE: 04/20/95

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
ALKALINITY	03/17/87	0001	MG/L CaCO3		150.		-	-
	05/16/87	0001		92.	-	-		
	09/20/87	0001		124.	-	-		
	10/09/88	0001		130.	-	-		
	04/02/89	0001		126.	-	-		
	02/23/93	N001		155	-	-		
ALUMINUM	03/17/87	0001	MG/L		0.2		0.1	-
	05/16/87	0001		0.05	J	0.1	-	
	09/20/87	0001		0.07	J	0.1	-	
	04/02/89	0001		<	0.1		0.1	-
AMMONIUM	03/17/87	0001	MG/L	<	0.1		0.1	-
	05/16/87	0001		<	0.1		0.1	-
	09/20/87	0001		<	0.1		0.1	-
	10/09/88	0001		<	0.1		0.1	-
	04/02/89	0001		<	0.1		0.1	-
AMMONIUM (TOTAL)	02/23/93	N001	MG/L	<	0.1		0.1	-
ANTIMONY	03/17/87	0001	MG/L		0.008		0.003	-
	05/16/87	0001		0.023		0.003	-	
	09/20/87	0001		<	0.003		0.003	-
	10/09/88	0001		<	0.003		0.003	-
	04/02/89	0001		<	0.003		0.003	-
ARSENIC	03/17/87	0001	MG/L		0.002	J	0.01	-
	05/16/87	0001		<	0.001	J	0.01	-
	09/20/87	0001			0.003	J	0.01	-
	10/09/88	0001			01.		0.01	-
	04/02/89	0001		<	0.01		0.01	-
ARSENIC (TOTAL)	02/23/93	N001	MG/L		0.010		0.005	-
BARIUM	03/17/87	0001	MG/L		0.1		0.1	-
	05/16/87	0001		0.06	J	0.1	-	
	09/20/87	0001		0.08	J	0.1	-	
	10/09/88	0001		<	0.1		0.1	-
	04/02/89	0001		<	0.1		0.1	-
BERYLLIUM	04/02/89	0001	MG/L	<	0.01		0.01	-
BORON	03/17/87	0001	MG/L		0.07	J	0.1	-
	05/16/87	0001		0.02	J	0.1	-	
	09/20/87	0001		0.06	J	0.1	-	
	04/02/89	0001		<	0.1		0.1	-
BROMIDE	09/20/87	0001	MG/L	<	0.1		0.1	-
	04/02/89	0001		<	0.1		0.1	-
CADMIUM	03/17/87	0001	MG/L	<	0.001		0.001	-
	05/16/87	0001		0.005		0.001	-	
	09/20/87	0001		<	0.005		0.005	-
	10/09/88	0001		<	0.001		0.001	-
	04/02/89	0001		<	0.001		0.001	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

OTHER PARAMETER VALUE FLAGS:
 J - ESTIMATED VALUE

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)
 N001 - UNFILTERED SAMPLE

SURFACE WATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0555
 NORTH COORDINATE: UNKNOWN
 EAST COORDINATE: UNKNOWN
 09/17/86 TO 02/25/93
 REPORT DATE: 04/20/95

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
CADMIUM (TOTAL)	02/23/93	N001	MG/L	<	0.001		0.001	-
CALCIUM	03/17/87	0001	MG/L		46.1		0.01	-
	05/16/87	0001		41.7	0.01	-		
	09/20/87	0001		62.0	0.01	-		
	10/09/88	0001		72.8	0.01	-		
	04/02/89	0001		56.1	0.01	-		
CALCIUM (TOTAL)	02/23/93	N001	MG/L		96.3		0.5	-
CHLORIDE	03/17/87	0001	MG/L		5.6		1.	-
	05/16/87	0001		3.3	1.	-		
	09/20/87	0001		13.0	1.	-		
	10/09/88	0001		15.	1.	-		
	04/02/89	0001		8.9	1.	-		
CHLORIDE (TOTAL)	02/23/93	N001	MG/L		13.8		0.5	-
CHROMIUM	03/17/87	0001	MG/L	<	0.01		0.01	-
	05/16/87	0001		<	0.02		0.01	-
	09/20/87	0001		<	0.01		0.01	-
	10/09/88	0001		<	0.03		0.01	-
	04/02/89	0001		<	0.01		0.01	-
CHROMIUM (TOTAL)	02/23/93	N001	MG/L		0.06		0.01	-
COBALT	03/17/87	0001	MG/L	<	0.05		0.05	-
	05/16/87	0001		<	0.01	J	0.05	-
	09/20/87	0001		<	0.01	J	0.05	-
	10/09/88	0001		<	0.05		0.05	-
	04/02/89	0001		<	0.05		0.05	-
COPPER	03/17/87	0001	MG/L		0.04		0.02	-
	05/16/87	0001		<	0.01	J	0.02	-
	09/20/87	0001		<	0.01	J	0.02	-
	10/09/88	0001		<	0.02		0.02	-
	04/02/89	0001		<	0.02		0.02	-
CYANIDE	04/02/89	0001	MG/L	<	0.01		0.01	-
FLUORIDE	03/17/87	0001	MG/L		0.22		0.1	-
	05/16/87	0001		0.19	0.1	-		
	09/20/87	0001		0.25	0.1	-		
	10/09/88	0001		0.3	0.1	-		
	04/02/89	0001		0.3	0.1	-		
GROSS ALPHA	09/20/87	0001	PCI/L		0.4		0.2	2.9
	10/09/88	0001		3.3	0.2	3.0		
	04/02/89	0001		0.0	0.2	2.1		
GROSS BETA	09/20/87	0001	PCI/L		4.2		1.	3.4
	10/09/88	0001		6.6	1.	1.7		
	04/02/89	0001		3.4	1.	1.3		
IRON	03/17/87	0001	MG/L		0.14		0.03	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

OTHER PARAMETER VALUE FLAGS:
 J - ESTIMATED VALUE

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)
 N001 - UNFILTERED SAMPLE

SURFACE WATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0555
 NORTH COORDINATE: UNKNOWN
 EAST COORDINATE: UNKNOWN
 09/17/86 TO 02/25/93
 REPORT DATE: 04/20/95

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
IRON	05/16/87	0001	MG/L		0.03		0.03	-
	09/20/87	0001		<	0.01	J	0.03	-
	10/09/88	0001		<	0.03		0.03	-
	04/02/89	0001		<	0.03		0.03	-
IRON (TOTAL)	02/23/93	N001	MG/L		67.8		0.03	-
LEAD	03/17/87	0001	MG/L	<	0.001	J	0.01	-
	05/16/87	0001			0.02		0.01	-
	09/20/87	0001		<	0.01		0.01	-
	10/09/88	0001		<	0.01		0.01	-
	04/02/89	0001		<	0.01		0.01	-
LEAD (TOTAL)	02/23/93	N001	MG/L		0.031	N	0.003	-
LEAD-210	03/17/87	0001	PCI/L		0.1		1.5	1.3
	05/16/87	0001			0.5		1.5	1.0
	04/02/89	0001			0.5		1.5	0.7
LEAD-210 (TOTAL)	02/23/93	N001	PCI/L		1.9		2.3	1.4
MAGNESIUM	03/17/87	0001	MG/L		12.2		0.001	-
	05/16/87	0001			7.35		0.001	-
	09/20/87	0001			12.2		0.001	-
	10/09/88	0001			13.1		0.001	-
	04/02/89	0001			12.0		0.001	-
MANGANESE	03/17/87	0001	MG/L		0.02		0.01	-
	05/16/87	0001			0.01		0.01	-
	09/20/87	0001			0.03		0.01	-
	04/02/89	0001			0.01		0.01	-
MANGANESE (TOTAL)	02/23/93	N001	MG/L		1.14		0.01	-
MERCURY	09/20/87	0001	MG/L	<	0.0002		0.0002	-
	10/09/88	0001		<	0.0002		0.0002	-
	04/02/89	0001		<	0.0002		0.0002	-
MOLYBDENUM	03/17/87	0001	MG/L	<	0.1		0.1	-
	05/16/87	0001		<	0.01		0.01	-
	09/20/87	0001			0.01		0.01	-
	10/09/88	0001		<	0.01		0.01	-
	04/02/89	0001		<	0.01		0.01	-
MOLYBDENUM (TOTAL)	02/23/93	N001	MG/L	<	0.01		0.01	-
NICKEL	03/17/87	0001	MG/L		0.03	J	0.04	-
	05/16/87	0001		<	0.01	J	0.04	-
	09/20/87	0001		<	0.01	J	0.04	-
	04/02/89	0001		<	0.04		0.04	-
NITRATE	03/17/87	0001	MG/L	<	0.1	J	1.	-
	05/16/87	0001			0.4	J	1.	-
	09/20/87	0001		<	0.1	J	1.	-
	10/09/88	0001			1.2		1.	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:

0001 - FILTERED SAMPLE (.45 MICRONS)

N001 - UNFILTERED SAMPLE

OTHER PARAMETER VALUE FLAGS:

J - ESTIMATED VALUE

N - SPIKE SAMPLE RECOVERY NOT WITHIN CONTROL LIMITS

SURFACE WATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0555
 NORTH COORDINATE: UNKNOWN
 EAST COORDINATE: UNKNOWN
 09/17/86 TO 02/25/93
 REPORT DATE: 04/20/95

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
NITRATE	04/02/89	0001	MG/L		2.3		1.	-
NITRATE (TOTAL)	02/23/93	N001	MG/L		1.7		1	-
NITRITE	03/17/87	0001	MG/L	<	0.1		0.1	-
	05/16/87	0001		<	0.1		0.1	-
	09/20/87	0001		<	0.1		0.1	-
NITRITE AND NITRATE	10/09/88	0001	MG/L	<	1.0		1.	-
PH	03/17/87	0001	SU		8.14		-	-
	05/16/87	0001			8.21		-	-
	09/20/87	0001			8.75		-	-
	10/09/88	0001			7.57		-	-
	04/02/89	0001			8.39		-	-
	02/23/93	N001			8.18		-	-
PHOSPHATE	03/17/87	0001	MG/L		0.25		0.1	-
	05/16/87	0001			0.33		0.1	-
	09/20/87	0001		<	0.1		0.1	-
	10/09/88	0001			0.1		0.1	-
	04/02/89	0001		<	0.1		0.1	-
PHOSPHATE (TOTAL)	02/23/93	N001	MG/L		1.1		0.1	-
POLONIUM-210	03/17/87	0001	PCI/L		0.0		1.	0.4
	05/16/87	0001			0.1		1.	0.5
	04/02/89	0001			0.2		1.	0.4
POLONIUM-210 (TOTAL)	02/23/93	N001	PCI/L		0.2	N	0.7	0.4
POTASSIUM	03/17/87	0001	MG/L		2.72		0.01	-
	05/16/87	0001			1.77		0.01	-
	09/20/87	0001			1.94		0.01	-
	10/09/88	0001			2.6		0.01	-
	04/02/89	0001			1.90		0.01	-
RADIUM-226	03/17/87	0001	PCI/L		0.2		1.	0.2
	05/16/87	0001			0.0		1.	0.2
	10/09/88	0001			0.1		1.	0.1
	04/02/89	0001			0.0		1.	0.2
RADIUM-226 (TOTAL)	02/23/93	N001	PCI/L		1.3		0.4	0.5
RADIUM-228	03/17/87	0001	PCI/L		0.0		1.	1.1
	05/16/87	0001			0.0		1.	1.0
	10/09/88	0001			0.3		1.	0.8
	04/02/89	0001			0.1		1.	0.1
SELENIUM	03/17/87	0001	MG/L	<	0.002	J	0.005	-
	05/16/87	0001		<	0.001	J	0.005	-
	09/20/87	0001			0.002	J	0.005	-
	10/09/88	0001			0.010		0.005	-
	04/02/89	0001		<	0.005		0.005	-
SELENIUM (TOTAL)	02/23/93	N001	MG/L	<	0.05	I	0.05	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:

0001 - FILTERED SAMPLE (.45 MICRONS)
 N001 - UNFILTERED SAMPLE

OTHER PARAMETER VALUE FLAGS:

I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION
 J - ESTIMATED VALUE
 N - SPIKE SAMPLE RECOVERY NOT WITHIN CONTROL LIMITS

SURFACE WATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0555
 NORTH COORDINATE: UNKNOWN
 EAST COORDINATE: UNKNOWN
 09/17/86 TO 02/25/93
 REPORT DATE: 04/20/95

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
SILICA - SIO2	03/17/87	0001	MG/L		8.5		2.	-
	05/16/87	0001		10.9		2.	-	
	09/20/87	0001		6.87		2.	-	
	04/02/89	0001		7.		2.	-	
SILVER	10/09/88	0001	MG/L	<	0.01		0.01	-
	04/02/89	0001		<	0.01		0.01	-
SODIUM	03/17/87	0001	MG/L		49.6		0.002	-
	05/16/87	0001		19.3		0.002	-	
	09/20/87	0001		41.8		0.002	-	
	10/09/88	0001		46.0		0.002	-	
	04/02/89	0001		29.1		0.002	-	
SODIUM (TOTAL)	02/23/93	N001	MG/L		61		1	-
SPECIFIC CONDUCTANCE	03/17/87	0001	UMHO/CM		265.		-	-
	05/16/87	0001		195.		-	-	
	09/20/87	0001		375.		-	-	
	10/09/88	0001		410.		-	-	
	04/02/89	0001		280.		-	-	
	02/23/93	N001		456		-	-	
STRONTIUM	03/17/87	0001	MG/L		0.72		0.1	-
	05/16/87	0001		0.49		0.1	-	
	09/20/87	0001		0.895		0.1	-	
	10/09/88	0001		0.9		0.1	-	
	04/02/89	0001		0.6		0.1	-	
STRONTIUM (TOTAL)	02/23/93	N001	MG/L		1.23		0.01	-
SULFATE	03/17/87	0001	MG/L		122.		0.1	-
	05/16/87	0001		73.		0.1	-	
	09/20/87	0001		153.		0.1	-	
	10/09/88	0001		159.		0.1	-	
	04/02/89	0001		119.		0.1	-	
SULFATE (TOTAL)	02/23/93	N001	MG/L		199		1	-
SULFIDE	09/20/87	0001	MG/L	<	0.1		0.1	-
	04/02/89	0001		<	0.1		0.1	-
TEMPERATURE	03/17/87	0001	C - DEGREE		12.		-	-
	05/16/87	0001		12.0		-	-	
	09/20/87	0001		20.0		-	-	
	10/09/88	0001		13.75		-	-	
	04/02/89	0001		10.5		-	-	
	02/23/93	N001		6.3		-	-	
THALLIUM	04/02/89	0001	MG/L	<	0.01		0.01	-
THORIUM-230	03/17/87	0001	PCI/L		0.5		1.	0.6
	05/16/87	0001		0.3		1.	0.6	
	10/09/88	0001		0.2		1.	0.4	
	04/02/89	0001		0.0		1.	0.3	

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)
 N001 - UNFILTERED SAMPLE

SURFACE WATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0555
 NORTH COORDINATE: UNKNOWN
 EAST COORDINATE: UNKNOWN
 09/17/86 TO 02/25/93
 REPORT DATE: 04/20/95

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
THORIUM-230 (TOTAL)	02/23/93	N001	PCI/L		0.4		0.6	0.4
TIN	03/17/87	0001	MG/L	<	0.005		0.005	-
	05/16/87	0001		<	0.005		0.005	-
	09/20/87	0001		<	0.003	J	0.005	-
	04/02/89	0001		<	0.005		0.005	-
TOTAL DISSOLVED SOLIDS	03/17/87	0001	MG/L		299.		10.	-
	05/16/87	0001			226.		10.	-
	09/20/87	0001			388.		10.	-
	10/09/88	0001			441.		10.	-
	04/02/89	0001			317.		10.	-
TOTAL DISSOLVED SOLIDS (TOTAL)	02/23/93	N001	MG/L		500		10	-
TOTAL ORGANIC CARBON	03/17/87	0001	MG/L		33.0		1.	
	05/16/87	0001			26.2		1.	
	04/02/89	0001			30.7		1.	
	02/23/93	N001			10.3		1	
URANIUM	03/17/87	0001	MG/L		0.0004	J	0.003	
	05/16/87	0001			0.0009	J	0.003	
	09/20/87	0001			0.0013	J	0.003	
	10/09/88	0001			0.0023	J	0.003	
	04/02/89	0001			0.0015	J	0.003	
URANIUM (TOTAL)	02/23/93	N001	MG/L		0.001		0.001	
VANADIUM	03/17/87	0001	MG/L	<	0.2		0.2	
	05/16/87	0001		<	0.01		0.01	
	09/20/87	0001			0.01		0.01	
	10/09/88	0001			0.01		0.01	
	04/02/89	0001		<	0.01		0.01	
VANADIUM (TOTAL)	02/23/93	N001	MG/L		0.14		0.01	
ZINC	03/17/87	0001	MG/L		0.011		0.005	
	05/16/87	0001		<	0.005		0.005	
	09/20/87	0001		<	0.005		0.005	
	10/09/88	0001		<	0.005		0.005	
	04/02/89	0001		<	0.005		0.005	

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)
 N001 - UNFILTERED SAMPLE

OTHER PARAMETER VALUE FLAGS:
 J - ESTIMATED VALUE

SURFACE WATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP02 SHIPROCK (TAILINGS AREA)
 LOCATION: 0662 RESERVED FOR CDAY
 NORTH COORDINATE: UNKNOWN
 EAST COORDINATE: UNKNOWN
 04/27/93 TO 01/31/95
 REPORT DATE: 04/20/95

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
MANGANESE (TOTAL)	05/20/93	N001	MG/L	<	0.01		0.01	-
NITRATE (TOTAL)	05/20/93	N001	MG/L		1.3		1.0	-
SELENIUM (TOTAL)	05/20/93	N001	MG/L	<	0.005		0.005	-
STRONTIUM (TOTAL)	05/20/93	N001	MG/L		10.3		0.01	-
URANIUM (TOTAL)	05/20/93	N001	MG/L		0.001		0.001	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
 N001 - UNFILTERED SAMPLE

SURFACE WATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP02 SHIPROCK (TAILINGS AREA)
 LOCATION: 0761 RESERVED FOR BT0H
 NORTH COORDINATE: UNKNOWN
 EAST COORDINATE: UNKNOWN
 04/27/93 TO 01/31/95
 REPORT DATE: 04/20/95

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
ALKALINITY	04/27/93	N001	MG/L CaCO3		55		-	-
AMMONIUM	04/27/93	N001	MG/L		0.6		0.1	-
ANTIMONY (TOTAL)	04/27/93	N001	MG/L	<	0.003		0.003	-
ARSENIC (TOTAL)	04/27/93	N001	MG/L	<	0.005	W	0.005	-
CADMIUM (TOTAL)	04/27/93	N001	MG/L	<	0.001		0.001	-
CALCIUM (TOTAL)	04/27/93	N001	MG/L		212		0.5	-
CHLORIDE	04/27/93	N001	MG/L		54.2		0.5	-
CHROMIUM (TOTAL)	04/27/93	N001	MG/L	<	0.01		0.01	-
COBALT (TOTAL)	04/27/93	N001	MG/L	<	0.05		0.05	-
COPPER (TOTAL)	04/27/93	N001	MG/L	<	0.02		0.02	-
GROSS ALPHA (TOTAL)	04/27/93	N001	PCI/L		0.0		37.4	20.1
GROSS BETA (TOTAL)	04/27/93	N001	PCI/L		0.0		33.5	19.3
IRON (TOTAL)	04/27/93	N001	MG/L		0.98		0.03	-
LEAD (TOTAL)	04/27/93	N001	MG/L	<	0.003		0.003	-
LEAD-210 (TOTAL)	04/27/93	N001	PCI/L		0.0		2.0	1.1
MANGANESE (TOTAL)	04/27/93	N001	MG/L		0.5		0.01	-
MOLYBDENUM (TOTAL)	04/27/93	N001	MG/L	<	0.01		0.01	-
NITRATE	04/27/93	N001	MG/L	<	1		1	-
PH	04/27/93	N001	SU		8.21		-	-
PHOSPHATE	04/27/93	N001	MG/L	<	0.1		0.1	-
POLONIUM-210 (TOTAL)	04/27/93	N001	PCI/L		1.2		1.7	1.2
RADIUM-226 (TOTAL)	04/27/93	N001	PCI/L		1.0		0.9	0.6
SELENIUM (TOTAL)	04/27/93	N001	MG/L	<	0.005	+S	0.005	-
SODIUM (TOTAL)	04/27/93	N001	MG/L		1400		0.1	-
SPECIFIC CONDUCTANCE	04/27/93	N001	UMHO/CM		4600		-	-
STRONTIUM (TOTAL)	04/27/93	N001	MG/L		12.8		0.01	-
SULFATE	04/27/93	N001	MG/L		2420		1	-
TEMPERATURE	04/27/93	N001	C - DEGREE		30.8		-	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
 N001 - UNFILTERED SAMPLE

OTHER PARAMETER VALUE FLAGS:

- + - CORRELATION COEFFICIENT FOR MSA < 0.995
- S - REPORTED VALUE DETERMINED USING METHOD OF STD ADDITION (MSA)
- W - POST-DIGEST SPIKE OUT OF CNTR LIM WHILE SAMP ABS < 50% SPIKE

SURFACE WATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP02 SHIPROCK (TAILINGS AREA)
 LOCATION: 0761 RESERVED FOR BTOTH
 NORTH COORDINATE: UNKNOWN
 EAST COORDINATE: UNKNOWN
 04/27/93 TO 01/31/95
 REPORT DATE: 04/20/95

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
THORIUM-230 (TOTAL)	04/27/93	N001	PCI/L		1.0		0.5	0.5
TOTAL DISSOLVED SOLIDS	04/27/93	N001	MG/L		3120	H	10	-
TOTAL ORGANIC CARBON	04/27/93	N001	MG/L	<	1		1	-
URANIUM (TOTAL)	04/27/93	N001	MG/L	<	0.001		0.001	-
VANADIUM (TOTAL)	04/27/93	N001	MG/L	<	0.01		0.01	-
ZINC (TOTAL)	04/27/93	N001	MG/L		0.01		0.005	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
N001 - UNFILTERED SAMPLE

OTHER PARAMETER VALUE FLAGS:
H - HOLD TIME EXPIRED, VALUE SUSPECT

SURFACE WATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP02 SHIPROCK (TAILINGS AREA)
 LOCATION: 0762 RESERVED FOR BTOTH
 NORTH COORDINATE: UNKNOWN
 EAST COORDINATE: UNKNOWN
 04/27/93 TO 01/31/95
 REPORT DATE: 04/20/95

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
ALKALINITY	04/27/93	N001	MG/L CaCO3		34		-	-
AMMONIUM	04/27/93	N001	MG/L	<	0.1		0.1	-
ANTIMONY (TOTAL)	04/27/93	N001	MG/L	<	0.003		0.003	-
ARSENIC (TOTAL)	04/27/93	N001	MG/L	<	0.005	W	0.005	-
CADMIUM (TOTAL)	04/27/93	N001	MG/L		0.001		0.001	-
CALCIUM (TOTAL)	04/27/93	N001	MG/L		115		0.5	-
CHLORIDE	04/27/93	N001	MG/L		54.1		0.5	-
CHROMIUM (TOTAL)	04/27/93	N001	MG/L	<	0.01		0.01	-
COBALT (TOTAL)	04/27/93	N001	MG/L	<	0.05		0.05	-
COPPER (TOTAL)	04/27/93	N001	MG/L	<	0.02		0.02	-
GROSS ALPHA (TOTAL)	04/27/93	N001	PCI/L		0.0		37.9	20.6
GROSS BETA (TOTAL)	04/27/93	N001	PCI/L		0.0		33.6	19.1
IRON (TOTAL)	04/27/93	N001	MG/L		0.06		0.03	-
LEAD (TOTAL)	04/27/93	N001	MG/L	<	0.003		0.003	-
LEAD-210 (TOTAL)	04/27/93	N001	PCI/L		0.0		2.0	1.2
MANGANESE (TOTAL)	04/27/93	N001	MG/L	<	0.01		0.01	-
MOLYBDENUM (TOTAL)	04/27/93	N001	MG/L	<	0.01		0.01	-
NITRATE	04/27/93	N001	MG/L		1		1	-
PH	04/27/93	N001	SU		8.26		-	-
PHOSPHATE	04/27/93	N001	MG/L	<	0.1		0.1	-
POLONIUM-210 (TOTAL)	04/27/93	N001	PCI/L		0.0		3.2	1.7
RADIUM-226 (TOTAL)	04/27/93	N001	PCI/L		0.6		0.9	0.6
SELENIUM (TOTAL)	04/27/93	N001	MG/L	<	0.005	W	0.005	-
SODIUM (TOTAL)	04/27/93	N001	MG/L		860		0.1	-
SPECIFIC CONDUCTANCE	04/27/93	N001	UMHO/CM		4150		-	-
STRONTIUM (TOTAL)	04/27/93	N001	MG/L		12.5		0.01	-
SULFATE	04/27/93	N001	MG/L		2520		1	-
TEMPERATURE	04/27/93	N001	C - DEGREE		25.3		-	-
THORIUM-230 (TOTAL)	04/27/93	N001	PCI/L		0.6		0.4	0.4

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
 N001 - UNFILTERED SAMPLE

OTHER PARAMETER VALUE FLAGS:
 W - POST-DIGEST SPIKE OUT OF CNTR LIM WHILE SAMP ABS < 50X SPIKE

SURFACE WATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP02 SHIPROCK (TAILINGS AREA)
 LOCATION: 0762 RESERVED FOR BTOTH
 NORTH COORDINATE: UNKNOWN
 EAST COORDINATE: UNKNOWN
 04/27/93 TO 01/31/95
 REPORT DATE: 04/20/95

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
TOTAL DISSOLVED SOLIDS	04/27/93	N001	MG/L		3130	H	10	-
TOTAL ORGANIC CARBON	04/27/93	N001	MG/L	<	1		1	-
URANIUM (TOTAL)	04/27/93	N001	MG/L	<	0.001		0.001	-
VANADIUM (TOTAL)	04/27/93	N001	MG/L	<	0.01		0.01	-
ZINC (TOTAL)	04/27/93	N001	MG/L	<	0.005		0.005	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
N001 - UNFILTERED SAMPLE

OTHER PARAMETER VALUE FLAGS:
H - HOLD TIME EXPIRED, VALUE SUSPECT

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SUPPLEMENT 6
SEDIMENT CHEMISTRY DATA BY LOCATION

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SOIL CHEMISTRY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0546 RESERVED FOR PMIDDLEBROOKS
 NORTH COORDINATE: UNKNOWN
 EAST COORDINATE: UNKNOWN
 02/23/93 TO 02/25/93
 REPORT DATE: 04/20/95

PARAMETER NAME	LOG DATE	SAMP ID	DEPTH RANGE (FT)	DIG. CODE	SAMP DESC	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERT.
% SOLIDS	02/25/93	0002	-			%		78.1		0.1	-
ARSENIC	02/25/93	0002	-			MG/KG		2.7		2.0	-
CADMIUM	02/25/93	0002	-			MG/KG	<	1.0		1.0	-
CALCIUM	02/25/93	0002	-			MG/KG		6700		16.0	-
CHLORIDE	02/25/93	0002	-			MG/KG		8.5		8.0	-
CHROMIUM	02/25/93	0002	-			MG/KG		5.3		4.0	-
IRON	02/25/93	0002	-			MG/KG		12600		5.0	-
LEAD	02/25/93	0002	-			MG/KG		18.7	*	1.0	-
LEAD-210	02/25/93	0002	-			PCI/G	<	4.0		4.0	-
MANGANESE	02/25/93	0002	-			MG/KG		263	N	1.0	-
MOLYBDENUM	02/25/93	0002	-			MG/KG	<	27.0		27.0	-
POLONIUM-210	02/25/93	0002	-			PCI/G		2.4		-	0.4
RADIUM-226	02/25/93	0002	-			PCI/G		1.39		-	0.28
SELENIUM	02/25/93	0002	-			MG/KG	<	2.0		2.0	-
STRONTIUM	02/25/93	0002	-			MG/KG		62.7		1.0	-
THORIUM-230	02/25/93	0002	-			PCI/G		1.2		-	0.3
URANIUM	02/25/93	0002	-			MG/KG		4.5		1.0	-
VANADIUM	02/25/93	0002	-			MG/KG		16.9		9.0	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT
 OTHER PARAMETER VALUE FLAGS: * - DUPLICATE ANALYSIS NOT WITHIN CONTROL LIMITS
 N - SPIKE SAMPLE RECOVERY NOT WITHIN CONTROL LIMITS
 -
 SAMPLE DIGESTION TYPE CODES: -
 SAMPLE DESCRIPTION CODES: -

SOIL CHEMISTRY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0546 RESERVED FOR PMIDDLEBROOKS
 NORTH COORDINATE: UNKNOWN
 EAST COORDINATE: UNKNOWN
 02/23/93 TO 02/25/93
 REPORT DATE: 04/20/95

PARAMETER NAME	LOG DATE	SAMP ID	DEPTH RANGE (FT)	DIG. CODE	SAMP DESC	UNITS OF MEASURE	PARAMETER VALUE	PARAMETER FLAGS	DETECTION LIMIT	PARAMETER UNCERT.
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PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SOIL CHEMISTRY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0547 RESERVED FOR PMIDDLEBROOKS
 NORTH COORDINATE: UNKNOWN
 EAST COORDINATE: UNKNOWN
 02/23/93 TO 02/25/93
 REPORT DATE: 04/20/95

PARAMETER NAME	LOG DATE	SAMP ID	DEPTH RANGE (FT)	DIG. CODE	SAMP DESC	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERT.
% SOLIDS	02/23/93	0002	-			%		78.0		0.1	-
ARSENIC	02/23/93	0002	-			MG/KG		2.2		2.0	-
CADMIUM	02/23/93	0002	-			MG/KG	<	1.0		1.0	-
CALCIUM	02/23/93	0002	-			MG/KG		7070		16.0	-
CHLORIDE	02/23/93	0002	-			MG/KG		8.1		8.0	-
CHROMIUM	02/23/93	0002	-			MG/KG	<	4.0		4.0	-
IRON	02/23/93	0002	-			MG/KG		8850		5.0	-
LEAD	02/23/93	0002	-			MG/KG		7.2	*	1.0	-
LEAD-210	02/23/93	0002	-			PCI/G	<	4.0		4.0	-
MANGANESE	02/23/93	0002	-			MG/KG		309	N	1.0	-
MOLYBDENUM	02/23/93	0002	-			MG/KG	<	27.0		27.0	-
POLONIUM-210	02/23/93	0002	-			PCI/G		0.78		-	0.18
RADIUM-226	02/23/93	0002	-			PCI/G		1.17		-	0.19
SELENIUM	02/23/93	0002	-			MG/KG	<	2.0	W	2.0	-
STRONTIUM	02/23/93	0002	-			MG/KG		45.5		1.0	-
THORIUM-230	02/23/93	0002	-			PCI/G		1.6		-	0.2
URANIUM	02/23/93	0002	-			MG/KG		3.4		1.0	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT
 OTHER PARAMETER VALUE FLAGS:
 * - DUPLICATE ANALYSIS NOT WITHIN CONTROL LIMITS
 N - SPIKE SAMPLE RECOVERY NOT WITHIN CONTROL LIMITS
 W - POST-DIGEST SPIKE OUT OF CNTR LIM WHILE SAMP ABS < 50% SPIKE
 SAMPLE DIGESTION TYPE CODES: -
 SAMPLE DESCRIPTION CODES: -

SOIL CHEMISTRY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0547 RESERVED FOR PMIDDLEBROOKS
 NORTH COORDINATE: UNKNOWN
 EAST COORDINATE: UNKNOWN
 02/23/93 TO 02/25/93
 REPORT DATE: 04/20/95

PARAMETER NAME	LOG DATE	SAMP ID	DEPTH RANGE (FT)	DIG. CODE	SAMP DESC	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERT.
VANADIUM	02/23/93	0002	-			MG/KG		12.7		9.0	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT
 SAMPLE DIGESTION TYPE CODES: -
 SAMPLE DESCRIPTION CODES: -

SOIL CHEMISTRY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0548 RESERVED FOR PMIDDLEBROOKS
 NORTH COORDINATE: UNKNOWN
 EAST COORDINATE: UNKNOWN
 02/23/93 TO 02/25/93
 REPORT DATE: 04/20/95

PARAMETER NAME	LOG DATE	SAMP ID	DEPTH RANGE (FT)	DIG. CODE	SAMP DESC	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERT.
% SOLIDS	02/23/93	0002	-			%		79.3		0.1	-
	02/23/93	0004	-					74.5		0.1	-
ARSENIC	02/23/93	0002	-			MG/KG		2.7		2.0	-
	02/23/93	0004	-					3.6		2.0	-
CADMIUM	02/23/93	0002	-			MG/KG	<	1.0		1.0	-
	02/23/93	0004	-				<	1.0		1.0	-
CALCIUM	02/23/93	0002	-			MG/KG		14700		16.0	-
	02/23/93	0004	-					24200		16.0	-
CHLORIDE	02/23/93	0002	-			MG/KG		38.6		8.0	-
	02/23/93	0004	-				<	8.0		8.0	-
CHROMIUM	02/23/93	0002	-			MG/KG		5.5		4.0	-
	02/23/93	0004	-					9.0		4.0	-
IRON	02/23/93	0002	-			MG/KG		10600		5.0	-
	02/23/93	0004	-					14000		5.0	-
LEAD	02/23/93	0002	-			MG/KG		7.5	*	1.0	-
	02/23/93	0004	-					14.6	*	1.0	-
LEAD-210	02/23/93	0002	-			PCI/G	<	4.0		4.0	-
	02/23/93	0004	-				<	4.0		4.0	-
MANGANESE	02/23/93	0002	-			MG/KG		264	N	1.0	-
	02/23/93	0004	-					388	N	1.0	-
MOLYBDENUM	02/23/93	0002	-			MG/KG	<	27.0		27.0	-
	02/23/93	0004	-				<	27.0		27.0	-
POLONIUM-210	02/23/93	0002	-			PCI/G		1.1		-	0.2

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT
 OTHER PARAMETER VALUE FLAGS: * - DUPLICATE ANALYSIS NOT WITHIN CONTROL LIMITS
 N - SPIKE SAMPLE RECOVERY NOT WITHIN CONTROL LIMITS
 SAMPLE DIGESTION TYPE CODES: -
 SAMPLE DESCRIPTION CODES: -

SOIL CHEMISTRY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0548 RESERVED FOR PMIDDLEBROOKS
 NORTH COORDINATE: UNKNOWN
 EAST COORDINATE: UNKNOWN
 02/23/93 TO 02/25/93
 REPORT DATE: 04/20/95

PARAMETER NAME	LOG DATE	SAMP ID	DEPTH RANGE (FT)	DIG. CODE	SAMP DESC	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERT.
POLONIUM-210	02/23/93	0004	-			PCI/G		1.1		-	0.2
RADIUM-226	02/23/93	0002	-			PCI/G		1.45		-	0.18
	02/23/93	0004	-					1.49		-	0.22
SELENIUM	02/23/93	0002	-			MG/KG	<	2.0		2.0	-
	02/23/93	0004	-				<	2.0		2.0	-
STRONTIUM	02/23/93	0002	-			MG/KG		64.0		1.0	-
	02/23/93	0004	-					119		1.0	-
THORIUM-230	02/23/93	0002	-			PCI/G		1.6		-	0.3
	02/23/93	0004	-					1.9		-	0.3
URANIUM	02/23/93	0002	-			MG/KG		4.9		1.0	-
	02/23/93	0004	-					5.0		1.0	-
VANADIUM	02/23/93	0002	-			MG/KG		12.7		9.0	-
	02/23/93	0004	-					19.4		9.0	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT
 SAMPLE DIGESTION TYPE CODES: -
 SAMPLE DESCRIPTION CODES: -

SOIL CHEMISTRY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0549 RESERVED FOR PMIDDLEBROOKS
 NORTH COORDINATE: UNKNOWN
 EAST COORDINATE: UNKNOWN
 02/23/93 TO 02/25/93
 REPORT DATE: 04/20/95

PARAMETER NAME	LOG DATE	SAMP ID	DEPTH RANGE (FT)	DIG. CODE	SAMP DESC	UNITS OF MEASURE	PARAMETER			DETECTION LIMIT	PARAMETER UNCERT.
							PVI	VALUE	FLAGS		
% SOLIDS	02/25/93	0002	-			%		72.6		0.1	-
ARSENIC	02/25/93	0002	-			MG/KG		2.8		2.0	-
CADMIUM	02/25/93	0002	-			MG/KG	<	1.0		1.0	-
CALCIUM	02/25/93	0002	-			MG/KG		12400		16.0	-
CHLORIDE	02/25/93	0002	-			MG/KG		35.3		8.0	-
CHROMIUM	02/25/93	0002	-			MG/KG		5.8		4.0	-
IRON	02/25/93	0002	-			MG/KG		12200		5.0	-
LEAD	02/25/93	0002	-			MG/KG		18.3	*	1.0	-
LEAD-210	02/25/93	0002	-			PCI/G	<	4.0		4.0	-
MANGANESE	02/25/93	0002	-			MG/KG		360	N	1.0	-
MOLYBDENUM	02/25/93	0002	-			MG/KG	<	27.0		27.0	-
POLONIUM-210	02/25/93	0002	-			PCI/G		1.2		-	0.2
RADIUM-226	02/25/93	0002	-			PCI/G		1.40		-	0.32
SELENIUM	02/25/93	0002	-			MG/KG	<	2.0		2.0	-
STRONTIUM	02/25/93	0002	-			MG/KG		64.6		1.0	-
THORIUM-230	02/25/93	0002	-			PCI/G		1.2		-	0.3
URANIUM	02/25/93	0002	-			MG/KG		4.4		1.0	-
VANADIUM	02/25/93	0002	-			MG/KG		17.9		9.0	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT
 OTHER PARAMETER VALUE FLAGS: * - DUPLICATE ANALYSIS NOT WITHIN CONTROL LIMITS
 N - SPIKE SAMPLE RECOVERY NOT WITHIN CONTROL LIMITS
 SAMPLE DIGESTION TYPE CODES: -
 SAMPLE DESCRIPTION CODES: -

SOIL CHEMISTRY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0549 RESERVED FOR PMIDDLEBROOKS
 NORTH COORDINATE: UNKNOWN
 EAST COORDINATE: UNKNOWN
 02/23/93 TO 02/25/93
 REPORT DATE: 04/20/95

PARAMETER NAME	LOG DATE	SAMP ID	DEPTH RANGE (FT)	DIG. CODE	SAMP DESC	UNITS OF MEASURE	PARAMETER VALUE	PARAMETER FLAGS	DETECTION LIMIT	PARAMETER UNCERT.
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PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SOIL CHEMISTRY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0550
 NORTH COORDINATE: UNKNOWN
 EAST COORDINATE: UNKNOWN
 02/23/93 TO 02/25/93
 REPORT DATE: 04/20/95

PARAMETER NAME	LOG DATE	SAMP ID	DEPTH RANGE (FT)	DIG. CODE	SAMP DESC	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERT.
% SOLIDS	02/23/93	0002	-			%		73.4		0.1	-
ARSENIC	02/23/93	0002	-			MG/KG		2.3		2.0	-
CADMIUM	02/23/93	0002	-			MG/KG	<	1.0		1.0	-
CALCIUM	02/23/93	0002	-			MG/KG		6060		16.0	-
CHLORIDE	02/23/93	0002	-			MG/KG		25.6		8.0	-
CHROMIUM	02/23/93	0002	-			MG/KG	<	4.0		4.0	-
IRON	02/23/93	0002	-			MG/KG		7890		5.0	-
LEAD	02/23/93	0002	-			MG/KG		8.4	*	1.0	-
LEAD-210	02/23/93	0002	-			PCI/G	<	4.0		4.0	-
MANGANESE	02/23/93	0002	-			MG/KG		293	N	1.0	-
MOLYBDENUM	02/23/93	0002	-			MG/KG	<	27.0		27.0	-
POLONIUM-210	02/23/93	0002	-			PCI/G		0.86		-	0.19
RADIUM-226	02/23/93	0002	-			PCI/G		1.18		-	0.19
SELENIUM	02/23/93	0002	-			MG/KG	<	2.0		2.0	-
STRONTIUM	02/23/93	0002	-			MG/KG		43.5		1.0	-
THORIUM-230	02/23/93	0002	-			PCI/G		0.7		-	0.2
URANIUM	02/23/93	0002	-			MG/KG		3.9		1.0	-
VANADIUM	02/23/93	0002	-			MG/KG		12.9		9.0	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT
 OTHER PARAMETER VALUE FLAGS: * - DUPLICATE ANALYSIS NOT WITHIN CONTROL LIMITS
 N - SPIKE SAMPLE RECOVERY NOT WITHIN CONTROL LIMITS
 SAMPLE DIGESTION TYPE CODES: -
 SAMPLE DESCRIPTION CODES: -

SOIL CHEMISTRY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0550
 NORTH COORDINATE: UNKNOWN
 EAST COORDINATE: UNKNOWN
 02/23/93 TO 02/25/93
 REPORT DATE: 04/20/95

PARAMETER NAME	LOG DATE	SAMP ID	DEPTH RANGE (FT)	DIG. CODE	SAMP DESC	UNITS OF MEASURE	PARAMETER VALUE	PARAMETER FLAGS	DETECTION LIMIT	PARAMETER UNCERT.
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PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SOIL CHEMISTRY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0551
 NORTH COORDINATE: UNKNOWN
 EAST COORDINATE: UNKNOWN
 02/23/93 TO 02/25/93
 REPORT DATE: 04/20/95

PARAMETER NAME	LOG DATE	SAMP ID	DEPTH RANGE (FT)	DIG. CODE	SAMP DESC	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERT.
% SOLIDS	02/24/93	0002	-			%		81.4		0.1	-
ARSENIC	02/24/93	0002	-			MG/KG		2.1		2.0	-
CADMIUM	02/24/93	0002	-			MG/KG	<	1.0		1.0	-
CALCIUM	02/24/93	0002	-			MG/KG		7300		16.0	-
CHLORIDE	02/24/93	0002	-			MG/KG		14.7		8.0	-
CHROMIUM	02/24/93	0002	-			MG/KG		4.7		4.0	-
IRON	02/24/93	0002	-			MG/KG		9910		5.0	-
LEAD	02/24/93	0002	-			MG/KG		7.5	*	1.0	-
LEAD-210	02/24/93	0002	-			PCI/G	<	4.0		4.0	-
MANGANESE	02/24/93	0002	-			MG/KG		346	N	1.0	-
MOLYBDENUM	02/24/93	0002	-			MG/KG	<	27.0		27.0	-
POLONIUM-210	02/24/93	0002	-			PCI/G		0.78		-	0.18
RADIUM-226	02/24/93	0002	-			PCI/G		1.09		-	0.29
SELENIUM	02/24/93	0002	-			MG/KG	<	2.0		2.0	-
STRONTIUM	02/24/93	0002	-			MG/KG		49.8		1.0	-
THORIUM-230	02/24/93	0002	-			PCI/G		1.1		-	0.3
URANIUM	02/24/93	0002	-			MG/KG		3.7		1.0	-
VANADIUM	02/24/93	0002	-			MG/KG		14.8		9.0	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT
 OTHER PARAMETER VALUE FLAGS: * - DUPLICATE ANALYSIS NOT WITHIN CONTROL LIMITS
 N - SPIKE SAMPLE RECOVERY NOT WITHIN CONTROL LIMITS
 SAMPLE DIGESTION TYPE CODES:
 SAMPLE DESCRIPTION CODES:

SOIL CHEMISTRY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0551
 NORTH COORDINATE: UNKNOWN
 EAST COORDINATE: UNKNOWN
 02/23/93 TO 02/25/93
 REPORT DATE: 04/20/95

PARAMETER NAME	LOG DATE	SAMP ID	DEPTH RANGE (FT)	DIG. CODE	SAMP DESC	UNITS OF MEASURE	PARAMETER		DETECTION LIMIT	PARAMETER UNCERT.
							PVI	VALUE FLAGS		

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SOIL CHEMISTRY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0552
 NORTH COORDINATE: UNKNOWN
 EAST COORDINATE: UNKNOWN
 02/23/93 TO 02/25/93
 REPORT DATE: 04/20/95

PARAMETER NAME	LOG DATE	SAMP ID	DEPTH RANGE (FT)	DIG. CODE	SAMP DESC	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERT.
% SOLIDS	02/25/93	0002	-			%		71.6		0.1	-
ARSENIC	02/25/93	0002	-			MG/KG		2.3		2.0	-
CADMIUM	02/25/93	0002	-			MG/KG	<	1.0		1.0	-
CALCIUM	02/25/93	0002	-			MG/KG		11600		16.0	-
CHLORIDE	02/25/93	0002	-			MG/KG		57.0		8.0	-
CHROMIUM	02/25/93	0002	-			MG/KG		6.6		4.0	-
IRON	02/25/93	0002	-			MG/KG		11400		5.0	-
LEAD	02/25/93	0002	-			MG/KG		17.4	*	1.0	-
LEAD-210	02/25/93	0002	-			PCI/G	<	4.0		4.0	-
MANGANESE	02/25/93	0002	-			MG/KG		285	N	1.0	-
MOLYBDENUM	02/25/93	0002	-			MG/KG	<	27.0		27.0	-
POLONIUM-210	02/25/93	0002	-			PCI/G		1.02		-	0.18
RADIUM-226	02/25/93	0002	-			PCI/G		1.57		-	0.23
SELENIUM	02/25/93	0002	-			MG/KG	<	2.0		2.0	-
STRONTIUM	02/25/93	0002	-			MG/KG		69.2		1.0	-
THORIUM-230	02/25/93	0002	-			PCI/G		1.2		-	0.2
URANIUM	02/25/93	0002	-			MG/KG		4.4		1.0	-
VANADIUM	02/25/93	0002	-			MG/KG		16.9		9.0	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT
 OTHER PARAMETER VALUE FLAGS: * - DUPLICATE ANALYSIS NOT WITHIN CONTROL LIMITS
 N - SPIKE SAMPLE RECOVERY NOT WITHIN CONTROL LIMITS
 SAMPLE DIGESTION TYPE CODES: -
 SAMPLE DESCRIPTION CODES: -

SOIL CHEMISTRY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0552
 NORTH COORDINATE: UNKNOWN
 EAST COORDINATE: UNKNOWN
 02/23/93 TO 02/25/93
 REPORT DATE: 04/20/95

PARAMETER NAME	LOG DATE	SAMP ID	DEPTH RANGE (FT)	DIG. CODE	SAMP DESC	UNITS OF MEASURE	PARAMETER		DETECTION LIMIT	PARAMETER UNCERT.
							PVI	VALUE FLAGS		

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SOIL CHEMISTRY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0553
 NORTH COORDINATE: UNKNOWN
 EAST COORDINATE: UNKNOWN
 02/23/93 TO 02/25/93
 REPORT DATE: 04/20/95

PARAMETER NAME	LOG DATE	SAMP ID	DEPTH RANGE (FT)	DIG. CODE	SAMP DESC	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERT.
% SOLIDS	02/23/93	0002	-			%		87.2		0.1	-
ARSENIC	02/23/93	0002	-			MG/KG	<	2.0		2.0	-
CADMIUM	02/23/93	0002	-			MG/KG	<	1.0		1.0	-
CALCIUM	02/23/93	0002	-			MG/KG		1560		16.0	-
CHLORIDE	02/23/93	0002	-			MG/KG		758		8.0	-
CHROMIUM	02/23/93	0002	-			MG/KG	<	4.0		4.0	-
IRON	02/23/93	0002	-			MG/KG		4440		5.0	-
LEAD	02/23/93	0002	-			MG/KG		10.1	*	1.0	-
LEAD-210	02/23/93	0002	-			PCI/G	<	4.0		4.0	-
MANGANESE	02/23/93	0002	-			MG/KG		130	N	1.0	-
MOLYBDENUM	02/23/93	0002	-			MG/KG	<	27.0		27.0	-
POLONIUM-210	02/23/93	0002	-			PCI/G		1.2		-	0.3
RADIUM-226	02/23/93	0002	-			PCI/G		0.94		-	0.14
SELENIUM	02/23/93	0002	-			MG/KG	<	2.0		2.0	-
STRONTIUM	02/23/93	0002	-			MG/KG		15.1		1.0	-
THORIUM-230	02/23/93	0002	-			PCI/G		2.4		-	0.4
URANIUM	02/23/93	0002	-			MG/KG		5.2		1.0	-
VANADIUM	02/23/93	0002	-			MG/KG	<	9.0		9.0	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT
 OTHER PARAMETER VALUE FLAGS: * - DUPLICATE ANALYSIS NOT WITHIN CONTROL LIMITS
 N - SPIKE SAMPLE RECOVERY NOT WITHIN CONTROL LIMITS
 SAMPLE DIGESTION TYPE CODES:
 SAMPLE DESCRIPTION CODES:

SOIL CHEMISTRY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0553
 NORTH COORDINATE: UNKNOWN
 EAST COORDINATE: UNKNOWN
 02/23/93 TO 02/25/93
 REPORT DATE: 04/20/95

PARAMETER NAME	LOG DATE	SAMP ID	DEPTH RANGE (FT)	DIG. CODE	SAMP DESC	UNITS OF MEASURE	PARAMETER VALUE	PARAMETER FLAGS	DETECTION LIMIT	PARAMETER UNCERT.
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PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SOIL CHEMISTRY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0554
 NORTH COORDINATE: UNKNOWN
 EAST COORDINATE: UNKNOWN
 02/23/93 TO 02/25/93
 REPORT DATE: 04/20/95

PARAMETER NAME	LOG DATE	SAMP ID	DEPTH RANGE (FT)	DIG. CODE	SAMP DESC	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERT.
% SOLIDS	02/25/93	0002	-			%		75.7		0.1	-
ARSENIC	02/25/93	0002	-			MG/KG	<	2.0		2.0	-
CADMIUM	02/25/93	0002	-			MG/KG	<	1.0		1.0	-
CALCIUM	02/25/93	0002	-			MG/KG		6100		16.0	-
CHLORIDE	02/25/93	0002	-			MG/KG		17.7		8.0	-
CHROMIUM	02/25/93	0002	-			MG/KG		4.9		4.0	-
IRON	02/25/93	0002	-			MG/KG		9310		5.0	-
LEAD	02/25/93	0002	-			MG/KG		9.8	*	1.0	-
LEAD-210	02/25/93	0002	-			PCI/G	<	4.0		4.0	-
MANGANESE	02/25/93	0002	-			MG/KG		263	N	1.0	-
MOLYBDENUM	02/25/93	0002	-			MG/KG	<	27.0		27.0	-
POLONIUM-210	02/25/93	0002	-			PCI/G		0.87		-	0.18
RADIUM-226	02/25/93	0002	-			PCI/G		1.03		-	0.28
SELENIUM	02/25/93	0002	-			MG/KG	<	2.0		2.0	-
STRONTIUM	02/25/93	0002	-			MG/KG		52.3		1.0	-
THORIUM-230	02/25/93	0002	-			PCI/G		2.3		-	0.4
URANIUM	02/25/93	0002	-			MG/KG		3.9		1.0	-
VANADIUM	02/25/93	0002	-			MG/KG		15.1		9.0	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT
 OTHER PARAMETER VALUE FLAGS: * - DUPLICATE ANALYSIS NOT WITHIN CONTROL LIMITS
 N - SPIKE SAMPLE RECOVERY NOT WITHIN CONTROL LIMITS
 SAMPLE DIGESTION TYPE CODES: -
 SAMPLE DESCRIPTION CODES: -

SOIL CHEMISTRY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0554
 NORTH COORDINATE: UNKNOWN
 EAST COORDINATE: UNKNOWN
 02/23/93 TO 02/25/93
 REPORT DATE: 04/20/95

PARAMETER NAME	LOG DATE	SAMP ID	DEPTH RANGE (FT)	DIG. CODE	SAMP DESC	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERT.
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PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SOIL CHEMISTRY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0555
 NORTH COORDINATE: UNKNOWN
 EAST COORDINATE: UNKNOWN
 02/23/93 TO 02/25/93
 REPORT DATE: 04/20/95

PARAMETER NAME	LOG DATE	SAMP ID	DEPTH RANGE (FT)	DIG. CODE	SAMP DESC	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERT.
% SOLIDS	02/23/93	0002	-			%		74.1		0.1	-
ARSENIC	02/23/93	0002	-			MG/KG		3.6		2.0	-
CADMIUM	02/23/93	0002	-			MG/KG	<	1.0		1.0	-
CALCIUM	02/23/93	0002	-			MG/KG		20700		16.0	-
CHLORIDE	02/23/93	0002	-			MG/KG		102		8.0	-
CHROMIUM	02/23/93	0002	-			MG/KG		7.4		4.0	-
IRON	02/23/93	0002	-			MG/KG		14200		5.0	-
LEAD	02/23/93	0002	-			MG/KG		14.2	*	1.0	-
LEAD-210	02/23/93	0002	-			PCI/G	<	4.0		4.0	-
MANGANESE	02/23/93	0002	-			MG/KG		362	N	1.0	-
MOLYBDENUM	02/23/93	0002	-			MG/KG	<	27.0		27.0	-
POLONIUM-210	02/23/93	0002	-			PCI/G		1.5		-	0.3
RADIUM-226	02/23/93	0002	-			PCI/G		1.71		-	0.23
SELENIUM	02/23/93	0002	-			MG/KG	<	2.0		2.0	-
STRONTIUM	02/23/93	0002	-			MG/KG		99.0		1.0	-
THORIUM-230	02/23/93	0002	-			PCI/G		2.2		-	0.3
URANIUM	02/23/93	0002	-			MG/KG		5.1		1.0	-
VANADIUM	02/23/93	0002	-			MG/KG		19.3		9.0	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT
 OTHER PARAMETER VALUE FLAGS: * - DUPLICATE ANALYSIS NOT WITHIN CONTROL LIMITS
 N - SPIKE SAMPLE RECOVERY NOT WITHIN CONTROL LIMITS
 SAMPLE DIGESTION TYPE CODES: -
 SAMPLE DESCRIPTION CODES: -

SOIL CHEMISTRY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0555
 NORTH COORDINATE: UNKNOWN
 EAST COORDINATE: UNKNOWN
 02/23/93 TO 02/25/93
 REPORT DATE: 04/20/95

PARAMETER NAME	LOG DATE	SAMP ID	DEPTH RANGE (FT)	DIG. CODE	SAMP DESC	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERT.
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PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

DATA FILE NAME: \DART\SHPO1\SCI10000.DAT

**SUPPLEMENT 7
GEOCHEMICAL MODELING REPORT**

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CALCULATION COVER SHEET

CALC NO. SHPO793150000 DISCIPLINE Geochemistry NO. OF SHEETS 2

PROJECT: UMTRA

SITE: Shiprock, New Mexico

FEATURE: Effect of groundwater discharge (contaminated) on water quality in the San Juan River

SOURCES OF DATA:
SPEAR database
USGS stream discharge at station 09368000 on the San Juan River near Shiprock, NM

SOURCES OF FORMULAE & REFERENCES:

PRELIMINARY CALC. FINAL CALC. SUPERSEDES CALC. NO. _____

00		A Groffman	7/93	DLarsen	7/6/95	Robert A. San	3-14-96
REV. NO.	REVISION	CALCULATION BY	DATE	CHECKED BY	DATE	APPROVED BY	DATE

Memo

Subject: Shiprock, NM BLRA Supplement

From: Dan Larsen, geochemistry

The supplement includes 1) output files from geochemical modeling using the MINTEQA2 (Allison and others, 1991) geochemical code and 2) calculations used to estimate the effects of contaminated groundwater discharge on water quality in the San Juan River (Section 3.5 - Surface water monitoring). The output files are presented to substantiate statements made in section 3.4 (Contaminant fate and transport) regarding speciation and mineral saturation state of contaminated groundwater (monitor well 615).

References:

Allison, J. D., Brown, D. S., and Novo-Gradac, K. J., 1991, MINTEQA2/PRODEFA2, A geochemical assessment model for environmental systems: Version 3.0 user's manual. Athens, Georgia, United States Environmental Protection Agency, 106 p.

CALCULATION SET

Effect of contaminated ground water discharge on surface water within the San Juan River, Shiprock, New Mexico, UMTRA Site.

This set of calculations estimates the effect of contaminated ground water discharge on water quality within the San Juan River under low flow conditions. The values for parameters used in these calculations are those presented in the Baseline Risk Assessment.

hydraulic conductivity (K) = 0.0038 ft/sec

hydraulic gradient (I) = 0.002 ft/ft

cross-sectional area of contamination perpendicular to ground water flow
= 2500 ft width x 8.0 ft depth = 20,000 ft²

$$\text{Discharge of ground water} = Q_{gw} = K \times I \times A = 0.0038 \text{ ft/sec} \times 0.002 \text{ ft/ft} \times 20,000 \text{ ft}^2 \\ = 0.2 \text{ ft}^3/\text{sec}$$

The hydraulic conductivity is estimated as the maximum value for uniform, medium-grained sand, the dominant sediment type observed in the floodplain. The measured horizontal hydraulic gradient within the alluvium is based on a water table contour map constructed from water level measurements in monitor wells obtained during April 1993. The cross-sectional area of represents an estimate of the area of groundwater discharge along the north bank of the floodplain.

Assuming that all of this flux discharges to the San Juan River, then the concentration of a given contaminant (at a point downstream where the groundwater discharge and ambient stream water are well-mixed) is given as

$$C_f = (Q_r \times C_r + Q_{gw} \times C_{gw}) / (Q_{gw} + Q_r)$$

where C_f = final concentration (in mg/L)

Q_{gw} = discharge of ground water to the river (in ft³/sec, as computed above)

Q_r = discharge of river (in ft³/sec)

C_{gw} = concentration of a constituent in ground water (in mg/L)

C_r = concentration (in mg/L) of the same constituent in the river water, upstream of the ground water discharge point.

Let:

Q_{gw} = 0.2 ft³/sec (computed above)

Q_r = 81.3 ft³/sec (statistical low flow for the San Juan River)

C_{gw} = 2.28 mg/L for uranium, 175 mg/L for nitrate, and 14,600 mg/L for sulfate

C_r = 0.0005 mg/L for uranium, 0.05 mg/L nitrate and 187 mg/L for sulfate

Then:

C_f = 0.006 mg/L for uranium, 0.5 mg/L for nitrate, and 222 mg/L for sulfate.

These concentrations are within the observed range of ambient San Juan River water quality.



JACOBS ENGINEERING GROUP INC.
ALBUQUERQUE OPERATIONS

CALCULATION COVER SHEET

CALC NO. SHPO793141400 DISCIPLINE Geochemistry NO. OF SHEETS 14

PROJECT: UMTRA

SITE: Shiprock, New Mexico

FEATURE: Speciation modeling of contaminated groundwater.

SOURCES OF DATA:
SPEAR Database

SOURCES OF FORMULAE & REFERENCES:
MINTEQA2 geochemical code
Allison and others (1991)

PRELIMINARY CALC. FINAL CALC. SUPERSEDES CALC. NO. _____

00		AGroffman	7/93	DLarsen	7/6/95	Redd (San)	3-14-96
REV. NO.	REVISION	CALCULATION BY	DATE	CHECKED BY	DATE	APPROVED BY	DATE

PART 1 of OUTPUT FILE

PC MINTEQA2 v3.10 DATE OF CALCULATIONS: 7-JUL-93 TIME: 10:54:41

GEOCHEMICAL MODELING OF MW 615, SHP01, NEW MEXICO.
RISK ASSESSMENT, SPECIATION, 1993 WQ DATA, AGROFFMAN.

Temperature (Celsius): 9.30
Units of concentration: MG/L
Ionic strength to be computed.
Carbonate concentration represents carbonate alkalinity.
Do not automatically terminate if charge imbalance exceeds 30%
Precipitation is allowed only for those solids specified as ALLOWED
in the input file (if any).
The maximum number of iterations is: 40
The method used to compute activity coefficients is: Davies equation
Intermediate output file

330 0.000E-01 -6.84 y
140 3.825E+02 -18.88 y
1 0.000E-01 -8.71 y
490 7.650E+01 -2.37 y
740 4.300E-03 -7.60 y
90 8.000E-01 -4.89 y
150 3.800E+02 -2.02 y
180 4.580E+02 -1.89 y
270 8.000E-01 -4.38 y
460 2.120E+03 -1.06 y
470 5.680E+00 -3.99 y
492 2.970E+03 -1.32 y
410 1.060E+02 -2.57 y
761 9.023E-01 -5.15 y
770 2.080E+01 -3.66 y
500 3.280E+03 -0.85 y
800 9.030E+00 -3.99 y
732 1.190E+04 -0.91 y
893 3.060E+00 -4.95 y
902 5.500E-01 -5.09 y
950 1.700E-02 -6.58 y

H2O has been inserted as a COMPONENT

ID	NAME	ACTIVITY	LOG	ANAL	TOTAL
3	H2O	6.8400	0.0000		
2	H2O	8.7079	0.0000		

INPUT DATA BEFORE TYPE MODIFICATIONS

ID	NAME	ACTIVITY GUESS	LOG GUESS	ANAL TOTAL
330	H+1	1.445E-07	-6.840	0.000E-01
140	CO3-2	1.318E-19	-18.880	3.825E+02
1	E-1	1.950E-09	-8.710	0.000E-01
490	NH4+1	4.266E-03	-2.370	7.650E+01
740	Sb(OH)3	2.512E-08	-7.600	4.300E-03
90	H3BO3	1.288E-05	-4.890	8.000E-01
150	Ca+2	9.550E-03	-2.020	3.800E+02
180	Cl-1	1.288E-02	-1.890	4.580E+02
270	F-1	4.169E-05	-4.380	8.000E-01
460	Mg+2	8.710E-02	-1.060	2.120E+03
470	Mn+2	1.023E-04	-3.990	5.680E+00
492	NO3-1	4.786E-02	-1.320	2.970E+03
410	K+1	2.692E-03	-2.570	1.060E+02
761	HSeO3-1	7.079E-06	-5.150	9.023E-01
770	H4SiO4	2.188E-04	-3.660	2.080E+01
500	Na+1	1.413E-01	-0.850	3.280E+03
800	Sr+2	1.023E-04	-3.990	9.030E+00
732	SO4-2	1.230E-01	-0.910	1.190E+04
893	UO2+2	1.122E-05	-4.950	3.060E+00
902	VO+2	8.128E-06	-5.090	5.500E-01
950	Zn+2	2.630E-07	-6.580	1.700E-02

2 H2O 1.000E+00 0.000 0.000E-01

Charge Balance: UNSPECIATED

Sum of CATIONS= 3.511E-01 Sum of ANIONS = 3.285E-01

PERCENT DIFFERENCE = 3.319E+00 (ANIONS - CATIONS)/(ANIONS + CATIONS)

IMPROVED ACTIVITY GUESSES PRIOR TO FIRST ITERATION:		
CO3-2	Log activity guess:	-5.95
Sb(OH)3	Log activity guess:	-7.89
Mn+2	Log activity guess:	-3.98
HSeO3-1	Log activity guess:	-5.15
H4SiO4	Log activity guess:	-3.66
SO4-2	Log activity guess:	-0.90

PART 3 of OUTPUT FILE

PC MINTEQA2 v3.10 DATE OF CALCULATIONS: 7-JUL-93 TIME: 10:54:48

PARAMETERS OF THE COMPONENT MOST OUT OF BALANCE:

ITER	NAME	TOTAL MOL	DIFF FXN	LOG ACTVTY	RESIDUAL
0	UO2+2	1.158E-05	1.571E+03	-4.95000	1.571E+03
1	UO2+2	1.158E-05	4.656E+02	-5.12610	4.656E+02
2	UO2+2	1.158E-05	1.942E+02	-5.30220	1.941E+02
3	UO2+2	1.158E-05	5.755E+01	-5.47833	5.754E+01
4	UO2+2	1.158E-05	8.988E+00	-5.65449	8.987E+00
5	UO2+2	1.158E-05	5.036E+00	-5.83060	5.036E+00
6	UO2+2	1.158E-05	1.474E+00	-6.00696	1.474E+00
7	UO2+2	1.158E-05	4.442E-01	-6.18390	4.442E-01
8	UO2+2	1.158E-05	1.320E-01	-6.36267	1.320E-01
9	UO2+2	1.158E-05	3.907E-02	-6.54018	3.906E-02
10	UO2+2	1.158E-05	1.281E-02	-6.73718	1.281E-02
11	UO2+2	1.158E-05	3.973E-03	-6.95830	3.972E-03
12	UO2+2	1.158E-05	1.207E-03	-7.59184	1.207E-03
13	UO2+2	1.158E-05	3.089E-03	-8.59184	3.089E-03
14	UO2+2	1.158E-05	9.578E-04	-8.65252	9.577E-04
15	UO2+2	1.158E-05	6.024E-04	-9.65252	6.024E-04
16	UO2+2	1.158E-05	8.292E-05	-10.65252	8.292E-05
17	UO2+2	1.158E-05	2.023E-06	-11.65252	2.022E-06
18	UO2+2	1.158E-05	-2.688E-07	-11.77165	2.676E-07
19	UO2+2	1.158E-05	2.211E-09	-11.76691	1.052E-09
21	UO2+2	1.158E-05	-2.283E-07	-11.76773	2.271E-07
22	UO2+2	1.158E-05	-1.544E-08	-11.76035	1.428E-08

ID	NAME	ANAL MOL	CALC MOL	LOG ACTVTY	GAMMA	DIFF FXN
902	VO+2	8.399E-06	6.399E-07	-6.77091	0.264830	-1.260E-10
140	CO3-2	1.494E-02	6.544E-06	-5.76116	0.264830	-3.491E-07
950	Zn+2	2.658E-07	8.849E-08	-7.63015	0.264830	-2.523E-12
490	NH4+1	4.335E-03	3.472E-03	-2.60365	0.717368	-2.824E-08
740	Sb(OH)3	2.544E-08	1.277E-08	-7.85670	1.089215	4.336E-13
90	H3BO3	1.323E-05	1.317E-05	-4.84342	1.089215	2.240E-10
150	Ca+2	9.691E-03	5.242E-03	-2.85751	0.264830	-6.343E-08
180	Cl-1	1.321E-02	1.320E-02	-2.02354	0.717368	-8.625E-08
270	F-1	4.304E-05	2.706E-05	-4.71191	0.717368	-2.745E-10
460	Mg+2	8.914E-02	5.062E-02	-1.87268	0.264830	-7.035E-07
470	Mn+2	1.057E-04	6.052E-05	-4.79513	0.264830	-8.839E-10
492	NO3-1	4.896E-02	4.896E-02	-1.45440	0.717368	-3.198E-07
410	K+1	2.771E-03	2.516E-03	-2.74348	0.717368	-1.810E-08
761	HSeO3-1	7.207E-06	6.831E-06	-5.30977	0.717368	-5.444E-11
770	H4SiO4	2.212E-04	2.211E-04	-3.61830	1.089215	3.767E-09
500	Na+1	1.458E-01	1.340E-01	-1.01731	0.717368	-9.462E-07
800	Sr+2	1.053E-04	1.053E-04	-4.55443	0.264830	-2.752E-09
732	SO4-2	1.266E-01	7.260E-02	-1.71612	0.264830	-1.276E-06
893	UO2+2	1.158E-05	6.562E-12	-11.75997	0.264830	-1.091E-09
2	H2O	0.000E-01	-1.066E-05	-0.00332	1.000000	0.000E-01
1	E-1	0.000E-01	2.364E-39	-8.70790	0.717368	0.000E-01
330	H+1	0.000E-01	2.015E-07	-6.84000	0.717368	0.000E-01

Type I - COMPONENTS AS SPECIES IN SOLUTION

ID	NAME	CALC MOL	ACTIVITY	LOG ACTVTY	GAMMA	NEW LOGK
330	H+1	2.015E-07	1.445E-07	-6.84000	0.71737	0.144
140	CO3-2	6.544E-06	1.733E-06	-5.76116	0.26483	0.577
950	Zn+2	8.849E-08	2.343E-08	-7.63015	0.26483	0.577
490	NH4+1	3.472E-03	2.491E-03	-2.60365	0.71737	0.144
740	Sb(OH)3	1.277E-08	1.391E-08	-7.85670	1.08922	-0.037
90	H3BO3	1.317E-05	1.434E-05	-4.84342	1.08922	-0.037
150	Ca+2	5.242E-03	1.388E-03	-2.85751	0.26483	0.577
180	Cl-1	1.320E-02	9.472E-03	-2.02354	0.71737	0.144
270	F-1	2.706E-05	1.941E-05	-4.71191	0.71737	0.144
460	Mg+2	5.062E-02	1.341E-02	-1.87268	0.26483	0.577
470	Mn+2	6.052E-05	1.603E-05	-4.79513	0.26483	0.577

492	NO3-1	4.896E-02	3.512E-02	-1.45440	0.71737	0.144
410	K+1	2.516E-03	1.805E-03	-2.74348	0.71737	0.144
761	HSeO3-1	6.831E-06	4.900E-06	-5.30977	0.71737	0.144
770	H4SiO4	2.211E-04	2.408E-04	-3.61830	1.08922	-0.037
500	Na+1	1.340E-01	9.609E-02	-1.01731	0.71737	0.144
800	Sr+2	1.053E-04	2.790E-05	-4.55443	0.26483	0.577
732	SO4-2	7.260E-02	1.923E-02	-1.71612	0.26483	0.577
893	UO2+2	6.562E-12	1.738E-12	-11.75997	0.26483	0.577
902	VO+2	6.399E-07	1.695E-07	-6.77091	0.26483	0.577

Type II - OTHER SPECIES IN SOLUTION OR ADSORBED

ID	NAME	CALC MOL	ACTIVITY	LOG ACTVTY	GAMMA	NEW LOGK
9021800	VOCl +1	2.343E-09	1.681E-09	-8.77445	0.71737	0.164
3307611	SeO3-2	3.759E-07	9.956E-08	-7.00191	0.26483	-7.955
3307610	H2SeO3	2.479E-10	2.700E-10	-9.56862	1.08922	2.544
3300020	OH-	2.749E-08	1.972E-08	-7.70501	0.71737	-14.397
3307700	H3SiO4 -	1.145E-07	8.215E-08	-7.08538	0.71737	-10.163
3307701	H2SiO4 -2	5.675E-13	1.503E-13	-12.82310	0.26483	-22.308
7702700	SiF6 -2	1.524E-28	4.036E-29	-28.39406	0.26483	31.419
3300900	H2BO3 -1	5.896E-08	4.230E-08	-7.37368	0.71737	-9.226
902700	BF(OH)3 -	1.302E-10	9.339E-11	-10.02971	0.71737	-0.330
902701	BF2(OH)2 -	4.015E-14	2.880E-14	-13.54054	0.71737	7.708
902702	BF3OH -	1.671E-19	1.199E-19	-18.92116	0.71737	13.876
902703	BF4 -	1.951E-24	1.400E-24	-23.85400	0.71737	20.491
3304900	NH3 AQ	2.792E-06	3.041E-06	-5.51697	1.08922	-9.790
4907320	NH4SO4 -	8.600E-04	6.169E-04	-3.20977	0.71737	1.254
4603300	MgOH +	5.010E-08	3.594E-08	-7.44446	0.71737	-12.264
4602700	MgF +	1.546E-05	1.109E-05	-4.95502	0.71737	1.774
4601400	MgCO3 AQ	1.600E-05	1.742E-05	-4.75884	1.08922	2.838
4601401	MgHCO3 +	1.575E-03	1.130E-03	-2.94707	0.71737	11.671
4607320	MgSO4 AQ	3.691E-02	4.020E-02	-1.39580	1.08922	2.156
1503300	CaOH +	8.575E-10	6.152E-10	-9.21100	0.71737	-13.046
1501400	CaHCO3 +	9.760E-05	7.001E-05	-4.15482	0.71737	11.448
1501401	CaCO3 AQ	2.409E-06	2.624E-06	-5.58100	1.08922	3.001
1507320	CaSO4 AQ	4.349E-03	4.737E-03	-2.32452	1.08922	2.212
1502700	CaF +	2.291E-07	1.644E-07	-6.78416	0.71737	0.930
5001400	NaCO3 -	1.865E-06	1.338E-06	-5.87353	0.71737	1.049
5001401	NaHCO3 AQ	2.657E-04	2.894E-04	-3.53848	1.08922	10.043
5007320	NaSO4 -	1.162E-02	8.336E-03	-2.07907	0.71737	0.799
5002700	NaF AQ	2.778E-07	3.025E-07	-6.51923	1.08922	-0.827
4107320	KSO4 -	2.546E-04	1.827E-04	-3.73836	0.71737	0.865
8003300	SrOH +	4.550E-12	3.264E-12	-11.48629	0.71737	-13.624
4701800	MnCl +	8.562E-07	6.142E-07	-6.21167	0.71737	0.751
4701801	MnCl2 AQ	1.451E-09	1.580E-09	-8.80122	1.08922	0.004
4701802	MnCl3 -	9.408E-12	6.749E-12	-11.17076	0.71737	-0.161
4703300	MnOH +	1.021E-09	7.327E-10	-9.13509	0.71737	-11.032
4703301	Mn(OH)3 -1	1.146E-19	8.221E-20	-19.08508	0.71737	-34.656
4700020	MnO4 -	3.763E-42	2.700E-42	-41.56868	0.71737	-134.876
4700021	MnO4 -2	5.864E-40	1.553E-40	-39.80886	0.26483	-123.975
4702700	MnF +	3.071E-09	2.203E-09	-8.65705	0.71737	0.994
4707320	MnSO4 AQ	4.200E-05	4.574E-05	-4.33966	1.08922	2.134
4704920	Mn(NO3)2AQ	7.501E-08	8.170E-08	-7.08779	1.08922	0.579
4701400	MnHCO3 +	2.228E-06	1.598E-06	-5.79629	0.71737	11.744
9501800	ZnCl +	4.010E-10	2.877E-10	-9.54107	0.71737	0.257
9501801	ZnCl2 AQ	2.451E-12	2.670E-12	-11.57354	1.08922	0.067
9501802	ZnCl3 -	3.581E-14	2.569E-14	-13.59027	0.71737	0.255
9501803	ZnCl4 -2	4.029E-16	1.067E-16	-15.97185	0.26483	0.330
9502700	ZnF +	7.273E-12	5.218E-12	-11.28251	0.71737	1.204
9503300	ZnOH +	6.997E-11	5.019E-11	-10.29937	0.71737	-9.362
9503301	Zn(OH)2 AQ	1.280E-11	1.394E-11	-10.85579	1.08922	-16.936
9503302	Zn(OH)3 -	4.218E-16	3.026E-16	-15.51911	0.71737	-28.255
9503303	Zn(OH)4 -2	1.243E-21	3.293E-22	-21.48242	0.26483	-40.622
9501804	ZnOHCl AQ	4.633E-11	5.046E-11	-10.29701	1.08922	-7.517
9507320	ZnSO4 AQ	8.535E-08	9.296E-08	-7.03168	1.08922	2.277
9507321	Zn(SO4)2-2	6.232E-08	1.650E-08	-7.78239	0.26483	3.857
9501400	ZnHCO3 +	2.056E-08	1.475E-08	-7.83132	0.71737	12.544
9501401	ZnCO3 AQ	7.440E-09	8.104E-09	-8.09132	1.08922	5.263
9501402	Zn(CO3)2-2	1.134E-09	3.003E-10	-9.52248	0.26483	10.207
7400021	HSbO2	1.267E-08	1.380E-08	-7.86007	1.08922	-0.044
7402700	SbOF (aq)	5.589E-14	6.087E-14	-13.21558	1.08922	6.149
7402702	Sb(OH)2F aq	5.640E-14	6.143E-14	-13.21160	1.08922	6.157
7403300	SbO+	1.980E-14	1.421E-14	-13.84753	0.71737	0.987

7403301	SbO2-	4.429E-14	3.177E-14	-13.49792	0.71737	-12.340
7403302	Sb(OH)2+	6.858E-14	4.919E-14	-13.30808	0.71737	1.530
400020	Sb(OH)4-1	2.519E-14	1.807E-14	-13.74310	0.71737	-12.579
3301400	HCO3 -	1.097E-02	7.870E-03	-2.10404	0.71737	10.641
3301401	H2CO3 AQ	1.969E-03	2.145E-03	-2.66862	1.08922	16.735
3307320	HSO4 -	2.461E-07	1.765E-07	-6.75313	0.71737	1.947
3302700	HF AQ	2.748E-09	2.993E-09	-8.52388	1.08922	2.991
3302701	HF2 -	2.780E-13	1.994E-13	-12.70020	0.71737	3.708
3302702	H2F2 AQ	4.237E-17	4.615E-17	-16.33583	1.08922	6.731
8933300	UO2OH +1	5.185E-11	3.720E-11	-10.42950	0.71737	-5.362
8933301	UO2}2OH2+2	4.663E-16	1.235E-16	-15.90836	0.26483	-5.485
8933302	UO2}3OH5+1	2.711E-18	1.945E-18	-17.71109	0.71737	-16.470
8931400	UO2CO3 AQ	3.359E-08	3.659E-08	-7.43668	1.08922	10.047
8931401	UO2CO3}2-2	1.401E-06	3.710E-07	-6.43068	0.26483	17.429
8931402	UO2CO3}3-4	1.015E-05	4.992E-08	-7.30174	0.00492	24.050
8932700	UO2F +1	6.248E-12	4.482E-12	-11.34855	0.71737	5.268
8932701	UO2F2 AQ	5.442E-13	5.927E-13	-12.22713	1.08922	8.920
8932702	UO2F3 -1	4.438E-15	3.184E-15	-14.49708	0.71737	11.543
8932703	UO2F4 -2	4.180E-18	1.107E-18	-17.95581	0.26483	13.229
8931800	UO2Cl +1	3.392E-14	2.434E-14	-13.61375	0.71737	0.314
8937320	UO2SO4 AQ	1.101E-11	1.199E-11	-10.92104	1.08922	2.518
8937321	UO2SO4}2-2	2.415E-11	6.397E-12	-11.19404	0.26483	4.575
8937700	UO2H3SiO4	1.607E-11	1.153E-11	-10.93827	0.71737	-2.256
9023300	V(OH)3 +1	3.441E-06	2.469E-06	-5.60754	0.71737	-5.526
9023301	H2V2O4 +2	1.856E-06	4.915E-07	-6.30845	0.26483	-5.863
9022700	VOF +	8.395E-09	6.022E-09	-8.22023	0.71737	3.407
9022701	VOF2 AQ	2.320E-11	2.527E-11	-10.59733	1.08922	5.560
9022702	VOF3 -1	2.178E-14	1.562E-14	-13.80628	0.71737	7.245
9022703	VOF4 -2	6.423E-18	1.701E-18	-17.76931	0.26483	8.426
9027320	VOSO4 AQ	5.947E-07	6.478E-07	-6.18859	1.08922	2.261

Type III - SPECIES WITH FIXED ACTIVITY

ID	NAME	CALC MOL	LOG MOL	NEW LOGK	DH
2	H2O	-1.066E-05	-4.972	0.003	0.000
1	E-1	2.364E-39	-38.626	8.708	0.000
330	H+1	-1.684E-02	-1.774	6.840	0.000

Type VI - EXCLUDED SPECIES (not included in mole balance)

ID	NAME	CALC MOL	LOG MOL	NEW LOGK	DH
4904920	NH4/NO3	6.222E-11	-10.206	126.698	-187.055
3301404	CH4 (g)	0.000E-01	-101.229	42.585	-61.000
3301403	CO2 (g)	5.543E-02	-1.256	18.182	-0.530
3300021	O2 (g)	4.097E-27	-26.387	-88.572	133.830

PERCENTAGE DISTRIBUTION OF COMPONENTS AMONG
TYPE I and TYPE II (dissolved and adsorbed) species

VO+2	7.6	PERCENT BOUND IN SPECIES #	902	VO+2
	41.0	PERCENT BOUND IN SPECIES #	9023300	V(OH)3 +1
	44.2	PERCENT BOUND IN SPECIES #	9023301	H2V2O4 +2
	7.1	PERCENT BOUND IN SPECIES #	9027320	VOSO4 AQ
CO3-2	10.5	PERCENT BOUND IN SPECIES #	4601401	MgHCO3 +
	1.8	PERCENT BOUND IN SPECIES #	5001401	NaHCO3 AQ
	73.4	PERCENT BOUND IN SPECIES #	3301400	HCO3 -
	13.2	PERCENT BOUND IN SPECIES #	3301401	H2CO3 AQ
Zn+2	33.3	PERCENT BOUND IN SPECIES #	950	Zn+2
	32.1	PERCENT BOUND IN SPECIES #	9507320	ZnSO4 AQ
	23.4	PERCENT BOUND IN SPECIES #	9507321	Zn(SO4)2-2
	7.7	PERCENT BOUND IN SPECIES #	9501400	ZnHCO3 +
	2.8	PERCENT BOUND IN SPECIES #	9501401	ZnCO3 AQ
NH4+1	80.1	PERCENT BOUND IN SPECIES #	490	NH4+1
	19.8	PERCENT BOUND IN SPECIES #	4907320	NH4SO4 -
Sb(OH)3	50.2	PERCENT BOUND IN SPECIES #	740	Sb(OH)3
	49.8	PERCENT BOUND IN SPECIES #	7400021	HSbO2
H3BO3	99.6	PERCENT BOUND IN SPECIES #	90	H3BO3
Ca+2	54.1	PERCENT BOUND IN SPECIES #	150	Ca+2
	1.0	PERCENT BOUND IN SPECIES #	1501400	CaHCO3 +
	44.9	PERCENT BOUND IN SPECIES #	1507320	CaSO4 AQ
Cl-1	100.0	PERCENT BOUND IN SPECIES #	180	Cl-1
F-1	62.9	PERCENT BOUND IN SPECIES #	270	F-1

	35.9	PERCENT BOUND IN SPECIES #4602700	MgF +
Mg+2	56.8	PERCENT BOUND IN SPECIES # 460	Mg+2
	1.8	PERCENT BOUND IN SPECIES #4601401	MgHCO3 +
	41.4	PERCENT BOUND IN SPECIES #4607320	MgSO4 AQ
Mn+2	57.3	PERCENT BOUND IN SPECIES # 470	Mn+2
	39.7	PERCENT BOUND IN SPECIES #4707320	MnSO4 AQ
	2.1	PERCENT BOUND IN SPECIES #4701400	MnHCO3 +
NO3-1	100.0	PERCENT BOUND IN SPECIES # 492	NO3-1
K+1	90.8	PERCENT BOUND IN SPECIES # 410	K+1
	9.2	PERCENT BOUND IN SPECIES #4107320	KSO4 -
HSeO3-1	94.8	PERCENT BOUND IN SPECIES # 761	HSeO3-1
	5.2	PERCENT BOUND IN SPECIES #3307611	SeO3-2
H4SiO4	99.9	PERCENT BOUND IN SPECIES # 770	H4SiO4
Na+1	91.8	PERCENT BOUND IN SPECIES # 500	Na+1
	8.0	PERCENT BOUND IN SPECIES #5007320	NaSO4 -
Sr+2	100.0	PERCENT BOUND IN SPECIES # 800	Sr+2
SO4-2	57.3	PERCENT BOUND IN SPECIES # 732	SO4-2
	29.1	PERCENT BOUND IN SPECIES #4607320	MgSO4 AQ
	3.4	PERCENT BOUND IN SPECIES #1507320	CaSO4 AQ
	9.2	PERCENT BOUND IN SPECIES #5007320	NaSO4 -
UO2+2	12.1	PERCENT BOUND IN SPECIES #8931401	UO2CO3}2-2
	87.6	PERCENT BOUND IN SPECIES #8931402	UO2CO3}3-4
H2O	64.6	PERCENT BOUND IN SPECIES #9023300	V(OH)3 +1
	34.8	PERCENT BOUND IN SPECIES #9023301	H2V2O4 +2
F-1	99.2	PERCENT BOUND IN SPECIES #4700021	MnO4 -2

H+1

9.4	PERCENT BOUND IN SPECIES #4601401	MgHCO3 +
1.6	PERCENT BOUND IN SPECIES #5001401	NaHCO3 AQ
65.1	PERCENT BOUND IN SPECIES #3301400	HCO3 -
23.4	PERCENT BOUND IN SPECIES #3301401	H2CO3 AQ

PART 5 of OUTPUT FILE

PC MINTEQA2 v3.10 DATE OF CALCULATIONS: 7-JUL-93 TIME: 10:54:53

EQUILIBRATED MASS DISTRIBUTION -----

IDX	NAME	DISSOLVED		SORBED		PRECIPITATED	
		MOL/KG	PERCENT	MOL/KG	PERCENT	MOL/KG	PERCENT
902	VO+2	8.399E-06	100.0	0.000E-01	0.0	0.000E-01	0.0
140	CO3-2	1.494E-02	100.0	0.000E-01	0.0	0.000E-01	0.0
950	Zn+2	2.658E-07	100.0	0.000E-01	0.0	0.000E-01	0.0
490	NH4+1	4.335E-03	100.0	0.000E-01	0.0	0.000E-01	0.0
740	Sb(OH)3	2.544E-08	100.0	0.000E-01	0.0	0.000E-01	0.0
90	H3BO3	1.323E-05	100.0	0.000E-01	0.0	0.000E-01	0.0
150	Ca+2	9.691E-03	100.0	0.000E-01	0.0	0.000E-01	0.0
180	Cl-1	1.321E-02	100.0	0.000E-01	0.0	0.000E-01	0.0
270	F-1	4.304E-05	100.0	0.000E-01	0.0	0.000E-01	0.0
460	Mg+2	8.913E-02	100.0	0.000E-01	0.0	0.000E-01	0.0
470	Mn+2	1.057E-04	100.0	0.000E-01	0.0	0.000E-01	0.0
492	NO3-1	4.896E-02	100.0	0.000E-01	0.0	0.000E-01	0.0
410	K+1	2.771E-03	100.0	0.000E-01	0.0	0.000E-01	0.0
761	HSeO3-1	7.207E-06	100.0	0.000E-01	0.0	0.000E-01	0.0
770	H4SiO4	2.212E-04	100.0	0.000E-01	0.0	0.000E-01	0.0
500	Na+1	1.458E-01	100.0	0.000E-01	0.0	0.000E-01	0.0
800	Sr+2	1.053E-04	100.0	0.000E-01	0.0	0.000E-01	0.0
732	SO4-2	1.266E-01	100.0	0.000E-01	0.0	0.000E-01	0.0
893	UO2+2	1.158E-05	100.0	0.000E-01	0.0	0.000E-01	0.0
2	H2O	1.066E-05	100.0	0.000E-01	0.0	0.000E-01	0.0
1	E-1	-2.364E-39	100.0	0.000E-01	0.0	0.000E-01	0.0
30	H+1	1.684E-02	100.0	0.000E-01	0.0	0.000E-01	0.0

Charge Balance: SPECIATED

Sum of CATIONS = 2.537E-01 Sum of ANIONS 2.312E-01

PERCENT DIFFERENCE = 4.650E+00 (ANIONS - CATIONS)/(ANIONS + CATIONS)

NON-CARBONATE ALKALINITY = -1.731E-07

EQUILIBRIUM IONIC STRENGTH (m) = 3.711E-01

EQUILIBRIUM pH = 6.840

EQUILIBRIUM pe = 8.708 or Eh = 488.00 mv

DATE ID NUMBER: 930707

TIME ID NUMBER: 10545358

PART 6 of OUTPUT FILE

PC MINTEQA2 v3.10 DATE OF CALCULATIONS: 7-JUL-93 TIME: 10:54:53

Saturation indices and stoichiometry of all minerals

ID #	NAME	Sat. Index	Stoichiometry in [brackets]					
2089300	UO3 (C)	-6.589	[-2.000]	330	[1.000]	893	[1.000]	2
2089301	GUMMITE	-9.424	[-2.000]	330	[1.000]	893	[1.000]	2
2089302	B-UO2(OH)2	-4.190	[-2.000]	330	[1.000]	893	[2.000]	2
2089303	SCHOEPITE	-3.985	[-2.000]	330	[1.000]	893	[3.000]	2
5089300	RUTHERFORDIN	-3.074	[1.000]	893	[1.000]	140		
8015000	URANOPHANE	-10.064	[-6.000]	330	[2.000]	893	[1.000]	150
			[2.000]	770				
5189300	UO2NO3)2	-27.858	[1.000]	893	[2.000]	492		
5189301	UO2NO3.2H2O	-19.773	[1.000]	893	[2.000]	492	[2.000]	2
5189302	UO2NO3.3H2O	-18.419	[1.000]	893	[2.000]	492	[3.000]	2
5189303	UO2NO3.6H2O	-16.794	[1.000]	893	[2.000]	492	[6.000]	2
6015000	ANHYDRITE	-0.090	[1.000]	150	[1.000]	732		
5015000	ARAGONITE	-0.413	[1.000]	150	[1.000]	140		
5046000	ARTINITE	-6.614	[-2.000]	330	[2.000]	460	[1.000]	140
			[5.000]	2				
2046000	BRUCITE	-6.044	[1.000]	460	[2.000]	2	[-2.000]	330
5015001	CALCITE	-0.214	[1.000]	150	[1.000]	140		
6080000	CELESTITE	0.175	[1.000]	800	[1.000]	732		
2077000	CHALCEDONY	0.099	[-2.000]	2	[1.000]	770		
8646000	CHRYSOPILE	-6.144	[-6.000]	330	[3.000]	460	[2.000]	770
			[1.000]	2				
8246000	CLINOENSTITE	-3.961	[-1.000]	2	[1.000]	460	[1.000]	770
			[-2.000]	330				
2077001	CRISTOBALITE	0.199	[-2.000]	2	[1.000]	770		
8215000	DIOPSIDE	-5.801	[-2.000]	2	[1.000]	150	[1.000]	460
			[2.000]	770	[-4.000]	330		
5015002	DOLOMITE	0.410	[1.000]	150	[1.000]	460	[2.000]	140
6046000	EPSOMITE	-1.357	[1.000]	460	[1.000]	732	[7.000]	2
8646003	SEPIOLITE (C)	-4.263	[-0.500]	2	[2.000]	460	[3.000]	770
			[-4.000]	330				
4215000	FLUORITE	-1.125	[1.000]	150	[2.000]	270		
8046000	FORSTERITE	-10.278	[-4.000]	330	[2.000]	460	[1.000]	770
6015001	GYPSUM	0.278	[1.000]	150	[1.000]	732	[2.000]	2
4150000	HALITE	-4.585	[1.000]	500	[1.000]	180		
5015003	HUNTITE	-2.602	[3.000]	460	[1.000]	150	[4.000]	140
5046001	HYDRMAGNESIT	-12.109	[5.000]	460	[4.000]	140	[-2.000]	330
			[6.000]	2				
8450000	MAGADIITE	-5.176	[-1.000]	330	[-9.000]	2	[1.000]	500
			[7.000]	770				
5046002	MAGNESITE	0.144	[1.000]	460	[1.000]	140		
6050001	MIRABILITE	-1.896	[2.000]	500	[1.000]	732	[7.780]	2
3050000	NATRON	-5.876	[2.000]	500	[1.000]	140	[7.780]	2
5046003	NESQUEHONITE	-2.259	[1.000]	460	[1.000]	140	[3.000]	2

ID #	NAME	Sat. Index	Stoichiometry in [brackets]					
2077002	QUARTZ	0.648	[-2.000]	2	[1.000]	770		
8646004	SEPIOLITE (A)	-6.019	[-0.500]	2	[2.000]	460	[3.000]	770
			[-4.000]	330				
2077003	SIO2 (A, GL)	-0.413	[-2.000]	2	[1.000]	770		
2077004	SIO2 (A, PT)	-0.742	[-2.000]	2	[1.000]	770		
4280000	SRF2	-5.387	[1.000]	800	[2.000]	270		
5080000	STRONTIANITE	-1.094	[1.000]	800	[1.000]	140		
8646002	TALC	-3.519	[-4.000]	2	[3.000]	460	[4.000]	770
			[-6.000]	330				
6050002	THENARDITE	-3.595	[2.000]	500	[1.000]	732		
5050001	THERMONATR	-8.038	[2.000]	500	[1.000]	140	[1.000]	2
8215001	TREMOLITE	-8.721	[-8.000]	2	[2.000]	150	[5.000]	460
			[8.000]	770	[-14.000]	330		
3047000	HAUSMANNITE	-7.068	[-8.000]	330	[-2.000]	1	[3.000]	470
			[4.000]	2				
2047003	PYROCROITE	-7.130	[-2.000]	330	[1.000]	470	[2.000]	2
5047000	RHODOCHROSIT	-0.231	[1.000]	470	[1.000]	140		
4147000	MNCL2, 4H2O	-10.857	[1.000]	470	[2.000]	180	[4.000]	2
6047000	MNSO4	-9.811	[1.000]	470	[1.000]	732		
95000	ZN METAL	-52.301	[1.000]	950	[2.000]	1		
4195000	ZNCL2	-19.419	[1.000]	950	[2.000]	180		
5095000	SMITHSONITE	-3.569	[1.000]	950	[1.000]	140		
5095001	ZNCO3, 1H2O	-3.135	[1.000]	950	[1.000]	140	[1.000]	2
4295000	ZNF2	-16.067	[1.000]	950	[2.000]	270		
2095000	ZN(OH)2 (A)	-6.407	[-2.000]	330	[1.000]	950	[2.000]	2
2095001	ZN(OH)2 (C)	-6.157	[-2.000]	330	[1.000]	950	[2.000]	2
2095002	ZN(OH)2 (B)	-5.707	[-2.000]	330	[1.000]	950	[2.000]	2
2095003	ZN(OH)2 (G)	-5.667	[-2.000]	330	[1.000]	950	[2.000]	2
2095004	ZN(OH)2 (E)	-5.457	[-2.000]	330	[1.000]	950	[2.000]	2
4195001	ZN2(OH)3CL	-11.974	[-3.000]	330	[2.000]	950	[3.000]	2
			[1.000]	180				
4195002	ZN5(OH)8CL2	-26.004	[-8.000]	330	[5.000]	950	[8.000]	2
			[2.000]	180				
6095000	ZN2(OH)2SO4	-10.803	[-2.000]	330	[2.000]	950	[2.000]	2
			[1.000]	732				
6095001	ZN4(OH)6SO4	-19.617	[-6.000]	330	[4.000]	950	[6.000]	2
			[1.000]	732				
5195000	ZNNO3)2, 6H2O	-13.774	[1.000]	950	[2.000]	492	[6.000]	2
2095005	ZNO(ACTIVE)	-5.263	[-2.000]	330	[1.000]	950	[1.000]	2
2095006	ZINCITE	-5.984	[-2.000]	330	[1.000]	950	[1.000]	2
6095002	ZN3O(SO4)2	-34.192	[-2.000]	330	[3.000]	950	[2.000]	732
			[1.000]	2				
8295000	ZNSIO3	-1.239	[-2.000]	330	[-1.000]	2	[1.000]	950
			[1.000]	770				
8095000	WILLEMITE	-8.208	[-4.000]	330	[2.000]	950	[1.000]	770
6095003	ZINCOSITE	-13.139	[1.000]	950	[1.000]	732		
6095004	ZNSO4, 1H2O	-9.213	[1.000]	950	[1.000]	732	[1.000]	2
6095005	BIANCHITE	-7.608	[1.000]	950	[1.000]	732	[6.000]	2
6095006	GOSLARITE	-7.275	[1.000]	950	[1.000]	732	[7.000]	2
74001	Sb	-41.968	[1.000]	740	[3.000]	330	[3.000]	1
			[-3.000]	2				

ID #	NAME	Sat. Index	Stoichiometry in {brackets}					
1474002	ZnSb	-91.085	[1.000]	740	[5.000]	1	[1.000]	950
			[3.000]	330	[-3.000]	2		
1474005	Mg2Sb3	-276.732	[2.000]	460	[3.000]	740	[9.000]	330
			[13.000]	1	[-9.000]	2		
1474007	Na3Sb	-182.281	[3.000]	500	[1.000]	740	[3.000]	330
			[6.000]	1	[-3.000]	2		
1474008	NaSb	-88.305	[1.000]	500	[1.000]	740	[3.000]	330
			[4.000]	1	[-3.000]	2		
1474009	Mn2Sb	-159.992	[2.000]	470	[1.000]	740	[7.000]	1
			[3.000]	330	[-3.000]	2		
1474010	Ca3Sb2	-319.910	[3.000]	150	[2.000]	740	[6.000]	330
			[12.000]	1	[-6.000]	2		
1474011	USb2	-230.872	[1.000]	893	[2.000]	740	[12.000]	1
			[7.780]	330	[-8.000]	2		
2074001	Sb2O4	11.266	[2.000]	740	[-2.000]	2	[-2.000]	330
			[-2.000]	1				
2074002	Sb4O6 II, CUB	-11.153	[4.000]	740	[-6.000]	2		
2074003	Sb4O6 I, ORTH	-14.006	[4.000]	740	[-6.000]	2		
2074004	Sb(OH)3 (s)	-0.453	[1.000]	740				
2074006	Sb2O3 SENARM	-3.040	[2.000]	740	[-3.000]	2		
2074007	Sb2O3 VALENT	-7.038	[2.000]	740	[-3.000]	2		
4174000	SbCl3	-35.372	[1.000]	740	[3.000]	180	[3.000]	330
			[-3.000]	2				
4274000	SbF3	-32.343	[1.000]	740	[3.000]	330	[3.000]	270
			[-3.000]	2				
5295000	Zn(BO2)2	-11.920	[-2.000]	2	[-2.000]	330	[1.000]	950
			[2.000]	90				
3090200	V2O4	2.063	[-2.000]	330	[1.000]	902	[1.000]	2
2090200	VO(OH)2	1.052	[-2.000]	330	[1.000]	902	[2.000]	2
4290200	VF4	-56.164	[-1.000]	2	[1.000]	902	[4.000]	270
			[2.000]	330				
6090200	VOSO4 (C)	-12.901	[1.000]	902	[1.000]	732		
4190200	VOCL2	-24.757	[1.000]	902	[2.000]	180		
3090101	V3O5	-13.204	[-4.000]	330	[3.000]	902	[2.000]	2
			[2.000]	1				
3090201	V4O7	-12.204	[-6.000]	330	[4.000]	902	[3.000]	2
			[2.000]	1				
2015000	LIME	-23.863	[-2.000]	330	[1.000]	150	[1.000]	2
2015001	PORTLANDITE	-13.110	[-2.000]	330	[1.000]	150	[2.000]	2
2046001	PERICLASE	-11.178	[-2.000]	330	[1.000]	460	[1.000]	2
8215002	WOLLASTONITE	-6.583	[-1.000]	2	[-2.000]	330	[1.000]	770
			[1.000]	150				
8215003	P-WOLLSTANIT	-7.497	[-1.000]	2	[-2.000]	330	[1.000]	770
			[1.000]	150				
8015001	CA-OLIVINE	-21.851	[-4.000]	330	[1.000]	770	[2.000]	150
8015002	LARNITE	-23.446	[-4.000]	330	[1.000]	770	[2.000]	150
8015007	CA3SIO5	-49.353	[-6.000]	330	[1.000]	770	[3.000]	150
			[1.000]	2				
8015003	MONTICELLITE	-13.274	[-4.000]	330	[1.000]	770	[1.000]	150
			[1.000]	460				
8015005	AKERMINITE	-24.367	[-1.000]	2	[-6.000]	330	[2.000]	770
			[2.000]	150	[1.000]	460		

ID #	NAME	Sat. Index	Stoichiometry in [brackets]					
8015004	MERWINITE	-35.869	[-8.000]	330	[2.000]	770	[1.000]	460
			[3.000]	150				
2076100	SeO2	-12.257	[1.000]	761	[1.000]	330	[-1.000]	2
6115000	CaSeO3:2H2O	-4.337	[1.000]	761	[1.000]	150	[2.000]	2
			[-1.000]	330				
6146000	MgSeO3:6H2O	-4.343	[1.000]	761	[1.000]	460	[6.000]	2
			[-1.000]	330				
6147001	MnSeO3:2H2O	-4.171	[1.000]	761	[1.000]	470	[2.000]	2
			[-1.000]	330				
6180000	SrSeO3	-3.128	[1.000]	761	[1.000]	800	[-1.000]	330
6147000	MnSeO3	-4.475	[1.000]	761	[1.000]	470	[-1.000]	330

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0614
 NORTH COORDINATE: 9189.4 FT
 EAST COORDINATE: 11058.0 FT
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: DOWN GRADIENT (D)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
NITRATE	05/14/91	0001	MG/L		611.		1.	-
	09/17/92	0001			2800	J	0.044	-
NITRITE	09/18/87	0001	MG/L	<	0.1		0.1	-
NITRITE AND NITRATE	10/11/88	0001	MG/L		250.		1.	-
PH	09/18/87	0001	SU		6.89		-	-
	10/11/88	0001			6.85		-	-
	04/03/89	0001			7.04		-	-
	06/01/90	0001			6.91		-	-
	10/07/90	0001			6.76		-	-
	05/14/91	0001			6.85		-	-
	09/17/92	0001			6.75		-	-
	02/21/93	0001			6.94		-	-
PHOSPHATE	09/18/87	0001	MG/L		0.81	H	0.1	-
	10/11/88	0001		<	0.1		0.1	-
	04/03/89	0001		<	0.1		0.1	-
	06/01/90	0001		<	0.1	J	0.1	-
	10/07/90	0001			0.1		0.1	-
	05/14/91	0001			0.2		0.1	-
POLONIUM-210	09/18/87	0001	PCI/L		0.6		1.	0.6
	04/03/89	0001			0.7		1.	0.4
POTASSIUM	09/18/87	0001	MG/L		77.5	J	0.01	-
	10/11/88	0001			933.		0.01	-
	04/03/89	0001			69.9		0.01	-
	06/01/90	0001			82.8		0.01	-
	10/07/90	0001			79.		0.01	-
	05/14/91	0001			76.		5.	-
	09/17/92	0001			100	E	0.20	-
	02/21/93	0001			90.1		0.1	-
POTASSIUM (TOTAL)	02/21/93	N001	MG/L		88.9		0.1	-
RADIUM-226	09/18/87	0001	PCI/L		0.1		1.	0.1
	10/11/88	0001			0.1		1.	0.1
	04/03/89	0001			0.0		1.	0.1
	06/01/90	0001			0.3		1.	0.2
	10/07/90	0001			0.2		1.	0.2
	05/14/91	0001			0.5		1.	0.4
	09/17/92	0001			0.12		.0603	.0501
	02/21/93	0001			3.0		0.7	0.9
RADIUM-226 (TOTAL)	02/21/93	N001	PCI/L		1.7		0.7	0.7
RADIUM-228	09/18/87	0001	PCI/L		1.1		1.	1.2
	10/11/88	0001			1.1		1.	0.8
	04/03/89	0001			0.2		1.	0.9
	06/01/90	0001			1.2		1.	0.8
	10/07/90	0001			0.0		1.	2.8
	05/14/91	0001			2.6	J	1.	2.7

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)
 N001 - UNFILTERED SAMPLE

OTHER PARAMETER VALUE FLAGS:
 E - ESTIMATED VALUE BECAUSE OF INTERFERENCE, SEE CASE NARRATIVE
 H - HOLD TIME EXPIRED, VALUE SUSPECT
 J - ESTIMATED VALUE

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0614
 NORTH COORDINATE: 9189.4 FT
 EAST COORDINATE: 11058.0 FT
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: DOWN GRADIENT (D)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
RADIUM-228	09/17/92	0001	PCI/L		2.3		1.56	.884
	02/21/93	0001			3.2		3.6	2.4
REDOX POTENTIAL	02/21/93	0001	mVOLTS		463.7		-	-
SELENIUM	09/18/87	0001	MG/L		0.173		0.005	-
	10/11/88	0001			0.430		0.005	-
	04/03/89	0001			0.174	N	0.005	-
	06/01/90	0001			0.056		0.005	-
	10/07/90	0001			0.110		0.005	-
	05/14/91	0001			0.5750	W	0.005	-
	09/17/92	0001			0.21	*EN	0.0015	-
	02/21/93	0001			0.274	*+	0.005	-
SELENIUM (TOTAL)	02/21/93	N001	MG/L		0.281	S	0.005	-
SILICA - SiO2	09/18/87	0001	MG/L		15.6		2.	-
	04/03/89	0001			11.		2.	-
	06/01/90	0001			13.		2.	-
	10/07/90	0001			7.3		0.1	-
	05/14/91	0001			13.2		0.1	-
SILVER	10/11/88	0001	MG/L		0.03		0.01	-
	04/03/89	0001		<	0.01		0.01	-
	06/01/90	0001		<	0.01		0.01	-
	10/07/90	0001		<	0.01		0.01	-
	05/14/91	0001		<	0.01		0.01	-
SODIUM	09/18/87	0001	MG/L		1110.		0.002	-
	10/11/88	0001			1330.		0.002	-
	04/03/89	0001			1090.		0.002	-
	06/01/90	0001			1360.		0.002	-
	10/07/90	0001			1660.		0.002	-
	05/14/91	0001			1770.		20.	-
	09/17/92	0001			2300		0.011	-
	02/21/93	0001			2030		1	-
SODIUM (TOTAL)	02/21/93	N001	MG/L		1980		1	-
SPECIFIC CONDUCTANCE	09/18/87	0001	UMHO/CM		4275.		-	-
	10/11/88	0001			8500.		-	-
	04/03/89	0001			6100.		-	-
	06/01/90	0001			7500.		-	-
	10/07/90	0001			11000.		-	-
	05/14/91	0001			12880.		-	-
	09/17/92	0001			14280		-	-
	02/21/93	0001			10800		-	-
STRONTIUM	09/18/87	0001	MG/L		8.50		0.1	-
	10/11/88	0001			8.1		0.1	-
	04/03/89	0001			7.5		0.1	-
	06/01/90	0001			7.83		0.1	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:

0001 - FILTERED SAMPLE (.45 MICRONS)
 N001 - UNFILTERED SAMPLE

OTHER PARAMETER VALUE FLAGS:

* - DUPLICATE ANALYSIS NOT WITHIN CONTROL LIMITS
 + - CORRELATION COEFFICIENT FOR MSA < 0.995
 E - ESTIMATED VALUE BECAUSE OF INTERFERENCE, SEE CASE NARRATIVE
 N - SPIKE SAMPLE RECOVERY NOT WITHIN CONTROL LIMITS
 S - REPORTED VALUE DETERMINED USING METHOD OF STD ADDITION (MSA)
 W - POST-DIGEST SPIKE OUT OF CNTR LIM WHILE SAMP ABS < 50% SPIKE

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0614
 NORTH COORDINATE: 9189.4 FT
 EAST COORDINATE: 11058.0 FT
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: DOWN GRADIENT (D)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
STRONTIUM	10/07/90	0001	MG/L		9.1		0.01	-
	05/14/91	0001		8.67		0.01	-	
	09/17/92	0001		8.9	N	0.010	-	
	02/21/93	0001		8.97		0.01	-	
STRONTIUM (TOTAL)	02/21/93	N001	MG/L		7.94		0.01	-
SULFATE	09/18/87	0001	MG/L		6690.		0.1	-
	10/11/88	0001		7230.		0.1	-	
	04/03/89	0001		6630.	H	0.1	-	
	06/01/90	0001		7500.	HJ	0.1	-	
	10/07/90	0001		8620.		0.1	-	
	05/14/91	0001		8880.		10.	-	
	09/17/92	0001		10000	N	10.0	-	
SULFATE (TOTAL)	02/21/93	N001	MG/L		10300		1	-
SULFIDE	09/18/87	0001	MG/L	<	0.1		0.1	-
	04/03/89	0001		<	0.1		0.1	-
TEMPERATURE	09/18/87	0001	C - DEGREE		21.0		-	-
	10/11/88	0001		20.0		-	-	
	04/03/89	0001		11.		-	-	
	06/01/90	0001		15.0		-	-	
	10/07/90	0001		21.2		-	-	
	05/14/91	0001		12.8		-	-	
	09/17/92	0001		20.5		-	-	
	02/21/93	0001		9.4		-	-	
THALLIUM	04/03/89	0001	MG/L		0.01		0.01	-
	06/01/90	0001		<	0.01		0.01	-
	10/07/90	0001		<	0.05	I	0.05	-
	05/14/91	0001		<	0.05	I	0.05	-
THORIUM-230	09/18/87	0001	PCI/L		0.4		1.	0.9
	10/11/88	0001		0.5		1.	0.7	
	04/03/89	0001		0.3		1.	0.5	
TIN	09/18/87	0001	MG/L		0.049		0.005	-
	04/03/89	0001		0.024		0.005	-	
	06/01/90	0001		<	0.005		0.005	-
	10/07/90	0001		<	0.05	I	0.05	-
	05/14/91	0001		<	0.025	I	0.025	-
TOTAL DISSOLVED SOLIDS	09/18/87	0001	MG/L		11200.		10.	-
	10/11/88	0001		12300.		10.	-	
	04/03/89	0001		12100.	HJ	10.	-	
	06/01/90	0001		12100.		10.	-	
	10/07/90	0001		14300.	H	10.	-	
	05/14/91	0001		14900.		10.	-	
	09/17/92	0001		18000	H	10.0	-	
TOTAL DISSOLVED SOLIDS (TOTAL)	02/21/93	N001	MG/L		18200		10	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)
 N001 - UNFILTERED SAMPLE

OTHER PARAMETER VALUE FLAGS:
 H - HOLD TIME EXPIRED, VALUE SUSPECT
 I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION
 J - ESTIMATED VALUE
 N - SPIKE SAMPLE RECOVERY NOT WITHIN CONTROL LIMITS

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0614
 NORTH COORDINATE: 9189.4 FT
 EAST COORDINATE: 11058.0 FT
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: DOWN GRADIENT (D)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
TOTAL ORGANIC CARBON	09/18/87	0001	MG/L		130.		1.	-
	04/03/89	0001			94.1		1.	-
URANIUM	09/18/87	0001	MG/L		0.830		0.003	-
	10/11/88	0001			1.24		0.003	-
	04/03/89	0001			1.30		0.003	-
	06/01/90	0001			1.37		0.003	-
	10/07/90	0001			1.61		0.001	-
	05/14/91	0001			1.61		0.001	-
	09/17/92	0001			1.8		.001	-
	02/21/93	0001			2.20		0.001	-
URANIUM (TOTAL)	02/21/93	N001	MG/L		2.52		0.001	-
VANADIUM	09/18/87	0001	MG/L		0.12		0.01	-
	10/11/88	0001			0.11		0.01	-
	04/03/89	0001			0.10		0.01	-
	06/01/90	0001		<	0.01		0.01	-
	10/07/90	0001		<	0.01		0.01	-
	05/14/91	0001		<	0.01		0.01	-
ZINC	09/18/87	0001	MG/L		0.077		0.005	-
	10/11/88	0001			0.113		0.005	-
	04/03/89	0001			0.087		0.005	-
	06/01/90	0001			0.081		0.005	-
	10/07/90	0001			0.099		0.005	-
	05/14/91	0001			0.096		0.005	-
	09/17/92	0001			0.19	E	0.0010	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)
 N001 - UNFILTERED SAMPLE

OTHER PARAMETER VALUE FLAGS:
 E - ESTIMATED VALUE BECAUSE OF INTERFERENCE, SEE CASE NARRATIVE

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0615
 NORTH COORDINATE: 9744.7 FT
 EAST COORDINATE: 10667.3 FT
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: DOWN GRADIENT (D)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
ALKALINITY	09/18/87	0001	MG/L CaCO3		489.		-	-
	04/03/89	0001			768.		-	-
	06/01/90	0001			695.		-	-
	10/09/90	0001			728.	L	-	-
	05/14/91	0001			754.		-	-
	09/17/92	0001			568		-	-
	02/21/93	0001			638		-	-
	02/21/93	0002			638		-	-
ALUMINUM	09/18/87	0001	MG/L		0.46		0.1	-
	04/03/89	0001		<	0.1		0.1	-
	06/01/90	0001		<	0.1		0.1	-
	10/09/90	0001		<	0.1	IL	0.1	-
	05/14/91	0001		<	0.2	I	0.2	-
AMMONIUM	09/18/87	0001	MG/L		190.		0.1	-
	04/03/89	0001			200.		0.1	-
	06/01/90	0001			141.		0.1	-
	10/09/90	0001			140.	L	0.1	-
	05/14/91	0001			134.		0.1	-
	02/21/93	0001			69.5		0.1	-
ANTIMONY	09/18/87	0001	MG/L		0.074		0.003	-
	04/03/89	0001			0.049		0.003	-
	06/01/90	0001			0.003		0.003	-
	10/09/90	0001		<	0.02	IL	0.02	-
	05/14/91	0001		<	0.015	I	0.015	-
	09/17/92	0001			0.003	NW	0.0015	-
ARSENIC	09/18/87	0001	MG/L		0.031		0.01	-
	04/03/89	0001			0.03		0.01	-
	06/01/90	0001			0.04		0.01	-
	10/09/90	0001		<	0.1	IL	0.1	-
	05/14/91	0001		<	0.05	I	0.05	-
	09/17/92	0001		<	0.015	INW	0.015	-
	02/21/93	0001		<	0.005	W	0.005	-
	02/21/93	0002		<	0.005	W	0.005	-
ARSENIC (TOTAL)	02/21/93	N001	MG/L	<	0.005	W	0.005	-
	02/21/93	N002		<	0.005	W	0.005	-
BARIUM	09/18/87	0001	MG/L		0.03	J	0.1	-
	04/03/89	0001		<	0.1		0.1	-
	06/01/90	0001		<	0.1		0.1	-
	10/09/90	0001			0.01	L	0.01	-
	05/14/91	0001		<	0.05	I	0.05	-
BERYLLIUM	04/03/89	0001	MG/L	<	0.01		0.01	-
	06/01/90	0001		<	0.01		0.01	-
	10/09/90	0001		<	0.01	IL	0.01	-
	05/14/91	0001		<	0.03	I	0.03	-
BORON	09/18/87	0001	MG/L		0.92		0.1	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

OTHER PARAMETER VALUE FLAGS:

- I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION
- J - ESTIMATED VALUE
- L - LESS THAN THREE BORE VOLUMES REMOVED BEFORE SAMPLING
- N - SPIKE SAMPLE RECOVERY NOT WITHIN CONTROL LIMITS
- W - POST-DIGEST SPIKE OUT OF CNTR LIM WHILE SAMP ABS < 50% SPIKE

SAMPLE ID CODES:

- 0001 - FILTERED SAMPLE (.45 MICRONS)
- 0002 - FILTERED REPLICATE SAMPLE (.45 MICRONS)
- N001 - UNFILTERED SAMPLE
- N002 - UNFILTERED REPLICATE SAMPLE

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0615
 NORTH COORDINATE: 9744.7 FT
 EAST COORDINATE: 10667.3 FT
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: DOWN GRADIENT (D)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
BORON	04/03/89	0001	MG/L		0.6		0.1	-
	06/01/90	0001		0.6		0.1	-	
	10/09/90	0001		0.9	L	0.05	-	
	05/14/91	0001		0.8		0.2	-	
BROMIDE	09/18/87	0001	MG/L		0.1		0.01	-
	04/03/89	0001		<	0.1		0.1	-
CADMIUM	09/18/87	0001	MG/L	<	0.005	J	0.005	-
	04/03/89	0001			0.013		0.001	-
	06/01/90	0001		<	0.001		0.001	-
	10/09/90	0001			0.001	L	0.001	-
	05/14/91	0001		<	0.005	I	0.005	-
	09/17/92	0001			0.0011		0.00003	-
	02/21/93	0001		<	0.001		0.001	-
	02/21/93	0002		<	0.001	S	0.001	-
CADMIUM (TOTAL)	02/21/93	N001	MG/L	<	0.01	IW	0.01	-
	02/21/93	N002		<	0.01	IW	0.01	-
CALCIUM	09/18/87	0001	MG/L		510.		0.01	-
	04/03/89	0001			390.		0.01	-
	06/01/90	0001			495.		0.01	-
	10/09/90	0001			435.	L	0.01	-
	05/14/91	0001			497.		2.	-
	09/17/92	0001			490		0.0050	-
	02/21/93	0001			380		0.5	-
	02/21/93	0002			380		0.5	-
CALCIUM (TOTAL)	02/21/93	N001	MG/L		366		0.5	-
	02/21/93	N002			297		0.5	-
CHLORIDE	09/18/87	0001	MG/L		385.		1.	-
	04/03/89	0001			610.		1.	-
	06/01/90	0001			634.		1.	-
	10/09/90	0001			605.	HL	1.	-
	05/14/91	0001			700.		1.	-
	09/17/92	0001			440	N	0.50	-
	02/21/93	0001			461		0.5	-
	CHLORIDE (TOTAL)	02/21/93		N001	MG/L		441	
02/21/93		N002		451			0.5	-
CHROMIUM	09/18/87	0001	MG/L	<	0.01		0.01	-
	04/03/89	0001		<	0.01		0.01	-
	06/01/90	0001		<	0.01		0.01	-
	10/09/90	0001			0.32	L	0.01	-
	05/14/91	0001		<	0.05	I	0.05	-
	02/21/93	0001		<	0.01		0.01	-
	02/21/93	0002		<	0.01		0.01	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:

OTHER PARAMETER VALUE FLAGS:

H - HOLD TIME EXPIRED, VALUE SUSPECT

I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION

J - ESTIMATED VALUE

L - LESS THAN THREE BORE VOLUMES REMOVED BEFORE SAMPLING

N - SPIKE SAMPLE RECOVERY NOT WITHIN CONTROL LIMITS

S - REPORTED VALUE DETERMINED USING METHOD OF STD ADDITION (MSA)

W - POST-DIGEST SPIKE OUT OF CNTR LIM WHILE SAMP ABS < 50% SPIKE

0001 - FILTERED SAMPLE (.45 MICRONS)

0002 - FILTERED REPLICATE SAMPLE (.45 MICRONS)

N001 - UNFILTERED SAMPLE

N002 - UNFILTERED REPLICATE SAMPLE

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0615
 NORTH COORDINATE: 9744.7 FT
 EAST COORDINATE: 10667.3 FT
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: DOWN GRADIENT (D)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
CHROMIUM (TOTAL)	02/21/93	N001	MG/L	<	0.01		0.01	-
	02/21/93	N002		<	0.01		0.01	-
COBALT	09/18/87	0001	MG/L		0.02	J	0.05	-
	04/03/89	0001		<	0.05		0.05	-
	06/01/90	0001		<	0.05		0.05	-
	10/09/90	0001			0.08	L	0.03	-
	05/14/91	0001		<	0.1	I	0.1	-
COPPER	09/18/87	0001	MG/L		0.01	J	0.02	-
	04/03/89	0001			0.03		0.02	-
	06/01/90	0001		<	0.02		0.02	-
	10/09/90	0001		<	0.02	IL	0.02	-
	05/14/91	0001		<	0.05	I	0.05	-
CYANIDE	04/03/89	0001	MG/L	<	0.01		0.01	-
DISSOLVED OXYGEN	02/21/93	0001	MG/L		0.9		-	-
	02/21/93	0002			0.9		-	-
FLUORIDE	09/18/87	0001	MG/L		0.39		0.1	-
	04/03/89	0001			0.3		0.1	-
	06/01/90	0001			0.4		0.1	-
	10/09/90	0001			0.9	L	0.1	-
	05/14/91	0001			0.8		0.1	-
GROSS ALPHA	09/18/87	0001	PCI/L		1200.		0.2	20.
	04/03/89	0001			1900.		0.2	300.
	09/17/92	0001			1300.		214	358
	02/21/93	0001			888.		196.	212.
	02/21/93	0002			760.		196.	201.
GROSS ALPHA (TOTAL)	02/21/93	N001	PCI/L		1000.		195.	220.
	02/21/93	N002			851.		193.	207.
GROSS BETA	09/18/87	0001	PCI/L		960.		1.	70.
	04/03/89	0001			1200.		1.	100.
	09/17/92	0001			350.		198	144
	02/21/93	0001			584.		148.	119.
	02/21/93	0002			677.		223.	170.
GROSS BETA (TOTAL)	02/21/93	N001	PCI/L		694.		151.	126.
	02/21/93	N002			494.		147.	114.
IRON	09/18/87	0001	MG/L	<	0.01	J	0.03	-
	04/03/89	0001			0.16		0.03	-
	06/01/90	0001			0.19		0.03	-
	10/09/90	0001		<	0.3	IL	0.3	-
	05/14/91	0001		<	0.1	I	0.1	-
	09/17/92	0001		<	0.018	I	0.018	-
LEAD	09/18/87	0001	MG/L		0.03		0.01	-
	04/03/89	0001		<	0.01		0.01	-
	06/01/90	0001		<	0.01		0.01	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

OTHER PARAMETER VALUE FLAGS:

I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION

J - ESTIMATED VALUE

L - LESS THAN THREE BORE VOLUMES REMOVED BEFORE SAMPLING

SAMPLE ID CODES:

0001 - FILTERED SAMPLE (.45 MICRONS)

0002 - FILTERED REPLICATE SAMPLE (.45 MICRONS)

N001 - UNFILTERED SAMPLE

N002 - UNFILTERED REPLICATE SAMPLE

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0615
 NORTH COORDINATE: 9744.7 FT
 EAST COORDINATE: 10667.3 FT
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: DOWN GRADIENT (D)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
LEAD	10/09/90	0001	MG/L	<	0.05	IL	0.05	-
	05/14/91	0001		<	0.05	I	0.05	-
	02/21/93	0001		<	0.03	I	0.03	-
	02/21/93	0002		<	0.03	I	0.03	-
LEAD (TOTAL)	02/21/93	N001	MG/L	<	0.03	IN	0.03	-
	02/21/93	N002		<	0.03	IN	0.03	-
LEAD-210	04/03/89	0001	PCI/L		1.1		1.5	0.7
	02/21/93	0001			1.3		1.7	1.1
	02/21/93	0002			1.2		1.7	1.1
LEAD-210 (TOTAL)	02/21/93	N001	PCI/L		2.5		1.7	1.1
	02/21/93	N002			1.4		1.7	1.1
MAGNESIUM	09/18/87	0001	MG/L		1252.		0.001	-
	04/03/89	0001			1370.		0.001	-
	06/01/90	0001			2440.		0.001	-
	10/09/90	0001			2540.	L	0.001	-
	05/14/91	0001			2750.		10.	-
	09/17/92	0001			2000		0.011	-
	02/21/93	0001			1940		0.1	-
	02/21/93	0002			2120		0.1	-
MAGNESIUM (TOTAL)	02/21/93	N001	MG/L		1880		0.1	-
	02/21/93	N002			1870		0.1	-
MANGANESE	09/18/87	0001	MG/L		5.81		0.01	-
	04/03/89	0001			9.38		0.01	-
	06/01/90	0001			8.08		0.01	-
	10/09/90	0001			6.94	L	0.01	-
	05/14/91	0001			9.75		0.05	-
	09/17/92	0001			8.1		0.0064	-
	02/21/93	0001			5.66		0.01	-
	02/21/93	0002			5.68		0.01	-
MANGANESE (TOTAL)	02/21/93	N001	MG/L		5.39		0.01	-
	02/21/93	N002			5.40		0.01	-
MERCURY	09/18/87	0001	MG/L	<	0.0002		0.0002	-
	04/03/89	0001		<	0.0002		0.0002	-
	06/01/90	0001		<	0.0002		0.0002	-
	10/09/90	0001		<	0.0002	L	0.0002	-
	05/14/91	0001		<	0.0002		0.0002	-
MOLYBDENUM	09/18/87	0001	MG/L	<	0.01		0.01	-
	04/03/89	0001			0.03		0.01	-
	06/01/90	0001		<	0.01		0.01	-
	10/09/90	0001			0.36	L	0.01	-
	05/14/91	0001		<	0.05	I	0.05	-
	09/17/92	0001		<	0.025	I	0.025	-
	02/21/93	0001		<	0.01		0.01	-
02/21/93	0002			0.01		0.01	-	
MOLYBDENUM (TOTAL)	02/21/93	N001	MG/L		0.01		0.01	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

OTHER PARAMETER VALUE FLAGS:
 I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION
 L - LESS THAN THREE BORE VOLUMES REMOVED BEFORE SAMPLING
 N - SPIKE SAMPLE RECOVERY NOT WITHIN CONTROL LIMITS

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)
 0002 - FILTERED REPLICATE SAMPLE (.45 MICRONS)
 N001 - UNFILTERED SAMPLE
 N002 - UNFILTERED REPLICATE SAMPLE

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0615
 NORTH COORDINATE: 9744.7 FT
 EAST COORDINATE: 10667.3 FT
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: DOWN GRADIENT (D)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
MOLYBDENUM (TOTAL)	02/21/93	N002	MG/L		0.01		0.01	-
NICKEL	09/18/87	0001	MG/L	<	0.01	J	0.04	-
	04/03/89	0001			0.04		0.04	-
	06/01/90	0001			0.07		0.04	-
	10/09/90	0001			0.40	L	0.04	-
	05/14/91	0001			0.2	I	0.2	-
	09/17/92	0001			0.061	I	0.061	-
NITRATE	09/18/87	0001	MG/L		1570.		1.	-
	04/03/89	0001			3300.		1.	-
	06/01/90	0001			400.		1.	-
	10/09/90	0001			4220.	L	1.	-
	05/14/91	0001			4010.		1.	-
	09/17/92	0001			5300	J	0.044	-
	02/21/93	0001			2960		1	-
NITRITE	09/18/87	0001	MG/L	<	0.1		0.1	-
PH	09/18/87	0001	SU		6.88		-	-
	04/03/89	0001			6.99		-	-
	06/01/90	0001			6.81		-	-
	10/09/90	0001			6.89	L	-	-
	05/14/91	0001			6.82		-	-
	09/17/92	0001			6.73		-	-
	02/21/93	0001			6.84		-	-
	02/21/93	0002			6.84		-	-
PHOSPHATE	09/18/87	0001	MG/L	<	1.04	H	0.1	-
	04/03/89	0001			0.1		0.1	-
	06/01/90	0001			0.6	J	0.1	-
	10/09/90	0001			0.1	L	0.1	-
	05/14/91	0001			0.1		0.1	-
	02/21/93	0001			0.1		0.1	-
POLONIUM-210	09/18/87	0001	PCI/L		1.1		1.	1.0
	04/03/89	0001			3.3		1.	1.0
	02/21/93	0001			0.0		1.9	1.1
	02/21/93	0002			1.6		1.9	1.2
POLONIUM-210 (TOTAL)	02/21/93	N001	PCI/L		0.0	N	1.9	1.1
	02/21/93	N002			2.3		1.9	1.3
POTASSIUM	09/18/87	0001	MG/L		121.	J	0.01	-
	04/03/89	0001			165.		0.01	-
	06/01/90	0001			152.		0.01	-
	10/09/90	0001			120.	L	0.01	-
	05/14/91	0001			120.		20.	-
	09/17/92	0001			140	E	0.20	-
	02/21/93	0001			109		0.1	-
	02/21/93	0002			106		0.1	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

OTHER PARAMETER VALUE FLAGS:

- E - ESTIMATED VALUE BECAUSE OF INTERFERENCE, SEE CASE NARRATIVE
- H - HOLD TIME EXPIRED, VALUE SUSPECT
- I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION
- J - ESTIMATED VALUE
- L - LESS THAN THREE BORE VOLUMES REMOVED BEFORE SAMPLING
- N - SPIKE SAMPLE RECOVERY NOT WITHIN CONTROL LIMITS

SAMPLE ID CODES:

- 0001 - FILTERED SAMPLE (.45 MICRONS)
- 0002 - FILTERED REPLICATE SAMPLE (.45 MICRONS)
- N001 - UNFILTERED SAMPLE
- N002 - UNFILTERED REPLICATE SAMPLE

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0615
 NORTH COORDINATE: 9744.7 FT
 EAST COORDINATE: 10667.3 FT
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: DOWN GRADIENT (D)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
POTASSIUM (TOTAL)	02/21/93	N001	MG/L		109		0.1	-
	02/21/93	N002			106		0.1	-
RADIUM-226	09/18/87	0001	PCI/L		0.2		1.	0.2
	04/03/89	0001			0.0		1.	0.2
	06/01/90	0001			0.6		1.	0.3
	10/09/90	0001			0.7	L	1.	0.4
	05/14/91	0001			0.4		1.	0.3
	09/17/92	0001			0.20		.0637	.0644
	02/21/93	0001			2.2		0.7	0.8
	02/21/93	0002			2.6		0.7	0.8
RADIUM-226 (TOTAL)	02/21/93	N001	PCI/L		2.1		0.7	0.8
	02/21/93	N002			1.9		0.7	0.8
RADIUM-228	09/18/87	0001	PCI/L		0.5		1.	1.3
	04/03/89	0001			0.0		1.	0.9
	06/01/90	0001			1.4		1.	0.8
	10/09/90	0001			0.0	L	1.	3.0
	05/14/91	0001			0.9	J	1.	2.6
	09/17/92	0001			1.3		1.67	.899
	02/21/93	0001			3.7		3.5	2.4
	02/21/93	0002			4.0		3.6	2.5
REDOX POTENTIAL	02/21/93	0001	mVOLTS		487.8		-	-
	02/21/93	0002			487.8		-	-
SELENIUM	09/18/87	0001	MG/L		0.255		0.005	-
	04/03/89	0001			0.122	N	0.005	-
	06/01/90	0001			0.165		0.005	-
	10/09/90	0001			0.070	L	0.005	-
	05/14/91	0001			0.090		0.05	-
	09/17/92	0001			0.10	*EN	0.0015	-
	02/21/93	0001			0.640	*S	0.005	-
	02/21/93	0002			0.557	*S	0.005	-
SELENIUM (TOTAL)	02/21/93	N001	MG/L		0.664	S	0.005	-
	02/21/93	N002			0.589	S	0.005	-
SILICA - SiO2	09/18/87	0001	MG/L		15.4		2.	-
	04/03/89	0001			10.		2.	-
	06/01/90	0001			10.		2.	-
	10/09/90	0001			14.7	L	0.1	-
	05/14/91	0001			13.0		0.5	-
SILVER	04/03/89	0001	MG/L	<	0.01		0.01	-
	06/01/90	0001		<	0.01		0.01	-
	10/09/90	0001			0.02	L	0.01	-
	05/14/91	0001		<	0.05	I	0.05	-
SODIUM	09/18/87	0001	MG/L		2107.		0.002	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

OTHER PARAMETER VALUE FLAGS:

- * - DUPLICATE ANALYSIS NOT WITHIN CONTROL LIMITS
- E - ESTIMATED VALUE BECAUSE OF INTERFERENCE, SEE CASE NARRATIVE
- I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION
- J - ESTIMATED VALUE
- L - LESS THAN THREE BORE VOLUMES REMOVED BEFORE SAMPLING
- N - SPIKE SAMPLE RECOVERY NOT WITHIN CONTROL LIMITS
- S - REPORTED VALUE DETERMINED USING METHOD OF STD ADDITION (MSA)

SAMPLE ID CODES:

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GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0615
 NORTH COORDINATE: 9744.7 FT
 EAST COORDINATE: 10667.3 FT
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: DOWN GRADIENT (D)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
SODIUM	04/03/89	0001	MG/L		1650.		0.002	-
	06/01/90	0001		3560.		0.002	-	
	10/09/90	0001		3630.	L	0.002	-	
	05/14/91	0001		3810.		20.	-	
	09/17/92	0001		3500		0.011	-	
	02/21/93	0001		3010		1	-	
	02/21/93	0002		3280		1	-	
SODIUM (TOTAL)	02/21/93	N001	MG/L		2940		1	-
	02/21/93	N002			2950		1	-
SPECIFIC CONDUCTANCE	09/18/87	0001	UMHO/CM		5610.		-	-
	04/03/89	0001		10000.		-	-	
	06/01/90	0001		14500.		-	-	
	10/09/90	0001		2000.	LR	-	-	
	05/14/91	0001		18510.		-	-	
	09/17/92	0001		16600		-	-	
	02/21/93	0001		12820		-	-	
02/21/93	0002	12820		-	-			
STRONTIUM	09/18/87	0001	MG/L		10.1		0.1	-
	04/03/89	0001		14.0		0.1	-	
	06/01/90	0001		11.9		0.1	-	
	10/09/90	0001		8.94	L	0.01	-	
	05/14/91	0001		12.2		0.05	-	
	09/17/92	0001		9.6	N	0.010	-	
	02/21/93	0001		9.02		0.01	-	
02/21/93	0002	9.03		0.01	-			
STRONTIUM (TOTAL)	02/21/93	N001	MG/L		8.44		0.01	-
	02/21/93	N002			7.65		0.01	-
SULFATE	09/18/87	0001	MG/L		9930.		0.1	-
	04/03/89	0001		6230.	H	0.1	-	
	06/01/90	0001		15000.	HJ	0.1	-	
	10/09/90	0001		15600.	L	0.1	-	
	05/14/91	0001		14300.		10.	-	
	09/17/92	0001		13000	N	10.0	-	
	02/21/93	0001		12000		1	-	
SULFATE (TOTAL)	02/21/93	N001	MG/L		12400		1	-
	02/21/93	N002			12300		1	-
SULFIDE	09/18/87	0001	MG/L	<	0.1		0.1	-
	04/03/89	0001		<	0.1		0.1	-
TEMPERATURE	09/18/87	0001	C - DEGREE		23.5		-	-
	04/03/89	0001		12.5		-	-	
	06/01/90	0001		18.0		-	-	
	10/09/90	0001		22.1	L	-	-	
	05/14/91	0001		14.5		-	-	
	09/17/92	0001		23.5		-	-	

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

OTHER PARAMETER VALUE FLAGS:

- H - HOLD TIME EXPIRED, VALUE SUSPECT
- J - ESTIMATED VALUE
- L - LESS THAN THREE BORE VOLUMES REMOVED BEFORE SAMPLING
- N - SPIKE SAMPLE RECOVERY NOT WITHIN CONTROL LIMITS
- R - UNUSABLE DATA POINT

SAMPLE ID CODES:

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GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0615
 NORTH COORDINATE: 9744.7 FT
 EAST COORDINATE: 10667.3 FT
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: DOWN GRADIENT (D)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
TEMPERATURE	02/21/93	0001	C - DEGREE		9.3		-	-
	02/21/93	0002			9.3		-	-
THALLIUM	04/03/89	0001	MG/L		0.02		0.01	-
	06/01/90	0001		<	0.01		0.01	-
	10/09/90	0001		<	0.05	IL	0.05	-
	05/14/91	0001		<	0.05	I	0.05	-
THORIUM-230	09/18/87	0001	PCI/L		0.0		1.	0.6
	04/03/89	0001			0.0		1.	0.6
	02/21/93	0001			0.5		0.5	0.4
	02/21/93	0002			0.2		0.3	0.2
THORIUM-230 (TOTAL)	02/21/93	N001	PCI/L		0.1		0.2	0.2
	02/21/93	N002			0.2		0.7	0.3
TIN	09/18/87	0001	MG/L		0.089		0.005	
	04/03/89	0001			0.062		0.005	
	06/01/90	0001		<	0.005		0.005	
	10/09/90	0001		<	0.1	IL	0.1	
	05/14/91	0001		<	0.025	I	0.025	
TOTAL DISSOLVED SOLIDS	09/18/87	0001	MG/L		17200.		10.	
	04/03/89	0001			28200.	HJ	10.	
	06/01/90	0001			27100.		10.	
	10/09/90	0001			28600.	HL	10.	
	05/14/91	0001			26700.		10.	
	09/17/92	0001			22000	H	10.0	
	02/21/93	0001			22600		10	
TOTAL DISSOLVED SOLIDS (TOTAL)	02/21/93	N001	MG/L		22400		10	
	02/21/93	N002			22500		10	
TOTAL ORGANIC CARBON	09/18/87	0001	MG/L		165.		1.	
	04/03/89	0001			143.		1.	
URANIUM	09/18/87	0001	MG/L		1.64		0.003	
	04/03/89	0001			4.07		0.003	
	06/01/90	0001			3.00		0.003	
	10/09/90	0001			2.93	L	0.001	
	05/14/91	0001			2.80		0.001	
	09/17/92	0001			2.1		.001	
	02/21/93	0001			2.64		0.001	
	02/21/93	0002			2.71		0.001	
URANIUM (TOTAL)	02/21/93	N001	MG/L		2.89		0.001	
	02/21/93	N002			2.42		0.001	
VANADIUM	09/18/87	0001	MG/L		0.14		0.01	
	04/03/89	0001			0.16		0.01	
	06/01/90	0001		<	0.01		0.01	
	10/09/90	0001			0.16	L	0.01	
	05/14/91	0001		<	0.05	I	0.05	
	09/17/92	0001			0.34	E	0.0019	

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:

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 N001 - UNFILTERED SAMPLE
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OTHER PARAMETER VALUE FLAGS:

E - ESTIMATED VALUE BECAUSE OF INTERFERENCE, SEE CASE NARRATIVE
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GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0615
 NORTH COORDINATE: 9744.7 FT
 EAST COORDINATE: 10667.3 FT
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: DOWN GRADIENT (D)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
ZINC	09/18/87	0001	MG/L		0.008		0.005	-
	04/03/89	0001			0.021		0.005	-
	06/01/90	0001		<	0.005		0.005	-
	10/09/90	0001		<	0.01	IL	0.01	-
	05/14/91	0001		<	0.1	I	0.1	-
	09/17/92	0001			0.017	E	0.0010	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)

OTHER PARAMETER VALUE FLAGS:

- E - ESTIMATED VALUE BECAUSE OF INTERFERENCE, SEE CASE NARRATIVE
- I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION
- L - LESS THAN THREE BORE VOLUMES REMOVED BEFORE SAMPLING

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0616
 NORTH COORDINATE: 10213.5 FT
 EAST COORDINATE: 11140.8 FT
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: DOWN GRADIENT (D)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
ALKALINITY	09/18/87	0001	MG/L CAC03		318.		-	-
	04/04/89	0001		295.	-	-		
	06/01/90	0001		287.	-	-		
	10/09/90	0001		323.	-	-		
	05/13/91	0001		319.	-	-		
	09/17/92	0001		312	-	-		
	02/25/93	0001		353	-	-		
ALUMINUM	09/18/87	0001	MG/L		0.25		0.1	-
	04/04/89	0001		<	0.1		0.1	-
	06/01/90	0001		<	0.1		0.1	-
	10/09/90	0001		<	0.05		0.05	-
	05/13/91	0001		<	0.05		0.05	-
AMMONIUM	09/18/87	0001	MG/L		14.2		0.1	-
	04/04/89	0001			17.		0.1	-
	06/01/90	0001			19.4		0.1	-
	10/09/90	0001			22.5		0.1	-
	05/13/91	0001			28.9		0.1	-
ANTIMONY	09/18/87	0001	MG/L		0.080		0.003	-
	04/04/89	0001			0.007		0.003	-
	06/01/90	0001			0.003		0.003	-
	10/09/90	0001		<	0.003		0.003	-
	05/13/91	0001		<	0.015	I	0.015	-
	09/17/92	0001			0.002	NW	0.0015	-
ARSENIC	09/18/87	0001	MG/L		0.009	J	0.01	-
	04/04/89	0001		<	0.01		0.01	-
	06/01/90	0001		<	0.01		0.01	-
	10/09/90	0001		<	0.05	I	0.05	-
	05/13/91	0001			0.03	W	0.01	-
	09/17/92	0001		<	0.0015	N	0.0015	-
	02/25/93	0001		<	0.005		0.005	-
ARSENIC (TOTAL)	02/25/93	N001	MG/L	<	0.005	W	0.005	-
BARIUM	09/18/87	0001	MG/L		0.04	J	0.1	-
	04/04/89	0001		<	0.1		0.1	-
	06/01/90	0001		<	0.1		0.1	-
	10/09/90	0001			0.02		0.01	-
	05/13/91	0001			0.02		0.01	-
BERYLLIUM	04/04/89	0001	MG/L	<	0.01		0.01	-
	06/01/90	0001		<	0.01		0.01	-
	10/09/90	0001		<	0.005		0.005	-
	05/13/91	0001		<	0.005		0.005	-
BORON	09/18/87	0001	MG/L		0.32		0.1	-
	04/04/89	0001			0.3		0.1	-
	06/01/90	0001			0.3		0.1	-
	10/09/90	0001			0.37		0.05	-
	05/13/91	0001			0.31		0.05	-
BROMIDE	09/18/87	0001	MG/L	<	0.1		0.1	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:

0001 - FILTERED SAMPLE (.45 MICRONS)

N001 - UNFILTERED SAMPLE

OTHER PARAMETER VALUE FLAGS:

I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION

J - ESTIMATED VALUE

N - SPIKE SAMPLE RECOVERY NOT WITHIN CONTROL LIMITS

W - POST-DIGEST SPIKE OUT OF CNTR LIM WHILE SAMP ABS < 50% SPIKE

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0616
 NORTH COORDINATE: 10213.5 FT
 EAST COORDINATE: 11140.8 FT
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: DOWN GRADIENT (D)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
BROMIDE	04/04/89	0001	MG/L		0.1		0.1	-
CADMIUM	09/18/87	0001	MG/L	<	0.005	J	0.005	-
	04/04/89	0001			0.004		0.001	-
	06/01/90	0001		<	0.001		0.001	-
	10/09/90	0001		<	0.001		0.001	-
	05/13/91	0001		<	0.001		0.001	-
	09/17/92	0001		<	0.0005	S	0.00003	-
	02/25/93	0001		<	0.001		0.001	-
CADMIUM (TOTAL)	02/25/93	N001	MG/L	<	0.002	IW	0.002	-
CALCIUM	09/18/87	0001	MG/L		514.		0.01	-
	04/04/89	0001			445.		0.01	-
	06/01/90	0001			522.		0.01	-
	10/09/90	0001			502.		0.01	-
	05/13/91	0001			565.		2.	-
	09/17/92	0001			580		0.0050	-
	02/25/93	0001			512		0.5	-
CALCIUM (TOTAL)	02/25/93	N001	MG/L		506		0.5	-
CHLORIDE	09/18/87	0001	MG/L		86.3		1.	-
	04/04/89	0001			65.		1.	-
	06/01/90	0001			76.		1.	-
	10/09/90	0001			62.	H	1.	-
	05/13/91	0001			74.		1.	-
	09/17/92	0001			69	N	0.50	-
CHLORIDE (TOTAL)	02/25/93	N001	MG/L		113		0.5	-
CHROMIUM	09/18/87	0001	MG/L	<	0.01		0.01	-
	04/04/89	0001		<	0.01		0.01	-
	06/01/90	0001		<	0.01		0.01	-
	10/09/90	0001		<	0.01		0.01	-
	05/13/91	0001		<	0.01		0.01	-
	02/25/93	0001		<	0.01		0.01	-
CHROMIUM (TOTAL)	02/25/93	N001	MG/L	<	0.01		0.01	-
COBALT	09/18/87	0001	MG/L	<	0.01	J	0.05	-
	04/04/89	0001		<	0.05		0.05	-
	06/01/90	0001		<	0.05		0.05	-
	10/09/90	0001		<	0.03		0.03	-
	05/13/91	0001		<	0.03		0.03	-
COPPER	09/18/87	0001	MG/L	<	0.01	J	0.02	-
	04/04/89	0001		<	0.02		0.02	-
	06/01/90	0001		<	0.02		0.02	-
	10/09/90	0001		<	0.01		0.01	-
	05/13/91	0001		<	0.01		0.01	-
CYANIDE	04/04/89	0001	MG/L	<	0.01		0.01	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)
 N001 - UNFILTERED SAMPLE

OTHER PARAMETER VALUE FLAGS:
 H - HOLD TIME EXPIRED, VALUE SUSPECT
 I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION
 J - ESTIMATED VALUE
 N - SPIKE SAMPLE RECOVERY NOT WITHIN CONTROL LIMITS
 S - REPORTED VALUE DETERMINED USING METHOD OF STD ADDITION (MSA)
 W - POST-DIGEST SPIKE OUT OF CNTR LIM WHILE SAMP ABS < 50% SPIKE

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0616
 NORTH COORDINATE: 10213.5 FT
 EAST COORDINATE: 11140.8 FT
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: DOWN GRADIENT (D)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
DISSOLVED OXYGEN	02/25/93	0001	MG/L		0.2		-	-
FLUORIDE	09/18/87	0001	MG/L		0.42		0.1	-
	04/04/89	0001		0.5	0.1	-		
	06/01/90	0001		0.5	0.1	-		
	10/09/90	0001		0.6	0.1	-		
	05/13/91	0001		0.7	0.1	-		
GROSS ALPHA	09/18/87	0001	PCI/L		230.		0.2	40.
	04/04/89	0001		180.	0.2	40.		
	09/17/92	0001		240.	48.5	76		
	02/25/93	0001		314.	53.8	67.1		
GROSS ALPHA (TOTAL)	02/25/93	N001	PCI/L		277.		59.8	66.3
GROSS BETA	09/18/87	0001	PCI/L		200.		1.	20.
	04/04/89	0001		140.	1.	20.		
	09/17/92	0001		60.	49.4	33.2		
	02/25/93	0001		184.	41.8	35.3		
GROSS BETA (TOTAL)	02/25/93	N001	PCI/L		112.		48.0	34.8
IRON	09/18/87	0001	MG/L	<	0.01	J	0.03	-
	04/04/89	0001		0.09	0.03	-		
	06/01/90	0001		0.10	0.03	-		
	10/09/90	0001		<	0.03	0.03	-	
	05/13/91	0001		<	0.03	0.03	-	
	09/17/92	0001		0.020	0.0035	-		
LEAD	09/18/87	0001	MG/L		0.01		0.01	-
	04/04/89	0001		<	0.01	0.01	-	
	06/01/90	0001		<	0.01	0.01	-	
	10/09/90	0001		<	0.01	0.01	-	
	05/13/91	0001		<	0.03	0.03	-	
	02/25/93	0001		<	0.003	0.003	-	
LEAD (TOTAL)	02/25/93	N001	MG/L	<	0.003	*N	0.003	-
LEAD-210	04/04/89	0001	PCI/L		0.0		1.5	0.7
	02/25/93	0001		1.4	2.3	1.4		
LEAD-210 (TOTAL)	02/25/93	N001	PCI/L		1.9		2.3	1.4
MAGNESIUM	09/18/87	0001	MG/L		138.		0.001	-
	04/04/89	0001		286.	0.001	-		
	06/01/90	0001		307.	0.001	-		
	10/09/90	0001		296.	0.001	-		
	05/13/91	0001		356.	0.5	-		
	09/17/92	0001		350	0.011	-		
02/25/93	0001	392	0.1	-				
MAGNESIUM (TOTAL)	02/25/93	N001	MG/L		375		0.1	-
MANGANESE	09/18/87	0001	MG/L		1.93		0.01	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)
 N001 - UNFILTERED SAMPLE

OTHER PARAMETER VALUE FLAGS:

- * - DUPLICATE ANALYSIS NOT WITHIN CONTROL LIMITS
- I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION
- J - ESTIMATED VALUE
- N - SPIKE SAMPLE RECOVERY NOT WITHIN CONTROL LIMITS
- W - POST-DIGEST SPIKE OUT OF CNTR LIM WHILE SAMP ABS < 50% SPIKE

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0616
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 EAST COORDINATE: 11140.8 FT
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: DOWN GRADIENT (D)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
MANGANESE	04/04/89	0001	MG/L		3.34		0.01	-
	06/01/90	0001			4.46		0.01	-
	10/09/90	0001			5.00		0.01	-
	05/13/91	0001			4.39		0.01	-
	09/17/92	0001			5.2		0.0064	-
	02/25/93	0001			4.75		0.01	-
MANGANESE (TOTAL)	02/25/93	N001	MG/L		4.78		0.01	-
MERCURY	09/18/87	0001	MG/L	<	0.0002		0.0002	-
	04/04/89	0001		<	0.0002		0.0002	-
	06/01/90	0001		<	0.0002		0.0002	-
	10/09/90	0001		<	0.0002		0.0002	-
	05/13/91	0001		<	0.0002		0.0002	-
MOLYBDENUM	09/18/87	0001	MG/L	<	0.01		0.01	-
	04/04/89	0001		<	0.01		0.01	-
	06/01/90	0001			0.02		0.01	-
	10/09/90	0001		<	0.01		0.01	-
	05/13/91	0001		<	0.01		0.01	-
	09/17/92	0001		<	0.025	I	0.025	-
02/25/93	0001		<	0.01		0.01	-	
MOLYBDENUM (TOTAL)	02/25/93	N001	MG/L	<	0.01		0.01	-
NICKEL	09/18/87	0001	MG/L	<	0.01	J	0.04	-
	04/04/89	0001		<	0.04		0.04	-
	06/01/90	0001		<	0.04		0.04	-
	10/09/90	0001		<	0.04		0.04	-
	05/13/91	0001		<	0.04		0.04	-
	09/17/92	0001		<	0.061	I	0.061	-
NITRATE	09/18/87	0001	MG/L		25.7		1.	-
	04/04/89	0001			1.8		1.	-
	06/01/90	0001			8.		1.	-
	10/09/90	0001			21.		1.	-
	05/13/91	0001			76.1		1.	-
	09/17/92	0001			110	J	0.044	-
NITRITE	09/18/87	0001	MG/L	<	0.1		0.1	-
PH	09/18/87	0001	SU		7.00		-	-
	04/04/89	0001			7.09		-	-
	06/01/90	0001			7.11		-	-
	10/09/90	0001			6.96		-	-
	05/13/91	0001			6.91		-	-
	09/17/92	0001			6.80		-	-
02/25/93	0001			6.88		-	-	
PHOSPHATE	09/18/87	0001	MG/L		0.45	H	0.1	-
	04/04/89	0001		<	0.1		0.1	-
	06/01/90	0001		<	0.1	J	0.1	-
	10/09/90	0001			0.1		0.1	-
	05/13/91	0001			0.1		0.1	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)
 N001 - UNFILTERED SAMPLE

OTHER PARAMETER VALUE FLAGS:
 H - HOLD TIME EXPIRED, VALUE SUSPECT
 I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION
 J - ESTIMATED VALUE

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0616
 NORTH COORDINATE: 10213.5 FT
 EAST COORDINATE: 11140.8 FT
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: DOWN GRADIENT (D)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY	
POLONIUM-210	09/18/87	0001	PCI/L		0.9		1.	0.7	
	04/04/89	0001			2.5		1.	0.6	
	02/25/93	0001			0.0	N	0.7	0.3	
POLONIUM-210 (TOTAL)	02/25/93	N001	PCI/L		0.4	N	0.7	0.5	
POTASSIUM	09/18/87	0001	MG/L		26.2	J	0.01	-	
	04/04/89	0001			40.2		0.01	-	
	06/01/90	0001			47.3		0.01	-	
	10/09/90	0001			49.		0.01	-	
	05/13/91	0001			48.		5.	-	
	09/17/92	0001			55	E	0.20	-	
	02/25/93	0001		48.9		0.1	-		
POTASSIUM (TOTAL)	02/25/93	N001	MG/L		50.2		0.1	-	
RADIUM-226	09/18/87	0001	PCI/L		0.1		1.	0.2	
	04/04/89	0001			0.0		1.	0.1	
	06/01/90	0001			0.2		1.	0.2	
	10/09/90	0001			0.1		1.	0.2	
	05/13/91	0001			0.2		1.	0.2	
	09/17/92	0001			0.000		.0613	.0212	
	02/25/93	0001		0.2		0.4	0.3		
RADIUM-226 (TOTAL)	02/25/93	N001	PCI/L		0.5		0.4	0.4	
RADIUM-228	09/18/87	0001	PCI/L		0.4		1.	1.4	
	04/04/89	0001			0.3		1.	0.9	
	06/01/90	0001			1.2		1.	0.8	
	10/09/90	0001			0.0		1.	3.2	
	05/13/91	0001			2.4	J	1.	2.0	
	09/17/92	0001			1.3		1.85	.991	
	02/25/93	0001		0.0		4.0	2.3		
REDOX POTENTIAL	02/25/93	0001	mVOLTS		490.0		-	-	
SELENIUM	09/18/87	0001	MG/L		0.027		0.005	-	
	04/04/89	0001			0.027	N	0.005	-	
	06/01/90	0001			0.023		0.005	-	
	10/09/90	0001			<	0.03	I	0.03	-
	05/13/91	0001			<	0.03	IW	0.03	-
	09/17/92	0001			<	0.011	*NW	0.0015	-
	02/25/93	0001		<	0.05	*I	0.05	-	
SELENIUM (TOTAL)	02/25/93	N001	MG/L		<	0.005	NW	0.005	
SILICA - SiO2	09/18/87	0001	MG/L		17.6		2.	-	
	04/04/89	0001			15.		2.	-	
	06/01/90	0001			16.		2.	-	
	10/09/90	0001			17.9		0.1	-	
	05/13/91	0001			15.6		0.1	-	

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)
 N001 - UNFILTERED SAMPLE

OTHER PARAMETER VALUE FLAGS:

- * - DUPLICATE ANALYSIS NOT WITHIN CONTROL LIMITS
- E - ESTIMATED VALUE BECAUSE OF INTERFERENCE, SEE CASE NARRATIVE
- I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION
- J - ESTIMATED VALUE
- N - SPIKE SAMPLE RECOVERY NOT WITHIN CONTROL LIMITS
- W - POST-DIGEST SPIKE OUT OF CNTR LIM WHILE SAMP ABS < 50% SPIKE

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0616
 NORTH COORDINATE: 10213.5 FT
 EAST COORDINATE: 11140.8 FT
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: DOWN GRADIENT (D)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
SILVER	04/04/89	0001	MG/L	<	0.01		0.01	-
	06/01/90	0001		<	0.01		0.01	-
	10/09/90	0001		<	0.01		0.01	-
	05/13/91	0001		<	0.01		0.01	-
SODIUM	09/18/87	0001	MG/L		366.		0.002	-
	04/04/89	0001			431.		0.002	-
	06/01/90	0001			421.		0.002	-
	10/09/90	0001			403.		0.002	-
	05/13/91	0001			490.		5.	-
	09/17/92	0001			560		0.011	-
	02/25/93	0001			696		1	-
SODIUM (TOTAL)	02/25/93	N001	MG/L		665		1	-
SPECIFIC CONDUCTANCE	09/18/87	0001	UMHO/CM		2150.		-	-
	04/04/89	0001			2600.		-	-
	06/01/90	0001			3200.		-	-
	10/09/90	0001			4250.		-	-
	05/13/91	0001			5300.		-	-
	09/17/92	0001			4960		-	-
	02/25/93	0001			4860		-	-
STRONTIUM	09/18/87	0001	MG/L		4.25		0.1	-
	04/04/89	0001			4.8		0.1	-
	06/01/90	0001			4.85		0.1	-
	10/09/90	0001			4.80		0.01	-
	05/13/91	0001			5.05		0.01	-
	09/17/92	0001			4.5	N	0.010	-
	02/25/93	0001			5.66		0.01	-
STRONTIUM (TOTAL)	02/25/93	N001	MG/L		5.64		0.01	-
SULFATE	09/18/87	0001	MG/L		2250.		0.1	-
	04/04/89	0001			2880.	H	0.1	-
	06/01/90	0001			2870.	HJ	0.1	-
	10/09/90	0001			3230.		0.1	-
	05/13/91	0001			3430.	H	10.	-
	09/17/92	0001			3300	N	10.0	-
	SULFATE (TOTAL)	02/25/93		N001	MG/L		4020	
SULFIDE	09/18/87	0001	MG/L	<	0.1		0.1	-
	04/04/89	0001		<	0.1		0.1	-
TEMPERATURE	09/18/87	0001	C - DEGREE		20.5		-	-
	04/04/89	0001			12.		-	-
	06/01/90	0001			16.0		-	-
	10/09/90	0001			20.5		-	-
	05/13/91	0001			13.8		-	-
	09/17/92	0001			20.2		-	-
	02/25/93	0001			10.7		-	-
THALLIUM	04/04/89	0001	MG/L	<	0.01		0.01	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:

0001 - FILTERED SAMPLE (.45 MICRONS)

N001 - UNFILTERED SAMPLE

OTHER PARAMETER VALUE FLAGS:

H - HOLD TIME EXPIRED, VALUE SUSPECT

J - ESTIMATED VALUE

N - SPIKE SAMPLE RECOVERY NOT WITHIN CONTROL LIMITS

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0616
 NORTH COORDINATE: 10213.5 FT
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 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: DOWN GRADIENT (D)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
THALLIUM	06/01/90	0001	MG/L	<	0.01		0.01	-
	10/09/90	0001		<	0.01		0.01	-
	05/13/91	0001		<	0.05	I	0.05	-
THORIUM-230	09/18/87	0001	PCI/L		0.3		1.	0.8
	04/04/89	0001			0.0		1.	0.3
	02/25/93	0001			0.7		0.3	0.4
THORIUM-230 (TOTAL)	02/25/93	N001	PCI/L		0.0		0.4	0.1
TIN	09/18/87	0001	MG/L		0.025		0.005	-
	04/04/89	0001			0.009		0.005	-
	06/01/90	0001		<	0.005		0.005	-
	10/09/90	0001		<	0.05	I	0.05	-
	05/13/91	0001		<	0.05	I	0.05	-
TOTAL DISSOLVED SOLIDS	09/18/87	0001	MG/L		3900.		10.	-
	04/04/89	0001			4940.	HJ	10.	-
	06/01/90	0001			5030.		10.	-
	10/09/90	0001			4800.	H	10.	-
	05/13/91	0001			5590.		10.	-
	09/17/92	0001			5000	H	10.0	-
TOTAL DISSOLVED SOLIDS (TOTAL)	02/25/93	N001	MG/L		6360		10	-
TOTAL ORGANIC CARBON	09/18/87	0001	MG/L		95.0		1.	-
	04/04/89	0001			89.4		1.	-
URANIUM	09/18/87	0001	MG/L		0.433		0.003	-
	04/04/89	0001			0.305		0.003	-
	06/01/90	0001			0.274		0.003	-
	10/09/90	0001			0.348		0.001	-
	05/13/91	0001			0.560		0.001	-
	09/17/92	0001			0.34		.0002	-
	02/25/93	0001			0.589		0.001	-
URANIUM (TOTAL)	02/25/93	N001	MG/L		0.577		0.001	-
VANADIUM	09/18/87	0001	MG/L		0.07		0.01	-
	04/04/89	0001			0.06		0.01	-
	06/01/90	0001		<	0.01		0.01	-
	10/09/90	0001		<	0.01		0.01	-
	05/13/91	0001		<	0.01		0.01	-
ZINC	09/18/87	0001	MG/L		0.064		0.005	-
	04/04/89	0001			0.098		0.005	-
	06/01/90	0001			0.100		0.005	-
	10/09/90	0001			0.105		0.005	-
	05/13/91	0001			0.123		0.005	-
	09/17/92	0001			0.17	E	0.0010	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

OTHER PARAMETER VALUE FLAGS:

- E - ESTIMATED VALUE BECAUSE OF INTERFERENCE, SEE CASE NARRATIVE
- H - HOLD TIME EXPIRED, VALUE SUSPECT
- I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION
- J - ESTIMATED VALUE

SAMPLE ID CODES:

- 0001 - FILTERED SAMPLE (.45 MICRONS)
- N001 - UNFILTERED SAMPLE

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0617
 NORTH COORDINATE: 10140.6 FT
 EAST COORDINATE: 10862.4 FT
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: DOWN GRADIENT (D)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
ALKALINITY	09/18/87	0001	MG/L CaCO3		407.		5.	
	04/04/89	0001		387.				
	06/01/90	0001		352.				
	10/09/90	0001		390.				
	05/13/91	0001		463.				
	09/16/92	0001		524.				
	02/22/93	0001		466.				
ALUMINUM	09/18/87	0001	MG/L		0.45		0.1	
	04/04/89	0001		<	0.1		0.1	
	06/01/90	0001		<	0.1		0.1	
	10/09/90	0001		<	0.05		0.05	
	05/13/91	0001		<	0.05		0.05	
AMMONIUM	09/18/87	0001	MG/L		129.		0.1	-
	04/04/89	0001			120.		0.1	-
	06/01/90	0001			108.		0.1	-
	10/09/90	0001			109.		0.1	-
	05/13/91	0001			103.		0.1	-
AMMONIUM (TOTAL)	02/22/93	N001	MG/L		106	N	0.1	-
ANTIMONY	09/18/87	0001	MG/L		0.068		0.003	-
	04/04/89	0001			0.004		0.003	-
	06/01/90	0001		<	0.003		0.003	-
	10/09/90	0001		<	0.003		0.003	-
	05/13/91	0001		<	0.015	I	0.015	-
	09/16/92	0001			0.003	N	0.0015	-
ARSENIC	09/18/87	0001	MG/L		0.013		0.01	-
	04/04/89	0001			0.01		0.01	-
	06/01/90	0001		<	0.01		0.01	-
	10/09/90	0001		<	0.05	I	0.05	-
	05/13/91	0001		<	0.03	I	0.03	-
	09/16/92	0001		<	0.015	IN	0.015	-
	02/22/93	0001		<	0.005		0.005	-
ARSENIC (TOTAL)	02/22/93	N001	MG/L	<	0.005	W	0.005	-
BARIUM	09/18/87	0001	MG/L		0.02	J	0.1	-
	04/04/89	0001		<	0.1		0.1	-
	06/01/90	0001		<	0.1		0.1	-
	10/09/90	0001			0.01		0.01	-
	05/13/91	0001			0.01		0.01	-
BERYLLIUM	04/04/89	0001	MG/L	<	0.01		0.01	-
	06/01/90	0001		<	0.01		0.01	-
	10/09/90	0001		<	0.005		0.005	-
	05/13/91	0001		<	0.005		0.005	-
BORON	09/18/87	0001	MG/L		0.63		0.1	-
	04/04/89	0001			0.36		0.1	-
	06/01/90	0001			0.4		0.1	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:

0001 - FILTERED SAMPLE (.45 MICRONS)
 N001 - UNFILTERED SAMPLE

OTHER PARAMETER VALUE FLAGS:

I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION
 J - ESTIMATED VALUE
 N - SPIKE SAMPLE RECOVERY NOT WITHIN CONTROL LIMITS
 W - POST-DIGEST SPIKE OUT OF CNTR LIM WHILE SAMP ABS < 50% SPIKE

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0617
 NORTH COORDINATE: 10140.6 FT
 EAST COORDINATE: 10862.4 FT
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: DOWN GRADIENT (D)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
BORON	10/09/90	0001	MG/L		0.34		0.05	-
	05/13/91	0001			0.31		0.05	-
BROMIDE	09/18/87	0001	MG/L	<	0.1		0.1	-
	04/04/89	0001		<	0.1		0.1	-
CADMIUM	09/18/87	0001	MG/L	<	0.005	J	0.005	-
	04/04/89	0001			0.005		0.001	-
	06/01/90	0001		<	0.001		0.001	-
	10/09/90	0001		<	0.001		0.001	-
	05/13/91	0001		<	0.001		0.001	-
	09/16/92	0001		<	0.0005	NW	0.00003	-
02/22/93	0001	<	0.001		0.001	-		
CADMIUM (TOTAL)	02/22/93	N001	MG/L	<	0.005	I	0.005	-
CALCIUM	09/18/87	0001	MG/L		462.		0.01	-
	04/04/89	0001			428.		0.01	-
	06/01/90	0001			458.		0.01	-
	10/09/90	0001			530.		0.01	-
	05/13/91	0001			595.		2.	-
	09/16/92	0001			550		0.0050	-
02/22/93	0001		412		0.5	-		
CALCIUM (TOTAL)	02/22/93	N001	MG/L		417		0.5	-
CHLORIDE	09/18/87	0001	MG/L		82.6		1.	-
	04/04/89	0001			100.		1.	-
	06/01/90	0001			131.		1.	-
	10/09/90	0001			134.	H	1.	-
	05/13/91	0001			238.		1.	-
	09/16/92	0001			240		0.50	-
CHLORIDE (TOTAL)	02/22/93	N001	MG/L		250		0.5	-
CHROMIUM	09/18/87	0001	MG/L	<	0.01		0.01	-
	04/04/89	0001		<	0.01		0.01	-
	06/01/90	0001		<	0.01		0.01	-
	10/09/90	0001		<	0.01		0.01	-
	05/13/91	0001		<	0.01		0.01	-
	02/22/93	0001		<	0.01		0.01	-
CHROMIUM (TOTAL)	02/22/93	N001	MG/L	<	0.01		0.01	-
COBALT	09/18/87	0001	MG/L	<	0.01	J	0.05	-
	04/04/89	0001		<	0.05		0.05	-
	06/01/90	0001		<	0.05		0.05	-
	10/09/90	0001		<	0.03		0.03	-
	05/13/91	0001		<	0.03		0.03	-
COPPER	09/18/87	0001	MG/L		0.02		0.02	-
	04/04/89	0001		<	0.02		0.02	-
	06/01/90	0001		<	0.02		0.02	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:

0001 - FILTERED SAMPLE (.45 MICRONS)

N001 - UNFILTERED SAMPLE

OTHER PARAMETER VALUE FLAGS:

H - HOLD TIME EXPIRED, VALUE SUSPECT

I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION

J - ESTIMATED VALUE

N - SPIKE SAMPLE RECOVERY NOT WITHIN CONTROL LIMITS

W - POST-DIGEST SPIKE OUT OF CNTR LIM WHILE SAMP ABS < 50% SPIKE

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0617
 NORTH COORDINATE: 10140.6 FT
 EAST COORDINATE: 10862.4 FT
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: DOWN GRADIENT (D)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
COPPER	10/09/90	0001	MG/L	<	0.01		0.01	-
	05/13/91	0001		<	0.01		0.01	-
CYANIDE	04/04/89	0001	MG/L	<	0.01		0.01	-
DISSOLVED OXYGEN	02/22/93	0001	MG/L		0.3		-	-
FLUORIDE	09/18/87	0001	MG/L		0.24		0.1	-
	04/04/89	0001			0.2		0.1	-
	06/01/90	0001			0.2		0.1	-
	10/09/90	0001			0.1		0.1	-
	05/13/91	0001			0.4		0.1	-
GROSS ALPHA	09/18/87	0001	PCI/L		320.		0.2	50.
	04/04/89	0001			300.		0.2	60.
	09/16/92	0001			360.		136	156
	02/22/93	0001			343.		71.1	82.6
GROSS ALPHA (TOTAL)	02/22/93	N001	PCI/L		491.		126.	132.
GROSS BETA	09/18/87	0001	PCI/L		290.		1.	30.
	04/04/89	0001			190.		1.	20.
	09/16/92	0001			120.		107	69.8
	02/22/93	0001			175.		58.3	45.1
GROSS BETA (TOTAL)	02/22/93	N001	PCI/L		216.		105.	74.3
IRON	09/18/87	0001	MG/L	<	0.01	J	0.03	-
	04/04/89	0001			0.09		0.03	-
	06/01/90	0001			0.12		0.03	-
	10/09/90	0001		<	0.03		0.03	-
	05/13/91	0001		<	0.03		0.03	-
	09/16/92	0001		<	0.018	I	0.018	-
LEAD	09/18/87	0001	MG/L		0.03		0.01	-
	04/04/89	0001		<	0.01		0.01	-
	06/01/90	0001		<	0.01		0.01	-
	10/09/90	0001		<	0.01		0.01	-
	05/13/91	0001		<	0.03	I	0.03	-
	02/22/93	0001		<	0.003	W	0.003	-
LEAD (TOTAL)	02/22/93	N001	MG/L	<	0.003	*NW	0.003	-
LEAD-210	04/04/89	0001	PCI/L		0.6		1.5	0.8
MAGNESIUM	09/18/87	0001	MG/L		504.		0.001	-
	04/04/89	0001			467.		0.001	-
	06/01/90	0001			492.		0.001	-
	10/09/90	0001			560.		0.01	-
	05/13/91	0001			865.		2.	-
	09/16/92	0001			1100		0.011	-
	02/22/93	0001			925		0.1	-
MAGNESIUM (TOTAL)	02/22/93	N001	MG/L		1090		0.1	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)
 N001 - UNFILTERED SAMPLE

OTHER PARAMETER VALUE FLAGS:

- * - DUPLICATE ANALYSIS NOT WITHIN CONTROL LIMITS
- I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION
- J - ESTIMATED VALUE
- N - SPIKE SAMPLE RECOVERY NOT WITHIN CONTROL LIMITS
- W - POST-DIGEST SPIKE OUT OF CNTR LIM WHILE SAMP ABS < 50% SPIKE

GROUNDWATER QUALITY DATA BY LOCATION
 DATA EVALUATED FOR THE BLRA
 SITE: SHP01 SHIPROCK
 LOCATION: 0617
 NORTH COORDINATE: 10140.6 FT
 EAST COORDINATE: 10862.4 FT
 03/17/87 TO 04/27/93
 REPORT DATE: 04/20/95

FORMATION OF COMPLETION: ALLUVIUM (AL)
 HYDRAULIC FLOW RELATIONSHIP: DOWN GRADIENT (D)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
MANGANESE	09/18/87	0001	MG/L		5.92		0.01	-
	04/04/89	0001			5.12		0.01	-
	06/01/90	0001			5.14		0.01	-
	10/09/90	0001			4.49		0.01	-
	05/13/91	0001			6.67	R	0.01	-
	09/16/92	0001			11		0.0064	-
	02/22/93	0001			7.60		0.01	-
MANGANESE (TOTAL)	02/22/93	N001	MG/L		9.02		0.01	-
MERCURY	09/18/87	0001	MG/L	<	0.0002		0.0002	-
	04/04/89	0001		<	0.0002		0.0002	-
	06/01/90	0001		<	0.0002		0.0002	-
	10/09/90	0001		<	0.0002		0.0002	-
	05/13/91	0001		<	0.0002		0.0002	-
MOLYBDENUM	09/18/87	0001	MG/L	<	0.01		0.01	-
	04/04/89	0001		<	0.01		0.01	-
	06/01/90	0001		<	0.01		0.01	-
	10/09/90	0001		<	0.01		0.01	-
	05/13/91	0001		<	0.01	W	0.01	-
	09/16/92	0001		<	0.025	I	0.025	-
	02/22/93	0001		<	0.01		0.01	-
MOLYBDENUM (TOTAL)	02/22/93	N001	MG/L	<	0.01		0.01	-
NICKEL	09/18/87	0001	MG/L	<	0.01	J	0.04	-
	04/04/89	0001		<	0.04		0.04	-
	06/01/90	0001		<	0.04		0.04	-
	10/09/90	0001		<	0.04		0.04	-
	05/13/91	0001		<	0.04		0.04	-
	09/16/92	0001		<	0.061	I	0.061	-
NITRATE	09/18/87	0001	MG/L		25.7		1.	-
	04/04/89	0001			50.		1.	-
	06/01/90	0001			7.		1.	-
	10/09/90	0001			213.		1.	-
	05/13/91	0001			1420.		1.	-
	09/16/92	0001			2700	J	0.044	-
NITRATE (TOTAL)	02/22/93	N001	MG/L		1320		1	-
NITRITE	09/18/87	0001	MG/L	<	0.1		0.1	-
PH	09/18/87	0001	SU		6.85		-	-
	04/04/89	0001			6.93		-	-
	06/01/90	0001			6.93		-	-
	10/09/90	0001			6.86		-	-
	05/13/91	0001			6.78		-	-
	09/16/92	0001			6.66		-	-
	02/22/93	0001			6.83		-	-
PHOSPHATE	09/18/87	0001	MG/L		0.98	H	0.1	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)
 N001 - UNFILTERED SAMPLE

OTHER PARAMETER VALUE FLAGS:

- H - HOLD TIME EXPIRED, VALUE SUSPECT
- I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION
- J - ESTIMATED VALUE
- R - UNUSABLE DATA POINT
- W - POST-DIGEST SPIKE OUT OF CNTR LIM WHILE SAMP ABS < 50% SPIKE

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**SUPPLEMENT 8
MONITOR WELL COMPLETION REPORT**

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Well Repair and Abandonment

UMTRA Site	Location ID	New Locks	Exterior Label	Concrete Pad	Well Casing Diameter (inches)	New Protective Casing	Protective Casing Diameter (inches)	Cap Diameter (inches)	New Pin	New Cap	Remarks
GUN-01	211	7' deep, filled with clean sand and capped									
GUN-01	112	1	1	1	2	0	5.50	Hinge	0	0	
GUN-01	12	1	1	0	2	0	5.5	6.00	1	1	
GUN-08	609	0	1	0	4.00	0	8.00	10.00	0	0	
GUN-08	610	0	1	0	4.00	0	8.00	10.00	0	0	
GUN-08	621	0	1	0	4.00	0	8.00	10.00	0	0	
GUN-08	622	1	1	1	2.00	1	8.00	10.00	1	1	
GUN-08	623	1	1	1	2.00	1	8.00	10.00	1	1	
GUN-08	624	1	1	1	2.00	1	8.00	10.00	1	1	
GUN-08	628	0	1	0	4.00	0	8.00	10.00	0	0	
GUN-08	632	0	1	0	4.00	0	8.00	10.00	0	0	
GUN-08	633	0	1	0	4.00	0	8.00	10.00	0	0	
GUN-08	634	0	1	0	4.00	0	8.00	10.00	0	0	
GUN-08	639	abandoned									
GUN-08	640	0	1	0	4.00	0	8.00	10.00	0	0	
GUN-08	663	1	1	1	2.00	1	8.00	10.00	1	1	
GUN-08	665	1	1	1	1.50	1	5.25	Hinge	0	1	
GUN-08	666	couldn't locate well									
GUN-08	668	couldn't locate well									
GUN-08	669	couldn't locate well									
GUN-08	703	0	1	0	4.00	0	8.00	10.00	0	0	
GUN-08	704	0	1	0	4.00	0	8.00	10.00	0	0	
GUN-08	707	0	1	0	4.00	0	8.00	10.00	0	0	
GUN-08	708	0	1	0	4.00	0	8.00	10.00	0	0	
GUN-08	709	0	1	1	4.00	0	8.00	10.00	0	0	
GUN-08	711	0	1	1	4.00	0	8.00	10.00	0	0	
GUN-08	713	0	1	0	4.00	0	8.00	10.00	0	0	
GUN-08	714	0	1	0	4.00	0	8.00	10.00	0	0	
GUN-08	715	0	1	0	4.00	0	8.00	10.00	0	0	
GUN-08	717	0	1	0	4.00	0	8.00	10.00	0	0	
GUN-08	739	0	1	0	4.00	0	8.00	10.00	0	0	
SHP-01	600	0	0	0	1.25	0	0.00	0.00	0	0	Well point with galvanized threaded cap
SHP-01	601	0	0	0	1.25	0	0.00	0.00	0	0	Well point with galvanized threaded cap
SHP-01	602	0	0	0	1.25	0	0.00	0.00	0	0	Well point with galvanized threaded cap
SHP-01	603	0	0	0	1.25	0	0.00	0.00	0	0	Well point with galvanized threaded cap
SHP-01	604	0	0	0	1.25	0	0.00	0.00	0	0	Well point with galvanized threaded cap
SHP-01	605	0	0	0	1.25	0	0.00	0.00	0	0	Well point with galvanized threaded cap
SHP-01	606	0	0	0	1.25	0	0.00	0.00	0	0	Well point with galvanized threaded cap
SHP-01	607	0	0	0	1.25	0	0.00	0.00	0	0	Well point with galvanized threaded cap
SHP-01	608	0	1	0	4.00	0	8.00	10.00	0	0	
SHP-01	609	0	1	0	4.00	0	8.00	10.00	0	0	
SHP-01	610	1	1	1	4.00	0	8.00	10.00	0	0	Poured concrete pad around casing
SHP-01	611	1	1	1	4.00	0	8.00	10.00	0	0	Poured concrete pad around casing
SHP-01	612	0	1	0	4.00	0	8.00	10.00	0	0	
SHP-01	613	1	1	1	4.00	0	8.00	10.00	0	0	Poured concrete pad around casing
SHP-01	614	1	1	1	4.00	0	8.00	10.00	0	0	Poured concrete pad around casing

Well Repair and Abandonment

UMTRA Site	Location ID	New Locks	Exterior Label	Concrete Pad	Well Casing Diameter (inches)	New Protective Casing	Protective Casing Diameter (inches)	Cap Diameter (inches)	New Pin	New Cap	Remarks	
SHP-01	615	0	1	0	4.00	0	8.00	10.00	0	0		
SHP-01	616	1	1	1	4.00	0	8.00	10.00	0	0	Poured concrete pad around casing	
SHP-01	617	0	1	1	4.00	0	8.00	10.00	0	0	Poured concrete pad around casing	
SHP-01	618	0	1	0	4.00	0	8.00	10.00	0	0	Poured concrete pad around casing	
SHP-01	619	0	1	1	4.00	0	8.00	10.00	0	0	Poured concrete pad around casing	
SHP-01	620	0	1	0	4.00	0	8.00	10.00	0	0	Seal may need to be replaced in few years	
SHP-01	621	0	1	0	4.00	0	8.00	10.00	0	0	Seal may need to be replaced in few years	
SHP-01	622	0	1	0	4.00	0	8.00	10.00	0	0	Seal may need to be replaced in few years	
SHP-01	623	0	1	1	4.00	0	8.00	10.00	0	0	Poured concrete pad around casing	
SHP-01	624	0	1	0	4.00	0	8.00	10.00	0	0		
SHP-01	625	0	1	1	4.00	0	8.00	10.00	0	0	Poured concrete pad around casing	
SHP-01	626	2	1	0	4.00	0	8.00	10.00	0	0		
SHP-01	627	2	1	0	4.00	0	8.00	10.00	0	0		
SHP-01	628	2	1	0	4.00	0	8.00	10.00	0	0		
SHP-01	629	1	1	0	4.00	0	8.00	10.00	0	1		
SHP-01	630	1	1	0	4.00	0	8.00	10.00	0	0		
SHP-01	631	could not locate the monitoring					0				0	
SHP-01	632	could not locate the monitoring					0				0	
SHP-01	638	Could not locate well, may have been destroyed area; area has been									0	
SHP-01	639	1	1	0	2.00	0	0.00	2.25	0	0		
SHP-01	640	1	1	0	2.00	0	0.00	2.25	0	0		
SHP-01	641	Could not locate well; area is heavily brushed and near a low canal/										
SHP-01	642	1	1	0	2.00	0	0.00	2.25	0	0		
SHP-01	643	1	1	0	2.00	0	0.00	2.25	0	0		
SHP-01	644	1	1	0	2.00	0	0.00	2.25	0	0		
SHP-01	645	1	1	0	2.00	0	0.00	2.25	0	0		
SHP-01	646	1	1	0	2.00	0	0.00	2.25	0	0		
SHP-01	647	1	1	0	2.00	0	0.00	2.25	0	0		
SHP-02	UN-7	1	1	0	2.00	0	6.00	8.00	1	1		
SHP-02	UNMARKED	1	*	0	4.00	0	8.00	10.00	1	1	Not marked	
SHP-02	600	1	1	0	4.00	0	6.00	8.00	1	1		
SHP-02	601	1	1	0	4.00	0	6.00	8.00	1	1	Replaced slip cap on casing, labelled 607 on casing	
SHP-02	602	1	1	0	4.00	0	6.00	8.00	1	1		
SHP-02	603	1	1	0	2.00	0	6.00	8.00	1	1	Raised protective casing 1.0 feet	
RPO-01	581	1	1	1	4.00	0	6.00	8.00	1	1	Raised protective casing 12"; added 10" to 4"PVC	
RPO-01	582	1	1	1	4.00	0	6.00	8.00	1	1	Raised protective casing 14"; added 12" to 4"PVC	
RPO-01	583	1	1	1	4.00	1	6.00	8.00	1	1	Added 4" to 4"PVC	
RPO-01	595	1	1	1	2.00	1	6.00	8.00	1	1	no change in PVC height	
RPO-01	596	1	1	1	2.00	1	6.00	8.00	1	1	no change in PVC height	
RPO-01	594	Couldn't locate, 2"PVC laying on ground near approximate location										
RPO-01	593	1	1	1	2.00	1	6.00	8.00	1	1	Casing 10" high; 2"PVC is 5" above well; Needs to be re-sur	
RPO-01	622	0	1	0	4.00	0	8.00	10.00	0	0		
RPO-01	623	0	1	0	4.00	0	8.00	10.00	0	0		
RPO-01	586	1	1	1	4.00	0	6.00	8.00	1	1	Extended protective and PVC casing, did not have PVC cap or	
RPO-01	587	1	1	1	4.00	1	8.00	10.00	1	1	added 10" to 4"PVC	
RPO-01	588	1	1	1	4.00	0	6.00	8.00	1	1	Extended casing, did not have PVC cap or lock	

TERRACE

LOCATION TYPE SUMMARY REPORT
 MONITORING LOCATIONS AT SHIPROCK
 SITE: SHP01 SHIPROCK
 REPORT DATE: 04/20/95

LOCATION ID	NORTH COORDINATE (FT)	EAST COORDINATE (FT)	GROUND ELEVATION (FT MSL)	DATE ESTABLISHED	INSTALLED BY	LOCATION TYPE	LOCATION CROSS REFERENCE
0301	8998.1	10200.2	-	08/02/83	BDX	BH	
0302	9199.8	10000.0	-	08/02/83	BDX	BH	
0303	9399.7	9800.1	-	08/02/83	BDX	BH	
0304	9599.9	9600.0	-	08/02/83	BDX	BH	
0305	9398.0	9599.9	-	08/02/83	BDX	BH	
0306	9199.8	9799.7	-	08/02/83	BDX	BH	
0307	8998.1	-	-	08/02/83	BDX	BH	
0308	8797.9	10200.1	-	08/02/83	BDX	BH	
0309	8800.1	10000.0	-	08/02/83	BDX	BH	
0310	8998.1	9799.6	-	08/02/83	BDX	BH	
0311	9199.8	9579.8	-	08/02/83	BDX	BH	
0312	9297.4	9248.6	-	08/02/83	BDX	BH	
0313	9199.8	9399.6	-	08/02/83	BDX	BH	
0314	8998.1	9599.8	-	08/02/83	BDX	BH	
0315	8800.5	9797.6	-	08/02/83	BDX	BH	
0316	8600.1	10000.0	-	08/02/83	BDX	BH	
0317	8600.2	9797.6	-	08/02/83	BDX	BH	
0318	8400.5	9997.4	-	08/02/83	BDX	BH	
0320	8200.5	9987.7	-	08/02/83	BDX	BH	
0321	8200.3	9797.6	-	08/02/83	BDX	BH	
0322	8000.3	9792.9	-	08/02/83	BDX	BH	
0323	8000.3	9592.9	-	08/02/83	BDX	BH	
0324	7818.9	9796.6	-	08/02/83	BDX	BH	
0325	8000.3	9357.4	-	08/02/83	BDX	BH	
0326	7800.3	9572.9	-	08/02/83	BDX	BH	
0327	8000.3	9192.6	-	08/02/83	BDX	BH	
0329	7624.3	9583.2	-	08/02/83	BDX	BH	
0331	7803.3	9192.1	-	08/02/83	BDX	BH	
0332	7603.2	9172.1	-	08/02/83	BDX	BH	
0333	8004.3	8993.2	-	08/02/83	BDX	BH	
0334	8000.3	8793.0	-	08/02/83	BDX	BH	
0335	8204.3	8793.0	-	08/02/83	BDX	BH	
0336	8204.4	8793.1	-	08/02/83	BDX	BH	
0337	8204.3	8993.2	-	08/02/83	BDX	BH	
0338	8404.2	8993.2	-	08/02/83	BDX	BH	
0339	8404.4	8793.1	-	08/02/83	BDX	BH	
0340	8404.2	8593.3	-	08/02/83	BDX	BH	
0341	8604.6	8793.1	-	08/02/83	BDX	BH	
0342	8604.6	8993.2	-	08/02/83	BDX	BH	
0343	8804.4	8993.2	-	08/02/83	BDX	BH	
0344	8804.3	8793.1	-	08/02/83	BDX	BH	
0345	7403.6	9190.6	-	08/02/83	BDX	BH	
0346	7373.1	9392.2	-	08/02/83	BDX	BH	
0347	7203.6	9390.7	-	08/02/83	BDX	BH	
0348	7173.2	9592.2	-	08/02/83	BDX	BH	
0349	7003.6	9590.7	-	08/02/83	BDX	BH	
0350	6973.4	9792.0	-	08/02/83	BDX	BH	
0351	6803.6	9790.6	-	08/02/83	BDX	BH	
0352	6778.4	9991.9	-	08/02/83	BDX	BH	
0353	6603.6	9990.7	-	08/02/83	BDX	BH	
0354	6603.1	10142.2	-	08/02/83	BDX	BH	
0355	6403.6	10190.6	-	08/02/83	BDX	BH	
0356	6424.2	10392.2	-	08/02/83	BDX	BH	
0357	6200.3	10387.3	-	08/02/83	BDX	BH	
0358	6200.3	10587.3	-	08/02/83	BDX	BH	
0359	6003.2	10792.1	-	08/02/83	BDX	BH	
0360	6400.6	10587.6	-	08/02/83	BDX	BH	
0361	6200.3	10787.5	-	08/02/83	BDX	BH	
0362	6000.4	10987.4	-	08/02/83	BDX	BH	
0363	6400.6	10787.6	-	08/02/83	BDX	BH	
0364	6200.3	10987.5	-	08/02/83	BDX	BH	

FIELDS DISPLAYED AS DASHES INDICATE DATA IS UNAVAILABLE

LOCATION TYPE SUMMARY REPORT
 MONITORING LOCATIONS AT SHIPROCK
 SITE: SHP01 SHIPROCK
 REPORT DATE: 04/20/95

LOCATION ID	NORTH COORDINATE (FT)	EAST COORDINATE (FT)	GROUND ELEVATION (FT MSL)	DATE ESTABLISHED	INSTALLED BY	LOCATION TYPE	LOCATION CROSS REFERENCE
0365	6000.4	11167.4	-	08/02/83	BDX	BH	
0366	6600.1	10811.1	-	08/02/83	BDX	BH	
0367	6400.6	10987.6	-	08/02/83	BDX	BH	
0368	6200.3	11167.2	-	08/02/83	BDX	BH	
0369	6600.4	10987.4	-	08/02/83	BDX	BH	
0370	6400.6	11187.6	-	08/02/83	BDX	BH	
0371	6200.3	11264.5	-	08/02/83	BDX	BH	
0372	6800.5	11020.5	-	08/02/83	BDX	BH	
0373	6600.4	11187.4	-	08/02/83	BDX	BH	
0374	6397.0	11390.4	-	08/02/83	BDX	BH	
0375	6800.4	11187.4	-	08/02/83	BDX	BH	
0376	6596.9	11390.4	-	08/02/83	BDX	BH	
0377	6596.9	11390.4	-	08/02/83	BDX	BH	
0378	7000.4	11225.4	-	08/02/83	BDX	BH	
0379	6797.0	11390.4	-	08/02/83	BDX	BH	
0380	6597.9	11591.7	-	08/02/83	BDX	BH	
0381	6996.8	11390.4	-	08/02/83	BDX	BH	
0382	6797.9	11591.7	-	08/02/83	BDX	BH	
0383	7197.0	11390.4	-	08/02/83	BDX	BH	
0384	6997.9	11591.6	-	08/02/83	BDX	BH	
0385	7197.0	11590.6	-	08/02/83	BDX	BH	
0386	6998.8	11791.0	-	08/02/83	BDX	BH	
0387	7408.3	11587.3	-	08/02/83	BDX	BH	
0388	7197.0	11790.5	-	08/02/83	BDX	BH	
0389	7397.0	11790.5	-	08/02/83	BDX	BH	
0390	7197.0	11990.6	-	08/02/83	BDX	BH	
0391	8199.6	11800.4	-	08/02/83	BDX	BH	
0392	8400.2	11599.8	-	08/02/83	BDX	BH	
0393	8600.3	11599.8	-	08/02/83	BDX	BH	
0395	8800.1	11199.9	-	08/02/83	BDX	BH	
0425	-	-	-	-	-	SL	
0426	-	-	-	-	-	SL	
0501	7780.0	12270.0	-	05/19/86	SHB	SL	
0502	10250.0	11430.0	-	05/19/86	SHB	SL	
0503	11000.0	10000.0	-	05/19/86	SHB	SL	
0504	8880.0	11810.0	-	05/19/86	SHB	SL	
0505	9550.0	11530.0	-	05/19/86	SHB	SL	
0510	9643.0	9341.0	-	-	-	BH	
0511	9660.0	11010.0	-	05/19/86	SHB	SL	
0512	10300.0	11400.0	-	05/19/86	SHB	SL	
0513	10900.0	10000.0	-	05/19/86	SHB	SL	
0517	9526.0	9278.0	-	-	-	BH	
0518	9517.0	9012.0	-	-	-	BH	
0535	8791.0	8784.0	-	-	-	SL	
0546	-	-	-	-	-	BH	RESERVED FOR PMIDDLEBROOKS
0547	-	-	-	-	-	BH	RESERVED FOR PMIDDLEBROOKS
0548	-	-	-	-	-	BH	RESERVED FOR PMIDDLEBROOKS
0549	-	-	-	-	-	BH	RESERVED FOR PMIDDLEBROOKS
0550	-	-	-	03/18/87	SHB	SL	
0551	-	-	-	03/18/87	SHB	SL	
0552	-	-	-	03/18/87	SHB	SL	
0553	-	-	-	03/18/87	SHB	SL	
0554	-	-	-	03/18/87	SHB	SL	
0555	-	-	-	03/18/87	SHB	SL	
0556	-	-	-	-	-	SL	
0557	-	-	-	09/18/86	SHB	SL	
0558	-	-	-	09/17/86	SHB	SL	
0559	9149.0	8796.0	-	-	-	BH	
0560	-	-	-	09/17/86	SHB	SL	
0600	-	-	-	-	-	WL	
0601	10400.0	11250.0	4890.00	09/29/84	SHB	WL	

FIELDS DISPLAYED AS DASHES INDICATE DATA IS UNAVAILABLE

LOCATION TYPE SUMMARY REPORT
 MONITORING LOCATIONS AT SHIPROCK
 SITE: SHP01 SHIPROCK
 REPORT DATE: 04/20/95

LOCATION ID	NORTH COORDINATE (FT)	EAST COORDINATE (FT)	GROUND ELEVATION (FT MSL)	DATE ESTABLISHED	INSTALLED BY	LOCATION TYPE	LOCATION CROSS REFERENCE
0602	10140.0	10850.0	4890.00	09/29/84	SHB	WL	
0603	10300.0	10200.0	4888.00	09/29/84	SHB	WL	
0604	10720.0	9750.0	4888.00	09/29/84	SHB	WL	
0605	10117.0	9370.5	4898.77	10/17/84	SHB	WL	
0606	10446.1	9550.5	4887.67	10/17/84	SHB	WL	
0607	10160.0	10350.0	4888.00	10/17/84	SHB	WL	
0608	8642.0	11819.1	4892.74	08/29/85	KDC	WL	
0609	8656.6	11812.4	4892.59	08/29/85	KDC	WL	
0610	8893.0	11440.6	4893.95	08/30/85	KDC	WL	
0611	8899.2	11429.7	4894.05	09/03/85	KDC	WL	
0612	9192.1	11665.7	4892.90	09/04/85	KDC	WL	
0613	9196.3	11047.9	4891.88	09/04/85	KDC	WL	
0614	9189.4	11058.0	4891.83	09/04/85	KDC	WL	
0615	9744.7	10667.3	4890.96	09/06/85	KDC	WL	
0616	10213.5	11140.8	4890.78	09/05/85	KDC	WL	
0617	10140.6	10862.4	4890.35	09/05/85	KDC	WL	
0618	10138.1	10849.3	4890.13	09/05/85	KDC	WL	
0619	10524.1	10501.5	4891.02	09/06/85	KDC	WL	
0620	10162.2	10344.0	4888.36	08/27/85	KDC	WL	
0621	10161.7	10353.9	4888.50	08/28/85	KDC	WL	
0622	10160.5	10364.8	4888.70	08/28/85	KDC	WL	
0623	10610.8	10355.8	4889.86	09/07/85	KDC	WL	
0624	10598.4	10352.1	4889.60	09/07/85	KDC	WL	
0625	10586.5	10348.9	4889.89	09/07/85	KDC	WL	
0626	10524.9	10040.7	4888.76	09/08/85	KDC	WL	
0627	10725.9	9749.2	4887.84	09/08/85	KDC	WL	
0628	10716.5	9758.9	4888.37	09/09/85	KDC	WL	
0629	10558.8	9477.7	4886.18	09/09/85	KDC	WL	
0630	10547.5	9482.5	4886.24	09/09/85	KDC	WL	
0631	12355.1	9131.7	4889.55	09/11/85	KDC	WL	
0632	12343.9	9137.7	4889.56	09/11/85	KDC	WL	
0633	9589.5	9300.9	4915.99	10/04/85	SHB	WL	
0634	-	-	-	-	-	SL	
0635	-	-	-	-	-	SL	
0638	11976.10	9077.18	4882.17	03/11/87	SHB	WL	
0639	11927.74	10059.70	4886.26	03/11/87	SHB	WL	
0640	11641.31	8731.07	4881.37	03/11/87	SHB	WL	
0641	11109.44	9787.20	4884.21	03/11/87	SHB	WL	
0642	11574.93	10026.72	4883.87	03/11/87	SHB	WL	
0643	11637.55	9256.77	4882.73	03/11/87	SHB	WL	
0644	11338.35	10614.86	4884.97	03/11/87	SHB	WL	
0645	7879.14	12214.45	4898.70	03/11/87	SHB	WL	
0646	7818.68	12228.07	4898.63	03/11/87	SHB	WL	
0647	7756.05	12228.85	4898.02	03/11/87	SHB	WL	
0648	-	-	-	03/17/87	-	WL	
0650	-	-	-	03/11/87	SHB	BH	
0651	-	-	-	03/11/87	SHB	WL	
0652	-	-	-	03/11/87	SHB	WL	
0655	-	-	-	-	-	SL	RESERVED FOR CDAY
0656	-	-	-	-	-	SL	RESERVED FOR CDAY
0657	-	-	-	-	-	SL	RESERVED FOR CDAY
0658	-	-	-	-	-	SL	RESERVED FOR CDAY
0659	-	-	-	-	-	SL	RESERVED FOR CDAY
0660	-	-	-	-	-	SL	RESERVED FOR CDAY
0661	-	-	-	-	-	SL	RESERVED FOR CDAY
0662	-	-	-	-	-	BH	
0670	11752.44	10654.87	4889.40	01/19/88	NEN	WL	
0671	11621.37	10757.00	4889.49	01/19/88	NEN	WL	
0672	11032.52	11483.89	4891.50	01/19/88	NEN	WL	
0725	-	-	-	-	-	WL	RESERVED FOR PAUL MARTINEZ
0726	-	-	-	-	-	WL	RESERVED FOR PAUL MARTINEZ

FIELDS DISPLAYED AS DASHES INDICATE DATA IS UNAVAILABLE

LOCATION TYPE SUMMARY REPORT
 MONITORING LOCATIONS AT SHIPROCK
 SITE: SHP01 SHIPROCK
 REPORT DATE: 04/20/95

LOCATION ID	NORTH COORDINATE (FT)	EAST COORDINATE (FT)	GROUND ELEVATION (FT MSL)	DATE ESTABLISHED	INSTALLED BY	LOCATION TYPE	LOCATION CROSS REFERENCE
0727	-	-	-		-	WL	RESERVED FOR PAUL MARTINEZ
0728	-	-	-		-	WL	RESERVED FOR PAUL MARTINEZ
0729	-	-	-		-	BH	RESERVED FOR PAUL MARTINEZ
0730	-	-	-		-	WL	RESERVED FOR PAUL MARTINEZ
0731	-	-	-		-	WL	RESERVED FOR PAUL MARTINEZ
0732	-	-	-		-	WL	RESERVED FOR PAUL MARTINEZ
0733	-	-	-		-	WL	RESERVED FOR PAUL MARTINEZ
0734	-	-	-		-	WL	RESERVED FOR PAUL MARTINEZ
0735	-	-	-		-	WL	RESERVED FOR PAUL MARTINEZ
0736	-	-	-		-	WL	RESERVED FOR PAUL MARTINEZ
0737	-	-	-		-	BH	RESERVED FOR PAUL MARTINEZ
0738	-	-	-		-	BH	RESERVED FOR PAUL MARTINEZ
0739	-	-	-		-	BH	RESERVED FOR PAUL MARTINEZ
0740	-	-	-		-	BH	RESERVED FOR PAUL MARTINEZ
0741	-	-	-		-	BH	RESERVED FOR PAUL MARTINEZ
0742	-	-	-		-	BH	RESERVED FOR PAUL MARTINEZ
0743	-	-	-		-	BH	RESERVED FOR PAUL MARTINEZ
0744	-	-	-		-	BH	RESERVED FOR PAUL MARTINEZ
0745	-	-	-		-	BH	RESERVED FOR PAUL MARTINEZ
0746	-	-	-		-	BH	RESERVED FOR PAUL MARTINEZ
0747	-	-	-		-	BH	RESERVED FOR PAUL MARTINEZ
0748	-	-	-		-	BH	RESERVED FOR PAUL MARTINEZ
0749	-	-	-		-	BH	RESERVED FOR PAUL MARTINEZ
0750	-	-	-		-	BH	RESERVED FOR PAUL MARTINEZ
0999	-	-	-		-	BH	RESERVED FOR PAUL MARTINEZ

FIELDS DISPLAYED AS DASHES INDICATE DATA IS UNAVAILABLE

DATA FILE: \DART\SHPO1\MLC10000.DAT

LOCATION TYPE SUMMARY REPORT
 MONITORING LOCATIONS AT SHIPROCK
 SITE: SHPO2 SHIPROCK (TAILINGS AREA)
 REPORT DATE: 04/20/95

LOCATION ID	NORTH COORDINATE (FT)	EAST COORDINATE (FT)	GROUND ELEVATION (FT MSL)	DATE ESTABLISHED	INSTALLED BY	LOCATION TYPE	LOCATION CROSS REFERENCE
0600	-	-	-	-	-	WL	
0601	-	-	-	-	-	WL	
0602	-	-	-	-	-	WL	
0603	-	-	-	-	-	WL	
0649	-	-	-	-	-	BH	
0651	-	-	-	-	-	BH	
0662	-	-	-	-	-	SL	RESERVED FOR CDAY
0700	7756.05	12228.5	4898.02	03/24/93	JEG	TP	RESERVED FOR AGROFFMAN
0701	8642.0	11819.1	4892.74	03/24/93	JEG	TP	RESERVED FOR AGROFFMAN
0702	8893.0	11440.6	4893.95	03/24/93	JEG	TP	RESERVED FOR AGROFFMAN
0703	9192.1	11665.7	4892.9	03/24/93	JEG	TP	RESERVED FOR AGROFFMAN
0704	9189.4	11058.0	4891.83	03/24/93	JEG	TP	RESERVED FOR AGROFFMAN
0705	9744.7	10667.3	4890.96	03/24/93	JEG	TP	RESERVED FOR AGROFFMAN
0706	10213.5	11140.8	4890.73	03/24/93	JEG	TP	RESERVED FOR AGROFFMAN
0707	10586.5	10348.9	4889.89	03/24/93	JEG	TP	RESERVED FOR AGROFFMAN
0708	11574.93	10026.72	4883.87	03/24/93	JEG	TP	RESERVED FOR AGROFFMAN
0709	11641.31	8731.07	4881.37	03/24/93	JEG	TP	RESERVED FOR AGROFFMAN
0710	7756	13000.0	4898.02	03/25/93	JEG	TP	RESERVED FOR AGROFFMAN
0711	10400.0	9600.0	4898.0	03/25/93	JEG	TP	RESERVED FOR AGROFFMAN
0712	-	-	-	-	-	BH	RESERVED FOR AGROFFMAN
0713	-	-	-	-	-	BH	RESERVED FOR AGROFFMAN
0714	-	-	-	-	-	BH	RESERVED FOR AGROFFMAN
0715	-	-	-	-	-	BH	RESERVED FOR AGROFFMAN
0716	-	-	-	-	-	BH	RESERVED FOR AGROFFMAN
0717	-	-	-	-	-	BH	RESERVED FOR AGROFFMAN
0718	-	-	-	-	-	BH	RESERVED FOR AGROFFMAN
0719	-	-	-	-	-	BH	RESERVED FOR AGROFFMAN
0720	-	-	-	-	-	BH	RESERVED FOR AGROFFMAN
0721	-	-	-	-	-	BH	RESERVED FOR AGROFFMAN
0722	-	-	-	-	-	BH	RESERVED FOR AGROFFMAN
0723	-	-	-	-	-	BH	RESERVED FOR AGROFFMAN
0724	-	-	-	-	-	BH	RESERVED FOR AGROFFMAN
0725	-	-	-	-	-	WL	RESERVED FOR PAUL MARTINEZ
0726	-	-	-	-	-	WL	RESERVED FOR PAUL MARTINEZ
0727	-	-	-	-	-	WL	RESERVED FOR PAUL MARTINEZ
0728	-	-	-	-	-	WL	RESERVED FOR PAUL MARTINEZ
0729	-	-	-	-	-	BH	RESERVED FOR PAUL MARTINEZ
0730	-	-	-	-	-	WL	RESERVED FOR PAUL MARTINEZ
0731	-	-	-	-	-	WL	RESERVED FOR PAUL MARTINEZ
0732	-	-	-	-	-	BH	RESERVED FOR PAUL MARTINEZ
0733	-	-	-	-	-	BH	RESERVED FOR PAUL MARTINEZ
0734	-	-	-	-	-	BH	RESERVED FOR PAUL MARTINEZ
0735	-	-	-	-	-	BH	RESERVED FOR PAUL MARTINEZ
0736	-	-	-	-	-	BH	RESERVED FOR PAUL MARTINEZ
0737	-	-	-	-	-	BH	RESERVED FOR PAUL MARTINEZ
0738	-	-	-	-	-	BH	RESERVED FOR PAUL MARTINEZ
0739	-	-	-	-	-	BH	RESERVED FOR PAUL MARTINEZ
0740	-	-	-	-	-	BH	RESERVED FOR PAUL MARTINEZ
0741	-	-	-	-	-	BH	RESERVED FOR PAUL MARTINEZ
0742	-	-	-	-	-	BH	RESERVED FOR PAUL MARTINEZ
0743	-	-	-	-	-	BH	RESERVED FOR PAUL MARTINEZ
0744	-	-	-	-	-	BH	RESERVED FOR PAUL MARTINEZ
0745	-	-	-	-	-	BH	RESERVED FOR PAUL MARTINEZ
0746	-	-	-	-	-	BH	RESERVED FOR PAUL MARTINEZ
0747	-	-	-	-	-	BH	RESERVED FOR PAUL MARTINEZ
0748	-	-	-	-	-	BH	RESERVED FOR PAUL MARTINEZ
0749	-	-	-	-	-	BH	RESERVED FOR PAUL MARTINEZ
0750	-	-	-	-	-	BH	RESERVED FOR PAUL MARTINEZ
0761	-	-	-	-	-	BH	RESERVED FOR BTOTH
0762	-	-	-	-	-	BH	RESERVED FOR BTOTH
0999	-	-	-	-	-	BH	

FIELDS DISPLAYED AS DASHES INDICATE DATA IS UNAVAILABLE

LOCATION TYPE SUMMARY REPORT
MONITORING LOCATIONS AT SHIPROCK
SITE: SHP02 SHIPROCK (TAILINGS AREA)
REPORT DATE: 04/20/95

LOCATION ID	NORTH COORDINATE (FT)	EAST COORDINATE (FT)	GROUND ELEVATION (FT MSL)	DATE ESTABLISHED	INSTALLED BY	LOCATION TYPE	LOCATION CROSS REFERENCE

DATA FILE: \DART\SHPO2\MLC10000.DAT

JOB NO. SHP01 DATE 03/28/93 TOTAL DEPTH 40.0 feet
 SURFACE ELEVATION 4937.98 RIG TYPE ODEX, IR, TH-60
 TOP OF FILTER PACK 15.75 BORING TYPE ODEX ROTARY AIR
 WELL CASING TYPE 2.0-IN. SCHED. 40 PVC LOCATION N 9648.97 E 9075.03
 COMPLETION ALLUVIUM. DATUM MSL

Depth	Well Con.	Remarks	Lithology	USCS	Visual Classification
0		Installed 2-in. PVC well to 39.25 ft. Steel casing set to 3 feet. Grout seal placed to 7.75 feet.		GP	ALLUVIUM: SAND AND GRAVEL, some silt, poorly graded with gravel to 2-in., occasional cobbles, subrounded, nonplastic, brown.
5		Bentonite chip seal placed from 7.75 to 15.75 feet.			
10				CL	MANCOS SHALE FM.: SHALE, soft, weathered, tan to grey. Note: Becoming mod. hard, and light grey at 14 feet. Note: Moist zone, after drilling observed seepage from this zone from 17 feet down. Note: Occasional seam of brown shale from 20 feet.
15					
20		Filter pack placed from 15.7 to 40 feet.			
25					
30		Prepacked well screen, .050-in. slot, set from 27.2 to 37.2 ft.			Note: Shale becoming mod. hard to hard at 30 feet.
35					
40		Two ft. sump placed from 37.2 to 39.2 ft.			
40					TD AT 40 FEET.
45		Well developed with pump to 5 NTU.			
50					

GROUNDWATER		
DEPTH	HOUR	DATE

JOB NO. SHP01 DATE 03/25/93 TOTAL DEPTH 15.0 feet
 SURFACE ELEVATION 4888.24 RIG TYPE ODEX, IR, TH-60
 TOP OF FILTER PACK 4.00 BORING TYPE ODEX ROTARY AIR
 WELL CASING TYPE 2.0-IN. SCHED. 40 PVC LOCATION N 12084.40 E 9657.68
 COMPLETION ALLUVIUM. DATUM MSL

Depth	Well Con.	Remarks	Lithology	USCS	Visual Classification		
0		Installed 2-in. PVC well to 13.5 ft.		GM	ALLUVIUM: SILTY SAND AND GRAVEL, poorly graded to 1-in., nonplastic, subrounded, brown.		
5		Steel casing set to 3 feet.					
		Grout seal placed to 2 feet.					
		Bentonite chip seal placed from 2 to 4.0 feet.					
10		Filter pack placed from 4.0 to 13.5 feet.					
		Prepacked well screen, .050-in. slot, set from 6.5 to 11.5 ft.					
15					GP	SILTY GRAVEL, with cobbles, poorly graded, nonplastic, brown.	
				Two ft. sump placed from 11.5 to 13.5 ft.			TD AT 15 FEET. Note: severe caving from 11 feet.
20				Cave-in fill from 13.5 to 15 feet.			
25				Well developed to 3 NTU.			
30							
35							
40							
45							
50							

GROUNDWATER		
DEPTH	HOUR	DATE

JOB NO. SHP01, DATE 03/29/93 TOTAL DEPTH 19.0 feet
 SURFACE ELEVATION 4897.31 RIG TYPE ODEX, IR, TH-60
 TOP OF FILTER PACK 4.50 BORING TYPE ODEX ROTARY AIR
 WELL CASING TYPE 2.0-IN. SCHED. 40 PVC LOCATION N 6837.70 E 12746.52
 COMPLETION ALLUVIUM. DATUM MSL

Depth	Well Con.	Remarks	Lithology	USCS	Visual Classification	
0		Installed 2-in. PVC well to 19 ft.		GM	ALLUVIUM: SILTY SAND AND GRAVEL, poorly graded gravel to 3/4-in., nonplastic, brown. Note: Occ. boulders to 8-in., subrounded.	
5		Steel casing set to 5 feet. Grout seal placed to 2 feet. Bentonite chip seal placed from 2 to 4.5 feet.				
10		Filter pack placed from 4.5 to 19 feet.				
15		Prepacked well screen, .050-in. slot, set from 7 to 17 ft.		CL	MANCOS SHALE FM.: SHALE, soft, weathered, brown to grey. Note: formation appears to be dry from contact.	
17		Two ft. sump placed from 17 to 19 ft.				
20						TD AT 19 FEET.
25				Well developed by FTR.		
30						
35						
40						
45						
50						

GROUNDWATER		
DEPTH	HOUR	DATE

JOB NO. SHP01, DATE 03/24/93
 SURFACE ELEVATION 4969.89
 TOP OF FILTER PACK 17.00
 WELL CASING TYPE 2.0-IN. SCHED. 40 PVC
 COMPLETION ALLUVIUM.

TOTAL DEPTH 29.0 feet
 RIG TYPE ODEX, IR, TH-60
 BORING TYPE ODEX ROTARY AIR
 LOCATION N 5485.08 E 11507.42
 DATUM MSL

Depth	Well Con.	Remarks	Lithology	USCS	Visual Classification
0		Installed 2-in. PVC well to 29 ft. Steel casing set to 5 feet.		GW	ALLUVIUM: SAND, GRAVEL AND COBBLES, with boulders to 8-in., some silt, nonplastic, subrounded, light brown. Note: Occasional thin sand seam. Note: possible cemented seam from 16 to 18 feet? Note: Moist from 19 to 25 feet.
5	Grout seal placed to 5 feet.				
10	Bentonite chip seal placed from 5 to 10 feet.				
15	Filter pack placed from 17 to 29 feet.				
20	Prepacked well screen, .050-in. slot, set from 17 to 27 ft.				
25	Two ft. sump placed from 27 to 29 ft.		CL	MANCOS SHALE FM.: SHALE, very weathered, brown to grey. Note: Moist zone from contact at 23 to 26. Becoming dry below 26 ft.	
30					TD AT 29 FEET.
35		Well developed by FTR.			
40					
45					
50					

GROUNDWATER		
DEPTH	HOUR	DATE

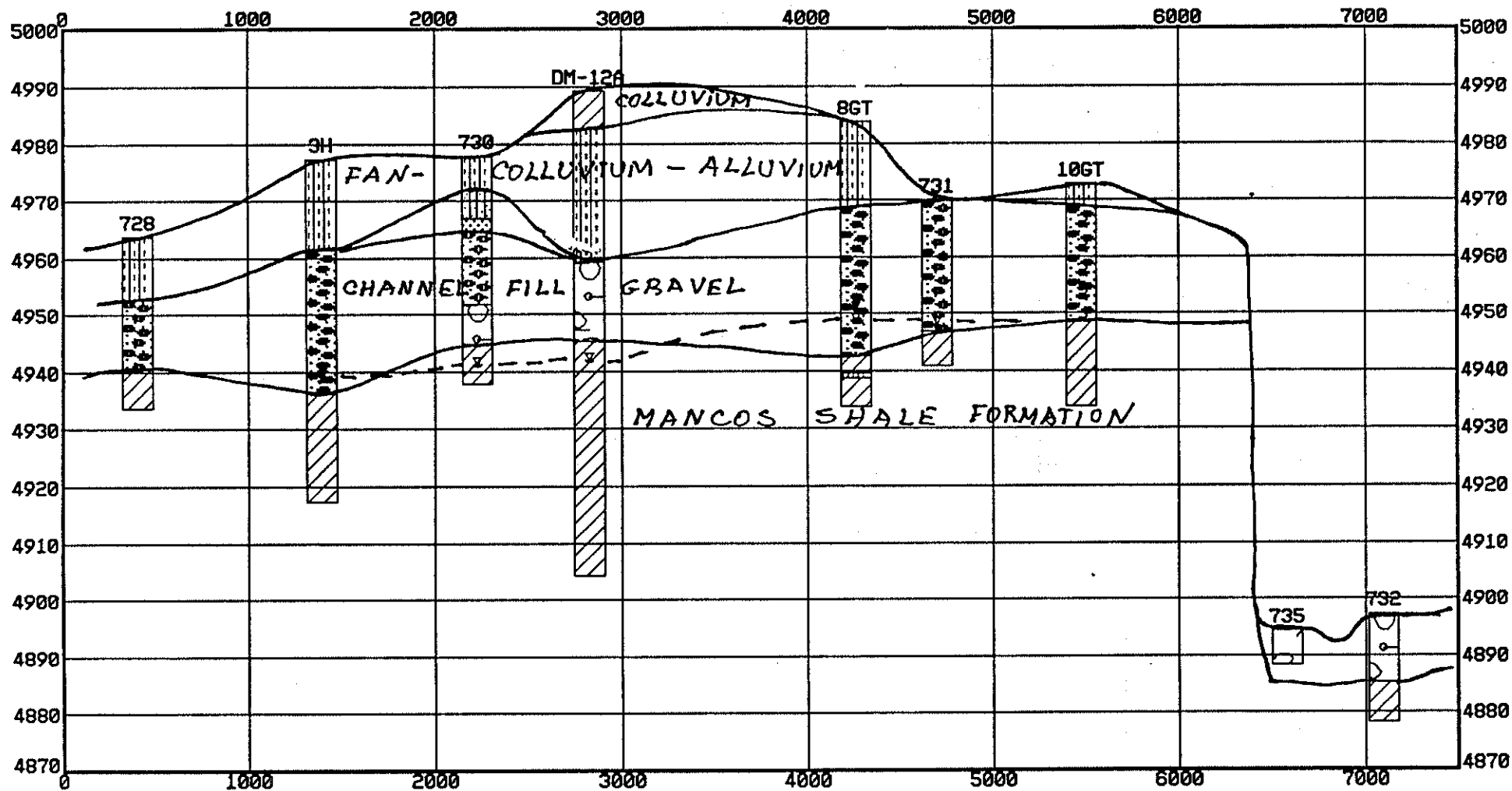
JOB NO. SHP01 DATE 03/26/93
 SURFACE ELEVATION 4977.78
 TOP OF FILTER PACK 25.00
 WELL CASING TYPE 2.0-IN. SCHED. 40 PVC
 COMPLETION ALLUVIUM

TOTAL DEPTH 40.0 feet
 RIG TYPE ODEX, IR, TH-60
 BORING TYPE ODEX ROTARY AIR
 LOCATION N 6629.21 E 9608.98
 DATUM MSL

Depth	Well Con.	Remarks	Lithology	USCS	Visual Classification
0		Installed 2-in. PVC well to 39 ft. Steel casing set to 5 feet.		ML	ALLUVIUM: CLAYEY SILT, low plasticity, tan.
5				SM	SILTY SAND, fine, nonplastic, tan.
10		Grout seal placed to 10 feet.		SP	SAND, fine, with fine gravel, some silt, nonplastic, tan.
15		Bentonite chip seal placed from 10 to 25 feet.		GW	SAND AND GRAVEL, well graded to 2-in., some silt, occasional cobbles, subrounded, nonplastic, tan.
20					
25		Filter pack placed from 25 to 40 feet.		GM	SILTY SAND AND GRAVEL, with cobbles, poorly graded, occ. boulder to 10-in., subrounded, nonplastic, tan.
30		Prepacked well screen, .050-in. slot, set from 27 to 37 ft.			Note: Becoming moist at 31 ft.
35				CL	MANCOS SHALE FM.: SHALE, soft, weatherd, brown to grey. Note: Only the upper 1 foot of contact is moist. becomes drier with depth.
40		Two ft. sump placed from 37 to 39 ft.			TD AT 40 FEET.
45		Well bailed dry and unable to develop. Added water not recovered			
50					

GROUNDWATER

DEPTH	HOUR	DATE



Borehole	North	East	Elev.	Depth
10GT	6259.2	11610.8	4972.8	39.0
3H	6800.9	8789.5	4977.3	60.0
728	7737.0	8466.1	4963.7	30.0
730	6629.2	9609.0	4977.8	40.0
731	5485.1	11507.4	4969.9	29.0
732	6837.7	12746.5	4897.3	19.0
735	7113.8	12306.3	4894.3	6.0
8GT	5500.8	11074.6	4983.7	50.0
DM-12A	6050.0	9750.0	4989.2	85.0

DISTANCES:

Beginning 0.0
Ending 7500.0

VIEWING ANGLES (degrees):

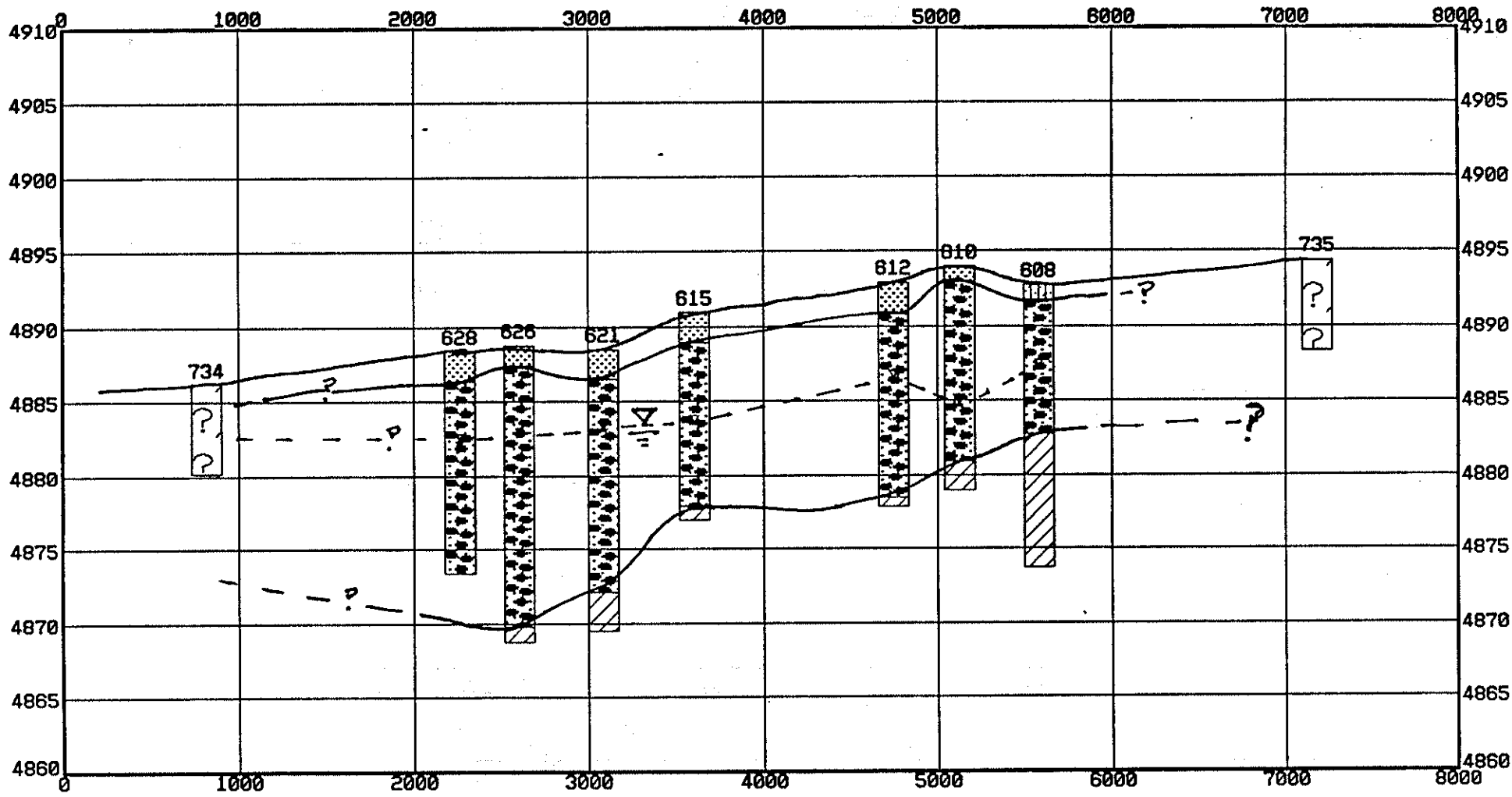
Horizontal 0.0
Vertical 0.0

Position	North	East
Left, Front	7736.95	8466.14
Right, Front	7707.70	12746.52
Left, Back		
Right, Back		

SUBSURFACE FENCE DIAGRAM :UPGRAD. WELLS

SHIPROCK SITE, NM

PROJECT #	DATE	PLATE
SHP01,	APR 93	1



Borehole	North	East	Elev.	Depth
608	8642.0	11819.1	4892.7	19.0
610	8893.0	11440.6	4894.0	15.0
612	9192.1	11665.7	4892.9	15.0
615	9744.7	10667.3	4891.0	14.0
621	10161.7	10353.9	4888.5	19.0
626	10524.9	10040.7	4888.8	20.0
628	10716.5	9758.9	4888.4	15.0
734	11700.2	8702.7	4886.2	6.0
735	7113.8	12306.3	4894.3	6.0

DISTANCES:
 Beginning 0.0
 Ending 8000.0

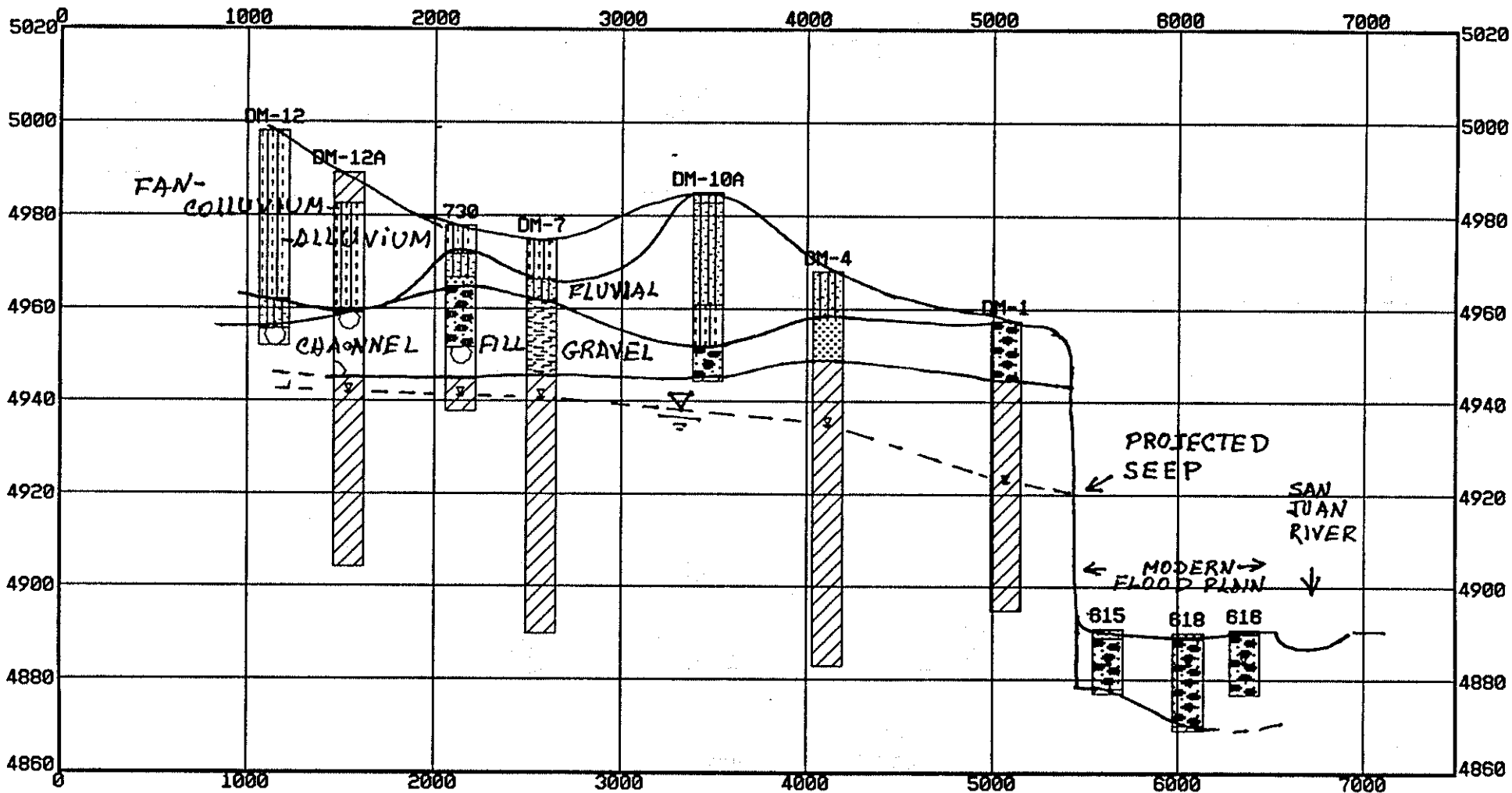
VIEWING ANGLES (degrees):
 Horizontal 0.0
 Vertical 0.0

Position	North	East
Left, Front	1700.20	8702.66
Right, Front	7113.77	12306.33
Left, Back		
Right, Back		

SUBSURFACE FENCE DIAGRAM : FLOOD PLAIN WELLS

SHIPROCK SITE, NM

PROJECT #	DATE	PLATE
SHP01,	APR 93	1



Borehole	North	East	Elev.	Depth
615	9744.7	10687.3	4891.0	14.0
616	10213.5	11140.8	4890.8	14.0
618	10138.1	10849.3	4890.1	21.0
730	6629.2	9609.0	4977.8	40.0
DM-1	9199.0	10761.0	4957.5	62.7
DM-10A	7640.0	10380.0	4985.0	40.7
DM-12	5666.0	9657.0	4998.0	46.0
DM-12A	6050.0	9750.0	4989.2	85.0
DM-4	8273.0	10519.0	4968.0	85.3
DM-7	6844.0	9987.0	4974.8	85.1

DISTANCES:
 Beginning 0.0
 Ending 7500.0
 VIEWING ANGLES (degrees):
 Horizontal 0.0
 Vertical 0.0

Position	North	East
Left, Front	5666.00	9657.00
Right, Front	10213.54	11140.82
Left, Back		
Right, Back		

SUBSURFACE FENCE DIAGRAM :CELL AREA

SHIPROCK SITE, NM

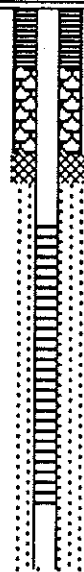
PROJECT #	DATE	PLATE
SHP01,	APR 93	1

JOB NO. <u>SHP01</u>	DATE <u>03/27/93</u>	TOTAL DEPTH <u>19.0 feet</u>
SURFACE ELEVATION <u>4938.79</u>	RIG TYPE <u>ODEX, IR, TH-60</u>	
TOP OF FILTER PACK <u>5.50</u>	BORING TYPE <u>ODEX ROTARY AIR</u>	
WELL CASING TYPE <u>2.0-IN. SCHED. 40 PVC</u>	LOCATION <u>N 8915.41 E 8780.14</u>	
COMPLETION <u>ALLUVIUM.</u>	DATUM <u>MSL</u>	

Depth	Well Con.	Remarks	Lithology	USCS	Visual Classification
0		Installed 2-in. PVC well to 18.7 ft.		CL	ALLUVIUM: SILTY CLAY, medium plasticity, tan.
5		Steel casing set to 3 feet. Grout seal placed to 2.5 feet. Bentonite chip seal placed from 2.5 to 5.5 feet.		GP	SAND, GRAVEL AND COBBLES, poorly graded, cobbles size to 8-in. some silt, subrounded, nonplastic, tan.
10		Filter pack placed from 5.5 to 19 feet. Prepacked well screen, .050-in. slot, set from 6.7 to 16.7 ft.	CL		MANCOS SHALE FM.: SHALE, soft, weathered, tan to grey.
15		Two ft. sump placed from 16.7 to 18.7 ft.			Note: Becoming slightly weathered, mod. soft, and light grey at 15 feet.
20					Note: No moist conditions observed during drilling. Perched zone may be very thin. TD AT 19 FEET.
25		Well developed with pump to 5 NTU.			
30					
35					
40					
45					
50					

GROUNDWATER		
DEPTH	HOUR	DATE

JOB NO. <u>SHP01</u>	DATE <u>03/28/93</u>	TOTAL DEPTH <u>20.0 feet</u>
SURFACE ELEVATION <u>4906.40</u>	RIG TYPE <u>ODEX,IR,TH-60</u>	
TOP OF FILTER PACK <u>6.00</u>	BORING TYPE <u>ODEX ROTARY AIR</u>	
WELL CASING TYPE <u>2.0-IN.SCHED.40 PVC</u>	LOCATION <u>N 10207.42 E 9292.16</u>	
COMPLETION <u>ALLUVIUM.</u>	DATUM <u>MSL</u>	

Depth	Well Con.	Remarks	Lithology	USCS	Visual Classification
0		Installed 2-in. PVC well to 19.5 ft.		GC	ALLUVIUM: CLAYEY SAND AND GRAVEL, gravel poorly graded to 1-in., occasional cobbles, low to medium plasticity, brown.
5		Steel casing set to 3 feet. Grout seal placed to 2 feet. Bentonite chip seal placed from 2 to 6 feet. Prepacked well screen, .050-in. slot, set from 7.5 to 17.5 ft. Filter pack placed from 6 to 20 feet.		SM	SILTY SAND, very fine, some fine gravel, nonplastic, brown. Note: occ. seams of sandy silt.
10					
15				GM	SILTY GRAVEL AND COBBLES, poorly graded with cobbles to 6-in., ubrounded, nonplastic, brown.
		Two ft. sump placed from 17.5 to 19.5 ft.		CL	MANCOS SHALE FM.: SHALE, soft, weathered, brown to grey.
20					TD AT 20 FEET.
25		Well developed with pump to 4 NTU.			
30					
35					
40					
45					
50					

GROUNDWATER		
DEPTH	HOUR	DATE

JOB NO. SHP01 DATE 03/26/93
 SURFACE ELEVATION 4963.70
 TOP OF FILTER PACK 14.00
 WELL CASING TYPE 2.0-IN. SCHED. 40 PVC
 COMPLETION ALLUVIUM.

TOTAL DEPTH 30.0 feet
 RIG TYPE ODEX, IR, TH-60
 BORING TYPE ODEX ROTARY AIR
 LOCATION N 7736.95 E 8466.14
 DATUM MSL

Depth	Well Con.	Remarks	Lithology	USCS	Visual Classification
0		Installed 2-in. PVC well to 29 ft. Steel casing set to 3 feet. Grout seal placed to 7.0 feet.		ML	ALLUVIUM: CLAYEY SILT, low to med. plasticity, brown. Note: moist to 6 feet.
5					
10		Bentonite chip seal placed from 7.0 to 14.0 feet.			
15		Filter pack placed from 14 to 30 feet.		GW	SAND, GRAVEL AND COBBLES, well graded to 6-in., occasional boulder to 10-in., some silt, subrounded, nonplastic, tan.
20		Prepacked well screen, .050-in. slot, set from 17 to 27 ft.			
25				CL	MANCOS SHALE FM.: SHALE, soft, weathered, grey. Note: Moist at contact, then becoming drier with depth. Note: Dry.
30		Two ft. sump placed from 27 to 29 ft.			TD AT 30 FEET.
35		Well developed with pump to 5 NTU.			
40					
45					
50					

GROUNDWATER

DEPTH	HOUR	DATE

JOB NO. SHP01 DATE 09/07/85
 SURFACE ELEVATION 4889.57
 TOP OF FILTER PACK 12.00
 WELL CASING TYPE 4.0-IN. SCHED. 40 PVC
 COMPLETION ALLUVIUM

TOTAL DEPTH 29.0 feet
 RIG TYPE GARDNER-DENVER
 BORING TYPE ROTARY MUD
 LOCATION N 10598.41 E 10352.08
 DATUM MSL

Depth	Well Con.	Remarks	Lithology	USCS	Visual Classification
0		Placed steel protective casing to 2.0 feet.		SP	ALLUVIUM: SAND, little to some silt, fine to medium, occasional gravel, nonplastic, light brown.
5					
10		Installed bentonite/cement grout to 10 feet		GP	SANDY GRAVEL , with cobbles, poorly graded, occasional boulder size, subrounded, nonplastic, brown to grey.
15		Placed bentonite pellet seal from 10 to 12 feet.			
20		Installed 8-12 sand filter pack from 12 to 22 ft.			
25		Placed .050-in slot well screen from 15 to 20 ft.		CL	MANCOS SHALE FORMATION: SHALE, soft, grey.
30		Placed two foot sump from 20 to 22 ft.			
35					
40					
45					
50					
		Cave-in fill material from 22 to 29 ft.			TD AT 24 FEET.

GROUNDWATER

DEPTH	HOUR	DATE
7.1	12:30	10-03-85

PROJECT SHIPROCK SITE, NM

LOG OF WELL BORING NO. 625

JOB NO. SHP01, DATE 09/07/85 TOTAL DEPTH 17.0 feet
 SURFACE ELEVATION 4889.89 RIG TYPE GARDNER-DENVER
 TOP OF FILTER PACK 3.50 BORING TYPE ROTARY MUD
 WELL CASING TYPE 4.0-IN.SCHED. 40 PVC LOCATION N 10586.48 E 10348.87
 COMPLETION ALLUVIUM DATUM MSL

Depth	Well Con.	Remarks	Lithology	USCS	Visual Classification	
0		Placed steel protective casing to 2.0 feet. Installed bentonite/cement grout to 2.0 feet Placed bentonite pellet seal from 2 to 3.5 feet. Installed 8-12 sand filter pack from 3.5 to 11.5 ft. Placed .050-in slot well screen from 4.5 to 9.5 ft. Placed two foot sump from 9.5 to 11.5 ft. Cave-in fill material from 11.5 to 17 ft.		SP	ALLUVIUM: SAND, little to some silt, fine to medium, occasional gravel, nonplastic, light brown.	
5				GP		SANDY GRAVEL , with cobbles, poorly graded, occasional boulder size, subrounded, nonplastic, brown to grey.
10						
15						
20						
25						
30						
35						
40						
45						
50						

GROUNDWATER		
DEPTH	HOUR	DATE
7.1	11:00	10-03-85

JEG TAC TEAM

PROJECT SHIPROCK SITE, NM

LOG OF WELL BORING NO. 626

JOB NO. SHP01 DATE 09/08/85 TOTAL DEPTH 20.0 feet
 SURFACE ELEVATION 4888.76 RIG TYPE GARDNER-DENVER
 TOP OF FILTER PACK 7.00 BORING TYPE ROTARY MUD
 WELL CASING TYPE 4.0-IN. SCHED. 40 PVC LOCATION N 10524.93 E 10040.71
 COMPLETION ALLUVIUM DATUM MSL

Depth	Well Con.	Remarks	Lithology	USCS	Visual Classification
0		Placed steel protective casing to 2.0 feet.		SP	ALLUVIUM: SAND, little to some silt, fine to medium, occasional gravel, nonplastic, light brown.
5		Installed bentonite/cement grout to 5.0 feet		GP	
7		Placed bentonite pellet seal from 5 to 7 feet.			SANDY GRAVEL , with cobbles, poorly graded, occasional boulder size, subrounded, nonplastic, brown to grey.
8		Installed 8-12 sand filter pack from 7 to 16.5 ft.			
9.5		Placed .050-in slot well screen from 9.5 to 14.5 ft.			
14.5		Placed two foot sump from 14.5 to 16.5 ft.			
16.5		Cave-in fill material from 16.5 to 20 ft.			
20				CL	MANCOS SHALE FORMATION: SHALE, soft, grey. TD AT 20 FEET.
25					
30					
35					
40					
45					
50					

GROUNDWATER		
DEPTH	HOUR	DATE
6.0	15:30	10-03-85

PROJECT SHIPROCK SITE, NM

LOG OF WELL BORING NO. 627

JOB NO. SHP01 DATE 09/08/85 TOTAL DEPTH 20.0 feet
 SURFACE ELEVATION 4887.84 RIG TYPE GARDNER-DENVER
 TOP OF FILTER PACK 6.00 BORING TYPE ROTARY MUD
 WELL CASING TYPE 4.0-IN. SCHED. 40 PVC LOCATION N 10725.88 E 9749.24
 COMPLETION ALLUVIUM DATUM MSL

Depth	Well Con.	Remarks	Lithology	USCS	Visual Classification
0				SP	ALLUVIUM: SAND, little to some silt, fine to medium, occasional gravel, nonplastic, light brown.
		Placed steel protective casing to 2.0 feet. Installed bentonite/cement grout to 4.0 feet		GP	
5		Placed bentonite pellet seal from 4 to 6 feet. Installed 8-12 sand filter pack from 6 to 15 ft.			SANDY GRAVEL , with cobbles, poorly graded, occasional boulder size, subrounded, nonplastic, brown to grey.
10		Placed .050-in slot well screen from 8 to 13 ft.			
15		Placed two foot sump from 13 to 15 ft.			
20		Cave-in fill material from 15 to 20 ft.		CL	MANCOS SHALE FORMATION: SHALE, soft, grey.
25					TD AT 20 FEET.
30					
35					
40					
45					
50					

GROUNDWATER

DEPTH	HOUR	DATE
5.5	17:05	10-03-85

JEG TAC TEAM

JOB NO. SHP01 DATE 09/09/85 TOTAL DEPTH 15.0 feet
 SURFACE ELEVATION 4888.37 RIG TYPE GARDNER-DENVER
 TOP OF FILTER PACK 3.50 BORING TYPE ROTARY MUD
 WELL CASING TYPE 4.0-IN. SCHED. 40 PVC LOCATION N 10716.54 E 9758.94
 COMPLETION ALLUVIUM DATUM MSL

Depth	Well Con.	Remarks	Lithology	USCS	Visual Classification			
0		Placed steel protective casing to 2.0 feet. Installed bentonite/cement grout to 2.0 feet Placed bentonite pellet seal from 2 to 3.5 feet. Installed 8-12 sand filter pack from 3.5 to 12 ft. Placed .050-in slot well screen from 6 to 10 ft. Placed two foot sump from 10 to 12 ft. Cave-in fill material from 12 to 15 ft.		SP	ALLUVIUM: SAND, little to some silt, fine to medium, occasional gravel, nonplastic, light brown.			
				GP		SANDY GRAVEL , with cobbles, poorly graded, occasional boulder size, subrounded, nonplastic, brown to grey.		
5								
10								
15								TD AT 15 FEET.
20								
25								
30								
35								
40								
45								
50								

GROUNDWATER

DEPTH	HOUR	DATE
6.0	11:35	10-04-85

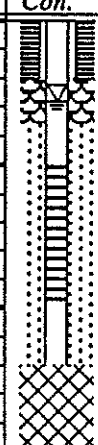

JOB NO. SHP01 DATE 09/09/85 TOTAL DEPTH 20.0 feet
 SURFACE ELEVATION 4886.18 RIG TYPE GARDNER-DENVER
 TOP OF FILTER PACK 8.00 BORING TYPE ROTARY MUD
 WELL CASING TYPE 4.0-IN.SCHED. 40 PVC LOCATION N 10558.80 E 9477.73
 COMPLETION ALLUVIUM DATUM MSL

Depth	Well Con.	Remarks	Lithology	USCS	Visual Classification
0		Placed steel protective casing to 2.0 feet.		SP	ALLUVIUM: SAND, little to some silt, fine to medium, occasional gravel, nonplastic, light brown.
		Installed bentonite/cement grout to 6.0 feet		GP	
5		Placed bentonite pellet seal from 6 to 8 feet.			SANDY GRAVEL, with cobbles, poorly graded, occasional boulder size, subrounded, nonplastic, brown to grey.
		Installed 8-12 sand filter pack from 8 to 15 ft.			
10		Placed .050-in slot well screen from 10 to 15 ft.			MANCOS SHALE FORMATION: SHALE, soft, grey.
		Placed two foot sump from 15 to 17 ft.		CL	
15		Cave-in fill material from 17 to 20 ft.			TD AT 20 FEET.
20					
25					
30					
35					
40					
45					
50					

GROUNDWATER

DEPTH	HOUR	DATE
2.7	18:35	10-03-85

JOB NO. SHPO1 DATE 09/09/85 TOTAL DEPTH 15.0 feet
 SURFACE ELEVATION 4886.24 RIG TYPE GARDNER-DENVER
 TOP OF FILTER PACK 3.50 BORING TYPE ROTARY MUD
 WELL CASING TYPE 4.0-IN.SCHED. 40 PVC LOCATION N 10547.53 E 9482.50
 COMPLETION ALLUVIUM DATUM MSL

Depth	Well Con.	Remarks	Lithology	USCS	Visual Classification		
0		Placed steel protective casing to 2.0 feet. Installed bentonite/cement grout to 2.0 feet Placed bentonite pellet seal from 2 to 3.5 feet. Installed 8-12 sand filter pack from 3.5 to 12 ft.		SP	ALLUVIUM: SAND, little to some silt, fine to medium, occasional gravel, nonplastic, light brown.		
5				Placed .050-in slot well screen from 5 to 10 ft.		GP	SANDY GRAVEL , with cobbles, poorly graded, occasional boulder size, subrounded, nonplastic, brown to grey.
10						CL	
15		Placed two foot sump from 10 to 12 ft.					
20		Cave-in fill material from 12 to 15 ft.					
25							
30							
35							
40							
45							
50							

GROUNDWATER

DEPTH	HOUR	DATE
2.8	09:55	10-04-85

PROJECT SHIPROCK SITE, NM

LOG OF WELL BORING NO. 631

JOB NO. SHP01 DATE 09/11/85
 SURFACE ELEVATION 4889.55
 TOP OF FILTER PACK 11.00
 WELL CASING TYPE 4.0-IN. SCHED. 40 PVC
 COMPLETION ALLUVIUM

TOTAL DEPTH 23.0 feet
 RIG TYPE GARDNER-DENVER
 BORING TYPE ROTARY MUD
 LOCATION N 12355.10 E 9131.70
 DATUM MSL

Depth	Well Con.	Remarks	Lithology	USCS	Visual Classification
0		Placed steel protective casing to 2.0 feet.		SP	ALLUVIUM: SAND, little to some silt, fine to medium, occasional gravel, nonplastic, light brown.
5		Installed bentonite/cement grout to 9.0 feet			
10		Placed bentonite pellet seal from 9 to 11 feet.			
10		Installed 8-12 sand filter pack from 11 to 13 ft.		GP	SANDY GRAVEL , with cobbles, poorly graded, occasional boulder size, subrounded, nonplastic, brown to grey.
15		Placed .050-in slot well screen from 13 to 18 ft.			
20		Placed two foot sump from 18 to 20 ft.			
20		Cave-in fill material from 20 to 23 ft.		CL	MANCOS SHALE FORMATION: SHALE, soft, grey.
25					
30					TD AT 23 FEET.
35					
40					
45					
50					

GROUNDWATER

DEPTH	HOUR	DATE
8.9	10:30	9-30-85

JOB NO. <u>SHP01</u>	DATE <u>09/11/85</u>	TOTAL DEPTH <u>20.0 feet</u>
SURFACE ELEVATION <u>4889.56</u>		RIG TYPE <u>GARDNER-DENVER</u>
TOP OF FILTER PACK <u>6.00</u>		BORING TYPE <u>ROTARY MUD</u>
WELL CASING TYPE <u>4.0-IN. SCHED. 40 PVC</u>		LOCATION <u>N 12343.88 E 9137.67</u>
COMPLETION <u>ALLUVIUM</u>		DATUM <u>MSL</u>

Depth	Well Con.	Remarks	Lithology	USCS	Visual Classification
0		Placed steel protective casing to 2.0 feet.		SP	ALLUVIUM: SAND, little to some silt, fine to medium, occasional gravel, nonplastic, light brown.
5		Installed bentonite/cement grout to 4.0 feet			
		Placed bentonite pellet seal from 4 to 6 feet.		GP	SANDY GRAVEL, with cobbles, poorly graded, occasional boulder size, subrounded, nonplastic, brown to grey.
10		Installed 8-12 sand filter pack from 6 to 15 ft.			
15		Placed .050-in slot well screen from 8 to 13 ft.			
		Placed two foot sump from 13 to 15 ft.			
		Cave-in fill material from 15 to 20 ft.		CL	MANCOS SHALE FORMATION: SHALE, soft, grey. TD AT 20 FEET.
20					
25					
30					
35					
40					
45					
50					

GROUNDWATER		
DEPTH	HOUR	DATE
9.0	16:30	09-29-85

JOB NO. SHP01 DATE 09/07/85 TOTAL DEPTH 29.0 feet
 SURFACE ELEVATION 4889.57 RIG TYPE GARDNER-DENVER
 TOP OF FILTER PACK 12.00 BORING TYPE ROTARY MUD
 WELL CASING TYPE 4.0-IN.SCHED. 40 PVC LOCATION N 10598.41 E 10352.08
 COMPLETION ALLUVIUM DATUM MSL

Depth	Well Con.	Remarks	Lithology	USCS	Visual Classification
0		Placed steel protective casing to 2.0 feet.		SP	ALLUVIUM: SAND, little to some silt, fine to medium, occasional gravel, nonplastic, light brown.
5					
10		Installed bentonite/cement grout to 10 feet		GP	SANDY GRAVEL , with cobbles, poorly graded, occasional boulder size, subrounded, nonplastic, brown to grey.
15		Placed bentonite pellet seal from 10 to 12 feet.			
20		Installed 8-12 sand filter pack from 12 to 22 ft.			
25		Placed .050-in slot well screen from 15 to 20 ft.		CL	MANCOS SHALE FORMATION: SHALE, soft, grey.
30		Placed two foot sump from 20 to 22 ft.			
35					
40					
45					
50					
		Cave-in fill material from 22 to 29 ft.			TD AT 24 FEET.

GROUNDWATER

DEPTH	HOUR	DATE
7.1	12:30	10-03-85

JOB NO. <u>SHP01,</u>	DATE <u>09/07/85</u>	TOTAL DEPTH <u>17.0 feet</u>
SURFACE ELEVATION <u>4889.89</u>	RIG TYPE <u>GARDNER-DENVER</u>	
TOP OF FILTER PACK <u>3.50</u>	BORING TYPE <u>ROTARY MUD</u>	
WELL CASING TYPE <u>4.0-IN. SCHED. 40 PVC</u>	LOCATION <u>N 10586.48 E 10348.87</u>	
COMPLETION <u>ALLUVIUM</u>	DATUM <u>MSL</u>	

Depth	Well Con.	Remarks	Lithology	USCS	Visual Classification			
0		Placed steel protective casing to 2.0 feet. Installed bentonite/cement grout to 2.0 feet Placed bentonite pellet seal from 2 to 3.5 feet. Installed 8-12 sand filter pack from 3.5 to 11.5 ft. Placed .050-in slot well screen from 4.5 to 9.5 ft. Placed two foot sump from 9.5 to 11.5 ft.		SP	ALLUVIUM: SAND, little to some silt, fine to medium, occasional gravel, nonplastic, light brown.			
5								
10								
15								
20								
25								
30								
35								
40								
45								
50								
				Cave-in fill material from 11.5 to 17 ft.				TD AT 17 FEET.

GROUNDWATER		
DEPTH	HOUR	DATE
7.1	11:00	10-03-85

JOB NO. SHP01 DATE 09/08/85
 SURFACE ELEVATION 4888.76
 TOP OF FILTER PACK 7.00
 WELL CASING TYPE 4.0-IN.SCHED. 40 PVC
 COMPLETION ALLUVIUM

TOTAL DEPTH 20.0 feet
 RIG TYPE GARDNER-DENVER
 BORING TYPE ROTARY MUD
 LOCATION N 10524.93 E 10040.71
 DATUM MSL

Depth	Well Con.	Remarks	Lithology	USCS	Visual Classification
0		Placed steel protective casing to 2.0 feet.		SP	ALLUVIUM: SAND, little to some silt, fine to medium, occasional gravel, nonplastic, light brown.
		Installed bentonite/cement grout to 5.0 feet		GP	
5		Placed bentonite pellet seal from 5 to 7 feet.			SANDY GRAVEL , with cobbles, poorly graded, occasional boulder size, subrounded, nonplastic, brown to grey.
		Installed 8-12 sand filter pack from 7 to 16.5 ft.			
10		Placed .050-in slot well screen from 9.5 to 14.5 ft.			
15		Placed two foot sump from 14.5 to 16.5 ft.			
		Cave-in fill material from 16.5 to 20 ft.			
20				CL	MANCOS SHALE FORMATION: SHALE, soft, grey. TD AT 20 FEET.
25					
30					
35					
40					
45					
50					

GROUNDWATER

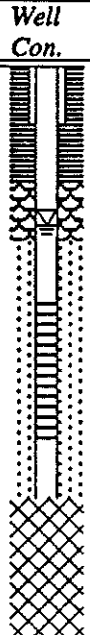

DEPTH	HOUR	DATE
6.0	15:30	10-03-85

PROJECT SHIPROCK SITE, NM

LOG OF WELL BORING NO. 627

JOB NO. SHP01, DATE 09/08/85
 SURFACE ELEVATION 4887.84
 TOP OF FILTER PACK 6.00
 WELL CASING TYPE 4.0-IN. SCHED. 40 PVC
 COMPLETION ALLUVIUM

TOTAL DEPTH 20.0 feet
 RIG TYPE GARDNER-DENVER
 BORING TYPE ROTARY MUD
 LOCATION N 10725.88 E 9749.24
 DATUM MSL

Depth	Well Con.	Remarks	Lithology	USCS	Visual Classification			
0		Placed steel protective casing to 2.0 feet.		SP	ALLUVIUM: SAND, little to some silt, fine to medium, occasional gravel, nonplastic, light brown.			
		Installed bentonite/cement grout to 4.0 feet		GP				
5		Placed bentonite pellet seal from 4 to 6 feet.				SANDY GRAVEL , with cobbles, poorly graded, occasional boulder size, subrounded, nonplastic, brown to grey.		
		Installed 8-12 sand filter pack from 6 to 15 ft.						
10		Placed .050-in slot well screen from 8 to 13 ft.						
		Placed two foot sump from 13 to 15 ft.						
15		Cave-in fill material from 15 to 20 ft.			CL		MANCOS SHALE FORMATION: SHALE, soft, grey.	
20								
								TD AT 20 FEET.
25								
30								
35								
40								
45								
50								

GROUNDWATER

DEPTH	HOUR	DATE
5.5	17:05	10-03-85

JOB NO. <u>SHP01</u>	DATE <u>09/09/85</u>	TOTAL DEPTH <u>15.0 feet</u>
SURFACE ELEVATION <u>4888.37</u>		RIG TYPE <u>GARDNER-DENVER</u>
TOP OF FILTER PACK <u>3.50</u>		BORING TYPE <u>ROTARY MUD</u>
WELL CASING TYPE <u>4.0-IN. SCHED. 40 PVC</u>		LOCATION <u>N 10716.54 E 9758.94</u>
COMPLETION <u>ALLUVIUM</u>		DATUM <u>MSL</u>

Depth	Well Con.	Remarks	Lithology	USCS	Visual Classification
0	[Symbol]	Placed steel protective casing to 2.0 feet.	[Symbol]	SP	ALLUVIUM: SAND, little to some silt, fine to medium, occasional gravel, nonplastic, light brown.
5	[Symbol]	Installed bentonite/cement grout to 2.0 feet	[Symbol]	GP	
10	[Symbol]	Placed bentonite pellet seal from 2 to 3.5 feet.	[Symbol]		SANDY GRAVEL , with cobbles, poorly graded, occasional boulder size, subrounded, nonplastic, brown to grey.
15	[Symbol]	Installed 8-12 sand filter pack from 3.5 to 12 ft.	[Symbol]		
20	[Symbol]	Placed .050-in slot well screen from 6 to 10 ft.	[Symbol]		
25	[Symbol]	Placed two foot sump from 10 to 12 ft.	[Symbol]		TD AT 15 FEET.
30	[Symbol]	Cave-in fill material from 12 to 15 ft.	[Symbol]		
35	[Symbol]		[Symbol]		
40	[Symbol]		[Symbol]		
45	[Symbol]		[Symbol]		
50	[Symbol]		[Symbol]		

GROUNDWATER

DEPTH	HOUR	DATE
6.0	11:35	10-04-85
[Symbol]		

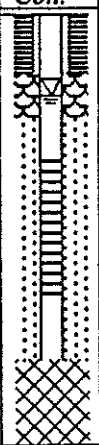
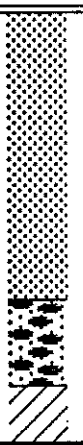
JOB NO. <u>SHP01</u>	DATE <u>09/09/85</u>	TOTAL DEPTH <u>20.0 feet</u>
SURFACE ELEVATION <u>4886.18</u>	RIG TYPE <u>GARDNER-DENVER</u>	
TOP OF FILTER PACK <u>8.00</u>	BORING TYPE <u>ROTARY MUD</u>	
WELL CASING TYPE <u>4.0-IN.SCHED. 40 PVC</u>	LOCATION <u>N 10558.80 E 9477.73</u>	
COMPLETION <u>ALLUVIUM</u>	DATUM <u>MSL</u>	

Depth	Well Con.	Remarks	Lithology	USCS	Visual Classification
0		Placed steel protective casing to 2.0 feet.		SP	ALLUVIUM: SAND, little to some silt, fine to medium, occasional gravel, nonplastic, light brown.
5		Installed bentonite/cement grout to 6.0 feet Placed bentonite pellet seal from 6 to 8 feet. Installed 8-12 sand filter pack from 8 to 15 ft.		GP	
10		Placed .050-in slot well screen from 10 to 15 ft.			SANDY GRAVEL , with cobbles, poorly graded, occasional boulder size, subrounded, nonplastic, brown to grey.
15		Placed two foot sump from 15 to 17 ft.		CL	
20		Cave-in fill material from 17 to 20 ft.			MANCOS SHALE FORMATION: SHALE, soft, grey.
25					TD AT 20 FEET.
30					
35					
40					
45					
50					

GROUNDWATER

DEPTH	HOUR	DATE
2.7	18:35	10-03-85

JOB NO. SHP01 DATE 09/09/85 TOTAL DEPTH 15.0 feet
 SURFACE ELEVATION 4886.24 RIG TYPE GARDNER-DENVER
 TOP OF FILTER PACK 3.50 BORING TYPE ROTARY MUD
 WELL CASING TYPE 4.0-IN. SCHED. 40 PVC LOCATION N 10547.53 E 9482.50
 COMPLETION ALLUVIUM DATUM MSL

Depth	Well Con.	Remarks	Lithology	USCS	Visual Classification	
0		Placed steel protective casing to 2.0 feet. Installed bentonite/cement grout to 2.0 feet Placed bentonite pellet seal from 2 to 3.5 feet. Installed 8-12 sand filter pack from 3.5 to 12 ft. Placed .050-in slot well screen from 5 to 10 ft. Placed two foot sump from 10 to 12 ft. Cave-in fill material from 12 to 15 ft.		SP	ALLUVIUM: SAND, little to some silt, fine to medium, occasional gravel, nonplastic, light brown.	
5				GP		SANDY GRAVEL , with cobbles, poorly graded, occasional boulder size, subrounded, nonplastic, brown to grey.
10				CL		
15						
20						
25						
30						
35						
40						
45						
50						

GROUNDWATER

DEPTH	HOUR	DATE
2.8	09:55	10-04-85

PROJECT SHIPROCK SITE, NM

LOG OF WELL BORING NO. 631

JOB NO. SHP01 DATE 09/11/85
 SURFACE ELEVATION 4889.55
 TOP OF FILTER PACK 11.00
 WELL CASING TYPE 4.0-IN.SCHED. 40 PVC
 COMPLETION ALLUVIUM

TOTAL DEPTH 23.0 feet
 RIG TYPE GARDNER-DENVER
 BORING TYPE ROTARY MUD
 LOCATION N 12355.10 E 9131.70
 DATUM MSL

Depth	Well Con.	Remarks	Lithology	USCS	Visual Classification
0		Placed steel protective casing to 2.0 feet. Installed bentonite/cement grout to 9.0 feet Placed bentonite pellet seal from 9 to 11 feet. Installed 8-12 sand filter pack from 11 to 13 ft. Placed .050-in slot well screen from 13 to 18 ft. Placed two foot sump from 18 to 20 ft. Cave-in fill material from 20 to 23 ft.		SP	ALLUVIUM: SAND, little to some silt, fine to medium, occasional gravel, nonplastic, light brown.
5				GP	SANDY GRAVEL, with cobbles, poorly graded, occasional boulder size, subrounded, nonplastic, brown to grey.
10				CL	MANCOS SHALE FORMATION: SHALE, soft, grey.
15					TD AT 23 FEET.
20					
25					
30					
35					
40					
45					
50					

GROUNDWATER		
DEPTH	HOUR	DATE
8.9	10:30	9-30-85

JEG TAC TEAM

PROJECT SHIPROCK SITE, NM

LOG OF WELL BORING NO. 632

JOB NO. SHP01 DATE 09/11/85
 SURFACE ELEVATION 4889.56
 TOP OF FILTER PACK 6.00
 WELL CASING TYPE 4.0-IN.SCHED. 40 PVC
 COMPLETION ALLUVIUM

TOTAL DEPTH 20.0 feet
 RIG TYPE GARDNER-DENVER
 BORING TYPE ROTARY MUD
 LOCATION N 12343.88 E 9137.67
 DATUM MSL

Depth	Well Con.	Remarks	Lithology	USCS	Visual Classification
0		Placed steel protective casing to 2.0 feet.		SP	ALLUVIUM: SAND, little to some silt, fine to medium, occasional gravel, nonplastic, light brown.
5		Installed bentonite/cement grout to 4.0 feet			
10		Placed bentonite pellet seal from 4 to 6 feet.		GP	SANDY GRAVEL, with cobbles, poorly graded, occasional boulder size, subrounded, nonplastic, brown to grey.
15		Installed 8-12 sand filter pack from 6 to 15 ft.			
20		Placed .050-in slot well screen from 8 to 13 ft.			
20		Placed two foot sump from 13 to 15 ft.			
20		Cave-in fill material from 15 to 20 ft.		CL	MANCOS SHALE FORMATION: SHALE, soft, grey. TD AT 20 FEET.
25					
30					
35					
40					
45					
50					

GROUNDWATER

DEPTH	HOUR	DATE
9.0	16:30	09-29-85

JOB NO. <u>SHP01,</u>	DATE <u>09/07/85</u>	TOTAL DEPTH <u>29.0 feet</u>
SURFACE ELEVATION <u>4889.57</u>		RIG TYPE <u>GARDNER-DENVER</u>
TOP OF FILTER PACK <u>12.00</u>		BORING TYPE <u>ROTARY MUD</u>
WELL CASING TYPE <u>4.0-IN. SCHED. 40 PVC</u>		LOCATION <u>N 10598.41 E 10352.08</u>
COMPLETION <u>ALLUVIUM</u>		DATUM <u>MSL</u>

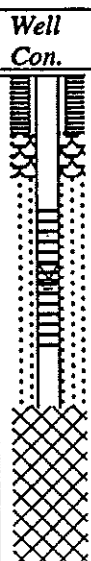

Depth	Well Con.	Remarks	Lithology	USCS	Visual Classification
0		Placed steel protective casing to 2.0 feet.		SP	ALLUVIUM: SAND, little to some silt, fine to medium, occasional gravel, nonplastic, light brown.
5					
10		Installed bentonite/cement grout to 10 feet		GP	SANDY GRAVEL, with cobbles, poorly graded, occasional boulder size, subrounded, nonplastic, brown to grey.
15		Placed bentonite pellet seal from 10 to 12 feet.			
20		Installed 8-12 sand filter pack from 12 to 22 ft.			
25		Placed .050-in slot well screen from 15 to 20 ft.		CL	MANCOS SHALE FORMATION: SHALE, soft, grey.
30		Placed two foot sump from 20 to 22 ft.			
35					
40					
45					
50					
25		Cave-in fill material from 22 to 29 ft.			TD AT 24 FEET.

GROUNDWATER

DEPTH	HOUR	DATE
7.1	12:30	10-03-85

PROJECT SHIPROCK SITE, NM

JOB NO. SHPO1 DATE 09/07/85 TOTAL DEPTH 17.0 feet
 SURFACE ELEVATION 4889.89 RIG TYPE GARDNER-DENVER
 TOP OF FILTER PACK 3.50 BORING TYPE ROTARY MUD
 WELL CASING TYPE 4.0-IN.SCHED. 40 PVC LOCATION N 10586.48 E 10348.87
 COMPLETION ALLUVIUM DATUM MSL

Depth	Well Con.	Remarks	Lithology	USCS	Visual Classification				
0		Placed steel protective casing to 2.0 feet. Installed bentonite/cement grout to 2.0 feet Placed bentonite pellet seal from 2 to 3.5 feet. Installed 8-12 sand filter pack from 3.5 to 11.5 ft. Placed .050-in slot well screen from 4.5 to 9.5 ft. Placed two foot sump from 9.5 to 11.5 ft.		SP	ALLUVIUM: SAND, little to some silt, fine to medium, occasional gravel, nonplastic, light brown. SANDY GRAVEL , with cobbles, poorly graded, occasional boulder size, subrounded, nonplastic, brown to grey.				
5									
10									
15									
20									
25									
30									
35									
40									
45									
50									
						Cave-in fill material from 11.5 to 17 ft.			TD AT 17 FEET.

GROUNDWATER		
DEPTH	HOUR	DATE
7.1	11:00	10-03-85

PROJECT SHIPROCK SITE, NM

LOG OF WELL BORING NO. 626

JOB NO. SHP01 DATE 09/08/85 TOTAL DEPTH 20.0 feet
 SURFACE ELEVATION 4888.76 RIG TYPE GARDNER-DENVER
 TOP OF FILTER PACK 7.00 BORING TYPE ROTARY MUD
 WELL CASING TYPE 4.0-IN.SCHED. 40 PVC LOCATION N 10524.93 E 10040.71
 COMPLETION ALLUVIUM DATUM MSL

Depth	Well Con.	Remarks	Lithology	USCS	Visual Classification
0		Placed steel protective casing to 2.0 feet.		SP	ALLUVIUM: SAND, little to some silt, fine to medium, occasional gravel, nonplastic, light brown.
5		Installed bentonite/cement grout to 5.0 feet		GP	
		Placed bentonite pellet seal from 5 to 7 feet.			SANDY GRAVEL , with cobbles, poorly graded, occasional boulder size, subrounded, nonplastic, brown to grey.
10		Installed 8-12 sand filter pack from 7 to 16.5 ft.			
15		Placed .050-in slot well screen from 9.5 to 14.5 ft.			
		Placed two foot sump from 14.5 to 16.5 ft.			
20		Cave-in fill material from 16.5 to 20 ft.		CL	MANCOS SHALE FORMATION: SHALE, soft, grey. TD AT 20 FEET.
25					
30					
35					
40					
45					
50					

GROUNDWATER

DEPTH	HOUR	DATE
6.0	15:30	10-03-85

JOB NO. <u>SHP01</u>	DATE <u>09/08/85</u>	TOTAL DEPTH <u>20.0 feet</u>
SURFACE ELEVATION <u>4887.84</u>		RIG TYPE <u>GARDNER-DENVER</u>
TOP OF FILTER PACK <u>6.00</u>		BORING TYPE <u>ROTARY MUD</u>
WELL CASING TYPE <u>4.0-IN.SCHED. 40 PVC</u>		LOCATION <u>N 10725.88 E 9749.24</u>
COMPLETION <u>ALLUVIUM</u>		DATUM <u>MSL</u>

Depth	Well Con.	Remarks	Lithology	USCS	Visual Classification	
0		Placed steel protective casing to 2.0 feet.		SP	ALLUVIUM: SAND, little to some silt, fine to medium, occasional gravel, nonplastic, light brown.	
5		Installed bentonite/cement grout to 4.0 feet		GP		SANDY GRAVEL, with cobbles, poorly graded, occasional boulder size, subrounded, nonplastic, brown to grey.
6		Placed bentonite pellet seal from 4 to 6 feet.				
8		Installed 8-12 sand filter pack from 6 to 15 ft.				
10		Placed .050-in slot well screen from 8 to 13 ft.				
13		Placed two foot sump from 13 to 15 ft.				
15		Cave-in fill material from 15 to 20 ft.				
20					CL	MANCOS SHALE FORMATION: SHALE, soft, grey.
20						TD AT 20 FEET.
25						
30						
35						
40						
45						
50						

GROUNDWATER		
DEPTH	HOUR	DATE
5.5	17:05	10-03-85

JOB NO. <u>SHP01</u>	DATE <u>09/09/85</u>	TOTAL DEPTH <u>15.0 feet</u>
SURFACE ELEVATION <u>4888.37</u>	RIG TYPE <u>GARDNER-DENVER</u>	
TOP OF FILTER PACK <u>3.50</u>	BORING TYPE <u>ROTARY MUD</u>	
WELL CASING TYPE <u>4.0-IN. SCHED. 40 PVC</u>	LOCATION <u>N 10716.54 E 9758.94</u>	
COMPLETION <u>ALLUVIUM</u>	DATUM <u>MSL</u>	

Depth	Well Con.	Remarks	Lithology	USCS	Visual Classification
0		Placed steel protective casing to 2.0 feet. Installed bentonite/cement grout to 2.0 feet Placed bentonite pellet seal from 2 to 3.5 feet. Installed 8-12 sand filter pack from 3.5 to 12 ft.		SP	ALLUVIUM: SAND, little to some silt, fine to medium, occasional gravel, nonplastic, light brown.
5	GP			SANDY GRAVEL, with cobbles, poorly graded, occasional boulder size, subrounded, nonplastic, brown to grey.	
10				Placed .050-in slot well screen from 6 to 10 ft.	
15		Placed two foot sump from 10 to 12 ft.			TD AT 15 FEET.
20		Cave-in fill material from 12 to 15 ft.			
25					
30					
35					
40					
45					
50					

GROUNDWATER

DEPTH	HOUR	DATE
6.0	11:35	10-04-85

PROJECT SHIPROCK SITE, NM

LOG OF WELL BORING NO. 629

JOB NO. SHP01 DATE 09/09/85 TOTAL DEPTH 20.0 feet
 SURFACE ELEVATION 4886.18 RIG TYPE GARDNER-DENVER
 TOP OF FILTER PACK 8.00 BORING TYPE ROTARY MUD
 WELL CASING TYPE 4.0-IN.SCHED. 40 PVC LOCATION N 10558.80 E 9477.73
 COMPLETION ALLUVIUM DATUM MSL

Depth	Well Con.	Remarks	Lithology	USCS	Visual Classification
0		Placed steel protective casing to 2.0 feet.		SP	ALLUVIUM: SAND, little to some silt, fine to medium, occasional gravel, nonplastic, light brown.
		Installed bentonite/cement grout to 6.0 feet		GP	
5		Placed bentonite pellet seal from 6 to 8 feet.			SANDY GRAVEL , with cobbles, poorly graded, occasional boulder size, subrounded, nonplastic, brown to grey.
		Installed 8-12 sand filter pack from 8 to 15 ft.			
10		Placed .050-in slot well screen from 10 to 15 ft.			MANCOS SHALE FORMATION: SHALE, soft, grey.
15		Placed two foot sump from 15 to 17 ft.		CL	
		Cave-in fill material from 17 to 20 ft.			
20					TD AT 20 FEET.
25					
30					
35					
40					
45					
50					

GROUNDWATER

DEPTH	HOUR	DATE
2.7	18:35	10-03-85

JEG TAC TEAM

JOB NO. SHP01 DATE 09/11/85 TOTAL DEPTH 20.0 feet
 SURFACE ELEVATION 4889.56 RIG TYPE GARDNER-DENVER
 TOP OF FILTER PACK 6.00 BORING TYPE ROTARY MUD
 WELL CASING TYPE 4.0-IN.SCHED. 40 PVC LOCATION N 12343.88 E 9137.67
 COMPLETION ALLUVIUM DATUM MSL

Depth	Well Con.	Remarks	Lithology	USCS	Visual Classification
0		Placed steel protective casing to 2.0 feet.		SP	ALLUVIUM: SAND, little to some silt, fine to medium, occasional gravel, nonplastic, light brown.
5		Installed bentonite/cement grout to 4.0 feet			
		Placed bentonite pellet seal from 4 to 6 feet.		GP	
10		Installed 8-12 sand filter pack from 6 to 15 ft.			SANDY GRAVEL, with cobbles, poorly graded, occasional boulder size, subrounded, nonplastic, brown to grey.
15		Placed .050-in slot well screen from 8 to 13 ft.			
		Placed two foot sump from 13 to 15 ft.			
20		Cave-in fill material from 15 to 20 ft.		CL	MANCOS SHALE FORMATION: SHALE, soft, grey. TD AT 20 FEET.
25					
30					
35					
40					
45					
50					

GROUNDWATER

DEPTH	HOUR	DATE
9.0	16:30	09-29-85

11/11/85

PROJECT SHIPROCK SITE, NM

LOG OF WELL BORING NO. 631

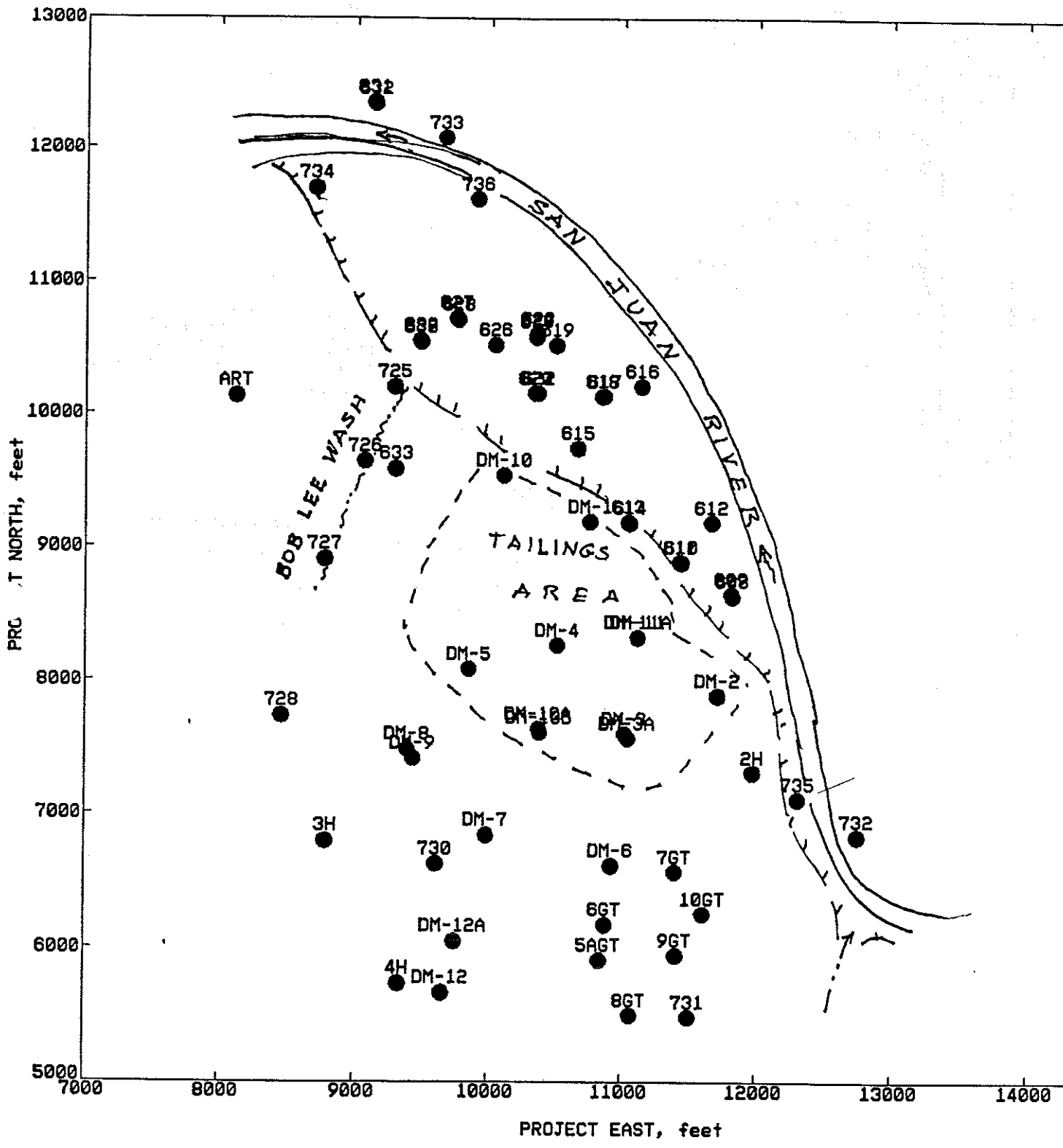
JOB NO. SHP01 DATE 09/11/85
 SURFACE ELEVATION 4889.55
 TOP OF FILTER PACK 11.00
 WELL CASING TYPE 4.0-IN. SCHED. 40 PVC
 COMPLETION ALLUVIUM

TOTAL DEPTH 23.0 feet
 RIG TYPE GARDNER-DENVER
 BORING TYPE ROTARY MUD
 LOCATION N 12355.10 E 9131.70
 DATUM MSL

Depth	Well Con.	Remarks	Lithology	USCS	Visual Classification
0		Placed steel protective casing to 2.0 feet. Installed bentonite/cement grout to 9.0 feet Placed bentonite pellet seal from 9 to 11 feet. Installed 8-12 sand filter pack from 11 to 13 ft.		SP	ALLUVIUM: SAND, little to some silt, fine to medium, occasional gravel, nonplastic, light brown.
5					
10		Placed .050-in slot well screen from 13 to 18 ft. Placed two foot sump from 18 to 20 ft. Cave-in fill material from 20 to 23 ft.		GP	SANDY GRAVEL , with cobbles, poorly graded, occasional boulder size, subrounded, nonplastic, brown to grey.
15					
20				CL	MANCOS SHALE FORMATION: SHALE, soft, grey.
25					TD AT 23 FEET.
30					
35					
40					
45					
50					

GROUNDWATER		
DEPTH	HOUR	DATE
8.9	10:30	9-30-85

JEG TAC TEAM



April 1993

SHIPROCK SITE, NM

SITE PLAN

Jacobs Engineering Group Albuquerque, New Mexico

FIGURE 1

JOB NO. SHP01, DATE 03/26/93
 SURFACE ELEVATION 4887.63
 TOP OF FILTER PACK _____
 WELL CASING TYPE 2-IN. STAINLESS.
 COMPLETION FLOOD PLAIN

TOTAL DEPTH 6.0 feet
 RIG TYPE _____
 BORING TYPE DRIVEN WELL POINT
 LOCATION N 11620.69 E 9902.76
 DATUM MSL

Depth	Well Con.	Remarks	Lithology	USCS	Visual Classification
0		<i>DRAFT</i>	?		ALLUVIUM: UNKNOWN DESCRIPTION.
			?		
			?		
			?		
5			?		
			?		
					EST. TD AT 6.0
10					
15					
20					
25					
30					
35					
40					
45					
50					

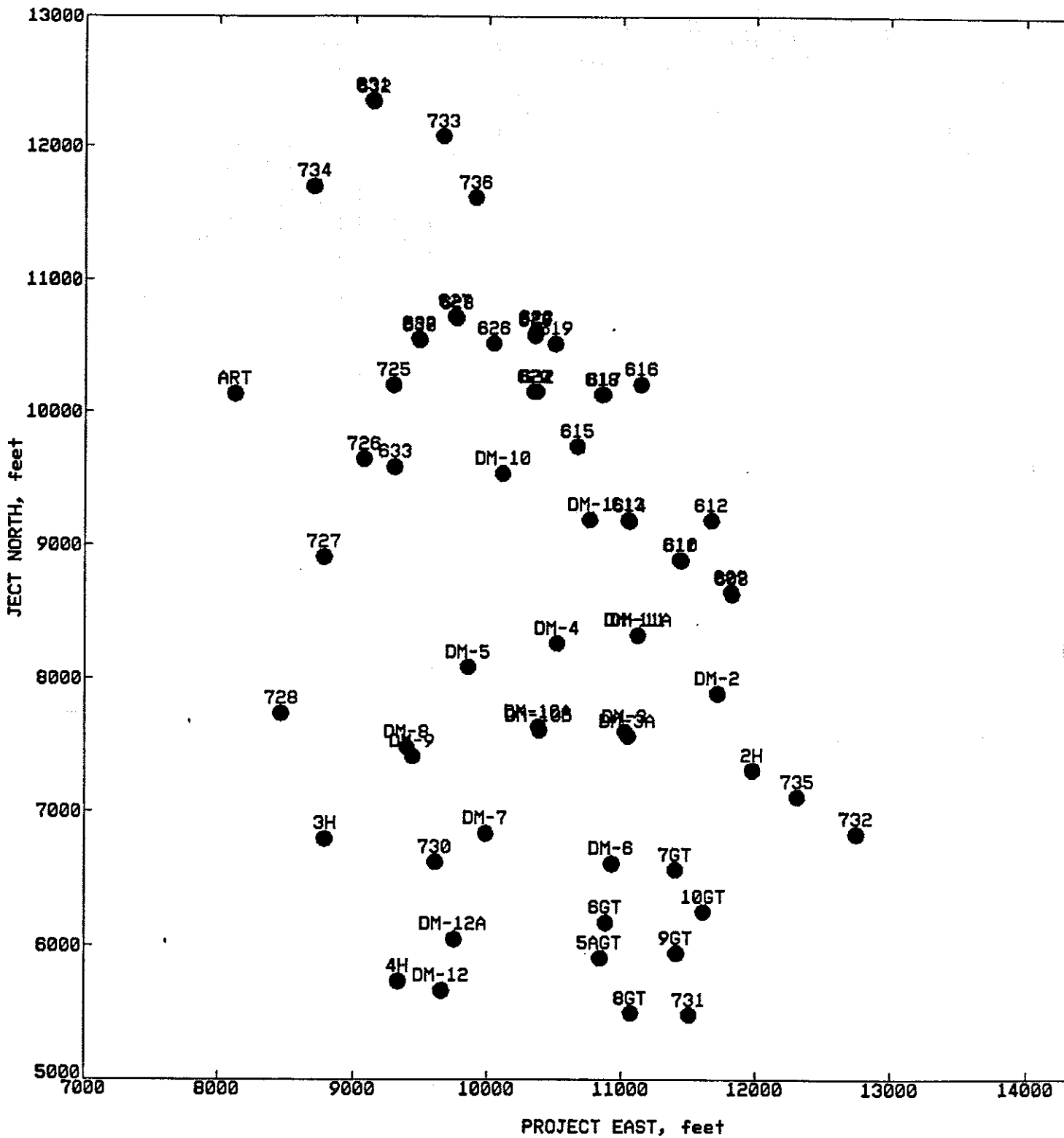
GROUNDWATER		
DEPTH	HOUR	DATE
∇		
∇		
∇		

JOB NO. SHP01 DATE 05/05/55
 SURFACE ELEVATION 4940.18
 TOP OF FILTER PACK _____
 WELL CASING TYPE 12-IN. STEEL
 COMPLETION ? DAKOTA (ARTESIAN FLOW)

TOTAL DEPTH 500.0 feet
 RIG TYPE UNK, EXISTING WELL
 BORING TYPE UNKNOWN
 LOCATION N 10136.75 E 8120.91
 DATUM MSL

Depth	Well Con.	Remarks	Lithology	USCS	Visual Classification
0			?		ALLUVIUM: UNKNOWN LITHOLOGY, EXISTING WELL.
5					? TD UNKNOWN Note; Flowing from casing for last 10 years or more. Flow from unvalved 3-in. pipe (at side of 12-in. steel casing) at 3.62 feet above ground level is described as warm".
10					Approximate discharge is .14 sec. feet. or 62 gallons per minute.
15					
20					
25					
30					
35					
40					
45					
50					

GROUNDWATER		
DEPTH	HOUR	DATE



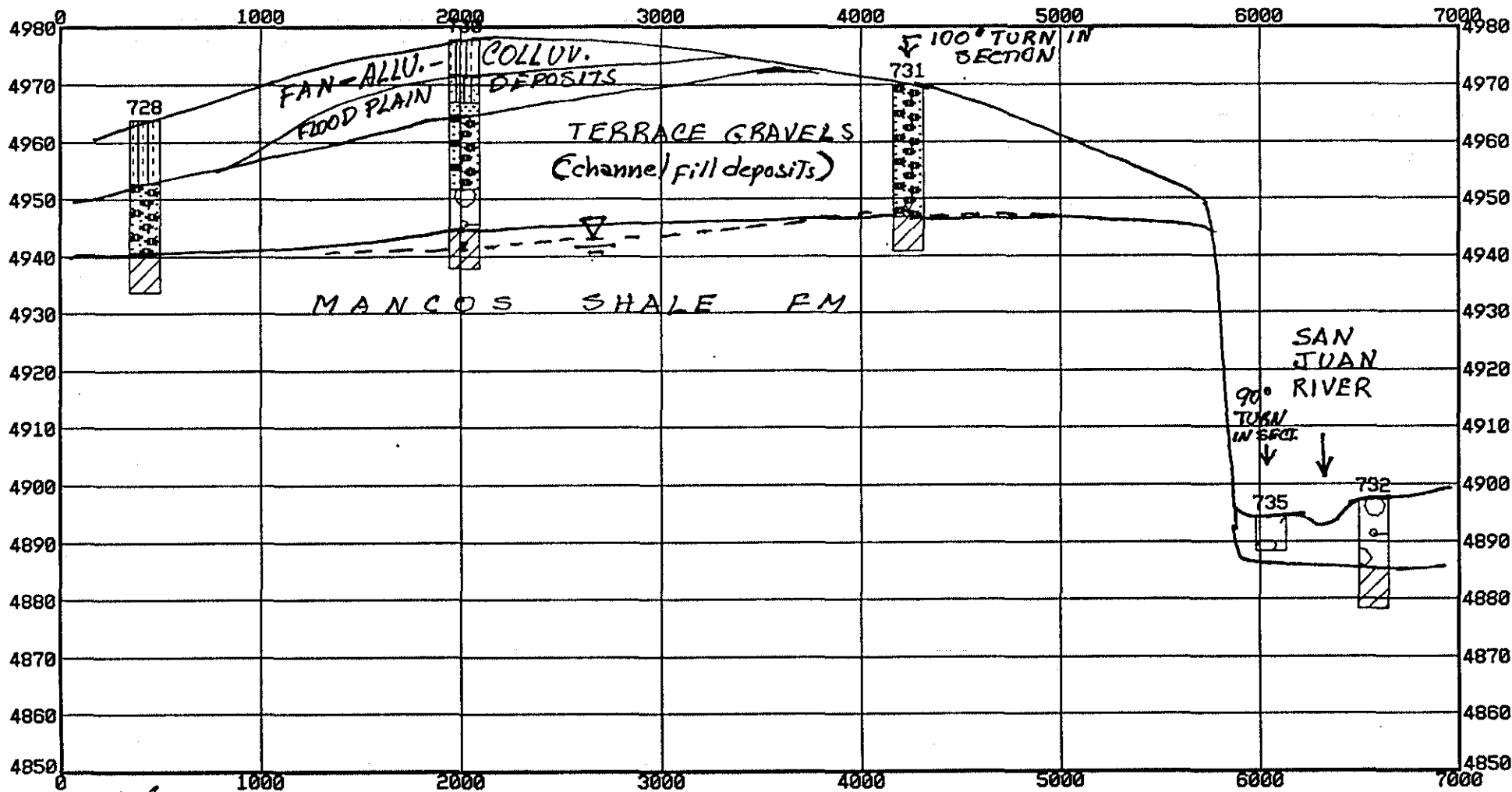
April 1993

SHIPROCK SITE, NM

SITE PLAN

FIGURE 1

Jacobs Engineering Group Albuquerque, New Mexico



LR

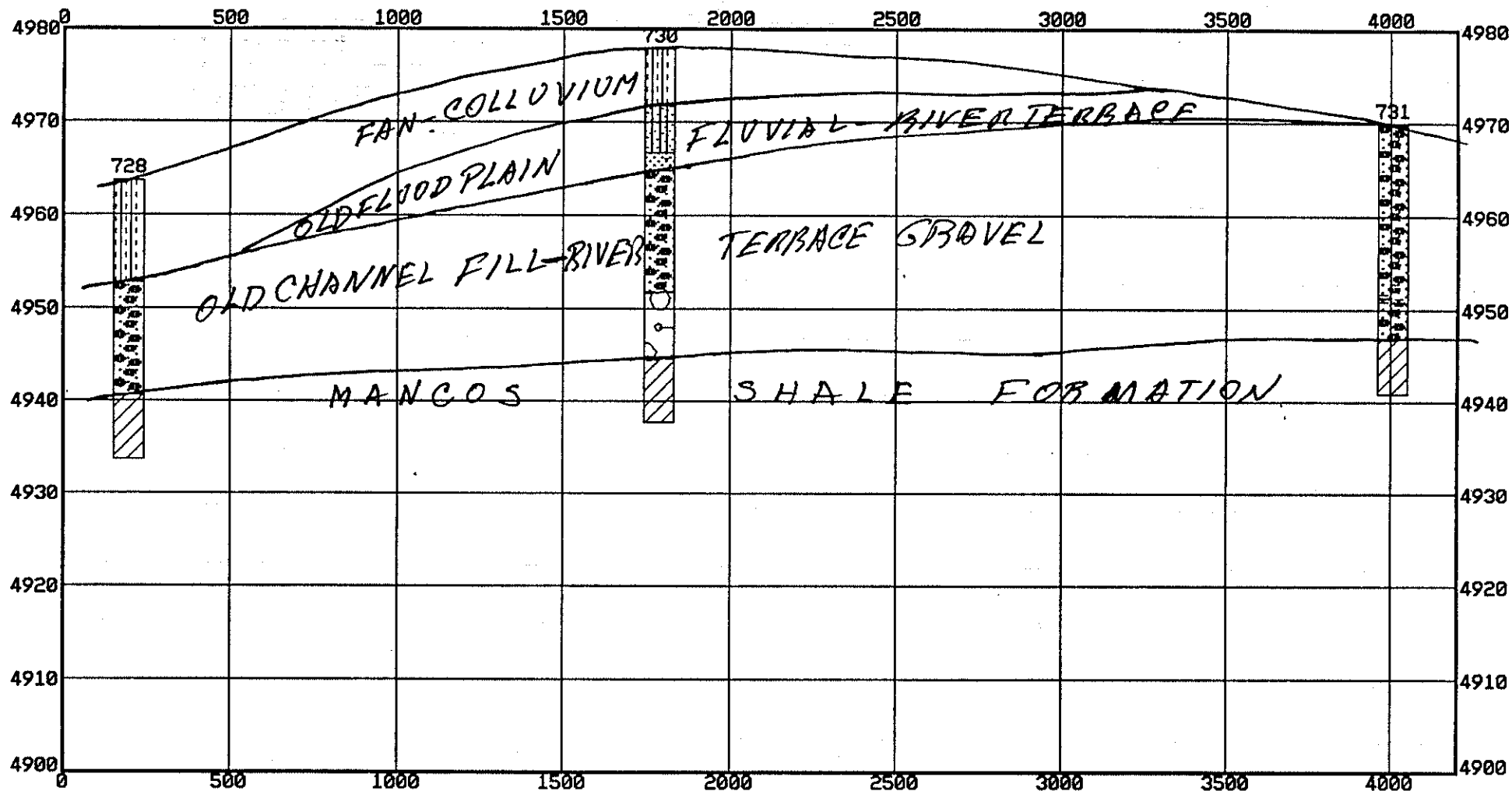
Borehole	North	East	Elev.	Depth
728	7737.0	8466.1	4963.7	30.0
730	6629.2	9609.0	4977.8	40.0
731	5485.1	11507.4	4969.9	29.0
732	6837.7	12746.5	4897.3	19.0
735	7113.8	12306.3	4894.3	6.0

DISTANCES:
 Beginning 0.0
 Ending 7000.0

VIEWING ANGLES (degrees):
 Horizontal 0.0
 Vertical 0.0

Position	North	East
Left, Front	7736.95	8466.14
Right, Front	6837.70	12746.52
Left, Back		
Right, Back		

SUBSURFACE FENCE DIAGRAM : UPGRADNT. WELLS		
SHIPROCK SITE, NM		
PROJECT #	DATE	PLATE
SHP01,	APR 93	1



Borehole	North	East	Elev.	Depth
728	7737.0	8466.1	4963.7	30.0
730	6629.2	9609.0	4977.8	40.0
731	5485.1	11507.4	4969.9	29.0

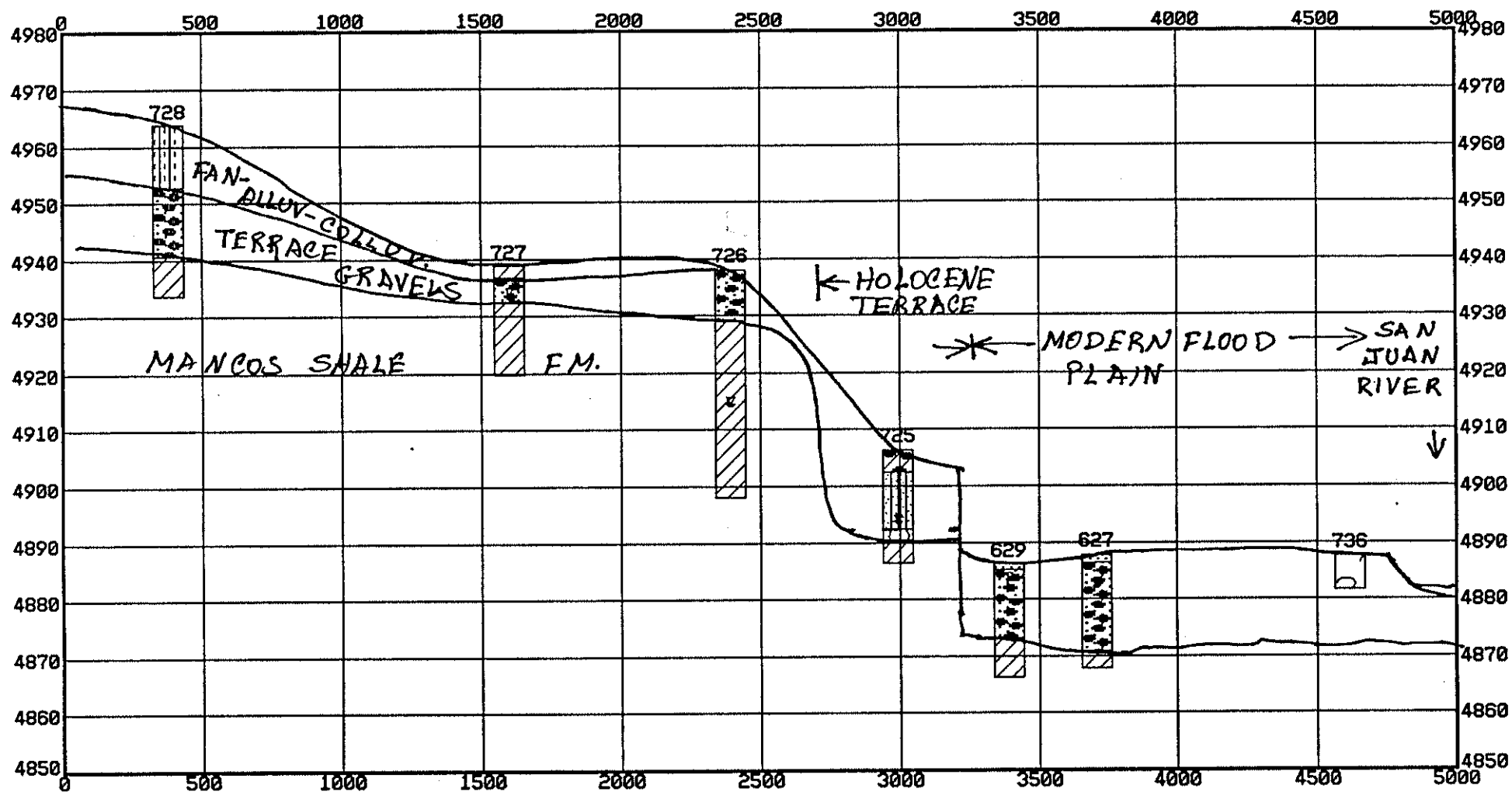
DISTANCES:
 Beginning 0.0
 Ending 4200.0
 VIEWING ANGLES (degrees):
 Horizontal 0.0
 Vertical 0.0

Position	North	East
Left, Front	7736.95	8466.14
Right, Front	5485.08	11507.42
Left, Back		
Right, Back		

SUBSURFACE FENCE DIAGRAM :NW TO SE, SW EDGE

SHIPROCK SITE, NM

PROJECT #	DATE	PLATE
SHP01,	APR 93	1



Borehole	North	East	Elev.	Depth
627	10725.9	9749.2	4887.8	20.0
629	10558.8	9477.7	4886.2	20.0
725	10207.4	9292.2	4906.4	20.0
726	9649.0	9075.0	4938.0	40.0
727	8915.4	8780.1	4938.8	19.0
728	7737.0	8466.1	4963.7	30.0
736	11620.7	9902.8	4887.6	6.0

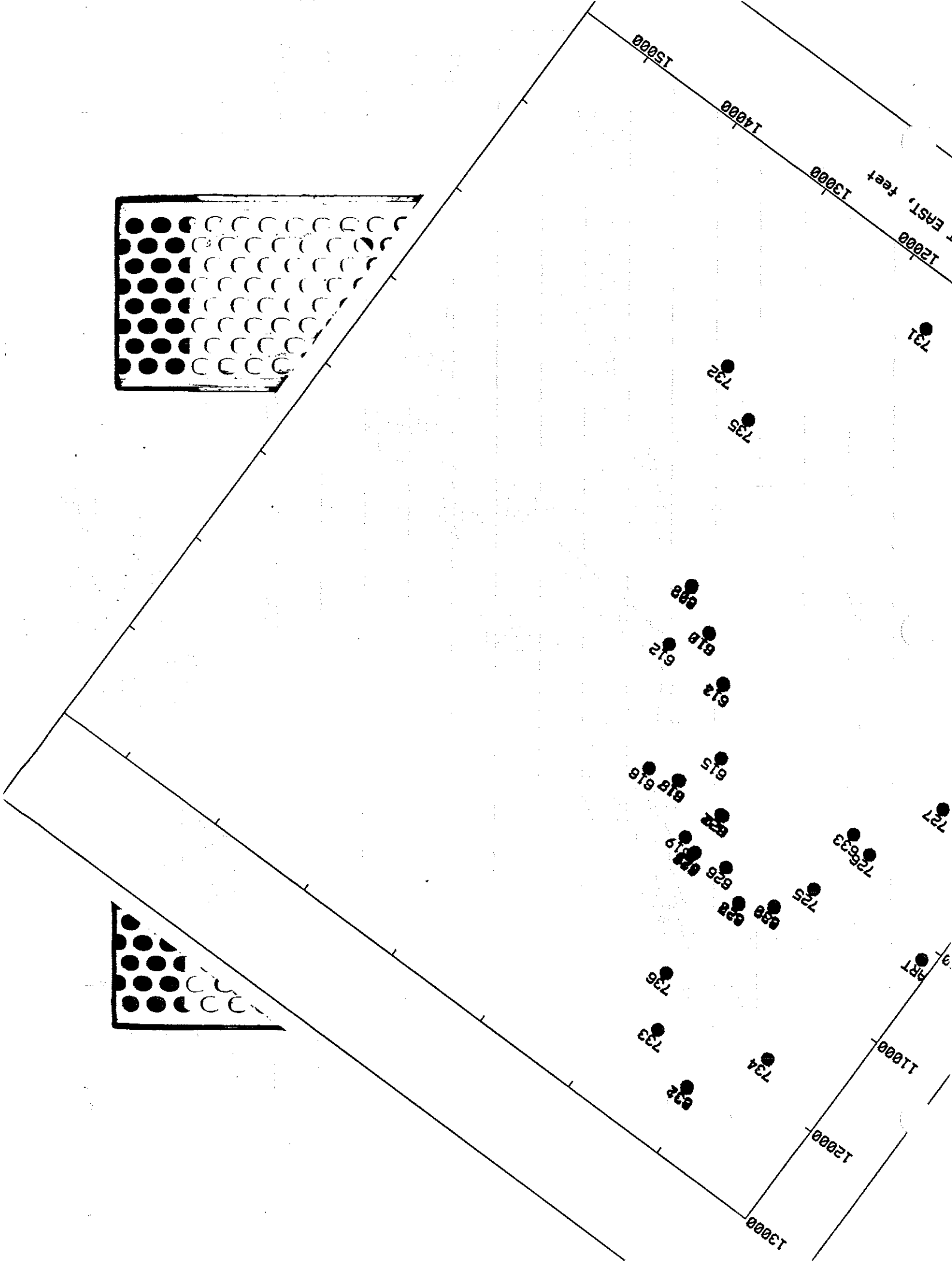
DISTANCES:
 Beginning 0.0
 Ending 5000.0
 VIEWING ANGLES (degrees):
 Horizontal 0.0
 Vertical 0.0

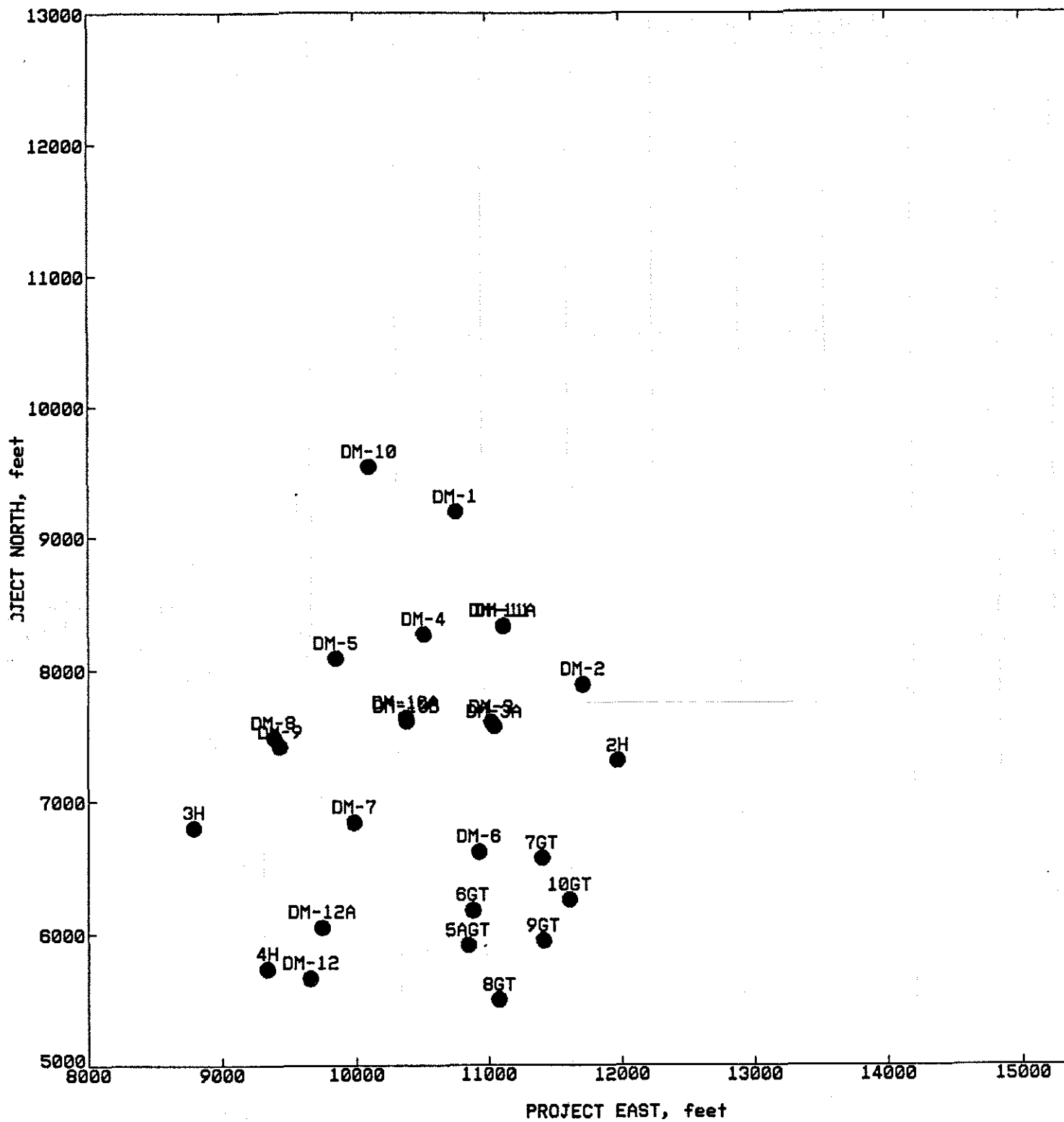
Position	North	East
Left, Front	7736.95	8466.14
Right, Front	1620.69	9902.76
Left, Back		
Right, Back		

SUBSURFACE FENCE DIAGRAM : BOB LEE WASH ALI

SHIPROCK SITE, NM

PROJECT #	DATE	PLATE
SHP01,	APR 93	1





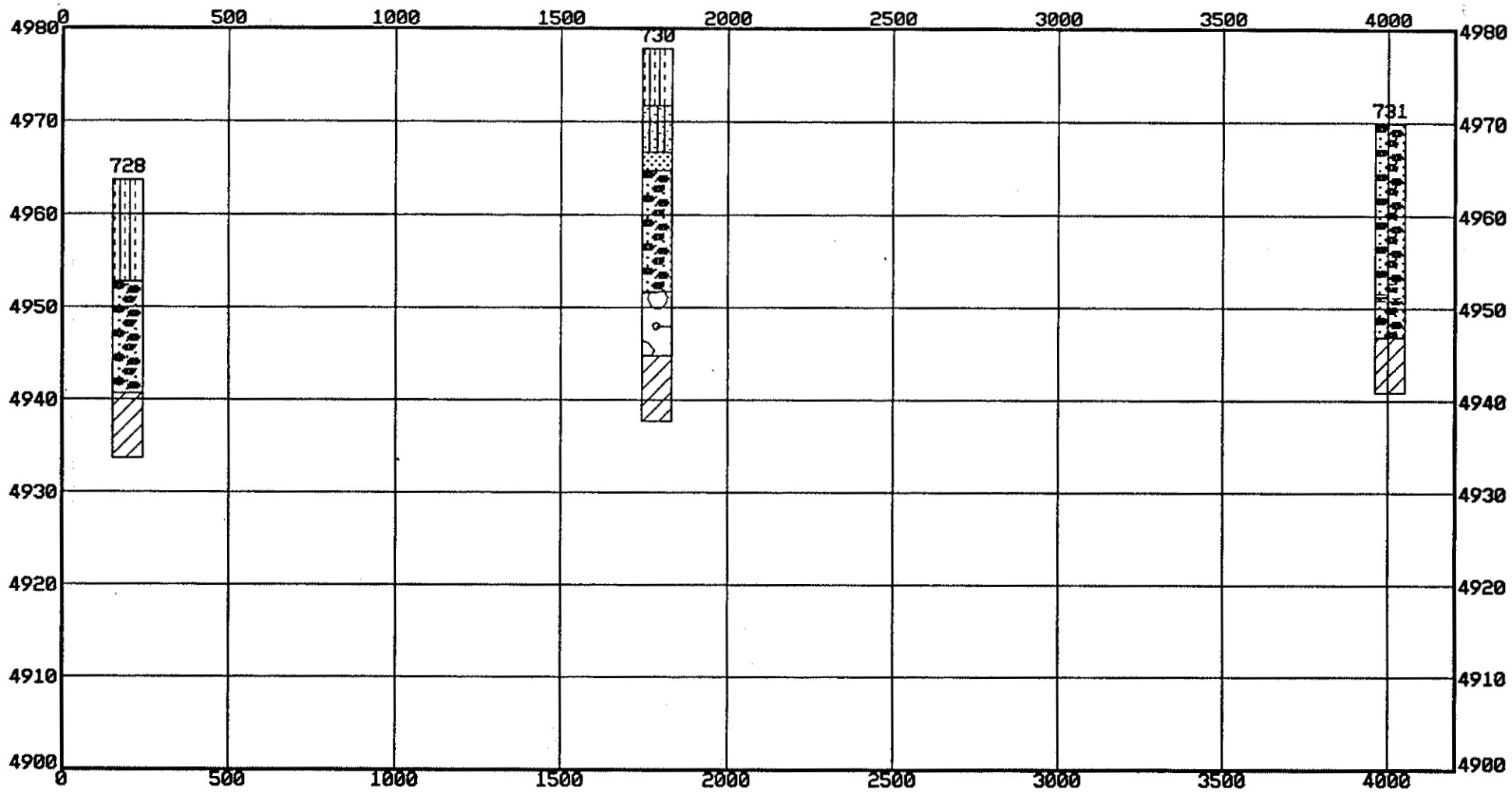
April 1993

SHIPROCK SITE, NEW MEXICO; UMTRA TAILINGS AREA

SITE PLAN

FIGURE 1

Jacobs Engineering Group Albuquerque, New Mexico



Borehole	North	East	Elev.	Depth
728	7737.0	8466.1	4963.7	30.0
730	6629.2	9609.0	4977.8	40.0
731	5485.1	11507.4	4969.9	29.0

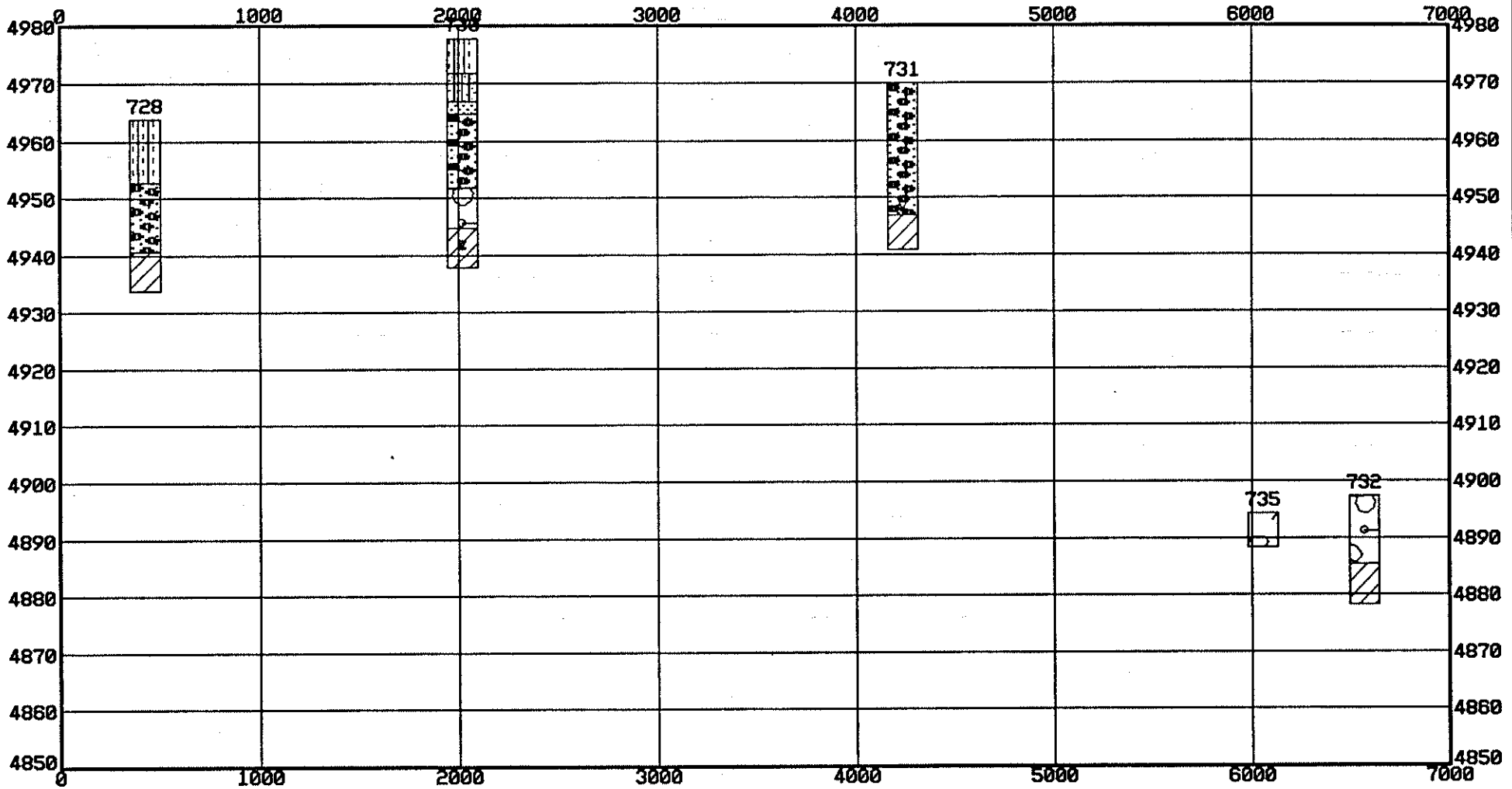
DISTANCES:
 Beginning 0.0
 Ending 4200.0
 VIEWING ANGLES (degrees):
 Horizontal 0.0
 Vertical 0.0

Position	North	East
Left, Front	7736.95	8466.14
Right, Front	5485.06	11507.42
Left, Back		
Right, Back		

SUBSURFACE FENCE DIAGRAM :NW TO SE, SW EDGE

SHIPROCK SITE, NM

PROJECT #	DATE	PLATE
SHP01,	APR 93	1



Borehole	North	East	Elev.	Depth
728	7737.0	8466.1	4963.7	30.0
730	6629.2	9609.0	4977.8	40.0
731	5485.1	11507.4	4969.9	29.0
732	6837.7	12746.5	4897.3	19.0
735	7113.8	12306.3	4894.3	6.0

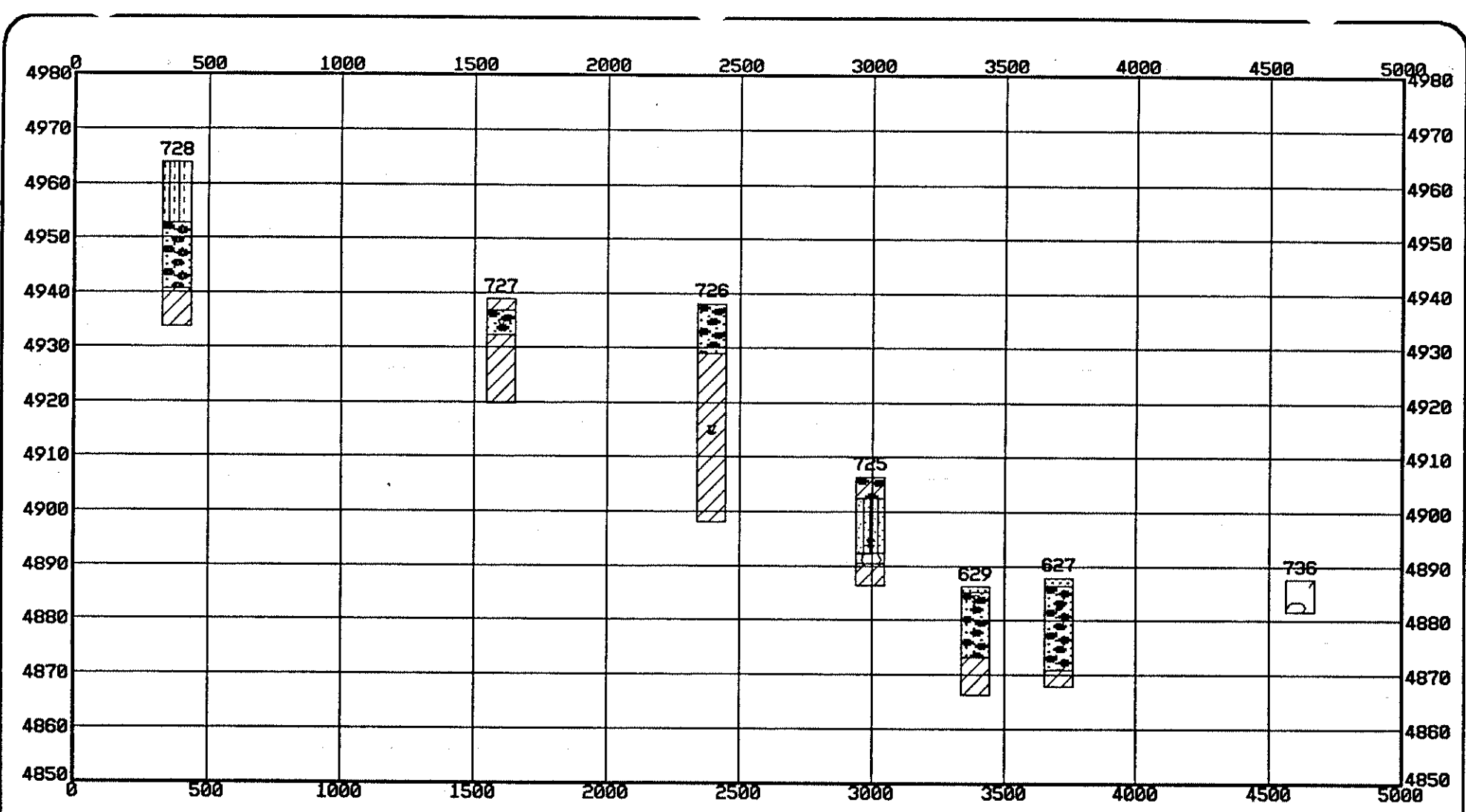
DISTANCES:
 Beginning 0.0
 Ending 7000.0
 VIEWING ANGLES (degrees):
 Horizontal 0.0
 Vertical 0.0

Position	North	East
Left, Front	7736.95	8466.14
Right, Front	6837.70	2746.52
Left, Back		
Right, Back		

SUBSURFACE FENCE DIAGRAM :UPGRADNT. WELLS

SHIPROCK SITE, NM

PROJECT #	DATE	PLATE
SHP01,	APR 93	1



Borehole	North	East	Elev.	Depth
627	10725.9	9749.2	4887.8	20.0
629	10558.8	9477.7	4886.2	20.0
725	10207.4	9292.2	4906.4	20.0
726	9649.0	9075.0	4938.0	40.0
727	8915.4	8780.1	4938.8	19.0
728	7737.0	8466.1	4963.7	30.0
736	11620.7	9902.8	4887.6	6.0

DISTANCES:
Beginning 0.0
Ending 5000.0

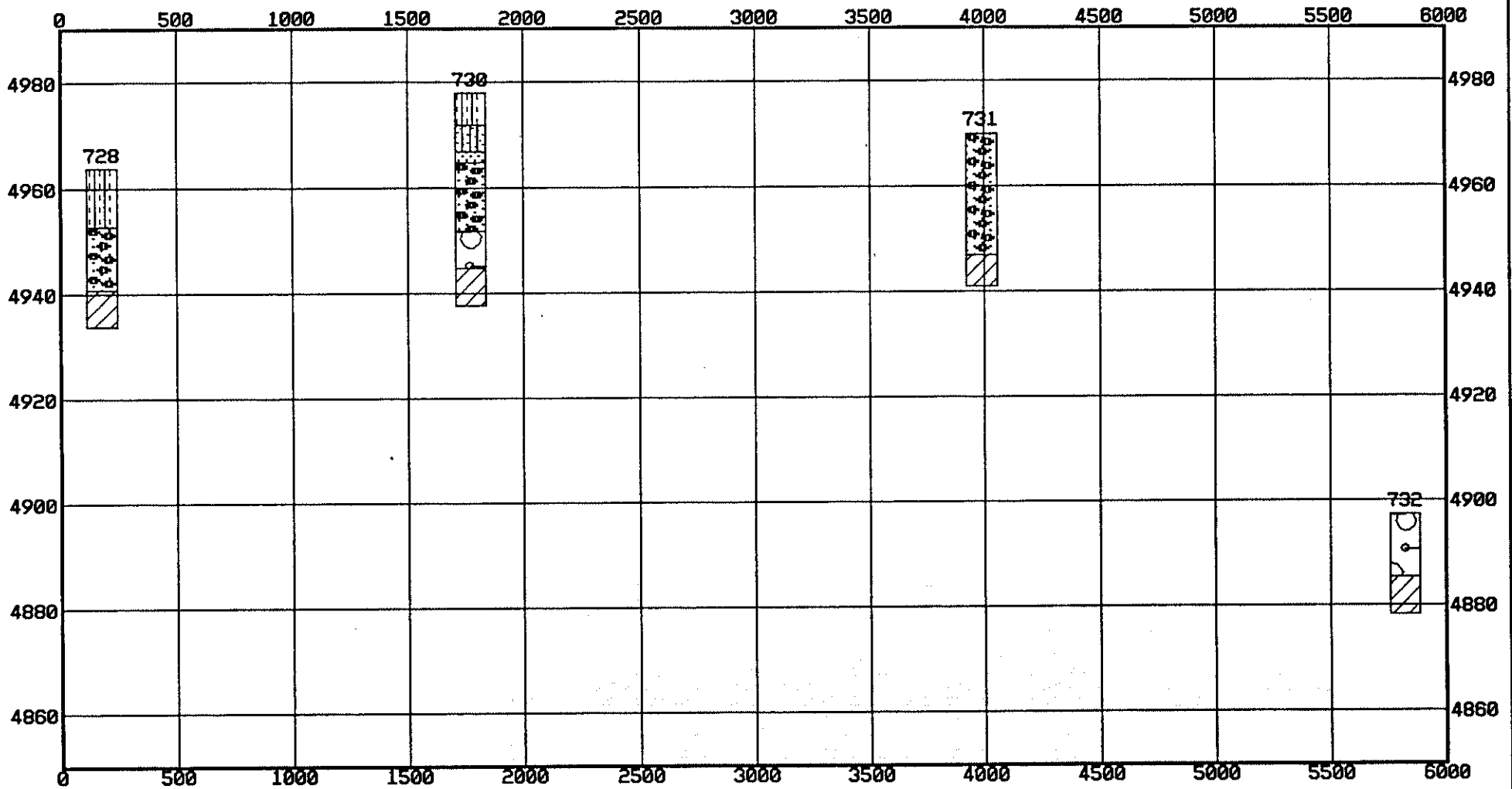
VIEWING ANGLES (degrees):
Horizontal 0.0
Vertical 0.0

Position	North	East
Left, Front	7736.95	8466.14
Right, Front	11620.69	9902.76
Left, Back		
Right, Back		

SUBSURFACE FENCE DIAGRAM : BOB LEE WASH ALI

SHIPROCK SITE, NM

PROJECT #	DATE	PLATE
SHP01,	APR 93	1



Borehole	North	East	Elev.	Depth
728	7737.0	8466.1	4963.7	30.0
730	6629.2	9609.0	4977.8	40.0
731	5485.1	11507.4	4969.9	29.0
732	6837.7	12746.5	4897.3	19.0

DISTANCES:

Beginning 0.0
Ending 6000.0

VIEWING ANGLES (degrees):

Horizontal 0.0
Vertical 0.0

Position	North	East
Left, Front	7736.95	8466.14
Right, Front	6837.70	12746.52
Left, Back		
Right, Back		

SUBSURFACE FENCE DIAGRAM :UPGRADIENT WELL

SHIPROCK SITE, NM

PROJECT #	DATE	PLATE
SHP01,	APR 93	1

Albuquerque, New Mexico

APR2993 08:49

Exploration Points in PROJECT ID SHP01 - Address 2201

POINT ID	F	DEPTH	LAST UPDATE
608	1	19.00	08/10/92 09:13
609	1	14.00	08/10/92 09:12
610	1	15.00	08/10/92 09:12
611	1	22.00	08/10/92 09:11
612	1	15.00	08/10/92 09:11
613	1	15.00	08/10/92 09:10
614	1	19.00	08/10/92 09:09
615	1	14.00	08/10/92 09:08
616	1	14.00	08/10/92 09:07
617	1	20.30	08/10/92 14:29
618	1	21.00	08/10/92 09:06
619	1	20.00	08/10/92 09:05
620	1	23.00	08/10/92 09:05
621	1	19.00	08/10/92 09:04
622	1	16.00	08/10/92 09:04
623	1	23.00	08/10/92 09:03
624	1	29.00	08/10/92 09:02
625	1	17.00	08/10/92 09:01
626	1	20.00	08/10/92 09:01
627	1	20.00	08/10/92 09:00
628	1	15.00	08/10/92 09:00
629	1	20.00	08/10/92 08:59
630	1	15.00	08/10/92 08:58
631	1	23.00	08/10/92 08:57
632	1	20.00	08/10/92 08:57
633	1	20.00	08/10/92 15:02
725	1	20.00	04/28/93 15:16
726	1	40.00	04/28/93 15:19
727	1	19.00	04/28/93 15:20
728	1	30.00	04/28/93 15:22
730	1	40.00	04/28/93 15:23
731	1	29.00	04/28/93 15:24
732	1	19.00	04/28/93 15:26
733	1	15.00	04/28/93 15:27

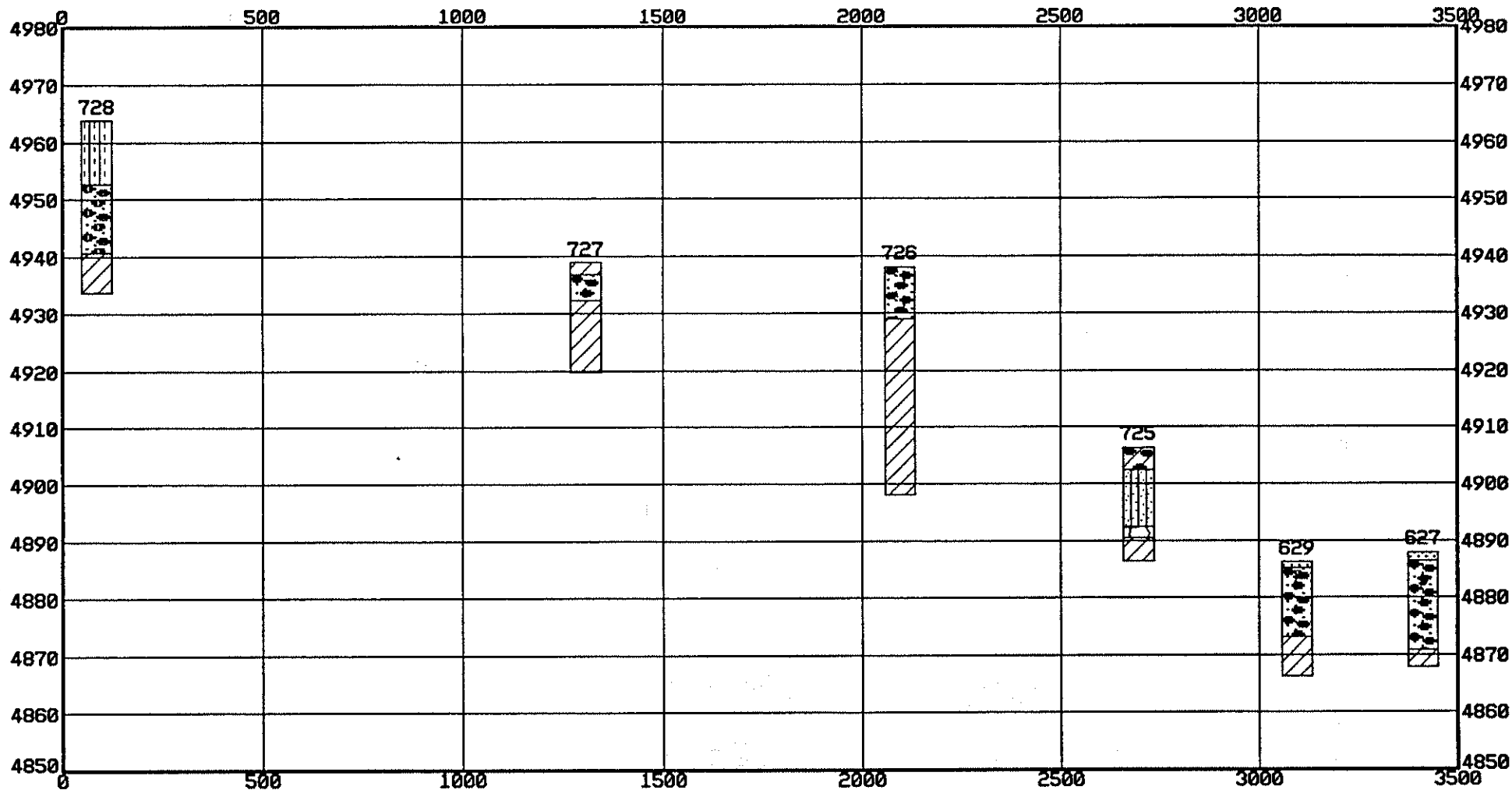
734
765
736
ART

Jacobs Engineering Group
Albuquerque, New Mexico

APR2993 08:49

eeeeeeeeeeee Exploration Points in PROJECT ID SHP02 - Address 2201 eeeeeeeeeeeee

POINT ID	F	DEPTH	LAST	UPDATE
10GT	1	39.00	08/18/92	16:36
1H	1	60.00	08/18/92	16:36
2H	1	60.00	08/18/92	16:37
3H	1	60.00	08/18/92	16:38
4H	1	80.00	08/18/92	16:40
5AGT	1	55.00	08/18/92	16:41
6GT	1	50.00	08/18/92	16:41
7GT	1	35.00	08/18/92	16:43
8GT	1	50.00	08/18/92	16:44
9GT	1	42.00	08/18/92	16:44
DM-1	1	62.70	08/13/92	15:17
DM-10	1	74.25	08/13/92	14:36
DM-10A	1	40.70	08/13/92	14:38
DM-10B	1	36.00	08/13/92	14:46
DM-11	1	71.30	08/13/92	14:54
DM-11A	1	45.00	08/13/92	14:55
DM-12	1	46.00	08/13/92	14:57
DM-12A	1	85.00	08/13/92	15:00
DM-2	1	53.70	08/13/92	14:08
DM-3	1	47.60	08/13/92	14:11
DM-3A	1	87.40	08/13/92	14:22
DM-4	1	85.30	08/13/92	14:13
DM-5	1	96.70	08/13/92	14:24
DM-6	1	92.50	08/13/92	14:26
DM-7	1	85.10	08/13/92	14:30
DM-8	1	87.60	08/13/92	14:31
DM-9	1	47.70	08/13/92	14:33



Borehole	North	East	Elev.	Depth
627	10725.9	9749.2	4887.8	20.0
629	10558.8	9477.7	4886.2	20.0
725	10207.4	9292.2	4906.4	20.0
726	9649.0	9075.0	4938.0	40.0
727	8915.4	8780.1	4938.8	19.0
728	7737.0	8466.1	4963.7	30.0

DISTANCES:

Beginning 0.0
Ending 3500.0

VIEWING ANGLES (degrees):

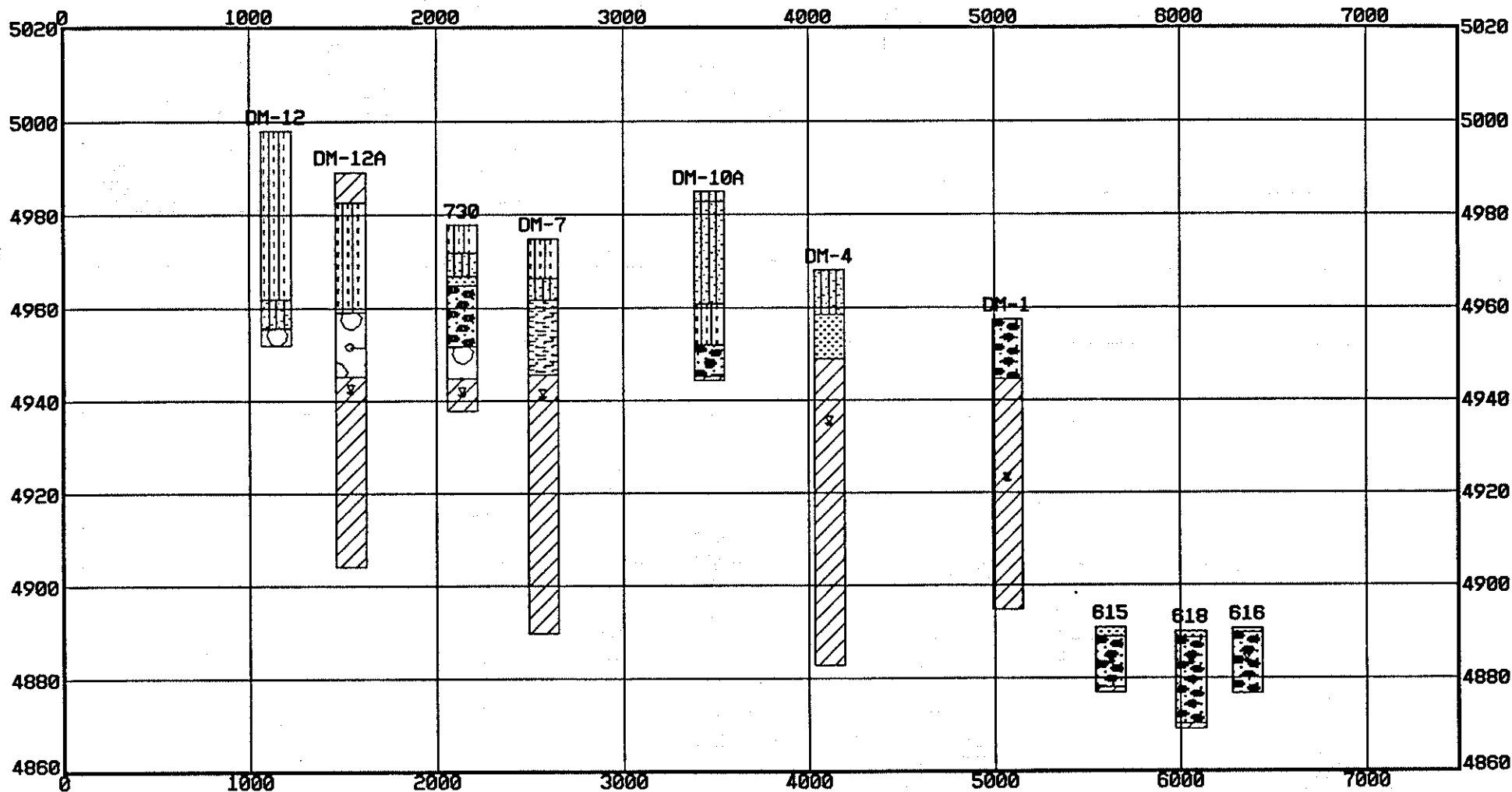
Horizontal 0.0
Vertical 0.0

Position	North	East
Left, Front	7736.95	8466.14
Right, Front	10725.88	9749.24
Left, Back		
Right, Back		

SUBSURFACE FENCE DIAGRAM :S-N, BOB LEE WAS

SHIPROCK SITE, NM

PROJECT #	DATE	PLATE
SHP01,	APR 93	1



Borehole	North	East	Elev.	Depth
615	9744.7	10667.3	4891.0	14.0
616	10213.5	11140.8	4890.8	14.0
618	10138.1	10849.3	4890.1	21.0
730	6629.2	9609.0	4977.8	40.0
DM-1	9199.0	10761.0	4957.5	62.7
DM-10A	7640.0	10380.0	4985.0	40.7
DM-12	5666.0	9657.0	4998.0	46.0
DM-12A	6050.0	9750.0	4989.2	85.0
DM-4	8273.0	10519.0	4968.0	85.3
DM-7	6844.0	9987.0	4974.8	85.1

DISTANCES:

Beginning 0.0
Ending 7500.0

VIEWING ANGLES (degrees):

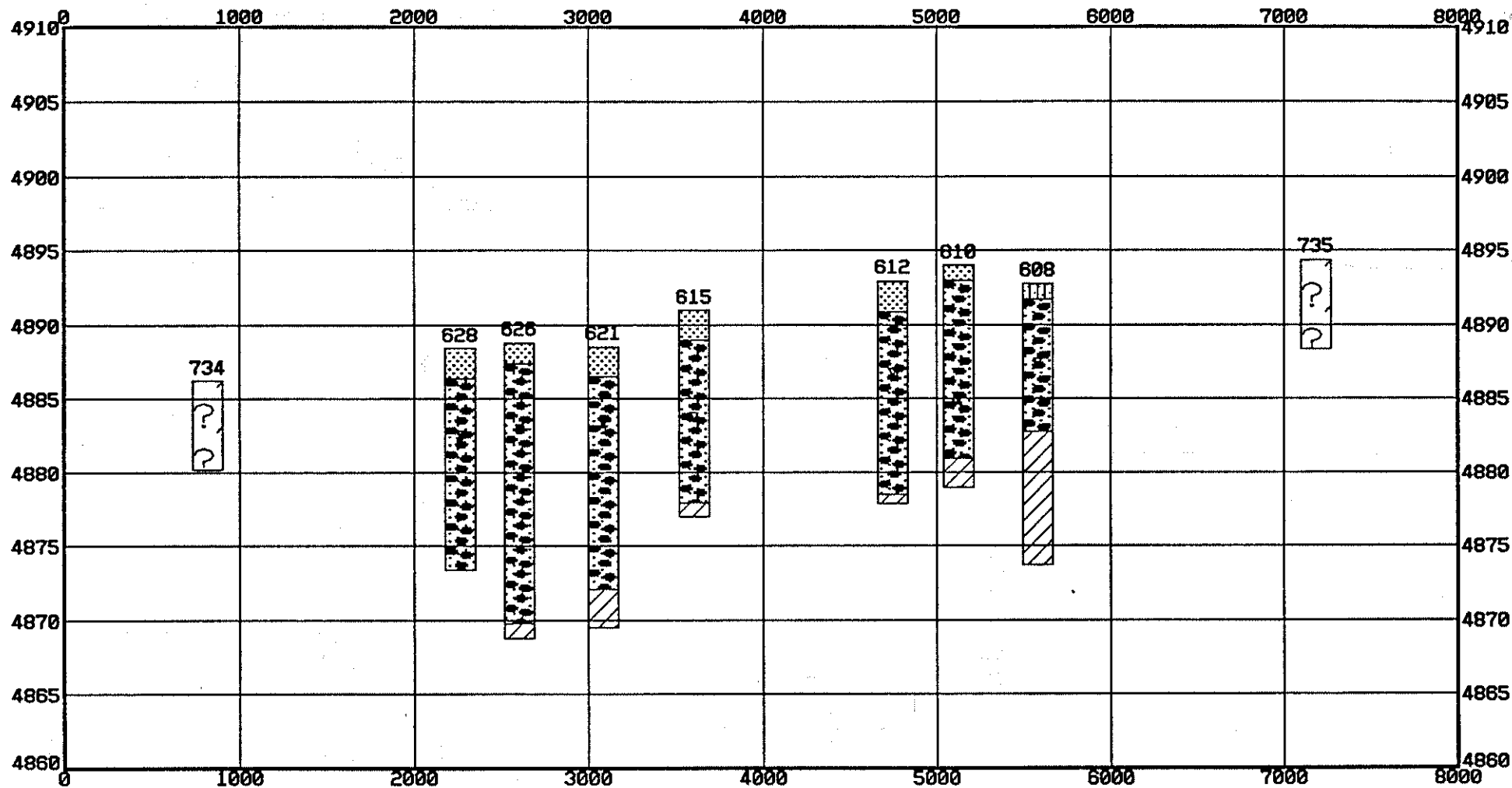
Horizontal 0.0
Vertical 0.0

Position	North	East
Left, Front	5666.00	9657.00
Right, Front	10213.54	11140.82
Left, Back		
Right, Back		

SUBSURFACE FENCE DIAGRAM : CELL AREA

SHIPROCK SITE, NM

PROJECT #	DATE	PLATE
SHP01,	APR 93	1



Borehole	North	East	Elev.	Depth
608	8642.0	11819.1	4892.7	19.0
610	8893.0	11440.6	4894.0	15.0
612	9192.1	11665.7	4892.9	15.0
615	9744.7	10667.3	4891.0	14.0
621	10161.7	10353.9	4888.5	19.0
626	10524.9	10040.7	4888.8	20.0
628	10716.5	9758.9	4888.4	15.0
734	11700.2	8702.7	4886.2	6.0
735	7113.8	12306.3	4894.3	6.0

DISTANCES:

Beginning 0.0
Ending 8000.0

VIEWING ANGLES (degrees):

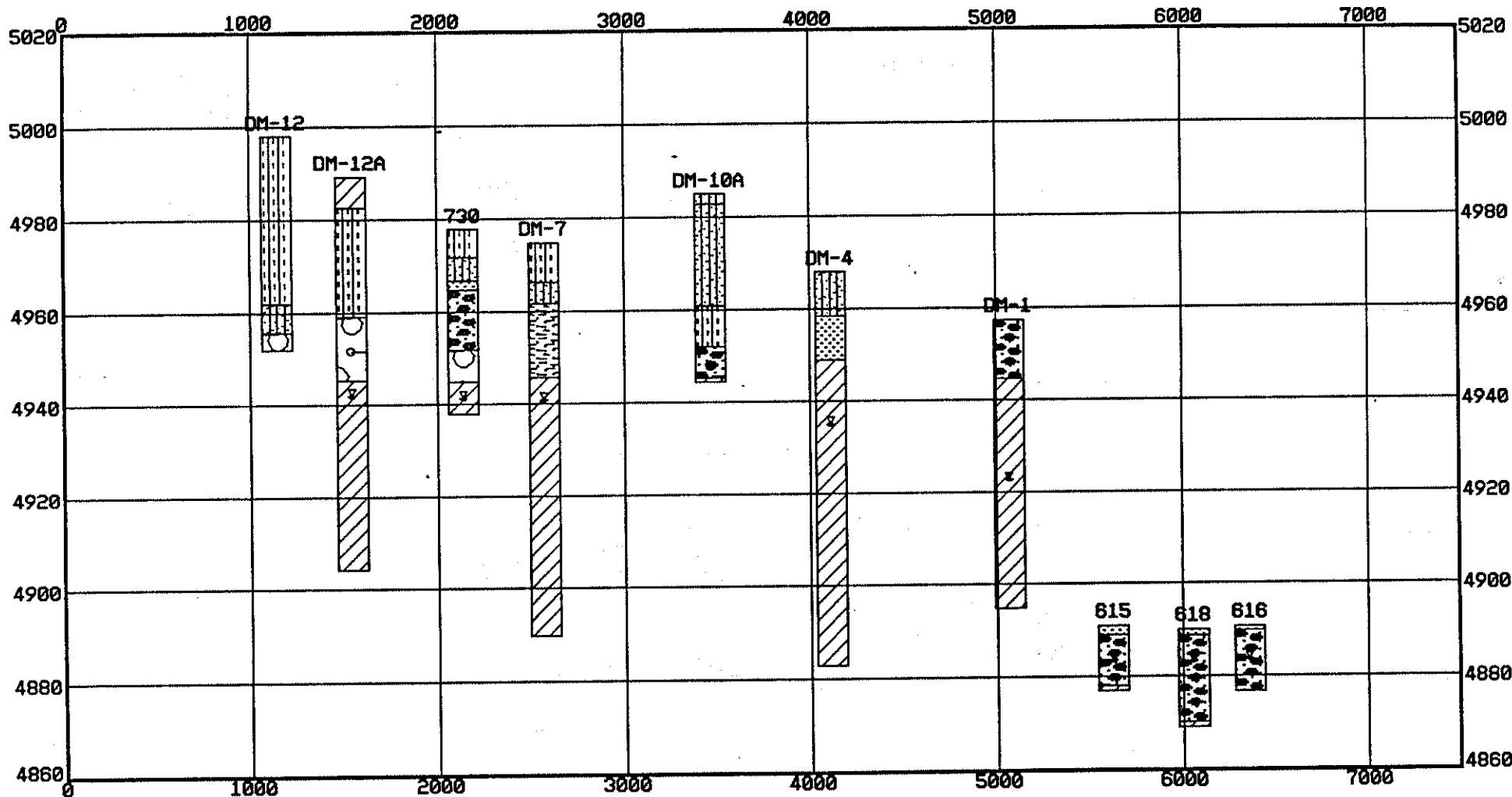
Horizontal 0.0
Vertical 0.0

Position	North	East
Left, Front	1700.20	8702.66
Right, Front	7113.71	12306.33
Left, Back		
Right, Bac		

SUBSURFACE FENCE DIAGRAM : FLOOD PLAIN WELL

SHIPROCK SITE, NM

PROJECT #	DATE	PLATE
SHP01,	APR 93	1



Borehole	North	East	Elev.	Depth
615	9744.7	10667.3	4891.0	14.0
616	10213.5	11140.8	4890.8	14.0
618	10138.1	10849.3	4890.1	21.0
730	6629.2	9609.0	4977.8	40.0
DM-1	9199.0	10761.0	4957.5	62.7
DM-10A	7640.0	10380.0	4985.0	40.7
DM-12	5666.0	9657.0	4998.0	46.0
DM-12A	6050.0	9750.0	4989.2	85.0
DM-4	8273.0	10519.0	4968.0	85.3
DM-7	6844.0	9987.0	4974.8	85.1

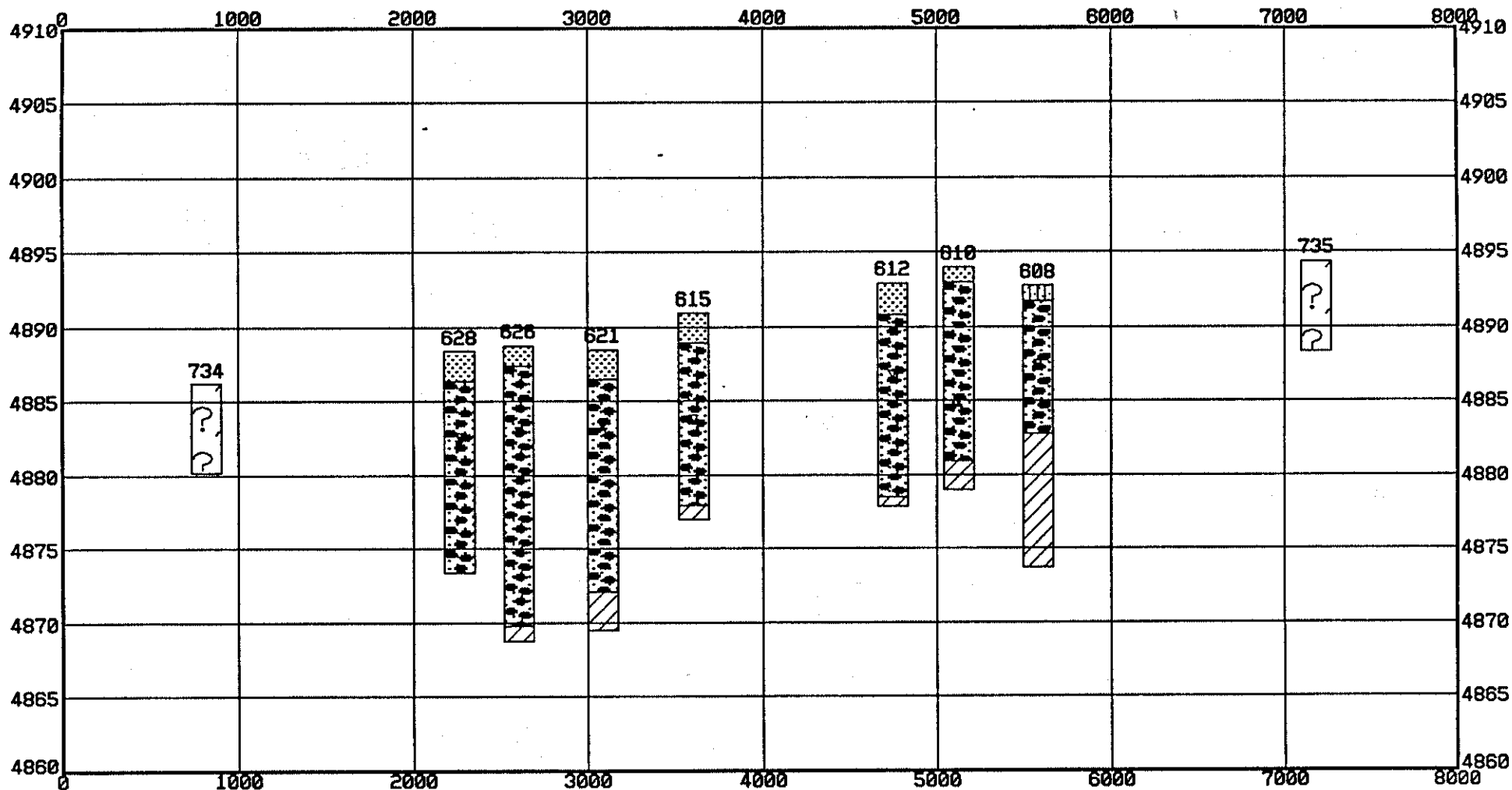
DISTANCES:
 Beginning 0.0
 Ending 7500.0
 VIEWING ANGLES (degrees):
 Horizontal 0.0
 Vertical 0.0

Position	North	East
Left, Front	5666.00	9657.00
Right, Front	10213.54	11140.82
Left, Back		
Right, Back		

SUBSURFACE FENCE DIAGRAM : CELL AREA

SHIPROCK SITE, NM

PROJECT #	DATE	PLATE
SHP01,	APR 93	1



Borehole	North	East	Elev.	Depth
608	8642.0	11819.1	4892.7	19.0
610	8893.0	11440.6	4894.0	15.0
612	9192.1	11665.7	4892.9	15.0
615	9744.7	10667.3	4891.0	14.0
621	10161.7	10353.9	4888.5	19.0
626	10524.9	10040.7	4888.8	20.0
628	10716.5	9758.9	4888.4	15.0
734	11700.2	8702.7	4886.2	6.0
735	7113.8	12306.3	4894.3	6.0

DISTANCES:

Beginning 0.0
Ending 8000.0

VIEWING ANGLES (degrees):

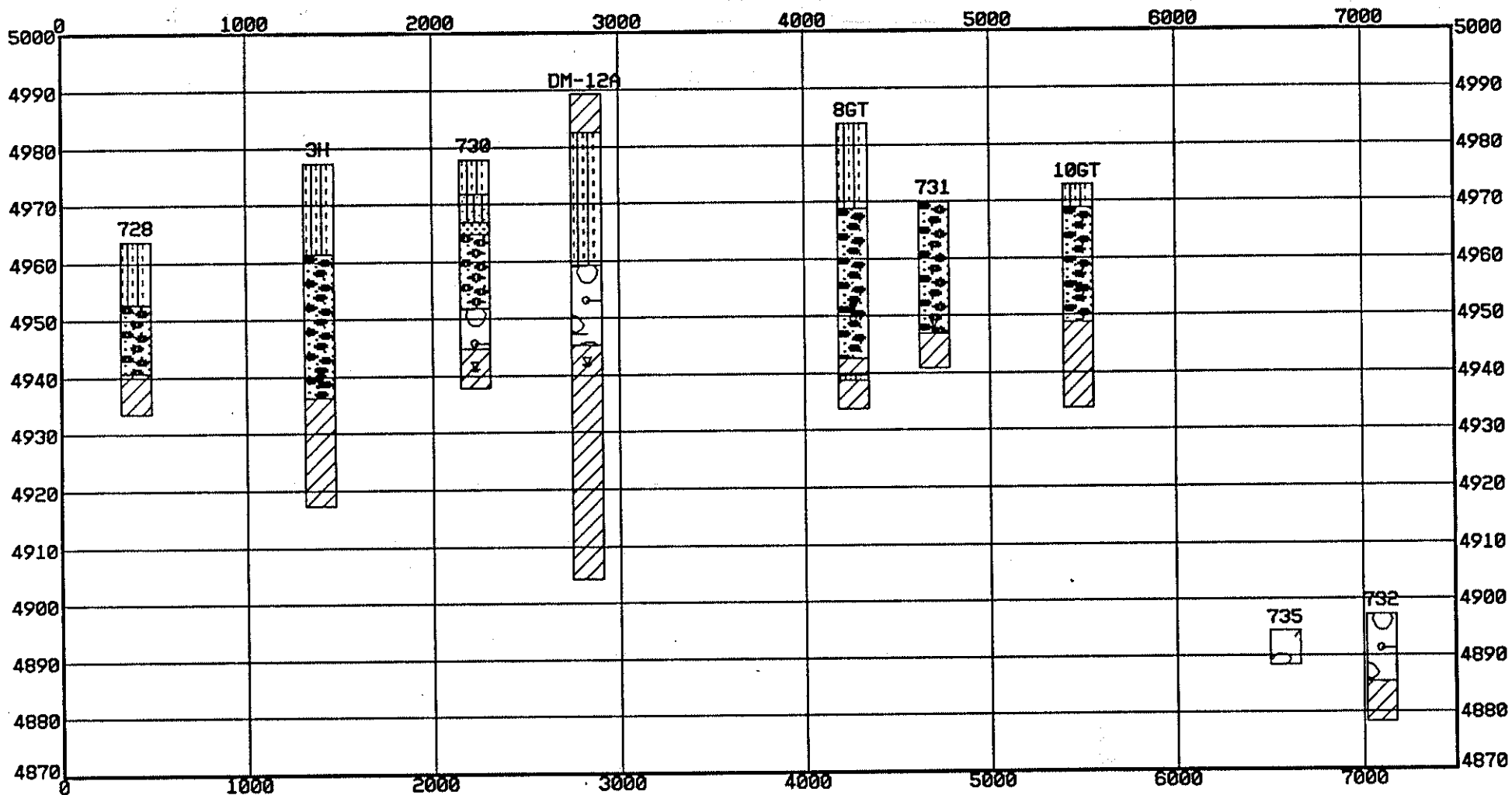
Horizontal 0.0
Vertical 0.0

Position	North	East
Left, Front	1700.20	8702.66
Right, Front	7113.77	2306.33
Left, Back		
Right, Bac		

SUBSURFACE FENCE DIAGRAM : FLOOD PLAIN WELL

SHIPROCK SITE, NM

PROJECT #	DATE	PLATE
SHP01,	APR 93	1



Borehole	North	East	Elev.	Depth
10GT	6259.2	11610.8	4972.8	39.0
3H	6800.9	8789.5	4977.3	60.0
728	7737.0	8466.1	4963.7	30.0
730	6629.2	9609.0	4977.8	40.0
731	5485.1	11507.4	4969.9	29.0
732	6837.7	12746.5	4897.3	19.0
735	7113.8	12306.3	4894.3	6.0
8GT	5500.8	11074.6	4983.7	50.0
DM-12A	6050.0	9750.0	4989.2	85.0

DISTANCES:

Beginning 0.0
Ending 7500.0

VIEWING ANGLES (degrees):

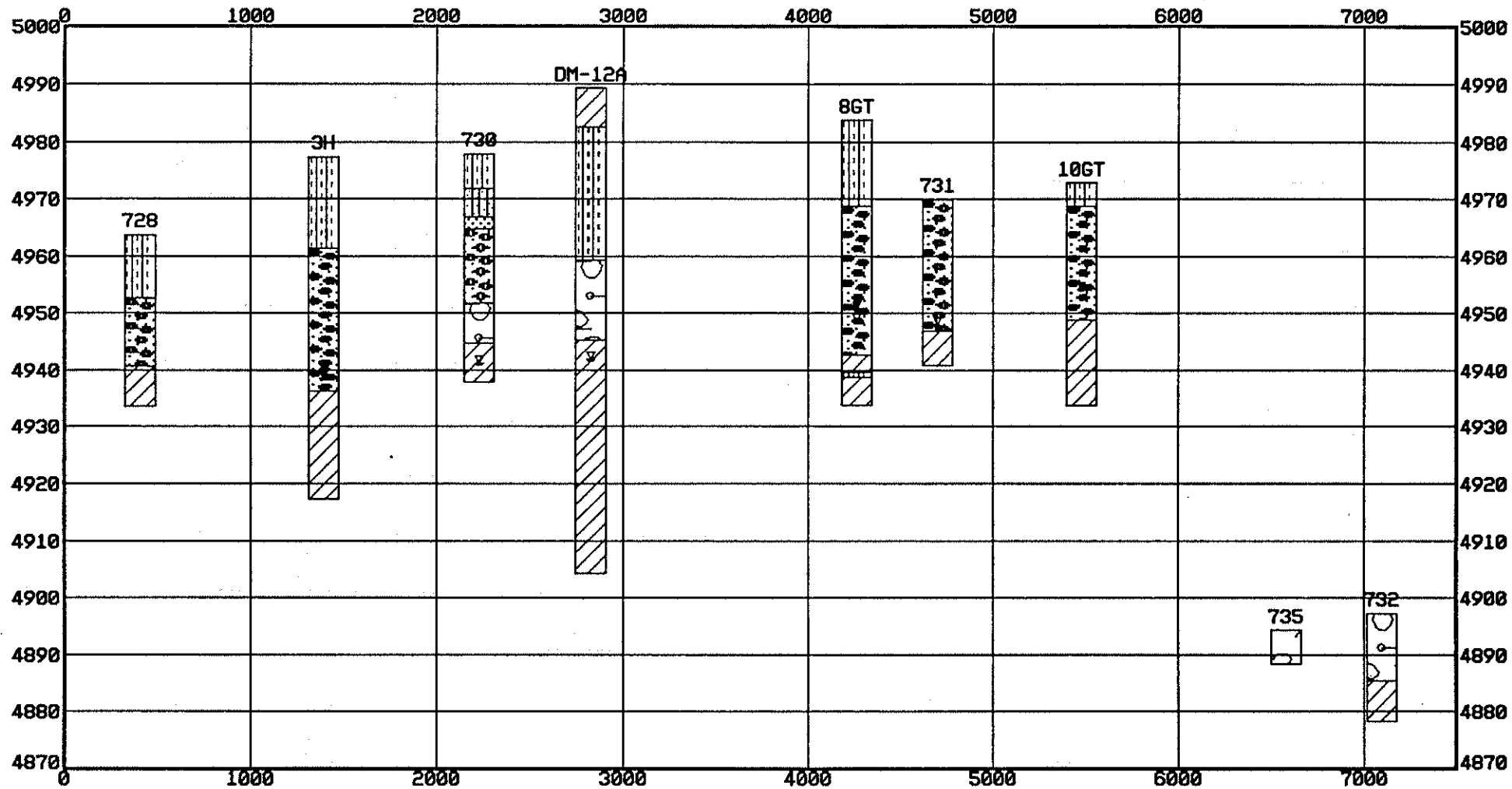
Horizontal 0.0
Vertical 0.0

Position	North	East
Left, Front	7736.95	8466.14
Right, Front	6837.70	12746.52
Left, Back		
Right, Back		

SUBSURFACE FENCE DIAGRAM :UPGRAD. WELLS

SHIPROCK SITE, NM

PROJECT #	DATE	PLATE
SHP01,	APR 93	1



Borehole	North	East	Elev.	Depth
10GT	6259.2	11610.8	4972.8	39.0
3H	6800.9	8789.5	4977.3	60.0
728	7737.0	8466.1	4963.7	30.0
730	6629.2	9609.0	4977.8	40.0
731	5485.1	11507.4	4969.9	29.0
732	6837.7	12746.5	4897.3	19.0
735	7113.8	12306.3	4894.3	6.0
8GT	5500.8	11074.6	4983.7	50.0
DM-12A	6050.0	9750.0	4989.2	85.0

DISTANCES:

Beginning 0.0
Ending 7500.0

VIEWING ANGLES (degrees):

Horizontal 0.0
Vertical 0.0

Position	North	East
Left, Front	7736.95	8466.14
Right, Front	6837.70	12746.52
Left, B:		
Right, L:		

SUBSURFACE FENCE DIAGRAM :UPGRAD. WELLS

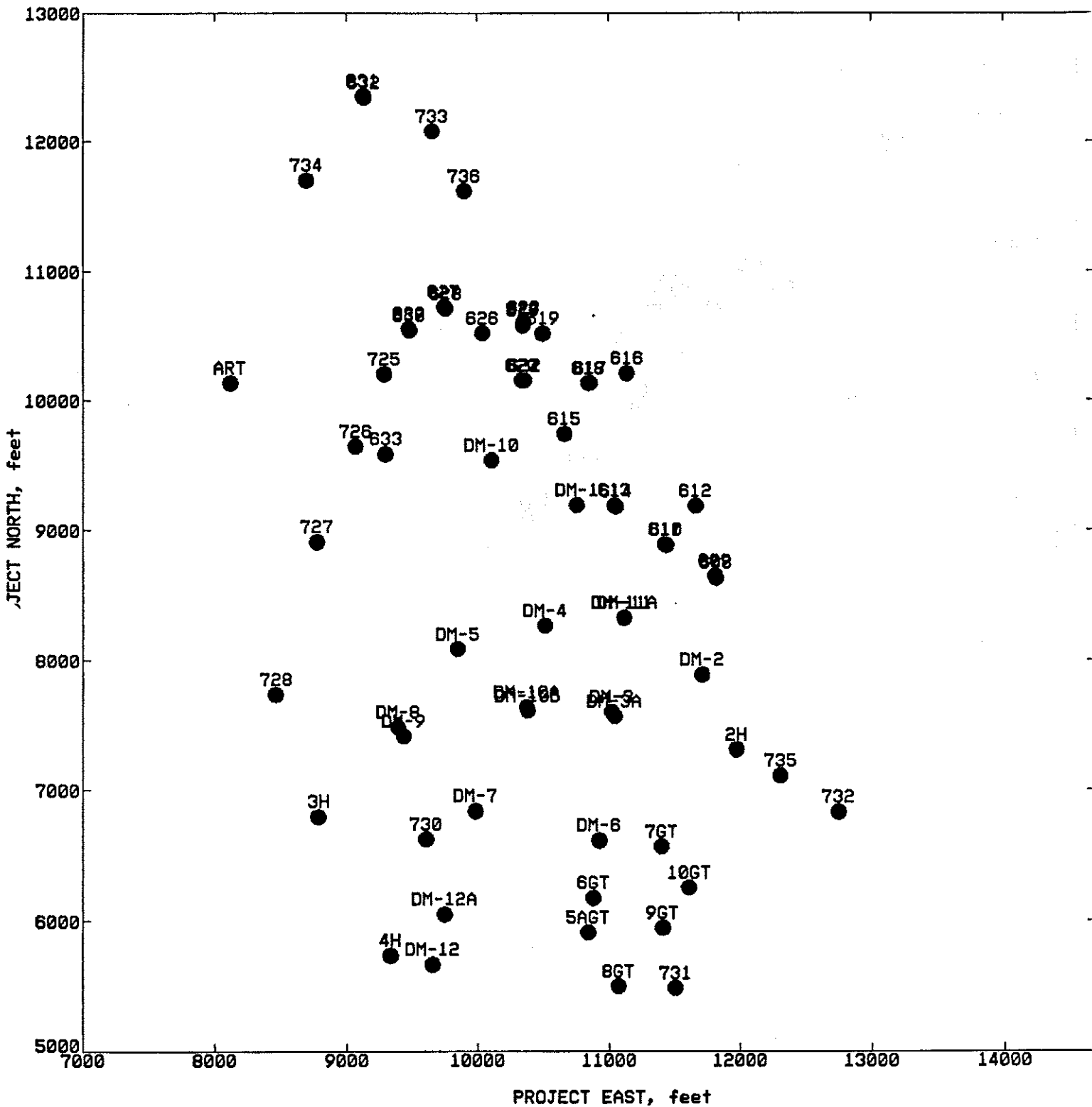
SHIPROCK SITE, NM

PROJECT #	DATE	PLATE
SHP01,	APR 93	1

SHP01,

APR 93

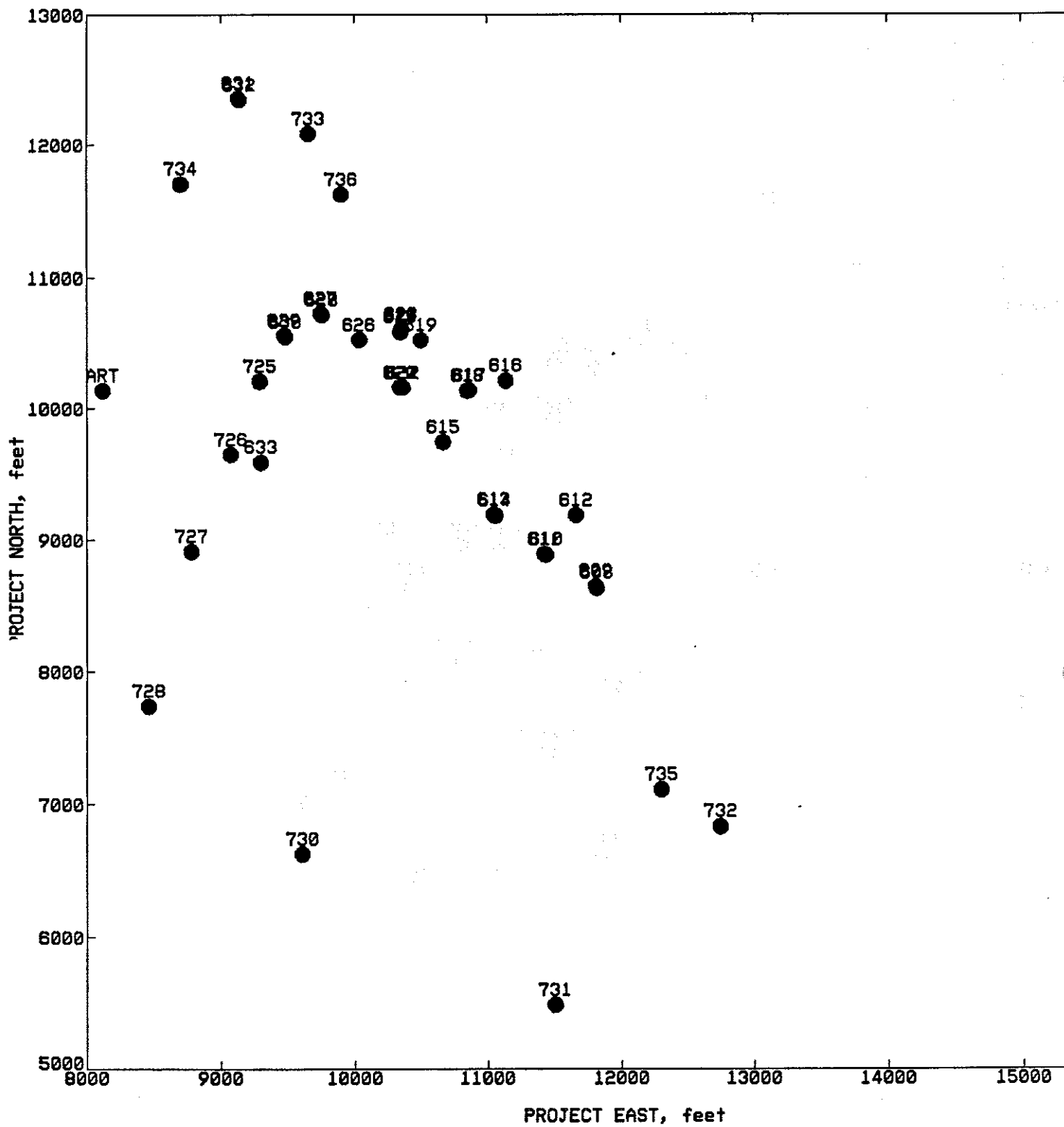
1



SHIPROCK SITE, NM

SITE PLAN

FIGURE 1

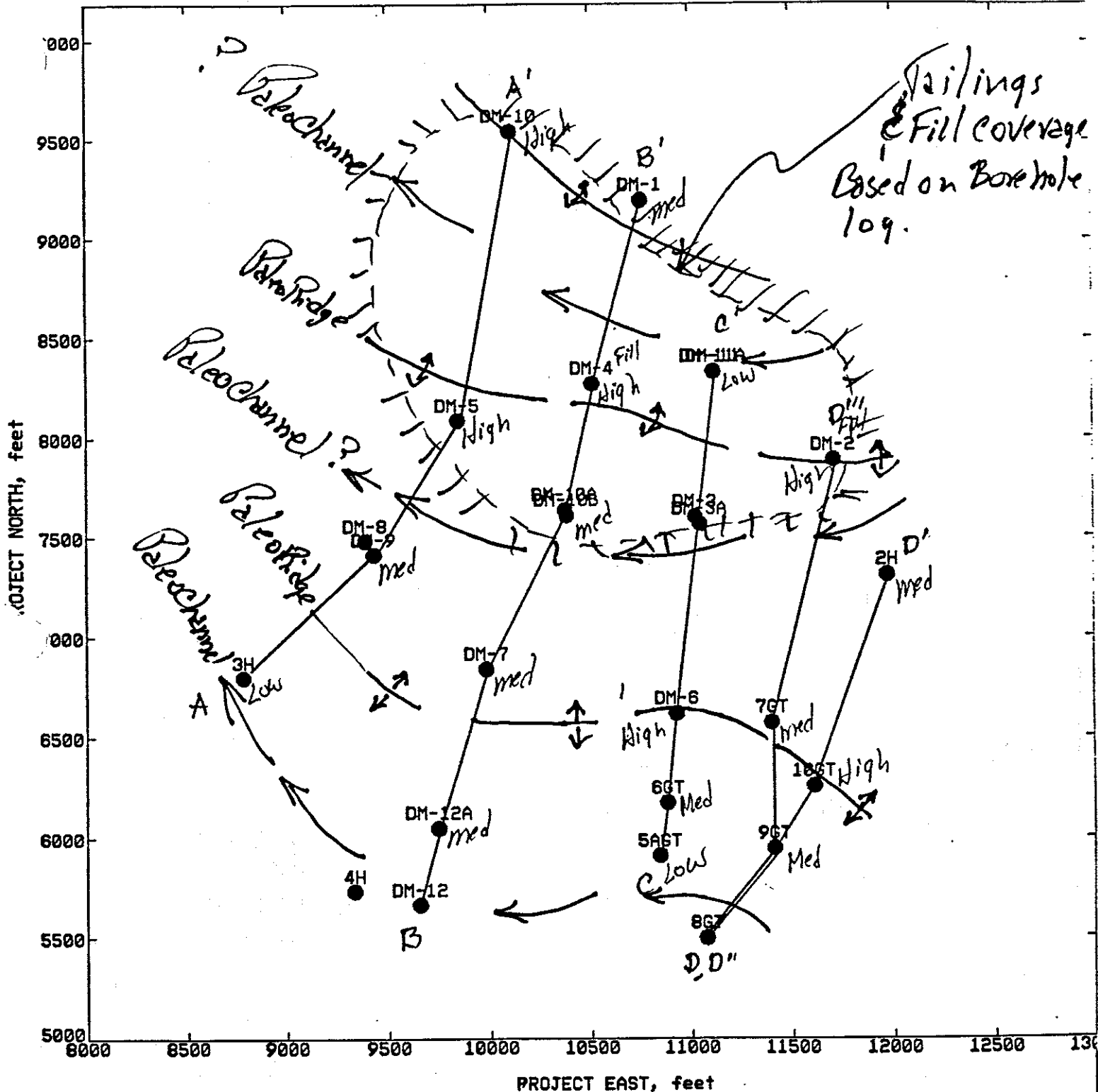


April 1993

SITE PLAN

Jacobs Engineering Group Albuquerque, New Mexico

FIGURE 1



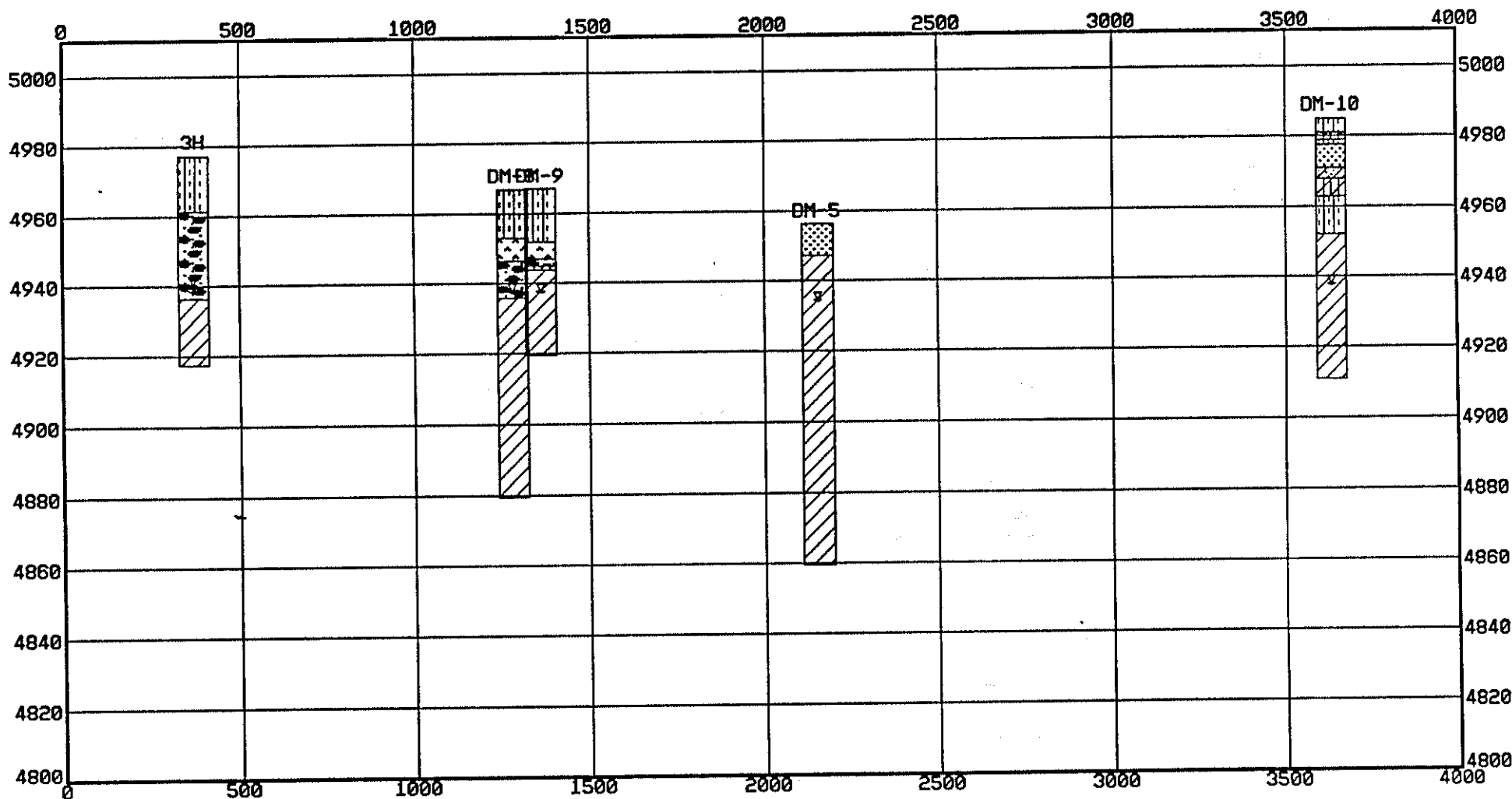
SHPO2

August 1992

SHIPROCK SITE, NEW MEXICO; UMTRA TAILINGS AREA

SITE PLAN

Jacobs Engineering Group Albuquerque, New Mexico



Borehole	North	East	Elev.	Depth
3H	6800.9	8789.5	4977.3	60.0
DM-10	9544.0	10112.0	4985.0	74.3
DM-5	8090.0	9852.0	4956.0	96.7
DM-8	7483.0	9395.0	4966.7	87.6
DM-9	7415.0	9438.0	4966.8	47.7

DISTANCES:

Beginning 0.0
Ending 4000.0

VIEWING ANGLES (degrees):

Horizontal 0.0
Vertical 0.0

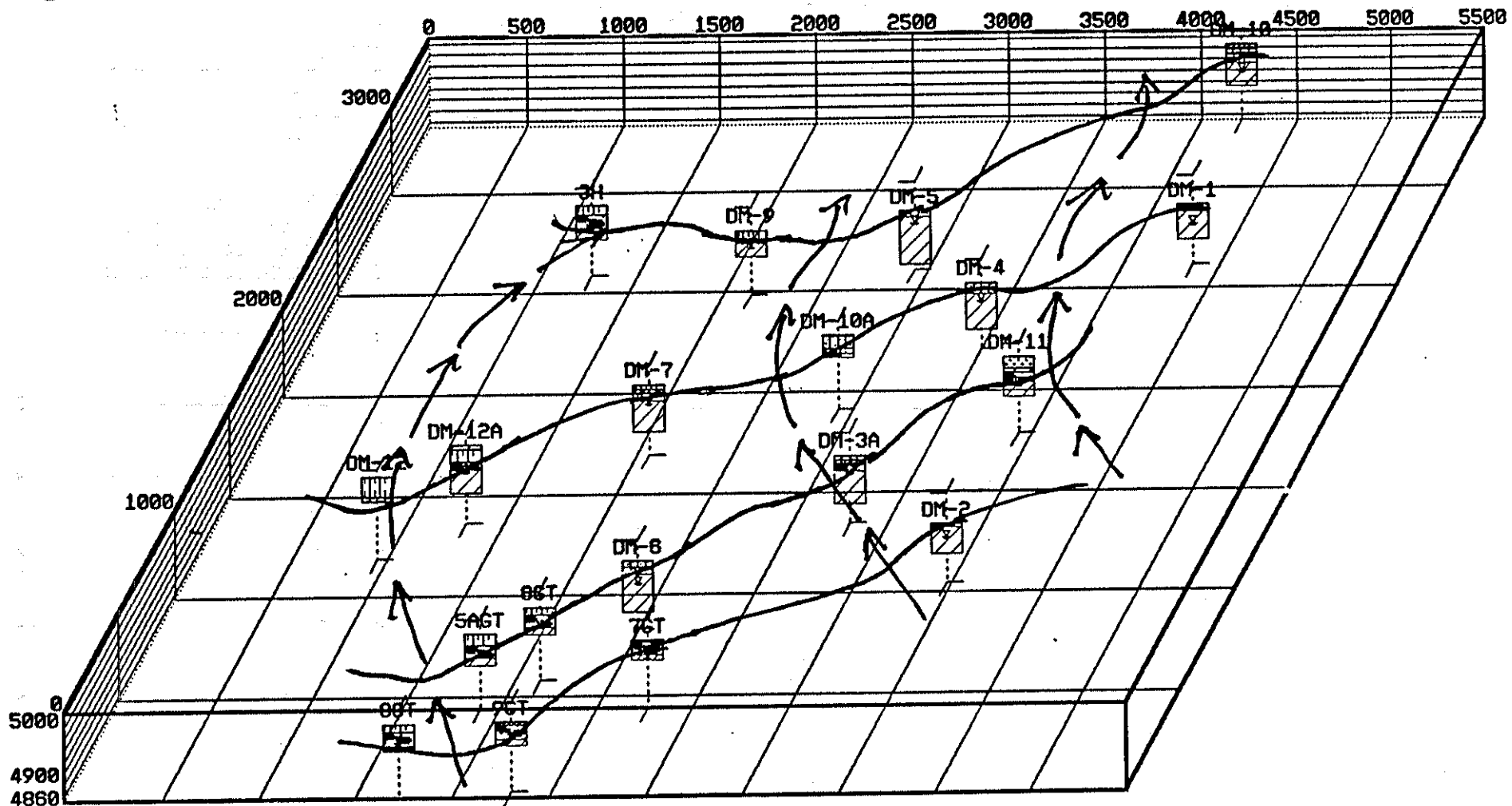
Position	North	East
Left, Front	6800.90	8789.50
Right, Front	9544.00	10112.00
Left, Back		
Right, Back		

SUBSURFACE FENCE DIAGRAM : CROSS SECTION A-

SHIPROCK SITE, NEW MEXICO; UMTRA

TAILINGS AREA

PROJECT #	DATE	PLATE
SHP02	AUG 92	1



Borehole	North	East	Elev.	Depth
3H	6800.9	8789.5	4977.3	60.0
5AGT	5913.3	10844.5	4983.9	55.0
6GT	6177.4	10883.2	4981.2	50.0
7GT	6574.2	11402.3	4971.4	35.0
8GT	5500.8	11074.6	4983.7	50.0
9GT	5948.1	11412.3	4975.2	42.0
DM-1	9199.0	10761.0	4957.5	62.7
DM-10	9544.0	10112.0	4985.0	74.3
DM-10A	7640.0	10380.0	4985.0	40.7
DM-11	8333.0	11120.0	4986.4	71.3
DM-12	5668.0	9657.0	4998.0	46.0
DM-12A	6050.0	9750.0	4989.2	85.0

DISTANCES:

Beginning 0.0
Ending 5500.0

VIEWING ANGLES (degrees):

Horizontal 30.0
Vertical 20.0

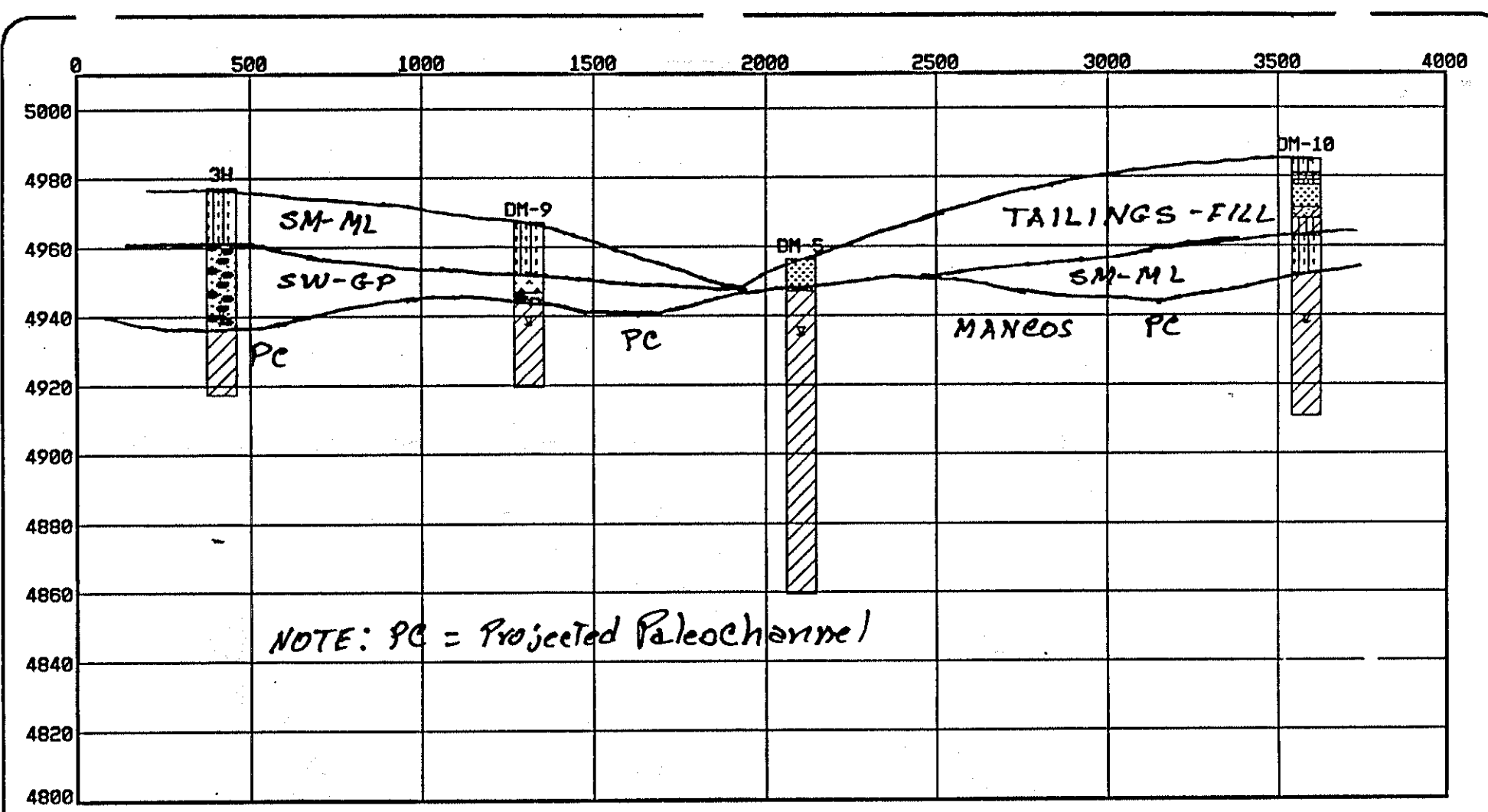
Position	North	East
Left, Front	1173.51	9958.53
Right, Front	8573.51	13658.53
Left, Back	6322.48	7403.00
Right, Back	10722.48	11103.00

SUBSURFACE FENCE DIAGRAM :TAILINGS AREA

SHIPROCK SITE, NEW MEXICO; UMTRA

TAILINGS AREA

PROJECT #	DATE	PLATE
SHP02	AUG 92	1



Borehole	North	East	Elev.	Depth
3H	8800.9	8789.5	4977.3	80.0
DM-10	9544.0	10112.0	4985.0	74.3
DM-5	8090.0	9852.0	4958.0	96.7
DM-9	7415.0	9438.0	4968.8	47.7

DISTANCES:
 Beginning 0.0
 Ending 4000.0

VIEWING ANGLES (degrees):
 Horizontal 0.0
 Vertical 0.0

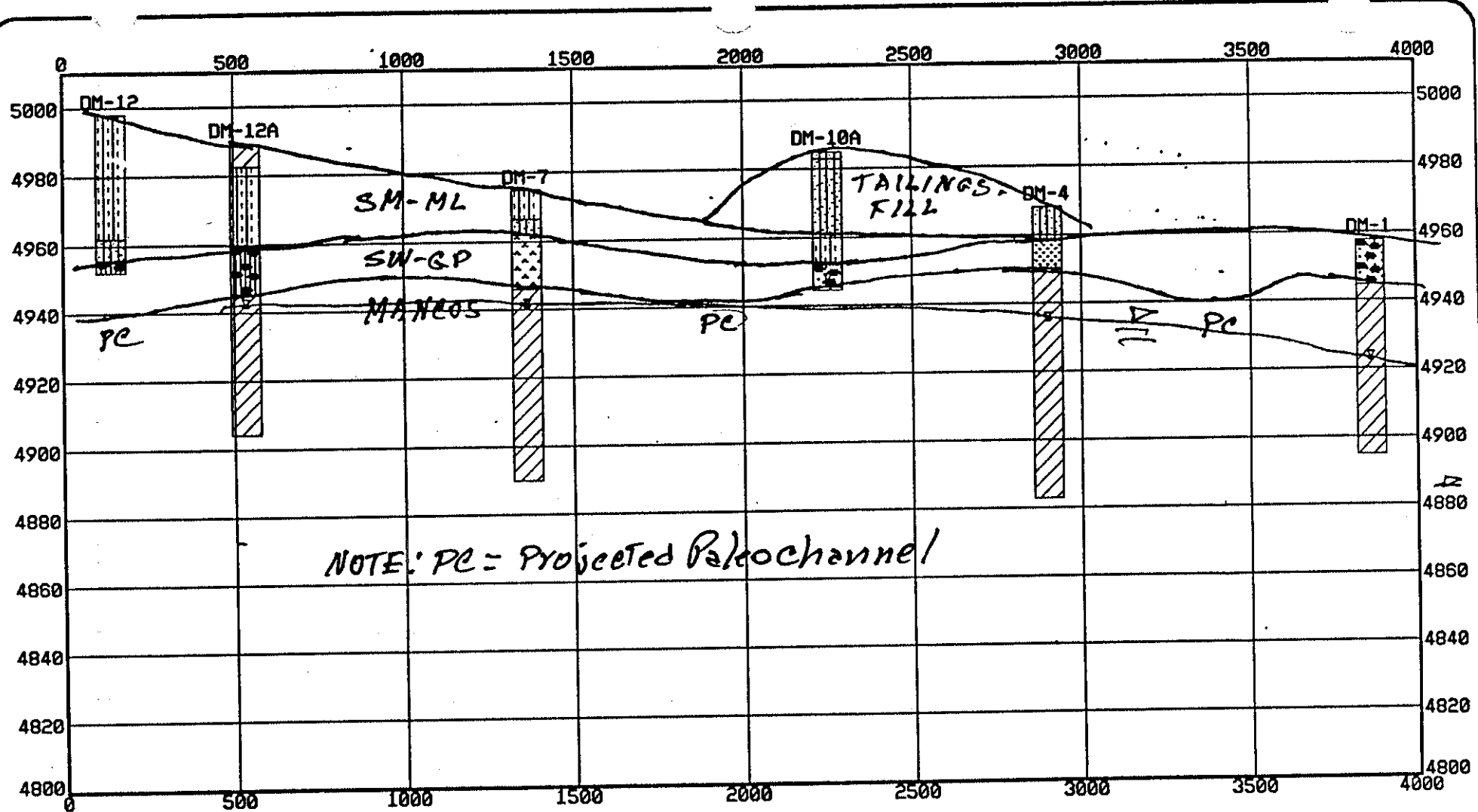
Position	North	East
Left, Front	8800.90	8789.50
Right, Front	9544.00	10112.00
Left, Back		
Right, Back		

SUBSURFACE FENCE DIAGRAM : CROSS SECTION A-A

SHIPROCK SITE, NEW MEXICO; UMTRA

TAILINGS AREA

PROJECT #	DATE	PLATE
SHP02	AUG 92	1



Borehole	North	East	Elev.	Depth
DM-1	9199.0	10761.0	4957.5	62.7
DM-10A	7640.0	10380.0	4985.0	40.7
DM-12	5668.0	9657.0	4998.0	46.0
DM-12A	6050.0	9750.0	4989.2	85.0
DM-4	8273.0	10519.0	4968.0	85.3
DM-7	6844.0	9987.0	4974.8	85.1

DISTANCES:
 Beginning 0.0
 Ending 4000.0

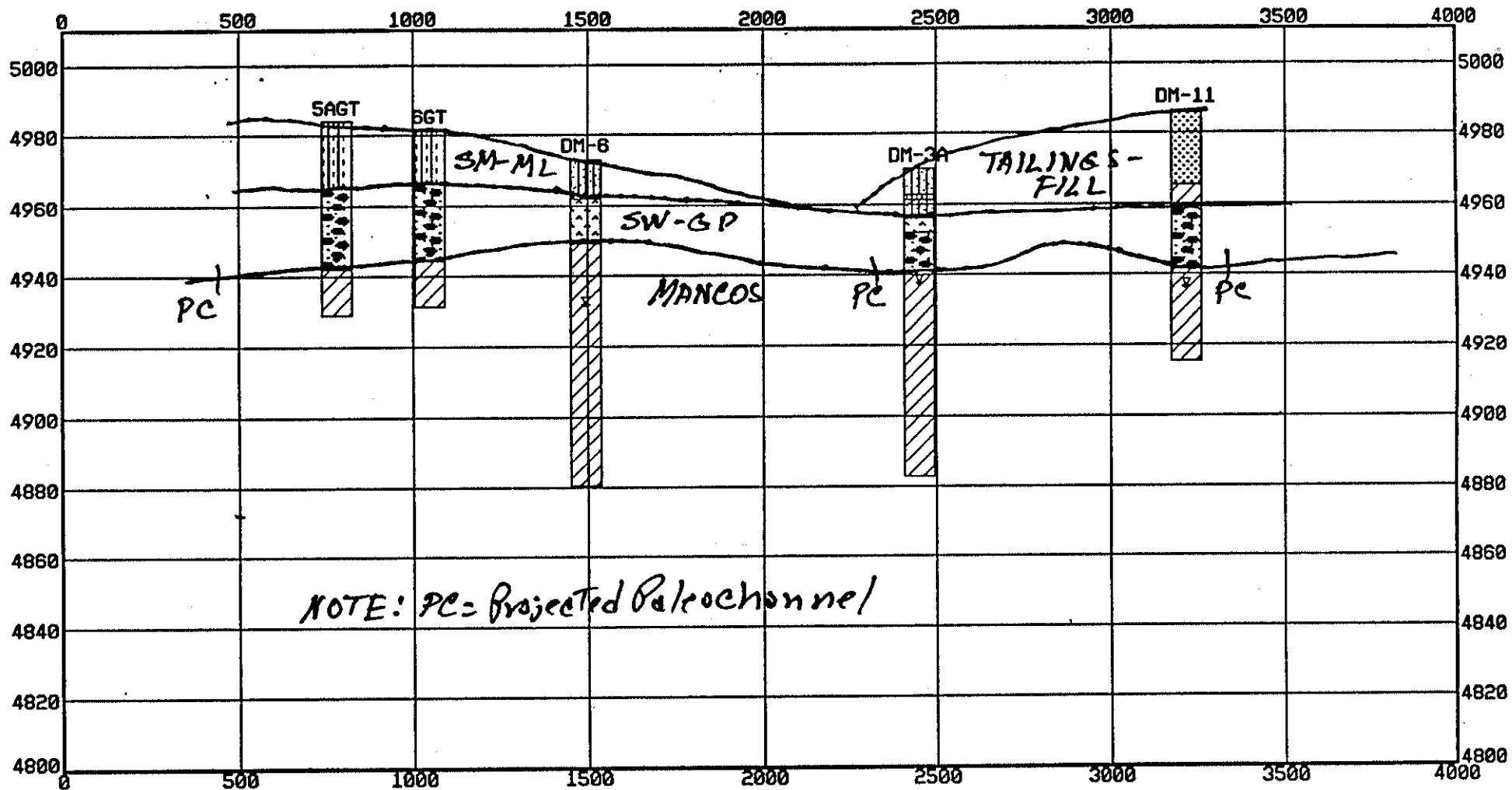
VIEWING ANGLES (degrees):
 Horizontal 0.0
 Vertical 0.0

Position	North	East
Left, Front	5668.00	9657.00
Right, Front	9199.00	10761.00
Left, Back		
Right, Back		

SUBSURFACE FENCE DIAGRAM : CROSS SECTION B-B

SHIPROCK SITE, NEW MEXICO; UMTRA
 TAILINGS AREA

PROJECT #	DATE	PLATE
SHP02	AUG 92	1



NOTE: PC = Projected Paleochannel

Borehole	North	East	Elev.	Depth
SAGT	5913.3	10844.5	4983.9	55.0
6GT	6177.4	10883.2	4981.2	50.0
DM-11	8333.0	11120.0	4986.4	71.3
DM-3A	7570.0	11048.0	4970.0	87.4
DM-6	6620.0	10929.0	4973.0	92.5

DISTANCES:
 Beginning 0.0
 Ending 4000.0
 VIEWING ANGLES (degrees):
 Horizontal 0.0
 Vertical 0.0

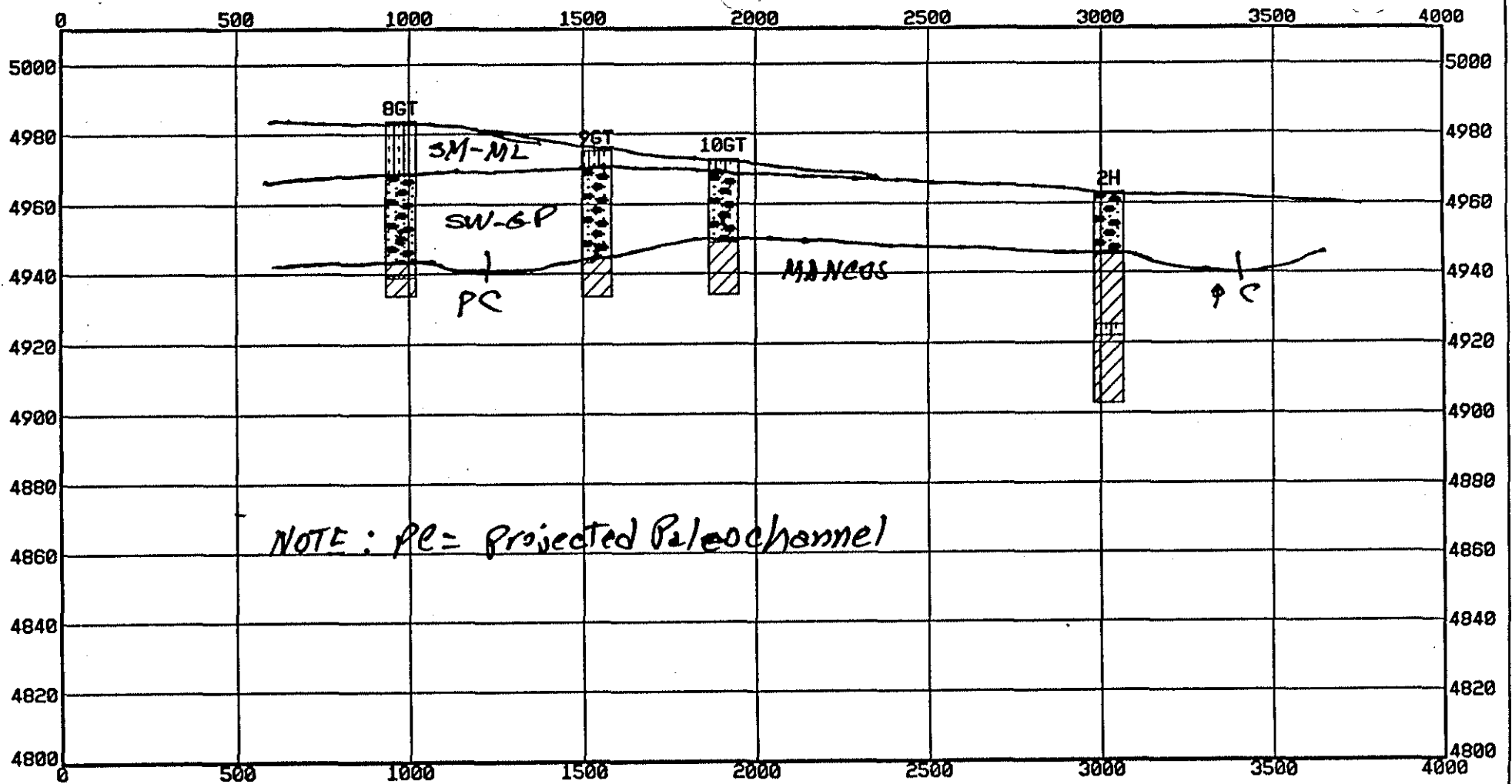
Position	North	East
Left, Front	5913.30	10844.53
Right, Front	8333.00	11120.00
Left, Back		
Right, Back		

SUBSURFACE FENCE DIAGRAM : CROSS SECTION C-C

SHIPROCK SITE, NEW MEXICO; UMTRA

TAILINGS AREA

PROJECT #	DATE	PLATE
SHP02	AUG 92	1



NOTE: PC = Projected Paleochannel

Borehole	North	East	Elev.	Depth
10GT	6259.2	11610.8	4972.8	39.0
2H	7312.6	11973.7	4962.9	60.0
8GT	5500.8	11074.6	4983.7	50.0
9GT	5948.1	11412.3	4975.2	42.0

DISTANCES:
 Beginning 0.0
 Ending 4000.0
 VIEWING ANGLES (degrees):
 Horizontal 0.0
 Vertical 0.0

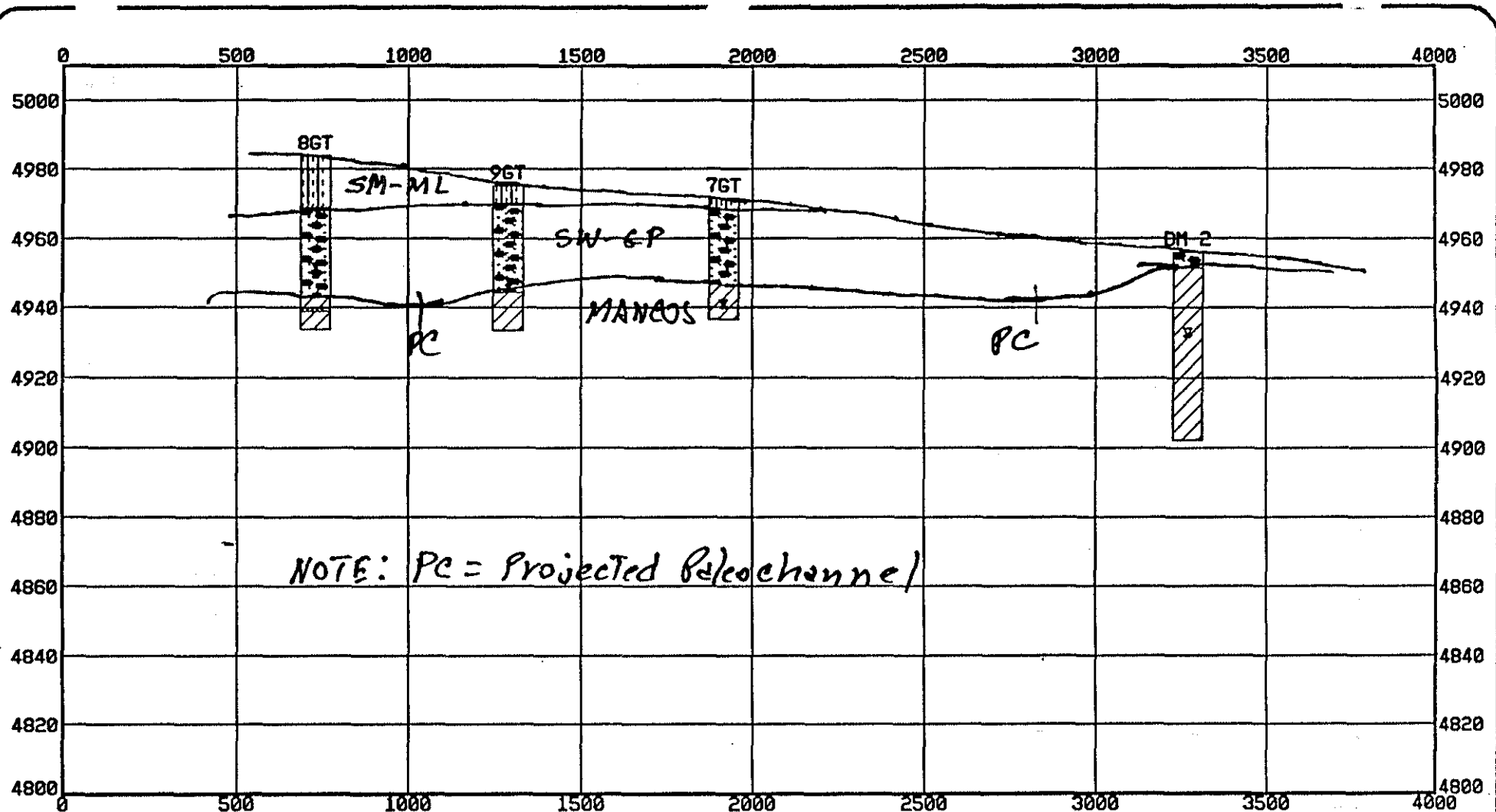
Position	North	East
Left, Front	5500.76	11074.62
Right, Front	7312.61	11973.70
Left, Back		
Right, Back		

SUBSURFACE FENCE DIAGRAM : CROSS SECTION D-C

SHIPROCK SITE, NEW MEXICO; UMTRA

TAILINGS AREA

PROJECT #	DATE	PLATE
SHP02	AUG 92	1



NOTE: PC = Projected Paleochannel

Borehole	North	East	Elev.	Depth
7GT	6574.2	11402.3	4971.4	35.0
8GT	5500.8	11074.6	4983.7	50.0
9GT	5948.1	11412.3	4975.2	42.0
DM-2	7890.0	11713.0	4955.8	53.7

DISTANCES:

Beginning 0.0
Ending 4000.0

VIEWING ANGLES (degrees):

Horizontal 0.0
Vertical 0.0

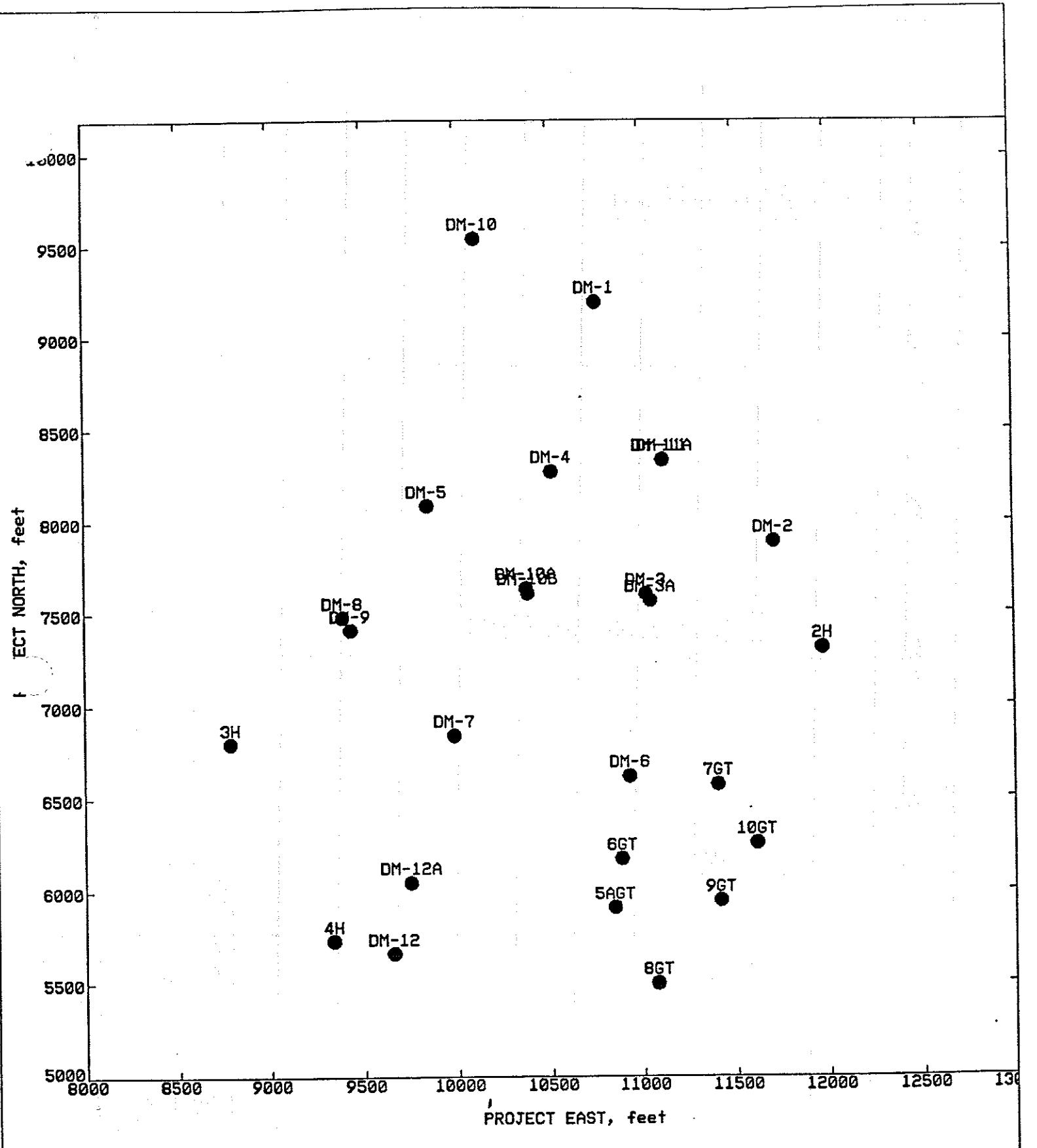
Position	North	East
Left, Front	5500.76	11074.62
Right, Front	7890.00	11713.00
Left, Back		
Right, Back		

SUBSURFACE FENCE DIAGRAM : CROSS SECTION D"-D

SHIPROCK SITE, NEW MEXICO; UMTRA

TAILINGS AREA

PROJECT #	DATE	PLATE
SHP02	AUG 92	1



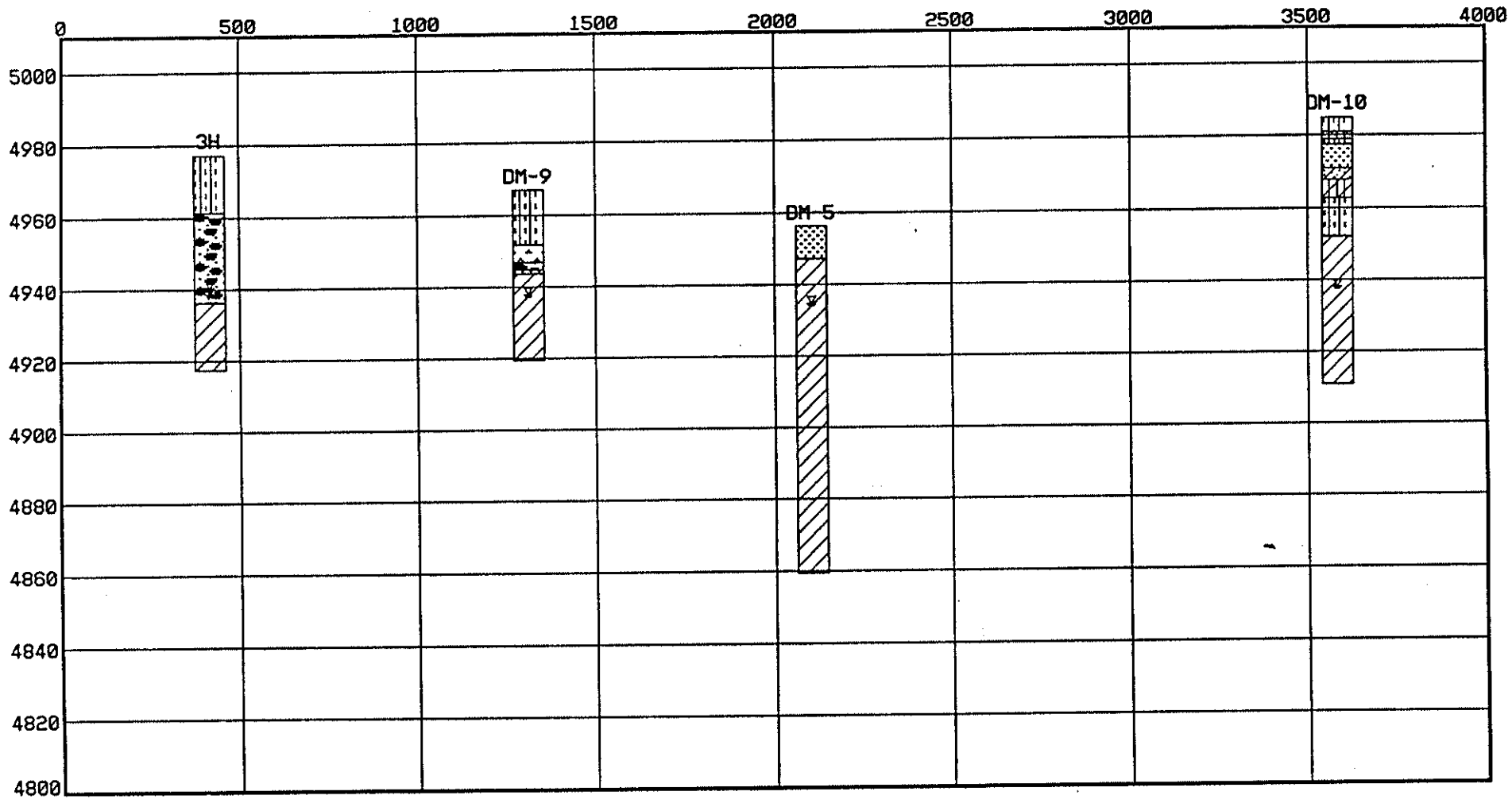
August 1992

SHIPROCK SITE, NEW MEXICO; UMTRA TAILINGS AREA

SITE PLAN

FIGURE 1

Jacobs Engineering Group Albuquerque, New Mexico



Borehole	North	East	Elev.	Depth
3H	6800.9	8789.5	4977.3	60.0
DM-10	9544.0	10112.0	4985.0	74.3
DM-5	8090.0	9852.0	4956.0	96.7
DM-9	7415.0	9438.0	4966.8	47.7

DISTANCES:
 Beginning 0.0
 Ending 4000.0
 VIEWING ANGLES (degrees):
 Horizontal 0.0
 Vertical 0.0

Position	North	East
Left, Front	6800.90	8789.50
Right, Fro	9544.00	10112.00
Left, Back		
Right, Bac		

SUBSURFACE FENCE DIAGRAM : CROSS SECTION A-A

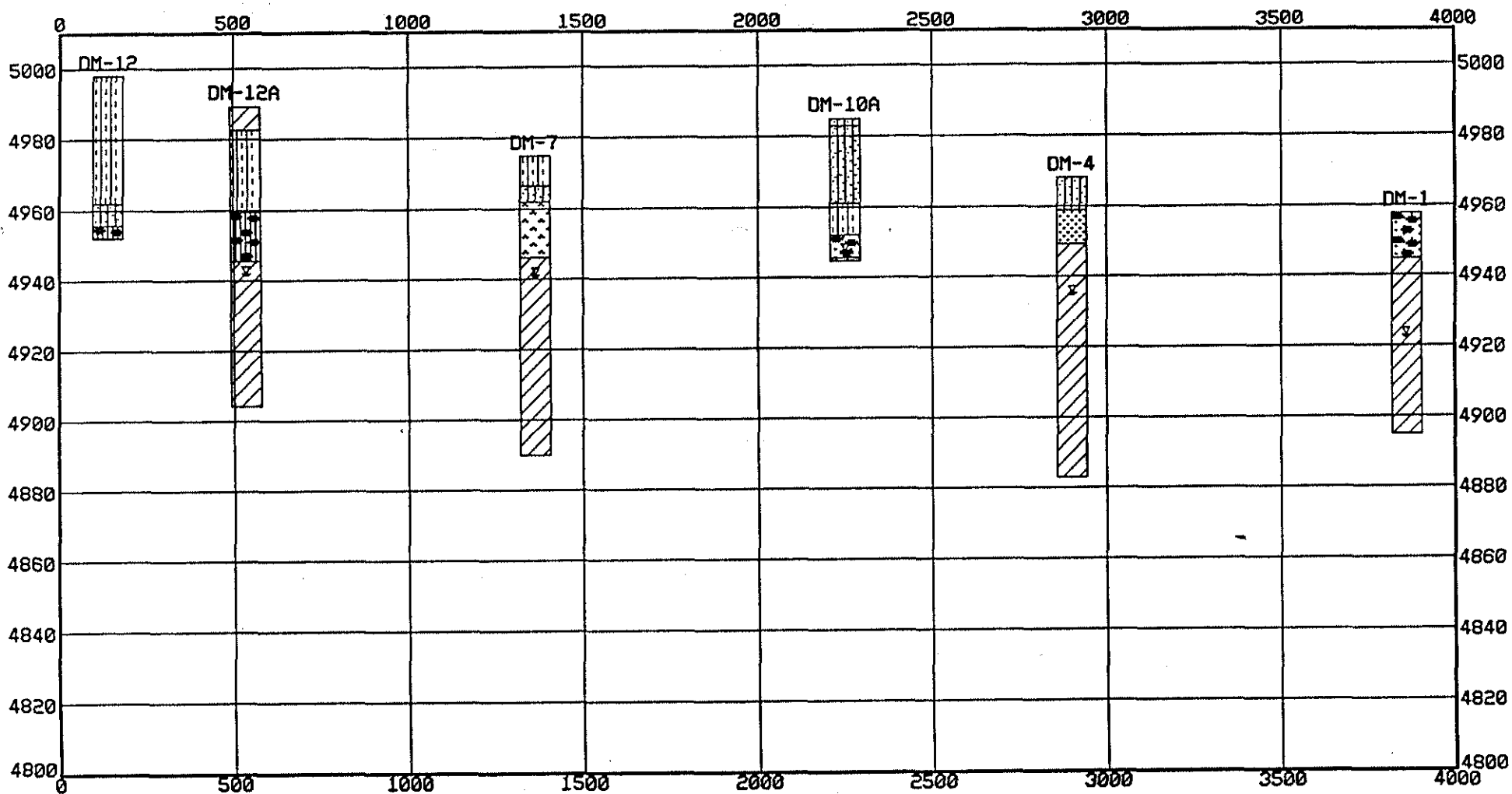
SHIPROCK SITE, NEW MEXICO; UMTRA
 TAILINGS AREA

PROJECT # DATE PLATE

SHP02

AUG 92

1



Borehole	North	East	Elev.	Depth
DM-1	919.0	10761.0	4957.5	62.7
DM-10A	764.0	10380.0	4985.0	40.7
DM-12	566.0	9657.0	4998.0	46.0
DM-12A	605.0	9750.0	4989.2	85.0
DM-4	827.0	10519.0	4968.0	85.3
DM-7	684.0	9987.0	4974.8	85.1

DISTANCES:

Beginning 0.0
Ending 4000.0

VIEWING ANGLES (degrees):

Horizontal 0.0
Vertical 0.0

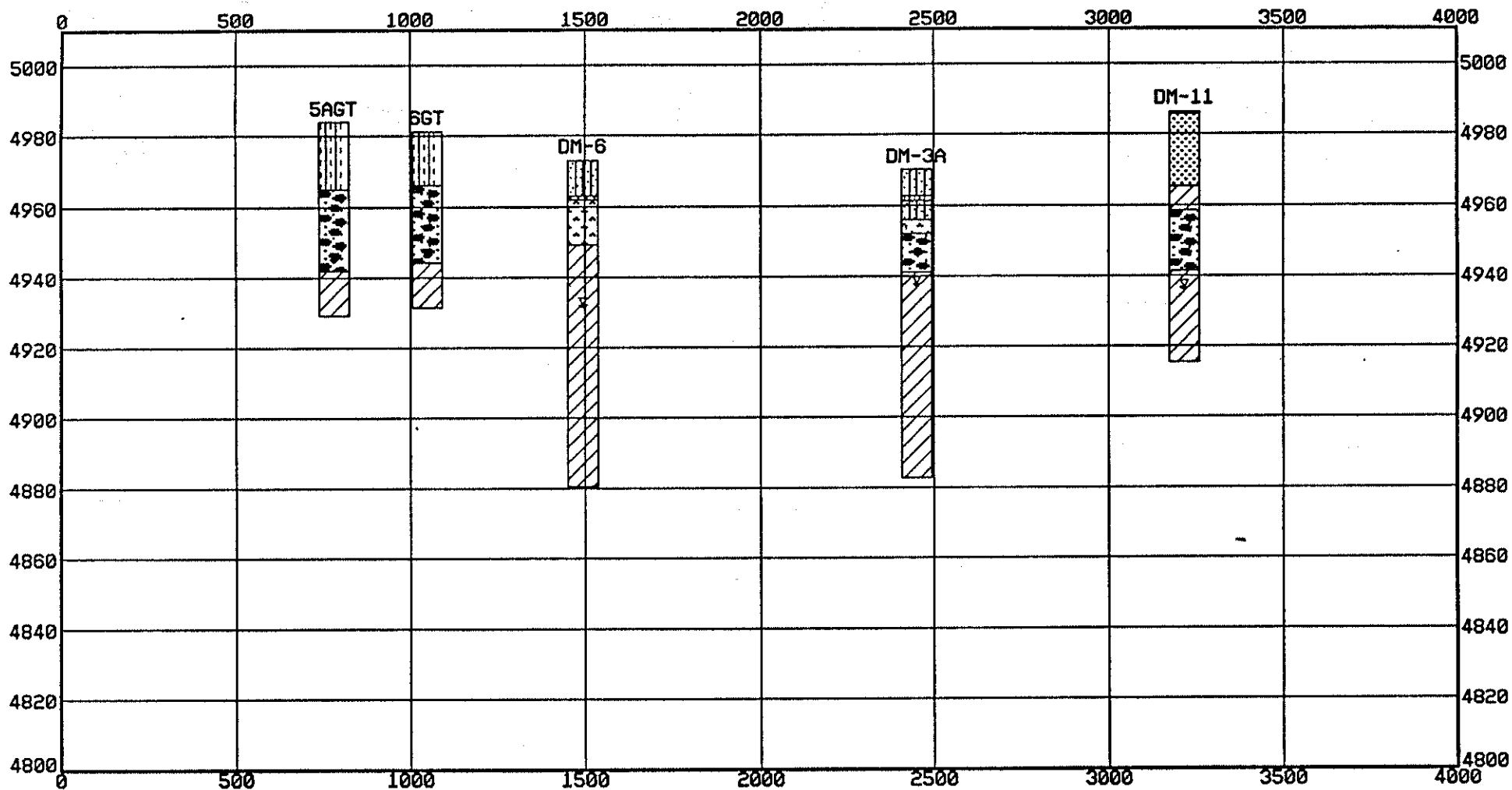
Position	North	East
Left, Front	566.00	9657.00
Right, Front	919.00	10761.00
Left, Back		
Right, Bac		

SUBSURFACE FENCE DIAGRAM : CROSS SECTION B-B

SHIPROCK SITE, NEW MEXICO; UMTRA

TAILINGS AREA

PROJECT #	DATE	PLATE
SHP02	AUG 92	1



Borehole	North	East	Elev.	Depth
5AGT	5913.3	10844.5	4983.9	55.0
6GT	6177.4	10883.2	4981.2	50.0
DM-11	8333.0	11120.0	4986.4	71.3
DM-3A	7570.0	11048.0	4970.0	87.4
DM-6	6620.0	10929.0	4973.0	92.5

DISTANCES:

Beginning 0.0
Ending 4000.0

VIEWING ANGLES (degrees):

Horizontal 0.0
Vertical 0.0

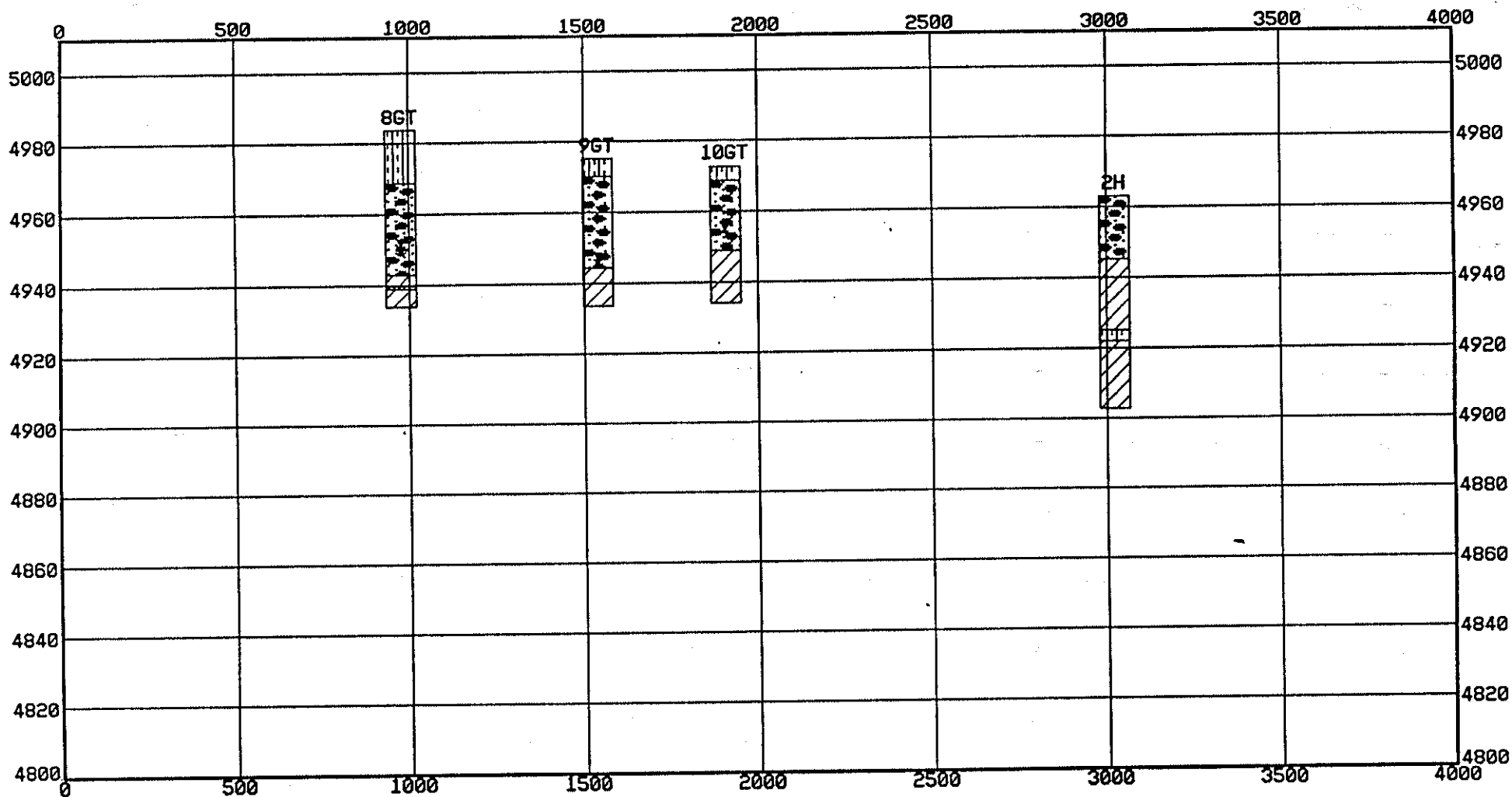
Position	North	East
Left, Front	5913.30	10844.53
Right, Front	8333.00	11120.00
Left, Back		
Right, Back		

SUBSURFACE FENCE DIAGRAM : CROSS SECTION C-C

SHIPROCK SITE, NEW MEXICO; UMTRA

TAILINGS AREA

PROJECT #	DATE	PLATE
SHP02	AUG 92	1



Borehole	North	East	Elev.	Depth
10GT	6259.2	11610.8	4972.8	39.0
2H	7312.6	11973.7	4962.9	60.0
8GT	5500.8	11074.6	4983.7	50.0
9GT	5948.1	11412.3	4975.2	42.0

DISTANCES:
 Beginning 0.0
 Ending 4000.0
 VIEWING ANGLES (degrees):
 Horizontal 0.0
 Vertical 0.0

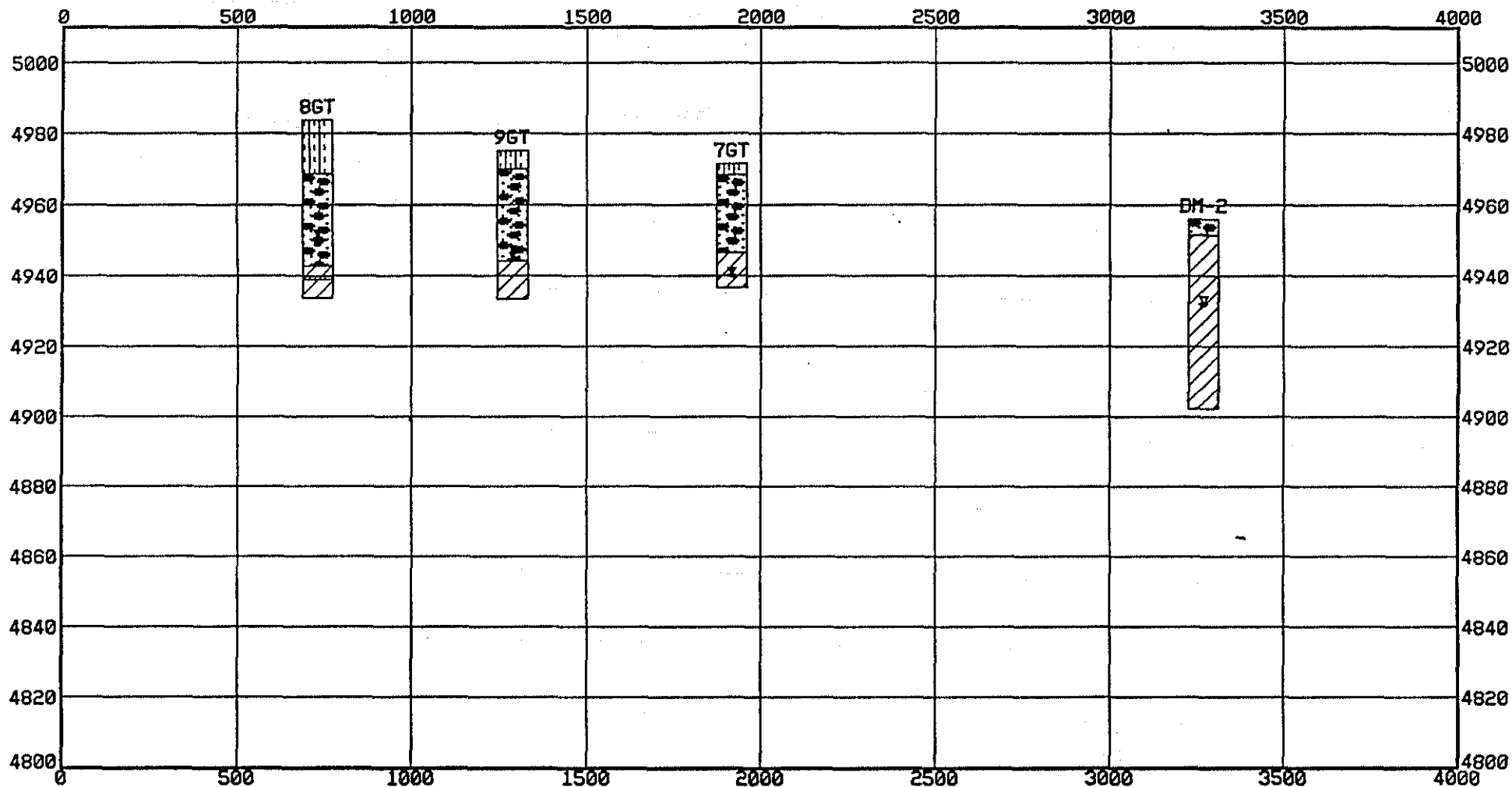
Position	North	East
Left, Front	5500.76	11074.62
Right, Front	7312.61	11973.70
Left, Back		
Right, Back		

SUBSURFACE FENCE DIAGRAM : CROSS SECTION D-D

SHIPROCK SITE, NEW MEXICO; UMTRA

TAILINGS AREA

PROJECT #	DATE	PLATE
SHP02	AUG 92	1



Borehole	North	East	Elev.	Depth
7GT	6574.2	11402.3	4971.4	35.0
8GT	5500.8	11074.6	4983.7	50.0
9GT	5948.1	11412.3	4975.2	42.0
DM-2	7890.0	11713.0	4955.8	53.7

DISTANCES:
 Beginning 0.0
 Ending 4000.0
 VIEWING ANGLES (degrees):
 Horizontal 0.0
 Vertical 0.0

Position	North	East
Left, Front	5500.76	11074.62
Right, Front	7890.00	11713.00
Left, Back		
Right, Back		

SUBSURFACE FENCE DIAGRAM : CROSS SECTION D"-D

SHIPROCK SITE, NEW MEXICO; UMTRA

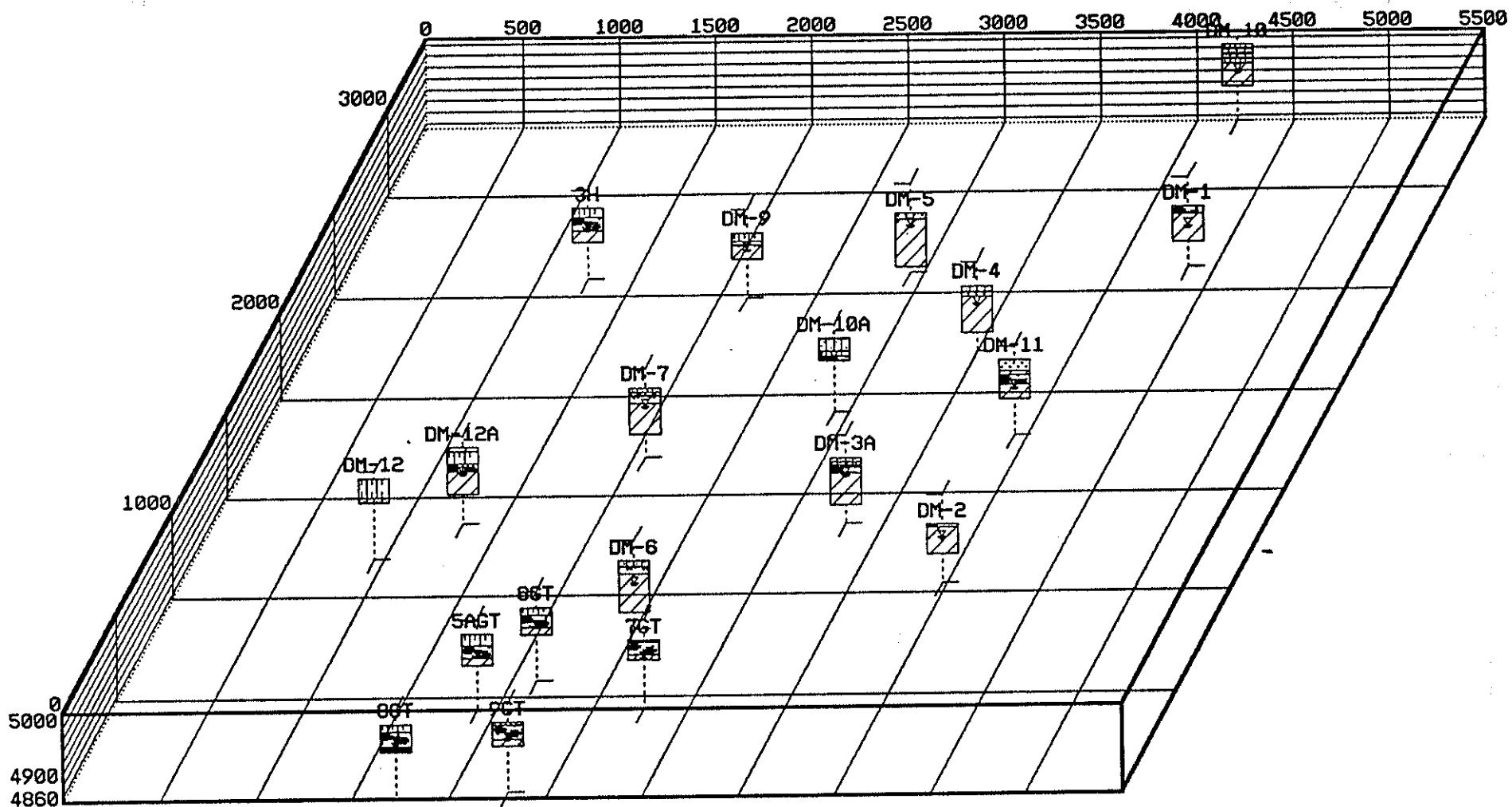
TAILINGS AREA

PROJECT # DATE PLATE

SHP02

AUG 92

1



Borehole	North	East	Elev.	Depth
3H	6800.9	8789.5	4977.3	60.0
5AGT	5913.3	10844.5	4983.9	55.0
6GT	6177.4	10883.2	4981.2	50.0
7GT	6574.2	11402.3	4971.4	35.0
8GT	5500.8	11074.8	4983.7	50.0
9GT	5948.1	11412.3	4975.2	42.0
DM-1	9199.0	10761.0	4957.5	62.7
DM-10	9544.0	10112.0	4985.0	74.3
DM-10A	7640.0	10380.0	4985.0	40.7
DM-11	8333.0	11120.0	4986.4	71.3
12	5666.0	9657.0	4998.0	46.0
12A	5252.0	8752.0	4999.2	85.0

DISTANCES:

Beginning 0.0
Ending 5500.0

VIEWING ANGLES (degrees):

Horizontal 30.0
Vertical 20.0

Position	North	East
Left, Front	4173.51	9958.53
Right, Front	8573.51	8658.53
Left, Back	322.48	7403.00
Right, Back	722.48	1103.00

SUBSURFACE FENCE DIAGRAM : TAILINGS AREA.

SHIPROCK SITE, NEW MEXICO; UMTRA

TAILINGS AREA

PROJECT #	DATE	PLATE
SHP02	AUG 92	1

JOB NO. <u>SHPOL</u>	DATE <u>08/29/85</u>	TOTAL DEPTH <u>19.0 feet</u>
SURFACE ELEVATION <u>4892.74</u>		RIG TYPE <u>GARDNER-DENVER</u>
TOP OF FILTER PACK <u>5.00</u>		BORING TYPE <u>ROTARY MUD</u>
WELL CASING TYPE <u>4.0-IN.SCHED. 40 PVC</u>		LOCATION <u>N 8642.03 E 11819.14</u>
COMPLETION <u>ALLUVIUM</u>		DATUM <u>MSL</u>

Depth	Well Con.	Remarks	Lithology	USCS	Visual Classification
0		Placed steel protective casing to 2.0 feet.		SM	ALLUVIUM: SILTY SAND, fine to medium, some gravel and occasional cobbles, nonplastic, lt. brown.
5		Installed bentonite/cement grout to 3.0 feet Placed bentonite pellet seal to 5.0 feet. Installed 8-12 sand filter pack from 5.0 to 17 ft.		GP	
10		Placed .050-in slot well screen from 10 to 15 ft.		CL	MANCOS SHALE FORMATION: SHALE, soft, grey.
15		Placed two foot sump from 15 to 17 ft.			
20		Cave-in fill material from 17 to 19 ft.			TD AT 19 FEET.
25					
30					
35					
40					
45					
50					

GROUNDWATER		
DEPTH	HOUR	DATE
5.5	16:20	09-28-85

JOB NO. <u>SHP01,</u>	DATE <u>08/30/85</u>	TOTAL DEPTH <u>14.0 feet</u>
SURFACE ELEVATION <u>4892.59</u>		RIG TYPE <u>GARDNER-DENVER</u>
TOP OF FILTER PACK <u>3.00</u>		BORING TYPE <u>ROTARY MUD</u>
WELL CASING TYPE <u>4.0-IN. SCHED. 40 PVC</u>		LOCATION <u>N 8656.57 E 11812.42</u>
COMPLETION <u>ALLUVIUM</u>		DATUM <u>MSL</u>

Depth	Well Con.	Remarks	Lithology	USCS	Visual Classification			
0		Placed steel protective casing to 2.0 feet. Installed bentonite/cement grout to 1.5 feet Placed bentonite pellet seal to 3.0 feet. Installed 8-12 sand filter pack from 3.0 to 10.8 ft. Placed .050-in slot well screen from 3.8 to 8.8 ft.		SP	ALLUVIUM: SAND, little silt, fine to medium, occasional gravel and cobbles, nonplastic, light brown.			
5				GP		SANDY GRAVEL, with cobbles, poorly graded, occasional boulders, subrounded, nonplastic, brown to grey.		
10				CL	MANCOS SHALE FORMATION: SHALE, soft, grey.			
15					Placed two foot sump from 8.8 to 10.8 ft. Cave-in fill material from 10.8 to 14 ft.		TD AT 14 FEET.	
20								
25								
30								
35								
40								
45								
50								

GROUNDWATER

DEPTH	HOUR	DATE
4.8	10.20	09-29-85

JOB NO. SHP01 DATE 09/03/85 TOTAL DEPTH 15.0 feet
 SURFACE ELEVATION 4893.95 RIG TYPE GARDNER-DENVER
 TOP OF FILTER PACK 3.00 BORING TYPE ROTARY MUD
 WELL CASING TYPE 4.0-IN.SCHED. 40 PVC LOCATION N 8892.95 E 11440.63
 COMPLETION ALLUVIUM DATUM MSL

Depth	Well Con.	Remarks	Lithology	USCS	Visual Classification
0		Placed steel protective casing to 2.0 feet. Installed bentonite/cement grout to 1.5 feet Placed bentonite pellet seal to 3.0 feet. Installed 8-12 sand filter pack from 3.0 to 11 ft.		SP GP	ALLUVIUM: SAND, little silt, fine to medium, occasional gravel, nonplastic, lt. brown.
5		Placed .050-in slot well screen from 4 to 9 ft.			SANDY GRAVEL with cobbles, poorly graded, occasional boulders, subrounded, nonplastic, brown to grey.
10		Placed two foot sump from 9 to 11 ft.		CL	MANCOS SHALE FORMATION: SHALE, soft, grey.
15		Cave-in fill material from 11 to 15 ft.			TD AT 15 FEET.
20					
25					
30					
35					
40					
45					
50					

GROUNDWATER

DEPTH	HOUR	DATE
9.2	12:35	09-29-85

PROJECT SHIPROCK SITE, NM

LOG OF WELL BORING NO. 611

JOB NO. SHPO1, DATE 09/03/85
 SURFACE ELEVATION 4894.05
 TOP OF FILTER PACK 7.00
 WELL CASING TYPE 4.0-IN.SCHED. 40 PVC
 COMPLETION ALLUVIUM

TOTAL DEPTH 22.0 feet
 RIG TYPE GARDNER-DENVER
 BORING TYPE ROTARY MUD
 LOCATION N 8899.15 E 11429.74
 DATUM MSL

Depth	Well Con.	Remarks	Lithology	USCS	Visual Classification
0		Placed steel protective casing to 2.0 feet.		SP	ALLUVIUM: SAND, little to some silt, fine to medium, occasional gravel, nonplastic, light brown.
		Installed bentonite/cement grout to 5 feet		GP	
5		Placed bentonite pellet seal to 7.0 feet.			SANDY GRAVEL , with cobbles, poorly graded, occasional boulder size, subrounded, nonplastic, brown to grey.
		Installed 8-12 sand filter pack from 7.0 to 16.5 ft.			
10		Placed .050-in slot well screen from 9.5 to 14.5 ft.			MANCOS SHALE FORMATION: SHALE, soft, grey.
15		Placed two foot sump from 14.5 to 16.5 ft.		CL	
20		Cave-in fill material from 16.5 to 22 ft.			
22					TD AT 22 FEET.
25					
30					
35					
40					
45					
50					

GROUNDWATER

DEPTH	HOUR	DATE
9.1	15:50	09-29-85

JEG TAC TEAM

PROJECT SHIPROCK SITE, NM

LOG OF WELL BORING NO. 612

JOB NO. SHP01, DATE 09/04/85
 SURFACE ELEVATION 4892.89
 TOP OF FILTER PACK 3.50
 WELL CASING TYPE 4.0-IN.SCHED. 40 PVC
 COMPLETION ALLUVIUM

TOTAL DEPTH 15.0 feet
 RIG TYPE GARDNER-DENVER
 BORING TYPE ROTARY MUD
 LOCATION N 9192.09 E 11665.72
 DATUM MSL

Depth	Well Con.	Remarks	Lithology	USCS	Visual Classification	
0		Placed steel protective casing to 2.0 feet.		SP	ALLUVIUM: SAND, little to some silt, fine to medium, occasional gravel, nonplastic, light brown.	
5		Installed bentonite/cement grout to 2 feet		GP		SANDY GRAVEL , with cobbles, poorly graded, occasional boulder size, subrounded, nonplastic, brown to grey.
		Placed bentonite pellet seal to 3.5 feet.				
		Installed 8-12 sand filter pack from 3.5 to 12 ft.				
10				Placed .050-in slot well screen from 5 to 10 ft.		
15				Placed two foot sump from 10 to 12 ft.	CL	MANCOS SHALE FORMATION: SHALE, soft, grey. TD AT 15 FEET.
				Cave-in fill material from 12 to 15 ft.		
20						
25						
30						
35						
40						
45						
50						

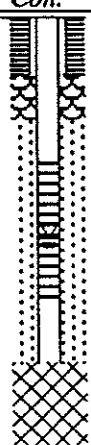

GROUNDWATER

DEPTH	HOUR	DATE
6.3	13:56	09-29-85

PROJECT SHIPROCK SITE, NM

LOG OF WELL BORING NO. 613

JOB NO. SHPOL DATE 09/04/85 TOTAL DEPTH 15.0 feet
 SURFACE ELEVATION 4891.88 RIG TYPE GARDNER-DENVER
 TOP OF FILTER PACK 3.50 BORING TYPE ROTARY MUD
 WELL CASING TYPE 4.0-IN. SCHED. 40 PVC LOCATION N 9196.28 E 11047.87
 COMPLETION ALLUVIUM DATUM MSL

Depth	Well Con.	Remarks	Lithology	USCS	Visual Classification	
0		Placed steel protective casing to 2.0 feet. Installed bentonite/cement grout to 2 feet		SP	ALLUVIUM: SAND, little to some silt, fine to medium, occasional gravel, nonplastic, light brown.	
5				GP		SANDY GRAVEL, with cobbles, poorly graded, occasional boulder size, subrounded, nonplastic, brown to grey.
10		Placed bentonite pellet seal to 3.5 feet. Installed 8-12 sand filter pack from 3.5 to 12 ft. Placed .050-in slot well screen from 5 to 10 ft.		CL	MANCOS SHALE FORMATION: SHALE, soft, grey. TD AT 15 FEET.	
15						Cave-in fill material from 12 to 15 ft.
20						
25						
30						
35						
40						
45						
50						

GROUNDWATER

DEPTH	HOUR	DATE
7.7	10:55	09-30-85

JEG TAC TEAM

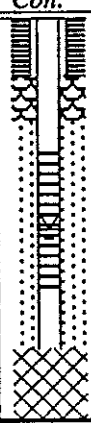

JOB NO. SHP01, DATE 09/04/85 TOTAL DEPTH 19.0 feet
 SURFACE ELEVATION 4891.83 RIG TYPE GARDNER-DENVER
 TOP OF FILTER PACK 8.00 BORING TYPE ROTARY MUD
 WELL CASING TYPE 4.0-IN. SCHED. 40 PVC LOCATION N 9189.42 E 11057.99
 COMPLETION ALLUVIUM DATUM MSL

Depth	Well Con.	Remarks	Lithology	USCS	Visual Classification
0		Placed steel protective casing to 2.0 feet.		SP	ALLUVIUM: SAND, little to some silt, fine to medium, occasional gravel, nonplastic, light brown.
5		Installed bentonite/cement grout to 6 feet		GP	SANDY GRAVEL , with cobbles, poorly graded, occasional boulder size, subrounded, nonplastic, brown to grey.
10		Placed bentonite pellet seal to 8 feet.		CL	MANCOS SHALE FORMATION: SHALE, soft, grey.
15		Installed 8-12 sand filter pack from 8 to 17 ft.			
		Placed .050-in slot well screen from 10 to 15 ft.			
		Placed two foot sump from 15 to 17 ft.			
		Cave-in fill material from 17 to 19 ft.			
20					TD AT 19 FEET.
25					
30					
35					
40					
45					
50					

GROUNDWATER

DEPTH	HOUR	DATE
7.3	15:30	09-30-85

JOB NO. SHP01 DATE 09/06/85 TOTAL DEPTH 14.0 feet
 SURFACE ELEVATION 4890.96 RIG TYPE GARDNER-DENVER
 TOP OF FILTER PACK 3.50 BORING TYPE ROTARY MUD
 WELL CASING TYPE 4.0-IN. SCHED. 40 PVC LOCATION N 9744.74 E 10667.33
 COMPLETION ALLUVIUM DATUM MSL

Depth	Well Con.	Remarks	Lithology	USCS	Visual Classification	
0		Placed steel protective casing to 2.0 feet. Installed bentonite/cement grout to 2 feet Placed bentonite pellet seal to 3.5 feet. Installed 8-12 sand filter pack from 3.5 to 11.5 ft. Placed .050-in slot well screen from 4.5 to 9.5 ft.		SP	ALLUVIUM: SAND, little to some silt, fine to medium, occasional gravel, nonplastic, light brown.	
5				GP		SANDY GRAVEL , with cobbles, poorly graded, occasional boulder size, subrounded, nonplastic, brown to grey.
10						
15				CL	MANCOS SHALE FORMATION: SHALE, soft, grey. TD AT 14 FEET.	
20						
25						
30						
35						
40						
45						
50						

GROUNDWATER		
DEPTH	HOUR	DATE
7.4	09:45	10-01-85

PROJECT SHIPROCK SITE, NM

LOG OF WELL BORING NO. 616

JOB NO. SHP01 DATE 09/05/85 TOTAL DEPTH 14.0 feet
 SURFACE ELEVATION 4890.78 RIG TYPE GARDNER-DENVER
 TOP OF FILTER PACK 3.50 BORING TYPE ROTARY MUD
 WELL CASING TYPE 4.0-IN. SCHED. 40 PVC LOCATION N 10213.54 E 11140.82
 COMPLETION ALLUVIUM DATUM MSL

Depth	Well Con.	Remarks	Lithology	USCS	Visual Classification				
0		Placed steel protective casing to 2.0 feet. Installed bentonite/cement grout to 1.5 feet Placed bentonite pellet seal to 3.5 feet. Installed 8-12 sand filter pack from 3.5 to 12 ft. Placed .050-in slot well screen from 5 to 10 ft.		SP	ALLUVIUM: SAND, little to some silt, fine to medium, occasional gravel, nonplastic, light brown. SANDY GRAVEL, with cobbles, poorly graded, occasional boulder size, subrounded, nonplastic, brown to grey.				
5				GP					
10									
15									
20									
25									
30									
35									
40									
45									
50									
						Placed two foot sump from 10 to 12 ft.			TD AT 14 FEET.
						Cave-in fill material from 12 to 14 ft.			

GROUNDWATER

DEPTH	HOUR	DATE
7.1	13:55	10-01-85

JOB NO. <u>SHP01</u>	DATE <u>09/05/85</u>	TOTAL DEPTH <u>20.3 feet</u>
SURFACE ELEVATION <u>4890.35</u>		RIG TYPE <u>GARDNER-DENVER</u>
TOP OF FILTER PACK <u>3.50</u>		BORING TYPE <u>ROTARY MUD</u>
WELL CASING TYPE <u>4.0-IN.SCHED. 40 PVC</u>		LOCATION <u>N 10140.59 E 10862.37</u>
COMPLETION <u>ALLUVIUM</u>		DATUM <u>MSL</u>

Depth	Well Con.	Remarks	Lithology	USCS	Visual Classification
0		Placed steel protective casing to 2.0 feet. Installed bentonite/cement grout to 2 feet		SP	ALLUVIUM: SAND, little to some silt, fine to medium, occasional gravel, nonplastic, light brown.
5		Placed bentonite pellet seal to 3.5 feet. Installed 8-12 sand filter pack from 3.5 to 12 ft.		GP	
10		Placed .050-in slot well screen from 5 to 10 ft.			SANDY GRAVEL, with cobbles, poorly graded, occasional boulder size, subrounded, nonplastic, brown to grey. Note: Loss of drill mud. Probable channelized subsurface flow.
15		Placed two foot sump from 10 to 12 ft.			
20		Cave-in fill material from 12 to 20 ft.			
20				CL	MANCOS SHALE FORMATION: SHALE, soft, grey. TD AT 20 FT.
25					
30					
35					
40					
45					
50					

GROUNDWATER		
DEPTH	HOUR	DATE
7.3	14:20	10-01-85

JOB NO. SHPO1 DATE 09/05/85 TOTAL DEPTH 21.0 feet
 SURFACE ELEVATION 4890.13 RIG TYPE GARDNER-DENVER
 TOP OF FILTER PACK 9.00 BORING TYPE ROTARY MUD
 WELL CASING TYPE 4.0-IN.SCHED. 40 PVC LOCATION N 10138.05 E 10849.30
 COMPLETION ALLUVIUM DATUM MSL

Depth	Well Con.	Remarks	Lithology	USCS	Visual Classification
0		Placed steel protective casing to 2.0 feet.		SP	ALLUVIUM: SAND, little to some silt, fine to medium, occasional gravel, nonplastic, light brown.
		Installed bentonite/cement grout to 7 feet		GP	
5		Placed bentonite pellet seal to 9.0 feet.			SANDY GRAVEL , with cobbles, poorly graded, occasional boulder size, subrounded, nonplastic, brown to grey.
		Installed 8-12 sand filter pack from 9.0 to 18 ft.			
10		Placed .050-in slot well screen from 11 to 16 ft.			
15		Placed two foot sump from 16 to 18 ft.			
20		Cave-in fill material from 18 to 21 ft.		CL	MANCOS SHALE FORMATION: SHALE, soft, grey. TD AT 21 FEET.
25					
30					
35					
40					
45					
50					

GROUNDWATER

DEPTH	HOUR	DATE
6.8	10:30	10-01-85

JOB NO. SHP01 DATE 09/06/85 TOTAL DEPTH 20.0 feet
 SURFACE ELEVATION 4891.02 RIG TYPE GARDNER-DENVER
 TOP OF FILTER PACK 6.00 BORING TYPE ROTARY MUD
 WELL CASING TYPE 4.0-IN. SCHED. 40 PVC LOCATION N 10524.13 E 10501.47
 COMPLETION ALLUVIUM DATUM MSL

Depth	Well Con.	Remarks	Lithology	USCS	Visual Classification			
0		<p>Placed steel protective casing to 2.0 feet. Installed bentonite/cement grout to 4 feet Placed bentonite pellet seal to 6.0 feet. Installed 8-12 sand filter pack from 6 to 15 ft. Placed .050-in slot well screen from 8 to 13 ft. Placed two foot sump from 13 to 15 ft. Cave-in fill material from 15 to 20 ft.</p>		SP	ALLUVIUM: SAND, little to some silt, fine to medium, occasional gravel, nonplastic, light brown.			
5				GP		SANDY GRAVEL, with cobbles, poorly graded, occasional boulder size, subrounded, nonplastic, brown to grey.		
10				CL			MANCOS SHALE FORMATION: SHALE, soft, grey.	
15					TD AT 20 FT.			
20								
25								
30								
35								
40								
45								
50								

GROUNDWATER

DEPTH	HOUR	DATE
8.1	10:50	10-02-85

PROJECT SHIPROCK SITE, NM

LOG OF WELL BORING NO. 620

JOB NO. SHP01, DATE 08/27/85
 SURFACE ELEVATION 4888.36
 TOP OF FILTER PACK 11.00
 WELL CASING TYPE 4.0-IN. SCHED. 40 PVC
 COMPLETION ALLUVIUM

TOTAL DEPTH 23.0 feet
 RIG TYPE GARDNER-DENVER
 BORING TYPE ROTARY MUD
 LOCATION N 10162.22 E 10344.01
 DATUM MSL

Depth	Well Con.	Remarks	Lithology	USCS	Visual Classification
0		Placed steel protective casing to 2.0 feet.		SP	ALLUVIUM: SAND, little to some silt, fine to medium, occasional gravel, nonplastic, light brown.
5		Installed bentonite/cement grout to 9 feet		GP	SANDY GRAVEL , with cobbles, poorly graded, occasional boulder size, subrounded, nonplastic, brown to grey.
10		Placed bentonite pellet seal from 9 to 11 feet.			
		Installed 8-12 sand filter pack from 11 to 20 ft.			
15		Placed .050-in slot well screen from 13 to 18 ft.			
		Placed two foot sump from 18 to 20 ft.			
20		Cave-in fill material from 20 to 23 ft.		CL	MANCOS SHALE FORMATION: SHALE, soft, grey.
25					TD AT 23 FEET.
30					
35					
40					
45					
50					

GROUNDWATER

DEPTH	HOUR	DATE
4.9	13:35	10-02-85

JEG TAC TEAM

JOB NO. <u>SHP01</u>	DATE <u>08/28/85</u>	TOTAL DEPTH <u>19.0 feet</u>
SURFACE ELEVATION <u>4888.50</u>	RIG TYPE <u>GARDNER-DENVER</u>	BORING TYPE <u>ROTARY MUD</u>
TOP OF FILTER PACK <u>8.00</u>	WELL CASING TYPE <u>4.0-IN.SCHED. 40 PVC</u>	LOCATION <u>N 10161.72 E 10353.91</u>
COMPLETION <u>ALLUVIUM</u>	DATUM <u>MSL</u>	

Depth	Well Con.	Remarks	Lithology	USCS	Visual Classification
0		Placed steel protective casing to 2.0 feet.		SP	ALLUVIUM: SAND, little to some silt, fine to medium, occasional gravel, nonplastic, light brown.
5		Installed bentonite/cement grout to 6 feet		GP	
		Placed bentonite pellet seal from 6 to 8 feet.			SANDY GRAVEL , with cobbles, poorly graded, occasional boulder size, subrounded, nonplastic, brown to grey.
10		Installed 8-12 sand filter pack from 8 to 17 ft.			
15		Placed .050-in slot well screen from 10 to 15 ft.			
		Placed two foot sump from 15 to 17 ft.			
		Cave-in fill material from 17 to 19 ft.		CL	MANCOS SHALE FORMATION: SHALE, soft, grey.
20					TD AT 19 FEET.
25					
30					
35					
40					
45					
50					

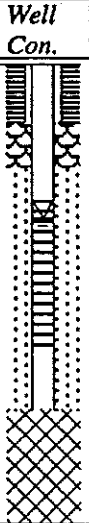

GROUNDWATER

DEPTH	HOUR	DATE
5.3	16:35	10-02-85

PROJECT SHIPROCK SITE, NM

LOG OF WELL BORING NO. 622

JOB NO. SHP01 DATE 08/28/85 TOTAL DEPTH 16.0 feet
 SURFACE ELEVATION 4888.70 RIG TYPE GARDNER-DENVER
 TOP OF FILTER PACK 3.50 BORING TYPE ROTARY MUD
 WELL CASING TYPE 4.0-IN.SCHED. 40 PVC LOCATION N 10160.52 E 10364.80
 COMPLETION ALLUVIUM DATUM MSL

Depth	Well Con.	Remarks	Lithology	USCS	Visual Classification	
0		Placed steel protective casing to 1.5 feet.		SP	ALLUVIUM: SAND, little to some silt, fine to medium, occasional gravel, nonplastic, light brown.	
		Installed bentonite/cement grout to 1.5 feet		GP		
5		Placed bentonite pellet seal from 1.5 to 3.5 feet.				SANDY GRAVEL, with cobbles, poorly graded, occasional boulder size, subrounded, nonplastic, brown to grey.
10		Installed 8-12 sand filter pack from 3.5 to 12 ft.				
15		Placed .050-in slot well screen from 5 to 10 ft.				
		Placed two foot sump from 10 to 15 ft.				
16		Cave-in fill material from 15 to 16 ft.			TD AT 16 FEET.	
20						
25						
30						
35						
40						
45						
50						

GROUNDWATER

DEPTH	HOUR	DATE
5.3	17:00	10-02-85

PROJECT SHIPROCK SITE, NM

LOG OF WELL BORING NO. 623

JOB NO. SHP01 DATE 09/07/85
 SURFACE ELEVATION 4889.86
 TOP OF FILTER PACK 8.00
 WELL CASING TYPE 4.0-IN. SCHED. 40 PVC
 COMPLETION ALLUVIUM

TOTAL DEPTH 23.0 feet
 RIG TYPE GARDNER-DENVER
 BORING TYPE ROTARY MUD
 LOCATION N 10610.77 E 10355.84
 DATUM MSL

Depth	Well Con.	Remarks	Lithology	USCS	Visual Classification
0		Placed steel protective casing to 2.0 feet.		SP	ALLUVIUM: SAND, little to some silt, fine to medium, occasional gravel, nonplastic, light brown.
5		Installed bentonite/cement grout to 6.0 feet			
		Placed bentonite pellet seal from 6 to 8 feet.			
10		Installed 8-12 sand filter pack from 8 to 17 ft.		GP	SANDY GRAVEL, with cobbles, poorly graded, occasional boulder size, subrounded, nonplastic, brown to grey.
15		Placed .050-in slot well screen from 10 to 15 ft.			
		Placed two foot sump from 15 to 17 ft.			
20		Cave-in fill material from 17 to 23 ft.		CL	MANCOS SHALE FORMATION: SHALE, soft, grey.
25					TD AT 23 FEET.
30					
35					
40					
45					
50					

GROUNDWATER		
DEPTH	HOUR	DATE
7.2	10:30	10-03-85

PROJECT SHIPROCK SITE, NM

LOG OF WELL BORING NO. 624

JOB NO. SHP01 DATE 09/07/85 TOTAL DEPTH 29.0 feet
 SURFACE ELEVATION 4889.57 RIG TYPE GARDNER-DENVER
 TOP OF FILTER PACK 12.00 BORING TYPE ROTARY MUD
 WELL CASING TYPE 4.0-IN. SCHED. 40 PVC LOCATION N 10598.41 E 10352.08
 COMPLETION ALLUVIUM DATUM MSL

Depth	Well Con.	Remarks	Lithology	USCS	Visual Classification
0		Placed steel protective casing to 2.0 feet.		SP	ALLUVIUM: SAND, little to some silt, fine to medium, occasional gravel, nonplastic, light brown.
5					
10		Installed bentonite/cement grout to 10 feet		GP	SANDY GRAVEL, with cobbles, poorly graded, occasional boulder size, subrounded, nonplastic, brown to grey.
15		Placed bentonite pellet seal from 10 to 12 feet.			
20		Installed 8-12 sand filter pack from 12 to 22 ft.			
25		Placed .050-in slot well screen from 15 to 20 ft.		CL	MANCOS SHALE FORMATION: SHALE, soft, grey.
30		Placed two foot sump from 20 to 22 ft.			
35					
40					
45					
50					
		Cave-in fill material from 22 to 29 ft.			TD AT 24 FEET.

GROUNDWATER

DEPTH	HOUR	DATE
7.1	12:30	10-03-85

JEG TAC TEAM

JOB NO. <u>SHP01,</u>	DATE <u>09/07/85</u>	TOTAL DEPTH <u>17.0 feet</u>
SURFACE ELEVATION <u>4889.89</u>		RIG TYPE <u>GARDNER-DENVER</u>
TOP OF FILTER PACK <u>3.50</u>		BORING TYPE <u>ROTARY MUD</u>
WELL CASING TYPE <u>4.0-IN.SCHED. 40 PVC</u>		LOCATION <u>N 10586.48 E 10348.87</u>
COMPLETION <u>ALLUVIUM</u>		DATUM <u>MSL</u>

Depth	Well Con.	Remarks	Lithology	USCS	Visual Classification			
0		Placed steel protective casing to 2.0 feet. Installed bentonite/cement grout to 2.0 feet Placed bentonite pellet seal from 2 to 3.5 feet. Installed 8-12 sand filter pack from 3.5 to 11.5 ft. Placed .050-in slot well screen from 4.5 to 9.5 ft. Placed two foot sump from 9.5 to 11.5 ft.		SP	ALLUVIUM: SAND, little to some silt, fine to medium, occasional gravel, nonplastic, light brown.			
5				GP		SANDY GRAVEL, with cobbles, poorly graded, occasional boulder size, subrounded, nonplastic, brown to grey.		
10								
15								
20								
25								
30								
35								
40								
45								
50								
					Cave-in fill material from 11.5 to 17 ft.			TD AT 17 FEET.

GROUNDWATER

DEPTH	HOUR	DATE
7.1	11:00	10-03-85

PROJECT SHIPROCK SITE, NM

LOG OF WELL BORING NO. 626

JOB NO. SHP01, DATE 09/08/85 TOTAL DEPTH 20.0 feet
 SURFACE ELEVATION 4888.76 RIG TYPE GARDNER-DENVER
 TOP OF FILTER PACK 7.00 BORING TYPE ROTARY MUD
 WELL CASING TYPE 4.0-IN. SCHED. 40 PVC LOCATION N 10524.93 E 10040.71
 COMPLETION ALLUVIUM DATUM MSL

Depth	Well Con.	Remarks	Lithology	USCS	Visual Classification
0		Placed steel protective casing to 2.0 feet.		SP	ALLUVIUM: SAND, little to some silt, fine to medium, occasional gravel, nonplastic, light brown.
		Installed bentonite/cement grout to 5.0 feet		GP	
5		Placed bentonite pellet seal from 5 to 7 feet.			SANDY GRAVEL , with cobbles, poorly graded, occasional boulder size, subrounded, nonplastic, brown to grey.
		Installed 8-12 sand filter pack from 7 to 16.5 ft.			
10		Placed .050-in slot well screen from 9.5 to 14.5 ft.			
15		Placed two foot sump from 14.5 to 16.5 ft.			
		Cave-in fill material from 16.5 to 20 ft.			
20				CL	MANCOS SHALE FORMATION: SHALE, soft, grey. TD AT 20 FEET.
25					
30					
35					
40					
45					
50					

GROUNDWATER

DEPTH	HOUR	DATE
6.0	15:30	10-03-85

JOB NO. SHP01, DATE 09/08/85 TOTAL DEPTH 20.0 feet
 SURFACE ELEVATION 4887.84 RIG TYPE GARDNER-DENVER
 TOP OF FILTER PACK 6.00 BORING TYPE ROTARY MUD
 WELL CASING TYPE 4.0-IN. SCHED. 40 PVC LOCATION N 10725.88 E 9749.24
 COMPLETION ALLUVIUM DATUM MSL

Depth	Well Con.	Remarks	Lithology	USCS	Visual Classification
0		Placed steel protective casing to 2.0 feet.		SP	ALLUVIUM: SAND, little to some silt, fine to medium, occasional gravel, nonplastic, light brown.
		Installed bentonite/cement grout to 4.0 feet		GP	
5		Placed bentonite pellet seal from 4 to 6 feet.			SANDY GRAVEL, with cobbles, poorly graded, occasional boulder size, subrounded, nonplastic, brown to grey.
		Installed 8-12 sand filter pack from 6 to 15 ft.			
10		Placed .050-in slot well screen from 8 to 13 ft.			
15		Placed two foot sump from 13 to 15 ft.			CL
		Cave-in fill material from 15 to 20 ft.			
20					MANCOS SHALE FORMATION: SHALE, soft, grey.
					TD AT 20 FEET.
25					
30					
35					
40					
45					
50					

GROUNDWATER

DEPTH	HOUR	DATE
5.5	17:05	10-03-85

PROJECT SHIPROCK SITE, NM

LOG OF WELL BORING NO. 628

JOB NO. SHPO1 DATE 09/09/85 TOTAL DEPTH 15.0 feet
 SURFACE ELEVATION 4888.37 RIG TYPE GARDNER-DENVER
 TOP OF FILTER PACK 3.50 BORING TYPE ROTARY MUD
 WELL CASING TYPE 4.0-IN.SCHED. 40 PVC LOCATION N 10716.54 E 9758.94
 COMPLETION ALLUVIUM DATUM MSL

Depth	Well Con.	Remarks	Lithology	USCS	Visual Classification
0		Placed steel protective casing to 2.0 feet.		SP	ALLUVIUM: SAND, little to some silt, fine to medium, occasional gravel, nonplastic, light brown.
		Installed bentonite/cement grout to 2.0 feet		GP	
5		Placed bentonite pellet seal from 2 to 3.5 feet.			SANDY GRAVEL , with cobbles, poorly graded, occasional boulder size, subrounded, nonplastic, brown to grey.
10		Installed 8-12 sand filter pack from 3.5 to 12 ft.			
		Placed .050-in slot well screen from 6 to 10 ft.			
15		Placed two foot sump from 10 to 12 ft.			TD AT 15 FEET.
		Cave-in fill material from 12 to 15 ft.			
20					
25					
30					
35					
40					
45					
50					

GROUNDWATER

DEPTH	HOUR	DATE
6.0	11:35	10-04-85

JEG TAC TEAM

JOB NO. <u>SHP01.</u>	DATE <u>09/09/85</u>	TOTAL DEPTH <u>20.0 feet</u>
SURFACE ELEVATION <u>4886.18</u>	RIG TYPE <u>GARDNER-DENVER</u>	
TOP OF FILTER PACK <u>8.00</u>	BORING TYPE <u>ROTARY MUD</u>	
WELL CASING TYPE <u>4.0-IN. SCHED. 40 PVC</u>	LOCATION <u>N 10558.80 E 9477.73</u>	
COMPLETION <u>ALLUVIUM</u>	DATUM <u>MSL</u>	

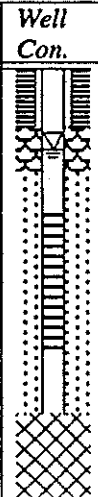
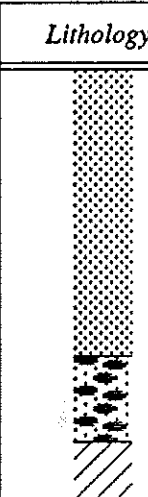
Depth	Well Con.	Remarks	Lithology	USCS	Visual Classification
0		Placed steel protective casing to 2.0 feet.		SP	ALLUVIUM: SAND, little to some silt, fine to medium, occasional gravel, nonplastic, light brown.
		Installed bentonite/cement grout to 6.0 feet		GP	
5		Placed bentonite pellet seal from 6 to 8 feet.			SANDY GRAVEL , with cobbles, poorly graded, occasional boulder size, subrounded, nonplastic, brown to grey.
		Installed 8-12 sand filter pack from 8 to 15 ft.			
10		Placed .050-in slot well screen from 10 to 15 ft.			
15		Placed two foot sump from 15 to 17 ft.		CL	MANCOS SHALE FORMATION: SHALE, soft, grey.
		Cave-in fill material from 17 to 20 ft.			
20					TD AT 20 FEET.
25					
30					
35					
40					
45					
50					

GROUNDWATER		
DEPTH	HOUR	DATE
2.7	18:35	10-03-85

PROJECT SHIPROCK SITE, NM

LOG OF WELL BORING NO. 630

JOB NO. SHP01 DATE 09/09/85 TOTAL DEPTH 15.0 feet
 SURFACE ELEVATION 4886.24 RIG TYPE GARDNER-DENVER
 TOP OF FILTER PACK 3.50 BORING TYPE ROTARY MUD
 WELL CASING TYPE 4.0-IN.SCHED. 40 PVC LOCATION N 10547.53 E 9482.50
 COMPLETION ALLUVIUM DATUM MSL

Depth	Well Con.	Remarks	Lithology	USCS	Visual Classification		
0		Placed steel protective casing to 2.0 feet. Installed bentonite/cement grout to 2.0 feet		SP	ALLUVIUM: SAND, little to some silt, fine to medium, occasional gravel, nonplastic, light brown.		
5				Placed bentonite pellet seal from 2 to 3.5 feet. Installed 8-12 sand filter pack from 3.5 to 12 ft.		GP	SANDY GRAVEL, with cobbles, poorly graded, occasional boulder size, subrounded, nonplastic, brown to grey.
10						CL	
15		Placed .050-in slot well screen from 5 to 10 ft. Placed two foot sump from 10 to 12 ft.					
20		Cave-in fill material from 12 to 15 ft.					
25							
30							
35							
40							
45							
50							

GROUNDWATER

DEPTH	HOUR	DATE
2.8	09:55	10-04-85

JOB NO. SHPO1 DATE 09/11/85
 SURFACE ELEVATION 4889.55
 TOP OF FILTER PACK 11.00
 WELL CASING TYPE 4.0-IN. SCHED. 40 PVC
 COMPLETION ALLUVIUM

TOTAL DEPTH 23.0 feet
 RIG TYPE GARDNER-DENVER
 BORING TYPE ROTARY MUD
 LOCATION N 12355.10 E 9131.70
 DATUM MSL

Depth	Well Con.	Remarks	Lithology	USCS	Visual Classification	
0		Placed steel protective casing to 2.0 feet. Installed bentonite/cement grout to 9.0 feet Placed bentonite pellet seal from 9 to 11 feet. Installed 8-12 sand filter pack from 11 to 13 ft.		SP	ALLUVIUM: SAND, little to some silt, fine to medium, occasional gravel, nonplastic, light brown.	
5				Placed .050-in slot well screen from 13 to 18 ft. Placed two foot sump from 18 to 20 ft.	GP	SANDY GRAVEL, with cobbles, poorly graded, occasional boulder size, subrounded, nonplastic, brown to grey.
10		Cave-in fill material from 20 to 23 ft.	CL		MANCOS SHALE FORMATION: SHALE, soft, grey.	
15						
20						
25						TD AT 23 FEET.
30						
35						
40						
45						
50						

GROUNDWATER

DEPTH	HOUR	DATE
8.9	10:30	9-30-85

PROJECT SHIPROCK SITE, NM

LOG OF WELL BORING NO. 632

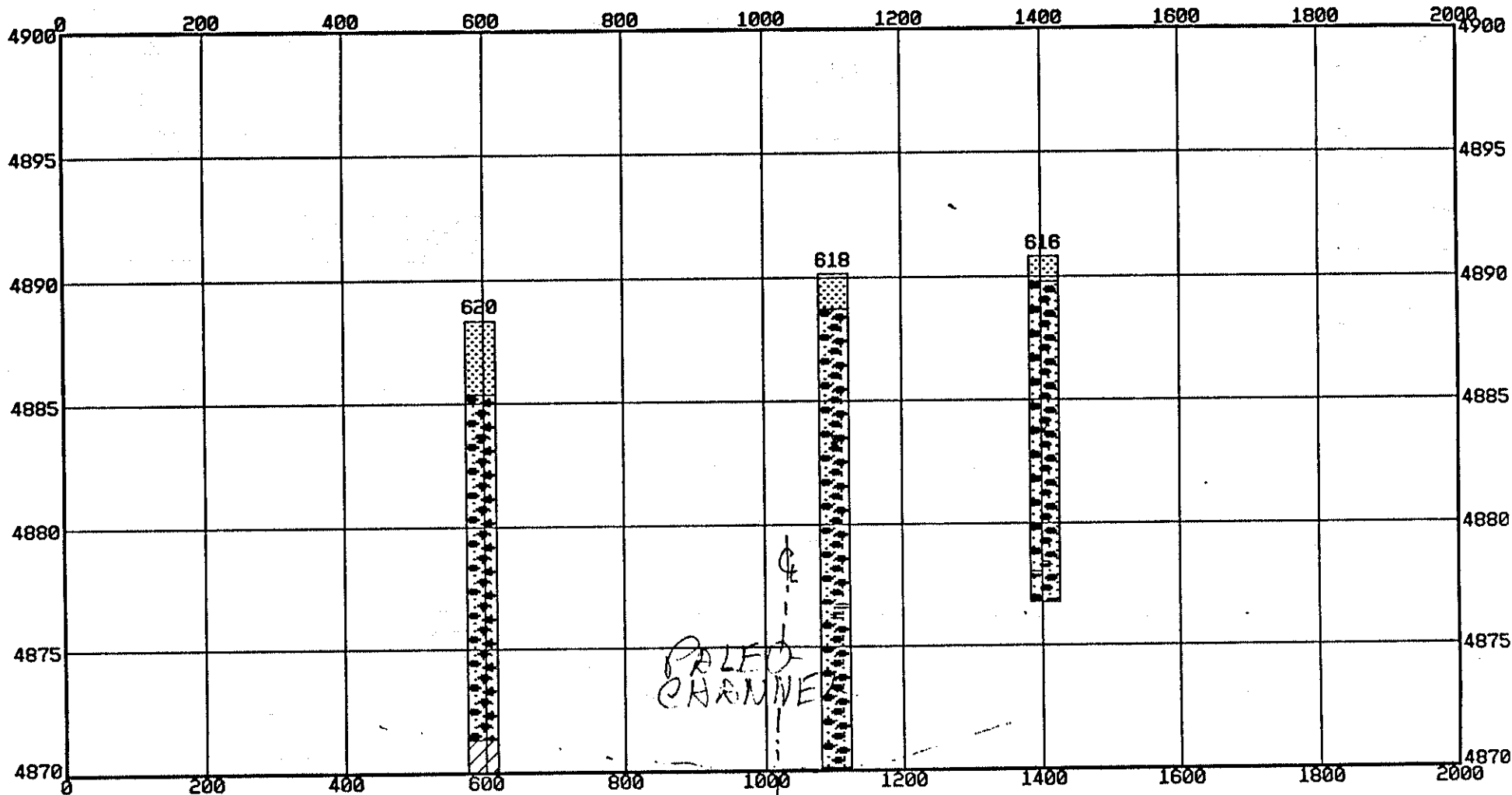
JOB NO. SHP01 DATE 09/11/85
 SURFACE ELEVATION 4889.56
 TOP OF FILTER PACK 6.00
 WELL CASING TYPE 4.0-IN.SCHED. 40 PVC
 COMPLETION ALLUVIUM

TOTAL DEPTH 20.0 feet
 RIG TYPE GARDNER-DENVER
 BORING TYPE ROTARY MUD
 LOCATION N 12343.88 E 9137.67
 DATUM MSL

Depth	Well Con.	Remarks	Lithology	USCS	Visual Classification
0		Placed steel protective casing to 2.0 feet.		SP	ALLUVIUM: SAND, little to some silt, fine to medium, occasional gravel, nonplastic, light brown.
5		Installed bentonite/cement grout to 4.0 feet			
6		Placed bentonite pellet seal from 4 to 6 feet.			
10		Installed 8-12 sand filter pack from 6 to 15 ft.		GP	SANDY GRAVEL, with cobbles, poorly graded, occasional boulder size, subrounded, nonplastic, brown to grey.
13		Placed .050-in slot well screen from 8 to 13 ft.			
15		Placed two foot sump from 13 to 15 ft.			
20		Cave-in fill material from 15 to 20 ft.		CL	MANCOS SHALE FORMATION: SHALE, soft, grey. TD AT 20 FEET.
25					
30					
35					
40					
45					
50					

GROUNDWATER

DEPTH	HOUR	DATE
9.0	16:30	09-29-85



Borehole	North	East	Elev.	Depth
616	10213.5	11140.8	4890.8	14.0
618	10138.1	10849.3	4890.1	21.0
620	10162.2	10344.0	4888.4	23.0

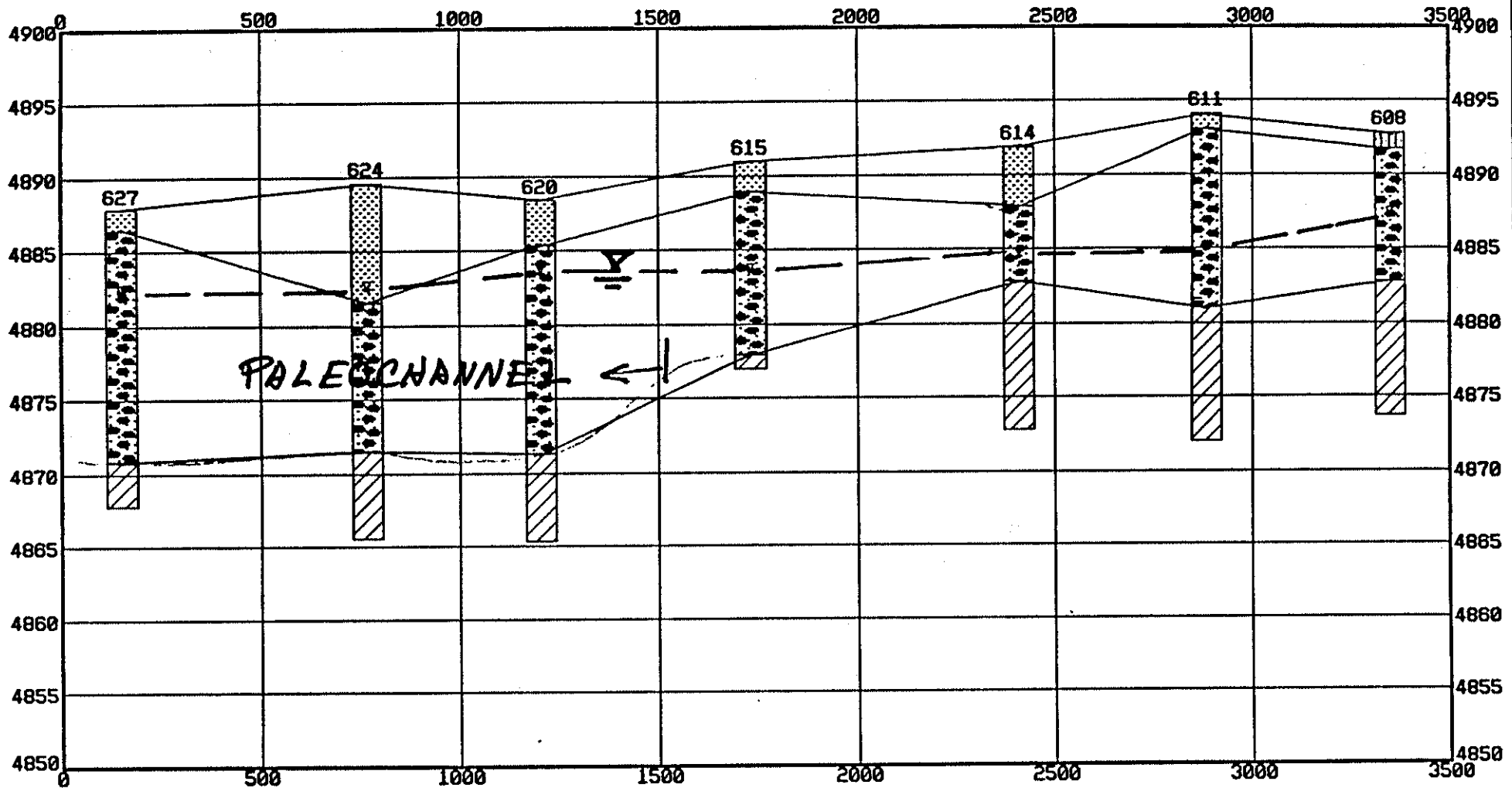
DISTANCES:
 Beginning 0.0
 Ending 2000.0
 VIEWING ANGLES (degrees):
 Horizontal 0.0
 Vertical 0.0

Position	North	East
Left, Front	10162.22	10344.01
Right, Front	10213.54	11140.82
Left, Back		
Right, Back		

SUBSURFACE FENCE DIAGRAM :EAST CENTRAL

SHIPROCK SITE, NM

PROJECT #	DATE	PLATE
SHP01,	AUG 92	1



Borehole	North	East	Elev.	Depth
608	8642.0	11819.1	4892.7	19.0
611	8899.2	11429.7	4894.1	22.0
614	9189.4	11058.0	4891.8	19.0
615	9744.7	10667.3	4891.0	14.0
620	10162.2	10344.0	4888.4	23.0
624	10598.4	10352.1	4889.6	29.0
627	10725.9	9749.2	4887.8	20.0

DISTANCES:

Beginning 0.0

Ending 3500.0

VIEWING ANGLES (degrees):

Horizontal 0.0

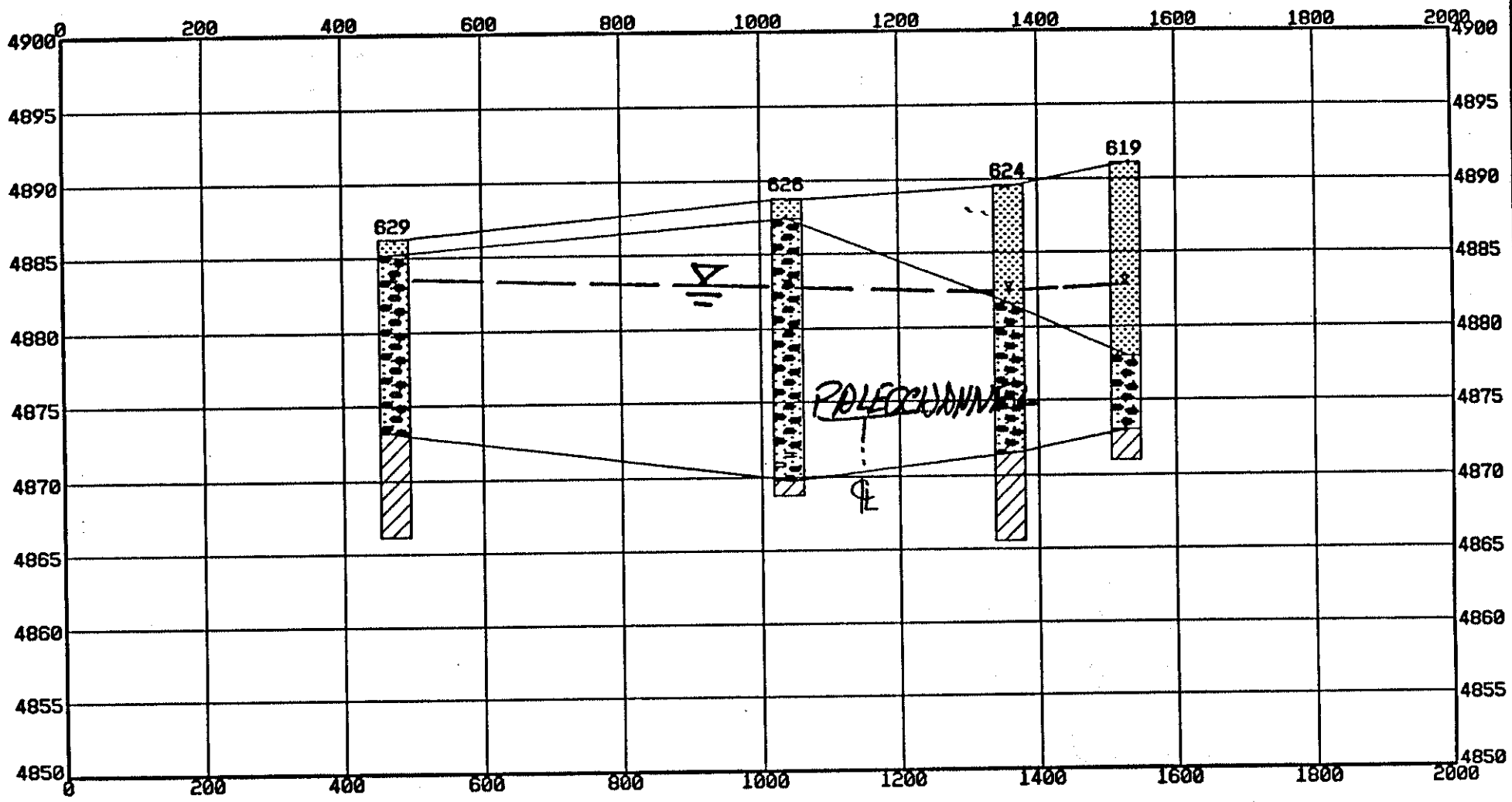
Vertical 0.0

Position	North	East
Left, Front	10725.88	9749.24
Right, Front	8642.03	11819.14
Left, Back		
Right, Back		

SUBSURFACE FENCE DIAGRAM : NORTHWEST TO SOUTHEAST

SHIPROCK SITE, NM

PROJECT #	DATE	PLATE
SHP01,	AUG 92	1



Borehole	North	East	Elev.	Depth
619	10524.1	10501.5	4891.0	20.0
624	10598.4	10352.1	4889.8	29.0
626	10524.9	10040.7	4888.8	20.0
629	10558.8	9477.7	4886.2	20.0

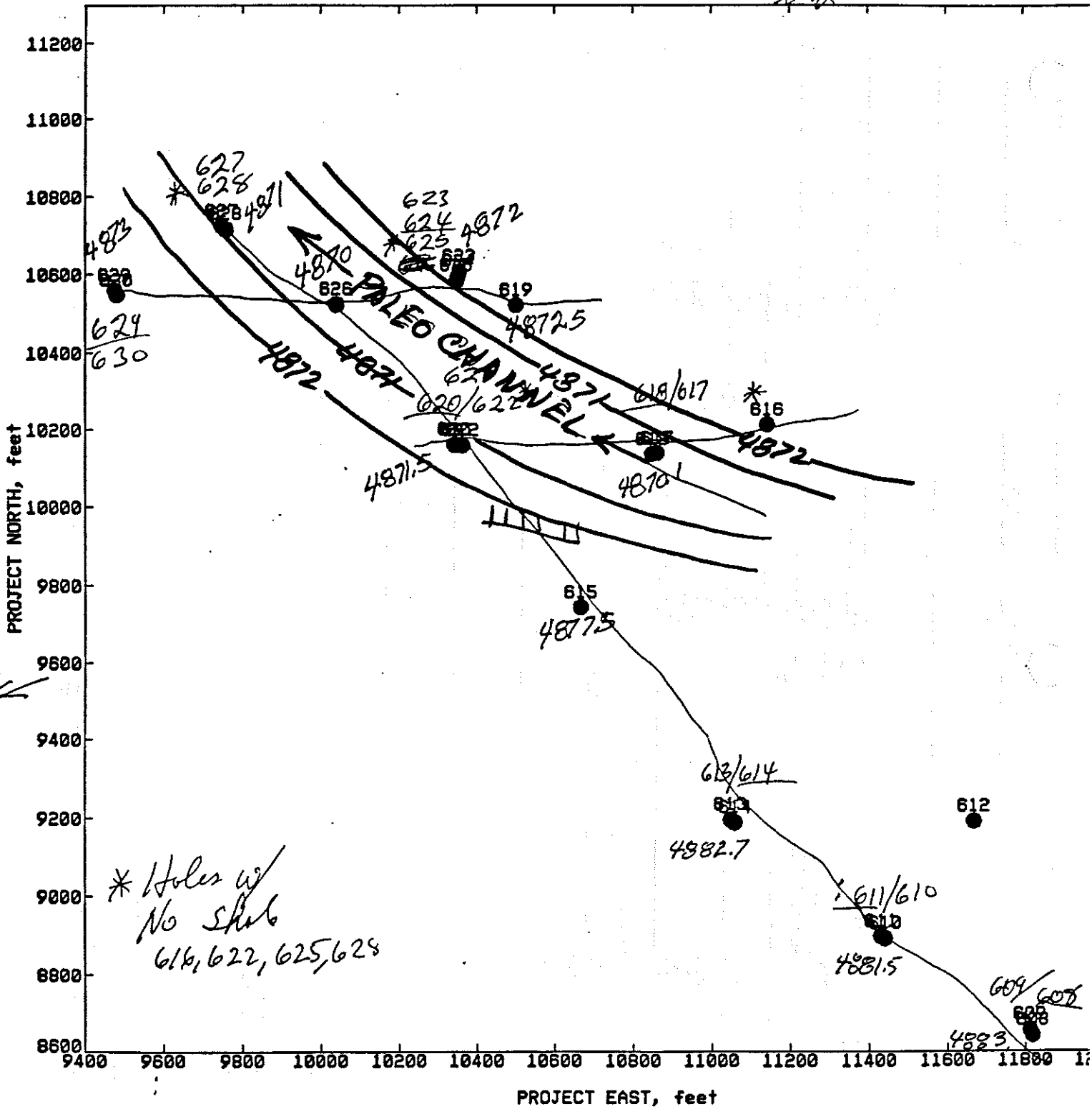
DISTANCES:
 Beginning 0.0
 Ending 2000.0
 VIEWING ANGLES (degrees):
 Horizontal 0.0
 Vertical 0.0

Position	North	East
Left, Front	10558.80	9477.73
Right, Front	10524.13	10501.47
Left, Back		
Right, Back		

SUBSURFACE FENCE DIAGRAM : WEST TO EAST		
SHIPROCK SITE, NM		
PROJECT #	DATE	PLATE
SHP01,	AUG 92	1

631 and 632 N. Side of River

UP



* Holes w/
No Shale
616, 622, 625, 628

August 199

SHIPROCK SITE, NM

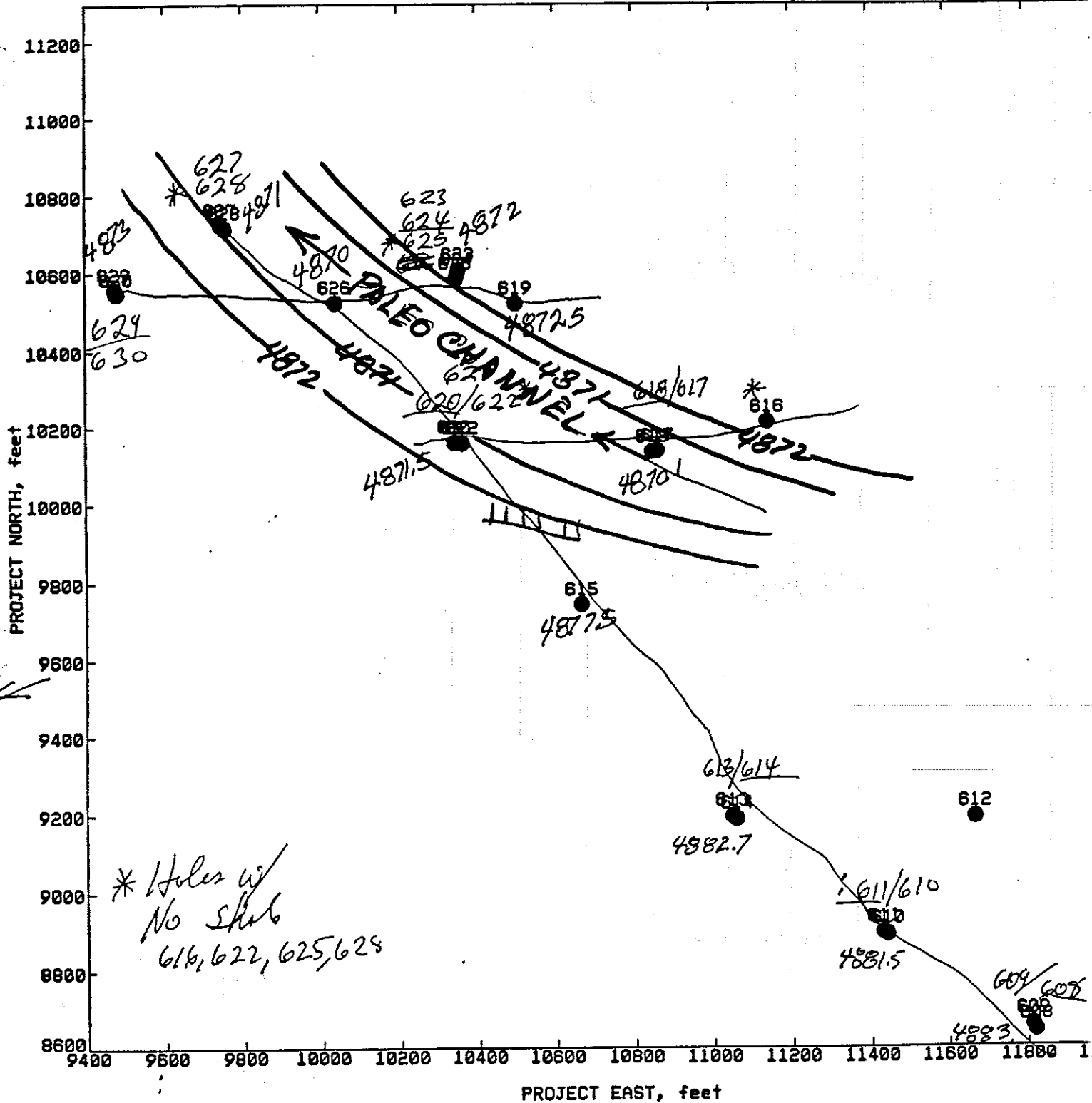
SITE PLAN

Jacobs Engineering Group Albuquerque, New Mexico

FIGURE

631 and 632 N. Side of River

Handwritten initials



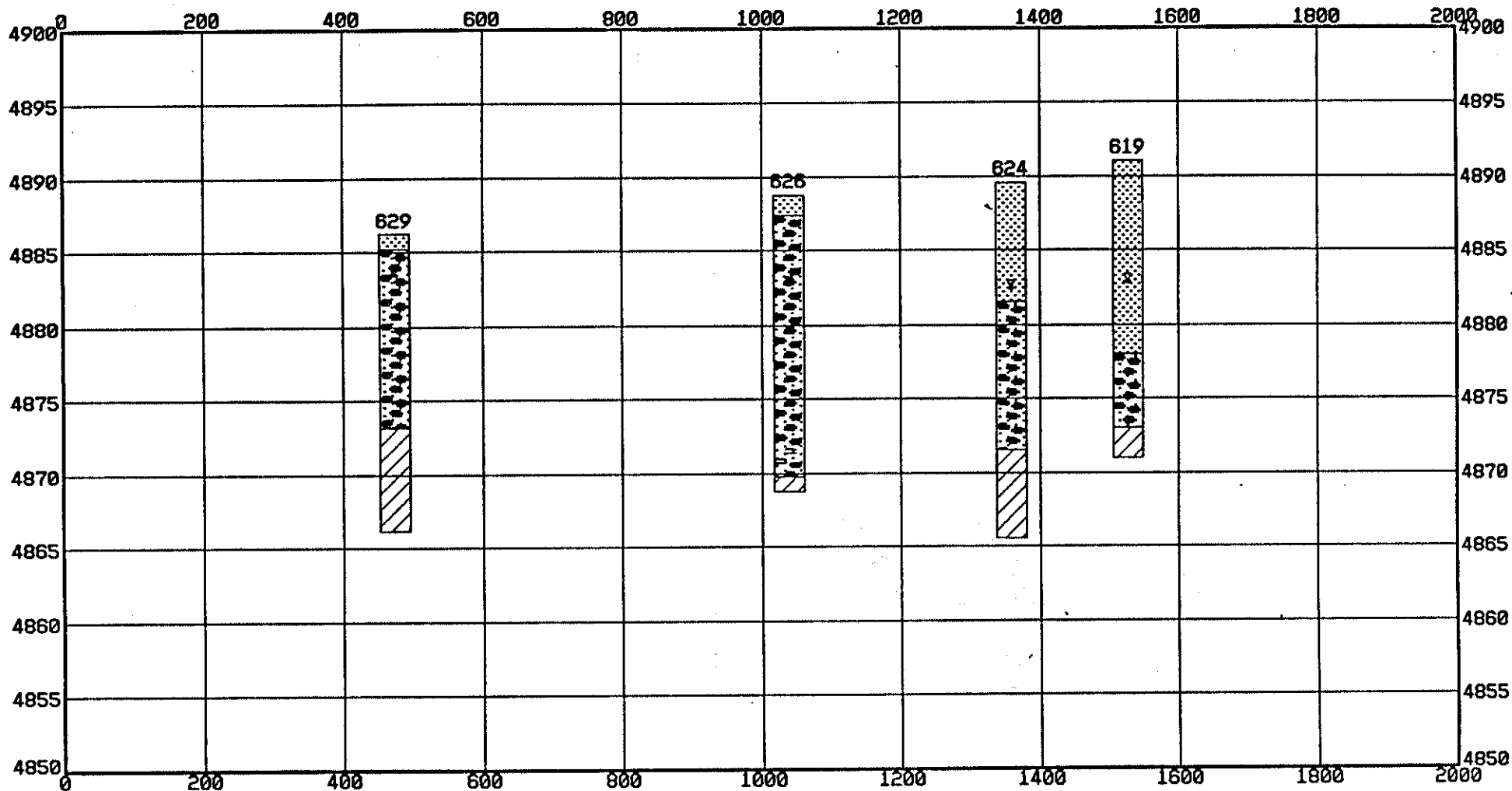
August 195

SHIPROCK SITE, NM

SITE PLAN

FIGURE

Jacobs Engineering Group Albuquerque, New Mexico



Borehole	North	East	Elev.	Depth
619	10524.1	10501.5	4891.0	20.0
624	10598.4	10352.1	4889.6	29.0
626	10524.9	10040.7	4888.8	20.0
629	10558.8	9477.7	4886.2	20.0

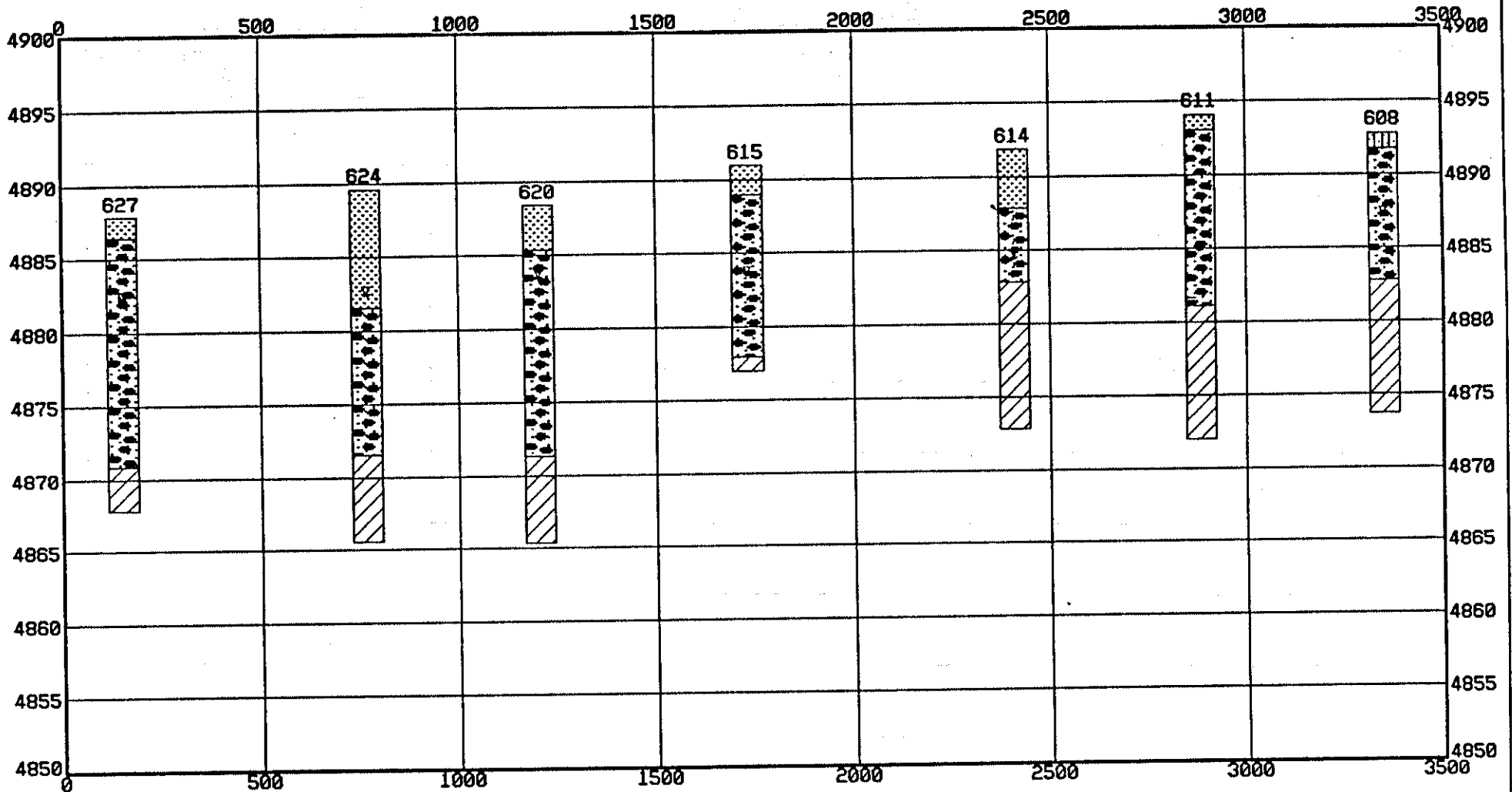
DISTANCES:
 Beginning 0.0
 Ending 2000.0
 VIEWING ANGLES (degrees):
 Horizontal 0.0
 Vertical 0.0

Position	North	East
Left, Front	10558.80	9477.73
Right, Front	10524.13	10501.47
Left, Back		
Right, Back		

SUBSURFACE FENCE DIAGRAM : WEST TO EAST

SHIPROCK SITE, NM

PROJECT #	DATE	PLATE
SHP01,	AUG 92	1



Borehole	North	East	Elev.	Depth
608	8642.0	11819.1	4892.7	19.0
611	8899.2	11429.7	4894.1	22.0
614	9189.4	11058.0	4891.8	19.0
615	9744.7	10667.3	4891.0	14.0
620	10162.2	10344.0	4888.4	23.0
624	10598.4	10352.1	4889.6	29.0
627	10725.9	9749.2	4887.8	20.0

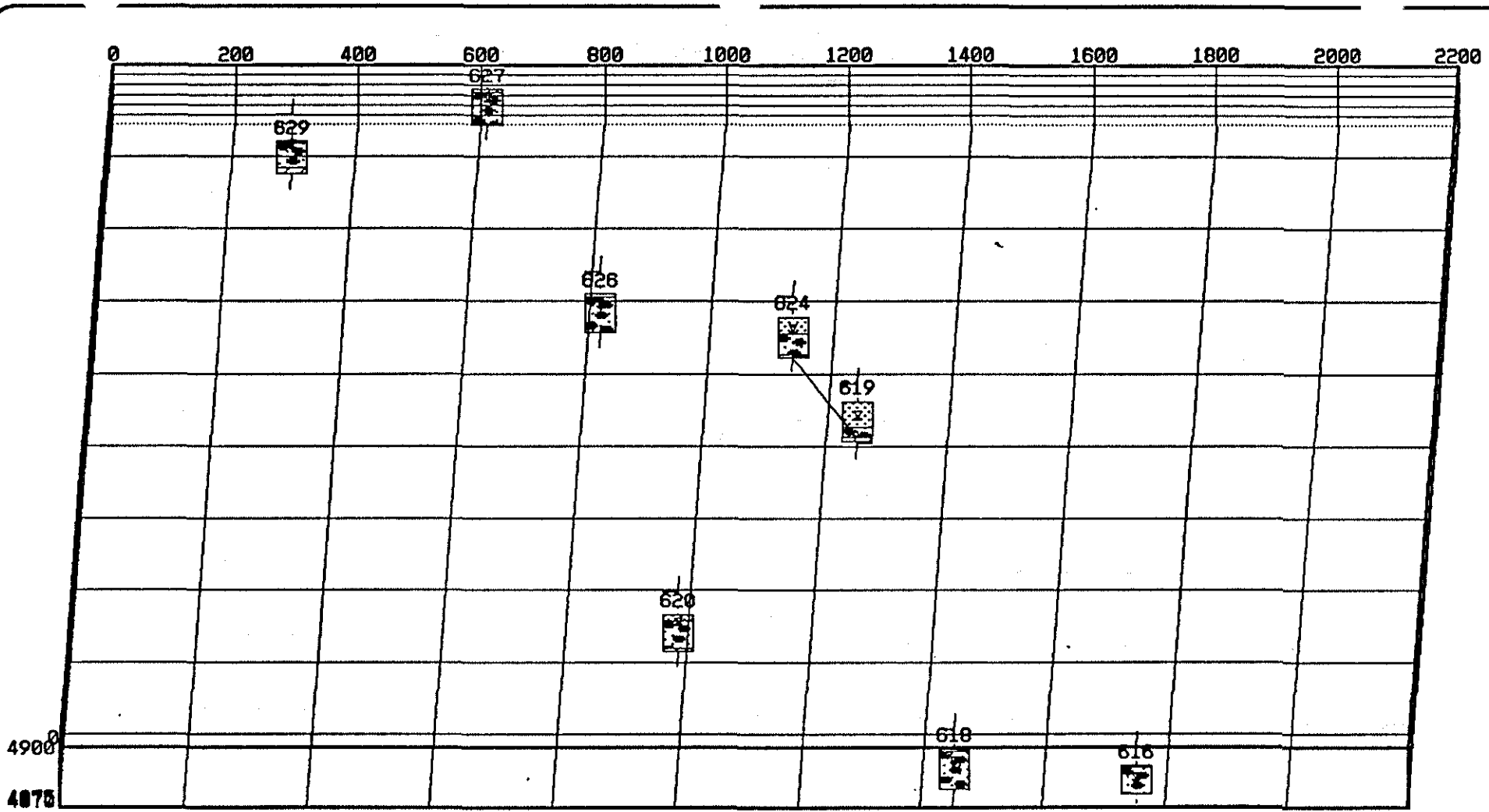
DISTANCES:
 Beginning 0.0
 Ending 3500.0
 VIEWING ANGLES (degrees):
 Horizontal 0.0
 Vertical 0.0

Position	North	East
Left, Front	10725.88	9749.24
Right, Front	8642.03	11819.14
Left, Back		
Right, Back		

SUBSURFACE FENCE DIAGRAM : NORTHWEST TO SOUTHEAST

SHIPROCK SITE, NM

PROJECT #	DATE	PLATE
SHP01,	AUG 92	1

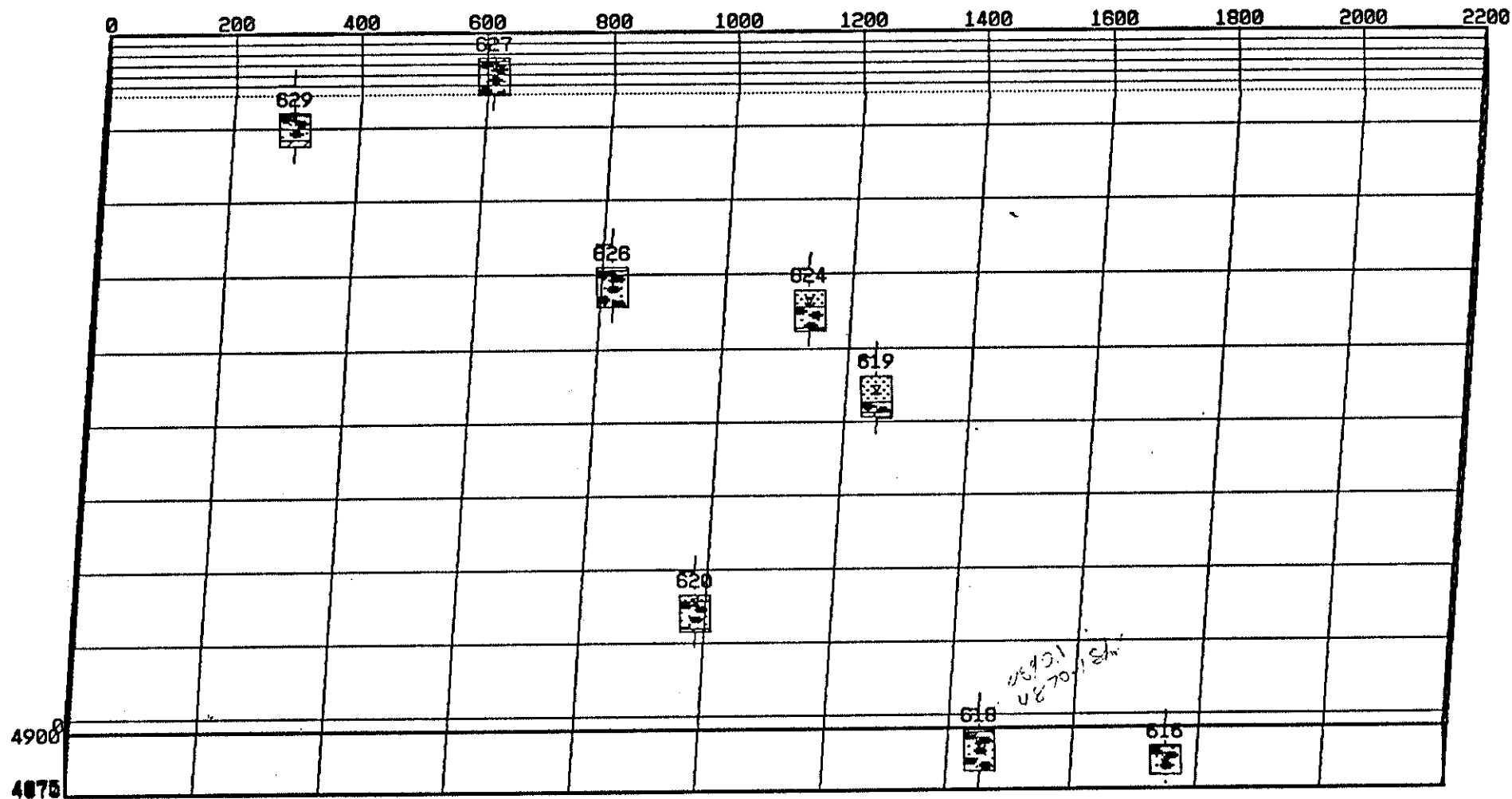


Borehole	North	East	Elev.	Depth
616	10213.5	11140.8	4890.8	14.0
618	10138.1	10849.3	4890.1	21.0
619	10524.1	10501.5	4891.0	20.0
620	10162.2	10344.0	4888.4	23.0
624	10598.4	10352.1	4889.6	29.0
626	10524.9	10040.7	4888.8	20.0
627	10725.9	9749.2	4887.8	20.0
629	10558.8	9477.7	4886.2	20.0

DISTANCES:
 Beginning 0.0
 Ending 2200.0
 VIEWING ANGLES (degrees):
 Horizontal 5.0
 Vertical 20.0

Position	North	East
Left, Front	9634.06	9485.15
Right, Front	9360.83	1561.64
Left, Back	10524.38	9173.54
Right, Back	1251.15	1250.02

SUBSURFACE FENCE DIAGRAM :NORTH HALF		
SHIPROCK SITE, NM		
PROJECT #	DATE	PLATE
SHP01,	AUG 92	1



Borehole	North	East	Elev.	Depth
616	10213.5	11140.8	4890.8	14.0
618	10138.1	10849.3	4890.1	21.0
619	10524.1	10501.5	4891.0	20.0
620	10162.2	10344.0	4888.4	23.0
624	10598.4	10352.1	4889.6	29.0
626	10524.9	10040.7	4888.8	20.0
627	10725.9	9749.2	4887.8	20.0
629	10558.8	9477.7	4886.2	20.0

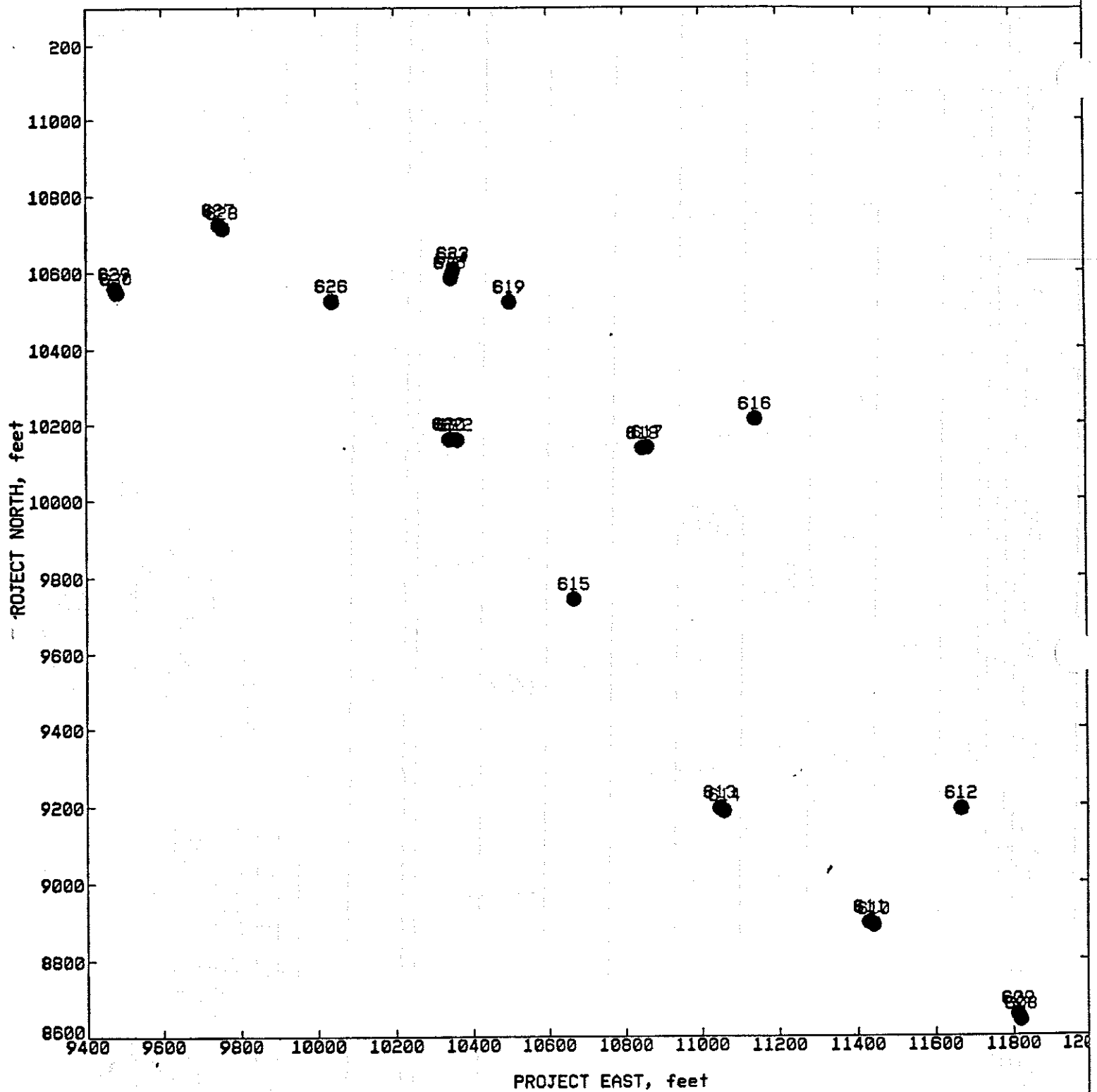
DISTANCES:
 Beginning 0.0
 Ending 2200.0
 VIEWING ANGLES (degrees):
 Horizontal 5.0
 Vertical 20.0

Position	North	East
Left, Front	9634.06	9485.15
Right, Front	10360.83	11561.64
Left, Back	10524.38	9173.54
Right, Back	11251.15	11250.02

SUBSURFACE FENCE DIAGRAM : NORTH HALF

SHIPROCK SITE, NM

PROJECT #	DATE	PLATE
SHP01,	AUG 92	1



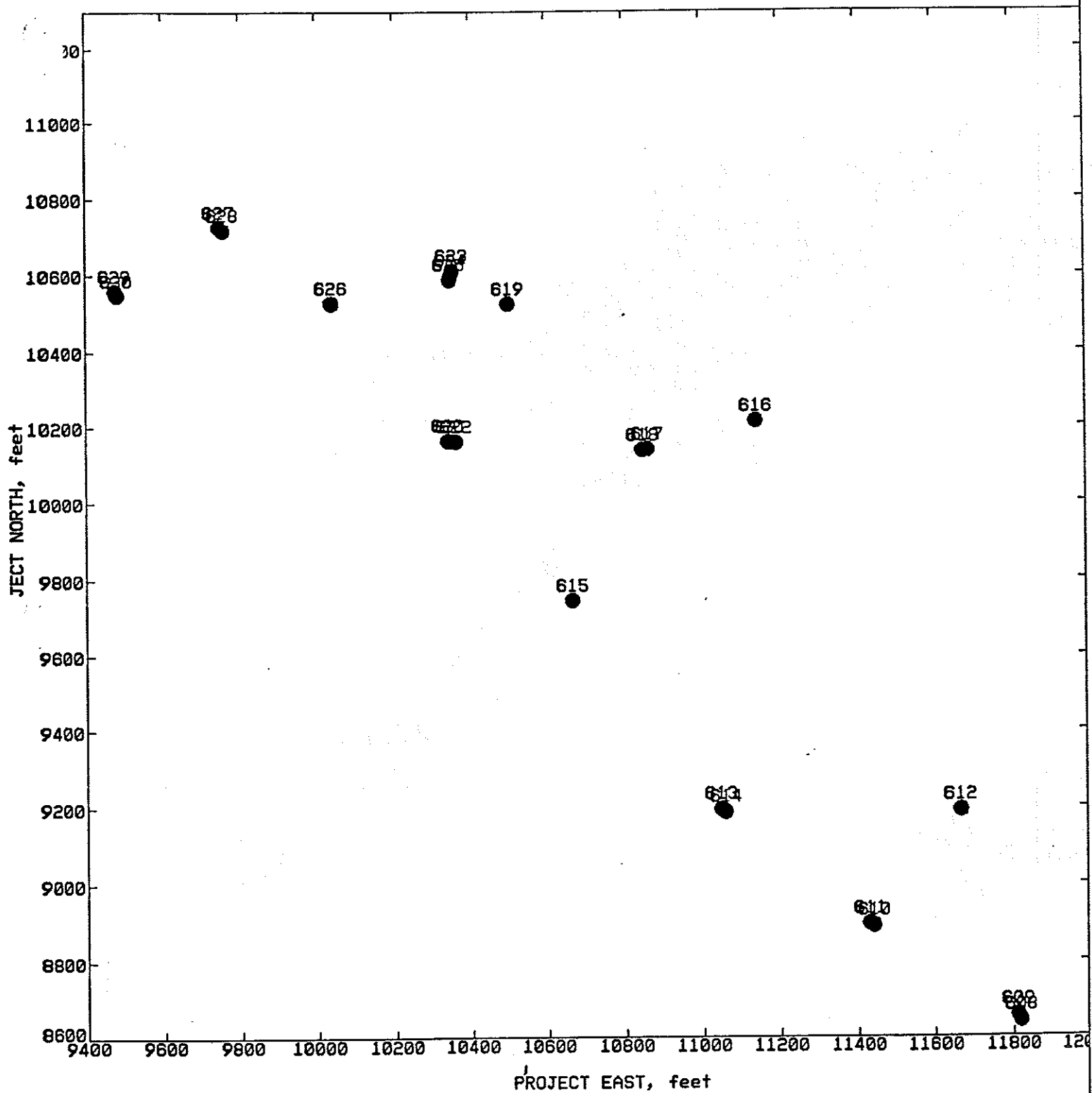
August 1992

SHIPROCK SITE, NM

SITE PLAN

FIGURE 1

Jacobs Engineering Group Albuquerque, New Mexico



August 1992

SHIPROCK SITE, NM

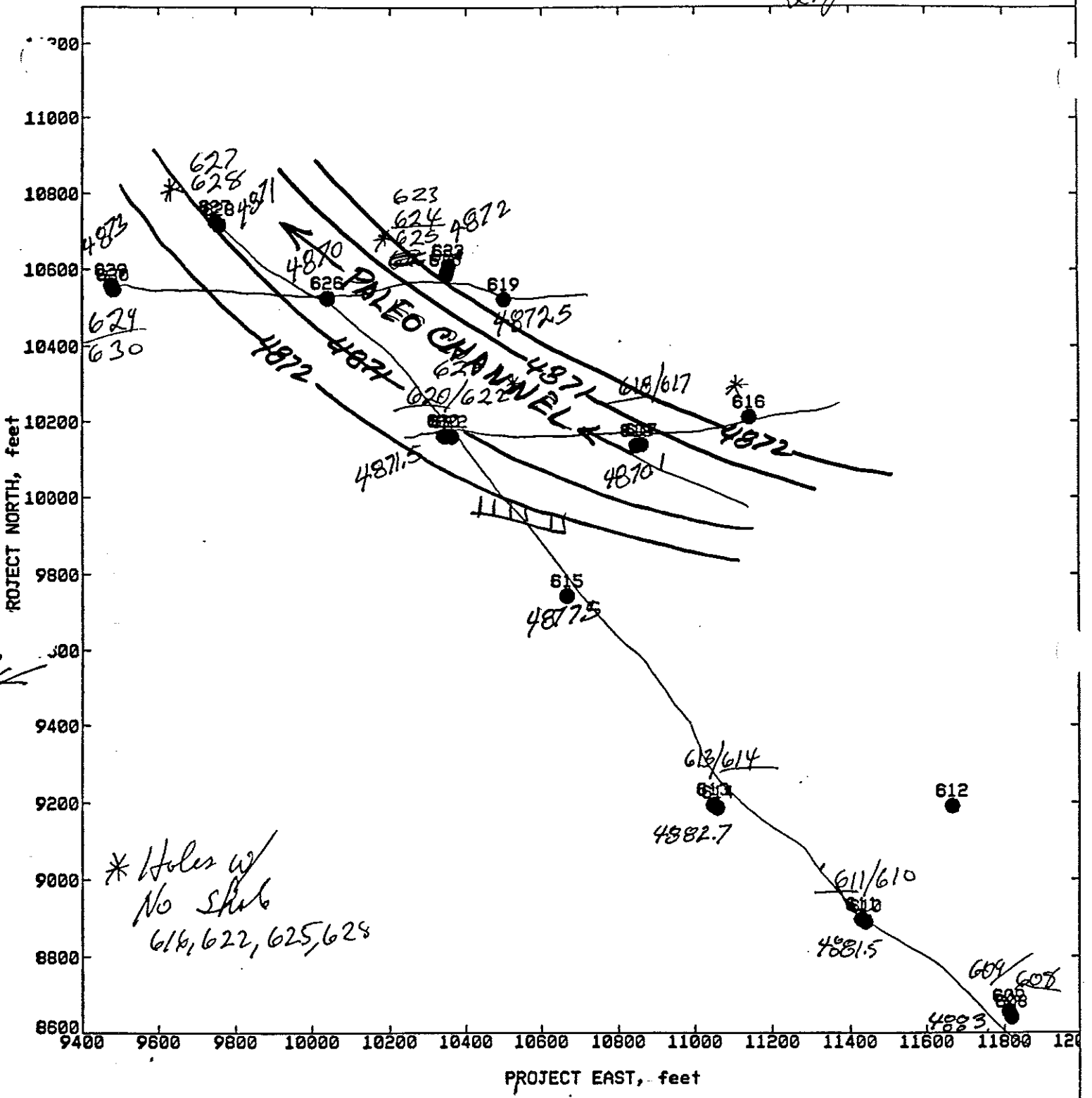
SITE PLAN

FIGURE 1

Jacobs Engineering Group Albuquerque, New Mexico

631 and 632 N. Side of River

2/27



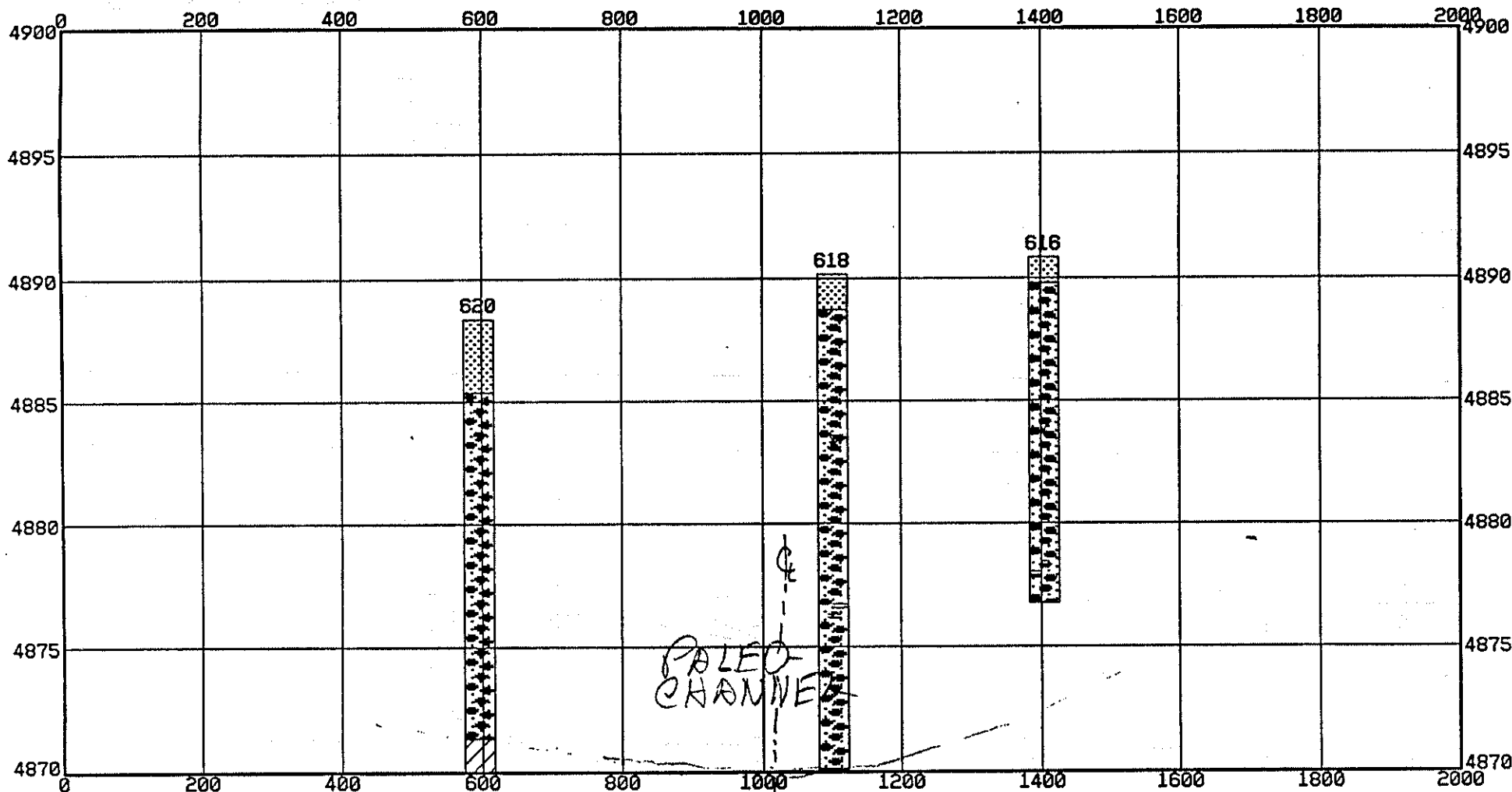
August 1992

SHIPROCK SITE, NM

SITE PLAN

FIGURE 1

Jacobs Engineering Group Albuquerque, New Mexico



Borehole	North	East	Elev.	Depth
616	10213.5	11140.8	4890.8	14.0
618	10138.1	10849.3	4890.1	21.0
620	10162.2	10344.0	4888.4	23.0

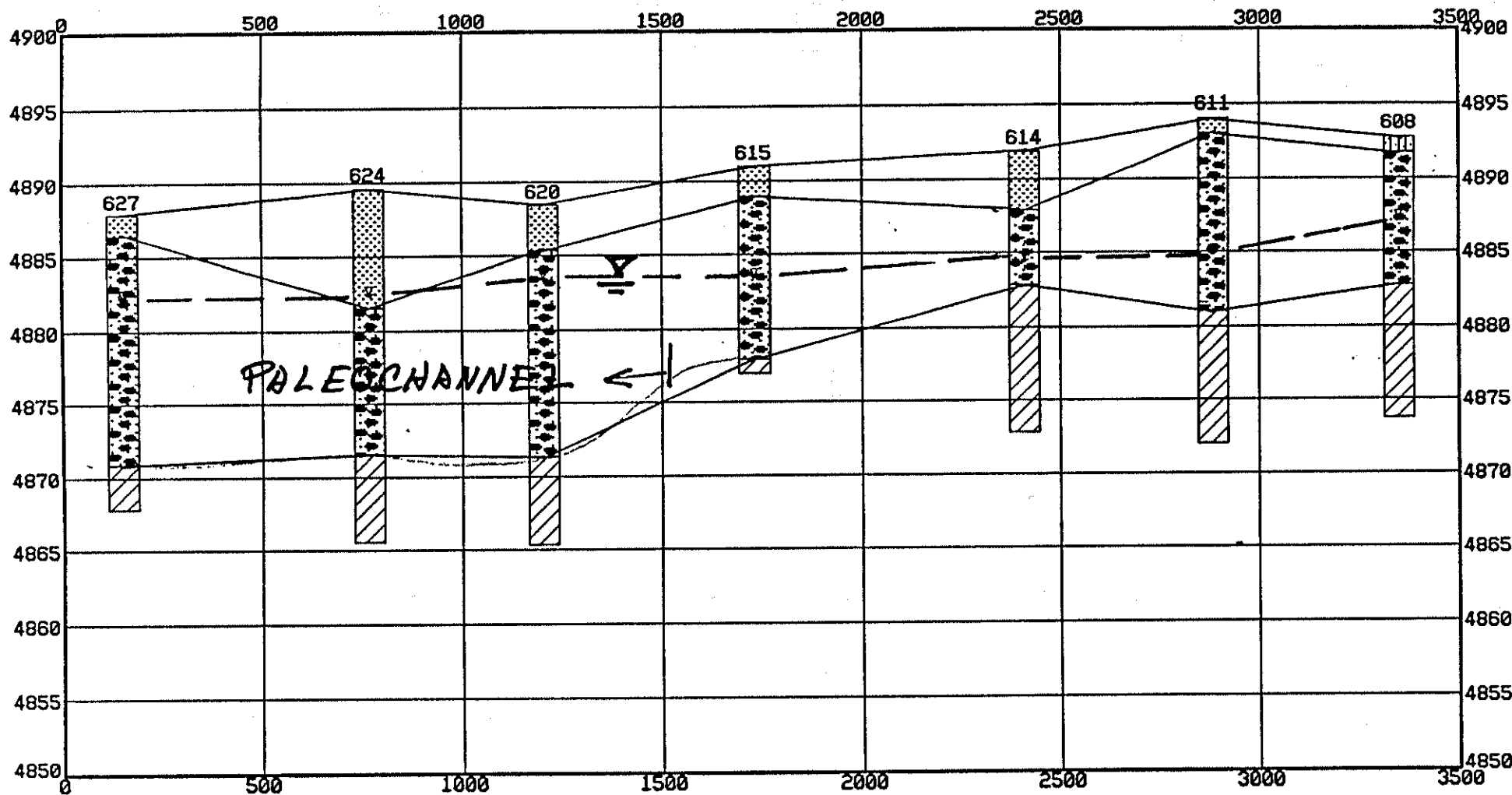
DISTANCES:
 Beginning 0.0
 Ending 2000.0
 VIEWING ANGLES (degrees):
 Horizontal 0.0
 Vertical 0.0

Position	North	East
Left, Front	10162.22	10344.01
Right, Front	10213.54	11140.82
Left, Back		
Right, Back		

SUBSURFACE FENCE DIAGRAM : EAST CENTRAL

SHIPROCK SITE, NM

PROJECT #	DATE	PLATE
SHP01,	AUG 92	1



Borehole	North	East	Elev.	Depth
608	8642.0	11819.1	4892.7	19.0
611	8899.2	11429.7	4894.1	22.0
614	9189.4	11058.0	4891.8	19.0
615	9744.7	10667.3	4891.0	14.0
620	10162.2	10344.0	4888.4	23.0
624	10598.4	10352.1	4889.6	29.0
627	10725.9	9749.2	4887.8	20.0

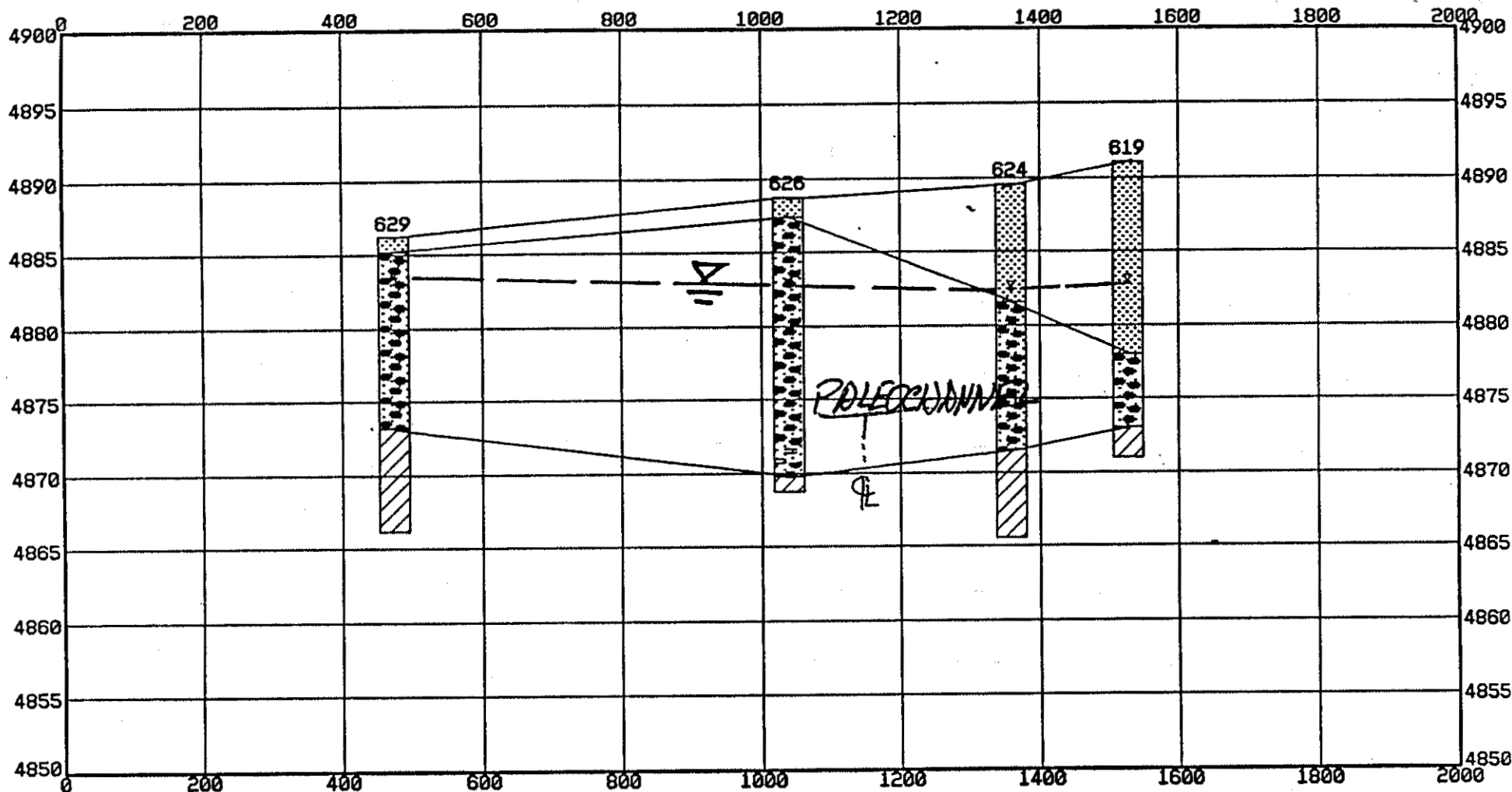
DISTANCES:
 Beginning 0.0
 Ending 3500.0
 VIEWING ANGLES (degrees):
 Horizontal 0.0
 Vertical 0.0

Position	North	East
Left, Front	10725.88	9749.24
Right, Front	8642.03	11819.14
Left, Back		
Right, Back		

SUBSURFACE FENCE DIAGRAM : NORTHWEST TO SOUTHEAST

SHIPROCK SITE, NM

PROJECT #	DATE	PLATE
SHP01,	AUG 92	1



Borehole	North	East	Elev.	Depth
619	10524.1	10501.5	4891.0	20.0
624	10598.4	10352.1	4889.6	29.0
626	10524.9	10040.7	4888.8	20.0
629	10558.8	9477.7	4886.2	20.0

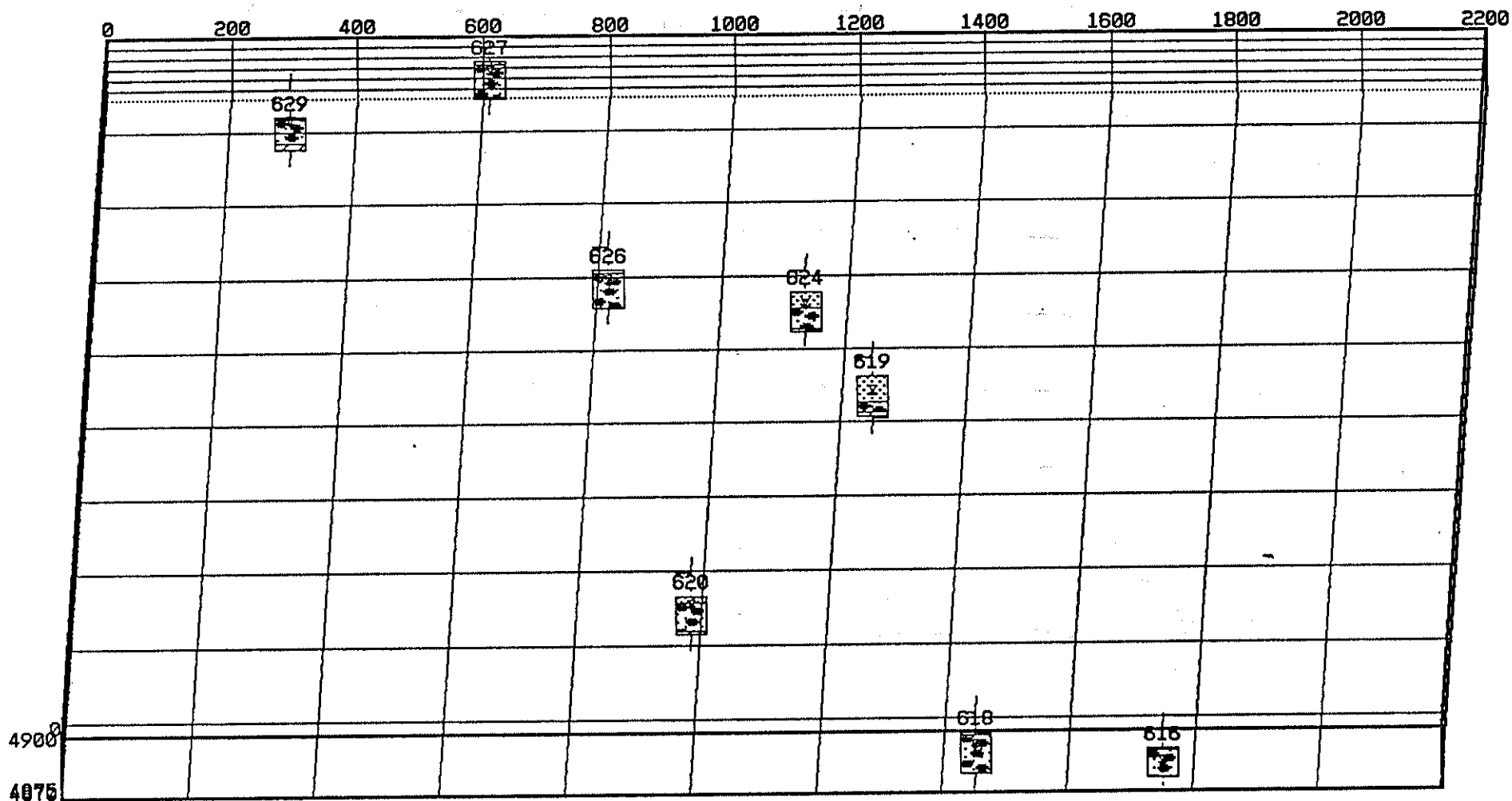
DISTANCES:
 Beginning 0.0
 Ending 2000.0
 VIEWING ANGLES (degrees):
 Horizontal 0.0
 Vertical 0.0

Position	North	East
Left, Front	10558.80	9477.73
Right, Front	10524.13	10501.47
Left, Back		
Right, Back		

SUBSURFACE FENCE DIAGRAM : WEST TO EAST

SHIPROCK SITE, NM

PROJECT #	DATE	PLATE
SHP01,	AUG 92	1



Borehole	North	East	Elev.	Depth
616	10213.5	11140.8	4890.8	14.0
618	10138.1	10849.3	4890.1	21.0
619	10524.1	10501.5	4891.0	20.0
620	10162.2	10344.0	4888.4	23.0
624	10598.4	10352.1	4889.6	29.0
626	10524.9	10040.7	4888.8	20.0
627	10725.9	9749.2	4887.8	20.0
629	10558.8	9477.7	4886.2	20.0

DISTANCES:

Beginning 0.0
Ending 2200.0

VIEWING ANGLES (degrees):

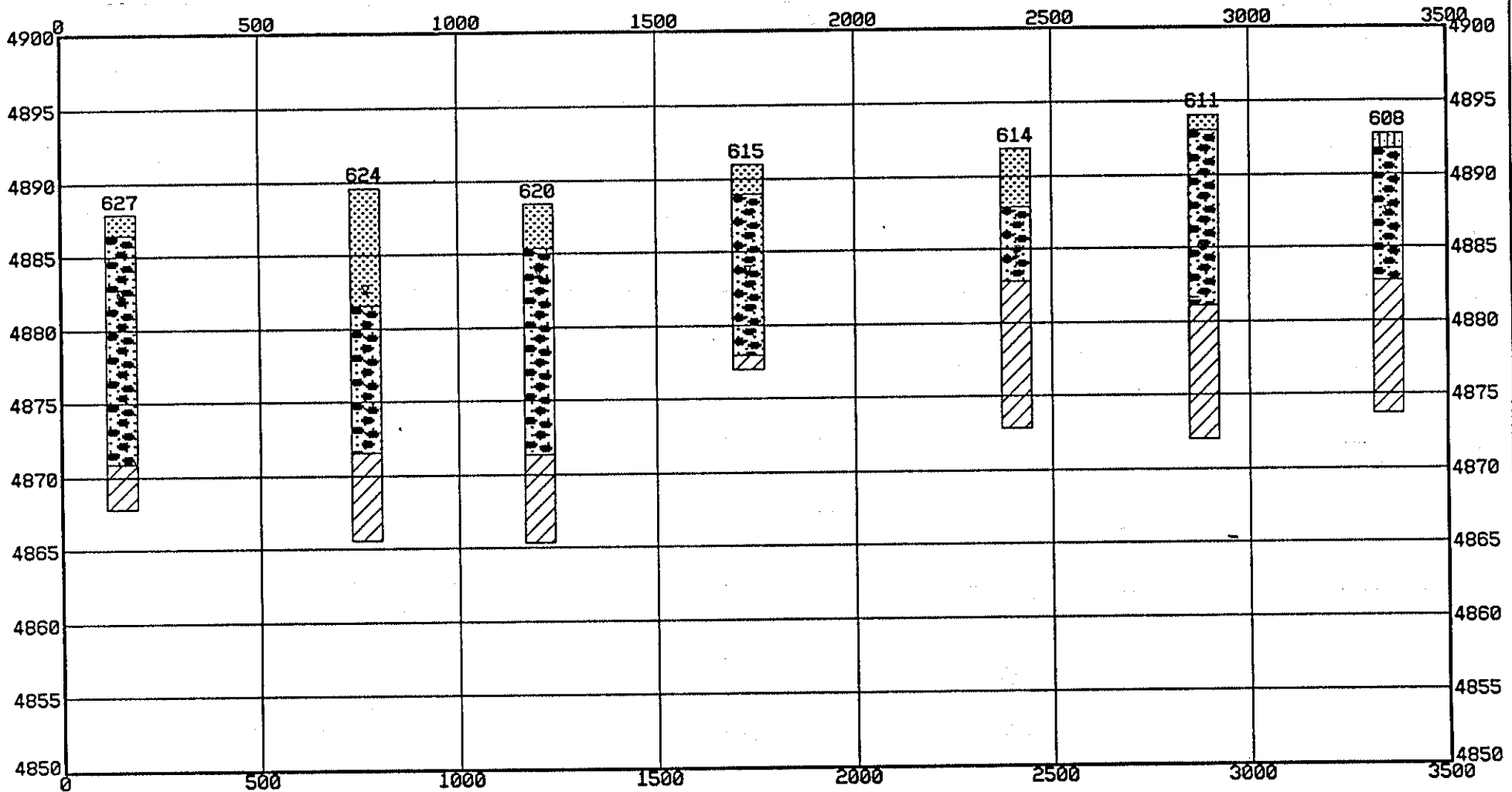
Horizontal 5.0
Vertical 20.0

Position	North	East
Left, Front	9634.06	9485.15
Right, Front	9360.83	1561.64
Left, Back	9524.38	9173.54
Right, Back	251.15	1250.02

SUBSURFACE FENCE DIAGRAM : NORTH HALF

SHIPROCK SITE, NM

PROJECT #	DATE	PLATE
SHP01,	AUG 92	1



Borehole	North	East	Elev.	Depth
608	8642.0	11819.1	4892.7	19.0
611	8899.2	11429.7	4894.1	22.0
614	9189.4	11058.0	4891.8	19.0
615	9744.7	10667.3	4891.0	14.0
620	10162.2	10344.0	4888.4	23.0
624	10598.4	10352.1	4889.6	29.0
627	10725.9	9749.2	4887.8	20.0

DISTANCES:

Beginning 0.0

Ending 3500.0

VIEWING ANGLES (degrees):

Horizontal 0.0

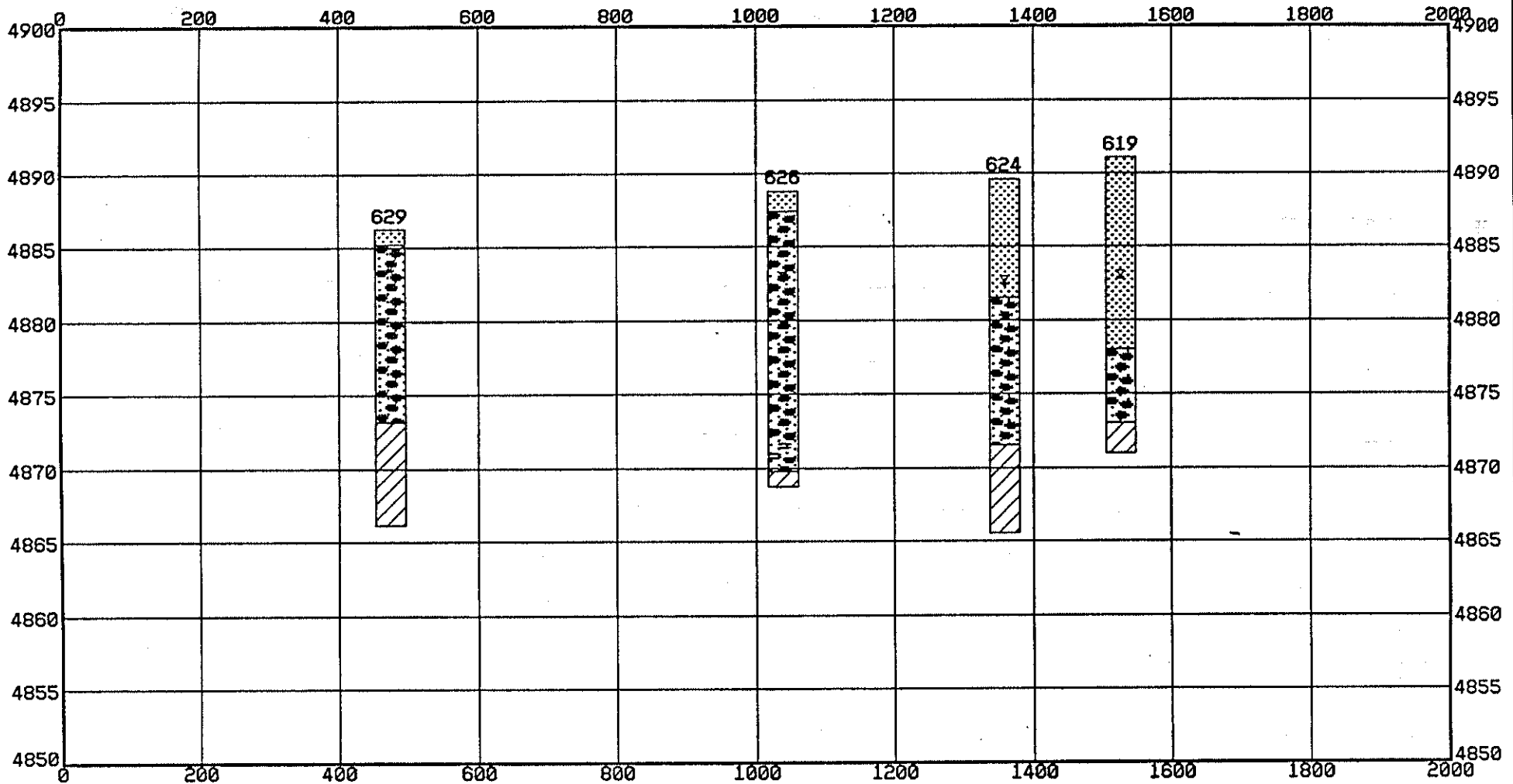
Vertical 0.0

Position	North	East
Left, Front	10725.88	9749.24
Right, Front	8642.03	11819.14
Left, Back		
Right, Back		

SUBSURFACE FENCE DIAGRAM : NORTHWEST TO SOUTHEAST

SHIPROCK SITE, NM

PROJECT #	DATE	PLATE
SHP01,	AUG 92	1



Borehole	North	East	Elev.	Depth
619	10524.1	10501.5	4891.0	20.0
624	10598.4	10352.1	4889.6	29.0
626	10524.9	10040.7	4888.8	20.0
629	10558.8	9477.7	4886.2	20.0

DISTANCES:
 Beginning 0.0
 Ending 2000.0
 VIEWING ANGLES (degrees):
 Horizontal 0.0
 Vertical 0.0

Position	North	East
Left, Front	10558.80	9477.73
Right, Fro	24.13	10501.47
Left, Back		
Right, Bat		

SUBSURFACE FENCE DIAGRAM :WEST TO EAST

SHIPROCK SITE, NM

PROJECT #	DATE	PLATE
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SHP01,

AUG 92

1

JOB NO. SHPO2 DATE 05/17/83 TOTAL DEPTH 60.0 feet
 SURFACE ELEVATION 9346.53 RIG TYPE BADGER 1250
 TOP OF FILTER PACK 5.00 BORING TYPE ROTARY MUD
 WELL CASING TYPE 2.0-IN. SCHED. 40 PVC LOCATION N 4943.33 E 10278.11
 COMPLETION MANCOS SHALE FM. DATUM MSL

Depth	Well Con.	Remarks	Lithology	USCS	Visual Classification
0		2.0-IN. well installed.		ML	MANCOS SHALE FORMATION: SILTSTONE, thinly bedded, mod. weathered, widely spaced fractures, hard, dark greyish brown.
		Protective steel casing placed at 3 ft.		CL	
5		Cement/bentonite grout installed to 3 feet.			SHALE, thinly laminated, mod. weathered, mod. hard, grey.
		Bentonite seal placed from 3 to 5 feet.			
10					
15		Filter pack of concrete sand placed from 5 to 25 ft.			
20		Well screen placed from 10 to 20 feet.			
25		Blank sump installed from 20 to 25 feet.			
		Sand fill from 25 to 28 feet.			
30		Grout fill placed from 28 to 60 feet.			
35					
40		NOTE: HOLE NO. ALSO KNOWN AS 9014			
45					
50					



GROUNDWATER

DEPTH	HOUR	DATE
▽	DRY	5-17-83
▽	DRY	6-20-83

PROJECT SHIPROCK SITE, NEW MEXICO; UMTRA
TAILINGS AREA

LOG OF WELL BORING NO. 1H

JOB NO. SHP02 DATE 05/17/83 TOTAL DEPTH 60.0 feet
 SURFACE ELEVATION 9346.53 RIG TYPE BADGER 1250
 TOP OF FILTER PACK 5.00 BORING TYPE ROTARY MUD
 WELL CASING TYPE 2.0-IN. SCHED. 40 PVC LOCATION N 4943.33 E 10278.11
 COMPLETION MANCOS SHALE FM. DATUM MSL

Depth	Well Con.	Remarks	Lithology	USCS	Visual Classification
55					MANCOS SHALE FORMATION: Continued.
60					
65					TD AT 60 FEET.
70					
75					
80					
85					
90					
95					
100					

GROUNDWATER

DEPTH	HOUR	DATE
	DRY	5-17-83
	DRY	6-20-83

JOB NO. SHPO2 DATE 05/23/83 TOTAL DEPTH 60.0 feet
 SURFACE ELEVATION 4962.90 RIG TYPE BADGER 1250
 TOP OF FILTER PACK 18.00 BORING TYPE ROTARY MUD
 WELL CASING TYPE 2.0-IN. SCHED. 40 PVC LOCATION N 7312.61 E 11973.70
 COMPLETION ALLUVIUM DATUM MSL

Depth	Well Con.	Remarks	Lithology	USCS	Visual Classification
0		2.0-IN. well installed.		GP	ALLUVIUM: SANDY GRAVEL, with cobbles, brown.
5		Protective steel casing placed at 18 ft.			
10		NOTE: HOLE NO. ALSO KNOWN AS 9014			
15		Cement/bentonite grout installed to 16 feet.			
20		Bentonite seal placed from 16 to 18 feet.		CL	MANCOS SHALE FORMATION: SHALE, thinly laminated, slightly weathered, mod. hard, grey.
25		Filter pack of concrete sand placed from 18 to 38 ft. Well screen placed from 23 to 33 feet.			
30					
35		Blank sump installed from 33 to 38 feet.			
40		Grout fill (assumed) from 38 to 60 feet.		ML	SILTSTONE, thinly bedded, slightly weathered, hard, widely spaced fractures, dark greyish brown.
45				CL	SHALE, thinly laminated, slightly weathered, mod. hard, closely spaced fractures, grey.
50					



GROUNDWATER

DEPTH	HOUR	DATE
∞	DRY	5-17-83
∞	DRY	6-20-83

PROJECT SHIPROCK SITE, NEW MEXICO; UMTRA
TAILINGS AREA

LOG OF WELL BORING NO. 2H

JOB NO. SHPO2 DATE 05/23/83 TOTAL DEPTH 60.0 feet
 SURFACE ELEVATION 4962.90 RIG TYPE BADGER 1250
 TOP OF FILTER PACK 18.00 BORING TYPE ROTARY MUD
 WELL CASING TYPE 2.0-IN.SCHED.40 PVC LOCATION N 7312.61 E 11973.70
 COMPLETION ALLUVIUM DATUM MSL

Depth	Well Con.	Remarks	Lithology	USCS	Visual Classification
55					MANCOS SHALE FORMATION, Continued.
60					
65					TD AT 60 FEET.
70					
75					
80					
85					
90					
95					
100					

GROUNDWATER

DEPTH	HOUR	DATE
▽	DRY	5-17-83
▽	DRY	6-20-83

JEG TAC TEAM

JOB NO. SHP02 DATE 05/31/83 TOTAL DEPTH 60.0 feet
 SURFACE ELEVATION 4977.31 RIG TYPE BADGER 1250
 TOP OF FILTER PACK 53.70 BORING TYPE ROTARY MUD
 WELL CASING TYPE 2.0-IN. SCHED. 40 PVC LOCATION N 6800.90 E 8789.50
 COMPLETION ALLUVIUM DATUM MSL

Depth	Well Con.	Remarks	Lithology	USCS	Visual Classification
0		2.0-IN. well installed.		ML	ALLUVIUM: SANDY SILT, nonplastic, brown.
5		Protective steel casing placed at 3.0 ft.			
10		Cement/bentonite grout installed to 31.7 feet.			
15		NOTE: HOLE NO. ALSO KNOWN AS 9015.		GP	SANDY GRAVEL, with cobbles, nonplastic, brown.
20					
25					
30		Bentonite seal placed from 31.7 to 33.7 feet.			
35		Filter pack of concrete sand placed from 33.7 to 53.7 ft.			Note: Possible encounter of water at 37 feet during drilling.
40		Well screen placed from 38.7 to 48.7 feet.			
45				CL	MANCOS SHALE FORMATION: SHALE, thinly laminated, slightly weathered, closely spaced fractures, mod. hard, grey.
50		Blank sump installed from 48.7 to 53.7 feet.			

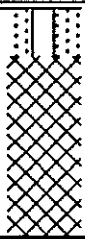
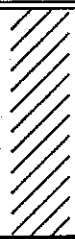
GROUNDWATER		
DEPTH	HOUR	DATE
37.0	12:00	5-23-83
38.8		6-20-83

PROJECT SHIPROCK SITE, NEW MEXICO; UMTRA
TAILINGS AREA

LOG OF WELL BORING NO. 3H

JOB NO. SHPO2 DATE 05/31/83
SURFACE ELEVATION 4977.31
TOP OF FILTER PACK 53.70
WELL CASING TYPE 2.0-IN.SCHED.40 PVC
COMPLETION ALLUVIUM

TOTAL DEPTH 60.0 feet
RIG TYPE BADGER 1250
BORING TYPE ROTARY MUD
LOCATION N 6800.90 E 8789.50
DATUM MSL

Depth	Well Con.	Remarks	Lithology	USCS	Visual Classification
55		Cave-in fill (assumed) from 53.7 to 60 feet.			MANCOS SHALE FORMATION, Continued.
60					TD AT 60 FEET.
65					
70					
75					
80					
85					
90					
95					
100					

GROUNDWATER

DEPTH	HOUR	DATE
37.0	12:00	5-23-83
38.8		6-20-83

JOB NO. SHP02 DATE 05/27/83 TOTAL DEPTH 80.0 feet
 SURFACE ELEVATION 4995.29 RIG TYPE BADGER 1250
 TOP OF FILTER PACK 57.70 BORING TYPE ROTARY MUD
 WELL CASING TYPE 2.0-IN. SCHED. 40 PVC LOCATION N 5735.41 E 9335.34
 COMPLETION ALLUVIUM DATUM MSL

Depth	Well Con.	Remarks	Lithology	USCS	Visual Classification
0		2.0-IN. well installed.		ML	ALLUVIUM: SANDY SILT, nonplastic, lt. brown.
5		Protective steel casing placed at 3.0 ft.			
10		Cement/bentonite grout installed to 55.7 feet. NOTE: HOLE NO. ALSO KNOWN AS 604 OR 9002			
15					
20					
25					
30				GP	
35					
40					
45					
50				SP	SAND, fine, nonplastic, brown.

GROUNDWATER

DEPTH	HOUR	DATE
56.0	16:00	5-31-83
55.5		6-20-83

PROJECT SHIPROCK SITE, NEW MEXICO; UMTRA TAILINGS AREA

LOG OF WELL BORING NO. 4H

JOB NO. SHPO2 DATE 05/27/83 TOTAL DEPTH 80.0 feet
 SURFACE ELEVATION 4995.29 RIG TYPE BADGER 1250
 TOP OF FILTER PACK 57.70 BORING TYPE ROTARY MUD
 WELL CASING TYPE 2.0-IN.SCHED.40 PVC LOCATION N 5735.41 E 9335.34
 COMPLETION ALLUVIUM DATUM MSL

Depth	Well Con.	Remarks	Lithology	USCS	Visual Classification
55		Bentonite seal placed from 55.7 to 57.7 feet.		GP	ALLUVIUM, Continued. SANDY GRAVEL, with cobbles, nonplastic, brown.
60		Filter pack of concrete sand placed from 57.7 to 77.7 ft.		CL	MANCOS SHALE FORMATION: SHALE, thinly laminated, very weathered, mod. soft, closely spaced fractures, grey.
65		Well screen placed from 62.7 to 72.7 feet.			Note: Becomes mod. weathered, mod. hard to hard, from 63 ft.
70					
75		Blank sump installed from 72.7 to 77.7 feet.			
80		Cave-in fill (assumed) from 77.7 to 80 feet.			TD AT 80 FEET.
85					
90					
95					
100					

GROUNDWATER

DEPTH	HOUR	DATE
56.0	16:00	5-31-83
55.5		6-20-83

JOB NO. SHP02 DATE 06/01/83
 SURFACE ELEVATION 4983.93
 TOP OF FILTER PACK 32.60
 WELL CASING TYPE 2.0-IN. SCHED. 40 PVC
 COMPLETION ALLUVIUM

TOTAL DEPTH 55.0 feet
 RIG TYPE BADGER 1250
 BORING TYPE ROTARY MUD
 LOCATION N 5913.30 E 10844.53
 DATUM MSL

Depth	Well Con.	Remarks	Lithology	USCS	Visual Classification
0		2.0-IN. well installed.		ML	ALLUVIUM: SANDY SILT, nonplastic, lt. brown.
5		Assumed depth of protective steel casing at 3.0 ft.			
10		Cement/bentonite grout installed to 30.6 feet.			
15		NOTE: HOLE NO. ALSO KNOWN AS 9016			
20				GP	
25					
30		Bentonite seal placed from 30.6 to 32.6 feet.			
35		Filter pack of concrete sand placed from 32.6 to 52.6 ft.			
40		Well screen placed from 37.6 to 47.6 feet.			
45				CL	
50		Blank sump installed from 47.6 to 52.6 feet.			



GROUNDWATER

DEPTH	HOUR	DATE
▽	DRY	6-6-83
▽	39.0	6-20-83

PROJECT SHIPROCK SITE, NEW MEXICO; UMTRA
TAILINGS AREA

LOG OF WELL BORING NO. 5AGT

JOB NO. SHPO2 DATE 06/01/83 TOTAL DEPTH 55.0 feet
 SURFACE ELEVATION 4983.93 RIG TYPE BADGER 1250
 TOP OF FILTER PACK 32.60 BORING TYPE ROTARY MUD
 WELL CASING TYPE 2.0-IN. SCHED. 40 PVC LOCATION N 5913.30 E 10844.53
 COMPLETION ALLUVIUM DATUM MSL

Depth	Well Con.	Remarks	Lithology	USCS	Visual Classification
55		Cave-in fill (assumed) from 52.6 to 55 feet.			MANCOS SHALE FORMATION, Continued. TD AT 55 FEET.
60					
65					
70					
75					
80					
85					
90					
95					
100					

GROUNDWATER

DEPTH	HOUR	DATE
	DRY	6-6-83
39.0		6-20-83

JEG TAC TEAM

JOB NO. SHP02 DATE 06/05/83 TOTAL DEPTH 50.0 feet
 SURFACE ELEVATION 4981.24 RIG TYPE BADGER 1250
 TOP OF FILTER PACK 25.30 BORING TYPE ROTARY MUD
 WELL CASING TYPE 2.0-IN. SCHED. 40 PVC LOCATION N 6177.42 E 10883.19
 COMPLETION ALLUVIUM DATUM MSL

Depth	Well Con.	Remarks	Lithology	USCS	Visual Classification
0		2.0-IN. well installed.		ML	ALLUVIUM: SANDY SILT, nonplastic, lt. brown.
5		Assumed depth of protective steel casing at 3.0 ft.			
10		Cement/bentonite grout installed to 23.3 feet.			
15		NOTE: HOLE NO. ALSO KNOWN AS 601.		GP	SANDY GRAVEL, with cobbles, nonplastic, brown.
20					
25		Bentonite seal placed from 23.3 to 25.3 feet.			
30		Filter pack of concrete sand placed from 25.3 to 45.3 ft.			
35		Well screen placed from 30.3 to 40.3 feet.			
40		Blank sump installed from 40.3 to 45.3 feet.		CL	MANCOS SHALE FORMATION: SHALE, thinly laminated, mod. weathered, mod. hard, closely spaced fractures, grey.
45		Cave-in fill (assumed) from 45.3 to 50 feet.			
50					TD AT 50 FEET.

GROUNDWATER

DEPTH	HOUR	DATE
Σ	DRY	6-5-83
35.0		6-20-83

JOB NO. SHPO2 DATE 06/05/83 TOTAL DEPTH 35.0 feet
 SURFACE ELEVATION 4971.43 RIG TYPE BADGER 1250
 TOP OF FILTER PACK 15.00 BORING TYPE ROTARY MUD
 WELL CASING TYPE 2.0-IN. SCHED. 40 PVC LOCATION N 6574.20 E 11402.30
 COMPLETION ALLUVIUM DATUM MSL

Depth	Well Con.	Remarks	Lithology	USCS	Visual Classification
0		2.0-IN. well installed.		ML	ALLUVIUM: SANDY SILT, nonplastic, lt. brown.
5		Assumed depth of protective steel casing at 3.0 ft.		GP	SANDY GRAVEL, with cobbles, nonplastic, brown.
10		Cement/bentonite grout installed to 13 feet.			
15		Bentonite seal placed from 13 to 15 feet.			
20		Filter pack of concrete sand placed from 15 to 35 ft.			
25		Well screen placed from 20 to 30 feet.		CL	MANCOS SHALE FORMATION: SHALE, thinnly laminated, mod. weathered, mod. hard, closely spaced fractures, grey.
30		Blank sump installed from 30 to 35 feet.			
35		NOTE: HOLE NO. ALSO KNOWN AS 9017.			TD AT 35 FEET.
40					
45					
50					

GROUNDWATER		
DEPTH	HOUR	DATE
▽	DRY	6-5-83
▽	31.3	6-20-83

JOB NO. SHPO2 DATE 06/02/83 TOTAL DEPTH 50.0 feet
 SURFACE ELEVATION 4983.71 RIG TYPE BADGER 1250
 TOP OF FILTER PACK 24.40 BORING TYPE ROTARY MUD
 WELL CASING TYPE 2.0-IN. SCHED. 40 PVC LOCATION N 5500.76 E 11074.62
 COMPLETION ALLUVIUM DATUM MSL

Depth	Well Con.	Remarks	Lithology	USCS	Visual Classification
0		2.0-IN. well installed.		ML	ALLUVIUM: SANDY SILT, nonplastic, lt. brown.
5		Assumed depth of protective steel casing at 3.0 ft.			
10					
15				GP	SANDY GRAVEL, with cobbles, nonplastic, brown.
20		Cement/bentonite grout installed to 22.4 feet.			
25		Bentonite seal placed from 22.4 to 24.4 feet.			
30		Filter pack of concrete sand placed from 24.4 to 39.4 ft.			
35		Well screen placed from 29.4 to 39.4 feet.			
40		Cave-in fill from 39.4 to 50 feet.		CL	MANCOS SHALE FORMATION: SHALE, thinly laminated, very weathered, mod. soft, closely spaced fractures, grey.
45		NOTE: HOLE NO. ALSO KNOWN AS 9018.		ML CL	SILTSTONE, hard, grey. SHALE, very weathered, mod. soft, grey.
50					TD AT 50 FEET.

GROUNDWATER

DEPTH	HOUR	DATE
35.0	14:45	6-2-83
33.0	09:00	6-5-83

JOB NO. SHPO2 DATE 06/03/83 TOTAL DEPTH 42.0 feet
 SURFACE ELEVATION 4975.18 RIG TYPE BADGER 1250
 TOP OF FILTER PACK 25.90 BORING TYPE ROTARY MUD
 WELL CASING TYPE 2.0-IN.SCHED.40 PVC LOCATION N 5948.09 E 11412.31
 COMPLETION ALLUVIUM DATUM MSL

Depth	Well Con.	Remarks	Lithology	USCS	Visual Classification
0		2.0-IN. well installed.		ML	ALLUVIUM: SANDY SILT, nonplastic, lt. brown.
5		Assumed depth of protective steel casing at 3.0 ft.		GP	SANDY GRAVEL, with cobbles, nonplastic, brown.
10		NOTE: HOLE NO. ALSO KNOWN AS 603.			
15					
20		Cement/bentonite grout installed to 23.9 feet.			
25		Bentonite seal placed from 23.9 to 25.9 feet.			
30		Filter pack of concrete sand placed from 25.9 to 40.9 ft.			
35		Well screen placed from 25.9 to 35.9 feet.		CL	MANCOS SHALE FORMATION: SHALE, thinnly laminated, very weathered, mod. soft, closely spaced fractures, grey.
40		Blank sump installed from 35.9 to 40.9 feet.			Note: Siltstone layer from 40.5 to 41 feet.
45		Cave-in fill from 40.9 to 42 feet.			TD AT 42 FEET.
50					

GROUNDWATER

DEPTH	HOUR	DATE
	DRY	6-3-83
28.8		6-20-83

JOB NO. SHP02 DATE 06/03/83 TOTAL DEPTH 39.0 feet
 SURFACE ELEVATION 4972.78 RIG TYPE BADGER 1250
 TOP OF FILTER PACK 14.00 BORING TYPE ROTARY MUD
 WELL CASING TYPE 2.0-IN. SCHED. 40 PVC LOCATION N 6259.18 E 11610.84
 COMPLETION ALLUVIUM DATUM MSL

Depth	Well Con.	Remarks	Lithology	USCS	Visual Classification
0		2.0-IN. well installed.		ML	ALLUVIUM: SANDY SILT, nonplastic, lt. brown.
5		Assumed depth of protective steel casing at 3.0 ft.		GP	SANDY GRAVEL, with cobbles, nonplastic, brown.
10					
15		Cement/bentonite grout installed to 12 feet.			
20		Bentonite seal placed from 12 to 14 feet.			
25		Filter pack of concrete sand placed from 14 to 34 ft.			
30		Well screen placed from 19 to 29 feet.		CL	MANCOS SHALE FORMATION: SHALE, thinly laminated, mod. weathered, mod. soft, closely spaced fractures, grey.
35		Blank sump installed from 29 to 34 feet.			
40		Cave-in fill from 34 to 39 feet.			TD AT 39 FEET.
45					
50					

GROUNDWATER

DEPTH	HOUR	DATE
▽	DRY	6-3-83
▽	18.5	6-20-83

JOB NO. SHPO2 DATE 01/13/82

LOCATION N9199.0 E10761.0
 RIG TYPE CABLE TOOL/ROTARY
 BORING TYPE ROTARY W/SPOON SAMP 6-IN
 SURFACE ELEV. 4957.50
 DATUM MSL

Depth In Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent Dry Weight	Unified Soil Classifi- cation	REMARKS	VISUAL CLASSIFICATION
0								GP	Installed "piezometer" to 62.7 feet. No details of installation available. Standard spoon penetration and samples taken in bore hole at intervals indicated.	ALLUVIUM: SANDY GRAVEL, with cobbles, occ. boulders, dense ,damp, brown. MANCOS SHALE FORMATION: SHALE, thinly bedded, highly weathered, closely fractured, soft, grey. Note: 11-in. siltstone layer at 17 ft. Note: 90 degree fracture at 23 ft. Note: Changing to mod. weathered at 33 feet. Note: 60 degree fracture at 37.5 ft. Note: 80 degree fracture at 42 ft. Note: 60 degree fracture at 43.5 ft. Note: Changing to slightly weathered from 47 feet. Note: 45 deg. fracture with gypsum
5										
10										
15			T			111	16.0	CL		
20	64 22		S							
25										
30	100 82		S							
35										
40	97 37		S							
45										
50	100 75		S							

GROUNDWATER		
DEPTH	HOUR	DATE
34.8		2/2/82

SAMPLE TYPE
 RX - Rock Coring - NX or HX
 S - 2" O.D. 1.38" I.D. tube sample.
 U - 3" O.D. 2.42" I.D. tube sample.
 T - 3" O.D. thin-walled Shelby tube.
 G - Grab, cuttings sample

JEG TAC TEAM

PROJECT SHIPROCK SITE, NEW MEXICO; UMTRA TAILINGS AREA

LOG OF TEST BORING NO. DM-1

JOB NO. SHP02 DATE 01/13/82

LOCATION N9199.0 E10761.0
 RIG TYPE CABLE TOOL/ROTARY
 BORING TYPE ROTARY W/SPOON SAMP 6-IN
 SURFACE ELEV 4957.50
 DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
55		Diagonal hatching								filling at 51 ft. MANCOS SHALE FM , Continued. Note: Changing to moderately weathered from 54 feet.
95 50		Diagonal hatching		S						
60										TD AT 62.7 FEET

GROUNDWATER

DEPTH	HOUR	DATE
34.8		2/2/82

SAMPLE TYPE

RX - Rock Coring - NX or HX
 S - 2" O.D. 1.38" I.D. tube sample.
 U - 3" O.D. 2.42" I.D. tube sample.
 T - 3" O.D. thin-walled Shelby tube.
 G - Grab, cuttings sample

JEG TAC TEAM

JOB NO. SHP02 DATE 01/16/82

LOCATION N7890.0 E11713.0
 RIG TYPE CABLE TOOL/ROTARY
 BORING TYPE ROTARY/CORE W/SPOON 6-IN
 SURFACE ELEV. 4955.80
 DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0								GP	Installed "piezometer" to 53.7 feet. No details of installation available. Standard spoon penetration and samples taken in bore hole at intervals indicated.	FILL: SANDY GRAVEL, occ. cobbles, med. dense, dry, grey.
5								CL		MANCOS SHALE FORMATION: SHALE, thinly bedded, closely spaced fractures, soft, grey. Note: Occasional interbedded carbonates".
73			S							
10										
81			S							
15										
20										
67			S							
25										
30			S							
66			S							
66										
35										
100			S							
57										
40										
45										
97			S							
63										
50										

Note: Moderately weathered, and moderately spaced fractures from 33 feet.

GROUNDWATER

DEPTH	HOUR	DATE
23.9		3/16/82

SAMPLE TYPE

RX - Rock Coring - NX or HX
 S - 2" O.D. 1.38" I.D. tube sample.
 U - 3" O.D. 2.42" I.D. tube sample.
 T - 3" O.D. thin-walled Shelby tube.
 G - Grab, cuttings sample

JEG TAC TEAM

PROJECT SHIPROCK SITE, NEW MEXICO; UMTRA
TAILINGS AREA

LOG OF TEST BORING NO. DM-2

JOB NO. SHPO2 DATE 01/16/82

LOCATION N7890.0 E11713.0
 RIG TYPE CABLE TOOL/ROTARY
 BORING TYPE ROTARY/CORE W/SPOON 6-IN
 SURFACE ELEV. 4955.80
 DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/ft 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
		///								TD AT 53.7 FEET.

GROUNDWATER

SAMPLE TYPE

DEPTH	HOUR	DATE
23.9		3/16/82

RX - Rock Coring - NX or HX
 S - 2" O.D. 1.38" I.D. tube sample.
 U - 3" O.D. 2.42" I.D. tube sample.
 T - 3" O.D. thin-walled Shelby tube.
 G - Grab, cuttings sample

MIN

JEG TAC TEAM

JOB NO. SHP02 DATE 01/30/81 LOCATION N7607.0 E11025.0

RIG TYPE AUGER/ROTARY WASH
 BORING TYPE ROTARY/CORE W/SPOON 6-IN
 SURFACE ELEV. 4970.60
 DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0								SM	Installed piezometer to 47.6 feet. No details on installation available.	FILL: SILTY SAND, with fine gravel, dense, moist, reddish brown.
5	28		S		96	13.0				
10	11		S		95	27.0		ML SM	Drilled with auger to 18 feet, Continued with rotary wash to td.	TAILINGS: SILT, with trace clay and crystals, loose, moist, brownish grey.
15	146		S		113	6.0		SW		FILL: SILTY SAND, fine, trace gravel, trace Mancos shale fragments, loose, moist, dark brown.
20								GP	Perched water level recorded at 21.3 feet, 3-16-82.	ALLUVIUM: GRAVELLY SAND, fine to coarse, occasional cobbles, cemented, very dense, moist, light brown.
25										SANDY GRAVEL , with cobbles, dense, moist, grey.
30	44 25		S					CL	Water level recorded at 30 feet, 2-18-82.	MANCOS SHALE FORMATION: SHALE, thinly bedded, highly weathered, soft, greenish grey.
35	91 44		S							Note: 12-in layer of siltstone, fresh, mod. soft, mod. fractured, at 32 feet.
40	99 52		S							
45	100 48		S							
	100		S							
										TD AT 47.6 FEET.

GROUNDWATER		
DEPTH	HOUR	DATE
30.0		2/18/82

SAMPLE TYPE
 RX - Rock Coring - NX or HX
 S - 2" O.D. 1.38" I.D. tube sample.
 U - 3" O.D. 2.42" I.D. tube sample.
 T - 3" O.D. thin-walled Shelby tube.
 G - Grab, cuttings sample

JEG TAC TEAM

JOB NO. SHP02

DATE 02/11/82

LOCATION N7570.0 E11048.0

RIG TYPE CABLE/ROTARY/CORE

BORING TYPE ROTARY/CORE W/SPOON 6-IN

SURFACE ELEV. 4970.00

DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classifi- cation	REMARKS	VISUAL CLASSIFICATION
0								SM	Piezometer installed to 87.4 feet No details on installation available.	FILL: SILTY SAND, brown.
5										
10								ML SM	Drilled with cable tool rig to 42 feet, then continued with rotary wash.	TAILINGS: SILT, grey. FILL: SILTY SAND, brown.
15								SW		
20								GP		SANDY GRAVEL, grey.
25										
30								CL	Water level recorded at 32.4 feet on 3-23-82	MANCOS SHALE FORMATION: SHALE, thinly bedded, highly weathered, highly fractured, with thin interbedded carbonates, soft, grey.
35										
40										
45	98 57			S						Note: Becomes mod. weathered from 42 feet.
50										Note: Trace of gypsum seams from 49 feet.

GROUNDWATER		
DEPTH	HOUR	DATE
32.4		3/23/82

SAMPLE TYPE
 RX - Rock Coring - NX or HX
 S - 2" O.D. 1.38" I.D. tube sample.
 U - 3" O.D. 2.42" I.D. tube sample.
 T - 3" O.D. thin-walled Shelby tube.
 G - Grab, cuttings sample

JOB NO. SHP02 DATE 12/10/81

LOCATION N8273.0 E10519.0
 RIG TYPE AUGER/ROTARY/CORE
 BORING TYPE ROTARY/CORE W/SPOON 6-IN
 SURFACE ELEV. 4968.00
 DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0								SM	Installed piezometer to 85.3 feet. No details on installation available.	FILL: SILTY SAND, fine, trace gravel, calcareous, dense, moist, brown. Note: 3-in. layer of tailings at 8 feet.
5	43		S		92	6.0				
10	20		S					SP	Drilled with auger to 22.5 feet, continued with rotary wash to td	ALLUVIUM: SAND, fine, trace silt, medium dense, moist, lt. brown. Note: With some gravel from 15 feet.
15	9		S							
20	142		S		104	14.0		CL	Water level recorded at 32.9 ft on 3-16-82.	MANCOS SHALE FORMATION: SHALE, thinly bedded, highly weathered, highly fractured, soft, grey. Note: Becomes moderately weathered from 23 feet.
25	73		S							
35	93		S							
40										Note: With interbedded carbonates from 37 feet.
45	98		S							Note: Moderately spaced fractures at 40 feet.
50										Note: 45 degree fracture at 43 feet.

GROUNDWATER		
DEPTH	HOUR	DATE
32.9		3/16/82

SAMPLE TYPE
 RX - Rock Coring - NX or HX
 S - 2" O.D. 1.38" I.D. tube sample.
 U - 3" O.D. 2.42" I.D. tube sample.
 T - 3" O.D. thin-walled Shelby tube.
 G - Grab, cuttings sample

JEG TAC TEAM

JOB NO. SHPO2 DATE 12/10/81

LOCATION N8273.0 E10519.0
 RIG TYPE AUGER/ROTARY/CORE
 BORING TYPE ROTARY/CORE W/SPOON 6-IN
 SURFACE ELEV. 4968.00
 DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION	
100		[Hatched pattern]		S					Note: 45 degree fracture at 52 feet.		
55											
60											
103				S							Note: Becomes slightly weathered, moderately hard, from 63 feet.
86											
65											
100				S							
89											
70											
104				S							
97											
75											
100			S								
96											
80											
85										TD AT 85.3 FEET.	

GROUNDWATER

DEPTH	HOUR	DATE
32.9		3/16/82

SAMPLE TYPE

- RX - Rock Coring - NX or HX
- S - 2" O.D. 1.38" I.D. tube sample.
- U - 3" O.D. 2.42" I.D. tube sample.
- T - 3" O.D. thin-walled Shelby tube.
- G - Grab, cuttings sample

JEG TAC TEAM

PROJECT SHIPROCK SITE, NEW MEXICO; UMTRA
TAILINGS AREA

LOG OF TEST BORING NO. DM-6

JOB NO. SHP02 DATE 12/16/81

LOCATION N6620.0 E10929.0

RIG TYPE AUGER/ROTARY/CORE

BORING TYPE ROTARY/CORE W/SPOON 6-IN

SURFACE ELEV. 4973.00

DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0								SM	Installed piezometer to 92.5 feet. Details of installation not available. Drilled with auger to 26 feet, continued with rotary wash to td	ALLUVIUM: SILTY SAND, calcareous, med. dense, dry, lt. brown.
26			S							
5										
39			S							
10						98	6.0	SP SW		SAND, fine, with limonite staining, brown.
15										GRAVELLY SAND, to SANDY GRAVEL, with cobbles, dense, dry, lt. brown.
20										
25								CL		MANCOS SHALE FORMATION: SHALE, thinly bedded, highly weathered, closely spaced fractures, soft, grey. Note: vertical fracture, fresh to slightly weathered, mod. hard from 34 feet.
30										
63			S							
35						149	2.0			
40			S							
41.0									Water level recorded at 41.0 feet, 3-23-82.	
45			S							
136										
50			S							
98										

GROUNDWATER

SAMPLE TYPE

DEPTH	HOUR	DATE
41.0		3/23/82

RX - Rock Coring - NX or HX
 S - 2" O.D. 1.38" I.D. tube sample.
 U - 3" O.D. 2.42" I.D. tube sample.
 T - 3" O.D. thin-walled Shelby tube.
 G - Grab, cuttings sample

JEG TAC TEAM

PROJECT SHIPROCK SITE, NEW MEXICO; UMTRA

LOG OF TEST BORING NO. DM-6

TAILINGS AREA

JOB NO. SHPO2 DATE 12/16/81

LOCATION N6620.0 E10929.0

RIG TYPE AUGER/ROTARY/CORE

BORING TYPE ROTARY/CORE W/SPOON 6-IN

SURFACE ELEV. 4973.00

DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
55						148	4.0			MANCOS SHALE FORMATION, Continued.
60										
100				S						
65										
70										
98				S						
75										
100				S						
80										
85										
99				S						
90										
									TD AT 92.5 FEET.	

GROUNDWATER

SAMPLE TYPE

DEPTH	HOUR	DATE
41.0		3/23/82

RX - Rock Coring - NX or HX
 S - 2" O.D. 1.38" I.D. tube sample.
 U - 3" O.D. 2.42" I.D. tube sample.
 T - 3" O.D. thin-walled Shelby tube.
 G - Grab, cuttings sample

JEG TAC TEAM

JOB NO. SHP02 DATE 01/25/82

LOCATION N6844.0 E9987.0
RIG TYPE AUGER/CABLE/ROTARY
BORING TYPE ROTARY/CORE W/SPOON 6-IN
SURFACE ELEV. 4974.80
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION	
0								ML	Installed piezometer to 85.1 feet. Details of installation not available. Drilled with auger to 13 feet, continued with cable tool rig to 36 ft, then with rotary wash to TD.	ALLUVIUM: SANDY SILT, fine, calcareous, trace white carbonate crystals, loose, dry, lt. brown.	
6			S								
38			S		97	10.0	SM				
10								SW			SILTY SAND , fine to coarse, with frag. of siltstone, calcareous, trace limonite cementation, dense, moist, lt. brown.
15											GRAVELLY SAND TO SANDY GRAVEL , with cobbles, dense, dry, brown.
20											
25											
30								CL			MANCOS SHALE FORMATION: SHALE, thinly bedded, moderately weathered, closely spaced fractures, soft, grey.
35											Water level recorded at 33.9 feet, 3-07-82.
100/1"			S		149	2.0					
91			S								
51											
96/1"			S								
93			S								
27											
50										Note: Becomes widely spaced fractures, with interbedded	

GROUNDWATER		
DEPTH	HOUR	DATE
33.9		3/07/82

SAMPLE TYPE
 RX - Rock Coring - NX or HX
 S - 2" O.D. 1.38" I.D. tube sample.
 U - 3" O.D. 2.42" I.D. tube sample.
 T - 3" O.D. thin-walled Shelby tube.
 G - Grab, cuttings sample

JOB NO. SHP02 DATE 01/25/82

LOCATION N6844.0 E9987.0
 RIG TYPE AUGER/CABLE/ROTARY
 BORING TYPE ROTARY/CORE W/SPOON 6-IN
 SURFACE ELEV. 4974.80
 DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
98		[Hatched Pattern]	[Hatched Pattern]	S						carbonates from 50 feet. MANCOS SHALE FORMATION, Continued.
84										
55										
102				S						
58										
60										
95				S						
67										
70				S		149	4.0			
102										
97										
75										
98			S							
80										
97										
85									TD AT 85.1 FEET.	

GROUNDWATER		
DEPTH	HOUR	DATE
33.9		3/07/82

SAMPLE TYPE
 RX - Rock Coring - NX or HX
 S - 2" O.D. 1.38" I.D. tube sample.
 U - 3" O.D. 2.42" I.D. tube sample.
 T - 3" O.D. thin-walled Shelby tube.
 G - Grab, cuttings sample

JEG TAC TEAM

JOB NO. SHPO2

DATE 02/19/82

LOCATION N7483.0 E9395.0

RIG TYPE AUGER/CABLE/ROTARY

BORING TYPE ROTARY/CORE W/SPOON 6-IN

SURFACE ELEV. 4966.70

DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classifi- cation	REMARKS	VISUAL CLASSIFICATION
0								ML	Installed piezometer to 85.6 feet. Details of installation not available. Drilled with auger to 21 feet, continued with cable tool rig to 36 ft, then with rotary wash to TD.	ALLUVIUM: SANDY SILT, fine, calcareous, trace carbonate crystals, medium dense, moist, lt. brown. Note: Thin lens of white sylvite crystals at 3 feet. Note: Thin lens with gravel at 11 feet.
5	25		S		109	10.0				
10	19		S		101	10.0				
15	37		S		103	13.0	SW			
20	100/1"		S				GP			
25										
30							CL			
35										
40										
45	84 16		S							
50								Water level recorded at 29.0 feet, 3-16-82.	MANCOS SHALE FORMATION: SHALE, thinly bedded, with inter bedded carbonate, highly weathered, closely spaced fractures, soft, dark grey. Note: Becomes moderately weathered, mod. soft, from 45 feet.	

GROUNDWATER		
DEPTH	HOUR	DATE
29.0		3/16/82

SAMPLE TYPE
 RX - Rock Coring - NX or HX
 S - 2" O.D. 1.38" I.D. tube sample.
 U - 3" O.D. 2.42" I.D. tube sample.
 T - 3" O.D. thin-walled Shelby tube.
 G - Grab, cuttings sample

JEG TAC TEAM

PROJECT SHIPROCK SITE, NEW MEXICO; UMTRA
TAILINGS AREA

LOG OF TEST BORING NO. DM-9

JOB NO. SHP02

DATE 02/19/82

LOCATION N7415.0 E9438.0

RIG TYPE CABLE/ROTARY

BORING TYPE ROTARY/CORE W/SPOON 6-IN

SURFACE ELEV. 4966.80

DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0								ML	Installed piezometer to 47.7 feet. Details of installation not available. Drilled with cable tool rig to 34 ft, then with rotary wash to TD.	ALLUVIUM: SILT, lt. brown.
5										
10										
15								SW		
20								GP		
22								SP		
24								CL		
25										
30										Water level recorded at 29.3 feet, 3-16-82.
35	58 13			S						
40										
45	84 5			S						
47.7										Note: Becomes moderately spaced fractures.
										TD AT 47.7 FEET.

GROUNDWATER

DEPTH	HOUR	DATE
29.3		3/16/82

SAMPLE TYPE

RX - Rock Coring - NX or HX
 S - 2" O.D. 1.38" I.D. tube sample.
 U - 3" O.D. 2.42" I.D. tube sample.
 T - 3" O.D. thin-walled Shelby tube.
 G - Grab, cuttings sample

JEG TAC TEAM

JOB NO. SHPO2 DATE 01/20/82

LOCATION N9544.0 E10112.0
 RIG TYPE AUGER/CABLE/ROTARY
 BORING TYPE ROTARY/CORE W/SPOON 6-IN?
 SURFACE ELEV. 4985.00
 DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0								ML	Installed piezometer to 74.2 feet. Details of installation not available. Drilled with auger to 37 ft., continued with cable tool rig to 44 ft, then with rotary wash to TD.	FILL: SANDY SILT, fine sand, trace fine gravel, very dense, moist, brown.
5	108			S				SM		TAILINGS: SILTY SAND, medium, very dense, moist, brownish grey.
								ML		SANDY SILT, trace clay, very dense, moist, brown.
10	78			S		103	3.0	SP		SAND, fine to medium graded, very dense, occasional lenses with trace clay.
15	20			S		101	18.0	SC		CLAYEY SAND, with thin lenses fine sand, stiff, medium dense, moist, grey.
20	19			S		73	48.0	ML		SANDY SILT, with interbedded lenses silty clay, stiff, moist, lt. to dk. grey.
								CL		
25	36			S		93	16.0	ML		ALLUVIUM?: SANDY SILT, fine sand, calcareous, trace white crystalline carbonate, dense, moist, brown.
30	20			S		94	14.0			Note: Becomes less calcareous, occ. thin lenses silty clay, from 29 feet.
35	150/2"			S	150			CL		Note: Some scattered gravel near bedrock contact.
40	65/3"			S						MANCOS SHALE FORMATION: SHALE, thinly bedded, closely spaced fractures, highly weathered, soft, grey.
	200/1"			S						
	100/1.5"			S						
45	67/1"			S						Note: With interbedded carbonates from 43 feet.
						144	1.0			
						146	2.0		Water level recorded at 47.1 feet, 3-16-82.	
50	100/9"			S						

GROUNDWATER		
DEPTH	HOUR	DATE
47.1		3/16/82

SAMPLE TYPE
 RX - Rock Coring - NX or HX
 S - 2" O.D. 1.38" I.D. tube sample.
 U - 3" O.D. 2.42" I.D. tube sample.
 T - 3" O.D. thin-walled Shelby tube.
 G - Grab, cuttings sample

PROJECT SHIPROCK SITE, NEW MEXICO; UMTRA TAILINGS AREA

LOG OF TEST BORING NO. DM-10

JOB NO. SHPO2 DATE 01/20/82

LOCATION N9544.0 E10112.0
 RIG TYPE AUGER/CABLE/ROTARY
 BORING TYPE ROTARY/CORE W/SPOON 6-IN ?
 SURFACE ELEV. 4985.00
 DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
55										<p>Note: With thin gypsum seams from 53 feet MANCOS SHALE FORMATION, Continued. Note: Vertical fracture at 58 feet.</p> <p>Note: Becomes moderately weathered from 60 feet.</p> <p>Note: Becomes slightly weathered, moderately spaced fractures from 70 feet.</p> <p>TD AT 74.25 FEET.</p>
60	96 28			S						
65										
70	100/49			S		148	1.0			
						146	4.0			

GROUNDWATER

SAMPLE TYPE

DEPTH	HOUR	DATE
47.1		3/16/82

RX - Rock Coring - NX or HX
 S - 2" O.D. 1.38" I.D. tube sample.
 U - 3" O.D. 2.42" I.D. tube sample.
 T - 3" O.D. thin-walled Shelby tube.
 G - Grab, cuttings sample

JEG TAC TEAM

PROJECT SHIPROCK SITE, NEW MEXICO; UMTRA TAILINGS AREA

LOG OF TEST BORING NO. DM-10A

JOB NO. SHP02 DATE 01/25/82

LOCATION N7640.0 E10380.0
 RIG TYPE AUGER/ROTARY
 BORING TYPE ROTARY/CORE W/SPOON 6-IN ?
 SURFACE ELEV. 4985.00
 DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/fogt 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION	
0								SM		FILL: SILTY SAND, with gravel, very dense, moist, brown.	
5								SM	Installed piezometer to 40.7 feet. Details of installation not available. Drilled with auger to 33 ft., continued with rotary wash to TD.	TAILINGS: SILTY SAND, fine to medium grained, med. dense, moist, greyish brown.	
10											
15											
20										Note: Becomes dark brown from 17 feet.	
25								ML		ALLUVIUM ?: SANDY SILT, fine, medium dense, moist, brown.	
30											
35				S				GP	Water level recorded at 37.6 feet, 3-26-82.	ALLUVIUM: SANDY GRAVEL, with cobbles, some limonite cementation, dense, moist, brown.	
	131/3"			S							
	100/1"			S							
	17/1"			S							
	43/1"			S							
40				S				CL		MANCOS SHALE FORMATION: SHALE, thinnly bedded, soft, grey. TD AT 40.7 FEET.	
	51/1"			S							

GROUNDWATER		
DEPTH	HOUR	DATE
37.6		3/26/82

SAMPLE TYPE
 RX - Rock Coring - NX or HX
 S - 2" O.D. 1.38" I.D. tube sample.
 U - 3" O.D. 2.42" I.D. tube sample.
 T - 3" O.D. thin-walled Shelby tube.
 G - Grab, cuttings sample

JEG TAC TEAM

JOB NO. SHP02 DATE 03/05/82 LOCATION N7614.0 E10387.0

RIG TYPE AUGER
 BORING TYPE AUGER W/SPOON 6-IN ?
 SURFACE ELEV. 4986.00
 DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0								SM	Installed piezometer to 36.0 feet. Details of installation not available. Drilled with auger to TD	FILL: SILTY SAND, with gravel, very dense, moist, brown. TAILINGS: SILTY SAND, fine to medium, med. dense, moist, dark greyish brown.
5			GB					SM		
10			GB						No Water observed.	CLAYEY SAND, dk. grey SILTY CLAY, medium stiff, moist, dark brown.
15			GB					SC		
20			GB					CL		
25			GB					ML		ALLUVIUM: SANDY SILT, calcareous, med. dense, moist, brown.
30										
35								GP		SANDY GRAVEL, occ. cobbles, dense, moist, brown. TD AT 36 FEET.

GROUNDWATER		
DEPTH	HOUR	DATE

SAMPLE TYPE
 RX - Rock Coring - NX or HX
 S - 2" O.D. 1.38" I.D. tube sample.
 U - 3" O.D. 2.42" I.D. tube sample.
 T - 3" O.D. thin-walled Shelby tube.
 G - Grab, cuttings sample

PROJECT SHIPROCK SITE, NEW MEXICO; UMTRA TAILINGS AREA

LOG OF TEST BORING NO. DM-11

JOB NO. SHPO2 DATE 01/28/82

LOCATION N8333.0 E11120.0
 RIG TYPE AUGER/CABLE/ROTARY
 BORING TYPE ROTARY/CORE W/SPOON 6-IN ?
 SURFACE ELEV 4986.40
 DATUM MSL

Depth in Feet	Cont Inuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION	
0								SW	Installed piezometer to 71.3 feet. Details of installation not available. Drilled with auger to 36 ft., continued with cable tool rig to 47 ft, then with rotary wash to TD.	FILL: GRAVELLY SAND, loose, dry, lt. brn. TAILINGS: SAND, fine, occ. thin silty seams, loose, dry, lt. grey. Note: Becomes mrd. dense from 15 feet. Note: Occasional thin lenses silty clay from 17 ft.	
11			S		89	4.0					
13			S		94	12.0					
21			S		78	22.0					
19			S		98	34.0					
22			S		66	55.0		CL			
99			S		109	2.0		GP			
40											Perched water level recorded at 38.9 feet, 3-16-82.
45								CL			
78			S								Water level recorded at 50.0 feet, 3-26-82.
28											

GROUNDWATER		
DEPTH	HOUR	DATE
50.0		3/26/82

SAMPLE TYPE
 RX - Rock Coring - NX or HX
 S - 2" O.D. 1.38" I.D. tube sample.
 U - 3" O.D. 2.42" I.D. tube sample.
 T - 3" O.D. thin-walled Shelby tube.
 G - Grab, cuttings sample

JEG TAC TEAM

JOB NO. SHP02 DATE 01/28/82

LOCATION N8333.0 E11120.0
 RIG TYPE AUGER/CABLE/ROTARY
 BORING TYPE ROTARY/CORE W/SPOON 6-IN ?
 SURFACE ELEV. 4986.40
 DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classifi- cation	REMARKS	VISUAL CLASSIFICATION
55	100 46	[Diagonal Hatching]	[Hatching]	S					<p>MANCOS SHALE FM, Continued. Note: becomes wide spaced fractures from 55 feet.</p> <p>Note: Vertical fracture at 59 feet.</p> <p>Note: closely spaced fractures at 65 feet. Note: Widely spaced fractures at 67 feet.</p> <p>TD AT 71.3 FEET.</p>	
60	103 70		[Hatching]	S						
65	100 75		[Hatching]	S						
	83 83		[Hatching]	S						
70	105 95		[Hatching]	S						

GROUNDWATER

SAMPLE TYPE

DEPTH	HOUR	DATE
50.0		3/26/82

RX - Rock Coring - NX or HX
 S - 2" O.D. 1.38" I.D. tube sample.
 U - 3" O.D. 2.42" I.D. tube sample.
 T - 3" O.D. thin-walled Shelby tube.
 G - Grab, cuttings sample

JEG TAC TEAM

JOB NO. SHP02 DATE 02/23/82

LOCATION N5666.0 E9657.0

RIG TYPE AUGER/ROTARY
 BORING TYPE ROTARY/CORE W/SPOON 6-IN ?
 SURFACE ELEV. 4998.00
 DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classifi- cation	REMARKS	VISUAL CLASSIFICATION	
0								ML		ALLUVIUM: CLAYEY SILT, calcareous, medium dense, dry, lt. brown.	
5			GB						Drilled with auger to TD		
10			GB								
15			GB								
20			GB								No Water observed.
25			GB								
30			GB								
35			GB								
40								SM		SILTY SAND, with gravel, med. dense, dry, brown.	
42.5	125/2.5		S					GM		SILTY GRAVEL, with sand, occ. cobbles, dense, dry, brown.	
46										TD AT 46 FEET.	

GROUNDWATER		
DEPTH	HOUR	DATE

SAMPLE TYPE
 RX - Rock Coring - NX or HX
 S - 2" O.D. 1.38" I.D. tube sample.
 U - 3" O.D. 2.42" I.D. tube sample.
 T - 3" O.D. thin-walled Shelby tube.
 G - Grab, cuttings sample

JOB NO. SHPO2 DATE 03/13/82

LOCATION N6050.0 E9750.0

RIG TYPE AUGER/CABLE/ROTARY

BORING TYPE ROTARY/CORE W/SPOON 6-IN ?

SURFACE ELEV. 4989.20

DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION		
0								CL	Installed piezometer to 85 feet. No details available on const.	ALLUVIUM: SILTY CLAY, calcareous, hard, dry, lt. brown.		
5				GB				ML		Drilled with auger to 32 ft. continued drilling with cable tool rig to 47 feet, then completed with rotary wash to TD.	CLAYEY SILT, calcareous, med. dense, dry, lt. brown.	
10				GB					Note: Becomes sandy from 23 feet.			
15				GB								
20				GB								
25				GB								
30				GB				GM		SILTY GRAVEL, with sand, dense, dry, brown.		
35												
40												
45								CL	Water level recorded at 47.3 feet, 3-26-82.	MANCOS SHALE FORMATION: SHALE, thinly bedded, with thin seams of carbonates, highly weathered, closely spaced fractures, soft, dark grey.		
50										Note: Becomes moderately		

GROUNDWATER

DEPTH	HOUR	DATE
47.3		3/26/82


SAMPLE TYPE

- RX - Rock Coring - NX or HX
- S - 2" O.D. 1.38" I.D. tube sample.
- U - 3" O.D. 2.42" I.D. tube sample.
- T - 3" O.D. thin-walled Shelby tube.
- G - Grab, cuttings sample

JEG TAC TEAM

JOB NO. SHP02 DATE 03/13/82 LOCATION N6050.0 E9750.0

RIG TYPE AUGER/CABLE/ROTARY
 BORING TYPE ROTARY/CORE W/SPOON 6-IN ?
 SURFACE ELEV. 4989.20
 DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classifi- cation	REMARKS	VISUAL CLASSIFICATION
55										weathered, moderately soft, from 51 feet. MANCOS SHALE FM., Continued.
56										
57										
58										
59										
60										
61										
62										
63										
64										
65										
66										
67										
68										
69										
70										
71										
72										
73										
74										
75										
76										
77										
78										
79										
80										
81										
82										
83										
84										
85										Note: Becomes slightly weathered, mod. hard, widely spaced fractures, from 82 feet. TD AT 85 FEET.

GROUNDWATER		
DEPTH	HOUR	DATE
47.3		3/26/82

SAMPLE TYPE
 RX - Rock Coring - NX or HX
 S - 2" O.D. 1.38" I.D. tube sample.
 U - 3" O.D. 2.42" I.D. tube sample.
 T - 3" O.D. thin-walled Shelby tube.
 G - Grab, cuttings sample

JEG TAC TEAM

JACOBS ENGINEERING GROUP, INC., ALBUQUERQUE OPERATIONS

TO: MNelson
FROM: JFritts *JFritts*
DATE: November 6, 1987
SUBJECT: Shiprock Well Locations North of San Juan River

Three additional locations north of the San Juan River have previously been sampled by the TAC. The following information is available on these locations.

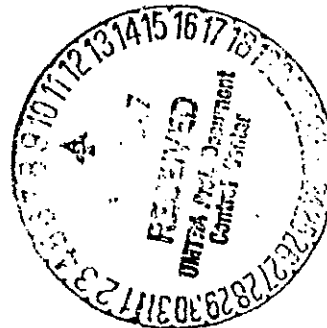
Location	Diameter	Total Depth	Sample Date
SHP01 - 634	N/K	24'	9/17/86
- 635	54'	11.6'	9/18/86
- 636	San Juan River		9/19/86

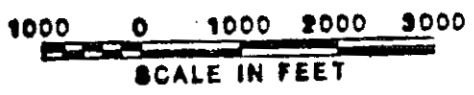
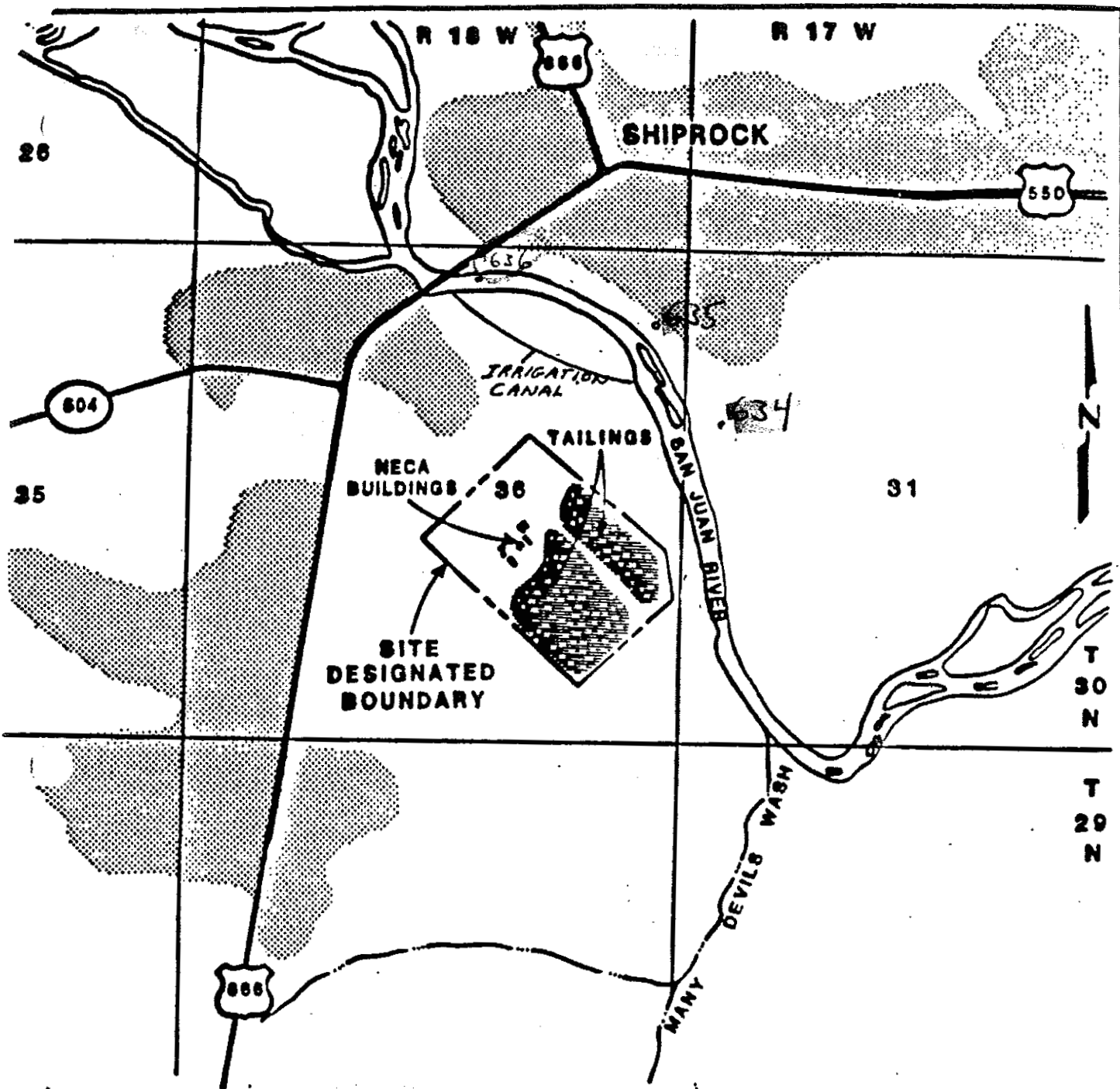
These approximate locations are plotted on the attached map as well as on maps contained in the Groundwater Sampling Records (see attached).

Water Quality Data for SHP01-634, 635 and 636 are also attached.

JF/11
Attachments

cc: PLongmire





- LEGEND**
- PRIMARY RESIDENTIAL AREA
 - MONITOR WELL

FIGURE 1
SHIPROCK SITE LOCATION MAP For
 Shp pt-634, 635 and 636

11/6/97

GROUND WATER SAMPLING RECORD

SITE ID: SHP 01 FINAL FIELD VALUES: SURFACE DOWN-HOLE

LOCATION ID: 634

SAMPLE ID: * 01 pH (S.U.): 7.02 N/A

STATIC WATER LEVEL (FT) ^{can't be taken} ≅ 24' Ec (umhos/cm) 900 /

SAMPLE DEPTH (FT) ≅ 24' Eh (millivolts) N/A /

SAMPLING DATE 8/6/17 TEMP. (°C): 18°

SAMPLING TIME: ALKALINITY (mg/l CaCO₃): 372 of 4.50

START 4:00 pm. LOCATION DESCRIPTION Hand pump well - up gradient

COMPLETE 6:00 pm. see pg 3.

CONTAINER SIZE ONE-LITER NONACIDIFIED (no.) ACIDIFIED (no.) VOL. ACID (ml)

NUMBER OF CONTAINERS COLLECTED: 150 ml _____

50 ml see attachment F.

SPECIFY OTHERS: _____

COMMENTS: titrate 1.6 N lot # 4133

Also collected SPLTS SHP 01 - 103' 641, 642, 643, 644.

1 filters used. (Gelman)

FIELD REP (S): D. Muller

DATE	TIME	TOTAL VOLUME WITHDRAWN		pH	Ec (umhos/cm)	TEMP. (°C)	COMMENTS
		(Gals)	(Bore Volumes)				
<u>8/6/17</u>	<u>4:35</u>	<u>0.0</u>	<u>0.0</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>START PUMPING</u>
	<u>4:40</u>	<u>2.0</u>	<u>-</u>	<u>6.86</u>	<u>900</u>	<u>18°</u>	
	<u>4:45</u>	<u>4.0</u>	<u>-</u>	<u>6.86</u>	<u>900</u>	<u>18°</u>	
	<u>4:50</u>	<u>6.0</u>		<u>7.01</u>	<u>900</u>	<u>18°</u>	
	<u>4:55</u>	<u>8.0</u>		<u>7.02</u>	<u>900</u>	<u>18°</u>	
	<u>5:00</u>	<u>10.0</u>		<u>7.02</u>	<u>900</u>	<u>18°</u>	

WATER QUALITY SAMPLING RECORD

BORE VOL CALCULATION

$$\left(\frac{d}{2}\right)^2 \pi (h_1 - h_2)$$

SHP 01 -
634

SAMPLING INFORMATION

DEPTH TO WATER (h_2) (FT.) can't be taken.

DEPTH OF WELL (h_1) (FT.) 241

WELL DIA (FT.) N/K

BORE VOL. (FT.)³ N/K

DEPTH TO SCREEN (FT.) Not known.

WITHDRAWAL METHOD hand pump well

SAMPLING METHOD filtered.

FILTER SIZE 0.45 μ

THERMOMETER ID PT

EC METER ID ~~1230~~ 12308

PH METER ID 350347

PUMP ID hand pump well.

CALIBRATION INFORMATION

DATE/TIME OF LAST EC CALIBRATION 8/6/13

TIME OF PH CALIBRATION 5:05

PH AFTER MEASUREMENT 7.02 FOR STANDARD PH 7.00

PH AFTER MEASUREMENT 10.01 FOR STANDARD SOLUTION PH 10.00

EH OF CALIBRATING SOLUTION N/A

EH READING IN CALIBRATING SOLN. AFTER MEASUREMENT N/A

TEMP. OF CALIBRATION SOLN. (°C) N/A

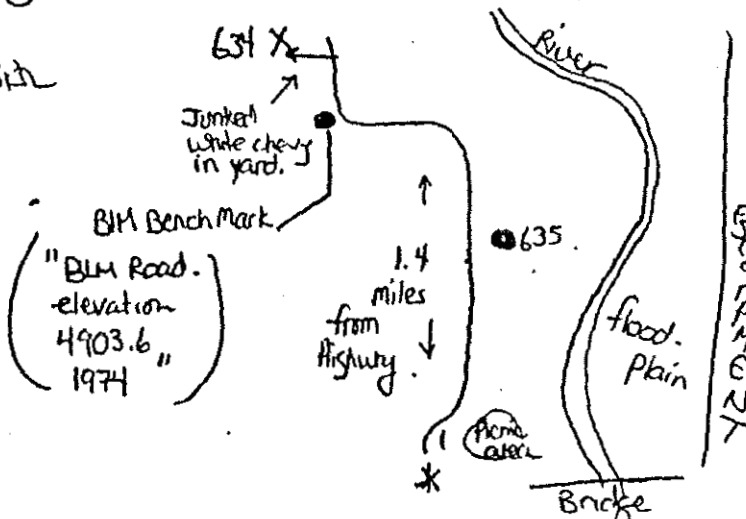
SHIPPING INFORMATION

LAB(S) SHIPPED TO: E.D.A

DATE(S) SHIPPED: 8/6/13

METHOD OF SHIPMENT: Trailways

NOTES: This was agreed upon with Masayd T. Director Navajo water resources to be a good. Upgradient Background Sample.





ALKALINITY TITRATION GRAPH

SITE ID: SHP 01

LOCATION ID: 634

DATE: 86/9/17

ERROR AT 4.50: $\left| \frac{X1 - X2}{XS} \right| \times 100 = \underline{\quad\quad} \%$

1st = 0.23 %

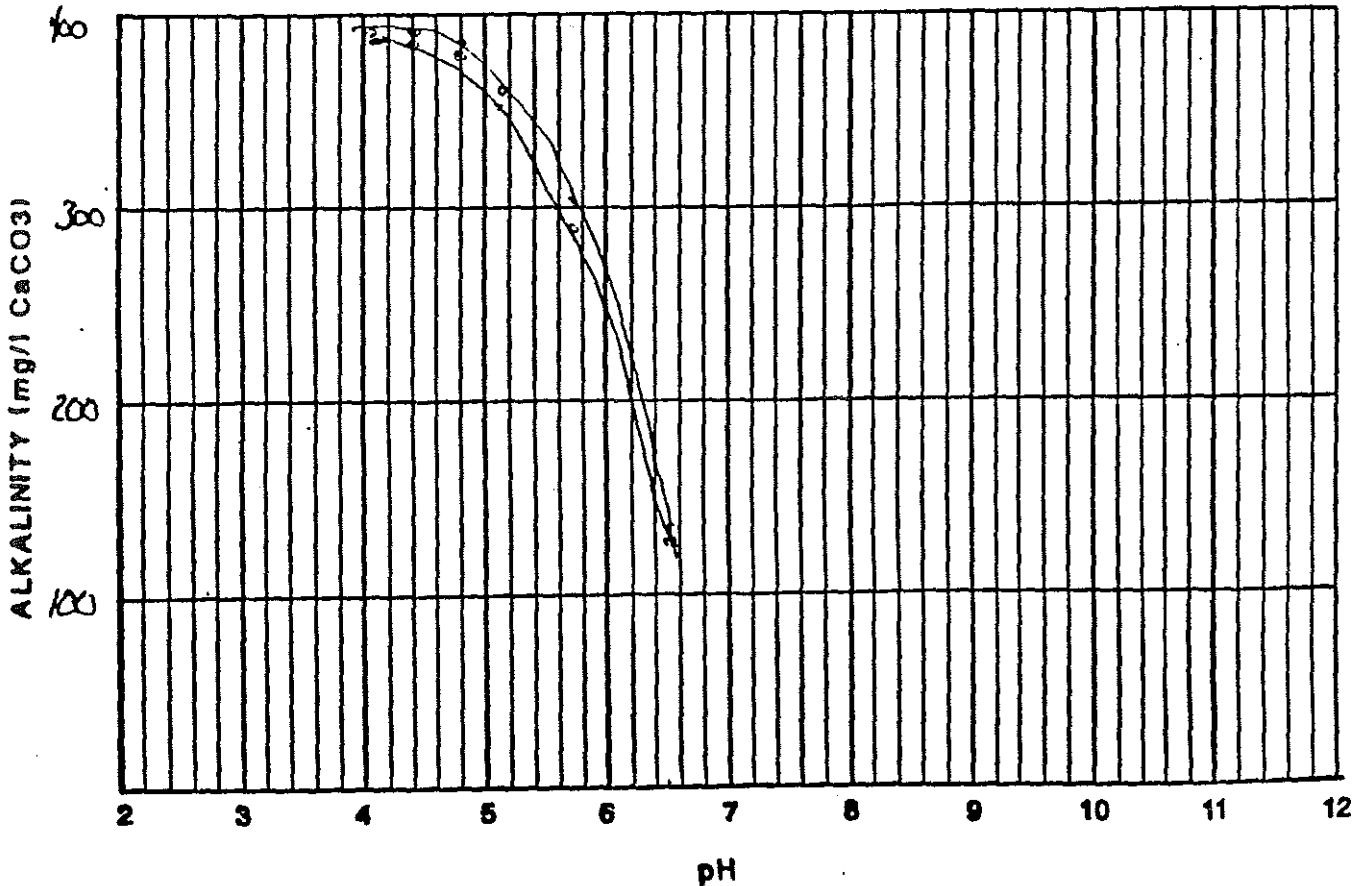
2nd = %

pH CHECK AFTER TITRATION

7.00 = 7.02

4.00 = 4.03

pH	ALKALINITY (mg/l CaCO3)		
	1st	2nd	3rd
8.90	—	—	
8.60	—	—	
8.30	—	—	
8.05	—	—	
7.80	—	—	
7.50	—	—	
6.50	122	125	
5.70	296	301	
5.10	356	358	
4.80	370	373	
4.50	372	373	
4.25	373	376	
4.00	374	378	





ATTACHMENT F

CONTRACT NO. ASD-34-6703-S-85-0026

ACKNOWLEDGEMENT OF RECEIPT OF SAMPLES FOR DELIVERY ORDER NO. A040

SITE ID: SHP 01 LOCATION ID: 634 SAMPLE ID: 01

SAMPLE SHIPMENT LIST

Lot # 1

Bottle ID	Amount	Rec'd	Bottle ID	Amount	Rec'd
A1	<u>20</u>	()	Th 230	<u>10</u>	()
A1-A	<u> </u>	()	G 1B	<u> </u>	()
M1	<u> </u>	()	N1	<u>10</u>	()
M1-A	<u> </u>	()	N2	<u> </u>	()
M2	<u>10</u>	()	CN	<u>10</u>	()
M2-A	<u> </u>	()	S	<u>10</u>	()
Pb 210	<u>10</u>	()	TOC	<u>500 ml.</u>	()
Po 210	<u>10</u>	()	TOX	<u> </u>	()
Ra 226	<u>20</u>	()	SiO2	<u> </u>	()
Ra 228	<u>20</u>	()	Alkalinity	<u>100 ml.</u>	()

DATE SHIPPED: 86/9/ METHOD OF SHIPMENT: Trailer

COMMENTS: _____

I hereby acknowledge receipt of the following on _____ (date)

() Delivery Order No. A0 _____ (Work Order Plan) dated _____.

Subcontractor: _____
 Name: _____
 Title: _____
 Date: _____

Partial Analysis Due: _____ Complete Analysis Due: _____

COMMENTS: _____

Delivery of Analysis in accordance with Exhibits B and C of the Subcontract is due no later than: Preliminary to JEG by: _____ Date
 Complete to JEG by: _____ Date

GROUND WATER SAMPLING RECORD

SITE ID: SHPΦ1
 LOCATION ID: 635
 SAMPLE ID: * Φ1
 STATIC WATER LEVEL (FT) 7.22
 SAMPLE DEPTH (FT) 11.0 (Boater)
 SAMPLING DATE 8/6/18
 SAMPLING TIME:
 START 3:00 pm 2:00 pm
 COMPLETE 3:20 pm

FINAL FIELD VALUES:

	SURFACE	DOWN-HOLE
pH (S.U.):	<u>7.10</u>	<u>N/A</u>
Ec (umhos/cm)	<u>2250</u>	<u> </u>
Eh (millivolts)	<u>N/A</u>	<u> </u>
TEMP. (°C):	<u>19°</u>	<u> </u>
ALKALINITY (mg/l CaCO ₃):	<u>382 at</u>	<u>4.50</u>

LOCATION DESCRIPTION mid tailings floodplain across River (see pg 3)

	CONTAINER SIZE	NONACIDIFIED (no.)	ACIDIFIED (no.)	VOL. ACID (ml)
NUMBER OF CONTAINERS COLLECTED:	ONE-LITER			
	150 ml			
	50 ml		<u>See attachment F</u>	
SPECIFY OTHERS:				

COMMENTS: titrate 1.6 Nbt # 4133
casing is 2.80' above ground surface.
1 filters used. (Gelman)

FIELD REP (S): D Miller

DATE	TIME	TOTAL VOLUME WITHDRAWN		pH	Ec (umhos/cm)	TEMP. (°C)	COMMENTS
		(Gals)	(Bore Volumes)				
<u>8/6/18</u>	<u>1:53</u>	<u>0.0</u>	<u>0.0</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>START PUMPING</u>
		<u>2.0</u>	<u>.26</u>	<u>7.20</u>	<u>2300</u>	<u>20°</u>	
	<u>1:57</u>	<u>4.0</u>	<u>.52</u>	<u>7.20</u>	<u>2300</u>	<u>20°</u>	
	<u>2:01</u>	<u>6.0</u>	<u>.78</u>	<u>7.17</u>	<u>2200</u>	<u>20°</u>	
	<u>2:07</u>	<u>8.0</u>	<u>1.04</u>	<u>7.12</u>	<u>2200</u>	<u>19°</u>	
	<u>2:12</u>	<u>10.0</u>	<u>1.30</u>	<u>7.12</u>	<u>2200</u>	<u>19°</u>	
	<u>2:15</u>	<u>12.0</u>	<u>1.56</u>	<u>7.14</u>	<u>2250</u>	<u>19°</u>	
	<u>2:18</u>	<u>14.0</u>	<u>1.82</u>	<u>7.12</u>	<u>2250</u>	<u>19°</u>	
	<u>2:21</u>	<u>16.0</u>	<u>2.08</u>	<u>7.13</u>	<u>2250</u>	<u>19°</u>	
	<u>2:24</u>	<u>18.0</u>	<u>2.34</u>	<u>7.10</u>	<u>2250</u>	<u>19°</u>	
	<u>2:27</u>	<u>20.0</u>	<u>2.60</u>	<u>7.10</u>	<u>2250</u>	<u>19°</u>	
	<u>2:30</u>	<u>22.0</u>	<u>2.86</u>	<u>7.10</u>	<u>2250</u>	<u>19°</u>	



ALKALINITY TITRATION GRAPH

SITE ID: SHP 01

LOCATION ID: 635

DATE: 8/6/85

ERROR AT 4.50: $\left| \frac{X1 - X2}{XS} \right| \times 100 = \underline{\hspace{2cm}} \%$

1st = 1.0 %

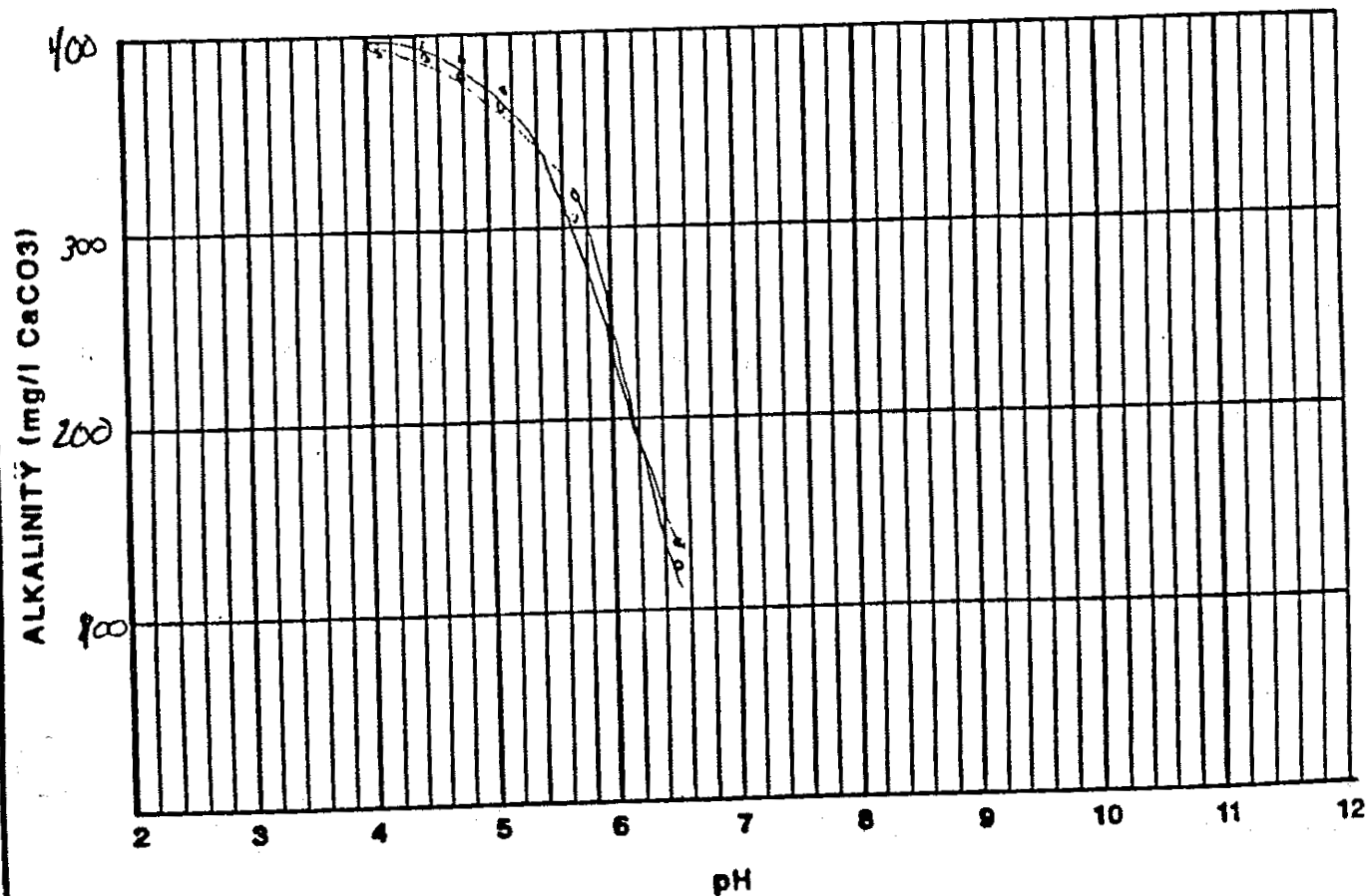
2nd = %

PH CHECK AFTER TITRATION

7.00 = 7.02

4.00 = 4.04

pH	ALKALINITY (mg/l CaCO3)		
	1st	2nd	3rd
8.90	—	—	
8.60	—	—	
8.30	—	—	
8.05	—	—	
7.80	—	—	
7.50	—	—	
6.50	128	132	
5.70	308	315	
5.10	366	370	
4.80	377	380	
4.50	382	382	
4.25	383	388	
4.00	384	389	





ATTACHMENT F

CONTRACT NO. ASD-34-6703-S-85-0026

ACKNOWLEDGEMENT OF RECEIPT OF SAMPLES FOR DELIVERY ORDER NO. AO 40

SITE ID: SHP d1 LOCATION ID: 635 SAMPLE ID: 41

SAMPLE SHIPMENT LIST

Lot # 4

Bottle ID	Amount	Rec'd	Bottle ID	Amount	Rec'd
A1	<u>20</u>	()	Th 230	<u>10</u>	()
A1-A	_____	()	G 1B	_____	()
M1	_____	()	H1	<u>10</u>	()
M1-A	_____	()	N2	_____	()
M2	<u>10</u>	()	CN	<u>10</u>	()
M2-A	_____	()	S	<u>10</u>	()
Pb 210	<u>10</u>	()	TOC	<u>500 ml.</u>	()
Po 210	<u>10</u>	()	TOX	_____	()
Ra 226	<u>20</u>	()	SiO2	_____	()
Ra 228	<u>20</u>	()	Alkalinity	<u>100 ml.</u>	()

DATE SHIPPED: 8/9/19 METHOD OF SHIPMENT: Trailer

COMMENTS: _____

I hereby acknowledge receipt of the following on _____ (date)

() Delivery Order No. AO _____ (Work Order Plan) dated _____.

Subcontractor: _____
Name: _____
Title: _____
Date: _____

Partial Analysis Due: _____ Complete Analysis Due: _____

COMMENTS: _____

Delivery of Analysis in accordance with Exhibits B and C of the Subcontract is due no later than: Preliminary to JEG by: _____

Date

Complete to JEG by: _____

Date

GROUND WATER SAMPLING RECORD

SITE ID: SHP #1 FINAL FIELD VALUES: SURFACE DOWN-HOLE

LOCATION ID: 636

SAMPLE ID: * # pH (S.U.): 7.96 N/A

STATIC WATER LEVEL (FT) Surface Ec (umhos/cm) 330 |

SAMPLE DEPTH (FT) N/A Eh (millivolts) N/A |

SAMPLING DATE 8/19/19 TEMP. (°C): 19° |

SAMPLING TIME: ALKALINITY (mg/l CaCO₃): 82 at 4.50

START 4:00 pm LOCATION DESCRIPTION San Juan River, 50 yds South of Bridge

COMPLETE 5:30 pm. on east side

	CONTAINER SIZE	NONACIDIFIED (no.)	ACIDIFIED (no.)	VOL. ACID (ml)
NUMBER OF CONTAINERS COLLECTED:	ONE-LITER	_____	_____	_____
	150 ml	_____	_____	_____
	50 ml	<u>See attachment F.</u>		
SPECIFY OTHERS:	_____	_____	_____	_____
COMMENTS:	<u>1.6 Nbt # 5280</u>			
	<u>filters used.</u>			
FIELD REP (S):	<u>D. Miller</u>			

DATE	TIME	TOTAL VOLUME WITHDRAWN		pH	Ec (umhos/cm)	TEMP. (°C)	COMMENTS
		(Gals)	(Bore Volumes)				
<u>8/19/19</u>	<u>3:50</u>	<u>0.0</u>	<u>0.0</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>START PUMPING</u>
	<u>3:55</u>	<u>2.0</u>	<u>-</u>	<u>7.96</u>			
	<u>4:00</u>	<u>4.0</u>	<u>-</u>	<u>7.96</u>			

WATER QUALITY SAMPLING RECORD

BORE VOL CALCULATION

$$\left(\frac{d}{2}\right)^2 \pi (h_1 - h_2)$$

SHP #1-
636

SAMPLING INFORMATION

DEPTH TO WATER (h_2) (FT.) Surface WITHDRAWAL METHOD Peristaltic
 DEPTH OF WELL (h_1) (FT.) N/A SAMPLING METHOD Filtered
 WELL DIA (FT.) ≈ 10' FILTER SIZE .45 μ
 BORE VOL. (FT.)³ N/A THERMOMETER ID YST
 DEPTH TO SCREEN (FT.) _____ EC METER ID 12308
 The well has intakes directly into the San Juan River. PH METER ID 350347
 PUMP ID GP-0467

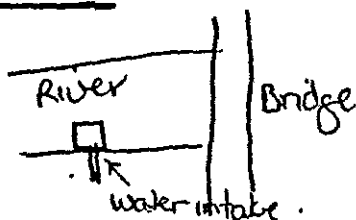
CALIBRATION INFORMATION

DATE/TIME OF LAST EC CALIBRATION 86/8/13.
 TIME OF pH CALIBRATION 4:01
 pH AFTER MEASUREMENT 7.00 FOR STANDARD pH 7.00
 pH AFTER MEASUREMENT 10.00 FOR STANDARD SOLUTION pH 10.00
 Eh OF CALIBRATING SOLUTION N/A
 Eh READING IN CALIBRATING SOLN. AFTER MEASUREMENT N/A
 TEMP. OF CALIBRATION SOLN. (°C) N/A

SHIPPING INFORMATION

LAB(S) SHIPPED TO: E.D.A _____
 DATE(S) SHIPPED: 86/9/20 _____
 METHOD OF SHIPMENT: Trailer _____

NOTES:



This is a wet well dug into the San Juan River. I am told that it has not been used for the Shiprock water supply ~~yet~~ because they are having trouble getting pressure to pump the H₂O up to the treatment plant. But it will be used in the near future. (P.M.P.)
 The well is ≈ 10' in dia. But the person who let me in ~~didn't have~~ was in a hurry so I couldn't get a ~~to~~ depth on it. He did tell me tho that it had been pumped 3 days ago so it did not contain ~~stagnant~~ ~~aged~~ water. D.M.

ALKALINITY TITRATION GRAPH

SITE ID: SHP#1

LOCATION ID: 636

DATE: 8/6/19

ERROR AT 4.50: $\left| \frac{X1 - X2}{XS} \right| \times 100 = \underline{\quad\quad} \%$

1st = 1.2 %

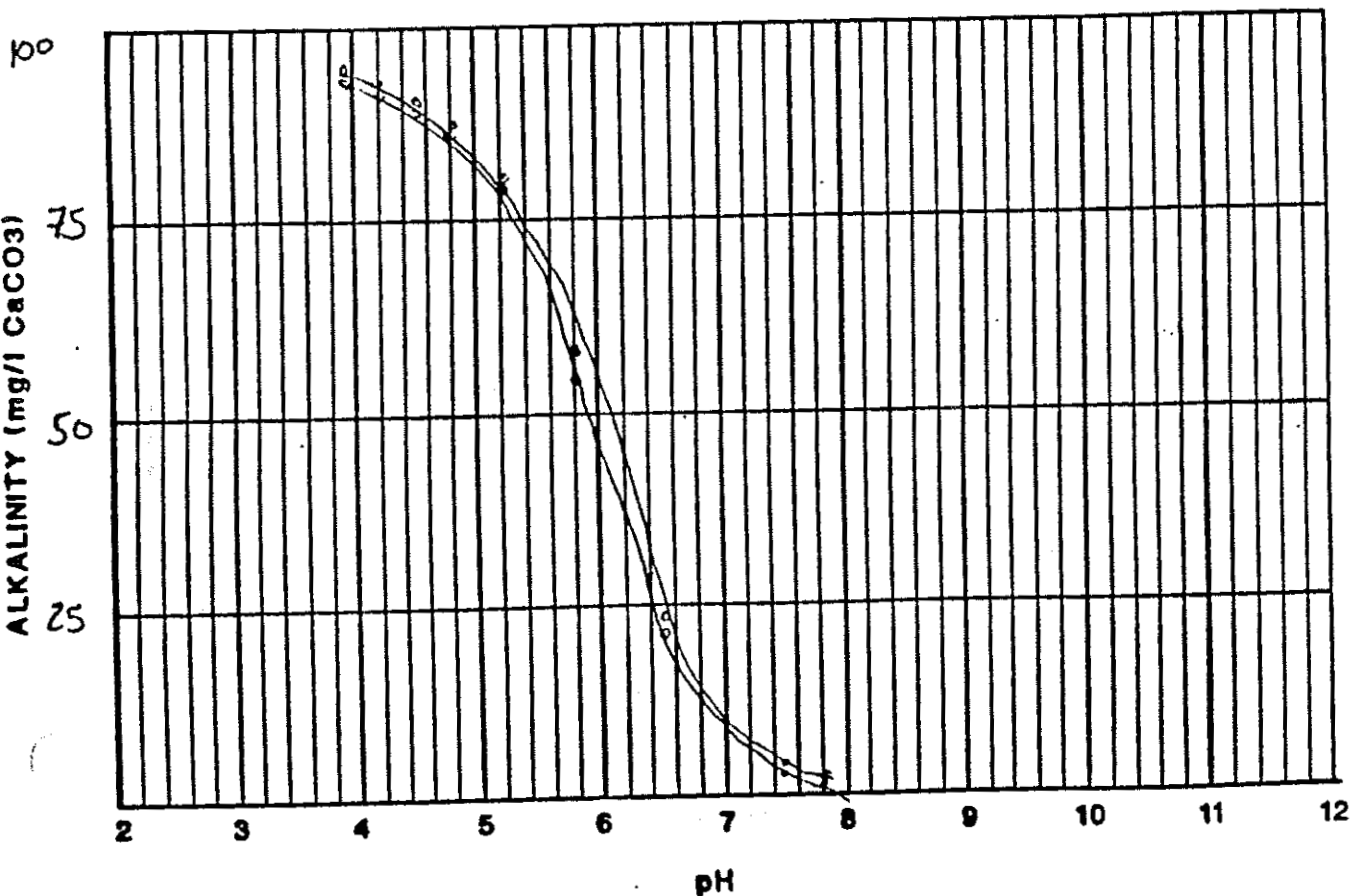
2nd = %

pH CHECK AFTER TITRATION

7.00 = 7.02

4.00 = 4.01

pH	ALKALINITY (mg/l CaCO3)		
	1st	2nd	3rd
8.90	-	-	
8.60	-	-	
8.30	-	-	
8.05	-	-	
7.80	1	1	
7.50	2	2	
6.50	20	22	
5.70	60	58	
5.10	79	76	
4.80	80	81	
4.50	82	83	
4.25	83	84	
4.00	84	85	





ATTACHMENT F

CONTRACT NO. ASD-34-6703-S-~~ES~~-0016

ACKNOWLEDGEMENT OF RECEIPT OF SAMPLES FOR DELIVERY ORDER NO. AO40

SITE ID: SHP #1 LOCATION ID: 636 SAMPLE ID: #1

SAMPLE SHIPMENT LIST

Lot # 1

Bottle ID	Amount	Rec'd	Bottle ID	Amount	Rec'd
A1	<u>20</u>	()	Th 230	<u>10</u>	()
A1-A	_____	()	G 1B	_____	()
M1	_____	()	N1	<u>10</u>	()
M1-A	_____	()	N2	_____	()
M2	<u>10</u>	()	CN	<u>10</u>	()
M2-A	_____	()	S	<u>10</u>	()
Pb 210	<u>10</u>	()	TOC	<u>500 ml.</u>	()
Po 210	<u>10</u>	()	TOX	_____	()
Ra 226	<u>20</u>	()	S102	_____	()
Ra 228	<u>20</u>	()	Alkalinity	<u>100 ml.</u>	()

DATE SHIPPED: 86/9/20 METHOD OF SHIPMENT: Trailways

COMMENTS: _____

I hereby acknowledge receipt of the following on _____ (date)

() Delivery Order No. AO___ (Work Order Plan) dated _____.

Subcontractor:
Name: _____
Title: _____
Date: _____

Partial Analysis Due: _____ Complete Analysis Due: _____

COMMENTS: _____

Delivery of Analysis in accordance with Exhibits B and C of the Subcontract is due no later than: Preliminary to JEG by: _____

Date

Complete to JEG by: _____

Date

DATE
WATER QUALITY DATA (USD)

E4540

*SITE *CODE	LOC ID	LOG DATE	SA ID	PAR U LAB COD I	PAR VALUE	VALUE UNCERTAINTY	DETECTION LIMIT
SHP01	634	860919	01	EDA AG	<	0.04	0.04
SHP01	634	860919	01	EDA AL	<	0.2	0.1
SHP01	634	860919	01	EDA ALK		372.0	
SHP01	634	860919	01	EDA AS	<	0.04	0.04
SHP01	634	860919	01	EDA B	<	0.1	0.1
SHP01	634	860919	01	EDA BA	<	0.1	0.1
SHP01	634	860919	01	EDA CA		100.0	0.04
SHP01	634	860919	01	EDA CD	<	0.004	0.004
SHP01	634	860919	01	EDA CL		10.0	1.0
SHP01	634	860919	01	EDA CN	<	0.04	0.04
SHP01	634	860919	01	EDA CO	<	0.05	0.05
SHP01	634	860919	01	EDA CR	<	0.05	0.04
SHP01	634	860919	01	EDA CU	<	0.02	0.02
SHP01	634	860919	01	EDA EC		900.0	
SHP01	634	860919	01	EDA F	<	0.04	0.1
SHP01	634	860919	01	EDA FE		0.07	0.03
SHP01	634	860919	01	EDA HG	<	0.0002	0.0002
SHP01	634	860919	01	EDA K		3.25	0.04
SHP01	634	860919	01	EDA M		37.0	0.004
SHP01	634	860919	01	EDA MD		0.02	0.04
SHP01	634	860919	01	EDA MD		0.09	0.04
SHP01	634	860919	01	EDA MA		66.0	0.002
SHP01	634	860919	01	EDA NH4	<	0.1	0.1
SHP01	634	860919	01	EDA NI	<	0.04	0.04
SHP01	634	860919	01	EDA NO2	<	0.1	0.1
SHP01	634	860919	01	EDA NO3		5.0	1.0
SHP01	634	860919	01	EDA PB		0.04	0.04
SHP01	634	860919	01	EDA P80		0.1	1.5
SHP01	634	860919	01	EDA PH		7.02	
SHP01	634	860919	01	EDA P00		0.0	0.6
SHP01	634	860919	01	EDA P04	<	0.1	1.0
SHP01	634	860919	01	EDA R6L		0.4	0.1
SHP01	634	860919	01	EDA RAB		0.2	0.8
SHP01	634	860919	01	EDA S	<	0.1	0.1
SHP01	634	860919	01	EDA SB	<	0.003	0.003
SHP01	634	860919	01	EDA SE	<	0.005	0.005
SHP01	634	860919	01	EDA SI		13	2.0
SHP01	634	860919	01	EDA SN	<	0.005	0.005
SHP01	634	860919	01	EDA SO4		256.0	0.1
SHP01	634	860919	01	EDA ST		4.6	0.1
SHP01	634	860919	01	EDA TOL		0.7	1.0
SHP01	634	860919	01	EDA TDS		799.0	10.0
SHP01	634	860919	01	EDA TMP		48.0	
SHP01	634	860919	01	EDA TCC		103.	1.0
SHP01	634	860919	01	EDA U		0.0400	0.003
SHP01	634	860919	01	EDA V		0.23	0.04
SHP01	634	860919	01	EDA ZN		0.150	0.005
SHP01	634	860919	02	EDA AG	<	0.04	0.04
SHP01	634	860919	02	EDA AL		0.2	0.1
SHP01	634	860919	02	EDA ALK		372.0	

low Fe, Mg, Mn
SO4

WATER QUALITY DATA (WQD)

E4540

*SITE *CODE	LGC ID	LOG DATE	SA ID	PAR LAB	U COO	I	PAR VALUE	VALUE UNCERTAINTY	DETECTION LIMIT
SHP01	634	860949	02	EDA	AS	<	0.04		0.04
SHP01	634	860949	02	EDA	B	<	0.1		0.1
SHP01	634	860949	02	EDA	BA	<	0.1		0.1
SHP01	634	860949	02	EDA	CA		130.0		0.04
SHP01	634	860949	02	EDA	CD	<	0.004		0.004
SHP01	634	860949	02	EDA	CL		10.0		1.0
SHP01	634	860949	02	EDA	CN	<	0.04		0.04
SHP01	634	860949	02	EDA	CO	<	0.05		0.05
SHP01	634	860949	02	EDA	CP		0.004		0.04
SHP01	634	860949	02	EDA	CU	<	0.02		0.02
SHP01	634	860949	02	EDA	EC		900.0		
SHP01	634	860949	02	EDA	F		0.7		0.1
SHP01	634	860949	02	EDA	FE		0.07		0.03
SHP01	634	860949	02	EDA	HG	<	0.0002		0.0002
SHP01	634	860949	02	EDA	K		3.25		0.04
SHP01	634	860949	02	EDA	MG		34.0		0.004
SHP01	634	860949	02	EDA	MN		0.02		0.04
SHP01	634	860949	02	EDA	MO		0.09		0.04
SHP01	634	860949	02	EDA	NA		66.0		0.002
SHP01	634	860949	02	EDA	NH4	<	0.1		0.1
SHP01	634	860949	02	EDA	NI	<	0.04		0.04
SHP01	634	860949	02	EDA	NO2	<	0.1		0.1
SHP01	634	860949	02	EDA	NO3		5.0		1.0
SHP01	634	860949	02	EDA	PB		0.04		0.04
SHP01	634	860949	02	EDA	PB0		0.7	1.0	1.5
SHP01	634	860949	02	EDA	PH		7.02		
SHP01	634	860949	02	EDA	PO0		0.0	0.6	1.0
SHP01	634	860949	02	EDA	PO4	<	0.1		0.1
SHP01	634	860949	02	EDA	R6L		0.2	0.3	1.0
SHP01	634	860949	02	EDA	RAB		0.0	1.0	1.0
SHP01	634	860949	02	EDA	S	<	0.1		0.1
SHP01	634	860949	02	EDA	S8	<	0.003		0.003
SHP01	634	860949	02	EDA	SE	<	0.005		0.005
SHP01	634	860949	02	EDA	SIO		13.		2.0
SHP01	634	860949	02	EDA	SN	<	0.005		0.005
SHP01	634	860949	02	EDA	SO4		256.0		0.1
SHP01	634	860949	02	EDA	SR		1.6		0.1
SHP01	634	860949	02	EDA	TOL		0.2	0.5	1.0
SHP01	634	860949	02	EDA	TDS		797.0		10.0
SHP01	634	860949	02	EDA	TMP		18.0		
SHP01	634	860949	02	EDA	TOC		104.		1.0
SHP01	634	860949	02	EDA	TP		0.002		0.003
SHP01	634	860949	02	EDA	TR		0.23		0.04
SHP01	634	860949	02	EDA	TR		0.150		0.005
SHP01	634	860949	03	EDA	AG	<	0.04		0.04
SHP01	634	860949	03	EDA	AL		0.2		0.1
SHP01	634	860949	03	EDA	ALK		372.0		
SHP01	634	860949	03	EDA	AS	<	0.04		0.04
SHP01	634	860949	03	EDA	B	<	0.1		0.1
SHP01	634	860949	03	EDA	BA	<	0.1		0.1
SHP01	634	860949	03	EDA	CA		130.0		0.04
SHP01	634	860949	03	EDA	CD	<	0.004		0.004

WATER QUALITY DATA (WQD)

*SITE *CODE	LOC ID	LOG DATE	SA ID	PAR LAB	U COD	1	PAR VALUE	VALUE UNCERTAINTY	DETECTION LIMIT
SHP01	634	860919	03	EDA	CL		10.0		1.0
SHP01	634	860919	03	EDA	CN	<	0.01		0.01
SHP01	634	860919	03	EDA	CO	<	0.05		0.05
SHP01	634	860919	03	EDA	CR		0.03		0.01
SHP01	634	860919	03	EDA	CU	<	0.02		0.02
SHP01	634	860919	03	EDA	EC		Y00.0		
SHP01	634	860919	03	EDA	F		0.6		0.1
SHP01	634	860919	03	EDA	FE		0.07		0.03
SHP01	634	860919	03	EDA	HG	<	0.0002		0.0002
SHP01	634	860919	03	EDA	K		3.25		0.01
SHP01	634	860919	03	EDA	MG		31.0		0.001
SHP01	634	860919	03	EDA	MN		0.02		0.01
SHP01	634	860919	03	EDA	MO		0.09		0.01
SHP01	634	860919	03	EDA	NA		66.0		0.002
SHP01	634	860919	03	EDA	NH4	<	0.1		0.1
SHP01	634	860919	03	EDA	NI	<	0.04		0.04
SHP01	634	860919	03	EDA	NO2	<	0.1		0.1
SHP01	634	860919	03	EDA	NO3		5.0		1.0
SHP01	634	860919	03	EDA	PB		0.01		0.01
SHP01	634	860919	03	EDA	PBO		0.0	1.0	1.5
SHP01	634	860919	03	EDA	PH		7.02		
SHP01	634	860919	03	EDA	PJO		0.0	0.6	1.0
SHP01	634	860919	03	EDA	PD4	<	0.1		0.1
SHP01	634	860919	03	EDA	R6L		0.2	0.3	1.0
SHP01	634	860919	03	EDA	RAB		0.0	1.0	1.0
SHP01	634	860919	03	EDA	S	<	0.1		0.1
SHP01	634	860919	03	EDA	SB	<	0.003		0.003
SHP01	634	860919	03	EDA	SE	<	0.005		0.005
SHP01	634	860919	03	EDA	SIO		13.		2.0
SHP01	634	860919	03	EDA	SN	<	0.005		0.005
SHP01	634	860919	03	EDA	SO4		256.0		0.1
SHP01	634	860919	03	EDA	SR		1.6		0.1
SHP01	634	860919	03	EDA	TOL		0.0	0.5	1.0
SHP01	634	860919	03	EDA	TDS		843.0		10.0
SHP01	634	860919	03	EDA	TMP		18.0		
SHP01	634	860919	03	EDA	TUC		108.		1.0
SHP01	634	860919	03	EDA	TR		0.0405		0.003
SHP01	634	860919	03	EDA	V		0.23		0.01
SHP01	634	860919	03	EDA	ZN		0.150		0.005
SHP01	634	860919	03	EDA	AG	<	0.01		0.01
SHP01	634	860919	04	EDA	AL		0.2		0.1
SHP01	634	860919	04	EDA	ALK		372.0		
SHP01	634	860919	04	EDA	AS	<	0.01		0.01
SHP01	634	860919	04	EDA	B	<	0.1		0.1
SHP01	634	860919	04	EDA	BA	<	0.1		0.1
SHP01	634	860919	04	EDA	CA		130.0		0.01
SHP01	634	860919	04	EDA	CD	<	0.001		0.001
SHP01	634	860919	04	EDA	CL		10.0		1.0
SHP01	634	860919	04	EDA	CN	<	0.01		0.01
SHP01	634	860919	04	EDA	CO	<	0.05		0.05
SHP01	634	860919	04	EDA	CR		0.03		0.01
SHP01	634	860919	04	EDA	CU	<	0.02		0.02

.WATER QUALITY DATA (WDD)

*SITE *CODE	LUC ID	LOG DATE	SA ID	PAR U LAB COD I	PAR VALUE	VALUE UNCERTAINTY	DETECTION LIMIT
SHP01	634	860919	04	EDA EC	900.0		
SHP01	634	860919	04	EDA F	0.6		0.1
SHP01	634	860919	04	EDA FE	0.07		0.03
SHP01	634	860919	04	EDA HG <	0.0002		0.0002
SHP01	634	860919	04	EDA K	3.25		0.01
SHP01	634	860919	04	EDA MG	34.0		0.001
SHP01	634	860919	04	EDA MN	0.02		0.01
SHP01	634	860919	04	EDA MO	0.09		0.01
SHP01	634	860919	04	EDA NA	66.0		0.002
SHP01	634	860919	04	EDA NH4 <	0.1		0.1
SHP01	634	860919	04	EDA NI <	0.04		0.04
SHP01	634	860919	04	EDA NO2 <	0.1		0.1
SHP01	634	860919	04	EDA NO3	5.0		1.0
SHP01	634	860919	04	EDA P8	0.01		0.01
SHP01	634	860919	04	EDA P80	0.0	1.0	1.5
SHP01	634	860919	04	EDA PH	7.02		1.0
SHP01	634	860919	04	EDA P00	0.0	0.5	1.0
SHP01	634	860919	04	EDA P04 <	0.1		0.1
SHP01	634	860919	04	EDA R6L	0.2	0.3	1.0
SHP01	634	860919	04	EDA RAB	0.2	0.8	1.0
SHP01	634	860919	04	EDA S <	0.1		0.1
SHP01	634	860919	04	EDA S8 <	0.003		0.003
SHP01	634	860919	04	EDA SE <	0.005		0.005
SHP01	634	860919	04	EDA S10	13.		2.0
SHP01	634	860919	04	EDA SN <	0.005		0.005
SHP01	634	860919	04	EDA S04	259.0		0.1
SHP01	634	860919	04	EDA SR	1.6		0.1
SHP01	634	860919	04	EDA TCL	0.3	0.6	1.0
SHP01	634	860919	04	EDA TDS	802.0		10.0
SHP01	634	860919	04	EDA TMP	18.0		
SHP01	634	860919	04	EDA TOC	103.		1.0
SHP01	634	860919	04	EDA T10	0.0110		0.003
SHP01	634	860919	04	EDA U	0.23		0.01
SHP01	634	860919	04	EDA ZH	0.150		0.005
SHP01	634	860919	05	EDA AG <	0.01		0.01
SHP01	634	860919	05	EDA AL	0.2		0.1
SHP01	634	860919	05	EDA ALK	372.0		
SHP01	634	860919	05	EDA AS <	0.01		0.01
SHP01	634	860919	05	EDA B <	0.1		0.1
SHP01	634	860919	05	EDA BA <	0.1		0.1
SHP01	634	860919	05	EDA CA	130.0		0.01
SHP01	634	860919	05	EDA CD <	0.001		0.001
SHP01	634	860919	05	EDA CL	10.0		1.0
SHP01	634	860919	05	EDA CN <	0.01		0.01
SHP01	634	860919	05	EDA CO <	0.05		0.05
SHP01	634	860919	05	EDA CR	0.03		0.01
SHP01	634	860919	05	EDA CU <	0.02		0.02
SHP01	634	860919	05	EDA EC	900.0		
SHP01	634	860919	05	EDA F	0.6		0.1
SHP01	634	860919	05	EDA FE	0.07		0.03
SHP01	634	860919	05	EDA HG <	0.0002		0.0002
SHP01	634	860919	05	EDA K	3.25		0.01

WATER QUALITY DATA (WQD)						PAR	VALUE	DETECTION
*SITE	LOG	SA	PAR	LAB	CODE	VALUE	UNCERTAINTY	LIMIT
*CODE	ID	DATE	ID	LAB	CODE			
SHP01	634	860919	05	EDA	MG	34.0		0.004
SHP01	634	860919	05	EDA	MN	0.02		0.01
SHP01	634	860919	05	EDA	MO	0.09		0.01
SHP01	634	860919	05	EDA	NA	66.0		0.002
SHP01	634	860919	05	EDA	NH4 <	0.1		0.1
SHP01	634	860919	05	EDA	NI <	0.04		0.04
SHP01	634	860919	05	EDA	NO2 <	0.1		0.1
SHP01	634	860919	05	EDA	NO3	5.0		1.0
SHP01	634	860919	05	EDA	PB	0.04		0.04
SHP01	634	860919	05	EDA	P80	0.0	0.9	1.5
SHP01	634	860919	05	EDA	PH	7.02		1.0
SHP01	634	860919	05	EDA	PH	0.0	0.6	0.1
SHP01	634	860919	05	EDA	P00	0.1		0.1
SHP01	634	860919	05	EDA	P04 <	0.0	0.2	1.0
SHP01	634	860919	05	EDA	R6L	0.0	0.9	1.0
SHP01	634	860919	05	EDA	RAB	0.3		0.1
SHP01	634	860919	05	EDA	S <	0.1		0.1
SHP01	634	860919	05	EDA	S <	0.003		0.003
SHP01	634	860919	05	EDA	SB <	0.005		0.005
SHP01	634	860919	05	EDA	SE <	0.005		2.0
SHP01	634	860919	05	EDA	SID	13.		0.005
SHP01	634	860919	05	EDA	SH <	0.005		0.1
SHP01	634	860919	05	EDA	SO4	259.0		0.1
SHP01	634	860919	05	EDA	SR	1.6		1.0
SHP01	634	860919	05	EDA	TOL	0.0	0.5	10.0
SHP01	634	860919	05	EDA	TDS	847.0		1.0
SHP01	634	860919	05	EDA	TMP	18.0		0.003
SHP01	634	860919	05	EDA	TOC	103.		0.01
SHP01	634	860919	05	EDA	U	0.0112		0.005
SHP01	634	860919	05	EDA	V	0.23		0.01
SHP01	634	860919	05	EDA	V	0.150		0.005
SHP01	634	860919	05	EDA	ZN	0.04		0.01
SHP01	635	860919	01	EDA	AG <	0.2		0.1
SHP01	635	860919	01	EDA	AL	0.2		0.01
SHP01	635	860919	01	EDA	ALK	392.0		0.1
SHP01	635	860919	01	EDA	AS <	0.01		0.1
SHP01	635	860919	01	EDA	B <	0.1		0.1
SHP01	635	860919	01	EDA	BA	0.1		0.01
SHP01	635	860919	01	EDA	CA	294.0		0.004
SHP01	635	860919	01	EDA	CD <	0.004		1.0
SHP01	635	860919	01	EDA	CL	48.0		0.01
SHP01	635	860919	01	EDA	CN <	0.01		0.05
SHP01	635	860919	01	EDA	CU	0.08		0.01
SHP01	635	860919	01	EDA	CU	0.02		0.02
SHP01	635	860919	01	EDA	CU	0.02		0.1
SHP01	635	860919	01	EDA	EC	2250.0		0.03
SHP01	635	860919	01	EDA	F	0.6		0.002
SHP01	635	860919	01	EDA	FE	0.83		0.01
SHP01	635	860919	01	EDA	FE	0.0002		0.01
SHP01	635	860919	01	EDA	HG <	8.54		0.004
SHP01	635	860919	01	EDA	K	130.0		0.01
SHP01	635	860919	01	EDA	NO	0.10		0.01
SHP01	635	860919	01	EDA	NO	0.06		0.002
SHP01	635	860919	01	EDA	MU	220.0		0.1
SHP01	635	860919	01	EDA	NA	0.1		0.1
SHP01	635	860919	01	EDA	NH4 <	0.1		0.1

higher Fe
Mg
Mn
high SO₄, TDS

.WATER QUALITY DATA (WQD)

*SITE	LUC	LOG	SA	PAR U	PAR	VALUE	DETECTION
*CODE	ID	DATE	ID	LAB	COD	VALUE	LIMIT
						UNCERTAINTY	
SHP01	635	860919	01	EDA NI	<	0.04	0.04
SHP01	635	860919	01	EDA NU2	<	0.1	0.1
SHP01	635	860919	01	EDA NO3		4.0	1.0
SHP01	635	860919	01	EDA PB	<	0.04	0.04
SHP01	635	860919	01	EDA PBO		0.0	1.5
SHP01	635	860919	01	EDA PH		7.10	
SHP01	635	860919	01	EDA P00		0.0	0.6
SHP01	635	860919	01	EDA P04	<	0.1	1.0
SHP01	635	860919	01	EDA R6L		0.0	0.2
SHP01	635	860919	01	EDA RAB		0.0	0.8
SHP01	635	860919	01	EDA S	<	0.1	0.1
SHP01	635	860919	01	EDA SB	<	0.003	0.003
SHP01	635	860919	01	EDA SE	<	0.005	0.005
SHP01	635	860919	01	EDA S10		10	2.0
SHP01	635	860919	01	EDA SN	<	0.005	0.005
SHP01	635	860919	01	EDA S04		0.000	0.1
SHP01	635	860919	01	EDA SR		3.9	0.1
SHP01	635	860919	01	EDA TOL		0.4	0.6
SHP01	635	860919	01	EDA T02		2850.0	10.0
SHP01	635	860919	01	EDA TMP		19.0	
SHP01	635	860919	01	EDA TOC		107.	1.0
SHP01	635	860919	01	EDA T01		0.075	0.003
SHP01	635	860919	01	EDA U		0.20	0.01
SHP01	635	860919	01	EDA ZN		0.047	0.005
SHP01	636	860920	01	EDA AG	<	0.04	0.04
SHP01	636	860920	01	EDA AL		0.2	0.1
SHP01	636	860920	01	EDA ALK		82.0	
SHP01	636	860920	01	EDA AS	<	0.04	0.04
SHP01	636	860920	01	EDA B	<	0.1	0.1
SHP01	636	860920	01	EDA BA		0.2	0.1
SHP01	636	860920	01	EDA CA		46.2	0.01
SHP01	636	860920	01	EDA CD	<	0.004	0.004
SHP01	636	860920	01	EDA CL		10.0	1.0
SHP01	636	860920	01	EDA CN	<	0.04	0.04
SHP01	636	860920	01	EDA CO	<	0.05	0.05
SHP01	636	860920	01	EDA CR		0.03	0.01
SHP01	636	860920	01	EDA CU		0.02	0.02
SHP01	636	860920	01	EDA EC		330.0	
SHP01	636	860920	01	EDA F		0.5	0.1
SHP01	636	860920	01	EDA FE		0.05	0.03
SHP01	636	860920	01	EDA HG	<	0.0002	0.0002
SHP01	636	860920	01	EDA K		2.43	0.04
SHP01	636	860920	01	EDA MG		8.34	0.001
SHP01	636	860920	01	EDA MN		0.03	0.04
SHP01	636	860920	01	EDA MO		0.06	0.04
SHP01	636	860920	01	EDA NA		34.5	0.002
SHP01	636	860920	01	EDA NH4	<	0.1	0.1
SHP01	636	860920	01	EDA NI	<	0.04	0.04
SHP01	636	860920	01	EDA NO2	<	0.1	0.1
SHP01	636	860920	01	EDA NO3		3.0	1.0
SHP01	636	860920	01	EDA PB	<	0.04	0.04
SHP01	636	860920	01	EDA PBO		0.0	1.5

River

WATER QUALITY DATA (WQD)

*SITE	LOC	LOG	SA	PAR	V	PAR	VALUE	DETECTION
*CODE	ID	DATE	ID	LAB	COD	I	UNCERTAINTY	LIMIT
SHP04	636	860920	04	EDA	PH		7.96	
SHP04	636	860920	04	EDA	POU		0.0	0.5
SHP04	636	860920	04	EDA	PO4	<	0.1	1.0
SHP04	636	860920	04	EDA	R6L		0.4	0.3
SHP04	636	860920	04	EDA	RAB		0.0	0.9
SHP04	636	860920	04	EDA	S	<	0.1	1.0
SHP04	636	860920	04	EDA	SB	<	0.003	0.1
SHP04	636	860920	04	EDA	SE	<	0.005	0.003
SHP04	636	860920	04	EDA	SIO		5.	0.005
SHP04	636	860920	04	EDA	SN	<	0.005	2.0
SHP04	636	860920	04	EDA	SR		0.6	0.005
SHP04	636	860920	04	EDA	TOL		0.5	0.1
SHP04	636	860920	04	EDA	TDS		307.0	0.6
SHP04	636	860920	04	EDA	TMP		19.0	1.0
SHP04	636	860920	04	EDA	TOC		30.	1.0
SHP04	636	860920	04	EDA	V		0.23	0.003
SHP04	636	860920	04	EDA	ZN		0.045	0.01

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SHIPROCK - SHP01

HISTORICAL DATA VALIDATION

FINAL REPORT

This document is a summary of the historical data validation (HDV) process used to validate data for constituents of concern (COCs) in ground water collected at the Shiprock, New Mexico, site (SHP01). Special consideration was given to data points which appeared anomalous or which were either the highest or lowest data points for a given location. The HDV process included a review of all available field and laboratory data for the period of September 1983 through December 1991, and a review of field data only for the sampling rounds conducted after December 1991. The establishment of an improved quality assurance (QA) program in January 1992 precluded the need for validation of laboratory data received after that time.

The following is a list of the COCs for the Shiprock site. These include the general COCs which are common to all sites included in the UMTRA project, as well as those analytes determined to be present at the Shiprock site at concentrations exceeding background levels. Only the dissolved fractions of each of these analytes or parameters in ground water samples collected from monitoring wells were targeted for validation.

General COCs: alkalinity, arsenic, iron, molybdenum, nitrate, pH, radium 226, radium 228, selenium, specific conductance, sulfate, uranium, and total dissolved solids

Site-Specific COCs: ammonium, antimony, arsenic, boron, cadmium, calcium, chloride, magnesium, manganese, nickel, nitrate, phosphate, potassium, selenium, sodium, strontium, sulfate, uranium, and zinc

The HDV program was initiated in 1992. A preliminary review of potentially anomalous data points conducted at that time is referred to as the "Phase I" review. The Phase I review included data points identified as anomalous according to a mathematical formula. The current HDV effort began with the generation of concentration-versus-time plots for each COC for all sampling rounds. The plots were used to identify trends and highlight data points which warranted investigation. Data points so identified as anomalous or which were either the highest or lowest data point for a given location were carefully reviewed in light of all available field and laboratory data. This review was used to verify whether each was truly anomalous or whether one or more deficiencies in sampling or analysis could be identified as the sole or primary cause of the data point appearing anomalous. All data points identified in the Phase I review were included in the current HDV effort.

Data were qualified using validation acceptance criteria established by the UMTRA Data Validation Standard Operating Procedure (DVSOP). These criteria are consistent with EPA validation guidelines. All data points which were investigated in depth are summarized in the

**SHIPROCK - SHP01
HISTORICAL DATA VALIDATION
FINAL REPORT**

following table (Table 1). All investigated data points also are included, with detailed comments, in the second table to follow (Table 2). Detailed discussions of QC findings are included in Table 2 for each sampling round, following the listing of individual data points for that round. These sections also reference data points which were not considered anomalous but which were qualified for one or more reasons.

A significant percentage of the data were classified as *qualitative (estimated)*. Five data points were classified as unusable. These include iron for locations 602 and 603 (August/September 1987 sampling round) and specific conductance for locations 609 (August/September 1987 sampling round), 645 (April 1989 sampling round), and 615 (October 1990 sampling round) (refer to pages 18, 21, 34, and 39, respectively, of Table 2). Also, data collected in June 1990 from location 603 at the tailings area (SHP02) had inadvertently been entered into the database for location 603 for SHP01 (refer to the "General Comments" section for this round on page 38 of Table 2). Location 603 from area SHP01 was not sampled during this round. Thus, the data which had been entered for this location for SHP01 for June 1990, most of which was strikingly different from previous data, was removed from the database but retained for SHP02. A check of data for other locations at SHP01 having the same identifications at SHP02 revealed no similar errors.

Field data are summarized in Table 3. Careful review was made of all field sampling logs but particularly those associated with potentially anomalous data points. In several instances, less than three bore volumes was purged, almost always because of poor recharge. The inability to purge the well of three bore volumes would not necessarily have precluded the collection of ground water representative of the aquifer but could have prevented the well from being "polished". Qualifier codes were therefore placed on all data for a particular sampling location for a given sampling round when it was determined that less than three bore volumes had been purged, regardless of the reason (each result coded with an "L").

The field logs and laboratory data packages were reviewed for the period of September 1983 through December 1991. Field data were located for the sampling round conducted in September 1983; however, no laboratory data could be located. These results had not been entered into the SHP01 database. Both field and laboratory data were located for each of the remaining rounds.

Prior to the August/September 1987 sampling round, no laboratory quality control (QC) data were provided. Thus, sample results generated prior to August 1987 were evaluated by the quality of sample collection activities, by the performance of one or more "UMTRA known" samples (spiked samples prepared by an independent laboratory and labeled as field samples) analyzed with every lot of samples shipped to the contract laboratory, and by the collection of one or more samples in quintuplicate (an original sample and four splits/replicates). UMTRA known recoveries are summarized in Table 4. The UMTRA known recoveries and results of field splits were used to evaluate analytical accuracy and cumulative precision, respectively.

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HISTORICAL DATA VALIDATION
FINAL REPORT**

3

From August 1987 through June 1990, only a minimal amount of laboratory QC data were provided by the contract laboratory (EDA/Barringer). A larger quantity of QC data was provided by other contract laboratories used after June 1990. All available field data, laboratory QC data, UMTRA known recoveries, and field split results were used to evaluate the quality of data appearing anomalous and/or to qualify data for a particular lot of samples.

In some instances, acceptable UMTRA known recoveries entered into the database were actually the result of one or more reanalyses, performed at the request of the UMTRA data reviewer when the original analyses were not within the acceptable range of 75-125% (specified by the UMTRA DVSOP). Sample results which could be verified as having been generated on the same date as the reanalysis and acceptable recoveries of UMTRA known samples were not qualified (refer to the discussion for nitrate for location 608 on page 20 of Table 2). When there was no evidence in the files that ground water samples associated with the initial, biased UMTRA known recoveries were reanalyzed when the acceptable recoveries were generated, the sample data were evaluated based upon the original UMTRA known recoveries. For example, the results for nitrate reported for locations 634 and 635 for the September 1986 sampling round were classified as qualitative due to the elevated recovery of 143% reported for nitrate in the original analysis of the associated UMTRA known. Although the UMTRA known was reanalyzed for nitrate and an acceptable recovery of 113% generated, neither sample 634 nor 635, the only ground water samples associated with this UMTRA known, was reanalyzed for nitrate. These results may be high-biased, based upon the initial analysis of the UMTRA known, and thus have been coded with a "J" (refer to the second paragraph of the "General Comments" section on page 11 of Table 2).

When analysis dates were not reported for individual samples, analytical holding times could not be precisely evaluated. In most instances, holding times could be estimated by comparing the date of sample collection with the date of sample receipt by the laboratory or with the date the data package was signed by the laboratory.

After the addition of any qualifiers, potentially anomalous data were reevaluated to determine whether the qualification fully explained the biased result or not. Investigated data points were then categorized as either "unresolved" or "resolved." Data points were categorized as "unresolved" either when no QC deficiencies of any kind were noted or when one or more deficiencies were noted but the direction of the potential bias was opposite that of the direction of the anomaly or when the QC deficiency(s) was minor. Data points were categorized as "resolved" (and appropriately coded with qualifiers) when the nature of the QC deficiency(s) was believed sufficient to have been the primary or sole cause of the anomaly or when data entry errors were identified. The majority of the investigated data points for the Shiprock site have been categorized as "unresolved", or not sufficiently explainable (refer to Tables 1 and 2).

One issue of concern remains. Due to the absence of laboratory QC data prior to August 1987, data from rounds prior to this time cannot be completely validated. It is impossible to

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HISTORICAL DATA VALIDATION
FINAL REPORT

determine whether data were correctly reported or unbiased, and generalizations have been made based upon the UMTRA known recoveries. For example, four UMTRA knowns were analyzed in association with the four lots of samples collected in October 1985, with recoveries of 57.1%, 100%, 150%, and 160% reported for boron. The widely-differing recoveries suggest that the analytical system was not in control. Instead of applying the recovery of each individual known to the samples in its particular lot and assuming that the recovery indicates the direction of the potential bias, all four recoveries were used to qualify all sample data for boron for this round and, in several instances, to categorize the findings as "resolved" (see the "General Comments" section for this round on pages 7 and 8 of Table 2).

**SHIPROCK - SHP01
HISTORICAL DATA VALIDATION**

TABLE 1

Summary of Investigated Data Points

<u>SAMPLING ROUND</u>	<u>LOCATION</u>	<u>ANALYTE</u>	<u>CONCENTRATION</u>		<u>CODE</u>	<u>BIAS</u>	<u>STATUS</u>
10/84	603	Zn	4.72	mg/L		HIGH	UNRESOLVED
	605	Mo	0.01	mg/L		LOW	UNRESOLVED
	607	Zn	4.4	mg/L		HIGH	UNRESOLVED
9-10/85	603	Alk	185	mg/L		LOW	UNRESOLVED
		Cl	39	mg/L		LOW	UNRESOLVED
		Mg	139	mg/L		LOW	UNRESOLVED
		NO ₃	4.0	mg/L		LOW	UNRESOLVED
		Na	318	mg/L		LOW	UNRESOLVED
		SO ₄	1780	mg/L		LOW	UNRESOLVED
		TDS	2920	mg/L		LOW	UNRESOLVED
	604	Mo	0.44	mg/L		HIGH	UNRESOLVED
	605	Mo	0.36	mg/L		HIGH	UNRESOLVED
	607	Fe	1.13	mg/L		HIGH	UNRESOLVED
		Se	<0.005	mg/L		LOW	UNRESOLVED
	608	NH ₄	170	mg/L		LOW	UNRESOLVED
		SO ₄	6570	mg/L		LOW	UNRESOLVED
		TDS	11,300	mg/L		LOW	UNRESOLVED
	609	NH ₄	180	mg/L		LOW	UNRESOLVED
	610	B	7.1	mg/L	J	HIGH	RESOLVED
	614	B	11	mg/L	J	HIGH	RESOLVED
		Mo	0.38	mg/L	J	HIGH	UNRESOLVED
	619	B	18	mg/L	J	HIGH	RESOLVED
		Na	7860	mg/L		HIGH	UNRESOLVED
		Ec	25,000	umhos/cm		HIGH	UNRESOLVED
		SO ₄	19,200	mg/L		HIGH	UNRESOLVED
	621	Mo	0.4	mg/L		HIGH	UNRESOLVED
		SO ₄	8700	mg/L		LOW	UNRESOLVED
	622	Cl	580	mg/L		--	UNRESOLVED
		Na	3200	mg/L		--	UNRESOLVED
	624	NH ₄	110	mg/L		HIGH	UNRESOLVED
Ec		15,500	umhos/cm		HIGH	UNRESOLVED	
626	Cl	730	mg/L		HIGH	UNRESOLVED	
	Na	3900	mg/L		HIGH	UNRESOLVED	
	SO ₄	11,300	mg/L		HIGH	UNRESOLVED	
	Ec	13,000	umhos/cm		HIGH	UNRESOLVED	
628	Mo	0.2	mg/L		HIGH	UNRESOLVED	
629	Mg	337	mg/L		HIGH	UNRESOLVED	
	TDS	18,600	mg/L	J	HIGH	UNRESOLVED	

**SHIPROCK - SHP01
HISTORICAL DATA VALIDATION
TABLE 2**

Review of Potential Anomalies/Qualified Data

B -	612, 609, 631, 608, 632, 611, 610, 613, 614, 615, 602, 617, 618, 616, 603, 607, 622, 621, 620, 619, 625, 623, 624, 604, 606, 626, 627, 629, 628, 630, 633, 605
Mo -	613, 614, 615, 602, 617, 618, 616
K -	613, 614, 615, 602, 617, 618, 616, 603, 607, 622, 621, 620, 619, 625, 623, 624
Se -	612, 609, 631, 608, 632, 611, 610

All four UMTRA knowns were analyzed twice for iron, manganese, and zinc. The duplicate results for these three analytes were either the same or close to one another and thus did not suggest any analytical bias.

As indicated above, UMTRA known recoveries of boron were low-biased in Lot 1 and high-biased in Lots 3 and 4. The widely varying recoveries suggest that the analyses of samples for boron were not in control. Thus, all results for boron in all four lots have been classified as qualitative (each coded with a "J"), with data points listed above as anomalous categorized as "resolved."

SAMPLING ROUND 9/86

(EDA)

UMTRA knowns:

640/950 (Lot 1), 649 (Lot 2), 654 (Lot 3)

<u>Location</u>	<u>Analyte</u>	<u>Concentration</u>	<u>Code(s)</u>	<u>Comments</u>
607	Alk	620 mg/L		Approximately one-half that measured in 10/85 (1291 mg/L); also much less than that measured in the next round (1660 mg/L in 9/87). 22.99 B.V. purged. "Well point." Second measurement yielded 621 mg/L and appears to confirm; however, slight rise in pH relative to previous measurements is opposite what would be expected. UNRESOLVED.
	Mg	467 mg/L		Lower than the findings of approximately 1500 mg/L in the two previous rounds and 1849 mg/L reported for the one subsequent round (9/87). 22.99 B.V. purged ("well point"). Lot 2. UMTRA known 649 = 106%. No lab QC data or repeat analyses of this sample for magnesium performed. One sample in this lot (622) was analyzed twice for magnesium, with acceptable precision (1570 mg/L and 1580 mg/L were reported). This provides a small measure of validity to the result for sample 607 and others in this lot. UNRESOLVED.

SHIPROCK - SHP01
HISTORICAL DATA VALIDATION

TABLE 2
Review of Potential Anomalies/Qualified Data

	Ec	8000	umhos/cm	J	Third and lowest of four data points. Field logs confirm this value was correctly entered into the database. No comments recorded in logs which would indicate error or problems in measurement. Drop in chloride, sodium, and calcium lend support; however, TDS of 16,000 mg/L is at odds with the conductivity result. Sum of major ions yielded approximately 14,600 mg/L, lending validity to the TDS result and suggesting greater inaccuracy in the conductivity. 22.99 B.V. purged. UNRESOLVED.
608	NO ₃	410	mg/L		Relatively low in comparison to the one previous data point (1800 mg/L in 9/85) and seven subsequent data points. 3.60 B.V. purged. Lot 3. UMTRA known 654 = 117%. No lab QC data provided. No repeat analyses of this sample, the UMTRA known, or of any other samples in this lot were performed. UNRESOLVED.
620	Ni	0.25	mg/L	J	Three to four times greater than that detected in each of the five subsequent rounds. 3.00 B.V. purged. Lot 2. UMTRA known 649 = 133%, or greater than the 125% upper control limit specified by the validation guidelines. The high bias reflected by the UMTRA known recovery likely explains part but not all of the elevated result for nickel in this sample. No lab QC data were provided, and no repeat analyses of this sample or any others in this lot were performed, so no measure of precision was available. RESOLVED.
	Sr	17.2	mg/L	J	First and highest of eight sampling rounds. May represent the beginning of a downward trend. Result was the second of two performed by the lab, with the first result of 17 mg/L supporting the value of 17.2 mg/L entered into the database. 3.00 B.V. purged. Lot 2. UMTRA known 649 = 133%, or greater than the 125% upper control limit. As with nickel, above, the bias reflected by the UMTRA known recovery likely explains part of the elevation in this result for strontium. RESOLVED.
621	NO ₃	2100	mg/L	L	Second and highest of three data points. Three times that detected in 10/85 (700 mg/L), and nearly double that detected in 9/87 (1200 mg/L). 2.64 B.V. purged. Lot 2. UMTRA known 649 was reported by

SHIPROCK - SHP01
HISTORICAL DATA VALIDATION
TABLE 2

Review of Potential Anomalies/Qualified Data

				<p>UNC to contain no nitrate (<0.1 mg/L); however, the three analyses of this sample by EDA yielded 6 mg/L, 4 mg/L, and 1.1 mg/L, with this last result being the one entered into the database. No repeat analyses of sample 621 were performed for nitrate; thus, the result of 2100 mg/L was associated with the UMTRA known result of 6 mg/L, the analysis which reflected the highest bias of the three. Due to the relatively high concentration reported for sample 621 as compared to the UMTRA known, however, analytical bias likely explains only a small part of the result for sample 621 during this round. UNRESOLVED.</p>
622	NO ₃	2400	mg/L	<p>Second and highest of three sampling rounds. 4.40 B.V. purged. Lot 2. See 621 above. UNRESOLVED.</p>
624	NH ₄	15.0	mg/L	<p>Second of six data points collected between 1985 and 1991, most of which have varied considerably from one another. Anomalously low in comparison to the finding of 110 mg/L in 10/85 and 71 mg/L in 9/87. 3.00 B.V. purged. Lot 2. UMTRA known 649 = 110%. No lab QC data were provided, and no repeat analyses of this sample, the UMTRA known, or any other samples in the lot for ammonium were performed. Ammonium salts in solution, acting alone, generally yield slightly acidic solutions; however, no significant change in pH was reported. UNRESOLVED.</p>
	NO ₃	2500	mg/L	<p>Second and highest of seven data points. 3.00 B.V. purged. Lot 2. See 621 above. UNRESOLVED.</p>
627	Sr	17.4	mg/L J	<p>Approximately twice as high as that detected in the subsequent round (9.25 mg/L in 9/87). Because only two data points have been collected from this location, either data point could be considered "anomalous." 3.08 B.V. purged. Lot 3. UMTRA known 654 = 145%. No lab QC data were provided, and no repeat analyses of this sample, the UMTRA known, or any other samples in this lot for strontium were performed. The high bias reflected in the UMTRA known recovery likely explains the elevation in the result for 627 for this round. RESOLVED.</p>

SHIPROCK - SHP01
HISTORICAL DATA VALIDATION
TABLE 2

Review of Potential Anomalies/Qualified Data

General Comments - Sampling Round 9/86:

No lab QC data were provided for any of the three lots. Dates of analysis were not provided for any analyses; thus, holding times could not be evaluated. Many holding times were likely exceeded, particularly when repeat analyses were performed.

Initial analyses of UMTRA known 640/950 for calcium and nitrate in Lot 1 yielded recoveries of 87.6% and 143%, respectively. The recovery of calcium was within the 75% to 125% acceptable range specified by the DVSOP and, thus, no data associated with this initial UMTRA known analysis required qualification. In contrast, no samples in Lot 1 were reanalyzed for nitrate in association with the acceptable UMTRA known recovery of $(15 \text{ mg/L}/13.3 \text{ mg/L}) \times 100 = 113\%$ for 640/950, which had been entered into the database, but instead were associated with the initial, high-biased recovery of 143%. Thus, the two ground water results for nitrate in Lot 1 were classified as qualitative (each coded with a "J").

NO₃ - 634, 635

UMTRA known 649 in Lot 2 was analyzed three times for boron (the first two more or less as part of the same analytical batch, or as lab duplicates), three times for nitrate in three distinct analytical batches, and twice for calcium and chloride as part of two separate analytical batches. In addition, duplicate analyses (assumed to be within a single analytical batch due to the reporting of the duplicate results on the same, "total" form) were performed for radium 226, radium 228, and uranium. Low recoveries were reported for the lab duplicates analyzed boron (64.0% and 72.0%). Low recoveries also were reported for the lab duplicates analyzed for radium 228 (38.3%, entered into the database, and 42.6%). In contrast, an elevated recovery of chloride (167%) was reported for the initial analysis of UMTRA known 649, as compared to the repeat analysis, in which a recovery of 100% was reported. Acceptable recoveries were reported for both the initial, lab duplicate and/or repeat analyses of UMTRA known 649 for calcium, radium 226, and uranium.

As noted in the discussion above for nitrate in sample 621, the UNC form containing the theoretical knowns for this known sample indicated that no nitrate was spiked. Thus, the three results reported by EDA for 649 (6 mg/L, 4 mg/L, and 1.1 mg/L) are all erroneous and reflect a high analytical bias. Samples in Lot 2 which were analyzed in association with the UMTRA known when biased recoveries were generated were classified as qualitative (each result coded with a "J", when greater than the detection limit and with a "UJ" when undetected and the recovery was low-biased). The results are indicated as follows.

B - 632, 621, 622, 624

Cl - 632, 607, 620, 621, 622, 624 (all samples in Lot 2)

Ra228 - 632, 607, 620, 621, 622, 624 (all samples in Lot 2)

NO₃ - 632, 607, 620, 621, 622, 624 (all samples in Lot 2)

**SHIPROCK - SHP01
HISTORICAL DATA VALIDATION
TABLE 2**

Review of Potential Anomalies/Qualified Data

Lab duplicate analyses of UMTRA known 654, associated with Lot 3 samples, were performed for boron, radium 226, and radium 228. Three distinct analyses of this sample for chloride were reported. With the exception of a slightly high recovery of radium 226 (131%) in the first of two lab duplicate analyses, all recoveries of boron, radium 226, and radium 228 were within the acceptable range of 75% to 125%. Because the bias in the radium 226 recovery was slight and because the duplicate recovery of 107% was acceptable, no data for radium 226 were qualified, based upon the UMTRA known recoveries.

The three analyses of UMTRA known 654 for chloride yielded recoveries of 400%, 267%, and 100%. This last result was the value which had been entered into the database. Of the nine samples included in Lot 3, only sample 610 was reanalyzed for chloride in association with the acceptable UMTRA known recovery of 100%; consequently, this sample result was not qualified. The remaining sample results for chloride in Lot 3 either were not reanalyzed at all or were reanalyzed in association with the second recovery of 267% generated for 654; consequently, these results are likely to be high-biased and have been classified as qualitative (each coded with a "J", as listed below).

GI - 631, 608, 609, 612, 613, 616, 627, 630

SAMPLING ROUND 3/87

(EDA)

UMTRA knowns:

650/950 (Lot 1), 951 (Lot 2)

<u>Location</u>	<u>Analyte</u>	<u>Concentration</u>	<u>Code(s)</u>	<u>Comments</u>
638	Ca	321 mg/L		Higher than any of the four subsequent data points. 26 B.V. purged. Lot 1. UMTRA known 950 = 108% in reanalysis; original analysis of known 950 yielded a recovery of 85.3% (neither this sample nor any others in this lot were reanalyzed for calcium; thus, the recovery of 85.3% is the more applicable measure of accuracy). TDS also was significantly higher during this round, lending support to the accuracy of this result. UNRESOLVED.
	Cl	348 mg/L		Appears to represent the beginning of a downward trend. 26 B.V. purged. Lot 1. UMTRA known 950 was analyzed for chloride twice, with the recovery of 93.3% resulting from the second analysis entered into the database. The first recovery of 117% also was acceptable; thus, sample results for chloride were not qualified. As noted above, calcium and TDS also were elevated during this round. UNRESOLVED.
	Mn	11.0 mg/L		First and highest of four data points. In the absence of other analytes, ionized manganese tends to

**SHIPROCK - SHP01
HISTORICAL DATA VALIDATION
TABLE 2**

Review of Potential Anomalies/Qualified Data

				produce slightly acidic solutions; however, no impact on pH was noted. 26 B.V. purged. Lot 1. UMTRA known 950 = 117%. Other ions and TDS also elevated during this round. UNRESOLVED.
	Zn	9.52	mg/L	First and highest of five data points. In contrast to the elevated concentrations of "spectator" ions such as calcium and chloride, ionized zinc tends to produce slightly acidic solutions. The elevated concentrations of zinc and manganese reported for this location during this round might have been expected to result in a slight decrease in pH; however, none was observed. 26 B.V. purged. Lot 1. UMTRA known 950 = 94.8%. UNRESOLVED.
641	Mn	0.31	mg/L	First and lowest of four data points. 9.24 B.V. purged. Lot 1. QC same as 638 above. UNRESOLVED.
642	Ca	620	mg/L	Slightly higher than that detected in the three subsequent rounds. 7.84 B.V. purged. Lot 1. QC same as 638 above. UNRESOLVED.
643	Ec	30,500	umhos/cm J	First and highest of three data points. Nearly three times higher than that detected six months later (10,490 umhos/cm in 9/87). TDS of 64,200 mg/L also higher than in the two subsequent rounds but is at odds with this Ec finding. Sum of major ions yielded approximately 60,100 mg/L, suggesting greater inaccuracy in the conductivity measurement than in the TDS result. 12.8 B.V. purged. UNRESOLVED.
	Ni	0.71	mg/L	Anomalously high in comparison with the findings of 0.05 mg/L in 9/87 and <0.04 mg/L in 4/89. 12.8 B.V. purged. Lot 1. UMTRA known 950 = 125%. UNRESOLVED.
	Zn	14.6	mg/L	Anomalously high in comparison with the findings of 0.205 mg/L in 9/87 and 0.033 mg/L in 4/89. See discussion in 638 above. 12.8 B.V. purged. Lot 1. UMTRA known 950 = 94.8%. UNRESOLVED.
647	Ca	316	mg/L	First of five splits collected from this location. TDS was also elevated during this round. 16.8 B.V.

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purged. Lot 2. UMTRA known 93.2%.
UNRESOLVED.

TDS 3060 mg/L

High relative to the next round. First of five splits collected from this location. TDS concentrations for this location have been erratic but appear correlated with calcium, and sulfate. Conductivity of 1700 umhos/cm suggests some inaccuracy in the TDS or conductivity result, or both. 16.8 B.V. purged. Lot 2. UMTRA known 98.7%. UNRESOLVED.

General Comments - Sampling Round 3/87:

No lab QC data could be located in any of the files; thus, data were validated based on UMTRA known recoveries only. With one exception, the recoveries of COCs which had been entered into the database for each of the two UMTRA knowns were acceptable. A low recovery of 61.7% was reported for antimony in the analysis of UMTRA known 951, associated with Lot 2 samples. However, this recovery value, as well as recoveries for molybdenum in this same known and for antimony, boron, calcium, and chloride in UMTRA known 950, were the result of repeat analyses generally performed because the initial recoveries were outside the acceptable recovery range of 75% to 125%. No samples were reanalyzed in association with the repeat, generally acceptable analyses of the UMTRA knowns.

The initial recoveries of antimony and molybdenum reported for 951 (14.7% and 150%, respectively), as well as the initial recoveries of antimony and boron reported for 950 (6.7% and 41.2%, respectively), suggest a significant loss of analytical accuracy. The negative findings reported for molybdenum for Lot 2 samples are assumed to have been unaffected by the potential positive analytical bias and therefore have not been qualified. In contrast, the positive findings reported for boron for all Lot 1 samples have been classified as qualitative (each coded with a "J") as the negative bias indicated by the UMTRA known recovery suggest that the actual concentrations of boron in these samples may be higher than reported.

B - 638, 639, 640, 641, 642, 643, 644, 645, 646

Due to the very low recovery of antimony in the initial analysis of UMTRA known 951, all Lot 2 sample results for antimony, all of which were nondetects, are considered inconclusive and therefore meaningless. These results have been coded with an "R".

Sb - 638, 639, 640, 641, 642, 643, 644, 645, 646

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SAMPLING ROUND 5/87

(Barringer)

UMTRA knowns:

650/950 (Lot 1), 951 (Lot 2)

<u>Location</u>	<u>Analyte</u>	<u>Concentration</u>	<u>Code(s)</u>	<u>Comments</u>
638	Sb	0.103 mg/L	J	Not detected in the one previous and three subsequent sampling rounds. 4.20 B.V. purged. Lot 1. UMTRA known 950 (identified in the field logs as "650") = 142% (slightly high-biased). A similar recovery of antimony in the second UMTRA known (951) analyzed in association with Lot 2 also was high-biased (131 %R). RESOLVED.
639	Sb	0.172 mg/L	J	Second and highest of five sampling rounds. Detected at similar concentrations in each of the four splits. Not detected in any of the five splits collected from this location two months earlier. 5.91 B.V. purged. Lot 1. See 638 above. RESOLVED.
	Cd	0.025 mg/L		Not detected in the one previous round nor in two of the three subsequent rounds. 5.91 B.V. purged. Lot 1. UMTRA known 950 = 105%. UNRESOLVED.
641	Sb	0.622 mg/L	J	Second and highest of five data points. Not detected in the previous round conducted two months earlier, and detected at only a low level (0.019 mg/L) in 9/87. 3.90 B.V. purged. Lot 1. See 638 above. RESOLVED.
642	Sb	0.622 mg/L	J	Second and highest of four data points. Not detected in the previous round conducted two months earlier, and detected at only a low level (0.032 mg/L) in 9/87. 3.84 B.V. purged. Lot 1. See 638 above. RESOLVED.
	Mg	499 mg/L		Anomalously low in comparison with the finding of 1280 mg/L in 3/87 and approximately 2000 mg/L detected in the two subsequent rounds. Chloride, Ec, TDS also slightly low during this round. 3.84 B.V. purged. Lot 1. UMTRA known 950 = 96%. UNRESOLVED.
644	Sb	0.742 mg/L	J	Second and highest of five data points. Not detected in the previous round conducted two months earlier, and detected at only a low level (0.039 mg/L) in

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				9/87. 3.72 B.V. purged. Lot 1. See 638 above. RESOLVED.
	Cd	0.117	mg/L	This data point is truly anomalous in light of the finding of nondetect in the one previous round, conducted in 3/87, and next subsequent round, conducted in 9/87. Detected at only low levels in the 10/88 round (0.003 mg/L) and 4/89 round (0.001 mg/L). 3.72 B.V. purged. Lot 1. UMTRA known 950 = 105%. UNRESOLVED.
	PO ₄	14.9	mg/L H	Anomalously high in comparison with the findings of the one previous and three subsequent rounds. Phosphates are typically insoluble; thus, to have detected phosphate in filtered samples such as these suggest its presence as a salt of sodium, potassium, rubidium, cesium, and/or ammonium. Only sodium and potassium were analyzed during this round, and the elevated concentrations which were detected could not provide support for the elevated phosphate. Acting alone, solutions of phosphate salts yield slightly basic solutions; however, no clear correlation with either pH or TDS was apparent. UNRESOLVED.
646	Sb	0.087	mg/L J	Second and highest of five data points. Not detected in the one previous and next subsequent rounds. 4.77 B.V. purged. Lot 1. See 638 above. RESOLVED.
	Cd	0.012	mg/L	Second of five data points. Detected in only one other instance (0.001 mg/L in 4/89). 4.77 B.V. purged. Lot 1. UMTRA known 950 = 105%. UNRESOLVED.
	PO ₄	1.57	mg/L H	Elevated relative to the finding of 0.10 mg/L in 5/87 and findings of nondetect in the three subsequent rounds. 4.77 B.V. purged. Lot 1. See discussion in 644 above. UNRESOLVED.
647	NO ₃	9.8	mg/L H	One of five splits collected from this location. All five results are in close agreement, but contradict the findings of approximately 200 mg/L detected in the five splits collected during the previous round (3/87). Results for this round appear substantiated by the finding of 8.0 mg/L reported for the subsequent round (9/87) but again are contradicted by the elevated

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concentration (380 mg/L) detected in 4/89. As a "spectator" ion, no affect on pH by nitrate alone would be expected. 3.98 B.V. purged. Lot 2. UMTRA known 951 = 102%. UNRESOLVED.

General Comments - Sampling Round 5/87:

The following data points have been classified as qualitative due to exceeded holding times.

NH ₄ -	638, 639, 641, 642, 644, 645, 646, 650, 651, 652, 653, 647, 648, 654, 655, 657
NO ₃ -	638, 639, 641, 642, 644, 645, 646, 650, 651, 652, 653, 647, 648, 654, 655, 657
PO ₄ -	638, 639, 641, 642, 644, 645, 646, 650, 651, 652, 653, 647, 648, 654, 655, 657
TDS -	638, 639, 641, 642, 644, 645, 646, 650, 651, 652, 653, 647, 648, 654, 655, 657

Only a limited amount of QC data, all of which was for radiochemical analyses, had been provided. All of these QC results were acceptable.

With the exception of elevated recoveries of antimony, all UMTRA known recoveries were acceptable. Because antimony was detected in all samples collected during this round and because the recoveries of antimony in UMTRA known 950 (142%) and 951 (131%) were biased high, all results for antimony were classified as qualitative (each coded with a "J") to reflect a possible high bias.

Sb -	638, 639, 641, 642, 644, 645, 646, 650, 651, 652, 653, 647, 648, 654, 655, 657
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Reanalyses of selected samples for some target analytes were performed on September 1, 1987. Samples 645 and 950 were reanalyzed for sodium, samples 648 and 951 were reanalyzed for strontium, and sample 951 was also reanalyzed for nitrate. The reanalysis for nitrate was performed over two months in excess of the acceptable holding time and has been classified as qualitative.

The initial result for sodium in the analysis of UMTRA known 950 yielded a recovery of 84%. Because this value exceeds the 75% minimum specified by the DVSOP, no qualification of sample data which were not reanalyzed on 9/1/87 when a recovery of 98.9% was obtained was necessary. Likewise, the initial analysis of UMTRA known 951 for nitrate (114%) was acceptable and did not require additional qualification of the results for nitrate which were not generated on 9/1/87, when a recovery of 102% was obtained.

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In contrast, the recovery of strontium in the initial analysis of UMTRA known 951 (142%) performed on 7/9/87 (142%) exceeded the upper control limit of 125%. Although the repeat analysis for strontium performed on 9/1/87 yielded a recovery of 110%, only sample 648 was reanalyzed on 9/1/87. Thus, all samples results for strontium excluding that of 648 were associated with the initial, high-biased recovery. Positive findings reported for the following samples have therefore been classified as qualitative (each coded with a "J").

Sr - 647, 654, 655, 656, 657

SAMPLING ROUND 8-9/87

(Barringer)

UMTRA knowns:

950 (Lot 1), 951 (Lot 2), 952 (Lot 3), 953 (Lot 4), 954 (Lot 5), and 955 (Lot 6)

<u>Location</u>	<u>Analyte</u>	<u>Concentration</u>	<u>Code(s)</u>	<u>Comments</u>
602	Sb	0.116 mg/L		Second of only two data points, the first of which was a finding of nondetect in 10/84. "Water rusty due to pipe." 43.46 B.V. purged. Lot 3. UMTRA known 952 = 100%. No method blank reported. Lab duplicate RPD = 12%. QCS = 105%. MS = 100%. UNRESOLVED.
	Fe	2.09 mg/L	R	Third and highest of three data points. Logs stated that water was "rusty due to pipe" (see Table 3). 43.46 B.V. purged. This likely contributed to the elevated iron concentration. Lot 3. UMTRA known 952 = 100%. Lab duplicate RPD = 0%. QCS, MS not analyzed/reported for iron. No method blank reported. RESOLVED.
603	Alk	1791 mg/L	J	High in comparison with the finding of 185 mg/L in 10/85; appears correlated with sulfate, TDS. No corresponding rise in pH, however. 10.56 B.V. purged. Second titration yielded 1811 mg/L. "Water rusty...sediment load in pipe" (see Table 3). RESOLVED.
	PO ₄	1.65 mg/L	H	Second and highest of four data points. Three years passed between the first sampling round and this one. Not greatly elevated in absolute terms but

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				significantly higher than that detected in the previous and subsequent rounds. Ionized phosphate alone will yield slightly basic solutions in water; however, this concentration was likely not elevated enough to have affected pH (which was essentially unchanged from the 1984 round). 10.56 B.V. purged. UMTRA known 952 = 92.3%. Lab duplicate RPD = 3.5%. No other lab QC data provided for phosphate. UNRESOLVED.
	Sr	25.0	mg/L	Second and highest of four data points. May not be considered "anomalous" but is significantly higher than the previous and subsequent findings of approximately 13 or 14 mg/L. 10.56 B.V. purged. Lot 3. UMTRA known 952 = 109%. Lab duplicate RPD = 0%. Lab QCS, MS not analyzed/reported for strontium. UNRESOLVED.
	SO ₄	23,300	mg/L	Third and highest of five data points. Appears substantiated by TDS results. 10.56 B.V. purged. Lot 3. UMTRA known 952 = 102%. Lab duplicate RPD = 0%. Lab QCS, MS not analyzed/reported for sulfate. UNRESOLVED.
607	PO ₄	1.32	mg/L H	Higher than the two previous data points, collected in 1984 and 1986. Results for phosphate for several locations appear elevated for this round and by approximately the same amount; analytical bias and/or lab contamination is a possibility. 17.4 B.V. purged. "Light tainted rust color...lost a lead weight down well point...never recovered" (refer to Table 3). Lot 3. See 603 above. UNRESOLVED.
	Se	0.434	mg/L J	Fourth and highest of four data points. Selenium concentrations reported for this location have been erratic. 17.4 B.V. purged. "Light tainted rust color...lost a lead weight down well point...never recovered" (refer to Table 3). Lot 3. UMTRA known 952 = 95.8%. No lab QC provided for selenium for UNRESOLVED.
608	Sb	0.129	mg/L	Second and highest of seven sampling rounds. Significantly higher than the four splits collected from this location, which ranged from 0.077 to 0.084 mg/L. 3.17 B.V. purged. "Yellow-green tinge" to

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				water. Lot 3. QC same as 602 above. UNRESOLVED.
NO ₃	365	mg/L	H J	This is the first of five splits results for this location and is lower by a factor of ten than the four remaining splits. It is similar to the finding of 410 mg/L detected in 9/86 but lower than that reported for the six subsequent rounds and is the result of a reanalysis performed on 1/8/88 (well in excess of the 28-day holding time). The initial analysis of this sample conducted on 10/13/87 yielded 368 mg/L, which substantiates the second result despite the exceeded holding time. The initial finding was associated with an initial recovery of 74.2% in the analysis of UMTRA known 952. The only lab QC data reported for nitrate analyses conducted for Lot 3 samples on 10/13/87 were for lab duplicates (RPD = 0%). No lab QC data were reported for repeat analyses for nitrate or for any other analytes. Second result for UMTRA known 952 = 106%. UNRESOLVED.
PO ₄	1.30	mg/L	H	Second and highest of seven sampling rounds. Collected in quintuplicate, all of which agree. Due to the similarity in the findings for phosphate for several locations for this round, analytical bias and/or lab contamination should be considered possible. 3.17 B.V. purged ("yellow-green tinge"). Lot 3. See 603 above. UNRESOLVED.
609 NH ₄	568	mg/L		Third and highest of three data points. Appears to represent an upward trend. 3.29 B.V. purged. Lot 3. UMTRA known 952 = 99.0%. Lab duplicate RPD = 0%. QCS = 99.5%. No other lab QC data reported for ammonium. UNRESOLVED.
Fe	<0.01	mg/L		Detected at concentrations of 0.1 mg/L and 0.13 mg/L in the 9/85 and 9/86 sampling rounds, respectively. 3.29 B.V. purged. Lot 3. QC same as 602 above. UNRESOLVED.
Mg	2479	mg/L		Appears to represent an upward trend. 3.29 B.V. purged. Lot 3. UMTRA known 952 = 98.7%. Lab duplicate RPD = 0%. QCS = 120%. MS = 100%. No lab blank reported. Substantiated by elevated TDS. UNRESOLVED.

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	PO ₄	1.47	mg/L	H	Second of only two data points. Not detected in the 1986 sampling round. 3.29 B.V. purged. Lot 3. See 603 above. UNRESOLVED.
	Se	0.228	mg/L		Third of three data points for this location. Selenium was reported as undetected in the two previous rounds, conducted in 9/85 and 9/86. 3.29 B.V. purged. Lot 3. QC same as 607 above. UNRESOLVED.
	Na	2637	mg/L		Nearly three times greater than that detected in the two previous rounds. 3.29 B.V. purged. Lot 3. UMTRA known 952 = 96.7%. Lab duplicate RPD = 0%. QCS = 84.9%. MS = 87%. No lab blank reported. UNRESOLVED.
	SO ₄	13,400	mg/L		Third and highest of three data points. Result correlated with related parameters. 3.29 B.V. purged. Lot 3. QC same as 603 above. UNRESOLVED.
	TDS	26,800	mg/L	H	Third and highest of three data points. Substantiated by elevated concentrations of major ions, including sulfate. Lot 3; holding time assumed met (see "General Comments" below). UMTRA known 952 = 102%. Conductivity of 5690 umhos/cm is at odds with this result. However, sum of major ions yielded approximately 24,800 mg/L, substantiating this finding and suggesting greater inaccuracy in the conductivity measurement. It is possible that the conductivity meter was reading in tenths of umhos. As a precaution, the conductivity result has been classified as unusable (coded with an "R"). No lab QC reported for TDS for Lot 3. UNRESOLVED.
610	Sb	0.103	mg/L		Second and highest of seven data points, the majority of which have been nondetects. Antimony from this round appears to be high-biased. 7.45 B.V. purged. Lot 3. QC same as 602 above. UNRESOLVED.
	Fe	<0.01	mg/L		Anomalously low in comparison with the detections of approximately 0.1 mg/L in the two previous and two subsequent rounds. Not detected in the three most recent rounds, however. 7.45 B.V. purged. Lot 3. QC same as 602 above. UNRESOLVED.

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TABLE 2
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	PO ₄	1.12	mg/L H	Significantly higher than the findings of nondetect or near-nondetect in the one previous and four subsequent sampling rounds. 7.45 B.V. purged. Lot 3. See 603 above. UNRESOLVED.
611	Fe	<0.01	mg/L	Anomalously low. 3.61 B.V. purged. Lot 4. UMTRA known 953 = 102%. Lab duplicate RPD = 0%. QCS = 110%. MS = 108%. No lab blank reported. UNRESOLVED.
	Se	0.222	mg/L N	Second of only two data points for this location. Selenium was not detected in the previous round, conducted in 9/85, and either of these two data points could be considered "anomalous." 3.61 B.V. purged. Lot 4. UMTRA known 953 = 101%. Lab duplicate RPD = 1.1%. QCS = 88.0%. MS = 72% (slightly low). No lab blank reported. UNRESOLVED.
612	Fe	<0.01	mg/L [J]	Third of four data points. This was the only instance in which iron was not detected. 4.29 B.V. purged ("sulfuric smell"). Lot 4. QC same as 611 above. UNRESOLVED.
613	Sb	0.103	mg/L	The second of only two data points, the first of which was a finding of nondetect in 10/84. 3.08 B.V. purged. Lot 4. UMTRA known 953 = 77.8%. Lab duplicate RPD = 8.5%. QCS = 105%. MS = 96%. UNRESOLVED.
614	Sb	0.68	mg/L	The first and highest of seven data points. Could represent the beginning of a true downward trend but more likely represents high analytical bias due to the similarity of results for antimony for this round (although lab QC data don't suggest this). 3.11 B.V. purged. Lot 4. QC same as 613 above. UNRESOLVED.
	Mo	0.02	mg/L	Lower than the 0.38 mg/L detected in 9/85 and 0.23 mg/L detected in 10/88. 3.11 B.V. purged. Lot 4. UMTRA known 953 = 95.8%. Lab duplicate RPD = 0%. QCS = 82.5%. MS = 103%. UNRESOLVED.
615	Sb	0.074	mg/L	The first and highest of six data points. Not greatly elevated relative to the next data point (0.049 mg/L detected in 4/89) and could represent the beginning of a true downward trend. 5.10 B.V. purged.

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				"Water slightly milky." Lot 4. QC same as 613 above. UNRESOLVED.
616	Sb	0.080	mg/L	The second and highest of seven data points. 3.79 B.V. purged. Lot 4. QC same as 613 above. UNRESOLVED.
617	TDS	21,300	mg/L H J	Anomalously high in comparison with the one previous round (7570 mg/L in 10/85) and subsequent rounds (ranging from 6610 mg/L in 6/90 to 13,000 mg/L in 9/92). 3.53 B.V. purged. Lot 4; seven-day holding time exceeded by 13 days. Lab duplicate RPD = 2.2%. QCS, MS not analyzed/reported for TDS. No corresponding rise in sulfate. A slight drop in Ec was noted; however, the TDS:Ec ratio of 6.23 indicates that either the TDS or Ec result, or both, are inaccurate. A sum of major ions yielded approximately 6089 mg/L, suggesting greater error in the TDS result than the Ec measurement. This data point has been classified as qualitative on this basis (coded with a "J"). UNRESOLVED.
619	PO ₄	1.22	mg/L H N	First and highest of five sampling rounds. 3.33 B.V. purged. Lot 4. UMTRA known 953 = 106%. Lab duplicate RPD = 9.0%. QCS = 96.0%. MS = 68% (slightly low-biased). UNRESOLVED.
620	Sb	0.205	mg/L L N	Second and highest of seven sampling rounds. Not detected in the previous round conducted in 9/86, and detected at concentrations of five to ten times lower in the five splits collected during the next round conducted in 4/89. 2.73 B.V. purged. "Water yellow-green tainted, no smell." Lot 5. UMTRA known 954 = 80.8%. Lab duplicate RPD = 3.1%. QCS = 95.0%. MS = 64% (biased low, or in the opposite direction of the anomaly). UNRESOLVED.
	As	0.049	mg/L L	Not greatly elevated, but higher than the finding of nondetect in the previous round (9/86), and higher than most subsequent data points. 2.73 B.V. purged. "Water yellow-green tainted, no smell." Lot 5. UMTRA known 954 = 110%. Lab duplicate RPD = 3.1%. QCS = 103%. MS = 76%. No lab blank reported. UNRESOLVED.

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**TABLE 2
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	Fe	<0.01 mg/L	L	As with other results for iron for this sampling round, the finding of nondetect is anomalous as iron was detected at concentrations of approximately 0.10 mg/L to 0.20 mg/L in five of the seven other rounds. 2.73 B.V. purged. "Water yellow-green tainted, no smell." Lot 5. UMTRA known 954 = 107%. Lab duplicate RPD = 0%. QCS = 111%. MS = 113%. UNRESOLVED.
621	Sb	0.205 mg/L		Second of two data points (<0.003 mg/L in 9/86). 3.53 B.V. purged. Water described as "milky yellow-green." Lot 5. QC same as 620 above. UNRESOLVED.
622	Sb	0.226 mg/L		Second of two data points (<0.003 mg/L in 9/86). 3.41 B.V. purged. Lot 5. QC same as 620 above. UNRESOLVED.
	Mg	2305 mg/L		Third and highest data point of three sampling rounds. Appears to represent the beginning of an upward trend. 3.41 B.V. purged. Lot 5. UMTRA known 954 = 101%. Lab duplicate RPD = 1.3%. QCS = 114%. MS = 104%. No lab blank reported. UNRESOLVED.
624	Sb	0.162 mg/L		Second and highest of six data points. 3.06 B.V. purged. "Water milky green-yellow...effervesces..." (see Table 3). Lot 5. QC same as 620 above. UNRESOLVED.
	Fe	1.01 mg/L		Elevated in comparison with the findings of nondetect or near nondetect in the three previous and three subsequent sampling rounds. 3.06 B.V. purged (see Table 3). Lot 5. QC same as 620 above. UNRESOLVED.
	Se	0.976 mg/L		Anomalously high in comparison with the low levels detected in the two previous rounds and three of the four subsequent rounds. Appears somewhat substantiated by the finding of 0.381 mg/L detected in 4/89. 3.06 B.V. purged. Lot 5. UMTRA known 954 = 94.7%. Lab duplicate RPD = 4.7%. QCS = 92.0%. MS = 84%. UNRESOLVED.
625	Se	0.764 mg/L		Second of only two data points for this location. No selenium was detected in the previous round,

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Review of Potential Anomalies/Qualified Data

				conducted in 10/85; thus, either data point could be considered "anomalous." 3.27 B.V. purged. Lot 5. QC same as 624 above. UNRESOLVED.
630	Mg	91.7	mg/L	Third of eight data points. Only half as great as that detected in the round conducted in 9/86, although appears validated by the finding of 95.2 mg/L reported for the next round (6/90). 3.08 B.V. purged. Lot 6. UMTRA known 955 = 93.6%. Lab duplicate RPD = 0.1%. QCS = 114%. MS = 111%. No lab blank reported. UNRESOLVED.
631	Fe	0.85	mg/L	Highest of three sampling rounds. 3.26 B.V. purged. Lot 6. UMTRA known 955 = 104%. Lab duplicate RPD = 0.08%. QCS = 107%. MS = 104%. No lab blank reported. UNRESOLVED.
632	Fe	0.17	mg/L	Lowest of four sampling rounds. 3.50 B.V. purged. Lot 6. QC same as 631 above. UNRESOLVED.
	Mo	<0.01	mg/L	The finding of nondetect is striking in light of the detection of this analyte at concentrations of approximately 0.15 mg/L in the previous and subsequent rounds. 3.50 B.V. purged. Lot 6. UMTRA known 955 = 96.7%. Lab duplicate RPD = 3.4%. QCS = 82.5% (a little low but still acceptable). MS = 90%. UNRESOLVED.
640	Se	0.325	mg/L	Second and highest of three data points. "Water milky." Purge volume not recorded (see Table 3). Lot 1. UMTRA known 950 = 108%. Lab duplicate RPD = 8.5%. QCS = 92.0%. MS = 76%. No lab blank reported. UNRESOLVED.
644	Mo	0.05	mg/L	Low in comparison to the findings of 0.50 mg/L and 0.31 mg/L detected in the previous and subsequent rounds, respectively. 10.87 B.V. purged. Lot 1. "Water yellow-green" (see Table 3). UMTRA known 950 = 125%. Lab duplicate RPD = 0%. QCS = 82.5%. MS = 94%. No lab blank reported. UNRESOLVED.
	NO ₃	5320	mg/L	Third and highest of five data points. In contrast to 608 above, this sample was apparently not reanalyzed for nitrate. See Table 3. Lot 1. Lab

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**TABLE 2
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				duplicate RPD = 0%. QCS = 102%. No MS analyzed/reported for Lot 1. UNRESOLVED.
647	Na	24.6	mg/L	Anomalously low in comparison with the two previous rounds and one subsequent round. 34.0 B.V. purged. "Water red and very dirty" (see Table 3). Lot 2. UMTRA known 951 = 103%. Lab duplicate RPD = 0.3%. QCS = 84.9%. MS = 95%. TDS also slightly low during this round. UNRESOLVED.
	SO ₄	114	mg/L	Low in comparison with that detected in the subsequent round (1610 mg/L in 4/89). See Table 3. Lot 2. UMTRA known 951 = 93.1%. Lab duplicate RPD = 1.3%. No QCS, MS analyzed/reported for sulfate. UNRESOLVED.
648	As	0.016	mg/L	Not detected four months earlier. Next round not conducted until 4/93. "Geothermal flowing well," purge volume not applicable (see Table 3). Lot 2. UMTRA known 951 = 98.0%. Lab duplicate RPD = 0%. QCS = 99.0%. MS = 92%. No lab blank reported for arsenic. UNRESOLVED.

General Comments - Sampling Round 8-9/87:

Six UMTRA knowns were submitted by UNC to Barringer during this round. With the exception of one or more recoveries of antimony, chloride, cadmium, potassium, and radium 228, all recoveries were within the acceptable range of 75% to 125%. The following data points have been qualified based upon UMTRA known recoveries outside the acceptable range (refer also to Table 4 for the direction of the potential bias).

- Sb - 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648
- Cl - 602, 603, 604, 607, 608, 609, 610
- Cd - 611, 612, 613, 614, 615, 616, 617, 619
- K - 602, 603, 604, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619
- Ra228 - 638, 639, 640, 641, 642, 643, 644, 645, 646, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632

Holding times were exceeded in the analysis of all samples in Lots 1, 2, 4, 5, and 6 for TDS. The analysis date for TDS was not provided in the QC data package for Lot 3 but was assumed

**SHIPROCK - SHP01
HISTORICAL DATA VALIDATION
TABLE 2**

Review of Potential Anomalies/Qualified Data

to be similar to the remaining five lots. All results for TDS have been classified as qualitative (each coded with an "H").

Holding times were exceeded by one or more days in the analysis of the following samples for ammonium and phosphate (each result coded with an "H").

NH₄ - 603, 604, 607, 620, 621, 622, 623, 624, 625, 629, 630, 631, 632

PO₄ - 642, 644, 645, 646, 647, 648, 602, 603, 604, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632

Holding times also were exceeded in the initial, first-time analysis of all samples in Lots 5 and 6 and samples 602, 603, 604, and 607 in Lot 3 for nitrate. Because all samples in Lots 3 and 5 were reanalyzed for nitrate in January 1988, well in excess of the 28-day holding time, and because these repeat results were the ones selected for entry into the database, all sample results for nitrate in Lots 3 and 5 have been classified as qualitative (coded with both an "H" and a "J"), in addition to all samples in Lot 6 (each coded with an "H").

Holding times also were exceeded in the analyses of selected samples in Lots 2 and 5 for chloride and for the repeat analyses of Lot 1, Lot 3, and Lot 6 samples for chloride; thus, these results have been classified as qualitative (each coded with an "H"). Because the repeat analyses for chloride for Lots 1, 3, and 6 were performed in January and February of 1988, well in excess of the 28-day holding time, these results have been additionally coded with a "J".

Cl - 620, 621, 622, 623, 624, 625 (H codes only)
602, 603, 604, 607, 608, 609, 610, 638, 639, 640, 641, 642, 643, 644, 645, 646, 629, 630, 631, 632 (H and J codes)

Antimony, selenium, and phosphate for this round appear high-biased, while data for iron appear low-biased. Neither the laboratory QC data nor the UMTRA known recoveries suggested analytical bias, however.

SAMPLING ROUND 11/87

(Barringer)

UMTRA knowns:

None

<u>Location</u>	<u>Analyte</u>	<u>Concentration</u>	<u>Code(s)</u>	<u>Comments</u>
632	Sb	0.043 mg/L		Third and highest of data points from three sampling rounds. Stands in sharp contrast to the finding of nondetect in the round conducted two months earlier. 3.24 B.V. purged. No UMTRA known analyzed, and no lab QC reported for antimony; consequently, data point cannot be validated. UNRESOLVED.

**SHIPROCK - SHP01
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TABLE 2**

Review of Potential Anomalies/Qualified Data

<p>PO₄ 8.9 mg/L</p>	<p>Only two other data points have been collected at this location. This result is significantly higher than that detected two months earlier (0.74 mg/L), and is contrasted by the finding of nondetect in 1986. Holding time met. Lab duplicate RPD = 1.1%. No other lab QC data reported for phosphate. UNRESOLVED.</p>
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General Comments - Sampling Round 11/87:

Only this one sample was collected during this sampling round. With minor exceptions, all lab QC data for general and site-specific COCs met validation acceptance criteria. A slightly low recovery of molybdenum was reported for the lab QCS (76.2% versus a lower recovery limit specified by the DVSOP of 80%), and a similarly low recovery of selenium was reported for the MS (72% versus a lower recovery limit of 75%). The results for molybdenum and selenium for this round have therefore been classified as qualitative (coded with a "J" and "N", respectively).

The analysis for TDS was performed 11 days from the date of collection, thereby exceeding the seven-day holding time by four days. This result has likewise been qualified (coded with an "H"). Holding times for all other COCs, including ammonium, phosphate, sulfate, and nitrate and metals, were met.

SAMPLING ROUND 1/88

(Barringer)

UMTRA knows:

None

<u>Location</u>	<u>Analyte</u>	<u>Concentration</u>	<u>Code(s)</u>	<u>Comments</u>
671	Cl	469 mg/L		First and highest of five data points. Nearly double that detected two months later (260 mg/L). UNRESOLVED.
	Mg	217 mg/L		First and highest of five data points extending over approximately two years. UNRESOLVED.
	NO ₃	141 mg/L		First and highest of five data points collected over a 15-month interval. The next highest concentration was only 2.0 mg/L detected in 5/88. UNRESOLVED.
	Na	1133 mg/L		First and highest of five data points. UNRESOLVED.
672	Ca	432 mg/L		Approximately double that detected in each of the four subsequent sampling rounds. UNRESOLVED.
	Mg	154 mg/L		First and highest of five data points extending over approximately two years. UNRESOLVED.

SHIPROCK - SHP01
HISTORICAL DATA VALIDATION

TABLE 2
Review of Potential Anomalies/Qualified Data

General Comments - Sampling Round 1/88:

As with the next two sampling rounds (3/88 and 5/88), only locations 670, 671, and 672 were sampled, and only for a subset of the parameters normally targeted. No UMTRA knowns were analyzed, and no lab QC data were provided. Consequently, these data points could not be validated.

Repeat analyses of the three samples for uranium were performed. The analytical findings of both the first and second analyses of each of the three samples were in close agreement with one another.

SAMPLING ROUND 3/88

(Barringer)

UMTRA knowns:

None

<u>Location</u>	<u>Analyte</u>	<u>Concentration</u>	<u>Code(s)</u>	<u>Comments</u>
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671	Se	0.210 mg/L	L	
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				Approximately five to ten times higher than that detected in the one previous and three subsequent rounds. 2.50 B.V. purged (logs indicated that one gallon was purged). Lab duplicate RPD = 0%. QCS = 100%. MS, lab blank not performed/reported for selenium. UNRESOLVED.
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General Comments - Sampling Round 3/88:

Samples from locations 670, 671, and 672 were collected during this round and analyzed for a subset of the analytes routinely targeted. All lab QC data which was reported met validation acceptance criteria.

Because samples were collected on 3/31/88 and analyzed for TDS on 4/7/88, the holding time of seven days was assumed to have been met. Holding times for sulfate, ammonium, and phosphate, as well as all for all metals analyses, were met.

Repeat analyses for nitrate were performed on 5/18/88, or 49 days from the date of collection (21 days in excess of the acceptable holding time). Because these results were the ones which had been entered into the database, each was qualified with an "H".

SAMPLING ROUND 5/88

(Barringer)

UMTRA knowns:

None

General Comments - Sampling Round 5/88:

No lab QC data for this round could be located in the files. The three samples collected during this round (670, 671, and 672) were analyzed for only a subset of those analytes usually targeted.

**SHIPROCK - SHP01
HISTORICAL DATA VALIDATION
TABLE 2**

Review of Potential Anomalies/Qualified Data

Because the three samples were received by the lab on 6/2/88 and were sampled on 5/17/88, holding times for TDS were exceeded by at least 16 days. Thus, these results have been classified as qualitative (each coded with an "H"). All other holding times were assumed to have been met.

SAMPLING ROUND 10/88

(Barringer)

UMTRA knowns:

950 (Lot 1), 951 (Lot 2)

<u>Location</u>	<u>Analyte</u>	<u>Concentration</u>	<u>Code(s)</u>	<u>Comments</u>
614	Mo	0.23 mg/L		Elevated in comparison to the finding of 0.02 mg/L detected in 9/87. 3.11 B.V. purged. Lot 1. UMTRA known 950 = 100%. No lab QC data were provided for Lot 1. UNRESOLVED.
	Se	0.430 mg/L		One of two relatively high concentrations detected at this location. 3.11 B.V. purged. Lot 1. UMTRA known 950 = 121%. UNRESOLVED.
	K	933 mg/L		Anomalously high. Greater by a factor of ten than the results reported for the two previous and seven subsequent rounds. Misreporting by the lab is a possibility. Because potassium is a "spectator" ion, no effect on pH would be expected by potassium alone. The anions of several potassium salts are also spectator ions which would have no effect on pH. No significant increase in chloride was noted; some increase in Ec and TDS relative to the closest previous and subsequent rounds was reported. 3.11 B.V. purged. Lot 1. UMTRA known 950 = 109%. UNRESOLVED.
618	As	0.03 mg/L		Five times higher than that detected in the round conducted in 9/87 (0.006 mg/L). 3.11 B.V. purged. Lot 1. UMTRA known 950 = 100%. UNRESOLVED.
641	Alk	2325 mg/L		Fourth and highest of five data points collected over a two-year interval. 26.30 B.V. purged. Second titration yielded 2329 mg/L and thus provides confirmation for this result. pH not particularly elevated in comparison with historical values. 26.30 B.V. purged. UNRESOLVED.
	As	0.32 mg/L		This data point is much higher than any of the three previous or one subsequent data points. 26.30 B.V.

SHIPROCK - SHP01
 HISTORICAL DATA VALIDATION

TABLE 2
 Review of Potential Anomalies/Qualified Data

				<p>purged. Lot 1. UMTRA known 950 = 100%. UNRESOLVED.</p>
	K	97.7	mg/L	<p>Two to three times higher than the three previous and one subsequent rounds. Increases in related parameters such as Ec, TDS, chloride were noted. 26.30 B.V. purged. Lot 1. UMTRA known 950 = 109%. See discussion for 614 above. UNRESOLVED.</p>
	Se	1.67	mg/L	<p>Fourth and highest of five data points. Much higher than the findings of 0.577 mg/L detected in 9/87 and 0.105 mg/L detected in 4/89. 26.30 B.V. purged. Lot 1. UMTRA known 950 = 121%. UNRESOLVED.</p>
	Ec	27,500	umhos/cm	<p>Fourth and highest of five data points. Over four times greater than that measured in the previous round (6000 umhos/cm in 9/87) and nearly three times greater than that measured in the subsequent round (10,000 umhos/cm in 4/89). 26.30 B.V. purged. A check of field logs confirmed the accuracy of this value. Elevated concentrations of chloride, sodium, magnesium, sulfate, and TDS provide support for the accuracy of this finding. UNRESOLVED.</p>
646	As	0.02	mg/L L	<p>Higher than the three previous data points, and not detected in the one subsequent round. Less than three B.V. purged due to slow recharge (see Table 3). Lot 1. UMTRA known 950 = 100%. UNRESOLVED.</p>
	NO ₃	240	mg/L L	<p>Approximately ten to 20 times higher than that detected in the three previous rounds and one subsequent round. See Table 3. Lot 1. UMTRA known 950 = 107%. UNRESOLVED.</p>
670	As	0.02	mg/L	<p>Slightly higher than in the three previous rounds. Not detected in the subsequent round conducted in 4/89. Lot 1. 32.00 B.V. purged. UMTRA known 950 = 100%. UNRESOLVED.</p>
672	As	0.02	mg/L L	<p>Approximately ten times greater than that detected in the three previous rounds. Not detected in the 4/89 sampling round. Less than three B.V. purged (see Table 3). Lot 1. UMTRA known 950 = 100%. UNRESOLVED.</p>

**SHIPROCK - SHP01
HISTORICAL DATA VALIDATION
TABLE 2**

Review of Potential Anomalies/Qualified Data

General Comments - Sampling Round 10/88:

No lab QC data were provided for Lot 1; thus, sample results were evaluated based upon UMTRA known recoveries only. No holding times could be evaluated. High analytical bias in the results for arsenic for this round is possible but can't be proven.

QC data for Lot 2, applicable to surface water samples, were reviewed to confirm that the analytical systems were in control for the general time period in which Lot 1 samples were analyzed. All lab duplicate RPDs and lab QCS and MS recoveries were acceptable.

SAMPLING ROUND 4/89

(Barringer)

UMTRA knowns:

649, 950, 952, 953

<u>Location</u>	<u>Analyte</u>	<u>Concentration</u>	<u>Code(s)</u>	<u>Comments</u>
603	NO ₃	5.3 mg/L	H	Similar to the finding of 4.0 mg/L detected in 10/85, but very low in comparison to that detected in 9/87 (120 mg/L) and in 6/90 (106 mg/L). No purge volume indicated. Lot 2. UMTRA known 649 = 113%. Holding time exceeded by eight days. Lab duplicate RPD = 1.2%. QCS = 105%. MS = 106%. UNRESOLVED.
608	Cd	0.018 mg/L		Not detected in the three previous rounds nor in three of the six subsequent rounds. 3.10 B.V. purged. Lot 1. Lab duplicate RPD = 7%. QCS = 92%. MS = 108%. UNRESOLVED.
615	Cd	0.013 mg/L		Not detected in the two previous rounds nor in four of the six subsequent rounds. 3.21 B.V. purged. Lot 1. QC same as 608 above. UNRESOLVED.
	SO ₄	6230 mg/L	H	Low in comparison with the two previous and five subsequent data points. Parallel drop in sodium but an increase, rather than a decrease (as would be expected), in TDS. Significant change in pH would not be expected and was not observed. See Table 3. Lot 1. UMTRA known 950 = 101%. Holding time exceeded by four days. Lab duplicate RPD = 1.4%. QCS = 103%. MS not performed for sulfate. UNRESOLVED.
619	Cd	0.020 mg/L		Not detected in the two previous nor three subsequent rounds. 3.02 B.V. purged. "Yellowish color." Lot 2. UMTRA known 649 = 109%. Lab

SHIPROCK - SHP01
HISTORICAL DATA VALIDATION
TABLE 2

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Review of Potential Anomalies/Qualified Data

				duplicate RPD = 7.0%. QCS = 92%. MS = 108%. UNRESOLVED.
	Se	0.456	mg/L	Highest of eight sampling rounds; somewhat substantiated by the finding of 0.372 mg/L detected in the previous round (9/87). See Table 3. Lot 2. UMTRA known 649 = 108%. Lab duplicate RPD = 4%. QCS = 96%. MS = 84%. UNRESOLVED.
620	Cd	0.015	mg/L	Not detected in the three previous nor four of the five subsequent rounds. Splits collected from this location (662 through 665). 3.06 B.V. purged. Lot 2. QC same as 619 above. UNRESOLVED.
624	Alk	1374	mg/L	Not greatly elevated, but the highest of seven data points. Second titration yielded 1375 mg/L and thus lends validity to this result. No significant change in pH over historical values. 3.15 B.V. purged. "Water has yellowish tint -- no odor." UNRESOLVED.
	Cd	0.013	mg/L	Not detected in the three previous rounds nor in two of the three subsequent rounds. 3.15 B.V. purged. Lot 2. QC same as 619 above. UNRESOLVED.
639	Fe	27.0	mg/L	Significantly higher than the detection of 11.7 mg/L in 10/88. Detected at concentrations of ranging from 0.09 mg/L in 3/87 to 3.80 mg/L in 9/87. Ionized iron will yield slightly acidic solutions; very slight drop in pH was observed during this round as compared with all previous measurements. 8.33 B.V. purged (see Table 3 for comments). Lot 4. UMTRA known 953 = 105%. Lab duplicate RPD = 5.1%. QCS = 101%. MS = 98%. UNRESOLVED.
641	Alk	1042	mg/L	Fifth of five data points collected over a two-year interval. Less than one-half that detected in the previous round (2325 mg/L in 10/88). Second titration yielded 1047 mg/L and thus supports this result (see Table 3 for field measurements and comments regarding this location). A decrease in pH would have been expected but was not observed. No change in calcium. UNRESOLVED.
	Mn	2.31	mg/L	Low in comparison with the findings of approximately 11 mg/L detected in the two previous rounds. 6.52 B.V. purged. Lot 3. UMTRA known 952 = 101%.

SHIPROCK - SHP01
HISTORICAL DATA VALIDATION
TABLE 2

Review of Potential Anomalies/Qualified Data

				Lab duplicate RPD = 0%. QCS = 99.5%. MS = 98%. UNRESOLVED.
643	Fe	89.0	mg/L	This data point is anomalously high in comparison to the findings of 0.37 mg/L and 0.02 mg/L in 3/87 and 9/87, respectively. 8.54 B.V. purged ("well point"). Solutions containing ionized iron will, in the absence of other solutes, yield slightly acidic solutions, and a slight decrease in pH was observed for this round in comparison with past measurements. Field logs did not indicate that water appeared rusty. Lot 3. UMTRA known 952 = 99.3%. Lab duplicate RPD = 0%. QCS = 98.5%. MS = 94%. UNRESOLVED.
644	Mo	<0.01	mg/L [J]	Low in comparison with the detection of 0.31 mg/L reported for the 10/88 sampling round. 8.36 B.V. purged ("well point"). Lot 3. UMTRA known 952 = 96.4%. Lab duplicate RPD = 0%. QCS = 98.5%. MS = 100%. UNRESOLVED.
645	Mg	126	mg/L	Fourth and highest of four data points, the remaining three of which were approximately five times lower. Lot 1. See Table 3 for field measurements and other pertinent information. UMTRA known 950 = 101%. Lab duplicate RPD = 0%. QCS = 100%. MS = 98%. UNRESOLVED.
	NO ₃	270	mg/L H	Anomalously high in comparison with the previous findings of <0.1 mg/L in 3/87, 2.2 mg/L in 5/87, and 7.1 mg/L in 9/87. Lot 1. See Table 3. UMTRA known 950 = 107%. Holding time exceeded by 11 days. Lab duplicate RPD = 0%. QCS = 105%. MS = 97%. UNRESOLVED.
	TDS	2850	mg/L H J	Anomalously high in comparison with the three previous rounds. Appears correlated with sulfate and sodium. Lot 1. UMTRA known 950 = 98%. Holding time exceeded by 32 days (data point is of questionable validity). Conductivity of 750 umhos/cm is at odds with this TDS result. A sum of major ions yielded approximately 5400 mg/L, suggesting some inaccuracy in both the TDS and Ec results. It is possible that the conductivity meter was reading in tenths of umhos. As a precaution, the conductivity result has been classified as unusable (coded with an "R"). Lab duplicate RPD = 4.2%.

**SHIPROCK - SHP01
HISTORICAL DATA VALIDATION**

**TABLE 2
Review of Potential Anomalies/Qualified Data**

				QCS = 98.3%. MS not performed for TDS. UNRESOLVED.
646	Fe	5.89	mg/L	High in comparison to the findings of nondetect or near-nondetect in the four previous rounds. Purge volume not indicated. ("Six inches of water but recharge should allow for sampling.") Lot 1. UMTRA known 950 = 96.3%. Lab duplicate RPD = 0%. QCS = 102%. MS = 95%. UNRESOLVED.
647	Cl	100	mg/L L	Fourth and highest of four sampling rounds. 2.00 B.V. purged (no explanation provided; poor recharge assumed). 2.00 B.V. purged. Lot 1. UMTRA known 950 = 115%. Lab duplicate RPD = 0%. QCS = 99.0%. MS = 105%. UNRESOLVED.
	Fe	5.49	mg/L L	Highest of four sampling rounds. Only low levels (ranging from 0.04 mg/L to 0.08 mg/L) were detected in samples and/or splits from the three previous rounds. 2.00 B.V. purged (no explanation provided; poor recharge assumed). Lot 1. QC same as 646 above. UNRESOLVED.
	Mg	167	mg/L L	Higher by a factor of ten than that detected in two of the previous rounds; comparable to the finding of 124 mg/L detected in 3/87. 2.00 B.V. purged. Lot 1. QC same as 645 above. UNRESOLVED.
	SO₄	1610	mg/L L H	Elevated in comparison with the previous round, in which 114 mg/L were detected (9/87). Concomitant increase in TDS detected. 2.00 B.V. purged. Lot 1. UMTRA known 950 = 101%. Holding time exceeded by five days. Lab duplicate RPD = 1.4%. QCS = 103%. MS not performed for sulfate. UNRESOLVED.

General Comments - Sampling Round 4/89:

Laboratory QC data, including duplicate results and QCS and MS percent recoveries, were provided for each of the four lots of samples. With three minor exceptions, all of the QC data met validation acceptance criteria. Slightly low recoveries were reported for the MS for selenium associated with Lots 1 and 3 (both 74% -- possibly the same MS analysis being applied to both lots), while a similarly low MS recovery of arsenic (72%) was reported in association with Lot 4. Thus, the following data points have been qualified (each coded with an "N").

**SHIPROCK - SHP01
HISTORICAL DATA VALIDATION
TABLE 2**

Review of Potential Anomalies/Qualified Data

Se -	645, 646, 647, 608, 610, 612, 614, 615, 616, 617, 600, 601, 602, 629, 640, 641, 642, 643, 644
As -	638, 639, 670, 671, 672

High analytical bias in the results for cadmium and iron for this round is a possibility but was not suggested from the laboratory QC data which were provided.

Reanalyses of samples for selected analytes were performed at the request of the data reviewer when either the UMTRA known recovery was erroneously high or low (as in the case of strontium, selenium, and/or antimony in one or more of the four lots) or when the cation/anion balance was not acceptable (as in the case of COCs such as sulfate, magnesium, and/or sodium in one or more of the four lots). Because all samples associated with erroneous UMTRA known recoveries were reanalyzed in association with the reanalysis and acceptable recoveries of the UMTRA knowns and because the 180-day holding times were met, no qualification of sample data were necessary.

Repeat analyses for major ions were conducted not because of erroneous UMTRA known recoveries but instead in an attempt to obtain acceptable cation/anion balances. When the repeat analyses were conducted in excess of the acceptable holding time and were the values chosen to enter into the database, the results were coded with an "H", as indicated below.

SO₄ - 608, 610, 615, 616, 617, 633, 629, 640, 641, 643, 639

Note that the reanalyses performed for sulfate were not accompanied by laboratory QC data. The lab QC data which were reported were for the initial analyses which were not entered into the database. Because the sulfate results for both the initial and repeat analyses were generally in agreement, the lab QC data which were provided can be assumed to provide general confirmation of the accuracy and precision of the analytical method being used.

The following results for sulfate were generated by the initial, one-time analysis of the samples which were nevertheless performed in excess of the 28-day holding time. Each result has been coded with an "H".

SO₄ - 603, 619, 620, 624, 626, 628, 645, 646, 647, 612, 614

Analysis of all samples for TDS was performed well in excess of the seven-day maximum holding time. Thus, sample results for TDS for all samples in all four lots have been coded with an "H". In addition, due to the fact these analyses were performed at least six days or more in excess of the holding time limit, all results have been additionally coded with a "J".

TDS - ALL

**SHIPROCK - SHP01
HISTORICAL DATA VALIDATION**

**TABLE 2
Review of Potential Anomalies/Qualified Data**

SAMPLING ROUND 5-6/90

(Barringer)

UMTRA knowns:

649, 650

<u>Location</u>	<u>Analyte</u>	<u>Concentration</u>	<u>Code(s)</u>	<u>Comments</u>
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610	Sb	<0.1 mg/L		Detection limit is elevated relative to previous and subsequent detection limits. All samples from this lot were reanalyzed for antimony due to an elevated recovery of UMTRA known 650 (174%) in the initial analysis, performed in June 1990. This result represents the third analysis of this sample by the lab performed in October 1990 (the first two results were 0.024 mg/L and 0.004 mg/L analyzed in June and August 1990, respectively). The UMTRA known was reanalyzed for antimony in August 1990, with an acceptable recovery of 118% reported; however, it was not reanalyzed in October, when this sample result was generated; consequently, neither the initial nor repeat analysis of the UMTRA known is directly applicable to this data point. Similarly, although all lab QC data were acceptable, all were generated in June 1990, in association with the result of 0.024 mg/L, which was rejected. UNRESOLVED.
615	NO ₃	400 mg/L		Anomalously low in comparison to the concentrations detected in the three previous and four subsequent rounds. 2.80 B.V. purged. Lot 1. UMTRA known 650 = 108%. Holding time of 28 days met. Lab duplicate RPD = 0%. QCS = 105%. MS = 110%. UNRESOLVED.
619	NO ₃	10 mg/L		Anomalously low. Concentrations of 750 mg/L to 1600 mg/L were detected in the three previous rounds, while concentrations of 320 mg/L to 389 mg/L were detected in the three subsequent rounds. 5.41 B.V. purged. Lot 1. Lab data confirms correct data entry. QC same as 615 above. UNRESOLVED.

General Comments - Sampling Round 5-6/90:

As most of the samples included in Lot 2 were for SHP02, rather than SHP01, UMTRA known 649 was not entered into the SHP01 database. The theoretical knowns were located in the files, however, and the recoveries calculated as indicated in Table 3.

**SHIPROCK - SHP01
HISTORICAL DATA VALIDATION
TABLE 2**

Review of Potential Anomalies/Qualified Data

Samples 600, 601, 602, and 603 were collected from the tailings area (SHP02). Area SHP01 also has locations identified as 601, 602, and 603, and inadvertently, sample results for location 603, collected from the tailings area, had been entered into the database for both SHP02 and SHP01. Location 603 from area SHP01 was not sampled during this round. Thus, the data which had been entered for this location for SHP01, most of which was strikingly different from previous data, was removed from the database and retained only for SHP02.

All laboratory QC data reported for Lots 1 and 2 were acceptable. All samples in Lot 1 and sample 628 from Lot 2 were reanalyzed for sulfate in October 1990, due to a recovery of 52.6% for UMTRA known 650. As the recovery of sulfate in the reanalysis of sample 650 was 91.9%, the results from the repeat analyses were selected for entry into the database. However, because the reanalyses were performed well in excess of the 28-day holding time, each of these results, indicated below, has been coded with both an "H" and a "J".

SO₄ - 608, 610, 614, 615, 616, 617, 619, 620, 628

Repeat analyses of all samples in Lot 1 were performed for antimony, due to an initial recovery of 174% in the analysis of UMTRA known 650 performed in June 1990. Because all samples in Lot 1 were reanalyzed in August 1990, when an acceptable recovery of 118% was generated for sample 650 and because the 180-day holding time was met, none of the results for antimony required qualification.

SAMPLING ROUND 10/90

(CORE)

UMTRA knowns:

649 (Lot 1), 650 (Lot 2)

Location Analyte Concentration Code(s)

Comments

615 Mo 0.36 mg/L L

Relatively high in comparison with the low levels detected in the four previous and three subsequent rounds. 2.50 B.V. purged (no explanation provided). Lot 1. UMTRA known 649 = 98.3%. Analyses for molybdenum were performed on 10/27/90 (QC batch 213629) and 11/5/90 (QC batch 214065). All QC data were acceptable. In contrast to CORE data reviewed for other sites, analysis of PDS samples were performed/reported only for one or two samples representative of the analytical batch, rather than for all samples in the batch. The lab provided no cross-references between samples and corresponding QC batches and, thus, there was no way to determine which of the two sets of QC data corresponded to the analysis of this particular sample. However, because all QC data, including PDS recoveries, were acceptable, this sample result and all others for

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				molybdenum did not require qualification. UNRESOLVED.
Ni	0.40	mg/L	L	One order of magnitude greater than that detected in the three previous and two subsequent sampling rounds. 2.50 B.V. purged. Lot 1. UMTRA known 649 = 100%. QC data reported for batches 213632 and 214067 were acceptable. Check of lab data confirms this data point was correctly entered into the database. UNRESOLVED.
Ec	2000	umhos/cm	L R	Anomalously low. 2.50 B.V. purged. No notable comments had been recorded on any of the field logs; however, it is considered likely that the instrument setting was off by a factor of ten or that the value was misrecorded by the field samplers. Although no evidence exists which clearly indicates an error in this measurement, the TDS concentration of 28,600 mg/L did not reflect a comparable decrease but instead was the highest of eight data points. Similarly, concentrations of chloride, sodium, and potassium were essentially the same as all previous and subsequent data points but would have been expected to have sharply decreased (a sum of these and other major ions yielded approximately 27,600 mg/L). Thus, this data point has been classified as unusable. RESOLVED.
619	NH ₄	273	mg/L	Greater by a factor of five to ten than that detected in the four previous or one subsequent sampling rounds. 3.21 B.V. purged. "Yellow tainted." Lot 1. UMTRA known 649 = 101%. QC data reported for batches 214044 and 214048 acceptable. Acting alone, ammonium ions would be expected to slightly lower the pH of a solution; however, no significant decrease in pH was noted. UNRESOLVED.

General Comments - Sampling Round 10/90:

The results for UMTRA known 650, associated with Lot 2 samples, had been entered into the database for SHP01 as "duplicate knowns" (DKs) for UMTRA known 649, associated with Lot 1 samples. These results likely were entered in this way because the site identification for 650 was given in the field logs and in the lab data package as "SHP02".

As discussed for molybdenum for sample 615, lab QC data for multiple batches could not be matched with specific samples as no cross-references between samples and QC batch numbers

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were provided by the lab. Post-digestion spikes were analyzed only for one or two samples for each QC batch, and often, the PDS recoveries which were reported were for samples unrelated to this project. However, all lab QC data were acceptable in all instances, and, thus, no qualification to any of the data was necessary.

Only one set of QC data were reported for TDS, with the date of analysis given as 10/24/90. Because all samples are assumed to have been analyzed on this date and because samples were collected on 10/7/90 through 10/12/90, all sample results for TDS are assumed to have been generated in excess of the maximum holding time of seven days. Thus, all sample results for Lots 1 and 2 have been coded with an "H", as indicated below.

TDS - 608, 610, 614, 615, 616, 617, 619, 624, 626, 628, 630

Similarly, only one set of QC data were provided for ammonium, nitrate, and chloride. Sample results which were assumed to have been performed in association with these QC batches were coded with an "H" when the holding time of 28 days was exceeded. The following sample results have thus been qualified.

NH₄ - 608, 610, 614

NO₃ - 608, 610, 614

Cl - 608, 610, 614, 615, 616, 617, 619, 624

Repeat analyses of UMTRA known 650 for sulfate and radium 228 and samples 617, 619, 630, and 650 for calcium, chloride, magnesium, and sodium (to obtain acceptable cation/anion balances) were performed. These repeat analyses for sulfate and chloride were performed well in excess of the acceptable holding time limit of 28 days from the date of collection; thus, in addition to the sample result indicated above, the following results for chloride have also been coded with an "H").

Cl - 617, 619, 630

Note that, because no lab QC data were provided for any of these repeat analyses and the repeat analyses were the ones selected for entry into the database, the acceptable QC data reported for calcium, chloride, magnesium, and/or sodium for samples 617, 619, and 630, as well as the acceptable UMTRA known recoveries, are not applicable.

Elevated detection limits in comparison with previous data were reported for arsenic. This is likely due to a more conservative approach to the reporting of data by this lab (CORE) as compared with the previous lab (EDA/Barringer).

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SAMPLING ROUND 5/91

(CORE)

UMTRA knowns:

650

<u>Location</u>	<u>Analyte</u>	<u>Concentration</u>	<u>Code(s)</u>	<u>Comments</u>
608	Ra228	8.4±3.1 pCi/L	J	Moderately elevated relative to the five previous rounds and two subsequent rounds. 3.00 B.V. purged. A single lot of samples for this round assumed. UMTRA known 650 = 69.5% (low biased). Lab QC reported for batch 113539 acceptable. UNRESOLVED.
614	Se	0.5750 mg/L	W	One of two data points which appear elevated relative to the remaining seven data points. 3.10 B.V. purged. UMTRA known 650 = 86.7%. With one minor exception, lab QC reported for batch 224355 acceptable. This sample was used for post-digestion spike analysis, with a recovery of 75% reported (less than the 85% minimum specified by the DVSOP). UNRESOLVED.
619	Cl	1300 mg/L		Sixth and highest of seven data points. 3.21 B.V. purged. UMTRA known 649 = 110%. Lab QC reported for batches 224069, 224070, and 224136 acceptable. UNRESOLVED.
624	NO ₃	77.0 mg/L		Sixth and lowest of seven data points. 3.02 B.V. purged. UMTRA known 650 = 100%. Lab QC reported for batch 224028 acceptable. UNRESOLVED.
626	Ra228	14.1±2.7 pCi/L	J	Statistically higher than that detected in all other rounds. 3.10 B.V. purged. See 608 above. UNRESOLVED.
	Ec	8940 umhos/cm		Nearly double that detected in previous and subsequent rounds. 3.10 B.V. purged. Sodium and chloride also were elevated during this round relative to previous and subsequent data. TDS of 8720 mg/L yields a ratio of TDS to Ec of 0.96, or within the predicted range of 0.5 to 0.9. UNRESOLVED.
628	Ra228	14.1±2.7 pCi/L	J	Statistically higher than that detected in all other rounds. See 608 above. UNRESOLVED.

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630	Mg	64.8	mg/L	J	Sixth and lowest of eight data points. Somewhat validated by the finding of 84.2 mg/L detected in 10/90 but much lower than the 210 mg/L detected in 9/92. 3.02 B.V. purged. UMTRA known 650 = 104%. With minor exceptions, lab QC reported for batches 224107, 224108, 224254, and 224255 acceptable. For batch 224107, the recovery of one of four CCVs (80%) was less than the 90% minimum, suggesting a possible negative bias to the data. Because the lab did not provide any cross-reference between samples and lab QC batches, the results of this batch and the remaining three were used to evaluate all data for magnesium (as was done for all other COCs when multiple QC batch results were reported). Although the DVSOP states that instruments should be recalibrated in the case of an ICV or CCV not falling within the 90% to 110% acceptable range, there was no way of confirming that this was done, despite the reporting of multiple QC batch results. Thus, this sample result has been coded with a "J" to indicate the potential for a slight negative bias. The actual concentration may be slightly higher than reported. UNRESOLVED.
	NO ₃	265	mg/L		Sixth and highest of eight data points. Elevated relative to the findings of 31 mg/L reported for the previous round (10/90) and 100 mg/L reported for the next round (9/92). 3.02 B.V. purged. See 624 above. UNRESOLVED.
	Ra228	14.1±2.7	pCi/L	J	Statistically higher than that detected in all other rounds. 3.02 B.V. purged. See 608 above. UNRESOLVED.

General Comments - Sampling Round 5/91:

With two exceptions, the recoveries of all analytes in the analysis of UMTRA known 650 were acceptable. An elevated recovery was reported for radium 226 (181%), while a low recovery was reported for radium 228 (69.5%). After taking uncertainty into account, all sample results for radium 226 were essentially nondetects and, thus, the positive bias exhibited by the UMTRA known recovery did not have any apparent impact on the sample findings. These results have therefore not been qualified. In contrast, all sample results for radium 228, including the low levels or findings of nondetect, potentially could have been affected by the negative bias exhibited by the UMTRA known recovery. Therefore, in addition to the data points listed individually above, all remaining sample results for radium 228 have been coded with a "J".

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Ra228 - 610, 614, 615, 616, 617, 619, 620, 624

As noted in 608 above, for many analytes, QC data for two or more analytical batches were reported, with no cross-references provided which would have allowed matching individual samples with specific analytical batches. Thus, when more than one set of QC data were provided for a particular analyte, all sets of QC data were used to validate all sample results for that analyte.

One or more sets of QC data for only one date were provided for ammonium, nitrate, chloride, and sulfate, implying that all of the samples were analyzed for these particular analytes on the indicated date and allowing a reasonable determination of holding times. The following sample results have been coded with an "H" to indicate that the maximum analytical holding time was exceeded.

SO₄ - 616, 617, 619, 620, 624, 626, 628, 630

As noted for magnesium for 630 above, several sets of QC data listed CCVs with recoveries of less than the 90% minimum. According to the DVSOP and the majority of lab SOPs, whenever an ICV or CCV is not within the specified range (for all COCs for this site, 90% to 110%), the instrument should be recalibrated and any samples reanalyzed. There was no way of determining whether this was done or not. Thus, only the single data point for magnesium for sample 630, cited as anomalously low, was qualified due to the error reported for the CCV.

In contrast to CORE data reviewed for other sites, post-digestion spikes were not performed/reported for all samples for this round but instead were reported only for one or two representative samples. The DVSOP allows professional judgement in the evaluation of PDS recoveries; thus, the decision was made to qualify only the specific sample results for which low or high PDS recoveries were reported, rather than applying the recoveries to all other samples in the lot. The following sample results have been coded with a "W" to indicate that the PDS recovery reported for that particular sample was not within the acceptable range of 85% to 115%.

Sb - 630

As - 616

Cd - 610, 614

Mo - 617

Se - 616, 630

Sr - 617

The result for strontium for sample 617 was reported as 6.22 mg/L and, for the aliquot used to perform the PDS analysis, 6.65 mg/L. Because the spiking level was only 1.00 mg/L and a recovery of only 15% was reported, reanalysis by the method of standard additions should have

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been performed but wasn't. This sample result has thus been additionally qualified with a "J" to indicate that the value is not quantitative.

A similarly low PDS recovery of 18% was reported for manganese in the analysis of this same sample. The laboratory should have diluted this sample and reanalyzed it, repeating this process as many times as necessary to achieve a PDS recovery of 40% or better. Because no manganese was detected in sample 617 and the spike recovery is particularly low, this sample result has been coded with an "R", as the absence of manganese was not clearly established.

SAMPLING ROUND 9/92

(Field data only)

<u>Location</u>	<u>Analyte</u>	<u>Concentration</u>	<u>Code(s)</u>	<u>Comments</u>
608	Ec	19,500 umhos/cm		Seventh and highest of nine sampling rounds, although not greatly elevated over more recent and subsequent rounds. Field logs confirm that this value was correctly entered into the database. TDS also exhibited a slight increase. UNRESOLVED.

SAMPLING ROUND 2/93

(Field data only)

<u>Location</u>	<u>Analyte</u>	<u>Concentration</u>	<u>Code(s)</u>	<u>Comments</u>
626	Ec	3220 umhos/cm		Eighth and lowest of eight data points. Field logs confirm that this value was correctly entered into the database. TDS exhibited a similar decrease, as did sodium, potassium, and chloride. UNRESOLVED.

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Sampling Date	Location	Bore Volumes Purged	pH (S.U.)	Ec (umhos/cm)	Alk (mg/L CaCO3)	Alk (mg/L CaCO3)	Lot	Shipping Date	Comments
10/12/83	DM-9	4.0	6.8	16090	2095	--	--	10/12/83	
10/12/83	SHB-3H	3.0	6.6	17500	1340	--	--	10/12/83	
10/12/83	DM-7	1.0	7.4	16000	410	--	--	10/12/83	
10/12/83	DM-6	--	6.6	13000	795	--	--	10/12/83	Ten gallons withdrawn.
10/13/83	DM-3	1.6	6.5	30700	1660	--	--	10/13/83	
10/12/83	SHB-6GT	4.0	6.3	24900	450	--	--	10/12/83	
10/10/83	SHB-9GT	5.3	--	--	460	--	--	10/11/83	
10/10/83	SHB-10GT	3.0	6.9	26700	340	--	--	10/10/83	
10/10/83	DM-4	--	6.9	18000	1600	--	--	10/12/83	Twenty-one gallons withdrawn.
10/10/83	DM-3A	2.0	7.2	14500	950	--	--	10/11/83	
10/11/83	DM-2	--	6.6	15500	1800	--	--	10/12/83	Twelve gallons withdrawn.
10/11/83	DM-5	1.5	6.8	21100	2200	--	--	10/12/83	
10/12/83	SHB-1H	--	10.2	12000	235	--	--	10/12/83	"Bailed for sample."
10/11/83	5-GT	--	8.7	16200	785	--	--	10/12/83	Ten gallons withdrawn. "Foamy liquid. Very hard to filter."
10/11/83	SHB-4H	3.2	7.2	23000	775	--	--	10/12/83	
10/11/83	DM-12A	--	6.9	16000	1560	--	--	10/12/83	Twenty-four gallons withdrawn.
10/12/83	DM-1	--	6.8	12000	1500	--	--	10/12/83	Ten gallons withdrawn.
10/12/83	DM-11	--	6.8	10500	1420	--	--	10/12/83	Fourteen gallons withdrawn.
10/12/83	DM-8	--	7.0	11200	710	--	--	10/12/83	Twenty-two gallons withdrawn.
9/23/83	SHB-10GT	--	--	--	460	--	--	9/25/83	Seven gallons withdrawn. "pH questionable - varies." "10/17/83 - Bendix sample incorrectly acidified."
9/23/83	SHB-9GT	--	--	--	500	--	--	--	Ten gallons withdrawn. "10/17/83 - Bendix sample incorrectly acidified."
9/23/83	SHB-3H	--	--	--	1480	1660	--	--	Ten gallons withdrawn. "10/17/83 - Bendix sample incorrectly acidified."
9/23/83	SHB-5GT	--	8.4	15200	606	540	--	--	Nine gallons withdrawn. "10/17/83 - Bendix sample incorrectly acidified." "Filter plugs up quickly with slimy material -- about 1/2 liter per filter change."
9/23/83	DM-12A	--	--	--	--	--	--	--	Eleven gallons withdrawn.
10/16/84	601	10.5	7.4	675	143	--	--	10/17/84	Site I.D. given as "SHP03."
10/16/84	602	16.3	6.9	7120	309	--	--	10/17/84	Site I.D. given as "SHP03."
10/16/84	603	15.6	7.4	14850	1170	--	--	10/17/84	Site I.D. given as "SHP03."
10/16/84	604	31.3	7.4	11280	447	--	--	10/17/84	Site I.D. given as "SHP03."
10/16/84	605	11.8	7.2	7470	248	--	--	10/17/84	Site I.D. given as "SHP03."
10/16/84	606	6.7	7.1	7490	191	--	--	10/17/84	Site I.D. given as "SHP03."
10/16/84	607	15.6	6.8	17320	2034	--	--	10/17/84	Site I.D. given as "SHP03."

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Summary of Ground Water Sampling Logs

Sampling Date	Location	Bore Volumes Purged	pH (S.U.)	Ec (umhos/cm)	Alk (mg/L CaCO3)	Alk (mg/L CaCO3)	Lot	Shipping Date	Comments
10/1/85	602	120	6.96	6800	302	306	2	10/2/85	Depth to water = 7.20 ft; depth of well = 7.70 ft. Thus, one bore volume = 0.05 gallons (0.125 ft diameter well). Apparently, this well recharged quickly despite the low standing volume.
10/2/85	603	50.0	7.39	2480	185	182	3	10/3/85	
10/3/85	604	76	7.38	9500	460	463	4	10/4/85	
10/4/85	605	--	7.23	8000	427	438	4	10/6/85	Six gallons purged. Not enough information on logs to determine number of bore volumes.
10/3/85	606	652	7.88	6500	296	299	4	10/4/85	Depth of well given as 2.91 ft. (I)
10/2/85	607	79.8	6.82	14950	1291	1276/1650	3	10/3/85	"Water is yellow."
9/28/85	608	3.02	7.09	7000	560	591	1	9/29/85	
9/29/85	609	5.72	7.01	7500	595	600	1	9/30/85	
9/29/85	610	11.56	7.09	9000	380	362	1	9/30/85	Extra volumes purged to obtain stable Ec measurements.
9/29/85	611	6.27	7.17	7000	287	286	1	9/30/85	
9/29/85	612	3.08	7.46	1250	213	215	1	9/30/85	
9/30/85	613	6.82	7.20	7000	390	387	2	10/1/85	
9/30/85	614	3.12	6.92	12000	561	564	2	10/1/85	
10/1/85	615	9.06	7.01	10500	473	489	2	--	"Pale yellow color."
10/1/85	616	9.47	7.20	1650	216	220	2	10/2/85	
10/1/85	617	3.09	7.06	6000	423	396	2	10/2/85	
10/1/85	618	3.12	6.94	7000	400	377	2	--	Splits 648, 649, 650, and 651 collected from this location.
10/2/85	619	4.12	7.26	25000	950	931	3	10/3/85	
10/2/85	620	4.40	6.83	13000	1160	1186	3	10/2/85	
10/2/85	621	5.50	6.91	10000	837	878	3	10/3/85	
10/2/85	622	3.14	7.04	12000	964	968	3	10/3/85	Splits collected.
10/3/85	623	3.06	6.92	13000	739	737	3	10/4/85	
10/3/85	624	4.00	6.85	15500	840	846	3	10/4/85	
10/3/85	625	4.69	7.12	12500	726	722	3	10/4/85	
10/3/85	626	3.21	7.22	13000	874	883	4	10/4/85	
10/3/85	627	3.12	7.07	8000	459	462	4	10/3/85	
10/4/85	628	6.66	7.18	7000	422	424	4	10/5/85	Extra volumes purged to obtain stable Ec measurements. Splits collected at this location.
10/3/85	629	3.30	7.23	7000	324	401/324	4	10/4/85	
10/4/85	630	3.18	7.22	7000	303	307	4	10/6/85	
9/30/85	631	6.58	6.96	4300	422	426	1	--	Extra volumes purged to obtain stable Ec measurements. Splits collected.
9/29/85	632	5.88	7.72	3900	376	372	1	9/29/85	

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Summary of Ground Water Sampling Logs

Sampling Date	Location	Bore Volumes Purged	pH (S.U.)	Ec (umhos/cm)	Alk (mg/L CaCO3)	Alk (mg/L CaCO3)	Lot	Shipping Date	Comments
10/4/85	633	--	7.60	10500	940	949	4	10/6/85	Six gallons purged (73 bore volumes). "Priority Pollutants collected here. Filter used." "Water had a lot of sediment; could account for such high alkalinity reading."
9/19/86	607	22.99	7.35	8000	620	621	2	9/19/86	"Well point."
9/17/86	608	3.60	6.85	8750	845	948/830	3	9/18/86	
9/16/86	609	4.40	6.87	9000	820	822	3	9/17/86	
9/17/86	610	9.83	7.09	7000	318	331	3	9/18/86	
9/17/86	612	5.52	7.12	2000	291	295	3	9/17/86	"Strong sulfur odor."
9/17/86	613	4.80	6.97	7750	548	545	3	9/18/86	
9/14/86	616	3.68	7.13	2000	247	226	3	9/15/86	
9/16/86	620	3.00	6.83	11000	1172	1180	2	9/16/86	
9/15/86	621	2.64	6.82	10000	1299	1340	2	9/16/86	
9/16/86	622	4.40	6.80	10750	1466	1447	2	9/16/86	
9/18/86	624	3.00	6.93	11000	879	890	2	9/18/86	
9/14/86	627	3.08	7.13	8500	593	590	3	9/14/86	
9/14/86	630	9.60	7.36	4250	170	167	3	9/15/86	
9/19/86	631	2.86	7.04	3800	486	467	3	9/20/86	Splits 650, 651, 652, and 653 collected from this location.
9/19/86	632	5.06	7.16	380	406	409	2	9/20/86	Splits 645, 646, 647, and 648 collected from this location.
9/17/86	634	--	7.02	900	372	373	1	--	Splits 641, 642, 643, and 644 collected from this location. Not enough information known to determine number of bore volumes purged. "A good upgradient background well." "Hand-pump well - upgradient."
9/18/86	635	3.90	7.10	2250	382	386	1	9/19/86	"Cast iron casing."
3/18/87	638	26	7.34	7400	578	525	1	3/18/87	
3/18/87	639	30	7.24	3150	604	589	1	3/19/87	Splits 650, 651, 652, and 653 collected from this location.
3/18/87	640	11.5	7.36	9000	823	824	1	3/19/87	
3/17/87	641	9.24	7.57	16500	1853	1843	1	3/18/87	
3/17/87	642	7.84	7.57	11500	842	859	1	3/18/87	
3/18/87	643	12.8	8.02	30500	1727	1688	1	3/19/87	
3/17/87	644	14.1	8.05	20000	749	725	1	3/18/87	
3/16/87	645	24.2	7.41	750	197	189	1	3/17/87	
3/17/87	646	40.0	7.28	1300	286	384	1	3/18/87	
3/17/87	647	16.8	7.32	1700	320	369/318	2	3/18/87	Logs indicated that this location was a well point. Splits 654, 655, 656, and 657 collected from this location.
3/16/87	648	--	7.95	3050	81	75	2	3/17/87	"Flowing well."

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Sampling Date	Location	Bore Volume Purged	pH (S.U.)	Ec (umhos/cm)	Alk (mg/L CaCO3)	Alk (mg/L CaCO3)	Lot	Shipping Date	Comments
5/13/87	638	4.20	7.97	3300	521	508	1	5/14/87	
5/13/87	639	5.91	7.40	1825	350	350	1	5/14/87	Splits 650, 651, 652, and 653 collected from this location.
5/20/87	641	3.90	7.40	6500	1564	1555	1	5/20/87	
5/19/87	642	3.84	7.45	4500	521	518	1	5/20/87	
5/19/87	644	3.72	7.62	10000	865	860	1	5/20/87	
5/15/87	645	3.56	7.70	575	219	214	1	5/16/87	
5/15/87	646	4.77	7.64	1200	247	245	1	5/16/87	
5/16/87	647	3.98	7.83	550	185	172	2	5/17/87	Splits 654, 655, 656, and 657 collected from this location.
5/15/87	648	-	8.11	3325	65	59	2	5/16/87	"Flowing well."
9/18/87	602	43.46	6.92	2700	231	248	3	9/18/87	"Well point, no screen interval; water rusty due to pipe."
9/2/87	603	10.56	7.47	16000	1791	1811	3	9/3/87	"Water rusty - blood in color, heavy to moderate sediment load in pipe." "Very slow recharge - anomalous for this site, may be due to problems in installation or deterioration of well point -- past installation."
9/2/87	604	103	7.45	3700	339	346	3	9/3/87	"Water is lightly tainted red; Ec lower than usual; good recharge."
8/31/87	607	17.4	7.09	10050	1660	1650	3	9/1/87	"Light tainted rust color, neutral smell." "Lost a lead weight down well point....consisting of lead beads and a plastic wire lead with brass connection. Never recovered."
9/21/87	608	3.17	6.72	7000	1001	1019	3	9/22/87	Splits 658, 659, 660, and 661 collected at this location. "Yellow-green tinge."
9/20/87	609	3.29	6.77	5690	1039	1280/1042	3	-	
9/20/87	610	7.45	6.91	4900	471	485	3	-	
9/18/87	611	3.61	6.90	4910	591	647	4	9/19/87	
9/18/87	612	4.29	7.02	1800	273	275	4	9/19/87	"Sulfuric smell."
9/17/87	613	3.08	6.94	4320	440	478	4	9/18/87	
9/17/87	614	3.11	6.89	4275	426	436	4	9/18/87	
9/17/87	615	5.10	6.88	5610	489	479	4	9/18/87	"Water slightly milky." "Titration 'bouncy' -- fluctuating back and forth." First two titrations yielded 549 and 687 mg/L.
9/17/87	616	3.79	7.00	2150	318	328	4	9/18/87	
9/16/87	617	3.53	6.85	3420	407	417	4	9/18/87	
9/16/87	618	3.17	6.89	3190	344	360	4	9/18/87	
9/18/87	619	3.33	6.96	5700	778	784	4	9/19/87	Splits 662, 663, 664, and 665 collected from this location.
8/30/87	620	2.73	6.77	9500	1405	1393	5	8/30/87	"Water yellow-green tainted, no smell."

**SHIPROCK - SHP01
HISTORICAL DATA VALIDATION
TABLE 3
Summary of Ground Water Sampling Logs**

Sampling Date	Location	Bore Volumes Purged	pH (S.U.)	Ec (umho/cm)	Alk (mg/L CaCO3)	Alk (mg/L CaCO3)	Lot	Shipping Date	Comments
8/31/87	621	3.53	6.83	10800	1370	1279	5	9/1/87	Water described as "milky yellow-green" from 12 to 24 gallons.
8/31/87	622	3.41	6.80	9000	1632	1655	5	9/1/87	
9/1/87	623	3.37	6.83	11500	995	987	5	9/3/87	
9/1/87	624	3.06	6.82	10200	960	957	5	9/3/87	"Water milky green-yellow, effervesces with gas, well seems to bubble before pumping -- strange."
9/1/87	625	3.27	6.86	11200	1091	1090	5	9/3/87	
9/15/87	626	3.00	7.02	4520	829	833	5	9/16/87	"Water yellow-green."
9/15/87	627	0.30	7.15	3690	330	350	5	9/16/87	
9/15/87	628	3.46	7.16	3910	399	405	5	9/16/87	
8/29/87	629	3.12	7.40	3750	125	120	6	8/30/87	
8/29/87	630	3.08	7.32	3300	124	123	6	8/30/87	
8/30/87	631	3.26	7.02	3600	447	445	6	8/30/87	
8/31/87	632	3.50	7.08	3000	428	431	6	9/1/87	
9/24/87	638	22.88	7.38	680	254	266	1	9/25/87	
9/24/87	639	18.29	7.26	2600	538	544	1	9/25/87	"Water clear and has neutral smell."
9/23/87	640	--	7.75	5500	742	745	1	9/24/87	"Good producer." "Water milky." Purge volume not recorded.
9/23/87	641	20.92	7.73	6000	1561	1619	1	9/24/87	Sample bailed due to inability to access well with truck.
9/22/87	642	12.21	7.71	7250	959	959	1	9/23/87	"Sampled like a surface sample due to well point proximity (Longmire Island)." "Water yellow-green in color; sediment content due to disturbance during bailing operation."
9/23/87	643	47.17	7.85	10490	1418	1457	1	9/24/87	"Very slow recharge." "Water very dirty - FeOx; light sediment."
9/22/87	644	10.87	7.62	7500	857	859	1	9/23/87	"Water yellow-green, slight sediment, high titration."
9/22/87	645	380	7.17	410	185	186	1	9/23/87	"Water clear and has neutral smell."
9/21/87	646	23.2	7.39	1020	184	224/185	1	9/22/87	
9/19/87	647	34.0	7.35	330	112	144/121	2	9/20/87	"Water red and very dirty. Red color probably due to well point pipe rust; cleared up after 20 bore volumes."
9/19/87	648	--	8.11	2900	66	69	2	9/20/87	"Geothermal flowing well; slight sulfuric smell; water clear."
11/12/87	632	3.24	7.10	3500	469	634/431	1	11/12/87	
1/20/88	670	16.0	7.08	1700	377	362	1	1/20/88	
1/20/88	671	21.6	7.51	2400	379	356	1	1/20/88	
1/20/88	672	4.05	7.27	2350	404	490/418	1	1/20/88	

**SHIPROCK - SHP01
HISTORICAL DATA VALIDATION
TABLE 3
Summary of Ground Water Sampling Logs**

Sampling Date	Location	Bore Volumes Purged	pH (S.U.)	Ec (umhos/cm)	Alk (mg/L CaCO ₃)	Alk (mg/L CaCO ₃)	Lot	Shipping Date	Comments
3/30/88	670	5.00	8.04	1800	387	390	1	3/31/88	
3/30/88	671	2.50	7.62	5000	753	763	1	3/31/88	Logs indicated that one gallon was purged.
3/30/88	672	6.00	7.63	1700	400	402	1	3/31/88	
5/17/88	670	3.89	7.47	1450	366	371	1	5/17/88	
5/17/88	671	4.76	7.61	2700	565	582	1	5/17/88	
5/17/88	672	2.71	7.58	1550	393	491/416	1	5/17/88	
10/10/88	600	1.02	7.25	13000	1542	1560	1	10/11/88	
10/11/88	601	4.80	6.43	20000	382	385	1	10/11/88	
10/10/88	602	3.08	6.61	16750	2293	2295	1	10/11/88	
10/11/88	614	3.11	6.85	8500	406	412	1	10/11/88	
10/10/88	618	3.11	6.83	4900	340	355	1	10/11/88	
10/8/88	638	--	6.62	800	180	208/185	1	10/9/88	"Slow recharge -- dirty (red) water with some rust particles."
10/8/88	639	--	6.98	4100	488	496	1	10/9/88	"Abundance of rust particles and very fine-grained sand in water."
10/8/88	641	26.30	7.91	27500	2325	2329	1	10/9/88	
10/8/88	644	33.33	7.27	16000	617	632	1	10/9/88	
10/7/88	646	--	6.91	1475	165	168	1	10/7/88	"Well point pulled 'dry' in five seconds -- slow recharge."
10/8/88	670	32.00	6.88	1250	347	349	1	10/9/88	
10/8/88	671	16.60	7.04	1425	470	478	1	10/9/88	
10/7/88	672	--	6.93	1000	322	328	1	10/9/88	"Purged 1/2 gallons then sampled well." First and second titrations yielded values of 557 and 434 mg/L, respectively.
4/19/89	600	1.01	6.78	11500	1489	1606	3	4/20/89	"Muddy. Bailed dry -- sample."
4/19/89	601	1.69	6.22	9250	294	295	3	4/20/89	"Well listed as 4" but is 2". Slow recharge."
4/19/89	602	3.05	7.18	13000	2254	2290	3	4/20/89	"Slow recharge."
4/6/89	603	--	7.74	9500	749	773	2	4/6/89	
4/3/89	608	3.10	6.88	8500	1138	1145	1	4/4/89	"Yellowish color to water -- no odor."
4/3/89	610	3.90	6.98	6250	624	662	1	4/4/89	"Blackish/green water -- no odor noted."
4/3/89	612	3.33	7.23	1175	201	205	1	4/4/89	
4/3/89	614	3.11	7.04	6100	406	407	1	4/4/89	
4/3/89	615	3.21	6.99	10000	768	778	1	4/4/89	
4/4/89	616	3.58	7.09	2600	295	313	1	4/4/89	
4/4/89	617	3.29	6.93	3800	387	390	1	4/4/89	
4/5/89	619	3.02	6.94	12500	1210	1218	2	4/5/89	"Yellowish color of water."
4/5/89	620	3.06	6.87	7500	1168	1176	2	4/5/89	Splits 662, 663, 664, and 665 collected from this location.

**SHIPROCK - SHP01
HISTORICAL DATA VALIDATION
TABLE 3
Summary of Ground Water Sampling Logs**

Sampling Date	Location	Bore Volumes Purged	pH (S.U.)	Ec (umhos/cm)	Alk (mg/L CaCO3)	Alk (mg/L CaCO3)	Lot	Shipping Date	Comments
4/4/89	624	3.15	6.93	11000	1374	1375	2	4/4/89	"Water has yellowish tint -- no odor."
4/5/89	626	3.24	7.21	4650	403	432	2	4/5/89	"Blackish water -- 'smoky.'"
4/5/89	628	3.33	7.35	4000	277	281	2	4/5/89	"Clear, clean water -- turning rusty brown."
4/18/89	629	3.07	7.44	3300	116	127	3	4/20/89	
4/20/89	638	4.00	6.70	1700	250	253	4	4/21/89	"Well was 4/5 buried -- sprayed with orange paint -- green dirty water -- very slow recharge."
4/21/89	639	8.33	6.98	3500	422	424	4	4/21/89	Bore volume very small. Although not indicated on the logs, it is assumed that three bore volumes was purged.
4/19/89	640	4.38	7.35	4600	548	557	3	4/20/89	
4/18/89	641	6.52	7.60	10000	1042	1047	3	4/20/89	"Well point."
4/18/89	642	6.84	7.34	12000	859	872	3	4/20/89	"Well point."
4/18/89	643	8.54	7.37	13500	1276	1298	3	4/20/89	"Well point."
4/18/89	644	8.36	7.66	4100	528	532	3	4/20/89	"Well point."
4/2/89	645	--	7.37	750	217	219	1	4/4/89	See 639 above.
4/2/89	646	--	7.28	750	183	195/167	1	4/4/89	"Six inches of water but recharge should allow for sampling."
4/2/89	647	2.00	7.18	1750	218	220	1	4/4/89	
4/21/89	670	--	7.45	1350	338	338	4	4/21/89	See 639 above.
4/21/89	671	--	7.18	1700	554	566	4	4/21/89	See 639 above.
4/22/89	672	--	7.33	950	345	354	4	4/22/89	See 639 above.
5/30/90	608	3.25	6.63	13000	1178	1276	1	6/1/90	"Muddy water, good recharge."
5/30/90	610	4.04	6.89	11000	675	677	1	6/1/90	
5/30/90	614	3.15	6.91	7500	493	494	1	6/1/90	
5/31/90	615	2.80	6.81	14500	695	707	1	6/1/90	
5/31/90	616	7.35	7.11	3200	287	289	1	6/1/90	
5/31/90	617	5.91	6.93	5000	352	366	1	6/1/90	
6/1/90	619	5.41	6.99	12000	1141	1178	1	6/1/90	
6/1/90	620	3.10	6.87	8000	939	959	1	6/1/90	Splits 662, 663, 664, and 665 collected from this location.
6/1/90	626	4.23	7.30	4550	320	334	2	6/4/90	"Black water, then brown water at 10 gallons."
6/2/90	628	5.55	7.41	4000	243	260	2	6/4/90	"Black water."
6/2/90	630	3.48	7.41	3850	130	134	2	6/4/90	
10/12/90	600	1.03	6.55	13100	1605	1620	2	10/12/90	"Yellow colored water."
10/11/90	601	2.57	6.53	13400	408	413	2	10/12/90	
10/12/90	602	2.05	6.53	17000	2231	2270	2	10/12/90	
10/7/90	608	3.21	6.70	17900	1196	1200	1	10/10/90	

SHIPROCK - SHP01
HISTORICAL DATA VALIDATION
TABLE 3
Summary of Ground Water Sampling Logs

Sampling Date	Location	Bore Volumes Purged	pH (S.U.)	Ec (umhos/cm)	Alk (mg/L CaCO3)	Alk (mg/L CaCO3)	Lot	Shipping Date	Comments
10/7/90	610	2.45	6.78	12200	674	687	1	10/10/90	
10/7/90	614	3.05	6.76	11000	565	573	1	10/10/90	"Yellow color."
10/9/90	615	2.50	6.89	2000	728	757	1	10/10/90	
10/9/90	616	3.82	6.96	4250	323	325	1	10/10/90	
10/9/90	617	3.68	6.86	6800	394	400	1	10/10/90	
10/9/90	619	3.21	6.85	14100	1093	1100	1	10/10/90	"Yellow tainted."
10/9/90	624	3.02	6.85	10400	723	831/780	1	10/10/90	
10/11/90	626	3.24	7.29	5200	301	328	2	10/12/90	
10/11/90	628	3.41	7.23	5300	293	307	2	10/12/90	
10/10/90	630	3.13	7.24	4610	224	242	2	10/12/90	
5/16/91	600	1.60	6.71	14590	1625	1701	--	5/16/91	"Poor recharge. Water yellow."
5/15/91	602	3.10	6.80	19510	2259	2259	--	5/16/91	
5/14/91	608	3.00	6.61	15510	1292	1293	--	5/16/91	
5/14/91	610	4.00	6.67	10600	756	779/556	--	5/16/91	
5/14/91	614	3.10	6.85	12880	525	529	--	5/16/91	
5/14/91	615	4.10	6.82	18510	754	787	--	5/16/91	
5/13/91	616	3.80	6.91	5300	319	343	--	5/14/91	
5/13/91	617	3.20	6.78	8990	463	511/485	--	5/14/91	
5/13/91	619	4.00	6.91	15750	861	877	--	5/14/91	
5/13/91	620	3.84	6.89	8920	727	780	--	5/14/91	"Unable to access by vehicle. Sun is making crew tired (heat exhaustion)."
5/13/91	624	3.10	6.97	9550	495	508	--	5/14/91	
5/12/91	626	3.20	7.26	8940	425	425	--	5/14/91	
5/12/91	628	3.40	7.09	7340	446	426	--	5/14/91	
5/12/91	630	3.06	7.40	4730	194	205	--	5/14/91	
9/18/92	600	0.88	6.65	1354	1599	1601	--	9/21/92	
9/18/92	602	3.03	6.39	18210	2181	2265	--	9/21/92	
9/17/92	608	3.09	6.59	19500	1144	1145	--	9/18/92	
9/17/92	610	3.45	6.73	13300	494	502	--	9/18/92	
9/17/92	614	3.10	6.75	14280	668	672	--	9/18/92	
9/17/92	615	3.04	6.73	16600	568	573	--	9/18/92	
9/17/92	616	3.20	6.80	4960	312	333	--	9/18/92	
9/16/92	617	3.04	6.66	8920	524	530	--	9/18/92	
9/16/92	619	3.21	6.98	13870	690	700	--	9/18/92	
9/17/92	620	3.01	6.79	8660	807	812	--	9/18/92	

SHIPROCK - SHP01
HISTORICAL DATA VALIDATION
TABLE 3
Summary of Ground Water Sampling Logs

Sampling Date	Location	Bore Volumes Purged	pH (S.U.)	Ec (umhos/cm)	Alk (mg/L CaCO3)	Alk (mg/L CaCO3)	Lot	Shipping Date	Comments
9/16/92	624	3.02	6.92	8000	436	439	--	9/18/92	
9/19/92	626	3.10	7.29	4610	280	280	--	9/21/92	
9/18/92	628	3.03	7.29	4370	211	220	--	9/18/92	
9/18/92	630	3.02	7.03	6750	518	526	--	9/21/92	
2/22/93	600	1.67	6.70	12750	1591	1660	--	2/25/93	Poor recharge.
2/22/93	602	3.16	6.55	17750	2238	2280	--	2/25/93	
2/21/93	608	3.02	6.68	10480	1075	1086	--	2/22/93	
2/21/93	610	4.09	6.90	9410	643	646	--	2/22/93	
2/21/93	614	3.09	6.94	10800	638	648	--	2/22/93	
2/21/93	615	4.02	6.84	12820	638	645	--	2/22/93	Sample collected in duplicate.
2/22/93	617	3.96	6.83	7940	466	475	--	2/22/93	Extra bore volumes purged to obtain stable pH readings.
2/23/93	619	3.10	6.99	11400	643	645	--	2/25/93	
2/21/93	620	3.01	6.87	6270	789	809	--	2/22/93	
2/22/93	626	3.08	7.38	3220	321	328	--	2/25/93	
2/23/93	628	3.09	7.09	5150	381	390	--	2/25/93	
2/20/93	630	3.27	7.09	5150	499	511	--	2/22/93	
2/21/93	999	--	--	--	--	--	--	2/22/93	*Field blank -- labels show 'filtered' but samples are nonfiltered* (N001). Equipment blank is N002
4/24/93	608	3.04	6.52	11100	1127	1138	--	4/26/93	
4/24/93	620	3.13	6.69	9220	885	892	--	4/26/93	
4/23/93	630	3.13	7.06	4200	412	433	--	4/26/93	
4/25/93	648	--	8.01	4460	60	64	--	4/26/93	"Flowing artesian well."
4/22/93	725	12.30	6.99	4640	250	250	--	4/23/93	
4/26/93	726	3.07	6.92	7560	376	388	--	4/28/93	
4/26/93	727	3.30	6.31	14680	1709	1769	--	4/28/93	
4/25/93	728	3.19	6.68	6930	416	429	--	4/26/93	
4/25/93	730	--	6.12	4070	144	148	--	--	"No samples were collected. Well bailed dry."
4/25/93	731	8.59	7.08	6990	344	345	--	4/26/93	"Lengthy purging process due to problems with Masterflex."
4/22/93	732	3.33	7.31	2410	234	237	--	4/23/93	
4/27/93	733	3.13	6.97	3930	448	450	--	4/28/93	
4/23/93	734	33.67	7.39	4450	406	422	--	4/26/93	
4/24/93	735	7.14	6.89	8250	548	551	--	4/26/93	Sample collected in duplicate.
4/23/93	736	19.70	7.24	14980	881	939	--	4/26/93	"Yellow tint."
4/24/93	999	--	--	--	--	--	--	4/26/93	Field blank (N001) and equipment blank (N002) collected at location 735.

**SHIPROCK - SHP01
HISTORICAL DATA VALIDATION
TABLE 3
Summary of Ground Water Sampling Logs**

Sampling Date	Location	Bore Volume Purged	pH (S.U.)	Ec (umhos/cm)	Alk (mg/L CaCO3)	Alk (mg/L CaCO3)	Lot	Shipping Date	Comments
1/13/94	600	3.02	6.69	11790	1561	1609	--	1/14/94	
1/13/94	602	3.04	6.67	16220	2187	2209	--	1/14/94	
1/13/94	725	3.94	7.12	4750	308	312	--	1/14/94	
1/13/94	726	3.20	6.95	8490	490	500	--	1/14/94	
1/13/94	727	2.20	6.49	14800	1718	1755	--	1/14/94	
1/13/94	728	3.13	6.57	10230	833	858	--	1/14/94	
1/12/94	730	--	5.47	4470	--	--	--	--	"Not enough water for a sample."
1/13/94	731	3.11	7.13	7400	557	587	--	1/14/94	
1/13/94	732	3.13	7.34	1210	236	240	--	1/14/94	
1/12/94	733	5.00	6.94	3730	420	420	--	1/14/94	
1/13/94	734	8.33	7.04	7660	525	530	--	1/14/94	Collected in duplicate.
1/12/94	735	10.91	7.04	5960	438	440	--	1/14/94	
1/12/94	736	17.79	7.41	13710	1029	1058	--	1/14/94	"Dirty water -- yellow-brown in color."
1/13/94	999	--	--	--	--	--	--	1/14/94	Field blank (N001) and equipment blank (N002).

SHIPROCK - SHP01
 HISTORICAL DATA VALIDATION
 TABLE 4

Summary of UMTRA Known Percent Recoveries

Known	Lot	Date	NH4	Sb	As	B	Cd	Ca	Cl	Fe	Mg	Mn	Mo	Ni
636	1	10/1/85	118	--	--	57.1	102	94.9	88	109	91	100	98	--
637	2	10/1/85	126	--	--	100	131	97.7	88	107	93.1	90	130	--
638	3	10/1/85	107	--	--	150	100	92.8	88	107	106	95	100	--
639	4	10/1/85	124	--	--	160	118	91.6	100	103	98.9	100	114	--
649	2	9/22/86	110	107	97.7	80	122	101	100	110	106	98.7	85.7	133
640/950	1	9/22/86	115	107	109	80	119	100	150	105	105	100	87	107
654	3	9/22/86	107	109	120	105	91.1	88.5	100	107	110	110	94.4	105
650/950	1	3/19/87	99.6	125	111	89.6	100	108	93.3	118	95.9	125	117	125
951	2	3/18/87	105	61.7	117	92.7	75.6	93.2	103	109	94.7	100	105	125
650/950	1	5/14/87	109	142	101	93.2	105	99.4	105	98.4	96	99	100	97.5
951	2	5/17/87	112	131	82.1	100	119	108	100	109	102	107	104	104
950	1	9/22/87	105	70.8	102	80	100	98.2	95	103	98.9	100	125	100
951	2	9/22/87	82.6	69.4	98	88	106	101	107	104	101	100	91.7	113
952	3	9/22/87	99	100	112	87.2	78.3	106	46	100	98.7	97.5	90	100
953	4	9/22/87	104	77.8	83.5	92.7	74.4	103	95.4	102	97	100	95.8	87.5
954	5	9/22/87	104	80.8	110	82	96.9	102	107	107	101	103	103	103
955	6	9/22/87	108	92.2	104	94.7	79.2	94.9	84	104	93.6	104	96.7	92
950	1	10/9/88	101	83.3	100	--	150	101	100	111	102	--	100	--
951	2	10/12/88	103	79.3	94.1	--	129	103	88.9	109	104	--	102	--
950	1	4/17/89	105	81.7	95.1	92	114	96	115	98.3	101	96.8	95	100
649	2	4/17/89	77.6	108	92.2	80	109	103	104	101	102	101	98.8	105
952	3	4/17/89	109	90.5	107	96	107	103	100	99.3	102	101	96.4	105
953	4	4/17/89	105	103	100	90	118	102	108	105	101	100	94.2	101
650	1	6/4/90	102	118	106	105	104	102	101	108	101	106	100	107
649 b/	2	6/4/90	--	122	96	--	100	--	--	103	98	101	100	--
649 c/	1	10/10/90	101	106	96	97.6	99.2	106	93.3	101	100	104	98.3	100
	2	10/9/90	93	106	104	94.8	103	106	96	101	101	104	98.3	100
649	--	1/8/91	101	97.4	103	--	100	103	104	99.5	103	101	96.2	98.8
650	--	5/2/91	104	78.3	83.3	100	100	104	110	100	104	100	97.1	93.8

SHIPI K - SHP01
 HISTORICAL DATA VALIDATION
 TABLE 4
 Summary of UMTRA Known Percent Recoveries

Known	Lot	Date	NO3	PO4	K	Ra226	Ra228	Se	Na	Sr	SO4	TDS	U	Zn
836	1	10/1/85	--	--	114	--	--	57.1	94.6	--	101	108	110	100
837	2	10/1/85	--	--	140	--	--	94	91.4	--	100	100	107	104
838	3	10/1/85	--	--	130	--	--	81	89	--	106	100	107	96
839	4	10/1/85	--	--	115	--	--	104	95	--	98.9	99.2	111	96.8
849	2	9/22/86	110 a/	114	110	111	38.3	112	106	133	102	101	116	108
640/950	1	9/22/86	113	105	113	107	72.33	111	110	114	105	99.9	102	104
854	3	9/22/86	117	104	106	131	92	107	113	145	107	100	101	102
650/950	1	3/19/87	112	101	100	110	114	116	93.9	125	99.8	100	107	94.8
951	2	3/18/87	109	98.7	97.7	119	114	111	109	133	106	98.7	102	97.5
650/950	1	5/14/87	105	120	106	98.9	108	109	98.9	100	102	100	100	104
951	2	5/17/87	102	113	125	92.4	76.7	88.3	92.3	110	107	98.8	104	108
950	1	9/22/87	106	97.4	111	96.3	162	108	102	118	97.7	100	105	95
951	2	9/22/87	99.4	94.4	100	98.8	104	99.7	103	118	93.1	98.5	108	87.5
952	3	9/22/87	106	92.3	150	99.5	108	95.8	96.7	109	102	102	101	88.3
953	4	9/22/87	100	106	70	123	95.9	101	93	104	100	100	102	88.1
954	5	9/22/87	116	102	99	108	58.4	94.7	97.5	115	105	100	104	104
955	6	9/22/87	104	104	93	106	128	93.7	97.1	108	104	101	89.7	100
950	1	10/9/88	107	97.9	109	97.7	102	121	104	143	102	101	100	108
951	2	10/12/88	104	99.2	107	102	100	120	105	153	94.9	103	111	106
950	1	4/17/89	107	104	107	112	97.4	87.7	98	109	101	98	100	96.4
849	2	4/17/89	113	104	104	100	96	108	95.4	115	104	98.5	116	105
952	3	4/17/89	94.8	105	100	102	92.4	96.4	92.2	115	107	98	115	107
953	4	4/17/89	113	101	105	--	98	103	92.3	103	104	99	118	103
850	1	6/4/90	108	203	102	112	112	113	96.5	100	91.9	99	101	111
649 b/	2	6/4/90	104	--	--	103	107	94	102	95	104	98	100	--
649 c/	1	10/10/90	102	104	92	96.3	77.1	104	103	102	106	96.8	102	102
	2	10/9/90	102	100	93	96.3	47.2	112	102	102	101	97.2	102	102
649	--	1/8/91	99.3	103	98.7	--	--	72.5	90.9	99.2	97.1	106	102	101
650	--	5/2/91	100	102	104	181	69.5	86.7	97.2	100	106	95.7	108	103

All values are percentages of actual known (AK) divided by theoretical known (TK).

a/ The theoretical known was given in the database and by the preparing lab as "< 1.0 mg/L".

b/ Not in SHP01 database.

c/ The value for 10/9/90 is the duplicate known (DK), while the value for 10/10/90 is the actual known (AK).

-- Not analyzed/not given.

SHIPROCK - SHP01
HISTORICAL DATA VALIDATION
TABLE 3
Summary of Ground Water Sampling Logs

Sampling Date	Location	Bore Volumes Purged	pH (S.U.)	Ec (umhos/cm)	Alk (mg/L CaCO3)	Alk (mg/L CaCO3)	Lot	Shipping Date	Comments
10/12/83	DM-9	4.0	6.8	16090	2095	--	--	10/12/83	
10/12/83	SHB-3H	3.0	6.6	17500	1340	--	--	10/12/83	
10/12/83	DM-7	1.0	7.4	16000	410	--	--	10/12/83	
10/12/83	DM-6	--	6.6	13000	795	--	--	10/12/83	Ten gallons withdrawn.
10/13/83	DM-3	1.6	6.5	30700	1880	--	--	10/13/83	
10/12/83	SHB-6GT	4.0	6.3	24900	450	--	--	10/12/83	
10/10/83	SHB-9GT	5.3	--	--	460	--	--	10/11/83	
10/10/83	SHB-10GT	3.0	6.9	26700	340	--	--	10/10/83	
10/10/83	DM-4	--	6.9	18000	1600	--	--	10/12/83	Twenty-one gallons withdrawn.
10/10/83	DM-3A	2.0	7.2	14500	950	--	--	10/11/83	
10/11/83	DM-2	--	6.6	15500	1800	--	--	10/12/83	Twelve gallons withdrawn.
10/11/83	DM-5	1.5	6.8	21100	2200	--	--	10/12/83	
10/12/83	SHB-1H	--	10.2	12000	235	--	--	10/12/83	"Bailed for sample."
10/11/83	5-GT	--	8.7	16200	785	--	--	10/12/83	Ten gallons withdrawn. "Foamy liquid. Very hard to filter."
10/11/83	SHB-4H	3.2	7.2	23000	775	--	--	10/12/83	
10/11/83	DM-12A	--	6.9	16000	1560	--	--	10/12/83	Twenty-four gallons withdrawn.
10/12/83	DM-1	--	6.8	12000	1500	--	--	10/12/83	Ten gallons withdrawn.
10/12/83	DM-11	--	6.8	10500	1420	--	--	10/12/83	Fourteen gallons withdrawn.
10/12/83	DM-8	--	7.0	11200	710	--	--	10/12/83	Twenty-two gallons withdrawn.
9/23/83	SHB-10GT	--	--	--	460	--	--	9/25/83	Seven gallons withdrawn. "pH questionable - varies." "10/17/83 - Bendix sample incorrectly acidified."
9/23/83	SHB-9GT	--	--	--	500	--	--	--	Ten gallons withdrawn. "10/17/83 - Bendix sample incorrectly acidified."
9/23/83	SHB-3H	--	--	--	1480	1660	--	--	Ten gallons withdrawn. "10/17/83 - Bendix sample incorrectly acidified."
9/23/83	SHB-5GT	--	8.4	15200	606	540	--	--	Nine gallons withdrawn. "10/17/83 - Bendix sample incorrectly acidified." "Filter plugs up quickly with slimy material -- about 1/2 liter per filter change."
9/23/83	DM-12A	--	--	--	--	--	--	--	Eleven gallons withdrawn.
10/16/84	601	10.5	7.4	675	143	--	--	10/17/84	Site I.D. given as "SHP03."
10/16/84	602	16.3	6.9	7120	309	--	--	10/17/84	Site I.D. given as "SHP03."
10/16/84	603	15.6	7.4	14850	1170	--	--	10/17/84	Site I.D. given as "SHP03."
10/16/84	604	31.3	7.4	11280	447	--	--	10/17/84	Site I.D. given as "SHP03."
10/16/84	605	11.8	7.2	7470	248	--	--	10/17/84	Site I.D. given as "SHP03."
10/16/84	606	6.7	7.1	7490	191	--	--	10/17/84	Site I.D. given as "SHP03."
10/16/84	607	15.6	6.8	17320	2034	--	--	10/17/84	Site I.D. given as "SHP03."

**SHIPROCK - SHP01
HISTORICAL DATA VALIDATION
TABLE 3
Summary of Ground Water Sampling Logs**

Sampling Date	Location	Bore Volumes Purged	pH (S.U.)	Ec (umhos/cm)	Alk (mg/L CaCO3)	Alk (mg/L CaCO3)	Lot	Shipping Date	Comments
10/1/85	602	120	6.96	6800	302	306	2	10/2/85	Depth to water = 7.20 ft; depth of well = 7.70 ft. Thus, one bore volume = 0.05 gallons (0.125 ft diameter well). Apparently, this well recharged quickly despite the low standing volume.
10/2/85	603	50.0	7.39	2480	185	182	3	10/3/85	
10/3/85	604	76	7.38	9500	460	463	4	10/4/85	
10/4/85	605	-	7.23	8000	427	438	4	10/6/85	Six gallons purged. Not enough information on logs to determine number of bore volumes.
10/3/85	606	652	7.88	6500	296	299	4	10/4/85	Depth of well given as 2.91 ft. (!)
10/2/85	607	79.8	6.82	14950	1291	1276/1650	3	10/3/85	"Water is yellow."
9/28/85	608	3.02	7.09	7000	560	591	1	9/29/85	
9/29/85	609	5.72	7.01	7500	595	600	1	9/30/85	
9/29/85	610	11.56	7.09	9000	380	362	1	9/30/85	Extra volumes purged to obtain stable Ec measurements.
9/29/85	611	6.27	7.17	7000	287	286	1	9/30/85	
9/29/85	612	3.08	7.46	1250	213	215	1	9/30/85	
9/30/85	613	6.82	7.20	7000	390	387	2	10/1/85	
9/30/85	614	3.12	6.92	12000	561	564	2	10/1/85	
10/1/85	615	9.06	7.01	10500	473	489	2	-	"Pale yellow color."
10/1/85	616	9.47	7.20	1650	216	220	2	10/2/85	
10/1/85	617	3.09	7.06	6000	423	396	2	10/2/85	
10/1/85	618	3.12	6.94	7000	400	377	2	-	Splits 648, 649, 650, and 651 collected from this location.
10/2/85	619	4.12	7.26	25000	950	931	3	10/3/85	
10/2/85	620	4.40	6.83	13000	1160	1186	3	10/2/85	
10/2/85	621	5.50	6.91	10000	837	878	3	10/3/85	
10/2/85	622	3.14	7.04	12000	964	968	3	10/3/85	Splits collected.
10/3/85	623	3.06	6.92	13000	739	737	3	10/4/85	
10/3/85	624	4.00	6.85	15500	840	846	3	10/4/85	
10/3/85	625	4.69	7.12	12500	726	722	3	10/4/85	
10/3/85	626	3.21	7.22	13000	874	883	4	10/4/85	
10/3/85	627	3.12	7.07	8000	459	462	4	10/3/85	
10/4/85	628	6.66	7.18	7000	422	424	4	10/5/85	Extra volumes purged to obtain stable Ec measurements. Splits collected at this location.
10/3/85	629	3.30	7.23	7000	324	401/324	4	10/4/85	
10/4/85	630	3.18	7.22	7000	303	307	4	10/6/85	
9/30/85	631	6.58	6.96	4300	422	426	1	-	Extra volumes purged to obtain stable Ec measurements. Splits collected.
9/29/85	632	5.88	7.72	3900	376	372	1	9/29/85	

SHIPROCK - SHP01
HISTORICAL DATA VALIDATION
TABLE 3
Summary of Ground Water Sampling Logs

Sampling Date	Location	Bore Volumes Purged	pH (S.U.)	Ec (umhos/cm)	Alk (mg/L CaCO3)	Alk (mg/L CaCO3)	Lot	Shipping Date	Comments
10/4/85	633	--	7.60	10500	940	949	4	10/6/85	Six gallons purged (73 bore volumes). "Priority Pollutants collected here. Filter used." "Water had a lot of sediment; could account for such high alkalinity reading."
9/19/86	607	22.99	7.35	8000	620	621	2	9/19/86	"Well point."
9/17/86	608	3.60	6.85	8750	845	948/830	3	9/18/86	
9/16/86	609	4.40	6.87	9000	820	822	3	9/17/86	
9/17/86	610	9.83	7.09	7000	318	331	3	9/18/86	
9/17/86	612	5.52	7.12	2000	291	295	3	9/17/86	"Strong sulfur odor."
9/17/86	613	4.80	6.97	7750	548	545	3	9/18/86	
9/14/86	616	3.68	7.13	2000	247	226	3	9/15/86	
9/16/86	620	3.00	6.83	11000	1172	1180	2	9/16/86	
9/15/86	621	2.64	6.82	10000	1299	1340	2	9/16/86	
9/16/86	622	4.40	6.80	10750	1466	1447	2	9/16/86	
9/18/86	624	3.00	6.93	11000	879	890	2	9/18/86	
9/14/86	627	3.08	7.13	6500	593	590	3	9/14/86	
9/14/86	630	9.60	7.36	4250	170	167	3	9/15/86	
9/19/86	631	2.86	7.04	3800	486	467	3	9/20/86	Splits 650, 651, 652, and 653 collected from this location.
9/19/86	632	5.06	7.16	380	406	409	2	9/20/86	Splits 645, 646, 647, and 648 collected from this location.
9/17/86	634	--	7.02	900	372	373	1	--	Splits 641, 642, 643, and 644 collected from this location. Not enough information known to determine number of bore volumes purged. "A good upgradient background well." "Hand-pump well - upgradient."
9/18/86	635	3.90	7.10	2250	382	386	1	9/19/86	"Cast iron casing."
3/18/87	638	26	7.34	7400	578	525	1	3/18/87	
3/18/87	639	30	7.24	3150	604	589	1	3/19/87	Splits 650, 651, 652, and 653 collected from this location.
3/18/87	640	11.5	7.36	9000	823	824	1	3/19/87	
3/17/87	641	9.24	7.57	16500	1853	1843	1	3/18/87	
3/17/87	642	7.84	7.57	11500	842	859	1	3/18/87	
3/18/87	643	12.8	8.02	30500	1727	1688	1	3/19/87	
3/17/87	644	14.1	8.05	20000	749	725	1	3/18/87	
3/16/87	645	24.2	7.41	750	197	189	1	3/17/87	
3/17/87	646	40.0	7.28	1300	286	384	1	3/18/87	
3/17/87	647	16.8	7.32	1700	320	369/318	2	3/18/87	Logs indicated that this location was a well point. Splits 654, 655, 656, and 657 collected from this location.
3/16/87	648	--	7.95	3050	81	75	2	3/17/87	"Flowing well."

**SHIPROCK - SHP01
HISTORICAL DATA VALIDATION
TABLE 3
Summary of Ground Water Sampling Logs**

Sampling Date	Location	Bore Volumes Purged	pH (S.U.)	Ec (umhos/cm)	Alk (mg/L CaCO3)	Alk (mg/L CaCO3)	Lot	Shipping Date	Comments
5/13/87	638	4.20	7.97	3300	521	508	1	5/14/87	
5/13/87	639	5.91	7.40	1825	350	350	1	5/14/87	Splits 650, 651, 652, and 653 collected from this location.
5/20/87	641	3.90	7.40	6500	1564	1555	1	5/20/87	
5/19/87	642	3.84	7.45	4500	521	518	1	5/20/87	
5/19/87	644	3.72	7.62	10000	885	860	1	5/20/87	
5/15/87	645	3.56	7.70	575	219	214	1	5/16/87	
5/15/87	646	4.77	7.64	1200	247	245	1	5/16/87	
5/16/87	647	3.98	7.83	550	185	172	2	5/17/87	Splits 654, 655, 656, and 657 collected from this location.
5/15/87	648	--	8.11	3325	65	59	2	5/16/87	"Flowing well."
9/16/87	602	43.48	6.92	2700	231	248	3	9/18/87	"Well point, no screen interval; water rusty due to pipe."
9/2/87	603	10.56	7.47	16000	1791	1811	3	9/3/87	"Water rusty - blood in color, heavy to moderate sediment load in pipe." "Very slow recharge - anomalous for this site, may be due to problems in installation or deterioration of well point -- past installation."
9/2/87	604	103	7.45	3700	339	346	3	9/3/87	"Water is lightly tainted red; Ec lower than usual; good recharge."
8/31/87	607	17.4	7.09	10050	1660	1650	3	9/1/87	"Light tainted rust color, neutral smell." "Lost a lead weight down well point....consisting of lead beads and a plastic wire lead with brass connection. Never recovered."
9/21/87	608	3.17	6.72	7000	1001	1019	3	9/22/87	Splits 658, 659, 660, and 661 collected at this location. "Yellow-green tinge."
9/20/87	609	3.29	6.77	5690	1039	1280/1042	3	--	
9/20/87	610	7.45	6.91	4900	471	485	3	--	
9/18/87	611	3.61	6.90	4910	591	647	4	9/19/87	
9/18/87	612	4.29	7.02	1800	273	275	4	9/19/87	"Sulfuric smell."
9/17/87	613	3.08	6.94	4320	440	478	4	9/18/87	
9/17/87	614	3.11	6.89	4275	426	436	4	9/18/87	
9/17/87	615	5.10	6.88	5610	489	479	4	9/18/87	"Water slightly milky." "Titration 'bouncy' -- fluctuating back and forth." First two titrations yielded 549 and 687 mg/L.
9/17/87	616	3.79	7.00	2150	318	328	4	9/18/87	
9/16/87	617	3.53	6.85	3420	407	417	4	9/18/87	
9/16/87	618	3.17	6.89	3190	344	360	4	9/18/87	
9/18/87	619	3.33	6.96	5700	778	784	4	9/19/87	Splits 662, 663, 664, and 665 collected from this location.
8/30/87	620	2.73	6.77	9500	1405	1393	5	8/30/87	"Water yellow-green tainted, no smell."

SHIPROCK - SHP01
HISTORICAL DATA VALIDATION
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Summary of Ground Water Sampling Logs

Sampling Date	Location	Bore Volumes Purged	pH (S.U.)	Ec (umhos/cm)	Alk (mg/L CaCO3)	Alk (mg/L CaCO3)	Lot	Shipping Date	Comments
8/31/87	621	3.53	6.83	10800	1370	1279	5	9/1/87	Water described as "milky yellow-green" from 12 to 24 gallons.
8/31/87	622	3.41	6.80	9000	1632	1655	5	9/1/87	
9/1/87	623	3.37	6.83	11500	995	987	5	9/3/87	
9/1/87	624	3.06	6.82	10200	960	957	5	9/3/87	"Water milky green-yellow, effervesces with gas, well seems to bubble before pumping -- strange."
9/1/87	625	3.27	6.86	11200	1091	1090	5	9/3/87	
9/15/87	626	3.00	7.02	4520	829	833	5	9/16/87	"Water yellow-green."
9/15/87	627	0.30	7.15	3690	330	350	5	9/16/87	
9/15/87	628	3.46	7.16	3910	399	405	5	9/16/87	
8/29/87	629	3.12	7.40	3750	125	120	6	8/30/87	
8/29/87	630	3.08	7.32	3300	124	123	6	8/30/87	
8/30/87	631	3.26	7.02	3600	447	445	6	8/30/87	
8/31/87	632	3.50	7.08	3000	428	431	6	9/1/87	
9/24/87	638	22.88	7.38	680	254	266	1	9/25/87	
9/24/87	639	16.29	7.26	2600	538	544	1	9/25/87	"Water clear and has neutral smell."
9/23/87	640	--	7.75	5500	742	745	1	9/24/87	"Good producer." "Water milky." Purge volume not recorded.
9/23/87	641	20.92	7.73	6000	1561	1619	1	9/24/87	Sample bailed due to inability to access well with truck.
9/22/87	642	12.21	7.71	7250	959	959	1	9/23/87	"Sampled like a surface sample due to well point proximity (Longmire Island)." "Water yellow-green in color; sediment content due to disturbance during bailing operation."
9/23/87	643	47.17	7.85	10490	1418	1457	1	9/24/87	"Very slow recharge." "Water very dirty - FeOx; light sediment."
9/22/87	644	10.87	7.62	7500	857	859	1	9/23/87	"Water yellow-green, slight sediment, high titration."
9/22/87	645	380	7.17	410	185	186	1	9/23/87	"Water clear and has neutral smell."
9/21/87	646	23.2	7.39	1020	184	224/185	1	9/22/87	
9/19/87	647	34.0	7.35	330	112	144/121	2	9/20/87	"Water red and very dirty. Red color probably due to well point pipe rust; cleared up after 20 bore volumes."
9/19/87	648	--	8.11	2900	66	69	2	9/20/87	"Geothermal flowing well; slight sulfuric smell; water clear."
11/12/87	632	3.24	7.10	3500	469	634/431	1	11/12/87	
1/20/88	670	16.0	7.08	1700	377	362	1	1/20/88	
1/20/88	671	21.6	7.51	2400	379	356	1	1/20/88	
1/20/88	672	4.05	7.27	2350	404	490/418	1	1/20/88	

**SHIPROCK - SHP01
HISTORICAL DATA VALIDATION
TABLE 3
Summary of Ground Water Sampling Logs**

Sampling Date	Location	Bore Volumes Purged	pH (S.U.)	Ec (umhos/cm)	Alk (mg/L CaCO3)	Alk (mg/L CaCO3)	Lot	Shipping Date	Comments
3/30/88	670	5.00	8.04	1800	387	390	1	3/31/88	
3/30/88	671	2.50	7.62	5000	753	763	1	3/31/88	Logs indicated that one gallon was purged.
3/30/88	672	6.00	7.63	1700	400	402	1	3/31/88	
5/17/88	670	3.89	7.47	1450	366	371	1	5/17/88	
5/17/88	671	4.76	7.61	2700	565	582	1	5/17/88	
5/17/88	672	2.71	7.58	1550	393	491/416	1	5/17/88	
10/10/88	600	1.02	7.25	13000	1542	1560	1	10/11/88	
10/11/88	601	4.60	6.43	20000	382	385	1	10/11/88	
10/10/88	602	3.08	6.61	16750	2293	2295	1	10/11/88	
10/11/88	614	3.11	6.85	8500	406	412	1	10/11/88	
10/10/88	618	3.11	6.83	4900	340	355	1	10/11/88	
10/8/88	638	--	6.62	800	180	208/185	1	10/9/88	"Slow recharge -- dirty (red) water with some rust particles."
10/8/88	639	--	6.98	4100	488	496	1	10/9/88	"Abundance of rust particles and very fine-grained sand in water."
10/8/88	641	26.30	7.91	27500	2325	2329	1	10/9/88	
10/8/88	644	33.33	7.27	16000	617	632	1	10/9/88	
10/7/88	646	--	6.91	1475	165	168	1	10/7/88	"Well point pulled 'dry' in five seconds -- slow recharge."
10/8/88	670	32.00	6.88	1250	347	349	1	10/9/88	
10/8/88	671	16.60	7.04	1425	470	478	1	10/9/88	
10/7/88	672	--	6.93	1000	322	328	1	10/9/88	"Purged 1/2 gallons then sampled well." First and second titrations yielded values of 557 and 434 mg/L, respectively.
4/19/89	600	1.01	6.78	11500	1489	1606	3	4/20/89	"Muddy. Bailed dry -- sample."
4/19/89	601	1.69	6.22	9250	294	295	3	4/20/89	"Well listed as 4" but is 2". Slow recharge."
4/19/89	602	3.05	7.18	13000	2254	2290	3	4/20/89	"Slow recharge."
4/6/89	603	--	7.74	9500	749	773	2	4/6/89	
4/3/89	608	3.10	6.88	8500	1138	1145	1	4/4/89	"Yellowish color to water -- no odor."
4/3/89	610	3.90	6.98	6250	624	662	1	4/4/89	"Blackish/green water -- no odor noted."
4/3/89	612	3.33	7.23	1175	201	205	1	4/4/89	
4/3/89	614	3.11	7.04	6100	406	407	1	4/4/89	
4/3/89	615	3.21	6.99	10000	768	778	1	4/4/89	
4/4/89	616	3.58	7.09	2800	295	313	1	4/4/89	
4/4/89	617	3.29	6.93	3800	387	390	1	4/4/89	
4/5/89	619	3.02	6.94	12500	1210	1218	2	4/5/89	"Yellowish color of water."
4/5/89	620	3.06	6.87	7500	1168	1176	2	4/5/89	Splits 662, 663, 664, and 665 collected from this location.

**SHIPROCK - SHP01
HISTORICAL DATA VALIDATION
TABLE 3
Summary of Ground Water Sampling Logs**

Sampling Date	Location	Bore Volumes Purged	pH (S.U.)	Ec (umhos/cm)	Alk (mg/L CaCO ₃)	Alk (mg/L CaCO ₃)	Lot	Shipping Date	Comments
4/4/89	624	3.15	6.93	11000	1374	1375	2	4/4/89	"Water has yellowish tint -- no odor."
4/5/89	626	3.24	7.21	4650	403	432	2	4/5/89	"Blackish water -- 'smoky.'"
4/5/89	628	3.33	7.35	4000	277	281	2	4/5/89	"Clear, clean water -- turning rusty brown."
4/18/89	629	3.07	7.44	3300	116	127	3	4/20/89	
4/20/89	638	4.00	6.70	1700	250	253	4	4/21/89	"Well was 4/5 buried -- sprayed with orange paint -- green dirty water -- very slow recharge."
4/21/89	639	8.33	6.98	3500	422	424	4	4/21/89	Bore volume very small. Although not indicated on the logs, it is assumed that three bore volumes was purged.
4/19/89	640	4.38	7.35	4600	548	557	3	4/20/89	
4/18/89	641	6.52	7.60	10000	1042	1047	3	4/20/89	"Well point."
4/18/89	642	6.84	7.34	12000	859	872	3	4/20/89	"Well point."
4/18/89	643	8.54	7.37	13500	1276	1298	3	4/20/89	"Well point."
4/18/89	644	8.38	7.66	4100	528	532	3	4/20/89	"Well point."
4/2/89	645	--	7.37	750	217	219	1	4/4/89	See 639 above.
4/2/89	646	--	7.28	750	183	195/167	1	4/4/89	"Six inches of water but recharge should allow for sampling."
4/2/89	647	2.00	7.18	1750	218	220	1	4/4/89	
4/21/89	670	--	7.45	1350	338	338	4	4/21/89	See 639 above.
4/21/89	671	--	7.18	1700	554	566	4	4/21/89	See 639 above.
4/22/89	672	--	7.33	950	345	354	4	4/22/89	See 639 above.
5/30/90	608	3.25	6.63	13000	1178	1276	1	6/1/90	"Muddy water, good recharge."
5/30/90	610	4.04	6.89	11000	675	677	1	6/1/90	
5/30/90	614	3.15	6.91	7500	493	494	1	6/1/90	
5/31/90	615	2.80	6.81	14500	695	707	1	6/1/90	
5/31/90	616	7.35	7.11	3200	287	289	1	6/1/90	
5/31/90	617	5.91	6.93	5000	352	366	1	6/1/90	
6/1/90	619	5.41	6.99	12000	1141	1178	1	6/1/90	
6/1/90	620	3.10	6.87	8000	939	959	1	6/1/90	Splits 662, 663, 664, and 665 collected from this location.
6/1/90	626	4.23	7.30	4550	320	334	2	6/4/90	"Black water, then brown water at 10 gallons."
6/2/90	628	5.55	7.41	4000	243	260	2	6/4/90	"Black water."
6/2/90	630	3.48	7.41	3850	130	134	2	6/4/90	
10/12/90	600	1.03	6.55	13100	1605	1620	2	10/12/90	"Yellow colored water."
10/11/90	601	2.57	6.53	13400	408	413	2	10/12/90	
10/12/90	602	2.05	6.53	17000	2231	2270	2	10/12/90	
10/7/90	608	3.21	6.70	17900	1196	1200	1	10/10/90	

SHIPROCK - SHP01
HISTORICAL DATA VALIDATION
TABLE 3
Summary of Ground Water Sampling Logs

Sampling Date	Location	Bore Volumes Purged	pH (S.U.)	Ec (umhos/cm)	Alk (mg/L CaCO3)	Alk (mg/L CaCO3)	Lot	Shipping Date	Comments
10/7/90	610	2.45	6.78	12200	674	687	1	10/10/90	
10/7/90	614	3.05	6.76	11000	585	573	1	10/10/90	"Yellow color."
10/9/90	615	2.50	6.89	2000	728	757	1	10/10/90	
10/9/90	616	3.82	6.96	4250	323	325	1	10/10/90	
10/9/90	617	3.68	6.86	8800	394	400	1	10/10/90	
10/9/90	619	3.21	6.65	14100	1093	1100	1	10/10/90	"Yellow tainted."
10/9/90	624	3.02	6.85	10400	723	831/780	1	10/10/90	
10/11/90	626	3.24	7.29	5200	301	328	2	10/12/90	
10/11/90	628	3.41	7.23	5300	293	307	2	10/12/90	
10/10/90	630	3.13	7.24	4610	224	242	2	10/12/90	
5/16/91	600	1.60	6.71	14590	1625	1701	--	5/16/91	"Poor recharge. Water yellow."
5/15/91	602	3.10	6.60	19510	2259	2259	--	5/16/91	
5/14/91	608	3.00	6.61	15510	1292	1293	--	5/16/91	
5/14/91	610	4.00	6.67	10600	756	779/556	--	5/16/91	
5/14/91	614	3.10	6.85	12880	525	529	--	5/16/91	
5/14/91	615	4.10	6.82	18510	754	787	--	5/16/91	
5/13/91	616	3.80	6.91	5300	319	343	--	5/14/91	
5/13/91	617	3.20	6.78	8990	463	511/485	--	5/14/91	
5/13/91	619	4.00	6.91	15750	861	877	--	5/14/91	
5/13/91	620	3.84	6.89	8920	727	780	--	5/14/91	"Unable to access by vehicle. Sun is making crew tired (heat exhaustion)."
5/13/91	624	3.10	6.97	9550	495	508	--	5/14/91	
5/12/91	626	3.20	7.26	8940	425	425	--	5/14/91	
5/12/91	628	3.40	7.09	7340	446	426	--	5/14/91	
5/12/91	630	3.06	7.40	4730	194	205	--	5/14/91	
9/18/92	600	0.88	6.65	1354	1599	1601	--	9/21/92	
9/18/92	602	3.03	6.39	18210	2181	2265	--	9/21/92	
9/17/92	608	3.09	6.59	19500	1144	1145	--	9/18/92	
9/17/92	610	3.45	6.73	13300	494	502	--	9/18/92	
9/17/92	614	3.10	6.75	14280	668	672	--	9/18/92	
9/17/92	615	3.04	6.73	16600	568	573	--	9/18/92	
9/17/92	616	3.20	6.80	4960	312	333	--	9/18/92	
9/16/92	617	3.04	6.66	8920	524	530	--	9/18/92	
9/16/92	619	3.21	6.98	13870	690	700	--	9/18/92	
9/17/92	620	3.01	6.79	8660	807	812	--	9/18/92	

SHIPROCK - SHP01
HISTORICAL DATA VALIDATION
TABLE 3
Summary of Ground Water Sampling Logs

Sampling Date	Location	Bore Volumes Purged	pH (S.U.)	Ec (umho/cm)	Alk (mg/L CaCO3)	Alk (mg/L CaCO3)	Lot	Shipping Date	Comments
9/16/92	624	3.02	6.92	8000	436	439	--	9/18/92	
9/19/92	626	3.10	7.29	4610	280	280	--	9/21/92	
9/16/92	628	3.03	7.29	4370	211	220	--	9/18/92	
9/18/92	630	3.02	7.03	6750	518	526	--	9/21/92	
2/22/93	600	1.67	6.70	12750	1591	1660	--	2/25/93	Poor recharge.
2/22/93	602	3.16	6.55	17750	2238	2280	--	2/25/93	
2/21/93	608	3.02	6.68	10480	1075	1086	--	2/22/93	
2/21/93	610	4.09	6.90	9410	643	646	--	2/22/93	
2/21/93	614	3.09	6.94	10800	638	648	--	2/22/93	
2/21/93	615	4.02	6.84	12820	638	645	--	2/22/93	Sample collected in duplicate.
2/22/93	617	3.96	6.83	7940	466	475	--	2/22/93	Extra bore volumes purged to obtain stable pH readings.
2/23/93	619	3.10	6.99	11400	643	645	--	2/25/93	
2/21/93	620	3.01	6.87	6270	789	809	--	2/22/93	
2/22/93	626	3.08	7.38	3220	321	328	--	2/25/93	
2/23/93	628	3.09	7.09	5150	381	390	--	2/25/93	
2/20/93	630	3.27	7.09	5150	499	511	--	2/22/93	
2/21/93	999	--	--	--	--	--	--	2/22/93	"Field blank -- labels show 'filtered' but samples are nonfiltered" (NO01). Equipment blank is NO02
4/24/93	608	3.04	6.52	11100	1127	1138	--	4/26/93	
4/24/93	620	3.13	6.69	9220	885	892	--	4/26/93	
4/23/93	630	3.13	7.06	4200	412	433	--	4/26/93	
4/25/93	648	--	8.01	4460	60	64	--	4/26/93	"Flowing artesian well."
4/22/93	725	12.30	6.99	4640	250	250	--	4/23/93	
4/26/93	726	3.07	6.92	7560	376	388	--	4/28/93	
4/26/93	727	3.30	6.31	14680	1709	1769	--	4/28/93	
4/25/93	728	3.19	6.68	6930	416	429	--	4/26/93	
4/25/93	730	--	6.12	4070	144	148	--	--	"No samples were collected. Well bailed dry."
4/25/93	731	8.59	7.08	6990	344	345	--	4/26/93	"Lengthy purging process due to problems with Masterflex."
4/22/93	732	3.33	7.31	2410	234	237	--	4/23/93	
4/27/93	733	3.13	6.97	3930	448	450	--	4/28/93	
4/23/93	734	33.67	7.39	4450	406	422	--	4/26/93	
4/24/93	735	7.14	6.89	8250	548	551	--	4/26/93	Sample collected in duplicate.
4/23/93	736	19.70	7.24	14980	881	939	--	4/26/93	"Yellow tint."
4/24/93	999	--	--	--	--	--	--	4/26/93	Field blank (NO01) and equipment blank (NO02) collected at location 735.

**SHIPROCK - SHP01
HISTORICAL DATA VALIDATION
TABLE 3
Summary of Ground Water Sampling Logs**

Sampling Date	Location	Bore Volumes Purged	pH (S.U.)	Ec (umhos/cm)	Alk (mg/L CaCO3)	Alk (mg/L CaCO3)	Lot	Shipping Date	Comments
1/13/94	600	3.02	6.69	11790	1561	1609	--	1/14/94	
1/13/94	602	3.04	6.67	16220	2187	2209	--	1/14/94	
1/13/94	725	3.94	7.12	4750	308	312	--	1/14/94	
1/13/94	726	3.20	6.95	8490	490	500	--	1/14/94	
1/13/94	727	2.20	6.49	14800	1718	1755	--	1/14/94	
1/13/94	728	3.13	6.57	10230	833	858	--	1/14/94	
1/12/94	730	--	5.47	4470	--	--	--	--	"Not enough water for a sample."
1/13/94	731	3.11	7.13	7400	557	587	--	1/14/94	
1/13/94	732	3.13	7.34	1210	236	240	--	1/14/94	
1/12/94	733	5.00	6.94	3730	420	420	--	1/14/94	
1/13/94	734	8.33	7.04	7660	525	530	--	1/14/94	Collected in duplicate.
1/12/94	735	10.91	7.04	5960	438	440	--	1/14/94	"Dirty water -- yellow-brown in color."
1/12/94	736	17.79	7.41	13710	1029	1058	--	1/14/94	"Dirty water -- yellow-brown in color."
1/13/94	999	--	--	--	--	--	--	1/14/94	Field blank (N001) and equipment blank (N002).

SHIPROCK - SHP01
 HISTORICAL DATA VALIDATION
 TABLE 4
 Summary of UMTRA Known Percent Recoveries

Known	Lot	Date	NH4	Sb	As	B	Cd	Ca	Cl	Fe	Mg	Mn	Mo	Ni
636	1	10/1/85	118	--	--	57.1	102	94.9	88	109	91	100	98	--
637	2	10/1/85	126	--	--	100	131	97.7	88	107	93.1	90	130	--
638	3	10/1/85	107	--	--	150	100	92.8	88	107	106	95	100	--
639	4	10/1/85	124	--	--	160	118	91.6	100	103	98.9	100	114	--
649	2	9/22/86	110	107	97.7	80	122	101	100	110	106	98.7	85.7	133
640/950	1	9/22/86	115	107	109	80	119	100	150	105	105	100	87	107
654	3	9/22/86	107	109	120	105	91.1	88.5	100	107	110	110	94.4	105
650/950	1	3/19/87	99.6	125	111	89.8	100	108	93.3	118	95.9	125	117	125
951	2	3/18/87	105	61.7	117	92.7	75.6	93.2	103	109	94.7	100	105	125
650/950	1	5/14/87	109	142	101	93.2	105	99.4	105	98.4	96	99	100	97.5
951	2	5/17/87	112	131	82.1	100	119	108	100	109	102	107	104	104
950	1	9/22/87	105	70.8	102	80	100	98.2	95	103	98.9	100	125	100
951	2	9/22/87	82.8	69.4	98	88	106	101	107	104	101	100	91.7	113
952	3	9/22/87	99	100	112	87.2	78.3	106	46	100	98.7	97.5	90	100
953	4	9/22/87	104	77.8	83.5	92.7	74.4	103	95.4	102	97	100	95.8	87.5
954	5	9/22/87	104	80.8	110	82	96.9	102	107	107	101	103	103	103
955	6	9/22/87	108	92.2	104	94.7	79.2	94.9	84	104	93.6	104	96.7	92
950	1	10/9/88	101	83.3	100	--	150	101	100	111	102	--	100	--
951	2	10/12/88	103	79.3	94.1	--	129	103	88.9	109	104	--	102	--
950	1	4/17/89	105	81.7	95.1	92	114	96	115	98.3	101	98.8	95	100
649	2	4/17/89	77.6	108	92.2	80	109	103	104	101	102	101	98.8	105
952	3	4/17/89	109	90.5	107	96	107	103	100	99.3	102	101	96.4	105
953	4	4/17/89	105	103	100	90	118	102	108	105	101	100	94.2	101
650	1	6/4/90	102	118	106	105	104	102	101	108	101	106	100	107
649 b/	2	6/4/90	--	122	96	--	100	--	--	103	98	101	100	--
649 c/	1	10/10/90	101	106	96	97.6	99.2	106	93.3	101	100	104	98.3	100
	2	10/9/90	93	106	104	94.8	103	106	96	101	101	104	98.3	100
649	--	1/8/91	101	97.4	103	--	100	103	104	99.5	103	101	96.2	98.8
650	--	5/2/91	104	78.3	83.3	100	100	104	110	100	104	100	97.1	93.8

SHPI K - SHP01
HISTORICAL DATA VALIDATION
TABLE 4
Summary of UMTRA Known Percent Recoveries

Known	Lot	Date	NO3	PO4	K	Ra226	Ra228	Se	Na	Sr	SO4	TDS	U	Zn
636	1	10/1/85	--	--	114	--	--	57.1	94.6	--	101	108	110	100
637	2	10/1/85	--	--	140	--	--	94	91.4	--	100	100	107	104
638	3	10/1/85	--	--	130	--	--	81	89	--	106	100	107	96
639	4	10/1/85	--	--	115	--	--	104	95	--	98.9	99.2	111	96.8
649	2	9/22/86	110 a/	114	110	111	38.3	112	106	133	102	101	116	108
640/950	1	9/22/86	113	105	113	107	72.33	111	110	114	105	99.9	102	104
654	3	9/22/86	117	104	106	131	92	107	113	145	107	100	101	102
650/950	1	3/19/87	112	101	100	110	114	116	93.9	125	99.8	100	107	94.8
951	2	3/18/87	109	98.7	97.7	119	114	111	109	133	106	98.7	102	97.5
650/950	1	5/14/87	105	120	106	98.9	108	109	98.9	100	102	100	100	104
951	2	5/17/87	102	113	125	92.4	76.7	88.3	92.3	110	107	98.8	104	108
950	1	9/22/87	106	97.4	111	96.3	162	108	102	118	97.7	100	105	95
951	2	9/22/87	99.4	94.4	100	98.8	104	99.7	103	118	93.1	98.5	108	87.5
952	3	9/22/87	106	92.3	150	99.5	108	95.8	96.7	109	102	102	101	88.3
953	4	9/22/87	100	106	70	123	95.9	101	93	104	100	100	102	88.1
954	5	9/22/87	116	102	99	108	58.4	94.7	97.5	115	105	100	104	104
955	6	9/22/87	104	104	93	106	128	93.7	97.1	108	104	101	89.7	100
950	1	10/9/88	107	97.9	109	97.7	102	121	104	143	102	101	100	108
951	2	10/12/88	104	99.2	107	102	100	120	105	153	94.9	103	111	106
950	1	4/17/89	107	104	107	112	97.4	87.7	98	109	101	98	100	96.4
649	2	4/17/89	113	104	104	100	96	108	95.4	115	104	98.5	116	105
952	3	4/17/89	94.8	105	100	102	92.4	96.4	92.2	115	107	98	115	107
953	4	4/17/89	113	101	105	--	98	103	92.3	103	104	99	118	103
650	1	6/4/90	108	203	102	112	112	113	96.5	100	91.9	99	101	111
649 b/	2	6/4/90	104	--	--	103	107	94	102	95	104	98	100	--
649 c/	1	10/10/90	102	104	92	96.3	77.1	104	103	102	106	96.8	102	102
	2	10/9/90	102	100	93	96.3	47.2	112	102	102	101	97.2	102	102
649	--	1/8/91	99.3	103	98.7	--	--	72.5	90.9	99.2	97.1	106	102	101
650	--	5/2/91	100	102	104	181	69.5	86.7	97.2	100	106	95.7	108	103

All values are percentages of actual known (AK) divided by theoretical known (TK).

a/ The theoretical known was given in the database and by the preparing lab as "< 1.0 mg/L".

b/ Not in SHP01 database.

c/ The value for 10/9/90 is the duplicate known (DK), while the value for 10/10/90 is the actual known (AK).

-- Not analyzed/not given.

CONFIDENTIAL

**SUPPLEMENT 10
STATISTICIAN'S REPORT**

The purpose of this report is to provide a summary of the statistical analysis performed on the data collected during the baseline risk assessment of ground water contamination at the uranium mill tailings site Shiprock, New Mexico. The data were analyzed using a variety of statistical techniques, including descriptive statistics, hypothesis testing, and regression analysis. The results of the analysis indicate that there is a significant correlation between the concentration of uranium in the ground water and the distance from the tailings pile. This finding is consistent with the expected behavior of uranium in the subsurface environment. The analysis also identified several areas where the concentration of uranium was significantly higher than the background level, which may indicate areas of contamination. The results of the analysis will be used to inform the risk assessment and to guide the remediation efforts.

The data were analyzed using a variety of statistical techniques, including descriptive statistics, hypothesis testing, and regression analysis. The results of the analysis indicate that there is a significant correlation between the concentration of uranium in the ground water and the distance from the tailings pile. This finding is consistent with the expected behavior of uranium in the subsurface environment. The analysis also identified several areas where the concentration of uranium was significantly higher than the background level, which may indicate areas of contamination. The results of the analysis will be used to inform the risk assessment and to guide the remediation efforts.

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STATISTICIAN'S REPORT

SHIPROCK, NM BASELINE RISK ASSESSMENT FEBRUARY 1996

INTRODUCTION

As discussed in Section 2.4 of the Shiprock, NM baseline risk assessment (BLRA), four hydrogeologic units are present at the former processing site: the terrace alluvium, the floodplain alluvium of the San Juan River, the Mancos Shale, and the deep bedrock aquifers (Dakota Sandstone and Morrison Formation). The ground waters in the terrace alluvium, the floodplain alluvium, and the upper weathered portion of the Manco Shale underlying the terrace alluvium are hydrologically connected, and clearly show impacts from site processing activities. The unweathered Mancos Shale, however, is generally impermeable, which protects its limited ground water resources and the underlying deeper aquifers from infiltration of contamination from above. Further protection of the deeper aquifers is provided by confined conditions. Because UMTRA Project BLRAs evaluate risks associated with exposure of people, plants, or animals to the most contaminated, potentially accessible ground water at former processing sites, the Shiprock BLRA focuses on ground water present in the alluvium present at the site.

Generally, an early step in the risk evaluation is a statistical comparison of background to on-site ground water quality to identify site contaminants. This step could not be completed for the terrace alluvium at Shiprock because site investigations have been unable to quantify background terrace alluvial ground water quality or quantity. Nevertheless, the BLRA summarizes in Table 3.3 of that document the terrace alluvial ground water quality data available at the time of BLRA preparation, and evaluates risks associated with ingestion by humans of the highest levels of nitrate, sulfate, and uranium found in the terrace alluvium. These three constituents are easily inferred to be associated with processing activities based on knowledge of the chemical processes used at the site. Exposure point concentrations used for risk evaluations represent the 95 percent upper confidence limit for the median concentration in ground water accessed by DOE monitor well 600. These computations are presented in Appendix A.

The remainder of the statistician's report addresses evaluation of the ground water in the better-characterized alluvial floodplain. Ground water quality collected from monitor wells completed in the floodplain between 1985 and April 1993 (SPEAR database June 1993) were available for use in the BLRA. Subsequent changes to that database are not reflected in calculations presented in the statistician's report or in the BLRA. Balancing the need to have adequate amounts of data with the need to describe current ground water conditions at the site, it was determined that generally only data collected at the site between 1987 and April 1993 would be used (one exception to this rule is discussed in the section below on background floodplain alluvial ground water quality). Furthermore, only chemical analysis results from filtered ground water samples were used in the statistical assessment. The reason for focusing on filtered samples is that the vast majority of available data reflect filtered samples, and combining results from filtered and unfiltered samples may introduce a bias into the comparison of background and on-site ground water quality. Limitations associated with the use of filtered ground

water samples for risk evaluation are discussed in the BLRA. Appendix B of this report presents a side-by-side comparison of measurements made on the filtered and unfiltered samples collected simultaneously at the site from both floodplain and terrace alluvium wells in February and April 1993.

The statistical evaluation of ground water quality data for the floodplain alluvium at the Shiprock site involved three steps.

- Determination of the location of the most contaminated ground water in the floodplain alluvium.
- Identification of radiological and nonradiological constituents that are present in the floodplain alluvial ground water at the site at levels above what naturally occurs in background ground water.
- Calculation of a conservative estimate of the average concentration of each site contaminant in the most contaminated ground water in the floodplain alluvium. For the Shiprock site, the 95 percent upper confidence limit (UCL) for the median was selected to describe average worst-case ground water quality. The interpretation of the median concentration is that the concentration of a contaminant in the most contaminated ground water will exceed the median value 50 percent of the time and will be less than the median value 50 percent of the time. The UCL for the median is used in the BLRA to quantify both human and ecological risks associated with exposure to contaminated alluvial floodplain ground water.

Most statistical calculations were done using SYSTAT Statistical Software, Version 4, 1988. A 0.10 level of significance was used for statistical testing. Tables and formulas used in any hand calculations are provided in Appendix C.

Background alluvial floodplain wells

Due to the physical features of the alluvial floodplain in the vicinity of the processing site (see Figure 2.2 of the BLRA), upgradient background wells could not be installed. Instead, background ground water quality was quantified using data collected from DOE monitoring wells 732 and 733 and private wells 634 and 635 completed in the alluvium on the far side of the river from the processing site (USGS sampling locations discussed in Section 3.1.2 of the BLRA provided support for background, but were not incorporated into the statistical assessments). Locations of the four background wells are shown in Figure 3.1 of the BLRA. Critical to defense of these wells as background is the argument, made in Section 2.4 of the BLRA, that contaminated ground water from the site cannot migrate under the San Juan River to impact wells on the other side.

Limited background ground water quality data were available at the time the BLRA was being prepared. The DOE monitoring wells were installed in 1993 and were sampled one time in April 1993 to provide data for the BLRA. The only water quality data for the private wells reflects a 1986 sampling round for a limited number of constituents. Table 3.2 of the BLRA summarizes the available background ground water quality for the floodplain alluvium.

On-site alluvial floodplain wells

Geochemical analyses presented in Section 3.2 of the BLRA demonstrate that site-related contamination of the floodplain alluvium is spatially variable, most likely the result of multiple plumes former from leachate and raffinate spills from the terrace onto the floodplain or from ponds on the floodplain used during mill operation. Ground water at the base of the escarpment (accessed by MW 608, 609, 610, 611, 613, 614, and 615) is generally more impacted than ground water farther from the terrace and closer to the river. Therefore, ground water data from these wells were investigated to identify the region of the most contaminated ground water at the site. Sampling histories of the wells are presented below.

TABLE 1

On-site floodplain alluvium monitor wells used for evaluating plume water quality

Well id	Sampling history	Number rounds	Number rounds 1987-April 1993
608	85-87,89-93	10	8
609	85-87	3	1
610	85-87,89-93	9	7
611	85,87	2	1
613	85-87	3	1
614	85,87-93	9	8
615	85,87,89-93	8	7

Selection of constituents for risk assessment

Constituents were selected for risk evaluation if concentrations in the most contaminated portion of the ground water plume are, on average, higher than those levels present in background ground water. Statistical methods were used to evaluate this condition and a 0.1 level of significance was used for each individual test done.

A number of constituents were omitted from statistical evaluation based on very low frequency of detection in ground water samples collected from plume wells 608, 609, 610, 611, 613, 614, and 615 between 1987 and April 1993, because of the lack of background data for comparison, or because excessively high detection limits make statistical comparison of background to plume well data impossible.

All data collected from plume and background wells for these constituents are listed in Appendix D-1 and are summarized in Table 2 below.

TABLE 2

Constituents omitted from statistical evaluation of floodplain alluvium

Criterion for omission	Constituent	detection limit(s) (mg/L)	frequency of detection in plume wells	maximum observed (mg/L)
Low detectability	Silver	0.01-0.05	2/17	0.03
	Beryllium	0.005-0.03	0/16	
	Cyanide	0.01	0/4	
	Cobalt	0.03-0.10	2/26	0.08
	Chromium	0.01-0.10	2/35	0.32
	Mercury	0.0002	2/24	0.0002
	Lead-210	1.5-2.3	0/8	
	Sulfide	0.1	0/11	
No background	Bromide	0.1	5/11	0.2
	Thallium	0.01-0.05	4/16	0.02
High detection limits	Barium	0.01-0.10	6/24	0.02

For the remaining monitored constituents at the site, the nonparametric Mann-Whitney test (Lehmann 1975) was used for background/plume ground water quality comparisons. Side-by-side boxplots of concentration data for key site indicators ammonium, nitrate, and sulfate (processing chemicals) and molybdenum, radium-226, selenium, uranium, and vanadium (ore related constituents) (Appendix D-2) show that while no single well uniformly stands out as being more contaminated than the others, concentrations in well 615 are on the high end of the scale for all constituents except ammonium, where well 608 concentrations exceed those of 615 by a considerable margin. Therefore, site contaminants were identified by a Mann-Whitney comparison of filtered sample water quality data from 615 (well 608 data in the case of ammonium) to pooled background data from the four wells 634, 635, 732, and 733. However, recognizing that the statistical power of these comparisons may be somewhat inadequate due to small numbers of data, a second series of statistical testing was performed for monitored constituents that failed to reach statistical significance. These followup tests involved pooling data from all plume wells listed in the preceding section for comparison to background levels using the Mann-Whitney test.

The Mann-Whitney test orders, then ranks all the data from smallest (rank=1) to highest (rank=n) then compares the average rank of background data to the average rank of plume well data. A significant result for a constituent is interpreted as meaning that concentrations of that constituent in ground water at the site are, on average, higher than concentrations in background ground water. The Mann-Whitney test was selected for the investigation because the validity of Mann-Whitney test results is less reliant on statistical assumptions than the more traditional "t-test".

The Mann-Whitney procedure incorporates nondetect data in a relatively straight-forward fashion. Data reported as below detection are all considered to be "tied" for smallest for purposes of ordering and ranking. However, variable detection limits add to the complexity of the ordering. Appendix D-3 presents data, individual decisions concerning treatment of nondetect data, and the results of the Mann-Whitney test individually by constituent.

The analyses described above identified 19 constituents present in elevated concentrations in alluvial ground water under the site. These constituents are: ammonium, antimony, arsenic, boron, cadmium, calcium, chloride, magnesium, manganese, nickel, nitrate, phosphate, potassium, selenium, sodium, strontium, sulfate, uranium, and zinc.

Table 3.2 of the BLRA provides a side-by-side comparison of floodplain alluvial plume and background ground water quality.

Exposure concentrations

A human health screening described in the site BLRA identified 11 constituents above background as of potential concern for human health. These constituents are (Table 3.4 of BLRA): antimony, arsenic, cadmium, magnesium, manganese, nitrate, selenium, sodium, strontium, sulfate, and uranium. For these constituents, and all monitored radionuclide decay products of natural uranium (thorium-230, radium-226, polonium-210 and lead 210), a conservative estimate of the average concentration in the most contaminated portion of the alluvial floodplain was computed. For the Shiprock site, this conservative estimate represents the upper 95 percent confidence limit for the true median concentration of each constituent in that ground water. In order to maintain conservativeness, UCLs are calculated upon substitution of the detection limit for all data reported as being below detection. Calculations shown in Appendix D-4 are based on ranks (nonparametric approach) and result in confidences that vary slightly from the nominal 95 percent. Results are summarized in Table 3 below.

Constituents ammonium, calcium, chloride, nickel, phosphate, potassium, and zinc were evaluated for ecological risks (BLRA Tables 7.1 and 7.2) based on the sample median values reported in Table 3.2 of the BLRA, as opposed to the UCL for the median concentration/activity, as reported in the footnotes of those tables. Appendix D-4 presents the sample median and the UCL for the median to demonstrate that the differences between the UCLs and the sample medians are small, such that conclusions of Section 7 of the BLRA are not likely impacted by the change.

Table 3

Approximate 95 percent upper confidence limit (UCL) for median concentration in most contaminated portion of alluvial floodplain aquifer

Constituent	Well(s)*	number samples	sample median	UCL for median	confidence coefficient
Arsenic	all	33	0.028	0.030	96.0 percent
Cadmium	all	33	0.001	0.005	96.0
Magnesium	615	7	2000	2540	93.8
Manganese	615	7	8.08	9.38	93.8
Sodium	615	7	3500	3630	93.8
Nitrate	615	7	3300	4220	93.8
Lead-210	all	6	1.2	1.3	98.4
Polonium-210	all	13	0.6	1.1	95.4
Radium-226	all	32	0.2	0.2	94.5
Antimony	all	29	<0.02	0.037	96.9
Selenium	615	7	0.122	0.255	93.8
Sulfate	615	7	13000	15000	93.8
Strontium	615	7	10.1	12.2	93.8
Thorium-230	all	14	0.35	0.6	97.1
Uranium	615	7	2.8	3.0	93.8

NOTES:

1. "all" means data from monitor wells 608, 609, 610, 611, 613, 614, and 615 combined
2. Units are mg/L for nonradiological constituents and uranium; pCi/L for radiological constituents.

Reference:

Lehmann, E.L. (1975). *Nonparametrics: Statistical Methods Based on Ranks*, Holden-Day, San Francisco, CA.

APPENDIX A

95 PERCENT UPPER CONFIDENCE LIMIT FOR MEDIAN CONCENTRATIONS OF
NITRATE, SULFATE, AND URANIUM IN GROUND WATER ACCESSIBLE BY
TERRACE ALLUVIUM MONITOR WELL 600, SHIPROCK

Const	date	concentration
NO3	910515	332.000
NO3	901012	385.000
NO3	930222	446.000
NO3	890419	470.000
NO3	920918	700.000
NO3	881011	840.000
NO3	900604	945.000

← median

← ucl

SO4	930222	9200.000
SO4	881011	9250.000
SO4	900604	9780.000
SO4	901012	9840.000
SO4	920918	9900.000
SO4	910515	10200.000
SO4	890419	11100.000

← median

← ucl

U	900604	1.060
U	920918	1.200
U	910515	1.310
U	930222	1.390
U	901012	1.440
U	890419	1.480
U	881011	1.570

median

ucl

BINOMIAL WITH N = 7 P = 0.500000

K	P(X LESS OR = K)
0	0.0078
1	0.0625
2	0.2266
3	0.5000
4	0.7734
5	0.9375
6	0.9922
7	1.0000

← 93.8% ucl

n - x' = 6

APPENDIX B

COMPARISON OF FILTERED AND UNFILTERED GROUND WATER SAMPLE RESULTS COLLECTED CONCURRENTLY AT THE SHIPROCK SITE, 1993

NOTE: measurements are concentrations (mg/L) for nonradiological constituents and uranium. Measurements are activities (pCi/L) for radium-226 (R6L), lead-210 (PB0), polonium-210 (PO0) and thorium-230 (T0L).

id	date	filtered result	unfiltered result
1. results for floodplain			
AS			
425	93.138	< 0.005	< 0.005
426	93.141	< 0.005	< 0.005
608	93.141	< 0.005	< 0.005
608	93.316	< 0.010	< 0.005
610	93.141	< 0.005	< 0.005
612	93.152	< 0.005	< 0.005
614	93.141	< 0.005	< 0.005
615	93.141	< 0.005	< 0.005
616	93.152	< 0.005	< 0.005
617	93.144	< 0.005	< 0.005
619	93.146	< 0.005	< 0.005
620	93.141	< 0.005	< 0.005
620	93.316	< 0.010	< 0.005
626	93.144	< 0.005	< 0.005
628	93.146	< 0.005	< 0.005
630	93.138	< 0.005	< 0.005
630	93.313	< 0.010	< 0.005
648	93.318	< 0.005	< 0.005
732	93.310	< 0.005	< 0.005
734	93.313	< 0.010	< 0.005
735	93.316	< 0.010	< 0.005
736	93.313	< 0.010	< 0.010
CA			
425	93.138	432	419
426	93.141	409	410
608	93.141	400	448
608	93.316	459	485
610	93.141	417	405
612	93.152	317	327
614	93.141	426	377
615	93.141	380	366
616	93.152	512	506
617	93.144	412	417
619	93.146	348	365
620	93.141	376	353
620	93.316	474	484
626	93.144	229	220
628	93.146	374	383
630	93.138	390	401
630	93.313	327	348
648	93.318	116	111
732	93.310	181	182
734	93.313	116	111
735	93.316	463	509
736	93.313	412	439
CD			
425	93.138	< 0.001	< 0.002
426	93.141	< 0.001	< 0.004
608	93.141	< 0.001	< 0.010
608	93.316	< 0.001	< 0.005
610	93.141	< 0.001	< 0.005
612	93.152	< 0.001	< 0.001
614	93.141	< 0.001	< 0.005
615	93.141	< 0.001	< 0.010
616	93.152	< 0.001	< 0.002
617	93.144	< 0.001	< 0.005
619	93.146	< 0.001	< 0.001

id	date	filtered result	unfiltered result
620	93.141	< 0.001	< 0.005
620	93.316	< 0.001	0.002
626	93.144	< 0.001	0.002
628	93.146	< 0.001	< 0.002
630	93.138	< 0.001	< 0.002
630	93.313	< 0.001	0.001
648	93.318	< 0.001	0.001
732	93.310	< 0.001	0.002
734	93.313	< 0.001	< 0.001
735	93.316	< 0.001	0.001
736	93.313	< 0.001	0.004
CL			
615	93.141	461	441
CO			
608	93.316	< 0.100	< 0.050
620	93.316	< 0.050	< 0.050
630	93.313	< 0.050	< 0.050
648	93.318	< 0.050	< 0.050
732	93.310	< 0.050	< 0.050
734	93.313	< 0.100	< 0.050
735	93.316	< 0.050	< 0.050
736	93.313	< 0.100	< 0.050
CR			
425	93.138	< 0.010	< 0.010
426	93.141	< 0.010	< 0.010
608	93.141	< 0.010	< 0.050
608	93.316	< 0.100	< 0.050
610	93.141	< 0.010	< 0.010
612	93.152	< 0.010	< 0.010
614	93.141	< 0.010	< 0.010
615	93.141	< 0.010	< 0.010
616	93.152	< 0.010	< 0.010
617	93.144	< 0.010	< 0.010
619	93.146	< 0.010	< 0.010
620	93.141	< 0.010	< 0.010
620	93.316	< 0.050	< 0.020
626	93.144	< 0.010	< 0.010
628	93.146	< 0.010	< 0.010
630	93.138	< 0.010	< 0.010
630	93.313	< 0.010	< 0.010
648	93.318	< 0.010	< 0.010
732	93.310	< 0.010	< 0.010
734	93.313	< 0.100	< 0.010
735	93.316	< 0.050	< 0.020
736	93.313	< 0.100	< 0.050
CU			
608	93.316	< 0.100	< 0.050
620	93.316	< 0.050	< 0.020
630	93.313	< 0.020	< 0.020
648	93.318	< 0.020	< 0.020
732	93.310	< 0.020	< 0.020
734	93.313	< 0.100	< 0.020
735	93.316	< 0.050	< 0.020
736	93.313	< 0.100	< 0.050
FE			
608	93.316	< 0.200	< 0.100
620	93.316	< 0.100	< 0.030
630	93.313	< 0.030	< 0.030
648	93.318	0.120	0.160
732	93.310	< 0.030	< 0.030

id	date		filtered result		unfiltered result
734	93.313		0.600		0.480
735	93.316	<	0.100	<	0.030
736	93.313	<	0.200	<	0.100
K					
425	93.138		25.600		25.600
426	93.141		24.300		25.500
608	93.141		166		166
610	93.141		99.800		96.100
612	93.152		10		10.800
614	93.141		90.100		88.900
615	93.141		109		109
616	93.152		48.900		50.200
617	93.144		62.400		69.500
619	93.146		65.700		68.300
620	93.141		43		42.700
626	93.144		18.900		18.800
628	93.146		13.900		14.900
630	93.138		13.900		141
MG					
425	93.138		395		380
426	93.141		408		389
608	93.141		2580		2370
610	93.141		1510		1420
612	93.152		150		147
614	93.141		1720		1640
615	93.141		1940		1880
616	93.152		392		375
617	93.144		925		1090
619	93.146		1100		1060
620	93.141		884		860
626	93.144		162		151
628	93.146		132		130
630	93.138		256		264
MN					
425	93.138		0.080		0.080
426	93.141		0.030		0.100
608	93.141		7.390		8.190
608	93.316		9.500		9.850
610	93.141		2.850		2.650
612	93.152		0.040		0.060
614	93.141		4.720		4.470
615	93.141		5.660		5.390
616	93.152		4.750		4.780
617	93.144		7.600		9.020
619	93.146		3.930		4.160
620	93.141		2.170		2.090
620	93.316		2.900		2.910
626	93.144		0.920		1.040
628	93.146		5.040		5.360
630	93.138		0.780		0.940
630	93.313		0.690		0.730
648	93.318		0.090		0.090
732	93.310		1.280		1.320
734	93.313		1.400		1.340
735	93.316		4.600		5.080
736	93.313		1.600		1.650
MO					
425	93.138	<	0.010		0.010
426	93.141	<	0.010		0.010
608	93.141	<	0.010	<	0.050

id	date	filtered result	unfiltered result
608	93.316	< 0.100	< 0.050
610	93.141	< 0.010	0.020
612	93.152	< 0.010	0.010
614	93.141	< 0.010	0.020
615	93.141	< 0.010	0.010
616	93.152	< 0.010	< 0.010
617	93.144	< 0.010	< 0.010
619	93.146	< 0.010	< 0.010
620	93.141	< 0.010	0.010
620	93.316	< 0.050	< 0.020
626	93.144	< 0.010	< 0.010
628	93.146	0.020	0.020
630	93.138	< 0.010	0.010
630	93.313	0.010	0.010
648	93.318	< 0.010	< 0.010
732	93.310	< 0.010	< 0.010
734	93.313	< 0.100	0.030
735	93.316	< 0.050	0.020
736	93.313	< 0.100	0.060
NA			
425	93.138	977	943
426	93.141	1960	1870
608	93.141	2540	2360
608	93.316	2050	2160
610	93.141	1900	1810
612	93.152	268	262
614	93.141	2030	1980
615	93.141	3010	2940
616	93.152	696	665
617	93.144	1360	1590
619	93.146	2570	2510
620	93.141	2050	2040
620	93.316	2190	2200
626	93.144	1060	1040
628	93.146	1520	1480
630	93.138	1380	1440
630	93.313	1120	1270
648	93.318	802	832
732	93.310	331	345
734	93.313	1640	1520
735	93.316	2040	2250
736	93.313	4090	4300
PB			
425	93.138	< 0.003	< 0.030
426	93.141	< 0.003	< 0.030
608	93.141	< 0.030	< 0.030
608	93.316	< 0.003	< 0.003
610	93.141	< 0.030	< 0.030
612	93.152	< 0.003	< 0.003
614	93.141	< 0.030	< 0.030
615	93.141	< 0.030	< 0.030
616	93.152	< 0.003	< 0.003
617	93.144	< 0.003	< 0.003
619	93.146	< 0.030	< 0.030
620	93.141	< 0.003	< 0.030
620	93.316	< 0.003	< 0.003
626	93.144	< 0.003	< 0.003
628	93.146	< 0.003	< 0.003
630	93.138	< 0.003	< 0.030
630	93.313	< 0.003	< 0.003

id	date	filtered result	unfiltered result
648	93.318	< 0.003	< 0.003
732	93.310	< 0.003	< 0.003
734	93.313	< 0.003	< 0.003
735	93.316	< 0.003	0.006
736	93.313	< 0.003	< 0.003
PBO			
608	93.141	1.300	1.700
612	93.152	0.700	1.300
615	93.141	1.300	2.500
616	93.152	1.400	1.900
POO			
608	93.141	0	3.900
612	93.152	0	0.400
615	93.141	0	0
616	93.152	0	0.400
R6L			
425	93.138	0.900	1.800
426	93.141	1.200	1.500
608	93.141	2.500	1.900
610	93.141	1.200	1.400
612	93.152	0.100	0.200
614	93.141	3	1.700
615	93.141	2.200	2.100
616	93.152	0.200	0.500
617	93.144	0.400	0.400
619	93.146	0.400	0.800
620	93.141	1.400	1.300
626	93.144	0.200	0
628	93.146	0.100	0.300
630	93.138	0.900	0.600
SB			
608	93.316	< 0.003	< 0.003
620	93.316	< 0.003	< 0.003
630	93.313	< 0.003	< 0.003
648	93.318	< 0.003	< 0.003
732	93.310	< 0.003	< 0.003
734	93.313	< 0.003	< 0.003
735	93.316	< 0.003	< 0.003
736	93.313	< 0.003	< 0.003
SE			
425	93.138	0.108	0.089
426	93.141	0.298	0.263
608	93.141	< 0.050	0.037
608	93.316	0.010	0.008
610	93.141	0.098	0.064
612	93.152	0.055	0.043
614	93.141	0.274	0.281
615	93.141	0.640	0.664
616	93.152	< 0.050	< 0.005
617	93.144	0.068	0.074
619	93.146	0.103	0.062
620	93.141	0.088	0.151
620	93.316	0.130	0.138
626	93.144	0.017	0.007
628	93.146	< 0.050	< 0.050
630	93.138	0.196	0.149
630	93.313	0.120	0.100
648	93.318	< 0.010	< 0.005
732	93.310	0.007	0.005
734	93.313	0.033	0.035

id	date	filtered result	unfiltered result
735	93.316	0.160	0.159
736	93.313	< 0.005	< 0.005
SO4			
615	93.141	12000	12400
SR			
425	93.138	6.690	6.270
426	93.141	9.640	8.920
608	93.141	11.100	11.800
608	93.316	12	12.700
610	93.141	8.830	8
612	93.152	2.840	2.920
614	93.141	8.970	7.940
615	93.141	9.020	8.440
616	93.152	5.660	5.640
617	93.144	6.830	8.280
619	93.146	6.410	6.870
620	93.141	7.900	7.310
620	93.316	10	10.200
626	93.144	5.250	5.230
628	93.146	8.190	8.900
630	93.138	14.400	14.300
630	93.313	11.300	12.600
648	93.318	11.900	12.200
732	93.310	2.660	2.780
734	93.313	3.200	3.110
735	93.316	8.900	9.980
736	93.313	10.400	11.100
TOL			
608	93.141	0.200	0.400
612	93.152	0.200	0.200
615	93.141	0.500	0.100
616	93.152	0.700	0
U			
425	93.138	0.436	0.438
426	93.141	0.734	0.773
608	93.141	2.410	2.720
608	93.316	2.220	2.600
610	93.141	1.870	2
612	93.152	0.411	0.435
614	93.141	2.200	2.520
615	93.141	2.640	2.890
616	93.152	0.589	0.577
617	93.144	0.832	0.849
619	93.146	1.080	1.200
620	93.141	1.090	0.976
620	93.316	1.100	1.070
626	93.144	0.175	0.174
628	93.146	0.188	0.182
630	93.138	0.538	0.557
630	93.313	0.337	0.287
648	93.318	< 0.001	< 0.001
732	93.310	0.015	0.018
733	93.324	0.023	0.027
734	93.313	0.152	0.520
735	93.316	0.138	0.146
736	93.313	1.330	1.410
V			
608	93.316	< 0.100	< 0.050
620	93.316	< 0.050	< 0.020
630	93.313	0.020	0.020

id	date	filtered result	unfiltered result
648	93.318	< 0.010	< 0.010
732	93.310	< 0.010	< 0.010
734	93.313	< 0.100	< 0.010
735	93.316	< 0.050	< 0.020
736	93.313	< 0.100	< 0.050
	ZN		
608	93.316	0.220	0.260
620	93.316	0.050	0.080
630	93.313	0.089	0.100
648	93.318	< 0.005	< 0.005
732	93.310	< 0.005	< 0.005
734	93.313	< 0.050	0.020
735	93.316	0.080	0.120
736	93.313	0.120	0.180

id	date	filtered result	unfiltered result
2. results for terrace			
AS			
600	93.144	< 0.005	< 0.050
602	93.144	< 0.005	< 0.050
726	93.321	< 0.005	< 0.005
727	93.321	< 0.005	< 0.010
728	93.318	< 0.005	< 0.005
731	93.318	< 0.005	< 0.005
CA			
600	93.144	362	477
602	93.144	427	387
726	93.321	337	470
727	93.321	457	498
728	93.318	541	514
731	93.318	433	481
CD			
600	93.144	< 0.001	0.005
602	93.144	< 0.002	< 0.001
726	93.321	< 0.001	0.003
727	93.321	0.001	0.006
728	93.318	< 0.001	0.001
731	93.318	< 0.001	0.002
CL			
600	93.144	324	394
602	93.144	862	787
CO			
726	93.321	< 0.050	< 0.050
727	93.321	< 0.100	< 0.050
728	93.318	< 0.050	< 0.050
731	93.318	< 0.050	< 0.050
CR			
600	93.144	< 0.010	0.050
602	93.144	< 0.100	< 0.010
726	93.321	< 0.010	< 0.050
727	93.321	< 0.100	< 0.050
728	93.318	< 0.010	< 0.010
731	93.318	< 0.010	0.020
CU			
726	93.321	< 0.020	< 0.050
727	93.321	< 0.100	< 0.050
728	93.318	< 0.020	< 0.020
731	93.318	< 0.020	< 0.020
FE			
726	93.321	< 0.030	10.400
727	93.321	< 0.200	3.130
728	93.318	< 0.030	4.890
731	93.318	< 0.030	10.100
K			
600	93.144	81.400	68.100
602	93.144	200	200
MG			
600	93.144	802	643
602	93.144	2670	2610
MN			
600	93.144	1.210	1.240
602	93.144	2.100	1.900
726	93.321	0.230	0.420
727	93.321	1.500	1.610
728	93.318	0.360	0.390

id	date		filtered result		unfiltered result
731	93.318		0.380		0.470
	MO				
600	93.144	<	0.010		0.010
602	93.144	<	0.100		0.010
726	93.321	<	0.010		0.050
727	93.321	<	0.100	<	0.050
728	93.318	<	0.010		0.010
731	93.318		0.010		0.010
	NA				
600	93.144		2880		3450
602	93.144		2920		2850
726	93.321		1330		1910
727	93.321		3030		3090
728	93.318		534		527
731	93.318		934		1080
	PB				
600	93.144	<	0.030		0.095
602	93.144	<	0.030	<	0.030
726	93.321	<	0.003		0.009
727	93.321	<	0.003		0.003
728	93.318	<	0.003	<	0.003
731	93.318	<	0.003		0.007
	PB0				
600	93.144		2.900		8
602	93.144		3.200		1.300
	PO0				
600	93.144		0.800		0.100
602	93.144		0		0.400
	R6L				
600	93.144		1.600		5.600
602	93.144		5.200		6.700
	SB				
726	93.321	<	0.003	<	0.003
727	93.321	<	0.003	<	0.003
728	93.318	<	0.003	<	0.003
731	93.318	<	0.003	<	0.003
	SE				
600	93.144	<	0.050	<	0.050
602	93.144	<	0.050	<	0.050
726	93.321	<	0.010		0.010
727	93.321	<	0.010	<	0.005
728	93.318		0.072		0.051
731	93.318		0.250		0.192
	SO4				
600	93.144		9200		9640
602	93.144		16900		17900
	SR				
600	93.144		8.840		9.370
602	93.144		12.700		12.200
726	93.321		4.940		7.070
727	93.321		14.700		15.700
728	93.318		7.410		7.240
731	93.318		7.050		8.140
	T0L				
600	93.144		0.100		6.200
602	93.144		0.300		1.100
	U				
600	93.144		1.390		1.350
602	93.144		0.809		0.823
725	93.310		0.496		0.503

id	date	filtered	result	unfiltered	result
726	93.321		0.022		0.024
727	93.321		0.496		0.546
728	93.318		0.037		0.342
731	93.318		0.480		0.035
	V				
726	93.321	<	0.010		0.050
727	93.321	<	0.100	<	0.050
728	93.318	<	0.010		0.030
731	93.318	<	0.010		0.040
	ZN				
726	93.321	<	0.005		0.040
727	93.321	<	0.050		0.020
728	93.318		0.012		0.050
731	93.318		0.159		0.050

APPENDIX C

FORMULAS AND TABLES USED FOR HAND CALCULATIONS

1. Approximate 95 percent upper confidence limit for the median value in a population (Appendix A, Appendix D4).

See description of procedure attached (reference: Helsel and Hirsch) and binomial cumulative probability tables generated by MINITAB and presented within the Appendices themselves.

2. Conversion of p-value for a Kruskal Wallis test to a p-value for a Mann-Whitney test of the hypothesis (Appendix D3):

$$\begin{aligned} H_0: \mu_{bkg} &\geq \mu_{plume} \\ H_a: \mu_{bkg} &< \mu_{plume} \end{aligned}$$

First compute the Average Rank for each group (Average Rank = Rank Sum/Count)

IF:	THEN MANN-WHITNEY P-VALUE EQUALS:
Average Rank _{bkg} < Average Rank _{plume}	0.5*Kruskal Wallis p-value
Average Rank _{bkg} > Average Rank _{plume}	1 - 0.5*Kruskal Wallis p-value

3. Exact significance probability of the Mann-Whitney test results, computed in cases where a high percentage of tied values makes the Normal Approximation to the result suspect (APPENDIX D3). See Lehmann (1975, pp 18-19).

References:

Lehmann E.L. (1975). *Nonparametrics: Statistical Methods Based on Ranks*, Holden-Day.

Helsel, D.R. and R.M. Hirsch (1991). *Statistical Methods for Water Resources*, Elsevier Publishers.

Statistical Methods in Water Resources

Dennis R. Helsel and Robert M. Hirsch

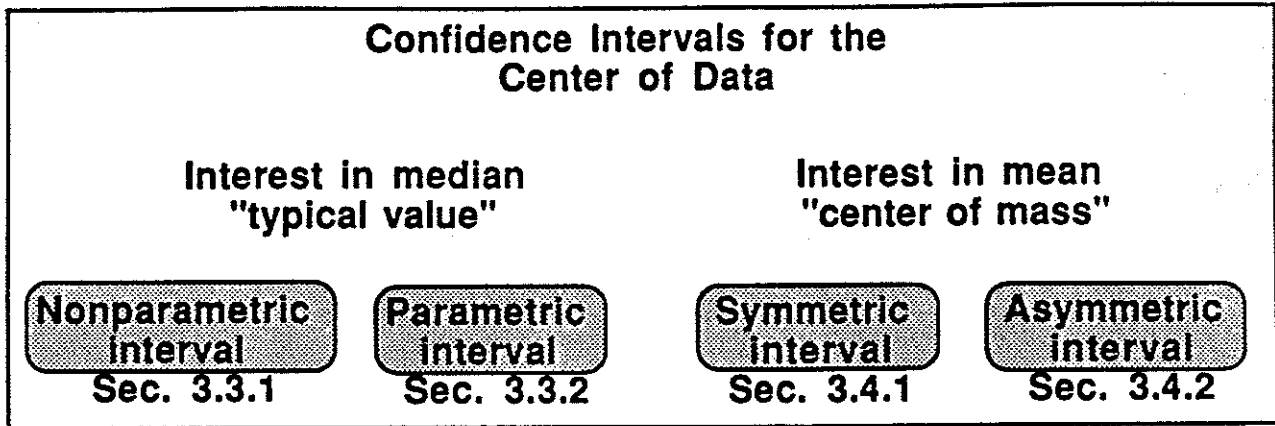
U. S. Geological Survey
Water Resources Division
Reston, Virginia, 22092
USA

Elsevier Publishers

1991

3.3 Confidence Intervals For The Median

A confidence interval for the true population median may be computed either without assuming the data follow any specific distribution (section 3.3.1), or assuming they follow a distribution such as the lognormal (section 3.3.2).



3.3.1 Nonparametric Interval Estimate For The Median

A nonparametric interval estimate for the true population median is computed using the binomial distribution. First, the desired significance level α is stated, the acceptable risk of not including the true median. One-half ($\alpha/2$) of this risk is assigned to each end of the interval (figure 3.4). A table of the binomial distribution provides lower and upper critical values x' and x at one-half the desired alpha level ($\alpha/2$). These critical values are transformed into the ranks R_l and R_u corresponding to data points C_l and C_u at the ends of the confidence interval.

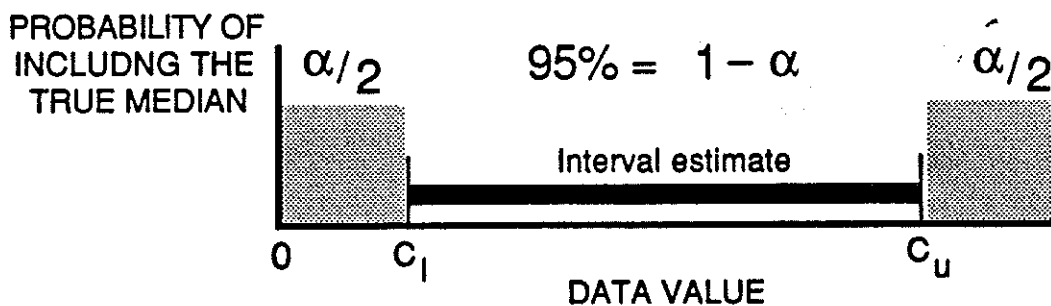


Figure 3.4 Probability of containing the true median $P_{.50}$ in a 2-sided interval estimate. $P_{.50}$ will be below the lower interval bound (C_l) $\alpha/2\%$ of the time, and above the upper interval bound (C_u) $\alpha/2\%$ of the time.

For small sample sizes, the binomial table is entered at the $p=0.5$ (median) column in order to compute a confidence interval on the median. This column is reproduced in Appendix Table B5 – it is identical to the quantiles for the sign test (see chapter 6). A

critical value x' is obtained from Table B5 corresponding to $\alpha/2$, or as close to $\alpha/2$ as possible. This critical value is then used to compute the ranks R_U and R_L corresponding to the data values at the upper and lower confidence limits for the median. These limits are the R_L th ranked data points going in from each end of the sorted list of n observations. The resulting confidence interval will reflect the shape (skewed or symmetric) of the original data.

$R_L = x' + 1$	[3.2]
$R_U = n - x' + 1$	for x' and x from Appendix Table B5 [3.3]

Nonparametric intervals cannot always exactly produce the desired confidence level when sample sizes are small. This is because they are discrete, jumping from one data value to the next at the ends of the intervals. However, confidence levels close to those desired are available for all but the smallest sample sizes.

Example 2

The following 25 arsenic concentrations (in ppb) were reported for ground waters of southeastern New Hampshire (Boudette and others, 1985). A histogram of the data is shown in figure 3.5. Compute the $\alpha=0.05$ interval estimate of the median concentration.

1.3	1.5	1.8	2.6	2.8	3.5	4.0	4.8	8
9.5	12	14	19	23	41	80	100	110
120	190	240	250	300	340	580		

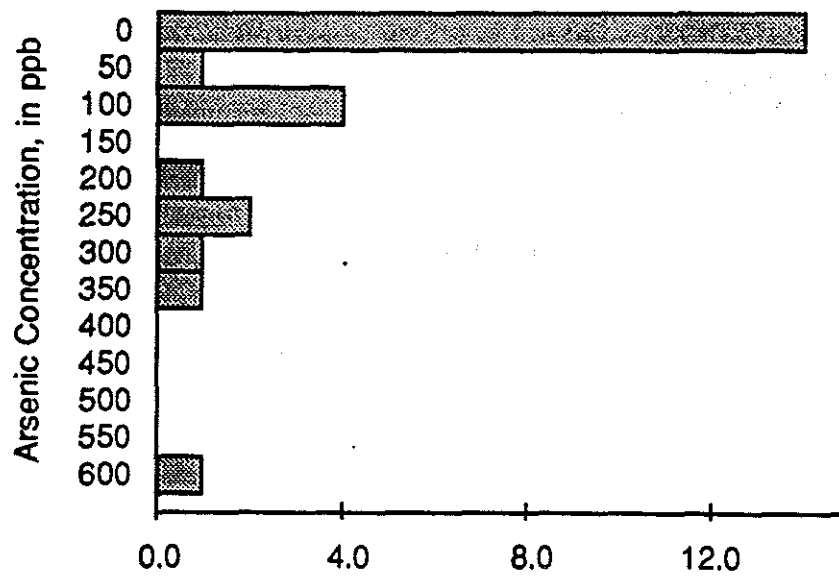


Figure 3.5 Histogram of Example 2 arsenic concentrations (in ppb)

ID

DATE

CONCENTRATION

QUALIFIER

APPENDIX D1

CONSTITUENTS OMITTED FROM STATISTICAL ANALYSIS BASED ON LOW FREQUENCY OF DETECTED VALUES AMONG FLOODPLAIN WELLS 608, 609, 610, 611, 613, 614 AND 615; EXCESSIVELY HIGH DETECTION LIMITS; OR LACK OF BACKGROUND DATA

ID	DATE	CONCENTRATION	QUALIFIER
AG (LOW DETECTABILITY)			
0608	89.258	< 0.010	
0608	90.419	< 0.010	
0608	90.769	< 0.020	I
0608	91.372	< 0.050	I
0610	89.258	< 0.010	
0610	90.419	< 0.010	
0610	90.769	< 0.010	L
0610	91.372	< 0.010	
0614	88.780	< 0.030	
0614	89.258	< 0.010	
0614	90.419	< 0.010	
0614	90.769	< 0.010	
0614	91.372	< 0.010	
0615	89.258	< 0.010	
0615	90.419	< 0.010	
0615	90.775	< 0.020	L
0615	91.372	< 0.050	I
Bkg < 0634	86.719	< 0.010	RX
0635	86.719	< 0.010	RX
BA (EXCESSIVELY HIGH DETECTION LIMITS)			
0608	87.727	< 0.100	J
0608	89.258	< 0.100	
0608	90.419	< 0.100	
0608	90.769	< 0.020	
0608	91.372	< 0.050	I
0609	87.724	< 0.100	J
0610	87.724	< 0.100	J
0610	89.258	< 0.100	
0610	90.419	< 0.100	
0610	90.769	< 0.020	L
0610	91.372	< 0.010	
0611	87.719	< 0.100	J
0613	87.716	< 0.100	J
0614	87.716	< 0.100	J
0614	88.780	< 0.100	
0614	89.258	< 0.100	
0614	90.419	< 0.100	
0614	90.769	< 0.020	
0614	91.372	< 0.010	
0615	87.716	< 0.100	J
0615	89.258	< 0.100	
0615	90.419	< 0.100	
0615	90.775	< 0.010	L
0615	91.372	< 0.050	I
Bkg < 0634	86.719	< 0.100	RX
0635	86.719	< 0.100	RX
BE (LOW DETECTABILITY)			
0608	89.258	< 0.010	
0608	90.419	< 0.010	
0608	90.769	< 0.010	I
0608	91.372	< 0.030	I
0610	91.372	< 0.005	
0610	89.258	< 0.010	
0610	90.419	< 0.010	
0610	90.769	< 0.005	L
0614	89.258	< 0.010	
0614	90.419	< 0.010	
0614	90.769	< 0.005	
0614	91.372	< 0.005	
0615	89.258	< 0.010	
0615	90.419	< 0.010	
0615	90.775	< 0.010	IL
0615	91.372	< 0.030	I

ID	DATE	CONCENTRATION	QUALIFIER
BR (NO BACKGROUND DATA)			
0608	87.727	0.100	
0608	89.258	< 0.100	
0609	87.724	0.100	
0610	87.724	< 0.100	
0610	89.258	< 0.100	
0611	87.719	0.100	
0613	87.716	0.200	
0614	87.716	< 0.100	
0614	89.258	< 0.100	
0615	87.716	0.100	
0615	89.258	< 0.100	
CN LOW DETECTABILITY)			
0608	89.258	< 0.010	
0610	89.258	< 0.010	
0614	89.258	< 0.010	
0615	89.258	< 0.010	
Bkg { 0634	86.719	< 0.010	RX
0635	86.719	< 0.010	RX
CO (LOW DETECTABILITY)			
0608	87.727	< 0.050	J
0608	89.258	< 0.050	
0608	90.419	< 0.050	
0608	90.769	< 0.060	I
0608	91.372	< 0.100	I
0608	93.316	< 0.100	I
0609	87.724	< 0.050	J
0610	91.372	< 0.030	
0610	87.724	< 0.050	J
0610	89.258	< 0.050	
0610	90.419	< 0.050	
0610	90.769	< 0.030	L
0611	87.719	< 0.050	J
0613	87.716	< 0.050	J
0614	87.716	< 0.050	J
0614	88.780	0.060	
0614	89.258	< 0.050	
0614	90.419	< 0.050	
0614	90.769	< 0.030	
0614	91.372	< 0.030	
0615	89.258	< 0.050	
0615	90.419	< 0.050	
0615	90.775	0.080	L
0615	91.372	< 0.100	I
0615	87.716	< 0.050	J
Bkg { 0634	86.719	< 0.050	RX
0635	86.719	0.080	RX
0732	93.310	< 0.050	
0733	93.316	< 0.050	
UNF 0608	93.316	< 0.100	I
UNF { 0732	93.310	< 0.050	
UNF 0733	93.316	< 0.050	
CR (LOW DETECTABILITY)			
0608	87.727	< 0.010	
0608	89.258	< 0.010	
0608	90.419	< 0.010	
0608	90.769	< 0.020	I
0608	91.372	< 0.050	I
0608	93.141	< 0.010	
0608	93.316	< 0.100	I
0609	87.724	< 0.010	
0610	91.372	< 0.010	
0610	93.141	< 0.010	

	ID	DATE	CONCENTRATION	QUALIFIER
	0610	87.724	< 0.010	
	0610	89.258	< 0.010	
	0610	90.419	< 0.010	
	0610	90.769	< 0.010	L
	0611	87.719	< 0.010	
	0613	87.716	< 0.010	
	0614	87.716	< 0.010	
	0614	88.780	0.200	
	0614	89.258	< 0.010	
	0614	90.419	< 0.010	
	0614	90.769	< 0.010	
	0614	91.372	< 0.010	
	0614	93.141	< 0.010	
	0615	89.258	< 0.010	
	0615	90.419	< 0.010	
	0615	90.775	0.320	L
	0615	91.372	< 0.050	I
	0615	93.141	< 0.010	
	0615	87.716	< 0.010	
Bkg	0634	86.719	0.050	RX
	0635	86.719	0.030	RX
	0732	93.310	< 0.010	
	0733	93.316	< 0.010	
UNF	0608	93.141	< 0.010	
UNF	0608	93.316	< 0.100	I
UNF	0610	93.141	< 0.010	
UNF	0612	93.152	< 0.010	
UNF	0614	93.141	< 0.010	
UNF	0615	93.141	< 0.010	
UNF	0732	93.310	< 0.010	
UNF	0733	93.316	< 0.010	
Bkg				
HG (LOW DETECTABILITY)				
	0608	87.727	< 0.000	
	0608	89.258	< 0.000	
	0608	90.419	< 0.000	
	0608	90.769	< 0.000	
	0608	91.372	< 0.000	
	0609	87.724	< 0.000	
	0610	91.372	< 0.000	
	0610	87.724	0.000	
	0610	89.258	< 0.000	
	0610	90.419	< 0.000	
	0610	90.769	< 0.000	L
	0611	87.719	< 0.000	
	0613	87.716	< 0.000	
	0614	87.716	< 0.000	
	0614	88.780	0.000	
	0614	89.258	< 0.000	
	0614	90.419	< 0.000	
	0614	90.769	< 0.000	
	0614	91.372	< 0.000	
	0615	89.258	< 0.000	
	0615	90.419	< 0.000	
	0615	90.775	< 0.000	L
	0615	91.372	< 0.000	
	0615	87.716	< 0.000	
Bkg	0634	86.719	< 0.000	RX
	0635	86.719	< 0.000	RX
LEAD 210 (LOW DETECTABILITY)				
	0608	89.258	< 1.500	
	0608	93.141	< 1.700	
	0610	89.258	< 1.500	
	0614	89.258	< 1.500	
	0615	89.258	< 1.500	
	0615	93.141	< 1.700	

	ID	DATE		CONCENTRATION	QUALIFIER
	BK3 < 0634	86.719	<	1.500	RX
	0635	86.719	<	1.500	RX
UNF	0608	93.141	<	1.700	
UNF	0612	93.152	<	2.300	
UNF	0615	93.141	<	1.700	
S (LOW DETECTABILITY)					
	0608	87.727	<	0.100	
	0608	89.258	<	0.100	
	0609	87.724	<	0.100	
	0610	87.724	<	0.100	
	0610	89.258	<	0.100	
	0611	87.719	<	0.100	
	0613	87.716	<	0.100	
	0614	87.716	<	0.100	
	0614	89.258	<	0.100	
	0615	89.258	<	0.100	
	0615	87.716	<	0.100	
	BK3 < 0634	86.719	<	0.100	RX
	0635	86.719	<	0.100	RX
TL (NO BACKGROUND DATA)					
	0608	89.258		0.020	
	0608	90.419	<	0.010	
	0608	90.769	<	0.050	I
	0608	91.372	<	0.050	I
	0610	89.258		0.020	
	0610	90.419	<	0.010	
	0610	90.769	<	0.050	IL
	0610	91.372	<	0.050	I
	0614	89.258		0.010	
	0614	90.419	<	0.010	
	0614	90.769	<	0.050	I
	0614	91.372	<	0.050	I
	0615	89.258		0.020	
	0615	90.419	<	0.010	
	0615	90.775	<	0.050	IL
	0615	91.372	<	0.050	I

APPENDIX D2

**COMPARISON OF WATER QUALITY (1987-APRIL 1993) OF GROUND WATER
SAMPLES COLLECTED FROM MONITORING WELLS LOCATED IN FLOODPLAIN
ADJACENT TO ESCARPMENT**

NONDETECTS OMITTED FOR GRAPHING

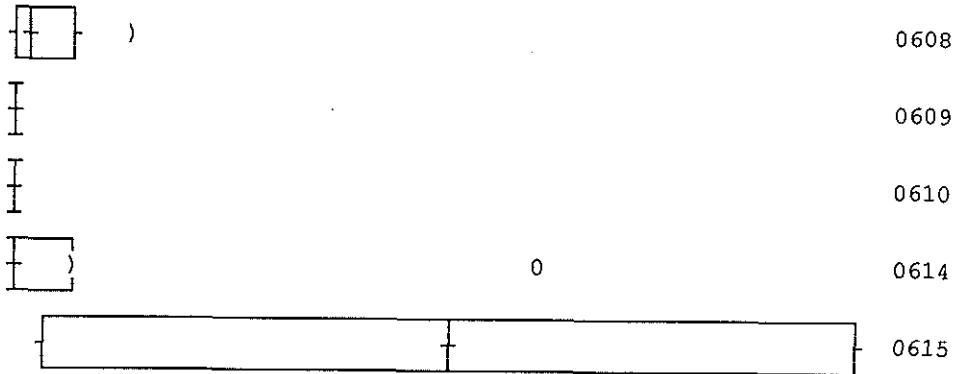
THE FOLLOWING RESULTS ARE FOR:

PARID\$ = MO

BOX PLOT OF VARIABLE: P , N = 12

GROUPED BY VARIABLE: LOCID\$

0.01 MINIMUM 0.36 MAXIMUM



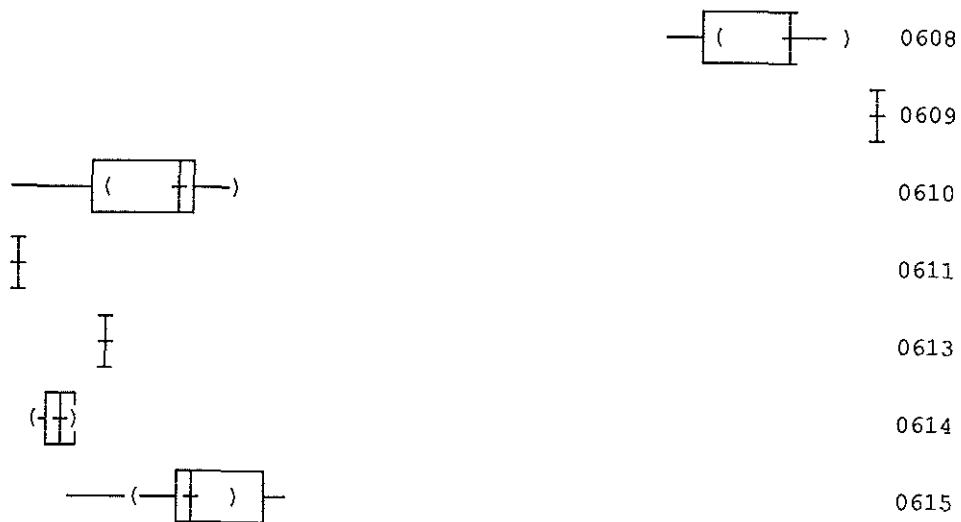
THE FOLLOWING RESULTS ARE FOR:

PARID\$ = NH4

BOX PLOT OF VARIABLE: P , N = 25

GROUPED BY VARIABLE: LOCID\$

21.90 MINIMUM 568.00 MAXIMUM



THE FOLLOWING RESULTS ARE FOR:

PARID\$ = NO3

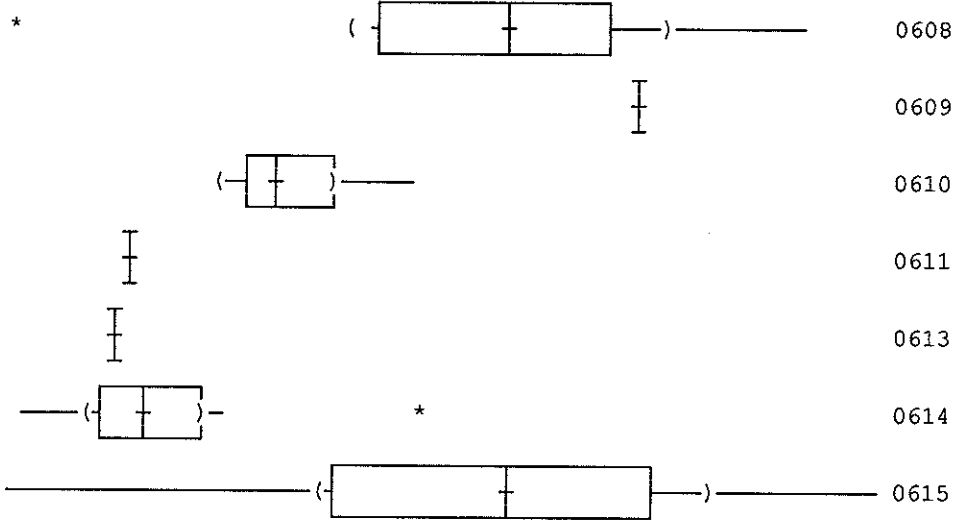
BOX PLOT OF VARIABLE:

GROUPED BY VARIABLE:

P , N = 29
LOCID\$

365.00
MINIMUM

5300.00
MAXIMUM



THE FOLLOWING RESULTS ARE FOR:

PARID\$ = R6L

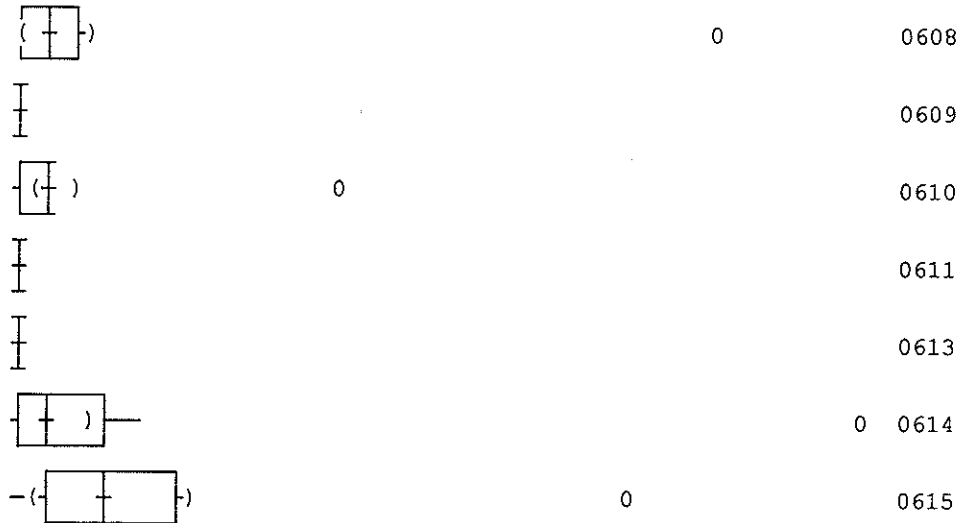
BOX PLOT OF VARIABLE:

GROUPED BY VARIABLE:

P , N = 32
LOCID\$

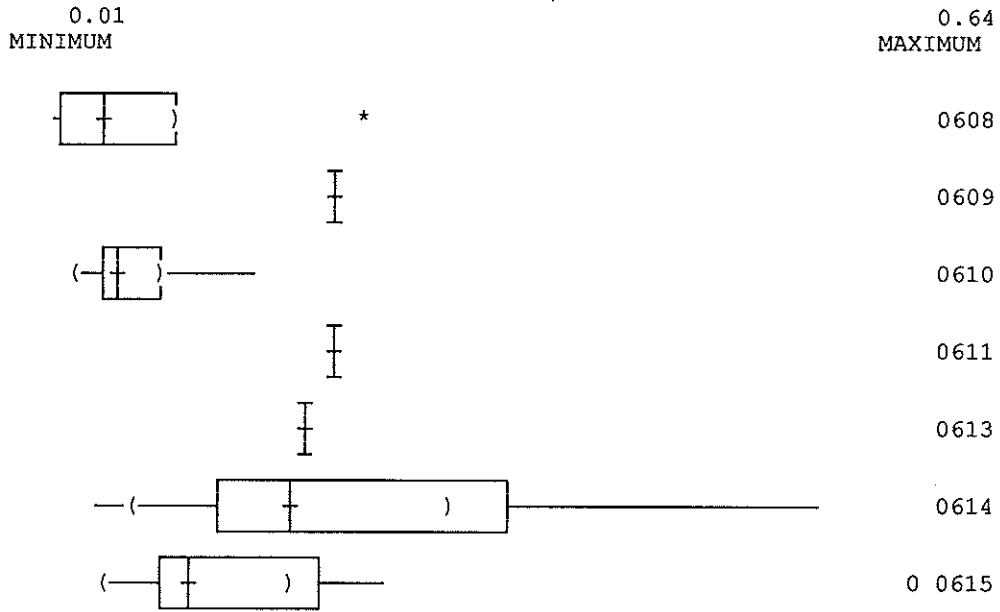
0.00
MINIMUM

3.00
MAXIMUM



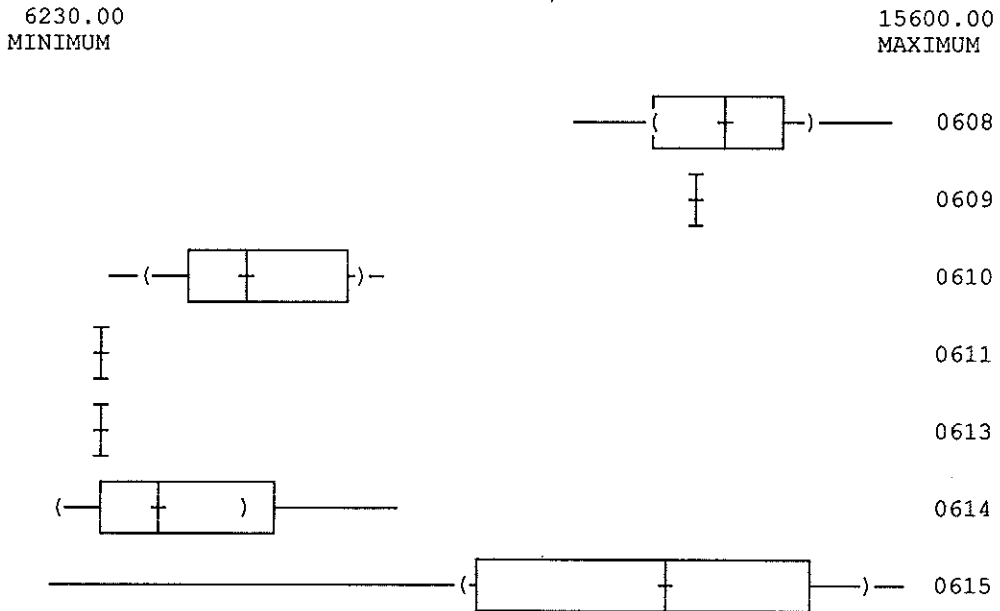
THE FOLLOWING RESULTS ARE FOR:
 PARID\$ = SE
 BOX PLOT OF VARIABLE:
 GROUPED BY VARIABLE:

P , N = 30
 LOCID\$



THE FOLLOWING RESULTS ARE FOR:
 PARID\$ = SO4
 BOX PLOT OF VARIABLE:
 GROUPED BY VARIABLE:

P , N = 29
 LOCID\$



THE FOLLOWING RESULTS ARE FOR:

PARID\$ = U

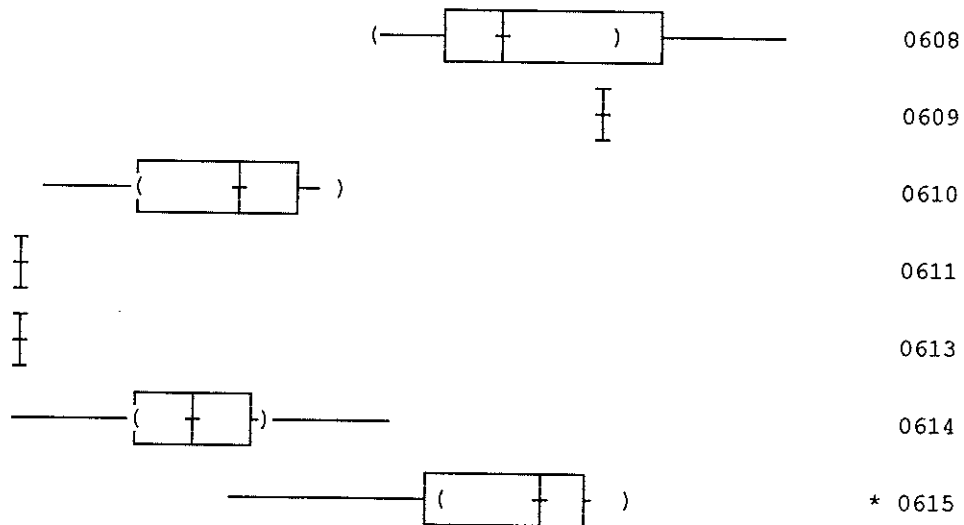
BOX PLOT OF VARIABLE:

GROUPED BY VARIABLE:

P , N = 33
LOCID\$

0.72
MINIMUM

4.07
MAXIMUM



THE FOLLOWING RESULTS ARE FOR:

PARID\$ = V

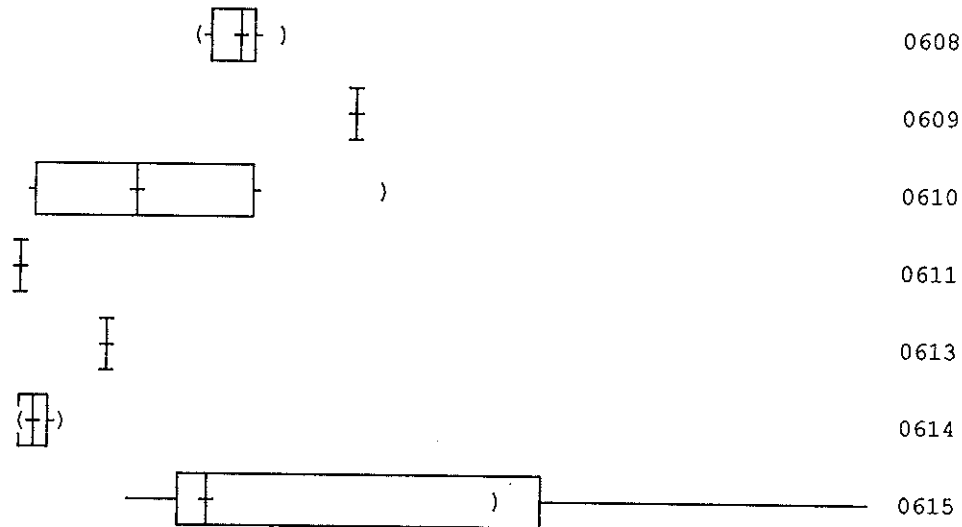
BOX PLOT OF VARIABLE:

GROUPED BY VARIABLE:

P , N = 14
LOCID\$

0.10
MINIMUM

0.34
MAXIMUM



APPENDIX D3

**COMPARISON OF BACKGROUND TO ON-SITE GROUND WATER QUALITY IN THE
ALLUVIAL FLOODPLAIN AT THE SHIPROCK SITE**

**STATISTICAL METHOD: MANN-WHITNEY NONPARAMETRIC COMPARISON
ONE-SIDED TEST AT LEVEL OF SIGNIFICANCE 0.05**

TEST 1: CONCENTRATIONS IN 615 (OR 608 IN THE CASE OF AMMONIUM)
VERSES POOLED BACKGROUND DATA FROM SHP-01-0634, -0635, -0732, -0733

TEST 2 : POOLED DATA FROM PLUME WELLS shp-01-0608, -0609, -0610, -0611, -
0613, -0614, -0615 VERSUS POOLED BACKGROUND DATA FROM SHP-01-0634, -
0635, -0732, -0733 (ONLY FOR CONSTITUENTS WITH INSIGNIFICANT RESULTS
FROM TEST 1)

ALUMINUM

ID	DATE	DET LIMIT	CONCENTRATION	RANK
0615	87.716	0.100	0.460	6.000
0615	89.258	0.100	< 0.100	2.000
0615	90.419	0.100	< 0.100	2.000
0615	90.775	0.100	< 0.100	2.000
0615	91.372	0.200	< 0.200	.
0634	86.719	0.100	0.200	4.500
0635	86.719	0.100	0.200	4.500

KRUSKAL-WALLIS ONE-WAY ANALYSIS OF VARIANCE FOR 6 CASES

GROUP	COUNT	RANK SUM	\bar{r}
0615	4	12.000	3.0
BKG	2	9.000	4.5

MANN-WHITNEY U TEST STATISTIC = 2.000
 PROBABILITY IS $1 - 0.317/2$ (NS)
 CHI-SQUARE APPROXIMATION = 1.000 WITH 1 DF

ID	DATE	DET LIMIT	CONCENTRATION	RANK
0608	87.727	0.100	0.610	21.000
0608	89.258	0.100	< 0.100	7.500
0608	90.419	0.100	< 0.100	7.500
0608	90.769	0.100	< 0.100	7.500
0608	91.372	0.200	< 0.200	.
0609	87.724	0.100	0.730	22.000
0610	87.724	0.100	0.770	23.000
0610	89.258	0.100	< 0.100	7.500
0610	90.419	0.100	< 0.100	7.500
0610	90.769	0.050	< 0.050	7.500
0610	91.372	0.050	< 0.050	7.500
0611	87.719	0.100	0.340	17.000
0613	87.716	0.100	0.430	19.000
0614	87.716	0.100	0.410	18.000
0614	89.258	0.100	< 0.100	7.500
0614	90.419	0.100	< 0.100	7.500
0614	90.769	0.050	< 0.050	7.500
0614	91.372	0.050	< 0.050	7.500
0615	87.716	0.100	0.460	20.000
0615	89.258	0.100	< 0.100	7.500
0615	90.419	0.100	< 0.100	7.500
0615	90.775	0.100	< 0.100	7.500
0615	91.372	0.200	< 0.200	.
0634	86.719	0.100	0.200	15.500
0635	86.719	0.100	0.200	15.500

KRUSKAL-WALLIS ONE-WAY ANALYSIS OF VARIANCE FOR 23 CASES

GROUP	COUNT	RANK SUM	\bar{r}
PLUME	21	245.000	11.7
BKG	2	31.000	15.5

MANN-WHITNEY U TEST STATISTIC = 14.000 NS
 PROBABILITY IS $1 - 0.386/2$
 CHI-SQUARE APPROXIMATION = 0.753 WITH 1 DF

AS

ID	DATE	DET LIMIT	CONCENTRATION	RANK
0615	87.716	0.010	0.031	7.000
0615	89.258	0.010	0.030	6.000
0615	90.419	0.010	0.040	8.000
0615	90.775	0.100	< 0.100	.
0615	91.372	0.050	< 0.050	.
0615	92.713	0.015	< 0.015	.
0615	93.141	0.005	< 0.005	3.000
0634	86.719	0.010	< 0.010	3.000
0635	86.719	0.010	< 0.010	3.000
0732	93.310	0.005	< 0.005	3.000
0733	93.316	0.005	< 0.005	3.000

KRUSKAL-WALLIS ONE-WAY ANALYSIS OF VARIANCE FOR 8 CASES

GROUP	COUNT	RANK SUM
0615	4	24.000
BKG	4	12.000

MANN-WHITNEY U TEST STATISTIC = 14.000
 PROBABILITY IS 0.047 / 2 = 0.024 *

CHI-SQUARE APPROXIMATION = 3.938 WITH 1 DF

B	DATE	DET LIMIT	CONCENTRATION	RANK
0615	87.716	0.100	0.920	6.000
0615	89.258	0.100	0.600	3.500
0615	90.419	0.100	0.600	3.500
0615	90.775	0.050	0.900	5.000
0615	91.372	0.200	0.800	.
0634	86.719	0.100	< 0.100	1.500
0635	86.719	0.100	< 0.100	1.500

KRUSKAL-WALLIS ONE-WAY ANALYSIS OF VARIANCE FOR 6 CASES

DEPENDENT VARIABLE IS PP
 GROUPING VARIABLE IS ID\$

GROUP	COUNT	RANK SUM
0615	4	18.000
BKG	2	3.000

MANN-WHITNEY U TEST STATISTIC = 8.000
 PROBABILITY IS 0.057 / 2 = 0.029 *

CHI-SQUARE APPROXIMATION = 3.636 WITH 1 DF

CA

ID	DATE	DET LIMIT	CONCENTRATION	RANK
0615	87.716	0.010	510.000	11.000
0615	89.258	0.010	390.000	6.000
0615	90.419	0.010	495.000	9.000
0615	90.775	0.010	435.000	7.000
0615	91.372	2.000	497.000	10.000
0615	92.713	0.005	490.000	8.000
0615	93.141	0.500	380.000	5.000
0634	86.719	0.010	100.000	1.000
0635	86.719	0.010	294.000	3.000
0732	93.310	0.500	181.000	2.000
0733	93.316	0.500	353.000	4.000

KRUSKAL-WALLIS ONE-WAY ANALYSIS OF VARIANCE FOR 11 CASES

GROUP	COUNT	RANK SUM	\bar{R}
0615	7	56.000	8.0
BKG	4	10.000	2.5

MANN-WHITNEY U TEST STATISTIC = 28.000
PROBABILITY IS 0.008/2
CHI-SQUARE APPROXIMATION = 7.000 WITH 1 DF

CD

ID	DATE	DET LIMIT	CONCENTRATION	RANK
0615	87.716	0.005	< 0.005	.
0615	89.258	0.001	0.013	9.000
0615	90.419	0.001	< 0.001	3.500
0615	90.775	0.001	0.001	7.500
0615	91.372	0.005	< 0.005	.
0615	92.713	0.000	0.001	7.500
0615	93.141	0.001	< 0.001	3.500
0634	86.719	0.001	< 0.001	3.500
0635	86.719	0.001	< 0.001	3.500
0732	93.310	0.001	< 0.001	3.500
0733	93.316	0.001	< 0.001	3.500

KRUSKAL-WALLIS ONE-WAY ANALYSIS OF VARIANCE FOR 9 CASES

GROUP	COUNT	RANK SUM	\bar{R}
0615	5	31.000	6.2
BKG	4	14.000	3.5

MANN-WHITNEY U TEST STATISTIC = 16.000
 PROBABILITY IS $0.079/2 = 0.040$ *
 CHI-SQUARE APPROXIMATION = 3.086 WITH 1 DF

CL

ID	DATE	DET LIMIT	CONCENTRATION	RANK
0615	87.716	1.000	385.000	3.000
0615	89.258	1.000	610.000	7.000
0615	90.419	1.000	634.000	8.000
0615	90.775	1.000	605.000	6.000
0615	91.372	1.000	700.000	9.000
0615	92.713	0.500	440.000	4.000
0615	93.141	0.500	461.000	5.000
0634	86.719	1.000	10.000	1.000
0635	86.719	1.000	48.000	2.000

KRUSKAL-WALLIS ONE-WAY ANALYSIS OF VARIANCE FOR 9 CASES

GROUP	COUNT	RANK SUM	\bar{R}
0615	7	42.000	6.0
BKG	2	3.000	1.5

MANN-WHITNEY U TEST STATISTIC = 14.000 *
 PROBABILITY IS $0.040/2 =$
 CHI-SQUARE APPROXIMATION = 4.200 WITH 1 DF

CU	ID	DATE	DET LIMIT	CONCENTRATION	RANK
	0615	87.716	0.020	< 0.020	3.500
	0615	89.258	0.020	0.030	8.000
	0615	90.419	0.020	< 0.020	3.500
	0615	90.775	0.020	< 0.020	3.500
	0615	91.372	0.050	< 0.050	.
	0634	86.719	0.020	< 0.020	3.500
	0635	86.719	0.020	0.020	7.000
	0732	93.310	0.020	< 0.020	3.500
	0733	93.316	0.020	< 0.020	3.500

KRUSKAL-WALLIS ONE-WAY ANALYSIS OF VARIANCE FOR 8 CASES

GROUP	COUNT	RANK SUM	\bar{R}
0615	4	18.500	4.6
BKG	4	17.500	4.4

MANN-WHITNEY U TEST STATISTIC = 8.500
 PROBABILITY IS 0.850 / 2 (NS)
 CHI-SQUARE APPROXIMATION = 0.036 WITH 1 DF

ID	DATE	DET LIMIT	CONCENTRATION	RANK
0608	87.727	0.020	0.030	23.500
0608	89.258	0.020	0.030	23.500
0608	90.419	0.020	< 0.020	9.500
0608	90.769	0.020	< 0.020	9.500
0608	91.372	0.050	< 0.050	.
0608	93.316	0.020	< 0.100	9.500
0609	87.724	0.020	0.050	26.500
0610	87.724	0.020	0.050	26.500
0610	89.258	0.020	0.020	20.000
0610	90.419	0.020	< 0.020	9.500
0610	90.769	0.010	< 0.010	9.500
0610	91.372	0.010	< 0.010	9.500
0611	87.719	0.020	< 0.020	9.500
0613	87.716	0.020	0.020	20.000
0614	87.716	0.020	< 0.020	9.500
0614	88.780	0.020	0.030	23.500
0614	89.258	0.020	< 0.020	9.500
0614	90.419	0.020	< 0.020	9.500
0614	90.769	0.010	0.010	9.500
0614	91.372	0.010	< 0.010	9.500
0615	87.716	0.020	< 0.020	9.500
0615	89.258	0.020	0.030	23.500
0615	90.419	0.020	< 0.020	9.500
0615	90.775	0.020	< 0.020	9.500
0615	91.372	0.050	< 0.050	.
0634	86.719	0.020	< 0.020	9.500
0635	86.719	0.020	0.020	20.000
0732	93.310	0.020	< 0.020	9.500
0733	93.316	0.020	< 0.020	9.500

KRUSKAL-WALLIS ONE-WAY ANALYSIS OF VARIANCE FOR 27 CASES

GROUP	COUNT	RANK SUM	\bar{R}
PLUME	23	329.500	14.3
BKG	4	48.500	12.1

MANN-WHITNEY U TEST STATISTIC = 53.500
 PROBABILITY IS 0.541 / 2 (NS)
 CHI-SQUARE APPROXIMATION = 0.375 WITH 1 DF

FE	ID	DATE	DET LIMIT	CONCENTRATION	RANK
	0615	87.716	0.030	< 0.030	2.000
	0615	89.258	0.030		5.000
	0615	90.419	0.030		6.000
	0615	90.775	0.300	< 0.300	.
	0615	91.372	0.100	< 0.100	.
	0615	92.713	0.018	< 0.018	2.000
	0634	86.719	0.030		4.000
	0635	86.719	0.030		8.000
	0732	93.310	0.030	< 0.030	2.000
	0733	93.316	0.030	1.610	7.000

KRUSKAL-WALLIS ONE-WAY ANALYSIS OF VARIANCE FOR 8 CASES

GROUP	COUNT	RANK SUM	\bar{R}
615	4	15.000	3.8
BKG	4	21.000	5.2

MANN-WHITNEY U TEST STATISTIC = 5.000
 PROBABILITY IS $1 - 0.375/2$
 CHI-SQUARE APPROXIMATION = 0.788 WITH 1 DF

NS

ID	DATE	DET LIMIT	CONCENTRATION	RANK
0608	87.727	0.020	0.030	23.500
0608	89.258	0.020	0.030	23.500
0608	90.419	0.020	< 0.020	9.500
0608	90.769	0.020	< 0.020	9.500
0608	91.372	0.050	< 0.050	.
0608	93.316	0.020	< 0.100	9.500
0609	87.724	0.020	0.050	26.500
0610	87.724	0.020	0.050	26.500
0610	89.258	0.020	0.020	20.000
0610	90.419	0.020	< 0.020	9.500
0610	90.769	0.010	< 0.010	9.500
0610	91.372	0.010	< 0.010	9.500
0611	87.719	0.020	< 0.020	9.500
0613	87.716	0.020	0.020	20.000
0614	87.716	0.020	< 0.020	9.500
0614	88.780	0.020	0.030	23.500
0614	89.258	0.020	< 0.020	9.500
0614	90.419	0.020	< 0.020	9.500
0614	90.769	0.010	0.010	9.500
0614	91.372	0.010	< 0.010	9.500
0615	87.716	0.020	< 0.020	9.500
0615	89.258	0.020	0.030	23.500
0615	90.419	0.020	< 0.020	9.500
0615	90.775	0.020	< 0.020	9.500
0615	91.372	0.050	< 0.050	.
0634	86.719	0.020	< 0.020	9.500
0635	86.719	0.020	0.020	20.000
0732	93.310	0.020	< 0.020	9.500
0733	93.316	0.020	< 0.020	9.500

KRUSKAL-WALLIS ONE-WAY ANALYSIS OF VARIANCE FOR 27 CASES

GROUP	COUNT	RANK SUM	\bar{R}
PLUME	23	329.500	14.3
BKG	4	48.500	12.1

MANN-WHITNEY U TEST STATISTIC = 53.500
 PROBABILITY IS $0.541/2$
 CHI-SQUARE APPROXIMATION = 0.375 WITH 1 DF

NS

K

ID	DATE	DET LIMIT	CONCENTRATION	RANK
0615	87.716	0.010	121.000	6.000
0615	89.258	0.010	165.000	9.000
0615	90.419	0.010	152.000	8.000
0615	90.775	0.010	120.000	4.500
0615	91.372	20.000	120.000	4.500
0615	92.713	0.200	140.000	7.000
0615	93.141	0.100	109.000	3.000
0634	86.719	0.010	3.250	1.000
0635	86.719	0.010	8.540	2.000

KRUSKAL-WALLIS ONE-WAY ANALYSIS OF VARIANCE FOR 9 CASES

GROUP	COUNT	RANK SUM	\bar{r}
0615	7	42.000	6.0
BKG	2	3.000	1.5

MANN-WHITNEY U TEST STATISTIC = 14.000
 PROBABILITY IS 0.040/2 *
 CHI-SQUARE APPROXIMATION = 4.235 WITH 1 DF

MG

ID	DATE	DET LIMIT	CONCENTRATION	RANK
0615	87.716	0.001	1252.000	3.000
0615	89.258	0.001	1370.000	4.000
0615	90.419	0.001	2440.000	7.000
0615	90.775	0.001	2540.000	8.000
0615	91.372	10.000	2750.000	9.000
0615	92.713	0.011	2000.000	6.000
0615	93.141	0.100	1940.000	5.000
0634	86.719	0.001	31.000	1.000
0635	86.719	0.001	150.000	2.000

KRUSKAL-WALLIS ONE-WAY ANALYSIS OF VARIANCE FOR 9 CASES

GROUP	COUNT	RANK SUM	\bar{r}
0615	7	42.000	6.0
BKG	2	3.000	1.5

MANN-WHITNEY U TEST STATISTIC = 14.000
 PROBABILITY IS 0.040/2 *
 CHI-SQUARE APPROXIMATION = 4.200 WITH 1 DF

MN

ID	DATE	DET LIMIT	CONCENTRATION	RANK
0615	87.716	0.010	5.810	6.000
0615	89.258	0.010	9.380	10.000
0615	90.419	0.010	8.080	8.000
0615	90.775	0.010	6.940	7.000
0615	91.372	0.050	9.750	.
0615	92.713	0.006	8.100	9.000
0615	93.141	0.010	5.660	5.000
0634	86.719	0.010	0.020	1.000
0635	86.719	0.010	1.100	2.000
0732	93.310	0.010	1.280	3.000
0733	93.316	0.010	3.990	4.000

KRUSKAL-WALLIS ONE-WAY ANALYSIS OF VARIANCE FOR 10 CASES

GROUP	COUNT	RANK SUM	\bar{r}
0615	6	45.000	7.5
BKG	4	10.000	2.5

MANN-WHITNEY U TEST STATISTIC = 24.000
PROBABILITY IS 0.011/2
CHI-SQUARE APPROXIMATION = 6.545 WITH 1 DF

NA

ID	DATE	DET LIMIT	CONCENTRATION	RANK
0615	87.716	0.002	2107.000	6.000
0615	89.258	0.002	1650.000	5.000
0615	90.419	0.002	3560.000	9.000
0615	90.775	0.002	3630.000	10.000
0615	91.372	20.000	3810.000	11.000
0615	92.713	0.011	3500.000	8.000
0615	93.141	1.000	3010.000	7.000
0634	86.719	0.002	125.000	1.000
0635	86.719	0.002	220.000	2.000
0732	93.310	0.100	331.000	3.000
0733	93.316	0.100	489.000	4.000

KRUSKAL-WALLIS ONE-WAY ANALYSIS OF VARIANCE FOR 11 CASES

GROUP	COUNT	RANK SUM	\bar{r}
0615	7	56.000	8.0
BKG	4	10.000	2.5

MANN-WHITNEY U TEST STATISTIC = 28.000
PROBABILITY IS 0.008/2
CHI-SQUARE APPROXIMATION = 7.000 WITH 1 DF

MO	ID	DATE	DET LIMIT	CONCENTRATION	RANK
	0615	87.716	0.010	< 0.010	3.000
	0615	89.258	0.010	0.030	6.000
	0615	90.419	0.010	< 0.010	3.000
	0615	90.775	0.010	0.360	9.000
	0615	91.372	0.050	< 0.050	.
	0615	92.713	0.025	< 0.025	.
	0615	93.141	0.010	< 0.010	3.000
	0634	86.719	0.010	0.090	8.000
	0635	86.719	0.010	0.060	7.000
	0732	93.310	0.010	< 0.010	3.000
	0733	93.316	0.010	< 0.010	3.000

KRUSKAL-WALLIS ONE-WAY ANALYSIS OF VARIANCE FOR 9 CASES

GROUP	COUNT	RANK SUM	<i>12</i>
0615	5	24.000	<i>4.8</i>
BKG	4	21.000	<i>5.2</i>

MANN-WHITNEY U TEST STATISTIC = 9.000

PROBABILITY IS *1 - 0.788/2*

CHI-SQUARE APPROXIMATION = 0.072 WITH 1 DF NS

ID	DATE	DET LIMIT	CONCENTRATION	RANK
0608	87.727	0.010	0.010	20.500
0608	89.258	0.010	< 0.010	9.500
0608	90.419	0.010	< 0.010	9.500
0608	90.769	0.020	< 0.020	.
0608	91.372	0.050	< 0.050	.
0608	92.713	0.004	0.043	27.500
0608	93.141	0.010	< 0.010	9.500
0608	93.316	0.010	< 0.100	9.500
0609	87.724	0.010	0.010	20.500
0610	87.724	0.010	0.020	24.000
0610	89.258	0.010	< 0.010	9.500
0610	90.419	0.010	< 0.010	9.500
0610	90.769	0.010	< 0.010	9.500
0610	91.372	0.010	0.020	24.000
0610	92.713	0.025	< 0.025	.
0610	93.141	0.010	< 0.010	9.500
0611	87.719	0.010	< 0.010	9.500
0613	87.716	0.010	< 0.010	9.500
0614	87.716	0.010	0.020	24.000
0614	88.780	0.010	0.230	31.000
0614	89.258	0.010	< 0.010	9.500
0614	90.419	0.010	< 0.010	9.500
0614	90.769	0.010	0.010	20.500
0614	91.372	0.010	0.010	20.500
0614	92.713	0.004	0.043	27.500
0614	93.141	0.010	< 0.010	9.500
0615	87.716	0.010	< 0.010	9.500
0615	89.258	0.010	0.030	26.000
0615	90.419	0.010	< 0.010	9.500
0615	90.775	0.010	0.360	32.000
0615	91.372	0.050	< 0.050	.
0615	92.713	0.025	< 0.025	.
0615	93.141	0.010	< 0.010	9.500
0634	86.719	0.010	0.090	30.000
0635	86.719	0.010	0.060	29.000
0732	93.310	0.010	< 0.010	9.500
0733	93.316	0.010	< 0.010	9.500

Moly (continued)

KRUSKAL-WALLIS ONE-WAY ANALYSIS OF VARIANCE FOR 32 CASES

GROUP	COUNT	RANK SUM	\bar{R}
PLUME	28	450.000	16.1
BKG	4	78.000	19.5

MANN-WHITNEY U TEST STATISTIC = 44.000
PROBABILITY IS $1 - 0.450 / 2$
CHI-SQUARE APPROXIMATION = 0.570 WITH 1 DF

NS

NH4

ID	DATE	DET LIMIT	CONCENTRATION	RANK
608	87.727	0.100	516.000	6.000
608	89.258	0.100	460.000	4.000
608	90.419	0.100	520.000	7.000
608	90.769	0.100	443.000	3.000
608	91.372	0.100	532.000	8.000
608	93.141	0.100	512.000	5.000
608	93.317	0.100	542.000	9.000
634	86.719	0.100	< 0.100	1.500
635	86.719	0.100	< 0.100	1.500

KRUSKAL-WALLIS ONE-WAY ANALYSIS OF VARIANCE FOR 9 CASES

DEPENDENT VARIABLE IS PP
GROUPING VARIABLE IS ID\$

GROUP	COUNT	RANK SUM	\bar{R}
PLUME	7	42.000	6.0
BKG	2	3.000	1.5

MANN-WHITNEY U TEST STATISTIC = 14.000
PROBABILITY IS $0.040 / 2 = 0.02$
CHI-SQUARE APPROXIMATION = 4.235 WITH 1 DF

*

NI	ID	DATE	DET LIMIT	CONCENTRATION	RANK
	0615	87.716	0.040	< 0.040	2.000
	0615	89.258	0.040	0.040	4.000
	0615	90.419	0.040	0.070	5.000
	0615	90.775	0.040	0.400	6.000
	0615	91.372	0.200	< 0.200	.
	0615	92.713	0.061	< 0.061	.
	0634	86.719	0.040	< 0.040	2.000
	0635	86.719	0.040	< 0.040	2.000

KRUSKAL-WALLIS ONE-WAY ANALYSIS OF VARIANCE FOR 6 CASES

GROUP	COUNT	RANK SUM	\bar{R}
0615	4	17.000	4.3
BKG	2	4.000	2.0

Note exact significance probability is $\frac{\binom{3}{2}}{\binom{6}{2}} = \frac{3}{15} = 0.2$

MANN-WHITNEY U TEST STATISTIC = 7.000
 PROBABILITY IS 0.140 *h*
 CHI-SQUARE APPROXIMATION = 2.177 WITH 1 DF

NS

ID	DATE	DET LIMIT	CONCENTRATION	RANK
0608	87.727	0.040	0.050	17.500
0608	89.258	0.040	0.060	19.000
0608	90.419	0.040	0.070	20.500
0608	90.769	0.080	< 0.080	.
0608	91.372	0.200	< 0.200	.
0608	92.713	0.061	< 0.061	.
0609	87.724	0.040	0.050	17.500
0610	87.724	0.040	< 0.040	7.000
0610	89.258	0.040	< 0.040	7.000
0610	90.419	0.040	< 0.040	7.000
0610	90.769	0.040	0.040	15.000
0610	91.372	0.040	0.040	15.000
0610	92.713	0.061	< 0.061	.
0611	87.719	0.040	< 0.040	7.000
0613	87.716	0.040	< 0.040	7.000
0614	87.716	0.040	< 0.040	7.000
0614	89.258	0.040	< 0.040	7.000
0614	90.419	0.040	< 0.040	7.000
0614	90.769	0.040	< 0.040	7.000
0614	91.372	0.040	< 0.040	7.000
0614	92.713	0.061	< 0.061	.
0615	87.716	0.040	< 0.040	7.000
0615	89.258	0.040	0.040	15.000
0615	90.419	0.040	0.070	20.500
0615	90.775	0.040	0.400	22.000
0615	91.372	0.200	< 0.200	.
0615	92.713	0.061	< 0.061	.
0634	86.719	0.040	< 0.040	7.000
0635	86.719	0.040	< 0.040	7.000

KRUSKAL-WALLIS ONE-WAY ANALYSIS OF VARIANCE FOR 22 CASES

GROUP	COUNT	RANK SUM	\bar{R}
PLUME	20	239.000	12.0
BKG	2	14.000	7.0

MANN-WHITNEY U TEST STATISTIC = 29.000
 PROBABILITY IS 0.248 *h*
 CHI-SQUARE APPROXIMATION = 1.336 WITH 1 DF

NS

NO3	ID	DATE	DET LIMIT	CONCENTRATION	RANK
	0615	87.716	1.000	1570.000	4.000
	0615	89.258	1.000	3300.000	6.000
	0615	90.419	1.000	400.000	3.000
	0615	90.775	1.000	4220.000	8.000
	0615	91.372	1.000	4010.000	7.000
	0615	92.713	0.044	5300.000	9.000
	0615	93.141	1.000	2960.000	5.000
	0634	86.719	1.000	5.000	2.000
	0635	86.719	1.000	4.000	1.000

KRUSKAL-WALLIS ONE-WAY ANALYSIS OF VARIANCE FOR 9 CASES

GROUP	COUNT	RANK SUM	<i>R</i>
0615	7	42.000	<i>6.0</i>
BKG	2	3.000	<i>1.5</i>

MANN-WHITNEY U TEST STATISTIC = 14.000
 PROBABILITY IS 0.040 *h*
 CHI-SQUARE APPROXIMATION = 4.200 WITH 1 DF *h*

PB	ID	DATE	DET LIMIT	CONCENTRATION	RANK
	0615	87.716	0.010	0.030	7.000
	0615	89.258	0.010	< 0.010	3.000
	0615	90.419	0.010	< 0.010	3.000
	0615	90.775	0.050	< 0.050	.
	0615	91.372	0.050	< 0.050	.
	0615	93.141	0.030	< 0.030	.
	0634	86.719	0.010	0.010	6.000
	0635	86.719	0.010	< 0.010	3.000
	0732	93.310	0.003	< 0.003	3.000
	0733	93.316	0.003	< 0.003	3.000

KRUSKAL-WALLIS ONE-WAY ANALYSIS OF VARIANCE FOR 7 CASES

GROUP	COUNT	RANK SUM	\bar{R}
0615	3	13.000	4.3
BKG	4	15.000	3.8

MANN-WHITNEY U TEST STATISTIC = 7.000
 PROBABILITY IS 0.659 / 2
 CHI-SQUARE APPROXIMATION = 0.194 WITH 1 DF

NS

ID	DATE	DET LIMIT	CONCENTRATION	RANK
0608	87.727	0.010	0.030	21.500
0608	89.258	0.010	< 0.010	8.000
0608	90.419	0.010	< 0.010	8.000
0608	90.769	0.050	< 0.050	.
0608	91.372	0.050	< 0.050	.
0608	93.141	0.030	< 0.030	.
0608	93.316	0.003	< 0.003	8.000
0609	87.724	0.010	0.030	21.500
0610	87.724	0.010	0.010	17.000
0610	89.258	0.010	< 0.010	8.000
0610	90.419	0.010	< 0.010	8.000
0610	90.769	0.010	< 0.010	8.000
0610	91.372	0.030	< 0.030	.
0610	93.141	0.030	< 0.030	.
0611	87.719	0.010	0.020	19.000
0613	87.716	0.010	0.030	21.500
0614	87.716	0.010	0.010	17.000
0614	88.780	0.010	< 0.010	8.000
0614	89.258	0.010	< 0.010	8.000
0614	90.419	0.010	< 0.010	8.000
0614	90.769	0.010	< 0.010	8.000
0614	91.372	0.030	< 0.030	.
0614	93.141	0.030	< 0.030	.
0615	87.716	0.010	0.030	21.500
0615	89.258	0.010	< 0.010	8.000
0615	90.419	0.010	< 0.010	8.000
0615	90.775	0.050	< 0.050	.
0615	91.372	0.050	< 0.050	.
0615	93.141	0.030	< 0.030	.
0634	86.719	0.010	0.010	17.000
0635	86.719	0.010	< 0.010	8.000
0732	93.310	0.003	< 0.003	8.000
0733	93.316	0.003	< 0.003	8.000

lead (continued)

KRUSKAL-WALLIS ONE-WAY ANALYSIS OF VARIANCE FOR 23 CASES

GROUP	COUNT	RANK SUM	\bar{R}
PLUME	19	235.000	12.4
BKG	4	41.000	10.3

MANN-WHITNEY U TEST STATISTIC = 45.000 (NS)
 PROBABILITY IS 0.502/2
 CHI-SQUARE APPROXIMATION = 0.450 WITH 1 DF

POLONIUM-210

ID	DATE	DET LIMIT	CONCENTRATION	RANK
0615	87.716	1.000	1.100	3.000
0615	89.258	1.000	3.300	4.000
0615	93.141	1.900	< 1.900	.
0634	86.719	1.000	< 1.000	1.500
0635	86.719	1.000	< 1.000	1.500

KRUSKAL-WALLIS ONE-WAY ANALYSIS OF VARIANCE FOR 4 CASES

GROUP	COUNT	RANK SUM	\bar{R}
0615	2	7.000	3.5
BKG	2	3.000	1.5

Note fact significance probability is

MANN-WHITNEY U TEST STATISTIC = 4.000
 PROBABILITY IS 0.102/2 = 0.051 (NS)
 CHI-SQUARE APPROXIMATION = 2.667 WITH 1 DF

$\frac{1}{\binom{4}{2}} = 0.17$ (NS)

ID	DATE	DET LIMIT	CONCENTRATION	RANK
0608	87.727	1.000	1.100	11.000
0608	89.258	1.000	1.100	11.000
0608	93.141	1.900	< 1.900	.
0609	87.724	1.000	< 1.000	5.000
0610	87.724	1.000	< 1.000	5.000
0610	89.258	1.000	< 1.000	5.000
0611	87.719	1.000	< 1.000	5.000
0613	87.716	1.000	< 1.000	5.000
0614	87.716	1.000	< 1.000	5.000
0614	89.258	1.000	< 1.000	5.000
0615	87.716	1.000	1.100	11.000
0615	89.258	1.000	3.300	13.000
0615	93.141	1.900	< 1.900	.
0634	86.719	1.000	< 1.000	5.000
0635	86.719	1.000	< 1.000	5.000

KRUSKAL-WALLIS ONE-WAY ANALYSIS OF VARIANCE FOR 13 CASES

GROUP	COUNT	RANK SUM	\bar{R}
PLUME	11	81.000	7.4
BKG	2	10.000	5.0

MANN-WHITNEY U TEST STATISTIC = 15.000 (NS)
 PROBABILITY IS 0.331/2
 CHI-SQUARE APPROXIMATION = 0.945 WITH 1 DF

PO4	615	87.716	0.100		1.040	8.000
	615	89.258	0.100	<	0.100	2.500
	615	90.419	0.100		0.600	7.000
	615	90.775	0.100		0.100	5.500
	615	91.372	0.100		0.100	5.500
	615	93.141	0.100	<	0.100	2.500
	634	86.719	0.100	<	0.100	2.500
	635	86.719	0.100	<	0.100	2.500

KRUSKAL-WALLIS ONE-WAY ANALYSIS OF VARIANCE FOR 8 CASES

DEPENDENT VARIABLE IS PP
GROUPING VARIABLE IS ID\$

GROUP	COUNT	RANK SUM	\bar{R}
PLUME	6	31.000	5.2
BKG	2	5.000	2.5

MANN-WHITNEY U TEST STATISTIC = 10.000
PROBABILITY IS 0.153 / 2 = 0.077 NS
CHI-SQUARE APPROXIMATION = 2.046 WITH 1 DF

PO4	608	87.727	0.100		1.300	30.000
	608	89.258	0.100	<	0.100	6.000
	608	90.419	0.100	<	0.100	6.000
	608	90.769	0.100		0.100	16.500
	608	91.372	0.100		0.100	16.500
	608	93.141	0.100		0.100	16.500
	608	93.317	0.100		0.100	16.500
	609	87.724	0.100		1.470	31.000
	610	87.724	0.100		1.120	29.000
	610	89.258	0.100	<	0.100	6.000
	610	90.419	0.100	<	0.100	6.000
	610	90.769	0.100		0.200	22.500
	610	91.372	0.100		0.100	16.500
	610	93.141	0.100		0.100	16.500
	611	87.719	0.100		0.650	25.000
	613	87.716	0.100		0.980	27.000
	614	87.716	0.100		0.810	26.000
	614	88.780	0.100	<	0.100	6.000
	614	89.258	0.100	<	0.100	6.000
	614	90.419	0.100	<	0.100	6.000
	614	90.769	0.100		0.100	16.500
	614	91.372	0.100		0.200	22.500
	614	93.141	0.100		0.100	16.500
	615	87.716	0.100		1.040	28.000
	615	89.258	0.100	<	0.100	6.000
	615	90.419	0.100		0.600	24.000
	615	90.775	0.100		0.100	16.500
	615	91.372	0.100		0.100	16.500
	615	93.141	0.100	<	0.100	6.000
	634	86.719	0.100	<	0.100	6.000
	635	86.719	0.100	<	0.100	6.000

KRUSKAL-WALLIS ONE-WAY ANALYSIS OF VARIANCE FOR 31 CASES

DEPENDENT VARIABLE IS PP

GROUP	COUNT	RANK SUM	\bar{R}
PLUME	29	484.000	16.7
BKG	2	12.000	6.0

MANN-WHITNEY U TEST STATISTIC = 49.000 *
PROBABILITY IS 0.094 / 2 = 0.047
CHI-SQUARE APPROXIMATION = 2.804 WITH 1 DF

	ID	DATE	DET LIMIT	CONCENTRATION	RANK
R6L	0615	87.716	1.000	< 1.000	4.500
	0615	89.258	1.000	< 1.000	4.500
	0615	90.419	1.000	< 1.000	4.500
	0615	90.775	1.000	< 1.000	4.500
	0615	91.372	1.000	< 1.000	4.500
	0615	92.713	0.063	0.200	4.500
	0615	93.141	0.700	2.200	9.000
	0634	86.719	1.000	< 1.000	4.500
	0635	86.719	1.000	< 1.000	4.500

KRUSKAL-WALLIS ONE-WAY ANALYSIS OF VARIANCE FOR 9 CASES

GROUP	COUNT	RANK SUM	
0615	7	36.000	$\frac{2}{5.1}$
BKG	2	9.000	$\frac{4.5}{8.000}$

MANN-WHITNEY U TEST STATISTIC = 8.000 (NS)
 PROBABILITY IS 0.593/2
 CHI-SQUARE APPROXIMATION = 0.286 WITH 1 DF

0608	87.727	1.000	< 1.000	15.500
0608	89.258	1.000	< 1.000	15.500
0608	90.419	1.000	< 1.000	15.500
0608	90.769	1.000	< 1.000	15.500
0608	91.372	1.000	< 1.000	15.500
0608	92.713	0.052	0.250	15.500
0608	93.141	0.700	2.500	33.000
0609	87.724	1.000	< 1.000	15.500
0610	87.724	1.000	< 1.000	15.500
0610	89.258	1.000	< 1.000	15.500
0610	90.419	1.000	< 1.000	15.500
0610	90.769	1.000	< 1.000	15.500
0610	91.372	1.000	< 1.000	15.500
0610	92.713	0.072	0.200	15.500
0610	93.141	0.700	1.200	31.000
0611	87.719	1.000	< 1.000	15.500
0613	87.716	1.000	< 1.000	15.500
0614	87.716	1.000	< 1.000	15.500
0614	88.780	1.000	< 1.000	15.500
0614	89.258	1.000	< 1.000	15.500
0614	90.419	1.000	< 1.000	15.500
0614	90.769	1.000	< 1.000	15.500
0614	91.372	1.000	< 1.000	15.500
0614	92.713	0.060	0.120	15.500
0614	93.141	0.700	3.000	34.000
0615	87.716	1.000	< 1.000	15.500
0615	89.258	1.000	< 1.000	15.500
0615	90.419	1.000	< 1.000	15.500
0615	90.775	1.000	< 1.000	15.500
0615	91.372	1.000	< 1.000	15.500
0615	92.713	0.063	0.200	15.500
0615	93.141	0.700	2.200	32.000
0634	86.719	1.000	< 1.000	15.500
0635	86.719	1.000	< 1.000	15.500

KRUSKAL-WALLIS ONE-WAY ANALYSIS OF VARIANCE FOR 34 CASES

GROUP	COUNT	RANK SUM	
PLUME	32	564.000	$\frac{17.6}{15.5}$
BKG	2	31.000	$\frac{36.000}{36.000}$

MANN-WHITNEY U TEST STATISTIC = 36.000 (NS)
 PROBABILITY IS 0.601/2
 CHI-SQUARE APPROXIMATION = 0.274 WITH 1 DF

	ID	DATE	DET LIMIT	CONCENTRATION	RANK
SB	0615	87.716	0.003	0.074	8.000
	0615	89.258	0.003	0.049	7.000
	0615	90.419	0.003	0.003	5.500
	0615	90.775	0.020	< 0.020	.
	0615	91.372	0.015	< 0.015	.
	0615	92.713	0.001	0.003	5.500
	0634	86.719	0.003	< 0.003	2.500
	0635	86.719	0.003	< 0.003	2.500
	0732	93.310	0.003	< 0.003	2.500
	0733	93.316	0.003	< 0.003	2.500

KRUSKAL-WALLIS ONE-WAY ANALYSIS OF VARIANCE FOR 8 CASES

GROUP	COUNT	RANK SUM	\bar{R}
0615	4	26.000	6.5
BKG	4	10.000	2.5

MANN-WHITNEY U TEST STATISTIC = 16.000
 PROBABILITY IS 0.013 / 2 *
 CHI-SQUARE APPROXIMATION = 6.137 WITH 1 DF

	ID	DATE	DET LIMIT	CONCENTRATION	RANK
SE	0615	87.716	0.005	0.255	9.000
	0615	89.258	0.005	0.122	7.000
	0615	90.419	0.005	0.165	8.000
	0615	90.775	0.005	0.070	5.000
	0615	91.372	0.050	0.090	.
	0615	92.713	0.001	0.100	6.000
	0615	93.141	0.005	0.640	10.000
	0634	86.719	0.005	< 0.005	2.000
	0635	86.719	0.005	< 0.005	2.000
	0732	93.310	0.005	0.007	4.000
	0733	93.316	0.005	< 0.005	2.000

KRUSKAL-WALLIS ONE-WAY ANALYSIS OF VARIANCE FOR 10 CASES

GROUP	COUNT	RANK SUM	\bar{R}
0615	6	45.000	7.5
BKG	4	10.000	2.5

MANN-WHITNEY U TEST STATISTIC = 24.000
 PROBABILITY IS 0.010 / 2 *
 CHI-SQUARE APPROXIMATION = 6.708 WITH 1 DF

	ID	DATE	DET LIMIT	CONCENTRATION	RANK
SIO	0615	87.716	2.000	15.400	7.000
	0615	89.258	2.000	10.000	1.500
	0615	90.419	2.000	10.000	1.500
	0615	90.775	0.100	14.700	6.000
	0615	91.372	0.500	13.000	5.000
	0634	86.719	2.000	12.000	4.000
	0635	86.719	2.000	11.000	3.000

KRUSKAL-WALLIS ONE-WAY ANALYSIS OF VARIANCE FOR 7 CASES

GROUP	COUNT	RANK SUM	\bar{R}
0615	5	21.000	4.2
BKG	2	7.000	3.5

MANN-WHITNEY U TEST STATISTIC = 6.000
 PROBABILITY IS 0.696 / 2
 CHI-SQUARE APPROXIMATION = 0.153 WITH 1 DF

NS

ID	DATE	DET LIMIT	CONCENTRATION	RANK
0608	87.727	2.000	11.700	9.000
0608	89.258	2.000	9.000	2.000
0608	90.419	2.000	11.000	7.000
0608	90.769	0.100	14.400	20.000
0608	91.372	0.500	13.000	14.500
0609	87.724	2.000	13.000	14.500
0610	87.724	2.000	14.100	19.000
0610	89.258	2.000	10.000	4.000
0610	90.419	2.000	12.000	10.500
0610	90.769	0.100	14.000	18.000
0610	91.372	0.100	12.200	12.000
0611	87.719	2.000	14.500	21.000
0613	87.716	2.000	14.700	22.500
0614	87.716	2.000	15.600	25.000
0614	89.258	2.000	11.000	7.000
0614	90.419	2.000	13.000	14.500
0614	90.769	0.100	7.300	1.000
0614	91.372	0.100	13.200	17.000
0615	87.716	2.000	15.400	24.000
0615	89.258	2.000	10.000	4.000
0615	90.419	2.000	10.000	4.000
0615	90.775	0.100	14.700	22.500
0615	91.372	0.500	13.000	14.500
0634	86.719	2.000	12.000	10.500
0635	86.719	2.000	11.000	7.000

KRUSKAL-WALLIS ONE-WAY ANALYSIS OF VARIANCE FOR 25 CASES

GROUP	COUNT	RANK SUM	\bar{R}
PLUME	23	307.500	13.3
BKG	2	17.500	8.8

MANN-WHITNEY U TEST STATISTIC = 31.500
 PROBABILITY IS 0.393 / 2
 CHI-SQUARE APPROXIMATION = 0.731 WITH 1 DF

NS

SN	ID	DATE	DET LIMIT	CONCENTRATION	RANK
	0615	87.716	0.005	0.089	6.000
	0615	89.258	0.005	0.062	5.000
	0615	90.419	0.005	< 0.005	2.500
	0615	90.775	0.100	< 0.100	.
	0615	91.372	0.025	< 0.025	2.500
	0634	86.719	0.005	< 0.005	2.500
	0635	86.719	0.005	< 0.005	2.500

KRUSKAL-WALLIS ONE-WAY ANALYSIS OF VARIANCE FOR 6 CASES
 DEPENDENT VARIABLE IS PP
 GROUPING VARIABLE IS ID\$

GROUP	COUNT	RANK SUM
PLUME	4	16.000
BKG	2	5.000

\bar{R}
4.0
2.5

Exact significance probability

$$\frac{\binom{4}{2}}{\binom{6}{4}} = \frac{6}{15} = 0.4 \text{ (NS)}$$

MANN-WHITNEY U TEST STATISTIC = 6.000
 PROBABILITY IS 0.273/2 (NS)
 CHI-SQUARE APPROXIMATION = 1.200 WITH 1 DF

SN	ID	DATE	DET LIMIT	CONCENTRATION	RANK
	0608	87.727	0.005	0.035	14.000
	0608	89.258	0.005	0.046	17.000
	0608	90.419	0.005	< 0.005	6.500
	0608	90.769	0.100	< 0.100	.
	0608	91.372	0.025	< 0.025	6.500
	0609	87.724	0.005	0.030	13.000
	0610	87.724	0.005	0.018	6.500
	0610	89.258	0.005	0.036	15.000
	0610	90.419	0.005	< 0.005	6.500
	0610	90.769	0.050	< 0.050	.
	0610	91.372	0.025	< 0.025	6.500
	0611	87.719	0.005	0.045	16.000
	0613	87.716	0.005	0.049	18.500
	0614	87.716	0.005	0.049	18.500
	0614	89.258	0.005	0.024	6.500
	0614	90.419	0.005	< 0.005	6.500
	0614	90.769	0.050	< 0.050	.
	0614	91.372	0.025	< 0.025	6.500
	0615	87.716	0.005	0.089	21.000
	0615	89.258	0.005	0.062	20.000
	0615	90.419	0.005	< 0.005	6.500
	0615	90.775	0.100	< 0.100	.
	0615	91.372	0.025	< 0.025	6.500
	0634	86.719	0.005	< 0.005	6.500
	0635	86.719	0.005	< 0.005	6.500

KRUSKAL-WALLIS ONE-WAY ANALYSIS OF VARIANCE FOR 21 CASES
 DEPENDENT VARIABLE IS PP
 GROUPING VARIABLE IS ID\$

GROUP	COUNT	RANK SUM
PLUME	19	218.000
BKG	2	13.000

Exact significance probability

$$\frac{\binom{12}{10}}{\binom{21}{19}} = \frac{66}{210} = 0.31 \text{ (NS)}$$

MANN-WHITNEY U TEST STATISTIC = 28.000
 PROBABILITY IS 0.232/2 (NS)
 CHI-SQUARE APPROXIMATION = 1.429 WITH 1 DF

	ID	DATE	DET LIMIT	CONCENTRATION	RANK
SO4	0615	87.716	0.100	9930.000	4.000
	0615	89.258	0.100	6230.000	3.000
	0615	90.419	0.100	15000.000	8.000
	0615	90.775	0.100	15600.000	9.000
	0615	91.372	10.000	14300.000	7.000
	0615	92.713	10.000	13000.000	6.000
	0615	93.141	1.000	12000.000	5.000
	0634	86.719	0.100	256.000	1.000
	0635	86.719	0.100	1480.000	2.000

KRUSKAL-WALLIS ONE-WAY ANALYSIS OF VARIANCE FOR 9 CASES

GROUP	COUNT	RANK SUM	\bar{R}
0615	7	42.000	6.0
BKG	2	3.000	1.5

MANN-WHITNEY U TEST STATISTIC = 14.000
 PROBABILITY IS 0.040
 CHI-SQUARE APPROXIMATION = 4.200 WITH 1 DF

	ID	DATE	DET LIMIT	CONCENTRATION	RANK
SR	0615	87.716	0.100	10.100	8.000
	0615	89.258	0.100	14.000	11.000
	0615	90.419	0.100	11.900	9.000
	0615	90.775	0.010	8.940	5.000
	0615	91.372	0.050	12.200	10.000
	0615	92.713	0.010	9.600	7.000
	0615	93.141	0.010	9.020	6.000
	0634	86.719	0.100	1.600	1.000
	0635	86.719	0.100	3.900	3.000
	0732	93.310	0.010	2.660	2.000
	0733	93.316	0.010	4.610	4.000

KRUSKAL-WALLIS ONE-WAY ANALYSIS OF VARIANCE FOR 11 CASES

GROUP	COUNT	RANK SUM	\bar{R}
0615	7	56.000	8.0
BKG	4	10.000	2.5

MANN-WHITNEY U TEST STATISTIC = 28.000
 PROBABILITY IS 0.008
 CHI-SQUARE APPROXIMATION = 7.000 WITH 1 DF

THORIUM-230

ID	DATE	DET LIMIT	CONCENTRATION	RANK
0615	87.716	1.000	< 1.000	3.000
0615	89.258	1.000	< 1.000	3.000
0615	93.141	0.500	0.500	3.000
0634	86.719	1.000	< 1.000	3.000
0635	86.719	1.000	< 1.000	3.000

KRUSKAL-WALLIS ONE-WAY ANALYSIS OF VARIANCE FOR 5 CASES

GROUP	COUNT	RANK SUM	\bar{R}
0615	3	9.000	3.0
BKG	2	6.000	3.0

Sign = 0.5

NOTE: NO VARIATION IN DATA

ID	DATE	DET LIMIT	CONCENTRATION	RANK
0608	87.727	1.000	1.900	16.000
0608	89.258	1.000	< 1.000	7.000
0608	93.141	0.400	< 0.400	7.000
0609	87.724	1.000	< 1.000	7.000
0610	87.724	1.000	< 1.000	7.000
0610	89.258	1.000	< 1.000	7.000
0611	87.719	1.000	1.000	14.000
0613	87.716	1.000	1.200	15.000
0614	87.716	1.000	< 1.000	7.000
0614	88.780	1.000	< 1.000	7.000
0614	89.258	1.000	< 1.000	7.000
0615	87.716	1.000	< 1.000	7.000
0615	89.258	1.000	< 1.000	7.000
0615	93.141	0.500	0.500	7.000
0634	86.719	1.000	< 1.000	7.000
0635	86.719	1.000	< 1.000	7.000

KRUSKAL-WALLIS ONE-WAY ANALYSIS OF VARIANCE FOR 16 CASES

GROUP	COUNT	RANK SUM	\bar{R}
PLUME	14	122.000	8.7
BKG	2	14.000	7.0

MANN-WHITNEY U TEST STATISTIC = 17.000
 PROBABILITY IS 0.485/2
 CHI-SQUARE APPROXIMATION = 0.488 WITH 1 DF

NS

	ID	DATE	DET LIMIT	CONCENTRATION	RANK
U	0615	87.716	0.003	1.640	5.000
	0615	89.258	0.003	4.070	11.000
	0615	90.419	0.003	3.000	10.000
	0615	90.775	0.001	2.930	9.000
	0615	91.372	0.001	2.800	8.000
	0615	92.713	0.001	2.100	6.000
	0615	93.141	0.001	2.640	7.000
	0634	86.719	0.003	0.010	1.000
	0635	86.719	0.003	0.017	3.000
	0732	93.310	0.001	0.015	2.000
	0733	93.324	0.001	0.023	4.000

KRUSKAL-WALLIS ONE-WAY ANALYSIS OF VARIANCE FOR 11 CASES

GROUP	COUNT	RANK SUM	\bar{R}
0615	7	56.000	8.0
BKG	4	10.000	2.5

MANN-WHITNEY U TEST STATISTIC = 28.000
 PROBABILITY IS 0.008 ¹²
 CHI-SQUARE APPROXIMATION = 7.000 WITH 1 DF

V	ID	DATE	DET LIMIT	CONCENTRATION	RANK
	0615	87.716	0.010	0.140	4.000
	0615	89.258	0.010	0.160	5.500
	0615	90.419	0.010	< 0.010	2.000
	0615	90.775	0.010	0.160	5.500
	0615	91.372	0.050	< 0.050	.
	0615	92.713	0.001	0.340	9.000
	0634	86.719	0.010	0.230	8.000
	0635	86.719	0.010	0.200	7.000
	0732	93.310	0.010	< 0.010	2.000
	0733	93.316	0.010	< 0.010	2.000

KRUSKAL-WALLIS ONE-WAY ANALYSIS OF VARIANCE FOR 9 CASES

GROUP	COUNT	RANK SUM	\bar{R}
0615	5	26.000	5.2
BKG	4	19.000	4.8

MANN-WHITNEY U TEST STATISTIC = 11.000 (NS)
 PROBABILITY IS 0.802/2
 CHI-SQUARE APPROXIMATION = 0.063 WITH 1 DF

ID	DATE	DET LIMIT	CONCENTRATION	RANK
0608	87.727	0.010	0.170	22.500
0608	89.258	0.010	0.160	20.000
0608	90.419	0.010	< 0.010	6.000
0608	90.769	0.020	< 0.020	.
0608	91.372	0.050	< 0.050	.
0608	93.316	0.010	< 0.100	6.000
0609	87.724	0.010	0.200	24.500
0610	87.724	0.010	0.170	22.500
0610	89.258	0.010	0.110	14.500
0610	90.419	0.010	< 0.010	6.000
0610	90.769	0.010	< 0.010	6.000
0610	91.372	0.010	< 0.010	6.000
0611	87.719	0.010	0.100	12.500
0613	87.716	0.010	0.130	17.000
0614	87.716	0.010	0.120	16.000
0614	88.780	0.010	0.110	14.500
0614	89.258	0.010	0.100	12.500
0614	90.419	0.010	< 0.010	6.000
0614	90.769	0.010	< 0.010	6.000
0614	91.372	0.010	< 0.010	6.000
0615	87.716	0.010	0.140	18.000
0615	89.258	0.010	0.160	20.000
0615	90.419	0.010	< 0.010	6.000
0615	90.775	0.010	0.160	20.000
0615	91.372	0.050	< 0.050	.
0615	92.713	0.001	0.340	27.000
0634	86.719	0.010	0.230	26.000
0635	86.719	0.010	0.200	24.500
0732	93.310	0.010	< 0.010	6.000
0733	93.316	0.010	< 0.010	6.000

KRUSKAL-WALLIS ONE-WAY ANALYSIS OF VARIANCE FOR 27 CASES

GROUP	COUNT	RANK SUM	\bar{R}
PLUME	23	315.500	13.7
BKG	4	62.500	15.6

MANN-WHITNEY U TEST STATISTIC = 39.500 (NS)
 PROBABILITY IS 1 - 0.646/2
 CHI-SQUARE APPROXIMATION = 0.212 WITH 1 DF

	ID	DATE	DET LIMIT	CONCENTRATION	RANK
ZN	0615	87.716	0.005	0.008	4.000
	0615	89.258	0.005	0.021	7.000
	0615	90.419	0.005	< 0.005	2.000
	0615	90.775	0.010	< 0.010	.
	0615	91.372	0.100	< 0.100	.
	0615	92.713	0.001	0.017	5.500
	0634	86.719	0.005	0.150	8.000
	0635	86.719	0.005	0.017	5.500
	0732	93.310	0.005	< 0.005	2.000
	0733	93.316	0.005	< 0.005	2.000

KRUSKAL-WALLIS ONE-WAY ANALYSIS OF VARIANCE FOR 8 CASES

GROUP	COUNT	RANK SUM	\bar{R}
0615	4	18.500	4.6
BKG	4	17.500	4.4

MANN-WHITNEY U TEST STATISTIC = 8.500
 PROBABILITY IS 0.882/2
 CHI-SQUARE APPROXIMATION = 0.022 WITH 1 DF

MS

ID	DATE	DET LIMIT	CONCENTRATION	RANK
0608	87.727	0.005	0.125	24.000
0608	89.258	0.005	0.133	25.000
0608	90.419	0.005	0.062	13.000
0608	90.769	0.005	0.090	18.000
0608	91.372	0.030	0.130	.
0608	92.713	0.001	0.170	27.000
0608	93.316	0.005	0.220	30.000
0609	87.724	0.005	0.211	29.000
0610	87.724	0.005	0.054	12.000
0610	89.258	0.005	0.070	14.000
0610	90.419	0.005	0.023	9.000
0610	90.769	0.005	0.032	10.000
0610	91.372	0.005	0.038	11.000
0610	92.713	0.001	0.091	19.000
0611	87.719	0.005	0.013	5.000
0613	87.716	0.005	0.102	22.000
0614	87.716	0.005	0.077	15.000
0614	88.780	0.005	0.113	23.000
0614	89.258	0.005	0.087	17.000
0614	90.419	0.005	0.081	16.000
0614	90.769	0.005	0.099	21.000
0614	91.372	0.005	0.096	20.000
0614	92.713	0.001	0.190	28.000
0615	87.716	0.005	0.008	4.000
0615	89.258	0.005	0.021	8.000
0615	90.419	0.005	< 0.005	2.000
0615	90.775	0.010	< 0.010	.
0615	91.372	0.100	< 0.100	.
0615	92.713	0.001	0.017	6.500
0634	86.719	0.005	0.150	26.000
0635	86.719	0.005	0.017	6.500
0732	93.310	0.005	< 0.005	2.000
0733	93.316	0.005	< 0.005	2.000

ZINC (CONTINUED)

KRUSKAL-WALLIS ONE-WAY ANALYSIS OF VARIANCE FOR 30 CASES

GROUP	COUNT	RANK SUM	\bar{R}
PLUME	26	428.500	16.5
BKG	4	36.500	9.1

MANN-WHITNEY U TEST STATISTIC = 77.500
PROBABILITY IS 0.120 / 2 = 0.060
CHI-SQUARE APPROXIMATION = 2.423 WITH 1 DF

NS

*Note: exact significance probability different
to complete 27,405 combinations)*

APPENDIX D4

MEDIAN AND UPPER 95 PERCENT CONFIDENCE LIMITS FOR MEDIAN CONCENTRATION OF SITE
CONTAMINANTS IN THE FLOODPLAIN ALLUVIUM, SHIPROCK, NM

Contaminant	Median Concentration	Upper 95 Percent Confidence Limit
Asbestos	0.001	0.002
Barium	10	20
Benzene	0.001	0.002
Bismuth	10	20
Chromium	10	20
Copper	10	20
Lead	10	20
Manganese	10	20
Mercury	0.001	0.002
Nickel	10	20
Selenium	10	20
Silver	10	20
Sulfate	10	20
Tin	10	20
Zinc	10	20

1. UCLS FOR HUMAN HEALTH

CONST	ID	DATE	CONCENT/ACTIVITY	RANK
AS	608.000	930221	< 0.005	1
AS	610.000	930221	< 0.005	2
AS	614.000	930221	< 0.005	3
AS	615.000	930221	< 0.005	4
AS	614.000	890403	< 0.010	5
AS	608.000	930424	< 0.010	6
AS	614.000	900601	< 0.010	7
AS	608.000	920917	< 0.015	8
AS	610.000	920917	< 0.015	9
AS	614.000	920917	< 0.015	10
AS	615.000	920917	< 0.015	11
AS	614.000	870918	0.016	12
AS	613.000	870918	0.019	13
AS	610.000	890403	0.020	14
AS	610.000	900601	0.020	15
AS	610.000	870921	0.028	16
AS	611.000	870919	0.028	17
AS	608.000	910514	< 0.030	18
AS	614.000	910514	< 0.030	19
AS	608.000	890403	0.030	20
AS	615.000	890403	0.030	21
AS	608.000	900601	0.030	22
AS	615.000	870918	0.031	23
AS	609.000	870921	0.034	24
AS	608.000	870922	0.038	25
AS	615.000	900601	0.040	26
AS	610.000	910514	< 0.05	27
AS	615.000	910514	< 0.05	28
AS	608.000	901007	< 0.05	29
AS	610.000	901007	< 0.05	30
AS	614.000	901007	< 0.05	31
AS	614.000	881011	0.05	32
AS	615.000	901009	< 0.10	33
CD	614.000	920917	0.000	1
CD	610.000	910514	< 0.001	2
CD	614.000	910514	< 0.001	3
CD	610.000	930221	< 0.001	4
CD	614.000	930221	< 0.001	5
CD	615.000	930221	< 0.001	6
CD	608.000	930424	< 0.001	7
CD	608.000	900601	< 0.001	8
CD	610.000	900601	< 0.001	9
CD	614.000	900601	< 0.001	10
CD	615.000	900601	< 0.001	11
CD	610.000	901007	< 0.001	12
CD	614.000	901007	< 0.001	13
CD	608.000	920917	0.001	14
CD	610.000	920917	0.001	15
CD	615.000	920917	0.001	16
CD	608.000	930221	0.001	17
CD	608.000	901007	0.001	18
CD	615.000	901009	0.001	19
CD	614.000	881011	0.002	20
CD	608.000	870922	< 0.005	21
CD	608.000	910514	< 0.005	22
CD	615.000	910514	< 0.005	23
CD	609.000	870921	< 0.005	24
CD	610.000	870921	< 0.005	25
CD	611.000	870919	< 0.005	26
CD	613.000	870918	< 0.005	27
CD	614.000	870918	< 0.005	28
CD	615.000	870918	< 0.005	29

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ucl

CD	610.000	890403	0.007	30	
CD	614.000	890403	0.008	31	
CD	615.000	890403	0.013	32	
CD	608.000	890403	0.018	33	
MG	615.000	870918	1252	1	
MG	615.000	890403	1370	2	
MG	615.000	930221	1940	3	
MG	615.000	920917	2000	4	
MG	615.000	900601	2440	5	
MG	615.000	901009	2540	6	ucl
MG	615.000	910514	2750	7	
MN	615.000	930221	5.66	1	
MN	615.000	870918	5.81	2	
MN	615.000	901009	6.94	3	
MN	615.000	900601	8.08	4	
MN	615.000	920917	8.10	5	
MN	615.000	890403	9.38	6	ucl
MN	615.000	910514	9.75	7	
NA	615.000	890403	1650	1	
NA	615.000	870918	2107	2	
NA	615.000	930221	3010	3	
NA	615.000	920917	3500	4	
NA	615.000	900601	3560	5	
NA	615.000	901009	3630	6	ucl
NA	615.000	910514	3810	7	
NO3	615.000	900601	400	1	
NO3	615.000	870918	1570	2	
NO3	615.000	930221	2960	3	
NO3	615.000	890403	3300	4	
NO3	615.000	910514	4010	5	
NO3	615.000	901009	4220	6	ucl
NO3	615.000	920917	5300	7	
PB0	614.000	890403	0.1	1	
PB0	610.000	890403	0.3	2	
PB0	615.000	890403	1.1	3	
PB0	608.000	890403	1.2	4	
PB0	608.000	930221	1.3	5	
PB0	615.000	930221	1.3	6	ucl
PO0	608.000	930221	0.0	1	
PO0	615.000	930221	0.0	2	
PO0	611.000	870919	0.2	3	
PO0	610.000	890403	0.4	4	
PO0	609.000	870921	0.6	5	
PO0	610.000	870921	0.6	6	
PO0	614.000	870918	0.6	7	
PO0	614.000	890403	0.7	8	
PO0	613.000	870918	0.9	9	
PO0	608.000	870922	1.1	10	ucl
PO0	615.000	870918	1.1	11	
PO0	608.000	890403	1.1	12	
PO0	615.000	890403	3.3	13	
R6L	608.000	870922	0.0	1	
R6L	608.000	890403	0.0	2	
R6L	609.000	870921	0.0	3	
R6L	610.000	890403	0.0	4	

R6L	611.000	870919	0.0	5
R6L	614.000	890403	0.0	6
R6L	615.000	890403	0.0	7
R6L	610.000	901007	0.0	8
R6L	610.000	870921	0.1	9
R6L	613.000	870918	0.1	10
R6L	614.000	870918	0.1	11
R6L	614.000	881011	0.1	12
R6L	608.000	901007	0.1	13
R6L	614.000	920917	0.12	14
R6L	610.000	910514	0.2	15
R6L	610.000	920917	0.2	16
R6L	615.000	920917	0.2	17
R6L	615.000	870918	0.2	18
R6L	608.000	900601	0.2	19
R6L	610.000	900601	0.2	20
R6L	614.000	901007	0.2	21
R6L	608.000	920917	0.25	22
R6L	608.000	910514	0.3	23
R6L	614.000	900601	0.3	24
R6L	615.000	910514	0.4	25
R6L	614.000	910514	0.5	26
R6L	615.000	900601	0.6	27
R6L	615.000	901009	0.7	28
R6L	610.000	930221	1.2	29
R6L	615.000	930221	2.2	30
R6L	608.000	930221	2.5	31
R6L	614.000	930221	3.0	32

ucl

SB	608.000	930424	<	0.003	1
SB	614.000	900601	<	0.003	2
SB	615.000	920917		0.003	3
SB	615.000	900601		0.003	4
SB	608.000	920917		0.005	5
SB	614.000	920917		0.005	6
SB	608.000	900601		0.005	7
SB	610.000	920917		0.007	8
SB	614.000	890403		0.007	9
SB	610.000	890403		0.009	10
SB	608.000	910514	<	0.015	11
SB	610.000	910514	<	0.015	12
SB	614.000	910514	<	0.015	13
SB	615.000	910514	<	0.015	14
SB	608.000	901007	<	0.020	15
SB	610.000	901007	<	0.020	16
SB	614.000	901007	<	0.020	17
SB	615.000	901009	<	0.020	18
SB	614.000	881011		0.027	19
SB	608.000	890403		0.037	20
SB	615.000	890403		0.049	21
SB	609.000	870921		0.055	22
SB	614.000	870918		0.068	23
SB	615.000	870918		0.074	24
SB	611.000	870919		0.084	25
SB	610.000	900601	<	0.100	26
SB	610.000	870921		0.103	27
SB	613.000	870918		0.103	28
SB	608.000	870922		0.129	29

ucl

SE	615.000	901009		0.070	1
SE	615.000	910514		0.090	2
SE	615.000	920917		0.100	3
SE	615.000	890403		0.122	4
SE	615.000	900601		0.165	5
SE	615.000	870918		0.255	6

ucl

SE	615.000	930221	0.640	7	
SO4	615.000	890403	6230	1	
SO4	615.000	870918	9930	2	
SO4	615.000	930221	12000	3	
SO4	615.000	920917	13000	4	
SO4	615.000	910514	14300	5	
SO4	615.000	900601	15000	6	ucl
SO4	615.000	901009	15600	7	
SR	615.000	901009	8.94	1	
SR	615.000	930221	9.02	2	
SR	615.000	920917	9.6	3	
SR	615.000	870918	10.1	4	
SR	615.000	900601	11.9	5	
SR	615.000	910514	12.2	6	ucl
SR	615.000	890403	14.0	7	
TOL	610.000	890403	0.0	1	
TOL	615.000	870918	0.0	2	
TOL	615.000	890403	0.0	3	
TOL	608.000	890403	0.1	4	
TOL	610.000	870921	0.1	5	
TOL	608.000	930221	0.2	6	
TOL	614.000	890403	0.3	7	
TOL	614.000	870918	0.4	8	
TOL	615.000	930221	0.5	9	
TOL	614.000	881011	0.5	10	
TOL	609.000	870921	0.6	11	ucl
TOL	611.000	870919	1.0	12	
TOL	613.000	870918	1.2	13	
TOL	608.000	870922	1.9	14	
U	615.000	870918	1.64	1	
U	615.000	920917	2.10	2	
U	615.000	930221	2.64	3	
U	615.000	910514	2.80	4	
U	615.000	901009	2.93	5	
U	615.000	900601	3.00	6	ucl
U	615.000	890403	4.07	7	

OTHER CONSTITUENTS STATISTICALLY ABOVE BACKGROUND, EVALUATED FOR POTENTIAL
ECOLOGICAL RISKS

B	615.000	890403		0.60	1	
B	615.000	900601		0.60	2	
B	615.000	910514		0.80	3	<i>med</i>
B	615.000	901009		0.90	4	
B	615.000	870918		0.92	5	<i>ucl</i>
CA	615.000	930221		380	1	
CA	615.000	890403		390	2	
CA	615.000	901009		435	3	
CA	615.000	920917		490	4	<i>med</i>
CA	615.000	900601		495	5	
CA	615.000	910514		497	6	<i>ucl</i>
CA	615.000	870918		510	7	
CL	615.000	870918		385	1	
CL	615.000	920917		440	2	
CL	615.000	930221		461	3	
CL	615.000	901009		605	4	<i>med</i>
CL	615.000	890403		610	5	
CL	615.000	900601		634	6	
CL	615.000	910514		700	7	<i>ucl</i>
K	615.000	930221		109	1	
K	615.000	910514		120	2	
K	615.000	901009		120	3	
K	615.000	870918		121	4	<i>med</i>
K	615.000	920917		140	5	
K	615.000	900601		152	6	
K	615.000	890403		165	7	<i>ucl</i>
NH4	608.000	901007		443	1	
NH4	608.000	890403		460	2	
NH4	608.000	930221		512	3	
NH4	608.000	870922		516	4	<i>med</i>
NH4	608.000	900601		520	5	
NH4	608.000	910514		532	6	
NH4	608.000	930424		542	7	<i>ucl</i>
NI	615.000	870918	<	0.01	1	
NI	610.000	870921		0.01	2	
NI	613.000	870918		0.01	3	
NI	611.000	870919		0.02	4	
NI	614.000	870918		0.03	5	
NI	614.000	910514	<	0.04	6	
NI	610.000	890403	<	0.04	7	
NI	614.000	890403	<	0.04	8	
NI	610.000	900601	<	0.04	9	
NI	614.000	900601	<	0.04	10	
NI	614.000	901007	<	0.04	11	
NI	610.000	910514		0.04	12	
NI	615.000	890403		0.04	13	
NI	610.000	901007		0.04	14	<i>ucl med</i>
NI	608.000	870922		0.05	15	
NI	609.000	870921		0.05	16	
NI	608.000	890403		0.06	17	
NI	608.000	920917	<	0.061	18	
NI	610.000	920917	<	0.061	19	
NI	614.000	920917	<	0.061	20	<i>← ucl</i>

NI	615.000	920917	<	0.061	21	
NI	608.000	900601		0.07	22	
NI	615.000	900601		0.07	23	
NI	608.000	901007	<	0.08	24	
NI	608.000	910514	<	0.20	25	
NI	615.000	910514	<	0.20	26	
NI	615.000	901009		0.4	27	
PO4	608.000	890403	<	0.1	1	
PO4	615.000	930221	<	0.1	2	
PO4	610.000	890403	<	0.1	3	
PO4	614.000	881011	<	0.1	4	
PO4	614.000	890403	<	0.1	5	
PO4	615.000	890403	<	0.1	6	
PO4	608.000	900601	<	0.1	7	
PO4	610.000	900601	<	0.1	8	
PO4	614.000	900601	<	0.1	9	
PO4	608.000			0.1	10	
PO4	608.000	910514		0.1	11	
PO4	610.000	910514		0.1	12	
PO4	615.000	910514		0.1	13	
PO4	608.000	930221		0.1	14	
PO4	610.000	930221		0.1	15	median
PO4	614.000	930221		0.1	16	
PO4	608.000	901007		0.1	17	
PO4	614.000	901007		0.1	18	
PO4	615.000	901009		0.1	19	ucl
PO4	614.000	910514		0.2	20	
PO4	610.000	901007		0.2	21	
PO4	615.000	900601		0.6	22	
PO4	611.000	870919		0.65	23	
PO4	614.000	870918		0.81	24	
PO4	613.000	870918		0.98	25	
PO4	615.000	870918		1.04	26	
PO4	610.000	870921		1.12	27	
PO4	608.000	870922		1.30	28	
PO4	609.000	870921		1.47	29	
ZN	615.000	900601	<	0.005	1	
ZN	615.000	870918		0.008	2	
ZN	615.000	901009	<	0.010	3	
ZN	611.000	870919		0.013	4	
ZN	615.000	920917		0.017	5	
ZN	615.000	890403		0.021	6	
ZN	610.000	900601		0.023	7	
ZN	610.000	901007		0.032	8	
ZN	610.000	910514		0.038	9	
ZN	610.000	870921		0.054	10	
ZN	608.000	900601		0.062	11	
ZN	610.000	890403		0.070	12	
ZN	614.000	870918		0.077	13	
ZN	614.000	900601		0.081	14	
ZN	614.000	890403		0.087	15	median
ZN	608.000	901007		0.090	16	
ZN	610.000	920917		0.091	17	
ZN	614.000	910514		0.096	18	
ZN	614.000	901007		0.099	19	ucl
ZN	615.000	910514	<	0.100	20	
ZN	613.000	870918		0.102	21	
ZN	614.000	881011		0.113	22	
ZN	608.000	870922		0.125	23	
ZN	608.000	910514		0.130	24	
ZN	608.000	890403		0.133	25	
ZN	608.000	920917		0.17	26	
ZN	614.000	920917		0.19	27	

ZN	609.000	870921	0.211	28
ZN	608.000	930424	0.22	29

BINOMIAL WITH N = 6 P = 0.500000

K	P(X LESS OR = K)
0	0.0156
1	0.1094
2	0.3437
3	0.6563
4	0.8906
5	0.9844
6	1.0000

BINOMIAL WITH N = 7 P = 0.500000

K	P(X LESS OR = K)
0	0.0078
$x' = 1$	0.0625 <i>for 93.8% ucl</i>
2	0.2266
3	0.5000
4	0.7734 <i>n - x' = 6</i>
5	0.9375
6	0.9922
7	1.0000

BINOMIAL WITH N = 13 P = 0.500000

K	P(X LESS OR = K)
0	0.0001
1	0.0017
2	0.0112
$x' = 3$	0.0461 <i>for 95.4% ucl</i>
4	0.1334
5	0.2905
6	0.5000
7	0.7095 <i>n - x' = 10</i>
8	0.8666
9	0.9539
10	0.9888
11	0.9983
12	0.9999
13	1.0000

BINOMIAL WITH N = 14 P = 0.500000

K	P(X LESS OR = K)
0	0.0001
1	0.0009
2	0.0065
$x' = 3$	0.0287 <i>for 97.1% ucl</i>
4	0.0898
5	0.2120
6	0.3953
7	0.6047 <i>n - x' = 11</i>
8	0.7880
9	0.9102
10	0.9713
11	0.9935
12	0.9991
13	0.9999
14	1.0000

BINOMIAL WITH N = 27 P = 0.500000

K	P(X LESS OR = K)	
3	0.0000	
4	0.0002	
5	0.0008	
6	0.0030	
7	0.0096	
x'_{α} 8	0.0261	for 97.4% ucl
x'_{β} 9	0.0610	for 93.9% ucl
10	0.1239	
11	0.2210	
12	0.3506	
13	0.5000	
14	0.6494	
15	0.7790	
16	0.8761	
17	0.9390	
18	0.9739	
19	0.9904	
20	0.9970	
21	0.9992	
22	0.9998	
23	1.0000	

$n - x' = 19$

BINOMIAL WITH N = 29 P = 0.500000

K	P(X LESS OR = K)	
3	0.0000	
4	0.0001	
5	0.0003	
6	0.0012	
7	0.0041	
8	0.0121	
x'_{α} 9	0.0307	for 96.9% ucl
x'_{β} 10	0.0680	for 93.2% ucl
11	0.1325	
12	0.2291	
13	0.3555	
14	0.5000	
15	0.6445	
16	0.7709	
17	0.8675	
18	0.9320	
19	0.9693	
20	0.9879	
21	0.9959	
22	0.9988	
23	0.9997	
24	0.9999	
25	1.0000	

$n - x' = 20$

BINOMIAL WITH N = 32 P = 0.500000

K	P(X LESS OR = K)	
4	0.0000	
5	0.0001	
6	0.0003	
7	0.0011	
8	0.0035	
9	0.0100	
10	0.0251	
$x' = 11$	0.0551	for 94.5% ucl
12	0.1077	
13	0.1885	
14	0.2983	
15	0.4300	
16	0.5700	
17	0.7017	
18	0.8115	$n - x' = 21$
19	0.8923	
20	0.9449	
21	0.9749	
22	0.9900	
23	0.9965	
24	0.9989	
25	0.9997	
26	0.9999	
27	1.0000	

BINOMIAL WITH N = 33 P = 0.500000

K	P(X LESS OR = K)	
5	0.0000	
6	0.0002	
7	0.0007	
8	0.0023	
9	0.0068	
10	0.0175	
$x' = 11$	0.0401	for 96.0% ucl
12	0.0814	
13	0.1481	
14	0.2434	
15	0.3642	
16	0.5000	
17	0.6358	$n - x' = 22$
18	0.7566	
19	0.8519	
20	0.9186	
21	0.9599	
22	0.9825	
23	0.9932	
24	0.9977	
25	0.9993	
26	0.9998	
27	1.0000	

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**SUPPLEMENT 11
EXPOSURE ASSESSMENT SPREADSHEETS**

11-1

11-2

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CALCULATION COVER SHEET

CALC NO. SHP1095090600 DISCIPLINE RISK ASSESSMENT NO. OF SHEETS 26 PP.

PROJECT: Baseline Risk Assessment of Ground Water Contamination at the Uranium Mill Tailings Site Near Shiprock, New Mexico

SITE: Shiprock, New Mexico

FEATURE: Exposure Dose Calculations

SOURCES OF DATA: UMTRA Project Database

SOURCES OF FORMULAE & REFERENCES:

EPA (1989). Risk Assessment Guidance for Superfund, Volume I, Human Health Evaluation Manual, EPA/540/1-89/001, Office of Emergency and Remedial Response, Washington, D.C.

EPA(1991). Risk Assessment Guidance for Superfund, Volume I: Human Health Evaluation Manual, Supplemental Guidance. "Standard Default Exposure Factors", Interim Final (OSWER Directive: 9285.6-03, March 25, 1991) Office of Solid Waste and Emergency Response, Washington, D.C.

PRELIMINARY CALC. FINAL CALC. SUPERSEDES CALC. NO. _____

		<u>J. Weidner</u>	<u>10/95</u>	<u>M. Randall</u>	<u>10/95</u>	<u>[Signature]</u>	<u>3/96</u>
REV. NO.	REVISION	CALCULATION BY	DATE	CHECKED BY	DATE	APPROVED BY	DA

Sheet1

Exposure dose calculations - Shiprock site (floodplain)									
Pathway: Ground water ingestion									
Receptor: Adults, infants (nitrate and sulfate only)									
Date prepared: 10/23/95									
Contaminant of potential concern	95% UCL concentration (mg/L)	Exposure Frequency (days/yr)	Exposure Duration (yrs)	Ingestion Rate (L/hr)	Body Weight (kg)	Averaging time	Exposure dose (mg/kg/day or pCi/Lifetime)		
Noncarcinogenic risk:									
Antimony	0.037	350	7	2	70	2555	1.0E-03		
Arsenic	0.03	350	7	2	70	2555	8.2E-04		
Cadmium	0.005	350	7	2	70	2555	1.4E-04		
Magnesium	2540	350	7	2	70	2555	7.0E+01		
Manganese	9.38	350	7	2	70	2555	2.6E-01		
Nitrate	4220	350	7	2	70	2555	1.2E+02		
Nitrate (infant)	4220	350	1	0.64	4	365	6.5E+02		
Selenium	0.26	350	7	2	70	2555	7.1E-03		
Sodium	3630	350	7	2	70	2555	9.9E+01		
Strontium	12.2	350	7	2	70	2555	3.3E-01		
Sulfate	15000	350	7	2	70	2555	4.1E+02		
Sulfate (infant)	15000	350	1	0.64	4	365	2.3E+03		
Uranium	3	350	7	2	70	2555	8.2E-02		
Carcinogenic risk:									
Arsenic	0.03	350	50	2	70	25,550	5.9E-04		
Uranium (pCi/L)	2058	350	50	2	NA	NA	7.2E+07		
Intake from ingestion of ground water is calculated as follows:									
Chemicals:		Chronic daily Intake (mg/kg-day) = $C_w \times IR_w \times EF \times ED / BW \times AT$							
Radionuclides:		Lifetime intake (pCi/lifetime) = $C_w \times IR_w \times EF \times ED$							
Where:									
C _w = contaminant concentration in ground water (upper 95 percent confidence interval for median from wells 608, 609, 610, 611, 613, 614, or 615)									
IR _w = ingestion rate for water (2 L/day for an adult, 0.64 L/day for an infant)									
EF = exposure frequency (350 days/year)									
ED = exposure duration (7 years for an adult and 1 year for an infant for noncarcinogens; 50 years for carcinogens)									
BW = body weight (70 kg for an adult, 4 kg for an infant)									
AT = averaging time (365 days x ED for noncarcinogens; 365 days x 70 years for carcinogens)									

Exposure dose calculations

Shiprock NM UMTRA site

M. Randall

10-23-95

Floodplain

GW Ingestion

$$\frac{C_w \times IR_w \times EF \times ED}{BW \times AT}$$

IRw = 2 L/day adults, 0.64 L/day infants

EF = 350 days/yr

ED = 7 yrs adults, 1 yr infants; 50 yrs carcinogens

BW = 70 kg adults, 4 kg infants

AT = 365 x ED noncarcinogens; 365 x 70 carcinogens

C_w

Exp Dose

NONCARCINOGENS

Antimony	$(0.037)(2)(350) / (70)(365) =$	1.01 E-03
Arsenic _{nc}	$(0.03)(2)(350) / (70)(365) =$	8.22 E-04
Cd	$(0.005)(2)(350) / (70)(365) =$	1.37 E-04
Mg	$(2540)(2)(350) / (70)(365) =$	6.96 E+01
Mn	$(9.38)(2)(350) / (70)(365) =$	2.57 E-01
NO ₃ ⁻ adults	$(4220)(2)(350) / (70)(365) =$	1.16 E+02
infants	$(4220)(.64)(350) / (4)(365) =$	6.47 E+02
Sn	$(0.26)(2)(350) / (70)(365) =$	7.12 E-03
Selenium	$(3630)(2)(350) / (70)(365) =$	9.9 E+01
Sr	$(12.2)(2)(350) / (70)(365) =$	3.34 E-01
SO ₄ ⁻ adults	$(15000)(2)(350) / (70)(365) =$	4.1 E+02
infants	$(15000)(.64)(350) / (4)(365) =$	2.3 E+03
Unc	$(3)(2)(350) / (70)(365) =$	8.2 E-02

CARCINOGENS

As _c	$(0.03)(2)(350)(50) / (70)(365)(70) =$	5.87 E-04
Uc (pCi/L)	$(2058)(2)(350)(50) =$	7.2 E+07

Exposure dose calculations - Shiprock site (floodplain)										
Dermal contact with ground water										
Receptor: Adult										
Date prepared: 10/23/95										
Contaminant of potential concern	95% UCL concentration (mg/L)	Exposure frequency (days/yr)	Exposure duration (yrs)	Skin surface area (cm ²)	Dermal permeability constant (cm/hour)	Conversion factor (L/cm ³)	Exposure time (hour/day)	Body weight (kg)	Averaging time	Exposure dose (mg/kg-day or pCi/lifetime)
Noncarcinogenic risk:										
Antimony	0.037	350	7	19,400	0.001	0.001	0.2	70	2555	2.0E-06
Arsenic	0.03	350	7	19,400	0.001	0.001	0.2	70	2555	1.6E-06
Cadmium	0.005	350	7	19,400	0.001	0.001	0.2	70	2555	2.7E-07
Magnesium	2540	350	7	19,400	0.001	0.001	0.2	70	2555	1.4E-01
Manganese	9.38	350	7	19,400	0.001	0.001	0.2	70	2555	5.0E-04
Nitrate	4220	350	7	19,400	0.001	0.001	0.2	70	2555	2.2E-01
Selenium	0.26	350	7	19,400	0.001	0.001	0.2	70	2555	1.4E-05
Sodium	3630	350	7	19,400	0.001	0.001	0.2	70	2555	1.9E-01
Strontium	12.2	350	7	19,400	0.001	0.001	0.2	70	2555	6.5E-04
Sulfate	15000	350	7	19,400	0.001	0.001	0.2	70	2555	8.0E-01
Uranium	3	350	7	19,400	0.001	0.001	0.2	70	2555	1.6E-04
Carcinogenic risk:										
Arsenic	0.03	350	50	19,400	0.001	0.001	0.2	70	25,550	1.1E-06
Uranium (pCi/L)	2058	350	50	19,400	0.001	0.001	0.2	NA	NA	1.4E+05
Intake from dermal contact with ground water is calculated as follows:										
Chemicals:		Chronic daily intake (mg/kg-day) = (Cw x SA x Pc x Cf) x ET x EF x ED / BW x AT								
Radionuclides:		Lifetime intake (pCi/lifetime) = Cw x SA x Pc x Cf x ET x EF x ED								
Where:										
Cw = contaminant concentration in ground water (upper 95 percent confidence interval for median from wells 608, 609, 610, 611, 613, 614, or 615)										
EF = exposure frequency (350 days/year)										
ED = exposure duration (7 years for an adult for noncarcinogens; 50 years for carcinogens)										
SA = skin surface area (19,400 cm ² for an adult), (EPA, 1992)										
Pc = dermal permeability constant for water (0.001 cm/hour), (EPA, 1992)										
Cf = conversion factor (0.001 L/cm ³) (EPA, 1992)										
ET = exposure time (0.2 hour/day)										
BW = body weight (70 kg for an adult)										
AT = averaging time (365 days x ED for noncarcinogens; 365 days x 70 years for carcinogens)										

Exposure dose calculations

M. Randall

Shiprock NM UMTA site

10-23-95

Floodplain

Dermal contact

Chemicals:
$$\frac{C_w \times SA \times P_c \times C_f \times E_T \times E_F \times E_D}{BW \times AT}$$

Radionuclides:
$$C_w \times SA \times P_c \times C_f \times E_T \times E_F \times E_D$$

$SA = 19,400 \text{ cm}^2$

$P_c = .001 \text{ cm/hr}$

$C_f = .001 \text{ L/cm}^3$

$E_T = 0.2 \text{ hr/day}$

$E_F = 350 \text{ days/yr}$

$E_D = 7 \text{ yrs}; 50 \text{ yrs carcinogens}$

$BW = 70 \text{ kg adult}$

$AT = 365 \text{ days} \times E_D \text{ noncarcinogens}; 365 \times 70 \text{ carcinogens}$

NONCARCINOGENS C_w

Exp
Dose

Antimony	(0.037)	(19400)	(.001)	(.001)	(0.2)	(350)	(7)	/	(70)	(365)	(7)	= 1.97E-06
Arsenic	(0.03)	(19400)	(.001)	(.001)	(0.2)	(350)	(7)	/	(70)	(365)	(7)	= 1.57E-06
Ca	(0.005)	(19400)	(.001)	(.001)	(0.2)	(350)	(7)	/	(70)	(365)	(7)	= 2.66E-07
g	(2540)	"	"	"	"	"	"	/	"	"	"	= 1.35E-0
Mn	(9.38)	"	"	"	"	"	"	/	"	"	"	= 4.97E-04
NO ₃ ⁻	(4220)	"	"	"	"	"	"	/	"	"	"	= 2.24E-01
Se	(0.26)	"	"	"	"	"	"	/	"	"	"	= 1.32E-05
Sodium	(3630)	"	"	"	"	"	"	/	"	"	"	= 1.93E-01
Sr	(12.2)	"	"	"	"	"	"	/	"	"	"	= 6.48E-04
SO ₄ ⁻	(15000)	"	"	"	"	"	"	/	"	"	"	= 7.77E-01
Unc	(3)	"	"	"	"	"	"	/	"	"	"	= 1.59E-04

CARCINOGENS

As	(0.03)	(19400)	(.001)	(.001)	(0.2)	(350)	(50)	/	(70)	(365)	(70)	= 1.14E-06
Uc	(2058)	(19400)	(.001)	(.001)	(0.2)	(350)	(50)	=				1.39E+05

Exposure dose calculations - Shiprock site (floodplain)															
Pathway: Ingestion of produce irrigated with contaminated ground water															
Receptor: Adult															
Date prepared: 10/23/95															
Contaminant of potential concern	Concentration in water (mg/L)	Kd (L/kg)	Bv (unitless)	Br (unitless)	Ingestion rate for produce - veg. (kg/day)	Ingestion rate for produce - rep. (kg/day)	Dry weight fraction (unitless)	Fraction of diet ingested (unitless)	Exposure frequency (days/yr)	Exposure duration (yrs)	Body weight (kg)	Averaging time	Exposure dose (vegetative) (mg/kg-day)	Exposure dose (reproductive) (mg/kg-day)	Total exposure dose (mg/kg-day)
Antimony	0.037	45	0.2	0.03	0.05	0.03	0.066	1	350	7	70	2555	1.5E-05	1.4E-06	1.6E-05
Arsenic	0.03	200	0.04	0.006	0.05	0.03	0.066	1	350	7	70	2555	1.1E-05	9.8E-07	1.2E-05
Cadmium	0.005	6.5	0.55	0.15	0.05	0.03	0.066	1	350	7	70	2555	8.1E-07	1.3E-07	9.4E-07
Magnesium	2540	4.5	1	0.55	0.05	0.03	0.066	1	350	7	70	2555	5.2E-01	1.7E-01	6.9E-01
Manganese	9.38	65	0.25	0.05	0.05	0.03	0.066	1	350	7	70	2555	6.9E-03	8.3E-04	7.7E-03
Nitrate	4220	NA	30	30	0.05	0.03	0.066	1	350	7	70	2555	NA	NA	NA
Selenium	0.26	300	0.025	0.025	0.05	0.03	0.066	1	350	7	70	2555	8.8E-05	5.3E-05	1.4E-04
Sodium	3630	100	0.075	0.055	0.05	0.03	0.066	1	350	7	70	2555	1.2E+00	5.4E-01	1.8E+00
Strontium	12.2	35	2.5	0.25	0.05	0.03	0.066	1	350	7	70	2555	4.8E-02	2.9E-03	5.1E-02
Sulfate	15000	7.5	0.5	0.5	0.05	0.03	0.066	1	350	7	70	2555	2.5E+00	1.5E+00	4.1E+00
Uranium	3	450	0.0085	0.004	0.05	0.03	0.066	1	350	7	70	2555	5.2E-04	1.5E-04	6.7E-04
Carcinogenic risk															
Arsenic	0.03	200	0.04	0.006	0.05	0.03	0.066	1	350	50	70	25550	7.7E-06	6.97E-07	8.4E-06
Uranium (pCi/L)	2058	450	0.0085	0.004	0.05	0.03	0.066	1	350	50	NA	NA	4.5E+05	1.28E+05	5.8E+05
Intake from consumption of contaminated produce irrigated with contaminated water is calculated as follows:															
Chemicals:					Chronic daily intake (mg/kg-day) = $C_w \times K_d \times B_v \text{ or } B_r \times DF \times IR_p \times FI \times EF \times ED / BW \times AT$										
Radionuclides:					Lifetime intake (pCi/lifetime) = $C_w \times K_d \times B_v \text{ or } B_r \times DF \times IR_p \times FI \times EF \times ED$										
Where:															
Cw = contaminant concentration in ground water (upper 95 percent confidence level of the median from wells 608, 609, 610, 611, 613, 614, or 615)(mg/L or pCi/L)															
IRp = ingestion rate for garden produce (0.05 kg/day for vegetative parts; 0.03 kg/day for reproductive parts)															
FI = fraction of garden produce ingested from contaminated source (1.0; unitless)															
EF = exposure frequency (350 days/yr)															
ED = exposure duration (7 years for an adult for noncarcinogens; 50 years for carcinogens)															
BW = body weight (70 kg for an adult)															
AT = averaging time (365 days x ED for noncarcinogens; 365 days x 70 years for carcinogens)															
Kd = Soil-water partition coefficient (L/kg) (Baes et al., 1984)															
Bv = Soil-to-plant concentration ratio for vegetative portions of plants (unitless) (Baes et al., 1984)															
Br = Soil-to-plant concentration ratio for reproductive portions of plants (unitless)(Baes et al., 1984)															
DF = Dry weight fraction of plant (0.066; unitless)															

Exposure dose calculations
Shiprock NM UMTRA site

M. Randall
10-23-95

Floodplain

Ingestion of produce

Chemicals:
$$\frac{C_w \times K_d \times B_v \text{ (or } B_r) \times D_f \times I_{rp} \times F_i \times E_f \times E_d}{B_w \times A_T}$$

Radionuclides:
$$C_w \times K_d \times B_v \text{ (or } B_r) \times D_f \times I_{rp} \times F_i \times E_f \times E_d$$

DF = 0.066 unitless

IR_p = 0.05 vegetative, 0.03 reproductive

FI = 1.0 unitless

EF = 350 days/yr

ED = 7 yrs adult noncarc., 50 yrs carcinogens

BW = 70 kg adult

AT = 365 days x ED noncarcinogens
365 days x 70 carcinogens

	<u>C_w</u>	<u>K_d</u>	<u>B_v</u>	<u>B_r</u>	
<u>NONCARCINOGENS</u>					
(veg) Antimony (rep)	(0.037)	(45)	(0.20)	-	(.066)(.05)(1)(350)(7)/70(365)(7) = 1.5E-04
(veg) Arsenic (rep)	(0.037)	(45)	-	(.03)	" (.03) " " " / " " " = 1.35E-04
(veg) Cd (rep)	(.03)	(200)	(.04)	-	(.066)(.05) " " " / " " " = 1.02E-04
(veg) Cd (rep)	(.03)	(200)	-	(.006)	(.066)(.03) " " " / " " " = 9.7E-05
(veg) Cd (rep)	(.005)	(6.5)	(.55)	-	(.066)(.05) " " " / " " " = 8.08E-05
(veg) Cd (rep)	(.005)	(6.5)	-	(.15)	(.066)(.03) " " " / " " " = 1.3E-05
(veg) Mg (rep)	(2540)	(4.5)	(1.0)	-	(.066)(.05) " " " / " " " = 5.17E-04
(veg) Mg (rep)	(2540)	(4.5)	-	(.55)	(.066)(.03) " " " / " " " = 1.7E-05
(veg) Mn (reprod)	(9.38)	(65)	(.25)	-	(.066)(.05) " " " / " " " = 6.29E-05
(veg) Mn (reprod)	(9.38)	(65)	-	(.05)	(.066)(.03) " " " / " " " = 8.27E-05
(veg) NO ₃ ⁻ (reprod)	(4000)	(1)			
(veg) Se (reprod)	(.26)	(300)	(.025)	-	(.066)(.05) " " " / " " " = 2.8E-05
(veg) Se (reprod)	(.26)	(300)	-	(.025)	(.066)(.03) " " " / " " " = 5.3E-05
(veg) Sodium (rep)	(3630)	(100)	(.075)	-	(.066)(.05) " " " / " " " = 1.23E+00
(veg) Sodium (rep)	(3630)	(100)	-	(.05)	(.066)(.03) " " " / " " " = 5.4E-01
(veg) Sr (rep)	(12.2)	(35)	(2.5)	-	(.066)(.05) " " " / " " " = 4.8E-02
(veg) Sr (rep)	(12.2)	(35)	-	(.25)	(.066)(.03) " " " / " " " = 2.9E-03
(veg) SO ₄ ⁻ (rep)	(15000)	(7.5)	(.5)	-	(.066)(.05) " " " / " " " = 2.5E+01
(veg) SO ₄ ⁻ (rep)	(15000)	(7.5)	-	(.5)	(.066)(.03) " " " / " " " = 1.5E+01
(veg) U (rep)	(3.0)	(450)	(.0085)	-	(.066)(.05) " " " / " " " = 5.6E-04
(veg) U (rep)	(3.0)	(450)	-	(.004)	(.066)(.03) " " " / " " " = 1.5E-04

Exposure dose rates (cont'd.)

Ingestion of produce

<u>TRCISOTOPE</u>	<u>CW</u>	<u>Kd</u>	<u>Bv</u>	<u>Br</u>	
veg) As	(.03)	(200)	(.04)	-	(.066)(.05)(1)(350)(60)/(70)(50)(70) = 7.76
veg) U	(.03)	(200)	-	(.006)	(.066)(.03)(1)(350)(50)/(70)(50)(70) = 6.97
(veg) U (pCi/L)	(2058)	(450)	(.0085)	-	(.066)(.05)(1)(350)(50) = 4.55E+05
(veg) U	(2058)	(450)	-	(.004)	(.066)(.03)(1)(350)(50) = 1.21E+05

Sheet1

Exposure dose calculations - Shiprock site								
Pathway: Ground water ingestion (terrace alluvium)								
Receptor: Adult								
Date prepared: 10/23/95								
Contaminant of potential concern	95% UCL concentration (mg/L)	Exposure Frequency (days/yr)	Exposure Duration (yrs)	Ingestion Rate (L/hr)	Body Weight (kg)	Averaging time	Exposure dose (mg/kg/day or pCi/Lifetime)	
Noncarcinogenic risk:								
Nitrate	2310	350	7	2	70	2555	6.3E+01	
Nitrate (infant)	2310	350	1	0.64	4	365	3.5E+02	
Sulfate	18100	350	7	2	70	2555	5.0E+02	
Sulfate (infant)	18100	350	1	0.64	4	365	2.8E+03	
Uranium	1.57	350	7	2	70	2555	4.3E-02	
Carcinogenic risk:								
Uranium (pCi/L)	1077	350	50	2	NA	NA	3.8E+07	
Intake from ingestion of ground water is calculated as follows:								
Chemicals:		Chronic daily Intake (mg/kg-day) = $C_w \times IR_w \times EF \times ED / BW \times AT$						
Radionuclides:		Lifetime intake (pCi/lifetime) = $C_w \times IR_w \times EF \times ED$						
Where:								
C _w = contaminant concentration in ground water (upper 95 percent confidence interval for median from wells 608, 609, 610, 611, 613, 614, or 615)								
IR _w = ingestion rate for water (2 L/day for an adult, 0.64 L/day for an infant)								
EF = exposure frequency (350 days/year)								
ED = exposure duration (7 years for an adult and 1 year for an infant for noncarcinogens; 50 years for carcinogens)								
BW = body weight (70 kg for an adult, 4 kg for an infant)								
AT = averaging time (365 days x ED for noncarcinogens; 365 days x 70 years for carcinogens)								

Exposure dose calculations
 Shiprock site (terrace alluvium)
 GW Ingestion

$$\frac{C_w \times IR_w \times EF \times ED}{BW \times AT}$$

Contaminant
 of
pot. concern

adult Nitrate $\frac{(2310)(2)(350)(7)}{(70)(2555)} = 6.3 E+01$

infant Nitrate $\frac{(2310)(0.64)(350)(1)}{(4)(365)(1)} = 3.5 E+02$

adult Sulfate $\frac{(18100)(2)(350)(7)}{(70)(2555)} = 4.96 E+02$

infant Sulfate $\frac{(18100)(0.64)(350)(1)}{(4)(365)(1)} = 2.78 E+03$

adult only U $\frac{(1.57)(2)(350)(7)}{(70)(2555)} = 4.3 E-02$

U (pCi/L) $(1077)(2)(350)(50) = 3.77 E+07$

Exposure dose calculations - Shiprock, NM UMTRA site								
Pathway: Ingestion of milk from cattle grazed in the San Juan River floodplain								
Receptor: Adult								
Date prepared: 10/31/95								
Contaminant of potential concern	Concentration in milk (mg/kg)	Ingestion rate for milk (kg/day)	Fraction of diet ingested (unitless)	Exposure frequency (days/yr)	Exposure duration (yrs)	Body weight (kg)	Averaging time	Exposure dose (mg/kg-day)
Noncarcinogens								
Selenium	1.40E-01	0.3	0.75	350	7	70	2555	4.3E-04
Strontium	7.80E+01	0.3	0.75	350	7	70	2555	2.4E-01
Uranium	5.50E-02	0.3	0.75	350	7	70	2555	1.7E-04
Carcinogens								
Uranium (pCi/L)	3.10E+01	0.3	0.75	350	70	NA	NA	1.7E+05
Intake from consumption of contaminated milk from cattle grazed on pasture grasses irrigated with contaminated water and watered with contaminated water is calculated as follows:								
Chemicals: Chronic daily intake (mg/kg-day) = $C_m \times IR_m \times FI \times EF \times ED / BW \times AT$								
and $C_m = F_m [(C_p \times Q_p) + (Q_s \times C_s) + (Q_w \times C_w)]$								
for selenium: $C_m = 0.004 [(1.7)(19) + (4.2)(0.38) + (0.035)(56)]$								
$C_m = 1.4E-01$								
for strontium: $C_m = 0.0015 [(2690)(19) + (1620)(0.38) + (7.34)(56)]$								
$C_m = 7.8E+01$								
for uranium (mg/L): $C_m = 0.0006 [(0.73)(19) + (44)(0.38) + (1.1)(56)]$								
$C_m = 5.5E-02$								
Where: for uranium (pCi/L): $C_m = 0.0006 [(500)(19) + (501)(0.38) + (755)(56)]$								
$C_m = 3.1E+01$								
C _m = contaminant concentration in milk (calculated value; chemical-specific; mg/kg)								
IR _m = ingestion rate for milk (0.030 kg/day) (EPA, 1989a)								
FI = fraction of diet (meat/milk) ingested (0.75, unitless; subsistence farm family)								
EF = exposure frequency (350 days/yr)								
ED = exposure duration (7 years)								
BW = body weight (70 kg for an adult)								
AT = averaging time (365 days x ED)								
F _m = feed-to-milk transfer coefficient (chemical-specific; unitless) (Baes et al., 1984)								
C _p = contaminant concentration in pasture grasses (mg/kg)								
Q _p = quantity of pasture ingested daily by cattle (19 kg DW/day; EPA, 1989a)								
Q _s = quantity of soil ingested daily by cattle (0.38 kg based on 2% of dry matter from feed ingestion rate; EPA, 1989a)								
C _s = contaminant concentration in sediment; mg/kg								
Q _w = quantity of water ingested daily by cattle (56 L/day; EPA, 1989a)								
C _w = contaminant concentration in surface water body; mg/L								

Ingestion of milk
Shiprock, NM (floodplain)

$$\frac{C_m \times I_{Rm} \times FI \times EF \times ED}{BW \times AT}$$

where: $C_m = F_m [(C_p \times Q_p) + (C_s \times Q_s) + (C_w \times Q_w)]$

$$I_{Rm} = 0.30$$

$$FI = 0.75$$

$$EF = 350 \text{ days/yr}$$

$$ED = 7 \text{ yrs re ; } 70 \text{ c}$$

<u>NONCARCINOGENS</u>	$F_m [(C_p \times Q_p) + (C_s \times Q_s) + (C_w \times Q_w)]$	C_m
Selenium	$0.004 [(1.7)(19) + (4.2)(.38) + (0.035)(56)]$	$1.4E-01$
Strontium	$0.0015 [(2690)(19) + (1680)(.38) + (7.34)(56)]$	$7.8E+01$
Uranium(m)	$0.0006 [(0.73)(19) + (44)(.38) + (1.1)(56)]$	$5.5E-02$
Uranium(c)	$0.0006 [(500)(19) + (501)(.38) + (755)(56)]$	$3.1E+01$

Exposure Dose:

$$\text{Selenium} \quad \frac{(1.4E-01)(0.3)(.75)(350)(7)}{(70)(365)(7)} = 4.3E-04$$

$$\text{Strontium} \quad \frac{(7.8E+01)(0.3)(.75)(350)(7)}{(70)(365)(7)} = 2.4E-01$$

$$\text{Uranium(m)} \quad \frac{(5.5E-02)(0.3)(.75)(350)(7)}{(70)(365)(7)} = 1.7E-04$$

$$\text{Uranium(c)} \quad (3.1E+01)(0.3)(.75)(350)(7) = 1.7E+05$$

Exposure dose calculations - Shiprock, NM UMTRA site								
Pathway: Ingestion of meat from cattle grazed in the San Juan River floodplain								
Receptor: Adult								
Date prepared: 10/31/95								
Contaminant of potential concern	Concentration in beef (Cb) (mg/kg)	Ingestion rate for beef (kg/day)	Fraction of diet ingested (unitless)	Exposure frequency (days/yr)	Exposure duration (yrs)	Body weight (kg)	Averaging time	Exposure dose (mg/kg-day)
Noncarcinogens								
Selenium	5.38E-01	0.075	0.75	350	7	70	2555	4.1E-04
Strontium	1.56E+01	0.075	0.75	350	7	70	2555	1.2E-02
Uranium	1.84E-02	0.075	0.75	350	7	70	2555	1.4E-05
Carcinogens								
Uranium (pCi/L)	1.00E+01	0.075	0.75	350	70	NA	NA	1.4E+04
Intake from consumption of contaminated meat from cattle grazed on pasture grasses irrigated with contaminated water and watered with contaminated water is calculated as follows:								
Chemicals:		Chronic daily intake (mg/kg-day) = Cb x IRb x FI x EF x ED / BW x AT						
		and		Cb = Fb [(Cp x Qp) + (Qs x Cs) + (Qw x Cw)]				
		for selenium:		Cb = 0.015 [(1.7)(19) + (4.2)(0.38) + (0.035)(56)]				
				Cb = 5.3784E-01				
		for strontium:		Cb = 0.0003[(2690)(19)+(1620)(0.38)+(7.34)(56)]				
				Cb = 1.564099E+01				
		for uranium (mg/L):		Cb = 0.0002 [(0.73)(19)+(44)(0.38)+(1.1)(56)]				
				Cb = 1.8483E-02				
		for uranium (pCi/L):		Cb = 0.0002[(500)(19)+(501)(0.38)+(755)(56)]				
				Cb = 1.0E+01				
Where:								
Cb = contaminant concentration in beef (calculated value; chemical-specific; mg/kg)								
IRb = ingestion rate for homegrown beef (0.075 kg/day) (EPA, 1989a)								
FI = fraction of diet ingested (0.75, unitless; subsistence farm family)								
EF = exposure frequency (350 days/yr)								
ED = exposure duration (7 years)								
BW = body weight (70 kg for an adult)								
AT = averaging time (365 days x ED)								
Fb = forage-to-beef transfer coefficient (chemical-specific; unitless) (Baes et al., 1984)								
Cp = contaminant concentration in pasture grasses (mg/kg)								
Qp = quantity of pasture ingested daily by cattle (19 kg DW/day; EPA, 1989a)								
Qs = quantity of soil ingested daily by cattle (0.38 kg based on 2% of dry matter from feed ingestion rate; EPA, 1989a)								
Cs = contaminant concentration in sediment; mg/kg)								
Qw = quantity of water ingested daily by cattle (56 L/day; EPA, 1989a)								
Cw = contaminant concentration in surface water body; mg/L								

Ingestion of meat
Shiprock, NM (Floodplain)

$$\frac{C_b \times IR_b \times FI \times EF \times ED}{BW \times AT}$$

where: $C_b = F_b [(C_p \times Q_p) + (C_s \times Q_s) + (C_w \times Q_w)]$

$$IR_b = 0.075$$

$$FI = 0.75$$

$$EF = 350 \text{ days/yr}$$

$$ED = 7 \text{ yr nc; } 70 \text{ c}$$

NONCARCINOGENS $F_b [(C_p \times Q_p) + (C_s \times Q_s) + (C_w \times Q_w)] = C_b$

Selenium $0.015 [(1.7)(19) + (4.2)(0.38) + (0.035)(56)] = 5.45 \times 10^{-1}$

Srntium $0.0003 [(2690)(19) + (1620)(0.38) + (7.34)(56)] = 1.6 \times 10^1$

Uranium(nc) $0.0002 [(0.73)(19) + (44)(0.38) + (1.1)(56)] = 1.8 \times 10^{-2}$

Uranium(c) $0.0002 [(500)(19) + (501)(0.38) + (755)(56)] = 1.0 \times 10^1$

Exposure Dose:

Selenium $\frac{(5.45 \times 10^{-1})(0.075)(0.75)(350)(7)}{(70)(365)(7)} = 4.2 \times 10^{-4}$

Srntium $\frac{(1.6 \times 10^1)(0.075)(0.75)(350)(7)}{(70)(365)(7)} = 1.2 \times 10^{-2}$

Uranium(nc) $\frac{(1.8 \times 10^{-2})(0.075)(0.75)(350)(7)}{(70)(365)(7)} = 1.4 \times 10^{-5}$

Uranium(c) $(1.0 \times 10^1)(0.075)(0.75)(350)(7) = 1.4 \times 10^4$

Exposure from Dermal contact with contaminated soil / sediment

NONROUTINE (INCIDENTAL) DERMAL CONTACT WITH SURFACE WATER

$$\text{Daily absorbed dose (mg/kg/day)} = \frac{(C_w \times S_A \times P_c \times C_f) \times (ET) \times (EF) \times (ED)}{BW \times AT}$$

C_w

S_A Skin surface area available to exposure (497 cm² ~~hour~~ for children at age 9-10 years old; 50th percentile: hands - 57 cm², arms - 130 cm², legs - 310 cm²) (EPA, 1989)

P_c Dermal permeability constant (0.001 cm²/h)

C_f Conversion factor (0.001 l/cm³)

ET Exposure time (1 hour per day)

EF 114 days

ED 7 yrs

BW 38.3 kg

AT 365 x ED

Dermal contact, with surface water
on the flood plain

$$\dot{C}_e = \frac{0.035 \times 497 \text{ cm}^2 \times 0.001 \text{ cm/hr} \times 0.001 \text{ l/cm}^3 \times 1 \text{ hr} \times 114 \times 7 \text{ yr}}{38.3 \times 365 \times 7 \text{ yr}}$$

$$= \frac{0.035 \times [0.057]}{13979.5} = 0.00000014 \approx 1.4 \text{ E}^{-07}$$

$$S_{tr} = \frac{7.34 \times [0.057]}{13979.5} = 0.000003 \approx 3 \text{ E}^{-05}$$

$$M = \frac{1.1 \times [0.057]}{13979.5} = 0.0000045 \approx 4.5 \text{ E}^{-06}$$

EQUATION DEFINITIONS FOR EXPOSURE

INCIDENTAL EXPOSURE DOSE CALCULATIONS
NON-ROUTINE
INCIDENTAL INGESTION OF SURFACE WATER IN
THE FLOODPLAIN OF THE SAN JUAN RIVER

Incidental daily intake (mg/kg/day) =

$$= \frac{C_W \times IR_W \times EF \times ED}{BW \times AT}$$

C_W Contaminant concentration in surface water bodies (highest determined concentration at given location)

IR_W Ingestion rate for water (l/day) (0.05 l/day for 9-10 yrs old child)

EF Exposure frequency (3 months per year during 7 day per week = 90 days & 3 months per year during 2 days per week = 24 days ; total = 114 days/year)

ED Exposure duration (7 years)

BW Body weight (38.3 kg for 9-10 years old child) 90th percentile body weight for 9-10 years old male child)

AT Averaging time (365 days x ED)

$$C_e = \frac{0.035 \times 0.05 \text{ l/D} \times 114 \text{ days/yr} \times 7 \text{ yrs}}{38.3 \text{ kg} \times 365 \times 7 \text{ yrs}} =$$
$$= \frac{0.035 \times 5.7}{13979.5} = 0.000014 \approx 1.4 \text{E-}05$$

$$S_T = \frac{7.34 \times [5.7]}{13979.5} = 0.003 \approx 3 \text{E-}03$$

$$M = \frac{1.1 \times [5.7]}{13979.5} = 0.00045 \approx 4.5 \text{E-}04$$

NONROUTINE (INCIDENTAL) INGESTION OF SOIL/SEDIMENT

NONROUTINE)

$$\text{INCIDENTAL DAILY INTAKE (mg/kg/day)} = \frac{(C_s) \times (C_{sf}) \times (IR_s) \times (FI) \times (EF) \times (ED)}{(BW) \times (AT)}$$

- C_s Contaminant concentration in soil/sediment (mg/kg)
- C_{sf} Conversion factor (10⁻⁶ kg/mg) (EPA, 1989)
- IR_s Ingestion rate for soil/sediment (~~50 mg/day~~¹⁰⁰ ~~0.05 kg/d~~ for 9-10 years old child)
- FI Fraction of soil/sediment ingested (1.0; unitless) (EPA, 1989)
- EF 114 days/yr
- ED 7 yrs
- BW 33.3 kg
- AT 365 days x ED

$$C_e = \frac{4.2 \times 0.0000010 \text{ kg/mg} \times \frac{100}{0.05} \text{ kg/d} \times 114 \text{ d} \times 7 \text{ yr}}{38.3 \text{ kg} \times 365 \text{ d} \times 7 \text{ yrs}}$$

$$= \frac{\frac{0.04788}{\cancel{0.0002394}}}{13979.5} = \frac{\cancel{0.000000017} \approx 1.7 \text{ E-08}}{3.425015 \text{ E-06}}$$

$$Sr = \frac{1620 \left[\frac{1.14 \text{ E-02}}{\cancel{0.000057}} \right]}{13979.5} = \frac{\cancel{0.0000066} \approx 6.6 \text{ E-06}}{1.321077 \text{ E-05}}$$

$$U = \frac{44 \left[\frac{1.14 \text{ E-02}}{\cancel{0.000057}} \right]}{13979.5} = \frac{\frac{3.588111 \text{ E-05}}{\cancel{0.00000018}} \approx 1.8 \text{ E-07}}{4 \text{ E-05}}$$

Table 6.1 - Carcinogenic risk
 Shiprock, NM - ingestion of flood plain gw

$CW \times IRW \times EF \times ED$ where $IRW = 2 \text{ L/d}$
 $EF = 350 \text{ d/yr}$
 $ED = 50 \text{ yrs}$

			$\frac{SF}{}$	$\frac{\text{Lifetime risk}}{}$
Lead - 210	$(1.3)(2)(350)(50) =$	$4.55E+04$	$5.1E-10$	$2.32E-05$
Pb - 210	$(0.9)(2)(350)(50) =$	$3.15E+04$	$1.5E-10$	$4.7E-06$
Ra - 226	$(0.2)(2)(350)(50) =$	$7.0E+03$	$1.2E-10$	$8.4E-07$
Tn - 230	$(0.6)(2)(350)(50) =$	<u>$2.1E+04$</u>	$1.3E-11$	<u>$2.73E-07$</u>
				$2.9E-05$

Note: These figures differ slightly from those presented in Table 6.1 in the ALRA.

CLIENT/SUBJECT SHP BLRA / UMTRA W.O. NO. _____

TASK DESCRIPTION INCREASED LIFETIME CANCER RISK FROM POTENTIAL URANIUM EXPOSURE FOR ADULTS TASK NO. _____

PREPARED BY _____ DEPT _____ DATE _____

APPROVED BY _____

MATH CHECK BY JLL DEPT _____ DATE _____

METHOD REV. BY _____ DEPT _____ DATE 3/15/96

DEPT _____ DATE 3/15/96

RE THE San Juan River flood plain alluvium

1) GROUND WATER INGESTION

Exposure dose $\approx 70,000,000$ pCi/lifetime

stop under secular equilibrium \Rightarrow

50% U-234
\$

50% U-238

Uranium ^{total} slope factor = $1.6E-11$ (pCi)⁻¹
(HEAST, 1993)

Estimated Increased Lifetime Cancer Risk =

$$= 70,000,000 \text{ pCi/lifetime} \times 1.6E-11 \text{ (pCi)}^{-1}$$

$$= 0.00112 \approx \underline{\underline{1E-03}}$$

CLIENT/SUBJECT SHP BLRA / UMTA W.O. NO. _____

TASK DESCRIPTION cancel milk for uranium TASK NO. _____

PREPARED BY _____ DEPT _____ DATE _____ APPROVED BY _____

MATH CHECK BY MS DEPT _____ DATE _____

METHOD REV. BY _____ DEPT _____ DATE 3/15/96 DEPT _____ DATE 3/15/96

2) meat and milk ingestion from cattle grazed and watered on the floodplain

$$\begin{aligned} \text{Exposure dose from milk ingestion} &= \\ &\approx 170,000 \text{ pCi/lifetime} \end{aligned}$$

$$\begin{aligned} \text{Exposure dose from meat ingestion} &= \\ &\approx 14,000 \text{ pCi/lifetime} \end{aligned}$$

$$\begin{aligned} \text{Total exposure dose (milk + meat)} &= \\ &= 184,000 \text{ pCi/lifetime} \approx \\ &\approx 200,000 \text{ pCi/lifetime} \end{aligned}$$

$$\begin{aligned} \text{Uranium oral slope factor} &= 1.6E-11 (\text{pCi})^{-1} \\ & \text{(HEAST, 1993)} \end{aligned}$$

$$\begin{aligned} \text{Estimated increased lifetime cancer risk} &= 200,000 \text{ pCi/lifetime} \times \\ & 1.6E-11 (\text{pCi})^{-1} = \\ & = 0.0000032 \approx 3E-06 \end{aligned}$$

CLIENT/SUBJECT SHP BLRA / UMTRA W.O. NO. _____

TASK DESCRIPTION Cancer risk from leachate TASK NO. _____

PREPARED BY _____ DEPT _____ DATE _____

APPROVED BY _____

MATH CHECK BY _____ DEPT _____ DATE _____

METHOD REV. BY MS DEPT _____ DATE 3/15/86 DEPT _____ DATE 3/15/86

RE: The Terrence aluminum ground water
ground water ingestion

$$\begin{aligned} \text{Exposure dose} &= 33,000,000 \text{ pCi/lifetime} \\ &= 40,000,000 \text{ pCi/lifetime} \end{aligned}$$

$$\text{Maximum oral slope factor} = 1.6E-11 (\text{pCi})^{-1}$$

Estimated increased lifetime

$$\text{Cancer risk} = 40,000,000 \text{ pCi/lifetime} \times 1.6E-11 (\text{pCi})^{-1}$$

$$= 0.00064 = \underline{\underline{6E-04}}$$

CLIENT/SUBJECT SMPBLRA / JMTRA W.O. NO. _____

TASK DESCRIPTION Cancer risk from Disselin on the floodplain alluvium ground water TASK NO. _____

PREPARED BY _____ DEPT _____ DATE _____ APPROVED BY _____

MATH CHECK BY _____ DEPT _____ DATE _____

METHOD REV. BY JMS DEPT _____ DATE 3/17/96 DEPT _____ DATE 3/17/96

RE The San Juan River floodplain alluvium ground water
Ground water ingestion pathway

$$\begin{aligned} \text{Exposure dose} &= 5.9E-04 \text{ mg/kg-day} \\ &\approx 6E-04 \text{ mg/kg-day} \end{aligned}$$

$$\text{As oral slope factor} = 1.8 (\text{mg/kg-day})^{-1}$$

$$\begin{aligned} \text{Estimated increased lifetime cancer risk} &= 6E-04 \text{ mg/kg-d} \times 1.8 (\text{mg/kg-d})^{-1} \\ &= 0.00108 \\ &\approx 1E-03 \end{aligned}$$

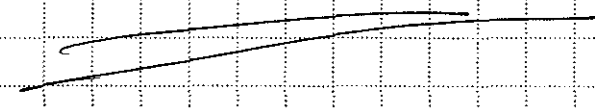


Table 7.1

Table 7.1 - Comparison of estimated plan concentrations to phytotoxic concentrations

Contaminant of potential concern	Cw (mg/L)	Kd (L/kg)	Estimated soil concentration (mg/kg) DW	Soil-to-plant concentration factors		Estimated concentration in vegetative growth (mg/kg DW)	Estimated concentration in fruits/tubers (mg/kg DW)
				Bv	Br		
Noncarcinogenic effects							
Antimony	0.037	45	1.7	0.2	0.03	0.33	0.05
Arsenic	0.03	200	6.0	0.04	0.006	0.24	0.036
Boron	0.8	3.0	2.4	4.0	2.0	9.6	4.8
Calcium	490	4.0	1960	3.5	0.35	6,860	686
Cadmium	0.0049	6.5	0.032	0.55	0.15	0.018	0.0048
Chloride	605	0.25	151	70	70	10,588	10,588
Magnesium	2540	4.5	11,430	1	0.55	11,430	6,287
Manganese	9.38	65	610	0.25	0.05	152	30
Nickel	0.04	150	6.0	0.06	0.06	0.36	0.36
Nitrate	4220	0.1	422	30	30	12,660	12,660
Potassium	120	5.5	660	1	0.55	660	363
Strontium	12.2	35	427	2.5	0.25	1,068	107
Sulfate	15,000	7.5	112,500	0.5	0.5	56,250	56,250
Uranium	3	450	1,350	0.0085	0.004	11	5.4
Sodium	3630	100	363,000	0.075	0.055	27,225	19,965
Selenium	0.255	300	77	0.025	0.025	1.9	1.9
Zinc	0.087	40	3.5	1.5	0.9	5.2	3.1
Carcinogenic effects							
Lead-210	2.9E-13	900	2.6E-10	0.045	0.009	1.2E-11	2.3E-12
Polonium-210	1.7E-11	500	8.5E-09	0.0025	0.0004	2.1E-11	3.4E-12
Radium-226	2E-10	450	9.0E-08	0.015	0.0015	1.4E-09	1.4E-10
Thorium-230	3E-08	150000	4.5E-03	0.00085	0.000085	3.8E-06	3.8E-07

SUPPLEMENT 12

CONTAMINANTS OF POTENTIAL CONCERN SCREENING

12-1

1. The purpose of this screening is to identify potential contaminants of concern that may be present in the ground water at the Uranium Mill Tailings Site, Shiprock, New Mexico. This screening is based on the results of the baseline risk assessment and the site characterization data.

2. The contaminants of potential concern are those that are known or suspected to be present in the tailings and that may be transported to the ground water. The screening process involves comparing the concentrations of these contaminants in the tailings to the screening levels established in the baseline risk assessment.

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Contaminants of Potential Concern Screening - Shiprock
The San Juan River floodplain alluvium aquifer ground water

	Maximum observed concentrations ^a (mg/L)	Nutritional requirement ^b (mg/day)	Dietary range ^b (mg/day)	Safe level in tap water ^c (mg/L)
Constituent				
Ammonium	542	NA	^d	NA
Boron	0.9	NA	NA	3.3
Calcium	510	400 -1200	NA	NA
Chloride	700	180-750	up to 6,000	NA
Nickel	0.4	NA	NA	0.73
Phosphate	1.5	300 - 1200 ^f	NA	NA
Potassium	165	500 - 2000	NA	NA
Zinc	0.2	5-19	NA	NA

NA - Not Applicable

- a Based on maximum detected concentrations in ground water from the San Juan River floodplain alluvium; includes data from wells 608, 609, 610, 611, 613, 614, and 615 collected from 1987 through 1993, filtered samples (see also Table 3.2 in the Baseline Risk Assessment).
- b National Research Council, 1989. Recommended Dietary Allowances, tenth edition, National Academy Press, Washington, D.C.
- c U.S. EPA Region III, March 1995. Risk-based concentrations.
- d Although ammonium is not considered a dietary component, it is produced in the human body at levels that exceed 4000 mg/day (Summerskill and Wolpert, 1970), roughly 4-times that could result from ingesting the most ammonium-contaminated water at the site (542 mg/L corresponds to about 1100 mg/day assuming a person ingests 2 liters of water per day). However, this level of ammonium is associated with the unpleasant taste and odor of the water which would reduce its consumption (the taste threshold for water solutions of ammonia is about 35 mg/L) (ATSTR, 1990).
- e Longer-term health advisory level is 1.7 mg/L for a 70-kg adult and 0.5 mg/L for a 10-kg child. One-day health advisory is 1 mg/L for a 10-kg child (EPA, 1995).
- f Value represents nutritional range for phosphorous.

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SUPPLEMENT 13
**CALCULATION OF MIXED SPECIFIC ACTIVITY
FOR NATURAL URANIUM**

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CALCULATION COVER SHEET

CALC NO. SHP0895170100 DISCIPLINE Health Physics NO. OF SHEETS 5

PROJECT: BASELINE RISK ASSESSMENT OF GROUND WATER CONTAMINATION AT THE URANIUM MILL TAILINGS SITES

SITE:

FEATURE: CALCULATION FOR MIXED SPECIFIC ACTIVITY OF URANIUM.

SOURCES OF DATA:

References noted on accompanying sheet

SOURCES OF FORMULAE & REFERENCES:

Basic first Principle reasoning / STD calculations for H.P.s

PRELIMINARY CALC. FINAL CALC. SUPERSEDES CALC. NO. _____

REV. NO.	REVISION	CALCULATION BY	DATE	CHECKED BY	DATE	APPROVED BY	DATE
		<i>M. J. Brennan</i>	<i>05/15/95</i>	<i>MCB</i>	<i>05/24/95</i>	<i>Mark A. [Signature]</i>	<i>9/15/95</i>

DETERMINATION OF MIXED SPECIFIC ACTIVITY
for U-NAT

ISOTOPE	SP. ACTIV. (uCi/g)	Wt. % * (Fractional)	ACTIV./g (uCi/g)	ACTIV. % (Fractional)
U-234	6.19E+03	5.50E-05	3.40E-01	4.96E-01
U-235	2.14E+00	7.20E-03	1.54E-02	2.24E-02
U-238	3.33E-01	0.992745	3.31E-01	4.82E-01
		1.0000	0.6864	

$$\frac{(0.6864 \text{ uCi/g})}{(1000 \text{ mg/g})} (1\text{E}+06 \text{ pCi/uCi}) = 686.4 \text{ pCi/mg}$$

* Natural Abundance (Wt. %) per Chart of the Nuclides (Knolls A. P. Lab).
Specific Activity of each radionuclide per Radiological Health Handbook.

The Mixed Specific Activity is determined by multiplying each radionuclide by its relative abundance (Wt. %), then sum the values to yield the MSA, which, converted to units of pCi/mg yields a value of 686.4