

Y-12

OAK RIDGE Y-12 PLANT

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CALENDAR YEAR 1996
ANNUAL GROUNDWATER MONITORING REPORT
FOR THE
CHESTNUT RIDGE HYDROGEOLOGIC REGIME
AT THE
U.S. DEPARTMENT OF ENERGY Y-12 PLANT,
OAK RIDGE, TENNESSEE

February 1997

MASTER

Prepared by

AJA TECHNICAL SERVICES, INC.
Under Purchase Order 70Y-KDS15V

for the

Y-12 Surveillance and Maintenance Program,
Environmental Restoration Program
and the
Water Compliance Department
Environmental Compliance Organization
Oak Ridge Y-12 Plant

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LOCKHEED MARTIN ENERGY SYSTEMS, INC.
for the U.S. Department of Energy
Under Contract No. DE-AC05-84OR21400

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List of Acronyms and Abbreviations

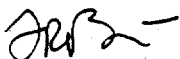
AAS	Atomic Absorption Spectroscopy
ANOVA	analysis of variance
ASO	Analytical Services Organization
BCV	Bear Creek Valley
bgs	below ground surface
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
Chestnut Ridge Regime	Chestnut Ridge Hydrogeologic Regime
CY	calendar year
DOE	U.S. Department of Energy
DNAPL	dense, nonaqueous phase liquids
DQO	data quality objective
EPA	U.S. Environmental Protection Agency
ft	feet
ft/d	feet per day
ft/yr	feet per year
GWPP	Groundwater Protection Program
ICP	Inductively Coupled Plasma (spectroscopy)
K-25	Oak Ridge K-25 Site
MCL	maximum contaminant level (for drinking water)
MDA	minimum detection activity
PMS	Plasma Mass Spectroscopy
$\mu\text{g/L}$	micrograms per liter
mg/L	milligrams per liter
msl	mean sea level
ORNL	Oak Ridge National Laboratory
ORR	Oak Ridge Reservation
OU	operable unit
PCE	tetrachloroethene
post-closure permit	RCRA Post-Closure Permit for the Chestnut Ridge Hydrogeologic Regime
QA/QC	quality assurance/quality control
RCRA	Resource Conservation and Recovery Act
ROD	record of decision
SAP	Sampling and Analysis Plan
Security Pits	Chestnut Ridge Security Pits
Sediment Disposal Basin	Chestnut Ridge Sediment Disposal Basin
SWDF	solid waste disposal facility (non-RCRA)
TCE	Trichloroethene
TDEC	Tennessee Department of Environment and Conservation
TDS	total dissolved solids
TSD	treatment, storage, or disposal (unit)

List of Acronyms and Abbreviations (cont'd)

TSS	total suspended solids
UTL	upper tolerance limit
VOC	volatile organic compound
1,2-DCE	1,2-dichloroethene
1,1,1-TCA	1,1,1-trichloroethane

Certification

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1.0 INTRODUCTION

This annual monitoring report contains groundwater and surface water monitoring data obtained in the Chestnut Ridge Hydrogeologic Regime (Chestnut Ridge Regime) during calendar year (CY) 1996. The Chestnut Ridge Regime encompasses a section of Chestnut Ridge west of Scarboro Road and east of an unnamed drainage feature southwest of the U.S. Department of Energy (DOE) Oak Ridge Y-12 Plant (unless otherwise noted, directions are in reference to the Y-12 Plant administrative grid). The Chestnut Ridge Regime contains several sites used for management of hazardous and nonhazardous wastes associated with plant operations (Figure 1). Groundwater and surface water quality monitoring associated with these waste management sites is performed under the auspices of the Y-12 Plant Groundwater Protection Program (GWPP).

Included in this annual monitoring report are the groundwater monitoring data obtained in compliance with the Resource Conservation and Recovery Act (RCRA) Post-Closure Permit for the Chestnut Ridge Regime (post-closure permit) issued by the Tennessee Department of Environment and Conservation (TDEC) in June 1996 (permit no. TNHW-088; Modification 2). Besides the signed certification statement (Page vii) and the RCRA facility information summarized below, condition II.C.6 of the post-closure permit requires annual reporting of groundwater monitoring activities, inclusive of the analytical data and results of applicable data evaluations, performed at three RCRA hazardous waste treatment, storage, or disposal (TSD) units: the Chestnut Ridge Sediment Disposal Basin (Sediment Disposal Basin), the Chestnut Ridge Security Pits (Security Pits), and Kerr Hollow Quarry.

RCRA FACILITY INFORMATION	
Facility:	Y-12 Plant
Facility Identification No.:	TN3 89 009 0001
Facility Address:	P.O. Box 2001 Oak Ridge, Tennessee 37831

Table 1 identifies the sections of this report that address each permit condition regarding groundwater monitoring at each site.

This annual monitoring report includes data from the second 180-day monitoring period required under permit condition V.H.1 for RCRA post-closure corrective action monitoring at the Security Pits. Also included are corresponding monitoring results obtained during the first 180-day reporting period that were previously submitted to the TDEC before the required September 1 reporting deadline.

Included with information required by the post-closure permit are CY 1996 groundwater and surface water monitoring data obtained under the auspices of the Y-12 Plant GWPP for the purposes of: (1) RCRA interim status assessment monitoring at the Security Pits, (2) RCRA interim status detection monitoring at Kerr Hollow Quarry, (3) detection monitoring according to applicable requirements of the operating permits issued by the TDEC for several nonhazardous solid waste disposal facilities (SWDFs) in the regime, (4) monitoring performed at several sites per the applicable Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) record of decision (ROD), and (5) monitoring performed as a best management practice of the Y-12 Plant GWPP. These data are incorporated to provide a comprehensive presentation of the CY 1996 groundwater and surface water monitoring results obtained for the multiple programmatic purposes of the Y-12 Plant GWPP. Narrative sections of the report:

- provide background information regarding the waste management sites in the Chestnut Ridge Regime, the hydrogeologic framework, and the extent of groundwater contamination (Section 2.0);
- summarize the CY 1996 groundwater and surface water sampling and analysis activities, including quality assurance/quality control (QA/QC) sampling and data management (Section 3.0);
- present the monitoring data evaluations required annually by the applicable post-closure permit conditions for the Security Pits, Sediment Disposal Basin, and Kerr Hollow Quarry (Section 4.0); and
- provide a brief summary of monitoring activities and findings (Section 5.0).

Documents cited for more detailed operational, regulatory, or technical information regarding the waste management sites and associated monitoring programs in the Chestnut Ridge Regime are listed in Section 6.0.

Narrative sections of the report reference a series of appendices. Illustrations (maps and trend graphs), data summary tables, and monitoring well construction details are presented in Appendix A, Appendix B, and Appendix C, respectively. Results of laboratory analyses and field measurements for each groundwater and surface water sampling location are presented in several subsections of Appendix D (organized by groups of related analytical parameters/measurements). Data for the QA/QC samples associated with each groundwater and surface water sample are presented in respective subsections of Appendix E. Appendix F describes the process used to identify CY 1996 groundwater and surface water data that do not meet applicable data quality objectives (DQOs) of the Y-12 Plant GWPP. Appendix G contains summary information and data regarding the statistical evaluations of the CY 1996 RCRA post-closure detection monitoring data for the Sediment Disposal Basin and Kerr Hollow Quarry.

2.0 BACKGROUND INFORMATION

The Chestnut Ridge Regime encompasses a section of Chestnut Ridge bordered by the Y-12 Plant in Bear Creek Valley (BCV) to the north, Scarboro Road to the east, Bethel Valley Road to the south, and an unnamed surface drainage feature to the west (Figure 1). The following sections contain background information regarding the waste management sites within the regime and their current regulatory status, the characteristics of the groundwater flow system and the extent of groundwater contamination, and the surface water drainage system. This information provides a contextual framework for the annual data evaluations presented in Section 4.0.

2.1 Site Descriptions

Groundwater quality monitoring in the Chestnut Ridge Regime was performed at three general classes of waste management facilities: (1) RCRA hazardous waste TSD units, some of which also are subject to regulation under CERCLA, (2) sites regulated as operable units (OUs) or low-priority Study Areas under CERCLA, as designated in the *Oak Ridge Reservation Site Management Plan for the Environmental Restoration Program* (U.S. Department of Energy 1995a), and (3) nonhazardous SWDFs (Table 2). General descriptions of each site are provided in the following sections.

2.1.1 RCRA Treatment, Storage, or Disposal Facilities

The Security Pits, Sediment Disposal Basin, Kerr Hollow Quarry, and East Chestnut Ridge Waste Pile are RCRA TSD units (Table 2). All but the East Chestnut Ridge Waste Pile were formerly granted RCRA interim status, which ended when separate post-closure permit modifications became effective for the Sediment Disposal Basin (September 18, 1995), Security Pits (March 8, 1996), and Kerr Hollow Quarry (June 11, 1996). In addition to RCRA requirements of the post-closure permit, the Security Pits are regulated as an OU under CERCLA, and the Sediment Disposal Basin and Kerr Hollow Quarry are Study Areas under CERCLA (U.S. Department of Energy 1995a). A CERCLA ROD for Kerr Hollow Quarry was approved by the U.S. Environmental

Protection Agency (EPA) in August 1995, and contains monitoring requirements in addition to those specified in the post-closure permit (U.S. Department of Energy 1995b).

The Security Pits are on the crest of Chestnut Ridge directly south of the central portion of the Y-12 Plant (Figure 2), and consist of two areas, each containing a series of east-west oriented trenches that are about 8 to 10 feet (ft) wide, 10 to 18 ft deep, and 700 to 800 ft long. This site was used for disposal of hazardous waste until December 1984, and for disposal of nonhazardous waste until the site was closed in November 1988. Closure was completed in 1989 per RCRA interim status requirements, and involved installation of a low-permeability cap over the disposal trenches (Martin Marietta Energy Systems, Inc. 1988a).

The Sediment Disposal Basin is on Chestnut Ridge about 1,500-ft southeast of the east end of the Y-12 Plant (Figure 2). It was used between 1973 and 1988 for the disposal of contaminated soils and sediments removed from various areas within the Y-12 Plant. Closure of the site was completed in CY 1989 per the TDEC-approved RCRA closure plan.

Kerr Hollow Quarry is in the southeast corner of the Chestnut Ridge Regime (Figure 2) and served as a source of stone construction material until it filled with water and was abandoned in the late 1940's. From the early 1950's until November 1988, the site was used for the disposal of reactive materials from the Y-12 Plant and the Oak Ridge National Laboratory (ORNL). Wastes were removed from the quarry between mid-1990 and late-1993 to obtain certified clean-closure status from the TDEC, but the site was finally closed with some remaining wastes in place.

The East Chestnut Ridge Waste Pile is a lined, RCRA-regulated TSD unit that is exempt from groundwater monitoring requirements. This site was constructed in CY 1987 to serve as a storage facility for contaminated soils from the Y-12 Plant, and is located in the northeastern corner of the Chestnut Ridge Regime near the Sediment Disposal Basin (Figure 2).

2.1.2 CERCLA Operable Units and Study Areas

The Ash Disposal Basin (Filled Coal Ash Pond), the United Nuclear Corporation Site, and Rogers Quarry are former RCRA solid waste management units currently designated as OUs under CERCLA. The Chestnut Ridge Borrow Area Waste Pile is currently listed as a Study Area to be investigated under CERCLA (Table 2). The EPA approved the CERCLA RODs for the United

Nuclear Corporation Site and the Ash Disposal Basin in June 1991, and October 1995, respectively (U.S. Department of Energy 1991; 1995c).

The Ash Disposal Basin is on the southern flank of Chestnut Ridge about one-half mile south of the Y-12 Plant (Figure 2). Construction of an earthen dam across a northern tributary of McCoy Branch created the basin in 1955, which by 1967 had filled with fly-ash slurry pumped from the Y-12 Steam Plant (Battelle Columbus Division 1988).

The United Nuclear Corporation Site lies on the crest of Chestnut Ridge southeast of the west end of the Y-12 Plant (Figure 2). The site received 11,000 drums (55-gallon) of sludge fixed in cement, 18,000 drums of contaminated soil, and 288 boxes of contaminated process and demolition materials before waste disposal ceased in 1984 (Grutzeck 1987; U.S. Department of Energy 1993). The site was capped and closed in CY 1992 in accordance with a RCRA closure plan and the CERCLA ROD (U.S. Department of Energy 1991).

Rogers Quarry is in the south-central portion of the Chestnut Ridge Regime about three miles west of Kerr Hollow Quarry (Figure 2). The site served as a source of stone construction material from the 1940's through the late 1950's, and was abandoned in the early 1960's when it filled with water. Beginning in 1967, the site received fly-ash slurry from the Y-12 Steam Plant that bypassed the filled Ash Disposal Basin through an emergency spillway and discharged directly into McCoy Branch (King *et al.* 1989); disposal of fly ash in Rogers Quarry ceased in July 1993 per agreement with the TDEC.

The Chestnut Ridge Borrow Area Waste Pile is located near the eastern end of the Chestnut Ridge Regime (Figure 2). This site was built as a temporary storage area for contaminated soils removed from the Oak Ridge Civic Center properties and the Oak Ridge Sewer Line Beltway.

2.1.3 Solid Waste Disposal and Storage Facilities

Five nonhazardous waste landfills are located in the Chestnut Ridge Regime: Industrial Landfills II, IV, and V, and Construction/Demolition Landfills VI and VII (Figure 2). These sites are classified as either Class II or Class IV facilities, as defined in *Rules of the Tennessee Department of Environment and Conservation, Division of Solid Waste Management, Chapter 1200-1-7, Solid Waste Processing and Disposal*. Each site has an operating permit issued by the

TDEC and is currently used for disposal of combustible, decomposable solid wastes generated at the Y-12 Plant and elsewhere on the DOE Oak Ridge Reservation (ORR) (Table 2).

2.2 Topography and Bedrock Geology

Chestnut Ridge is flanked to the north by BCV and to the south by Bethel Valley (Figure 1). The northern flank of the ridge forms a steep slope rising more than 200 ft above the floor of BCV. Ground surface elevations decrease along the ridge crest from about 1,200 ft above mean sea level (msl) west of Industrial Landfill IV, to about 1,060 ft msl east of the Sediment Disposal Basin (Figure 3). A series of prominent hills dominates the central part of the broad southern flank of Chestnut Ridge, which is dissected by several tributaries, including McCoy Branch in the middle of the regime (Figure 3).

The geology of the ORR is generally characterized by thrust-faulted sequences of southeast-dipping, clastic (primarily shale and siltstone) and carbonate (limestone and dolostone) strata of Lower Cambrian to Upper Ordovician age. Interbedded limestone and shale formations of the Conasauga Group directly underlie the Y-12 Plant in BCV, primarily dolostone strata of the Knox Group form Chestnut Ridge, and the argillaceous limestones and interbedded shales of the Chickamauga Group underlie Bethel Valley (Figure 3). Strike and dip of bedding in the area is generally N 55°E and 45°SE, respectively (as referenced to true north).

All the waste management sites in the Chestnut Ridge Regime except Kerr Hollow Quarry and Rogers Quarry are directly underlain by red-brown to yellow-orange residuum overlying the Knox Group. The residuum is characteristically acidic, predominantly composed of clays and iron sesquioxides, and contains semi-continuous, relict beds of fractured chert and other lithologic inhomogeneities (such as silt bodies) that provide a weakly connected network through which saturated flow can occur (Solomon *et al.* 1992). The residuum is thin or nonexistent near karst features such as dolines (sink holes), swallets (sinking streams), and solution pan features (Ketelle and Huff 1984). Depth to bedrock varies throughout the Chestnut Ridge Regime, but is usually less than 100 ft below ground surface (bgs).

All but the southernmost portion of the Chestnut Ridge Regime is underlain by the Knox Group (Figure 3). The Knox Group, which consists of about 2,600 to 3,300 ft of gray to blue-gray,

thin- to thick-bedded cherty dolostones with interbedded limestones, is divided into five formations (listed from oldest to youngest): Copper Ridge Dolomite, Chepultepec Dolomite, Longview Dolomite, Kingsport Formation, and Mascot Dolomite. Topographic and stratigraphic relationships suggest that the Copper Ridge Dolomite underlies the steep northern flank of the ridge, the Longview Dolomite forms the series of prominent hills across the middle of the southern flank of the ridge, and the Mascot Dolomite disconformably underlies the Chickamauga Group along the southern boundary of the regime (Hatcher *et al.* 1992).

The most pervasive structural features in the Chestnut Ridge Regime are extensional, hybrid, and shear fractures (Solomon *et al.* 1992). Three major fracture orientations are evident: one that roughly parallels bedding, one steeply dipping set that parallels geologic strike, and one steeply dipping set oriented perpendicular to strike (Dreier *et al.* 1987). Most fractures are short, ranging from tenths of inches to a few feet in length (Solomon *et al.* 1992). Dissolution of carbonates along fractures has produced many surface karst features on Chestnut Ridge, including a series of sinkholes along the crest of the ridge that show a prominent alignment parallel to strike. This linear trend may result from dissolution along a bedding plane or fracture set (Ketelle and Huff 1984; Smith *et al.* 1983).

2.3 Groundwater System

The Knox Aquifer, consisting of the Knox Group and the underlying Maynardville Limestone formation (Conasauga Group), is the principal hydrogeologic unit in the Chestnut Ridge Regime and is the uppermost aquifer at each waste management site except Rogers Quarry. The groundwater flow system in the Knox Aquifer generally consists of three vertically gradational subsystems: (1) the stormflow zone, (2) the vadose zone, and (3) the groundwater zone. The subsystems are distinguished by groundwater flux, which decreases with depth (Solomon *et al.* 1992).

Although detailed studies have not been conducted in the Chestnut Ridge Regime, investigations in Bethel Valley and Melton Valley near ORNL show that groundwater occurs intermittently above the water table in a shallow "stormflow zone" that extends to a depth of about 6 ft bgs (Moore 1989). Macropores and mesopores provide the primary channels for lateral flow in

the stormflow zone, which lasts only a few days or weeks after rainfall. Most groundwater within the stormflow zone is either lost to evapotranspiration or recharge to the water table, and the remaining water discharges at nearby seeps, springs, or streams (Moore 1989).

The vadose zone occurs between the stormflow zone and the water table, which typically occurs near the bedrock/residuum interface. The vadose zone is unsaturated except in the capillary fringe above the water table and within wetting fronts during periods of vertical percolation from the stormflow zone (Moore 1989). Most recharge through the vadose zone is episodic and occurs along discrete permeable fractures that become saturated, although surrounding micropores remain unsaturated (Solomon *et al.* 1992). Moore (1988) determined a geometric mean hydraulic conductivity of about 0.006 feet per day (ft/d) for residuum on Chestnut Ridge based on results of infiltrometer studies near ORNL reported by Watson and Luxmoore (1986) and Wilson and Luxmoore (1988).

Groundwater below the vadose zone occurs within orthogonal sets of permeable, planar fractures that form water-producing zones within an essentially impermeable matrix, and dissolution of bedrock carbonates has enlarged fractures and produced an interconnected conduit-flow system characteristic of karst aquifers. Because the occurrence of solution features and the frequency, aperture, and connectivity of permeable fractures decrease with depth, the bulk hydraulic conductivity of the groundwater zone is vertically gradational. Most groundwater flux occurs within the transitional horizon between residuum and unweathered bedrock (water table interval); lower flux (and longer solute residence times) occurs at successively greater depths in the bedrock (Solomon *et al.* 1992).

The water table in the Chestnut Ridge Regime is a subdued replica of surface topography and occurs at the greatest depth (>100 ft bgs) along the crest of Chestnut Ridge, which is a groundwater flow divide and a recharge area. Groundwater generally flows from west to east along the flow divide across the northern part of the regime, with radial components of flow north into BCV, and south toward tributary headwaters on the southern flank of the ridge (Figure 4). The central part of the regime is characterized by radial flow directions from local groundwater flow divides along hilltops between tributaries. Groundwater flow directions in the southern part of the regime are generally south toward Melton Hill Reservoir. The overall directions of groundwater flow

throughout the Chestnut Ridge Regime do not significantly change during seasonal groundwater flow conditions (Figure 4). Seasonal horizontal hydraulic gradients are highest along the steep northern flank of Chestnut Ridge (i.e., across geologic strike) and in the upper reaches of tributaries on the southern ridge flank, and are nearly flat along the southern boundary of the regime.

Results of straddle packer tests performed in core holes near the Sediment Disposal Basin and Industrial Landfill IV provide estimates regarding the hydraulic conductivity of water-producing intervals within the Knox Group (King and Haase 1988). The tested intervals were in the Copper Ridge Dolomite generally less than 600 ft bgs, and calculated hydraulic conductivities ranged from 0.0002 (matrix intervals) to 3.1 ft/d (water-producing intervals). These results probably reflect the range of diffuse-flow in the Knox Aquifer. Results of dye-tracer tests provide representative estimates of flow rates in permeable conduits within the Knox Aquifer. A dye-tracer test performed on Chestnut Ridge near ORNL indicated flow rates of about 490 to 1,250 ft/d (Ketelle and Huff 1984). Results of a dye-tracer test conducted at the Security Pits indicated flow rates of about 100 to 300 ft/d (Geraghty & Miller, Inc. 1990), although a second test using different tracers did not confirm these findings (Science Applications International Corporation 1993). Conduit-flow rates indicated by these tests are comparable to those of typical karst terrains (Quinlan and Ewers 1985).

The geochemistry of the groundwater in the Knox Aquifer is fairly homogeneous. Most wells yield calcium-magnesium bicarbonate groundwater with pH of 7.5 to 8.0; total dissolved solids (TDS) above 150 milligrams per liter (mg/L); equal or nearly equal molar concentrations of calcium and magnesium; low proportions (<5%) of chloride, sodium, sulfate, and potassium; and very low (i.e., <1 mg/L) carbonate alkalinity and nitrate (as N) concentrations. Some wells yield groundwater with enriched chloride and sulfate concentrations that probably reflect the geochemical influence of locally disseminated sulfides (e.g., pyrite) or evaporites (e.g., gypsum). Additionally, groundwater within low permeability (matrix) intervals in the upper Knox Group, as indicated by data for several wells at Kerr Hollow Quarry, has greater proportions of sulfate and potassium, and higher trace metal concentrations (e.g., strontium) than typical of the groundwater from low yield intervals within the lower Knox Group formations. These geochemical differences potentially reflect corresponding differences between carbonate mineralogies in the upper and lower sections of the Knox Group, or the types of disseminated secondary minerals (AJA Technical Services, Inc. 1996).

2.4 Groundwater Contamination

The extent of groundwater contamination is limited in the Chestnut Ridge Regime. Data obtained since the 1980's indicate that volatile organic compounds (VOCs) are the most common groundwater contaminants. Dissolved VOCs (primarily chloroethanes and chloroethenes) have been detected in the groundwater samples collected from monitoring at the Security Pits, Ash Disposal Basin, Industrial Landfills IV and V, and Kerr Hollow Quarry. However, a clearly distinct contaminant plume is indicated only by the data for wells at the Security Pits. Total boron and sodium concentrations reported for groundwater samples from a few wells at Industrial Landfill IV also potentially indicate contamination. Brief descriptions of groundwater contamination at these waste management sites are provided below.

Chestnut Ridge Security Pits

Data obtained from monitoring wells at the Security Pits indicate that a narrow, elongated plume of dissolved VOCs extends parallel with geologic strike for at least 2,600 ft downgradient to the east, and perpendicular to strike for at least 500 ft downgradient to the north and south (Figure 5). The primary components of the plume include 1,1-dichloroethene, 1,1-dichloroethane, and 1,1,1-trichloroethane (1,1,1-TCA) in the western trench area; and tetrachloroethene (PCE), trichloroethene (TCE), and 1,2-dichloroethene (1,2-DCE) in the eastern trench area. The distribution of the plume constituents relative to the respective source areas, and elongation of the plume along the axis of Chestnut Ridge despite steeper hydraulic gradients toward the ridge flanks, suggest primarily strike-parallel horizontal transport (west to east) in the groundwater. The maximum depth of vertical transport has not been conclusively determined, but is at least 150 ft bgs in the western trench area, 250 ft bgs near the middle of the site, and 270 ft bgs downgradient of the eastern trench area (AJA Technical Services, Inc. 1996).

Summed concentrations of VOCs in the groundwater at the Security Pits exceed 500 micrograms per liter ($\mu\text{g/L}$), and maximum concentrations of PCE, TCE, and 1,1,1-TCA exceed respective federal maximum concentration limits (MCLs). However, concentrations of all plume constituents show decreasing temporal trends evident since the disposal trenches were closed and capped in 1989. Additionally, VOC concentrations in groundwater at several wells show concurrent

fluctuations with seasonal groundwater elevations. Decreasing temporal trends after closure of the site coupled with seasonal concentration fluctuations suggest that the source of the VOCs is within the residuum and bedrock underlying the disposal trenches, possibly in the form of residual dense non-aqueous phase liquids (DNAPL) (AJA Technical Services, Inc. 1996).

Ash Disposal Basin and Industrial Landfill V

Data obtained since the early 1990's indicate very low concentrations (1 to 2 $\mu\text{g/L}$) of 1,1,1-TCA in the groundwater at two wells downgradient of the western disposal trenches at the Security Pits (Figure 5): well GW-796 at Industrial Landfill V (about 400 ft south of the disposal trenches), and well GW-514 at the Ash Disposal Basin (about 900 ft south of the disposal trenches). Although the concentrations are well below the MCL for 1,1,1-TCA (200 $\mu\text{g/L}$), the repeated detection of this compound in the groundwater samples from both wells reflects southward migration from the Security Pits, possibly along "quickflow" conduits oriented perpendicular to geologic strike (HSW Environmental Consultants, Inc. 1995a).

Industrial Landfill IV

Low levels of 1,1,1-TCA occur in the groundwater at well GW-305, located on the east (downgradient) side of Industrial Landfill IV about 4,500 ft west (upgradient) of the Security Pits (Figure 5). Groundwater samples have been collected from the well since early 1988, and low concentrations of 1,1,1-TCA first detected in January 1992 (0.6 $\mu\text{g/L}$) subsequently increased by an order-of-magnitude through July 1995 (6 $\mu\text{g/L}$). The source of the 1,1,1-TCA in the groundwater at the well is uncertain. Data obtained in CY 1992 indicated potential cross contamination of the well during sampling, but this explanation was discounted by subsequent results (HSW Environmental Consultants, Inc. 1993 and 1994). Transport along strike from the western disposal trenches at the Security Pits seems unlikely because the water-table elevation near Industrial Landfill IV is more than 20 ft higher than at the Security Pits during both seasonally high and low groundwater flow conditions (Figure 4). Groundwater transport downgradient from Industrial Landfill IV is possible, assuming the waste stream included chlorinated organic solvents, although

1,1,1-TCA has not been detected in any of the groundwater samples collected from the other downgradient wells at the site (AJA Technical Services, Inc. 1996).

Results for several wells indicate elevated total boron and sodium concentrations in the groundwater downgradient to the east (along strike) of Industrial Landfill IV (Figure 5). For example, data for well GW-217 show increasing boron levels after a conspicuous concentration spike in January 1992, and a corresponding trend of increasing sodium concentrations. Elevated boron and sodium concentrations in the groundwater east of Industrial Landfill IV potentially reflect downgradient transport of inorganic wastes such as borax (i.e., hydrated sodium borate) cleaning fluids, assuming the site received such wastes (AJA Technical Services, Inc. 1996).

Kerr Hollow Quarry

Low levels ($<5 \mu\text{g/L}$) of carbon tetrachloride, chloroform, and PCE occur in the groundwater at monitoring wells located to the south (GW-144) and southeast (GW-142) of Kerr Hollow Quarry (Figure 5). All three compounds have been detected in the groundwater at downgradient well GW-144, particularly carbon tetrachloride, which was detected in 14 of the 26 samples collected from the well since March 1991. Either chloroform (a degradation product of carbon tetrachloride) or PCE was detected in 7 of the 26 groundwater samples collected over the same period from well GW-142. Well GW-142 is typically upgradient or sidegradient in relation to the quarry. Because concentrations are so low, however, the apparently sporadic detection of VOCs in the groundwater samples from these wells potentially reflects volatilization during sampling rather than the absence of the compounds in the groundwater at Kerr Hollow Quarry (AJA Technical Services, Inc. 1996).

2.5 Surface Water System

Surface streams in the Chestnut Ridge Regime include four primary drainage basins on the southern flank of Chestnut Ridge: two unnamed tributaries located west and east of Industrial Landfill II in the western part of the regime; the McCoy Branch drainage basin in the central part of the regime; and an unnamed drainage basin in the eastern part of the regime (Figure 3). These tributaries are mainly intermittent above an elevation of 900 ft msl, and receive flow via surface runoff, stormflow discharge, and groundwater baseflow. Baseflow contributions increase

downstream along the length of the streams, and spring discharge represents substantial contributions to the total flow in most of the tributaries (Lockheed Martin Energy Systems, Inc. 1996a). All of the tributaries discharge into Melton Hill Reservoir (Clinch River) south of the Chestnut Ridge Regime.

Available data indicate that surface water contamination in the Chestnut Ridge Regime is generally restricted to the stream channel in McCoy Branch immediately downstream of the Ash Disposal Basin. Monitoring data obtained for other tributaries in the regime have not shown conclusive evidence of contamination from upstream sources, although elevated concentrations of some constituents (primarily barium) infrequently occur in water discharged from Kerr Hollow Quarry (Lockheed Martin Energy Systems, Inc. 1996a).

3.0 CY 1996 GROUNDWATER PROTECTION PROGRAM

Collection and laboratory analysis of groundwater and surface water samples in the Chestnut Ridge Regime was performed during CY 1996 for the multiple programmatic purposes of: (1) RCRA interim status assessment monitoring and RCRA post-closure corrective action monitoring, (2) RCRA interim status and RCRA post-closure detection monitoring, (3) detection monitoring in accordance with operating permits and applicable regulations for the SWDFs, (4) monitoring in accordance with approved CERCLA RODs, and (5) monitoring performed as a best management practice of the Y-12 Plant GWPP. Sampling and analysis activities associated with each monitoring program were performed in accordance with the CY 1996 Sampling and Analysis Plan (SAP) (HSW Environmental Consultants, Inc. 1995b). Addenda to the SAP were issued by the Y-12 Plant GWPP Manager throughout the year to document modifications to the planned sampling/analysis activities necessitated by new monitoring priorities and regulatory requirements (Table 3). The following sections provide an overview of the sampling and analysis activities performed during CY 1996, including descriptions of the monitoring well networks, sampling frequency, sample collection and transportation, chain-of-custody control, field measurements and laboratory analytical parameters, and data management.

3.1 Sampling Locations and Frequency

Groundwater sampling for the purposes of the monitoring programs listed above involved 72 of the monitoring wells located at waste management sites in the Chestnut Ridge Regime (Figure 6); construction details for each well (e.g., total depth) are provided in Appendix C. Other sampling locations included spring CBS-1, which discharges into the unnamed tributary about 1,200-ft directly south of Construction/Demolition Landfill VII, and Outfall 301 at Kerr Hollow Quarry (Figure 6). Descriptions of the respective sampling networks and frequencies for each monitoring program are provided in the following sections.

3.1.1 RCRA Interim Status Assessment/Post-Closure Corrective Action Monitoring

As noted in Section 2.1.1, requirements for RCRA post-closure corrective action monitoring at the Security Pits became effective on March 8, 1996. Before then, RCRA interim status assessment monitoring, which was initiated in January 1988, was performed to determine the extent of groundwater contamination at the site.

Eight monitoring wells were used for the purposes of RCRA post-closure corrective action monitoring at the Security Pits: background well GW-521 located at Industrial Landfill IV about one mile west (upgradient) of the site, point-of-compliance well GW-609 located about 800 ft east (downgradient) of the site, and six designated plume delineation wells. The plume delineation wells are located as follows: about 3,000 ft east of the site at the Chestnut Ridge Borrow Area Waste Pile (GW-301); about 2,000 ft southeast of the site at Industrial Landfill V (GW-557, GW-789, GW-799, GW-801); and about 1,500 ft south of the site (GW-831) at the Ash Disposal Basin (Figure 6). Well GW-796, which is located due south of the Security Pits and serves as an upgradient well for monitoring at Industrial Landfill V, is also listed in the post-closure permit as an eligible point-of-compliance well. Groundwater samples were collected semiannually (April/May and October 1996) from each well except GW-831 (Table 4), which was installed as required under post-closure permit condition V.B.4, and was first sampled per SAP Addendum 96-35 after its completion in August 1996 (Table 3). The RCRA post-closure corrective action monitoring data obtained in April/May 1996 were submitted to the TDEC within the 180-day reporting deadline (September 1) specified by post-closure permit condition IV.H.1 (Lockheed Martin Energy Systems, Inc. 1996b).

Nine monitoring wells at the Security Pits (GW-174, GW-175, GW-177, GW-608, GW-609, GW-610, GW-611, GW-742, and GW-743) were sampled for RCRA interim status assessment monitoring purposes (Figure 6). Interim status sampling was performed in January and February 1996 prior to the effective date of the post-closure permit (Table 4), and was subsequently discontinued in April 1996 per SAP Addendum 96-20 (Table 3).

3.1.2 RCRA Post-Closure/RCRA Interim Status Detection Monitoring

Semiannual RCRA post-closure detection monitoring was performed May 13-17 and October 14-17, 1996 at the Sediment Disposal Basin, and October 21-24, 1996 at Kerr Hollow

Quarry per SAP Addendum 96-31 (Table 3). Analyses and required statistical evaluations for each applicable semiannual sampling event were completed within 90-days after sampling at each site, and the results were reported to the TDEC as specified in the post-closure permit (Lockheed Martin Energy Systems, Inc. 1996c, 1997a, and 1997b).

The RCRA post-closure detection monitoring well network at the Sediment Disposal Basin includes one upgradient well (GW-159) and three point-of-compliance wells (GW-156, GW-731, and GW-732). Two upgradient wells (GW-142 and GW-231) and three point-of-compliance wells (GW-143, GW-144, and GW-145) comprise the detection monitoring network at Kerr Hollow Quarry (Figure 6). Samples were collected from each well over four consecutive days during each semiannual sampling event (Table 4). Analytical results for these samples provide the replicate data required for statistical evaluation. Under this sampling protocol, at least three well-volumes of groundwater were purged (if the well did not purge dry) only on the first day of each sampling event. Groundwater purging during subsequent daily sampling events was performed until field measurements showed stable pH and specific conductance.

Quarterly sampling for RCRA interim status detection monitoring at Kerr Hollow Quarry was performed during January and April 1996 (Table 4), and was discontinued in July 1996 per SAP Addendum 96-47 (Table 3). Groundwater samples were collected from two wells in addition to the five used for RCRA post-closure detection monitoring: GW-147, which is paired with upgradient well GW-231; and GW-146, which is paired with point-of-compliance well GW-145 (Figure 6). The RCRA interim status monitoring data, inclusive of analytical results and required statistical evaluations, were reported to the TDEC in July 1996 (Lockheed Martin Energy Systems, Inc. 1996d).

3.1.3 SWDF Detection Monitoring

Groundwater samples were collected from 25 monitoring wells and spring CBS-1 for the purposes of detection monitoring at Industrial Landfills II, IV, and V, and Construction/Demolition Landfills VI and VII (Figure 6). Samples were collected semiannually from spring CBS-1 and all the monitoring wells except well GW-521 at Industrial Landfill IV (Table 4), which was sampled quarterly per SAP Addendum 96-21. Monitoring wells GW-540, GW-541, and GW-546 at

Construction/Demolition Landfill VI were dropped from semiannual detection monitoring in October 1996 per SAP Addendum 96-47 (Table 3). Semiannual sampling was performed in April and October-November 1996 at each site except Industrial Landfill IV, where samples were collected in January and August (Table 4). Additionally, several wells at Industrial Landfills II and V, and Construction/Demolition Landfill VI were re-sampled per applicable addenda to the SAP (Table 3): wells GW-557, GW-560, and GW-562 in June 1996 (SAP Addendum 96-24); well GW-562 in November 1996 (SAP Addendum 96-49); wells GW-542, GW-543, GW-544, and GW-827 in December 1996 (SAP Addendum 96-47); and well GW-539 in December 1996 (SAP Addendum 96-51). Data obtained during each sampling event were reported to the TDEC Division of Solid Waste Management per applicable regulatory requirements and operating permit conditions.

3.1.4 CERCLA Record of Decision Monitoring

Groundwater samples were collected semiannually from wells 1090, GW-203, GW-205, GW-221, GW-302, and GW-339 (Figure 6) as part of the post-closure surveillance and maintenance activities specified in the CERCLA ROD for the United Nuclear Corporation Site (U.S. Department of Energy 1991). Semiannual sampling was performed in April and October 1996 (Table 4), and the monitoring results were reported to the Y-12 Plant Environmental Restoration Surveillance and Maintenance Program. Data for the United Nuclear Corporation Site ultimately will be incorporated into the annual remedial effectiveness report for the ORR issued by the Environmental Restoration Program.

The EPA-approved CERCLA ROD for Kerr Hollow Quarry requires semiannual surface water sampling at Outfall 301 (U.S. Department of Energy 1995b). Semiannual sampling was performed in March and August 1996 (Table 4) per SAP Addendum 96-12. Sampling was coordinated with semiannual RCRA post-closure detection monitoring at Kerr Hollow Quarry (SAP Addendum 96-37), although a set sampling schedule for Outfall 301 may not always be effective because of prolonged no-flow conditions.

3.1.5 Best Management Practice Monitoring

Groundwater samples were collected annually from 19 monitoring wells as a best management practice of the Y-12 Plant GWPP (Table 4), including four wells at the Ash Disposal Basin, five wells at the Chestnut Ridge Borrow Area Waste Pile, four wells at the East Chestnut Ridge Waste Pile, and four wells at Rogers Quarry (Figure 6). There are no current RCRA, SWDF, or CERCLA requirements for groundwater monitoring at these sites. Annual sampling was discontinued in September 1996 per SAP Addendum 96-39 as part of the efforts to streamline the Y-12 Plant GWPP (Table 3).

Best management practice monitoring also included one-time groundwater sampling at wells GW-174 and GW-612 (Figure 6). Both wells lie within the boundaries of the dissolved VOC plume in the groundwater at the Security Pits, and were last sampled in December 1992 for RCRA interim status assessment monitoring purposes. Samples were collected in August 1996 (Table 4) to provide more current data regarding VOC concentration trends in the groundwater at the site.

3.2 Sample Collection, Transportation, and Chain-of-Custody Control

Personnel from the Oak Ridge K-25 Site (K-25) Sampling and Environmental Support Department were responsible for collection, transportation, and chain-of-custody control of groundwater and surface water samples obtained for the multiple programmatic purposes of the Y-12 Plant GWPP. Sampling was performed in accordance with the *Technical Procedure for Groundwater Sampling* (Lockheed Martin Energy Systems, Inc. 1995), which is incorporated in and referenced by the post-closure permit; and the applicable methods and procedures specified in *Environmental Surveillance Procedures Quality Control Program* (Martin Marietta Energy Systems, Inc. 1988b), which have been approved by the EPA (Region IV) and the TDEC (Tennessee Department of Health and Environment 1988).

Groundwater samples were collected from monitoring wells using portable Bennet Pumps™ and disposable bailers. Samples from spring CBS-1 and Outfall 301 were collected using grab sample bottles. Filtered and unfiltered groundwater samples were collected from each monitoring well and spring CBS-1; only unfiltered surface water samples were collected from Outfall 301. Groundwater samples collected with a Bennet Pump™ were filtered in the field using in-line 0.45

micron filters, and samples collected with a bailer were filtered in the laboratory. All samples were labeled, logged, placed in ice-filled coolers, and transported to the appropriate analytical laboratory in accordance with chain-of-custody control requirements.

3.3 Field Measurements and Laboratory Analytes

Field personnel measured the depth to water before purging and sampling groundwater in each monitoring well. This long-standing protocol of the Y-12 Plant GWPP complies with corresponding post-closure permit conditions for RCRA post-closure corrective action/detection monitoring (Table 1). Sampling personnel also recorded field measurements of pH, temperature, specific conductance, and dissolved oxygen for each groundwater and surface water sample (Table 5). Applicable measurements recorded for each sampling location, including groundwater elevations calculated from the depth-to-water measurements, are presented in Appendix D.1.

Laboratory analyses of all groundwater samples included the following standard suite of analytes: (1) pH, specific conductance, turbidity, total suspended solids (TSS), and TDS; (2) major ions and trace metals, which is the term used hereafter to differentiate metals that are typically minor constituents in groundwater (e.g., cobalt) from metals that are usually major ionic species (e.g., magnesium); (3) VOCs; and (4) gross alpha and gross beta activity (Table 5). This standard suite of analyses was modified in January 1996 (SAP Addendum 96-10) to include Inductively Coupled Plasma (ICP) spectroscopy analysis for lithium. Surface water samples for Kerr Hollow Quarry were analyzed only for TSS, and the trace metals and radioanalytes specified in the CERCLA ROD (U.S. Department of Energy 1995b).

In addition to the standard suite of analyses, groundwater samples collected at several sites were analyzed for other parameters and constituents, depending on the requirements of the governing monitoring program. Groundwater samples collected for SWDF detection monitoring were analyzed for site-specific suites of additional organic compounds (e.g., acrolein), general water-quality indicators (e.g., chemical oxygen demand), inorganic compounds (e.g., ammonia nitrogen), and radioanalytes (e.g., gamma activity). Samples from wells at the United Nuclear Corporation Site were analyzed for several radioisotopes (e.g., technetium-99), and samples collected for RCRA

interim status detection monitoring at Kerr Hollow Quarry were analyzed for RCRA interim status indicator parameters (e.g., total organic carbon and phenols), and uranium isotopes (Table 5).

To address requirements of TDEC regulations governing detection monitoring at nonhazardous SWDFs, site-specific suites of additional organic compounds were modified in April 1996 per SAP Addendum 96-18 (Industrial Landfills II, IV, and V, and Construction/Demolition Landfills VI and VII), and in June 1996 per SAP Addendum 96-25 (Industrial Landfill II and Construction/Demolition Landfills VI and VII). In October 1996 the TDEC granted approval to streamline and standardize the detection monitoring programs at all the SWDFs. These changes were implemented in SAP Addendum 96-45 (Industrial Landfill II and Construction/Demolition Landfill VII), SAP Addendum 96-46 (Industrial Landfills II and IV), and SAP Addendum 96-47 (Construction/Demolition Landfill VII) (Table 3). Additionally, the suite of radiochemical analyses performed for CERCLA ROD monitoring at the United Nuclear Corporation Site after June 1996 was reduced to one radioisotope (strontium-89/90) at the request of the Y-12 Plant Environmental Restoration Program (SAP Addendum 96-23).

Laboratory analyses were performed in accordance with the EPA- and TDEC-approved analytical methods listed in Table 5. However, new or revised analytical methods for several of the standard analytes were performed. Atomic Absorption Spectroscopy (AAS) for lead analyses (total and dissolved), which is specified in the CY 1996 SAP for groundwater samples collected from spring CBS-1 and all monitoring wells except those used for best-management practice monitoring, was replaced with Plasma Mass Spectroscopy (PMS) analyses in July 1996 (SAP Addendum 96-34). Similarly, beginning in October 1996, total and dissolved arsenic concentrations were determined using PMS instead of ICP spectroscopy (SAP Addendum 96-48). Also, beginning in October 1996, three separate methods used for VOC analyses were replaced with a revised procedure that captured most compounds required for the multiple programmatic purposes of the Y-12 Plant GWPP (SAP Addendum 96-44).

Most laboratory analyses of the groundwater and surface water samples were performed by the K-25 Analytical Service Organization (ASO). Selected radiochemical analyses were performed by the Y-12 Plant ASO and the ORNL ASO. Analytical results are presented in Appendix D.1

(miscellaneous laboratory parameters), Appendix D.2 (inorganic analytes), Appendix D.3 (organic analytes), and Appendix D.4 (radiological analytes).

3.5 Quality Assurance/Quality Control Sampling

Quality assurance/quality control samples included a total of 83 laboratory blanks, 132 trip blanks, three field blanks, and 54 equipment rinsate samples. Laboratory blanks were samples of deionized water analyzed along with several associated groundwater and/or surface water samples. Trip blanks were samples of deionized water transported in each cooler containing groundwater and surface water samples to be analyzed for organic compounds. Field blanks were samples of deionized water prepared when groundwater samples were collected from selected monitoring wells. Equipment rinsates were samples of the deionized water used to decontaminate the portable groundwater sampling equipment (i.e., Bennet PumpsTM), and were collected after a sampling team had completed sampling at a site or finished each administrative well group (a series of sampling locations grouped in the SAP for data tracking and management purposes). If more than one sampling pump was used, an equipment rinsate sample was collected from each pump. Equipment rinsates for bailers were collected after they were unwrapped for use in the field.

Laboratory blanks, trip blanks, field blanks, and equipment rinsate samples were analyzed for VOCs; selected equipment rinsates also were analyzed for trace metals and radiochemical parameters. Analytical results for the QA/QC blanks and equipment rinsate samples are presented in respective subsections of Appendix E.

In addition to the blank samples and equipment rinsates, duplicate groundwater samples were collected for QA/QC purposes from a total of 18 monitoring wells (see Appendix F), including at least one well in each administrative well group defined in the CY 1996 SAP (and associated addenda). Duplicate groundwater samples were analyzed for the constituents and parameters specified for the well from which they were collected; analytical results are included with the corresponding well data presented in Appendix D.

3.6 Data Management

Analytical results for the groundwater and surface water samples were electronically downloaded directly into the Y-12 Plant GWPP SAS™ data sets from data files provided by the K-25, Y-12, and ORNL ASOs. Some data were manually input from hardcopy documentation (laboratory reports and field data sheets) by the database management subcontractor. Downloaded and manually input data were verified in accordance with the *Y-12 Plant Groundwater Protection Program - Groundwater Monitoring Program Data Management Plan* (Data Management Plan) (Martin Marietta Energy Systems, Inc. 1993). The database management subcontractor and the appropriate ASO worked to resolve any incomplete data transfers, irregular parameter names or reporting units, and discrepancies between electronic and hardcopy versions of the data.

A standardized data screening process was used to identify CY 1996 analytical data that do not meet the DQOs defined in the Data Management Plan. As shown below, most of the DQO criteria apply to analytical results for inorganic analytes.

DQO Criteria	Inorganic Analytes	Organic Analytes	Radiological Analytes	Miscellaneous Analytes
Duplicate Sample Data	●	●	●	●
Filtered/Unfiltered Sample Data	●	.	.	.
Ion Charge Balance	●	.	.	.
False Positive Results	.	●	.	.
Counting Errors	.	.	●	.

As described in Appendix F, the overwhelming majority of analytical results reported for the CY 1996 groundwater and surface water samples met applicable DQOs of the Y-12 Plant GWPP. Screened data included four duplicate sample results and ten total/dissolved trace metal concentrations that differ by an order-of-magnitude or more; sixteen false positive results for VOCs, most of which probably reflect contamination from the laboratory environment; and eleven radioisotope results that exceed the respective minimum detectable activity (MDA), but are less than the associated counting errors. Additionally, principal ion data for three groundwater samples,

including the sample collected in October 1996 from RCRA point-of-compliance well GW-609 at the Security Pits, are not suitable for quantitative evaluation because of charge balance errors.

4.0 DATA EVALUATION

This section presents data evaluations required annually for RCRA post-closure corrective action monitoring at the Security Pits and RCRA post-closure detection monitoring at the Sediment Disposal Basin and Kerr Hollow Quarry. Site-specific conditions of the post-closure permit require annual evaluations of applicable monitoring data regarding: (1) the groundwater flow direction and rate in the uppermost aquifer (Knox Aquifer) at each site, (2) temporal concentration trends of RCRA target compounds in groundwater at the RCRA point-of-compliance for the Security Pits, and (3) concentrations of RCRA target compounds in groundwater at the plume delineation wells designated for the Security Pits. Also included in this section are descriptions of the applicable statistical evaluations and quantitative trend analyses performed on the RCRA post-closure detection monitoring data for the Sediment Disposal Basin and Kerr Hollow Quarry.

4.1 Groundwater Flow Direction and Rate

Evaluation of groundwater flow directions in the Knox Aquifer was based on groundwater surface elevations determined from depth-to-water measurements obtained from 74 monitoring wells during April 1-9, 1996 (the seasonally high water table) and September 30 - October 7, 1996 (the seasonally low water table) (Table 6). Depth-to-water measurements recorded during groundwater sampling events were not used to determine flow directions because they were less contemporaneous, and may have been influenced by sampling activities (i.e., purging/sampling nearby monitoring wells).

The rate of groundwater flow (V) in the Knox Aquifer was estimated using the modified Darcy equation: $V = KI/\eta$, where K is the hydraulic conductivity of the medium, η is the effective porosity, and I is the horizontal hydraulic gradient. The calculated flow rates represent average velocities in fractured rock, assuming the Knox Aquifer functions as an equivalent porous medium. However, depending on fracture aperture and wall roughness, flow rates in individual fractures may vary over several orders of magnitude (Freeze and Cherry 1979). Additionally, variation in the effective porosity (0.01) assumed for the Knox Aquifer would produce an inversely proportional variation in the calculated Darcy flow velocity.

Groundwater Flow Directions

Groundwater elevations in monitoring wells at the Security Pits indicate flow primarily from west to east (Figure 4), particularly in light of the elongated geometry of the VOC plume in the groundwater at the site, with lesser components of flow to the north and south (Figure 5). Groundwater elevations in monitoring wells at the Sediment Disposal Basin indicate flow to the east and northeast, and flow directions at Kerr Hollow Quarry are generally south toward Melton Hill Reservoir, or southwest toward the unnamed tributary adjacent to the site (Figure 4).

Water-level elevations determined from depth-to-water measurements obtained at the Sediment Disposal Basin (Figure 7) and Kerr Hollow Quarry (Figure 8) prior to purging indicate concurrent, seasonal water-table fluctuations upgradient and downgradient of each site. These data also show that the designated point-of-compliance wells were hydraulically downgradient of each respective site during each semiannual sampling event, as required under post-closure permit conditions IV.G.3 (Sediment Disposal Basin) and VI.G.3 (Kerr Hollow Quarry). Designated point-of-compliance wells for the Security Pits (GW-609 and GW-796) were also hydraulically downgradient of the site throughout the year (Figure 4).

Groundwater levels in upgradient well GW-159 at the Sediment Disposal Basin do not fully recover after the well is purged on the first day of each RCRA post-closure detection monitoring sampling event (Figure 9). Lack of sufficient water level recovery between daily replicate sampling is problematic because non-representative, highly turbid groundwater samples have been collected when water levels in the well are very low. This is a particular concern because preservation (i.e., acidification) of turbid unfiltered samples may bias results for inorganic RCRA target compounds. Such bias is indicated by the total lead and uranium results reported for highly turbid unfiltered samples collected from well GW-159 on May 15, 1996 (TSS = 2,710 mg/L) and October 17, 1996 (TSS = 500 mg/L) when the water levels remained more than 25-ft lower than before the well was purged (Figure 9). The TSS reported for the unfiltered sample collected in October 1996 indicates that redevelopment of the well in September 1996 to remove silt from the well casing and filter pack was not entirely successful. The Y-12 Plant GWPP is reviewing the current sampling protocol to determine a replicate sampling frequency that will ensure collection of representative groundwater

samples when the water levels have sufficiently recovered, and avoid collection of highly turbid samples.

Groundwater Flow Rates

Groundwater flow rates estimated using the modified Darcy equation were based on the range of hydraulic conductivity values (0.0002 to 3.1 ft/d) indicated by the packer-test results (King and Haase 1988), an effective porosity (0.01) representative for fractured limestone (Smith *et al* 1976), and the following range of horizontal hydraulic gradients indicated by groundwater elevations in selected monitoring wells at the Security Pits, Sediment Disposal Basin, and Kerr Hollow Quarry (Figure 4).

Site/Monitoring Well No.			Groundwater Elevation (ft msl)		Lateral Distance (ft)	Horizontal Hydraulic Gradient (<i>I</i>)	
			April 1996	October 1996		April 1996	October 1996
Security Pits	Strike	GW-178	1,055.80	1,049.70	.	.	.
	Normal	GW-611	950.20	943.10	394	0.268	0.271
		GW-511	1,001.60	985.60	512	0.106	0.125
	Strike	GW-178	1,055.80	1,049.70	.	.	.
	Parallel	GW-173	990.00	968.40	1,680	0.039	0.048
		GW-609	948.80	942.50	2,272	0.047	0.047
Sediment Disposal Basin		GW-159	934.90	926.70	.	.	.
		GW-156	907.70	905.70	552	0.049	0.038
Kerr Hollow Quarry		GW-231	837.97	834.67	.	.	.
		GW-144	835.94	833.44	480	0.004	0.003
		GW-142	837.95	834.55	.	.	.
		GW-144	835.94	833.44	592	0.003	0.002
Note: Bold typeface denotes gradients used in groundwater flow rate calculations.							

As shown in the following summary, groundwater flow rates in the uppermost aquifer at each site, based on the input values and inherent assumptions associated with the modified Darcy equation, range from about 0.01 ft per year (ft/yr) at Kerr Hollow Quarry to 84 ft/d at the Security Pits.

Groundwater Flow Rates ($V = KI/\eta$)					
Security Pits	V (ft/d)	V (ft/yr)	K (ft/d)	I	η
Strike-normal flow:	0.002	0.7	0.0002	0.106	0.01
	84	30,660	3.1	0.271	
Strike-parallel flow:	0.0008	0.3	0.0002	0.039	0.01
	14.6	5,318	3.1	0.048	
Sediment Disposal Basin	0.0008	0.3	0.0002	0.038	0.01
	15	5,475	3.1	0.049	
Kerr Hollow Quarry 1.3	0.00004	0.01	0.0002	0.002	0.01
	1.3	475	3.1	0.004	

The lower flow rates are reasonable for diffuse flow in matrix intervals, and the upper values are within the range of conduit-flow rates typical of karst aquifers.

4.2 Point-of-Compliance Concentration Trends

Post-closure permit condition V.D.3 requires annual evaluation of the RCRA post-closure corrective action monitoring data for at least one point-of-compliance well at the Security Pits to determine if the concentrations of RCRA target compounds (Table 7) continue to decrease in the groundwater at the site. This evaluation was based on data reported for point-of-compliance wells GW-609 and GW-796. Point-of-compliance well GW-609 is located about 800 ft along strike (downgradient) to the east of the Security Pits (Figure 6), and is completed in the Copper Ridge Dolomite at a depth of 269-ft bgs. Point-of-compliance well GW-769 is completed in the Copper Ridge Dolomite at a depth of 136.5-ft bgs, and is located about 400 ft due south of the Security Pits (Figure 6). Construction details for both wells are provided in Appendix C. Tetrachloroethene, TCE, 1,2-DCE, chromium, lead, and nickel were the only RCRA target compounds detected in the unfiltered groundwater samples from well GW-609 (Table 8), and results for all these compounds met applicable DQOs described in Appendix F. One RCRA target compound (1,1,1-TCA) was detected in both samples from well GW-796; one of these results was screened as a false positive (see Section F.4 in Appendix F).

Concentrations of PCE, TCE, and 1,2-DCE detected in the groundwater samples from well GW-609 ranged from 2 µg/L (TCE) to 18 µg/L (PCE), with the higher concentration of each compound reported for the sample collected in April 1996 (i.e., the seasonally high water table) (Table 8). As shown in the following data table, the summed annual average concentrations of PCE (10 µg/L), TCE (0.3 µg/L), and 1,2-DCE (9 µg/L) reflect only a slight decrease from respective levels indicated by CY 1995 RCRA interim status assessment monitoring results, but a significant decrease (about 75%) from annual average concentrations in the early 1990's.

Summed Annual Average VOC Concentration (µg/L) in Point-of-Compliance Well GW-609						
CY 1990	CY 1991	CY 1992	CY 1993	CY 1994	CY 1995	CY 1996
78.0	67.5	35.5	28.4	54.5	28.0	19.3

Results for PCE illustrate both the decreasing temporal trend and the seasonal concentration fluctuations that characterize the VOC data for well GW-609 (Figure 10). These concentration trends suggest seasonal flushing of VOCs dissolved from residual DNAPL in the residuum and bedrock underlying the disposal trenches at the Security Pits (AJA Technical Services, Inc. 1996).

Chromium (0.018 mg/L), lead (0.0011 mg/L), and nickel (0.012 mg/L) concentrations reported for the unfiltered groundwater sample collected from well GW-609 in October 1996 (i.e., the seasonally low water table) are the only results for inorganic RCRA target compounds that exceed analytical reporting limits (Table 8). None of these results are supported by historical data for the well; chromium was not detected in any of the previous 26 unfiltered groundwater samples collected from the well since February 1990, and lead and nickel were detected in only one these samples. These results are probably analytical artifacts.

Groundwater samples were collected semiannually from well GW-796, and 1,1,1-TCA was detected in both samples. Because of contamination in the associated trip blank sample, however, the 1,1,1-TCA result for the sample collected in April 1996 (2 µg/L) was screened as a false positive (Figure 10). This compound has been detected at concentrations of 1 or 2 µg/L in every sample collected from well GW-796 since May 1993, although two of these results also were screened as

false positives. As noted in Section 2.4, the repeated detection of 1,1,1-TCA in the groundwater samples from well GW-796 indicates transport from the Security Pits along groundwater flowpaths oriented perpendicular to strike.

Based on the preceding evaluation of data for point-of-compliance wells GW-609 and GW-796, the CY 1996 RCRA post-closure corrective action monitoring results do not indicate significant changes in the overall effectiveness of closure activities at the Security Pits.

4.3 Plume Delineation Evaluation

Post-closure permit condition V.D.2 requires annual evaluation of the RCRA post-closure corrective action monitoring data for the Security Pits to determine if concentrations of RCRA target compounds in the groundwater at the specified plume delineation wells (GW-301, GW-557, GW-798, GW-799, GW-801, and GW-831) exceed the corresponding background levels indicated by data for well GW-521. All results for these wells met applicable DQO criteria described in Appendix F except the total lead concentration reported for the unfiltered sample collected from well GW-831 in October 1996; this result was screened because the corresponding dissolved lead concentration in the filtered sample was an order-of-magnitude higher (see Section F.3 in Appendix F).

Chromium (GW-301, GW-557, and GW-831), lead (GW-301, GW-798, and GW-831), uranium (GW-831), and gross beta (GW-801) were the only RCRA target compounds detected in unfiltered groundwater samples from the plume delineation wells (Table 8). Evaluation of these results involved comparison to respective maximum values in the historical data (January 1990 - July 1996) for well GW-521, and the statistically-derived upper tolerance limits (UTLs) reported in: *Determination of Reference Concentrations for Inorganic Analytes in Groundwater at the Department of Energy Y-12 Plant, Oak Ridge, Tennessee* (HSW Environmental Consultants, Inc. et al. 1995). The UTLs represent maximum concentrations expected in uncontaminated groundwater at the Y-12 Plant calculated from statistical analysis of the groundwater quality data for specific groups of wells (i.e., clusters) differentiated by similar geochemical characteristics. Only results that exceed both the maximum value for background well GW-521 and the UTL were evaluated as potential evidence of groundwater contamination.

Chromium, lead, and uranium results reported for a total of three unfiltered groundwater samples from plume delineation wells to the east (GW-301), southeast (GW-557), and southwest (GW-831) of the Security Pits (Figure 6) exceed the corresponding maximum value for background well GW-521 (Table 8). As shown in the following summary, however, only the chromium result for well GW-557 and the lead (PMS) result for well GW-301 exceed the applicable UTL.

SUMMARY OF CY 1996 RESULTS THAT EXCEED WELL GW-521 MAXIMUM VALUES								
RCRA Target Compound	CY 1996 Data			GW-521 Sampling History (January 1990 - July 1996)				Cluster 4 UTL (mg/L)
	Well Number	Date Sampled	Result (mg/L)	No. of Samples	Results > Detection Limit	Minimum (mg/L)	Maximum (mg/L)	
Chromium	GW-557	04/04/96	0.25	26	1	<0.01	0.014	0.029
	GW-831	08/27/96	0.015					
Lead (PMS)	GW-301	10/01/96	0.012	26	4	0.0017	0.011	0.0096
Uranium	GW-831	08/27/96	0.0017	26	1	<0.0005	0.001	0.005
Note: Bold typeface denotes results that exceed the UTL.								

The elevated trace metal concentrations reported for wells GW-557 and GW-831 are probably analytical or sampling artifacts. Results for well GW-301 are less readily attributable to sampling and/or analytical bias, but do not conclusively indicate contaminant migration from the Security Pits.

Ten unfiltered groundwater samples have been collected from well GW-557 since May 1993 (when the Y-12 Plant GWPP assumed administrative control of the well), and the chromium result reported for the sample collected in April 1996 (0.25 mg/L) is the only total (or dissolved) concentration to exceed the analytical reporting limit (0.01 mg/L). In light of these historical data, the April 1996 result for total chromium is probably an analytical artifact.

The less-than-detection-limit chromium and uranium (total) results reported for the unfiltered sample collected from well GW-831 in October 1996 (Table 8) suggest that the elevated concentrations reported for the sample collected in August 1996 are probably artifacts of the installation and development of the well, which were completed about 30 days before this sample was collected. Many wells at the Y-12 Plant have similarly produced initial groundwater samples

with elevated trace metal concentrations that subsequently decreased below analytical reporting limits after several sampling events.

The October 1996 PMS lead result (0.012 mg/L) reported for well GW-301 is the highest lead concentration reported for the well since November 1992 (0.077 mg/L). This result is consistent with historical data for well GW-301 showing lead concentrations at or near the analytical reporting limit punctuated by several concentration spikes that typically occur during seasonally low groundwater elevations (as indicated by pre-sampling water levels). Although results obtained since April 1995 indicate increasing lead concentrations, linear regression of the historical data shows a decreasing long-term trend (Figure 11). Total lead concentrations do not appear to reflect bias from preservation of turbid unfiltered samples (TSS was below 15 mg/L in the samples collected in April and October 1996), which suggests that the elevated concentrations are probably not sampling artifacts.

Several factors suggest that elevated lead concentrations in the groundwater at well GW-301 do not reflect migration from the Security Pits. Lead is listed in the inventory of wastes received by Security Pits (Attachment 3, Section A of the post-closure permit), but historical data for wells at the site, including the previously described results for point-of-compliance well GW-609, do not indicate elevated lead concentrations. Also, the mobility of lead is limited in groundwater because it tends to undergo cation exchange with clays (Fetter 1992), and well GW-301 is more than 3,000 ft downgradient of the Security Pits. Higher lead concentrations in well GW-301 during seasonally low groundwater elevations also tend to discount hydrochemical transport via seasonally or episodically active groundwater flow paths within the Knox Aquifer. The source of elevated lead concentrations in the groundwater at well GW-301 cannot be conclusively determined from available data, but is probably not the Security Pits.

The gross beta activity reported for the sample collected from well GW-801 in April 1996 (13.5 ± 5.8 picoCuries per liter) is the only radiochemical result for the plume delineation wells that exceeds the specified MDA (Table 8). Gross beta has not exceeded the MDA in any of the samples previously collected from the well, and the April 1996 result is probably an analytical artifact.

Based on the preceding evaluation, the CY 1996 RCRA post-closure corrective action monitoring data for the Security Pits do not conclusively indicate groundwater contamination from

the site at any of the plume delineation wells. These wells, therefore, remain effective for monitoring groundwater quality beyond the boundary of the dissolved VOC plume in groundwater at the site.

4.4 Results of Statistical Evaluations and Quantitative Trend Analyses

The CY 1996 data for applicable RCRA target compounds reported for the point-of-compliance wells and upgradient (background) wells at the Sediment Disposal Basin and Kerr Hollow Quarry were statistically evaluated in accordance with site-specific requirements of the post-closure permit (Table 1). Quantitative trend analysis of the results for selected RCRA target compounds specified for Kerr Hollow Quarry also were performed. The statistical evaluations and trend analyses were completed within 90 days after each applicable semiannual sampling event, and results of the evaluations were submitted to the TDEC in August 1996 (Sediment Disposal Basin) and January 1997 (Sediment Disposal Basin and Kerr Hollow Quarry).

Statistical data evaluations were performed in accordance with the procedures described in Attachment 2, Section H (Sediment Disposal Basin) and Attachment 4, Section H (Kerr Hollow Quarry) of the post-closure permit. Both attachments specify the following two-part statistical testing approach:

- 1 Depending on the data distribution for each RCRA target compound, a parametric analysis of variance test (or nonparametric equivalent) is performed to compare the mean concentration value for each downgradient point-of-compliance well with the mean value for the upgradient background well(s). Mean concentration values are determined from the four replicate groundwater sample results obtained during each semiannual sampling event. This test is limited to the data for each sampling event.
- 2 If the parametric or nonparametric variance test indicates that the concentration of an applicable RCRA target compound in a downgradient well is statistically higher than the concentration in the upgradient well(s), then the results for the target compound are compared with the corresponding UTL derived from historical data for the upgradient well(s). This comparison evaluates individual target compound results with respect to historical concentration variability upgradient of the site. Also, a parametric or nonparametric variance test (within-well test) is performed for the downgradient well to establish whether the variance of the replicate results for the compound exceeds that of the historical data. This test identifies results that significantly vary from the range of concentrations reported for the well.

Both parts of this approach must show a statistically significant increase to be considered valid. Results of these statistical evaluations are described in the following sections. Detailed statistical information for each site are provided in Appendix G.1 (Sediment Disposal Basin) and G.2 (Kerr Hollow Quarry).

4.4.1 Sediment Disposal Basin

As required by the post-closure permit, statistical evaluations of the CY 1996 semiannual RCRA post-closure monitoring results for cadmium, chromium, lead, mercury, nickel, silver, and uranium (total) were performed for upgradient background well GW-159, and downgradient point-of-compliance wells GW-156, GW-731, and GW-732. Results for both semiannual sampling events did not indicate groundwater contamination at the Sediment Disposal Basin (Lockheed Martin Energy Systems, Inc. 1996c and 1997a).

Semiannual sampling results for each RCRA target compound included large proportions of less-than-detection limit results for each well. Because these censored data could not be normalized, nonparametric variance tests (Kruskal-Wallis Test) were performed. Results of the variance tests for both semiannual sampling events showed that uranium (total) concentrations were significantly lower in groundwater at downgradient wells GW-731 and GW-732 than in groundwater at downgradient well GW-156 and upgradient well GW-159. Uranium results for wells GW-156 and GW-159 were statistically equal. Because the variance tests did not indicate statistically higher uranium concentrations in groundwater at the downgradient wells during either semiannual sampling event, UTL comparisons and within-well variance tests were not performed (Lockheed Martin Energy Systems, Inc. 1996c and 1997a).

Evaluation of the data for the first CY 1996 semiannual sampling event included within-well tests of historical (1991 - 1994) uranium (total) data to determine if results for upgradient well GW-159 were anomalously high, and if biased uranium results were reported for turbid groundwater samples from the well. Results of the within-well tests showed that the CY 1996 uranium results for well GW-156 were significantly less than historical values reported for the well. Additionally, review of the TSS data illustrated the problems discussed in Section 4.1 regarding the slow recovery

of well GW-159 and the collection of highly turbid groundwater during low water levels (Lockheed Martin Energy Systems, Inc. 1996c and 1997a).

4.4.2 Kerr Hollow Quarry

As required by the post-closure permit, statistical evaluations of the second CY 1996 semiannual RCRA post-closure detection monitoring results for carbon tetrachloride, cadmium, chromium, lead, mercury, nickel, PCE, and uranium (total) were performed for upgradient wells GW-142 and GW-231, and downgradient point-of-compliance wells GW-143, GW-144, and GW-145. Quantitative trend analysis was performed to evaluate results for boron, strontium (total), gross alpha, and gross beta. Statistical analysis is not appropriate for gross alpha and gross beta, and was not performed for boron and strontium because neither is a RCRA-regulated constituent, and historical results for both metals exhibit a high degree of temporal variability. Evaluation of the results for both semiannual sampling events indicated that Kerr Hollow Quarry has not released contaminants to the groundwater (Lockheed Martin Energy Systems, Inc. 1997b).

A nonparametric variance test (Kruskal-Wallis Test) was used to evaluate results for applicable RCRA target compounds because large proportions of less-than-detection limit results were reported for the upgradient and downgradient wells at the site. Statistically significant differences were indicated only for the uranium (total) results. Variance tests showed uranium concentrations in groundwater at upgradient well GW-142 and all the downgradient wells were statistically higher than uranium concentrations in the groundwater at upgradient well GW-231. However, UTL comparisons and within-well tests of historical data showed that the uranium results were below the UTL and were not significantly different from historical results for each downgradient well (Lockheed Martin Energy Systems, Inc. 1997b).

Quantitative trend analysis (Kendall-Tau B Test) of historical (1990 - 1996) boron, strontium (total), gross alpha, and gross beta results indicated positive (upward) boron concentration trends for upgradient well GW-231 and downgradient wells GW-143 and GW-145. Excluding obvious outliers in the boron data for each well, upward concentrations trends were indicated only for wells GW-231 and GW-145. Because upward concentration trends were evident both upgradient and downgradient

of the site, however, a release of boron from Kerr Hollow Quarry was not indicated (Lockheed Martin Energy Systems, Inc. 1997b).

5.0 SUMMARY AND CONCLUSIONS

This CY 1996 annual monitoring report contains the groundwater and surface water monitoring data obtained under the auspices of the Y-12 Plant GWPP for the multiple programmatic purposes of: (1) RCRA interim status assessment monitoring and RCRA post-closure corrective action monitoring at the Security Pits, (2) RCRA interim status and/or RCRA post-closure detection monitoring at the Sediment Disposal Basin and Kerr Hollow Quarry, (3) detection monitoring at nonhazardous SWDFs in accordance with operating permits and applicable regulations, (4) CERCLA monitoring in accordance with approved RODs for the United Nuclear Corporation Site and Kerr Hollow Quarry, and (5) monitoring performed at several sites as a best management practice of the Y-12 Plant GWPP.

Groundwater and surface water samples were collected from 72 monitoring wells, spring CBS-1, and Outfall 301 at Kerr Hollow Quarry. The sampling frequency for each location varied depending on the requirements of the governing monitoring program. Most of the groundwater and surface water samples were analyzed for a standard suite of analytical parameters, including principal ions, trace metals, VOCs, radiological parameters, and several miscellaneous field and laboratory measurements. Samples collected from some locations were analyzed for additional organics and radioanalytes.

Depth-to-water measurements recorded for 74 monitoring wells in the Chestnut Ridge Regime were used to evaluate seasonal groundwater flow directions in the Knox Aquifer. Flow directions at the Security Pits are primarily from west to east, with lesser components of flow to the north and south. Groundwater elevations in monitoring wells at the Sediment Disposal Basin indicate flow to the east and northeast, and flow directions at Kerr Hollow Quarry are generally south toward Melton Hill Reservoir.

Data obtained for RCRA post-closure detection monitoring purposes show that water levels in well GW-159 upgradient of the Sediment Disposal Basin do not fully recover between daily replicate sampling events, and that highly turbid groundwater samples were collected when water levels in the well were low. Also, redevelopment of the well in September 1996 to remove silt from the well casing and filter pack was not entirely successful. The Y-12 Plant GWPP is currently

reviewing available data to determine a replicate sampling frequency that will ensure representative sampling, and avoid collection of turbid groundwater samples.

Rates of groundwater flow at the Security Pits, Sediment Disposal Basin, and Kerr Hollow Quarry, estimated using the modified Darcy equation, are representative of diffuse flow (0.01 ft/yr) and conduit flow (84 ft/d) in the Knox Aquifer. However, the relatively limited extent of groundwater contamination in the Chestnut Ridge Regime suggests that natural attenuation processes greatly reduce contaminant transport relative to groundwater flow rates.

The CY 1996 monitoring results for RCRA point-of-compliance well GW-609 show that VOC concentrations in groundwater at the Security Pits continue to decrease and exhibit seasonal concentration fluctuations. A primary component of the VOC plume at the site (1,1,1-TCA) was detected in both samples collected from point-of-compliance well GW-796 (one of these results was screened as a false positive because of contamination in the associated trip blank). This compound has been detected in every sample collected from the well since May 1993. Repeated detection of 1,1,1-TCA in the groundwater at well GW-709 reflects strike-normal groundwater transport from the Security Pits.

Four of the RCRA target compounds specified for the Security Pits (chromium, lead, uranium, and gross beta) were detected in at least one of the CY 1996 groundwater samples collected from plume delineation wells GW-301, GW-557, GW-798, GW-801, and GW-831. Results for chromium (GW-557), lead (GW-301), and uranium (GW-831) exceed corresponding maximum values for background well GW-521, and the chromium and lead results exceed UTLs representative of maximum concentration expected for groundwater in the Knox Group. The elevated trace metal concentrations reported for wells GW-557 and GW-831 are probably analytical or sampling artifacts. Results for well GW-301 are less readily attributable to sampling or analytical bias, but are probably not indicative of contaminant migration from the Security Pits. These wells therefore remain effective for monitoring groundwater quality beyond the boundary of the dissolved VOC plume in groundwater at the Security Pits.

Results of statistical evaluations of the CY 1996 RCRA post-closure detection monitoring data for the Sediment Disposal Basin and Kerr Hollow Quarry did not reflect contaminant releases

from either site. This conclusion also was supported by quantitative trend analysis of selected RCRA target compounds specified for wells at Kerr Hollow Quarry.



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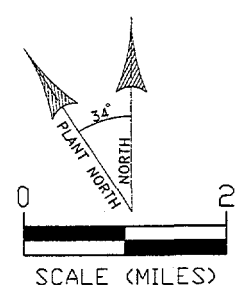
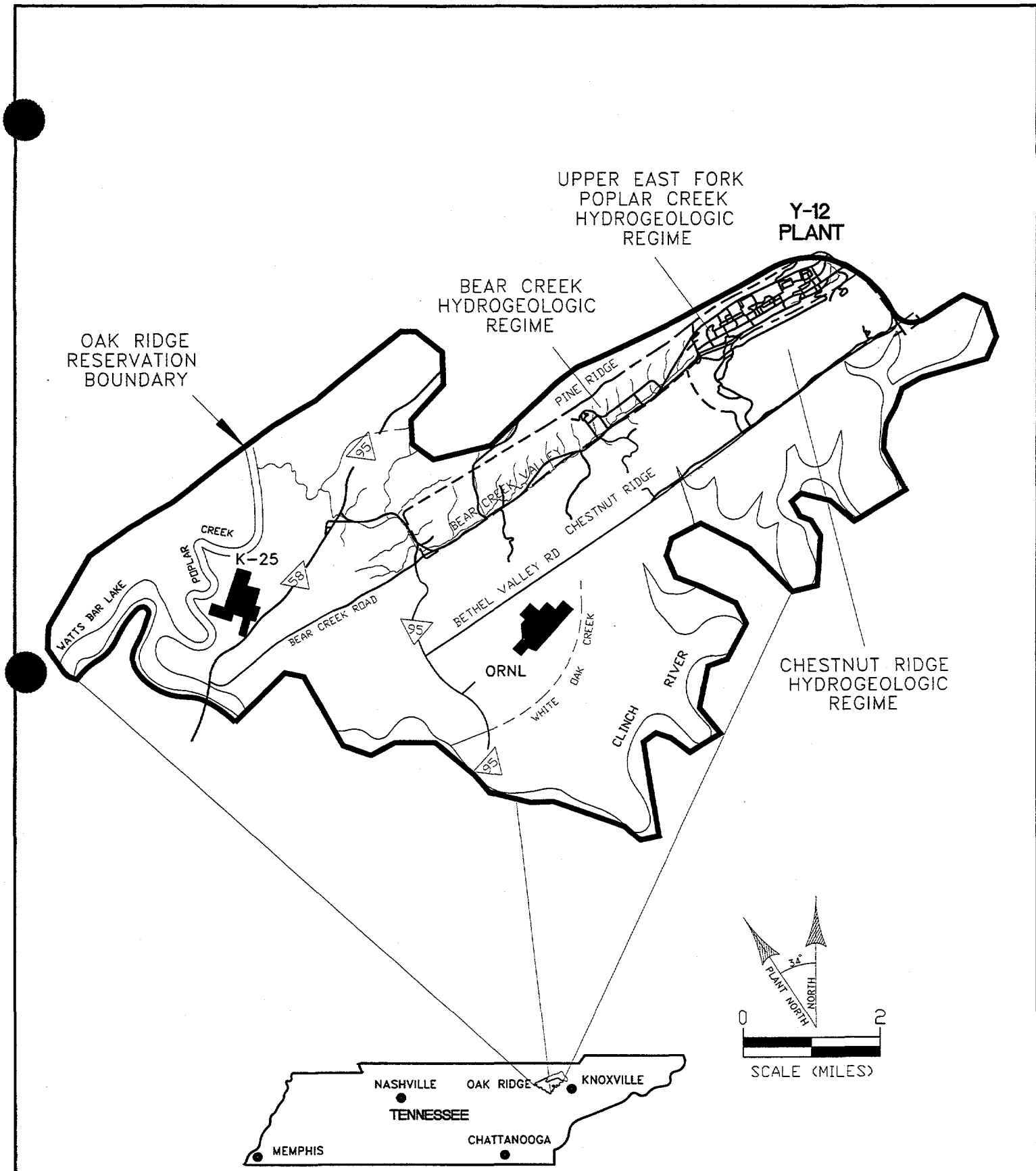
APPENDIX A

FIGURES



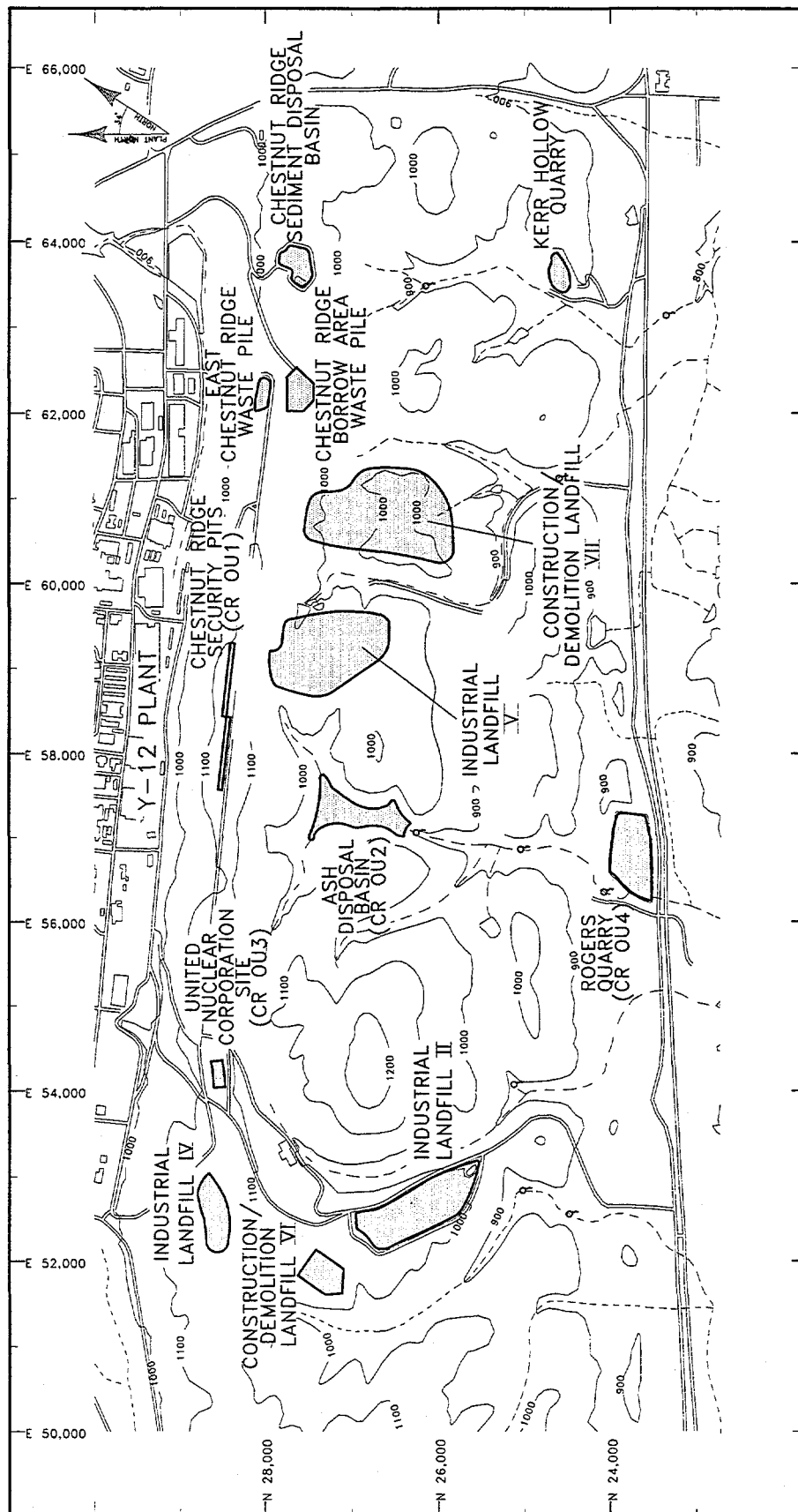






PREPARED FOR: LOCKHEED MARTIN ENERGY SYSTEMS, INC. PREPARED BY: AJA TECHNICAL SERVICES, INC.	LOCATION:	Y-12 PLANT OAK RIDGE, TN.	FIGURE 1 HYDROGEOLOGIC REGIMES AT THE Y-12 PLANT
	DOC NUMBER:	97-D003	
	DWG ID.:	97-007	
	DATE:	2-6-97	





2000
SCALE (ft)

EXPLANATION

— TOPOGRAPHIC CONTOUR

- - - SURFACE DRAINAGE FEATURE

○ SPRING

PREPARED FOR:
**LOCKHEED MARTIN
ENERGY SYSTEMS, INC.**

LOCATION: Y-12 PLANT
OAK RIDGE, TN.

FIGURE 2

**WASTE MANAGEMENT SITES IN THE
CHESTNUT RIDGE HYDROGEOLOGIC REGIME**

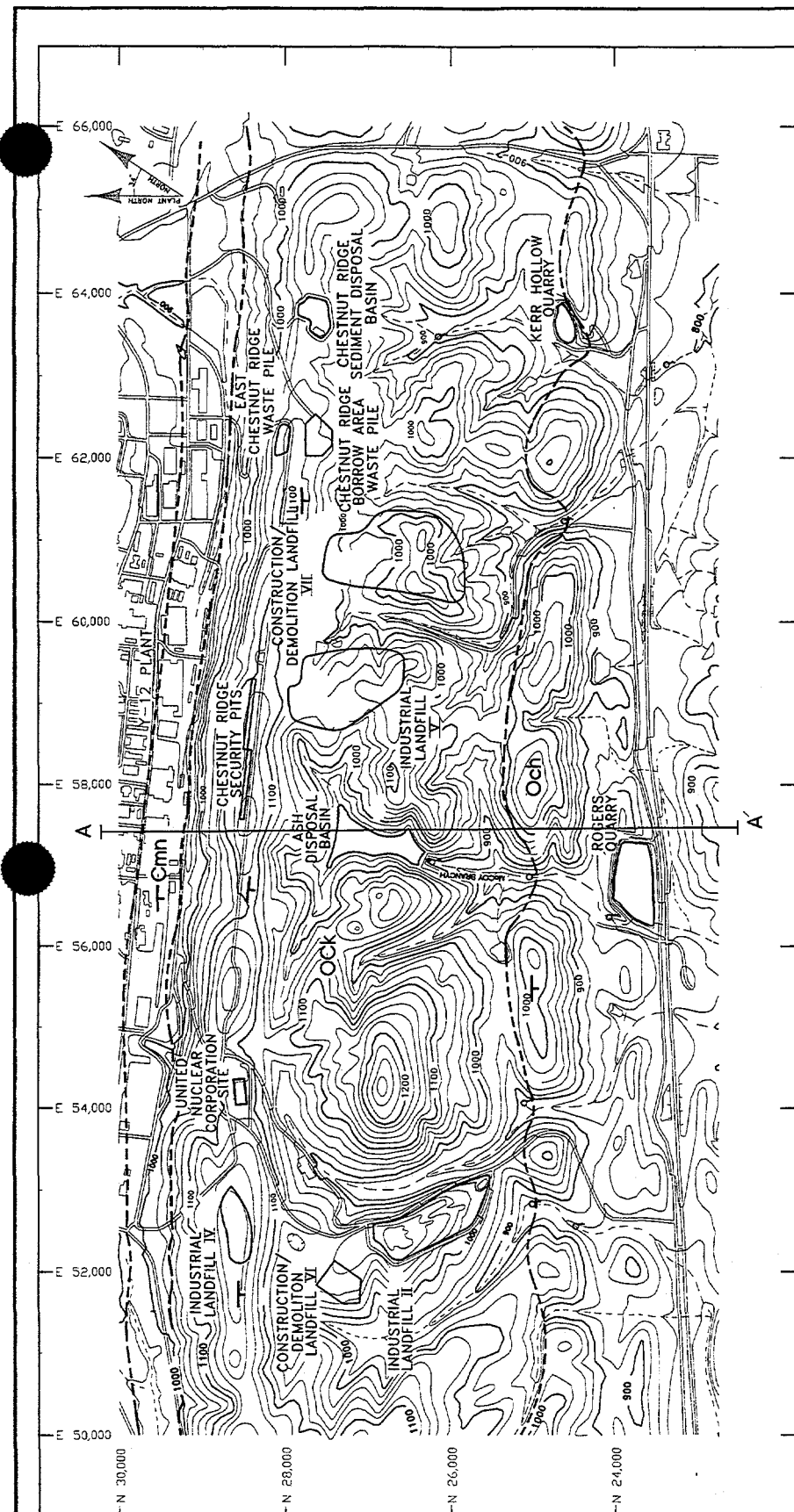
PREPARED BY:
**AJA TECHNICAL
SERVICES, INC.**

DOC NUMBER: 97-D001

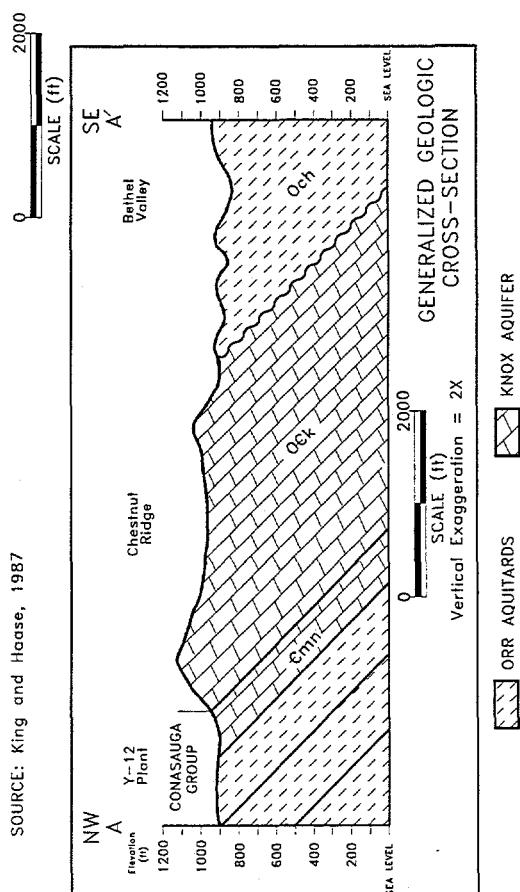
DWG ID.: 97-006

DATE: 2-13-97





SYSTEM	GROUP (Formation)	HYDRO UNIT	MAP SYMBOL	THICKNESS (FT)
UPPER ORDOVICIAN	CHICKAMAUGA (Undifferentiated)	ORR AQUITARDS	Och	1500 TO 2000
MIDDLE ORDOVICIAN	MISSING SECTION (Subaerial Erosion)			
LOWER ORDOVICIAN	KNOX (Undifferentiated)	KNOX AQUIFER	Ock	2500 TO 3000
CAMBRIAN	CONASAUGA (Waynadville Limestone)		Cmn	418 TO 450



SOURCE: King and Haase, 1987

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PREPARED BY:
AJA TECHNICAL
SERVICES, INC.

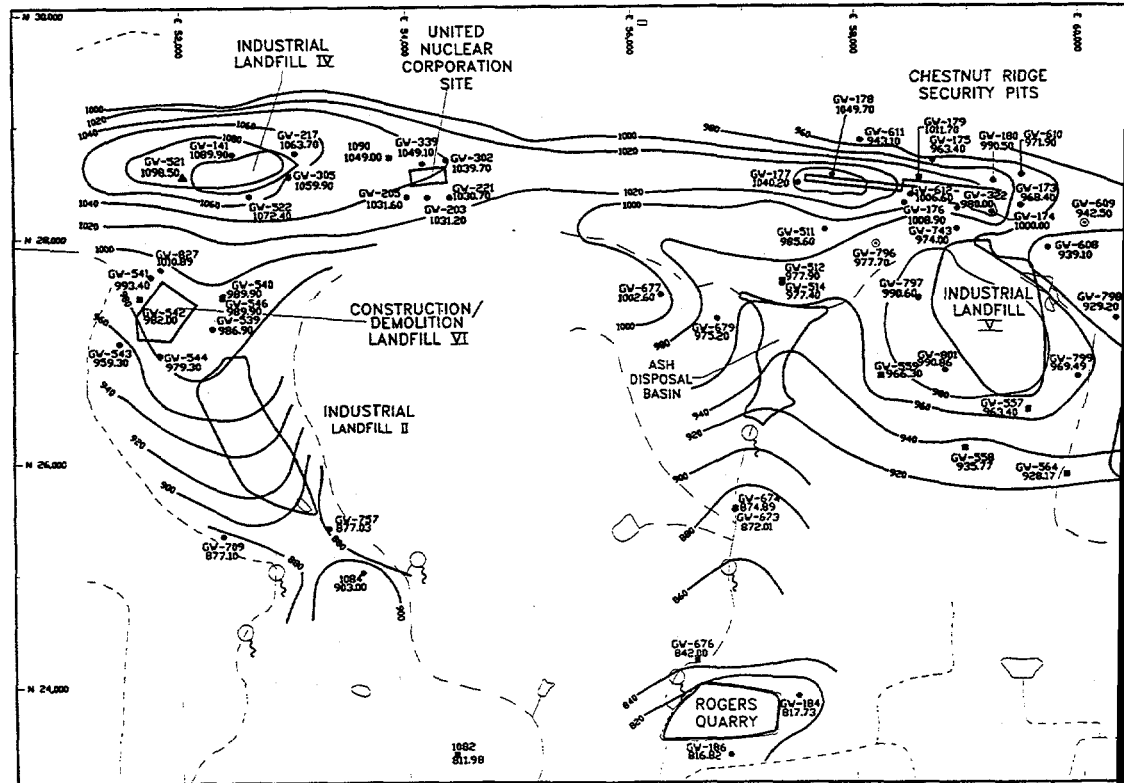
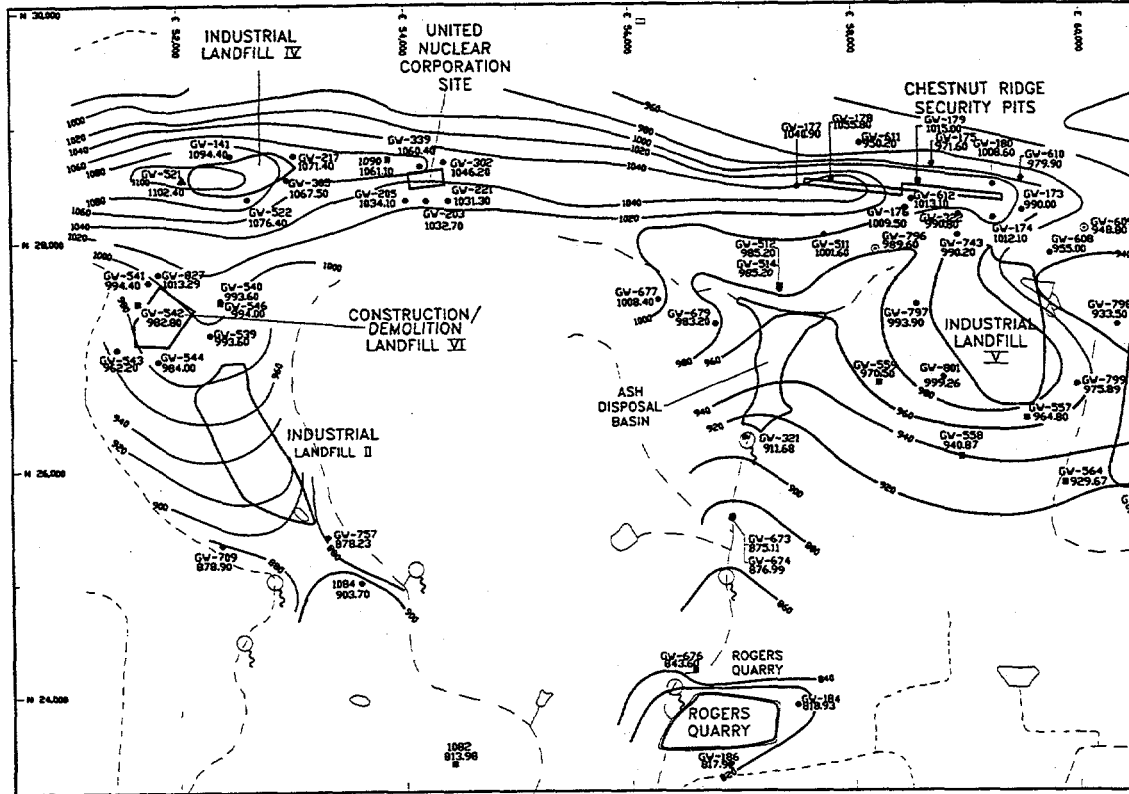
LOCATION: Y-12 PLANT
OAK RIDGE, TN.

DOC NUMBER: 97-D001
DWG ID.: 97-005
DATE: 1-12-97

FIGURE 3

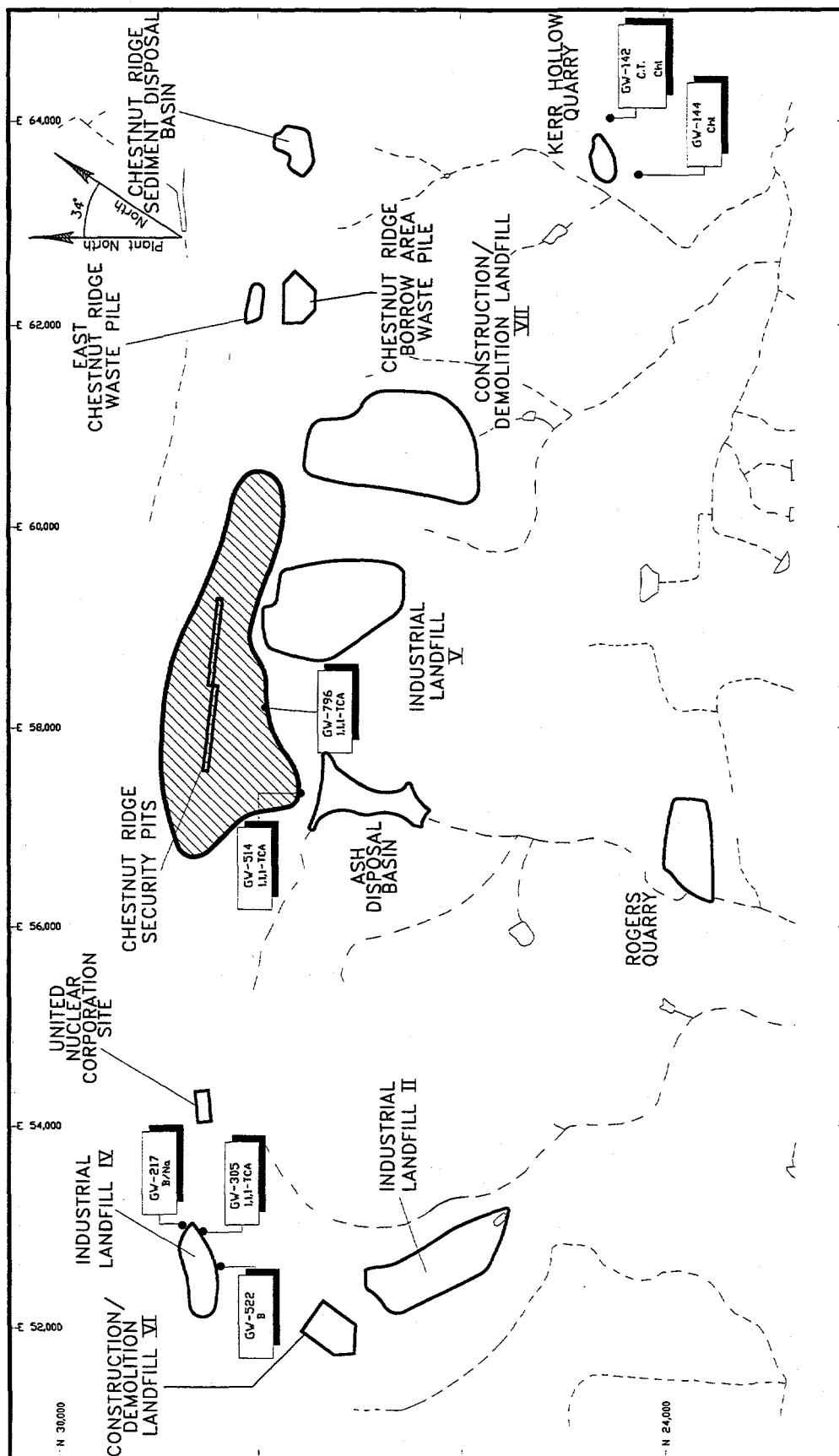
TOPOGRAPHY AND BEDROCK GEOLOGY
IN THE CHESTNUT RIDGE HYDROGEOLOGIC REGIME





EXPLANATION

- WATER TABLE MONITORING WELL
- BEDROCK INTERVAL MONITORING WELL
- ⊙ RCRA POINT-OF-COMPLIANCE MONITORING WELL
- ▲ RCRA BACKGROUND/UPGRADIENT MONITORING WELL
- 920 — WATER-LEVEL ISOPLETH (ft msl)
- - - SURFACE DRAINAGE FEATURE
- SPRING



1800
SCALE (FT)

EXPLANATION

- B --- Boron
 Na --- Sodium
 1,1,1-TCA --- 1,1,1-Trichloroethane
 C.T. --- Carbon Tetrachloride
 CH --- Chloroform
- Surface Drainage Feature
 --- Organic Compound Plume

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PREPARED BY:
**AJA TECHNICAL
SERVICES, INC.**

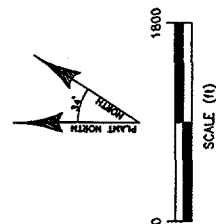
LOCATION: Y-12 PLANT
OAK RIDGE, TN.

DOC NUMBER: 97-001
DWG ID.: 97-004
DATE: 2-12-97

FIGURE 5

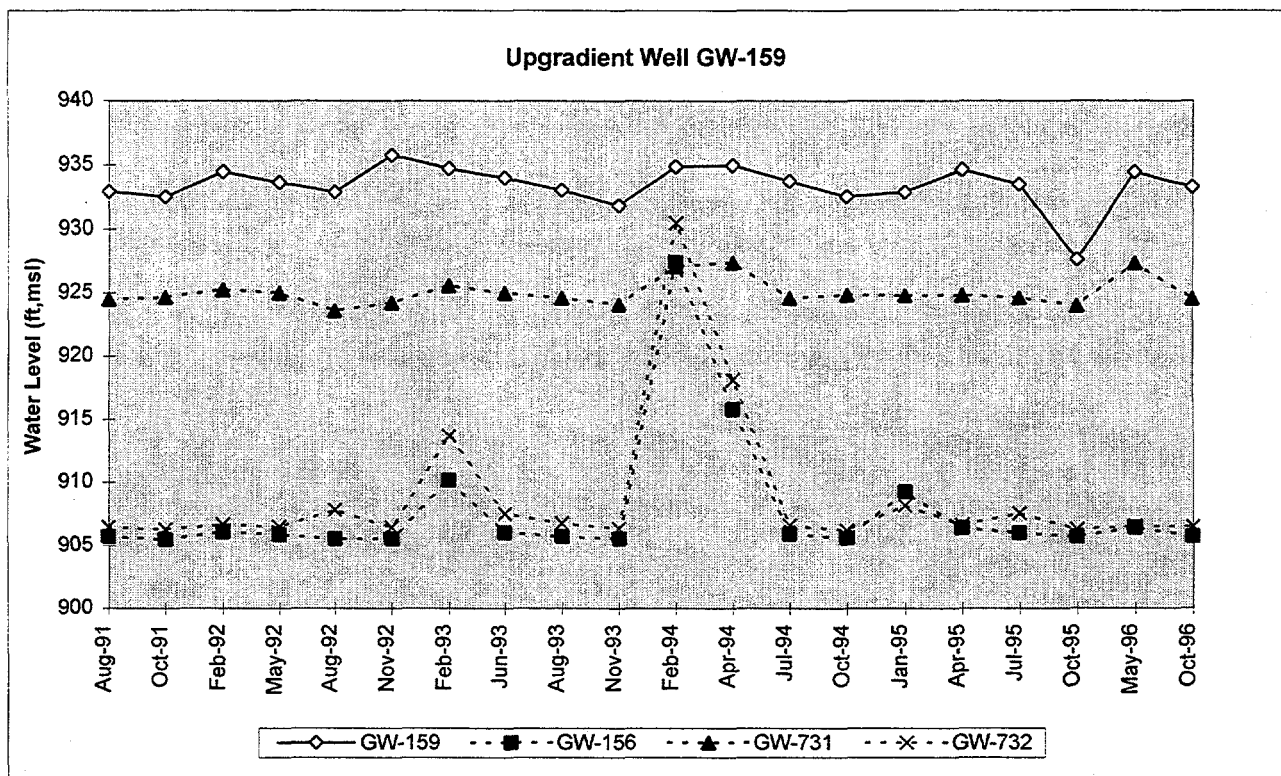
**GROUNDWATER CONTAMINATION IN THE
CHESTNUT RIDGE HYDROGEOLOGIC REGIME**





	MONITORING WELL	SURFACE DRAINAGE FEATURE
■	RCRA POINT-OF-COMPLIANCE MONITORING WELL	—
●	RCRA BACKGROUND\UPGRADIENT MONITORING WELL	—
▲	RCRA PLUME DELINEATION MONITORING WELL	—
★	RCRA PLUME DELINEATION MONITORING WELL	—
9	SPRING	—

A-6



PREPARED FOR:
**LOCKHEED MARTIN
 ENERGY SYSTEMS, INC.**

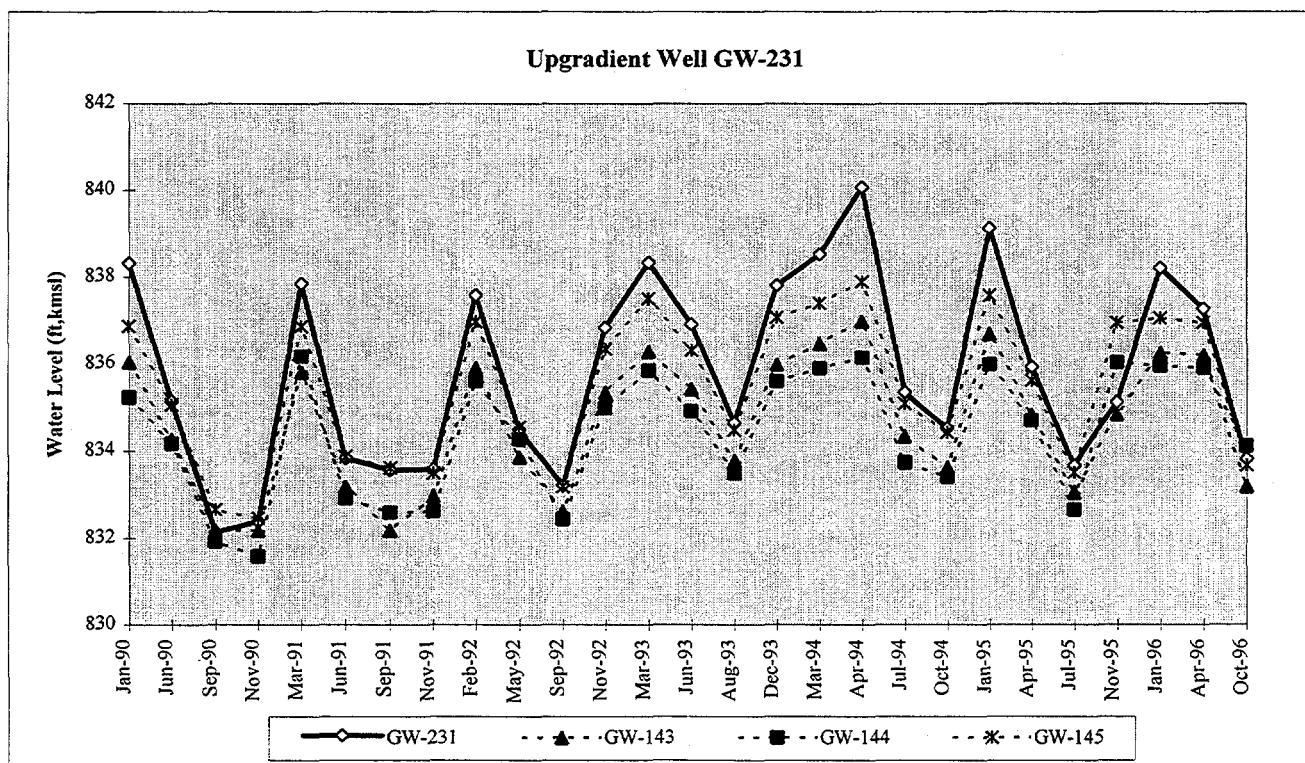
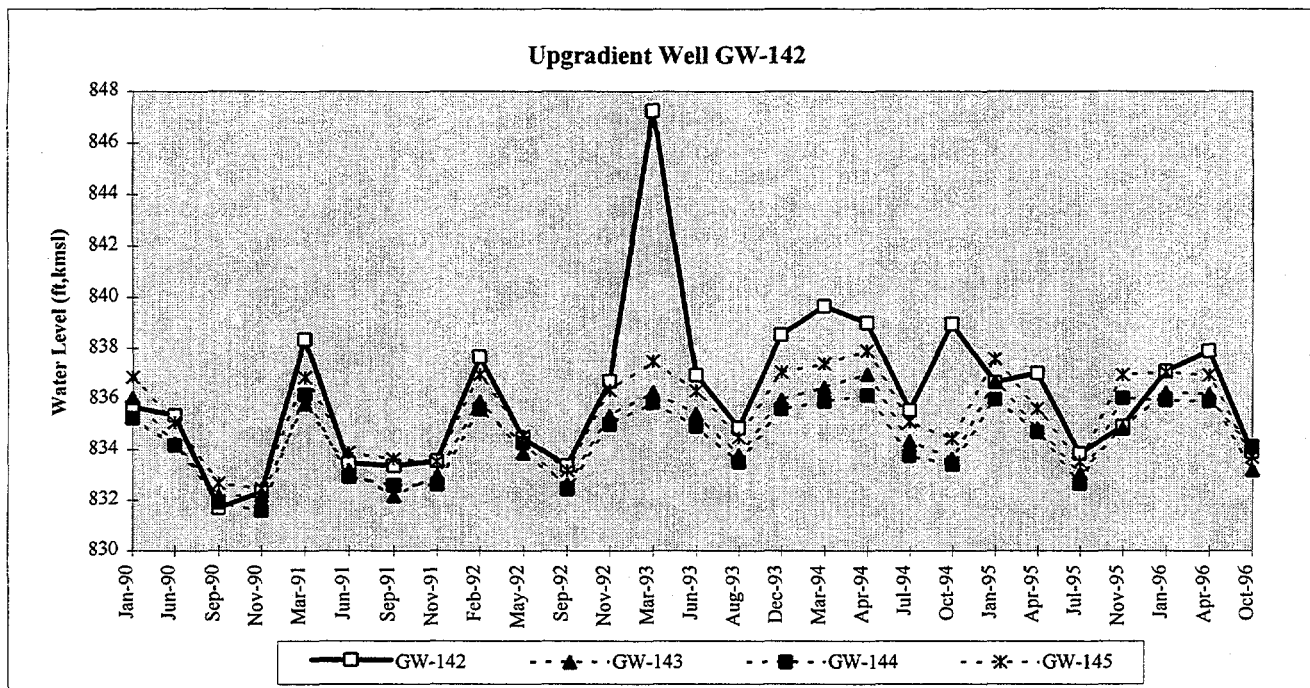
PREPARED BY:
**AJA TECHNICAL
 SERVICES, INC.**

LOCATION: Y-12 PLANT
 OAK RIDGE, TN.

DOC NUMBER: 97-D001
 DWG ID.: 97-003
 DATE: 1-12-97

FIGURE 7

**WATER-LEVEL HYDROGRAPHS FOR RCRA
 POST-CLOSURE DETECTION MONITORING WELLS
 AT THE CHESTNUT RIDGE SEDIMENT DISPOSAL BASIN**



PREPARED FOR:
**LOCKHEED MARTIN
ENERGY SYSTEMS, INC.**

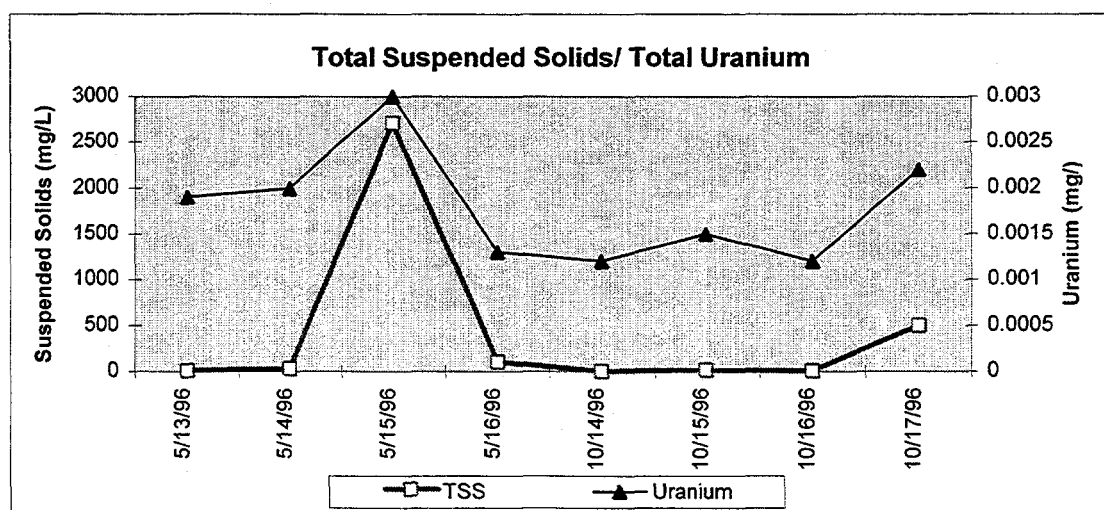
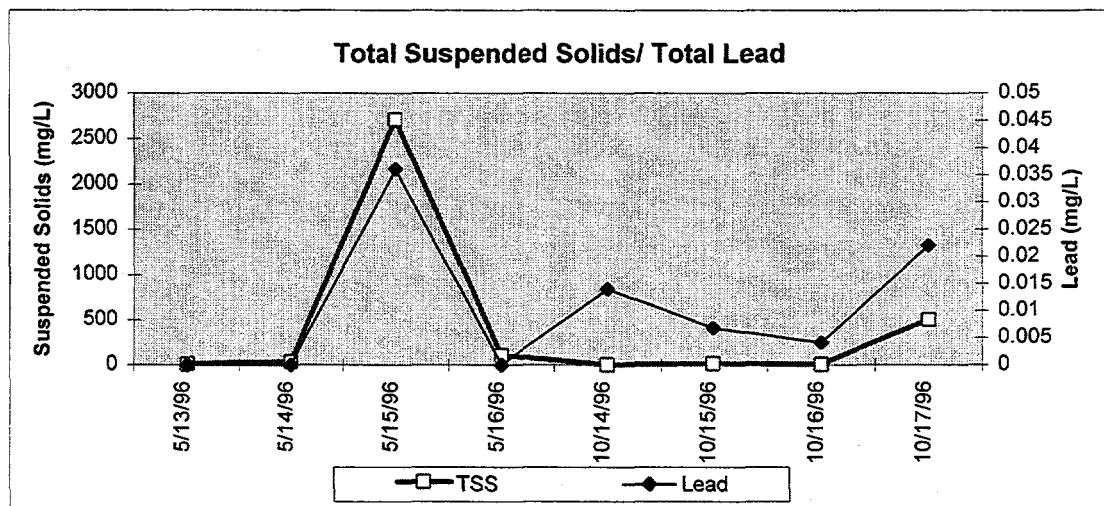
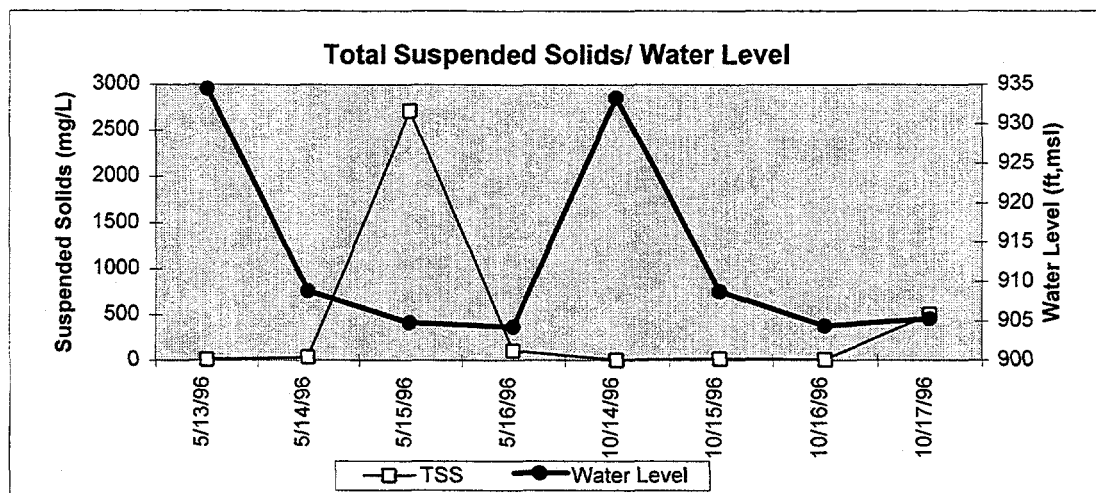
PREPARED BY:
**AJA TECHNICAL
SERVICES, INC.**

LOCATION: Y-12 PLANT
OAK RIDGE, TN.

DOC NUMBER: 97-D001
DWG ID.: 97-003
DATE: 1-12-97

FIGURE 8

**WATER-LEVEL HYDROGRAPHS FOR RCRA
POST-CLOSURE DETECTION MONITORING WELLS
AT KERR HOLLOW QUARRY**



PREPARED FOR:
**LOCKHEED MARTIN
ENERGY SYSTEMS, INC.**

PREPARED BY:

**AJA TECHNICAL
SERVICES, INC.**

LOCATION: Y-12 PLANT
OAK RIDGE, TN.

DOC NUMBER: 97-D001

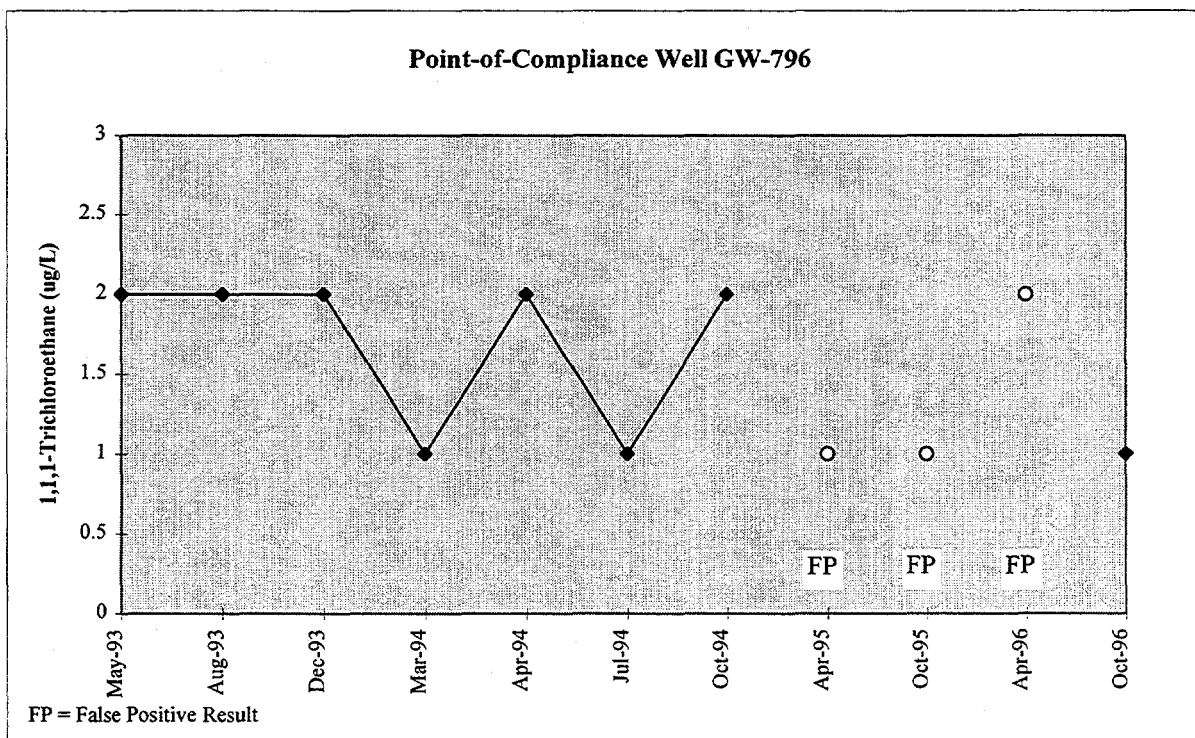
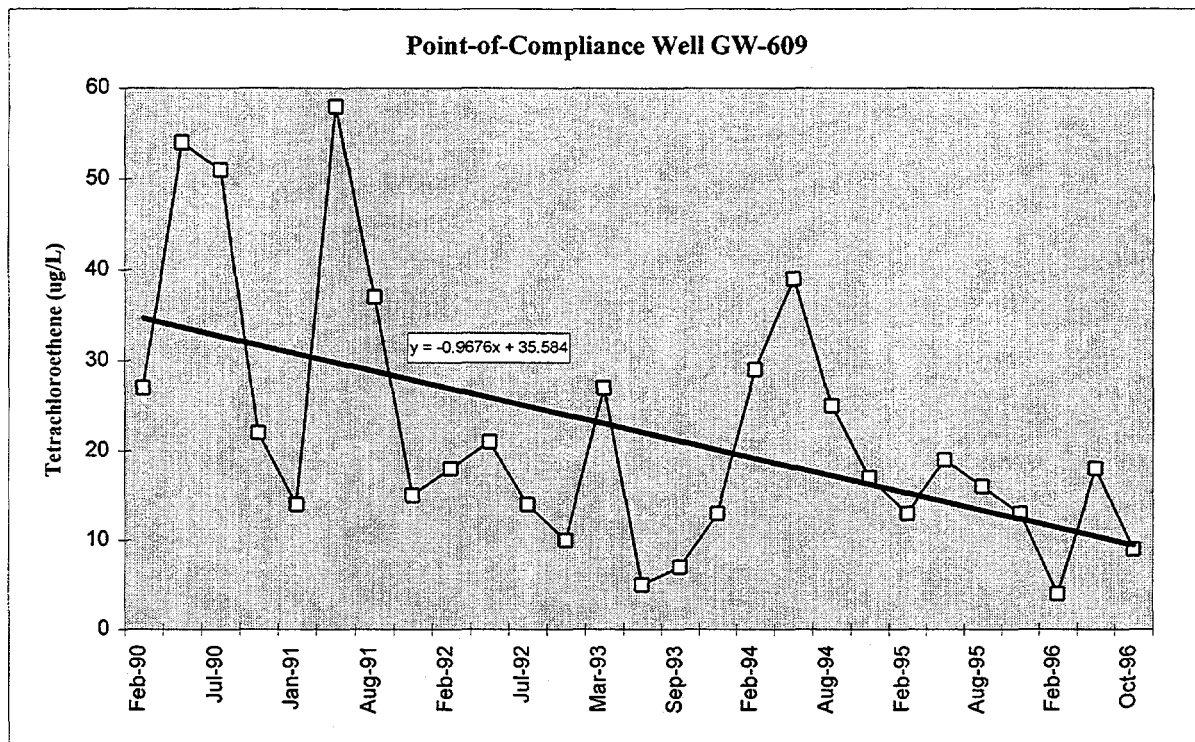
DWG ID.: 97-003

DATE: 1-12-97

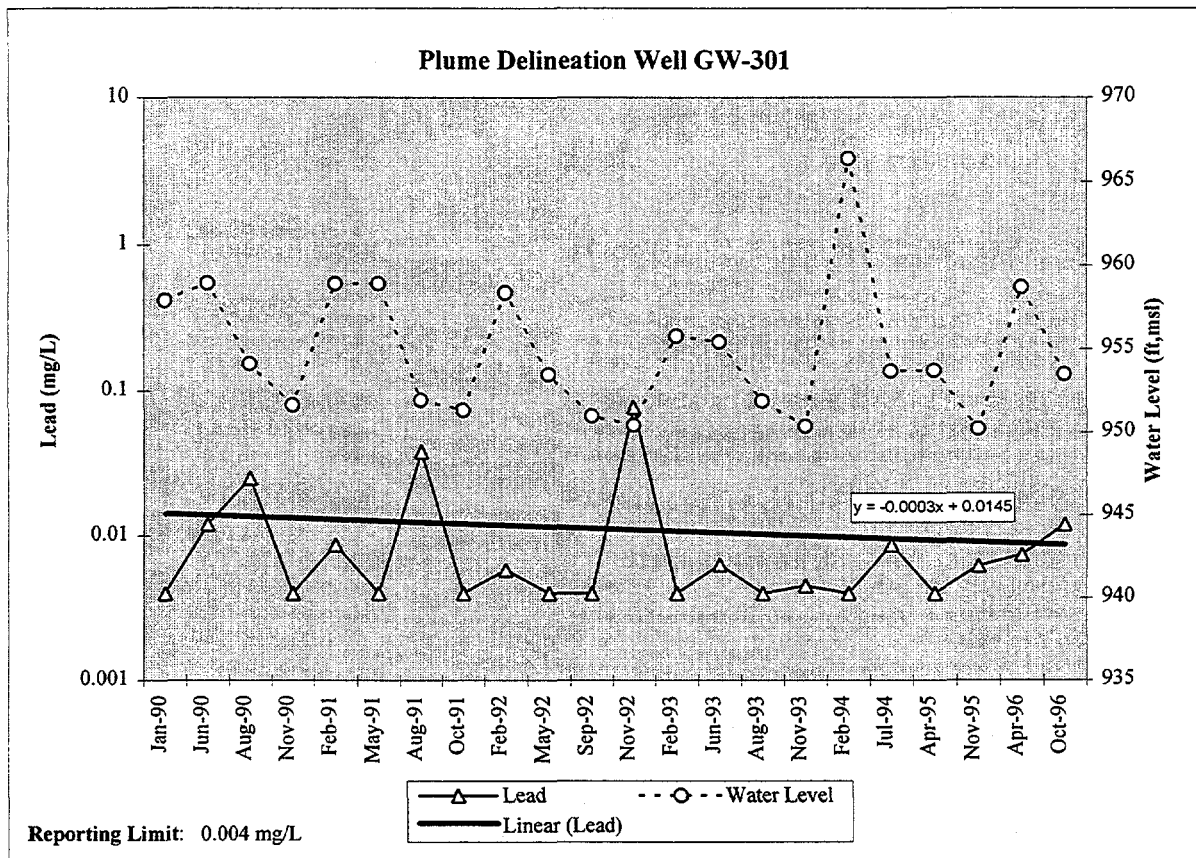
FIGURE 9

**TOTAL SUSPENDED SOLIDS AND SELECTED
TRACE METAL CONCENTRATIONS REPORTED FOR
UNFILTERED GROUNDWATER SAMPLES FROM WELL
GW-159 AT THE CHESTNUT RIDGE
SEDIMENT DISPOSAL BASIN**





PREPARED FOR: LOCKHEED MARTIN ENERGY SYSTEMS, INC. PREPARED BY: AJA TECHNICAL SERVICES, INC.	LOCATION:	Y-12 PLANT OAK RIDGE, TN.	FIGURE 10 CONCENTRATIONS OF SELECTED VOCs REPORTED FOR GROUNDWATER SAMPLES FROM RCRA POINT-OF-COMPLIANCE WELLS GW-609 AND GW-796, 1990-1996
	DOC NUMBER:	97-D001	
	DWG ID.:	97-003	
	DATE:	1-12-97	



PREPARED FOR:
**LOCKHEED MARTIN
 ENERGY SYSTEMS, INC.**

PREPARED BY:
**AJA TECHNICAL
 SERVICES, INC.**

LOCATION: Y-12 PLANT
 OAK RIDGE, TN.

DOC NUMBER: 97-D001
 DWG ID.: 97-003
 DATE: 2-12-97

FIGURE 11

**LEAD CONCENTRATIONS
 REPORTED FOR UNFILTERED GROUNDWATER
 SAMPLES FROM RCRA PLUME DELINEATION WELL
 GW-301, 1990-1996**

APPENDIX B

TABLES

Table 1.
Index of Post-Closure Permit Requirements for Groundwater Monitoring at the
Chestnut Ridge Security Pits, Chestnut Ridge Sediment Disposal Basin,
and Kerr Hollow Quarry.

SECTION OF ANNUAL MONITORING REPORT				
Groundwater Monitoring Requirement	RCRA Post-Closure Corrective Action Monitoring	RCRA Post-Closure Detection Monitoring		
	Chestnut Ridge Security Pits	Chestnut Ridge Sediment Disposal Basin	Kerr Hollow Quarry	
Well Network/Sampling Frequency	V.A; V.C; V.G.2	IV.A; IV.C; IV.G.1	VI.A; VI.C	3.0
Well Installation	V.B.4	Not Applicable	Not Applicable	3.1.1
Upgradient Wells	V.C.1	IV.C.1	VI.C.1	3.1.1 3.1.2
Point-of-Compliance Wells	V.C.2	IV.C.1	VI.C.1	3.1.1 3.1.2
Plume Delineation Wells	V.C.1	Not Applicable	Not Applicable	3.1.1
Sampling and Analysis	V.E; V.G.1	IV.D; IV.G.1	VI.D; IV.G.1	3.0
Sample Collection	V.E.1	IV.D.1	VI.D.1	3.2
Sample Preservation	V.E.2	IV.D.2	VI.D.2	3.2
Sample Transportation	V.E.3	IV.D.3	VI.D.3	3.2
Chain-of-Custody Control	V.E.4	IV.D.4	VI.D.4	3.2
Analytical Parameters	V.C.1 and 2	IV.C.1	VI.C.1	3.3
Analytical Methods	V.E.5	IV.D.5	VI.D.5	3.3
Groundwater Surface Elevation	V.F	IV.E	VI.E	3.2
Data Evaluation	V.D; V.G	IV.F; IV.G	VI.F; VI.G	4.0
Groundwater Flow Direction/Rate	V.G.3	IV.G.3	VI.G.3	4.1
Plume Delineation Evaluation	V.D.2	Not Applicable	Not Applicable	4.3
Point-of-Compliance Evaluation	V.D.3	IV.G.6	VI.G.6	4.2
Statistical Evaluation	Not Applicable	IV.F Attachment 2, Sect. H	VI.F Attachment 4, Sect. H	4.4
Quantitative Trend Analysis	Not Applicable	Not Applicable	VI.F Attachment 4, Sect. H	4.4.2

Table 2.

Waste Management Sites and Associated Groundwater Monitoring Programs in the Chestnut Ridge Hydrogeologic Regime

GROUNDWATER MONITORING PROGRAM		RCRA Interim Status Assessment/RCRA Post-Closure Corrective Action Monitoring ¹										
		RCRA Interim Status Detection/RCRA Post Closure Detection Monitoring ²										
		SWDF Detection Monitoring ³										
		CERCLA Record of Decision Monitoring ⁴										
Waste Management Site		Regulatory Classification	General Waste Inventory	Best Management Practice Monitoring ⁵			Operation	Active	Closed			
				Status								
Chestnut Ridge Sediment Disposal Basin (CRSDB)	RCRA/ CERCLA	Approximately 11,100 yd ³ of sediments from the Y-12 Plant containing heavy metals; approximately 100,000 gallons of methanol-brine waste (70/30% water/methyl alcohol); and 55-110 gallons of toluene.	1973-1987						●			●
East Chestnut Ridge Waste Pile (ECRWP)	RCRA/ CERCLA	Contaminated soil from the Y-12 Plant.	1987						●			
Kerr Hollow Quarry (KHQ)	RCRA/ CERCLA	Approximately 50 tons of water-reactive materials (alkali metals, metal hydrides); unstable organic materials (picric acid, ethers, peroxides, and hydrazone); reactive metals (phosphorous and magnesium); potentially explosive materials (e.g., gas cylinders); ammonia; and inorganic acids.	1951-1988						●			●
Chestnut Ridge Security Pits (CRSP)	RCRA/ CERCLA	Metals (lead); reactive materials (lithium hydride, lithium deuteride, zirconium); corrosive materials (acids); ignitable materials (alcohols); and chlorinated solvents.	1973-1988						●			●
Ash Disposal Basin (ADB)	CERCLA	Coal fly-ash slurry from the Y-12 Steam Plant.	1955-1967						●			
United Nuclear Corporation Site (UNCS)	CERCLA	Approximately 11,000 drums (55-gallon) of sludge fixed in cement, 18,000 drums of contaminated soil, and 288 boxes of contaminated process and demolition material.	1982-1984						●			
Rogers Quarry (RQ)	CERCLA	Coal fly-ash slurry that bypassed the Ash Disposal Basin via spillway into McCoy Branch.	1967-1993						●			

Table 2 (cont'd)

GROUNDWATER MONITORING PROGRAM		RCRA Interim Status Assessment/RCRA Post-Closure Corrective Action Monitoring ¹									
		RCRA Interim Status Detection/RCRA Post Closure Detection Monitoring ²									
		SWDF Detection Monitoring ³									
		CERCLA Record of Decision Monitoring ⁴									
		Best Management Practice Monitoring ⁵									
Waste Management Site	Regulatory Classification	General Waste Inventory	Operation	Active	Closed	Status					
Chestnut Ridge Borrow Area Waste Pile (CRBAWP)	CERCLA	Soils removed from the Oak Ridge Civic Center properties and the Oak Ridge Sewer Line Beltway contaminated with mercury and other metals, and possibly some organic compounds, that originated from the Y-12 Plant.	Mid-1980's		●			●			
Industrial Landfill II (LII)	SWDF	Combustible and decomposable solid waste and construction spoil material including scrap metal, glass, paper products, plastics, wood, organic garbage, textile products, asphalt roofing materials, and special wastes such as asbestos and beryllium oxide.	1986-1996		●				●		
Industrial Landfill IV (LIV)	SWDF	Approximately 12,000 ft ³ per year of non-hazardous, nonradioactive industrial wastes including: cardboard, plastics, rubber, scrap metal, wood, paper, and special waste.	1989-	●					●		
Industrial Landfill V (LV)	SWDF	Combustible/decomposable solid wastes.	1994-	●					●		
Construction/Demolition Landfill VI (CDLVI)	SWDF	Construction spoil: concrete, wood, metal, plastic, roofing materials; soil.	1994-	●					●		
Construction/Demolition Landfill VII (CDLVII)	SWDF	No wastes employed to date.	1994						●		

Notes:

- 1 Groundwater quality assessment monitoring in accordance with Resource Conservation and Recovery Act (RCRA) interim status regulations, and RCRA post-closure corrective action monitoring per the requirements specified in the RCRA post-closure permit for the Chestnut Ridge Regime.

Table 2 (cont'd)

Notes: (cont'd)

- 2 Detection monitoring in accordance with RCRA interim status regulations, and RCRA post-closure detection monitoring per the applicable requirements of the RCRA post-closure permit for the Chestnut Ridge Regime.
- 3 Detection monitoring in accordance with operating permits issued by the Tennessee Department of Environment and Conservation for the specified non-hazardous solid waste disposal facility (SWDF) and applicable TDEC solid waste management regulations.
- 4 Monitoring in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Record of Decision for the specified facility.
- 5 Monitoring performed as a best management practice of the Y-12 Plant Groundwater Protection Program.

Table 3.
**Summary of CY 1996 Sampling and Analysis Plan Addenda for Groundwater
and Surface Water Monitoring in the Chestnut Ridge Hydrogeologic Regime**

Addendum No.	Effective Date	Modification to the CY 1996 Sampling and Analysis Plan (SAP) ¹
96-01	01/01/96	Corrected the administrative parameter group X4 defined in the SAP.
96-06	01/04/96	Added trace metals to the suite of analytical parameters for wells GW-177, GW-301, and GW-514.
96-07	01/04/96	Modified the suite of analytes for equipment rinsate samples associated with monitoring wells at Landfill IV (administrative well group CR 1).
96-10	01/04/96	Added lithium to the suite of Inductively Coupled Plasma (ICP) analytes included in SAP administrative parameter group MET(1).
96-12	02/07/96	Specified the CERCLA Record of Decision (ROD) sampling and analysis requirements for Outfall 301, and added the outfall to the administrative well group (CR 7) for Kerr Hollow Quarry.
96-18	04/18/96	Added 1,2-dibromoethane to the suite of volatile organic compounds (VOCs) required for monitoring wells at Industrial Landfills II, IV, and V and Construction/Demolition Landfills VI and VII, per revised solid waste management regulations issued by the Tennessee Department of Environment and Conservation (TDEC).
96-20	04/01/96	Discontinued quarterly sampling of wells GW-175, GW-177, GW-611, GW-610, GW-742, and GW-743 for RCRA interim status assessment monitoring at the Chestnut Ridge Security Pits (Security Pits).
96-21	04/01/96	Changed the sampling frequency for well GW-521 from semiannual to quarterly.
96-22	04/01/96	Specified the sampling and analysis requirements for well GW-609, the point-of-compliance well for CY 1996 RCRA post-closure corrective action monitoring at the Security Pits.
96-23	06/04/96	Created administrative parameter group RAD(11) to address the Y-12 Plant Environmental Restoration Program request to streamline the radiological analytes for monitoring wells at the United Nuclear Corporation Site (administrative parameter group CR 2).
96-24	06/04/96	Required resampling of wells GW-557, GW-560, and GW-562 at Industrial Landfill V (administrative well group CR 12).
96-25	06/04/96	Added trans-1,4-dichloro-2-butene to the suite of organic analytes for wells at Industrial Landfills II, V, and IV, and Construction/Demolition Landfill VII, per revised solid waste management regulations issued by the TDEC.
96-30	07/02/96	Discontinued quarterly RCRA interim status detection monitoring at Kerr Hollow Quarry.
96-31	07/02/96	Specified the sampling and analysis requirements for RCRA post-closure detection monitoring at Kerr Hollow Quarry.

Table 3 (cont'd)

Addendum No.	Effective Date	Modification to the CY 1996 Sampling and Analysis Plan (SAP) ¹
96-34	07/01/96	Required Plasma Mass Spectroscopy instead of Atomic Absorption Spectroscopy for lead and thallium analyses included under administrative parameter groups MET(2) and MET(3).
96-35	08/12/96	Specified sampling and analysis requirements for a new well (GW-831) added to the RCRA post-closure corrective action monitoring network at the Security Pits (administrative well group CR 3).
96-37	08/06/96	Required collection of a sample from Outfall 301 at Kerr Hollow Quarry during the fourth quarter of 1996.
96-39	09/05/96	Discontinued sampling performed as a best-management practice at the East Chestnut Ridge Waste Pile, Chestnut Ridge Borrow Area Waste Pile, Ash Disposal Basin, Rogers Quarry, and the Above Ground Low Level Storage Facility (administrative well groups CR 4, CR 5, CR 8, CR 9, and BC 7).
96-40	09/05/96	Reassigned well GW-301 from administrative well group CR 5 (Chestnut Ridge Borrow Area Waste Pile) to administrative well group CR 3 (Security Pits).
96-41	09/05/96	Reassigned a field blank sample from administrative well group CR 3 to administrative well group EF 7.
96-44	10/01/96	Specified a revised analytical protocol for VOCs, and combined the suites of VOCs included in administrative parameter groups VOC(1) and VOC(2).
96-45	10/01/96	Specified the revised suite of analytical parameters approved by the TDEC for wells (and associated equipment rinsate samples) at Industrial Landfill V and Construction/Demolition Landfill VII, and created a new administrative well group (CR 13).
96-46	10/01/96	Specified the revised suite of analytical parameters approved by the TDEC for wells (and associated equipment rinsate samples) at Industrial Landfills II and IV (administrative well groups CR 1 and CR 10).
96-47	10/01/96	Discontinued sampling of three wells (GW-540, GW-541, and GW-546) at Construction Demolition Landfill VI, and specified the revised suite of analytical parameters approved by the TDEC for the remaining wells at the site (GW-542, GW-543, GW-544, and GW-827).
96-48	09/01/96	Modified administrative parameter group MET(1) to specify Plasma Mass Spectroscopy for arsenic analyses.
96-49	11/25/96	Required resampling well GW-562 at Industrial Landfill V during the fourth quarter of 1996 for metals.
96-50	12/17/96	Required resampling wells GW-542, GW-543, GW-544, and GW-827 at Construction/Demolition Landfill VI for VOC analyses.
96-51	12/26/96	Required resampling well GW-539 at Industrial Landfill III during the fourth quarter of 1996 for metals.

Table 3 (cont'd)

Note:

- 1 *Sampling and Analysis Plan for Groundwater and Surface Water Monitoring at the Y-12 Plant During Calendar Year 1996* (HSW Environmental Consultants, Inc. 1995b). The addenda listed are those which resulted in modifications to the sampling and analysis plan. Other addenda were issued to document administrative requirements of the Y-12 Plant GWPP.

Table 4.
CY 1996 Groundwater and Surface Water Sampling Dates

Groundwater Monitoring Program ¹		RCRA Interim Status Assessment (▲)/RCRA Post-Closure Corrective Action Monitoring (●)									
		RCRA Interim Status (▲)/Post-Closure Detection Monitoring (●)									
		SWDF Detection Monitoring									
		CERCLA Record of Decision Monitoring									
		Best Management Practice Monitoring									
Sampling Point ²	Sampling Location ³	Sampling Date ⁴									
		1st Quarter	2nd Quarter	3rd Quarter	4th Quarter						
1090	UNCS	.	04/23/96	.	10/30/96		●				
GW-141	LIV	01/04/96	.	07/02/96	.			●			
GW-142	KHQ	01/04/96	04/17/96	.	10/21 - 24/96				▲		
GW-143	KHQ	01/18/96	04/23/96	.	10/21 - 24/96				●		
GW-144	KHQ	01/22/96	04/24/96	.	10/21 - 24/96				▲		
GW-145	KHQ	01/23/96	04/25/96	.	10/21 - 24/96				●		
GW-146	KHQ	01/18/96	04/25/96	.	.				▲		
GW-147	KHQ	01/10/96	04/18/96	.	.				▲		
GW-156	CRSDB	.	05/13 - 17/96	.	10/14 - 17/96				●		
GW-159	CRSDB	.	05/13 - 17/96	.	10/14 - 17/96				●		
GW-160	CRBAWP	.	04/29/96	.	.	●					
GW-161	CRBAWP	.	04/26/96	.	.	●					
GW-174	CRSP	.	.	08/19/96	.	●					
GW-175	CRSP	02/25/96	.	.	.					▲	
GW-177	CRSP	02/25/96	.	.	.					▲	
GW-184	RQ	.	04/30/96	.	.	●					
GW-186	RQ	.	05/01/96	.	.	●					
GW-187	RQ	.	04/30/96	.	.	●					
GW-188	RQ	.	04/30/96	.	.	●					
GW-203	UNCS	.	04/17/96	.	10/28/96		●				
GW-205	UNCS	.	04/19/96	.	10/28/96		●				
GW-217	LIV	01/03/96	.	07/01/96	.			●			
GW-221	UNCS	.	04/22/96	.	10/29/96		●				
GW-231	KHQ	01/10/96	04/18/96	.	10/21 - 24/96				▲		
GW-292	ECRWP	.	05/08/96	.	.	●					
GW-293	ECRWP	.	05/08/96	.	.	●					
GW-294	ECRWP	.	05/02/96	.	.	●					
GW-296	ECRWP	.	05/02/96	.	.	●					

Table 4 (cont'd)

Groundwater Monitoring Program ¹		RCRA Interim Status Assessment (▲)/RCRA Post-Closure Corrective Action Monitoring (●)									
		RCRA Interim Status (▲)/Post-Closure Detection Monitoring (●)									
		SWDF Detection Monitoring									
		CERCLA Record of Decision Monitoring									
		Best Management Practice Monitoring									
Sampling Point ²	Sampling Location ³	Sampling Date ⁴									
		1st Quarter	2nd Quarter	3rd Quarter	4th Quarter						
GW-298	CRBAWP	.	05/01/96	.	.	●					
GW-299	CRBAWP	.	04/30/96	.	.	●					
GW-300	CRBAWP	.	04/30/96	.	.	●					
GW-301	CRBAWP	.	04/30/96	.	10/01/96	●					●
GW-302	UNCS	.	04/23/96	.	10/30/96		●				
GW-305	LIV	01/17/96	.	07/08/96	.			●			
GW-321	ADB	.	04/29/96	.	.	●					
GW-339	UNCS	.	04/22/96	.	10/29/96		●				
GW-512	ADB	.	05/02/96	.	.	●					
GW-513	ADB	.	04/29/96	.	.	●					
GW-514	ADB	.	05/03/96	.	.	●					
GW-521	LIV	01/16/96	04/16/96	07/02/96	10/01/96			●			●
GW-522	LIV	01/17/96	.	07/08/96	.			●			
GW-539	LII	.	04/02/96	.	11/04/96			●			
GW-540	CDLVI	.	04/09/96	.	.			●			
GW-541	CDLVI	.	04/15/96	.	.			●			
GW-542	CDLVI	.	04/16/96	.	11/05/96			●			
GW-543	CDLVI	.	04/16/96	.	11/06/96			●			
GW-544	CDLVI	.	04/16/96	.	11/06/96			●			
GW-546	CDLVI	.	04/09/96	.	.			●			
GW-557	LV	.	04/04/96	06/03/96	10/02/96			●			●
GW-560	CDLVII	.	04/02/96	06/03/96	10/02/96			●			
GW-562	CDLVII	.	04/02/96	06/03/96	10/02/96 11/25/96			●			
GW-564	CDLVII	.	04/04/96	.	10/03/96			●			
GW-608	CRSP	01/29/96	.	.	.						▲
GW-609	CRSP	02/25/96	04/16/96	.	10/07/96						▲ ●
GW-610	CRSP	02/23/96	.	.	.						▲
GW-611	CRSP	02/25/96	.	.	.						▲
GW-612	CRSP	.	.	08/29/96	.	●					
GW-709	LII	.	04/02/96	.	11/05/96			●			
GW-731	CRSDB	.	05/13-17/96	.	10/14 - 17/96				●		
GW-732	CRSDB	.	05/13-17/96	.	10/14 - 17/96				●		

Table 4 (cont'd)

Groundwater Monitoring Program ¹		RCRA Interim Status Assessment (▲)/RCRA Post-Closure Corrective Action Monitoring (●)									
		RCRA Interim Status (▲)/Post-Closure Detection Monitoring (●)									
		SWDF Detection Monitoring									
		CERCLA Record of Decision Monitoring									
		Best Management Practice Monitoring									
Sampling Point ²	Sampling Location ³	Sampling Date ⁴									
		1st Quarter	2nd Quarter	3rd Quarter	4th Quarter						
GW-742	CRSP	02/01/96	.	.	.					▲	
GW-743	CRSP	02/23/96	.	.	.					▲	
GW-757	LII	.	04/04/96	.	11/05/96			●			
GW-796	LV	.	04/10/96	.	10/03/96			●		●	
GW-797	LV	.	04/09/96	.	10/03/96			●			
GW-798	CDLVII	.	04/09/96	.	10/03/96			●		●	
GW-799	CDLVII	.	04/08/96	.	10/02/96			●		●	
GW-801	LV	.	04/10/96	.	10/07/96			●		●	
GW-827	CDLVI	.	04/16/96	.	11/05/96			●			
GW-831	ADB	.	.	08/27/96	10/01/96					●	
CBS-1	CDLVII	.	04/11/96	.	10/07/96			●			
OUTFAL L301	KHQ	03/13/96	.	08/06/96	.		●				

Notes:

- 1 See Table 5 for list of field measurements and laboratory analytes associated with each monitoring program.
- 2 Duplicate groundwater sample denoted by "D".
- 3
 - ADB - Ash Disposal Basin
 - CDLVI - Construction/Demolition Landfill VI
 - CDLVII - Construction/Demolition Landfill VII
 - CRBAWP - Chestnut Ridge Borrow Area Waste Pile
 - CRSDB - Chestnut Ridge Sediment Disposal Basin
 - CRSP - Chestnut Ridge Security Pits
 - ECRWP - East Chestnut Ridge Waste Pile
 - KHQ - Kerr Hollow Quarry
 - LII - Industrial Landfill II
 - LIV - Industrial Landfill IV
 - LV - Industrial Landfill V
 - RQ - Rogers Quarry
 - UNCS- United Nuclear Corporation Site
- 4 . - Not Sampled.

Table 5.
Laboratory Analytes and Field Measurements for CY 1996 Groundwater
and Surface Water Samples

GROUNDWATER MONITORING PROGRAM	RCRA Interim Status Assessment/RCRA Post-Closure Corrective Action Monitoring								
	RCRA Interim Status/RCRA Post Closure Detection Monitoring ¹								
	SWDF Detection Monitoring ²								
	CERCLA Record of Decision Monitoring ³								
	Best Management Practice Monitoring								
PRINCIPAL IONS	Analytical Method ⁴	RCRA Target List ⁵	Sample Type ⁶						
			Filtered	Unfiltered					
Alkalinity - HCO ₃	SM-2320 B	.	.	●	●	●	●	●	●
Alkalinity - CO ₃	SM-2320 B	.	.	●	●	●	●	●	●
Calcium	EPA-6010	.	●	●	●	●	●	●	●
Chloride	EPA-300.0	.	.	●	●	●	●	●	●
Fluoride	EPA-340.2	.	.	●	●	●	●	●	●
Magnesium	EPA-6010	.	●	●	●	●	●	●	●
Nitrate (as N)	EPA-300.0	.	.	●	●	●	●	●	●
Potassium	EPA-6010	.	●	●	●	●	●	●	●
Sodium	EPA-6010	.	●	●	●	●	●	●	●
Sulfate	EPA-300.0	.	.	●	●	●	●	●	●
TRACE METALS	Analytical Method	RCRA Target List	Sample Type						
			Filtered	Unfiltered					
Aluminum	EPA-6010	.	●	●	●	●	●	●	●
Antimony	EPA-6010	.	●	●	●	●	●	●	●
Arsenic	EPA-6010	.	●	●	●	●	●	●	●
	EPA-200.8	.	●	●	●	●	●	●	●
Barium	EPA-6010	.	●	●	●	●	●	●	●
	EPA-200.8	.	.	●	.	●	.	.	.
Beryllium	EPA-6010	.	●	●	●	●	●	●	●
	EPA-200.8	.	.	●	.	●	.	.	.
Boron	EPA-6010	●	●	●	●	●	●	●	●
Cadmium	EPA-6010	●	●	●	●	●	●	●	●
	EPA-200.8	.	.	●	.	●	.	.	.
Cerium	EPA-200.8	.	.	●	.	●	.	.	.
Chromium	EPA-6010	●	●	●	●	●	●	●	●
	EPA-200.8	.	.	●	.	●	.	.	.
Cobalt	EPA-6010	.	●	●	●	●	●	●	●
	EPA-200.8	.	.	●	.	●	.	.	.
Copper	EPA-6010	.	●	●	●	●	●	●	●
	EPA-200.8	.	.	●	.	●	.	.	.
Gallium	EPA-200.8	.	.	●	.	●	.	.	.

Table 5 (cont'd)

GROUNDWATER MONITORING PROGRAM	RCRA Interim Status Assessment/RCRA Post-Closure Corrective Action Monitoring									
	RCRA Interim Status/RCRA Post Closure Detection Monitoring ¹									
	SWDF Detection Monitoring ²									
	CERCLA Record of Decision Monitoring ³									
	Best Management Practice Monitoring									
TRACE METALS (cont'd)	Analytical Method	RCRA Target List	Sample Type							
			Filtered	Unfiltered						
Iron	EPA-6010	.	●	●	●	●	●	●	●	●
Lead	EPA-6010	●	●	●	●	●	●	●	●	●
	EPA-7841	●	●	●	.	.	.	●	●	●
	EPA-200.8	●	●	●	.	●	●	●	●	●
Lithium	EPA-6010	.	●	●	●	●	●	●	●	●
	EPA-200.8	.	.	●	.	●	.	.	.	.
Manganese	EPA-6010	.	●	●	●	●	●	●	●	●
	EPA-200.8	.	.	●	.	●	.	.	.	.
Mercury	EPA-7470	●	●	●	●	●	●	●	●	●
Molybdenum	EPA-6010	.	●	●	●	●	●	●	●	●
	EPA-200.8	.	.	●	.	●	.	.	.	.
Nickel	EPA-6010	●	●	●	●	●	●	●	●	●
	EPA-200.8	.	.	●	.	●	.	.	.	.
Selenium	EPA-6010	.	●	●	●	●	●	●	●	●
	EPA-200.8	.	.	●	.	●	.	.	.	.
Silver	EPA-6010	●	●	●	●	●	●	●	●	●
	EPA-200.8	.	.	●	.	●	.	.	.	.
Strontium	EPA-6010	●	●	●	●	●	●	●	●	●
Thallium	EPA-200.8	.	●	●	●	●	●	●	●	●
	EPA-7841	.	●	●	.	.	●	.	.	.
Thorium	EPA-6010	.	●	●	●	●	●	●	●	●
	EPA-200.8	.	.	●	.	●	.	.	.	.
Titanium	EPA-200.8	.	.	●	.	●	.	.	.	.
Uranium	EPA-200.8	●	●	●	●	●	●	●	●	●
Vanadium	EPA-6010	.	●	●	●	●	●	●	●	●
Zinc	EPA-6010	.	●	●	●	●	●	●	●	●
Zirconium	EPA-6010	.	.	●	.	●	.	.	.	.
VOLATILE ORGANIC COMPOUNDS	Analytical Method	RCRA Target List	Sample Type							
			Filtered	Unfiltered						
Acetone	ACD-240040	.	.	●	●	●	●	●	●	●
Benzene	ACD-240040	●	.	●	●	●	●	●	●	●
Bromodichloromethane	ACD-240040	.	.	●	●	●	●	●	●	●
Bromoform	ACD-240040	●	.	●	●	●	●	●	●	●
Bromomethane	ACD-240040	.	.	●	●	●	●	●	●	●

Table 5 (cont'd)

GROUNDWATER MONITORING PROGRAM	RCRA Interim Status Assessment/RCRA Post-Closure Corrective Action Monitoring								
	RCRA Interim Status/RCRA Post Closure Detection Monitoring ¹								
	SWDF Detection Monitoring ²								
	CERCLA Record of Decision Monitoring ³								
	Best Management Practice Monitoring								
VOLATILE ORGANIC COMPOUNDS (cont'd)	Analytical Method	RCRA Target List	Sample Type						
			Filtered	Unfiltered					
2-Butanone	ACD-240040	.	.	●	●	●	●	●	●
Carbon Disulfide	ACD-2400-40	.	.	●	●	●	●	●	●
Carbon Tetrachloride	ACD-240040	●	.	●	●	●	●	●	●
Chlorobenzene	ACD-240040	.	.	●	●	●	●	●	●
Chlorodibromomethane	ACD-240040	.	.	●	●	●	●	●	●
Chloroethane	ACD-240040	.	.	●	●	●	●	●	●
Chloroform	ACD-240040	●	.	●	●	●	●	●	●
Chloromethane	ACD-240040	.	.	●	●	●	●	●	●
1,1-Dichloroethane	ACD-240040	●	.	●	●	●	●	●	●
1,2-Dichloroethane	ACD-240040	●	.	●	●	●	●	●	●
1,1-Dichloroethene	ACD-240040	●	.	●	●	●	●	●	●
1,2-Dichloroethene	ACD-240040	●	.	●	●	●	●	●	●
Trans-1,2-Dichloroethene	ACD-240040	●	.	●	●	●	●	●	●
1,2-Dichloropropane	ACD-240040	.	.	●	●	●	●	●	●
Cis-1,3-Dichloropropene	ACD-240040	.	.	●	●	●	●	●	●
Trans-1,3-Dichloropropene	ACD-240040	.	.	●	●	●	●	●	●
Ethylbenzene	ACD-240040	.	.	●	●	●	●	●	●
2-Hexanone	ACD-240040	.	.	●	●	●	●	●	●
4-Methyl-2-Pentanone	ACD-240040	.	.	●	●	●	●	●	●
Methylene Chloride	ACD-240040	.	.	●	●	●	●	●	●
Styrene	ACD-240040	.	.	●	●	●	●	●	●
Tetrachloroethene	ACD-240040	●	.	●	●	●	●	●	●
1,1,2,2-Tetrachloroethane	ACD-240040	.	.	●	●	●	●	●	●
Toluene	ACD-240040	.	.	●	●	●	●	●	●
1,1,1-Trichloroethane	ACD-240040	●	.	●	●	●	●	●	●
1,1,2-Trichloroethane	ACD-240040	.	.	●	●	●	●	●	●
Trichloroethene	ACD-240040	●	.	●	●	●	●	●	●
Vinyl Acetate	ACD-240040	.	.	●	●	●	●	●	●
Vinyl Chloride	ACD-240040	.	.	●	●	●	●	●	●
Xylenes	ACD-240040	.	.	●	●	●	●	●	●
ADDITIONAL ORGANIC COMPOUNDS	Analytical Method	RCRA Target List	Sample Type						
			Filtered	Unfiltered					
Acrolein	EPA-8240	.	.	●	.	.	●	.	.
Acrylonitrile	EPA-8240	.	.	●	.	.	●	.	.

Table 5 (cont'd)

GROUNDWATER MONITORING PROGRAM	RCRA Interim Status Assessment/RCRA Post-Closure Corrective Action Monitoring									
	RCRA Interim Status/RCRA Post Closure Detection Monitoring ¹									
	SWDF Detection Monitoring ²									
	CERCLA Record of Decision Monitoring ³									
	Best Management Practice Monitoring									
ADDITIONAL ORGANIC COMPOUNDS (cont'd)	Analytical Method	RCRA Target List	Sample Type							
			Filtered	Unfiltered						
Bromochloromethane	EPA-8240	.	.	●	.	.	●			
2-Chloroethyl vinyl ether	EPA-8240	.	.	●	.	.	●			
1,2-Dibromo-3- chloropropane	EPA-8240	.	.	●	.	.	●			
1,2-Dibromoethane	EPA-8240	.	.	●	.	.	●			
Dibromomethane	EPA-8240	.	.	●	.	.	●			
1,2-Dichlorobenzene	EPA-8240	.	.	●	.	.	●			
1,4-Dichlorobenzene	EPA-8240	.	.	●	.	.	●			
1,4-Dichloro-2-butene	EPA-8240	.	.	●	.	.	●			
Trans-1,4-Dichloro-2-butene	EPA-8240	.	.	●	.	.	●			
Cis-1,2-Dichloroethene	EPA-8240	.	.	●	.	.	●			
Trans-1,2-Dichloroethene	EPA-8240	.	.	●	.	.	●			
Dichlorodifluoromethane	EPA-8240	.	.	●	.	.	●			
Ethanol	EPA-8240	.	.	●	.	.	●			
Ethyl methacrylate	EPA-8240	.	.	●	.	.	●			
Iodomethane	EPA-8240	.	.	●	.	.	●			
1,1,1,2-Tetrachloroethane	EPA-8240	.	.	●	.	.	●			
Trichlorofluoromethane	EPA-8240	.	.	●	.	.	●			
1,2,3-Trichloropropane	EPA-8240	.	.	●	.	.	●			
RADIOLOGICAL ANALYTES	Analytical Method	RCRA Target List	Sample Type							
			Filtered	Unfiltered						
Gross Alpha	Y/P65-7162	●	.	●	●	●	●	●	●	
Gross Beta	Y/P65-7162	●	.	●	●	●	●	●	●	
Gamma Activity (Spectrum)	Y/P65-7171	.	.	●	.	.	●			
Americium-241	Y/P65-7157	.	.	●	.	●	●			
Iodine-129	EPA-901.1	.	.	●	.	.	●			
Neptunium-237	Y/P65-7158	.	.	●	.	●	●			
Plutonium-238/239	Y/P65-7159	.	.	●	.	.	●			
Radium (Total)	EPA-903.0	.	.	●	.	.	●			
Radium-223/224/226	Y/P65-7163	.	.	●	.	●	.			
Radium-228	Y/P65-7165	.	.	●	.	●	.			
Strontium (89/90)	Y/P65-7196	.	.	●	.	●	●			
Technetium-99	Y/P65-7154	.	.	●	.	●	●			

Table 5 (cont'd)

GROUNDWATER MONITORING PROGRAM	RCRA Interim Status Assessment/RCRA Post-Closure Corrective Action Monitoring									
	RCRA Interim Status/RCRA Post Closure Detection Monitoring ¹									
	SWDF Detection Monitoring ²									
	CERCLA Record of Decision Monitoring ³									
	Best Management Practice Monitoring									
RADIOLOGICAL ANALYTES (cont'd)	Analytical Method	RCRA Target List	Sample Type							
			Filtered	Unfiltered						
Tritium	EPA-906.0	.	.	●	.	●	●	.	.	.
	Y/P65-7150	.	.	●	.	●	.	.	.	.
Thorium-228/230/232/234	Y/P65-7160	.	.	●	.	●	.	.	.	.
Uranium-234/235/238	Y/P65-7160	.	.	●	.	●	●	●	.	.
MISC. LABORATORY ANALYTES	Analytical Method	RCRA Target List	Sample Type							
			Filtered	Unfiltered						
Ammonia Nitrogen	EPA-350.3	.	.	●	.	.	●	.	.	.
Cyanide (colorimetric)	EPA-335.2	.	.	●	.	.	●	.	.	.
Chemical Oxygen Demand	EPA-410.4	.	.	●	.	.	●	.	.	.
Phenols	EPA-9065	.	.	●	.	.	●	●	.	.
pH	EPA-150.1	.	.	●	●	●	●	●	●	●
Specific Conductance	EPA-129.1	.	.	●	●	●	●	●	●	●
Total Dissolved Solids	EPA-160.1	.	.	●	●	●	●	●	●	●
Total Organic Carbon	EPA-906.0	.	.	●	.	.	●	●	.	.
Total Organic Halide	EPA-902.0	.	.	●	.	.	●	●	.	.
Total Petroleum Hydrocarbons	TDEC - DRO	.	.	●	.	.	●	.	.	.
Total Suspended Solids	EPA-160.2	.	.	●	●	●	●	●	●	●
Turbidity	EPA-180.1	.	.	●	●	●	●	●	●	●
FIELD MEASUREMENTS	Analytical Method	RCRA Target List	Sample Type							
			Filtered	Unfiltered						
Depth-to-Water	ESP 302-1	.	.	.	●	●	●	●	●	●
Water Temperature	ESP 307-1	.	.	●	●	●	●	●	●	●
pH	ESP 307-2	.	.	●	●	●	●	●	●	●
Specific Conductance	ESP 307-8	.	.	●	●	●	●	●	●	●
Dissolved Oxygen	ESP 307-5	.	.	●	●	●	●	●	●	●

Notes:

- 1 Only groundwater samples collected for RCRA interim status detection monitoring at Kerr Hollow Quarry were analyzed for uranium isotopes.
- 2 Only the groundwater samples collected from well GW-521 at Industrial Landfill IV were analyzed for radionuclides other than gamma activity and uranium isotopes.

Table 5 (cont'd)

Notes: (cont'd)

3 Groundwater samples collected from wells at the United Nuclear Corporation Site (see Table 4) were analyzed for specified trace metals (unfiltered and filtered samples) using Inductively Coupled Plasma Spectroscopy (EPA-6010), all the specified principal ions and VOCs, gross alpha, gross beta, total radium, and uranium isotopes. Surface water samples collected from Outfall 301 at Kerr Hollow Quarry were analyzed only for specific trace metals (unfiltered samples only) using Plasma Mass Spectroscopy (EPA-200.8) and ICP with unique detection limits (very low), the principal cations, and all radiological analytes except total radium.

4 Analytical/field methods and procedures from:

- *Test Methods for Evaluating Solid Waste Physical/Chemical Methods* (U.S. Environmental Protection Agency 1986)
- *Methods for Chemical Analysis of Water and Wastes* (U.S. Environmental Protection Agency 1983)
- *Environmental Surveillance Procedures Quality Control Program* (Martin Marietta Energy Systems, Inc. 1988b)
- *Tennessee Department of Environment and Conservation, Division of Underground Storage Tanks, Reference Handbook, Section 5.0.*
- *K-25 Site Analytical Chemistry Department Procedures Manual.*

Volatile organic compound (VOC) analyses performed in accordance with ACD-240040 until October 1, 1996; VOC analyses subsequently performed in accordance with EPA-8240.

5 Target compound defined in the RCRA post-closure-permit, as specified individually for the Chestnut Ridge Sediment Disposal Basin, Kerr Hollow Quarry, and the Chestnut Ridge Security Pits (see Table 7).

6 Groundwater samples collected with a Bennett Pump™ were filtered in the field, groundwater samples collected with bailers were filtered in the laboratory.

Table 6.
Depth-to-Water Measurements and Water-Level Elevations
for Selected Monitoring Wells in the Chestnut Ridge Hydrogeologic Regime

Water-Level Elevation (ft above mean sea level)		September 30 - October 7, 1996					
		April 1 - 9, 1996					
		Seasonal Fluctuation (+/- ft)					
Depth-to-Water (ft below Top of Well Casing)		September 30 - October 7, 1996					
		April 1 - 9, 1996					
Well No. ¹	Location ²	Measuring Point Elevation ³ (ft msl)					
1082	ORSF	837.28	23.3	25.3	-2.0	813.98	811.98
1084	ORSF	965.40	61.7	62.4	-0.7	903.70	903.00
1090	UNCS	1103.88	42.8	54.9	-12.1	1061.10	1049.00
GW-141	LIV	1186.06	91.7	96.2	-4.5	1094.40	1089.90
GW-142	KHQ	970.35	132.4	135.8	-3.4	837.95	834.55
GW-143	KHQ	913.18	76.9	79.3	-2.4	836.28	833.88
GW-144	KHQ	913.34	77.4	79.9	-2.5	835.94	833.44
GW-145	KHQ	840.04	3.9	5.5	-1.6	836.14	834.54
GW-147	KHQ	851.62	13.7	17.1	-3.4	837.92	834.52
GW-156	CRSDB	1049.13	141.4	143.4	-2.0	907.70	905.70
GW-158	CRSDB	983.05	44	46.8	-2.8	939.05	936.25
GW-159	CRSDB	1051.15	116.3	124.5	-8.2	934.90	926.70
GW-160	CRBAWP	1093.09	133.5	147.2	-13.7	959.60	945.90
GW-161	CRBAWP	1093.54	155.4	160.8	-5.4	938.10	932.70
GW-165	CRDT	1091.37	76.7	96.4	-19.7	1014.70	995.00
GW-166	CRDT	1093.29	79.2	98.6	-19.4	1014.10	994.70
GW-173	CRSP	1115.00	125	146.6	-21.6	990.00	968.40
GW-174	CRSP	1116.52	104.4	116.5	-12.1	1012.10	1000.00
GW-175	CRSP	1084.00	112.4	120.6	-8.2	971.60	963.40
GW-176	CRSP	1125.27	115.8	116.4	-0.6	1009.50	1008.90
GW-177	CRSP	1157.95	117.1	117.8	-0.7	1040.90	1040.20
GW-178	CRSP	1143.49	87.7	93.8	-6.1	1055.80	1049.70
GW-179	CRSP	1128.00	113	116.3	-3.3	1015.00	1011.70
GW-180	CRSP	1103.97	95.4	113.5	-18.1	1008.60	990.50
GW-184	RQ	927.63	108.7	109.9	-1.2	818.93	817.73
GW-186	RQ	831.32	13.4	14.5	-1.1	817.92	816.82
GW-203	UNCS	1105.26	72.6	74.1	-1.5	1032.70	1031.20
GW-205	UNCS	1103.97	69.9	72.4	-2.5	1034.10	1031.60
GW-217	LIV	1176.86	105.5	113.2	-7.7	1071.40	1063.70
GW-221	UNCS	1106.00	74.7	75.3	-0.6	1031.30	1030.70
GW-231	KHQ	849.47	11.5	14.8	-3.3	837.97	834.67
GW-241	CRSDB	982.64	35.2	48.1	-12.9	947.44	934.54
GW-292	ECRWP	1073.00	108.8	113.7	-4.9	964.20	959.30

Table 6 (cont'd)

Water-Level Elevation (ft above mean sea level)		September 30 - October 7, 1996					
		April 1 - 9, 1996					
		Seasonal Fluctuation (+/- ft)					
Depth-to-Water (ft below Top of Well Casing)		September 30 - October 7, 1996					
		April 1 -9, 1996					
Well No. ¹	Location ²	Measuring Point Elevation ³ (ft msl)					
GW-293	ECRWP	1063.90	110.8	116.2	-5.4	953.10	947.70
GW-298	CRBAWP	1049.01	104.4	109.4	-5.0	944.60	939.60
GW-299	CRBAWP	1053.86	92.1	96.5	-4.4	961.80	957.40
GW-300	CRBAWP	1073.12	103.7	109.8	-6.1	969.40	963.30
GW-301	CRBAWP	1086.38	126.4	133.2	-6.8	960.00	953.20
GW-302	UNCS	1141.67	95.5	102	-6.5	1046.20	1039.70
GW-303	CRSDB	1007.16	83	88.1	-5.1	924.20	919.10
GW-304	CRSDB	1045.49	116.1	117.3	-1.2	929.40	928.20
GW-305	LIV	1183.55	116.1	123.7	-7.6	1067.50	1059.90
GW-321	ADB	925.58	13.9	NM ⁴	.	911.68	.
GW-322	CRSP	1134.25	143.5	154.3	-10.8	990.80	980.00
GW-339	UNCS	1124.59	64.2	75.5	-11.3	1060.40	1049.10
GW-511	CRSP	1093.21	91.6	107.6	-16.0	1001.60	985.60
GW-512	ADB	1001.54	16.3	23.6	-7.3	985.20	977.90
GW-514	ADB	1001.22	16	23.8	-7.8	985.20	977.40
GW-521	LIV	1182.68	80.3	84.2	-3.9	1102.40	1098.50
GW-522	LIV	1175.31	98.9	102.9	-4.0	1076.40	1072.40
GW-539	LII	1093.00	99.4	106.1	-6.7	993.60	986.90
GW-540	CDLVI	1072.12	78.5	82.2	-3.7	993.60	989.90
GW-541	CDLVI	1058.40	64	65	-1.0	994.40	993.40
GW-542	CDLVI	1051.60	68.8	69.6	-0.8	982.80	982.00
GW-543	CDLVI	1023.80	61.6	64.5	-2.9	962.20	959.30
GW-544	CDLVI	1044.99	61	65.7	-4.7	984.00	979.30
GW-546	CDLVI	1072.21	78.2	82.3	-4.1	994.00	989.90
GW-557	LV	1081.16	116.4	117.8	-1.4	964.80	963.40
GW-558	SSCR	983.97	43.1	48.2	-5.1	940.87	935.77
GW-559	SSCR	1102.79	132.3	136.5	-4.2	970.50	966.30
GW-560	CDLVII	938.92	23.6	27.1	-3.5	915.32	911.82
GW-562	CDLVII	934.49	NM	4.7	.	.	929.79
GW-564	CDLVII	937.77	8.1	9.6	-1.5	929.67	928.17
GW-608	CRSP	1073.95	119	134.9	-15.9	955.00	939.10
GW-609	CRSP	1112.11	163.3	169.6	-6.3	948.80	942.50
GW-610	CRSP	1059.44	79.5	87.5	-8.0	979.90	971.90
GW-611	CRSP	1048.38	98.2	105.3	-7.1	950.20	943.10
GW-612	CRSP	1131.03	117.9	124.4	-6.5	1013.10	1006.60

Table 6 (cont'd)

Water-Level Elevation (ft above mean sea level)			September 30 - October 7, 1996				
			April 1 - 9, 1996				
			Seasonal Fluctuation (+/- ft)				
Depth-to-Water (ft below Top of Well Casing)			September 30 - October 7, 1996				
			April 1 - 9, 1996				
Well No. ¹	Location ²	Measuring Point Elevation ³ (ft msl)					
GW-673	ADB	882.01	6.9	10	-3.1	875.11	872.01
GW-674	ADB	883.79	6.8	8.9	-2.1	876.99	874.89
GW-676	ADB	846.50	2.9	4.5	-1.6	843.60	842.00
GW-677	ADB	1030.40	22	27.8	-5.8	1008.40	1002.60
GW-679	ADB	1026.86	43.7	51.7	-8.0	983.20	975.20
GW-709	LII	906.60	27.7	29.5	-1.8	878.90	877.10
GW-731	CRSDB	1049.18	123.6	124.7	-1.1	925.60	924.50
GW-732	CRSDB	1064.09	156.4	157.6	-1.2	907.70	906.50
GW-743	CRSP	1100.36	110.2	126.4	-16.2	990.20	974.00
GW-757	LII	961.43	83.2	84.4	-1.2	878.23	877.03
GW-796	LV	1052.42	62.8	74.7	-11.9	989.60	977.70
GW-797	LV	1059.80	65.9	69.2	-3.3	993.90	990.60
GW-798	CDLVII	1000.30	72.3	76.6	-4.3	933.50	929.20
GW-799	CDLVII	981.09	5.2	11.6	-6.4	975.89	969.49
GW-801	LV	1096.96	97.7	106.1	-8.4	999.26	990.86
GW-827	CDLVI	1051.39	38.1	40.5	-2.4	1013.29	1010.89

Notes:

- 1 Bold typeface denotes wells sampled during CY 1996.
- 2
 - ADB - Ash Disposal Basin
 - CDLVI - Construction/Demolition Landfill VI
 - CDLVII - Construction/Demolition Landfill VII
 - CRBAWP - Chestnut Ridge Borrow Area Waste Pile
 - CRDT - Chestnut Ridge/Deer Trap #10
 - CRSDB - Chestnut Ridge Sediment Disposal Basin
 - CRSP - Chestnut Ridge Security Pits
 - ECRWP - East Chestnut Ridge Waste Pile
 - KHQ - Kerr Hollow Quarry
 - LII - Industrial Landfill II
 - LIV - Industrial Landfill IV
 - LV - Industrial Landfill V
 - ORSF - Oak Ridge Sludge Farm

Table 6 (cont'd)

Notes: (cont'd)

RQ - Rogers Quarry
SSCR - South Side Chestnut Ridge
UNCS - United Nuclear Corporation Site

3 Measuring point (top of well casing) elevation (ft above mean sea level) as reported in Jones et al. (1995).

4 NM - Not Measured

Table 7.
RCRA Groundwater Target Compounds for the Chestnut Ridge Security Pits,
Chestnut Ridge Sediment Disposal Basin, and Kerr Hollow Quarry

RCRA Target Compound		Chestnut Ridge Security Pits ¹	Chestnut Ridge Sediment Disposal Basin ²	Kerr Hollow Quarry ³
Trace Metals	Boron	.	.	●
	Cadmium	●	●	●
	Chromium	●	●	●
	Lead	●	●	●
	Mercury	●	●	●
	Nickel	●	●	●
	Silver	.	●	.
	Strontium (total)	.	.	●
	Uranium (total)	●	●	●
Volatile Organic Compounds	Benzene	●	.	.
	Bromoform	●	.	.
	Carbon Tetrachloride	●	.	●
	Chloroform	●	.	●
	Tetrachloroethene	●	.	●
	Trichloroethene	●	.	.
	1,1-Dichloroethane	●	.	.
	1,1-Dichloroethene	●	.	.
	1,2-Dichloroethane	●	.	.
	1,2-Dichloroethene	●	.	.
Radiochemical Parameters	Gross Alpha	●	.	●
	Gross Beta	●	.	●

Notes:

- 1 Attachment 3, Section E of the post-closure permit for the Chestnut Ridge Hydrogeologic Regime.
- 2 Attachment 2, Section E of the post-closure permit for the Chestnut Ridge Hydrogeologic Regime.
- 3 Attachment 4, Section E of the post-closure permit for the Chestnut Ridge Hydrogeologic Regime.

Table 8.
Summary of CY 1996 RCRA Post-Closure Corrective Action Monitoring Results
for the Chestnut Ridge Security Pits

RCRA GROUNDWATER TARGET COMPOUNDS ¹						
Trace Metals ² (mg/L)	Background Value ³	UTL ⁴ (mg/L)	GW-301		GW-521	
			04/30/96	10/01/96	04/16/96	10/01/96
Cadmium	0.0032	0.0025	.	.	.	.
Chromium	0.014	0.029	0.012	.	.	.
Lead AAS	0.011	0.0096	0.0074	NA	.	NA
PMS	0.0044		NA	0.012	NA	0.0044
Mercury	0.0002	0.0003	.	.	.	.
Nickel	0.02	0.02	.	.	.	.
Uranium	0.001	0.005	.	.	0.00057	.
Volatile Organic Compounds ⁵ (ug/L)	MCL ⁶ (ug/L)					
Benzene	5		.	.	.	.
Bromoform	.		.	.	.	.
Carbon Tetrachloride	5		.	.	.	.
Chloroform	.		.	.	.	.
1,1-Dichloroethene	7		.	.	.	.
1,2-Dichloroethene	.		.	.	.	.
1,1-Dichloroethane	.		.	.	.	.
1,2-Dichloroethane	.		.	.	.	.
Tetrachloroethene	5		.	.	.	.
Trichloroethene	5		.	.	.	.
1,1,1-Trichloroethene	200		.	.	.	.
Radiochemical Parameters ⁷ (pCi/L)	Background Value ⁸ (pCi/L)					
Gross Alpha	2.37 ± 1.7		<MDA	<MDA	<MDA	<MDA
Gross Beta	5.09 ± 4.9		<MDA	<MDA	<MDA	<MDA

Table 8 (cont'd)

RCRA GROUNDWATER TARGET COMPOUNDS ¹						
Trace Metals ² (mg/L)	Background Value ³	UTL ⁴ (mg/L)	GW-557		GW-609	
			04/04/96	10/02/96	04/16/96	10/07/96
Cadmium	0.0032	0.0025	.	.	.	.
Chromium	0.014	0.029	0.25	.	.	0.018
Lead AAS PMS	0.011	0.0096	.	NA	.	NA
	0.0044	.	NA	.	NA	0.0011
Mercury	0.0002	0.0003	.	.	.	.
Nickel	0.02	0.02	.	.	.	0.012
Uranium	0.001	0.005	.	.	.	.
Volatile Organic Compounds ⁵ (ug/L)	MCL ⁶ (ug/L)					
Benzene	5		.	.	.	.
Bromoform	.		.	.	.	.
Carbon Tetrachloride	5		.	.	.	.
Chloroform	.		.	.	.	.
1,1-Dichloroethene	7		.	.	.	.
1,2-Dichloroethene	.		.	.	.	.
1,1-Dichloroethane	.		.	.	.	.
1,2-Dichloroethane	.		.	.	14	7
Tetrachloroethene	5		.	.	18	9
Trichloroethene	5		.	.	2	.
1,1,1-Trichloroethene	200		.	.	.	.
Radiochemical Parameters ⁷ (pCi/L)	Background Value ⁸					
Gross Alpha	2.37 ± 1.7		<MDA	<MDA	<MDA	<MDA
Gross Beta	5.09 ± 4.9		<MDA	<MDA	<MDA	<MDA

Table 8 (cont'd)

RCRA GROUNDWATER TARGET COMPOUNDS ¹						
Trace Metals ² (mg/L)	Background Value ³	UTL ⁴ (mg/L)	GW-796		GW-798	
			04/10/96	10/03/96	04/09/96	10/03/96
Cadmium	0.0032	0.0025	.	.	.	.
Chromium	0.014	0.029	.	.	.	.
Lead AAS PMS	0.011 0.0044	0.0096 .	. NA	NA .	. NA	NA 0.00061
Mercury	0.0002	0.0003	.	.	.	.
Nickel	0.02	0.02	.	.	.	.
Uranium	0.001	0.005	.	.	.	.
Volatile Organic Compounds ⁵ (ug/L)	MCL ⁶ (ug/L)					
Benzene	5		.	.	.	.
Bromoform	.		.	.	.	.
Carbon Tetrachloride	5		.	.	.	.
Chloroform	.		.	.	.	.
1,1-Dichloroethene	7		.	.	.	.
1,2-Dichloroethene	.		.	.	.	.
1,1-Dichloroethane	.		.	.	.	.
1,2-Dichloroethane	.		.	.	.	.
Tetrachloroethene	5		.	.	.	.
Trichloroethene	5		.	.	.	.
1,1,1-Trichloroethene	200		FP	1	.	.
Radiochemical Parameters ⁷ (pCi/L)	Background Value ⁸ (pCi/L)					
Gross Alpha	2.37 ± 1.7		<MDA	<MDA	<MDA	<MDA
Gross Beta	5.09 ± 4.9		<MDA	<MDA	<MDA	<MDA

Table 8 (cont'd)

RCRA GROUNDWATER TARGET COMPOUNDS ¹						
Trace Metals ² (mg/L)	Background Value ³	UTL ⁴ (mg/L)	GW-799		GW-801	
			04/08/96	10/02/96	04/10/96	10/07/96
Cadmium	0.0032	0.0025	.	.	.	.
Chromium	0.014	0.029	.	.	.	.
Lead AAS	0.011	0.0096	.	NA	.	NA
PMS	0.0044	.	NA	.	NA	.
Mercury	0.0002	0.0003	.	.	.	.
Nickel	0.02	0.02	.	.	.	.
Uranium	0.001	0.005	.	.	.	.
Volatile Organic Compounds ⁵ (ug/L)	MCL ⁶ (ug/L)					
Benzene	5		.	.	.	.
Bromoform	.		.	.	.	.
Carbon Tetrachloride	5		.	.	.	.
Chloroform	.		.	.	.	.
1,1-Dichloroethene	7		.	.	.	.
1,2-Dichloroethene	.		.	.	.	.
1,1-Dichloroethane	.		.	.	.	.
1,2-Dichloroethane	.		.	.	.	.
Tetrachloroethene	5		.	.	.	.
Trichloroethene	5		.	.	.	.
1,1,1-Trichloroethene	200		.	.	.	.
Radiochemical Parameters ⁷ (pCi/L)	Background Value ⁸ (pCi/L)					
Gross Alpha	2.37 ± 1.7		<MDA	<MDA	<MDA	<MDA
Gross Beta	5.09 ± 4.9		<MDA	<MDA	13.5 ± 5.8	<MDA

Table 8 (cont'd)

RCRA GROUNDWATER TARGET COMPOUNDS ¹				
Trace Metals ² (mg/L)	Background Value ³	UTL ⁴ (mg/L)	GW-831	
			08/27/96	10/01/96
Cadmium	0.0032	0.0025	.	.
Chromium	0.014	0.029	0.015	.
Lead AAS	0.011	0.0096	NA	NA
PMS	0.0044	.	0.0083	<DIS
Mercury	0.0002	0.0003	.	.
Nickel	0.02	0.02	.	.
Uranium	0.001	0.005	0.0017	.
Volatile Organic Compounds ⁵ (ug/L)	MCL ⁶ (ug/L)			
Benzene	5		.	.
Bromoform	.		.	.
Carbon Tetrachloride	5		.	.
Chloroform	.		.	.
1,1-Dichloroethene	7		.	.
1,2-Dichloroethene	.		.	.
1,1-Dichloroethane	.		.	.
1,2-Dichloroethane	.		.	.
Tetrachloroethene	5		.	.
Trichloroethene	5		.	.
1,1,1-Trichloroethene	200		.	.
Radiochemical Parameters ⁷ (pCi/L)	Background Value ⁸ (pCi/L)			
Gross Alpha	2.37 ± 1.7		<MDA	<MDA
Gross Beta	5.09 ± 4.9		<MDA	<MDA

Table 8 (cont'd)

Notes:

- 1 As specified in Attachment 3, Section E, of the RCRA post-closure permit for the Chestnut Ridge Hydrogeologic Regime.
- 2 Total concentrations in milligrams per liter (mg/L) reported for unfiltered groundwater samples ("." = not detected). Results for lead obtained from Atomic Absorption Spectroscopy (AAS) and Plasma Mass Spectroscopy (PMS); NA = not analyzed; <DIS= less than the dissolved concentration (see Appendix F).
- 3 Background values for trace metals were assumed to equal the maximum concentration (mg/L) reported for CY 1990-1996 groundwater samples collected from background well GW-521.
- 4 Upper tolerance limit (UTL), in mg/L, for Well Cluster 4 as specified in: *Table 8. Reference Concentrations used in 1996 Evaluation of Groundwater Quality at the Oak Ridge Y-12 Plant*; HSW Environmental Consultants, Inc. *et al.* (1996) (pp. B-40 - B-51).
- 5 All results in micrograms per liter ($\mu\text{g/L}$) ("." = not detected); FP = False positive result (see Appendix F).
- 6 Federal maximum contaminant level (MCL) for drinking water (in $\mu\text{g/L}$) provided for reference. The background value for each VOC determined from well GW-521 is the detection limit.
- 7 All results in picoCuries per liter (pCi/L) $\pm$ counting error; <MDA = less than minimum detectable activity.
- 8 Background values for gross alpha and gross beta (in pCi/L $\pm$ counting error) reported for CY 1990-1996 groundwater samples from background well GW-521.



APPENDIX C

MONITORING WELL CONSTRUCTION DETAILS



EXPLANATION

LOCATION:

ADB	-	Ash Disposal Basin
CDLVI	-	Construction/Demolition Landfill VI
CDLVII	-	Construction/Demolition Landfill VII
CRBAWP	-	Chestnut Ridge Borrow Area Waste Pile
CRSDB	-	Chestnut Ridge Sediment Disposal Basin
CRSP	-	Chestnut Ridge Security Pits
ECRWP	-	East Chestnut Ridge Waste Pile
KHQ	-	Kerr Hollow Quarry
LII	-	Industrial Landfill II
LIV	-	Industrial Landfill IV
LV	-	Industrial Landfill V
RQ	-	Rogers Quarry
UNCS	-	United Nuclear Corporation Site

PROGRAM:

AMP	-	RCRA Interim Status Assessment Monitoring
BMP	-	Best Management Plan Monitoring
BMP/C	-	Used for BMP and CMP
CMP	-	RCRA Post-Closure Corrective Action Monitoring
RDM	-	RCRA Post-Closure Detection Monitoring (Wells at Kerr Hollow Quarry were interim status until October)
ROD	-	CERCLA Record of Decision Monitoring
SDM	-	SWDF Detection Monitoring
SDM/C	-	Used for SDM and CMP

GENERAL INFORMATION:

Coordinates	-	Y-12 Plant grid system
Elevations	-	Feet above mean sea level
Depths	-	Feet below ground surface
AQF	-	Knox Aquifer
AQT	-	ORR Aquitards
BDR	-	Bedrock Interval
WT	-	Water Table Interval
Ock	-	Knox Group
Och	-	Chickamauga Group
.	-	Not Applicable or not available

EXPLANATION (cont'd)

CASING:

Diameters	-	Outside dimensions, in inches (nominal)
Casing Material:		
PVC/#40	-	Polyvinyl chloride, schedule 40
SS/#304	-	Stainless steel, schedule 304
Steel	-	Carbon steel
F-25/J-55	-	American Petroleum Institute Grade

MONITORED INTERVAL:

Top	-	Depth to top of filter pack or open-hole
Bottom	-	Depth to bottom of filter pack or open-hole
Screen Material:		
PVC/sl	-	PVC/slotted
PVC/sw/.01	-	PVC, spiral wound, 0.01 inch slot size
SS/sw/.01	-	Stainless steel, spiral wound, 0.01 inch slot size
SS/pp/.01	-	Stainless steel prepack screen, spiral wound, 0.01 inch slot size

Length of screen and open hole interval is in feet.

NOTE:

Data Compiled from *Updated Subsurface Data Base for Bear Creek Valley, Chestnut Ridge, and parts of Bethel Valley on the U.S. Department of Energy Oak Ridge Reservation* (Jones et al. 1995).

APPENDIX C
Monitoring Well Construction Details

1

Well Number	1090	GW-141	GW-142	GW-143	GW-144	GW-145	GW-146	GW-147
Location	UNCS	LIV	KHQ	KHQ	KHQ	KHQ	KHQ	KHQ
Program	ROD	SDM	RDM	RDM	RDM	RDM	RDM	RDM
GENERAL INFORMATION								
East Coordinate	53853.02	52463.00	64030.00	63522.00	63502.00	63266.00	63272.00	63428.00
North Coordinate	28718.02	28755.00	24524.00	24257.00	24255.00	24441.00	24432.00	24731.00
Measuring Pt. Elevation	1103.90	1186.10	970.35	913.18	913.34	840.04	838.16	851.62
Surface Elevation	1101.60	1183.50	968.29	911.04	910.48	837.29	837.00	848.41
Hydrostratigraphic Unit	AQF	AQF	AQF	AQF	AQF	AQF	AQF	AQF
Geologic Formation	Ock	Ock	Ock	Ock	Ock	Ock	Ock	Ock
Aquifer Zone	WT	BDR	BDR	BDR	BDR	WT	BDR	BDR
Weathered Rock - Depth	.	.	.	.	.	.	.	.
Weathered Rock - Elevation	.	.	.	.	.	.	.	.
Fresh Rock - Depth	.	57.0	.	18.0	.	.	11.0	6.0
Fresh Rock - Elevation	.	1126.50	.	893.04	.	.	826.00	842.41
Total Depth Drilled	96.7	156.0	295.0	253.0	195.0	110.0	220.0	69.0
SURFACE/CONDUCTOR CASING								
Casing Depth	.	65.0	20.0	20.0	40.0	12.0	13.0	4.6
Casing Diameter	.	10.75	12.50	10.63	12.50	12.50	12.50	10.63
Casing Material	none	Steel/F25	PVC/#40	PVC/#40	PVC/#40	PVC/#40	PVC/#40	PVC/#40
WELL CASING								
Borehole Depth	96.7	156.0	250.0	205.0	195.0	110.0	190.0	69.0
Borehole Diameter	8.00	10.00	11.00	10.00	11.00	11.00	11.00	10.00
Well Casing Depth	0.5	144.5	248.5	205.0	150.0	88.5	190.0	53.1
Well Casing Diameter	6.50	4.50	6.62	6.62	4.50	4.50	6.62	4.50
Well Casing Material	PVC/#40	SS/#304	Steel/F25	Steel/F25	PVC/#40	PVC/#40	Steel/F25	PVC/#40
MONITORED INTERVAL								
Top - Depth	0.0	141.0	248.5	205.0	148.0	86.0	190.0	52.0
Top - Elevation	.	1042.50	719.79	706.04	762.48	751.29	647.00	796.41
Midpoint - Depth	0.0	148.5	271.8	229.0	171.5	98.0	205.0	60.5
Midpoint - Elevation	.	1035.00	696.54	682.04	738.98	739.29	632.00	787.91
Bottom - Depth	0.0	156.0	295.0	253.0	195.0	110.0	220.0	69.0
Bottom - Elevation	.	1027.50	673.29	658.04	715.48	727.29	617.00	779.41
Screen Material	PVC/sl	SS/sw/.01	.	.	PVC/sw/.01	PVC/sw/.01	.	PVC/sw/.01
Screen Length	.	10.7	.	.	40.0	20.0	.	15.0
Open-Hole Length	.	.	46.5	48.0	.	.	30.0	.
Open-Hole Diameter	.	.	6.00	6.00	.	.	6.00	.

(CONTINUED)

APPENDIX C
Monitoring Well Construction Details

2

Well Number	GW-156	GW-159	GW-160	GW-161	GW-174	GW-175	GW-177	GW-184
Location	CRSDB	CRSDB	CRBAWP	CRBAWP	CRSP	CRSP	CRSP	RQ
Program	RDM	RDM	BMP	BMP	AMP	AMP	AMP	BMP
GENERAL INFORMATION								
East Coordinate	64020.00	63496.00	62165.00	62146.00	59215.00	58686.00	57497.00	57475.00
North Coordinate	27626.00	27764.00	27803.00	27805.00	28205.00	28676.00	28483.00	23915.00
Measuring Pt. Elevation	1049.10	1051.20	1093.10	1093.50	1116.50	1084.00	1158.00	927.63
Surface Elevation	1046.90	1048.80	1090.70	1090.90	1114.10	1081.90	1155.50	924.65
Hydrostratigraphic Unit	AQF	AQF	AQF	AQF	AQF	AQF	AQF	AQT
Geologic Formation	Ock	Ock	Ock	Ock	Ock	Ock	Ock	Och
Aquifer Zone	BDR	BDR	WT	BDR	BDR	BDR	BDR	BDR
Weathered Rock - Depth	84.0	.	60.0	65.0	51.0	46.0	62.0	.
Weathered Rock - Elevation	962.90	.	1030.70	1025.90	1063.10	1035.90	1093.50	.
Fresh Rock - Depth	93.0	100.0	.	95.5	80.0	98.5	98.0	8.0
Fresh Rock - Elevation	953.90	948.80	.	995.40	1034.10	983.40	1057.50	916.65
Total Depth Drilled	157.0	157.0	235.0	400.0	145.0	166.7	145.0	130.0
SURFACE/CONDUCTOR CASING								
Casing Depth	94.0	123.0	112.5	108.0	80.0	61.3	82.0	8.0
Casing Diameter	10.75	10.75	12.50	12.50	10.75	10.75	10.75	10.63
Casing Material	Steel/F25	Steel/F25	Steel/F25	Steel/F25	Steel/F25	unknown	Steel/F25	PVC/#40
WELL CASING								
Borehole Depth	157.0	157.0	205.0	350.0	145.0	166.7	145.0	130.0
Borehole Diameter	8.50	8.50	11.00	11.00	10.00	9.50	8.00	10.00
Well Casing Depth	147.0	147.0	205.0	350.0	135.0	150.6	133.0	107.5
Well Casing Diameter	4.50	4.50	6.62	6.62	4.50	4.50	4.50	4.50
Well Casing Material	PVC/#40	PVC/#40	Steel/F25	Steel/F25	SS/#304	SS/#304	PVC/#40	PVC/#40
MONITORED INTERVAL								
Top - Depth	146.0	146.0	205.0	350.0	134.0	148.3	132.0	101.5
Top - Elevation	900.90	902.80	885.70	740.90	980.10	933.60	1023.50	823.15
Midpoint - Depth	151.5	151.5	220.0	375.0	139.5	157.5	138.5	115.8
Midpoint - Elevation	895.40	897.30	870.70	715.90	974.60	924.40	1017.00	808.90
Bottom - Depth	157.0	157.0	235.0	400.0	145.0	166.7	145.0	130.0
Bottom - Elevation	889.90	891.80	855.70	690.90	969.10	915.20	1010.50	794.65
Screen Material	PVC/sw/.01	PVC/sw/.01	.	.	SS/sw/.01	SS/sw/.01	PVC/sl	PVC/sw/.01
Screen Length	10.0	10.0	.	.	10.0	15.8	10.0	20.0
Open-Hole Length	.	.	30.0	50.0	.	.	.	.
Open-Hole Diameter	.	.	6.00	11.00	.	.	.	.

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APPENDIX C
Monitoring Well Construction Details

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Well Number	GW-186	GW-187	GW-188	GW-203	GW-205	GW-217	GW-221	GW-231
Location	RQ	RQ	RQ	UNCS	UNCS	LIV	UNCS	KHQ
Program	BMP	BMP	BMP	ROD	ROD	SDM	ROD	RDM
GENERAL INFORMATION								
East Coordinate	56862.00	55980.00	56174.00	54190.48	54008.30	53020.00	54388.57	63410.00
North Coordinate	23387.00	23393.00	23663.00	28355.82	28362.98	28758.00	28359.44	24725.00
Measuring Pt. Elevation	831.32	834.28	837.09	1105.30	1104.00	1176.90	1106.00	849.47
Surface Elevation	828.31	831.59	834.33	1102.30	1101.50	1174.30	1103.40	846.90
Hydrostratigraphic Unit	AQT	AQT	AQT	AQF	AQF	AQF	AQF	AQF
Geologic Formation	Och	Och	Och	Ock	Ock	Ock	Ock	Ock
Aquifer Zone	BDR	BDR	BDR	BDR	BDR	BDR	BDR	BDR
Weathered Rock - Depth	12.0	7.0	13.0	86.0	100.0	55.0	36.0	.
Weathered Rock - Elevation	816.31	824.59	821.33	1016.30	1001.50	1119.30	1067.40	.
Fresh Rock - Depth	14.5	15.0	14.0	93.0	146.0	75.0	90.0	10.5
Fresh Rock - Elevation	813.81	816.59	820.33	1009.30	955.50	1099.30	1013.40	836.40
Total Depth Drilled	171.0	162.0	68.0	156.0	164.0	180.0	158.0	35.0
SURFACE/CONDUCTOR CASING								
Casing Depth	14.5	7.0	15.0	94.0	154.0	81.7	92.0	11.0
Casing Diameter	10.63	10.63	10.63	10.75	10.75	10.75	6.63	10.63
Casing Material	PVC/#40	PVC/#40	PVC/#40	Steel/F25	Steel/F25	Steel/F25	Steel/F25	PVC/#40
WELL CASING								
Borehole Depth	171.0	162.0	68.0	156.0	164.0	180.0	158.0	35.0
Borehole Diameter	10.00	10.00	10.00	8.50	10.00	10.00	6.00	11.00
Well Casing Depth	150.0	147.0	52.5	146.0	154.0	166.8	148.0	24.5
Well Casing Diameter	4.50	4.50	4.50	4.50	4.50	4.50	4.50	4.50
Well Casing Material	PVC/#40	PVC/#40	PVC/#40	PVC/#40	PVC/#40	SS/#304	PVC/#40	PVC/#40
MONITORED INTERVAL								
Top - Depth	142.0	139.0	49.0	144.0	154.0	165.2	147.0	22.8
Top - Elevation	686.31	692.59	785.33	958.30	947.50	1009.10	956.40	824.10
Midpoint - Depth	156.5	150.5	58.5	150.0	159.0	172.6	152.5	28.9
Midpoint - Elevation	671.81	681.09	775.83	952.30	942.50	1001.70	950.90	818.00
Bottom - Depth	171.0	162.0	68.0	156.0	164.0	180.0	158.0	35.0
Bottom - Elevation	657.31	669.59	766.33	946.30	937.50	994.30	945.40	811.90
Screen Material	PVC/sw/.01	PVC/sw/.01	PVC/sw/.01	PVC/sw/.01	PVC/sw/.01	SS/sw/.01	PVC/sw/.01	PVC/sw/.01
Screen Length	20.0	15.0	15.0	10.0	10.0	10.6	10.0	10.0
Open-Hole Length	.	.	.	.	.	.	.	.
Open-Hole Diameter	.	.	.	.	.	.	.	.

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APPENDIX C
Monitoring Well Construction Details

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Well Number	GW-292	GW-293	GW-294	GW-296	GW-298	GW-299	GW-300	GW-301
Location	ECRWP	ECRWP	ECRWP	ECRWP	CRBAWP	CRBAWP	CRBAWP	CRBAWP
Program	BMP	BMP	BMP	BMP	BMP	BMP	BMP	BMP/C
GENERAL INFORMATION								
East Coordinate	62146.00	62321.00	62483.00	62023.00	62445.00	62319.00	62041.00	61964.00
North Coordinate	28141.00	28112.00	27958.00	27994.00	27495.00	27392.00	27487.00	27662.00
Measuring Pt. Elevation	1073.00	1063.90	1083.60	1091.00	1049.00	1053.90	1073.10	1086.40
Surface Elevation	1070.10	1061.70	1081.70	1088.30	1046.40	1051.30	1070.70	1083.90
Hydrostratigraphic Unit	AQF	AQF	AQF	AQF	AQF	AQF	AQF	AQF
Geologic Formation	OCK	OCK	OCK	OCK	OCK	OCK	OCK	OCK
Aquifer Zone	BDR	BDR	BDR	BDR	BDR	BDR	BDR	BDR
Weathered Rock - Depth	32.0	57.0	62.0	67.0	65.0	66.0	102.0	94.0
Weathered Rock - Elevation	1038.10	1004.70	1019.70	1021.30	981.40	985.30	968.70	989.90
Fresh Rock - Depth	59.5	110.0	87.0	82.0	80.0	70.0	106.0	136.0
Fresh Rock - Elevation	1010.60	951.70	994.70	1006.30	966.40	981.30	964.70	947.90
Total Depth Drilled	186.0	214.0	128.0	147.0	190.0	168.0	147.0	163.5
SURFACE/CONDUCTOR CASING								
Casing Depth	51.0	57.8	74.5	86.5	83.3	80.0	115.0	105.0
Casing Diameter	10.75	10.75	10.75	10.75	10.75	10.75	10.75	10.75
Casing Material	Steel/F25	Steel/F25	Steel/F25	Steel/F25	Steel/F25	Steel/F25	Steel/F25	Steel/F25
WELL CASING								
Borehole Depth	186.0	197.0	128.0	147.0	190.0	168.0	147.0	163.5
Borehole Diameter	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
Well Casing Depth	174.1	197.0	117.6	136.3	176.0	155.8	134.8	151.0
Well Casing Diameter	4.50	6.62	4.50	4.50	4.50	4.50	4.50	4.50
Well Casing Material	SS/#304	Steel/F25	SS/#304	SS/#304	SS/#304	SS/#304	SS/#304	SS/#304
MONITORED INTERVAL								
Top - Depth	172.1	197.0	113.0	134.4	171.1	153.0	132.0	148.5
Top - Elevation	898.00	864.70	968.70	953.90	875.30	898.30	938.70	935.40
Midpoint - Depth	179.1	205.5	120.5	140.7	180.6	160.5	139.5	156.0
Midpoint - Elevation	891.05	856.20	961.20	947.60	865.85	890.80	931.20	927.90
Bottom - Depth	186.0	214.0	128.0	147.0	190.0	168.0	147.0	163.5
Bottom - Elevation	884.10	847.70	953.70	941.30	856.40	883.30	923.70	920.40
Screen Material	SS/sw/.01	.	SS/sw/.01	SS/sw/.01	SS/sw/.01	SS/sw/.01	SS/sw/.01	SS/sw/.01
Screen Length	10.7	.	10.4	10.5	10.0	10.8	10.6	10.0
Open-Hole Length	.	17.0	.	.	.	.	.	.
Open-Hole Diameter	.	6.00	.	.	.	.	.	.

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APPENDIX C
Monitoring Well Construction Details

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Well Number	GW-302	GW-305	GW-321	GW-339	GW-512	GW-513	GW-514	GW-521
Location	UNCS	LIV	ADB	UNCS	ADB	ADB	ADB	LIV
Program	ROD	SDM	BMP	ROD	BMP	BMP	BMP	SDM/C
GENERAL INFORMATION								
East Coordinate	54353.40	52962.00	57026.00	54146.52	57343.00	57332.00	57341.00	52040.00
North Coordinate	28693.55	28548.00	26275.00	28658.72	27601.00	27607.00	27575.00	28541.00
Measuring Pt. Elevation	1141.70	1183.60	925.58	1124.60	1001.50	1001.40	1001.20	1182.70
Surface Elevation	1139.60	1181.10	923.10	1122.20	998.99	998.99	998.66	1179.50
Hydrostratigraphic Unit	AQF	AQF	AQF	AQF	AQF	AQF	AQF	AQF
Geologic Formation	OCK	OCK	OCK	OCK	OCK	OCK	OCK	OCK
Aquifer Zone	BDR	BDR	BDR	BDR	WT	BDR	BDR	BDR
Weathered Rock - Depth	63.0	53.0	.	45.0	55.0	67.0	44.0	.
Weathered Rock - Elevation	1076.60	1128.10	.	1077.20	943.99	931.99	954.66	.
Fresh Rock - Depth	102.0	84.0	.	91.0	.	97.0	92.0	54.0
Fresh Rock - Elevation	1037.60	1097.10	.	1031.20	.	901.99	906.66	1125.50
Total Depth Drilled	136.0	179.6	98.6	114.0	61.0	125.3	195.0	136.0
SURFACE/CONDUCTOR CASING								
Casing Depth	63.8	64.0	22.0	91.0	.	98.0	105.0	60.5
Casing Diameter	10.75	10.75	10.75	10.75	.	10.75	10.75	10.75
Casing Material	Steel	Steel/F25	Steel/F25	Steel	none	unknown	unknown	unknown
WELL CASING								
Borehole Depth	136.0	179.6	98.6	114.0	61.0	125.3	174.0	136.0
Borehole Diameter	9.50	10.00	8.00	9.50	9.50	9.50	9.50	9.50
Well Casing Depth	124.5	168.9	87.3	103.7	50.5	114.8	174.0	124.9
Well Casing Diameter	4.50	4.50	4.50	4.50	4.50	4.50	6.62	4.50
Well Casing Material	SS/#304	SS/#304	SS/#304	SS/#304	SS/#304	SS/#304	Steel/F25	SS/#304
MONITORED INTERVAL								
Top - Depth	121.5	165.3	84.0	101.0	48.0	111.0	174.0	123.2
Top - Elevation	1018.10	1015.80	839.10	1021.20	950.99	887.99	824.66	1056.30
Midpoint - Depth	128.2	172.5	91.3	107.5	54.5	118.2	184.5	129.6
Midpoint - Elevation	1011.45	1008.65	831.80	1014.70	944.49	880.84	814.16	1049.90
Bottom - Depth	134.8	179.6	98.6	114.0	61.0	125.3	195.0	136.0
Bottom - Elevation	1004.80	1001.50	824.50	1008.20	937.99	873.69	803.66	1043.50
Screen Material	SS/sw/.01	SS/sw/.01	SS/sw/.01	SS/sw/.01	SS/sw/.01	SS/sw/.01	.	SS/sw/.01
Screen Length	10.3	10.7	10.7	10.3	10.0	10.0	.	10.3
Open-Hole Length	.	.	.	.	.	.	21.0	.
Open-Hole Diameter	.	.	.	.	.	.	6.00	.

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APPENDIX C
Monitoring Well Construction Details

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Well Number	GW-522	GW-539	GW-540	GW-541	GW-542	GW-543	GW-544	GW-546
Location	LIV	LII	CDLVI	CDLVI	CDLVI	CDLVI	CDLVI	CDLVI
Program	SDM	SDM	SDM	SDM	SDM	SDM	SDM	SDM
GENERAL INFORMATION								
East Coordinate	52612.00	52278.26	52371.31	51738.09	51641.74	51458.48	51819.56	52366.34
North Coordinate	28377.00	27192.53	27489.06	27653.53	27466.22	27072.06	26963.22	27473.75
Measuring Pt. Elevation	1175.30	1093.00	1072.10	1058.40	1051.60	1023.80	1045.00	1072.20
Surface Elevation	1172.00	1090.40	1069.40	1055.80	1049.00	1021.20	1042.50	1069.60
Hydrostratigraphic Unit	AQF	AQF	AQF	AQF	AQF	AQF	AQF	AQF
Geologic Formation	OCK	OCK	OCK	OCK	OCK	OCK	OCK	OCK
Aquifer Zone	BDR	BDR	BDR	BDR	WT	BDR	BDR	WT
Weathered Rock - Depth	85.0	.	110.0	53.5	.	16.0	47.0	74.5
Weathered Rock - Elevation	1087.00	.	959.40	1002.30	.	1005.20	995.50	995.10
Fresh Rock - Depth	130.0	74.0	150.0	69.5	.	37.0	52.5	.
Fresh Rock - Elevation	1042.00	1016.40	919.40	986.30	.	984.20	990.00	.
Total Depth Drilled	195.5	156.0	171.5	104.5	77.5	94.0	110.0	84.5
SURFACE/CONDUCTOR CASING								
Casing Depth	90.0	79.0	154.0	64.1	.	29.3	54.5	.
Casing Diameter	10.75	10.75	10.75	10.75	.	10.75	10.75	.
Casing Material	unknown	Steel	Steel	Steel	none	Steel	Steel	none
WELL CASING								
Borehole Depth	195.5	156.0	171.5	104.5	76.5	93.6	109.3	84.5
Borehole Diameter	9.50	9.25	9.25	9.25	9.25	9.25	9.25	9.25
Well Casing Depth	184.6	139.8	161.2	88.8	60.8	78.0	93.4	68.6
Well Casing Diameter	4.50	4.50	4.50	4.50	4.50	4.50	4.50	4.50
Well Casing Material	SS/#304	SS/#304	SS/#304	SS/#304	SS/#304	SS/#304	SS/#304	SS/#304
MONITORED INTERVAL								
Top - Depth	183.0	136.4	158.5	86.7	59.0	76.2	91.0	66.2
Top - Elevation	989.00	954.00	910.90	969.10	990.00	945.00	951.50	1003.40
Midpoint - Depth	189.2	146.2	165.0	95.6	67.8	84.9	100.2	75.3
Midpoint - Elevation	982.85	944.20	904.40	960.20	981.25	936.30	942.35	994.30
Bottom - Depth	195.3	156.0	171.5	104.5	76.5	93.6	109.3	84.4
Bottom - Elevation	976.70	934.40	897.90	951.30	972.50	927.60	933.20	985.20
Screen Material	SS/sw/.01	SS/sl/.01	SS/sl/.01	SS/sl/.01	SS/sl/.01	SS/sl/.01	SS/sl/.01	SS/sl/.01
Screen Length	10.4	15.9	10.3	15.7	15.7	15.6	15.9	15.8
Open-Hole Length	.	.	.	.	.	.	.	.
Open-Hole Diameter	.	.	.	.	.	.	.	.

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APPENDIX C
Monitoring Well Construction Details

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Well Number	GW-557	GW-560	GW-562	GW-564	GW-608	GW-609	GW-610	GW-611
Location	LV	CDLVII	CDLVII	CDLVII	CRSP	CRSP	CRSP	CRSP
Program	SDM/C	SDM	SDM	SDM	AMP	CMP	AMP	AMP
GENERAL INFORMATION								
East Coordinate	59519.59	60743.42	61640.17	59865.28	59724.35	60039.73	59471.94	58058.92
North Coordinate	26450.11	25692.28	26276.29	25872.94	27889.43	28109.43	28549.31	28855.52
Measuring Pt. Elevation	1081.20	938.92	934.49	937.77	1074.00	1112.10	1059.40	1048.40
Surface Elevation	1078.60	936.17	931.86	935.12	1071.00	1109.70	1056.80	1045.40
Hydrostratigraphic Unit	AQF	AQF	AQF	AQF	AQF	AQF	AQF	AQF
Geologic Formation	OCK	OCK	OCK	OCK	OCK	OCK	OCK	OCK
Aquifer Zone	WT	WT	WT	WT	BDR	BDR	BDR	BDR
Weathered Rock - Depth	-	-	-	-	113.0	-	39.0	30.0
Weathered Rock - Elevation	-	-	-	-	958.00	-	1017.80	1015.40
Fresh Rock - Depth	-	-	52.0	72.0	140.0	107.0	50.0	63.8
Fresh Rock - Elevation	-	-	879.86	863.12	931.00	1002.70	1006.80	981.60
Total Depth Drilled	139.0	117.0	133.0	88.0	220.0	269.0	117.4	121.6
SURFACE/CONDUCTOR CASING								
Casing Depth	85.0	-	-	-	-	107.0	107.1	75.0
Casing Diameter	10.75	-	-	-	10.75	10.75	10.75	10.75
Casing Material	Steel	none	none	none	Steel	Steel/J55	Steel/J55	Steel/J55
WELL CASING								
Borehole Depth	138.0	117.0	60.0	81.0	150.0	269.0	117.4	121.6
Borehole Diameter	9.50	9.50	9.50	9.50	15.50	9.50	9.50	9.50
Well Casing Depth	115.8	49.0	38.0	55.3	148.0	258.7	107.1	107.0
Well Casing Diameter	4.00	4.00	4.00	4.00	10.75	4.50	4.50	4.50
Well Casing Material	SS/#304	SS/#304	SS/#304	SS/#304	Steel/J55	SS/#304	SS/#304	SS/#304
MONITORED INTERVAL								
Top - Depth	112.9	45.2	36.0	52.0	148.0	256.4	105.1	101.5
Top - Elevation	965.70	890.97	895.86	883.12	923.00	853.30	951.70	943.90
Midpoint - Depth	125.5	57.1	48.0	66.5	184.0	262.7	111.3	111.6
Midpoint - Elevation	953.15	879.07	883.86	868.62	887.00	847.00	945.55	933.85
Bottom - Depth	138.0	69.0	60.0	81.0	220.0	269.0	117.4	121.6
Bottom - Elevation	940.60	867.17	871.86	854.12	851.00	840.70	939.40	923.80
Screen Material	SS/sw/.01	SS/sw/.01	SS/sw/.01	SS/sw/.01	-	SS/sw/.01	SS/sw/.01	SS/sw/.01
Screen Length	20.0	20.0	20.0	20.0	-	10.3	10.3	10.0
Open-Hole Length	-	-	-	-	72.0	-	-	-
Open-Hole Diameter	-	-	-	-	9.50	-	-	-

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APPENDIX C
Monitoring Well Construction Details

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Well Number	GW-612	GW-709	GW-731	GW-732	GW-742	GW-743	GW-757	GW-796
Location	CRSP	LII	CRSDB	CRSDB	CRSP	CRSP	LII	LV
Program	AMP	SDM	RDM	RDM	AMP	AMP	SDM	SDM/C
GENERAL INFORMATION	.	.	.	.	.	.	.	.
East Coordinate	58503.62	52371.88	63863.14	64267.74	58908.00	58908.00	53302.52	58206.40
North Coordinate	28370.61	25344.08	27463.65	27716.72	28038.00	28056.00	25409.50	27923.90
Measuring Pt. Elevation	1131.00	906.60	1049.20	1064.10	1101.00	1100.40	961.43	1052.40
Surface Elevation	1128.70	903.84	1045.80	1060.70	1097.80	1098.70	958.65	1048.80
Hydrostratigraphic Unit	AQF	AQF	AQF	AQF	AQF	AQF	AQF	AQF
Geologic Formation	Ock	Ock	Ock	Ock	Ock	Ock	Ock	Ock
Aquifer Zone	BDR	BDR	BDR	BDR	BDR	BDR	BDR	BDR
Weathered Rock - Depth	78.0	39.0	95.4	85.0	68.0	49.0	29.5	102.0
Weathered Rock - Elevation	1050.70	864.84	950.40	975.70	1029.80	1049.70	929.15	946.80
Fresh Rock - Depth	125.0	43.0	129.4	96.0	96.0	87.5	48.0	103.0
Fresh Rock - Elevation	1003.70	860.84	916.40	964.70	1001.80	1011.20	910.65	945.80
Total Depth Drilled	254.0	80.6	180.4	190.6	420.0	161.1	166.5	139.7
SURFACE/CONDUCTOR CASING	.	.	.	.	.	.	.	.
Casing Depth	136.9	50.0	122.0	100.7	92.0	82.9	46.8	107.6
Casing Diameter	11.75	11.75	11.75	11.75	11.75	11.75	10.75	10.75
Casing Material	Steel/J55	Steel/J55	Steel/J55	Steel/J55	Steel/J55	Steel/J55	Steel/J55	Steel/J55
WELL CASING	.	.	.	.	.	.	.	.
Borehole Depth	235.0	80.6	175.4	189.5	350.0	161.1	166.5	139.7
Borehole Diameter	10.63	10.60	10.60	10.60	10.60	10.60	9.62	9.50
Well Casing Depth	230.6	70.4	165.2	179.3	350.0	150.2	135.5	126.5
Well Casing Diameter	7.00	4.25	4.50	4.50	7.00	4.50	4.50	4.50
Well Casing Material	Steel/F25	SS/#304	SS/#304	SS/#304	Steel/F25	SS/#304	SS/#304	SS/#304
MONITORED INTERVAL	.	.	.	.	.	.	.	.
Top - Depth	235.0	68.7	164.0	178.3	350.0	150.1	134.0	122.9
Top - Elevation	893.70	835.14	881.80	882.40	747.80	948.60	824.65	925.90
Midpoint - Depth	244.5	74.7	171.4	184.2	385.0	155.6	150.4	129.7
Midpoint - Elevation	884.20	829.19	874.45	876.55	712.80	943.10	808.30	919.10
Bottom - Depth	254.0	80.6	178.7	190.0	420.0	161.1	166.7	136.5
Bottom - Elevation	874.70	823.24	867.10	870.70	677.80	937.60	791.95	912.30
Screen Material	.	SS/sw/.01	SS/sw/.01	SS/sw/.01	.	SS/sw/.01	SS/sw/.01	SS/sw/.01
Screen Length	.	10.0	10.0	10.0	.	10.1	30.0	10.0
Open-Hole Length	19.0	.	.	.	70.0	.	.	.
Open-Hole Diameter	6.25	.	.	.	6.25	.	.	.

(CONTINUED)

APPENDIX C
Monitoring Well Construction Details

9

Well Number	GW-797	GW-798	GW-799	GW-801	GW-827	GW-831
Location	LV	CDLVII	CDLVII	LV	CDLVI	ADB
Program	SDM	SDM/C	SDM/C	SDM/C	SDM	CMP
GENERAL INFORMATION						
East Coordinate	58550.40	60309.95	59961.20	58779.90	51826.32	56593.48
North Coordinate	27446.60	27264.85	26745.50	26807.80	27721.42	26653.53
Measuring Pt. Elevation	1059.80	1005.80	981.09	1096.96	1051.39	1091.09
Surface Elevation	1056.10	1002.42	978.10	1093.82	1048.13	1088.04
Hydrostratigraphic Unit	AQF	AQF	AQF	AQF	AQF	AQF
Geologic Formation	Ock	Ock	Ock	Ock	Ock	Ock
Aquifer Zone	BDR	BDR	BDR	BDR	BDR	BDR
Weathered Rock - Depth	67.1	94.4	60.8	112.5	.	134.8
Weathered Rock - Elevation	989.00	908.02	917.30	981.32	.	953.24
Fresh Rock - Depth	89.0	95.8	62.8	113.4	40.5	140.8
Fresh Rock - Elevation	967.10	906.62	915.30	980.42	1007.63	947.24
Total Depth Drilled	134.1	135.5	92.0	188.9	135.0	200.0
SURFACE/CONDUCTOR CASING						
Casing Depth	95.0	99.7	65.0	115.4	43.4	138.3
Casing Diameter	10.75	10.75	10.75	10.75	10.75	10.75
Casing Material	Steel/J55	Steel/J55	Steel/J55	Steel/J55	Steel	Steel
WELL CASING						
Borehole Depth	134.1	135.5	92.0	188.9	135.0	200.0
Borehole Diameter	9.50	9.50	9.50	9.87	9.87	9.87
Well Casing Depth	123.5	124.5	81.0	178.1	124.1	183.2
Well Casing Diameter	4.50	4.50	4.50	4.50	4.50	4.50
Well Casing Material	SS/#304	SS/#304	SS/#304	SS/#304	SS/#304	SS/#304
MONITORED INTERVAL						
Top - Depth	118.0	122.0	78.7	175.8	122.1	182.0
Top - Elevation	938.10	880.42	899.40	918.02	926.03	906.04
Midpoint - Depth	126.1	128.7	85.4	182.4	128.5	190.8
Midpoint - Elevation	930.05	873.72	892.75	911.47	919.68	897.24
Bottom - Depth	134.1	135.4	92.0	188.9	134.8	199.6
Bottom - Elevation	922.00	867.02	886.10	904.92	913.33	888.44
Screen Material	SS/sw/.01	SS/sw/.01	SS/sw/.01	SS/sw/.01	SS/sw/.01	SS/sw/.01
Screen Length	10.0	10.0	10.0	10.0	10.0	10.4
Open-Hole Length	.	.	.	.	.	.
Open-Hole Diameter	.	.	.	.	.	.



APPENDIX D

CY 1996 DATA FOR

GROUNDWATER AND SURFACE WATER SAMPLES



EXPLANATION

SAMPLING POINT:

- 1090 - Monitoring Well at the United Nuclear Corporation Site
- GW - Monitoring Well
- CBS-1 - Spring Sampling Location Downgradient from the
Construction/Demolition Landfill VII
- OUTFALL301 - Surface Water Sampling Location at Kerr Hollow Quarry

PROGRAM:

- AMP - RCRA Interim Status Assessment Monitoring
- BMP - Best Management Practice Monitoring
- BMP/C - Used for BMP and CMP
- CMP - RCRA Post-Closure Corrective Action Monitoring
- RDM - RCRA Post-Closure Detection Monitoring
(Wells at Kerr Hollow Quarry were interim status until October)
- ROD - CERCLA Record of Decision Monitoring
- SDM - SWDF Detection Monitoring
- SDM/C - Used for SDM and CMP

LOCATION:

- ADB - Ash Disposal Basin
- CDLVI - Construction/Demolition Landfill VI
- CDLVII - Construction/Demolition Landfill VII
- CRBAWP - Chestnut Ridge Borrow Area Waste Pile
- CRSDB - Chestnut Ridge Sediment Disposal Basin
- CRSP - Chestnut Ridge Security Pits
- ECRWP - East Chestnut Ridge Waste Pile
- KHQ - Kerr Hollow Quarry
- LII - Industrial Landfill II
- LIV - Industrial Landfill IV
- LV - Industrial Landfill V
- RQ - Rogers Quarry
- UNCS - United Nuclear Corporation Site

EXPLANATION (cont'd)

SAMPLE TYPE:

DUP	-	Field Duplicate Sample
DIS	-	Dissolved concentration (Filtered Sample)
TOT	-	Total concentration (Unfiltered Sample)
ACT	-	Activity
ERR	-	Counting Error (two standard deviations)
MDA	-	Minimum Detectable Activity

NOTES:

Bicarbonate (HCO_3) and carbonate (CO_3) alkalinity were reported as calcium carbonate.

All trace metal and cation analyses were performed using the inductively coupled plasma spectroscopy method unless otherwise noted.

.	-	Not analyzed
AAS	-	Atomic Absorption Spectroscopy
CVAA	-	Cold Vapor Atomic Absorption
PMS	-	Plasma Mass Spectroscopy
TDS	-	Total Dissolved Solids
TSS	-	Total Suspended Solids
Sp. Cond.	-	Specific Conductance

UNITS:

ft	-	feet (elevations are above mean sea level and depths are below grade)
ug/L	-	micrograms per liter
mg/L	-	milligrams per liter
mV	-	millivolts
umho/cm	-	micromhos per centimeter
NTU	-	Nephelometric Turbidity Units
pCi/L	-	picoCuries per liter

DATA QUALIFICATION:

The following laboratory qualifiers are presented with results in this appendix:

<	-	Inorganic compound not detected at the minimum attainable detection limit.
U	-	Organic compound not detected at the minimum attainable detection limit.

EXPLANATION (cont'd)

Miscellaneous Parameters:

The following results were reported with a "*" qualifier, indicating that results of replicate analyses were outside control limits.

Sampling Location	Sampling Date	Parameter
GW-144	01/22/96	Total Dissolved Solids
GW-144	04/24/96	Turbidity
GW-156	10/17/96	Turbidity
GW-159	10/14/96	Chloride
GW-159	10/15/96	Total Suspended Solids
GW-160 D	04/29/96	Total Suspended Solids
GW-188	04/30/96	Total Suspended Solids
GW-205	10/28/96	Total Suspended Solids
GW-217	07/01/96	Total Suspended Solids
GW-231	10/21/96	Turbidity
GW-231	10/23/96	Turbidity
GW-513	04/29/96	Total Suspended Solids
GW-514 D	05/03/96	Total Suspended Solids
GW-522	01/17/96	Total Suspended Solids
GW-539	04/02/96	Total Suspended Solids
GW-540	04/09/96	Total Suspended Solids
GW-542	04/16/96	Total Suspended Solids
GW-546	04/09/96	Total Suspended Solids
GW-562	04/02/96	Total Suspended Solids
GW-609	10/07/96	Turbidity
GW-732	10/14/96	Chloride
GW-757	04/04/96	Total Dissolved Solids
GW-796	04/10/96	Total Dissolved Solids
GW-799	10/02/96	Total Suspended Solids
GW-801 D	04/10/96	Total Suspended Solids

The following results were reported with an "h" qualifier, indicating that analyses were performed after the regulatory holding time.

Sampling Location	Sampling Date	Parameter
GW-159	10/17/96	Conductivity
GW-557	04/04/96	Turbidity
GW-557	04/04/96	Conductivity
GW-564	04/04/96	Turbidity
GW-564	04/04/96	Conductivity
GW-732	10/17/96	Conductivity
GW-757	04/04/96	Turbidity
GW-757	04/04/96	Conductivity

EXPLANATION (cont'd)

Inorganic Analytes:

PMS - All samples were diluted before analysis to obtain an optimal matrix; reporting limits were set with a five-fold dilution. Results less than the reporting limits were reported with a "d" qualifier.

ICP - For samples that were diluted before analyses, the results less than reporting limits were identified with a "d" qualifier. These samples are identified in Appendix D.2 in the bottom row of the table.

Organic Analytes:

All results less than 10 ug/L were estimated values below the reporting limit, and were reported with a "J" qualifier.

Twenty results for samples collected for volatile organics in the Chestnut Ridge Regime during CY 1996 were reported with a "B" qualifier, indicating that the organic compound also was detected in the associated laboratory blank. All false positive results that were screened by data reported for the laboratory or trip blanks (not indicated by a qualifier) are presented in Appendix F.

EXPLANATION (cont'd)

Radiological Analytes:

Radionuclide activities reported with a "J" qualifier indicate that a chemical tracer recovery was less than 50% or greater than 125%. This information is reflected in the counting error associated with the activity. The following results were associated with a "J" qualifier.

Sampling Location	Sampling Date	Results (pCi/L)		
		U ²³⁴	U ²³⁵	U ²³⁸
GW-144 D	01/22/96	2	0	0.714
GW-144	04/24/96	1.49	0.0708	0.285
GW-145	01/23/96	7.1	0.0805	3.37
GW-146	01/18/96	2.27	0.134	0.914
GW-146	04/25/96	2.06	0	0.378
GW-147	04/18/96	1.56	0.0141	0.778
GW-205	04/19/96	1.11	0.062	0.747
GW-205 D	04/19/96	1.08	-0.13	0.151
GW-231	04/18/96	0.0978	0	0.049
GW-231 D	04/18/96	0.238	0	0.163
GW-302	04/23/96	0.522	0	0.09
GW-521	04/16/96	0.0983	-0.0426	0.148
GW-521	07/02/96	0.296	0	0
GW-539	04/02/96	0.26	0	0.0515
GW-540	04/09/96	0.144	0.0777	0.0572
GW-543	04/16/96	0.0662	0	0.0155
GW-543 D	04/16/96	0.138	0	0.0743
GW-544	04/16/96	0.175	0	0.0445
GW-557	04/04/96	0.214	0	0
GW-560	04/02/96	0.0874	0.0167	0.0438
GW-564	04/04/96	0.0632	-0.034	0.0786
GW-796	04/10/96	0.302	0.0249	0.0856
GW-797	04/09/96	0.23	0.0178	0.0469
GW-798	04/09/96	0.0892	0.0964	0.0893
D=Duplicate sample		U=Uranium		



APPENDIX D.1

**FIELD MEASUREMENTS AND
MISCELLANEOUS PARAMETERS**

APPENDIX D.1
Field Measurements and Miscellaneous Parameters, CY 1996

1

Sampling Point	1090		CBS-1		GW-141		GW-142	
Program	ROD		SDM		SDM		RDM	
Location	UNCS		CDLVII		LIV		KHQ	
Date Sampled	04/23/96	10/30/96	04/11/96	10/07/96	01/04/96	07/02/96	01/04/96	
Sample Type					DUP		DUP	
FIELD MEASUREMENTS								
Top-of-Casing Elev. (ft)	1103.9	1103.9	.	.	1186.1	1186.1	1186.1	970.35
Depth to Water (ft)	48.79	57.25	.	.	93.10	93.10	94.63	133.25
Water-Level Elev. (ft)	1055.11	1046.65	.	.	1093	1093	1091.47	837.1
Water Temp (degrees C)	15.8	16.4	11.2	15.2	12.8	12.8	16	10.5
pH (pH units)	7.4	7.1	7.1	6.9	7	7	6.7	8.2
Sp. Cond. (umho/cm)	492	456	595	313	436	432	402	910
Dissolved Oxygen (ppm)	1.4	5.2	8.3	6.6	5.8	5.7	4.4	1.5
Oxidation/Reduction (mV)	197	172	186	165	241	244	192	183
MISCELLANEOUS PARAMETERS								
COD (mg/L)	.	.	6.2	.	6.7	6.1	<5	.
Cyanide (mg/L)	.	.	<0.1	.	<0.1	<0.1	<0.1	.
Phenols (mg/L)	.	.	.	.	.	.	.	<0.05
pH (pH units)	7.47	7.39	6.62	6.92	7.24	7.36	7.38	7.67
pH, 2 (pH units)	.	.	.	.	.	.	.	7.68
pH, 3 (pH units)	.	.	.	.	.	.	.	7.67
pH, 4 (pH units)	.	.	.	.	.	.	.	7.63
Sp. Cond. (umho/cm)	585	578	200	290	456	458	450	449
Sp. Cond., 2 (umho/cm)	.	.	.	.	.	.	.	448
Sp. Cond., 3 (umho/cm)	.	.	.	.	.	.	.	450
Sp. Cond., 4 (umho/cm)	.	.	.	.	.	.	.	450
TOC (mg/L)	.	.	2	.	37	45	4.93	2.7
TOC, 2 (mg/L)	.	.	.	.	.	.	.	4.8
TOC, 3 (mg/L)	.	.	.	.	.	.	.	2.5
TOC, 4 (mg/L)	.	.	.	.	.	.	.	5.1
TOX (ug/L)	.	.	<10	.	<10	<10	<10	<10
TOX, 2 (ug/L)	.	.	.	.	.	.	.	<10
TOX, 3 (ug/L)	.	.	.	.	.	.	.	<10
TOX, 4 (ug/L)	.	.	.	.	.	.	.	<10
TPH - DRO (mg/L)	.	.	0.1	.	.	.	.	.
TDS (mg/L)	296	296	116	156	248	298	284	198
TSS (mg/L)	3.5	<1	<1	1	170	53	31	3
Turbidity (NTU)	1.49	0.651	5.4	4.67	241	181	128	21.2

(CONTINUED)

APPENDIX D.1
Field Measurements and Miscellaneous Parameters, CY 1996

2

Sampling Point	GW-142					GW-143			
Program	RDM					RDM			
Location	KHQ					KHQ			
Date Sampled	04/17/96	10/21/96	10/22/96	10/23/96	10/24/96	01/18/96	04/23/96	10/21/96	
Sample Type									DUP
FIELD MEASUREMENTS	.	.	.	.	.	.	.	.	.
Top-of-Casing Elev. (ft)	970.35	970.35	970.35	970.35	970.35	913.18	913.18	913.18	913.18
Depth to Water (ft)	132.45	136.45	183.85	181.35	181.35	76.93	76.98	79.99	79.99
Water-Level Elev. (ft)	837.9	833.9	786.5	789	789	836.25	836.2	833.19	833.19
Water Temp (degrees C)	18	15	15.4	14.9	16.2	15.6	15.8	14.9	14.7
pH (pH units)	8	7.9	7.9	7.7	7.6	8	8.1	8.2	8.2
Sp. Cond. (umho/cm)	368	374	368	365	385	475	435	531	532
Dissolved Oxygen (ppm)	1.4	4.1	3.2	3.4	6.9	2.5	2.8	1.4	1.3
Oxidation/Reduction (mV)	92	-9	171	166	169	51	136	-80	-113
MISCELLANEOUS PARAMETERS	.	.	.	.	.	.	.	.	.
COD (mg/L)	.	.	.	.	.	.	.	.	.
Cyanide (mg/L)	.	.	.	.	.	.	.	.	.
Phenols (mg/L)	<0.05	.	.	.	.	<0.05	<0.05	.	.
pH (pH units)	7.86	7.81	7.72	7.84	7.75	7.83	7.93	7.96	7.96
pH, 2 (pH units)	7.71	.	.	.	.	7.89	7.9	.	.
pH, 3 (pH units)	7.71	.	.	.	.	7.87	7.91	.	.
pH, 4 (pH units)	7.84	.	.	.	.	7.92	7.99	.	.
Sp. Cond. (umho/cm)	450	441	447	450	451	503	507	492	493
Sp. Cond., 2 (umho/cm)	451	.	.	.	.	501	508	.	.
Sp. Cond., 3 (umho/cm)	451	.	.	.	.	503	499	.	.
Sp. Cond., 4 (umho/cm)	453	.	.	.	.	503	508	.	.
TOC (mg/L)	7.5	.	.	.	.	3.1	1.6	.	.
TOC, 2 (mg/L)	7.3	.	.	.	.	<1	5.7	.	.
TOC, 3 (mg/L)	6.8	.	.	.	.	2.6	2.8	.	.
TOC, 4 (mg/L)	4.2	.	.	.	.	<1	3	.	.
TOX (ug/L)	<10	.	.	.	.	<10	<10	.	.
TOX, 2 (ug/L)	<10	.	.	.	.	<10	<10	.	.
TOX, 3 (ug/L)	<10	.	.	.	.	<10	<10	.	.
TOX, 4 (ug/L)	<10	.	.	.	.	<10	<10	.	.
TPH - DRO (mg/L)	.	.	.	.	.	.	.	.	.
TDS (mg/L)	236	224	232	246	244	220	282	258	262
TSS (mg/L)	7	3.5	2.5	1	<1	34	18.5	<1	<1
Turbidity (NTU)	40.7	29.9	34.4	39.3	9.75	19.5	13	14.2	14.2

(CONTINUED)

APPENDIX D.1
Field Measurements and Miscellaneous Parameters, CY 1996

3

Sampling Point	GW-143						GW-144		
	RDM						RDM		
Location	KHQ						KHQ		
Date Sampled	10/22/96		10/23/96		10/24/96		01/22/96		04/24/96
Sample Type		DUP		DUP		DUP		DUP	
FIELD MEASUREMENTS									
Top-of-Casing Elev. (ft)	913.18	913.18	913.18	913.18	913.18	913.18	913.34	913.34	913.34
Depth to Water (ft)	170.00	170.00	172.15	172.15	172.61	172.61	77.40	77.40	77.44
Water-Level Elev. (ft)	743.18	743.18	741.03	741.03	740.57	740.57	835.94	835.94	835.9
Water Temp (degrees C)	15.1	15.7	14.5	14.4	13.1	14.3	13.7	13.8	15.9
pH (pH units)	8	8.1	8.1	8	7.9	8	8.1	8.1	8
Sp. Cond. (umho/cm)	414	419	427	421	440	441	338	468	296
Dissolved Oxygen (ppm)	1.9	3	1.4	1.1	1	0.9	5.1	5	6
Oxidation/Reduction (mV)	89	119	163	147	89	81	171	174	170
MISCELLANEOUS PARAMETERS									
COD (mg/L)									
Cyanide (mg/L)									
Phenols (mg/L)									
pH (pH units)	7.87	7.91	7.82	7.81	7.89	7.91	<0.05	<0.05	<0.05
pH, 2 (pH units)							7.73	7.7	7.68
pH, 3 (pH units)							7.76	7.76	7.7
pH, 4 (pH units)							7.79	7.8	7.7
Sp. Cond. (umho/cm)	486	487	487	488	486	486	7.77	7.77	7.74
Sp. Cond., 2 (umho/cm)							333	334	349
Sp. Cond., 3 (umho/cm)							334	332	348
Sp. Cond., 4 (umho/cm)							335	333	349
TOC (mg/L)							337	335	350
TOC, 2 (mg/L)							1.9	1.1	3.2
TOC, 3 (mg/L)							2.7	2.5	4.7
TOC, 4 (mg/L)							2.4	1.6	1.2
TOX (ug/L)							2.9	1	3.4
TOX, 2 (ug/L)							<10	<10	<10
TOX, 3 (ug/L)							<10	<10	<10
TOX, 4 (ug/L)							<10	<10	<10
TPH - DRO (mg/L)							<10	<10	<10
TDS (mg/L)	276	264	298	272	290	282			
TSS (mg/L)	<1	1.5	2.5	<1	<1	<1	166	154	206
Turbidity (NTU)	3.91	4.02	5.44	4.24	1.68	1.44	<1	1	<1
							1.27	1.92	0.887

(CONTINUED)

APPENDIX D.1
Field Measurements and Miscellaneous Parameters, CY 1996

4

Sampling Point Program Location Date Sampled Sample Type	GW-144				GW-145				
	RDM				RDM				
	KHQ				KHQ				
	10/21/96	10/22/96	10/23/96	10/24/96	01/23/96	04/25/96	10/21/96	10/22/96	10/23/96
FIELD MEASUREMENTS	.	.	.	.	.	.	.	.	.
Top-of-Casing Elev. (ft)	913.34	913.34	913.34	913.34	840.04	840.04	840.04	840.04	840.04
Depth to Water (ft)	79.23	80.44	80.38	80.41	3.00	3.10	6.36	43.95	29.65
Water-Level Elev. (ft)	834.11	832.9	832.96	832.93	837.04	836.94	833.68	796.09	810.39
Water Temp (degrees C)	14.7	14.9	14.4	14.4	15.5	17.8	15	15.6	15.3
pH (pH units)	7.5	7.9	7.7	7.6	7.9	8.2	8.5	7.5	7.5
Sp. Cond. (umho/cm)	270	281	279	280	512	443	467	460	447
Dissolved Oxygen (ppm)	4.4	4.8	4.8	4.7	8.2	9.8	8	5.8	4.9
Oxidation/Reduction (mV)	157	115	157	152	250	181	163	177	164
MISCELLANEOUS PARAMETERS	.	.	.	.	.	.	.	.	.
COD (mg/L)	.	.	.	.	.	.	.	.	.
Cyanide (mg/L)	.	.	.	.	.	.	.	.	.
Phenols (mg/L)	.	.	.	.	.	.	.	.	.
pH (pH units)	7.74	7.82	7.69	7.8	<0.05	<0.05	7.92	7.68	7.63
pH, 2 (pH units)	.	.	.	.	7.99	7.9	.	.	.
pH, 3 (pH units)	.	.	.	.	7.97	7.92	.	.	.
pH, 4 (pH units)	.	.	.	.	7.98	7.89	.	.	.
Sp. Cond. (umho/cm)	328	325	328	324	8	7.89	.	.	.
Sp. Cond., 2 (umho/cm)	.	.	.	.	536	529	549	539	545
Sp. Cond., 3 (umho/cm)	.	.	.	.	541	529	.	.	.
Sp. Cond., 4 (umho/cm)	.	.	.	.	538	530	.	.	.
TOC (mg/L)	.	.	.	.	537	531	.	.	.
TOC, 2 (mg/L)	.	.	.	.	1.4	16	.	.	.
TOC, 3 (mg/L)	.	.	.	.	1.1	5.3	.	.	.
TOC, 4 (mg/L)	.	.	.	.	1.6	7.8	.	.	.
TOX (ug/L)	.	.	.	.	14.9	6.5	.	.	.
TOX, 2 (ug/L)	.	.	.	.	<10	<10	.	.	.
TOX, 3 (ug/L)	.	.	.	.	<10	<10	.	.	.
TOX, 4 (ug/L)	.	.	.	.	<10	<10	.	.	.
TPH - DRO (mg/L)	.	.	.	.	.	.	.	.	.
TDS (mg/L)	172	172	132	204	282	314	240	290	302
TSS (mg/L)	8.5	<1	<1	<1	1	3	22	2	36
Turbidity (NTU)	0.864	0.614	0.328	1.65	10.8	36.1	15.9	4.96	32.4

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APPENDIX D.1
Field Measurements and Miscellaneous Parameters, CY 1996

5

Sampling Point	GW-145	GW-146	GW-147	GW-156					
Program	RDM	RDM	RDM	RDM					
Location	KHQ	KHQ	KHQ	CRSDB					
Date Sampled	10/24/96	01/18/96	04/25/96	01/10/96	04/18/96	05/13/96	05/14/96	05/15/96	05/16/96
Sample Type									
FIELD MEASUREMENTS									
Top-of-Casing Elev. (ft)	840.04	838.16	838.16	851.62	851.62	1049.1	1049.1	1049.1	1049.1
Depth to Water (ft)	31.56	100.45	85.03	13.47	14.40	142.64	142.90	142.80	142.75
Water-Level Elev. (ft)	808.48	737.71	753.13	838.15	837.22	906.46	906.2	906.3	906.35
Water Temp (degrees C)	14.5	15.6	16	12.9	13.9	14.6	16	15.5	16.5
pH (pH units)	7.5	8.1	8.1	7.4	8.3	7.3	7.4	7.6	7.4
Sp. Cond. (umho/cm)	464	534	480	675	327	549	545	575	588
Dissolved Oxygen (ppm)	4	3.9	6.3	8.5	7.4	6.5	5.8	7.8	6.8
Oxidation/Reduction (mV)	171	29	196	411	195	226	175	213	171
MISCELLANEOUS PARAMETERS									
COD (mg/L)	.	.	.	.	.	.	.	.	.
Cyanide (mg/L)	.	.	.	.	.	.	.	.	.
Phenols (mg/L)	.	<0.05	<0.05	<0.05	<0.05	.	.	.	.
pH, 2 (pH units)	7.73	7.98	7.9	8.08	7.99	7.36	7.33	7.32	7.35
pH, 3 (pH units)	.	8.01	7.93	8.06	8.02	.	.	.	.
pH, 4 (pH units)	.	8.01	7.95	8.16	8.02	.	.	.	.
Sp. Cond. (umho/cm)	541	575	571	347	325	643	624	615	618
Sp. Cond., 2 (umho/cm)	.	574	572	353	324	.	.	.	.
Sp. Cond., 3 (umho/cm)	.	576	571	329	326	.	.	.	.
Sp. Cond., 4 (umho/cm)	.	576	572	332	324	.	.	.	.
TOC (mg/L)	.	1.4	5.8	2.3	2.7	.	.	.	.
TOC, 2 (mg/L)	.	1.1	5.2	2.3	3.1	.	.	.	.
TOC, 3 (mg/L)	.	<1	7.8	1.6	1.1	.	.	.	.
TOC, 4 (mg/L)	.	1.2	4.8	4.8	3.2	.	.	.	.
TOX (ug/L)	.	<10	<10	<10	<10	.	.	.	.
TOX, 2 (ug/L)	.	<10	<10	<10	<10	.	.	.	.
TOX, 3 (ug/L)	.	<10	<10	<10	<10	.	.	.	.
TOX, 4 (ug/L)	.	<10	<10	11.6	<10	.	.	.	.
TPH - DRO (mg/L)	.	.	.	.	.	.	.	.	.
TDS (mg/L)	308	126	308	198	198	386	320	308	326
TSS (mg/L)	2	11	<1	44	26	2.4	1	<1	<1
Turbidity (NTU)	5.7	15.5	7.47	43.6	15.7	8.5	5.53	2.15	2.16

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APPENDIX D.1
Field Measurements and Miscellaneous Parameters, CY 1996

6

Sampling Point	GW-156				GW-159				
Program	RDM				RDM				
Location	CRSDB				CRSDB				
Date Sampled	10/14/96	10/15/96	10/16/96	10/17/96	05/13/96	05/14/96	05/15/96	05/16/96	10/14/96
Sample Type									
FIELD MEASUREMENTS	.	.	.	.	.	.	.	.	.
Top-of-Casing Elev. (ft)	1049.1	1049.1	1049.1	1049.1	1051.2	1051.2	1051.2	1051.2	1051.2
Depth to Water (ft)	143.35	144.75	144.85	145.00	116.74	142.35	146.35	146.90	117.90
Water-Level Elev. (ft)	905.75	904.35	904.25	904.1	934.46	908.85	904.85	904.3	933.3
Water Temp (degrees C)	16.3	19	21.3	15.9	13.8	14.1	14	16.2	14.2
pH (pH units)	7.1	7.1	7.3	7.2	7.8	7.8	7.6	7.8	7.8
Sp. Cond. (umho/cm)	549	558	555	517	341	345	346	337	340
Dissolved Oxygen (ppm)	11.6	6.8	9	5.7	6.5	8	10.6	8	8.1
Oxidation/Reduction (mV)	187	191	193	228	178	169	197	198	161
MISCELLANEOUS PARAMETERS	.	.	.	.	.	.	.	.	.
COD (mg/L)	.	.	.	.	.	.	.	.	.
Cyanide (mg/L)	.	.	.	.	.	.	.	.	.
Phenols (mg/L)	.	.	.	.	.	.	.	.	.
pH (pH units)	7.44	7.38	7.51	7.35	7.91	7.83	7.67	7.89	7.88
pH, 2 (pH units)	.	.	.	.	.	.	.	.	.
pH, 3 (pH units)	.	.	.	.	.	.	.	.	.
pH, 4 (pH units)	.	.	.	.	.	.	.	.	.
Sp. Cond. (umho/cm)	622	627	622	620	385	376	378	375	355
Sp. Cond., 2 (umho/cm)	.	.	.	.	.	.	.	.	.
Sp. Cond., 3 (umho/cm)	.	.	.	.	.	.	.	.	.
Sp. Cond., 4 (umho/cm)	.	.	.	.	.	.	.	.	.
TOC (mg/L)	.	.	.	.	.	.	.	.	.
TOC, 2 (mg/L)	.	.	.	.	.	.	.	.	.
TOC, 3 (mg/L)	.	.	.	.	.	.	.	.	.
TOC, 4 (mg/L)	.	.	.	.	.	.	.	.	.
TOX (ug/L)	.	.	.	.	.	.	.	.	.
TOX, 2 (ug/L)	.	.	.	.	.	.	.	.	.
TOX, 3 (ug/L)	.	.	.	.	.	.	.	.	.
TOX, 4 (ug/L)	.	.	.	.	.	.	.	.	.
TPH - DRO (mg/L)	.	.	.	.	.	.	.	.	.
TDS (mg/L)	360	330	330	320	236	204	218	186	210
TSS (mg/L)	561	2	2	<1	9	34	2710	105	5
Turbidity (NTU)	460	2.92	5.6	3.73	48.3	74	354	47.6	11.4

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APPENDIX D.1
Field Measurements and Miscellaneous Parameters, CY 1996

7

Sampling Point	GW-159			GW-160		GW-161	GW-174		GW-175
Program	RDM			BMP		BMP	BMP		AMP
Location	CRSDB			CRBAWP		CRBAWP	CRSP		CRSP
Date Sampled	10/15/96	10/16/96	10/17/96	04/29/96		04/26/96	08/19/96		02/25/96
Sample Type				DUP			DUP		
FIELD MEASUREMENTS	.	.	.	.	.	.	.	.	.
Top-of-Casing Elev. (ft)	1051.2	1051.2	1051.2	1093.1	1093.1	1093.5	1116.5	1116.5	1084
Depth to Water (ft)	142.40	146.75	145.88	141.65	141.65	157.50	104.01	104.01	111.92
Water-Level Elev. (ft)	908.8	904.45	905.32	951.45	951.45	936	1012.49	1012.49	972.08
Water Temp (degrees C)	14.4	14.4	15.8	14.4	14.6	16.3	17.5	17.5	13.2
pH (pH units)	7.8	8.1	8.6	7.1	7.2	7.8	7.4	7.4	7.7
Sp. Cond. (umho/cm)	344	347	346	395	398	310	351	354	431
Dissolved Oxygen (ppm)	11.2	8.4	9.8	6.6	6.7	9	4.8	5	9.5
Oxidation/Reduction (mV)	208	156	174	146	157	190	127	132	197
MISCELLANEOUS PARAMETERS	.	.	.	.	.	.	.	.	.
COD (mg/L)	.	.	.	.	.	.	.	.	.
Cyanide (mg/L)	.	.	.	.	.	.	.	.	.
Phenols (mg/L)	.	.	.	.	.	.	.	.	.
pH (pH units)	8.03	7.94	7.91	7.38	7.34	7.54	7.83	7.82	7.73
pH, 2 (pH units)	.	.	.	.	.	.	.	.	.
pH, 3 (pH units)	.	.	.	.	.	.	.	.	.
pH, 4 (pH units)	.	.	.	.	.	.	.	.	.
Sp. Cond. (umho/cm)	383	384	378	436	436	373	433	433	472
Sp. Cond., 2 (umho/cm)	.	.	.	.	.	.	.	.	.
Sp. Cond., 3 (umho/cm)	.	.	.	.	.	.	.	.	.
Sp. Cond., 4 (umho/cm)	.	.	.	.	.	.	.	.	.
TOC (mg/L)	.	.	.	.	.	.	.	.	.
TOC, 2 (mg/L)	.	.	.	.	.	.	.	.	.
TOC, 3 (mg/L)	.	.	.	.	.	.	.	.	.
TOC, 4 (mg/L)	.	.	.	.	.	.	.	.	.
TOX (ug/L)	.	.	.	.	.	.	.	.	.
TOX, 2 (ug/L)	.	.	.	.	.	.	.	.	.
TOX, 3 (ug/L)	.	.	.	.	.	.	.	.	.
TOX, 4 (ug/L)	.	.	.	.	.	.	.	.	.
TPH - DRO (mg/L)	.	.	.	.	.	.	.	.	.
TDS (mg/L)	204	182	198	302	322	204	302	280	240
TSS (mg/L)	17	6.5	502	162	223	<1	93	75	<1
Turbidity (NTU)	73.8	25	488	351	358	2.95	92.8	94.9	2.16

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APPENDIX D.1
Field Measurements and Miscellaneous Parameters, CY 1996

8

Sampling Point	GW-177	GW-184	GW-186	GW-187	GW-188	GW-203	GW-205
Program	AMP	BMP	BMP	BMP	BMP	ROD	ROD
Location	CRSP	RQ	RQ	RQ	RQ	UNCS	UNCS
Date Sampled	02/25/96	04/30/96	05/01/96	04/30/96	04/30/96	04/17/96	10/28/96
Sample Type			DUP				
FIELD MEASUREMENTS							
Top-of-Casing Elev. (ft)	1158	927.63	831.32	831.32	834.28	837.09	1105.3
Depth to Water (ft)	117.00	109.10	13.81	13.81	17.91	20.08	72.25
Water-Level Elev. (ft)	1041	818.53	817.51	817.51	816.37	817.01	1033.05
Water Temp (degrees C)	14.5	13.1	15.3	15.1	15.7	13.6	15.2
pH (pH units)	7.8	7.1	7.2	7.2	7.6	7.9	7.9
Sp. Cond. (umho/cm)	412	360	834	858	1017	415	242
Dissolved Oxygen (ppm)	5.9	2.1	0.4	0.3	0.5	5.1	4.1
Oxidation/Reduction (mV)	197	191	-18	-25	-265	34	220
MISCELLANEOUS PARAMETERS							
COD (mg/L)							
Cyanide (mg/L)							
Phenols (mg/L)							
pH (pH units)	7.73	7.41	7.05	7.03	7.58	7.81	7.88
pH, 2 (pH units)							
pH, 3 (pH units)							
pH, 4 (pH units)							
Sp. Cond. (umho/cm)	431	401	915	917	1133	457	280
Sp. Cond., 2 (umho/cm)							
Sp. Cond., 3 (umho/cm)							
Sp. Cond., 4 (umho/cm)							
TOC (mg/L)							
TOC, 2 (mg/L)							
TOC, 3 (mg/L)							
TOC, 4 (mg/L)							
TOX (ug/L)							
TOX, 2 (ug/L)							
TOX, 3 (ug/L)							
TOX, 4 (ug/L)							
TPH - DRO (mg/L)							
TDS (mg/L)	224	252	576	574	642	276	150
TSS (mg/L)	<1	3	2	<1	2	7	10
Turbidity (NTU)	8.13	4.13	10.1	10.1	47.1	13.9	18.8

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APPENDIX D.1
Field Measurements and Miscellaneous Parameters, CY 1996

9

Sampling Point	GW-205		GW-217		GW-221		GW-231	
Program	ROD		SDM		ROD		RDM	
Location	UNCS		LIV		UNCS		KHQ	
Date Sampled	04/19/96	10/28/96	01/03/96	07/01/96	04/22/96	10/29/96	01/10/96	04/18/96
Sample Type	DUP						DUP	
FIELD MEASUREMENTS								
Top-of-Casing Elev. (ft)	1104	1104	1176.9	1176.9	1106	1106	1106	849.47
Depth to Water (ft)	69.93	76.00	109.25	108.10	74.00	77.54	77.54	11.27
Water-Level Elev. (ft)	1034.07	1028	1067.65	1068.8	1032	1028.46	1028.46	838.2
Water Temp (degrees C)	15.3	15.8	10.6	21.3	16	16	15.9	13.2
pH (pH units)	8	7.7	7.8	6.4	7.7	7.7	7.6	7.5
Sp. Cond. (umho/cm)	263	254	308	268	244	249	246	252
Dissolved Oxygen (ppm)	3.7	3	5	9	5	175	8.9	3.7
Oxidation/Reduction (mV)	178	132	191	136	179	175	172	182
MISCELLANEOUS PARAMETERS								
COD (mg/L)			<5	<5				
Cyanide (mg/L)			<0.1	<0.1				
Phenols (mg/L)								
pH (pH units)	7.75	8.02	7.89	8.26	7.78	7.73	7.81	<0.05
pH, 2 (pH units)								7.5
pH, 3 (pH units)								7.56
pH, 4 (pH units)								7.58
Sp. Cond. (umho/cm)	301	274	304	316	286	301	302	262
Sp. Cond., 2 (umho/cm)								261
Sp. Cond., 3 (umho/cm)								262
Sp. Cond., 4 (umho/cm)								263
TOC (mg/L)			<1	<1				1.1
TOC, 2 (mg/L)								1.1
TOC, 3 (mg/L)								2.1
TOC, 4 (mg/L)								2.2
TOX (ug/L)			<10	<10				<10
TOX, 2 (ug/L)								<10
TOX, 3 (ug/L)								<10
TOX, 4 (ug/L)								<10
TPH - DRO (mg/L)								
TDS (mg/L)	152	144	168	164	164	162	162	140
TSS (mg/L)	<1	11	2.8	9	<1	<1	<1	<1
Turbidity (NTU)	1.81	26.2	3.64	9.22	2.28	0.69	0.888	1.77

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APPENDIX D.1
Field Measurements and Miscellaneous Parameters, CY 1996

10

Sampling Point	GW-231					GW-292		GW-293	GW-294
Program	RDM					BMP		BMP	BMP
Location	KHQ					ECRWP		ECRWP	ECRWP
Date Sampled	04/18/96	10/21/96	10/22/96	10/23/96	10/24/96	05/08/96		05/08/96	05/02/96
Sample Type	DUP					DUP			
FIELD MEASUREMENTS	-	-	-	-	-	-	-	-	-
Top-of-Casing Elev. (ft)	849.47	849.47	849.47	849.47	849.47	1073	1073	1063.9	1083.6
Depth to Water (ft)	12.21	15.65	15.65	15.65	15.65	111.20	111.20	113.70	94.80
Water-Level Elev. (ft)	837.26	833.82	833.82	833.82	833.82	961.8	961.8	950.2	988.8
Water Temp (degrees C)	13.5	13.9	14.5	13.3	13.1	15.2	15	15.8	15
pH (pH units)	7.7	7.1	7.2	7	6.6	7.2	7.3	7.3	6.7
Sp. Cond. (umho/cm)	272	330	330	325	327	439	442	457	417
Dissolved Oxygen (ppm)	2.9	0.8	0.6	0.9	0.4	7.1	7.2	5.1	7.8
Oxidation/Reduction (mV)	179	162	152	169	180	143	157	137	188
MISCELLANEOUS PARAMETERS	-	-	-	-	-	-	-	-	-
COD (mg/L)	-	-	-	-	-	-	-	-	-
Cyanide (mg/L)	-	-	-	-	-	-	-	-	-
Phenols (mg/L)	<0.05	-	-	-	-	-	-	-	-
pH (pH units)	7.67	7.3	7.32	7.28	7.38	7.44	7.47	7.5	7.61
pH, 2 (pH units)	7.67	-	-	-	-	-	-	-	-
pH, 3 (pH units)	7.69	-	-	-	-	-	-	-	-
pH, 4 (pH units)	7.73	-	-	-	-	-	-	-	-
Sp. Cond. (umho/cm)	301	371	368	370	364	500	499	516	475
Sp. Cond., 2 (umho/cm)	304	-	-	-	-	-	-	-	-
Sp. Cond., 3 (umho/cm)	303	-	-	-	-	-	-	-	-
Sp. Cond., 4 (umho/cm)	304	-	-	-	-	-	-	-	-
TOC (mg/L)	5	-	-	-	-	-	-	-	-
TOC, 2 (mg/L)	3.9	-	-	-	-	-	-	-	-
TOC, 3 (mg/L)	5.4	-	-	-	-	-	-	-	-
TOC, 4 (mg/L)	3.2	-	-	-	-	-	-	-	-
TOX (ug/L)	<10	-	-	-	-	-	-	-	-
TOX, 2 (ug/L)	<10	-	-	-	-	-	-	-	-
TOX, 3 (ug/L)	<10	-	-	-	-	-	-	-	-
TOX, 4 (ug/L)	<10	-	-	-	-	-	-	-	-
TPH - DRO (mg/L)	-	-	-	-	-	-	-	-	-
TDS (mg/L)	178	200	188	206	214	238	260	250	278
TSS (mg/L)	1	<1	<1	<1	<1	<1	<1	9	<1
Turbidity (NTU)	1.55	0.46	0.307	0.359	0.322	0.857	0.693	36.1	0.685

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APPENDIX D.1
Field Measurements and Miscellaneous Parameters, CY 1996

11

Sampling Point	GW-296	GW-298	GW-299	GW-300	GW-301	GW-302	GW-305		
Program	BMP	BMP	BMP	BMP	BMP/C	ROD	SDM		
Location	ECRWP	CRBAWP	CRBAWP	CRBAWP	CRBAWP	UNCS	LIV		
Date Sampled	05/02/96	05/01/96	04/30/96	04/30/96	04/30/96	10/01/96	04/23/96	10/30/96	01/17/96
Sample Type									
FIELD MEASUREMENTS									
Top-of-Casing Elev. (ft)	1091	1049	1053.9	1073.1	1086.4	1086.4	1141.7	1141.7	1183.6
Depth to Water (ft)	117.15	106.10	90.40	105.00	127.70	132.90	97.15	102.00	118.10
Water-Level Elev. (ft)	973.85	942.9	963.5	968.1	958.7	953.5	1044.55	1039.7	1065.5
Water Temp (degrees C)	14.3	15.4	13.7	13.2	12.6	16.1	15.3	15.6	15.6
pH (pH units)	6.8	8	7.9	7.4	7.9	7.7	7.5	7.1	8.3
Sp. Cond. (umho/cm)	372	288	235	284	286	297	471	430	260
Dissolved Oxygen (ppm)	7.8	1.6	3.9	5.5	7.9	8.6	3.1	6.6	8.4
Oxidation/Reduction (mV)	185	164	162	171	178	197	204	139	193
MISCELLANEOUS PARAMETERS									
COD (mg/L)	.	.	.	.	.	.	.	.	<5
Cyanide (mg/L)	.	.	.	.	.	.	.	.	<0.1
Phenols (mg/L)	.	.	.	.	.	.	.	.	.
pH (pH units)	7.5	8.01	7.9	7.52	7.93	7.96	7.64	7.51	7.96
pH, 2 (pH units)	.	.	.	.	.	.	.	.	.
pH, 3 (pH units)	.	.	.	.	.	.	.	.	.
pH, 4 (pH units)	.	.	.	.	.	.	.	.	.
Sp. Cond. (umho/cm)	416	333	272	244	326	335	548	546	272
Sp. Cond., 2 (umho/cm)	.	.	.	.	.	.	.	.	.
Sp. Cond., 3 (umho/cm)	.	.	.	.	.	.	.	.	.
Sp. Cond., 4 (umho/cm)	.	.	.	.	.	.	.	.	.
TOC (mg/L)	.	.	.	.	.	.	.	.	<1
TOC, 2 (mg/L)	.	.	.	.	.	.	.	.	.
TOC, 3 (mg/L)	.	.	.	.	.	.	.	.	.
TOC, 4 (mg/L)	.	.	.	.	.	.	.	.	.
TOX (ug/L)	.	.	.	.	.	.	.	.	10.2
TOX, 2 (ug/L)	.	.	.	.	.	.	.	.	.
TOX, 3 (ug/L)	.	.	.	.	.	.	.	.	.
TOX, 4 (ug/L)	.	.	.	.	.	.	.	.	.
TPH - DRO (mg/L)	.	.	.	.	.	.	.	.	.
TDS (mg/L)	244	200	154	142	188	164	322	280	138
TSS (mg/L)	3.5	4	<1	<1	14	8.5	14	17	<1
Turbidity (NTU)	1.62	10.6	0.735	3.48	23.8	14.8	39.7	36.8	3.85

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APPENDIX D.1
Field Measurements and Miscellaneous Parameters, CY 1996

12

Sampling Point	GW-305	GW-321	GW-339		GW-512	GW-513	GW-514		GW-521
Program	SDM	BMP	ROD		BMP	BMP	BMP		SDM/C
Location	LIV	ADB	UNCS		ADB	ADB	ADB		LIV
Date Sampled	07/08/96	04/29/96	04/22/96	10/29/96	05/02/96	04/29/96	05/03/96		01/16/96
Sample Type							DUP		
FIELD MEASUREMENTS									
Top-of-Casing Elev. (ft)	1183.6	925.58	1124.6	1124.6	1001.5	1001.4	1001.2	1001.2	1182.7
Depth to Water (ft)	121.65	14.86	69.00	77.55	17.82	17.37	17.59	17.59	81.62
Water-Level Elev. (ft)	1061.95	910.72	1055.6	1047.05	983.68	984.03	983.61	983.61	1101.08
Water Temp (degrees C)	18	15	22.6	17.3	14.8	15.7	16.2	15.9	13.1
pH (pH units)	8	8	7.6	7.5	7.1	7.6	7.7	7.7	7.9
Sp. Cond. (umho/cm)	279	224	497	490	309	304	283	303	279
Dissolved Oxygen (ppm)	6.2	9.8	1.6	6	6	5.7	3.9	3.8	8.1
Oxidation/Reduction (mV)	180	184	183	158	152	208	166	168	171
MISCELLANEOUS PARAMETERS									
COD (mg/L)	<5	.	.	.	.	.	.	.	8.9
Cyanide (mg/L)	<0.1	.	.	.	.	.	.	.	<0.1
Phenols (mg/L)	.	.	.	.	.	.	.	.	.
pH (pH units)	8.05	7.99	7.42	7.61	7.24	7.77	7.67	7.67	7.9
pH, 2 (pH units)	.	.	.	.	.	.	.	.	.
pH, 3 (pH units)	.	.	.	.	.	.	.	.	.
pH, 4 (pH units)	.	.	.	.	.	.	.	.	.
Sp. Cond. (umho/cm)	273	242	596	573	322	337	342	343	289
Sp. Cond., 2 (umho/cm)	.	.	.	.	.	.	.	.	.
Sp. Cond., 3 (umho/cm)	.	.	.	.	.	.	.	.	.
Sp. Cond., 4 (umho/cm)	.	.	.	.	.	.	.	.	.
TOC (mg/L)	<1	.	.	.	.	.	.	.	<1
TOC, 2 (mg/L)	.	.	.	.	.	.	.	.	.
TOC, 3 (mg/L)	.	.	.	.	.	.	.	.	.
TOC, 4 (mg/L)	.	.	.	.	.	.	.	.	.
TOX (ug/L)	12	.	.	.	.	.	.	.	<10
TOX, 2 (ug/L)	.	.	.	.	.	.	.	.	.
TOX, 3 (ug/L)	.	.	.	.	.	.	.	.	.
TOX, 4 (ug/L)	.	.	.	.	.	.	.	.	.
TPH - DRO (mg/L)	.	.	.	.	.	.	.	.	.
TDS (mg/L)	160	152	324	314	190	190	196	198	164
TSS (mg/L)	<1	1	1	1	2	2	<1	4	<1
Turbidity (NTU)	5.77	3.55	9.92	12.9	5.96	3.65	4.21	4.38	13.5

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APPENDIX D.1
Field Measurements and Miscellaneous Parameters, CY 1996

13

Sampling Point	GW-521			GW-522		GW-539			GW-540
Program	SDM/C			SDM		SDM			SDM
Location	LIV			LIV		LII			CDLVI
Date Sampled	04/16/96	07/02/96	10/01/96	01/17/96	07/08/96	04/02/96	11/04/96	12/18/96	04/09/96
Sample Type									
FIELD MEASUREMENTS	.	.	.	.	.	.	.	.	.
Top-of-Casing Elev. (ft)	1182.7	1182.7	1182.7	1175.3	1175.3	1093	1093	1093	1072.1
Depth to Water (ft)	81.10	81.85	83.88	99.55	100.52	99.35	107.80	103.50	77.68
Water-Level Elev. (ft)	1101.6	1100.85	1098.82	1075.75	1074.78	993.65	985.2	989.5	994.42
Water Temp (degrees C)	13.9	17	14.7	13.6	16	12.5	14.8	9.8	14.2
pH (pH units)	8.2	6	7.7	7.9	7.5	8.1	8.2	8	7.9
Sp. Cond. (umho/cm)	242	248	250	245	264	324	326	325	353
Dissolved Oxygen (ppm)	8	4.7	8	7.5	6.3	7.2	11	10	4
Oxidation/Reduction (mV)	159	190	130	169	188	144	197	193	156
MISCELLANEOUS PARAMETERS	.	.	.	.	.	.	.	.	.
COD (mg/L)	7.1	<5	<5	<5	<5	<5	.	.	<5
Cyanide (mg/L)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	.	.	<0.1
Phenols (mg/L)	.	.	.	.	.	.	.	.	.
pH, 2 (pH units)	7.8	7.96	7.9	7.89	7.95	8.08	8.1	.	7.66
pH, 3 (pH units)	.	.	.	.	.	.	.	.	.
pH, 4 (pH units)	.	.	.	.	.	.	.	.	.
Sp. Cond., 2 (umho/cm)	284	282	282	256	242	363	347	.	380
Sp. Cond., 3 (umho/cm)	.	.	.	.	.	.	.	.	.
Sp. Cond., 4 (umho/cm)	.	.	.	.	.	.	.	.	.
TOC (mg/L)	2.2	2.04	3.55	2.6	<1	3.4	.	.	21.4
TOC, 2 (mg/L)	.	.	.	.	.	.	.	.	.
TOC, 3 (mg/L)	.	.	.	.	.	.	.	.	.
TOC, 4 (mg/L)	.	.	.	.	.	.	.	.	.
TOX (ug/L)	<10	<10	<10	<10	<10	<10	.	.	<10
TOX, 2 (ug/L)	.	.	.	.	.	.	.	.	.
TOX, 3 (ug/L)	.	.	.	.	.	.	.	.	.
TOX, 4 (ug/L)	.	.	.	.	.	.	.	.	.
TPH - DRO (mg/L)	.	.	.	.	.	.	.	.	.
TDS (mg/L)	160	146	156	148	152	200	186	.	136
TSS (mg/L)	2	2.5	3	14	102	14	32	.	3
Turbidity (NTU)	14.3	7.18	35.5	10.9	80.6	6.11	63.1	.	0.764

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APPENDIX D.1
Field Measurements and Miscellaneous Parameters, CY 1996

14

Sampling Point	GW-541	GW-542				GW-543			
Program	SDM	SDM				SDM			
Location	CDLVI	CDLVI				CDLVI			
Date Sampled	04/15/96	04/16/96	11/05/96	12/17/96	04/16/96	11/06/96	12/17/96		
Sample Type						DUP	DUP		
FIELD MEASUREMENTS									
Top-of-Casing Elev. (ft)	1058.4	1051.6	1051.6	1051.6	1023.8	1023.8	1023.8	1023.8	1023.8
Depth to Water (ft)	64.63	69.11	69.92	69.10	63.08	63.08	65.21	65.21	60.50
Water-Level Elev. (ft)	993.77	982.49	981.68	982.5	960.72	960.72	958.59	958.59	963.3
Water Temp (degrees C)	18.7	13.6	13.7	12.6	14.3	14.3	14.4	14.4	13.2
pH (pH units)	8.1	7	6.7	6.8	7.6	7.6	7.4	7.3	7.4
Sp. Cond. (umho/cm)	326	163	131	282	401	400	331	321	434
Dissolved Oxygen (ppm)	4.3	6.6	7	5.5	6.6	6.6	6.9	6.9	7
Oxidation/Reduction (mV)	185	207	161	248	172	180	157	156	234
MISCELLANEOUS PARAMETERS									
COD (mg/L)	<5	5.9			<5	5.9			
Cyanide (mg/L)	<0.1	<0.1			<0.1	<0.1			
Phenols (mg/L)									
pH, 2 (pH units)	7.7	6.79	6.44		7.42	7.46	7.21	7.24	
pH, 3 (pH units)									
pH, 4 (pH units)									
Sp. Cond., 2 (umho/cm)	348	223	137		455	448	427	429	
Sp. Cond., 3 (umho/cm)									
Sp. Cond., 4 (umho/cm)									
TOC (mg/L)	3.4	<1			3.2	5.1			
TOC, 2 (mg/L)									
TOC, 3 (mg/L)									
TOC, 4 (mg/L)									
TOX (ug/L)	<10	<10			<10	<10			
TOX, 2 (ug/L)									
TOX, 3 (ug/L)									
TOX, 4 (ug/L)									
TPH - DRO (mg/L)									
TDS (mg/L)	200	146	126		230	238	216	206	
TSS (mg/L)	<1	3	48		<1	<1	<1	<1	
Turbidity (NTU)	1.44	18.1	83.5		3.83	4.21	14.5	6.29	

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APPENDIX D.1
Field Measurements and Miscellaneous Parameters, CY 1996

15

Sampling Point	GW-543	GW-544		GW-546	GW-557			
Program	SDM	SDM		SDM	SDM/C			
Location	CDLVI	CDLVI		CDLVI	LV			
Date Sampled	12/17/96	04/16/96	11/06/96	12/17/96	04/09/96	04/04/96	06/03/96	10/02/96
Sample Type	DUP							DUP
FIELD MEASUREMENTS								
Top-of-Casing Elev. (ft)	1023.8	1045	1045	1045	1072.2	1081.2	1081.2	1081.2
Depth to Water (ft)	60.50	62.25	66.18	67.35	78.35	116.20	116.10	117.58
Water-Level Elev. (ft)	963.3	982.75	978.82	977.65	993.85	965	965.1	963.62
Water Temp (degrees C)	13.4	15	15.6	13	13.5	15.6	16.7	15.7
pH (pH units)	7.3	7.9	7.9	7.8	8.3	7.8	7.4	7.4
Sp. Cond. (umho/cm)	426	410	363	456	280	320	295	285
Dissolved Oxygen (ppm)	6.6	4.8	4.1	9.9	4.6	7.2	7.6	7.6
Oxidation/Reduction (mV)	235	199	144	228	155	181	111	135
MISCELLANEOUS PARAMETERS								
COD (mg/L)		7.4			<5	<5		
Cyanide (mg/L)		<0.1			<0.1	<0.1		
Phenols (mg/L)								
pH, 2 (pH units)		7.56	7.73		7.97	7.73		7.72
pH, 3 (pH units)								
pH, 4 (pH units)								
Sp. Cond., 2 (umho/cm)		458	461		283	325		326
Sp. Cond., 3 (umho/cm)								
Sp. Cond., 4 (umho/cm)								
TOC (mg/L)		3.6			6.5	2.3		
TOC, 2 (mg/L)								
TOC, 3 (mg/L)								
TOC, 4 (mg/L)								
TOX (ug/L)		<10			<10	<10		
TOX, 2 (ug/L)								
TOX, 3 (ug/L)								
TOX, 4 (ug/L)								
TPH - DRO (mg/L)								
TDS (mg/L)		244	222		156	170		188
TSS (mg/L)		<1	<1		16	3.5		<1
Turbidity (NTU)		1.57	1.69		12.2	3.96		2.66

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APPENDIX D.1
Field Measurements and Miscellaneous Parameters, CY 1996

16

Sampling Point	GW-560				GW-562				GW-564
Program	SDM				SDM				SDM
Location	CDLVII				CDLVII				CDLVII
Date Sampled	04/02/96	06/03/96	10/02/96		04/02/96	06/03/96	10/02/96	11/25/96	04/04/96
Sample Type				DUP					
FIELD MEASUREMENTS									
Top-of-Casing Elev. (ft)	938.92	938.92	938.92	938.92	934.49	934.49	934.49	934.49	937.77
Depth to Water (ft)	23.75	25.40	27.50	27.50	2.15	2.52	4.75	5.26	8.25
Water-Level Elev. (ft)	915.17	913.52	911.42	911.42	932.34	931.97	929.74	929.23	929.52
Water Temp (degrees C)	13.4	14.6	15	14.8	13.5	15	15	13.5	14.8
pH (pH units)	7.5	7.4	7.3	7.3	7.5	7.6	7.5	7.5	7.3
Sp. Cond. (umho/cm)	245	239	250	252	305	300	311	307	248
Dissolved Oxygen (ppm)	7.1	7.1	7.2	7.2	5.7	4	5.8	6.1	7.6
Oxidation/Reduction (mV)	166	171	210	212	163	139	207	157	171
MISCELLANEOUS PARAMETERS									
COD (mg/L)	6.8				5				<5
Cyanide (mg/L)	<0.1				<0.1				<0.1
Phenols (mg/L)									
pH, 2 (pH units)	7.71		7.66	7.67	7.79		7.72		7.48
pH, 3 (pH units)									
pH, 4 (pH units)									
Sp. Cond., 2 (umho/cm)	282		284	284	354		352		260
Sp. Cond., 3 (umho/cm)									
Sp. Cond., 4 (umho/cm)									
TOC (mg/L)	1.8				<1				2.1
TOC, 2 (mg/L)									
TOC, 3 (mg/L)									
TOC, 4 (mg/L)									
TOX (ug/L)	<10				<10				<10
TOX, 2 (ug/L)									
TOX, 3 (ug/L)									
TOX, 4 (ug/L)									
TPH - DRO (mg/L)	0.1				0.1				0.1
TDS (mg/L)	148		156	160	196		188		146
TSS (mg/L)	<1		<1	<1	4		<1		1
Turbidity (NTU)	0.54		0.237	0.255	19.1		3.67		2.16

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APPENDIX D.1
Field Measurements and Miscellaneous Parameters, CY 1996

17

Sampling Point	GW-564	GW-608	GW-609			GW-610	GW-611	GW-612	GW-709
Program	SDM	AMP	CMP			AMP	AMP	BMP	SDM
Location	CDLVII	CRSP	CRSP			CRSP	CRSP	CRSP	LII
Date Sampled	10/03/96	01/29/96	02/25/96	04/16/96	10/07/96	02/23/96	02/25/96	08/29/96	04/02/96
Sample Type									
FIELD MEASUREMENTS									
Top-of-Casing Elev. (ft)	937.77	1074	1112.1	1112.1	1112.1	1059.4	1048.4	1131	906.6
Depth to Water (ft)	9.72	118.53	165.15	166.45	169.45	80.15	97.60	118.74	27.97
Water-Level Elev. (ft)	928.05	955.47	946.95	945.65	942.65	979.25	950.8	1012.26	878.63
Water Temp (degrees C)	15.6	12.8	15.3	14.3	15.2	15.8	14.9	16.8	15
pH (pH units)	7.3	7.4	7.7	7.8	7.5	7.6	7.5	7.2	8.3
Sp. Cond. (umho/cm)	254	309	364	324	315	416	498	344	281
Dissolved Oxygen (ppm)	7.7	8.7	6.6	6.8	5.3	7.3	9.1	5	5.7
Oxidation/Reduction (mV)	205	203	198	182	158	204	211	146	105
MISCELLANEOUS PARAMETERS									
COD (mg/L)									<5
Cyanide (mg/L)									<0.1
Phenols (mg/L)									
pH (pH units)	7.53	7.5	7.73	7.76	7.61	7.7	7.41	7.64	7.88
pH, 2 (pH units)									
pH, 3 (pH units)									
pH, 4 (pH units)									
Sp. Cond. (umho/cm)	277	308	389	383	382	450	530	395	341
Sp. Cond., 2 (umho/cm)									
Sp. Cond., 3 (umho/cm)									
Sp. Cond., 4 (umho/cm)									
TOC (mg/L)									2.9
TOC, 2 (mg/L)									
TOC, 3 (mg/L)									
TOC, 4 (mg/L)									
TOX (ug/L)									<10
TOX, 2 (ug/L)									
TOX, 3 (ug/L)									
TOX, 4 (ug/L)									
TPH - DRO (mg/L)									
TDS (mg/L)	142	130	204	208	198	234	298	216	172
TSS (mg/L)	<1	6	<1	2.5	<1	<1	<1	<1	<1
Turbidity (NTU)	0.702	21.7	0.804	1.3	0.844	2.05	0.494	2.37	0.766

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APPENDIX D.1
Field Measurements and Miscellaneous Parameters, CY 1996

18

Sampling Point	GW-709		GW-731						
Program	SDM		RDM						
Location	LII		CRSDB						
Date Sampled	04/02/96	11/05/96	05/13/96	05/14/96	05/15/96	05/16/96			
Sample Type	DUP			DUP		DUP		DUP	
FIELD MEASUREMENTS									
Top-of-Casing Elev. (ft)	906.6	906.6	1049.2	1049.2	1049.2	1049.2	1049.2	1049.2	1049.2
Depth to Water (ft)	27.97	29.44	121.84	121.84	122.80	122.80	122.80	122.80	123.60
Water-Level Elev. (ft)	878.63	877.16	927.36	927.36	926.4	926.4	926.4	926.4	925.6
Water Temp (degrees C)	14.8	13.5	14.1	14.2	16	15.6	14.5	14.5	16.1
pH (pH units)	8.3	8	8.8	8.8	8.3	8.1	8.5	8.5	8.4
Sp. Cond. (umho/cm)	289	291	224	224	210	211	215	208	209
Dissolved Oxygen (ppm)	5.7	9.5	4.5	4.6	4.6	4.8	4.8	4.9	4.6
Oxidation/Reduction (mV)	109	196	133	138	162	160	160	163	167
MISCELLANEOUS PARAMETERS									
COD (mg/L)	<5								
Cyanide (mg/L)	<0.1								
Phenols (mg/L)									
pH (pH units)	7.93	7.77	8.93	8.92	8.42	8.41	8.36	8.37	8.45
pH, 2 (pH units)									
pH, 3 (pH units)									
pH, 4 (pH units)									
Sp. Cond. (umho/cm)	338	341	249	251	233	233	238	239	236
Sp. Cond., 2 (umho/cm)									
Sp. Cond., 3 (umho/cm)									
Sp. Cond., 4 (umho/cm)									
TOC (mg/L)	3.4								
TOC, 2 (mg/L)									
TOC, 3 (mg/L)									
TOC, 4 (mg/L)									
TOX (ug/L)	<10								
TOX, 2 (ug/L)									
TOX, 3 (ug/L)									
TOX, 4 (ug/L)									
TPH - DRO (mg/L)									
TDS (mg/L)	182	210	174	154	126	128	122	120	128
TSS (mg/L)	1	26	56	10	1.5	3	1.5	1.5	<1
Turbidity (NTU)	0.869	11.1	17.3	17.4	5.97	5.47	5.76	5.23	2.32

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APPENDIX D.1
Field Measurements and Miscellaneous Parameters, CY 1996

19

Sampling Point	GW-731									
Program	RDM									
Location	CRSDB									
Date Sampled	05/16/96	10/14/96		10/15/96		10/16/96		10/17/96		
Sample Type	DUP		DUP		DUP		DUP		DUP	
FIELD MEASUREMENTS	.	.	.	.	.	.	.	.	.	.
Top-of-Casing Elev. (ft)	1049.2	1049.2	1049.2	1049.2	1049.2	1049.2	1049.2	1049.2	1049.2	1049.2
Depth to Water (ft)	123.60	124.67	124.67	124.68	124.68	124.58	124.58	124.75	124.75	124.75
Water-Level Elev. (ft)	925.6	924.53	924.53	924.52	924.52	924.62	924.62	924.45	924.45	924.45
Water Temp (degrees C)	16.1	13.9	14	14.1	14.3	14.3	14.3	14.4	14.4	14.4
pH (pH units)	8.3	8.4	8.2	7.9	8	8.2	8.2	8.2	8.2	8.2
Sp. Cond. (umho/cm)	212	214	211	211	210	206	206	199	199	198
Dissolved Oxygen (ppm)	4.7	5.1	5.2	5.5	5.1	5	5	6.1	5.9	5.9
Oxidation/Reduction (mV)	177	147	148	181	179	179	179	166	170	170
MISCELLANEOUS PARAMETERS	.	.	.	.	.	.	.	.	.	.
COD (mg/L)	.	.	.	.	.	.	.	.	.	.
Cyanide (mg/L)	.	.	.	.	.	.	.	.	.	.
Phenols (mg/L)	.	.	.	.	.	.	.	.	.	.
pH (pH units)	8.47	8.46	8.46	8.49	8.5	8.52	8.52	8.47	8.51	8.51
pH, 2 (pH units)	.	.	.	.	.	.	.	.	.	.
pH, 3 (pH units)	.	.	.	.	.	.	.	.	.	.
pH, 4 (pH units)	.	.	.	.	.	.	.	.	.	.
Sp. Cond. (umho/cm)	234	242	243	245	245	238	239	239	238	238
Sp. Cond., 2 (umho/cm)	.	.	.	.	.	.	.	.	.	.
Sp. Cond., 3 (umho/cm)	.	.	.	.	.	.	.	.	.	.
Sp. Cond., 4 (umho/cm)	.	.	.	.	.	.	.	.	.	.
TOC (mg/L)	.	.	.	.	.	.	.	.	.	.
TOC, 2 (mg/L)	.	.	.	.	.	.	.	.	.	.
TOC, 3 (mg/L)	.	.	.	.	.	.	.	.	.	.
TOC, 4 (mg/L)	.	.	.	.	.	.	.	.	.	.
TOX (ug/L)	.	.	.	.	.	.	.	.	.	.
TOX, 2 (ug/L)	.	.	.	.	.	.	.	.	.	.
TOX, 3 (ug/L)	.	.	.	.	.	.	.	.	.	.
TOX, 4 (ug/L)	.	.	.	.	.	.	.	.	.	.
TPH - DRO (mg/L)	.	.	.	.	.	.	.	.	.	.
TDS (mg/L)	128	146	142	118	132	118	114	114	110	110
TSS (mg/L)	<1	6.5	4.5	5	2.5	5	3	3	2.5	2.5
Turbidity (NTU)	2.68	8.28	7.36	5.68	5.96	6.49	6.43	6.37	5.73	5.73

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APPENDIX D.1
Field Measurements and Miscellaneous Parameters, CY 1996

20

Sampling Point	GW-732								GW-742
Program	RDM								AMP
Location	CRSDB								CRSP
Date Sampled	05/13/96	05/14/96	05/15/96	05/16/96	10/14/96	10/15/96	10/16/96	10/17/96	02/01/96
Sample Type									
FIELD MEASUREMENTS									
Top-of-Casing Elev. (ft)	1064.1	1064.1	1064.1	1064.1	1064.1	1064.1	1064.1	1064.1	1101
Depth to Water (ft)	157.54	157.47	157.37	157.25	157.60	157.60	157.65	154.72	125.15
Water-Level Elev. (ft)	906.56	906.63	906.73	906.85	906.5	906.5	906.45	909.38	975.85
Water Temp (degrees C)	13.8	13.6	14	14.5	14.7	14.6	15.1	14.9	12
pH (pH units)	7.6	7.7	7.4	7.6	7.6	7.7	7.9	8	7.8
Sp. Cond. (umho/cm)	283	298	300	329	262	362	266	264	327
Dissolved Oxygen (ppm)	7.1	6.9	7.8	7.5	7.8	7	8	7.3	0.9
Oxidation/Reduction (mV)	198	180	183	175	159	188	124	160	143
MISCELLANEOUS PARAMETERS									
COD (mg/L)	.	.	.	.	.	.	.	.	.
Cyanide (mg/L)	.	.	.	.	.	.	.	.	.
Phenols (mg/L)	.	.	.	.	.	.	.	.	.
pH (pH units)	7.83	7.72	7.69	7.63	7.8	7.79	7.96	7.78	7.77
pH, 2 (pH units)	.	.	.	.	.	.	.	.	.
pH, 3 (pH units)	.	.	.	.	.	.	.	.	.
pH, 4 (pH units)	.	.	.	.	.	.	.	.	.
Sp. Cond. (umho/cm)	316	319	321	325	299	311	308	307	347
Sp. Cond., 2 (umho/cm)	.	.	.	.	.	.	.	.	.
Sp. Cond., 3 (umho/cm)	.	.	.	.	.	.	.	.	.
Sp. Cond., 4 (umho/cm)	.	.	.	.	.	.	.	.	.
TOC (mg/L)	.	.	.	.	.	.	.	.	.
TOC, 2 (mg/L)	.	.	.	.	.	.	.	.	.
TOC, 3 (mg/L)	.	.	.	.	.	.	.	.	.
TOC, 4 (mg/L)	.	.	.	.	.	.	.	.	.
TOX (ug/L)	.	.	.	.	.	.	.	.	.
TOX, 2 (ug/L)	.	.	.	.	.	.	.	.	.
TOX, 3 (ug/L)	.	.	.	.	.	.	.	.	.
TOX, 4 (ug/L)	.	.	.	.	.	.	.	.	.
TPH - DRO (mg/L)	.	.	.	.	.	.	.	.	.
TDS (mg/L)	196	146	136	170	178	164	144	142	166
TSS (mg/L)	5	2.5	<1	<1	4.5	16	1.5	<1	<1
Turbidity (NTU)	3.53	3.32	1.09	1.76	4.2	10.2	0.87	2.16	7.48

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APPENDIX D.1
Field Measurements and Miscellaneous Parameters, CY 1996

21

Sampling Point	GW-743		GW-757			GW-796		GW-797
Program	AMP		SDM			SDM/C		SDM
Location	CRSP		LII			LV		LV
Date Sampled	02/23/96		04/04/96	11/05/96	12/10/96	04/10/96	10/03/96	04/09/96
Sample Type	DUP			DUP				
FIELD MEASUREMENTS								
Top-of-Casing Elev. (ft)	1100.4	1100.4	961.43	961.43	961.43	961.43	1052.4	1059.8
Depth to Water (ft)	115.69	115.69	83.55	84.23	84.23	83.62	63.10	66.34
Water-Level Elev. (ft)	984.71	984.71	877.88	877.2	877.2	877.81	989.3	993.46
Water Temp (degrees C)	15.2	15	14.6	14.2	14	13.3	13.2	14
pH (pH units)	7.5	7.6	8.3	8.3	8.2	8.2	8.9	8
Sp. Cond. (umho/cm)	261	261	263	277	270	277	193	272
Dissolved Oxygen (ppm)	8.9	9	5.6	11.1	10.1	7.1	8.9	7.4
Oxidation/Reduction (mV)	204	203	178	212	209	142	176	176
MISCELLANEOUS PARAMETERS								
COD (mg/L)			<5				8	<5
Cyanide (mg/L)			<0.1				<0.1	<0.1
Phenols (mg/L)								
pH (pH units)	7.8	7.85	8.13	8.15	8.17		8.05	7.9
pH, 2 (pH units)								
pH, 3 (pH units)								
pH, 4 (pH units)								
Sp. Cond. (umho/cm)	270	270	293	312	318		213	300
Sp. Cond., 2 (umho/cm)								
Sp. Cond., 3 (umho/cm)								
Sp. Cond., 4 (umho/cm)								
TOC (mg/L)			2.3				1.2	21.4
TOC, 2 (mg/L)								
TOC, 3 (mg/L)								
TOC, 4 (mg/L)								
TOX (ug/L)			<10				<10	<10
TOX, 2 (ug/L)								
TOX, 3 (ug/L)								
TOX, 4 (ug/L)								
TPH - DRO (mg/L)								
TDS (mg/L)	132	100	154	198	194		114	212
TSS (mg/L)	<1	<1	2	5	3		1	<1
Turbidity (NTU)	2.76	1.35	1.62	3.57	3.93		2.15	1.41

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APPENDIX D.1
Field Measurements and Miscellaneous Parameters, CY 1996

22

Sampling Point	GW-797	GW-798	GW-799	GW-801	GW-827
Program	SDM	SDM/C	SDM/C	SDM/C	SDM
Location	LV	CDLVII	CDLVII	LV	CDLVI
Date Sampled	10/03/96	04/09/96	10/03/96	04/08/96	10/02/96
Sample Type				DUP	
FIELD MEASUREMENTS					
Top-of-Casing Elev. (ft)	1059.8	1005.8	1005.8	981.09	981.09
Depth to Water (ft)	69.27	71.91	76.60	5.99	11.72
Water-Level Elev. (ft)	990.53	933.89	929.2	975.1	969.37
Water Temp (degrees C)	16.1	13.6	16	13	15.5
pH (pH units)	7.3	7.7	7.8	7.7	7.5
Sp. Cond. (umho/cm)	245	236	229	250	222
Dissolved Oxygen (ppm)	6.7	7.3	7.4	9.4	7.7
Oxidation/Reduction (mV)	120	192	193	175	119
MISCELLANEOUS PARAMETERS					
COD (mg/L)		<5		<5	6.2
Cyanide (mg/L)		<0.1		<0.1	<0.1
Phenols (mg/L)					
pH, 2 (pH units)	8.43	7.67	7.86	7.7	7.81
pH, 3 (pH units)					
pH, 4 (pH units)					
Sp. Cond., 2 (umho/cm)	292	257	256	254	261
Sp. Cond., 3 (umho/cm)					
Sp. Cond., 4 (umho/cm)					
TOC (mg/L)		11		<1	2.5
TOC, 2 (mg/L)					
TOC, 3 (mg/L)					
TOC, 4 (mg/L)					
TOX (ug/L)		<10		<10	<10
TOX, 2 (ug/L)					
TOX, 3 (ug/L)					
TOX, 4 (ug/L)					
TPH - DRO (mg/L)		0.1			
TDS (mg/L)	156	92	148	130	136
TSS (mg/L)	<1	<1	<1	<1	12
Turbidity (NTU)	1.03	2.35	0.909	7.81	31.4

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APPENDIX D.1
Field Measurements and Miscellaneous Parameters, CY 1996

23

Sampling Point	GW-827		GW-831		OUTFALL301	
Program	SDM		CMP		ROD	
Location	CDLVI		ADB		KHQ	
Date Sampled	11/05/96	12/17/96	08/27/96	10/01/96	03/13/96	08/06/96
Sample Type						
FIELD MEASUREMENTS						
Top-of-Casing Elev. (ft)	1051.39	1051.39	1091.09	1091.09	.	.
Depth to Water (ft)	41.92	39.70	125.65	127.35	.	.
Water-Level Elev. (ft)	1009.47	1011.69	965.44	963.74	.	.
Water Temp (degrees C)	13.7	13.3	15.5	16.8	10	21.4
pH (pH units)	8	7.8	7.5	7.6	8.1	6.74
Sp. Cond. (umho/cm)	338	298	348	337	1496	246
Dissolved Oxygen (ppm)	3.6	3.9	5.3	6.9	10.8	9.1
Oxidation/Reduction (mV)	154	219	136	208	172	120
MISCELLANEOUS PARAMETERS						
COD (mg/L)	.	.	.	.	.	.
Cyanide (mg/L)	.	.	.	.	.	.
Phenols (mg/L)	.	.	.	.	.	.
pH (pH units)	7.73	.	7.85	7.72	.	.
pH, 2 (pH units)	.	.	.	.	.	.
pH, 3 (pH units)	.	.	.	.	.	.
pH, 4 (pH units)	.	.	.	.	.	.
Sp. Cond. (umho/cm)	285	.	380	371	.	.
Sp. Cond., 2 (umho/cm)	.	.	.	.	.	.
Sp. Cond., 3 (umho/cm)	.	.	.	.	.	.
Sp. Cond., 4 (umho/cm)	.	.	.	.	.	.
TOC (mg/L)	.	.	.	.	.	.
TOC, 2 (mg/L)	.	.	.	.	.	.
TOC, 3 (mg/L)	.	.	.	.	.	.
TOC, 4 (mg/L)	.	.	.	.	.	.
TOX (ug/L)	.	.	.	.	.	.
TOX, 2 (ug/L)	.	.	.	.	.	.
TOX, 3 (ug/L)	.	.	.	.	.	.
TOX, 4 (ug/L)	.	.	.	.	.	.
TPH - DRO (mg/L)	.	.	.	.	.	.
TDS (mg/L)	166	.	230	176	.	.
TSS (mg/L)	<1	.	75	<1	<1	3
Turbidity (NTU)	1.95	.	300	1.98	.	.



APPENDIX D.2
INORGANIC ANALYTES

APPENDIX D.2
Inorganic Analytes, CY 1996

1

Sampling Point	1090				CBS-1				GW-141	
Program	ROD				SDM				SDM	
Location	UNCS				CDLVII				LIV	
Date Sampled	04/23/96		10/30/96		04/11/96		10/07/96		01/04/96	
Sample Type										
	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS
METALS (mg/L)										
Aluminum	0.087	<0.02	0.021	0.034	0.18	<0.02	0.091	0.028	12	0.07
Antimony	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Arsenic	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Arsenic (PMS)			<0.005	<0.005			<0.005	<0.005		
Barium	0.029	0.028	0.029	0.029	0.055	0.057	0.12	0.12	0.041	0.024
Beryllium	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	0.0036	<0.0003
Boron	0.02	0.031	0.011	0.016	0.011	0.018	0.014	0.064	0.064	0.035
Cadmium	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Chromium	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Copper	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	0.016	<0.004
Iron	0.056	<0.005	0.02	<0.005	0.076	0.0066	0.076	0.012	10	<0.005
Lead	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Lead (AAS)					<0.004	<0.004			0.023	<0.004
Lead (PMS)			0.0012	<0.0005			<0.0005	<0.0005		
Lithium	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	0.02	<0.004
Manganese	0.003	<0.001	<0.001	<0.001	0.0038	0.0028	0.0055	0.0059	0.15	<0.001
Mercury (CVAA)	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Nickel	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.018	<0.01
Selenium	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Silver	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006
Strontium	0.026	0.025	0.025	0.025	0.045	0.048	0.065	0.067	0.03	0.027
Thallium (AAS)					<0.01	<0.01			<0.01	<0.01
Thallium (PMS)			<0.0005	<0.0005			0.00061	<0.0005		
Thorium	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Uranium (PMS)	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.00076	<0.0005
Vanadium	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.025	<0.005
Zinc	0.003	0.0026	0.0025	0.0034	0.0082	0.011	0.0083	0.097	0.2	0.013
IONS (mg/L)										
Calcium	57	57	58	57	23	24	36	36	56	53
Magnesium	37	37	34	34	7.9	8.4	13	13	34	32
Potassium	1	0.65	0.63	0.94	0.87	1	1	1.1	1.6	0.84
Sodium	13	13	13	13	2.1	2.4	1.9	2.1	2.3	2.4
Alkalinity-HCO3	266		280		85		136		247	
Alkalinity-CO3	<1		<1		<1		<1		<1	
Ammonia-N					<0.2					
Chloride	26.3		32		4.82		5.1		2.54	
Fluoride	<0.1		<0.1		<0.1		<0.1		<0.1	
Nitrate-N	0.77		0.81		0.38		0.33		0.78	
Sulfate	4.55		4.32		6.18		8.85		2.98	
Diluted ICP										

(CONTINUED)

APPENDIX D.2
Inorganic Analytes, CY 1996

2

Sampling Point	GW-141						GW-142			
Program	SDM						RDM			
Location	LIV						KHQ			
Date Sampled	01/04/96		07/02/96				01/04/96		04/17/96	
Sample Type	DUP		DUP							
	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS
METALS (mg/L)	.	.	.	.	.	.	.	.	.	.
Aluminum	8.3	0.034	2.5	0.031	3.1	<0.02	0.048	0.072	0.98	0.094
Antimony	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.056	<0.056
Arsenic	<0.05	<0.05	<0.05	<0.05	0.055	<0.05	<0.05	<0.05	<0.056	<0.056
Arsenic (PMS)	.	.	.	.	.	.	.	.	.	.
Barium	0.037	0.023	0.025	0.019	0.025	0.019	0.46	0.43	0.48	0.39
Beryllium	0.003	<0.0003	0.0017	<0.0003	0.0011	<0.0003	<0.0003	<0.0003	<0.00033	<0.00033
Boron	0.027	0.021	0.015	0.017	0.019	0.016	0.07	0.061	0.069	0.035
Cadmium	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.0033	<0.0033
Chromium	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.011	<0.011
Cobalt	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0056	<0.0056
Copper	0.011	<0.004	0.0096	<0.004	0.0044	<0.004	<0.004	<0.004	<0.0044	<0.0044
Iron	6.5	<0.005	5.1	0.04	3.3	0.0064	2.9	<0.005	4.5	0.094
Lead	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.056	<0.056
Lead (AAS)	0.018	<0.004	.	.	.	.	.	.	.	.
Lead (PMS)	.	.	0.0061	0.00094	0.0081	<0.0005	.	.	.	.
Lithium	0.0092	<0.004	<0.004	<0.004	<0.004	<0.004	0.021	0.021	0.025	0.023
Manganese	0.11	<0.001	0.081	0.0019	0.053	0.001	0.033	0.026	0.07	0.034
Mercury (CVAA)	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.011	<0.011
Nickel	0.013	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.011	<0.011
Selenium	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.056	<0.056
Silver	<0.006	<0.006	<0.006	<0.006	<0.006	0.0064	<0.006	<0.006	0.0073	<0.0067
Strontium	0.03	0.027	0.023	0.021	0.022	0.022	0.54	0.52	0.53	0.49
Thallium (AAS)	<0.01	<0.01	.	.	.	.	.	.	.	.
Thallium (PMS)	.	.	<0.0005	<0.0005	<0.0005	<0.0005	.	.	.	.
Thorium	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.22	<0.22
Uranium (PMS)	0.00062	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.029	0.028	0.0028	0.0019
Vanadium	0.018	<0.005	0.015	<0.005	0.01	<0.005	<0.005	<0.005	<0.0056	<0.0056
Zinc	0.15	0.013	0.13	0.015	0.088	0.01	0.0087	0.009	0.014	0.003
IONS (mg/L)	.	.	.	.	.	.	.	.	.	.
Calcium	58	55	52	49	50	50	51	50	50	43
Magnesium	35	33	32	30	31	31	33	32	35	32
Potassium	1.6	0.78	1.4	0.79	0.99	1	6.7	3.7	4	3.1
Sodium	2.4	2.3	2.1	2	1.8	1.9	1.3	1.2	1.5	1.2
Alkalinity-HCO3	254	.	233	.	242	.	236	.	240	.
Alkalinity-CO3	<1	.	<1	.	<1	.	<1	.	<1	.
Ammonia-N	.	.	.	.	.	.	.	.	.	.
Chloride	2.45	.	1.65	.	1.67	.	2.36	.	2.22	.
Fluoride	<0.1	.	<0.1	.	<0.1	.	0.53	.	0.54	.
Nitrate-N	0.77	.	0.57	.	0.58	.	0.6	.	<0.2	.
Sulfate	3.02	.	3.76	.	3.6	.	5.25	.	5.18	.
Diluted ICP	.	.	.	.	.	.	.	.	Dilute	Dilute

(CONTINUED)

APPENDIX D.2
Inorganic Analytes, CY 1996

3

Sampling Point	GW-142								GW-143	
Program	RDM								RDM	
Location	KHQ								KHQ	
Date Sampled	10/21/96		10/22/96		10/23/96		10/24/96		01/18/96	
Sample Type										
	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS
METALS (mg/L)										
Aluminum	0.02	<0.02	0.023	0.034	0.023	<0.02	<0.02	<0.02	0.59	<0.02
Antimony	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Arsenic	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Arsenic (PMS)	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005		
Barium	0.44	0.44	0.47	0.46	0.46	0.45	0.45	0.46	0.046	0.034
Beryllium	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Boron	0.052	0.07	0.042	0.044	0.089	0.087	0.063	0.054	0.94	0.89
Cadmium	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Chromium	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.028	<0.01
Cobalt	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Copper	0.0058	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	0.012	<0.004
Iron	2.5	1.3	2.3	0.071	1.8	<0.005	0.76	<0.005	7.3	0.027
Lead	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Lead (AAS)										
Lead (PMS)	0.00051	<0.0005	<0.0005	<0.0005	0.0045	<0.0005	<0.0005	0.0014		
Lithium	0.026	0.026	0.024	0.026	0.023	0.022	0.022	0.023	0.29	0.28
Manganese	0.058	0.055	0.039	0.038	0.024	0.021	0.013	0.013	0.041	0.01
Mercury (CVAA)	0.0003	0.00026	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Nickel	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.011	<0.01
Selenium	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Silver	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006
Strontium	0.51	0.52	0.51	0.5	0.52	0.52	0.51	0.52	2.9	2.7
Thallium (AAS)										
Thallium (PMS)	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005		
Thorium	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Uranium (PMS)	0.0016	0.0014	0.0084	0.0074	0.012	0.0098	0.012	0.011	0.0024	0.0017
Vanadium	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc	0.0099	0.01	0.004	0.0065	0.0036	0.0082	0.003	0.0036	0.021	0.0022
IONS (mg/L)										
Calcium	43	42	45	45	44	45	42	44	32	29
Magnesium	31	32	32	32	31	31	31	32	27	25
Potassium	4.7	3.9	3.9	4	3.9	4	3.3	4.1	18	17
Sodium	1.3	1.3	1.1	1.2	1	1.1	0.96	1.1	25	24
Alkalinity-HCO3	234		234		244		236		204	
Alkalinity-CO3	<1		<1		<1		<1		<1	
Ammonia-N										
Chloride	1.4		1.34		1.27		1.3		6.3	
Fluoride	0.6		0.56		0.54		0.57		2.7	
Nitrate-N	<0.03		0.14		0.39		0.495		<0.2	
Sulfate	6.16		5.61		6.2		5.74		39.3	
Diluted ICP										

(CONTINUED)

APPENDIX D.2
Inorganic Analytes, CY 1996

4

Sampling Point	GW-143									
Program	RDM									
Location	KHQ									
Date Sampled	04/23/96		10/21/96				10/22/96			
Sample Type			DUP				DUP			
	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS
METALS (mg/L)										
Aluminum	0.91	0.079	0.041	0.028	0.023	0.029	0.09	0.51	<0.02	0.027
Antimony	<0.056	<0.056	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Arsenic	<0.056	<0.056	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Arsenic (PMS)			<0.005	0.0052	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Barium	0.071	0.039	0.031	0.028	0.028	0.027	0.027	0.027	0.028	0.026
Beryllium	<0.00033	<0.00033	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Boron	0.8	0.83	0.88	0.92	0.92	0.89	0.93	0.92	0.95	0.92
Cadmium	<0.0033	<0.0033	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Chromium	<0.011	<0.011	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt	<0.0056	<0.0056	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Copper	0.014	<0.0044	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Iron	24	0.011	1.1	0.36	1.1	0.33	0.3	0.11	0.79	0.098
Lead	<0.056	<0.056	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Lead (AAS)										
Lead (PMS)			0.00054	<0.0005	0.00062	0.00061	<0.0005	<0.0005	<0.0005	<0.0005
Lithium	0.28	0.28	0.3	0.3	0.29	0.3	0.31	0.31	0.31	0.3
Manganese	0.15	0.013	0.036	0.037	0.036	0.036	0.011	0.016	0.015	0.011
Mercury (CVAA)	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum	<0.011	<0.011	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Nickel	<0.011	<0.011	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Selenium	<0.056	<0.056	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Silver	<0.0067	<0.0067	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006
Strontium	3	2.7	2.5	2.5	2.5	2.5	2.4	2.4	2.5	2.4
Thallium (AAS)										
Thallium (PMS)			<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Thorium	<0.22	<0.22	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Uranium (PMS)	0.003	0.0016	0.001	0.001	0.00098	0.00093	0.0022	0.0023	0.0028	0.0023
Vanadium	<0.0056	<0.0056	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc	0.024	0.0039	0.0034	0.003	0.0041	<0.002	0.0052	0.01	0.0052	0.0046
IONS (mg/L)										
Calcium	39	31	31	31	30	31	30	30	31	30
Magnesium	29	25	24	25	24	24	24	24	25	24
Potassium	18	17	18	18	17	18	18	18	18	18
Sodium	24	24	26	26	25	25	27	27	27	26
Alkalinity-HCO3	205		210		204		208		212	
Alkalinity-CO3	<1		<1		<1		<1		<1	
Ammonia-N										
Chloride	6.83		6.66		6.41		6.63		6.44	
Fluoride	3		2.94		2.94		2.99		2.95	
Nitrate-N	<0.2		<0.03		<0.03		<0.03		<0.03	
Sulfate	44.2		34.8		34.7		33		34.4	
Diluted ICP	Dilute	Dilute								

(CONTINUED)

APPENDIX D.2
Inorganic Analytes, CY 1996

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Sampling Point	GW-143								GW-144	
Program	RDM								RDM	
Location	KHQ								KHQ	
Date Sampled	10/23/96				10/24/96				01/22/96	
Sample Type	DUP		DUP		DUP		DUP			
	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS
METALS (mg/L)	.	.	.	.	.	.	.	.	.	.
Aluminum	<0.02	0.031	<0.02	<0.02	0.037	<0.02	<0.02	<0.02	<0.02	<0.02
Antimony	<0.05	<0.053	<0.051	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Arsenic	<0.05	<0.053	<0.051	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Arsenic (PMS)	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	.
Barium	0.029	0.028	0.028	0.028	0.026	0.029	0.028	0.03	0.048	0.046
Beryllium	<0.0003	<0.00032	<0.00031	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Boron	0.99	0.99	0.97	0.97	0.96	0.88	0.87	0.88	0.036	0.032
Cadmium	<0.003	<0.0032	<0.0031	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Chromium	<0.01	<0.011	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt	<0.005	<0.0053	<0.0051	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Copper	<0.004	<0.0042	<0.0041	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Iron	0.63	0.039	0.37	0.066	0.56	0.021	0.26	0.062	0.16	<0.005
Lead	<0.05	<0.053	<0.051	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Lead (AAS)	.	.	.	.	.	.	.	.	.	.
Lead (PMS)	<0.0005	<0.0005	<0.0005	<0.0005	0.00053	<0.0005	0.00066	<0.0005	.	.
Lithium	0.3	0.3	0.3	0.31	0.27	0.28	0.27	0.28	0.029	0.028
Manganese	0.01	0.0084	0.0092	0.0093	0.0068	0.0045	0.0049	0.005	<0.001	<0.001
Mercury (CVAA)	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum	<0.01	<0.011	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Nickel	<0.01	<0.011	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Selenium	<0.05	<0.053	<0.051	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Silver	<0.006	0.0078	0.0087	0.0064	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006
Strontium	2.5	2.5	2.5	2.5	2.3	2.4	2.3	2.4	0.086	0.08
Thallium (AAS)	.	.	.	.	.	.	.	.	.	.
Thallium (PMS)	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	.	.
Thorium	<0.2	<0.21	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Uranium (PMS)	0.0033	0.0024	0.0025	0.0024	0.0019	0.0016	0.0016	0.0017	0.0021	0.0018
Vanadium	<0.005	<0.0053	<0.0051	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc	0.005	0.0077	0.0064	0.0058	0.0057	0.003	0.0029	0.0045	0.0046	0.0035
IONS (mg/L)	.	.	.	.	.	.	.	.	.	.
Calcium	31	30	30	31	28	29	28	29	40	39
Magnesium	24	24	24	24	24	25	24	24	16	15
Potassium	18	18	18	18	16	17	17	17	0.97	1.2
Sodium	26	25	25	26	25	25	24	25	1.1	1.1
Alkalinity-HCO3	208	.	216	.	210	.	207	.	156	.
Alkalinity-CO3	<1	.	<1	.	<1	.	<1	.	<1	.
Ammonia-N	.	.	.	.	.	.	.	.	.	.
Chloride	5.14	.	4.76	.	6.99	.	6.7	.	2.73	.
Fluoride	3.01	.	3.02	.	2.95	.	2.85	.	0.11	.
Nitrate-N	<0.03	.	<0.03	.	<0.03	.	<0.03	.	2.63	.
Sulfate	38	.	38.4	.	35	.	34.8	.	5.55	.
Diluted ICP	.	Dilute	.	.	.	.	.	.	.	.

(CONTINUED)

APPENDIX D.2
Inorganic Analytes, CY 1996

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Sampling Point	GW-144									
Program	RDM									
Location	KHQ									
Date Sampled	01/22/96		04/24/96		10/21/96		10/22/96		10/23/96	
Sample Type	DUP									
	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS
METALS (mg/L)	.	.	.	.	.	.	.	.	.	.
Aluminum	<0.02	<0.02	0.061	0.086	0.055	<0.02	<0.02	<0.02	0.03	0.17
Antimony	<0.05	<0.05	<0.056	<0.056	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Arsenic	<0.05	<0.05	<0.056	<0.056	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Arsenic (PMS)	.	.	.	.	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Barium	0.049	0.046	0.049	0.048	0.045	0.044	0.044	0.044	0.046	0.046
Beryllium	<0.0003	<0.0003	<0.00033	<0.00033	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Boron	0.067	0.051	0.013	0.012	0.21	0.031	0.016	0.036	0.076	0.045
Cadmium	<0.003	<0.003	<0.0033	<0.0033	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Chromium	<0.01	<0.01	<0.011	<0.011	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt	<0.005	<0.005	<0.0056	<0.0056	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Copper	<0.004	<0.004	<0.0044	<0.0044	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Iron	0.31	<0.005	0.014	<0.0056	0.0094	<0.005	<0.005	<0.005	<0.005	<0.005
Lead	<0.05	<0.05	<0.056	<0.056	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Lead (AAS)	.	.	.	.	.	.	.	.	.	.
Lead (PMS)	.	.	.	.	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Lithium	0.029	0.029	0.027	0.029	0.028	0.027	0.025	0.025	0.025	0.027
Manganese	<0.001	0.0014	0.0015	<0.0011	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Mercury (CVAA)	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum	<0.01	<0.01	<0.011	<0.011	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Nickel	<0.01	<0.01	<0.011	<0.011	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Selenium	<0.05	<0.05	<0.056	<0.056	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Silver	<0.006	<0.006	<0.0067	<0.0067	<0.006	<0.006	<0.006	0.0081	<0.006	0.0069
Strontium	0.084	0.078	0.091	0.089	0.092	0.089	0.081	0.079	0.09	0.086
Thallium (AAS)	.	.	.	.	.	.	.	.	.	.
Thallium (PMS)	.	.	.	.	<0.0005	<0.0005	<0.0005	<0.0005	0.00051	<0.0005
Thorium	<0.2	<0.2	<0.22	<0.22	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Uranium (PMS)	0.002	0.0022	0.0015	0.0015	0.0015	0.0016	0.0016	0.0016	0.0017	0.0017
Vanadium	<0.005	<0.005	<0.0056	<0.0056	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc	0.0052	0.0029	0.016	<0.0022	0.0021	0.004	0.0041	0.0046	0.0044	0.0039
IONS (mg/L)	.	.	.	.	.	.	.	.	.	.
Calcium	41	39	44	43	41	41	40	41	44	42
Magnesium	16	15	17	16	15	15	16	16	16	16
Potassium	1.5	1.5	1.1	1.6	1.6	1.4	2	2	1.7	2.2
Sodium	1.4	1.1	2.4	1.2	1.6	1.3	1.1	1.1	1.2	1.2
Alkalinity-HCO3	156	.	167	.	159	.	163	.	161	.
Alkalinity-CO3	<1	.	<1	.	<1	.	<1	.	<1	.
Ammonia-N	.	.	.	.	.	.	.	.	.	.
Chloride	2.69	.	2.68	.	2.06	.	1.73	.	1.92	.
Fluoride	0.11	.	0.11	.	0.11	.	<0.1	.	0.1	.
Nitrate-N	2.64	.	6.21	.	2.24	.	2.16	.	2.46	.
Sulfate	5.56	.	6.37	.	5.4	.	4.58	.	5.75	.
Diluted ICP	.	.	Dilute	Dilute	.	.	.	.	.	.

(CONTINUED)

APPENDIX D.2
Inorganic Analytes, CY 1996

7

Sampling Point	GW-144				GW-145					
Program	RDM				RDM					
Location	KHQ				KHQ					
Date Sampled	10/24/96		01/23/96		04/25/96		10/21/96		10/22/96	
Sample Type										
	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS
METALS (mg/L)	.	.	.	.	.	.	.	.	.	.
Aluminum	<0.02	0.035	0.34	<0.02	0.32	0.096	0.24	<0.02	0.25	0.083
Antimony	<0.05	<0.05	<0.05	<0.05	<0.056	<0.056	<0.05	<0.05	<0.05	<0.05
Arsenic	<0.05	<0.05	<0.05	<0.05	<0.056	<0.056	<0.05	<0.05	<0.05	<0.05
Arsenic (PMS)	<0.005	<0.005	.	.	.	.	<0.005	<0.005	<0.005	<0.005
Barium	0.046	0.045	0.17	0.16	0.12	0.1	0.097	0.074	0.084	0.08
Beryllium	<0.0003	0.00034	<0.0003	<0.0003	<0.00033	<0.00033	<0.0003	<0.0003	<0.0003	<0.0003
Boron	0.062	0.069	0.29	0.25	0.22	0.22	0.24	0.22	0.26	0.38
Cadmium	<0.003	<0.003	<0.003	<0.003	<0.0033	<0.0033	<0.003	<0.003	<0.003	<0.003
Chromium	<0.01	<0.01	<0.01	<0.01	<0.011	<0.011	<0.01	<0.01	<0.01	<0.01
Cobalt	<0.005	<0.005	<0.005	<0.005	<0.0056	<0.0056	<0.005	<0.005	<0.005	<0.005
Copper	<0.004	0.0093	<0.004	<0.004	<0.0044	<0.0044	<0.004	<0.004	<0.004	<0.004
Iron	<0.005	0.015	0.45	0.026	0.25	0.0093	0.21	<0.005	0.17	<0.005
Lead	<0.05	<0.05	<0.05	<0.05	<0.056	<0.056	<0.05	<0.05	<0.05	<0.05
Lead (AAS)	.	.	.	.	.	.	.	.	.	.
Lead (PMS)	<0.0005	<0.0005	.	.	.	.	0.00085	<0.0005	0.001	<0.0005
Lithium	0.024	0.023	0.096	0.097	0.097	0.098	0.1	0.098	0.11	0.098
Manganese	<0.001	<0.001	0.046	0.031	0.037	0.014	0.018	<0.001	0.017	0.0058
Mercury (CVAA)	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum	<0.01	<0.01	0.011	0.011	0.014	0.011	<0.01	<0.01	0.011	<0.01
Nickel	<0.01	<0.01	<0.01	<0.01	<0.011	<0.011	<0.01	<0.01	<0.01	<0.01
Selenium	<0.05	<0.05	<0.05	<0.05	<0.056	<0.056	<0.05	<0.05	<0.05	<0.05
Silver	<0.006	<0.006	<0.006	<0.006	<0.0067	<0.0067	<0.006	<0.006	0.0062	<0.006
Strontium	0.076	0.072	7.8	7.7	7.3	7.4	8	7.1	7.5	7.4
Thallium (AAS)	.	.	.	.	.	.	.	.	.	.
Thallium (PMS)	<0.0005	<0.0005	.	.	.	.	<0.0005	<0.0005	<0.0005	<0.0005
Thorium	<0.2	<0.2	<0.2	<0.2	<0.22	<0.22	<0.2	<0.2	<0.2	<0.2
Uranium (PMS)	0.0015	0.0015	0.011	0.0094	0.01	0.011	0.011	0.012	0.012	0.012
Vanadium	<0.005	<0.005	<0.005	<0.005	<0.0056	<0.0056	<0.005	<0.005	<0.005	<0.005
Zinc	0.0042	0.0046	0.01	0.0023	0.0045	<0.0022	0.0049	0.0023	0.0068	0.0043
IONS (mg/L)	.	.	.	.	.	.	.	.	.	.
Calcium	41	39	44	43	43	42	48	44	47	43
Magnesium	16	16	38	38	37	36	39	36	39	36
Potassium	1.5	1.9	12	13	12	13	13	12	13	12
Sodium	1.1	1.2	5.4	5.2	6.9	7.7	7.5	5.2	4.6	4.6
Alkalinity-HCO3	159	.	230	.	235	.	229	.	238	.
Alkalinity-CO3	<1	.	<1	.	<1	.	<1	.	<1	.
Ammonia-N	.	.	.	.	.	.	.	.	.	.
Chloride	1.77	.	9.14	.	9.03	.	11.7	.	11.6	.
Fluoride	0.1	.	2.2	.	2.5	.	2.45	.	2.35	.
Nitrate-N	2.34	.	0.35	.	<0.2	.	0.16	.	0.04	.
Sulfate	4.93	.	36.6	.	34.2	.	41.2	.	41.2	.
Diluted ICP	.	.	.	.	Dilute	Dilute	.	.	.	.

(CONTINUED)

APPENDIX D.2
Inorganic Analytes, CY 1996

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Sampling Point	GW-145				GW-146				GW-147	
Program	RDM				RDM				RDM	
Location	KHQ				KHQ				KHQ	
Date Sampled	10/23/96		10/24/96		01/18/96		04/25/96		01/10/96	
Sample Type										
	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS
METALS (mg/L)	.	.	.	.	.	.	.	.	.	.
Aluminum	0.13	<0.02	0.057	0.047	0.059	<0.02	0.1	0.07	0.3	<0.02
Antimony	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.056	<0.056	<0.05	<0.05
Arsenic	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.056	<0.056	<0.05	<0.05
Arsenic (PMS)	<0.005	<0.005	<0.005	<0.005	.	.	.	.	.	.
Barium	0.084	0.079	0.08	0.056	0.064	0.053	0.062	0.058	0.079	0.077
Beryllium	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.00033	<0.00033	<0.0003	<0.0003
Boron	0.29	0.22	0.25	0.16	0.56	0.51	0.46	0.46	0.07	0.066
Cadmium	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.0033	<0.0033	<0.003	<0.003
Chromium	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.011	<0.011	<0.01	<0.01
Cobalt	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0056	<0.0056	<0.005	<0.005
Copper	<0.004	<0.004	<0.004	0.0043	0.0087	<0.004	<0.0044	0.0053	<0.004	<0.004
Iron	0.19	<0.005	0.11	<0.005	5	<0.005	2.8	0.012	0.36	<0.005
Lead	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.056	<0.056	<0.05	<0.05
Lead (AAS)	.	.	.	.	.	.	.	.	.	.
Lead (PMS)	0.0013	<0.0005	0.00061	0.00074	.	.	.	.	.	.
Lithium	0.1	0.1	0.096	0.067	0.23	0.22	0.23	0.23	0.027	0.028
Manganese	0.021	0.0068	0.014	0.0063	0.029	0.014	0.019	0.0079	0.034	0.0018
Mercury (CVAA)	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.011	<0.011	<0.01	<0.01
Nickel	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.011	<0.011	<0.01	<0.01
Selenium	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.056	<0.056	<0.05	<0.05
Silver	<0.006	<0.006	<0.006	0.014	<0.006	<0.006	<0.0067	<0.0067	<0.006	<0.006
Strontium	7.1	7	6.5	4.5	6.9	6.6	6.8	6.8	2.2	2.3
Thallium (AAS)	.	.	.	.	.	.	.	.	.	.
Thallium (PMS)	<0.0005	<0.0005	<0.0005	<0.0005	.	.	.	.	.	.
Thorium	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.22	<0.22	<0.2	<0.2
Uranium (PMS)	0.012	0.011	0.01	0.01	0.0017	0.0017	0.0013	0.0013	0.0027	0.0027
Vanadium	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0056	<0.0056	<0.005	<0.005
Zinc	0.006	0.0053	0.0043	0.0073	0.013	0.0051	0.0037	0.015	0.013	0.0049
IONS (mg/L)	.	.	.	.	.	.	.	.	.	.
Calcium	46	43	42	29	40	38	41	40	37	36
Magnesium	38	36	37	26	35	33	35	35	22	22
Potassium	13	13	12	8.7	16	15	15	17	5.4	5.4
Sodium	4.6	4.4	4.2	3	13	13	14	13	3.9	3.9
Alkalinity-HCO3	240	.	237	.	201	.	202	.	171	.
Alkalinity-CO3	<1	.	<1	.	<1	.	<1	.	<1	.
Ammonia-N	.	.	.	.	.	.	.	.	.	.
Chloride	11.5	.	12.2	.	11.4	.	11.8	.	2.32	.
Fluoride	2.3	.	2.33	.	2.5	.	2.8	.	0.71	.
Nitrate-N	0.05	.	<0.03	.	0.43	.	0.35	.	0.98	.
Sulfate	44.6	.	39.8	.	68.9	.	66.8	.	6.06	.
Diluted ICP	.	.	.	.	.	.	Dilute	Dilute	.	.

(CONTINUED)

APPENDIX D.2
Inorganic Analytes, CY 1996

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Sampling Point	GW-147		GW-156							
Program	RDM		RDM							
Location	KHQ		CRSDB							
Date Sampled	04/18/96		05/13/96		05/14/96		05/15/96		05/16/96	
Sample Type										
	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS
METALS (mg/L)	.	.	.	.	.	.	.	.	.	.
Aluminum	1.1	0.11	0.074	<0.02	0.046	<0.02	<0.02	<0.02	<0.02	<0.02
Antimony	<0.056	<0.056	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Arsenic	<0.056	<0.056	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Arsenic (PMS)	.	.	.	.	.	.	.	.	.	.
Barium	0.077	0.097	0.028	0.026	0.023	0.025	0.021	0.022	0.021	0.021
Beryllium	<0.00033	<0.00033	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Boron	0.026	0.041	0.017	0.019	0.0094	0.022	0.013	0.014	0.019	0.031
Cadmium	<0.0033	<0.0033	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Chromium	<0.011	<0.011	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt	<0.0056	<0.0056	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Copper	<0.0044	<0.0044	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Iron	0.71	0.026	0.11	0.0095	0.07	0.0082	0.03	<0.005	0.042	<0.005
Lead	<0.056	<0.056	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Lead (AAS)	.	.	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Lead (PMS)	.	.	.	.	.	.	.	.	.	.
Lithium	0.02	0.023	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Manganese	0.12	0.0096	0.0042	0.0023	0.0028	0.0014	0.0013	0.001	0.002	0.001
Mercury (CVAA)	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum	<0.011	<0.011	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Nickel	<0.011	<0.011	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Selenium	<0.056	<0.056	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Silver	<0.0067	<0.0067	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006
Strontium	0.91	1.2	0.03	0.029	0.027	0.029	0.026	0.027	0.029	0.027
Thallium (AAS)	.	.	.	.	.	.	.	.	.	.
Thallium (PMS)	.	.	.	.	.	.	.	.	.	.
Thorium	<0.22	<0.22	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Uranium (PMS)	0.0022	0.0029	0.0023	0.0024	0.002	0.0027	0.0018	0.0018	0.0015	0.0014
Vanadium	<0.0056	<0.0056	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc	0.012	0.0036	0.042	0.037	0.024	0.032	0.014	0.014	0.013	0.012
IONS (mg/L)	.	.	.	.	.	.	.	.	.	.
Calcium	32	31	66	62	61	63	57	59	63	59
Magnesium	20	19	41	39	38	40	38	39	42	39
Potassium	4.8	4.9	9.1	9.7	7.6	12	6.1	6.2	5.3	5.1
Sodium	3.3	4.8	4.5	4.7	3.4	5.5	2.7	2.8	2.5	2.4
Alkalinity-HCO3	161	.	369	.	361	.	355	.	350	.
Alkalinity-CO3	<1	.	<1	.	<1	.	<1	.	<1	.
Ammonia-N	.	.	.	.	.	.	.	.	.	.
Chloride	2.39	.	2.71	.	2.46	.	2.88	.	2.8	.
Fluoride	0.36	.	<0.1	.	<0.1	.	<0.1	.	<0.1	.
Nitrate-N	1.34	.	0.3	.	0.32	.	0.28	.	0.32	.
Sulfate	3.86	.	6.96	.	5.55	.	4.69	.	4.34	.
Diluted ICP	Dilute	Dilute	.	.	.	.	.	.	.	.

(CONTINUED)

APPENDIX D.2
Inorganic Analytes, CY 1996

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Sampling Point Program Location Date Sampled Sample Type	GW-156								GW-159	
	RDM								RDM	
	CRSDB								CRSDB	
	10/14/96		10/15/96		10/16/96		10/17/96		05/13/96	
	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS
METALS (mg/L)	.	.	.	.	.	.	.	.	.	.
Aluminum	0.69	0.021	0.94	0.032	0.047	<0.02	0.022	0.027	0.39	0.024
Antimony	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Arsenic	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Arsenic (PMS)	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	.	.
Barium	0.04	0.038	0.03	0.027	0.023	0.024	0.021	0.021	0.016	0.013
Beryllium	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Boron	<0.004	<0.004	0.0066	0.017	<0.004	0.0068	<0.004	0.0088	0.0068	0.0051
Cadmium	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Chromium	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Copper	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Iron	0.61	0.011	1.2	0.029	0.065	<0.005	0.039	<0.005	0.39	<0.005
Lead	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Lead (AAS)	.	.	.	.	.	.	.	.	<0.004	<0.004
Lead (PMS)	0.004	0.00088	0.0042	0.00057	0.0021	0.00096	0.0012	0.00092	.	.
Lithium	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Manganese	0.03	0.0032	0.034	0.0027	0.0034	0.0023	0.0022	0.0024	0.024	0.0026
Mercury (CVAA)	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Nickel	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Selenium	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Silver	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006
Strontium	0.035	0.028	0.033	0.028	0.027	0.027	0.026	0.026	0.029	0.023
Thallium (AAS)	.	.	.	.	.	.	.	.	.	.
Thallium (PMS)	0.00072	<0.0005	<0.0005	<0.0005	0.00062	0.00075	<0.0005	<0.0005	.	.
Thorium	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Uranium (PMS)	0.0025	0.003	0.0027	0.0026	0.0018	0.0021	0.0015	0.0026	0.0019	0.0015
Vanadium	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc	0.083	0.05	0.049	0.029	0.023	0.027	0.029	0.022	0.015	0.01
IONS (mg/L)	.	.	.	.	.	.	.	.	.	.
Calcium	80	62	82	66	61	61	62	60	38	36
Magnesium	48	37	49	40	37	37	38	37	25	23
Potassium	7.4	6.8	6.2	6.5	5.2	5.4	4.8	4.7	2.1	1.7
Sodium	3.2	3.3	2.9	3.3	2.2	2.2	1.9	1.9	0.52	0.52
Alkalinity-HCO3	353	.	337	.	337	.	345	.	198	.
Alkalinity-CO3	<1	.	<1	.	<1	.	<1	.	<1	.
Ammonia-N	.	.	.	.	.	.	.	.	.	.
Chloride	0.77	.	1.8	.	1.88	.	1.82	.	1.74	.
Fluoride	<0.1	.	<0.1	.	<0.1	.	<0.1	.	<0.1	.
Nitrate-N	0.24	.	0.26	.	0.26	.	0.26	.	<0.2	.
Sulfate	4.9	.	5.31	.	5.18	.	4.73	.	11.1	.
Diluted ICP	.	.	.	.	.	.	.	.	.	.

(CONTINUED)

APPENDIX D.2
Inorganic Analytes, CY 1996

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Sampling Point	GW-159									
Program	RDM									
Location	CRSDB									
Date Sampled	05/14/96		05/15/96		05/16/96		10/14/96		10/15/96	
Sample Type										
	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS
METALS (mg/L)	.	.	.	.	.	.	.	.	.	.
Aluminum	1.1	<0.02	4.3	0.35	0.53	0.04	0.17	<0.02	1.8	0.03
Antimony	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Arsenic	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Arsenic (PMS)	.	.	.	.	.	.	<0.005	<0.005	<0.005	<0.005
Barium	0.019	0.016	0.037	0.017	0.024	0.021	0.022	0.024	0.033	0.027
Beryllium	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Boron	0.012	0.017	0.045	0.016	0.02	0.014	0.005	<0.004	0.01	0.029
Cadmium	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Chromium	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Copper	<0.004	<0.004	0.033	0.0086	<0.004	<0.004	0.0055	<0.004	0.011	<0.004
Iron	1.1	<0.005	7.5	0.59	0.46	0.016	0.31	<0.005	2.6	0.01
Lead	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Lead (AAS)	<0.004	<0.004	0.036	<0.004	<0.004	<0.004	.	.	.	.
Lead (PMS)	.	.	.	.	.	.	0.0014	<0.0005	0.0068	0.00085
Lithium	<0.004	<0.004	0.0051	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Manganese	0.061	0.0065	0.36	0.038	0.035	0.0095	0.014	0.0016	0.091	0.0025
Mercury (CVAA)	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Nickel	<0.01	<0.01	0.017	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Selenium	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Silver	<0.006	<0.006	<0.006	0.11	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006
Strontium	0.033	0.028	0.1	0.032	0.028	0.025	0.023	0.027	0.029	0.025
Thallium (AAS)	.	.	.	.	.	.	.	.	.	.
Thallium (PMS)	.	.	.	.	.	.	<0.0005	<0.0005	<0.0005	<0.0005
Thorium	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Uranium (PMS)	0.002	0.0018	0.003	0.0015	0.0013	0.0012	0.0012	0.001	0.0015	0.0012
Vanadium	<0.005	<0.005	0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc	0.024	0.0088	0.064	0.016	0.015	0.011	0.013	0.012	0.037	0.013
IONS (mg/L)	.	.	.	.	.	.	.	.	.	.
Calcium	41	36	190	35	36	34	39	37	45	37
Magnesium	28	24	120	23	26	25	27	28	29	26
Potassium	2.5	2	3.2	2.5	2.4	2.1	2.4	3.2	2.6	2.4
Sodium	0.6	0.55	0.8	0.95	0.64	0.62	0.7	0.71	0.68	0.69
Alkalinity-HCO3	204	.	197	.	205	.	191	.	203	.
Alkalinity-CO3	<1	.	<1	.	<1	.	<1	.	<1	.
Ammonia-N	.	.	.	.	.	.	.	.	.	.
Chloride	1.76	.	1.76	.	2.77	.	1.09	.	1.01	.
Fluoride	<0.1	.	<0.1	.	<0.1	.	<0.1	.	<0.1	.
Nitrate-N	<0.2	.	<0.2	.	<0.2	.	0.2	.	0.18	.
Sulfate	9.19	.	8.94	.	8.73	.	9.6	.	9.27	.
Diluted ICP	.	.	.	.	.	.	.	.	.	.

(CONTINUED)

APPENDIX D.2
Inorganic Analytes, CY 1996

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Sampling Point	GW-159				GW-160				GW-161	
Program	RDM				BMP				BMP	
Location	CRSDB				CRBAWP				CRBAWP	
Date Sampled	10/16/96		10/17/96		04/29/96				04/26/96	
Sample Type					DUP					
	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS
METALS (mg/L)	.	.	.	.	.	.	.	.	.	.
Aluminum	1.1	<0.02	2.4	<0.02	14	<0.02	6.1	<0.02	<0.02	<0.02
Antimony	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Arsenic	<0.05	<0.05	<0.05	<0.05	0.06	<0.05	0.058	<0.05	<0.05	<0.05
Arsenic (PMS)	<0.005	<0.005	0.0076	<0.005	.	.	.	.	.	.
Barium	0.03	0.02	0.029	0.018	0.031	0.011	0.026	0.011	0.0099	0.01
Beryllium	<0.0003	<0.0003	<0.0003	<0.0003	0.0017	<0.0003	0.0016	<0.0003	<0.0003	<0.0003
Boron	<0.004	<0.004	<0.004	<0.004	0.012	0.026	0.014	0.016	0.013	<0.004
Cadmium	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Chromium	<0.01	<0.01	<0.01	<0.01	0.02	<0.01	0.023	<0.01	<0.01	<0.01
Cobalt	<0.005	<0.005	<0.005	<0.005	0.0069	<0.005	<0.005	<0.005	<0.005	<0.005
Copper	0.0051	<0.004	0.017	<0.004	0.021	<0.004	0.02	<0.004	<0.004	<0.004
Iron	1.2	0.0068	2.9	0.0054	18	0.012	19	0.012	0.2	0.016
Lead	<0.05	<0.05	<0.05	<0.05	0.062	<0.05	0.051	0.05	<0.05	<0.05
Lead (AAS)	.	.	.	.	.	.	.	.	.	.
Lead (PMS)	0.0041	0.00059	0.022	0.00061	.	.	.	.	.	.
Lithium	<0.004	<0.004	<0.004	<0.004	0.016	0.0044	0.0092	<0.004	0.0045	<0.004
Manganese	0.048	0.0014	0.29	0.0035	0.29	0.0083	0.3	0.008	0.0047	0.0047
Mercury (CVAA)	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Nickel	0.011	<0.01	<0.01	<0.01	0.023	<0.01	0.02	<0.01	<0.01	<0.01
Selenium	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Silver	<0.006	<0.006	<0.006	<0.006	<0.006	0.01	<0.006	0.0065	<0.006	<0.006
Strontium	0.026	0.033	0.055	0.026	0.026	0.024	0.026	0.024	0.012	0.013
Thallium (AAS)	.	.	.	.	.	.	.	.	.	.
Thallium (PMS)	<0.0005	<0.0005	<0.0005	<0.0005	.	.	.	.	.	.
Thorium	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Uranium (PMS)	0.0012	0.0044	0.0022	0.00066	0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vanadium	<0.005	<0.005	0.0076	<0.005	0.039	<0.005	0.034	<0.005	<0.005	<0.005
Zinc	0.018	0.012	0.026	0.0075	0.11	<0.002	0.11	<0.002	0.0029	0.0061
IONS (mg/L)	.	.	.	.	.	.	.	.	.	.
Calcium	40	37	150	39	49	47	49	47	39	40
Magnesium	27	23	87	24	31	30	32	30	26	27
Potassium	3	2.3	2	1.5	3.8	1.7	1.9	2	1.6	1.6
Sodium	0.76	0.66	0.42	0.39	3.1	3.2	3.2	3.3	0.97	1.1
Alkalinity-HCO3	201	.	206	.	226	.	221	.	211	.
Alkalinity-CO3	<1	.	<1	.	<1	.	<1	.	<1	.
Ammonia-N	.	.	.	.	.	.	.	.	.	.
Chloride	1.11	.	0.88	.	6.93	.	7.1	.	2.1	.
Fluoride	<0.1	.	<0.1	.	<0.1	.	<0.1	.	<0.1	.
Nitrate-N	0.15	.	0.19	.	0.63	.	0.65	.	0.27	.
Sulfate	10.6	.	8.72	.	3.84	.	3.86	.	1.55	.
Diluted ICP	.	.	.	.	.	.	.	.	.	.

(CONTINUED)

APPENDIX D.2
Inorganic Analytes, CY 1996

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Sampling Point	GW-174				GW-175		GW-177		GW-184	
Program	BMP				AMP		AMP		BMP	
Location	CRSP				CRSP		CRSP		RQ	
Date Sampled	08/19/96				02/25/96		02/25/96		04/30/96	
Sample Type	DUP									
	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS
METALS (mg/L)	.	.	.	.	.	.	.	.	.	.
Aluminum	2.1	0.14	2.9	0.27	<0.02	0.038	0.089	<0.02	0.17	<0.02
Antimony	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Arsenic	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Arsenic (PMS)	.	.	.	.	.	.	.	.	.	.
Barium	0.027	0.018	0.032	0.017	0.042	0.042	0.017	0.018	0.021	0.018
Beryllium	0.00047	<0.0003	0.0005	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Boron	0.0066	0.085	0.017	0.0083	0.041	0.17	0.2	0.021	0.036	0.049
Cadmium	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Chromium	0.065	<0.01	0.092	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Copper	0.022	0.0046	0.027	<0.004	0.0061	<0.004	0.0045	<0.004	0.01	<0.004
Iron	4	0.013	4.6	0.12	0.28	0.0095	0.089	<0.005	0.14	0.019
Lead	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.004	<0.05	<0.05	<0.05
Lead (AAS)	.	.	.	.	.	.	.	.	.	.
Lead (PMS)	0.01	0.00087	0.013	0.0023	.	.	.	.	.	.
Lithium	0.0058	<0.004	0.0063	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Manganese	0.064	0.0032	0.079	0.0036	0.0054	<0.001	0.0034	<0.001	0.0068	0.0012
Mercury (CVAA)	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Nickel	0.078	<0.01	0.1	<0.01	0.058	<0.01	<0.01	<0.01	<0.01	<0.01
Selenium	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Silver	<0.006	0.0061	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.0061	<0.006
Strontium	0.044	0.03	0.049	0.026	0.016	0.016	0.017	0.018	0.14	0.14
Thallium (AAS)	.	.	.	.	.	.	.	.	.	.
Thallium (PMS)	<0.0005	<0.0005	<0.0005	<0.0005	.	.	.	.	.	.
Thorium	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Uranium (PMS)	0.00071	<0.0005	0.00071	<0.0005	<0.0005	<0.0005	0.002	0.002	<0.0005	<0.0005
Vanadium	<0.005	<0.005	0.0066	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc	0.08	0.009	0.093	0.022	0.01	0.0093	0.086	0.081	0.037	0.018
IONS (mg/L)	.	.	.	.	.	.	.	.	.	.
Calcium	45	44	46	43	50	49	44	45	72	71
Magnesium	30	28	30	28	34	33	29	30	6.2	6.2
Potassium	2.7	2.6	2.8	2	<0.6	<0.6	2.3	2.6	1.1	1.1
Sodium	5.5	4.8	5.6	4.1	1.1	1.4	1.5	1.4	1.5	1.5
Alkalinity-HCO3	210	.	216	.	254	.	219	.	176	.
Alkalinity-CO3	<1	.	<1	.	<1	.	<1	.	<1	.
Ammonia-N	.	.	.	.	.	.	.	.	.	.
Chloride	10	.	10	.	2.55	.	2.68	.	2.05	.
Fluoride	<0.1	.	<0.1	.	<0.1	.	<0.1	.	<0.1	.
Nitrate-N	0.69	.	0.7	.	0.22	.	<0.2	.	3.76	.
Sulfate	4.17	.	3.79	.	1.09	.	9.63	.	17.4	.
Diluted ICP	.	.	.	.	.	.	.	.	.	.

(CONTINUED)

APPENDIX D.2
Inorganic Analytes, CY 1996

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Sampling Point	GW-186				GW-187		GW-188		GW-203	
Program	BMP				BMP		BMP		ROD	
Location	RQ				RQ		RQ		UNCS	
Date Sampled	05/01/96				04/30/96		04/30/96		04/17/96	
Sample Type	DUP									
	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS
METALS (mg/L)										
Aluminum	0.036	0.021	0.03	0.024	0.056	0.033	0.65	0.026	0.76	<0.02
Antimony	<0.05	<0.05	<0.05	<0.052	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Arsenic	<0.05	<0.05	<0.05	<0.052	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Arsenic (PMS)										
Barium	0.12	0.12	0.12	0.12	0.32	0.32	0.034	0.032	0.01	0.01
Beryllium	<0.0003	<0.0003	<0.0003	<0.00031	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Boron	0.2	0.21	0.18	0.19	0.59	0.58	0.15	0.14	0.015	0.017
Cadmium	<0.003	<0.003	<0.003	<0.0031	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Chromium	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt	<0.005	<0.005	<0.005	<0.0052	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Copper	<0.004	<0.004	<0.004	<0.0041	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Iron	0.88	0.88	0.9	0.87	0.062	0.033	0.45	0.0079	0.73	0.0091
Lead	<0.05	<0.05	<0.05	<0.052	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Lead (AAS)										
Lead (PMS)										
Lithium	0.036	0.036	0.037	0.036	0.21	0.21	0.02	0.019	<0.004	<0.004
Manganese	0.13	0.14	0.14	0.14	0.0052	0.0051	0.048	0.036	0.03	0.0019
Mercury (CVAA)	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Nickel	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Selenium	<0.05	<0.05	<0.05	<0.052	<0.05	<0.05	<0.05	<0.05	0.058	<0.05
Silver	<0.006	<0.006	<0.006	<0.0062	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006
Strontium	1.7	1.7	1.7	1.7	1.1	1.1	2	2.1	0.01	0.013
Thallium (AAS)										
Thallium (PMS)										
Thorium	<0.2	<0.2	<0.2	<0.21	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Uranium (PMS)	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vanadium	<0.005	<0.005	<0.005	<0.0052	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc	0.013	0.0082	0.013	0.011	0.0092	0.01	0.0081	0.0047	0.012	0.014
IONS (mg/L)										
Calcium	110	110	110	110	53	53	36	36	29	29
Magnesium	32	33	33	32	24	24	26	27	18	18
Potassium	3	3	3	2.9	2.1	2	2.4	2.3	<0.6	<0.6
Sodium	47	47	47	47	160	160	22	21	0.54	0.72
Alkalinity-HCO3	433		426		323		207		145	
Alkalinity-CO3	<1		<1		<1		<1		<1	
Ammonia-N										
Chloride	17.2		17.4		124		5.65		1.94	
Fluoride	0.19		0.18		1.1		0.66		<0.1	
Nitrate-N	<0.2		<0.2		<0.2		<0.2		1.04	
Sulfate	58.1		56.8		34.1		24.7		1.12	
Diluted ICP				Dilute						

(CONTINUED)

APPENDIX D.2
Inorganic Analytes, CY 1996

15

Sampling Point	GW-203		GW-205				GW-217			
Program	ROD		ROD				SDM			
Location	UNCS		UNCS				LIV			
Date Sampled	10/28/96		04/19/96		10/28/96		01/03/96			
Sample Type			DUP							
	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS
METALS (mg/L)	.	.	.	.	.	.	.	.	.	.
Aluminum	0.19	<0.02	<0.02	<0.02	<0.02	<0.02	0.27	<0.02	0.083	0.059
Antimony	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Arsenic	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Arsenic (PMS)	<0.005	<0.005	.	.	.	.	<0.005	<0.005	.	.
Barium	0.0088	0.008	0.015	0.014	0.015	0.014	0.013	0.011	0.031	0.029
Beryllium	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Boron	0.03	0.0062	0.046	0.019	0.058	0.042	0.068	0.0072	0.18	0.18
Cadmium	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	0.0032	<0.003
Chromium	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Copper	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	0.015	0.0066
Iron	0.13	<0.005	0.019	0.013	0.015	0.0053	1	<0.005	0.041	<0.005
Lead	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Lead (AAS)	.	.	.	.	.	.	.	.	<0.004	<0.004
Lead (PMS)	0.00059	<0.0005	.	.	.	.	0.0016	<0.0005	.	.
Lithium	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Manganese	0.0039	<0.001	0.0042	0.0083	0.0044	0.0088	0.037	0.0091	0.0059	0.0026
Mercury (CVAA)	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Nickel	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Selenium	<0.05	<0.05	0.051	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Silver	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	0.013	<0.006
Strontium	0.01	0.011	0.011	0.01	0.011	0.01	0.0093	0.0082	0.015	0.014
Thallium (AAS)	.	.	.	.	.	.	.	.	<0.01	<0.01
Thallium (PMS)	<0.0005	<0.0005	.	.	.	.	<0.0005	<0.0005	.	.
Thorium	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Uranium (PMS)	<0.0005	<0.0005	0.00079	0.00073	0.00077	0.00075	0.00055	0.00052	<0.0005	<0.0005
Vanadium	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc	0.0025	<0.002	0.0083	0.021	0.0096	0.0084	0.004	<0.002	0.035	0.024
IONS (mg/L)	.	.	.	.	.	.	.	.	.	.
Calcium	30	30	32	30	32	30	26	24	33	31
Magnesium	17	17	20	20	20	20	19	18	20	19
Potassium	0.72	0.94	<0.6	1.3	1.1	0.75	4.9	5.7	3.5	3.7
Sodium	0.62	0.61	0.8	0.86	0.85	0.93	1.3	1.4	6.3	5.9
Alkalinity-HCO3	145	.	154	.	153	.	152	.	164	.
Alkalinity-CO3	<1	.	<1	.	<1	.	<1	.	<1	.
Ammonia-N	.	.	.	.	.	.	.	.	.	.
Chloride	1.17	.	2.44	.	2.46	.	2.15	.	2.47	.
Fluoride	<0.1	.	<0.1	.	<0.1	.	<0.1	.	<0.1	.
Nitrate-N	1.17	.	0.25	.	0.26	.	0.17	.	0.636	.
Sulfate	0.79	.	3.82	.	3.75	.	3.26	.	6.02	.
Diluted ICP	.	.	.	.	.	.	.	.	.	.

(CONTINUED)

APPENDIX D.2
Inorganic Analytes, CY 1996

16

Sampling Point	GW-217		GW-221				GW-231			
Program	SDM		ROD				RDM			
Location	LIV		UNCS				KHQ			
Date Sampled	07/01/96		04/22/96		10/29/96		01/10/96			
Sample Type							DUP			
	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS
METALS (mg/L)										
Aluminum	0.22	0.035	<0.02	0.11	0.024	0.022	<0.02	0.023	0.074	0.063
Antimony	<0.05	0.19	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Arsenic	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Arsenic (PMS)					<0.005	<0.005	<0.005	<0.005		
Barium	0.028	0.041	0.0065	0.0076	0.0077	0.0076	0.0077	0.0077	0.065	0.064
Beryllium	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Boron	0.17	0.18	0.012	0.021	0.016	0.0062	0.02	0.0092	0.026	0.017
Cadmium	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Chromium	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Copper	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Iron	0.27	0.014	0.038	0.0085	0.032	0.035	0.062	<0.005	<0.005	<0.005
Lead	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Lead (AAS)										
Lead (PMS)	0.00089	0.00077			<0.0005	<0.0005	0.00054	0.0024		
Lithium	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Manganese	0.0077	0.022	0.0012	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Mercury (CVAA)	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum	<0.01	0.018	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Nickel	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Selenium	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Silver	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006
Strontium	0.014	0.029	0.0098	0.011	0.01	0.01	0.01	0.011	0.027	0.057
Thallium (AAS)										
Thallium (PMS)	<0.0005	<0.0005			<0.0005	<0.0005	<0.0005	<0.0005		
Thorium	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Uranium (PMS)	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vanadium	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc	0.059	0.053	0.004	0.0081	0.0027	0.0028	0.0055	0.0038	0.0064	0.0059
IONS (mg/L)										
Calcium	31	35	31	31	32	32	32	32	30	30
Magnesium	19	19	20	20	20	19	19	19	15	15
Potassium	3.1	2.8	<0.6	0.89	0.66	1	0.71	0.83	0.92	0.84
Sodium	4.9	5.4	0.6	0.69	0.68	0.74	0.68	0.7	0.8	0.8
Alkalinity-HCO3	165		149		161		169		129	
Alkalinity-CO3	<1		<1		<1		<1		<1	
Ammonia-N										
Chloride	2.28		1.69		1.14		1.08		2.51	
Fluoride	<0.1		<0.1		<0.1		<0.1		<0.1	
Nitrate-N	0.42		0.53		0.48		0.46		1.69	
Sulfate	6.97		1.27		1.24		0.98		4.82	
Diluted ICP										

(CONTINUED)

APPENDIX D.2
Inorganic Analytes, CY 1996

17

Sampling Point	GW-231									
Program	RDM									
Location	KHQ									
Date Sampled	04/18/96		10/21/96		10/22/96		10/23/96			
Sample Type	DUP									
	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS
METALS (mg/L)										
Aluminum	0.13	0.12	0.1	0.13	0.024	0.021	0.028	0.042	0.026	<0.02
Antimony	<0.056	<0.056	<0.056	<0.056	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Arsenic	<0.056	<0.056	<0.056	<0.056	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Arsenic (PMS)					<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Barium	0.069	0.07	0.071	0.071	0.094	0.096	0.098	0.098	0.098	0.096
Beryllium	<0.00033	<0.00033	<0.00033	<0.00033	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Boron	<0.0044	<0.0044	<0.0044	0.0074	0.014	0.0066	0.029	0.0095	0.055	0.021
Cadmium	<0.0033	<0.0033	<0.0033	<0.0033	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Chromium	<0.011	<0.011	<0.011	<0.011	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt	<0.0056	<0.0056	<0.0056	<0.0056	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Copper	<0.0044	<0.0044	<0.0044	0.01	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Iron	0.011	<0.0056	0.02	<0.0056	0.012	0.0057	0.0081	0.0075	<0.005	<0.005
Lead	<0.056	<0.056	<0.056	<0.056	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Lead (AAS)										
Lead (PMS)					<0.0005	0.00062	0.0035	<0.0005	<0.0005	<0.0005
Lithium	<0.0044	<0.0044	<0.0044	<0.0044	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Manganese	0.0018	<0.0011	0.0023	0.0021	0.0072	0.0056	0.0051	0.0048	0.0047	0.0042
Mercury (CVAA)	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum	<0.011	<0.011	<0.011	<0.011	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Nickel	<0.011	<0.011	<0.011	<0.011	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Selenium	<0.056	<0.056	<0.056	<0.056	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Silver	<0.0067	<0.0067	<0.0067	<0.0067	<0.006	<0.006	<0.006	<0.006	0.006	0.0074
Strontium	0.031	0.032	0.038	0.033	0.044	0.04	0.042	0.052	0.047	0.046
Thallium (AAS)										
Thallium (PMS)					<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Thorium	<0.22	<0.22	<0.22	<0.22	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Uranium (PMS)	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vanadium	<0.0056	<0.0056	<0.0056	<0.0056	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc	0.0032	<0.0022	0.0031	0.0051	0.013	0.013	0.0071	0.0084	0.0062	0.0055
IONS (mg/L)										
Calcium	32	33	33	33	43	44	43	43	43	42
Magnesium	17	17	18	17	22	22	22	22	22	22
Potassium	0.95	0.93	1	0.82	1.5	0.86	1.9	1.9	1.3	1.6
Sodium	0.74	0.8	0.95	0.81	0.95	0.9	0.96	1	0.94	1
Alkalinity-HCO3	152		148		192		194		196	
Alkalinity-CO3	<1		<1		<1		<1		<1	
Ammonia-N										
Chloride	3.12		2.87		1.44		1.49		1.64	
Fluoride	<0.1		<0.1		<0.1		<0.1		<0.1	
Nitrate-N	1.79		1.82		0.28		0.26		0.27	
Sulfate	4.02		3.8		3.92		3.9		4.18	
Diluted ICP	Dilute	Dilute	Dilute	Dilute						

(CONTINUED)

APPENDIX D.2
Inorganic Analytes, CY 1996

18

Sampling Point	GW-231		GW-292		GW-293		GW-294			
Program	RDM		BMP		BMP		BMP			
Location	KHQ		ECRWP		ECRWP		ECRWP			
Date Sampled	10/24/96		05/08/96		05/08/96		05/02/96			
Sample Type			DUP							
	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS
METALS (mg/L)	.	.	.	.	.	.	.	.	.	.
Aluminum	<0.02	0.023	0.032	0.057	<0.02	0.041	0.075	<0.02	0.077	<0.04
Antimony	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1
Arsenic	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1
Arsenic (PMS)	<0.005	<0.005	.	.	.	.	.	.	.	.
Barium	0.092	0.091	0.13	0.13	0.13	0.12	0.2	0.2	0.0097	0.011
Beryllium	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	0.00034	<0.0003	<0.0006
Boron	0.17	0.027	0.019	0.039	0.016	0.081	0.027	0.025	0.033	0.038
Cadmium	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.006
Chromium	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02
Cobalt	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01
Copper	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.008
Iron	<0.005	<0.005	0.022	0.013	0.019	0.018	6.7	0.027	0.13	<0.01
Lead	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1
Lead (AAS)	.	.	.	.	.	.	.	.	.	.
Lead (PMS)	<0.0005	0.00087	.	.	.	.	.	.	.	.
Lithium	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.008
Manganese	0.0051	0.0043	<0.001	<0.001	<0.001	<0.001	0.044	0.022	0.0022	<0.002
Mercury (CVAA)	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02
Nickel	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02
Selenium	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1
Silver	0.057	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.012
Strontium	0.04	0.04	0.019	0.018	0.019	0.018	0.02	0.02	0.023	0.026
Thallium (AAS)	.	.	.	.	.	.	.	.	.	.
Thallium (PMS)	<0.0005	<0.0005	.	.	.	.	.	.	.	.
Thorium	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.4
Uranium (PMS)	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vanadium	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01
Zinc	0.0035	0.0068	0.014	0.0066	0.0083	0.011	0.0094	0.013	0.013	0.056
IONS (mg/L)	.	.	.	.	.	.	.	.	.	.
Calcium	41	41	54	54	59	53	57	54	48	52
Magnesium	22	22	33	33	36	33	34	33	30	32
Potassium	1.3	1.5	0.73	0.71	0.71	0.8	1.4	1.3	0.94	1.2
Sodium	1.2	0.91	5.3	5.3	5.5	5.3	6	5.9	3.2	4.6
Alkalinity-HCO3	186	.	258	.	261	.	253	.	233	.
Alkalinity-CO3	<1	.	<1	.	<1	.	<1	.	<1	.
Ammonia-N	.	.	.	.	.	.	.	.	.	.
Chloride	1.76	.	9.68	.	9.61	.	12.5	.	9.46	.
Fluoride	<0.1	.	<0.1	.	<0.1	.	<0.1	.	<0.1	.
Nitrate-N	0.188	.	0.58	.	0.59	.	0.58	.	2.49	.
Sulfate	3.79	.	3.29	.	3.32	.	3.86	.	3.42	.
Diluted ICP	.	.	.	.	.	.	.	.	.	Dilute

(CONTINUED)

APPENDIX D.2
Inorganic Analytes, CY 1996

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Sampling Point	GW-296		GW-298		GW-299		GW-300		GW-301	
Program	BMP		BMP		BMP		BMP		BMP/C	
Location	ECRWP		CRBAWP		CRBAWP		CRBAWP		CRBAWP	
Date Sampled	05/02/96		05/01/96		04/30/96		04/30/96		04/30/96	
Sample Type										
	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS
METALS (mg/L)	.	.	.	.	.	.	.	.	.	.
Aluminum	0.047	0.037	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	1.3	<0.02
Antimony	<0.051	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Arsenic	<0.051	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Arsenic (PMS)	.	.	.	.	.	.	.	.	.	.
Barium	0.011	0.011	0.013	0.012	0.0095	0.0091	0.018	0.017	0.023	0.019
Beryllium	<0.00031	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Boron	0.025	0.026	0.016	0.042	0.038	0.015	0.0056	0.024	0.055	0.016
Cadmium	<0.0031	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Chromium	<0.01	<0.01	0.011	<0.01	0.01	<0.01	<0.01	<0.01	0.012	<0.01
Cobalt	<0.0051	<0.005	<0.005	<0.005	0.005	0.007	<0.005	<0.005	<0.005	<0.005
Copper	<0.0041	<0.004	0.0047	<0.004	0.0051	<0.004	0.0046	<0.004	0.017	0.006
Iron	0.052	<0.005	0.068	0.024	0.021	0.0051	0.033	0.0059	1.4	0.013
Lead	<0.051	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Lead (AAS)	.	.	.	.	.	.	.	.	0.0074	<0.004
Lead (PMS)	.	.	.	.	.	.	.	.	.	.
Lithium	<0.0041	<0.004	0.0044	<0.004	<0.004	<0.004	<0.004	<0.004	0.0042	<0.004
Manganese	0.0014	<0.001	0.0016	0.0021	0.0016	0.0011	0.0016	0.0011	0.043	0.0027
Mercury (CVAA)	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum	<0.01	<0.01	0.012	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Nickel	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Selenium	<0.051	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Silver	<0.0061	<0.006	0.007	0.007	<0.006	<0.006	<0.006	<0.006	<0.006	0.0075
Strontium	0.018	0.018	0.026	0.024	0.016	0.015	0.018	0.017	0.023	0.021
Thallium (AAS)	.	.	.	.	.	.	.	.	.	.
Thallium (PMS)	.	.	.	.	.	.	.	.	.	.
Thorium	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Uranium (PMS)	<0.0005	<0.0005	0.0015	0.0017	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vanadium	<0.0051	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.0071	<0.005
Zinc	0.011	0.0095	0.0042	<0.002	<0.002	<0.002	0.0049	<0.002	0.016	0.013
IONS (mg/L)	.	.	.	.	.	.	.	.	.	.
Calcium	47	46	35	35	30	29	27	25	42	34
Magnesium	29	29	23	22	19	18	17	16	28	23
Potassium	0.77	0.65	1.6	1.6	1.4	1.4	1.7	1.3	2.1	1.4
Sodium	2.6	2.7	1.6	1.6	1.1	1.2	0.66	0.66	1.1	1
Alkalinity-HCO3	218	.	169	.	145	.	127	.	175	.
Alkalinity-CO3	<1	.	<1	.	<1	.	<1	.	<1	.
Ammonia-N	.	.	.	.	.	.	.	.	.	.
Chloride	5.58	.	1.44	.	1.66	.	1.67	.	1.63	.
Fluoride	<0.1	.	<0.1	.	<0.1	.	<0.1	.	<0.1	.
Nitrate-N	<0.2	.	<0.2	.	<0.2	.	<0.2	.	0.31	.
Sulfate	1.56	.	7.04	.	3.48	.	3.96	.	2.26	.
Diluted ICP	.	.	.	.	.	.	.	.	.	.

(CONTINUED)

APPENDIX D.2
Inorganic Analytes, CY 1996

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Sampling Point	GW-301		GW-302				GW-305			
Program	BMP/C		ROD				SDM			
Location	CRBAWP		UNCS				LIV			
Date Sampled	10/01/96		04/23/96		10/30/96		01/17/96		07/08/96	
Sample Type										
	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS
METALS (mg/L)	.	.	.	.	.	.	.	.	.	.
Aluminum	0.2	<0.02	0.49	0.025	0.14	0.025	0.08	0.074	0.042	<0.02
Antimony	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Arsenic	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Arsenic (PMS)	<0.005	<0.005	.	.	<0.005	<0.005	.	.	.	.
Barium	0.02	0.017	0.026	0.021	0.024	0.021	0.0092	0.0078	0.0092	0.0091
Beryllium	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Boron	0.016	0.0065	0.031	0.015	0.018	0.15	0.021	0.023	0.039	0.018
Cadmium	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	0.0032	<0.003	<0.003	<0.003
Chromium	<0.01	<0.01	0.54	<0.01	0.58	0.023	<0.01	<0.01	<0.01	<0.01
Cobalt	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Copper	0.0092	0.0061	0.0088	<0.004	0.0076	<0.004	<0.004	<0.004	<0.004	<0.004
Iron	0.22	<0.005	4.5	0.02	3.1	0.18	0.06	<0.005	0.075	0.023
Lead	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Lead (AAS)	.	.	.	.	.	.	<0.004	<0.004	.	.
Lead (PMS)	0.012	<0.0005	.	.	0.0012	<0.0005	.	.	<0.0005	<0.0005
Lithium	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Manganese	0.009	0.001	0.13	0.0056	0.061	0.0083	0.0038	<0.001	0.0083	0.0071
Mercury (CVAA)	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Nickel	<0.01	<0.01	0.24	0.14	0.36	0.3	<0.01	<0.01	0.011	0.012
Selenium	<0.05	<0.05	<0.05	0.055	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Silver	0.0095	0.0082	<0.006	<0.006	0.007	<0.006	<0.006	<0.006	<0.006	<0.006
Strontium	0.019	0.017	0.019	0.019	0.019	0.019	0.011	0.011	0.013	0.013
Thallium (AAS)	.	.	.	.	.	.	<0.01	<0.01	.	.
Thallium (PMS)	<0.0005	<0.0005	.	.	<0.0005	<0.0005	.	.	<0.0005	<0.0005
Thorium	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Uranium (PMS)	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vanadium	<0.005	<0.005	0.0068	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc	0.032	0.026	0.013	0.0042	0.0035	0.0032	0.01	0.0066	0.036	0.033
IONS (mg/L)	.	.	.	.	.	.	.	.	.	.
Calcium	37	35	51	52	53	53	31	29	30	29
Magnesium	22	22	34	35	33	33	19	17	19	18
Potassium	1.3	0.99	1.2	1.7	0.87	<0.6	0.66	0.76	0.66	0.86
Sodium	0.72	0.6	12	12	12	13	1.2	1.1	1.5	1.4
Alkalinity-HCO3	181	.	242	.	258	.	143	.	144	.
Alkalinity-CO3	<1	.	<1	.	<1	.	<1	.	<1	.
Ammonia-N	.	.	.	.	.	.	.	.	.	.
Chloride	0.89	.	27.6	.	32.6	.	2.3	.	3.3	.
Fluoride	<0.1	.	<0.1	.	<0.1	.	<0.1	.	<0.1	.
Nitrate-N	0.39	.	0.9	.	0.93	.	0.44	.	0.23	.
Sulfate	1.67	.	3.39	.	3.36	.	<1	.	1.68	.
Diluted ICP	.	.	.	.	.	.	.	.	.	.

(CONTINUED)

APPENDIX D.2
Inorganic Analytes, CY 1996

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Sampling Point	GW-321		GW-339				GW-512		GW-513	
Program	BMP		ROD				BMP		BMP	
Location	ADB		UNCS				ADB		ADB	
Date Sampled	04/29/96		04/22/96		10/29/96		05/02/96		04/29/96	
Sample Type										
	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS
METALS (mg/L)	.	.	.	.	.	.	.	.	.	.
Aluminum	0.029	0.023	0.032	0.033	0.04	0.02	0.08	0.038	0.11	0.029
Antimony	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Arsenic	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Arsenic (PMS)	.	.	.	.	<0.005	<0.005	.	.	.	.
Barium	0.053	0.05	0.021	0.02	0.021	0.021	0.024	0.024	0.0076	0.0076
Beryllium	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Boron	0.08	0.022	0.021	0.034	0.03	0.012	0.03	0.062	0.025	0.05
Cadmium	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Chromium	<0.01	<0.01	<0.01	<0.01	0.12	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Copper	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Iron	0.026	0.33	0.078	<0.005	0.48	0.021	0.18	<0.005	0.099	0.0052
Lead	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Lead (AAS)	.	.	.	.	.	.	.	.	.	.
Lead (PMS)	.	.	.	.	<0.0005	<0.0005	.	.	.	.
Lithium	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Manganese	0.0028	0.0032	0.0053	0.0056	0.012	0.0046	0.0049	<0.001	0.0028	<0.001
Mercury (CVAA)	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Nickel	<0.01	<0.01	0.063	0.064	0.087	0.056	<0.01	<0.01	<0.01	<0.01
Selenium	<0.05	<0.05	0.06	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Silver	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006
Strontium	0.018	0.017	0.024	0.023	0.024	0.023	0.024	0.024	0.021	0.021
Thallium (AAS)	.	.	.	.	.	.	.	.	.	.
Thallium (PMS)	.	.	.	.	<0.0005	<0.0005	.	.	.	.
Thorium	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Uranium (PMS)	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vanadium	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc	0.01	0.014	0.019	0.015	0.0033	0.0068	0.015	0.015	0.0071	0.0066
IONS (mg/L)	.	.	.	.	.	.	.	.	.	.
Calcium	26	25	59	57	57	57	34	34	35	37
Magnesium	15	14	38	36	33	34	20	20	21	22
Potassium	<0.6	<0.6	0.84	1.7	1.5	1	3.8	4.1	1.4	1.5
Sodium	0.68	0.61	14	13	13	13	0.77	0.85	0.95	1
Alkalinity-HCO3	130	.	264	.	276	.	172	.	182	.
Alkalinity-CO3	<1	.	<1	.	<1	.	<1	.	<1	.
Ammonia-N	.	.	.	.	.	.	.	.	.	.
Chloride	1.57	.	32.9	.	33.7	.	1.58	.	1.74	.
Fluoride	<0.1	.	<0.1	.	<0.1	.	<0.1	.	<0.1	.
Nitrate-N	0.24	.	0.78	.	0.71	.	<0.2	.	<0.2	.
Sulfate	2	.	4.27	.	4.58	.	2.44	.	1.96	.
Diluted ICP	.	.	.	.	.	.	.	.	.	.

(CONTINUED)

APPENDIX D.2
Inorganic Analytes, CY 1996

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Sampling Point	GW-514				GW-521					
Program	BMP				SDM/C					
Location	ADB				LIV					
Date Sampled	05/03/96				01/16/96		04/16/96		07/02/96	
Sample Type	DUP									
	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS
METALS (mg/L)	.	.	.	.	.	.	.	.	.	.
Aluminum	0.17	0.033	0.035	0.03	0.57	0.17	0.92	0.025	0.25	<0.02
Antimony	<0.052	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Arsenic	<0.052	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Arsenic (PMS)	.	.	.	.	.	.	.	.	.	.
Barium	0.007	0.0068	0.0071	0.007	0.0094	0.0089	0.0095	0.0074	0.008	0.0074
Beryllium	<0.00031	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Boron	0.024	0.046	0.05	0.047	0.018	0.026	0.016	0.016	0.014	0.013
Cadmium	<0.0031	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Chromium	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt	<0.0052	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Copper	<0.0041	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Iron	0.48	0.0086	0.42	0.0096	0.43	<0.005	0.63	0.022	0.26	0.023
Lead	<0.052	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Lead (AAS)	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	.	.
Lead (PMS)	.	.	.	.	.	.	.	.	0.0017	<0.0005
Lithium	<0.0041	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Manganese	0.0078	0.0049	0.0071	0.0055	0.011	0.0012	0.016	<0.001	0.0093	0.0011
Mercury (CVAA)	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Nickel	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Selenium	<0.052	<0.05	<0.05	<0.05	<0.05	<0.05	0.067	<0.05	<0.05	<0.05
Silver	<0.0062	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	0.0066	<0.006	<0.006
Strontium	0.022	0.021	0.022	0.022	0.011	0.011	0.01	0.0092	0.01	0.0097
Thallium (AAS)	.	.	.	.	<0.01	<0.01	<0.01	<0.01	.	.
Thallium (PMS)	.	.	.	.	.	.	.	.	<0.0005	<0.0005
Thorium	<0.21	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Uranium (PMS)	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.00057	<0.0005	<0.0005	<0.0005
Vanadium	<0.0052	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.0054	<0.005
Zinc	0.012	0.0037	0.0082	0.0055	0.015	0.0051	0.022	0.013	0.012	0.0048
IONS (mg/L)	.	.	.	.	.	.	.	.	.	.
Calcium	38	37	38	38	32	31	29	27	31	30
Magnesium	23	22	22	22	20	20	20	18	19	18
Potassium	0.93	0.88	1	0.96	0.66	0.66	0.96	1.2	<0.6	0.68
Sodium	0.47	0.47	0.47	0.7	0.92	0.88	0.88	0.91	0.72	0.79
Alkalinity-HCO3	183	.	196	.	153	.	150	.	148	.
Alkalinity-CO3	<1	.	<1	.	<1	.	<1	.	<1	.
Ammonia-N	.	.	.	.	.	.	.	.	.	.
Chloride	1.8	.	1.8	.	1.82	.	1.92	.	1.31	.
Fluoride	<0.1	.	<0.1	.	<0.1	.	<0.1	.	<0.1	.
Nitrate-N	<0.2	.	0.24	.	0.44	.	0.25	.	0.29	.
Sulfate	4.3	.	4.25	.	1.36	.	1.4	.	2.33	.
Diluted ICP	Dilute	.	.	.	.	.	.	.	.	.

(CONTINUED)

APPENDIX D.2
Inorganic Analytes, CY 1996

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Sampling Point	GW-521		GW-522				GW-539			
Program	SDM/C		SDM				SDM			
Location	LIV		LIV				LII			
Date Sampled	10/01/96		01/17/96		07/08/96		04/02/96		11/04/96	
Sample Type										
	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS
METALS (mg/L)										
Aluminum	1.3	0.12	0.18	0.056	2.6	0.047	0.46	0.023	7.9	0.026
Antimony	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Arsenic	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Arsenic (PMS)	<0.005	<0.005							<0.005	<0.005
Barium	0.01	0.01	0.0076	0.0074	0.011	0.0064	0.012	0.011	0.16	0.011
Beryllium	<0.0003	<0.0003	<0.0003	<0.0003	0.0011	<0.0003	<0.0003	<0.0003	0.00055	<0.0003
Boron	0.019	0.085	0.031	0.022	0.043	0.028	0.011	0.028	0.015	0.02
Cadmium	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Chromium	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.062	<0.01	8.5	<0.01
Cobalt	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.055	<0.005
Copper	<0.004	0.0045	<0.004	<0.004	0.0042	<0.004	0.0064	<0.004	0.34	<0.004
Iron	1.2	0.059	0.23	<0.005	2.4	0.071	1.4	<0.005	91	0.073
Lead	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.073	<0.05
Lead (AAS)										
Lead (PMS)	0.0044	0.00063	<0.004	<0.004	0.0072	0.0016	<0.004	<0.004	0.08	0.00066
Lithium	<0.004	<0.004	<0.004	<0.004	0.0042	<0.004	<0.004	<0.004	<0.004	<0.004
Manganese	0.028	<0.001	0.0074	0.0015	0.056	0.0019	0.02	0.0019	1.2	0.0056
Mercury (CVAA)	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.068	<0.01
Nickel	<0.01	<0.01	<0.01	0.012	<0.01	<0.01	0.16	0.074	2.6	0.13
Selenium	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Silver	<0.006	<0.006	<0.006	<0.006	<0.006	0.006	<0.006	<0.006	<0.006	<0.006
Strontium	0.01	0.011	0.011	0.01	0.017	0.0095	0.021	0.023	0.094	0.023
Thallium (AAS)			<0.01	<0.01			<0.01	<0.01		
Thallium (PMS)	<0.0005	0.001			<0.0005	<0.0005			0.00072	<0.0005
Thorium	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Uranium (PMS)	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.00084	0.0024	0.0033	0.00059
Vanadium	0.006	<0.005	<0.005	<0.005	0.0073	<0.005	<0.005	<0.005	0.049	<0.005
Zinc	0.026	0.0047	0.019	0.0091	0.11	0.016	0.03	0.02	0.51	0.0074
IONS (mg/L)										
Calcium	29	29	31	28	52	26	37	38	150	35
Magnesium	19	19	18	16	32	16	22	23	39	22
Potassium	0.78	0.62	0.76	0.74	1.5	1.4	<0.6	<0.6	1.4	1.7
Sodium	0.85	1.1	0.63	0.61	0.9	0.71	2.4	2.7	2.9	2.8
Alkalinity-HCO3	151		134		133		152		162	
Alkalinity-CO3	<1		<1		<1		<1		<1	
Ammonia-N							<0.2			
Chloride	0.93		1.82		2.36		14.8		13.8	
Fluoride	<0.1		<0.1		<0.1		<0.1		<0.1	
Nitrate-N	0.2		0.58		0.35		0.3		0.39	
Sulfate	1.04		<1		<1		7.25		7.53	
Diluted ICP										

(CONTINUED)

APPENDIX D.2
Inorganic Analytes, CY 1996

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Sampling Point	GW-539		GW-540		GW-541		GW-542			
Program	SDM		SDM		SDM		SDM			
Location	LII		CDLVI		CDLVI		CDLVI			
Date Sampled	12/18/96		04/09/96		04/15/96		04/16/96		11/05/96	
Sample Type										
	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS
METALS (mg/L)										
Aluminum	0.13	<0.02	<0.02	<0.02	0.069	0.023	1.3	0.053	3.9	0.035
Antimony	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Arsenic	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Arsenic (PMS)	<0.005	<0.005							<0.005	<0.005
Barium	0.011	<0.001	0.0098	0.0095	0.0086	0.0085	0.015	0.012	0.022	0.021
Beryllium	<0.0003	<0.0003	0.00035	<0.0003	<0.0003	<0.0003	0.00034	<0.0003	0.00062	<0.0003
Boron	0.013	0.015	0.019	0.023	0.015	0.033	0.022	0.012	0.0098	0.024
Cadmium	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Chromium	0.022	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Copper	0.0052	0.0072	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	0.011	<0.004
Iron	0.52	0.22	0.0094	<0.005	0.055	<0.005	0.65	<0.005	2.8	0.014
Lead	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Lead (AAS)			<0.004	<0.004	<0.004	<0.004	<0.004	<0.004		
Lead (PMS)	0.0013	<0.0005							0.0054	0.00058
Lithium	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Manganese	0.0088	0.0011	<0.001	<0.001	0.0055	0.0053	0.017	0.0015	0.078	0.0084
Mercury (CVAA)	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum	<0.01	<0.01	<0.01	<0.01	0.027	0.026	<0.01	<0.01	<0.01	<0.01
Nickel	0.12	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Selenium	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Silver	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006
Strontium	0.019	<0.0004	0.028	0.028	0.027	0.029	0.029	0.028	0.017	0.016
Thallium (AAS)			<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		
Thallium (PMS)	<0.0005	0.00059							<0.0005	<0.0005
Thorium	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Uranium (PMS)	0.00069	0.00096	<0.0005	<0.0005	0.0023	0.0023	<0.0005	<0.0005	<0.0005	<0.0005
Vanadium	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.0072	<0.005
Zinc	0.034	0.015	0.01	0.015	0.022	0.016	0.046	0.015	0.13	0.027
IONS (mg/L)										
Calcium	36	0.49	43	43	45	40	27	25	18	17
Magnesium	22	0.22	24	24	23	21	12	11	8.2	7.4
Potassium	0.97	<0.6	0.8	0.76	0.89	1.1	2.4	2.1	2.8	2.5
Sodium	2.2	0.13	1.9	2	0.62	0.63	1.4	1.4	0.98	1
Alkalinity-HCO3			198		187		109		76	
Alkalinity-CO3			<1		<1		<1		<1	
Ammonia-N			<0.2		<0.2		<0.2			
Chloride			1.97		1.72		1.84		0.83	
Fluoride			<0.1		<0.1		<0.1		<0.1	
Nitrate-N			<0.2		<0.2		0.3		0.29	
Sulfate			4.07		11.4		3.17		1.72	
Diluted ICP										

(CONTINUED)

APPENDIX D.2
Inorganic Analytes, CY 1996

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Sampling Point	GW-543								GW-544	
Program	SDM								SDM	
Location	CDLVI								CDLVI	
Date Sampled	04/16/96				11/06/96				04/16/96	
Sample Type			DUP				DUP			
	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS
METALS (mg/L)	.	.	.	.	.	.	.	.	.	.
Aluminum	0.2	0.028	0.25	0.042	0.22	<0.02	0.18	0.063	0.041	0.031
Antimony	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Arsenic	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Arsenic (PMS)	.	.	.	.	<0.005	<0.005	<0.005	<0.005	.	.
Barium	0.01	0.0091	0.01	0.0095	0.0096	0.0086	0.0088	0.0085	0.0094	0.0084
Beryllium	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	0.00032	<0.0003
Boron	0.03	0.017	0.019	0.019	0.012	0.0071	0.027	0.01	0.014	0.013
Cadmium	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Chromium	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Copper	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Iron	0.091	0.039	0.12	<0.005	0.2	0.0092	0.12	<0.005	0.015	<0.005
Lead	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Lead (AAS)	<0.004	<0.004	<0.004	<0.004	.	.	.	.	<0.004	<0.004
Lead (PMS)	.	.	.	.	<0.0005	<0.0005	<0.0005	<0.0005	.	.
Lithium	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Manganese	0.0017	<0.001	0.0017	<0.001	0.0023	<0.001	0.0014	<0.001	0.0012	<0.001
Mercury (CVAA)	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Nickel	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Selenium	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Silver	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006
Strontium	0.025	0.024	0.025	0.025	0.023	0.022	0.024	0.023	0.023	0.022
Thallium (AAS)	<0.01	<0.01	<0.01	<0.01	.	.	.	.	<0.01	<0.01
Thallium (PMS)	.	.	.	.	<0.0005	<0.0005	<0.0005	<0.0005	.	.
Thorium	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Uranium (PMS)	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vanadium	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc	0.014	0.011	0.015	0.011	0.01	0.0078	0.0081	0.0088	0.01	0.0079
IONS (mg/L)	.	.	.	.	.	.	.	.	.	.
Calcium	52	51	52	53	46	44	47	44	53	51
Magnesium	28	28	28	29	28	27	29	27	28	27
Potassium	0.85	0.78	0.98	0.8	1	1.3	1.3	0.87	1.2	1.2
Sodium	1.2	1	1.2	1.1	1	0.99	1.1	0.98	4.5	15
Alkalinity-HCO3	238	.	233	.	230	.	242	.	209	.
Alkalinity-CO3	<1	.	<1	.	<1	.	<1	.	<1	.
Ammonia-N	<0.2	.	<0.2	.	.	.	.	.	<0.2	.
Chloride	3.22	.	3.12	.	1.92	.	1.93	.	10.6	.
Fluoride	<0.1	.	<0.1	.	<0.1	.	<0.1	.	<0.1	.
Nitrate-N	0.26	.	0.26	.	0.24	.	0.24	.	0.76	.
Sulfate	3.72	.	3.82	.	4.06	.	4.03	.	8.73	.
Diluted ICP	.	.	.	.	.	.	.	.	.	.

(CONTINUED)

APPENDIX D.2
Inorganic Analytes, CY 1996

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Sampling Point	GW-544		GW-546		GW-557					
Program	SDM		SDM		SDM/C					
Location	CDLVI		CDLVI		LV					
Date Sampled	11/06/96		04/09/96		04/04/96		06/03/96		10/02/96	
Sample Type										
	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS
METALS (mg/L)										
Aluminum	<0.02	0.042	0.24	0.033	0.12	0.036	0.029	0.023	0.025	0.021
Antimony	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Arsenic	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Arsenic (PMS)	<0.005	<0.005							<0.005	<0.005
Barium	0.011	0.012	0.0044	0.0035	0.024	0.011	0.01	0.011	0.011	0.011
Beryllium	<0.0003	<0.0003	0.00039	0.00043	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Boron	0.0093	0.13	0.016	0.024	0.017	0.057	0.013	0.031	0.006	0.037
Cadmium	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Chromium	<0.01	<0.01	<0.01	<0.01	0.25	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Copper	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Iron	0.05	0.01	0.3	0.0052	0.14	<0.005	0.071	<0.005	0.038	<0.005
Lead	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Lead (AAS)			<0.004	<0.004	<0.004	<0.004				
Lead (PMS)	<0.0005	<0.0005							<0.0005	<0.0005
Lithium	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Manganese	0.0043	<0.001	0.021	<0.001	0.0024	<0.001	0.0027	0.0011	<0.001	<0.001
Mercury (CVAA)	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002			<0.0002	<0.0002
Molybdenum	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Nickel	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Selenium	<0.05	<0.05	<0.05	<0.05	0.066	0.057	<0.05	<0.05	<0.05	<0.05
Silver	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006
Strontium	0.023	0.024	0.019	0.018	0.016	0.016	0.015	0.015	0.016	0.016
Thallium (AAS)			<0.01	<0.01	<0.01	<0.01				
Thallium (PMS)	<0.0005	<0.0005							<0.0005	<0.0005
Thorium	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Uranium (PMS)	0.0012	0.0021	<0.0005	<0.0005	<0.0005	<0.0005			<0.0005	<0.0005
Vanadium	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc	0.048	0.025	0.02	0.011	0.011	0.017	0.0068	0.0071	0.0051	0.0047
IONS (mg/L)										
Calcium	48	47	33	30	35	36	34	34	35	34
Magnesium	29	29	18	17	21	22	21	21	21	21
Potassium	1.8	2.2	1.6	1.5	0.98	1	1.3	1.9	2	1.6
Sodium	4.9	4.8	2.1	2.2	0.64	0.82	0.78	0.83	0.69	0.65
Alkalinity-HCO3	246		148		166				174	
Alkalinity-CO3	<1		<1		<1				<1	
Ammonia-N			<0.2		<0.2					
Chloride	12.3		2.26		1.92				1.12	
Fluoride	<0.1		<0.1		<0.1				<0.1	
Nitrate-N	0.73		<0.2		0.89				0.94	
Sulfate	10		3.41		1.5				1.27	
Diluted ICP										

(CONTINUED)

APPENDIX D.2
Inorganic Analytes, CY 1996

27

Sampling Point	GW-557		GW-560				GW-562			
Program	SDM/C		SDM				SDM			
Location	LV		CDLVII				CDLVII			
Date Sampled	10/02/96		04/02/96		10/02/96		04/02/96			
Sample Type	DUP				DUP					
	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS
METALS (mg/L)	.	.	.	.	.	.	.	.	.	.
Aluminum	0.028	0.03	0.024	0.022	0.02	<0.02	0.026	<0.02	0.69	<0.02
Antimony	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Arsenic	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Arsenic (PMS)	<0.005	<0.005	.	.	<0.005	<0.005	<0.005	<0.005	.	.
Barium	0.011	0.011	0.22	0.21	0.23	0.23	0.23	0.23	0.013	0.15
Beryllium	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Boron	0.082	0.025	0.0068	0.03	0.045	0.031	0.011	0.019	0.037	0.0048
Cadmium	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Chromium	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Copper	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Iron	0.019	0.0094	0.0083	<0.005	<0.005	<0.005	<0.005	<0.005	0.59	<0.005
Lead	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Lead (AAS)	.	.	<0.004	<0.004	.	.	.	.	<0.004	<0.004
Lead (PMS)	<0.0005	<0.0005	.	.	0.00097	0.001	0.00085	0.00097	.	.
Lithium	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Manganese	<0.001	<0.001	0.0011	<0.001	<0.001	<0.001	<0.001	<0.001	0.017	<0.001
Mercury (CVAA)	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Nickel	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Selenium	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.058	<0.05	<0.05
Silver	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006
Strontium	0.016	0.016	0.022	0.022	0.023	0.023	0.024	0.023	0.018	0.018
Thallium (AAS)	.	.	<0.01	<0.01	.	.	.	.	<0.01	<0.01
Thallium (PMS)	<0.0005	0.00057	.	.	<0.0005	0.00062	<0.0005	<0.0005	.	.
Thorium	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Uranium (PMS)	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vanadium	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc	0.0074	0.016	0.022	0.021	0.019	0.019	0.019	0.021	0.014	0.0064
IONS (mg/L)	.	.	.	.	.	.	.	.	.	.
Calcium	35	35	35	33	35	34	35	35	37	37
Magnesium	21	21	15	14	15	14	15	15	23	22
Potassium	1.8	1.7	0.71	0.79	1.3	1.6	1.3	1.3	<0.6	<0.6
Sodium	0.84	0.72	0.63	0.69	0.68	1.4	0.69	0.69	0.72	0.73
Alkalinity-HCO3	168	.	145	.	147	.	148	.	192	.
Alkalinity-CO3	<1	.	<1	.	<1	.	<1	.	<1	.
Ammonia-N	.	.	<0.2	.	.	.	.	.	<0.2	.
Chloride	1.1	.	1.8	.	0.79	.	0.74	.	2.18	.
Fluoride	<0.1	.	<0.1	.	<0.1	.	<0.1	.	<0.1	.
Nitrate-N	0.95	.	<0.2	.	0.11	.	0.11	.	0.36	.
Sulfate	1.23	.	2.22	.	1.82	.	1.63	.	2.65	.
Diluted ICP	.	.	.	.	.	.	.	.	.	.

(CONTINUED)

APPENDIX D.2
Inorganic Analytes, CY 1996

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Sampling Point	GW-562				GW-564				GW-608	
Program	SDM				SDM				AMP	
Location	CDLVII				CDLVII				CRSP	
Date Sampled	10/02/96		11/25/96		04/04/96		10/03/96		01/29/96	
Sample Type										
	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS
METALS (mg/L)	.	.	.	.	.	.	.	.	.	.
Aluminum	0.078	<0.02	0.2	0.089	<0.02	0.04	<0.02	<0.02	0.69	<0.02
Antimony	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Arsenic	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Arsenic (PMS)	<0.005	<0.005	.	.	.	.	<0.005	<0.005	.	.
Barium	0.013	0.011	0.011	0.01	0.012	0.012	0.014	0.017	0.015	0.014
Beryllium	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	0.00031	<0.0003
Boron	0.011	0.016	0.015	0.026	0.0095	0.013	0.064	0.022	0.024	0.046
Cadmium	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Chromium	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Copper	0.0048	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Iron	0.029	<0.005	0.32	<0.005	0.053	0.018	<0.005	<0.005	1	0.062
Lead	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Lead (AAS)	.	.	.	.	<0.004	<0.004	.	.	.	.
Lead (PMS)	0.0007	0.00056	.	.	.	.	0.00082	0.0062	.	.
Lithium	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Manganese	0.0019	<0.001	0.01	<0.001	<0.001	<0.001	<0.001	<0.001	0.024	0.0046
Mercury (CVAA)	<0.0002	<0.0002	.	.	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Nickel	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Selenium	0.058	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Silver	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006
Strontium	0.019	0.018	0.018	0.018	0.017	0.018	0.019	0.019	0.015	0.015
Thallium (AAS)	.	.	.	.	<0.01	<0.01	.	.	.	.
Thallium (PMS)	<0.0005	<0.0005	.	.	.	.	<0.0005	<0.0005	.	.
Thorium	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Uranium (PMS)	<0.0005	<0.0005	.	.	<0.0005	<0.0005	<0.0005	<0.0005	0.00076	0.00071
Vanadium	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc	0.0076	0.006	0.0072	0.0025	0.014	0.017	0.011	0.019	0.014	0.0036
IONS (mg/L)	.	.	.	.	.	.	.	.	.	.
Calcium	38	38	37	38	30	31	32	32	34	34
Magnesium	24	23	22	22	14	15	16	16	20	20
Potassium	0.87	<0.6	0.69	<0.6	0.65	0.73	1	1.6	1.2	1.3
Sodium	0.82	0.75	0.68	0.72	0.6	0.68	0.94	0.86	0.84	0.85
Alkalinity-HCO3	182	.	.	.	139	.	146	.	155	.
Alkalinity-CO3	<1	.	.	.	<1	.	<1	.	<1	.
Ammonia-N	.	.	.	.	<0.2	.	.	.	.	.
Chloride	1.47	.	.	.	1.81	.	0.88	.	3.01	.
Fluoride	<0.1	.	.	.	<0.1	.	<0.1	.	<0.1	.
Nitrate-N	0.63	.	.	.	0.34	.	0.44	.	0.94	.
Sulfate	1.95	.	.	.	1.27	.	1.02	.	2.43	.
Diluted ICP	.	.	.	.	.	.	.	.	.	.

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APPENDIX D.2
Inorganic Analytes, CY 1996

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Sampling Point	GW-609						GW-610		GW-611	
Program	CMP						AMP		AMP	
Location	CRSP						CRSP		CRSP	
Date Sampled	02/25/96		04/16/96		10/07/96		02/23/96		02/25/96	
Sample Type										
	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS
METALS (mg/L)	.	.	.	.	.	.	.	.	.	.
Aluminum	<0.02	<0.02	<0.02	0.022	<0.02	0.024	<0.02	<0.02	0.023	0.024
Antimony	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Arsenic	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Arsenic (PMS)	.	.	.	.	<0.005	<0.005	.	.	.	.
Barium	0.013	0.013	0.012	0.012	0.013	0.012	0.11	0.12	0.015	0.014
Beryllium	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Boron	0.028	0.025	0.011	0.028	0.0082	0.033	0.031	0.02	0.086	0.049
Cadmium	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Chromium	<0.01	<0.01	<0.01	<0.01	0.018	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Copper	<0.004	<0.004	<0.004	0.0044	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Iron	0.017	<0.005	0.011	0.0052	0.065	<0.005	0.07	0.0053	0.024	<0.005
Lead	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Lead (AAS)	.	.	<0.004	<0.004	.	.	.	.	.	.
Lead (PMS)	.	.	.	.	0.0011	<0.0005	.	.	.	.
Lithium	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Manganese	<0.001	<0.001	<0.001	<0.001	0.0026	0.0033	0.0012	<0.001	<0.001	<0.001
Mercury (CVAA)	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Nickel	<0.01	<0.01	<0.01	<0.01	0.012	<0.01	<0.01	<0.01	<0.01	<0.01
Selenium	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Silver	<0.006	<0.006	<0.006	<0.006	<0.006	0.0095	<0.006	<0.006	<0.006	<0.006
Strontium	0.015	0.015	0.014	0.013	0.014	0.014	0.018	0.019	0.019	0.018
Thallium (AAS)	.	.	.	.	.	.	.	.	.	.
Thallium (PMS)	.	.	.	.	<0.0005	<0.0005	.	.	.	.
Thorium	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Uranium (PMS)	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vanadium	<0.005	<0.005	0.0052	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc	0.0085	0.0085	0.012	0.015	0.021	0.011	0.0076	0.0099	0.034	0.037
IONS (mg/L)	.	.	.	.	.	.	.	.	.	.
Calcium	41	42	37	36	42	42	46	51	56	55
Magnesium	27	28	24	24	26	25	31	34	37	36
Potassium	0.98	<0.6	2.5	2.9	1.5	1.2	0.88	0.62	<0.6	0.62
Sodium	0.95	0.78	0.9	0.96	0.87	0.85	1.1	1.1	1.7	1.5
Alkalinity-HCO3	207	.	196	.	132	.	241	.	286	.
Alkalinity-CO3	<1	.	<1	.	<1	.	<1	.	<1	.
Ammonia-N	.	.	.	.	.	.	.	.	.	.
Chloride	2.16	.	2.27	.	1.29	.	2.98	.	2.03	.
Fluoride	<0.1	.	<0.1	.	<0.1	.	<0.1	.	<0.1	.
Nitrate-N	1.06	.	1.06	.	1.16	.	0.76	.	3.6	.
Sulfate	2.38	.	2.39	.	2.14	.	1.14	.	1.75	.
Diluted ICP	.	.	.	.	.	.	.	.	.	.

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APPENDIX D.2
Inorganic Analytes, CY 1996

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Sampling Point	GW-612		GW-709				GW-731			
Program	BMP		SDM				RDM			
Location	CRSP		LII				CRSDB			
Date Sampled	08/29/96		04/02/96				11/05/96		05/13/96	
Sample Type			DUP							
	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS
METALS (mg/L)	.	.	.	.	.	.	.	.	.	.
Aluminum	0.14	0.036	0.22	0.023	0.023	0.023	0.54	0.036	0.44	<0.02
Antimony	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Arsenic	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Arsenic (PMS)	.	.	.	.	.	.	<0.005	<0.005	.	.
Barium	0.016	0.018	0.25	0.26	0.23	0.24	0.27	0.26	0.007	0.0062
Beryllium	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Boron	0.3	0.29	0.064	0.0059	0.019	0.0042	0.05	0.0096	0.013	0.009
Cadmium	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Chromium	<0.01	<0.01	0.074	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Copper	<0.004	<0.004	0.0083	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Iron	0.37	0.012	0.14	<0.005	0.022	<0.005	0.6	0.013	0.52	<0.005
Lead	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Lead (AAS)	.	.	<0.004	<0.004	<0.004	<0.004	.	.	<0.004	<0.004
Lead (PMS)	0.0014	0.0016	.	.	.	.	0.0031	<0.0005	.	.
Lithium	0.0046	0.0041	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	0.0087	0.0072
Manganese	0.02	0.016	0.0046	<0.001	<0.001	<0.001	0.012	0.0018	0.013	<0.001
Mercury (CVAA)	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Nickel	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Selenium	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Silver	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006
Strontium	0.017	0.016	0.03	0.032	0.029	0.03	0.033	0.031	0.02	0.019
Thallium (AAS)	.	.	<0.01	<0.01	<0.01	<0.01	.	.	.	.
Thallium (PMS)	<0.0005	<0.0005	.	.	.	.	<0.0005	<0.0005	.	.
Thorium	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Uranium (PMS)	0.00052	0.00051	<0.0005	<0.0005	0.00056	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vanadium	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc	0.0071	0.0061	0.024	0.015	0.011	0.011	0.026	0.013	0.011	0.0037
IONS (mg/L)	.	.	.	.	.	.	.	.	.	.
Calcium	42	42	37	39	35	36	40	37	19	20
Magnesium	28	28	22	23	21	22	23	22	15	15
Potassium	1.8	2.2	0.62	0.82	<0.6	<0.6	0.8	1.3	10	9.2
Sodium	0.84	0.85	0.88	0.81	2.6	0.87	0.67	0.66	3	2.7
Alkalinity-HCO3	217	.	179	.	176	.	192	.	117	.
Alkalinity-CO3	<1	.	<1	.	<1	.	<1	.	12	.
Ammonia-N	.	.	.	.	.	.	.	.	.	.
Chloride	1.89	.	2.15	.	2.12	.	1.44	.	1.68	.
Fluoride	<0.1	.	<0.1	.	<0.1	.	<0.1	.	<0.1	.
Nitrate-N	0.29	.	<0.2	.	<0.2	.	0.15	.	0.24	.
Sulfate	2.78	.	1.98	.	2	.	2.08	.	4.66	.
Diluted ICP	.	.	.	.	.	.	.	.	.	.

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APPENDIX D.2
Inorganic Analytes, CY 1996

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Sampling Point	GW-731									
Program	RDM									
Location	CRSDB									
Date Sampled	05/13/96		05/14/96				05/15/96			
Sample Type	DUP				DUP				DUP	
	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS
METALS (mg/L)	.	.	.	.	.	.	.	.	.	.
Aluminum	0.51	0.062	0.088	<0.02	0.086	<0.02	0.88	<0.02	0.3	<0.02
Antimony	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Arsenic	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Arsenic (PMS)	.	.	.	.	.	.	.	.	.	.
Barium	0.0068	0.0068	0.0078	0.0074	0.0079	0.0074	0.015	0.0094	0.012	0.0089
Beryllium	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Boron	0.027	0.035	0.0084	0.0056	0.0092	0.017	0.017	0.037	0.029	0.017
Cadmium	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Chromium	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Copper	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	0.018	<0.004	<0.004	<0.004
Iron	0.57	0.088	0.085	0.008	0.076	0.0068	1.1	0.013	0.49	0.016
Lead	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Lead (AAS)	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Lead (PMS)	.	.	.	.	.	.	.	.	.	.
Lithium	0.0086	0.007	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Manganese	0.013	0.0033	0.0039	<0.001	0.004	<0.001	0.055	0.0012	0.018	0.0018
Mercury (CVAA)	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Nickel	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Selenium	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Silver	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	0.21	<0.006	<0.006	<0.006
Strontium	0.019	0.019	0.026	0.025	0.026	0.026	0.03	0.022	0.033	0.021
Thallium (AAS)	.	.	.	.	.	.	.	.	.	.
Thallium (PMS)	.	.	.	.	.	.	.	.	.	.
Thorium	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Uranium (PMS)	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vanadium	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc	0.012	0.0037	0.0046	0.0076	0.0053	0.0068	0.023	0.0036	0.0094	0.0066
IONS (mg/L)	.	.	.	.	.	.	.	.	.	.
Calcium	18	20	21	20	21	20	37	24	30	24
Magnesium	14	15	14	13	14	13	20	16	16	16
Potassium	10	8.7	4	3.9	4.1	3.9	2.7	3	3.9	2.8
Sodium	2.9	2.6	2.1	2.1	2.2	2.2	1.3	1.5	2	1.4
Alkalinity-HCO3	114	.	119	.	120	.	117	.	124	.
Alkalinity-CO3	12	.	<1	.	<1	.	<1	.	<1	.
Ammonia-N	.	.	.	.	.	.	.	.	.	.
Chloride	1.69	.	1.72	.	1.73	.	1.7	.	1.72	.
Fluoride	<0.1	.	<0.1	.	<0.1	.	<0.1	.	<0.1	.
Nitrate-N	<0.2	.	<0.2	.	<0.2	.	<0.2	.	0.23	.
Sulfate	4.7	.	4.96	.	5.03	.	5.03	.	5.07	.
Diluted ICP	.	.	.	.	.	.	.	.	.	.

(CONTINUED)

APPENDIX D.2
Inorganic Analytes, CY 1996

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Sampling Point	GW-731									
Program	RDM									
Location	CRSDB									
Date Sampled	05/16/96				10/14/96				10/15/96	
Sample Type			DUP				DUP			
	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS
METALS (mg/L)	.	.	.	.	.	.	.	.	.	.
Aluminum	0.066	<0.02	0.049	<0.02	0.094	0.02	0.067	0.024	0.055	<0.023
Antimony	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.057
Arsenic	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.057
Arsenic (PMS)	.	.	.	.	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Barium	0.0086	0.0087	0.0086	0.0086	0.007	0.0067	0.0079	0.006	0.008	0.0072
Beryllium	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.00034
Boron	0.03	0.016	0.015	0.011	0.0068	0.0071	0.0043	0.077	0.045	0.067
Cadmium	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.0034
Chromium	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.011
Cobalt	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0057
Copper	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	0.005	<0.004	<0.004	<0.0046
Iron	0.066	<0.005	0.056	<0.005	0.19	0.0051	0.086	<0.005	0.049	<0.0057
Lead	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.057
Lead (AAS)	<0.004	<0.004	<0.004	<0.004	.	.	.	.	.	.
Lead (PMS)	.	.	.	.	0.001	0.002	0.0012	0.00079	0.00053	<0.0005
Lithium	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.0046
Manganese	0.0021	0.0014	0.0024	<0.001	0.0047	<0.001	0.0039	<0.001	0.0035	<0.0011
Mercury (CVAA)	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.011
Nickel	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.011
Selenium	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.057
Silver	<0.006	0.27	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.0068
Strontium	0.029	0.029	0.029	0.029	0.021	0.021	0.022	0.02	0.023	0.024
Thallium (AAS)	.	.	.	.	.	.	.	.	.	.
Thallium (PMS)	.	.	.	.	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Thorium	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.23
Uranium (PMS)	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vanadium	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0057
Zinc	0.0039	0.0076	0.0029	0.0057	0.015	0.012	0.016	0.011	0.0068	0.0092
IONS (mg/L)	.	.	.	.	.	.	.	.	.	.
Calcium	20	22	20	20	24	23	25	23	24	23
Magnesium	14	14	14	14	15	15	15	14	15	14
Potassium	4.1	3.9	4	4.1	4.1	4.3	4.6	4.1	4	4.4
Sodium	2.3	2.3	2.2	2.3	2.3	2.3	2.3	2.3	2.1	2.2
Alkalinity-HCO3	120	.	122	.	125	.	119	.	126	.
Alkalinity-CO3	<1	.	<1	.	<1	.	<1	.	<1	.
Ammonia-N	.	.	.	.	.	.	.	.	.	.
Chloride	1.72	.	1.72	.	0.79	.	0.87	.	0.91	.
Fluoride	<0.1	.	<0.1	.	<0.1	.	<0.1	.	<0.1	.
Nitrate-N	0.26	.	<0.2	.	0.04	.	0.22	.	0.21	.
Sulfate	5.04	.	5.11	.	5.05	.	4.99	.	4.98	.
Diluted ICP	.	.	.	.	.	.	.	.	.	Dilute

(CONTINUED)

APPENDIX D.2
Inorganic Analytes, CY 1996

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Sampling Point	GW-731									
Program	RDM									
Location	CRSDB									
Date Sampled	10/15/96		10/16/96				10/17/96			
Sample Type	DUP				DUP				DUP	
	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS
METALS (mg/L)	.	.	.	.	.	.	.	.	.	.
Aluminum	0.088	<0.023	0.041	0.022	0.04	0.027	0.045	<0.02	0.027	0.054
Antimony	<0.05	<0.058	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Arsenic	<0.05	<0.058	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Arsenic (PMS)	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Barium	0.0072	0.007	0.0071	0.0068	0.0071	0.007	0.0082	0.0066	0.0077	0.0075
Beryllium	<0.0003	<0.00035	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Boron	0.044	0.029	0.052	0.004	<0.004	0.042	0.024	0.037	0.013	0.0085
Cadmium	<0.003	<0.0035	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Chromium	<0.01	<0.012	<0.01	<0.01	<0.01	0.014	<0.01	<0.01	<0.01	<0.01
Cobalt	<0.005	<0.0058	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Copper	<0.004	<0.0046	0.0051	0.0047	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Iron	0.057	<0.0058	0.03	0.0052	0.095	0.03	0.048	0.02	0.03	0.071
Lead	<0.05	<0.058	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Lead (AAS)	.	.	.	.	.	.	.	.	.	.
Lead (PMS)	0.00077	<0.0005	0.0013	0.00072	0.0015	0.00053	0.0014	<0.0005	0.00094	0.00069
Lithium	<0.004	<0.0046	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Manganese	0.0026	<0.0012	0.0028	<0.001	0.0023	<0.001	0.0021	<0.001	0.0014	0.0034
Mercury (CVAA)	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum	<0.01	<0.012	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Nickel	<0.01	<0.012	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Selenium	<0.05	<0.058	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Silver	<0.006	<0.007	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006
Strontium	0.024	0.023	0.023	0.022	0.024	0.022	0.025	0.02	0.025	0.025
Thallium (AAS)	.	.	.	.	.	.	.	.	.	.
Thallium (PMS)	<0.0005	<0.0005	<0.0005	<0.0005	0.00065	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Thorium	<0.2	<0.23	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Uranium (PMS)	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vanadium	<0.005	<0.0058	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc	0.006	0.0029	0.009	0.0038	0.005	0.0047	0.007	0.005	0.0044	0.0039
IONS (mg/L)	.	.	.	.	.	.	.	.	.	.
Calcium	24	24	22	21	22	21	23	20	22	23
Magnesium	15	14	13	14	14	14	14	11	14	14
Potassium	3.5	3.4	4	4	4	3.9	3.9	3	3.6	3.6
Sodium	2.2	2	2	1.9	2	2	1.9	1.6	1.9	1.9
Alkalinity-HCO3	126	.	120	.	118	.	122	.	122	.
Alkalinity-CO3	<1	.	<1	.	<1	.	<1	.	<1	.
Ammonia-N	.	.	.	.	.	.	.	.	.	.
Chloride	0.9	.	0.83	.	0.88	.	0.88	.	0.92	.
Fluoride	<0.1	.	<0.1	.	<0.1	.	<0.1	.	<0.1	.
Nitrate-N	0.21	.	0.22	.	0.21	.	0.21	.	0.21	.
Sulfate	4.96	.	4.81	.	5.01	.	4.73	.	4.96	.
Diluted ICP	.	Dilute	.	.	.	.	.	.	.	.

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APPENDIX D.2
Inorganic Analytes, CY 1996

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Sampling Point	GW-732									
Program	RDM									
Location	CRSDB									
Date Sampled	05/13/96		05/14/96		05/15/96		05/16/96		10/14/96	
Sample Type										
	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS
METALS (mg/L)	.	.	.	.	.	.	.	.	.	.
Aluminum	0.23	<0.02	0.16	<0.02	0.049	<0.02	0.056	<0.02	0.028	<0.02
Antimony	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Arsenic	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Arsenic (PMS)	.	.	.	.	.	.	.	.	<0.005	<0.005
Barium	0.015	0.013	0.01	0.0089	0.009	0.0083	0.0089	0.0082	0.013	0.011
Beryllium	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Boron	0.018	0.009	0.015	0.0078	0.018	0.01	0.035	0.034	<0.004	<0.004
Cadmium	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Chromium	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Copper	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Iron	0.16	0.0065	0.089	<0.005	0.042	0.0068	0.044	<0.005	0.02	<0.005
Lead	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Lead (AAS)	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	.	.
Lead (PMS)	.	.	.	.	.	.	.	.	0.0026	<0.0005
Lithium	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Manganese	0.0084	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Mercury (CVAA)	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Nickel	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Selenium	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Silver	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006
Strontium	0.027	0.025	0.018	0.015	0.015	0.014	0.015	0.014	0.02	0.016
Thallium (AAS)	.	.	.	.	.	.	.	.	.	.
Thallium (PMS)	.	.	.	.	.	.	.	.	<0.0005	<0.0005
Thorium	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Uranium (PMS)	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vanadium	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc	0.013	0.0094	0.0066	0.0061	0.0089	0.0055	0.0058	0.0067	0.0097	0.0094
IONS (mg/L)	.	.	.	.	.	.	.	.	.	.
Calcium	30	30	32	32	29	30	30	30	33	31
Magnesium	19	19	21	21	20	21	20	21	19	18
Potassium	2	2.2	0.94	0.98	0.95	0.97	0.91	1	1.6	1.4
Sodium	0.95	0.95	0.54	0.56	0.62	0.61	0.6	0.6	0.89	0.86
Alkalinity-HCO3	173	.	178	.	186	.	181	.	158	.
Alkalinity-CO3	<1	.	<1	.	<1	.	<1	.	<1	.
Ammonia-N	.	.	.	.	.	.	.	.	.	.
Chloride	1.68	.	1.65	.	1.67	.	1.65	.	0.6	.
Fluoride	<0.1	.	<0.1	.	<0.1	.	<0.1	.	<0.1	.
Nitrate-N	<0.2	.	0.3	.	<0.2	.	<0.2	.	0.21	.
Sulfate	1.87	.	1.75	.	1.66	.	1.52	.	2	.
Diluted ICP	.	.	.	.	.	.	.	.	.	.

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APPENDIX D.2
Inorganic Analytes, CY 1996

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Sampling Point	GW-732						GW-742		GW-743	
Program	RDM						AMP		AMP	
Location	CRSDB						CRSP		CRSP	
Date Sampled	10/15/96		10/16/96		10/17/96		02/01/96		02/23/96	
Sample Type										
	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS
METALS (mg/L)	.	.	.	.	.	.	.	.	.	.
Aluminum	0.33	0.05	0.021	<0.02	0.11	<0.02	<0.02	<0.02	0.022	<0.02
Antimony	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Arsenic	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Arsenic (PMS)	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	.	.	.	.
Barium	0.012	0.0085	0.012	0.01	0.0094	0.0077	0.12	0.12	0.011	0.011
Beryllium	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Boron	0.038	0.01	<0.004	0.032	<0.004	<0.004	0.019	<0.004	0.027	0.029
Cadmium	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Chromium	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Copper	0.0045	<0.004	<0.004	<0.004	<0.004	0.01	<0.004	<0.004	<0.004	<0.004
Iron	0.17	0.035	0.032	<0.005	0.07	0.066	0.76	0.13	0.089	<0.005
Lead	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Lead (AAS)	.	.	.	.	.	.	.	.	.	.
Lead (PMS)	0.0015	0.0028	0.00054	<0.0005	0.00064	0.00057	.	.	.	.
Lithium	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Manganese	0.0022	<0.001	<0.001	<0.001	0.002	<0.001	0.024	0.023	0.0015	<0.001
Mercury (CVAA)	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Nickel	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Selenium	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Silver	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006
Strontium	0.018	0.014	0.019	0.016	0.016	0.012	0.015	0.016	0.02	0.02
Thallium (AAS)	.	.	.	.	.	.	.	.	.	.
Thallium (PMS)	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	.	.	.	.
Thorium	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Uranium (PMS)	0.00056	<0.0005	0.00071	<0.0005	<0.0005	<0.0005	0.00068	<0.0005	0.00061	<0.0005
Vanadium	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc	0.02	0.0094	0.0078	0.007	0.0078	0.0074	0.0059	0.0037	0.003	<0.002
IONS (mg/L)	.	.	.	.	.	.	.	.	.	.
Calcium	33	32	31	31	33	31	38	38	27	28
Magnesium	20	19	19	19	20	19	22	22	18	18
Potassium	0.96	1	1.5	1.6	0.74	0.77	0.89	0.76	1.2	1.2
Sodium	0.66	0.56	0.68	0.71	0.35	0.37	0.59	0.58	1	1.1
Alkalinity-HCO3	160	.	161	.	163	.	169	.	140	.
Alkalinity-CO3	<1	.	<1	.	<1	.	<1	.	<1	.
Ammonia-N	.	.	.	.	.	.	.	.	.	.
Chloride	0.63	.	0.62	.	0.76	.	1.58	.	2.47	.
Fluoride	<0.1	.	<0.1	.	<0.1	.	<0.1	.	<0.1	.
Nitrate-N	0.21	.	0.2	.	0.19	.	<0.2	.	0.72	.
Sulfate	1.72	.	1.72	.	1.63	.	12.6	.	4.17	.
Diluted ICP	.	.	.	.	.	.	.	.	.	.

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APPENDIX D.2
Inorganic Analytes, CY 1996

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Sampling Point	GW-743				GW-757				GW-796	
Program	AMP				SDM				SDM/C	
Location	CRSP				LII				LV	
Date Sampled	02/23/96		04/04/96		11/05/96				04/10/96	
Sample Type	DUP						DUP			
	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS
METALS (mg/L)	.	.	.	.	.	.	.	.	.	.
Aluminum	<0.02	<0.02	0.052	<0.02	0.12	<0.02	0.09	0.038	<0.02	<0.02
Antimony	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Arsenic	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Arsenic (PMS)	.	.	.	.	<0.005	<0.005	<0.005	<0.005	.	.
Barium	0.012	0.011	0.2	0.2	0.21	0.2	0.22	0.21	0.012	0.012
Beryllium	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Boron	0.068	0.028	0.0074	0.0065	0.011	0.01	0.01	0.062	0.0099	0.017
Cadmium	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Chromium	<0.01	<0.01	0.011	0.013	<0.01	<0.01	0.014	<0.01	<0.01	<0.01
Cobalt	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Copper	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	0.0044	<0.004	<0.004
Iron	0.061	0.007	0.047	<0.005	0.15	<0.005	0.16	0.0073	0.0094	<0.005
Lead	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Lead (AAS)	.	.	<0.004	<0.004	.	.	.	.	<0.004	<0.004
Lead (PMS)	.	.	.	.	0.0007	0.0023	<0.0005	<0.0005	.	.
Lithium	<0.004	<0.004	<0.004	<0.004	0.004	<0.004	<0.004	0.0041	<0.004	<0.004
Manganese	0.0012	<0.001	<0.001	<0.001	0.0023	<0.001	0.003	0.001	<0.001	<0.001
Mercury (CVAA)	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Nickel	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Selenium	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Silver	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006
Strontium	0.02	0.02	0.8	0.73	0.75	0.75	0.66	0.75	0.044	0.044
Thallium (AAS)	.	.	<0.01	<0.01	.	.	.	.	<0.01	<0.01
Thallium (PMS)	.	.	.	.	<0.0005	<0.0005	<0.0005	<0.0005	.	.
Thorium	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Uranium (PMS)	<0.0005	<0.0005	0.0044	0.0043	0.0045	0.0044	0.0046	0.0044	<0.0005	<0.0005
Vanadium	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc	0.0037	0.0054	0.0087	0.011	0.01	0.0079	0.0086	0.013	0.0024	0.0032
IONS (mg/L)	.	.	.	.	.	.	.	.	.	.
Calcium	28	28	31	30	29	29	29	29	22	22
Magnesium	18	18	18	18	17	17	18	17	12	13
Potassium	0.71	1.2	1.3	0.83	3.1	2.7	3.6	2.9	2.3	2.5
Sodium	1.1	1	2.1	2.8	5.8	5.1	9.5	5.5	0.91	0.93
Alkalinity-HCO3	135	.	143	.	154	.	148	.	112	.
Alkalinity-CO3	<1	.	<1	.	<1	.	<1	.	<1	.
Ammonia-N	.	.	.	.	.	.	.	.	<0.2	.
Chloride	2.49	.	2.14	.	1.65	.	1.83	.	2.02	.
Fluoride	<0.1	.	1.8	.	2.04	.	2.02	.	<0.1	.
Nitrate-N	0.7	.	<0.2	.	0.09	.	0.09	.	<0.2	.
Sulfate	4.22	.	10.4	.	11.4	.	11.4	.	1.48	.
Diluted ICP	.	.	.	.	.	.	.	.	.	.

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APPENDIX D.2
Inorganic Analytes, CY 1996

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Sampling Point	GW-796		GW-797				GW-798			
Program	SDM/C		SDM				SDM/C			
Location	LV		LV				CDLVII			
Date Sampled	10/03/96		04/09/96		10/03/96		04/09/96		10/03/96	
Sample Type										
	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS
METALS (mg/L)	.	.	.	.	.	.	.	.	.	.
Aluminum	0.035	0.035	0.02	<0.02	0.023	<0.02	<0.02	<0.02	<0.02	<0.024
Antimony	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.06
Arsenic	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.06
Arsenic (PMS)	<0.005	<0.005	.	.	<0.005	<0.005	.	.	<0.005	<0.005
Barium	0.012	0.012	0.0079	0.0079	0.01	0.01	0.0087	0.0085	0.01	0.0094
Beryllium	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.00036
Boron	<0.004	0.061	0.016	0.028	0.017	0.018	0.013	0.013	0.028	0.017
Cadmium	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.0036
Chromium	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.012
Cobalt	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.006
Copper	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.0048
Iron	0.021	0.0076	0.012	0.0053	0.0092	<0.005	0.0069	<0.005	<0.005	<0.006
Lead	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.06
Lead (AAS)	.	.	<0.004	<0.004	.	.	<0.004	<0.004	.	.
Lead (PMS)	<0.0005	<0.0005	.	.	<0.0005	0.067	.	.	0.00061	0.00072
Lithium	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.0048
Manganese	0.0012	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0012
Mercury (CVAA)	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.012
Nickel	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.012
Selenium	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.06
Silver	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.0072
Strontium	0.027	0.028	0.019	0.019	0.02	0.02	0.016	0.015	0.015	0.015
Thallium (AAS)	.	.	<0.01	<0.01	.	.	<0.01	<0.01	.	.
Thallium (PMS)	<0.0005	<0.0005	.	.	<0.0005	<0.0005	.	.	<0.0005	<0.0005
Thorium	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.24
Uranium (PMS)	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vanadium	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.006
Zinc	0.0036	0.0052	0.0048	0.0048	0.0081	0.0078	0.0078	0.0034	0.016	0.01
IONS (mg/L)	.	.	.	.	.	.	.	.	.	.
Calcium	22	22	32	33	30	30	29	28	27	27
Magnesium	14	14	18	19	18	18	15	15	16	16
Potassium	2.9	2.9	1.2	1.3	1.5	1.7	1.2	1.4	1.7	1.6
Sodium	1	1.2	1.1	1.1	3.1	3.2	0.56	0.53	0.77	0.67
Alkalinity-HCO3	114	.	165	.	154	.	136	.	134	.
Alkalinity-CO3	<1	.	<1	.	<1	.	<1	.	<1	.
Ammonia-N	.	.	<0.2	.	.	.	<0.2	.	.	.
Chloride	1.32	.	1.81	.	1.37	.	1.56	.	0.77	.
Fluoride	<0.1	.	<0.1	.	<0.1	.	<0.1	.	<0.1	.
Nitrate-N	0.06	.	<0.2	.	0.26	.	0.67	.	0.69	.
Sulfate	1.23	.	2.48	.	6.96	.	2.37	.	1.86	.
Diluted ICP	.	.	.	.	.	.	.	.	.	Dilute

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APPENDIX D.2
Inorganic Analytes, CY 1996

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Sampling Point	GW-799				GW-801					
Program	SDM/C				SDM/C					
Location	CDLVII				LV					
Date Sampled	04/08/96		10/02/96		04/10/96			10/07/96		
Sample Type							DUP			
	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS
METALS (mg/L)	.	.	.	.	.	.	.	.	.	.
Aluminum	0.15	<0.02	0.46	0.044	0.022	<0.02	<0.02	<0.02	0.034	<0.02
Antimony	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Arsenic	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Arsenic (PMS)	.	.	<0.005	<0.005	.	.	.	.	<0.005	<0.005
Barium	0.0053	0.0044	0.007	0.0052	0.0019	0.0019	0.002	0.0019	0.0024	0.0018
Beryllium	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Boron	0.0092	0.0077	0.019	0.027	0.014	0.015	0.018	0.018	0.039	0.013
Cadmium	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Chromium	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Copper	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Iron	0.085	0.099	0.58	0.027	0.016	<0.005	0.013	<0.005	0.017	<0.005
Lead	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Lead (AAS)	<0.004	<0.004	.	.	<0.004	<0.004	<0.004	<0.004	.	.
Lead (PMS)	.	.	<0.0005	<0.0005	.	.	.	.	<0.0005	<0.0005
Lithium	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Manganese	0.0051	0.0028	0.032	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Mercury (CVAA)	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Nickel	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Selenium	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Silver	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006
Strontium	0.015	0.014	0.015	0.015	0.016	0.015	0.015	0.015	0.014	0.014
Thallium (AAS)	<0.01	<0.01	.	.	<0.01	<0.01	<0.01	<0.01	.	.
Thallium (PMS)	.	.	<0.0005	<0.0005	.	.	.	.	<0.0005	<0.0005
Thorium	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Uranium (PMS)	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vanadium	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc	0.0058	0.0043	0.0065	0.0032	0.0086	0.0041	0.0037	0.005	0.0031	0.0042
IONS (mg/L)	.	.	.	.	.	.	.	.	.	.
Calcium	29	27	27	26	32	30	31	30	29	28
Magnesium	15	14	16	15	18	16	17	17	17	17
Potassium	0.89	0.81	1.3	1.3	0.66	0.66	0.73	0.71	<0.6	<0.6
Sodium	0.53	0.49	1.8	1.8	0.53	0.53	0.52	0.52	0.61	0.6
Alkalinity-HCO3	135	.	135	.	146	.	144	.	142	.
Alkalinity-CO3	<1	.	<1	.	<1	.	<1	.	<1	.
Ammonia-N	<0.2	.	.	.	<0.2	.	<0.2	.	.	.
Chloride	1.77	.	2.27	.	1.97	.	1.97	.	1.17	.
Fluoride	<0.1	.	<0.1	.	<0.1	.	<0.1	.	<0.1	.
Nitrate-N	1	.	2.77	.	<0.2	.	<0.2	.	0.085	.
Sulfate	1.18	.	4.06	.	2.83	.	2.8	.	2.4	.
Diluted ICP	.	.	.	.	.	.	.	.	.	.

(CONTINUED)

APPENDIX D.2
Inorganic Analytes, CY 1996

39

Sampling Point	GW-827				GW-831			
Program	SDM				CMP			
Location	CDLVI				ADB			
Date Sampled	04/16/96		11/05/96		08/27/96		10/01/96	
Sample Type								
	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS
METALS (mg/L)	.	.	.	.	.	.	.	.
Aluminum	<0.02	0.043	<0.02	<0.02	11	0.11	0.071	0.022
Antimony	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Arsenic	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Arsenic (PMS)	.	.	<0.005	<0.005	.	.	<0.005	<0.005
Barium	0.0083	0.0076	0.009	0.0089	0.035	0.019	0.021	0.019
Beryllium	<0.0003	<0.0003	<0.0003	<0.0003	0.001	<0.0003	<0.0003	<0.0003
Boron	0.018	0.028	0.026	0.0068	0.027	0.012	0.016	<0.004
Cadmium	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Chromium	<0.01	<0.01	<0.01	<0.01	0.015	<0.01	<0.01	<0.01
Cobalt	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Copper	<0.004	<0.004	<0.004	<0.004	0.028	<0.004	0.0061	0.0048
Iron	0.023	<0.005	0.013	<0.005	12	0.082	0.078	<0.005
Lead	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Lead (AAS)	<0.004	<0.004	.	.	.	.	.	.
Lead (PMS)	.	.	<0.0005	<0.0005	0.0083	0.00058	0.001	0.092
Lithium	<0.004	<0.004	<0.004	<0.004	0.013	0.0041	<0.004	<0.004
Manganese	0.001	<0.001	<0.001	<0.001	0.29	0.062	0.041	0.035
Mercury (CVAA)	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Nickel	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Selenium	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Silver	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	0.0066
Strontium	0.017	0.016	0.016	0.016	0.037	0.031	0.02	0.019
Thallium (AAS)	<0.01	<0.01	.	.	.	.	.	.
Thallium (PMS)	.	.	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Thorium	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Uranium (PMS)	<0.0005	<0.0005	<0.0005	<0.0005	0.0017	0.001	<0.0005	<0.0005
Vanadium	<0.005	<0.005	<0.005	<0.005	0.028	<0.005	<0.005	<0.005
Zinc	0.007	0.019	0.0064	0.0047	0.08	0.02	0.035	0.029
IONS (mg/L)	.	.	.	.	.	.	.	.
Calcium	33	31	30	30	46	39	41	39
Magnesium	18	17	18	18	27	23	24	23
Potassium	1.2	1.1	1.8	1.4	5.3	3.1	1.6	1.9
Sodium	0.59	0.59	0.77	0.75	1.4	1.2	0.56	0.56
Alkalinity-HCO3	149	.	158	.	203	.	201	.
Alkalinity-CO3	<1	.	<1	.	<1	.	<1	.
Ammonia-N	<0.2	.	.	.	.	.	.	.
Chloride	1.57	.	0.62	.	0.62	.	0.67	.
Fluoride	<0.1	.	<0.1	.	<0.1	.	<0.1	.
Nitrate-N	<0.2	.	0.07	.	0.05	.	0.06	.
Sulfate	1.79	.	1.75	.	4.88	.	1.69	.
Diluted ICP	.	.	.	.	.	.	.	.

APPENDIX D.2
Inorganic Analytes, CY 1996

40

Sampling Point		OUTFALL301	
Program		ROD	
Location		KHQ	
Date Sampled		03/13/96	08/06/96
Sample Type		TOT	TOT
Metals (mg/L)	Method		
Aluminum	ICP	0.038	0.03
Arsenic	PMS	<0.005	<0.005
Barium	PMS	0.053	0.052
Beryllium	PMS	<0.0005	<0.0005
Boron	ICP	0.0075	<0.004
Cadmium	PMS	<0.0005	<0.0005
Cerium	PMS	<0.0005	<0.0005
Chromium	PMS	<0.001	0.0012
Cobalt	PMS	<0.0005	<0.0005
Copper	PMS	<0.005	<0.005
Gallium	PMS	<0.0005	<0.0005
Iron	ICP	0.035	<0.005
Lead	PMS	<0.0005	0.00059
Lithium	PMS	0.0053	0.00092
Manganese	PMS	0.0019	0.0037
Mercury	CVAA	<0.00018	<0.0002
Molybdenum	PMS	<0.0005	<0.0005
Nickel	PMS	<0.005	<0.005
Selenium	PMS	<0.01	<0.01
Silver	PMS	<0.0005	<0.0005
Strontium	PMS	0.038	0.036
Thallium	PMS	<0.0005	<0.0005
Thorium	PMS	<0.0005	<0.0005
Titanium	PMS	0.014	0.012
Uranium	PMS	0.001	0.00063
Vanadium	ICP	<0.005	<0.005
Zinc	ICP	0.0051	0.021
Zirconium	ICP	<0.005	0.0051
Ions (mg/L)			
Calcium	ICP	31	32
Magnesium	ICP	14	15
Potassium	ICP	1.2	1.2
Sodium	ICP	0.84	1.1

APPENDIX D.3
ORGANIC ANALYTES

APPENDIX D.3
Organic Analytes, CY 1996

1

Sampling Point	1090		CBS-1		GW-141		
Program	ROD		SDM		SDM		
Location	UNCS		CDLVII		LIV		
Date Sampled	04/23/96	10/30/96	04/11/96	10/07/96	01/04/96	07/02/96	
Sample Type						DUP	
VOLATILE ORGANICS (ug/L)							
Acetone	10U	10U	10U	10U	10U	10U	10U
Benzene	10U	10U	10U	10U	10U	10U	10U
Bromodichloromethane	10U	10U	10U	10U	10U	10U	10U
Bromoform	10U	10U	10U	10U	10U	10U	10U
Bromomethane	10U	10U	10U	10U	10U	10U	10U
2-Butanone	10U	5	10U	10U	10U	10U	10U
Carbon Disulfide	10U	10U	10U	10U	10U	10U	10U
Carbon Tetrachloride	10U	10U	10U	10U	10U	10U	10U
Chlorobenzene	10U	10U	10U	10U	10U	10U	10U
Chlorodibromomethane	10U	10U	10U	10U	10U	10U	10U
Chloroethane	10U	10U	10U	10U	10U	10U	10U
Chloroform	10U	10U	10U	10U	10U	10U	10U
Chloromethane	10U	10U	10U	10U	10U	10U	10U
1,1-Dichloroethane	10U	10U	10U	10U	10U	10U	10U
1,2-Dichloroethane	10U	10U	10U	10U	10U	10U	10U
1,1-Dichloroethene	10U	10U	10U	10U	10U	10U	10U
1,2-Dichloroethene	10U	10U	10U	10U	10U	10U	10U
Trans-1,2-Dichloroethene				10U	10U	10U	10U
1,2-Dichloropropane	10U	10U	10U	10U	10U	10U	10U
Cis-1,3-Dichloropropene	10U	10U	10U	10U	10U	10U	10U
Trans-1,3-Dichloropropene	10U	10U	10U	10U	10U	10U	10U
Ethylbenzene	10U	10U	10U	10U	10U	10U	10U
2-Hexanone	10U	10U	10U	10U	10U	10U	10U
4-Methyl-2-Pentanone	10U	10U	10U	10U	10U	10U	10U
Methylene Chloride	10U	10U	10U	10U	10U	10U	10U
Styrene	10U	10U	10U	10U	10U	10U	10U
1,1,2,2-Tetrachloroethane	10U	10U	10U	10U	10U	10U	10U
Tetrachloroethene	10U	10U	10U	10U	10U	10U	10U
Toluene	10U	10U	10U	10U	10U	10U	10U
1,1,1-Trichloroethane	10U	10U	10U	10U	10U	10U	10U
1,1,2-Trichloroethane	10U	10U	10U	10U	10U	10U	10U
Trichloroethene	10U	10U	10U	10U	10U	10U	10U
Vinyl Acetate	10U	10U	10U	10U	10U	10U	10U
Vinyl Chloride	10U	10U	10U	10U	10U	10U	10U
Xylenes	10U	10U	10U	10U	10U	10U	10U

(CONTINUED)

APPENDIX D.3
Organic Analytes, CY 1996

2

Sampling Point	GW-141	GW-142						
Program	SDM	RDM						
Location	LIV	KHQ						
Date Sampled	07/02/96	01/04/96	04/17/96	10/21/96	10/22/96	10/23/96	10/24/96	
Sample Type	DUP							
VOLATILE ORGANICS (ug/L)								
Acetone	10U	10U	10U	10U	10U	10U	10U	10U
Benzene	10U	10U	10U	10U	10U	10U	10U	10U
Bromodichloromethane	10U	10U	10U	10U	10U	10U	10U	10U
Bromoform	10U	10U	10U	10U	10U	10U	10U	10U
Bromomethane	10U	10U	10U	10U	10U	10U	10U	10U
2-Butanone	10U	10U	10U	10U	10U	10U	10U	10U
Carbon Disulfide	10U	10U	10U	10U	10U	10U	10U	10U
Carbon Tetrachloride	10U	10U	10U	10U	10U	10U	10U	10U
Chlorobenzene	10U	10U	10U	10U	10U	10U	10U	10U
Chlorodibromomethane	10U	10U	10U	10U	10U	10U	10U	10U
Chloroethane	10U	10U	10U	10U	10U	10U	10U	10U
Chloroform	10U	10U	10U	10U	10U	10U	10U	10U
Chloromethane	10U	10U	10U	10U	10U	10U	10U	10U
1,1-Dichloroethane	10U	10U	10U	10U	10U	10U	10U	10U
1,2-Dichloroethane	10U	10U	10U	10U	10U	10U	10U	10U
1,1-Dichloroethene	10U	10U	10U	10U	10U	10U	10U	10U
1,2-Dichloroethene	10U	10U	10U	10U	10U	10U	10U	10U
Trans-1,2-Dichloroethene				10U	10U	10U	10U	10U
1,2-Dichloropropane	10U	10U	10U	10U	10U	10U	10U	10U
Cis-1,3-Dichloropropene	10U	10U	10U	10U	10U	10U	10U	10U
Trans-1,3-Dichloropropene	10U	10U	10U	10U	10U	10U	10U	10U
Ethylbenzene	10U	10U	10U	10U	10U	10U	10U	10U
2-Hexanone	10U	10U	10U	10U	10U	10U	10U	10U
4-Methyl-2-Pentanone	10U	10U	10U	10U	10U	10U	10U	10U
Methylene Chloride	10U	10U	10U	10U	10U	10U	10U	10U
Styrene	10U	10U	10U	10U	10U	10U	10U	10U
1,1,2,2-Tetrachloroethane	10U	10U	10U	10U	10U	10U	10U	10U
Tetrachloroethene	10U	10U	10U	10U	10U	10U	10U	10U
Toluene	10U	10U	10U	10U	10U	10U	10U	10U
1,1,1-Trichloroethane	10U	10U	10U	10U	10U	10U	10U	10U
1,1,2-Trichloroethane	10U	10U	10U	10U	10U	10U	10U	10U
Trichloroethene	10U	10U	10U	10U	10U	10U	10U	10U
Vinyl Acetate	10U	10U	10U	10U	10U	10U	10U	10U
Vinyl Chloride	10U	10U	10U	10U	10U	10U	10U	10U
Xylenes	10U	10U	10U	10U	10U	10U	10U	10U

(CONTINUED)

APPENDIX D.3
Organic Analytes, CY 1996

3

Sampling Point	GW-143					
Program	RDM					
Location	KHQ					
Date Sampled	01/18/96	04/23/96	10/21/96	10/22/96	10/23/96	
Sample Type			DUP	DUP		
VOLATILE ORGANICS (ug/L)						
Acetone	10U	10U	10U	10U	10U	10U
Benzene	10U	10U	10U	10U	10U	10U
Bromodichloromethane	10U	10U	10U	10U	10U	10U
Bromoform	10U	10U	10U	10U	10U	10U
Bromomethane	10U	10U	10U	10U	10U	10U
2-Butanone	10U	10U	13	10U	10U	10U
Carbon Disulfide	10U	10U	10U	10U	10U	10U
Carbon Tetrachloride	10U	10U	10U	10U	10U	10U
Chlorobenzene	10U	10U	10U	10U	10U	10U
Chlorodibromomethane	10U	10U	10U	10U	10U	10U
Chloroethane	10U	10U	10U	10U	10U	10U
Chloroform	10U	10U	10U	10U	10U	10U
Chloromethane	10U	10U	10U	10U	10U	10U
1,1-Dichloroethane	10U	10U	10U	10U	10U	10U
1,2-Dichloroethane	10U	10U	10U	10U	10U	10U
1,1-Dichloroethene	10U	10U	10U	10U	10U	10U
1,2-Dichloroethene	10U	10U	10U	10U	10U	10U
Trans-1,2-Dichloroethene			10U	10U	10U	10U
1,2-Dichloropropane	10U	10U	10U	10U	10U	10U
Cis-1,3-Dichloropropene	10U	10U	10U	10U	10U	10U
Trans-1,3-Dichloropropene	10U	10U	10U	10U	10U	10U
Ethylbenzene	10U	10U	10U	10U	10U	10U
2-Hexanone	10U	10U	10U	10U	10U	10U
4-Methyl-2-Pentanone	10U	10U	10U	10U	10U	10U
Methylene Chloride	10U	10U	10U	10U	10U	10U
Styrene	10U	10U	10U	10U	10U	10U
1,1,2,2-Tetrachloroethane	10U	10U	10U	10U	10U	10U
Tetrachloroethene	10U	10U	10U	10U	10U	10U
Toluene	10U	10U	10U	10U	10U	10U
1,1,1-Trichloroethane	10U	10U	10U	10U	10U	10U
1,1,2-Trichloroethane	10U	10U	10U	10U	10U	10U
Trichloroethene	10U	10U	10U	10U	10U	10U
Vinyl Acetate	10U	10U	10U	10U	10U	10U
Vinyl Chloride	10U	10U	10U	10U	10U	10U
Xylenes	10U	10U	10U	10U	10U	10U

(CONTINUED)

APPENDIX D.3
Organic Analytes, CY 1996

4

Sampling Point	GW-143			GW-144			
Program	RDM			RDM			
Location	KHQ			KHQ			
Date Sampled	10/23/96	10/24/96		01/22/96	04/24/96	10/21/96	
Sample Type	DUP		DUP		DUP		
VOLATILE ORGANICS (ug/L)							
Acetone	10U	10U	10U	10U	10U	10U	10U
Benzene	10U	10U	10U	10U	10U	10U	10U
Bromodichloromethane	10U	10U	10U	10U	10U	10U	10U
Bromoform	10U	10U	10U	10U	10U	10U	10U
Bromomethane	10U	10U	10U	10U	10U	10U	10U
2-Butanone	10U	10U	10U	10U	10U	10U	10U
Carbon Disulfide	10U	10U	10U	10U	10U	10U	10U
Carbon Tetrachloride	10U	10U	10U	3	3	4	10U
Chlorobenzene	10U	10U	10U	10U	10U	10U	10U
Chlorodibromomethane	10U	10U	10U	10U	10U	10U	10U
Chloroethane	10U	10U	10U	10U	10U	10U	10U
Chloroform	10U	10U	10U	10U	10U	10U	10U
Chloromethane	10U	10U	10U	10U	10U	10U	10U
1,1-Dichloroethane	10U	10U	10U	10U	10U	10U	10U
1,2-Dichloroethane	10U	10U	10U	10U	10U	10U	10U
1,1-Dichloroethene	10U	10U	10U	10U	10U	10U	10U
1,2-Dichloroethene	10U	10U	10U	10U	10U	10U	10U
Trans-1,2-Dichloroethene	10U	10U	10U				10U
1,2-Dichloropropane	10U	10U	10U	10U	10U	10U	10U
Cis-1,3-Dichloropropene	10U	10U	10U	10U	10U	10U	10U
Trans-1,3-Dichloropropene	10U	10U	10U	10U	10U	10U	10U
Ethylbenzene	10U	10U	10U	10U	10U	10U	10U
2-Hexanone	10U	10U	10U	10U	10U	10U	10U
4-Methyl-2-Pentanone	10U	10U	10U	10U	10U	10U	10U
Methylene Chloride	10U	10U	10U	10U	10U	10U	10U
Styrene	10U	10U	10U	10U	10U	10U	10U
1,1,2,2-Tetrachloroethane	10U	10U	10U	10U	10U	10U	10U
Tetrachloroethene	10U	10U	10U	10U	10U	10U	10U
Toluene	10U	10U	10U	10U	10U	10U	10U
1,1,1-Trichloroethane	10U	10U	10U	10U	10U	10U	10U
1,1,2-Trichloroethane	10U	10U	10U	10U	10U	10U	10U
Trichloroethene	10U	10U	10U	10U	10U	10U	10U
Vinyl Acetate	10U	10U	10U	10U	10U	10U	10U
Vinyl Chloride	10U	10U	10U	10U	10U	10U	10U
Xylenes	10U	10U	10U	10U	10U	10U	10U

(CONTINUED)

APPENDIX D.3
Organic Analytes, CY 1996

5

Sampling Point	GW-144			GW-145			
Program	RDM			RDM			
Location	KHQ			KHQ			
Date Sampled	10/22/96	10/23/96	10/24/96	01/23/96	04/25/96	10/21/96	10/22/96
Sample Type							
VOLATILE ORGANICS (ug/L)							
Acetone	10U	10U	10U	10U	10U	10U	10U
Benzene	10U	10U	10U	10U	10U	10U	10U
Bromodichloromethane	10U	10U	10U	10U	10U	10U	10U
Bromoform	10U	10U	10U	10U	10U	10U	10U
Bromomethane	10U	10U	10U	10U	10U	10U	10U
2-Butanone	14	10U	10U	10U	10U	10U	17
Carbon Disulfide	10U	10U	10U	10U	10U	10U	10U
Carbon Tetrachloride	10U	10U	10U	10U	10U	10U	10U
Chlorobenzene	10U	10U	10U	10U	10U	10U	10U
Chlorodibromomethane	10U	10U	10U	10U	10U	10U	10U
Chloroethane	10U	10U	10U	10U	10U	10U	10U
Chloroform	10U	10U	10U	10U	10U	10U	10U
Chloromethane	10U	10U	10U	10U	10U	10U	10U
1,1-Dichloroethane	10U	10U	10U	10U	10U	10U	10U
1,2-Dichloroethane	10U	10U	10U	10U	10U	10U	10U
1,1-Dichloroethene	10U	10U	10U	10U	10U	10U	10U
1,2-Dichloroethene	10U	10U	10U	10U	10U	10U	10U
Trans-1,2-Dichloroethene	10U	10U	10U			10U	10U
1,2-Dichloropropane	10U	10U	10U	10U	10U	10U	10U
Cis-1,3-Dichloropropene	10U	10U	10U	10U	10U	10U	10U
Trans-1,3-Dichloropropene	10U	10U	10U	10U	10U	10U	10U
Ethylbenzene	10U	10U	10U	10U	10U	10U	10U
2-Hexanone	10U	10U	10U	10U	10U	10U	10U
4-Methyl-2-Pentanone	10U	10U	10U	10U	10U	10U	10U
Methylene Chloride	10U	10U	10U	10U	10U	10U	10U
Styrene	10U	10U	10U	10U	10U	10U	10U
1,1,2,2-Tetrachloroethane	10U	10U	10U	10U	10U	10U	10U
Tetrachloroethene	10U	10U	10U	10U	10U	10U	10U
Toluene	10U	10U	10U	10U	10U	10U	10U
1,1,1-Trichloroethane	10U	10U	10U	10U	10U	10U	10U
1,1,2-Trichloroethane	10U	10U	10U	10U	10U	10U	10U
Trichloroethene	10U	10U	10U	10U	10U	10U	10U
Vinyl Acetate	10U	10U	10U	10U	10U	10U	10U
Vinyl Chloride	10U	10U	10U	10U	10U	10U	10U
Xylenes	10U	10U	10U	10U	10U	10U	10U

(CONTINUED)

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Organic Analytes, CY 1996

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Sampling Point	GW-145		GW-146		GW-147		GW-160
Program	RDM		RDM		RDM		BMP
Location	KHQ		KHQ		KHQ		CRBAWP
Date Sampled	10/23/96	10/24/96	01/18/96	04/25/96	01/10/96	04/18/96	04/29/96
Sample Type							
VOLATILE ORGANICS (ug/L)							
Acetone	10U	10U	10U	10U	10U	10U	10U
Benzene	10U	10U	10U	10U	10U	10U	10U
Bromodichloromethane	10U	10U	10U	10U	10U	10U	10U
Bromoform	10U	10U	10U	10U	10U	10U	10U
Bromomethane	10U	10U	10U	10U	10U	10U	10U
2-Butanone	10U	10U	13	10U	10	10U	10U
Carbon Disulfide	10U	10U	10U	10U	10U	10U	10U
Carbon Tetrachloride	10U	10U	10U	10U	10U	10U	10U
Chlorobenzene	10U	10U	10U	10U	10U	10U	10U
Chlorodibromomethane	10U	10U	10U	10U	10U	10U	10U
Chloroethane	10U	10U	10U	10U	10U	10U	10U
Chloroform	10U	10U	10U	10U	10U	10U	10U
Chloromethane	10U	10U	10U	10U	10U	10U	10U
1,1-Dichloroethane	10U	10U	10U	10U	10U	10U	10U
1,2-Dichloroethane	10U	10U	10U	10U	10U	10U	10U
1,1-Dichloroethene	10U	10U	10U	10U	10U	10U	10U
1,2-Dichloroethene	10U	10U	10U	10U	10U	10U	10U
Trans-1,2-Dichloroethene	10U	10U					
1,2-Dichloropropane	10U	10U	10U	10U	10U	10U	10U
Cis-1,3-Dichloropropene	10U	10U	10U	10U	10U	10U	10U
Trans-1,3-Dichloropropene	10U	10U	10U	10U	10U	10U	10U
Ethylbenzene	10U	10U	10U	10U	10U	10U	10U
2-Hexanone	10U	10U	10U	10U	10U	10U	10U
4-Methyl-2-Pentanone	10U	10U	10U	10U	10U	10U	10U
Methylene Chloride	10U	10U	10U	10U	10U	10U	10U
Styrene	10U	10U	10U	10U	10U	10U	10U
1,1,2,2-Tetrachloroethane	10U	10U	10U	10U	10U	10U	10U
Tetrachloroethene	10U	10U	10U	10U	10U	10U	10U
Toluene	10U	10U	10U	10U	10U	10U	10U
1,1,1-Trichloroethane	10U	10U	10U	10U	10U	10U	10U
1,1,2-Trichloroethane	10U	10U	10U	10U	10U	10U	10U
Trichloroethene	10U	10U	10U	10U	10U	10U	10U
Vinyl Acetate	10U	10U	10U	10U	10U	10U	10U
Vinyl Chloride	10U	10U	10U	10U	10U	10U	10U
Xylenes	10U	10U	10U	10U	10U	10U	10U

(CONTINUED)

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Organic Analytes, CY 1996

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Sampling Point	GW-160	GW-161	GW-174	GW-175	GW-177	GW-184
Program	BMP	BMP	BMP	AMP	AMP	BMP
Location	CRBAMP	CRBAMP	CRSP	CRSP	CRSP	RQ
Date Sampled	04/29/96	04/26/96	08/19/96	02/25/96	02/25/96	04/30/96
Sample Type	DUP		DUP			
VOLATILE ORGANICS (ug/L)						
Acetone	10U	10U	10U	10U	10U	10U
Benzene	10U	10U	10U	10U	10U	10U
Bromodichloromethane	10U	10U	10U	10U	10U	10U
Bromoform	10U	10U	10U	10U	10U	10U
Bromomethane	10U	10U	10U	10U	10U	10U
2-Butanone	10U	10U	10U	10U	10U	10U
Carbon Disulfide	10U	10U	10U	10U	10U	10U
Carbon Tetrachloride	10U	10U	10U	10U	10U	10U
Chlorobenzene	10U	10U	10U	10U	10U	10U
Chlorodibromomethane	10U	10U	10U	10U	10U	10U
Chloroethane	10U	10U	10U	10U	10U	10U
Chloroform	10U	10U	10U	10U	10U	10U
Chloromethane	10U	10U	10U	10U	10U	10U
1,1-Dichloroethane	10U	10U	10U	10U	10	10U
1,2-Dichloroethane	10U	10U	10U	10U	10U	10U
1,1-Dichloroethene	10U	10U	10U	10U	2	10U
1,2-Dichloroethene	10U	10U	1	1	10U	10U
Trans-1,2-Dichloroethene	10U	10U	10U	10U	10U	10U
1,2-Dichloropropane	10U	10U	10U	10U	10U	10U
Cis-1,3-Dichloropropene	10U	10U	10U	10U	10U	10U
Trans-1,3-Dichloropropene	10U	10U	10U	10U	10U	10U
Ethylbenzene	10U	10U	10U	10U	10U	10U
2-Hexanone	10U	10U	10U	10U	10U	10U
4-Methyl-2-Pentanone	10U	10U	10U	10U	10U	10U
Methylene Chloride	10U	10U	10U	10U	10U	10U
Styrene	10U	10U	10U	10U	10U	10U
1,1,2,2-Tetrachloroethane	10U	10U	10U	10U	10U	10U
Tetrachloroethene	10U	10U	13	12	11	10U
Toluene	10U	10U	10U	10U	10U	10U
1,1,1-Trichloroethane	10U	10U	10U	10U	2	10U
1,1,2-Trichloroethane	10U	10U	10U	10U	10	10U
Trichloroethene	10U	10U	10U	10U	10U	10U
Vinyl Acetate	10U	10U	10U	10U	10U	10U
Vinyl Chloride	10U	10U	10U	10U	10U	10U
Xylenes	10U	10U	10U	10U	10U	10U

(CONTINUED)

APPENDIX D.3
Organic Analytes, CY 1996

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Sampling Point	GW-186		GW-187	GW-188	GW-203		GW-205
Program	BMP		BMP	BMP	ROD		ROD
Location	RQ		RQ	RQ	UNCS		UNCS
Date Sampled	05/01/96		04/30/96	04/30/96	04/17/96	10/28/96	04/19/96
Sample Type	DUP						
VOLATILE ORGANICS (ug/L)							
Acetone	10U	10U	10U	10U	10U	10U	10U
Benzene	10U	10U	10U	10U	10U	10U	10U
Bromodichloromethane	10U	10U	10U	10U	10U	10U	10U
Bromoform	10U	10U	10U	10U	10U	10U	10U
Bromomethane	10U	10U	10U	10U	10U	10U	10U
2-Butanone	10U	10U	10U	10U	10U	10U	10U
Carbon Disulfide	10U	10U	10U	10U	10U	10U	10U
Carbon Tetrachloride	10U	10U	10U	10U	10U	10U	10U
Chlorobenzene	10U	10U	10U	10U	10U	10U	10U
Chlorodibromomethane	10U	10U	10U	10U	10U	10U	10U
Chloroethane	10U	10U	10U	10U	10U	10U	10U
Chloroform	10U	10U	10U	10U	10U	10U	10U
Chloromethane	10U	10U	10U	10U	10U	10U	10U
1,1-Dichloroethane	10U	10U	10U	10U	10U	10U	10U
1,2-Dichloroethane	10U	10U	10U	10U	10U	10U	10U
1,1-Dichloroethene	10U	10U	10U	10U	10U	10U	10U
1,2-Dichloroethene	10U	10U	10U	10U	10U	10U	10U
Trans-1,2-Dichloroethene							
1,2-Dichloropropane	10U	10U	10U	10U	10U	10U	10U
Cis-1,3-Dichloropropene	10U	10U	10U	10U	10U	10U	10U
Trans-1,3-Dichloropropene	10U	10U	10U	10U	10U	10U	10U
Ethylbenzene	10U	10U	10U	10U	10U	10U	10U
2-Hexanone	10U	10U	10U	10U	10U	10U	10U
4-Methyl-2-Pentanone	10U	10U	10U	10U	10U	10U	10U
Methylene Chloride	10U	10U	10U	10U	10U	10U	10U
Styrene	10U	10U	10U	10U	10U	10U	10U
1,1,2,2-Tetrachloroethane	10U	10U	10U	10U	10U	10U	10U
Tetrachloroethene	10U	10U	10U	10U	10U	10U	10U
Toluene	10U	10U	10U	10U	10U	10U	10U
1,1,1-Trichloroethane	10U	10U	10U	10U	10U	10U	10U
1,1,2-Trichloroethane	10U	10U	10U	10U	10U	10U	10U
Trichloroethene	10U	10U	10U	10U	10U	10U	10U
Vinyl Acetate	10U	10U	10U	10U	10U	10U	10U
Vinyl Chloride	10U	10U	10U	10U	10U	10U	10U
Xylenes	10U	10U	10U	10U	10U	10U	10U

(CONTINUED)

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Organic Analytes, CY 1996

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Sampling Point	GW-205		GW-217		GW-221	
Program	ROD		SDM		ROD	
Location	UNCS		LIV		UNCS	
Date Sampled	04/19/96	10/28/96	01/03/96	07/01/96	04/22/96	10/29/96
Sample Type	DUP					DUP
VOLATILE ORGANICS (ug/L)						
Acetone	10U	10U	10U	10U	10U	10U
Benzene	10U	10U	10U	10U	10U	10U
Bromodichloromethane	10U	10U	10U	10U	10U	10U
Bromoform	10U	10U	10U	10U	10U	10U
Bromomethane	10U	10U	10U	10U	10U	10U
2-Butanone	10U	10U	10U	10U	10U	10U
Carbon Disulfide	10U	10U	10U	10U	10U	10U
Carbon Tetrachloride	10U	10U	10U	10U	10U	10U
Chlorobenzene	10U	10U	10U	10U	10U	10U
Chlorodibromomethane	10U	10U	10U	10U	10U	10U
Chloroethane	10U	10U	10U	10U	10U	10U
Chloroform	10U	10U	10U	10U	10U	10U
Chloromethane	10U	10U	10U	10U	10U	10U
1,1-Dichloroethane	10U	10U	10U	10U	10U	10U
1,2-Dichloroethane	10U	10U	10U	10U	10U	10U
1,1-Dichloroethene	10U	10U	10U	10U	10U	10U
1,2-Dichloroethene	10U	10U	10U	10U	10U	10U
Trans-1,2-Dichloroethene				10U		
1,2-Dichloropropane	10U	10U	10U	10U	10U	10U
Cis-1,3-Dichloropropene	10U	10U	10U	10U	10U	10U
Trans-1,3-Dichloropropene	10U	10U	10U	10U	10U	10U
Ethylbenzene	10U	10U	10U	10U	10U	10U
2-Hexanone	10U	10U	10U	10U	10U	10U
4-Methyl-2-Pentanone	10U	10U	10U	10U	10U	10U
Methylene Chloride	10U	10U	10U	10U	10U	10U
Styrene	10U	10U	10U	10U	10U	10U
1,1,2,2-Tetrachloroethane	10U	10U	10U	10U	10U	10U
Tetrachloroethene	10U	10U	10U	10U	10U	10U
Toluene	10U	10U	10U	10U	10U	10U
1,1,1-Trichloroethane	10U	10U	10U	10U	10U	10U
1,1,2-Trichloroethane	10U	10U	10U	10U	10U	10U
Trichloroethene	10U	10U	10U	10U	10U	10U
Vinyl Acetate	10U	10U	10U	10U	10U	10U
Vinyl Chloride	10U	10U	10U	10U	10U	10U
Xylenes	10U	10U	10U	10U	10U	10U

(CONTINUED)

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Organic Analytes, CY 1996

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Sampling Point	GW-231					
Program	RDM					
Location	KHQ					
Date Sampled	01/10/96	04/18/96	10/21/96	10/22/96	10/23/96	10/24/96
Sample Type		DUP				
VOLATILE ORGANICS (ug/L)						
Acetone	10U	10U	10U	10U	10U	10U
Benzene	10U	10U	10U	10U	10U	10U
Bromodichloromethane	10U	10U	10U	10U	10U	10U
Bromoform	10U	10U	10U	10U	10U	10U
Bromomethane	10U	10U	10U	10U	10U	10U
2-Butanone	12	10U	10U	12	10U	10U
Carbon Disulfide	10U	10U	10U	10U	10U	10U
Carbon Tetrachloride	10U	10U	10U	10U	10U	10U
Chlorobenzene	10U	10U	10U	10U	10U	10U
Chlorodibromomethane	10U	10U	10U	10U	10U	10U
Chloroethane	10U	10U	10U	10U	10U	10U
Chloroform	10U	10U	10U	10U	10U	10U
Chloromethane	10U	10U	10U	10U	10U	10U
1,1-Dichloroethane	10U	10U	10U	10U	10U	10U
1,2-Dichloroethane	10U	10U	10U	10U	10U	10U
1,1-Dichloroethene	10U	10U	10U	10U	10U	10U
1,2-Dichloroethene	10U	10U	10U	10U	10U	10U
Trans-1,2-Dichloroethene			10U	10U	10U	10U
1,2-Dichloropropane	10U	10U	10U	10U	10U	10U
Cis-1,3-Dichloropropene	10U	10U	10U	10U	10U	10U
Trans-1,3-Dichloropropene	10U	10U	10U	10U	10U	10U
Ethylbenzene	10U	10U	10U	10U	10U	10U
2-Hexanone	10U	10U	10U	10U	10U	10U
4-Methyl-2-Pentanone	10U	10U	10U	10U	10U	10U
Methylene Chloride	10U	10U	10U	10U	10U	10U
Styrene	10U	10U	10U	10U	10U	10U
1,1,2,2-Tetrachloroethane	10U	10U	10U	10U	10U	10U
Tetrachloroethene	10U	10U	10U	10U	10U	10U
Toluene	10U	10U	10U	10U	10U	10U
1,1,1-Trichloroethane	10U	10U	10U	10U	10U	10U
1,1,2-Trichloroethane	10U	10U	10U	10U	10U	10U
Trichloroethene	10U	10U	10U	10U	10U	10U
Vinyl Acetate	10U	10U	10U	10U	10U	10U
Vinyl Chloride	10U	10U	10U	10U	10U	10U
Xylenes	10U	10U	10U	10U	10U	10U

(CONTINUED)

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Sampling Point	GW-292		GW-293	GW-294	GW-296	GW-298	GW-299
Program	BMP		BMP	BMP	BMP	BMP	BMP
Location	ECRWP		ECRWP	ECRWP	ECRWP	CRBAWP	CRBAWP
Date Sampled	05/08/96		05/08/96	05/02/96	05/02/96	05/01/96	04/30/96
Sample Type	DUP						
VOLATILE ORGANICS (ug/L)							
Acetone	10U	10U	10U	10U	10U	10U	10U
Benzene	10U	10U	10U	10U	10U	10U	10U
Bromodichloromethane	10U	10U	10U	10U	10U	10U	10U
Bromoform	10U	10U	10U	10U	10U	10U	10U
Bromomethane	10U	10U	10U	10U	10U	10U	10U
2-Butanone	10U	10U	10U	10U	10U	10U	10U
Carbon Disulfide	10U	10U	10U	10U	10U	10U	10U
Carbon Tetrachloride	10U	10U	10U	10U	10U	10U	10U
Chlorobenzene	10U	10U	10U	10U	10U	10U	10U
Chlorodibromomethane	10U	10U	10U	10U	10U	10U	10U
Chloroethane	10U	10U	10U	10U	10U	10U	10U
Chloroform	10U	10U	10U	10U	10U	10U	10U
Chloromethane	10U	10U	10U	10U	10U	10U	10U
1,1-Dichloroethane	10U	10U	10U	10U	10U	10U	10U
1,2-Dichloroethane	10U	10U	10U	10U	10U	10U	10U
1,1-Dichloroethene	10U	10U	10U	10U	10U	10U	10U
1,2-Dichloroethene	10U	10U	10U	10U	10U	10U	10U
Trans-1,2-Dichloroethene							
1,2-Dichloropropane	10U	10U	10U	10U	10U	10U	10U
Cis-1,3-Dichloropropene	10U	10U	10U	10U	10U	10U	10U
Trans-1,3-Dichloropropene	10U	10U	10U	10U	10U	10U	10U
Ethylbenzene	10U	10U	10U	10U	10U	10U	10U
2-Hexanone	10U	10U	10U	10U	10U	10U	10U
4-Methyl-2-Pentanone	10U	10U	10U	10U	10U	10U	10U
Methylene Chloride	10U	10U	10U	10U	10U	10U	10U
Styrene	10U	10U	10U	10U	10U	10U	10U
1,1,2,2-Tetrachloroethane	10U	10U	10U	10U	10U	10U	10U
Tetrachloroethene	10U	10U	10U	10U	10U	10U	10U
Toluene	10U	10U	10U	10U	10U	10U	10U
1,1,1-Trichloroethane	10U	10U	10U	10U	10U	10U	10U
1,1,2-Trichloroethane	10U	10U	10U	10U	10U	10U	10U
Trichloroethene	10U	10U	10U	10U	10U	10U	10U
Vinyl Acetate	10U	10U	10U	10U	10U	10U	10U
Vinyl Chloride	10U	10U	10U	10U	10U	10U	10U
Xylenes	10U	10U	10U	10U	10U	10U	10U

(CONTINUED)

APPENDIX D.3
Organic Analytes, CY 1996

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Sampling Point	GW-300	GW-301		GW-302		GW-305	
Program	BMP	BMP/C		ROD		SDM	
Location	CRBAWP	CRBAWP		UNCS		LIV	
Date Sampled	04/30/96	04/30/96	10/01/96	04/23/96	10/30/96	01/17/96	07/08/96
Sample Type							
VOLATILE ORGANICS (ug/L)							
Acetone	10U	10U	10U	10U	1	10U	10U
Benzene	10U	10U	10U	10U	10U	10U	10U
Bromodichloromethane	10U	10U	10U	10U	10U	10U	10U
Bromoform	10U	10U	10U	10U	10U	10U	10U
Bromomethane	10U	10U	10U	10U	10U	10U	10U
2-Butanone	10U	10U	10U	10U	7	10U	10U
Carbon Disulfide	10U	10U	10U	10U	10U	10U	10U
Carbon Tetrachloride	10U	10U	10U	10U	10U	10U	10U
Chlorobenzene	10U	10U	10U	10U	10U	10U	10U
Chlorodibromomethane	10U	10U	10U	10U	10U	10U	10U
Chloroethane	10U	10U	10U	10U	10U	10U	10U
Chloroform	10U	10U	10U	10U	10U	10U	10U
Chloromethane	10U	10U	10U	10U	10U	10U	10U
1,1-Dichloroethane	10U	10U	10U	10U	10U	10U	1
1,2-Dichloroethane	10U	10U	10U	10U	10U	10U	10U
1,1-Dichloroethene	10U	10U	10U	10U	10U	10U	10U
1,2-Dichloroethene	10U	10U	10U	10U	10U	10U	10U
Trans-1,2-Dichloroethene			10U			10U	
1,2-Dichloropropane	10U	10U	10U	10U	10U	10U	10U
Cis-1,3-Dichloropropene	10U	10U	10U	10U	10U	10U	10U
Trans-1,3-Dichloropropene	10U	10U	10U	10U	10U	10U	10U
Ethylbenzene	10U	10U	10U	10U	10U	10U	10U
2-Hexanone	10U	10U	10U	10U	10U	10U	10U
4-Methyl-2-Pentanone	10U	10U	10U	10U	10U	10U	10U
Methylene Chloride	10U	10U	10U	10U	10U	10U	10U
Styrene	10U	10U	10U	10U	10U	10U	10U
1,1,2,2-Tetrachloroethane	10U	10U	10U	10U	10U	10U	10U
Tetrachloroethene	10U	10U	10U	10U	10U	10U	10U
Toluene	10U	10U	10U	10U	10U	10U	10U
1,1,1-Trichloroethane	10U	10U	10U	10U	10U	9	9
1,1,2-Trichloroethane	10U	10U	10U	10U	10U	10U	10U
Trichloroethene	10U	10U	10U	10U	10U	10U	10U
Vinyl Acetate	10U	10U	10U	10U	10U	10U	10U
Vinyl Chloride	10U	10U	10U	10U	10U	10U	10U
Xylenes	10U	10U	10U	10U	10U	10U	10U

(CONTINUED)

APPENDIX D.3
Organic Analytes, CY 1996

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Sampling Point	GW-321	GW-339		GW-512	GW-513	GW-514	
Program	BMP	ROD		BMP	BMP	BMP	
Location	ADB	UNCS		ADB	ADB	ADB	
Date Sampled	04/29/96	04/22/96	10/29/96	05/02/96	04/29/96	05/03/96	
Sample Type							DUP
VOLATILE ORGANICS (ug/L)							
Acetone	10U	10U	10U	10U	10U	10U	10U
Benzene	10U	10U	10U	10U	10U	10U	10U
Bromodichloromethane	10U	10U	10U	10U	10U	10U	10U
Bromoform	10U	10U	10U	10U	10U	10U	10U
Bromomethane	10U	10U	10U	10U	10U	10U	10U
2-Butanone	10U	10U	10U	10U	10U	10U	10U
Carbon Disulfide	10U	10U	10U	10U	10U	10U	10U
Carbon Tetrachloride	10U	10U	10U	10U	10U	10U	10U
Chlorobenzene	10U	10U	10U	10U	10U	10U	10U
Chlorodibromomethane	10U	10U	10U	10U	10U	10U	10U
Chloroethane	10U	10U	10U	10U	10U	10U	10U
Chloroform	10U	10U	10U	10U	10U	10U	10U
Chloromethane	10U	10U	10U	10U	10U	10U	10U
1,1-Dichloroethane	10U	10U	10U	10U	10U	10U	10U
1,2-Dichloroethane	10U	10U	10U	10U	10U	10U	10U
1,1-Dichloroethene	10U	10U	10U	10U	10U	10U	10U
1,2-Dichloroethene	10U	10U	10U	10U	10U	10U	10U
Trans-1,2-Dichloroethene	10U	10U	10U	10U	10U	10U	10U
1,2-Dichloropropane	10U	10U	10U	10U	10U	10U	10U
Cis-1,3-Dichloropropene	10U	10U	10U	10U	10U	10U	10U
Trans-1,3-Dichloropropene	10U	10U	10U	10U	10U	10U	10U
Ethylbenzene	10U	10U	10U	10U	10U	10U	10U
2-Hexanone	10U	10U	10U	10U	10U	10U	10U
4-Methyl-2-Pentanone	10U	10U	10U	10U	10U	10U	10U
Methylene Chloride	10U	10U	10U	10U	10U	10U	10U
Styrene	10U	10U	10U	10U	10U	10U	10U
1,1,2,2-Tetrachloroethane	10U	10U	10U	10U	10U	10U	10U
Tetrachloroethene	10U	10U	10U	10U	10U	10U	10U
Toluene	10U	10U	10U	10U	10U	10U	10U
1,1,1-Trichloroethane	10U	10U	10U	10U	10U	10U	10U
1,1,2-Trichloroethane	10U	10U	10U	10U	10U	10U	10U
Trichloroethene	10U	10U	10U	10U	10U	10U	10U
Vinyl Acetate	10U	10U	10U	10U	10U	10U	10U
Vinyl Chloride	10U	10U	10U	10U	10U	10U	10U
Xylenes	10U	10U	10U	10U	10U	10U	10U

(CONTINUED)

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Organic Analytes, CY 1996

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Sampling Point	GW-521				GW-522		GW-539
Program	SDM/C				SDM		SDM
Location	LIV				LIV		LII
Date Sampled	01/16/96	04/16/96	07/02/96	10/01/96	01/17/96	07/08/96	04/02/96
Sample Type							
VOLATILE ORGANICS (ug/L)							
Acetone	10U	10U	10U	10U	10U	10U	10U
Benzene	10U	10U	10U	10U	10U	10U	10U
Bromodichloromethane	10U	10U	10U	10U	10U	10U	10U
Bromoform	10U	10U	10U	10U	10U	10U	10U
Bromomethane	10U	10U	10U	10U	10U	10U	10U
2-Butanone	10U	10U	10U	10U	10U	10U	11
Carbon Disulfide	10U	10U	10U	10U	10U	10U	10U
Carbon Tetrachloride	10U	10U	10U	10U	10U	10U	10U
Chlorobenzene	10U	10U	10U	10U	10U	10U	10U
Chlorodibromomethane	10U	10U	10U	10U	10U	10U	10U
Chloroethane	10U	10U	10U	10U	10U	10U	10U
Chloroform	10U	10U	10U	10U	10U	10U	10U
Chloromethane	10U	10U	10U	10U	10U	10U	10U
1,1-Dichloroethane	10U	10U	10U	10U	10U	10U	10U
1,2-Dichloroethane	10U	10U	10U	10U	10U	10U	10U
1,1-Dichloroethene	10U	10U	10U	10U	10U	10U	10U
1,2-Dichloroethene			10U	10U		10U	10U
Trans-1,2-Dichloroethene	10U	10U	10U	10U	10U		
1,2-Dichloropropane	10U	10U	10U	10U	10U	10U	10U
Cis-1,3-Dichloropropene	10U	10U	10U	10U	10U	10U	10U
Trans-1,3-Dichloropropene	10U	10U	10U	10U	10U	10U	10U
Ethylbenzene	10U	10U	10U	10U	10U	10U	10U
2-Hexanone	10U	10U	10U	10U	10U	10U	10U
4-Methyl-2-Pentanone	10U	10U	10U	10U	10U	10U	10U
Methylene Chloride	10U	10U	10U	10U	10U	10U	10U
Styrene	10U	10U	10U	10U	10U	10U	10U
1,1,2,2-Tetrachloroethane	10U	10U	10U	10U	10U	10U	10U
Tetrachloroethene	10U	10U	10U	10U	10U	10U	10U
Toluene	10U	10U	10U	10U	10U	10U	10U
1,1,1-Trichloroethane	10U	10U	10U	10U	10U	10U	10U
1,1,2-Trichloroethane	10U	10U	10U	10U	10U	10U	10U
Trichloroethene	10U	10U	10U	10U	10U	10U	10U
Vinyl Acetate	10U	10U	10U	10U	10U	10U	10U
Vinyl Chloride	10U	10U	10U	10U	10U	10U	10U
Xylenes	10U	10U	10U	10U	10U	10U	10U

(CONTINUED)

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Organic Analytes, CY 1996

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Sampling Point	GW-540	GW-541	GW-542	GW-543	GW-544	GW-546
Program	SDM	SDM	SDM	SDM	SDM	SDM
Location	CDLVI	CDLVI	CDLVI	CDLVI	CDLVI	CDLVI
Date Sampled	04/09/96	04/15/96	04/16/96	04/16/96	04/16/96	04/09/96
Sample Type				DUP		
VOLATILE ORGANICS (ug/L)						
Acetone	10U	10U	10U	10U	10U	10U
Benzene	10U	10U	10U	10U	10U	10U
Bromodichloromethane	10U	10U	10U	10U	10U	10U
Bromoform	10U	10U	10U	10U	10U	10U
Bromomethane	10U	10U	10U	10U	10U	10U
2-Butanone	7	10U	10U	10U	10U	10U
Carbon Disulfide	10U	10U	10U	10U	10U	10U
Carbon Tetrachloride	10U	10U	10U	10U	10U	10U
Chlorobenzene	10U	10U	10U	10U	10U	10U
Chlorodibromomethane	10U	10U	10U	10U	10U	10U
Chloroethane	10U	10U	10U	10U	10U	10U
Chloroform	10U	10U	10U	10U	10U	10U
Chloromethane	10U	10U	10U	10U	10U	10U
1,1-Dichloroethane	10U	10U	10U	10U	10U	10U
1,2-Dichloroethane	10U	10U	10U	10U	10U	10U
1,1-Dichloroethene	10U	10U	10U	10U	10U	10U
1,2-Dichloroethene	10U	10U	10U	10U	10U	10U
Trans-1,2-Dichloroethene						
1,2-Dichloropropane	10U	10U	10U	10U	10U	10U
Cis-1,3-Dichloropropene	10U	10U	10U	10U	10U	10U
Trans-1,3-Dichloropropene	10U	10U	10U	10U	10U	10U
Ethylbenzene	10U	10U	10U	10U	10U	10U
2-Hexanone	10U	10U	10U	10U	10U	10U
4-Methyl-2-Pentanone	10U	10U	10U	10U	10U	10U
Methylene Chloride	10U	10U	10U	10U	10U	10U
Styrene	10U	10U	10U	10U	10U	10U
1,1,2,2-Tetrachloroethane	10U	10U	10U	10U	10U	10U
Tetrachloroethene	10U	10U	10U	10U	10U	10U
Toluene	10U	10U	10U	10U	10U	10U
1,1,1-Trichloroethane	1	10U	10U	10U	10U	10U
1,1,2-Trichloroethane	10U	10U	10U	10U	10U	10U
Trichloroethene	10U	10U	10U	10U	10U	10U
Vinyl Acetate	10U	10U	10U	10U	10U	10U
Vinyl Chloride	10U	10U	10U	10U	10U	10U
Xylenes	10U	10U	10U	10U	10U	10U

(CONTINUED)

APPENDIX D.3
Organic Analytes, CY 1996

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Sampling Point	GW-557			GW-560			
Program	SDM/C			SDM			
Location	LV			CDLVII			
Date Sampled	04/04/96	10/02/96		04/02/96	06/03/96	10/02/96	
Sample Type			DUP				DUP
VOLATILE ORGANICS (ug/L)							
Acetone	10U	10U	10U	24	10U	10U	10U
Benzene	10U	10U	10U	10U	10U	10U	10U
Bromodichloromethane	10U	10U	10U	10U	10U	10U	10U
Bromoform	10U	10U	10U	10U	10U	10U	10U
Bromomethane	10U	10U	10U	10U	10U	10U	10U
2-Butanone	10U	10U	10U	10U	10U	10U	10U
Carbon Disulfide	10U	10U	10U	10U	10U	10U	10U
Carbon Tetrachloride	10U	10U	10U	10U	10U	10U	10U
Chlorobenzene	10U	10U	10U	10U	10U	10U	10U
Chlorodibromomethane	10U	10U	10U	10U	10U	10U	10U
Chloroethane	10U	10U	10U	10U	10U	10U	10U
Chloroform	10U	10U	10U	10U	10U	10U	10U
Chloromethane	10U	10U	10U	10U	10U	10U	10U
1,1-Dichloroethane	10U	10U	10U	10U	10U	10U	10U
1,2-Dichloroethane	10U	10U	10U	10U	10U	10U	10U
1,1-Dichloroethene	10U	10U	10U	10U	10U	10U	10U
1,2-Dichloroethene	10U	10U	10U	10U	10U	10U	10U
Trans-1,2-Dichloroethene		10U	10U			10U	10U
1,2-Dichloropropane	10U	10U	10U	10U	10U	10U	10U
Cis-1,3-Dichloropropene	10U	10U	10U	10U	10U	10U	10U
Trans-1,3-Dichloropropene	10U	10U	10U	10U	10U	10U	10U
Ethylbenzene	10U	10U	10U	10U	10U	10U	10U
2-Hexanone	10U	10U	10U	10U	10U	10U	10U
4-Methyl-2-Pentanone	10U	10U	10U	10U	10U	10U	10U
Methylene Chloride	10U	10U	10U	10U	10U	10U	10U
Styrene	10U	10U	10U	10U	10U	10U	10U
1,1,2,2-Tetrachloroethane	10U	10U	10U	10U	10U	10U	10U
Tetrachloroethene	10U	10U	10U	10U	10U	10U	10U
Toluene	10U	10U	10U	10U	10U	10U	10U
1,1,1-Trichloroethane	10U	10U	10U	10U	10U	10U	10U
1,1,2-Trichloroethane	10U	10U	10U	10U	10U	10U	10U
Trichloroethene	10U	10U	10U	10U	10U	10U	10U
Vinyl Acetate	10U	10U	10U	10U	10U	10U	10U
Vinyl Chloride	10U	10U	10U	10U	10U	10U	10U
Xylenes	10U	10U	10U	10U	10U	10U	10U

(CONTINUED)

APPENDIX D.3
Organic Analytes, CY 1996

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Sampling Point	GW-562			GW-564		GW-608	GW-609
Program	SDM			SDM		AMP	CMP
Location	CDLVII			CDLVII		CRSP	CRSP
Date Sampled	04/02/96	06/03/96	10/02/96	04/04/96	10/03/96	01/29/96	02/25/96
Sample Type							
VOLATILE ORGANICS (ug/L)							
Acetone	13	10U	10U	10U	10U	10U	10U
Benzene	10U	10U	10U	10U	10U	10U	10U
Bromodichloromethane	10U	10U	10U	10U	10U	10U	10U
Bromoform	10U	10U	10U	10U	10U	10U	10U
Bromomethane	10U	10U	10U	10U	10U	10U	10U
2-Butanone	10U	10U	10U	10U	10U	12	10U
Carbon Disulfide	10U	10U	10U	10U	10U	10U	10U
Carbon Tetrachloride	10U	10U	10U	10U	10U	10U	10U
Chlorobenzene	10U	10U	10U	10U	10U	10U	10U
Chlorodibromomethane	10U	10U	10U	10U	10U	10U	10U
Chloroethane	10U	10U	10U	10U	10U	10U	10U
Chloroform	10U	10U	10U	10U	10U	10U	10U
Chloromethane	10U	10U	10U	10U	10U	10U	10U
1,1-Dichloroethane	10U	10U	10U	10U	10U	5	10U
1,2-Dichloroethane	10U	10U	10U	10U	10U	10U	10U
1,1-Dichloroethene	10U	10U	10U	10U	10U	3	10U
1,2-Dichloroethene	10U	10U	10U	10U	10U	1	6
Trans-1,2-Dichloroethene			10U		10U		
1,2-Dichloropropane	10U	10U	10U	10U	10U	10U	10U
Cis-1,3-Dichloropropene	10U	10U	10U	10U	10U	10U	10U
Trans-1,3-Dichloropropene	10U	10U	10U	10U	10U	10U	10U
Ethylbenzene	10U	10U	10U	10U	10U	10U	10U
2-Hexanone	10U	10U	10U	10U	10U	10U	10U
4-Methyl-2-Pentanone	10U	10U	10U	10U	10U	10U	10U
Methylene Chloride	10U	10U	10U	10U	10U	10U	10U
Styrene	10U	10U	10U	10U	10U	10U	10U
1,1,2,2-Tetrachloroethane	10U	10U	10U	10U	10U	10U	10U
Tetrachloroethene	10U	10U	10U	10U	10U	3	4
Toluene	10U	10U	10U	10U	10U	10U	10U
1,1,1-Trichloroethane	10U	10U	10U	10U	10U	6	10U
1,1,2-Trichloroethane	10U	10U	10U	10U	10U	10U	10U
Trichloroethene	10U	10U	10U	10U	10U	10U	10U
Vinyl Acetate	10U	10U	10U	10U	10U	10U	10U
Vinyl Chloride	10U	10U	10U	10U	10U	10U	10U
Xylenes	10U	10U	10U	10U	10U	10U	10U

(CONTINUED)

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Sampling Point	GW-609		GW-610	GW-611	GW-612	GW-709	
Program	CMP		AMP	AMP	BMP	SDM	
Location	CRSP		CRSP	CRSP	CRSP	LII	
Date Sampled	04/16/96	10/07/96	02/23/96	02/25/96	08/29/96	04/02/96	
Sample Type							DUP
VOLATILE ORGANICS (ug/L)							
Acetone	10U	10U	10U	10U	10U	4	10U
Benzene	10U	10U	10U	10U	10U	10U	10U
Bromodichloromethane	10U	10U	10U	10U	10U	10U	10U
Bromoform	10U	10U	10U	10U	10U	10U	10U
Bromomethane	10U	10U	10U	10U	10U	10U	10U
2-Butanone	10U	10U	10U	10U	10U	10U	10U
Carbon Disulfide	10U	10U	10U	10U	10U	10U	10U
Carbon Tetrachloride	10U	10U	10U	10U	10U	10U	10U
Chlorobenzene	10U	10U	10U	10U	10U	10U	10U
Chlorodibromomethane	10U	10U	10U	10U	10U	10U	10U
Chloroethane	10U	10U	10U	10U	10U	10U	10U
Chloroform	10U	10U	10U	10U	10U	10U	10U
Chloromethane	10U	10U	10U	10U	10U	10U	10U
1,1-Dichloroethane	10U	10U	10U	10U	83	10U	10U
1,2-Dichloroethane	10U	10U	10U	10U	4	10U	10U
1,1-Dichloroethene	10U	10U	10U	1	52	10U	10U
1,2-Dichloroethene	14	7	10U	10U	10U	10U	10U
Trans-1,2-Dichloroethene		10U					
1,2-Dichloropropane	10U	10U	10U	10U	10U	10U	10U
Cis-1,3-Dichloropropene	10U	10U	10U	10U	10U	10U	10U
Trans-1,3-Dichloropropene	10U	10U	10U	10U	10U	10U	10U
Ethylbenzene	10U	10U	10U	10U	10U	10U	10U
2-Hexanone	10U	10U	10U	10U	10U	10U	10U
4-Methyl-2-Pentanone	10U	10U	10U	10U	10U	10U	10U
Methylene Chloride	10U	10U	10U	10U	10U	10U	10U
Styrene	10U	10U	10U	10U	10U	10U	10U
1,1,2,2-Tetrachloroethane	10U	10U	10U	10U	10U	10U	10U
Tetrachloroethene	18	9	10U	10U	7	10U	10U
Toluene	10U	10U	10U	10U	10U	10U	10U
1,1,1-Trichloroethane	10U	10U	10U	4	120	10U	10U
1,1,2-Trichloroethane	10U	10U	10U	10U	10U	10U	10U
Trichloroethene	2	10U	10U	10U	10U	10U	10U
Vinyl Acetate	10U	10U	10U	10U	10U	10U	10U
Vinyl Chloride	10U	10U	10U	10U	10U	10U	10U
Xylenes	10U	10U	10U	10U	10U	10U	10U

(CONTINUED)

APPENDIX D.3
Organic Analytes, CY 1996

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Sampling Point	GW-742	GW-743	GW-757	GW-796	GW-797
Program	AMP	AMP	SDM	SDM/C	SDM
Location	CRSP	CRSP	LII	LV	LV
Date Sampled	02/01/96	02/23/96	04/04/96	04/10/96	10/03/96
Sample Type		DUP			
VOLATILE ORGANICS (ug/L)					
Acetone	10U	10U	10U	10U	10U
Benzene	10U	10U	10U	10U	10U
Bromodichloromethane	10U	10U	10U	10U	10U
Bromoform	10U	10U	10U	10U	10U
Bromomethane	10U	10U	10U	10U	10U
2-Butanone	12	10U	10U	10U	10U
Carbon Disulfide	10U	10U	10U	10U	10U
Carbon Tetrachloride	10U	10U	10U	10U	10U
Chlorobenzene	10U	10U	10U	10U	10U
Chlorodibromomethane	10U	10U	10U	10U	10U
Chloroethane	10U	10U	10U	10U	10U
Chloroform	10U	10U	10U	10U	10U
Chloromethane	10U	10U	10U	10U	10U
1,1-Dichloroethane	10U	10U	10U	10U	10U
1,2-Dichloroethane	10U	10U	10U	10U	10U
1,1-Dichloroethene	10U	10U	10U	10U	10U
1,2-Dichloroethene	10U	10U	10U	10U	10U
Trans-1,2-Dichloroethene				10U	
1,2-Dichloropropane	10U	10U	10U	10U	10U
Cis-1,3-Dichloropropene	10U	10U	10U	10U	10U
Trans-1,3-Dichloropropene	10U	10U	10U	10U	10U
Ethylbenzene	10U	10U	10U	10U	10U
2-Hexanone	10U	10U	10U	10U	10U
4-Methyl-2-Pentanone	10U	10U	10U	10U	10U
Methylene Chloride	10U	10U	10U	10U	10U
Styrene	10U	10U	10U	10U	10U
1,1,2,2-Tetrachloroethane	10U	10U	10U	10U	10U
Tetrachloroethene	10U	10U	10U	10U	10U
Toluene	10U	10U	10U	10U	10U
1,1,1-Trichloroethane	10U	10U	10U	2	1
1,1,2-Trichloroethane	10U	10U	10U	10U	10U
Trichloroethene	10U	10U	10U	10U	10U
Vinyl Acetate	10U	10U	10U	10U	10U
Vinyl Chloride	10U	10U	10U	10U	10U
Xylenes	10U	10U	10U	10U	10U

(CONTINUED)

APPENDIX D.3
Organic Analytes, CY 1996

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Sampling Point	GW-797	GW-798	GW-799	GW-801
Program	SDM	SDM/C	SDM/C	SDM/C
Location	LV	CDLVII	CDLVII	LV
Date Sampled	10/03/96	04/09/96	10/03/96	04/08/96
Sample Type				DUP
VOLATILE ORGANICS (ug/L)				
Acetone	10U	10U	10U	10U
Benzene	10U	10U	10U	10U
Bromodichloromethane	10U	10U	10U	10U
Bromoform	10U	10U	10U	10U
Bromomethane	10U	10U	10U	10U
2-Butanone	10U	10U	10U	10U
Carbon Disulfide	10U	10U	10U	10U
Carbon Tetrachloride	10U	10U	10U	10U
Chlorobenzene	10U	10U	10U	10U
Chlorodibromomethane	10U	10U	10U	10U
Chloroethane	10U	10U	10U	10U
Chloroform	10U	10U	10U	10U
Chloromethane	10U	10U	10U	10U
1,1-Dichloroethane	10U	10U	10U	10U
1,2-Dichloroethane	10U	10U	10U	10U
1,1-Dichloroethene	10U	10U	10U	10U
1,2-Dichloroethene	10U	10U	10U	10U
Trans-1,2-Dichloroethene	10U	10U	10U	10U
1,2-Dichloropropane	10U	10U	10U	10U
Cis-1,3-Dichloropropene	10U	10U	10U	10U
Trans-1,3-Dichloropropene	10U	10U	10U	10U
Ethylbenzene	10U	10U	10U	10U
2-Hexanone	10U	10U	10U	10U
4-Methyl-2-Pentanone	10U	10U	10U	10U
Methylene Chloride	10U	10U	10U	10U
Styrene	10U	10U	10U	10U
1,1,2,2-Tetrachloroethane	10U	10U	10U	10U
Tetrachloroethene	10U	10U	10U	10U
Toluene	10U	10U	10U	10U
1,1,1-Trichloroethane	10U	10U	10U	10U
1,1,2-Trichloroethane	10U	10U	10U	10U
Trichloroethene	10U	10U	10U	10U
Vinyl Acetate	10U	10U	10U	10U
Vinyl Chloride	10U	10U	10U	10U
Xylenes	10U	10U	10U	10U

(CONTINUED)

APPENDIX D.3
Organic Analytes, CY 1996

21

Sampling Point	GW-801	GW-827	GW-831	
Program	SDM/C	SDM	CMP	
Location	LV	CDLVI	ADB	
Date Sampled	10/07/96	04/16/96	08/27/96	10/01/96
Sample Type				
VOLATILE ORGANICS (ug/L)				
Acetone	10U	10U	10U	10U
Benzene	10U	10U	10U	10U
Bromodichloromethane	10U	10U	10U	10U
Bromoform	10U	10U	10U	10U
Bromomethane	10U	10U	10U	10U
2-Butanone	10U	10U	10U	10U
Carbon Disulfide	10U	10U	10U	10U
Carbon Tetrachloride	10U	10U	10U	10U
Chlorobenzene	10U	10U	10U	10U
Chlorodibromomethane	10U	10U	10U	10U
Chloroethane	10U	10U	10U	10U
Chloroform	10U	10U	10U	10U
Chloromethane	10U	10U	10U	10U
1,1-Dichloroethane	10U	10U	10U	10U
1,2-Dichloroethane	10U	10U	10U	10U
1,1-Dichloroethene	10U	10U	10U	10U
1,2-Dichloroethene	10U	10U	10U	10U
Trans-1,2-Dichloroethene	10U			10U
1,2-Dichloropropane	10U	10U	10U	10U
Cis-1,3-Dichloropropene	10U	10U	10U	10U
Trans-1,3-Dichloropropene	10U	10U	10U	10U
Ethylbenzene	10U	10U	10U	10U
2-Hexanone	10U	10U	10U	10U
4-Methyl-2-Pentanone	10U	10U	10U	10U
Methylene Chloride	10U	10U	10U	10U
Styrene	10U	10U	10U	10U
1,1,2,2-Tetrachloroethane	10U	10U	10U	10U
Tetrachloroethene	10U	10U	10U	10U
Toluene	10U	10U	10U	10U
1,1,1-Trichloroethane	10U	10U	10U	10U
1,1,2-Trichloroethane	10U	10U	10U	10U
Trichloroethene	10U	10U	10U	10U
Vinyl Acetate	10U	10U	10U	10U
Vinyl Chloride	10U	10U	10U	10U
Xylenes	10U	10U	10U	10U

APPENDIX D.3
Additional Organic Compounds, CY 1996

22

Sampling Point	CBS-1		GW-141				GW-217		GW-305
Program	SDM		SDM				SDM		SDM
Location	CDLVII		LIV				LIV		LIV
Date Sampled	04/11/96	10/07/96	01/04/96	07/02/96	07/02/96	07/02/96	01/03/96	07/01/96	01/17/96
			DUP		DUP				
Additional Organics (ug/L)									
Acrolein	50U	10U	50U	50U	50U	50U	50U	50U	50U
Acrylonitrile	50U	10U	50U	50U	50U	50U	50U	50U	50U
Bromochloromethane	10U	10U	10U	10U	10U	10U	10U	10U	10U
2-Chloroethyl vinyl ether	10U	10U	10U	10U	10U	10U	10U	10U	10U
1,2-Dibromo-3-chloropropane	10U	10U	10U	10U	10U	10U	10U	10U	10U
1,2-Dibromoethane	10U	10U		10U	10U	10U		10U	
Dibromomethane	10U	10U	10U	10U	10U	10U	10U	10U	10U
1,2-Dichlorobenzene	10U	10U	10U	10U	10U	10U	10U	10U	10U
1,4-Dichlorobenzene	10U	10U	10U	10U	10U	10U	10U	10U	10U
1,4-Dichloro-2-butene	5U	5U	5U	5U	5U	5U	5U	5U	5U
Trans-1,4-Dichloro-2-butene		5U		5U	5U			5U	
Dichlorodifluoromethane	5U	5U	5U	5U	5U	5U	5U	5U	5U
Cis-1,2-Dichloroethene	10U	10U	10U	10U	10U	10U	10U	10U	10U
Trans-1,2-Dichloroethene	10U	10U	10U	10U	10U	10U	10U	10U	10U
Ethanol	10000U	500U	10000U	10000U	10000U	10000U	10000U	10000U	10000U
Ethyl methacrylate	5U	5U	5U	5U	5U	5U	5U	5U	5U
Iodomethane	5U	5U	5U	5U	5U	5U	5U	5U	5U
1,1,1,2-Tetrachloroethane	10U	10U	10U	10U	10U	10U	10U	10U	10U
Trichlorofluoromethane	5U	5U	5U	5U	5U	5U	5U	5U	5U
1,2,3-Trichloropropane	5U	5U	5U	5U	5U	5U	5U	5U	5U

(CONTINUED)

Sampling Point	GW-305		GW-521				GW-522		GW-539	
Program	SDM		SDM/C				SDM		SDM	
Location	LIV		LIV				LIV		LII	
Date Sampled	07/08/96	01/16/96	04/16/96	07/02/96	10/01/96	01/17/96	07/08/96	04/02/96	11/04/96	
Additional Organics (ug/L)										
Acrolein	50U	50U	50U	50U	50U	50U	50U	50U	50U	10U
Acrylonitrile	50U	50U	50U	50U	50U	50U	50U	50U	50U	10U
Bromochloromethane	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U
2-Chloroethyl vinyl ether	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U
1,2-Dibromo-3-chloropropane	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U
1,2-Dibromoethane	10U		10U	10U	10U		10U	10U	10U	10U
Dibromomethane	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U
1,2-Dichlorobenzene	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U
1,4-Dichlorobenzene	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U
1,4-Dichloro-2-butene	5U	5U	5U	5U	5U	5U	5U	5U	5U	5U
Trans-1,4-Dichloro-2-butene	5U			5U	5U		5U		5U	
Dichlorodifluoromethane	5U	5U	5U	5U	5U	5U	5U	5U	5U	5U
Cis-1,2-Dichloroethene	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U
Trans-1,2-Dichloroethene	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U
Ethanol	10000U	10000U	10000U	10000U	500U	10000U	10000U	10000U	500U	
Ethyl methacrylate	5U	5U	5U	5U	5U	5U	5U	5U	5U	5U
Iodomethane	5U	5U	5U	5U	5U	5U	5U	5U	5U	5U
1,1,1,2-Tetrachloroethane	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U
Trichlorofluoromethane	5U	5U	5U	5U	5U	5U	5U	5U	5U	5U
1,2,3-Trichloropropane	5U	5U	5U	5U	5U	5U	5U	5U	5U	5U

(CONTINUED)

APPENDIX D.3
Additional Organic Compounds, CY 1996

23

Sampling Point	GW-540	GW-541	GW-542		GW-543			GW-544
Program	SDM	SDM	SDM		SDM			SDM
Location	CDLVI	CDLVI	CDLVI		CDLVI			CDLVI
Date Sampled	04/09/96	04/15/96	04/16/96	12/17/96	04/16/96	12/17/96	04/16/96	
						DUP	DUP	
Additional Organics (ug/L)	.	.	.	.	.	.	.	.
Acrolein	.	.	.	.	.	.	.	.
Acrylonitrile	.	.	.	.	.	.	.	.
Bromochloromethane	10U	10U	10U	10U	10U	10U	10U	10U
2-Chloroethyl vinyl ether	.	.	.	.	.	.	.	.
1,2-Dibromo-3-chloropropane	10U	10U	10U	10U	10U	10U	10U	10U
1,2-Dibromoethane	10U	10U	10U	10U	10U	10U	10U	10U
Dibromomethane	10U	10U	10U	10U	10U	10U	10U	10U
1,2-Dichlorobenzene	10U	10U	10U	10U	10U	10U	10U	10U
1,4-Dichlorobenzene	10U	10U	10U	10U	10U	10U	10U	10U
1,4-Dichloro-2-butene	.	.	.	.	.	.	.	.
Trans-1,4-Dichloro-2-butene	.	.	.	.	.	.	.	.
Dichlorodifluoromethane	.	.	.	.	.	.	.	.
Cis-1,2-Dichloroethene	10U	10U	10U	10U	10U	10U	10U	10U
Trans-1,2-Dichloroethene	10U	10U	10U	10U	10U	10U	10U	10U
Ethanol	.	.	.	.	.	.	.	.
Ethyl methacrylate	.	.	.	.	.	.	.	.
Iodomethane	.	.	.	.	.	.	.	.
1,1,1,2-Tetrachloroethane	10U	10U	10U	10U	10U	10U	10U	10U
Trichlorofluoromethane	.	.	.	.	.	.	.	.
1,2,3-Trichloropropane	.	.	.	.	.	.	.	.

(CONTINUED)

Sampling Point	GW-544	GW-546	GW-557		GW-560			GW-562
Program	SDM	SDM	SDM/C		SDM			SDM
Location	CDLVI	CDLVI	LV		CDLVII			CDLVII
Date Sampled	12/17/96	04/09/96	04/04/96	10/02/96	04/02/96	10/02/96	04/02/96	
					DUP		DUP	
Additional Organics (ug/L)	.	.	.	.	.	.	.	.
Acrolein	.	.	50U	10U	10U	50U	10U	50U
Acrylonitrile	.	.	50U	10U	10U	50U	10U	50U
Bromochloromethane	10U	10U	10U	10U	10U	10U	10U	10U
2-Chloroethyl vinyl ether	.	.	10U	10U	10U	10U	10U	10U
1,2-Dibromo-3-chloropropane	10U	10U	10U	10U	10U	10U	10U	10U
1,2-Dibromoethane	10U	10U	10U	10U	10U	10U	10U	10U
Dibromomethane	10U	10U	10U	10U	10U	10U	10U	10U
1,2-Dichlorobenzene	10U	10U	10U	10U	10U	10U	10U	10U
1,4-Dichlorobenzene	10U	10U	10U	10U	10U	10U	10U	10U
1,4-Dichloro-2-butene	.	.	5U	5U	5U	5U	5U	5U
Trans-1,4-Dichloro-2-butene	.	.	.	5U	5U	5U	5U	.
Dichlorodifluoromethane	.	.	5U	5U	5U	5U	5U	5U
Cis-1,2-Dichloroethene	10U	10U	10U	10U	10U	10U	10U	10U
Trans-1,2-Dichloroethene	10U	10U	10U	10U	10U	10U	10U	10U
Ethanol	.	.	10000U	500U	500U	10000U	500U	10000U
Ethyl methacrylate	.	.	5U	5U	5U	5U	5U	5U
Iodomethane	.	.	5U	5U	5U	5U	5U	5U
1,1,1,2-Tetrachloroethane	10U	10U	10U	10U	10U	10U	10U	10U
Trichlorofluoromethane	.	.	5U	5U	5U	5U	5U	5U
1,2,3-Trichloropropane	.	.	5U	5U	5U	5U	5U	5U

(CONTINUED)

APPENDIX D.3
Additional Organic Compounds, CY 1996

24

Sampling Point	GW-562	GW-564	GW-709	GW-757
Program	SDM	SDM	SDM	SDM
Location	CDLVII	CDLVII	LII	LII
Date Sampled	10/02/96	04/04/96	10/03/96	04/02/96
			DUP	DUP
Additional Organics (ug/L)	.	.	.	.
Acrolein	10U	50U	10U	50U
Acrylonitrile	10U	50U	10U	50U
Bromochloromethane	10U	10U	10U	10U
2-Chloroethyl vinyl ether	10U	10U	10U	10U
1,2-Dibromo-3-chloropropane	10U	10U	10U	10U
1,2-Dibromoethane	10U	10U	10U	10U
Dibromomethane	10U	10U	10U	10U
1,2-Dichlorobenzene	10U	10U	10U	10U
1,4-Dichlorobenzene	10U	10U	10U	10U
1,4-Dichloro-2-butene	5U	5U	5U	5U
Trans-1,4-Dichloro-2-butene	5U	5U	5U	5U
Dichlorodifluoromethane	5U	5U	5U	5U
Cis-1,2-Dichloroethene	10U	10U	10U	10U
Trans-1,2-Dichloroethene	10U	10U	10U	10U
Ethanol	500U	10000U	500U	10000U
Ethyl methacrylate	5U	5U	5U	5U
Iodomethane	5U	5U	5U	5U
1,1,1,2-Tetrachloroethane	10U	10U	10U	10U
Trichlorofluoromethane	5U	5U	5U	5U
1,2,3-Trichloropropane	5U	5U	5U	5U

(CONTINUED)

Sampling Point	GW-796	GW-797	GW-798	GW-799	GW-801
Program	SDM/C	SDM	SDM/C	SDM/C	SDM/C
Location	LV	LV	CDLVII	CDLVII	LV
Date Sampled	04/10/96	10/03/96	04/09/96	10/03/96	04/09/96
Additional Organics (ug/L)	.	.	.	.	.
Acrolein	50U	10U	50U	10U	50U
Acrylonitrile	50U	10U	50U	10U	50U
Bromochloromethane	10U	10U	10U	10U	10U
2-Chloroethyl vinyl ether	10U	10U	10U	10U	10U
1,2-Dibromo-3-chloropropane	10U	10U	10U	10U	10U
1,2-Dibromoethane	10U	10U	10U	10U	10U
Dibromomethane	10U	10U	10U	10U	10U
1,2-Dichlorobenzene	10U	10U	10U	10U	10U
1,4-Dichlorobenzene	10U	10U	10U	10U	10U
1,4-Dichloro-2-butene	5U	5U	5U	5U	5U
Trans-1,4-Dichloro-2-butene	5U	5U	5U	5U	5U
Dichlorodifluoromethane	5U	5U	5U	5U	5U
Cis-1,2-Dichloroethene	10U	10U	10U	10U	10U
Trans-1,2-Dichloroethene	10U	10U	10U	10U	10U
Ethanol	10000U	500U	10000U	500U	10000U
Ethyl methacrylate	5U	5U	5U	5U	5U
Iodomethane	5U	5U	5U	5U	5U
1,1,1,2-Tetrachloroethane	10U	10U	10U	10U	10U
Trichlorofluoromethane	5U	5U	5U	5U	5U
1,2,3-Trichloropropane	5U	5U	5U	5U	5U

(CONTINUED)

APPENDIX D.3
Additional Organic Compounds, CY 1996

25

Sampling Point	GW-801		GW-827	
Program	SDM/C		SDM	
Location	LV		CDLVI	
Date Sampled	04/10/96	10/07/96	04/16/96	12/17/96
	DUP			
Additional Organics (ug/L)				
Acrolein	50U	10U	.	.
Acrylonitrile	50U	10U	.	.
Bromochloromethane	10U	10U	10U	10U
2-Chloroethyl vinyl ether	10U	10U	.	.
1,2-Dibromo-3-chloropropane	10U	10U	10U	10U
1,2-Dibromoethane	10U	10U	10U	10U
Dibromomethane	10U	10U	10U	10U
1,2-Dichlorobenzene	10U	10U	10U	10U
1,4-Dichlorobenzene	10U	10U	10U	10U
1,4-Dichloro-2-butene	5U	5U	.	.
Trans-1,4-Dichloro-2-butene	.	5U	.	.
Dichlorodifluoromethane	5U	5U	.	.
Cis-1,2-Dichloroethene	10U	10U	10U	10U
Trans-1,2-Dichloroethene	10U	10U	10U	10U
Ethanol	10000U	500U	.	.
Ethyl methacrylate	5U	5U	.	.
Iodomethane	5U	5U	.	.
1,1,1,2-Tetrachloroethane	10U	10U	10U	10U
Trichlorofluoromethane	5U	5U	.	.
1,2,3-Trichloropropane	5U	5U	.	.

APPENDIX D.4

RADIOLOGICAL ANALYTES

APPENDIX D.4
Radiological Analytes, CY 1996

1

Sampling Point	1090						CBS-1		
Program	ROD						SDM		
Location	UNCS						CDLVII		
Date Sampled	04/23/96			10/30/96			04/11/96		
Sample Type									
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)	.	.	.	.	.	.	.	.	.
Gross Alpha	-1.66	0.24	7.53	1.23	1.9	3.02	1.18	3.8	7.33
Gross Beta	3.02	5	8.31	1.27	13	8.58	-0.31	0.05	8.61
Cesium 137	.	.	.	.	.	.	-0.707	5	4.69
Protactinium 234M	.	.	.	.	.	.	628	420	776
Radium (total)	1.3	1.2	1.84	.	.	.	.	.	.
Strontium 89/90	.	.	.	-32.6	24	47.2	.	.	.
Thorium 234	.	.	.	.	.	.	334	90	153
Uranium 234	0.699	0.44	0.172	.	.	.	0.0994	0.17	0.312
Uranium 235	0.0242	0.19	0.215	.	.	.	0	0	0.129
Uranium 238	0.147	0.24	0.419	.	.	.	0.114	0.13	0.103

(CONTINUED)

Sampling Point	CBS-1			GW-141					
Program	SDM			SDM					
Location	CDLVII			LIV					
Date Sampled	10/07/96			01/04/96					
Sample Type				DUP					
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)	.	.	.	.	.	.	.	.	.
Gross Alpha	-0.309	1.4	3.21	16.6	9.8	15.7	13.3	9.1	15.3
Gross Beta	-1.59	37	6.95	6.26	10	16.3	1.25	10	16.3
Cesium 137	.	.	.	.	.	.	.	.	.
Protactinium 234M	.	.	.	.	.	.	.	.	.
Radium (total)	.	.	.	.	.	.	.	.	.
Strontium 89/90	.	.	.	.	.	.	.	.	.
Thorium 234	.	.	.	.	.	.	.	.	.
Uranium 234	.	.	.	.	.	.	.	.	.
Uranium 235	.	.	.	.	.	.	.	.	.
Uranium 238	.	.	.	.	.	.	.	.	.

(CONTINUED)

APPENDIX D.4
Radiological Analytes, CY 1996

2

Sampling Point	GW-141						GW-142		
Program	SDM						RDM		
Location	LIV						KHQ		
Date Sampled	07/02/96						01/04/96		
Sample Type	DUP								
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)	.	.	.	.	.	.	.	.	.
Gross Alpha	-0.41	0.22	7.16	1.63	4.5	7.14	16.8	9.4	14.8
Gross Beta	1.56	4.8	7.96	1.77	4.8	7.96	3.1	10	16.2
Cesium 137	.	.	.	.	.	.	.	.	.
Protactinium 234M	.	.	.	.	.	.	.	.	.
Radium (total)	.	.	.	.	.	.	.	.	.
Strontium 89/90	.	.	.	.	.	.	.	.	.
Thorium 234	.	.	.	.	.	.	.	.	.
Uranium 234	.	.	.	.	.	.	9.38	1.5	0.065
Uranium 235	.	.	.	.	.	.	0.239	0.17	0.0811
Uranium 238	.	.	.	.	.	.	9.09	1.4	0.0652

(CONTINUED)

Sampling Point	GW-142								
Program	RDM								
Location	KHQ								
Date Sampled	04/17/96			10/21/96			10/22/96		
Sample Type	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)	.	.	.	.	.	.	.	.	.
Gross Alpha	2.68	4.6	7.49	3.31	2.5	3.33	6.79	3.3	3.35
Gross Beta	2.08	5.1	8.31	-0.842	37	6.81	6.73	5.2	7.56
Cesium 137	.	.	.	.	.	.	.	.	.
Protactinium 234M	.	.	.	.	.	.	.	.	.
Radium (total)	.	.	.	.	.	.	.	.	.
Strontium 89/90	.	.	.	.	.	.	.	.	.
Thorium 234	.	.	.	.	.	.	.	.	.
Uranium 234	1.8	0.61	0.324	.	.	.	.	.	.
Uranium 235	0.148	0.17	0.134	.	.	.	.	.	.
Uranium 238	1.31	0.49	0.107	.	.	.	.	.	.

(CONTINUED)

APPENDIX D.4
Radiological Analytes, CY 1996

3

Sampling Point	GW-142						GW-143		
Program	RDM						RDM		
Location	KHQ						KHQ		
Date Sampled	10/23/96			10/24/96			01/18/96		
Sample Type									
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)	.	.	.	.	.	.	.	.	.
Gross Alpha	8.11	3.5	3.29	6.95	3.2	3.28	9.59	5.6	7.61
Gross Beta	7.43	4.4	7.03	5.7	4.7	7.35	20.9	6.8	8.47
Cesium 137	.	.	.	.	.	.	.	.	.
Protactinium 234M	.	.	.	.	.	.	.	.	.
Radium (total)	.	.	.	.	.	.	.	.	.
Strontium 89/90	.	.	.	.	.	.	.	.	.
Thorium 234	.	.	.	.	.	.	.	.	.
Uranium 234	.	.	.	.	.	.	2.47	0.87	0.159
Uranium 235	.	.	.	.	.	.	0.0957	0.23	0.482
Uranium 238	.	.	.	.	.	.	1	0.52	0.16

(CONTINUED)

Sampling Point	GW-143								
Program	RDM								
Location	KHQ								
Date Sampled	04/23/96			10/21/96					
Sample Type				DUP					
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)	.	.	.	.	.	.	.	.	.
Gross Alpha	7.36	2.3	7.63	1.44	2.2	3.46	2.28	2.4	3.45
Gross Beta	15.5	6.1	8.33	16.9	5.4	7.03	12.7	4.8	6.87
Cesium 137	.	.	.	.	.	.	.	.	.
Protactinium 234M	.	.	.	.	.	.	.	.	.
Radium (total)	.	.	.	.	.	.	.	.	.
Strontium 89/90	.	.	.	.	.	.	.	.	.
Thorium 234	.	.	.	.	.	.	.	.	.
Uranium 234	2.48	0.69	0.232	.	.	.	.	.	.
Uranium 235	0	0	0.119	.	.	.	.	.	.
Uranium 238	0.564	0.29	0.0956	.	.	.	.	.	.

(CONTINUED)

APPENDIX D.4
Radiological Analytes, CY 1996

4

Sampling Point	GW-143								
Program	RDM								
Location	KHQ								
Date Sampled	10/22/96						10/23/96		
Sample Type				DUP					
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)	.	.	.	.	.	.	.	.	.
Gross Alpha	4.83	2.9	3.45	2.29	2.4	3.46	6.16	3.2	3.52
Gross Beta	18	5.1	6.63	14.6	5.1	6.98	14.9	4.8	6.68
Cesium 137	.	.	.	.	.	.	.	.	.
Protactinium 234M	.	.	.	.	.	.	.	.	.
Radium (total)	.	.	.	.	.	.	.	.	.
Strontium 89/90	.	.	.	.	.	.	.	.	.
Thorium 234	.	.	.	.	.	.	.	.	.
Uranium 234	.	.	.	.	.	.	.	.	.
Uranium 235	.	.	.	.	.	.	.	.	.
Uranium 238	.	.	.	.	.	.	.	.	.

(CONTINUED)

Sampling Point	GW-143								
Program	RDM								
Location	KHQ								
Date Sampled	10/23/96						10/24/96		
Sample Type	DUP						DUP		
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)	.	.	.	.	.	.	.	.	.
Gross Alpha	5.65	3.1	3.44	3.78	2.8	3.55	6.83	3	2.21
Gross Beta	17.9	5.6	7.13	12.5	4.6	6.7	15	4.9	6.15
Cesium 137	.	.	.	.	.	.	.	.	.
Protactinium 234M	.	.	.	.	.	.	.	.	.
Radium (total)	.	.	.	.	.	.	.	.	.
Strontium 89/90	.	.	.	.	.	.	.	.	.
Thorium 234	.	.	.	.	.	.	.	.	.
Uranium 234	.	.	.	.	.	.	.	.	.
Uranium 235	.	.	.	.	.	.	.	.	.
Uranium 238	.	.	.	.	.	.	.	.	.

(CONTINUED)

APPENDIX D.4
Radiological Analytes, CY 1996

5

Sampling Point	GW-144								
Program	RDM								
Location	KHQ								
Date Sampled	01/22/96						04/24/96		
Sample Type	DUP								
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)	.	.	.	.	.	.	.	.	.
Gross Alpha	2.58	4.3	7.09	8.54	5.2	7.09	1.4	4.1	7.23
Gross Beta	0.21	4.9	8.39	-1.55	0.05	8.39	-2.18	0.05	8.27
Cesium 137	.	.	.	.	.	.	.	.	.
Protactinium 234M	.	.	.	.	.	.	.	.	.
Radium (total)	.	.	.	.	.	.	.	.	.
Strontium 89/90	.	.	.	.	.	.	.	.	.
Thorium 234	.	.	.	.	.	.	.	.	.
Uranium 234	1.26	0.54	0.316	2	0.84	0.193	1.49	0.65	0.374
Uranium 235	0	0	0.162	0	0	0.241	0.0708	0.14	0.192
Uranium 238	0.867	0.43	0.131	0.714	0.47	0.194	0.285	0.266	0.154

(CONTINUED)

Sampling Point	GW-144								
Program	RDM								
Location	KHQ								
Date Sampled	10/21/96			10/22/96			10/23/96		
Sample Type									
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)	.	.	.	.	.	.	.	.	.
Gross Alpha	3.46	2.5	3.32	0.776	1.7	3.19	1.27	1.9	3.23
Gross Beta	0.316	0.71	6.55	-2.39	5.9	6.85	1.07	5.9	7.46
Cesium 137	.	.	.	.	.	.	.	.	.
Protactinium 234M	.	.	.	.	.	.	.	.	.
Radium (total)	.	.	.	.	.	.	.	.	.
Strontium 89/90	.	.	.	.	.	.	.	.	.
Thorium 234	.	.	.	.	.	.	.	.	.
Uranium 234	.	.	.	.	.	.	.	.	.
Uranium 235	.	.	.	.	.	.	.	.	.
Uranium 238	.	.	.	.	.	.	.	.	.

(CONTINUED)

APPENDIX D.4
Radiological Analytes, CY 1996

6

Sampling Point	GW-144			GW-145					
Program	RDM			RDM					
Location	KHQ			KHQ					
Date Sampled	10/24/96			01/23/96			04/25/96		
Sample Type									
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)	.	.	.	.	.	.	.	.	.
Gross Alpha	1.8	1.6	2.11	11.6	5.9	7.51	6.27	5.1	7.58
Gross Beta	2.2	3.1	5.98	13.1	6	8.45	10.5	5.7	8.32
Cesium 137	.	.	.	.	.	.	.	.	.
Protactinium 234M	.	.	.	.	.	.	.	.	.
Radium (total)	.	.	.	.	.	.	.	.	.
Strontium 89/90	.	.	.	.	.	.	.	.	.
Thorium 234	.	.	.	.	.	.	.	.	.
Uranium 234	.	.	.	7.1	1.6	0.405	8.36	1.9	0.329
Uranium 235	.	.	.	0.0805	0.19	0.406	0.374	0.31	0.169
Uranium 238	.	.	.	3.37	0.97	0.134	4.37	1.2	0.33

(CONTINUED)

Sampling Point	GW-145								
Program	RDM								
Location	KHQ								
Date Sampled	10/21/96			10/22/96			10/23/96		
Sample Type									
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)	.	.	.	.	.	.	.	.	.
Gross Alpha	12.8	4.3	3.42	13.3	4.5	3.46	11.1	4.1	3.45
Gross Beta	18.9	5.6	7.11	11.1	4.5	6.73	9.38	4.4	6.87
Cesium 137	.	.	.	.	.	.	.	.	.
Protactinium 234M	.	.	.	.	.	.	.	.	.
Radium (total)	.	.	.	.	.	.	.	.	.
Strontium 89/90	.	.	.	.	.	.	.	.	.
Thorium 234	.	.	.	.	.	.	.	.	.
Uranium 234	.	.	.	.	.	.	.	.	.
Uranium 235	.	.	.	.	.	.	.	.	.
Uranium 238	.	.	.	.	.	.	.	.	.

(CONTINUED)

APPENDIX D.4
Radiological Analytes, CY 1996

7

Sampling Point	GW-145			GW-146					
Program	RDM			RDM					
Location	KHQ			KHQ					
Date Sampled	10/24/96			01/18/96			04/25/96		
Sample Type									
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)	.	.	.	.	.	.	.	.	.
Gross Alpha	10	3.6	2.17	7.43	5.3	7.57	5.32	5	7.71
Gross Beta	21.7	6.2	6.93	16.7	6.4	8.46	13.7	6	8.34
Cesium 137	.	.	.	.	.	.	.	.	.
Protactinium 234M	.	.	.	.	.	.	.	.	.
Radium (total)	.	.	.	.	.	.	.	.	.
Strontium 89/90	.	.	.	.	.	.	.	.	.
Thorium 234	.	.	.	.	.	.	.	.	.
Uranium 234	.	.	.	2.27	0.8	0.353	2.06	0.76	0.355
Uranium 235	.	.	.	0.134	0.19	0.181	0	0	0.182
Uranium 238	.	.	.	0.914	0.47	0.146	0.378	0.29	0.146

(CONTINUED)

Sampling Point	GW-147			GW-156					
Program	RDM			RDM					
Location	KHQ			CRSDB					
Date Sampled	01/10/96			04/18/96			05/13/96		
Sample Type									
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)	.	.	.	.	.	.	.	.	.
Gross Alpha	5.83	7.5	14.7	0.61	4.2	7.38	5.95	5.1	7.7
Gross Beta	-3.51	0.1	16.2	-3.12	0.05	8.29	10.5	5.7	8.34
Cesium 137	.	.	.	.	.	.	.	.	.
Protactinium 234M	.	.	.	.	.	.	.	.	.
Radium (total)	.	.	.	.	.	.	.	.	.
Strontium 89/90	.	.	.	.	.	.	.	.	.
Thorium 234	.	.	.	.	.	.	.	.	.
Uranium 234	1.78	0.58	0.103	1.56	0.53	0.243	.	.	.
Uranium 235	0.0288	0.16	0.386	0.0141	0.11	0.303	.	.	.
Uranium 238	0.463	0.25	0.25	0.778	0.36	0.1	.	.	.

(CONTINUED)

APPENDIX D.4
Radiological Analytes, CY 1996

8

Sampling Point	GW-156								
Program	RDM								
Location	CRSDB								
Date Sampled	05/14/96			05/15/96			05/16/96		
Sample Type									
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)	.	.	.	.	.	.	.	.	.
Gross Alpha	4.84	4.9	7.63	4.86	4.9	7.67	0.83	4.7	7.56
Gross Beta	10.6	5.7	8.33	4.91	5.2	8.33	1.77	5.4	7.61
Cesium 137	.	.	.	.	.	.	.	.	.
Protactinium 234M	.	.	.	.	.	.	.	.	.
Radium (total)	.	.	.	.	.	.	.	.	.
Strontium 89/90	.	.	.	.	.	.	.	.	.
Thorium 234	.	.	.	.	.	.	.	.	.
Uranium 234	.	.	.	.	.	.	.	.	.
Uranium 235	.	.	.	.	.	.	.	.	.
Uranium 238	.	.	.	.	.	.	.	.	.

(CONTINUED)

Sampling Point	GW-156								
Program	RDM								
Location	CRSDB								
Date Sampled	10/14/96			10/15/96			10/16/96		
Sample Type									
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)	.	.	.	.	.	.	.	.	.
Gross Alpha	6.92	3	2.45	3.19	2.2	2.49	0.549	1.9	3.4
Gross Beta	9.66	4.7	6.57	8.86	4.7	6.61	0.649	4.4	9.15
Cesium 137	.	.	.	.	.	.	.	.	.
Protactinium 234M	.	.	.	.	.	.	.	.	.
Radium (total)	.	.	.	.	.	.	.	.	.
Strontium 89/90	.	.	.	.	.	.	.	.	.
Thorium 234	.	.	.	.	.	.	.	.	.
Uranium 234	.	.	.	.	.	.	.	.	.
Uranium 235	.	.	.	.	.	.	.	.	.
Uranium 238	.	.	.	.	.	.	.	.	.

(CONTINUED)

APPENDIX D.4
Radiological Analytes, CY 1996

9

Sampling Point	GW-156			GW-159					
Program	RDM			RDM					
Location	CRSDB			CRSDB					
Date Sampled	10/17/96			05/13/96			05/14/96		
Sample Type									
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)	.	.	.	.	.	.	.	.	.
Gross Alpha	1.45	2.2	3.48	2.65	4.4	7.38	450	59	7.45
Gross Beta	-3.65	11	8.3	2.91	5	8.29	535	70	8.3
Cesium 137	.	.	.	.	.	.	.	.	.
Protactinium 234M	.	.	.	.	.	.	.	.	.
Radium (total)	.	.	.	.	.	.	.	.	.
Strontium 89/90	.	.	.	.	.	.	.	.	.
Thorium 234	.	.	.	.	.	.	.	.	.
Uranium 234	.	.	.	.	.	.	.	.	.
Uranium 235	.	.	.	.	.	.	.	.	.
Uranium 238	.	.	.	.	.	.	.	.	.

(CONTINUED)

Sampling Point	GW-159								
Program	RDM								
Location	CRSDB								
Date Sampled	05/15/96			05/16/96			10/14/96		
Sample Type									
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)	.	.	.	.	.	.	.	.	.
Gross Alpha	2.75	6.5	9.99	3.82	5	7.29	1.97	1.8	2.43
Gross Beta	2.06	5.6	7.91	-3.95	0.05	7.57	1.97	3.4	6.33
Cesium 137	.	.	.	.	.	.	.	.	.
Protactinium 234M	.	.	.	.	.	.	.	.	.
Radium (total)	.	.	.	.	.	.	.	.	.
Strontium 89/90	.	.	.	.	.	.	.	.	.
Thorium 234	.	.	.	.	.	.	.	.	.
Uranium 234	.	.	.	.	.	.	.	.	.
Uranium 235	.	.	.	.	.	.	.	.	.
Uranium 238	.	.	.	.	.	.	.	.	.

(CONTINUED)

APPENDIX D.4
Radiological Analytes, CY 1996

10

Sampling Point	GW-159								
Program	RDM								
Location	CRSDB								
Date Sampled	10/15/96			10/16/96			10/17/96		
Sample Type									
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)	.	.	.	.	.	.	.	.	.
Gross Alpha	3.56	2.2	2.51	4.68	2.8	3.37	9.11	4.1	3.93
Gross Beta	10.1	5.3	7.01	4.93	6	9.31	2.29	9.7	9.61
Cesium 137	.	.	.	.	.	.	.	.	.
Protactinium 234M	.	.	.	.	.	.	.	.	.
Radium (total)	.	.	.	.	.	.	.	.	.
Strontium 89/90	.	.	.	.	.	.	.	.	.
Thorium 234	.	.	.	.	.	.	.	.	.
Uranium 234	.	.	.	.	.	.	.	.	.
Uranium 235	.	.	.	.	.	.	.	.	.
Uranium 238	.	.	.	.	.	.	.	.	.

(CONTINUED)

Sampling Point	GW-160						GW-161		
Program	BMP						BMP		
Location	CRBAWP						CRBAWP		
Date Sampled	04/29/96						04/26/96		
Sample Type				DUP					
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)	.	.	.	.	.	.	.	.	.
Gross Alpha	3.05	4.4	7.36	2.03	4.3	7.36	-1.01	0.23	7.31
Gross Beta	0.42	7.8	8.29	0.62	4.8	8.29	-0.93	0.05	8.28
Cesium 137	.	.	.	.	.	.	.	.	.
Protactinium 234M	.	.	.	.	.	.	.	.	.
Radium (total)	.	.	.	.	.	.	.	.	.
Strontium 89/90	.	.	.	.	.	.	.	.	.
Thorium 234	.	.	.	.	.	.	.	.	.
Uranium 234	.	.	.	.	.	.	.	.	.
Uranium 235	.	.	.	.	.	.	.	.	.
Uranium 238	.	.	.	.	.	.	.	.	.

(CONTINUED)

APPENDIX D.4
Radiological Analytes, CY 1996

11

Sampling Point	GW-174						GW-175		
Program	BMP						AMP		
Location	CRSP						CRSP		
Date Sampled	08/19/96						02/25/96		
Sample Type	DUP								
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)	.	.	.	.	.	.	.	.	.
Gross Alpha	0.327	1.5	2.92	1.3	1.8	2.92	-1.83	0.21	6.88
Gross Beta	8.68	6	7.36	1.3	5.6	6.62	6.65	4.8	8.21
Cesium 137	.	.	.	.	.	.	.	.	.
Protactinium 234M	.	.	.	.	.	.	.	.	.
Radium (total)	.	.	.	.	.	.	.	.	.
Strontium 89/90	.	.	.	.	.	.	.	.	.
Thorium 234	.	.	.	.	.	.	.	.	.
Uranium 234	.	.	.	.	.	.	.	.	.
Uranium 235	.	.	.	.	.	.	.	.	.
Uranium 238	.	.	.	.	.	.	.	.	.

(CONTINUED)

Sampling Point	GW-177			GW-184			GW-186		
Program	AMP			BMP			BMP		
Location	CRSP			RQ			RQ		
Date Sampled	02/25/96			04/30/96			05/01/96		
Sample Type									
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)	.	.	.	.	.	.	.	.	.
Gross Alpha	1.61	4.6	6.83	1.43	4.5	7.43	2.35	5.3	8.52
Gross Beta	6.13	4.8	8.2	3.96	5.2	8.3	0.85	5.1	8.46
Cesium 137	.	.	.	.	.	.	.	.	.
Protactinium 234M	.	.	.	.	.	.	.	.	.
Radium (total)	.	.	.	.	.	.	.	.	.
Strontium 89/90	.	.	.	.	.	.	.	.	.
Thorium 234	.	.	.	.	.	.	.	.	.
Uranium 234	.	.	.	.	.	.	.	.	.
Uranium 235	.	.	.	.	.	.	.	.	.
Uranium 238	.	.	.	.	.	.	.	.	.

(CONTINUED)

APPENDIX D.4
Radiological Analytes, CY 1996

12

Sampling Point	GW-186			GW-187			GW-188		
Program	BMP			BMP			BMP		
Location	RQ			RQ			RQ		
Date Sampled	05/01/96			04/30/96			04/30/96		
Sample Type	DUP								
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)	.	.	.	.	.	.	.	.	.
Gross Alpha	-1.16	0.25	8.44	2.03	5.6	9.21	1.67	4.6	7.55
Gross Beta	2.33	5.2	8.45	-2.47	0.05	8.55	-3.13	0.05	8.32
Cesium 137	.	.	.	.	.	.	.	.	.
Protactinium 234M	.	.	.	.	.	.	.	.	.
Radium (total)	.	.	.	.	.	.	.	.	.
Strontium 89/90	.	.	.	.	.	.	.	.	.
Thorium 234	.	.	.	.	.	.	.	.	.
Uranium 234	.	.	.	.	.	.	.	.	.
Uranium 235	.	.	.	.	.	.	.	.	.
Uranium 238	.	.	.	.	.	.	.	.	.

(CONTINUED)

Sampling Point	GW-203			GW-205		
Program	ROD			ROD		
Location	UNCS			UNCS		
Date Sampled	04/17/96			10/28/96		
Sample Type						
	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)	.	.	.	.	.	.
Gross Alpha	0.2	4	7.27	-0.307	1.1	2.86
Gross Beta	-1.97	0.05	8.27	-3.86	7.4	7.43
Cesium 137	.	.	.	.	.	.
Protactinium 234M	.	.	.	.	.	.
Radium (total)	2.2	1.2	0.43	.	.	.
Strontium 89/90	.	.	.	1.49	1.7	3.54
Thorium 234	.	.	.	.	.	.
Uranium 234	0.286	0.25	0.301	.	.	.
Uranium 235	0	0	0.155	.	.	.
Uranium 238	0	0	0.124	.	.	.

(CONTINUED)

APPENDIX D.4
Radiological Analytes, CY 1996

13

Sampling Point	GW-205						GW-217		
Program	ROD						SDM		
Location	UNCS						LIV		
Date Sampled	04/19/96			10/28/96			01/03/96		
Sample Type	DUP								
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)	.	.	.	.	.	.	.	.	.
Gross Alpha	0	0.22	7.25	2.13	2	2.9	0	0.53	14.7
Gross Beta	-0.41	0.05	8.27	6.46	5.8	8.47	1.65	10	16.2
Cesium 137	.	.	.	.	.	.	.	.	.
Protactinium 234M	.	.	.	.	.	.	.	.	.
Radium (total)	0.84	0.96	1.81	.	.	.	.	.	.
Strontium 89/90	.	.	.	13	2.5	2.71	.	.	.
Thorium 234	.	.	.	.	.	.	.	.	.
Uranium 234	1.08	0.44	0.308	.	.	.	.	.	.
Uranium 235	-0.13	0.13	0.49	.	.	.	.	.	.
Uranium 238	0.151	0.15	0.102	.	.	.	.	.	.

(CONTINUED)

Sampling Point Program Location Date Sampled Sample Type	GW-217			GW-221					
	SDM			ROD					
	LIV			UNCS					
	07/01/96			04/22/96			10/29/96		
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)	.	.	.	.	.	.	.	.	.
Gross Alpha	-2.01	0.21	7.05	-0.99	0.02	7.19	0.315	1.4	2.82
Gross Beta	0.73	4.7	7.95	1.45	4.9	8.26	0.00527	3.4	8.23
Cesium 137	.	.	.	.	.	.	.	.	.
Protactinium 234M	.	.	.	.	.	.	.	.	.
Radium (total)	.	.	.	-0.28	0.44	1.92	.	.	.
Strontium 89/90	.	.	.	.	.	.	-1.75	1.2	2.92
Thorium 234	.	.	.	.	.	.	.	.	.
Uranium 234	.	.	.	0.228	0.23	0.154	.	.	.
Uranium 235	.	.	.	-0.0985	0.14	0.581	.	.	.
Uranium 238	.	.	.	0	0	0.155	.	.	.

(CONTINUED)

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Sampling Point	GW-221			GW-231					
Program	ROD			RDM					
Location	UNCS			KHQ					
Date Sampled	10/29/96			01/10/96			04/18/96		
Sample Type	DUP								
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)	.	.	.	.	.	.	.	.	.
Gross Alpha	2.06	2	2.83	38.4	7	14.6	1.19	4.2	7.19
Gross Beta	0.967	2.6	7.86	-5.98	0.1	16.1	-1.55	0.05	8.26
Cesium 137	.	.	.	.	.	.	.	.	.
Protactinium 234M	.	.	.	.	.	.	.	.	.
Radium (total)	.	.	.	.	.	.	.	.	.
Strontium 89/90	4.15	1.7	2.93	.	.	.	.	.	.
Thorium 234	.	.	.	.	.	.	.	.	.
Uranium 234	.	.	.	0.0509	0.13	0.259	0.0978	0.14	0.133
Uranium 235	.	.	.	-0.082	0.095	0.371	0	0	0.165
Uranium 238	.	.	.	0.196	0.18	0.208	0.049	0.098	0.133

(CONTINUED)

Sampling Point	GW-231								
Program	RDM								
Location	KHQ								
Date Sampled	04/18/96			10/21/96			10/22/96		
Sample Type	DUP								
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)	.	.	.	.	.	.	.	.	.
Gross Alpha	0	0.22	7.28	0.806	1.8	3.24	0.0315	13	3.31
Gross Beta	-4.05	0.05	8.28	2.06	4.4	7.33	-4.71	4.5	6.79
Cesium 137	.	.	.	.	.	.	.	.	.
Protactinium 234M	.	.	.	.	.	.	.	.	.
Radium (total)	.	.	.	.	.	.	.	.	.
Strontium 89/90	.	.	.	.	.	.	.	.	.
Thorium 234	.	.	.	.	.	.	.	.	.
Uranium 234	0.238	0.21	0.249	.	.	.	.	.	.
Uranium 235	0	0	0.128	.	.	.	.	.	.
Uranium 238	0.163	0.18	0.249	.	.	.	.	.	.

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Radiological Analytes, CY 1996

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Sampling Point	GW-231						GW-292		
Program	RDM						BMP		
Location	KHQ						ECRWP		
Date Sampled	10/23/96			10/24/96			05/08/96		
Sample Type									
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)	.	.	.	.	.	.	.	.	.
Gross Alpha	1.31	3	4.11	1.61	1.6	2.08	1.45	4.6	7.53
Gross Beta	-2.54	4.8	7.04	4.75	4.3	6.4	1.88	5.1	8.31
Cesium 137	.	.	.	.	.	.	.	.	.
Protactinium 234M	.	.	.	.	.	.	.	.	.
Radium (total)	.	.	.	.	.	.	.	.	.
Strontium 89/90	.	.	.	.	.	.	.	.	.
Thorium 234	.	.	.	.	.	.	.	.	.
Uranium 234	.	.	.	.	.	.	.	.	.
Uranium 235	.	.	.	.	.	.	.	.	.
Uranium 238	.	.	.	.	.	.	.	.	.

(CONTINUED)

Sampling Point	GW-292			GW-293			GW-294		
Program	BMP			BMP			BMP		
Location	ECRWP			ECRWP			ECRWP		
Date Sampled	05/08/96			05/08/96			05/02/96		
Sample Type	DUP								
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)	.	.	.	.	.	.	.	.	.
Gross Alpha	-1.04	0.22	7.55	2.09	4.7	7.57	2.67	4.7	7.44
Gross Beta	-1.77	0.05	8.32	2.09	5.1	8.32	-4.37	0.05	8.3
Cesium 137	.	.	.	.	.	.	.	.	.
Protactinium 234M	.	.	.	.	.	.	.	.	.
Radium (total)	.	.	.	.	.	.	.	.	.
Strontium 89/90	.	.	.	.	.	.	.	.	.
Thorium 234	.	.	.	.	.	.	.	.	.
Uranium 234	.	.	.	.	.	.	.	.	.
Uranium 235	.	.	.	.	.	.	.	.	.
Uranium 238	.	.	.	.	.	.	.	.	.

(CONTINUED)

APPENDIX D.4
Radiological Analytes, CY 1996

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Sampling Point	GW-296			GW-298			GW-299		
Program	BMP			BMP			BMP		
Location	ECRWP			CRBAWP			CRBAWP		
Date Sampled	05/02/96			05/01/96			04/30/96		
Sample Type									
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)	.	.	.	.	.	.	.	.	.
Gross Alpha	-1.01	0.22	7.36	3.41	4.7	7.27	1.98	4.5	7.19
Gross Beta	-1.04	0.05	8.29	-2.91	0.05	8.27	0.52	4.9	8.26
Cesium 137	.	.	.	.	.	.	.	.	.
Protactinium 234M	.	.	.	.	.	.	.	.	.
Radium (total)	.	.	.	.	.	.	.	.	.
Strontium 89/90	.	.	.	.	.	.	.	.	.
Thorium 234	.	.	.	.	.	.	.	.	.
Uranium 234	.	.	.	.	.	.	.	.	.
Uranium 235	.	.	.	.	.	.	.	.	.
Uranium 238	.	.	.	.	.	.	.	.	.

(CONTINUED)

Sampling Point	GW-300			GW-301					
Program	BMP			BMP/C					
Location	CRBAWP			CRBAWP					
Date Sampled	04/30/96			04/30/96			10/01/96		
Sample Type									
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)	.	.	.	.	.	.	.	.	.
Gross Alpha	12.2	5.9	7.14	-0.6	0.21	7.27	0.778	1.8	3.37
Gross Beta	9.32	5.6	8.25	-2.91	0.05	8.27	-4.88	4.8	7.08
Cesium 137	.	.	.	.	.	.	.	.	.
Protactinium 234M	.	.	.	.	.	.	.	.	.
Radium (total)	.	.	.	.	.	.	.	.	.
Strontium 89/90	.	.	.	.	.	.	.	.	.
Thorium 234	.	.	.	.	.	.	.	.	.
Uranium 234	.	.	.	.	.	.	.	.	.
Uranium 235	.	.	.	.	.	.	.	.	.
Uranium 238	.	.	.	.	.	.	.	.	.

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Sampling Point	GW-302						GW-305		
Program	ROD						SDM		
Location	UNCS						LIV		
Date Sampled	04/23/96			10/30/96			01/17/96		
Sample Type									
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)	.	.	.	.	.	.	.	.	.
Gross Alpha	1.45	4.3	7.52	0.357	1.6	2.93	7.71	7.8	15.2
Gross Beta	1.98	1.9	8.31	-5.79	5	7.76	1.03	10	16.1
Cesium 137	.	.	.	.	.	.	.	.	.
Protactinium 234M	.	.	.	.	.	.	.	.	.
Radium (total)	1.6	1.1	1.27	.	.	.	.	.	.
Strontium 89/90	.	.	.	-0.82	1.4	3.36	.	.	.
Thorium 234	.	.	.	.	.	.	.	.	.
Uranium 234	0.522	0.35	0.368	.	.	.	.	.	.
Uranium 235	0	0	0.152	.	.	.	.	.	.
Uranium 238	0.09	0.13	0.122	.	.	.	.	.	.

(CONTINUED)

Sampling Point	GW-305			GW-321			GW-339		
Program	SDM			BMP			ROD		
Location	LIV			ADB			UNCS		
Date Sampled	07/08/96			04/29/96			04/22/96		
Sample Type									
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)	.	.	.	.	.	.	.	.	.
Gross Alpha	-0.59	0.2	5.94	-0.98	0.23	7.11	2.08	4.4	7.53
Gross Beta	-4.66	0.05	8.38	-2.69	0.05	8.25	-1.25	0.05	8.31
Cesium 137	.	.	.	.	.	.	.	.	.
Protactinium 234M	.	.	.	.	.	.	.	.	.
Radium (total)	.	.	.	.	.	.	1.4	1	1.08
Strontium 89/90	.	.	.	.	.	.	.	.	.
Thorium 234	.	.	.	.	.	.	.	.	.
Uranium 234	.	.	.	.	.	.	0.537	0.35	0.145
Uranium 235	.	.	.	.	.	.	-0.0465	0.093	0.441
Uranium 238	.	.	.	.	.	.	0.0164	0.13	0.354

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Sampling Point	GW-339			GW-512			GW-513		
Program	ROD			BMP			BMP		
Location	UNCS			ADB			ADB		
Date Sampled	10/29/96			05/02/96			04/29/96		
Sample Type									
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)	.	.	.	.	.	.	.	.	.
Gross Alpha	0.423	1.9	3.09	1.61	4.5	7.31	3.99	4.5	7.23
Gross Beta	-6.14	5.3	7.53	0.73	5	8.28	-0.73	0.05	8.27
Cesium 137	.	.	.	.	.	.	.	.	.
Protactinium 234M	.	.	.	.	.	.	.	.	.
Radium (total)	.	.	.	.	.	.	.	.	.
Strontium 89/90	-0.51	1.6	3.68	.	.	.	.	.	.
Thorium 234	.	.	.	.	.	.	.	.	.
Uranium 234	.	.	.	.	.	.	.	.	.
Uranium 235	.	.	.	.	.	.	.	.	.
Uranium 238	.	.	.	.	.	.	.	.	.

(CONTINUED)

Sampling Point	GW-514						GW-522		
Program	BMP						SDM		
Location	ADB						LIV		
Date Sampled	05/03/96						01/17/96		
Sample Type	DUP								
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)	.	.	.	.	.	.	.	.	.
Gross Alpha	-3.43	0.21	7.31	8.03	5.4	7.28	6.94	7.6	15.2
Gross Beta	-3.84	0.05	8.28	13.5	6	8.27	-1.45	0.1	16.1
Cesium 137	.	.	.	.	.	.	.	.	.
Protactinium 234M	.	.	.	.	.	.	.	.	.
Radium (total)	.	.	.	.	.	.	.	.	.
Strontium 89/90	.	.	.	.	.	.	.	.	.
Thorium 234	.	.	.	.	.	.	.	.	.
Uranium 234	.	.	.	.	.	.	.	.	.
Uranium 235	.	.	.	.	.	.	.	.	.
Uranium 238	.	.	.	.	.	.	.	.	.

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Sampling Point	GW-522			GW-539					
Program	SDM			SDM					
Location	LIV			LII					
Date Sampled	07/08/96			04/02/96			11/04/96		
Sample Type									
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)	.	.	.	.	.	.	.	.	.
Gross Alpha	-1.04	0.21	6.24	3.01	4.2	7.49	8.5	3.9	3.54
Gross Beta	-1.56	0.05	8.44	0.21	4.6	8.64	3.24	4.8	8.18
Cesium 137	.	.	.	2.16	3.5	3.21	.	.	.
Protactinium 234M	.	.	.	595	530	661	.	.	.
Radium (total)	.	.	.	.	.	.	.	.	.
Strontium 89/90	.	.	.	.	.	.	.	.	.
Thorium 234	.	.	.	-38.5	100	109	.	.	.
Uranium 234	.	.	.	0.26	0.24	0.322	.	.	.
Uranium 235	.	.	.	0	0	0.133	.	.	.
Uranium 238	.	.	.	0.0515	0.12	0.26	.	.	.

(CONTINUED)

Sampling Point	GW-540			GW-541			GW-542		
Program	SDM			SDM			SDM		
Location	CDLVI			CDLVI			CDLVI		
Date Sampled	04/09/96			04/15/96			04/16/96		
Sample Type									
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)	.	.	.	.	.	.	.	.	.
Gross Alpha	2.01	4	7.5	2.63	4.5	7.33	2.16	4.3	7.14
Gross Beta	-2.39	0.05	8.64	-1.77	0.05	8.28	-3	0.05	8.25
Cesium 137	5.83	3.2	4.45	5.37	4.2	3.34	0.537	1.7	2.94
Protactinium 234M	141	400	707	279	380	671	348	320	545
Radium (total)	.	.	.	.	.	.	.	.	.
Strontium 89/90	.	.	.	.	.	.	.	.	.
Thorium 234	224	300	137	18.3	120	127	23.2	100	86.8
Uranium 234	0.144	0.23	0.41	0.557	0.38	0.476	0.104	0.17	0.296
Uranium 235	0.0777	0.16	0.211	-0.158	0.16	0.594	-0.0389	0.078	0.369
Uranium 238	0.0572	0.26	0.588	0.835	0.42	0.3	0.0138	0.11	0.296

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Sampling Point	GW-542			GW-543					
Program	SDM			SDM					
Location	CDLVI			CDLVI					
Date Sampled	11/05/96			04/16/96					
Sample Type							DUP		
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)	.	.	.	.	.	.	.	.	.
Gross Alpha	2.14	2.2	3.33	2.04	4.4	7.41	0.61	4.2	7.38
Gross Beta	6.38	4.1	6.33	1.04	5	8.3	-2.5	0.05	8.29
Cesium 137	.	.	.	6.28	2.6	4.68	3.7	4	3.43
Protactinium 234M	.	.	.	590	430	784	243	370	657
Radium (total)	.	.	.	.	.	.	.	.	.
Strontium 89/90	.	.	.	.	.	.	.	.	.
Thorium 234	.	.	.	303	88	150	320	70	120
Uranium 234	.	.	.	0.0662	0.16	0.334	0.138	0.16	0.125
Uranium 235	.	.	.	0	0	0.171	0	0	0.156
Uranium 238	.	.	.	0.0155	0.12	0.335	0.0743	0.18	0.378

(CONTINUED)

Sampling Point	GW-543			GW-544					
Program	SDM			SDM					
Location	CDLVI			CDLVI					
Date Sampled	11/06/96			04/16/96					
Sample Type				DUP					
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)	.	.	.	.	.	.	.	.	.
Gross Alpha	0.0327	1.1	3.36	0.169	1.7	3.29	3.68	4.7	7.41
Gross Beta	2.66	3.5	6.27	5.27	4.6	6.69	-3.02	0.05	8.3
Cesium 137	.	.	.	.	.	.	5.28	2.2	4.22
Protactinium 234M	.	.	.	.	.	.	510	430	691
Radium (total)	.	.	.	.	.	.	.	.	.
Strontium 89/90	.	.	.	.	.	.	.	.	.
Thorium 234	.	.	.	.	.	.	454	67	108
Uranium 234	.	.	.	.	.	.	0.175	0.24	0.396
Uranium 235	.	.	.	.	.	.	0	0	0.164
Uranium 238	.	.	.	.	.	.	0.0445	0.2	0.457

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Sampling Point	GW-544			GW-546			GW-557		
Program	SDM			SDM			SDM/C		
Location	CDLVI			CDLVI			LV		
Date Sampled	11/06/96			04/09/96			04/04/96		
Sample Type									
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)	.	.	.	.	.	.	.	.	.
Gross Alpha	2.91	2.4	3.29	3.26	4.3	7.61	3.2	4.2	7.47
Gross Beta	4.8	5.5	7.01	0.52	4.6	8.66	2.49	4.8	8.63
Cesium 137	.	.	.	3.86	3.3	5.1	0.068	0.00047	3.74
Protactinium 234M	.	.	.	513	470	860	5.13	400	689
Radium (total)	.	.	.	.	.	.	.	.	.
Strontium 89/90	.	.	.	.	.	.	.	.	.
Thorium 234	.	.	.	7.04	120	125	396	410	133
Uranium 234	.	.	.	0.0963	0.24	0.489	0.214	0.21	0.266
Uranium 235	.	.	.	0	0	0.202	0	0	0.136
Uranium 238	.	.	.	0.18	0.21	0.162	0	0	0.11

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Sampling Point	GW-557						GW-560		
Program	SDM/C						SDM		
Location	LV						CDLVII		
Date Sampled	10/02/96						04/02/96		
Sample Type	DUP								
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)	.	.	.	.	.	.	.	.	.
Gross Alpha	0.0264	1.1	3.27	0.991	1.9	3.27	0.6	3.7	7.43
Gross Beta	2.12	6	8.04	-3.53	5.9	7.26	1.55	4.7	8.63
Cesium 137	.	.	.	.	.	.	4.64	2.6	4.7
Protactinium 234M	.	.	.	.	.	.	110	420	740
Radium (total)	.	.	.	.	.	.	.	.	.
Strontium 89/90	.	.	.	.	.	.	.	.	.
Thorium 234	.	.	.	.	.	.	26.4	140	153
Uranium 234	.	.	.	.	.	.	0.0874	0.12	0.119
Uranium 235	.	.	.	.	.	.	0.0167	0.13	0.359
Uranium 238	.	.	.	.	.	.	0.0438	0.088	0.119

(CONTINUED)

APPENDIX D.4
Radiological Analytes, CY 1996

22

Sampling Point	GW-560						GW-562		
Program	SDM						SDM		
Location	CDLVII						CDLVII		
Date Sampled	10/02/96						04/02/96		
Sample Type	DUP								
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)	.	.	.	.	.	.	.	.	.
Gross Alpha	0.142	1.4	3.15	-0.626	1.3	3.19	1.61	4	7.53
Gross Beta	-3.8	5.7	7.26	-3.63	4.2	7.82	0	0.05	8.64
Cesium 137	.	.	.	.	.	.	2.94	4.3	3.25
Protactinium 234M	.	.	.	.	.	.	468	380	695
Radium (total)	.	.	.	.	.	.	.	.	.
Strontium 89/90	.	.	.	.	.	.	.	.	.
Thorium 234	.	.	.	.	.	.	340	73	120
Uranium 234	.	.	.	.	.	.	0.13	0.17	0.258
Uranium 235	.	.	.	.	.	.	-0.0339	0.068	0.322
Uranium 238	.	.	.	.	.	.	0.103	0.18	0.322

(CONTINUED)

Sampling Point	GW-562			GW-564					
Program	SDM			SDM					
Location	CDLVII			CDLVII					
Date Sampled	10/02/96			04/04/96			10/03/96		
Sample Type									
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)	.	.	.	.	.	.	.	.	.
Gross Alpha	1.01	1.9	3.29	0.59	3.7	7.39	-0.319	1.4	3.16
Gross Beta	1.48	7	8.06	1.76	4.7	8.62	-0.551	5.2	7.33
Cesium 137	.	.	.	1.73	1.6	2.97	.	.	.
Protactinium 234M	.	.	.	377	320	580	.	.	.
Radium (total)	.	.	.	.	.	.	.	.	.
Strontium 89/90	.	.	.	.	.	.	.	.	.
Thorium 234	.	.	.	0.191	0.00015	87.4	.	.	.
Uranium 234	.	.	.	0.0632	0.16	0.321	.	.	.
Uranium 235	.	.	.	-0.034	0.068	0.322	.	.	.
Uranium 238	.	.	.	0.0786	0.11	0.107	.	.	.

(CONTINUED)

APPENDIX D.4
Radiological Analytes, CY 1996

23

Sampling Point	GW-608			GW-609					
Program	AMP			CMP					
Location	CRSP			CRSP					
Date Sampled	01/29/96			02/25/96			04/16/96		
Sample Type									
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)	.	.	.	.	.	.	.	.	.
Gross Alpha	2.59	4.3	7.12	-0.4	0.21	6.79	2.02	4.4	7.31
Gross Beta	0.41	4.9	8.39	3.11	4.5	8.2	-1.45	0.05	8.28
Cesium 137	.	.	.	.	.	.	.	.	.
Protactinium 234M	.	.	.	.	.	.	.	.	.
Radium (total)	.	.	.	.	.	.	.	.	.
Strontium 89/90	.	.	.	.	.	.	.	.	.
Thorium 234	.	.	.	.	.	.	.	.	.
Uranium 234	.	.	.	.	.	.	.	.	.
Uranium 235	.	.	.	.	.	.	.	.	.
Uranium 238	.	.	.	.	.	.	.	.	.

(CONTINUED)

Sampling Point	GW-609			GW-610			GW-611		
Program	CMP			AMP			AMP		
Location	CRSP			CRSP			CRSP		
Date Sampled	10/07/96			02/23/96			02/25/96		
Sample Type									
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)	.	.	.	.	.	.	.	.	.
Gross Alpha	0.82	1.8	3.25	-0.4	0.21	6.8	-2.44	0.21	6.9
Gross Beta	-2.31	4.2	7.87	3.01	4.5	8.2	2.29	4.5	8.22
Cesium 137	.	.	.	.	.	.	.	.	.
Protactinium 234M	.	.	.	.	.	.	.	.	.
Radium (total)	.	.	.	.	.	.	.	.	.
Strontium 89/90	.	.	.	.	.	.	.	.	.
Thorium 234	.	.	.	.	.	.	.	.	.
Uranium 234	.	.	.	.	.	.	.	.	.
Uranium 235	.	.	.	.	.	.	.	.	.
Uranium 238	.	.	.	.	.	.	.	.	.

(CONTINUED)

APPENDIX D.4
Radiological Analytes, CY 1996

24

Sampling Point	GW-612			GW-709					
Program	BMP			SDM					
Location	CRSP			LII					
Date Sampled	08/29/96			04/02/96					
Sample Type							DUP		
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)	.	.	.	.	.	.	.	.	.
Gross Alpha	0.0205	1.5	4.17	5.98	4.7	7.45	2.6	4.1	7.46
Gross Beta	-2.98	9	6.88	1.04	4.7	8.63	1.04	4.7	8.63
Cesium 137	.	.	.	.	.	.	.	.	.
Protactinium 234M	.	.	.	.	.	.	.	.	.
Radium (total)	.	.	.	.	.	.	.	.	.
Strontium 89/90	.	.	.	.	.	.	.	.	.
Thorium 234	.	.	.	.	.	.	.	.	.
Uranium 234	.	.	.	.	.	.	.	.	.
Uranium 235	.	.	.	.	.	.	.	.	.
Uranium 238	.	.	.	.	.	.	.	.	.

(CONTINUED)

Sampling Point	GW-709			GW-731					
Program	SDM			RDM					
Location	LII			CRSDB					
Date Sampled	11/05/96			05/13/96					
Sample Type							DUP		
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)	.	.	.	.	.	.	.	.	.
Gross Alpha	1.63	2.1	3.3	1	4	7.25	1.6	4.1	7.25
Gross Beta	-0.385	3.2	6.46	6.74	5.3	8.27	6.02	5.2	8.27
Cesium 137	.	.	.	.	.	.	.	.	.
Protactinium 234M	.	.	.	.	.	.	.	.	.
Radium (total)	.	.	.	.	.	.	.	.	.
Strontium 89/90	.	.	.	.	.	.	.	.	.
Thorium 234	.	.	.	.	.	.	.	.	.
Uranium 234	.	.	.	.	.	.	.	.	.
Uranium 235	.	.	.	.	.	.	.	.	.
Uranium 238	.	.	.	.	.	.	.	.	.

(CONTINUED)

APPENDIX D.4
Radiological Analytes, CY 1996

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Sampling Point	GW-731								
Program	RDM								
Location	CRSDB								
Date Sampled	05/14/96						05/15/96		
Sample Type	DUP								
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)	.	.	.	.	.	.	.	.	.
Gross Alpha	3.95	4.5	7.15	1	4	7.23	-1.59	0.2	7.2
Gross Beta	4.35	5.1	8.26	7.47	5.4	8.27	1.76	5.4	7.56
Cesium 137	.	.	.	.	.	.	.	.	.
Protactinium 234M	.	.	.	.	.	.	.	.	.
Radium (total)	.	.	.	.	.	.	.	.	.
Strontium 89/90	.	.	.	.	.	.	.	.	.
Thorium 234	.	.	.	.	.	.	.	.	.
Uranium 234	.	.	.	.	.	.	.	.	.
Uranium 235	.	.	.	.	.	.	.	.	.
Uranium 238	.	.	.	.	.	.	.	.	.

(CONTINUED)

Sampling Point	GW-731								
Program	RDM								
Location	CRSDB								
Date Sampled	05/15/96			05/16/96					
Sample Type	DUP						DUP		
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)	.	.	.	.	.	.	.	.	.
Gross Alpha	-2.95	0.2	7.13	-0.98	0.2	7.11	-0.98	0.2	7.13
Gross Beta	0.21	5.2	7.55	0.93	5.3	7.55	-1.86	0.05	7.55
Cesium 137	.	.	.	.	.	.	.	.	.
Protactinium 234M	.	.	.	.	.	.	.	.	.
Radium (total)	.	.	.	.	.	.	.	.	.
Strontium 89/90	.	.	.	.	.	.	.	.	.
Thorium 234	.	.	.	.	.	.	.	.	.
Uranium 234	.	.	.	.	.	.	.	.	.
Uranium 235	.	.	.	.	.	.	.	.	.
Uranium 238	.	.	.	.	.	.	.	.	.

(CONTINUED)

APPENDIX D.4
Radiological Analytes, CY 1996

26

Sampling Point	GW-731								
Program	RDM								
Location	CRSDB								
Date Sampled	10/14/96						10/15/96		
Sample Type	DUP								
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)	.	.	.	.	.	.	.	.	.
Gross Alpha	1.58	1.6	2.37	1.43	1.6	2.38	-0.343	1.5	3.16
Gross Beta	12.9	5.6	7.11	2.55	3.8	6.43	-9.36	5.6	8.39
Cesium 137	.	.	.	.	.	.	.	.	.
Protactinium 234M	.	.	.	.	.	.	.	.	.
Radium (total)	.	.	.	.	.	.	.	.	.
Strontium 89/90	.	.	.	.	.	.	.	.	.
Thorium 234	.	.	.	.	.	.	.	.	.
Uranium 234	.	.	.	.	.	.	.	.	.
Uranium 235	.	.	.	.	.	.	.	.	.
Uranium 238	.	.	.	.	.	.	.	.	.

(CONTINUED)

Sampling Point	GW-731								
Program	RDM								
Location	CRSDB								
Date Sampled	10/15/96			10/16/96					
Sample Type	DUP						DUP		
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)	.	.	.	.	.	.	.	.	.
Gross Alpha	0.792	1.8	3.24	-0.649	1.3	3.19	-0.0343	1.1	3.16
Gross Beta	-8.64	5.9	8.28	-5.76	9.1	7.95	-5.63	7.3	8.32
Cesium 137	.	.	.	.	.	.	.	.	.
Protactinium 234M	.	.	.	.	.	.	.	.	.
Radium (total)	.	.	.	.	.	.	.	.	.
Strontium 89/90	.	.	.	.	.	.	.	.	.
Thorium 234	.	.	.	.	.	.	.	.	.
Uranium 234	.	.	.	.	.	.	.	.	.
Uranium 235	.	.	.	.	.	.	.	.	.
Uranium 238	.	.	.	.	.	.	.	.	.

(CONTINUED)

APPENDIX D.4
Radiological Analytes, CY 1996

27

Sampling Point	GW-731						GW-732		
Program	RDM						RDM		
Location	CRSDB						CRSDB		
Date Sampled	10/17/96						05/13/96		
Sample Type	DUP								
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)	.	.	.	.	.	.	.	.	.
Gross Alpha	0.132	1.3	3.18	-0.007	1.1	3.23	0.4	3.9	7.27
Gross Beta	-6.52	5.1	9.13	-9.71	5.7	8.27	1.76	4.9	8.27
Cesium 137	.	.	.	.	.	.	.	.	.
Protactinium 234M	.	.	.	.	.	.	.	.	.
Radium (total)	.	.	.	.	.	.	.	.	.
Strontium 89/90	.	.	.	.	.	.	.	.	.
Thorium 234	.	.	.	.	.	.	.	.	.
Uranium 234	.	.	.	.	.	.	.	.	.
Uranium 235	.	.	.	.	.	.	.	.	.
Uranium 238	.	.	.	.	.	.	.	.	.

(CONTINUED)

Sampling Point	GW-732								
Program	RDM								
Location	CRSDB								
Date Sampled	05/14/96			05/15/96			05/16/96		
Sample Type									
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)	.	.	.	.	.	.	.	.	.
Gross Alpha	1.6	4.1	7.27	2	4.2	7.24	-3.18	0.2	7.2
Gross Beta	0	0.05	8.27	-1.35	0.05	8.27	-2.9	0.05	7.56
Cesium 137	.	.	.	.	.	.	.	.	.
Protactinium 234M	.	.	.	.	.	.	.	.	.
Radium (total)	.	.	.	.	.	.	.	.	.
Strontium 89/90	.	.	.	.	.	.	.	.	.
Thorium 234	.	.	.	.	.	.	.	.	.
Uranium 234	.	.	.	.	.	.	.	.	.
Uranium 235	.	.	.	.	.	.	.	.	.
Uranium 238	.	.	.	.	.	.	.	.	.

(CONTINUED)

APPENDIX D.4
Radiological Analytes, CY 1996

28

Sampling Point	GW-732								
Program	RDM								
Location	CRSDB								
Date Sampled	10/14/96			10/15/96			10/16/96		
Sample Type									
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)	.	.	.	.	.	.	.	.	.
Gross Alpha	0.304	1.1	2.34	1.11	1.5	2.37	0.169	1.7	3.28
Gross Beta	2.13	4.2	6.53	0.745	2.3	6.19	-10.3	5.5	8.33
Cesium 137	.	.	.	.	.	.	.	.	.
Protactinium 234M	.	.	.	.	.	.	.	.	.
Radium (total)	.	.	.	.	.	.	.	.	.
Strontium 89/90	.	.	.	.	.	.	.	.	.
Thorium 234	.	.	.	.	.	.	.	.	.
Uranium 234	.	.	.	.	.	.	.	.	.
Uranium 235	.	.	.	.	.	.	.	.	.
Uranium 238	.	.	.	.	.	.	.	.	.

(CONTINUED)

Sampling Point	GW-732			GW-742			GW-743		
Program	RDM			AMP			AMP		
Location	CRSDB			CRSP			CRSP		
Date Sampled	10/17/96			02/01/96			02/23/96		
Sample Type									
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)	.	.	.	.	.	.	.	.	.
Gross Alpha	1.56	2	3.21	0.83	4	7.25	-1.38	0.2	6.69
Gross Beta	-6.57	7.9	7.97	3.65	4.7	7.74	-0.1	0.06	8.18
Cesium 137	.	.	.	.	.	.	.	.	.
Protactinium 234M	.	.	.	.	.	.	.	.	.
Radium (total)	.	.	.	.	.	.	.	.	.
Strontium 89/90	.	.	.	.	.	.	.	.	.
Thorium 234	.	.	.	.	.	.	.	.	.
Uranium 234	.	.	.	.	.	.	.	.	.
Uranium 235	.	.	.	.	.	.	.	.	.
Uranium 238	.	.	.	.	.	.	.	.	.

(CONTINUED)

APPENDIX D.4
Radiological Analytes, CY 1996

29

Sampling Point	GW-743			GW-757					
Program	AMP			SDM					
Location	CRSP			LII					
Date Sampled	02/23/96			04/04/96			11/05/96		
Sample Type	DUP								
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)	.	.	.	.	.	.	.	.	.
Gross Alpha	0.2	4.3	6.69	4.58	4.4	7.44	5.71	3	3.24
Gross Beta	4.35	4.6	8.18	3.32	4.8	8.63	4.82	5.4	6.97
Cesium 137	.	.	.	.	.	.	.	.	.
Protactinium 234M	.	.	.	.	.	.	.	.	.
Radium (total)	.	.	.	.	.	.	.	.	.
Strontium 89/90	.	.	.	.	.	.	.	.	.
Thorium 234	.	.	.	.	.	.	.	.	.
Uranium 234	.	.	.	.	.	.	.	.	.
Uranium 235	.	.	.	.	.	.	.	.	.
Uranium 238	.	.	.	.	.	.	.	.	.

(CONTINUED)

Sampling Point	GW-757			GW-796					
Program	SDM			SDM/C					
Location	LII			LV					
Date Sampled	11/05/96			04/10/96			10/03/96		
Sample Type	DUP								
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)	.	.	.	.	.	.	.	.	.
Gross Alpha	5.95	3	3.21	1.58	3.9	7.36	-0.627	1.3	3.19
Gross Beta	3.13	4.1	6.48	5.07	5	8.62	0.826	2.3	7.46
Cesium 137	.	.	.	3.78	2.1	3.92	.	.	.
Protactinium 234M	.	.	.	399	370	664	.	.	.
Radium (total)	.	.	.	.	.	.	.	.	.
Strontium 89/90	.	.	.	.	.	.	.	.	.
Thorium 234	.	.	.	351	73	124	.	.	.
Uranium 234	.	.	.	0.302	0.35	0.536	.	.	.
Uranium 235	.	.	.	0.0249	0.2	0.537	.	.	.
Uranium 238	.	.	.	0.0856	0.21	0.432	.	.	.

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APPENDIX D.4
Radiological Analytes, CY 1996

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Sampling Point	GW-797						GW-798		
Program	SDM						SDM/C		
Location	LV						CDLVII		
Date Sampled	04/09/96			10/03/96			04/09/96		
Sample Type									
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)	-	-	-	-	-	-	-	-	-
Gross Alpha	-1.39	0.24	7.4	-0.74	1.1	3.63	0.2	3.6	7.36
Gross Beta	1.76	4.7	8.62	-4.72	5.2	7.24	0.72	4.6	8.62
Cesium 137	-0.444	3.6	4.22	-	-	-	1.2	1.7	3.11
Protactinium 234M	519	370	678	-	-	-	329	290	537
Radium (total)	-	-	-	-	-	-	-	-	-
Strontium 89/90	-	-	-	-	-	-	-	-	-
Thorium 234	31.7	99	110	-	-	-	194	170	91.8
Uranium 234	0.23	0.27	0.441	-	-	-	0.0892	0.14	0.255
Uranium 235	0.0178	0.14	0.384	-	-	-	0.0964	0.14	0.131
Uranium 238	0.0469	0.094	0.127	-	-	-	0.0893	0.15	0.255

(CONTINUED)

Sampling Point	GW-798			GW-799					
Program	SDM/C			SDM/C					
Location	CDLVII			CDLVII					
Date Sampled	10/03/96			04/08/96			10/02/96		
Sample Type									
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)	.	.	.	.	.	.	.	.	.
Gross Alpha	0.158	1.6	3.19	0.99	3.8	7.38	1	1.9	3.29
Gross Beta	-3.1	3.9	7.98	-0.52	0.05	8.62	-5.11	5.4	7.1
Cesium 137	.	.	.	5.07	3.7	4.52	.	.	.
Protactinium 234M	.	.	.	240	490	862	.	.	.
Radium (total)	.	.	.	.	.	.	.	.	.
Strontium 89/90	.	.	.	.	.	.	.	.	.
Thorium 234	.	.	.	85.1	150	87	.	.	.
Uranium 234	.	.	.	0.151	0.26	0.474	.	.	.
Uranium 235	.	.	.	0	0	0.196	.	.	.
Uranium 238	.	.	.	-0.0403	0.081	0.382	.	.	.

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APPENDIX D.4
Radiological Analytes, CY 1996

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Sampling Point	GW-801								
Program	SDM/C								
Location	LV								
Date Sampled	04/10/96						10/07/96		
Sample Type	DUP								
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)	.	.	.	.	.	.	.	.	.
Gross Alpha	6.92	4.8	7.39	2.18	4	7.42	-0.325	1.5	3.14
Gross Beta	13.5	5.8	8.62	3.01	4.8	8.63	-4.97	5.1	7.25
Cesium 137	6.1	4.1	3.38	-0.329	1.7	2.99	.	.	.
Protactinium 234M	325	360	648	199	300	543	.	.	.
Radium (total)	.	.	.	.	.	.	.	.	.
Strontium 89/90	.	.	.	.	.	.	.	.	.
Thorium 234	11.4	120	111	140	160	88.5	.	.	.
Uranium 234	0.391	0.36	0.484	0.28	0.3	0.471	.	.	.
Uranium 235	0	0	0.2	0.0172	0.14	0.152	.	.	.
Uranium 238	-0.0411	0.083	0.39	0.0452	0.091	0.122	.	.	.

(CONTINUED)

Sampling Point	GW-827						GW-831		
Program	SDM						CMP		
Location	CDLVI						ADB		
Date Sampled	04/16/96			11/05/96			08/27/96		
Sample Type									
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)	.	.	.	.	.	.	.	.	.
Gross Alpha	-2	0.22	7.27	0.437	1.6	3.18	1.64	5.8	8.83
Gross Beta	-2.08	0.05	8.27	1.23	4.3	6.51	-1.64	11	14
Cesium 137	0.000245	3.5	3.48	.	.	.	.	.	.
Protactinium 234M	599	310	639	.	.	.	.	.	.
Radium (total)	.	.	.	.	.	.	.	.	.
Strontium 89/90	.	.	.	.	.	.	.	.	.
Thorium 234	469	69	111	.	.	.	.	.	.
Uranium 234	0.201	0.22	0.308	.	.	.	.	.	.
Uranium 235	0.0583	0.12	0.158	.	.	.	.	.	.
Uranium 238	0.122	0.21	0.384	.	.	.	.	.	.

(CONTINUED)

APPENDIX D.4
Radiological Analytes, CY 1996

32

Sampling Point	GW-831		
Program	CMP		
Location	ADB		
Date Sampled	10/01/96		
Sample Type			
	ACT	ERR	MDA
ACTIVITY (pCi/L)	.	.	.
Gross Alpha	-0.146	1.5	3.43
Gross Beta	1.36	1.9	6.78
Cesium 137	.	.	.
Protactinium 234M	.	.	.
Radium (total)	.	.	.
Strontium 89/90	.	.	.
Thorium 234	.	.	.
Uranium 234	.	.	.
Uranium 235	.	.	.
Uranium 238	.	.	.

APPENDIX D.4
Radiological Analytes, CY 1996

33

Sampling Point	GW-521								
Program	SDM/C								
Location	LIV								
Date Sampled	01/16/96			04/16/96			07/02/96		
Sample Type									
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)	-	-	-	-	-	-	-	-	-
Gross Alpha	1.16	6.5	15.3	0	0.22	7.19	-1.59	0.2	5.94
Gross Beta	-4.96	0.1	16.1	0.62	5	8.26	-3.11	0.05	8.38
Americium 241	0.155	0.16	0.105	0.0688	0.12	0.216	-0.00454	0.2	0.513
Iodine 129	-1	44	23	6	28	18	1	52	43
Neptunium 237	0.0398	0.0797	0.108	0.0366	0.073	0.0993	0.00882	0.07	0.19
Plutonium 238	-0.00413	0.18	0.467	0.0664	0.16	0.337	0.00786	0.16	0.37
Plutonium 239	-0.0344	0.069	0.326	0.247	0.2	0.112	0.0461	0.11	0.233
Radium (total)	0.77	0.9	1.38	0.69	0.82	1.49	0.13	0.77	2.05
Radium 223/224/226	-	-	-	-	-	-	-	-	-
Radium 228	-	-	-	-	-	-	-	-	-
Strontium 89/90	1.65	0.77	4.11	-0.13	1.3	2.95	-3.06	1.5	3.22
Technetium 99	5	21	12.9	1	3.2	12.9	-11	8.1	13.1
Thorium 228	-	-	-	-	-	-	-	-	-
Thorium 230	-	-	-	-	-	-	-	-	-
Thorium 232	-	-	-	-	-	-	-	-	-
Thorium 234	-	-	-	-	-	-	-	-	-
Tritium (X10)	190	170	260	340	180	193	210	190	216
Tritium	-	-	-	-	-	-	-	-	-
Uranium 234	0.229	0.15	0.0622	0.0983	0.14	0.133	0.296	0.41	0.672
Uranium 235	0	0	0.0775	-0.0426	0.085	0.404	0	0	0.277
Uranium 238	0.03	0.073	0.151	0.148	0.17	0.134	0	0	0.223

(CONTINUED)

Sampling Point	GW-521			OUTFALL301					
Program	SDM/C			ROD					
Location	LIV			KHQ					
Date Sampled	10/01/96			03/13/96			08/06/96		
Sample Type									
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)	-	-	-	-	-	-	-	-	-
Gross Alpha	1.59	2.1	3.4	4.52	4.4	7.13	0.0371	1.2	3.45
Gross Beta	-1.23	4.2	7.62	-4.14	0.05	8.85	2.13	3.4	6.38
Americium 241	0.0611	0.15	0.31	0.0404	0.19	0.415	0.0039	0.0067	0.0122
Iodine 129	-12	37	61	-	-	-	-	-	-
Neptunium 237	0.06	0.084	0.081	0	0	0.486	0.0459	0.065	0.0622
Plutonium 238	-0.0509	0.072	0.3	-	-	-	-	-	-
Plutonium 239	0.0366	0.073	0.0992	-	-	-	-	-	-
Radium (total)	-	-	-	-	-	-	-	-	-
Radium 223/224/226	0.437	0.53	0.915	0.26	0.48	0.468	0.338	0.49	0.568
Radium 228	-	-	-	0.0844	0.44	1.1	0.00135	0.48	1.19
Strontium 89/90	-0.78	1.1	3.73	-1.34	1.1	2.89	-0.13	1.4	3.28
Technetium 99	11.5	4.4	6.53	4	4.2	5.86	0.5	4.2	6.36
Thorium 228	-	-	-	0.276	0.22	0.241	0	0	0.105
Thorium 230	-	-	-	0.219	0.18	0.0991	0.129	0.19	0.316
Thorium 232	-	-	-	0.0364	0.073	0.0988	-0.0267	0.054	0.254
Thorium 234	-	-	-	-0.0657	0.094	0.388	0.319	0.23	0.108
Tritium (X10)	-	-	-	-	-	-	-	-	-
Tritium	40	210	237	-35.8	240	411	116	220	375
Uranium 234	0.111	0.16	0.15	0.608	0.34	0.319	0.649	0.35	0.262
Uranium 235	-0.0502	0.1	0.462	0.0485	0.097	0.131	-0.0345	0.069	0.327
Uranium 238	0.182	0.24	0.371	0.585	0.31	0.106	0.319	0.23	0.108



APPENDIX E
CY 1996 DATA FOR
QUALITY ASSURANCE/QUALITY CONTROL SAMPLES



EXPLANATION

SAMPLING POINT:

- 1090 - Monitoring Well at the United Nuclear Corporation Site
- GW - Monitoring Well
- CBS-1 - Spring Sampling Location Downgradient from the
Construction/Demolition Landfill VII
- OUTFALL301 - Surface Water Sampling Location at Kerr Hollow Quarry
- D - Field Duplicate Sample

LOCATION:

- ADB - Ash Disposal Basin
- CDLVI - Construction/Demolition Landfill VI
- CDLVII - Construction/Demolition Landfill VII
- CRBAWP - Chestnut Ridge Borrow Area Waste Pile
- CRSDB - Chestnut Ridge Sediment Disposal Basin
- CRSP - Chestnut Ridge Security Pits
- ECRWP - East Chestnut Ridge Waste Pile
- KHQ - Kerr Hollow Quarry
- LII - Industrial Landfill II
- LIV - Industrial Landfill IV
- LV - Industrial Landfill V
- RQ - Rogers Quarry
- UNCS - United Nuclear Corporation Site

UNITS:

- ug/L - micrograms per liter (organic analytes)
- mg/L - milligrams per liter (inorganic analytes)
- pCi/L - picoCuries per liter (radiological analytes)

SAMPLE TYPE (Radiological):

- ACT - Activity
- ERR - Counting Error (two standard deviations)
- MDA - Minimum Detectable Activity

NOTES:

- .
- U - Not analyzed
- U - Organic compound not detected at the reported minimum attainable
detection limit.

EXPLANATION (cont'd)

Only results for volatile organic compounds (VOCs) are presented in this appendix. Results for additional organic compounds (AOCs) are not summarized in this appendix because analysis for these compounds was performed only for SWDF monitoring locations. The following table shows the number of QA/QC samples that were analyzed for each parameter group.

Parameter Group	Trip Blanks	Laboratory Blanks	Equipment Rinsates	Field Blanks
VOCs	78	46	26	3
AOCs	54	37	22	0
Total Samples	132	83	48	3

Only three AOCs were detected in QA/QC samples: ethanol (in four laboratory blanks), and 1,2-dichlorobutene and 1,4-dichlorobutene (in one laboratory blank). These compounds were not detected in groundwater or surface water samples.

Organic Compounds Detected in QA/QC Samples, CY 1996

Trip Blank Samples	Quarter of CY 1996				Annual Total
	First	Second	Third	Fourth	
Total Number of Samples	14	35	6	23	78
Samples With VOCs	8	19	5	13	45
Percent Contaminated	57	54	83	57	58
Acetone	1	3	0	1	5
2-Butanone	1	7	0	2	10
Carbon Disulfide	0	1	0	0	1
Chloroform	0	6	3	11	20
1,2-Dichloropropane	1	10	4	2	17
Toluene	1	0	0	0	1
1,1,1-Trichloroethane	7	0	0	0	7

Laboratory Blank Samples	Quarter of CY 1996				Annual Total
	First	Second	Third	Fourth	
Total Number of Samples	12	17	6	11	46
Samples With VOCs	4	4	0	1	9
Percent Contaminated	33	24	0	9	20
Acetone	4	0	0	1	5
2-Butanone	4	2	0	1	7
Tetrachloroethene	0	1	0	0	1
1,1,1-Trichloroethane	0	1	0	0	1

Equipment Rinsate Samples	Quarter of CY 1996				Annual Total
	First	Second	Third	Fourth	
Total Number of Samples	4	11	3	8	26
Samples With VOCs	1	9	3	8	21
Percent Contaminated	25	82	100	100	81
Acetone	0	3	2	5	10
2-Butanone	0	1	1	1	3
Chloroform	0	3	3	8	14
1,2-Dichloropropane	0	6	1	1	8
2-Hexanone	0	0	2	0	2
1,1,1-Trichloroethane	1	0	0	0	1

Field Blank Samples	Quarter of CY 1996				Annual Total
	First	Second	Third	Fourth	
Total Number of Samples	1	1	0	1	3
Samples With VOCs	1	1	0	1	3
Percent Contaminated	100	100	.	100	100
Acetone	1	0	0	0	1
Chloroform	0	0	0	1	1
1,2-Dichloropropane	0	1	0	0	1



APPENDIX E.1

**CORRELATION OF GROUNDWATER AND SURFACE WATER
SAMPLES TO ASSOCIATED BLANKS**

APPENDIX E.1
Correlation of Samples to Associated Blanks
First Quarter 1996

Sampling Point	Location	Date Sampled	Sample No.	Trip Blank No.	Lab Blank No.
GW-141	LIV	01/04/96	960105-005	960105-007	960111-024
GW-141 D	LIV	01/04/96	960105-012	960105-007	960109-004
GW-142	KHQ	01/04/96	960104-054	960104-056	960109-004
GW-143	KHQ	01/18/96	960122-014	960122-016	960123-001
GW-144	KHQ	01/22/96	960122-076	960122-078	960123-025
GW-144 D	KHQ	01/22/96	960122-079	960122-078	960123-025
GW-145	KHQ	01/23/96	960123-055	960123-057	960124-017
GW-146	KHQ	01/18/96	960122-017	960122-016	960123-001
GW-147	KHQ	01/10/96	960110-125	960110-127	960111-020
GW-175	CRSP	02/25/96	960226-013	960226-015	960227-066
GW-177	CRSP	02/25/96	960225-020		960227-009
GW-217	LIV	01/03/96	960104-001	960104-003	960105-023
GW-231	KHQ	01/10/96	960110-123	960110-127	960111-020
GW-305	LIV	01/17/96	960118-003	960118-050	960119-022
GW-521	LIV	01/16/96	960116-045	960116-047	960117-014
GW-522	LIV	01/17/96	960118-048	960118-050	960119-022
GW-608	CRSP	01/29/96	960129-093	960129-095	960131-001
GW-609	CRSP	02/25/96	960226-016	960226-015	960227-066
GW-610	CRSP	02/23/96	960225-011	960225-008	960227-009
GW-611	CRSP	02/25/96	960225-023	960225-022	960227-009
GW-742	CRSP	02/01/96	960201-076	960201-078	960206-001
GW-743	CRSP	02/23/96	960225-006	960225-008	960227-009
GW-743 D	CRSP	02/23/96	960225-009	960225-008	960227-009

APPENDIX E.1
Correlation of Samples to Associated Blanks
Second Quarter 1996

Sampling Point	Location	Date Sampled	Sample No.	Trip Blank No.	Lab Blank No.
1090	UNCS	04/23/96	960423-135	960423-140	960425-003
CBS-1	CDLVII	04/11/96	960411-112	960411-114	960416-034
GW-142	KHQ	04/17/96	960418-048	960418-050	960419-017
GW-143	KHQ	04/23/96	960423-132	960423-134	960425-003
GW-144	KHQ	04/24/96	960424-057	960424-059	960425-003
GW-145	KHQ	04/25/96	960426-012	960426-014	960429-001
GW-146	KHQ	04/25/96	960426-016	960426-014	960429-001
GW-147	KHQ	04/18/96	960419-005	960419-007	960420-011
GW-160	CRBAWP	04/29/96	960429-134	960429-136	960502-004
GW-160 D	CRBAWP	04/29/96	960429-137	960429-136	960502-004
GW-161	CRBAWP	04/26/96	960426-101	960426-103	960502-004
GW-184	RQ	04/30/96	960501-005	960501-007	960516-012
GW-186	RQ	05/01/96	960501-084	960501-086	960516-012
GW-186 D	RQ	05/01/96	960501-087	960501-086	960516-012
GW-187	RQ	04/30/96	960501-003	960501-007	960516-012
GW-188	RQ	04/30/96	960501-001	960501-007	960516-012
GW-203	UNCS	04/17/96	960418-045	960418-047	960419-017
GW-205	UNCS	04/19/96	960419-103	960419-105	960424-002
GW-205 D	UNCS	04/19/96	960419-106	960419-105	960424-002
GW-221	UNCS	04/22/96	960422-171	960422-173	960424-002
GW-231	KHQ	04/18/96	960419-001	960419-007	960420-011
GW-231 D	KHQ	04/18/96	960419-003	960419-007	960420-011
GW-292	ECRWP	05/08/96	960509-007	960509-013	960513-002
GW-292 D	ECRWP	05/08/96	960509-009	960509-013	960513-002
GW-293	ECRWP	05/08/96	960509-011	960509-013	960513-002
GW-294	ECRWP	05/02/96	960502-066	960502-070	960506-031
GW-296	ECRWP	05/02/96	960502-068	960502-070	960506-031
GW-298	CRBAWP	05/01/96	960501-091	960501-093	960506-031
GW-299	CRBAWP	04/30/96	960501-008	960501-014	960516-012
GW-300	CRBAWP	04/30/96	960501-010	960501-014	960516-012
GW-301	CRBAWP	04/30/96	960501-012	960501-014	960516-012
GW-302	UNCS	04/23/96	960423-138	960423-140	960425-003
GW-321	ADB	04/29/96	960429-131	960429-133	960502-004
GW-339	UNCS	04/22/96	960422-174	960422-173	960424-002
GW-512	ADB	05/02/96	960502-063	960502-065	960506-031
GW-513	ADB	04/29/96	960429-129	960429-133	960502-004
GW-514	ADB	05/03/96	960506-003	960506-005	960507-012
GW-514 D	ADB	05/03/96	960506-006	960506-005	960507-012
GW-521	LIV	04/16/96	960418-001	960418-003	960420-011
GW-539	LII	04/02/96	960402-048	960402-050	960403-013
GW-540	CDLVI	04/09/96	960410-001	960410-003	960411-161
GW-541	CDLVI	04/15/96	960417-019	960417-021	960418-018
GW-542	CDLVI	04/16/96	960417-036	960417-033	960418-018
GW-543	CDLVI	04/16/96	960417-039	960417-033	960418-018
GW-543 D	CDLVI	04/16/96	960417-042	960417-033	960418-018
GW-544	CDLVI	04/16/96	960417-045	960417-033	960418-018
GW-546	CDLVI	04/09/96	960410-006	960410-003	960411-161
GW-557	LV	04/04/96	960404-085	960404-080	960409-019
GW-560	CDLVII	04/02/96	960402-034	960402-036	960403-013
GW-560	CDLVII	06/03/96	960603-083	960603-084	960605-019
GW-562	CDLVII	04/02/96	960402-041	960402-036	960403-013
GW-562	CDLVII	06/03/96	960603-081	960603-082	960605-019
GW-564	CDLVII	04/04/96	960404-078	960404-080	960409-019
GW-609	CRSP	04/16/96	960418-014	960418-003	960419-017

APPENDIX E.1
Correlation of Samples to Associated Blanks
Second Quarter 1996

Sampling Point	Location	Date Sampled	Sample No.	Trip Blank No.	Lab Blank No.
GW-709	LII	04/02/96	960402-055	960402-050	960403-013
GW-709 D	LII	04/02/96	960402-059	960402-050	960403-013
GW-757	LII	04/04/96	960404-071	960404-073	960409-019
GW-796	LV	04/10/96	960410-038	960410-040	960411-161
GW-797	LV	04/09/96	960409-142	960409-146	960411-161
GW-798	CDLVII	04/09/96	960409-144	960409-146	960411-161
GW-799	CDLVII	04/08/96	960408-056	960408-058	960409-019
GW-801	LV	04/10/96	960410-045	960410-040	960416-038
GW-801 D	LV	04/10/96	960410-049	960410-040	960416-038
GW-827	CDLVI	04/16/96	960417-031	960417-033	960418-018

APPENDIX E.1
Correlation of Samples to Associated Blanks
Third Quarter 1996

Sampling Point	Location	Date Sampled	Sample No.	Trip Blank No.	Lab Blank No.
GW-141	LIV	07/02/96	960702-108	960702-112	960705-017
GW-141 D	LIV	07/02/96	960702-115	960702-112	960705-017
GW-174	CRSP	08/19/96	960820-062	960820-064	960821-002
GW-174 D	CRSP	08/19/96	960820-065	960820-064	960821-002
GW-217	LIV	07/01/96	960701-155	960701-157	960702-006
GW-305	LIV	07/08/96	960709-018	960709-026	960710-003
GW-521	LIV	07/02/96	960702-104	960702-112	960705-017
GW-522	LIV	07/08/96	960709-022	960709-026	960710-003
GW-612	CRSP	08/29/96	960829-037	960829-039	960830-003
GW-831	ADB	08/27/96	960828-014	960828-016	960829-011

APPENDIX E.1
Correlation of Samples to Associated Blanks
Fourth Quarter 1996

Sampling Point	Location	Date Sampled	Sample No.	Trip Blank No.	Lab Blank No.
1090	UNCS	10/30/96	961031-A04	961031-A03	961118-A42
CBS-1	CDLVII	10/07/96	961007-B43	961007-B51	961011-A35
GW-142	KHQ	10/21/96	961022-A05	961022-A07	961030-A14
GW-142	KHQ	10/22/96	961022-A53	961022-A55	961030-A14
GW-142	KHQ	10/23/96	961024-A02	961024-A04	961112-A19
GW-142	KHQ	10/24/96	961024-A52	961024-A54	961030-A43
GW-143	KHQ	10/21/96	961022-A08	961022-A12	961030-A14
GW-143 D	KHQ	10/21/96	961022-A10	961022-A12	961107-A15
GW-143	KHQ	10/22/96	961022-A48	961022-A50	961030-A14
GW-143 D	KHQ	10/22/96	961022-A51	961022-A50	961112-A19
GW-143	KHQ	10/23/96	961024-A05	961024-A07	961112-A19
GW-143 D	KHQ	10/23/96	961024-A08	961024-A07	961112-A19
GW-143	KHQ	10/24/96	961024-A56	961024-A58	961030-A43
GW-143 D	KHQ	10/24/96	961024-A59	961024-A58	961030-A43
GW-144	KHQ	10/21/96	961022-A13	961022-A19	961105-A08
GW-144	KHQ	10/22/96	961022-A72	961022-A69	961030-A14
GW-144	KHQ	10/23/96	961023-A58	961023-A64	961030-A43
GW-144	KHQ	10/24/96	961024-A70	961024-A74	961030-A43
GW-145	KHQ	10/21/96	961022-A15	961022-A19	961105-A08
GW-145	KHQ	10/22/96	961022-A70	961022-A69	961030-A14
GW-145	KHQ	10/23/96	961023-A60	961023-A64	961112-A19
GW-145	KHQ	10/24/96	961024-A67	961024-A74	961030-A43
GW-203	UNCS	10/28/96	961028-A51	961028-A53	961107-A58
GW-205	UNCS	10/28/96	961028-A49	961028-A53	961107-A58
GW-221	UNCS	10/29/96	961029-A49	961029-A51	961107-A58
GW-221 D	UNCS	10/29/96	961029-A47	961029-A51	961107-A58
GW-231	KHQ	10/21/96	961022-A17	961022-A19	961105-A08
GW-231	KHQ	10/22/96	961022-A67	961022-A69	961030-A14
GW-231	KHQ	10/23/96	961023-A62	961023-A64	961112-A19
GW-231	KHQ	10/24/96	961024-A72	961024-A74	961030-A43
GW-301	CRBAMP	10/01/96	961001-B29	961001-B33	961002-A08
GW-302	UNCS	10/30/96	961031-A01	961031-A03	961118-A42
GW-339	UNCS	10/29/96	961029-A45	961029-A51	961107-A58
GW-521	LIV	10/01/96	961001-B37	961001-B41	961002-A08
GW-539	LII	11/04/96	961104-A16	961104-A18	961119-A68
GW-542	CDLVI	11/05/96	961105-A75	961105-A79	961119-A68
GW-542	CDLVI	12/17/96	961217-A48	961217-A54	961220-A09
GW-543	CDLVI	11/06/96	961107-A01	961107-A03	961121-A32
GW-543 D	CDLVI	11/06/96	961107-A04	961107-A03	961121-A32
GW-543	CDLVI	12/17/96	961217-A49	961217-A54	961220-A09
GW-543 D	CDLVI	12/17/96	961217-A50	961217-A54	961220-A09
GW-544	CDLVI	11/06/96	961107-A06	961107-A03	961121-A32
GW-557	LV	10/02/96	961003-A07	961003-A09	961003-A06
GW-557 D	LV	10/02/96	961003-A14	961003-A09	961003-A06
GW-560	CDLVII	10/02/96	961002-A48	961002-A52	961003-A06
GW-560 D	CDLVII	10/02/96	961002-A44	961002-A52	961003-A06
GW-562	CDLVII	10/02/96	961002-A40	961002-A52	961003-A06
GW-564	CDLVII	10/03/96	961003-A64	961003-A68	961004-A12
GW-609	CRSP	10/07/96	961007-B33	961007-B35	961011-A35
GW-709	LII	11/05/96	961105-A66	961105-A69	961119-A68
GW-757	LII	11/05/96	961105-A58	961105-A69	961119-A68
GW-757 D	LII	11/05/96	961105-A61	961105-A69	961119-A68
GW-757	LII	12/10/96	961210-A32	961210-A33	961217-A34
GW-796	LV	10/03/96	961004-A08	961004-A03	961004-A12

APPENDIX E.1
Correlation of Samples to Associated Blanks
Fourth Quarter 1996

Sampling Point	Location	Date Sampled	Sample No.	Trip Blank No.	Lab Blank No.
GW-797	LV	10/03/96	961004-A01	961004-A03	961004-A12
GW-798	CDLVII	10/03/96	961003-A71	961003-A68	961004-A12
GW-799	CDLVII	10/02/96	961003-A18	961003-A09	961003-A06
GW-801	LV	10/07/96	961007-B47	961007-B51	961011-A35
GW-827	CDLVI	11/05/96	961105-A77	961105-A79	961119-A68
GW-827	CDLVI	12/17/96	961217-A53	961217-A54	961220-A09
GW-831	ADB	10/01/96	961001-B31	961001-B33	961002-A08

APPENDIX E.2

TRIP BLANK DATA SUMMARY

APPENDIX E.2
Organics Detected in Trip Blank Samples, First Quarter 1996

1

Sample Number	960104-003	960104-056	960105-007	960110-127	960116-047	960118-050	960122-016	960122-078
ORGANICS (ug/L)	.	.	.	.	.	.	.	.
Acetone	10U	10U	10U	10U	10U	10U	10U	10U
2-Butanone	10U	10U	10U	10U	10U	10U	13	10U
1,2-Dichloropropane	10U	10U	10U	10U	10U	10U	3	10U
Toluene	10U	10U	10U	10U	10U	10U	1	10U
1,1,1-Trichloroethane	2	2	2	2	10U	10U	10U	2

(CONTINUED)

Sample Number	960123-057	960129-095	960201-078	960225-008	960225-022	960226-015
ORGANICS (ug/L)	.	.	.	.	.	.
Acetone	10U	12	10U	10U	10U	10U
2-Butanone	10U	10U	10U	10U	10U	10U
1,2-Dichloropropane	10U	10U	10U	10U	10U	10U
Toluene	10U	10U	10U	10U	10U	10U
1,1,1-Trichloroethane	2	3	10U	10U	10U	10U

APPENDIX E.2
Organics Detected in Trip Blank Samples, Second Quarter 1996

2

Sample Number	960402-036	960402-050	960404-073	960404-075	960404-080	960408-058	960409-146	960410-003
ORGANICS (ug/L)	-	-	-	-	-	-	-	-
Acetone	10U	10U	10U	10U	3	10U	10U	10U
2-Butanone	10U	10	10U	10U	10U	10U	10U	10U
Carbon Disulfide	10U	10U	10U	10U	10U	10U	10U	1
Chloroform	10U	10U	10U	10U	10U	10U	10U	10U
1,2-Dichloropropane	10U	10U	10U	10U	10U	1	10U	2

(CONTINUED)

Sample Number	960410-040	960411-114	960417-021	960417-033	960418-003	960418-047	960418-050	960419-007
ORGANICS (ug/L)	-	-	-	-	-	-	-	-
Acetone	10U	10U	10U	6	10U	10U	10U	10U
2-Butanone	10U	10U	10U	10U	10U	10U	10	10U
Carbon Disulfide	10U	10U	10U	10U	10U	10U	10U	10U
Chloroform	10U	10U	10U	10U	10U	10U	10U	10U
1,2-Dichloropropane	10U	10U	10U	1	2	10U	1	10U

(CONTINUED)

Sample Number	960419-105	960422-173	960423-134	960423-140	960424-059	960426-014	960426-103	960429-133
ORGANICS (ug/L)	-	-	-	-	-	-	-	-
Acetone	10U	10U	10U	10U	10U	5	10U	10U
2-Butanone	10	10	10	10	10U	10U	10U	10U
Carbon Disulfide	10U	10U	10U	10U	10U	10U	10U	10U
Chloroform	10U	10U	10U	10U	10U	10U	1	10U
1,2-Dichloropropane	1	10U	10U	1	10U	10U	10U	10U

(CONTINUED)

Sample Number	960429-136	960501-007	960501-014	960501-086	960501-093	960502-065	960502-070	960506-005
ORGANICS (ug/L)	-	-	-	-	-	-	-	-
Acetone	10U	10U	10U	10U	10U	10U	10U	10U
2-Butanone	10	10U	10U	10U	10U	10U	10U	10U
Carbon Disulfide	10U	10U	10U	10U	10U	10U	10U	10U
Chloroform	1	10U	10U	1	1	10U	10U	10U
1,2-Dichloropropane	10U	10U	10U	10U	10U	10U	10U	10U

(CONTINUED)

Sample Number	960509-013	960603-082	960603-084
ORGANICS (ug/L)	-	-	-
Acetone	10U	10U	10U
2-Butanone	10U	10U	10U
Carbon Disulfide	10U	10U	10U
Chloroform	10U	2	2
1,2-Dichloropropane	1	2	2

APPENDIX E.2
Organics Detected in Trip Blank Samples, Third Quarter 1996

3

Sample Number	960701-157	960702-112	960709-026	960820-064	960828-016	960829-039
ORGANICS (ug/L)	.	.	.	.	.	.
Chloroform	1	10U	10U	10U	1	2
1,2-Dichloropropane	10U	10U	2	2	1	2

APPENDIX E.2
Organics Detected in Trip Blank Samples, Fourth Quarter 1996

4

Sample Number	961001-B33	961001-B41	961002-A52	961003-A09	961003-A68	961004-A03	961007-B35	961007-B51
ORGANICS (ug/L)	-	-	-	-	-	-	-	-
Acetone	10U	10U	10U	10U	10U	10U	10U	10U
2-Butanone	10U	10U	10U	10U	10U	10U	10U	10U
Chloroform	10U	1	5	3	4	5	1	10U
1,2-Dichloropropane	1	1	10U	10U	10U	10U	10U	10U

(CONTINUED)

Sample Number	961022-A07	961022-A12	961022-A19	961022-A50	961022-A55	961022-A69	961023-A64	961024-A04
ORGANICS (ug/L)	-	-	-	-	-	-	-	-
Acetone	10U	10U	10U	10U	10U	10U	10U	10U
2-Butanone	10U	10U	10U	10U	10U	15	10U	10U
Chloroform	4	3	2	2	10U	10U	10U	10U
1,2-Dichloropropane	10U	10U	10U	10U	10U	10U	10U	10U

(CONTINUED)

Sample Number	961024-A07	961024-A54	961024-A58	961024-A74	961028-A53	961029-A51	961031-A03
ORGANICS (ug/L)	-	-	-	-	-	-	-
Acetone	10U	10U	10U	10U	10U	10U	1
2-Butanone	10U	10U	10U	10U	10U	10U	4
Chloroform	10U	10U	10U	10U	10U	10U	2
1,2-Dichloropropane	10U	10U	10U	10U	10U	10U	10U

APPENDIX E.3

LABORATORY BLANK DATA SUMMARY

APPENDIX E.3
Organics Detected in Laboratory Blank Samples, First Quarter 1996

1

Sample Number	960109-004	960111-020	960111-024	960117-014	960119-022	960123-001	960123-025	960124-017
ORGANICS (ug/L)	.	.	.	.	.	.	.	.
Acetone	10U	22	10U	10U	10U	26	10U	10U
2-Butanone	10U	11	10U	10U	10U	12	10U	10U

(CONTINUED)

Sample Number	960131-001	960206-001	960227-009	960227-066
ORGANICS (ug/L)	.	.	.	.
Acetone	10	8	10U	10U
2-Butanone	10	12	10U	10U

APPENDIX E.3
Organics Detected in Laboratory Blank Samples, Second Quarter 1996

2

Sample Number	960403-013	960409-019	960411-161	960416-034	960416-038	960418-018	960419-017	960420-011
ORGANICS (ug/L)	-	-	-	-	-	-	-	-
2-Butanone	10U	10U	10U	10U	10U	10U	10U	10U
Tetrachloroethene	10U	10U	10U	10U	10U	10U	10U	10U
1,1,1-Trichloroethane	10U	10U	1	10U	10U	10U	10U	10U

(CONTINUED)

Sample Number	960424-002	960425-003	960429-001	960502-004	960506-031	960507-012	960513-002	960516-012
ORGANICS (ug/L)	-	-	-	-	-	-	-	-
2-Butanone	10U	10U	10	10U	10U	10	10U	10U
Tetrachloroethene	10U	10U	10U	10U	10U	10U	10U	10U
1,1,1-Trichloroethane	10U	10U	10U	10U	10U	10U	10U	10U

(CONTINUED)

Sample Number	960605-019
ORGANICS (ug/L)	-
2-Butanone	10U
Tetrachloroethene	10U
1,1,1-Trichloroethane	10U

APPENDIX E.3
Organics Detected in Laboratory Blank Samples, Third Quarter 1996

3

Sample Number	960702-006	960705-017	960710-003	960821-002	960829-011	960830-003
ORGANICS (ug/L)	:	:	:	:	:	:
None Detected	:	:	:	:	:	:

APPENDIX E.3
Organics Detected in Laboratory Blank Samples, Fourth Quarter 1996

4

Sample Number	961002-A08	961003-A06	961004-A12	961011-A35	961030-A14	961030-A43	961105-A08	961107-A15
ORGANICS (ug/L)	.	.	.	.	.	.	.	.
Acetone	10U	10U	10U	10U	10U	10U	10U	10U
2-Butanone	10U	10U	10U	10U	10U	10U	10U	10U

(CONTINUED)

Sample Number	961107-A58	961112-A19	961118-A42
ORGANICS (ug/L)	.	.	.
Acetone	10U	10U	2
2-Butanone	10U	10U	6

APPENDIX E.4

EQUIPMENT RINSATE DATA SUMMARY

APPENDIX E.4
Organic and Inorganic Analytes Detected in Equipment Rinsate Samples, CY 1996

1

Associated Well	1090		GW-142	GW-143	GW-145			GW-156	
Date Sampled	04/23/96	10/30/96	10/24/96	10/24/96	01/23/96	04/25/96	10/24/96	05/16/96	10/17/96
Pump Number	6	4	7	11	2	2	5	11	7
ORGANICS (ug/L)									
Acetone	.	.	.	.	.	.	.	.	.
2-Butanone	10U	3	16	10U	10U	15	15	.	.
Chloroform	10U	6	10U	10U	10U	10U	10U	.	.
1,2-Dichloropropane	10U	1	8	8	10U	1	9	.	.
2-Hexanone	1	1	10U	10U	10U	10U	10U	.	.
1,1,1-Trichloroethane	10U	10U	10U	10U	10U	10U	10U	.	.
METALS (mg/L)									
Aluminum	.	.	<0.02	0.032	<0.02	0.11	<0.02	<0.02	0.022
Barium	.	.	0.014	0.0012	0.039	0.0087	0.0011	0.0011	0.001
Beryllium	.	.	<0.0003	<0.0003	<0.0003	<0.00033	0.00031	<0.0003	<0.0003
Boron	.	.	0.037	0.043	0.068	<0.0044	0.012	0.0046	0.013
Cadmium	.	.	<0.003	<0.003	<0.003	<0.0033	<0.003	<0.003	<0.003
Chromium	.	.	0.031	0.014	<0.01	<0.011	<0.01	<0.01	<0.01
Copper	.	.	<0.004	0.008	0.0044	0.0071	<0.004	<0.004	0.006
Iron	.	.	0.15	0.21	1.2	0.3	0.01	0.14	<0.005
Lead (PMS)	.	.	<0.0005	<0.0005	.	.	0.00081	.	0.00083
Lithium	.	.	<0.004	<0.004	0.0075	<0.0044	<0.004	<0.004	<0.004
Manganese	.	.	0.0029	<0.001	0.0072	0.0029	<0.001	0.0023	<0.001
Nickel	.	.	0.012	<0.01	<0.01	<0.011	<0.01	<0.01	<0.01
Selenium	.	.	<0.05	<0.05	<0.05	<0.056	<0.05	<0.05	<0.05
Silver	.	.	<0.006	<0.006	<0.006	<0.0067	<0.006	<0.006	0.0062
Strontium	.	.	0.0034	0.042	0.76	0.11	0.0036	<0.0004	0.00067
Thallium (PMS)	.	.	<0.0005	<0.0005	.	.	<0.0005	.	0.00073
Uranium (PMS)	.	.	<0.0005	<0.0005	0.00051	<0.0005	<0.0005	<0.0005	<0.0005
Zinc	.	.	0.0044	0.01	0.021	0.0083	0.0026	0.0062	0.018
IONS (MG/L)									
Calcium	.	.	.	.	.	.	.	.	.
Magnesium	.	.	0.14	0.46	33	0.96	0.048	0.52	0.23
Potassium	.	.	0.044	0.11	10	0.18	0.02	0.13	0.067
Sodium	.	.	<0.6	0.71	1.7	<0.67	<0.6	<0.6	0.75
	.	.	0.21	0.18	6.9	0.3	0.12	0.043	0.26

(CONTINUED)

APPENDIX E.4
Organic and Inorganic Analytes Detected in Equipment Rinsate Samples, CY 1996

2

Associated Well	GW-186	GW-292	GW-298	GW-305	GW-514	GW-521	GW-539		
Date Sampled	05/01/96	05/08/96	05/01/96	01/17/96	07/08/96	05/03/96	04/16/96	10/01/96	12/18/96
Pump Number	BA	4	10	7	7	11	7	11	8
ORGANICS (ug/L)	.	.	.	.	.	.	.	.	.
Acetone	10U	40	26	10U	64	10U	10U	53	.
2-Butanone	10U	10U	10U	10U	29	10U	10U	10U	.
Chloroform	2	10U	1	10U	2	10U	10U	2	.
1,2-Dichloropropane	10U	1	1	10U	10U	1	10U	10U	.
2-Hexanone	10U	10U	10U	10U	7	10U	10U	10U	.
1,1,1-Trichloroethane	10U	10U	10U	10U	10U	10U	10U	10U	.
METALS (mg/L)	.	.	.	.	.	.	.	.	.
Aluminum	.	.	<0.02	<0.02	<0.02	.	<0.02	<0.02	<0.02
Barium	.	.	<0.001	0.01	<0.001	.	<0.001	<0.001	0.011
Beryllium	.	.	<0.0003	<0.0003	<0.0003	.	<0.0003	<0.0003	<0.0003
Boron	.	.	0.014	0.02	0.047	.	0.011	0.028	0.024
Cadmium	.	.	<0.003	<0.003	<0.003	.	<0.003	<0.003	<0.003
Chromium	.	.	<0.01	<0.01	<0.01	.	<0.01	<0.01	<0.01
Copper	.	.	<0.004	<0.004	<0.004	.	<0.004	<0.004	<0.004
Iron	.	.	0.0081	0.01	0.011	.	0.024	<0.005	0.011
Lead (PMS)	.	.	.	.	<0.0005	.	.	<0.0005	0.00068
Lithium	.	.	0.0042	<0.004	<0.004	.	<0.004	<0.004	<0.004
Manganese	.	.	<0.001	<0.001	<0.001	.	<0.001	<0.001	0.0031
Nickel	.	.	0.036	<0.01	<0.01	.	<0.01	<0.01	0.098
Selenium	.	.	<0.05	<0.05	<0.05	.	<0.05	<0.05	<0.05
Silver	.	.	<0.006	<0.006	<0.006	.	<0.006	<0.006	<0.006
Strontium	.	.	<0.0004	0.012	0.00078	.	<0.0004	<0.0004	0.019
Thallium (PMS)	.	.	.	.	<0.0005	.	.	<0.0005	<0.0005
Uranium (PMS)	.	.	<0.0005	<0.0005	<0.0005	.	<0.0005	<0.0005	<0.0005
Zinc	.	.	<0.002	0.0045	0.0073	.	0.015	0.0045	0.016
IONS (MG/L)	.	.	.	.	.	.	.	.	.
Calcium	.	.	<0.008	1.2	0.2	.	0.35	0.1	36
Magnesium	.	.	0.02	0.77	0.061	.	0.15	0.021	22
Potassium	.	.	0.73	<0.6	<0.6	.	<0.6	<0.6	<0.6
Sodium	.	.	0.21	0.12	0.18	.	0.11	0.18	2.1

(CONTINUED)

APPENDIX E.4
Organic and Inorganic Analytes Detected in Equipment Rinsate Samples, CY 1996

3

Associated Well	GW-544	GW-562	GW-609			GW-610	GW-612	GW-731	GW-732
Date Sampled	04/16/96	11/25/96	02/25/96	04/16/96	10/07/96	02/23/96	08/29/96	05/16/96	10/17/96
Pump Number	5	11	11	11	5	2	5	5	11
ORGANICS (ug/L)									
Acetone	10U	.	10U	10U	10U	10U	10U	.	.
2-Butanone	10U	.	10U	10U	10U	10U	10U	.	.
Chloroform	10U	.	10U	10U	5	10U	4	.	.
1,2-Dichloropropane	2	.	10U	1	10U	10U	2	.	.
2-Hexanone	10U	.	10U	10U	10U	10U	10U	.	.
1,1,1-Trichloroethane	10U	.	10U	10U	10U	10U	10U	.	.
METALS (mg/L)									
Aluminum	.	0.039	0.031	<0.02	<0.02	0.034	0.06	<0.02	<0.02
Barium	.	<0.001	<0.001	<0.001	0.0017	0.0071	<0.001	<0.001	<0.001
Beryllium	.	<0.00031	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Boron	.	0.012	0.063	0.012	0.028	0.024	0.0054	0.0058	0.043
Cadmium	.	<0.0031	0.0054	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Chromium	.	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Copper	.	<0.0042	0.0045	<0.004	<0.004	0.0073	<0.004	<0.004	<0.004
Iron	.	<0.0052	0.27	<0.005	<0.005	1.8	0.014	0.0089	0.8
Lead (PMS)	.	.	.	.	<0.0005	.	0.00084	.	0.00061
Lithium	.	<0.0042	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Manganese	.	<0.001	0.0016	<0.001	<0.001	0.0042	<0.001	0.0018	0.0028
Nickel	.	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Selenium	.	<0.052	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Silver	.	<0.0062	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	0.0063
Strontium	.	-0.00042	0.0014	<0.0004	0.00068	0.00089	0.00058	<0.0004	<0.0004
Thallium (PMS)	.	.	.	.	<0.0005	.	<0.0005	.	<0.0005
Uranium (PMS)	.	.	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Zinc	.	0.0045	0.018	0.0066	0.004	0.026	0.0041	0.011	0.0042
IONS (MG/L)									
Calcium	.	0.13	0.57	0.083	1.4	0.9	0.2	0.052	0.08
Magnesium	.	0.037	0.19	0.027	0.78	0.13	0.031	0.021	0.0057
Potassium	.	<0.62	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	0.9
Sodium	.	0.031	0.2	0.063	0.12	0.25	0.26	0.026	0.21

(CONTINUED)

APPENDIX E.4

4

Organic and Inorganic Analytes Detected in Equipment Rinsate Samples, CY 1996

Associated Well	GW-757	GW-798	GW-801	GW-831
Date Sampled	04/04/96	10/03/96	04/10/96	10/07/96
Pump Number	11	7	7	11
ORGANICS (ug/L)				
Acetone	10U	10U	10U	23
2-Butanone	11	10U	10U	10U
Chloroform	10U	3	10U	6
1,2-Dichloropropane	10U	10U	10U	10U
2-Hexanone	10U	10U	10U	10U
1,1,1-Trichloroethane	10U	10U	10U	10U
METALS (mg/L)				
Aluminum	.	.	.	0.41
Barium	.	.	.	0.0031
Beryllium	.	.	.	<0.0003
Boron	.	.	.	0.017
Cadmium	.	.	.	<0.003
Chromium	.	.	.	<0.01
Copper	.	.	.	0.0061
Iron	.	.	.	0.35
Lead (PMS)	.	.	.	0.0021
Lithium	.	.	.	<0.004
Manganese	.	.	.	0.014
Nickel	.	.	.	<0.01
Selenium	.	.	.	<0.05
Silver	.	.	.	<0.006
Strontium	.	.	.	0.0026
Thallium (PMS)	.	.	.	<0.0005
Uranium (PMS)	.	.	.	<0.0005
Zinc	.	.	.	0.031
IONS (MG/L)				
Calcium	.	.	.	1.6
Magnesium	.	.	.	0.72
Potassium	.	.	.	1.5
Sodium	.	.	.	0.36

APPENDIX E.4
Radiological Analytes in Equipment Rinsate Samples, CY 1996

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Associated Well	GW-156						GW-305		
Date Sampled	05/16/96			10/17/96			01/17/96		
Pump Number	11			7			7		
Sample Type	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)	.	.	.	.	.	.	.	.	.
Gross Alpha	-1.13	0.19	6.86	-0.818	1.3	3.05	4.15	7	14.9
Gross Beta	-2.06	0.05	7.51	-9.67	5.6	8.3	-2.88	0.1	16.1
Americium 241	.	.	.	.	.	.	0.24	0.17	0.17
Iodine 129	.	.	.	.	.	.	4	28	16
Neptunium 237	.	.	.	.	.	.	0.0285	0.057	0.0773
Plutonium 238	.	.	.	.	.	.	0.171	0.22	0.341
Plutonium 239	.	.	.	.	.	.	0	0	0.14
Radium (total)	.	.	.	.	.	.	2.3	1.4	1.35
Radium 223/224/226	.	.	.	.	.	.	.	.	.
Strontium 89/90	.	.	.	.	.	.	-0.18	0.49	2.81
Technetium 99	.	.	.	.	.	.	-5	7.3	12.9
Tritium (X10)	.	.	.	.	.	.	570	180	260
Tritium	.	.	.	.	.	.	.	.	.
Uranium 234	.	.	.	.	.	.	-0.00223	0.1	0.253
Uranium 235	.	.	.	.	.	.	0.067	0.095	0.0907
Uranium 238	.	.	.	.	.	.	0.0655	0.18	0.177

(CONTINUED)

Associated Well	GW-305			GW-521					
Date Sampled	07/08/96			04/16/96			10/01/96		
Pump Number	7			7			11		
Sample Type	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)	.	.	.	.	.	.	.	.	.
Gross Alpha	-1.89	0.19	5.67	-1.7	0.21	6.85	-0.0131	1.1	3.36
Gross Beta	-5.15	0.05	8.33	-3.09	0.05	8.21	-4.69	5.8	6.74
Americium 241	-0.00712	0.22	0.521	0.194	0.18	0.24	0.0509	0.18	0.379
Iodine 129	1	28	24	4	28	18	15	33	55
Neptunium 237	0	0	0.127	0.12	0.21	0.378	-0.0263	0.053	0.249
Plutonium 238	0	0	0.0869	-0.0548	0.23	0.573	0.144	0.15	0.0975
Plutonium 239	-0.0223	0.045	0.211	1.19	0.51	0.309	0.036	0.072	0.0975
Radium (total)	-0.38	0.52	2.14	1.3	1.2	1.89	.	.	.
Radium 223/224/226	.	.	.	.	.	.	-0.126	0.35	0.836
Strontium 89/90	-2.52	1.7	3.58	1.01	1.9	4.14	0.42	1.1	3.71
Technetium 99	-8	8.3	13.1	-7	8.2	12.9	0	4.4	6.53
Tritium (X10)	630	210	215	700	200	193	.	.	.
Tritium	.	.	.	.	.	.	130	220	237
Uranium 234	0	0	0.183	0.014	0.11	0.301	-0.0398	0.08	0.378
Uranium 235	0	0	0.228	-0.0395	0.079	0.375	0.0715	0.14	0.194
Uranium 238	0.0206	0.16	0.444	-0.0318	0.064	0.301	0.115	0.16	0.156

(CONTINUED)

APPENDIX E.4
Radiological Analytes in Equipment Rinsate Samples, CY 1996

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Associated Well	GW-731			GW-732			GW-798		
Date Sampled	05/16/96			10/17/96			10/03/96		
Pump Number	5			11			7		
Sample Type	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)	.	.	.	.	.	.	.	.	.
Gross Alpha	0.38	4.2	6.85	-0.372	1.7	3.04	-0.33	1.5	3.12
Gross Beta	-5.97	0.05	7.51	-13	5.1	8.23	-7.77	4.5	7.14
Americium 241	.	.	.	.	.	.	.	.	.
Iodine 129	.	.	.	.	.	.	.	.	.
Neptunium 237	.	.	.	.	.	.	.	.	.
Plutonium 238	.	.	.	.	.	.	.	.	.
Plutonium 239	.	.	.	.	.	.	.	.	.
Radium (total)	.	.	.	.	.	.	.	.	.
Radium 223/224/226	.	.	.	.	.	.	.	.	.
Strontium 89/90	.	.	.	.	.	.	.	.	.
Technetium 99	.	.	.	.	.	.	.	.	.
Tritium (X10)	.	.	.	.	.	.	.	.	.
Tritium	.	.	.	.	.	.	.	.	.
Uranium 234	.	.	.	.	.	.	.	.	.
Uranium 235	.	.	.	.	.	.	.	.	.
Uranium 238	.	.	.	.	.	.	.	.	.

(CONTINUED)

Associated Well	GW-801					
Date Sampled	04/10/96			10/07/96		
Pump Number	7			11		
Sample Type	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)	.	.	.	.	.	.
Gross Alpha	-0.38	0.23	7.09	-0.0211	1	3.13
Gross Beta	-0.82	0.05	8.57	-2.5	4	7.93
Americium 241	.	.	.	.	.	.
Iodine 129	.	.	.	.	.	.
Neptunium 237	.	.	.	.	.	.
Plutonium 238	.	.	.	.	.	.
Plutonium 239	.	.	.	.	.	.
Radium (total)	.	.	.	.	.	.
Radium 223/224/226	.	.	.	.	.	.
Strontium 89/90	.	.	.	.	.	.
Technetium 99	.	.	.	.	.	.
Tritium (X10)	.	.	.	.	.	.
Tritium	.	.	.	.	.	.
Uranium 234	.	.	.	.	.	.
Uranium 235	.	.	.	.	.	.
Uranium 238	.	.	.	.	.	.

APPENDIX E.5

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FIELD BLANK DATA SUMMARY

APPENDIX E.5
Organic and Inorganic Analytes Detected in Field Blanks, CY 1996

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Associated Well	GW-609		
Date Sampled	02/26/96	04/16/96	10/07/96
ORGANICS (ug/L)	.	.	.
Acetone	8	10U	10U
Chloroform	10U	10U	5
1,2-Dichloropropane	10U	1	10U
INORGANICS (mg/L)	.	.	.
Aluminum	<0.02	<0.02	0.031
Boron	0.026	0.015	<0.004
Cadmium	<0.003	0.0049	<0.003
Calcium	0.049	0.012	0.38
Magnesium	0.0088	0.0089	0.24
Sodium	0.15	<0.02	0.17
Strontium	<0.0004	<0.0004	0.00041
Zinc	<0.002	0.0071	0.004



APPENDIX F
DATA SCREENING PROCESS AND DQO CRITERIA



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List of Acronyms and Abbreviations

BQR	blank qualification result
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CY	calendar year
DQO	data quality objective
GWPP	Groundwater Protection Program
MDA	minimum detectable activity
$\mu\text{g/L}$	micrograms per liter
mg/L	milligrams per liter
pCi/L	picoCuries per liter
RCRA	Resource Conservation and Recovery Act
ROD	Record of Decision
RPD	relative percent difference
Security Pits	Chestnut Ridge Security Pits
Sediment Disposal Basin	Chestnut Ridge Sediment Disposal Basin
SWDF	Solid Waste Disposal Facility
TDEC	Tennessee Department of Environment and Conservation
VOC	volatile organic compound
1,1,1-TCA	1,1,1-trichloroethane

F.1 INTRODUCTION

The following sections describe the data screening process used to identify calendar year (CY) 1996 groundwater and surface water quality data that did not meet data quality objectives (DQOs) of the Y-12 Groundwater Protection Program (GWPP). Table F-1 shows the DQO criteria applicable to analytical results for principal ions, trace metals, volatile organic compounds (VOCs), radiological analytes (gross alpha, gross beta, and radionuclides), and miscellaneous laboratory analytes (see Table 5 in Appendix B for complete list of analytes).

Table F-1. DQO Criteria for Groundwater and Surface Water Quality Data

DQO Criteria	Principal Ions		Trace Metals	VOCs	Radioanalytes	Misc. Analytes
	Anions	Cations				
Duplicate Sample Results	●	●	●	●	●	●
Filtered/Unfiltered Sample	.	●	●	.	.	.
Ion Charge Balance Errors	●	●	.	.	.	.
False Positive Results	.	.	.	●	.	.
Counting Errors	.	.	.	.	●	.

As noted in Section 3.6 of this annual monitoring report, the data screening process was applied to groundwater and surface water quality data obtained for the multiple purposes of: (1) Resource Conservation and Recovery Act (RCRA) interim status assessment monitoring and interim status detection monitoring; (2) RCRA post-closure detection monitoring and corrective action monitoring, (3) detection monitoring at nonhazardous solid waste disposal facilities (SWDFs), (4) monitoring performed as required by the approved Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Record of Decision (ROD), and (5) monitoring performed as a best management practice of the Y-12 Plant GWPP.

Results that did not meet applicable DQO criteria were screened, i.e., replaced with an appropriate surrogate value (e.g., zero) or considered qualitative (principal ions). The following sections describe the DQO criteria and summarize the CY 1996 results that did not meet applicable criteria. Each section is particularly focused on results for RCRA target compounds defined for the Chestnut Ridge Security Pits (Security Pits), Chestnut Ridge Sediment Disposal Basin (Sediment

Disposal Basin), and Kerr Hollow Quarry in the RCRA post-closure permit for the Chestnut Ridge Hydrogeologic Regime (see Table 7 in Appendix B).

F.2 SCREENED RESULTS FOR DUPLICATE SAMPLES

As shown in Table F-2, duplicate groundwater samples were collected from 18 monitoring wells, including three wells used for RCRA post-closure corrective action monitoring at the Security Pits (point-of-compliance well GW-609, and plume delineation wells GW-557 and GW-801), and two wells used for RCRA post-closure detection monitoring (downgradient well GW-143 at Kerr Hollow Quarry, and downgradient well GW-731 at the Sediment Disposal Basin).

Table F-2. Duplicate Sampling Locations and Dates

RCRA Interim Status Assessment (▲)/RCRA Post-Closure Corrective Action Monitoring (●)									
RCRA Interim Status (▲)/Post-Closure Detection Monitoring (●)									
SWDF Detection Monitoring									
CERCLA Record of Decision Monitoring									
Best Management Practice Monitoring									
Sampling Point and Location		Sampling Date ⁴							
		1st Quarter	2nd Quarter	3rd Quarter	4th Quarter				
GW-141	LIV	01/04/96	.	07/02/96	.			●	
GW-143	KHQ	.	.	.	10/21-24/96			●	
GW-144	KHQ	01/22/96	.	.	.			▲	
GW-160	CRBAWP	.	04/29/96	.	.	●			
GW-174	CRSP	.	.	08/19/96	.	●			
GW-186	RQ	.	05/01/96	.	.	●			
GW-205	UNCS	.	04/19/96	.	.		●		
GW-221	UNCS	.	.	.	10/29/96		●		
GW-231	KHQ	.	04/18/96	.	.			▲	
GW-292	ECRWP	.	05/08/96	.	.	●			
GW-514	ADB	.	05/03/96	.	.	●			
GW-543	CDLVI	.	04/16/96	.	11/06/96			●	
GW-557	LV	.	.	.	10/02/96			●	●
GW-560	CDLVII	.	.	.	10/02/96			●	
GW-709	LII	.	04/02/96	.	.			●	
GW-731	CRSDB	.	05/13-17/96	.	10/14-17/96			●	
GW-743	CRSP	02/23/96	.	.	.				▲
GW-757	LII	.	.	.	11/05/96			●	
GW-801	LV	.	04/10/96	.	.				●

Duplicate samples were analyzed for the suite of laboratory analytes required by the applicable monitoring program. Corresponding results for duplicate samples that differ by an order-of-magnitude or more were screened; each screened result was replaced with a missing value (i.e., no analytical result). Such differences occurred between the duplicate results shown in Table F-3.

Table F-3. Screened Results for Duplicate Groundwater Samples

RCRA Interim Status Assessment (▲)/Post-Closure Corrective Action Monitoring (●)						
RCRA Interim Status (▲)/Post-Closure Detection Monitoring (●)						
CERCLA ROD (▲)/Best Management Practice Monitoring (●)						
SWDF Detection Monitoring						
Sampling Location	Date Sampled	Analyte	Concentration (mg/L)			
			Original	Duplicate		
GW-221	10/29/96	Dissolved Oxygen	8.9	175		▲
GW-557	10/02/96	Boron	0.006	0.082	●	
GW-731	05/15/96	Silver	0.21	< 0.006		●
GW-731	10/16/96	Boron	0.052	< 0.004		●

Silver is a RCRA target compound for the Sediment Disposal Basin, and the screened result for point-of-compliance well GW-731 was included in the statistical data evaluation described in the first, 180-day RCRA post-closure detection monitoring report submitted to the Tennessee Department of Environment and Conservation (TDEC) in August 1996 (see Appendix G).

F.3 SCREENED RESULTS FOR FILTERED/UNFILTERED SAMPLES

Filtered and unfiltered groundwater samples were analyzed for the principal cations and trace metals (see Table 5 in Appendix B). Results were screened (replaced with missing values) if the dissolved (filtered) concentration exceeded the corresponding total (unfiltered) concentration by an order-of-magnitude or more. Screened results were replaced with missing values. Such differences occurred between the filtered and unfiltered sample results shown in Table F-4.

Table F-4. Screened Results for Filtered/Unfiltered Samples.

RCRA Interim Status Assessment (▲)/Post-Closure Corrective Action Monitoring (●)							
RCRA Interim Status (▲)/Post-Closure Detection Monitoring (●)							
CERCLA ROD (▲)/Best Management Practice Monitoring (●)							
SWDF Detection Monitoring							
Sampling Location	Date Sampled	Analyte	Concentration (mg/L)				
			Unfiltered	Filtered			
CBS-1	10/07/96	Zinc	0.0083	0.097	●		
GW-159	05/15/96	★ Silver	0.006	0.11			●
GW-174	08/19/96	Boron	0.0066	0.085		●	
GW-321	04/29/96	Iron	0.026	0.33		●	
GW-544	11/06/96	Boron	0.0093	0.13	●		
GW-562	04/02/96	Barium	0.013	0.15	●		
GW-731	05/16/96	★ Silver	0.006	0.27			●
GW-796	10/03/96	Boron	0.004	0.061			●
GW-797	10/03/96	Lead (PMS)	0.0005	0.067	●		
GW-831	10/01/96	★ Lead (PMS)	0.001	0.092			●
Note: ★ = RCRA Target Compound							

The results for wells GW-159 and GW-731 at the Sediment Disposal Basin were included in the RCRA post-closure detection monitoring report submitted to the TDEC in August 1996 (see **Appendix G**). Furthermore, the screened lead concentration (PMS) for well GW-831 represents a loss of data for evaluation, because this well is an RCRA plume delineation well for the Chestnut Ridge Security Pits.

F.4 SCREENED RESULTS FOR PRINCIPAL IONS

Data for the principal anions (bicarbonate alkalinity, carbonate alkalinity, chloride, fluoride, nitrate, and sulfate) and cations (calcium, magnesium, potassium, and sodium) were screened based on the calculated ion charge balance. If the relative percent difference (RPD) exceeded 10% between respective summed milliequivalent concentrations (i.e., molecular weight of the ion divided by the net ionic charge) of the dissolved cations (which exclude digested cations) and the total anions, then results for all the principal ions were considered qualitative. However, the charge balance screening

criterion did not impact the RCRA post-closure corrective action and RCRA post-closure detection monitoring data because none of the major ions are RCRA target compounds.

As summarized below in Table F-5, ion charge balance RPDs for three groundwater samples exceeded 10%.

Table F-5. Groundwater Samples with Unacceptable Ion Charge Balance Errors

RCRA Interim Status Assessment (▲)/Post-Closure Corrective Action Monitoring (●)				
RCRA Interim Status (▲)/Post-Closure Detection Monitoring (●)				
CERCLA ROD (▲)/Best Management Practice Monitoring (●)				
SWDF Detection Monitoring				
Sampling Location	Date Sampled	Charge Balance RPD	Comments	
GW-145	10/24/96	-21%	Low calcium: 29 mg/L	●
GW-609	10/07/96	20%	Low chloride: 1.29 mg/L	●
GW-731	10/17/96	-11%	Low magnesium: 11 mg/L	●

All the principal ion results reported for these samples were screened because the actual source of the charge-balance error cannot be conclusively determined.

F.5 SCREENED RESULTS FOR VOLATILE ORGANIC COMPOUNDS

Results for the laboratory blank and trip blank samples associated with each groundwater sample were used to screen false positive results (i.e., sampling and/or analytical artifacts) for the VOCs listed in Appendix B, Table 5. A false positive result was defined as a VOC concentration (in micrograms per liter [$\mu\text{g/L}$]) reported for the groundwater sample that was less than the blank qualification result (BQR) for the respective compound. The BQRs for acetone, methylene chloride, toluene, and 2-butanone (common laboratory reagents) represented the highest concentration in either associated blank sample multiplied by a factor of ten; BQRS for all other VOCs were similarly calculated using a factor of five (U.S. Environmental Protection Agency 1988). Zero served as the surrogate value for false positive VOC results.

As summarized in Table F-6, the CY 1996 groundwater and surface water quality data included a total of 16 false positive results for two common laboratory reagents (2-butanone and

acetone), and three false positive results for 1,1,1-trichloroethane (1,1,1-TCA), which is a principal component of the dissolved VOC plume believed to originated from the western trench area at the Security Pits.

Table F-6. False Positive Results for VOCs

RCRA Interim Status Assessment (▲)/Post-Closure Corrective Action Monitoring (●)								
RCRA Interim Status (▲)/Post-Closure Detection Monitoring (●)								
CERCLA ROD(▲)/Best Management Practice Monitoring (●)								
SWDF Detection Monitoring								
Compound	Reporting Limit (µg/L)	Sampling Location	Date Sampled	Result (µg/L)	BQR			
					Lab. Blank	Trip Blank		
2-Butanone	10	1090	10/30/96	5	60	.	▲	
2-Butanone	10	GW-144	10/22/96	14	.	150		●
2-Butanone	10	GW-145	10/22/96	17	.	150		●
2-Butanone	10	GW-146	01/18/96	13	.	130		▲
2-Butanone	10	GW-147	01/10/96	10	110	.		▲
2-Butanone	10	GW-231	01/10/96	12	110	.		▲
2-Butanone	10	GW-231	10/22/96	12	.	150		●
Acetone	10	GW-302	10/30/96	1	20	.	▲	
2-Butanone	10	GW-302	10/30/96	7	60	.	▲	
2-Butanone	10	GW-514 D	05/03/96	9	100	.	●	
2-Butanone	10	GW-539	04/02/96	11	.	100	●	
1,1,1-TCA	10	GW-540	04/09/96	1	5	.	●	
1,1,1-TCA	10	GW-608	01/29/96	6	.	15		▲
2-Butanone	10	GW-608	01/29/96	12	100	.		▲
2-Butanone	10	GW-742	02/01/96	12	120	.		▲
1,1,1-TCA	10	GW-796	04/10/96	2	5	.	●	●

False positive results for 2-butanone and acetone had no impact on the evaluation of groundwater quality in the Chestnut Ridge Regime. However, false positive results for 1,1,1-TCA represent a loss of data for RCRA evaluation purposes, particularly the screened result for well GW-796, which is a point-of-compliance well located directly south (down dip) of the western trench area at the Security Pits.

F.6 SCREENED RESULTS FOR RADIOANALYTES

Results for radioanalytes were screened based on the counting error reported with each result. The counting error, reported in picoCuries per liter (pCi/L), expresses the degree of analytical uncertainty, and is defined as twice the sample standard deviation. Results for gross alpha, gross beta, and radionuclides were screened (replaced with missing values) if the reported activity for each radioanalyte exceeded the specified minimum detectable activity (MDA), but was less than the reported counting error. These screened results are summarized in Table F-7.

Table F-7. Screened Results for Radioanalytes

RCRA Interim Status Assessment (▲)/Post-Closure Corrective Action Monitoring (●)								
RCRA Interim Status (▲)/Post-Closure Detection Monitoring (●)								
CERCLA ROD (▲)/Best Management Practice Monitoring (●)								
SWDF Detection Monitoring								
Radioanalyte	Sampling Location	Date Sampled	MDA (pCi/L)	Activity ± Counting Error (pCi/L)				
Uranium-238	CBS-1	04/11/96	0.103	0.114 ± 0.13	●			
Uranium-235	GW-142	04/17/96	0.134	0.148 ± 0.17				▲
Uranium-234	GW-221	04/22/96	0.154	0.228 ± 0.23				▲
Americium-241	GW-521	01/16/96	0.105	0.155 ± 0.16	●			
Uranium-238	GW-521	04/16/96	0.134	0.148 ± 0.17	●			
Thorium-234	GW-540	04/09/96	137	224 ± 300	●			
Cesium-137	GW-543 D	04/16/96	3.43	3.7 ± 4	●			
Uranium-234	GW-543 D	05/16/96	0.125	0.138 ± 0.16	●			
Uranium-238	GW-546	04/09/96	0.162	0.18 ± 0.21	●			
Thorium-234	GW-557	04/04/96	133	396 ± 410	●			
Thorium-234	GW-801 D	04/10/96	88.5	140 ± 160	●			
D = Duplicate sample								

None of these screened results were for RCRA target compounds. The bulk of these results are for samples from wells used for SWDF detection monitoring because only samples from these wells were analyzed for the specified radioanalytes.

F.7 SUMMARY AND CONCLUSIONS

The overwhelming majority of analytical results reported for the CY 1996 groundwater and surface water samples met applicable DQOs of the Y-12 Plant GWPP. Screened data included four duplicate sample results and ten total/dissolved trace metal concentrations that differ by an order-of-magnitude or more; 16 false positive results for VOCs, most of which probably reflect contamination from the laboratory environment; and 11 radioisotope results that exceed MDAs but are less than the associated counting errors. Additionally, principal ion data for three groundwater samples are not suitable for qualitative evaluation because of charge balance errors. However, the outcome of the data screening process resulted in minimal loss of data quality with respect to RCRA groundwater monitoring purposes in the Chestnut Ridge Regime.

APPENDIX G

**CY 1996 SEMIANNUAL RCRA POST-CLOSURE
DETECTION MONITORING STATISTICAL EVALUATION DATA**



APPENDIX G.1

CHESTNUT RIDGE SEDIMENT DISPOSAL BASIN
First 180-Day Reporting Period, CY 1996

SUMMARY OF POST-CLOSURE DETECTION MONITORING
AT THE CHESTNUT RIDGE SEDIMENT DISPOSAL BASIN (CRSDB)
FIRST, 180-DAY REPORTING PERIOD OF CALENDAR YEAR (CY) 1996

Conditions IV.D and IV.F of post-closure permit number TNHW-088 require specific sample collection protocols and a statistical evaluation of semiannual post-closure detection monitoring data. The required target list compounds are cadmium, chromium, lead, mercury, nickel, silver, and total uranium. Statistical evaluations are as follows:

1. Collection of four replicate samples at a suitable time interval to account for chemical variability in the groundwater system. Four replicate samples collected over four consecutive days (not more than 24 hours apart) are specified to comply with this requirement.
2. Statistical comparison of target list compound concentrations at each groundwater monitoring well at the point of compliance to background values derived from the upgradient well (Well GW-159) using a variance test. Analysis of variance (ANOVA) is specified for parametric data distribution. Alternately, a nonparametric variance test may be employed for non-normal data distribution.
3. If the variance test indicates that target list constituent concentrations are higher in downgradient wells as compared with the upgradient well, then comparison of target compound concentrations at each groundwater monitoring well to historical background data (upper tolerance limits [UTLs]) and data within each well (intrawell comparisons) will be conducted to establish whether the variance also exceeds the normal range of concentrations over time.

The two-part test is denoted in the post-closure permit to account for the considerable natural geochemical variability in the karst groundwater system that exists beneath the CRSDB. Both parts of the test must show a statistical increase for the test to be considered valid. The variance test compares the mean value of each target list compound concentration (calculated from the four replicate samples) at each downgradient well to the mean result at the upgradient well; the test is limited to data from a single sampling event. The UTL test compares individual downgradient well results with the maximum expected value (UTL) for a constituent based on historical variability upgradient of the site. The within-well comparisons determine whether a particular result is statistically greater than the range of observed concentrations within a particular well.

For the first semiannual sampling event of CY 1996, a high proportion of nondetected constituents resulted in nonparametric data distributions for all target list parameters. As a result, parametric ANOVA tests could not be conducted; rather, a nonparametric variance test (Kruskal-Wallis Test) was used. The variance test indicated that no statistical differences exist among the four facility monitoring wells for any indicator parameter except total uranium. In the case of total uranium concentrations, downgradient Wells GW-731 and GW-732 were actually significantly less than the remaining downgradient well (Well GW-156) and the upgradient well (Well GW-159). Total uranium concentrations in downgradient Well GW-156 and upgradient Well GW-159 were statistically equal. Because the variance test did not indicate statistically higher indicator parameter concentrations in downgradient wells as compared with the upgradient well, no further comparisons were performed.

However, to evaluate whether the total uranium concentrations in the upgradient well were anomalously high, within-well comparisons were performed using data collected between CY 1991 and CY 1994 for the monitoring well network. In addition, a review of total suspended

solids (TSS) content in the semiannual samples was done. These two evaluations showed that the only significant difference within all of the monitoring wells for indicator parameters was total uranium in Well GW-156 (first semiannual CY 1996 concentrations were significantly less than historical values). In addition, TSS values in the upgradient well were considerably higher than the expected normal range (Enclosure 2). The elevated TSS levels observed in Well GW-159 were apparently produced by agitation during purging. High TSS levels can interfere with the analyses of target list constituents and can produce falsely elevated results, particularly in unfiltered samples. Redevelopment of both Wells GW-156 and GW-159, which were installed in October 1985, is scheduled to be completed prior to the next semiannual sampling event in order to reduce siltation within the screened interval and filter pack and to improve sample quality.

**FIRST 180 DAY 1996 REPORT FOR
CHESTNUT RIDGE SEDIMENT DISPOSAL BASIN
DATA ANALYSIS**



**KRUSKAL-WALLIS TEST RESULTS
(NONPARAMETRIC PROCEDURE USED INSTEAD OF 1-WAY ANOVA)
AND FOLLOW UP MULTIPLE COMPARISON TESTS,
IF INDICATED BY KRUSKAL WALLIS TEST RESULT**

**4 replicate measurements collected
at 1 upgradient and 3 downgradient wells during 2nd Quarter 1996**

COMPARISON OF DOWNGRADIENT WELLS TO UPGRADIENT WELL

MEASUREMENTS REPORTED AS <#, CONVERTED TO # FOR CALCULATIONS

SUMMARY OF KRUSKAL-WALLIS TEST RESULTS
AND MULTIPLE COMPARISON TESTS
CHESTNUT RIDGE SEDIMENT DISPOSAL BASIN

PARAMETER	KRUSKAL-WALLIS TEST RESULT	MULTIPLE COMPARISON TEST RESULTS (Iso-lines indicate "no difference")	Conclusion
Cadmium (mg/L)	There are no statistical differences in the location parameter across 4 monitoring wells		
Chromium (mg/L)	There are no statistical differences in the location parameter across 4 monitoring wells		
Lead (mg/L)	There are no statistical differences in the location parameter across 4 monitoring wells		
Mercury (mg/L)	There are no statistical differences in the location parameter across 4 monitoring wells		
Nickel (mg/L)	There are no statistical differences in the location parameter across 4 monitoring wells		
Silver (mg/L)	There are no statistical differences in the location parameter across 4 monitoring wells		
Uranium (mg/L)	There are statistical differences in the location parameter across 4 monitoring wells	GW-731 GW-732 GW-156 GW-159 ----- -----	GW-731 & GW-732 < GW-156 & GW-159

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RANK OF MEAN RANK	STATION NAME	SAMPLE DATE	CADMIUM ICAP (MG/L)	RANK
1	GW-156	13MAY96	.003	1
		14MAY96	.003	8
		15MAY96	.003	9
		16MAY96	.003	14
2	GW-159	13MAY96	.003	3
		14MAY96	.003	5
		15MAY96	.003	11
		16MAY96	.003	16
3	GW-731	13MAY96	.003	4
		14MAY96	.003	6
		15MAY96	.003	12
		16MAY96	.003	15
4	GW-732	13MAY96	.003	2
		14MAY96	.003	7
		15MAY96	.003	10
		16MAY96	.003	13

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N P A R I W A Y P R O C E D U R E

Wilcoxon Scores (Rank Sums) for Variable M7
Classified by Variable WELLID

WELLID	N	Sum of Scores	Expected Under H0	Std Dev Under H0	Mean Score
GW-156	4	34.0	34.0	0.0	8.50000000
GW-732	4	34.0	34.0	0.0	8.50000000
GW-159	4	34.0	34.0	0.0	8.50000000
GW-731	4	34.0	34.0	0.0	8.50000000

Average Scores were used for Ties

Kruskal-Wallis Test (Chi-Square Approximation)
CHISQ= 0 DF= 3 Prob > CHISQ= 0.9999

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RANK OF MEAN RANK	STATION NAME	SAMPLE DATE	CHROMIUM ICAP (MG/L)	RANK
1	GW-156	13MAY96	0.01	1
		14MAY96	0.01	8
		15MAY96	0.01	9
		16MAY96	0.01	14
2	GW-159	13MAY96	0.01	3
		14MAY96	0.01	5
		15MAY96	0.01	11
		16MAY96	0.01	16
3	GW-731	13MAY96	0.01	4
		14MAY96	0.01	6
		15MAY96	0.01	12
		16MAY96	0.01	15
4	GW-732	13MAY96	0.01	2
		14MAY96	0.01	7
		15MAY96	0.01	10
		16MAY96	0.01	13

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N P A R I W A Y P R O C E D U R E

Wilcoxon Scores (Rank Sums) for Variable M9
Classified by Variable WELLID

WELLID	N	Sum of Scores	Expected Under H0	Std Dev Under H0	Mean Score
GW-156	4	34.0	34.0	0.0	8.50000000
GW-732	4	34.0	34.0	0.0	8.50000000
GW-159	4	34.0	34.0	0.0	8.50000000
GW-731	4	34.0	34.0	0.0	8.50000000

Average Scores were used for Ties

Kruskal-Wallis Test (Chi-Square Approximation)
CHISQ= 0 DF= 3 Prob > CHISQ= 0.9999

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RANK OF MEAN RANK	STATION NAME	SAMPLE DATE	LEAD AAS (MG/L)	RANK
1	GW-156	13MAY96	0.004	1
		14MAY96	0.004	8
		15MAY96	0.004	9
		16MAY96	0.004	13
2	GW-731	13MAY96	0.004	4
		14MAY96	0.004	6
		15MAY96	0.004	11
		16MAY96	0.004	14
3	GW-732	13MAY96	0.004	2
		14MAY96	0.004	7
		15MAY96	0.004	10
		16MAY96	0.004	12
4	GW-159	13MAY96	0.004	3
		14MAY96	0.004	5
		16MAY96	0.004	15
		15MAY96	0.036	16

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N P A R 1 W A Y P R O C E D U R E

Wilcoxon Scores (Rank Sums) for Variable M13A
Classified by Variable WELLID

WELLID	N	Sum of Scores	Expected Under H0	Std Dev Under H0	Mean Score
GW-156	4	32.0	34.0	3.46410162	8.0
GW-732	4	32.0	34.0	3.46410162	8.0
GW-159	4	40.0	34.0	3.46410162	10.0
GW-731	4	32.0	34.0	3.46410162	8.0

Average Scores were used for Ties

Kruskal-Wallis Test (Chi-Square Approximation)
CHISQ= 3.0000 DF= 3 Prob > CHISQ= 0.3916

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RANK OF MEAN RANK	STATION NAME	SAMPLE DATE	MERCURY CVAA (MG/L)	RANK
1	GW-156	13MAY96	.0002	1
		14MAY96	.0002	8
		15MAY96	.0002	9
		16MAY96	.0002	14
2	GW-159	13MAY96	.0002	3
		14MAY96	.0002	5
		15MAY96	.0002	11
		16MAY96	.0002	16
3	GW-731	13MAY96	.0002	4
		14MAY96	.0002	6
		15MAY96	.0002	12
		16MAY96	.0002	15
4	GW-732	13MAY96	.0002	2
		14MAY96	.0002	7
		15MAY96	.0002	10
		16MAY96	.0002	13

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N P A R 1 W A Y P R O C E D U R E

Wilcoxon Scores (Rank Sums) for Variable HG
Classified by Variable WELLID

WELLID	N	Sum of Scores	Expected Under H0	Std Dev Under H0	Mean Score
GW-156	4	34.0	34.0	0.0	8.50000000
GW-732	4	34.0	34.0	0.0	8.50000000
GW-159	4	34.0	34.0	0.0	8.50000000
GW-731	4	34.0	34.0	0.0	8.50000000

Average Scores were used for Ties

Kruskal-Wallis Test (Chi-Square Approximation)
CHISQ= 0 DF= 3 Prob > CHISQ= 0.9999

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RANK OF MEAN RANK	STATION NAME	SAMPLE DATE	NICKEL ICAP (MG/L)	RANK
1	GW-156	13MAY96	0.010	1
		14MAY96	0.010	8
		15MAY96	0.010	9
		16MAY96	0.010	13
2	GW-731	13MAY96	0.010	4
		14MAY96	0.010	6
		15MAY96	0.010	11
		16MAY96	0.010	14
3	GW-732	13MAY96	0.010	2
		14MAY96	0.010	7
		15MAY96	0.010	10
		16MAY96	0.010	12
4	GW-159	13MAY96	0.010	3
		14MAY96	0.010	5
		16MAY96	0.010	15
		15MAY96	0.017	16

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N P A R 1 W A Y P R O C E D U R E

Wilcoxon Scores (Rank Sums) for Variable M18
Classified by Variable WELLID

WELLID	N	Sum of Scores	Expected Under H0	Std Dev Under H0	Mean Score
GW-156	4	32.0	34.0	3.46410162	8.0
GW-732	4	32.0	34.0	3.46410162	8.0
GW-159	4	40.0	34.0	3.46410162	10.0
GW-731	4	32.0	34.0	3.46410162	8.0

Average Scores were used for Ties

Kruskal-Wallis Test (Chi-Square Approximation)
CHISQ= 3.0000 DF= 3 Prob > CHISQ= 0.3916

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RANK OF MEAN RANK	STATION NAME	SAMPLE DATE	SILVER ICAP (MG/L)	RANK
1	GW-156	13MAY96	0.006	1
		14MAY96	0.006	8
		15MAY96	0.006	9
		16MAY96	0.006	13
2	GW-159	13MAY96	0.006	3
		14MAY96	0.006	5
		15MAY96	0.006	11
		16MAY96	0.006	15
3	GW-732	13MAY96	0.006	2
		14MAY96	0.006	7
		15MAY96	0.006	10
		16MAY96	0.006	12
4	GW-731	13MAY96	0.006	4
		14MAY96	0.006	6
		16MAY96	0.006	14
		15MAY96	0.210	16

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N P A R 1 W A Y P R O C E D U R E

Wilcoxon Scores (Rank Sums) for Variable M21
Classified by Variable WELLID

WELLID	N	Sum of Scores	Expected Under H0	Std Dev Under H0	Mean Score
GW-156	4	32.0	34.0	3.46410162	8.0
GW-732	4	32.0	34.0	3.46410162	8.0
GW-159	4	32.0	34.0	3.46410162	8.0
GW-731	4	40.0	34.0	3.46410162	10.0

Average Scores were used for Ties

Kruskal-Wallis Test (Chi-Square Approximation)
CHISQ= 3.0000 DF= 3 Prob > CHISQ= 0.3916

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RANK OF MEAN RANK	STATION NAME	SAMPLE DATE	URANIUM PMS (MG/L)	RANK
1	GW-731	13MAY96	.0005	2
		14MAY96	.0005	3
		15MAY96	.0005	6
		16MAY96	.0005	8
2	GW-732	13MAY96	.0005	1
		14MAY96	.0005	4
		15MAY96	.0005	5
		16MAY96	.0005	7
3	GW-156	16MAY96	.0015	10
		15MAY96	.0018	11
		14MAY96	.0020	14
		13MAY96	.0023	15
4	GW-159	16MAY96	.0013	9
		13MAY96	.0019	12
		14MAY96	.0020	13
		15MAY96	.0030	16

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N P A R 1 W A Y P R O C E D U R E

Wilcoxon Scores (Rank Sums) for Variable UT
Classified by Variable WELLID

WELLID	N	Sum of Scores	Expected Under H0	Std Dev Under H0	Mean Score
GW-156	4	49.5000000	34.0	7.71362431	12.3750000
GW-732	4	18.0000000	34.0	7.71362431	4.5000000
GW-159	4	50.5000000	34.0	7.71362431	12.6250000
GW-731	4	18.0000000	34.0	7.71362431	4.5000000

Average Scores were used for Ties

Kruskal-Wallis Test (Chi-Square Approximation)
CHISQ= 12.914 DF= 3 Prob > CHISQ= 0.0048

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Anderson County, Tennessee

Wells 731, 732, and 156

N P A R 1 W A Y P R O C E D U R E

Wilcoxon Scores (Rank Sums) for Variable UT
Classified by Variable WELLID

WELLID	N	Sum of Scores	Expected Under H0	Std Dev Under H0	Mean Score
GW-156	4	42.0	26.0	4.94821670	10.5000000
GW-732	4	18.0	26.0	4.94821670	4.5000000
GW-731	4	18.0	26.0	4.94821670	4.5000000

Average Scores were used for Ties

Kruskal-Wallis Test (Chi-Square Approximation)
CHISQ= 10.455 DF= 2 Prob > CHISQ= 0.0054

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Anderson County, Tennessee

Wells 732, 156, and 159

N P A R I W A Y P R O C E D U R E

Wilcoxon Scores (Rank Sums) for Variable UT
Classified by Variable WELLID

WELLID	N	Sum of Scores	Expected Under H0	Std Dev Under H0	Mean Score
GW-156	4	33.5000000	26.0	5.77350269	8.37500000
GW-732	4	10.0000000	26.0	5.77350269	2.50000000
GW-159	4	34.5000000	26.0	5.77350269	8.62500000

Average Scores were used for Ties

Kruskal-Wallis Test (Chi-Square Approximation)
CHISQ= 7.6900 DF= 2 Prob > CHISQ= 0.0214

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Chestnut Ridge Sediment Disposal Basin
Anderson County, Tennessee

Wells 731, and 732

N P A R I W A Y P R O C E D U R E

Wilcoxon Scores (Rank Sums) for Variable UT
Classified by Variable WELLID

WELLID	N	Sum of Scores	Expected Under H0	Std Dev Under H0	Mean Score
GW-732	4	18.0	18.0	0.0	4.50000000
GW-731	4	18.0	18.0	0.0	4.50000000

Average Scores were used for Ties
Wilcoxon 2-Sample Test (Normal Approximation)
(with Continuity Correction of .5)

S= 18.0000 Z= 0 Prob > |Z| = 0.9999

T-Test approx. Significance = 0.9999

Kruskal-Wallis Test (Chi-Square Approximation)
CHISQ= 0 DF= 1 Prob > CHISQ= 0.9999

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Chestnut Ridge Sediment Disposal Basin
Anderson County, Tennessee

Wells 732, and 156

N P A R I W A Y P R O C E D U R E

Wilcoxon Scores (Rank Sums) for Variable UT
Classified by Variable WELLID

WELLID	N	Sum of Scores	Expected Under H0	Std Dev Under H0	Mean Score
GW-156	4	26.0	18.0	3.25137334	6.50000000
GW-732	4	10.0	18.0	3.25137334	2.50000000

Average Scores were used for Ties

Wilcoxon 2-Sample Test (Normal Approximation)
(with Continuity Correction of .5)

S= 26.0000 Z= 2.30672 Prob > |Z| = 0.0211

T-Test approx. Significance = 0.0544

Kruskal-Wallis Test (Chi-Square Approximation)
CHISQ= 6.0541 DF= 1 Prob > CHISQ= 0.0139

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Wells 156, and 159

N P A R I W A Y P R O C E D U R E

Wilcoxon Scores (Rank Sums) for Variable UT
Classified by Variable WELLID

WELLID	N	Sum of Scores	Expected Under H0	Std Dev Under H0	Mean Score
GW-156	4	17.5000000	18.0	3.44342023	4.37500000
GW-159	4	18.5000000	18.0	3.44342023	4.62500000

Average Scores were used for Ties

Wilcoxon 2-Sample Test (Normal Approximation)
(with Continuity Correction of .5)

S= 17.5000 Z= 0 Prob > |Z| = 0.9999

T-Test approx. Significance = 0.9999

Kruskal-Wallis Test (Chi-Square Approximation)

CHISQ= 0.02108 DF= 1 Prob > CHISQ= 0.8845

**WILCOXON RANK-SUM TEST
(NONPARAMETRIC PROCEDURE USED INSTEAD OF T-TEST)**

**INTRAWELL COMPARISONS OF 2ND QUARTER 1996 WELL MEASUREMENTS
TO HISTORIC MEASUREMENTS**

**MEASUREMENTS REPORTED AS <#
WERE CONVERTED TO # FOR CALCULATIONS**

**MEASUREMENTS REPORTED AT ELEVATED DETECTION LIMITS
WERE DELETED**

**MEASUREMENTS FOR ANALYTES REPORTED
AT MULTIPLE DETECTION LIMITS
WERE CONVERTED TO THE HIGHER DETECTION LIMIT**

SUMMARY OF WILCOXON RANK-SUM TEST RESULTS
CHESTNUT RIDGE SEDIMENT DISPOSAL BASIN

PARAMETER	WILCOXON RANK-SUM TEST	WELL	CONCLUSION
Cadmium (mg/L)	There are no statistical differences in the location parameter within wells		
Chromium (mg/L)	There are no statistical differences in the location parameter within wells		
Lead (mg/L)	There are no statistical differences in the location parameter within wells		
Mercury (mg/L)	There are no statistical differences in the location parameter within wells		
Nickel (mg/L)	There are no statistical differences in the location parameter within wells		
Silver (mg/L)	There are no statistical differences in the location parameter within wells		
Uranium (mg/L)	There are statistical differences in the location parameter within wells	GW-156	1995 Q4 < Historic

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WELL	PERIOD	SAMPLE DATE	CADMIUM (MG/L)
GW-156	1996 Q2	05/13/96	<0.003
		05/14/96	<0.003
		05/15/96	<0.003
		05/16/96	<0.003
GW-156	Historic	08/20/92	.
		08/23/91	<0.003
		10/30/91	<0.003
		02/14/92	<0.003
		05/09/92	<0.003
		08/17/92	<0.003
		11/13/92	<0.003
		02/24/93	<0.003
		06/15/93	<0.003
		08/12/93	<0.003
		11/30/93	<0.003
		02/12/94	<0.003
		04/07/94	<0.003
		07/09/94	<0.003
		10/20/94	<0.003
GW-159	1996 Q2	05/13/96	<0.003
		05/14/96	<0.003
		05/15/96	<0.003
		05/16/96	<0.003
GW-159	Historic	08/20/92	.
		04/05/94	.
		08/23/91	<0.003
		10/29/91	<0.003
		02/13/92	<0.003
		05/09/92	<0.003
		08/15/92	<0.003
		11/09/92	<0.003
		02/22/93	<0.003
		06/14/93	<0.003
		08/10/93	<0.003
		11/29/93	<0.003
		02/10/94	<0.003
		04/04/94	<0.003
		07/08/94	<0.003
		10/17/94	<0.003
GW-731	1996 Q2	05/13/96	<0.003
		05/14/96	<0.003

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Anderson County, Tennessee

WELL	PERIOD	SAMPLE DATE	CADMIUM (MG/L)
GW-731	1996 Q2	05/15/96	<0.003
		05/16/96	<0.003
GW-731	Historic	08/20/92	.
		09/27/91	<0.003
		10/31/91	<0.003
		02/15/92	<0.003
		05/09/92	<0.003
		08/16/92	<0.003
		11/11/92	<0.003
		02/23/93	<0.003
		06/15/93	<0.003
		08/11/93	<0.003
		11/29/93	<0.003
		02/11/94	<0.003
		04/04/94	<0.003
		07/09/94	<0.003
		10/18/94	<0.003
GW-732	1996 Q2	05/13/96	<0.003
		05/14/96	<0.003
		05/15/96	<0.003
		05/16/96	<0.003
GW-732	Historic	08/20/92	.
		09/27/91	<0.003
		10/30/91	<0.003
		02/14/92	<0.003
		05/09/92	<0.003
		08/16/92	<0.003
		11/12/92	<0.003
		02/23/93	<0.003
		06/15/93	<0.003
		08/12/93	<0.003
		11/30/93	<0.003
		02/12/94	<0.003
		04/06/94	<0.003
		07/09/94	<0.003
		10/19/94	<0.003

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WELL	PERIOD	SAMPLE DATE	CHROMIUM (MG/L)
GW-156	1996 Q2	05/13/96	<0.01
		05/14/96	<0.01
		05/15/96	<0.01
		05/16/96	<0.01
GW-156	Historic	08/20/92	.
		08/23/91	<0.01
		10/30/91	<0.01
		02/14/92	<0.01
		08/17/92	<0.01
		11/13/92	<0.01
		02/24/93	<0.01
		06/15/93	<0.01
		08/12/93	<0.01
		11/30/93	<0.01
		02/12/94	<0.01
		04/07/94	<0.01
		07/09/94	<0.01
		10/20/94	<0.01
		05/09/92	0.01
GW-159	1996 Q2	05/13/96	<0.01
		05/14/96	<0.01
		05/15/96	<0.01
		05/16/96	<0.01
GW-159	Historic	08/20/92	.
		04/05/94	.
		08/23/91	<0.01
		10/29/91	<0.01
		02/13/92	<0.01
		05/09/92	<0.01
		08/15/92	<0.01
		11/09/92	<0.01
		02/22/93	<0.01
		06/14/93	<0.01
		08/10/93	<0.01
		11/29/93	<0.01
		02/10/94	<0.01
		04/04/94	<0.01
		07/08/94	<0.01
		10/17/94	<0.01
GW-731	1996 Q2	05/13/96	<0.01
		05/14/96	<0.01

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WELL	PERIOD	SAMPLE DATE	CHROMIUM (MG/L)
GW-731	1996 Q2	05/15/96	<0.01
		05/16/96	<0.01
GW-731	Historic	08/20/92	.
		09/27/91	<0.01
		10/31/91	<0.01
		02/15/92	<0.01
		08/11/93	<0.01
		11/29/93	<0.01
		02/11/94	<0.01
		04/04/94	<0.01
		07/09/94	<0.01
		10/18/94	<0.01
		02/23/93	0.01
		11/11/92	0.012
		06/15/93	0.013
		05/09/92	0.016
		08/16/92	0.022
GW-732	1996 Q2	05/13/96	<0.01
		05/14/96	<0.01
		05/15/96	<0.01
		05/16/96	<0.01
GW-732	Historic	08/20/92	.
		09/27/91	<0.01
		10/30/91	<0.01
		02/14/92	<0.01
		05/09/92	<0.01
		08/16/92	<0.01
		11/12/92	<0.01
		02/23/93	<0.01
		06/15/93	<0.01
		08/12/93	<0.01
		11/30/93	<0.01
		02/12/94	<0.01
		04/06/94	<0.01
		07/09/94	<0.01
		10/19/94	<0.01

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WELL	PERIOD	SAMPLE DATE	LEAD AAS (MG/L)
GW-156	1996 Q2	05/13/96	<0.004
		05/14/96	<0.004
		05/15/96	<0.004
		05/16/96	<0.004
GW-156	Historic	08/20/92	.
		08/23/91	<0.004
		10/30/91	<0.004
		02/14/92	<0.004
		02/24/93	<0.004
		06/15/93	<0.004
		11/30/93	<0.004
		02/12/94	<0.004
		04/07/94	<0.004
		07/09/94	<0.004
		10/20/94	<0.004
		11/13/92	0.005
		08/12/93	0.0054
		08/17/92	0.0099
		05/09/92	0.027
GW-159	1996 Q2	05/13/96	<0.004
		05/14/96	<0.004
		05/16/96	<0.004
		05/15/96	0.036
GW-159	Historic	08/20/92	.
		04/05/94	.
		08/23/91	<0.004
		10/29/91	<0.004
		02/13/92	<0.004
		05/09/92	<0.004
		11/09/92	<0.004
		02/22/93	<0.004
		06/14/93	<0.004
		08/10/93	<0.004
		11/29/93	<0.004
		02/10/94	<0.004
		04/04/94	<0.004
		07/08/94	<0.004
		10/17/94	<0.004
		08/15/92	0.0058
GW-731	1996 Q2	05/13/96	<0.004
		05/14/96	<0.004

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WELL	PERIOD	SAMPLE DATE	LEAD AAS (MG/L)
GW-731	1996 Q2	05/15/96	<0.004
		05/16/96	<0.004
GW-731	Historic	08/20/92	.
		09/27/91	<0.004
		10/31/91	<0.004
		02/15/92	<0.004
		11/29/93	<0.004
		02/11/94	<0.004
		04/04/94	<0.004
		07/09/94	<0.004
		10/18/94	<0.004
		08/11/93	0.0078
		11/11/92	0.021
		06/15/93	0.032
		02/23/93	0.036
		05/09/92	0.066
		08/16/92	0.068
GW-732	1996 Q2	05/13/96	<0.004
		05/14/96	<0.004
		05/15/96	<0.004
		05/16/96	<0.004
GW-732	Historic	08/20/92	.
		09/27/91	<0.004
		10/30/91	<0.004
		02/14/92	<0.004
		05/09/92	<0.004
		08/16/92	<0.004
		11/12/92	<0.004
		02/23/93	<0.004
		08/12/93	<0.004
		02/12/94	<0.004
		04/06/94	<0.004
		06/15/93	0.012
		07/09/94	0.013
		10/19/94	0.019
		11/30/93	0.022

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WELL	PERIOD	SAMPLE DATE	MERCURY CVAA (MG/L)
GW-156	1996 Q2	05/13/96	<0.0002
		05/14/96	<0.0002
		05/15/96	<0.0002
		05/16/96	<0.0002
GW-156	Historic	08/20/92	.
		08/23/91	<0.0002
		10/30/91	<0.0002
		02/14/92	<0.0002
		05/09/92	<0.0002
		08/17/92	<0.0002
		11/13/92	<0.0002
		02/24/93	<0.0002
		06/15/93	<0.0002
		08/12/93	<0.0002
		11/30/93	<0.0002
		02/12/94	<0.0002
		04/07/94	<0.0002
		07/09/94	<0.0002
		10/20/94	<0.0002
GW-159	1996 Q2	05/13/96	<0.0002
		05/14/96	<0.0002
		05/15/96	<0.0002
		05/16/96	<0.0002
GW-159	Historic	08/20/92	.
		04/05/94	.
		10/29/91	<0.0002
		02/13/92	<0.0002
		05/09/92	<0.0002
		08/15/92	<0.0002
		11/09/92	<0.0002
		02/22/93	<0.0002
		06/14/93	<0.0002
		08/10/93	<0.0002
		11/29/93	<0.0002
		02/10/94	<0.0002
		04/04/94	<0.0002
		07/08/94	<0.0002
		10/17/94	<0.0002
		08/23/91	0.00037
GW-731	1996 Q2	05/13/96	<0.0002
		05/14/96	<0.0002

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WELL	PERIOD	SAMPLE DATE	MERCURY CVAA (MG/L)
GW-731	1996 Q2	05/15/96	<0.0002
		05/16/96	<0.0002
GW-731	Historic	08/20/92	.
		09/27/91	<0.0002
		10/31/91	<0.0002
		02/15/92	<0.0002
		05/09/92	<0.0002
		08/16/92	<0.0002
		11/11/92	<0.0002
		06/15/93	<0.0002
		08/11/93	<0.0002
		11/29/93	<0.0002
		02/11/94	<0.0002
		04/04/94	<0.0002
		07/09/94	<0.0002
		10/18/94	<0.0002
		02/23/93	0.00023
GW-732	1996 Q2	05/13/96	<0.0002
		05/14/96	<0.0002
		05/15/96	<0.0002
		05/16/96	<0.0002
GW-732	Historic	08/20/92	.
		09/27/91	<0.0002
		10/30/91	<0.0002
		02/14/92	<0.0002
		05/09/92	<0.0002
		08/16/92	<0.0002
		11/12/92	<0.0002
		02/23/93	<0.0002
		06/15/93	<0.0002
		08/12/93	<0.0002
		11/30/93	<0.0002
		02/12/94	<0.0002
		04/06/94	<0.0002
		07/09/94	<0.0002
		10/19/94	<0.0002

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WELL	PERIOD	SAMPLE DATE	NICKEL ICAP (MG/L)
GW-156	1996 Q2	05/13/96	<0.01
		05/14/96	<0.01
		05/15/96	<0.01
		05/16/96	<0.01
GW-156	Historic	08/20/92	.
		10/30/91	<0.01
		02/14/92	<0.01
		05/09/92	<0.01
		08/17/92	<0.01
		06/15/93	<0.01
		11/30/93	<0.01
		02/12/94	<0.01
		04/07/94	<0.01
		07/09/94	<0.01
		10/20/94	<0.01
		11/13/92	0.013
		08/23/91	0.016
		02/24/93	0.018
		08/12/93	0.018
GW-159	1996 Q2	05/13/96	<0.01
		05/14/96	<0.01
		05/16/96	<0.01
		05/15/96	0.017
GW-159	Historic	08/20/92	.
		04/05/94	.
		08/23/91	<0.01
		10/29/91	<0.01
		02/13/92	<0.01
		05/09/92	<0.01
		08/15/92	<0.01
		11/09/92	<0.01
		02/22/93	<0.01
		06/14/93	<0.01
		08/10/93	<0.01
		11/29/93	<0.01
		02/10/94	<0.01
		04/04/94	<0.01
		07/08/94	<0.01
		10/17/94	<0.01
GW-731	1996 Q2	05/13/96	<0.01
		05/14/96	<0.01

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WELL	PERIOD	SAMPLE DATE	NICKEL ICAP (MG/L)
GW-731	1996 Q2	05/15/96	<0.01
		05/16/96	<0.01
GW-731	Historic	08/20/92	.
		09/27/91	<0.01
		10/31/91	<0.01
		02/15/92	<0.01
		11/29/93	<0.01
		02/11/94	<0.01
		04/04/94	<0.01
		07/09/94	<0.01
		10/18/94	<0.01
		11/11/92	0.013
		05/09/92	0.015
		08/11/93	0.023
		02/23/93	0.029
		06/15/93	0.029
		08/16/92	0.058
GW-732	1996 Q2	05/13/96	<0.01
		05/14/96	<0.01
		05/15/96	<0.01
		05/16/96	<0.01
GW-732	Historic	08/20/92	.
		09/27/91	<0.01
		10/30/91	<0.01
		02/14/92	<0.01
		05/09/92	<0.01
		08/16/92	<0.01
		02/23/93	<0.01
		06/15/93	<0.01
		08/12/93	<0.01
		11/30/93	<0.01
		02/12/94	<0.01
		04/06/94	<0.01
		07/09/94	<0.01
		10/19/94	<0.01
		11/12/92	0.024

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WELL	PERIOD	SAMPLE DATE	SILVER ICAP (MG/L)
GW-156	1996 Q2	05/13/96	<0.006
		05/14/96	<0.006
		05/15/96	<0.006
		05/16/96	<0.006
GW-156	Historic	08/20/92	.
		08/23/91	<0.006
		10/30/91	<0.006
		02/14/92	<0.006
		05/09/92	<0.006
		08/17/92	<0.006
		11/13/92	<0.006
		02/24/93	<0.006
		06/15/93	<0.006
		08/12/93	<0.006
		11/30/93	<0.006
		02/12/94	<0.006
		04/07/94	<0.006
		07/09/94	<0.006
		10/20/94	<0.006
GW-159	1996 Q2	05/13/96	<0.006
		05/14/96	<0.006
		05/15/96	<0.006
		05/16/96	<0.006
GW-159	Historic	08/20/92	.
		04/05/94	.
		08/23/91	<0.006
		10/29/91	<0.006
		02/13/92	<0.006
		05/09/92	<0.006
		08/15/92	<0.006
		11/09/92	<0.006
		02/22/93	<0.006
		06/14/93	<0.006
		08/10/93	<0.006
		11/29/93	<0.006
		02/10/94	<0.006
		04/04/94	<0.006
		07/08/94	<0.006
		10/17/94	0.0064
GW-731	1996 Q2	05/13/96	<0.006
		05/14/96	<0.006

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WELL	PERIOD	SAMPLE DATE	SILVER ICAP (MG/L)
GW-731	1996 Q2	05/16/96	<0.006
		05/15/96	0.21
GW-731	Historic	08/20/92	.
		09/27/91	<0.006
		10/31/91	<0.006
		02/15/92	<0.006
		05/09/92	<0.006
		08/16/92	<0.006
		11/11/92	<0.006
		02/23/93	<0.006
		06/15/93	<0.006
		08/11/93	<0.006
		11/29/93	<0.006
		02/11/94	<0.006
		04/04/94	<0.006
		07/09/94	<0.006
		10/18/94	<0.006
GW-732	1996 Q2	05/13/96	<0.006
		05/14/96	<0.006
		05/15/96	<0.006
		05/16/96	<0.006
GW-732	Historic	08/20/92	.
		09/27/91	<0.006
		10/30/91	<0.006
		02/14/92	<0.006
		05/09/92	<0.006
		08/16/92	<0.006
		11/12/92	<0.006
		02/23/93	<0.006
		06/15/93	<0.006
		08/12/93	<0.006
		11/30/93	<0.006
		02/12/94	<0.006
		04/06/94	<0.006
		07/09/94	<0.006
		10/19/94	<0.006

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WELL	PERIOD	SAMPLE DATE	URANIUM (MG/L)
GW-156	1996 Q2	05/16/96	0.0015
		05/15/96	0.0018
		05/14/96	0.002
		05/13/96	0.0023
GW-156	Historic	08/20/92	.
		10/20/94	.
		08/12/93	0.002
		11/30/93	0.002
		02/12/94	0.002
		08/23/91	0.003
		10/30/91	0.003
		05/09/92	0.003
		08/17/92	0.003
		11/13/92	0.003
		06/15/93	0.003
		02/24/93	0.004
		02/14/92	0.005
		04/07/94	0.005
		07/09/94	0.007
GW-159	1996 Q2	05/16/96	0.0013
		05/13/96	0.0019
		05/14/96	0.002
		05/15/96	0.003
GW-159	Historic	08/20/92	.
		04/05/94	.
		10/17/94	.
		04/04/94	<0.001
		10/29/91	0.001
		02/13/92	0.001
		02/22/93	0.001
		08/10/93	0.001
		11/29/93	0.001
		02/10/94	0.001
		07/08/94	0.001
		08/23/91	0.002
		05/09/92	0.002
		08/15/92	0.002
		11/09/92	0.002
		06/14/93	0.002
GW-731	1996 Q2	05/13/96	<0.001
		05/14/96	<0.001

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WELL	PERIOD	SAMPLE DATE	URANIUM (MG/L)
GW-731	1996 Q2	05/15/96	<0.001
		05/16/96	<0.001
GW-731	Historic	08/20/92	.
		10/18/94	.
		09/27/91	<0.001
		11/29/93	<0.001
		02/11/94	<0.001
		04/04/94	<0.001
		10/31/91	0.001
		11/11/92	0.001
		02/23/93	0.001
		06/15/93	0.001
		08/11/93	0.001
		05/09/92	0.002
		08/16/92	0.002
		07/09/94	0.004
		02/15/92	0.01
GW-732	1996 Q2	05/13/96	<0.001
		05/14/96	<0.001
		05/15/96	<0.001
		05/16/96	<0.001
GW-732	Historic	08/20/92	.
		10/19/94	.
		10/30/91	<0.001
		02/14/92	<0.001
		05/09/92	<0.001
		08/16/92	<0.001
		11/12/92	<0.001
		02/23/93	<0.001
		04/06/94	<0.001
		09/27/91	0.001
		06/15/93	0.002
		08/12/93	0.002
		11/30/93	0.002
		02/12/94	0.002
		07/09/94	0.005

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----- WELL=GW-156 -----

N P A R I W A Y P R O C E D U R E

Wilcoxon Scores (Rank Sums) for Variable M7
Classified by Variable PERIOD

PERIOD	N	Sum of Scores	Expected Under H0	Std Dev Under H0	Mean Score
1996 Q2	4	38.0	38.0	0.0	9.50000000
Historic	14	133.0	133.0	0.0	9.50000000

Average Scores were used for Ties

Wilcoxon 2-Sample Test (Normal Approximation)
(with Continuity Correction of .5)

S= 38.0000 Z= 0 Prob > |Z| = 0.9999

T-Test approx. Significance = 0.9999

Kruskal-Wallis Test (Chi-Square Approximation)
CHISQ= 0 DF= 1 Prob > CHISQ= 0.9999

----- WELL=GW-156 -----

N P A R I W A Y P R O C E D U R E

Wilcoxon Scores (Rank Sums) for Variable M9
Classified by Variable PERIOD

PERIOD	N	Sum of Scores	Expected Under H0	Std Dev Under H0	Mean Score
1996 Q2	4	38.0	38.0	0.0	9.50000000
Historic	14	133.0	133.0	0.0	9.50000000

Average Scores were used for Ties

Wilcoxon 2-Sample Test (Normal Approximation)
(with Continuity Correction of .5)

S= 38.0000 Z= 0 Prob > |Z| = 0.9999

T-Test approx. Significance = 0.9999

Kruskal-Wallis Test (Chi-Square Approximation)
CHISQ= 0 DF= 1 Prob > CHISQ= 0.9999

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----- WELL=GW-156 -----

N P A R I W A Y P R O C E D U R E

Wilcoxon Scores (Rank Sums) for Variable M13A
Classified by Variable PERIOD

PERIOD	N	Sum of Scores	Expected Under H0	Std Dev Under H0	Mean Score
1996 Q2	4	30.0	38.0	6.85803760	7.5000000
Historic	14	141.0	133.0	6.85803760	10.0714286

Average Scores were used for Ties
Wilcoxon 2-Sample Test (Normal Approximation)
(with Continuity Correction of .5)

S= 30.0000 Z= -1.09361 Prob > |Z| = 0.2741

T-Test approx. Significance = 0.2894

Kruskal-Wallis Test (Chi-Square Approximation)
CHISQ= 1.3608 DF= 1 Prob > CHISQ= 0.2434

----- WELL=GW-156 -----

N P A R I W A Y P R O C E D U R E

Wilcoxon Scores (Rank Sums) for Variable HG
Classified by Variable PERIOD

PERIOD	N	Sum of Scores	Expected Under H0	Std Dev Under H0	Mean Score
1996 Q2	4	38.0	38.0	0.0	9.50000000
Historic	14	133.0	133.0	0.0	9.50000000

Average Scores were used for Ties
Wilcoxon 2-Sample Test (Normal Approximation)
(with Continuity Correction of .5)

S= 38.0000 Z= 0 Prob > |Z| = 0.9999

T-Test approx. Significance = 0.9999

Kruskal-Wallis Test (Chi-Square Approximation)
CHISQ= 0 DF= 1 Prob > CHISQ= 0.9999

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Anderson County, Tennessee

----- WELL=GW-156 -----

N P A R 1 W A Y P R O C E D U R E

Wilcoxon Scores (Rank Sums) for Variable M18
Classified by Variable PERIOD

PERIOD	N	Sum of Scores	Expected Under H0	Std Dev Under H0	Mean Score
1996 Q2	4	30.0	38.0	6.85136311	7.5000000
Historic	14	141.0	133.0	6.85136311	10.0714286

Average Scores were used for Ties

Wilcoxon 2-Sample Test (Normal Approximation)
(with Continuity Correction of .5)

S= 30.0000 Z= -1.09467 Prob > |Z| = 0.2737

T-Test approx. Significance = 0.2889

Kruskal-Wallis Test (Chi-Square Approximation)
CHISQ= 1.3634 DF= 1 Prob > CHISQ= 0.2429

----- WELL=GW-156 -----

N P A R 1 W A Y P R O C E D U R E

Wilcoxon Scores (Rank Sums) for Variable M21
Classified by Variable PERIOD

PERIOD	N	Sum of Scores	Expected Under H0	Std Dev Under H0	Mean Score
1996 Q2	4	38.0	38.0	0.0	9.50000000
Historic	14	133.0	133.0	0.0	9.50000000

Average Scores were used for Ties

Wilcoxon 2-Sample Test (Normal Approximation)
(with Continuity Correction of .5)

S= 38.0000 Z= 0 Prob > |Z| = 0.9999

T-Test approx. Significance = 0.9999

Kruskal-Wallis Test (Chi-Square Approximation)
CHISQ= 0 DF= 1 Prob > CHISQ= 0.9999

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----- WELL=GW-156 -----

N P A R I W A Y P R O C E D U R E

Wilcoxon Scores (Rank Sums) for Variable U_
Classified by Variable PERIOD

PERIOD	N	Sum of Scores	Expected Under H0	Std Dev Under H0	Mean Score
1996 Q2	4	14.500000	36.0	8.57921565	3.6250000
Historic	13	138.500000	117.0	8.57921565	10.6538462

Average Scores were used for Ties

Wilcoxon 2-Sample Test (Normal Approximation)
(with Continuity Correction of .5)

S= 14.5000 Z= -2.44778 Prob > |Z| = 0.0144

T-Test approx. Significance = 0.0263

Kruskal-Wallis Test (Chi-Square Approximation)
CHISQ= 6.2803 DF= 1 Prob > CHISQ= 0.0122

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Anderson County, Tennessee

----- WELL=GW-159 -----

N P A R I W A Y P R O C E D U R E

Wilcoxon Scores (Rank Sums) for Variable M7
Classified by Variable PERIOD

PERIOD	N	Sum of Scores	Expected Under H0	Std Dev Under H0	Mean Score
1996 Q2	4	38.0	38.0	0.0	9.50000000
Historic	14	133.0	133.0	0.0	9.50000000

Average Scores were used for Ties

Wilcoxon 2-Sample Test (Normal Approximation)
(with Continuity Correction of .5)

S= 38.0000 Z= 0 Prob > |Z| = 0.9999

T-Test approx. Significance = 0.9999

Kruskal-Wallis Test (Chi-Square Approximation)

CHISQ= 0 DF= 1 Prob > CHISQ= 0.9999

----- WELL=GW-159 -----

N P A R I W A Y P R O C E D U R E

Wilcoxon Scores (Rank Sums) for Variable M9
Classified by Variable PERIOD

PERIOD	N	Sum of Scores	Expected Under H0	Std Dev Under H0	Mean Score
1996 Q2	4	38.0	38.0	0.0	9.50000000
Historic	14	133.0	133.0	0.0	9.50000000

Average Scores were used for Ties

Wilcoxon 2-Sample Test (Normal Approximation)
(with Continuity Correction of .5)

S= 38.0000 Z= 0 Prob > |Z| = 0.9999

T-Test approx. Significance = 0.9999

Kruskal-Wallis Test (Chi-Square Approximation)

CHISQ= 0 DF= 1 Prob > CHISQ= 0.9999

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----- WELL=GW-159 -----

N P A R I W A Y P R O C E D U R E

Wilcoxon Scores (Rank Sums) for Variable M13A
Classified by Variable PERIOD

PERIOD	N	Sum of Scores	Expected Under H0	Std Dev Under H0	Mean Score
1996 Q2	4	43.500000	38.0	5.14241621	10.8750000
Historic	14	127.500000	133.0	5.14241621	9.1071429

Average Scores were used for Ties
Wilcoxon 2-Sample Test (Normal Approximation)
(with Continuity Correction of .5)

S= 43.5000 Z= 0.972306 Prob > |Z| = 0.3309

T-Test approx. Significance = 0.3445

Kruskal-Wallis Test (Chi-Square Approximation)
CHISQ= 1.1439 DF= 1 Prob > CHISQ= 0.2848

----- WELL=GW-159 -----

N P A R I W A Y P R O C E D U R E

Wilcoxon Scores (Rank Sums) for Variable HG
Classified by Variable PERIOD

PERIOD	N	Sum of Scores	Expected Under H0	Std Dev Under H0	Mean Score
1996 Q2	4	36.0	38.0	3.74165739	9.00000000
Historic	14	135.0	133.0	3.74165739	9.64285714

Average Scores were used for Ties
Wilcoxon 2-Sample Test (Normal Approximation)
(with Continuity Correction of .5)

S= 36.0000 Z= -.400892 Prob > |Z| = 0.6885

T-Test approx. Significance = 0.6935

Kruskal-Wallis Test (Chi-Square Approximation)
CHISQ= 0.28571 DF= 1 Prob > CHISQ= 0.5930

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Anderson County, Tennessee

----- WELL=GW-159 -----

N P A R 1 W A Y P R O C E D U R E

Wilcoxon Scores (Rank Sums) for Variable M18
Classified by Variable PERIOD

PERIOD	N	Sum of Scores	Expected Under H0	Std Dev Under H0	Mean Score
1996 Q2	4	45.0	38.0	3.74165739	11.2500000
Historic	14	126.0	133.0	3.74165739	9.0000000

Average Scores were used for Ties

Wilcoxon 2-Sample Test (Normal Approximation)
(with Continuity Correction of .5)

S= 45.0000 Z= 1.73720 Prob > |Z| = 0.0824

T-Test approx. Significance = 0.1004

Kruskal-Wallis Test (Chi-Square Approximation)

CHISQ= 3.5000 DF= 1 Prob > CHISQ= 0.0614

----- WELL=GW-159 -----

N P A R 1 W A Y P R O C E D U R E

Wilcoxon Scores (Rank Sums) for Variable M21
Classified by Variable PERIOD

PERIOD	N	Sum of Scores	Expected Under H0	Std Dev Under H0	Mean Score
1996 Q2	4	36.0	38.0	3.74165739	9.00000000
Historic	14	135.0	133.0	3.74165739	9.64285714

Average Scores were used for Ties

Wilcoxon 2-Sample Test (Normal Approximation)
(with Continuity Correction of .5)

S= 36.0000 Z= -.400892 Prob > |Z| = 0.6885

T-Test approx. Significance = 0.6935

Kruskal-Wallis Test (Chi-Square Approximation)

CHISQ= 0.28571 DF= 1 Prob > CHISQ= 0.5930

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Anderson County, Tennessee

----- WELL=GW-159 -----

N P A R I W A Y P R O C E D U R E

Wilcoxon Scores (Rank Sums) for Variable U_
Classified by Variable PERIOD

PERIOD	N	Sum of Scores	Expected Under H0	Std Dev Under H0	Mean Score
1996 Q2	4	49.500000	36.0	8.16241386	12.3750000
Historic	13	103.500000	117.0	8.16241386	7.9615385

Average Scores were used for Ties
Wilcoxon 2-Sample Test (Normal Approximation)
(with Continuity Correction of .5)

S= 49.5000 Z= 1.59267 Prob > |Z| = 0.1112

T-Test approx. Significance = 0.1308

Kruskal-Wallis Test (Chi-Square Approximation)
CHISQ= 2.7355 DF= 1 Prob > CHISQ= 0.0981

1996 Groundwater Monitoring Report
Chestnut Ridge Sediment Disposal Basin
Anderson County, Tennessee

----- WELL=GW-731 -----

N P A R I W A Y P R O C E D U R E

Wilcoxon Scores (Rank Sums) for Variable M7
Classified by Variable PERIOD

PERIOD	N	Sum of Scores	Expected Under H0	Std Dev Under H0	Mean Score
1996 Q2	4	38.0	38.0	0.0	9.50000000
Historic	14	133.0	133.0	0.0	9.50000000

Average Scores were used for Ties
Wilcoxon 2-Sample Test (Normal Approximation)
(with Continuity Correction of .5)

S= 38.0000 Z= 0 Prob > |Z| = 0.9999

T-Test approx. Significance = 0.9999

Kruskal-Wallis Test (Chi-Square Approximation)
CHISQ= 0 DF= 1 Prob > CHISQ= 0.9999

----- WELL=GW-731 -----

N P A R I W A Y P R O C E D U R E

Wilcoxon Scores (Rank Sums) for Variable M9
Classified by Variable PERIOD

PERIOD	N	Sum of Scores	Expected Under H0	Std Dev Under H0	Mean Score
1996 Q2	4	30.0	38.0	6.85803760	7.50000000
Historic	14	141.0	133.0	6.85803760	10.0714286

Average Scores were used for Ties
Wilcoxon 2-Sample Test (Normal Approximation)
(with Continuity Correction of .5)

S= 30.0000 Z= -1.09361 Prob > |Z| = 0.2741

T-Test approx. Significance = 0.2894

Kruskal-Wallis Test (Chi-Square Approximation)
CHISQ= 1.3608 DF= 1 Prob > CHISQ= 0.2434

1996 Groundwater Monitoring Report
Chestnut Ridge Sediment Disposal Basin
Anderson County, Tennessee

----- WELL=GW-731 -----

N P A R I W A Y P R O C E D U R E

Wilcoxon Scores (Rank Sums) for Variable M13A
Classified by Variable PERIOD

PERIOD	N	Sum of Scores	Expected Under H0	Std Dev Under H0	Mean Score
1996 Q2	4	26.0	38.0	7.90548746	6.5000000
Historic	14	145.0	133.0	7.90548746	10.3571429

Average Scores were used for Ties
Wilcoxon 2-Sample Test (Normal Approximation)
(with Continuity Correction of .5)

S= 26.0000 Z= -1.45469 Prob > |Z| = 0.1458

T-Test approx. Significance = 0.1640

Kruskal-Wallis Test (Chi-Square Approximation)
CHISQ= 2.3041 DF= 1 Prob > CHISQ= 0.1290

----- WELL=GW-731 -----

N P A R I W A Y P R O C E D U R E

Wilcoxon Scores (Rank Sums) for Variable HG
Classified by Variable PERIOD

PERIOD	N	Sum of Scores	Expected Under H0	Std Dev Under H0	Mean Score
1996 Q2	4	36.0	38.0	3.74165739	9.0000000
Historic	14	135.0	133.0	3.74165739	9.64285714

Average Scores were used for Ties
Wilcoxon 2-Sample Test (Normal Approximation)
(with Continuity Correction of .5)

S= 36.0000 Z= -.400892 Prob > |Z| = 0.6885

T-Test approx. Significance = 0.6935

Kruskal-Wallis Test (Chi-Square Approximation)
CHISQ= 0.28571 DF= 1 Prob > CHISQ= 0.5930

1996 Groundwater Monitoring Report
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Anderson County, Tennessee

----- WELL=GW-731 -----

N P A R 1 W A Y P R O C E D U R E

Wilcoxon Scores (Rank Sums) for Variable M18
Classified by Variable PERIOD

PERIOD	N	Sum of Scores	Expected Under H0	Std Dev Under H0	Mean Score
1996 Q2	4	26.0	38.0	7.89969802	6.5000000
Historic	14	145.0	133.0	7.89969802	10.3571429

Average Scores were used for Ties

Wilcoxon 2-Sample Test (Normal Approximation)
(with Continuity Correction of .5)

S= 26.0000 Z= -1.45575 Prob > |Z| = 0.1455

T-Test approx. Significance = 0.1637

Kruskal-Wallis Test (Chi-Square Approximation)

CHISQ= 2.3075 DF= 1 Prob > CHISQ= 0.1288

----- WELL=GW-731 -----

N P A R 1 W A Y P R O C E D U R E

Wilcoxon Scores (Rank Sums) for Variable M21
Classified by Variable PERIOD

PERIOD	N	Sum of Scores	Expected Under H0	Std Dev Under H0	Mean Score
1996 Q2	4	45.0	38.0	3.74165739	11.2500000
Historic	14	126.0	133.0	3.74165739	9.0000000

Average Scores were used for Ties

Wilcoxon 2-Sample Test (Normal Approximation)
(with Continuity Correction of .5)

S= 45.0000 Z= 1.73720 Prob > |Z| = 0.0824

T-Test approx. Significance = 0.1004

Kruskal-Wallis Test (Chi-Square Approximation)

CHISQ= 3.5000 DF= 1 Prob > CHISQ= 0.0614

1996 Groundwater Monitoring Report
Chestnut Ridge Sediment Disposal Basin
Anderson County, Tennessee

----- WELL=GW-731 -----

N P A R I W A Y P R O C E D U R E

Wilcoxon Scores (Rank Sums) for Variable U_
Classified by Variable PERIOD

PERIOD	N	Sum of Scores	Expected Under H0	Std Dev Under H0	Mean Score
1996 Q2	4	28.0	36.0	6.56584299	7.00000000
Historic	13	125.0	117.0	6.56584299	9.61538462

Average Scores were used for Ties

Wilcoxon 2-Sample Test (Normal Approximation)
(with Continuity Correction of .5)

S= 28.0000 Z= -1.14228 Prob > |Z| = 0.2533

T-Test approx. Significance = 0.2701

Kruskal-Wallis Test (Chi-Square Approximation)

CHISQ= 1.4846 DF= 1 Prob > CHISQ= 0.2231

1996 Groundwater Monitoring Report
Chestnut Ridge Sediment Disposal Basin
Anderson County, Tennessee

----- WELL=GW-732 -----

N P A R I W A Y P R O C E D U R E

Wilcoxon Scores (Rank Sums) for Variable M7
Classified by Variable PERIOD

PERIOD	N	Sum of Scores	Expected Under H0	Std Dev Under H0	Mean Score
1996 Q2	4	38.0	38.0	0.0	9.50000000
Historic	14	133.0	133.0	0.0	9.50000000

Average Scores were used for Ties

Wilcoxon 2-Sample Test (Normal Approximation)
(with Continuity Correction of .5)

S= 38.0000 Z= 0 Prob > |Z| = 0.9999

T-Test approx. Significance = 0.9999

Kruskal-Wallis Test (Chi-Square Approximation)
CHISQ= 0 DF= 1 Prob > CHISQ= 0.9999

----- WELL=GW-732 -----

N P A R I W A Y P R O C E D U R E

Wilcoxon Scores (Rank Sums) for Variable M9
Classified by Variable PERIOD

PERIOD	N	Sum of Scores	Expected Under H0	Std Dev Under H0	Mean Score
1996 Q2	4	38.0	38.0	0.0	9.50000000
Historic	14	133.0	133.0	0.0	9.50000000

Average Scores were used for Ties

Wilcoxon 2-Sample Test (Normal Approximation)
(with Continuity Correction of .5)

S= 38.0000 Z= 0 Prob > |Z| = 0.9999

T-Test approx. Significance = 0.9999

Kruskal-Wallis Test (Chi-Square Approximation)
CHISQ= 0 DF= 1 Prob > CHISQ= 0.9999

1996 Groundwater Monitoring Report
Chestnut Ridge Sediment Disposal Basin
Anderson County, Tennessee

----- WELL=GW-732 -----

N P A R I W A Y P R O C E D U R E

Wilcoxon Scores (Rank Sums) for Variable M13A
Classified by Variable PERIOD

PERIOD	N	Sum of Scores	Expected Under H0	Std Dev Under H0	Mean Score
1996 Q2	4	30.0	38.0	6.85803760	7.5000000
Historic	14	141.0	133.0	6.85803760	10.0714286

Average Scores were used for Ties
Wilcoxon 2-Sample Test (Normal Approximation)
(with Continuity Correction of .5)

S= 30.0000 Z= -1.09361 Prob > |Z| = 0.2741

T-Test approx. Significance = 0.2894

Kruskal-Wallis Test (Chi-Square Approximation)
CHISQ= 1.3608 DF= 1 Prob > CHISQ= 0.2434

----- WELL=GW-732 -----

N P A R I W A Y P R O C E D U R E

Wilcoxon Scores (Rank Sums) for Variable HG
Classified by Variable PERIOD

PERIOD	N	Sum of Scores	Expected Under H0	Std Dev Under H0	Mean Score
1996 Q2	4	38.0	38.0	0.0	9.50000000
Historic	14	133.0	133.0	0.0	9.50000000

Average Scores were used for Ties
Wilcoxon 2-Sample Test (Normal Approximation)
(with Continuity Correction of .5)

S= 38.0000 Z= 0 Prob > |Z| = 0.9999

T-Test approx. Significance = 0.9999

Kruskal-Wallis Test (Chi-Square Approximation)
CHISQ= 0 DF= 1 Prob > CHISQ= 0.9999

1996 Groundwater Monitoring Report
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----- WELL=GW-732 -----

N P A R I W A Y P R O C E D U R E

Wilcoxon Scores (Rank Sums) for Variable M18
Classified by Variable PERIOD

PERIOD	N	Sum of Scores	Expected Under H0	Std Dev Under H0	Mean Score
1996 Q2	4	36.0	38.0	3.74165739	9.00000000
Historic	14	135.0	133.0	3.74165739	9.64285714

Average Scores were used for Ties

Wilcoxon 2-Sample Test (Normal Approximation)
(with Continuity Correction of .5)

S= 36.0000 Z= -.400892 Prob > |Z| = 0.6885

T-Test approx. Significance = 0.6935

Kruskal-Wallis Test (Chi-Square Approximation)
CHISQ= 0.28571 DF= 1 Prob > CHISQ= 0.5930

----- WELL=GW-732 -----

N P A R I W A Y P R O C E D U R E

Wilcoxon Scores (Rank Sums) for Variable M21
Classified by Variable PERIOD

PERIOD	N	Sum of Scores	Expected Under H0	Std Dev Under H0	Mean Score
1996 Q2	4	38.0	38.0	0.0	9.50000000
Historic	14	133.0	133.0	0.0	9.50000000

Average Scores were used for Ties

Wilcoxon 2-Sample Test (Normal Approximation)
(with Continuity Correction of .5)

S= 38.0000 Z= 0 Prob > |Z| = 0.9999

T-Test approx. Significance = 0.9999

Kruskal-Wallis Test (Chi-Square Approximation)
CHISQ= 0 DF= 1 Prob > CHISQ= 0.9999

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----- WELL=GW-732 -----

N P A R I W A Y P R O C E D U R E

Wilcoxon Scores (Rank Sums) for Variable U_
Classified by Variable PERIOD

PERIOD	N	Sum of Scores	Expected Under H0	Std Dev Under H0	Mean Score
1996 Q2	4	26.0	36.0	7.05023988	6.50000000
Historic	13	127.0	117.0	7.05023988	9.76923077

Average Scores were used for Ties

Wilcoxon 2-Sample Test (Normal Approximation)
(with Continuity Correction of .5)

S= 26.0000 Z= -1.34747 Prob > |Z| = 0.1778

T-Test approx. Significance = 0.1966

Kruskal-Wallis Test (Chi-Square Approximation)

CHISQ= 2.0118 DF= 1 Prob > CHISQ= 0.1561



APPENDIX G.1

CHESTNUT RIDGE SEDIMENT DISPOSAL BASIN
Second 180-Day Reporting Period, CY 1996

SUMMARY OF POST-CLOSURE DETECTION MONITORING
AT THE CHESTNUT RIDGE SEDIMENT DISPOSAL BASIN (CRSDB)
SECOND, 180-DAY REPORTING PERIOD OF CALENDAR YEAR (CY) 1996

Conditions IV.D and IV.F of post-closure Permit TNHW-088 require specific sample collection protocols and a statistical evaluation of semiannual post-closure detection monitoring data. The required target list compounds are cadmium, chromium, lead, mercury, nickel, silver, and total uranium. Statistical evaluations are as follows:

1. Four replicate samples are collected at a suitable time interval to account for chemical variability in the groundwater system. Four replicate samples collected over four consecutive days (not more than 24 hours apart) are specified to comply with this requirement.
2. Statistical comparisons of target list compound concentrations at each groundwater monitoring well at the point of compliance with background values derived from the upgradient well (Well GW-159) are performed using a variance test. Analysis of variance (ANOVA) is specified for parametric data distribution. Alternately, a nonparametric variance test may be employed for non-normal data distribution.
3. If the variance test indicates that target list constituent concentrations are higher in downgradient wells as compared with the upgradient well, then comparison of target compound concentrations at each groundwater monitoring well to historical background data (upper tolerance limits [UTLs]) and data within each well (intrawell comparisons) will be conducted to establish whether the variance also exceeds the normal range of concentrations over time.

The two-part test is denoted in the post-closure permit to account for the considerable natural geochemical variability in the karst groundwater system that exists beneath the CRSDB. Both parts of the test must show a statistical increase for the test to be considered valid. The variance test compares the mean value of each target list compound concentration (calculated from the four replicate samples) at each downgradient well with the mean result at the upgradient well; the test is limited to data from a single sampling event. The UTL test compares individual downgradient well results with the maximum expected value (the UTL) for a constituent based on historical variability upgradient of the site. The within-well comparisons determine whether a particular result from a well is statistically greater than the range of historical concentrations observed within that particular well.

For the second semiannual sampling event of CY 1996, a high proportion of nondetected constituents resulted in nonparametric data distributions for all target list parameters. As a result, parametric ANOVA tests could not be conducted; rather, a nonparametric variance test (Kruskal-Wallis Test) was used.

As shown in the summary table, the variance test indicated that no statistical differences exist among the four facility monitoring wells for any indicator parameter except total uranium. In the case of total uranium concentrations, downgradient Wells GW-731 and GW-732 were significantly less than the upgradient well (Well GW-159). Total uranium concentrations in downgradient Well GW-156 and upgradient Well GW-159 were statistically equal. Because the variance test did not indicate statistically higher indicator parameter concentrations in downgradient wells as compared with the upgradient well, comparisons to UTLs were not performed.

To evaluate the effectiveness of well redevelopment efforts conducted in September 1996, within-well comparisons for all target list constituents were performed using data collected from the monitoring well network between CY 1991 and CY 1994. In addition, a comparison of total suspended solids (TSS) content, turbidity, and water levels with target list constituent concentrations was done. The within-well comparisons showed that the only significant differences within all of the monitoring wells for indicator parameters were: (1) total uranium in Well GW-156 (second semiannual sample concentrations were significantly less than historical values) and (2) total lead in Well GW-159 (second semiannual sample concentrations were significantly higher than historical values).

As shown in the summary table below, TSS and turbidity values in Well GW-159 increased substantially over the four-day sampling period, despite the redevelopment efforts conducted in September 1996. Water level measurements taken prior to sampling each of the four days show that the well does not recover appreciably between the daily sampling events. The elevated TSS and turbidity levels observed in Well GW-159 were apparently produced as a result of the low water level within the well and the resultant sediment agitation produced by purging. The elevated TSS and turbidity levels interfere with the analyses of target list constituents and can produce falsely elevated results, particularly in unfiltered samples. By comparison, TSS and turbidity

Well/Sample Date	TSS ⁽¹⁾	Turbidity ⁽²⁾	Water Level ⁽³⁾	Lead ⁽¹⁾	Uranium ⁽¹⁾
GW-159:					
10/14/96	5	11.4	117.90	0.0014	0.0012
10/15/96	17	73.8	142.40	0.0068	0.0015
10/16/96	6.5	25.0	146.75	0.0041	0.0012
10/17/96	502	488	145.88	0.022	0.0022
GW-156:					
10/14/96	561	460	143.35	0.004	0.0025
10/15/96	2	2.92	144.75	0.0042	0.0027
10/16/96	2	5.60	144.85	0.0021	0.0018
10/17/96	<1	3.73	145.00	0.0012	0.0015
GW-731:					
10/14/96	6.5	8.28	124.67	0.001	<0.0005
10/15/96	5	5.68	124.68	0.00053	<0.0005
10/16/96	5	6.49	124.58	0.0013	<0.0005
10/17/96	3	6.37	124.75	0.0014	<0.0005
GW-732:					
10/14/96	4.5	4.2	157.60	0.0026	<0.0005
10/15/96	16	10.2	157.60	0.0015	0.00056
10/16/96	1.5	0.87	157.65	0.00054	0.00071
10/17/96	<1	2.16	154.72	0.00064	<0.0005

(1) Concentrations in mg/L.

(2) Values in nephelometric turbidity units (NTU).

(3) Water levels in feet below top of casing.

levels decreased and water levels remained approximately the same in the three downgradient wells. Consequently, target list constituent concentrations either decreased or did not vary appreciably over the course of the four-day sampling event. Redevelopment efforts for Well GW-156 were successful based on the evaluation.

For the purposes of statistical evaluations, the following baseline assumptions were used:

1. As a conservative assumption for calculations conducted for the Kruskal-Wallis Test, the detection limit was substituted for analytical measurements reported as less than the detection limit.
2. As a conservative assumption for calculations conducted for the Wilcoxon Rank-Sum Test, the detection limit was substituted for analytical measurements reported as less than the detection limit.
3. Measurements reported at detection limits higher than those in the baseline period (1991 through 1994) were deleted from the ranking process.
4. Measurements reported at detection limits lower than those in the baseline period (1991 through 1994) were converted to the baseline (higher) detection limit in the ranking process.

**SECOND 180 DAY 1996 REPORT FOR
CHESTNUT RIDGE SEDIMENT DISPOSAL BASIN**

DATA ANALYSIS

APPENDIX G.2

KERR HOLLOW QUARRY

SUMMARY OF POST-CLOSURE DETECTION MONITORING
AT THE KERR HOLLOW QUARRY (KHQ),
SECOND, 180-DAY REPORTING PERIOD OF CALENDAR YEAR (CY) 1996

1.0 Statistical Methods

Conditions VI.D and VI.F of post-closure Permit TNHW-088 require specific sample collection protocols and a statistical evaluation of semiannual post-closure detection monitoring data. The required target list compounds are cadmium, chromium, lead, mercury, nickel, total uranium, carbon tetrachloride, tetrachloroethene, chloroform, boron, total strontium, gross alpha, and gross beta. Statistical evaluations are as follows:

1. Four replicate samples are collected at a suitable time interval to account for chemical variability in the groundwater system. Four replicate samples collected over four consecutive days (not more than 24 hours apart) are specified to comply with this requirement.
2. Statistical comparisons are performed for all target list compound concentrations (except boron, total strontium, gross alpha, and gross beta) between each groundwater monitoring well at the point of compliance and the upgradient wells (Wells GW-142 and GW-231) using a variance test. Analysis of variance (ANOVA) is specified for parametric data distribution. Alternately, a nonparametric variance test may be employed for nonnormal data distribution.
3. If the variance test indicates that target list constituent concentrations are higher in downgradient wells as compared with the upgradient wells, then comparison of target compound concentrations at each groundwater monitoring well to historical background data (upper tolerance limits [UTLs]) and data within each well (intra-well comparisons) will be conducted to establish whether the variance also exceeds the normal range of concentrations over time. Practical quantitation limits (PQLs) are used where UTLs could not be calculated from the pool of historical data (1986 through 1994) due to a high proportion of nondetected results. For a water matrix, PQLs are set at 10 times the instrument detection limit.
4. Boron and total strontium are nonregulated compounds of concern, and both exhibit a high degree of variability in concentration distribution over time. Because of these two factors, quantitative trend analysis is conducted for these parameters to determine if a statistically positive trend exists over time. Gross alpha and gross beta measurements are statistical summary results with associated error; therefore, application of statistical calculations is not feasible. Accordingly, quantitative trending is used to evaluate these two target list parameters.

The two-part test is denoted in the post-closure permit to account for the considerable natural geochemical variability in the karst groundwater system that exists beneath the KHQ. Both parts of the test must show a statistical increase for the test to be considered valid. The variance test compares the mean value of each target list compound concentration (calculated from the four replicate samples) at each downgradient well with the mean result at the upgradient well; the test is limited to data from a single sampling event. Comparison of individual downgradient well results with the UTL (or PQL) determines if a constituent concentration is higher than expected based on historical variability upgradient of the site. The within-well comparisons determine whether a particular result from a well is statistically greater than the range of historical concentrations observed within that particular well.

2.0 Results for the Second, 180-Day Reporting Period for CY 1996

A high proportion of nondetected constituents resulted in nonparametric data distributions for all target list parameters. As a result, parametric ANOVA tests could not be conducted; rather, a nonparametric variance test (Kruskal-Wallis Test) was used. As shown in the summary table, the variance test indicated that no statistical differences existed among the five facility monitoring wells for any indicator parameter except total uranium. In the case of total uranium concentrations, all downgradient wells were statistically equal to upgradient Well GW-142. In addition, total uranium levels in all downgradient wells and upgradient Well GW-142 were significantly higher than upgradient Well GW-231. Two of the downgradient wells were also statistically different from each other. Because the variance test indicated that total uranium levels were statistically higher in the downgradient wells as compared with one of the upgradient wells, comparisons to UTLs and intrawell comparisons were performed for this parameter.

The total uranium UTL of 0.019 milligrams per liter (mg/L) was established in the post-closure permit application for the KHQ using available interim status historical data collected between 1986 and 1994 from the two upgradient wells (SAIC, Inc., 1995). As demonstrated in the summary table, total uranium results in any downgradient well did not exceed the UTL. The intrawell comparisons (Wilcoxon Rank-Sum Test) showed that none of the total uranium results within any of the monitoring wells were significantly higher than past results. In downgradient Well GW-144, total uranium results for the second, semiannual CY 1996 sampling event were actually statistically lower than past results. Accordingly, a release of total uranium was determined not to have occurred.

Quantitative trend analysis (Kendall-Tau B Test) was performed for boron, total strontium, gross alpha, and gross beta using data collected during the period CY 1990 through CY 1996 (Enclosure 2). Results of the trending analyses indicated that only boron results exhibited a significant trend over this time period. A positive (upward) trend for boron was observed in downgradient Wells GW-143 and GW-145 and in upgradient Well GW-231. Given that upgradient, as well as downgradient locations, exhibited a significant trend, a release of boron is determined not to have occurred.

The statistical trend test denoted above does not exclude outliers nor does it assign weighting factors to any data point. Evaluation of the time-series data (Enclosure 2) for these three wells indicated that three obvious data outliers could produce a statistically significant trend as follows: (1) a low concentration outlier for Well GW-143 during the fourth quarter of 1990, (2) a high concentration outlier for Well GW-145 during the fourth quarter of CY 1995, and (3) a high concentration outlier for Well GW-231 from the fourth daily replicate sample collected during the fourth quarter of CY 1996. The effect of elimination of these three outliers was tested. Results showed that a positive slope no longer existed in Well GW-143, whereas the positive slope remained in Wells GW-145 and GW-231. Other statistical outliers may be identified by a formal outlier test. Performance of an outlier test and screening of statistical outliers will be evaluated and considered as a possible future component of the trend analysis.

3.0 Assumptions for Statistical Evaluations

For the purposes of statistical evaluations, the following baseline assumptions were used:

- A. Kruskal-Wallis Test. As a conservative assumption for calculations, the detection limit was substituted for analytical measurements reported as less than the detection limit.

B. Wilcoxon Rank-Sum Test

1. As a conservative assumption for calculations, the detection limit was substituted for analytical measurements reported as less than the detection limit.
2. The baseline period for the intrawell comparisons included interim status monitoring results collected during the period CY 1990 through CY 1995.
3. Measurements reported at multiple detection limits during the baseline period were converted to the highest detection limit in the ranking process.
4. Current measurements reported at detection limits higher than those in the baseline period were deleted from the ranking process.

C. Kendall-Tau B Test. The data set used to conduct trending analyses included all data collected since the first quarter of CY 1990.

**SUMMARY OF KRUSKAL-WALLIS TEST RESULTS AND MULTIPLE COMPARISON TESTS
KERR HOLLOW QUARRY**

PARAMETER	KRUSKAL-WALLIS TEST RESULT	MULTIPLE COMPARISON TEST RESULTS	
Cadmium (mg/L)	There are no statistical differences in the location parameter across 5 monitoring wells		
Chromium (mg/L)	There are no statistical differences in the location parameter across 5 monitoring wells		
Lead (mg/L)	There are no statistical differences in the location parameter across 5 monitoring wells		
Mercury (mg/L)	There are no statistical differences in the location parameter across 5 monitoring wells		
Nickel (mg/L)	There are no statistical differences in the location parameter across 5 monitoring wells		
Uranium (mg/L)	There are statistical differences in the location parameter across 5 monitoring wells	GW-231 GW-144 GW-143 GW-142 GW-145 ----- ----- ----- ----- -----	Uranium results in all downgradient wells and in upgradient well GW-142 are statistically greater than those in upgradient well GW-231. (NOTE: Uranium results in all downgradient wells are statistically equal to those in upgradient well GW-142) Uranium results in downgradient well GW-144 are statistically less than those in downgradient well GW-145.
Carbon tetrachloride (ug/L)	There are no statistical differences in the location parameter across 5 monitoring wells		
Tetrachloroethene (ug/L)	There are no statistical differences in the location parameter across 5 monitoring wells		
Chloroform (ug/L)	There are no statistical differences in the location parameter across 5 monitoring wells		

Comparison of Total Uranium Results to Upper Tolerance Limits
Second, 180-Day Reporting Period of CY 1996

Rank of Mean	Station Name	Sample Date	Uranium (mg/L)	Exceeds UTL ⁽¹⁾	Rank
2	GW-144	21Oct96	0.0015	No	6
	GW-144	24Oct96	0.0015	No	7
	GW-144	22Oct96	0.0016	No	9
	GW-144	23Oct96	0.0017	No	10
3	GW-143	21Oct96	0.001	No	5
	GW-143	24Oct96	0.0019	No	11
	GW-143	22Oct96	0.0022	No	12
	GW-143	23Oct96	0.0033	No	13
4	GW-142	21Oct96	0.0016	No	8
	GW-142	22Oct96	0.0084	No	14
	GW-142	23Oct96	0.012	No	17
	GW-142	24Oct96	0.012	No	18
5	GW-145	24Oct96	0.010	No	15
	GW-145	21Oct96	0.011	No	16
	GW-145	22Oct96	0.012	No	19
	GW-145	23Oct96	0.012	No	20
5	GW-231	21Oct96	<0.0005	No	1
	GW-231	22Oct96	<0.0005	No	2
	GW-231	23Oct96	<0.0005	No	3
	GW-231	24Oct96	<0.0005	No	4

(1) Total uranium UTL = 0.019 mg/L.

SUMMARY OF WILCOXON RANK-SUM TEST RESULTS
KERR HOLLOW QUARRY

PARAMETER	WILCOXON RANK-SUM TEST	WELL	CONCLUSION
Uranium	There are statistical differences in the location parameter within wells.	GW-144	1996 Q4 < Historic

**SECOND 180 DAY 1996 REPORT FOR
KERR HOLLOW QUARRY**

DATA ANALYSIS

SUMMARY OF KRUSKAL-WALLIS TEST RESULTS AND MULTIPLE COMPARISON TESTS
KERR HOLLOW CARRY

PARAMETER	KRUSKAL-WALLIS TEST RESULT	MULTIPLE COMPARISON TEST RESULTS	
Cadmium (mg/L)	There are no statistical differences in the location parameter across 5 monitoring wells		
Chromium (mg/L)	There are no statistical differences in the location parameter across 5 monitoring wells		
Lead (mg/L)	There are no statistical differences in the location parameter across 5 monitoring wells		
Mercury (mg/L)	There are no statistical differences in the location parameter across 5 monitoring wells		
Nickel (mg/L)	There are no statistical differences in the location parameter across 5 monitoring wells		
Uranium (mg/L)	There are statistical differences in the location parameter across 5 monitoring wells	GW-231 GW-144 GW-143 GW-142 GW-145 ----- Uranium results in all downgradient wells and in upgradient well GW-142 are statistically greater than those in upgradient well GW-231. (NOTE: Uranium results in all downgradient wells are statistically equal to those in upgradient well GW-142) Uranium results in downgradient well GW-144 are statistically less than those in downgradient well GW-145.	
Carbon tetrachloride (ug/L)	There are no statistical differences in the location parameter across 5 monitoring wells		
Tetrachloroethene (ug/L)	There are no statistical differences in the location parameter across 5 monitoring wells		
Chloroform (ug/L)	There are no statistical differences in the location parameter across 5 monitoring wells		

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RANK OF MEAN RANK	STATION NAME	SAMPLE DATE	CADMIUM ICAP (MG/L)	RANK
1	GW-142	21OCT96	<0.003	1
		22OCT96	<0.003	2
		23OCT96	<0.003	3
		24OCT96	<0.003	4
2	GW-143	21OCT96	<0.003	5
		22OCT96	<0.003	6
		23OCT96	<0.003	7
		24OCT96	<0.003	8
3	GW-144	21OCT96	<0.003	9
		22OCT96	<0.003	10
		23OCT96	<0.003	11
		24OCT96	<0.003	12
4	GW-145	21OCT96	<0.003	13
		22OCT96	<0.003	14
		23OCT96	<0.003	15
		24OCT96	<0.003	16
4	GW-231	21OCT96	<0.003	17
		22OCT96	<0.003	18
		23OCT96	<0.003	19
		24OCT96	<0.003	20

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N P A R 1 W A Y P R O C E D U R E

Wilcoxon Scores (Rank Sums) for Variable M7
Classified by Variable WELLID

WELLID	N	Sum of Scores	Expected Under H0	Std Dev Under H0	Mean Score
GW-142	4	42.0	42.0	0.0	10.5000000
GW-143	4	42.0	42.0	0.0	10.5000000
GW-144	4	42.0	42.0	0.0	10.5000000
GW-145	4	42.0	42.0	0.0	10.5000000
GW-231	4	42.0	42.0	0.0	10.5000000

Average Scores were used for Ties

Kruskal-Wallis Test (Chi-Square Approximation)
CHISQ= 0 DF= 4 Prob > CHISQ= 0.9999

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RANK OF MEAN RANK	STATION NAME	SAMPLE DATE	CHROMIUM ICAP (MG/L)	RANK
1	GW-142	21OCT96	<0.01	1
		22OCT96	<0.01	2
		23OCT96	<0.01	3
		24OCT96	<0.01	4
2	GW-143	21OCT96	<0.01	5
		22OCT96	<0.01	6
		23OCT96	<0.01	7
		24OCT96	<0.01	8
3	GW-144	21OCT96	<0.01	9
		22OCT96	<0.01	10
		23OCT96	<0.01	11
		24OCT96	<0.01	12
4	GW-145	21OCT96	<0.01	13
		22OCT96	<0.01	14
		23OCT96	<0.01	15
		24OCT96	<0.01	16
4	GW-231	21OCT96	<0.01	17
		22OCT96	<0.01	18
		23OCT96	<0.01	19
		24OCT96	<0.01	20

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N P A R I W A Y P R O C E D U R E

Wilcoxon Scores (Rank Sums) for Variable M9
Classified by Variable WELLID

WELLID	N	Sum of Scores	Expected Under H0	Std Dev Under H0	Mean Score
GW-142	4	42.0	42.0	0.0	10.5000000
GW-143	4	42.0	42.0	0.0	10.5000000
GW-144	4	42.0	42.0	0.0	10.5000000
GW-145	4	42.0	42.0	0.0	10.5000000
GW-231	4	42.0	42.0	0.0	10.5000000

Average Scores were used for Ties

Kruskal-Wallis Test (Chi-Square Approximation)
CHISQ= 0 DF= 4 Prob > CHISQ= 0.9999

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RANK OF MEAN RANK	STATION NAME	SAMPLE DATE	LEAD PMS (MG/L)	RANK
1	GW-144	21OCT96	<0.0005	5
		22OCT96	<0.0005	6
		23OCT96	<0.0005	7
		24OCT96	<0.0005	8
3	GW-143	22OCT96	<0.0005	3
		23OCT96	<0.0005	4
		24OCT96	0.00053	13
		21OCT96	0.00054	14
4	GW-142	22OCT96	<0.0005	1
		24OCT96	<0.0005	2
		21OCT96	0.00051	12
		23OCT96	0.0045	20
5	GW-145	24OCT96	0.00061	15
		21OCT96	0.00085	16
		22OCT96	0.001	17
		23OCT96	0.0013	18
5	GW-231	21OCT96	<0.0005	9
		23OCT96	<0.0005	10
		24OCT96	<0.0005	11
		22OCT96	0.0035	19

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N P A R 1 W A Y P R O C E D U R E

Wilcoxon Scores (Rank Sums) for Variable M13P
Classified by Variable WELLID

WELLID	N	Sum of Scores	Expected Under H0	Std Dev Under H0	Mean Score
GW-142	4	44.0	42.0	9.66817895	11.0000000
GW-143	4	39.0	42.0	9.66817895	9.7500000
GW-144	4	24.0	42.0	9.66817895	6.0000000
GW-145	4	66.0	42.0	9.66817895	16.5000000
GW-231	4	37.0	42.0	9.66817895	9.2500000

Average Scores were used for Ties

Kruskal-Wallis Test (Chi-Square Approximation)
CHISQ= 8.0279 DF= 4 Prob > CHISQ= 0.0906

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RANK OF MEAN RANK	STATION NAME	SAMPLE DATE	MERCURY CVAA (MG/L)	RANK
1	GW-142	22OCT96	<0.0002	1
		23OCT96	<0.0002	2
		24OCT96	<0.0002	3
		21OCT96	0.0003	20
2	GW-143	21OCT96	<0.0002	4
		22OCT96	<0.0002	5
		23OCT96	<0.0002	6
		24OCT96	<0.0002	7
3	GW-144	21OCT96	<0.0002	8
		22OCT96	<0.0002	9
		23OCT96	<0.0002	10
		24OCT96	<0.0002	11
4	GW-145	21OCT96	<0.0002	12
		22OCT96	<0.0002	13
		23OCT96	<0.0002	14
		24OCT96	<0.0002	15
4	GW-231	21OCT96	<0.0002	16
		22OCT96	<0.0002	17
		23OCT96	<0.0002	18
		24OCT96	<0.0002	19

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N P A R 1 W A Y P R O C E D U R E

Wilcoxon Scores (Rank Sums) for Variable HG
Classified by Variable WELLID

WELLID	N	Sum of Scores	Expected Under H0	Std Dev Under H0	Mean Score
GW-142	4	50.0	42.0	4.0	12.5000000
GW-143	4	40.0	42.0	4.0	10.0000000
GW-144	4	40.0	42.0	4.0	10.0000000
GW-145	4	40.0	42.0	4.0	10.0000000
GW-231	4	40.0	42.0	4.0	10.0000000

Average Scores were used for Ties

Kruskal-Wallis Test (Chi-Square Approximation)
CHISQ= 4.0000 DF= 4 Prob > CHISQ= 0.4060

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RANK OF MEAN RANK	STATION NAME	SAMPLE DATE	NICKEL ICAP (MG/L)	RANK
1	GW-142	21OCT96	<0.01	1
		22OCT96	<0.01	2
		23OCT96	<0.01	3
		24OCT96	<0.01	4
2	GW-143	21OCT96	<0.01	5
		22OCT96	<0.01	6
		23OCT96	<0.01	7
		24OCT96	<0.01	8
3	GW-144	21OCT96	<0.01	9
		22OCT96	<0.01	10
		23OCT96	<0.01	11
		24OCT96	<0.01	12
4	GW-145	21OCT96	<0.01	13
		22OCT96	<0.01	14
		23OCT96	<0.01	15
		24OCT96	<0.01	16
4	GW-231	21OCT96	<0.01	17
		22OCT96	<0.01	18
		23OCT96	<0.01	19
		24OCT96	<0.01	20

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N P A R I W A Y P R O C E D U R E

Wilcoxon Scores (Rank Sums) for Variable M18
Classified by Variable WELLID

WELLID	N	Sum of Scores	Expected Under H0	Std Dev Under H0	Mean Score
GW-142	4	42.0	42.0	0.0	10.5000000
GW-143	4	42.0	42.0	0.0	10.5000000
GW-144	4	42.0	42.0	0.0	10.5000000
GW-145	4	42.0	42.0	0.0	10.5000000
GW-231	4	42.0	42.0	0.0	10.5000000

Average Scores were used for Ties

Kruskal-Wallis Test (Chi-Square Approximation)

CHISQ= 0 DF= 4 Prob > CHISQ= 0.9999

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RANK OF MEAN RANK	STATION NAME	SAMPLE DATE	URANIUM PMS (MG/L)	RANK
2	GW-144	21OCT96	0.0015	6
		24OCT96	0.0015	7
		22OCT96	0.0016	9
		23OCT96	0.0017	10
3	GW-143	21OCT96	0.001	5
		24OCT96	0.0019	11
		22OCT96	0.0022	12
		23OCT96	0.0033	13
4	GW-142	21OCT96	0.0016	8
		22OCT96	0.0084	14
		23OCT96	0.012	17
		24OCT96	0.012	18
5	GW-145	24OCT96	0.01	15
		21OCT96	0.011	16
		22OCT96	0.012	19
		23OCT96	0.012	20
5	GW-231	21OCT96	<0.0005	1
		22OCT96	<0.0005	2
		23OCT96	<0.0005	3
		24OCT96	<0.0005	4

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N P A R 1 W A Y P R O C E D U R E

Wilcoxon Scores (Rank Sums) for Variable UT
Classified by Variable WELLID

WELLID	N	Sum of Scores	Expected Under H0	Std Dev Under H0	Mean Score
GW-142	4	59.5000000	42.0	10.4951116	14.8750000
GW-143	4	41.0000000	42.0	10.4951116	10.2500000
GW-144	4	31.5000000	42.0	10.4951116	7.8750000
GW-145	4	68.0000000	42.0	10.4951116	17.0000000
GW-231	4	10.0000000	42.0	10.4951116	2.5000000

Average Scores were used for Ties

Kruskal-Wallis Test (Chi-Square Approximation)
CHISQ= 15.379 DF= 4 Prob > CHISQ= 0.0040

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Wells 144, 143, 142, and 145

N P A R 1 W A Y P R O C E D U R E

Wilcoxon Scores (Rank Sums) for Variable UT
Classified by Variable WELLID

WELLID	N	Sum of Scores	Expected Under H0	Std Dev Under H0	Mean Score
GW-142	4	43.5000000	34.0	8.17312670	10.8750000
GW-143	4	25.0000000	34.0	8.17312670	6.2500000
GW-144	4	15.5000000	34.0	8.17312670	3.8750000
GW-145	4	52.0000000	34.0	8.17312670	13.0000000

Average Scores were used for Ties

Kruskal-Wallis Test (Chi-Square Approximation)
CHISQ= 9.4031 DF= 3 Prob > CHISQ= 0.0244

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4th Quarter 1996
Wells 231, 144, 143, and 142

N P A R I W A Y P R O C E D U R E

Wilcoxon Scores (Rank Sums) for Variable UT
Classified by Variable WELLID

WELLID	N	Sum of Scores	Expected Under H0	Std Dev Under H0	Mean Score
GW-142	4	53.5000000	34.0	8.16700680	13.3750000
GW-143	4	41.0000000	34.0	8.16700680	10.2500000
GW-144	4	31.5000000	34.0	8.16700680	7.8750000
GW-231	4	10.0000000	34.0	8.16700680	2.5000000

Average Scores were used for Ties

Kruskal-Wallis Test (Chi-Square Approximation)
CHISQ= 11.374 DF= 3 Prob > CHISQ= 0.0099

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Kerr Hollow Quarry
Anderson County, Tennessee

4th Quarter 1996
Wells 231, 144, and 143

N P A R I W A Y P R O C E D U R E

Wilcoxon Scores (Rank Sums) for Variable UT
Classified by Variable WELLID

WELLID	N	Sum of Scores	Expected Under H0	Std Dev Under H0	Mean Score
GW-143	4	38.0	26.0	5.77350269	9.50000000
GW-144	4	30.0	26.0	5.77350269	7.50000000
GW-231	4	10.0	26.0	5.77350269	2.50000000

Average Scores were used for Ties

Kruskal-Wallis Test (Chi-Square Approximation)
CHISQ= 8.3200 DF= 2 Prob > CHISQ= 0.0156

1996 Groundwater Monitoring Report
Kerr Hollow Quarry
Anderson County, Tennessee

4th Quarter 1996
Wells 144, 143, and 142

N P A R I W A Y P R O C E D U R E

Wilcoxon Scores (Rank Sums) for Variable UT
Classified by Variable WELLID

WELLID	N	Sum of Scores	Expected Under H0	Std Dev Under H0	Mean Score
GW-142	4	37.5000000	26.0	5.85687889	9.37500000
GW-143	4	25.0000000	26.0	5.85687889	6.25000000
GW-144	4	15.5000000	26.0	5.85687889	3.87500000

Average Scores were used for Ties

Kruskal-Wallis Test (Chi-Square Approximation)
CHISQ= 4.7323 DF= 2 Prob > CHISQ= 0.0938

1996 Groundwater Monitoring Report
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4th Quarter 1996
Wells 143, 142, and 145

N P A R 1 W A Y P R O C E D U R E

Wilcoxon Scores (Rank Sums) for Variable UT
Classified by Variable WELLID

WELLID	N	Sum of Scores	Expected Under H0	Std Dev Under H0	Mean Score
GW-142	4	29.0	26.0	5.78399044	7.25000000
GW-143	4	13.0	26.0	5.78399044	3.25000000
GW-145	4	36.0	26.0	5.78399044	9.00000000

Average Scores were used for Ties

Kruskal-Wallis Test (Chi-Square Approximation)
CHISQ= 5.5399 DF= 2 Prob > CHISQ= 0.0627

1996 Groundwater Monitoring Report
Kerr Hollow Quarry
Anderson County, Tennessee

4th Quarter 1996
Wells 231 and 144

N P A R 1 W A Y P R O C E D U R E

Wilcoxon Scores (Rank Sums) for Variable UT
Classified by Variable WELLID

WELLID	N	Sum of Scores	Expected Under H0	Std Dev Under H0	Mean Score
GW-144	4	26.0	18.0	3.22932987	6.50000000
GW-231	4	10.0	18.0	3.22932987	2.50000000

Average Scores were used for Ties

Wilcoxon 2-Sample Test (Normal Approximation)
(with Continuity Correction of .5)

S= 26.0000 Z= 2.32246 Prob > |Z| = 0.0202

T-Test approx. Significance = 0.0532

Kruskal-Wallis Test (Chi-Square Approximation)

CHISQ= 6.1370 DF= 1 Prob > CHISQ= 0.0132

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4th Quarter 1996
Wells 144 and 143

N P A R 1 W A Y P R O C E D U R E

Wilcoxon Scores (Rank Sums) for Variable UT
Classified by Variable WELLID

WELLID	N	Sum of Scores	Expected Under H0	Std Dev Under H0	Mean Score
GW-143	4	22.0	18.0	3.44342023	5.50000000
GW-144	4	14.0	18.0	3.44342023	3.50000000

Average Scores were used for Ties

Wilcoxon 2-Sample Test (Normal Approximation)
(with Continuity Correction of .5)

S= 22.0000 Z= 1.01643 Prob > |Z| = 0.3094

T-Test approx. Significance = 0.3433

Kruskal-Wallis Test (Chi-Square Approximation)
CHISQ= 1.3494 DF= 1 Prob > CHISQ= 0.2454

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4th Quarter 1996
Wells 143 and 142

N P A R I W A Y P R O C E D U R E

Wilcoxon Scores (Rank Sums) for Variable UT
Classified by Variable WELLID

WELLID	N	Sum of Scores	Expected Under H0	Std Dev Under H0	Mean Score
GW-142	4	23.0	18.0	3.44342023	5.75000000
GW-143	4	13.0	18.0	3.44342023	3.25000000

Average Scores were used for Ties

Wilcoxon 2-Sample Test (Normal Approximation)
(with Continuity Correction of .5)

S= 23.0000 Z= 1.30684 Prob > |Z| = 0.1913

T-Test approx. Significance = 0.2326

Kruskal-Wallis Test (Chi-Square Approximation)

CHISQ= 2.1084 DF= 1 Prob > CHISQ= 0.1465

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4th Quarter 1996
Wells 142 and 145

N P A R I W A Y P R O C E D U R E

Wilcoxon Scores (Rank Sums) for Variable UT
Classified by Variable WELLID

WELLID	N	Sum of Scores	Expected Under H0	Std Dev Under H0	Mean Score
GW-142	4	16.0	18.0	3.25137334	4.0
GW-145	4	20.0	18.0	3.25137334	5.0

Average Scores were used for Ties

Wilcoxon 2-Sample Test (Normal Approximation)
(with Continuity Correction of .5)

S= 16.0000 Z= -.461344 Prob > |Z| = 0.6446

T-Test approx. Significance = 0.6585

Kruskal-Wallis Test (Chi-Square Approximation)
CHISQ= 0.37838 DF= 1 Prob > CHISQ= 0.5385

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4th Quarter 1996

RANK OF MEAN RANK	STATION NAME	SAMPLE DATE	CARBON TETRACHLORIDE (UG/L)	RANK
1	GW-142	21OCT96	10U	1
		22OCT96	10U	2
		23OCT96	10U	3
		24OCT96	10U	4
2	GW-143	21OCT96	10U	5
		22OCT96	10U	6
		23OCT96	10U	7
		24OCT96	10U	8
3	GW-144	21OCT96	10U	9
		22OCT96	10U	10
		23OCT96	10U	11
		24OCT96	10U	12
4	GW-145	21OCT96	10U	13
		22OCT96	10U	14
		23OCT96	10U	15
		24OCT96	10U	16
4	GW-231	21OCT96	10U	17
		22OCT96	10U	18
		23OCT96	10U	19
		24OCT96	10U	20

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4th Quarter 1996

N P A R I W A Y P R O C E D U R E

Wilcoxon Scores (Rank Sums) for Variable V5
 Classified by Variable WELLID

WELLID	N	Sum of Scores	Expected Under H0	Std Dev Under H0	Mean Score
GW-142	4	42.0	42.0	0.0	10.5000000
GW-143	4	42.0	42.0	0.0	10.5000000
GW-144	4	42.0	42.0	0.0	10.5000000
GW-145	4	42.0	42.0	0.0	10.5000000
GW-231	4	42.0	42.0	0.0	10.5000000

Average Scores were used for Ties

Kruskal-Wallis Test (Chi-Square Approximation)
 CHISQ= 0 DF= 4 Prob > CHISQ= 0.9999

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RANK OF MEAN RANK	STATION NAME	SAMPLE DATE	TETRACHLOROETHENE (UG/L)	RANK
1	GW-142	21OCT96	10U	1
		22OCT96	10U	2
		23OCT96	10U	3
		24OCT96	10U	4
2	GW-143	21OCT96	10U	5
		22OCT96	10U	6
		23OCT96	10U	7
		24OCT96	10U	8
3	GW-144	21OCT96	10U	9
		22OCT96	10U	10
		23OCT96	10U	11
		24OCT96	10U	12
4	GW-145	21OCT96	10U	13
		22OCT96	10U	14
		23OCT96	10U	15
		24OCT96	10U	16
4	GW-231	21OCT96	10U	17
		22OCT96	10U	18
		23OCT96	10U	19
		24OCT96	10U	20

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4th Quarter 1996

N P A R I W A Y P R O C E D U R E

Wilcoxon Scores (Rank Sums) for Variable V24
Classified by Variable WELLID

WELLID	N	Sum of Scores	Expected Under H0	Std Dev Under H0	Mean Score
GW-142	4	42.0	42.0	0.0	10.5000000
GW-143	4	42.0	42.0	0.0	10.5000000
GW-144	4	42.0	42.0	0.0	10.5000000
GW-145	4	42.0	42.0	0.0	10.5000000
GW-231	4	42.0	42.0	0.0	10.5000000

Average Scores were used for Ties

Kruskal-Wallis Test (Chi-Square Approximation)
CHISQ= 0 DF= 4 Prob > CHISQ= 0.9999

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RANK OF MEAN RANK	STATION NAME	SAMPLE DATE	CHLOROFORM (UG/L)	RANK
1	GW-142	21OCT96	10U	1
		22OCT96	10U	2
		23OCT96	10U	3
		24OCT96	10U	4
2	GW-143	21OCT96	10U	5
		22OCT96	10U	6
		23OCT96	10U	7
		24OCT96	10U	8
3	GW-144	21OCT96	10U	9
		22OCT96	10U	10
		23OCT96	10U	11
		24OCT96	10U	12
4	GW-145	21OCT96	10U	13
		22OCT96	10U	14
		23OCT96	10U	15
		24OCT96	10U	16
4	GW-231	21OCT96	10U	17
		22OCT96	10U	18
		23OCT96	10U	19
		24OCT96	10U	20

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N P A R I W A Y P R O C E D U R E

Wilcoxon Scores (Rank Sums) for Variable V10
 Classified by Variable WELLID

WELLID	N	Sum of Scores	Expected Under H0	Std Dev Under H0	Mean Score
GW-142	4	42.0	42.0	0.0	10.5000000
GW-143	4	42.0	42.0	0.0	10.5000000
GW-144	4	42.0	42.0	0.0	10.5000000
GW-145	4	42.0	42.0	0.0	10.5000000
GW-231	4	42.0	42.0	0.0	10.5000000

Average Scores were used for Ties

Kruskal-Wallis Test (Chi-Square Approximation)
 CHISQ= 0 DF= 4 Prob > CHISQ= 0.9999

COMPARISON TO UPPER TOLERANCE LIMITS



Comparison of Total Uranium Results to Upper Tolerance Limits
Second, 180-Day Reporting Period of CY 1996

Rank of Mean	Station Name	Sample Date	Uranium (mg/L)	Exceeds UTL ⁽¹⁾	Rank
2	GW-144	21Oct96	0.0015	No	6
	GW-144	24Oct96	0.0015	No	7
	GW-144	22Oct96	0.0016	No	9
	GW-144	23Oct96	0.0017	No	10
3	GW-143	21Oct96	0.001	No	5
	GW-143	24Oct96	0.0019	No	11
	GW-143	22Oct96	0.0022	No	12
	GW-143	23Oct96	0.0033	No	13
4	GW-142	21Oct96	0.0016	No	8
	GW-142	22Oct96	0.0084	No	14
	GW-142	23Oct96	0.012	No	17
	GW-142	24Oct96	0.012	No	18
5	GW-145	24Oct96	0.010	No	15
	GW-145	21Oct96	0.011	No	16
	GW-145	22Oct96	0.012	No	19
	GW-145	23Oct96	0.012	No	20
5	GW-231	21Oct96	<0.0005	No	1
	GW-231	22Oct96	<0.0005	No	2
	GW-231	23Oct96	<0.0005	No	3
	GW-231	24Oct96	<0.0005	No	4

(1) Total uranium UTL = 0.019 mg/L.

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RANK OF MEAN RANK	STATION NAME	SAMPLE DATE	URANIUM PMS (MG/L)	EXCEEDS UTL ? (0.035 MG/L)	RANK
2	GW-144	21OCT96	0.0015	No	6
		24OCT96	0.0015	No	7
		22OCT96	0.0016	No	9
		23OCT96	0.0017	No	10
3	GW-143	21OCT96	0.001	No	5
		24OCT96	0.0019	No	11
		22OCT96	0.0022	No	12
		23OCT96	0.0033	No	13
4	GW-142	21OCT96	0.0016	No	8
		22OCT96	0.0084	No	14
		23OCT96	0.012	No	17
		24OCT96	0.012	No	18
5	GW-145	24OCT96	0.01	No	15
		21OCT96	0.011	No	16
		22OCT96	0.012	No	19
		23OCT96	0.012	No	20
5	GW-231	21OCT96	<0.0005	No	1
		22OCT96	<0.0005	No	2
		23OCT96	<0.0005	No	3
		24OCT96	<0.0005	No	4

**WILCOXON RANK-SUM TEST
(NONPARAMETRIC PROCEDURE USED INSTEAD OF T-TEST)**

**INTRAWELL COMPARISONS OF 4TH QUARTER 1996 WELL MEASUREMENTS
TO HISTORIC MEASUREMENTS**

**MEASUREMENTS REPORTED AS <#
WERE CONVERTED TO # FOR CALCULATIONS**

**MEASUREMENTS REPORTED AT ELEVATED DETECTION LIMITS
WERE DELETED**

**MEASUREMENTS FOR ANALYTES REPORTED
AT MULTIPLE DETECTION LIMITS
WERE CONVERTED TO THE HIGHER DETECTION LIMIT**

SUMMARY OF WILCOXON RANK-SUM TEST RESULTS
KERR HOLLOW QUARRY

PARAMETER	WILCOXON RANK-SUM TEST	WELL	CONCLUSION
Uranium	There are statistical differences in the location parameter within wells.	GW-144	1996 Q4 < Historic

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STATION NAME	PERIOD	SAMPLE DATE	URANIUM (MG/L)
GW-142	1996 Q4	10/21/96	0.0016
		10/22/96	0.0084
		10/23/96	0.012
		10/24/96	0.012
GW-142	Historic	10/22/94	.
		03/20/95	.
		06/11/90	<0.001
		02/20/92	<0.001
		09/17/90	0.001
		11/05/95	0.0018
		09/14/92	0.003
		07/21/94	0.003
		11/04/91	0.004
		05/28/92	0.004
		03/05/93	0.004
		11/30/92	0.005
		07/14/95	0.0095
		08/03/91	0.01
		04/12/94	0.01
		04/20/95	0.01
		01/10/95	0.011
		03/15/91	0.014
		11/26/90	0.016
		06/11/93	0.019
		12/15/93	0.019
		06/13/91	0.02
		02/16/94	0.024
		08/25/93	0.032
GW-143	1996 Q4	10/21/96	0.001
		10/24/96	0.0019
		10/22/96	0.0022
		10/23/96	0.0033
GW-143	Historic	06/13/93	.
		10/24/94	.
		06/14/90	<0.001
		09/17/90	0.001
		11/27/90	0.001
		03/16/91	0.001
		06/16/91	0.001
		11/07/91	0.001
		02/21/92	0.001
		05/29/92	0.001

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STATION NAME	PERIOD	SAMPLE DATE	URANIUM (MG/L)
GW-143	Historic	12/01/92	0.001
		04/18/94	0.001
		01/17/95	0.0012
		04/24/95	0.0012
		07/16/95	0.0017
		06/12/93	0.002
		12/15/93	0.002
		03/03/94	0.002
		07/24/94	0.002
		11/09/95	0.0022
		09/05/91	0.003
		03/06/93	0.003
		08/27/93	0.003
		09/28/92	0.006
GW-144	1996 Q4	10/21/96	0.0015
		10/24/96	0.0015
		10/22/96	0.0016
		10/23/96	0.0017
GW-144	Historic	10/25/94	.
		03/22/95	.
		07/16/95	<0.001
		06/13/90	0.001
		09/17/90	0.001
		11/27/90	0.001
		03/16/91	0.002
		03/10/94	0.002
		04/19/94	0.002
		07/26/94	0.002
		04/25/95	0.002
		11/14/95	0.0023
		01/18/95	0.0025
		06/12/93	0.003
		08/26/93	0.003
		06/15/91	0.004
		02/21/92	0.004
		05/29/92	0.004
		12/01/92	0.004
		03/06/93	0.004
		12/15/93	0.004
		11/06/91	0.005
		09/15/92	0.005
		09/05/91	0.007

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STATION NAME	PERIOD	SAMPLE DATE	URANIUM (MG/L)
GW-145	1996 Q4	10/24/96	0.01
		10/21/96	0.011
		10/22/96	0.012
		10/23/96	0.012
GW-145	Historic	10/26/94	.
		03/24/95	.
		07/17/95	<0.001
		08/25/93	0.008
		07/26/94	0.01
		03/16/91	0.011
		09/04/91	0.011
		06/14/91	0.012
		06/12/93	0.012
		04/26/95	0.012
		11/15/95	0.012
		11/30/92	0.013
		12/14/93	0.013
		03/11/94	0.013
		01/18/95	0.013
		11/26/90	0.014
		05/29/92	0.014
		09/15/92	0.014
		03/06/93	0.014
		04/20/94	0.014
GW-231	1996 Q4	10/21/96	<0.001
		10/22/96	<0.001
		10/23/96	<0.001
		10/24/96	<0.001
GW-231	Historic	10/23/94	.
		06/12/90	<0.001
		10/08/90	<0.001
		11/26/90	<0.001
		03/14/91	<0.001
		07/19/91	<0.001
		09/04/91	<0.001
		11/05/91	<0.001
		02/21/92	<0.001
		05/28/92	<0.001

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STATION NAME	PERIOD	SAMPLE DATE	URANIUM (MG/L)
GW-231	Historic	03/05/93	<0.001
		06/11/93	<0.001
		12/14/93	<0.001
		02/28/94	<0.001
		04/13/94	<0.001
		01/15/95	<0.001
		04/21/95	<0.001
		07/15/95	<0.001
		11/06/95	<0.001
		11/30/92	0.001
		08/24/93	0.001
		09/15/92	0.002
		07/23/94	0.002

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----- STATION NAME=GW-142 -----

N P A R 1 W A Y P R O C E D U R E

Wilcoxon Scores (Rank Sums) for Variable U_
Classified by Variable PERIOD

PERIOD	N	Sum of Scores	Expected Under H0	Std Dev Under H0	Mean Score
1996 Q	4	53.0	54.0	14.0351208	13.2500000
Historic	22	298.0	297.0	14.0351208	13.5454545

Average Scores were used for Ties

Wilcoxon 2-Sample Test (Normal Approximation)
(with Continuity Correction of .5)

S= 53.0000 Z= -.035625 Prob > |Z| = 0.9716

T-Test approx. Significance = 0.9719

Kruskal-Wallis Test (Chi-Square Approximation)
CHISQ= 0.00508 DF= 1 Prob > CHISQ= 0.9432

----- STATION NAME=GW-143 -----

N P A R 1 W A Y P R O C E D U R E

Wilcoxon Scores (Rank Sums) for Variable U_
Classified by Variable PERIOD

PERIOD	N	Sum of Scores	Expected Under H0	Std Dev Under H0	Mean Score
1996 Q4	4	66.500000	54.0	13.4916498	16.6250000
Historic	22	284.500000	297.0	13.4916498	12.9318182

Average Scores were used for Ties

Wilcoxon 2-Sample Test (Normal Approximation)
(with Continuity Correction of .5)

S= 66.5000 Z= 0.889439 Prob > |Z| = 0.3738

T-Test approx. Significance = 0.3822

Kruskal-Wallis Test (Chi-Square Approximation)
CHISQ= 0.85840 DF= 1 Prob > CHISQ= 0.3542

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----- STATION NAME=GW-144 -----

N P A R I W A Y P R O C E D U R E

Wilcoxon Scores (Rank Sums) for Variable U_
Classified by Variable PERIOD

PERIOD	N	Sum of Scores	Expected Under H0	Std Dev Under H0	Mean Score
1996 Q4	4	26.0	54.0	13.9067222	6.5000000
Historic	22	325.0	297.0	13.9067222	14.7727273

Average Scores were used for Ties

Wilcoxon 2-Sample Test (Normal Approximation)
(with Continuity Correction of .5)

S= 26.0000 Z= -1.97746 Prob > |Z| = 0.0480

T-Test approx. Significance = 0.0591

Kruskal-Wallis Test (Chi-Square Approximation)
CHISQ= 4.0538 DF= 1 Prob > CHISQ= 0.0441

----- STATION NAME=GW-145 -----

N P A R I W A Y P R O C E D U R E

Wilcoxon Scores (Rank Sums) for Variable U_
Classified by Variable PERIOD

PERIOD	N	Sum of Scores	Expected Under H0	Std Dev Under H0	Mean Score
1996 Q4	4	30.500000	54.0	13.8969836	7.6250000
Historic	22	320.500000	297.0	13.8969836	14.5681818

Average Scores were used for Ties

Wilcoxon 2-Sample Test (Normal Approximation)
(with Continuity Correction of .5)

S= 30.5000 Z= -1.65504 Prob > |Z| = 0.0979

T-Test approx. Significance = 0.1104

Kruskal-Wallis Test (Chi-Square Approximation)
CHISQ= 2.8595 DF= 1 Prob > CHISQ= 0.0908

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----- STATION NAME=GW-231 -----

N P A R I W A Y P R O C E D U R E

Wilcoxon Scores (Rank Sums) for Variable U_
Classified by Variable PERIOD

PERIOD	N	Sum of Scores	Expected Under H0	Std Dev Under H0	Mean Score
1996 Q4	4	50.0	54.0	6.49923072	12.5000000
Historic	22	301.0	297.0	6.49923072	13.6818182

Average Scores were used for Ties

Wilcoxon 2-Sample Test (Normal Approximation)
(with Continuity Correction of .5)

S= 50.0000 Z= -.538525 Prob > |Z| = 0.5902

T-Test approx. Significance = 0.5950

Kruskal-Wallis Test (Chi-Square Approximation)
CHISQ= 0.37879 DF= 1 Prob > CHISQ= 0.5383

SUMMARY OF KENDALL TAU B TEST RESULTS
KERR HOLLOW QUARRY

PARAMETER	KENDALL TAU B TEST RESULT	
Boron (mg/L)	There is a statistically significant increase in boron concentrations over time for the following wells:	GW-143 GW-145 GW-231
Strontium (mg/L)	There is no statistically significant increase in strontium concentrations over time for any well.	
Gross alpha (pCi/L)	There is no statistically significant increase in strontium concentrations over time for any well.	
Gross beta (pCi/L)	There is no statistically significant increase in strontium concentrations over time for any well.	

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----- STATION NAME=GW-142 -----

Correlation Analysis

1 'WITH' Variables: SAMPLEDT
4 'VAR' Variables: M6 M23 GAA GBA

Simple Statistics

Variable	N	Mean	Std Dev	Median
SAMPLEDT	28	12320	731.946520	12346
M6	28	0.056996	0.026577	0.051500
M23	28	0.511429	0.036078	0.510000
GAA	27	7.128519	4.479439	6.340000
GBA	27	9.169556	7.884109	7.560000

Simple Statistics

Variable	Minimum	Maximum	Label	
SAMPLEDT	11119.0	13446.0	SAMPLE DATE	
M6	0.00790	0.1500	BORON	ICAP (MG/L)
M23	0.4300	0.5800	STRONTIUM	ICAP (MG/L)
GAA	1.5300	15.8200	GROSS ALPHA	(PCI/L)
GBA	-6.7900	38.8000	GROSS BETA	(PCI/L)

Kendall Tau b Correlation Coefficients
/ Prob > |R| under Ho: Rho=0 / Number of Observations

	M6	M23	GAA	GBA
SAMPLEDT	0.21867	0.05452	-0.09402	-0.37322
SAMPLE DATE	0.1048	0.6911	0.4915	0.0063
	28	28	27	27

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----- STATION NAME=GW-143 -----

Correlation Analysis

1 'WITH' Variables: SAMPLEDT
4 'VAR' Variables: M6 M23 GAA GBA

Simple Statistics

Variable	N	Mean	Std Dev	Median
SAMPLEDT	28	12301	723.091281	12255
M6	27	0.891852	0.099113	0.900000
M23	27	2.522222	0.245472	2.500000
GAA	27	4.176444	2.652141	3.860000
GBA	27	16.833333	4.881961	16.900000

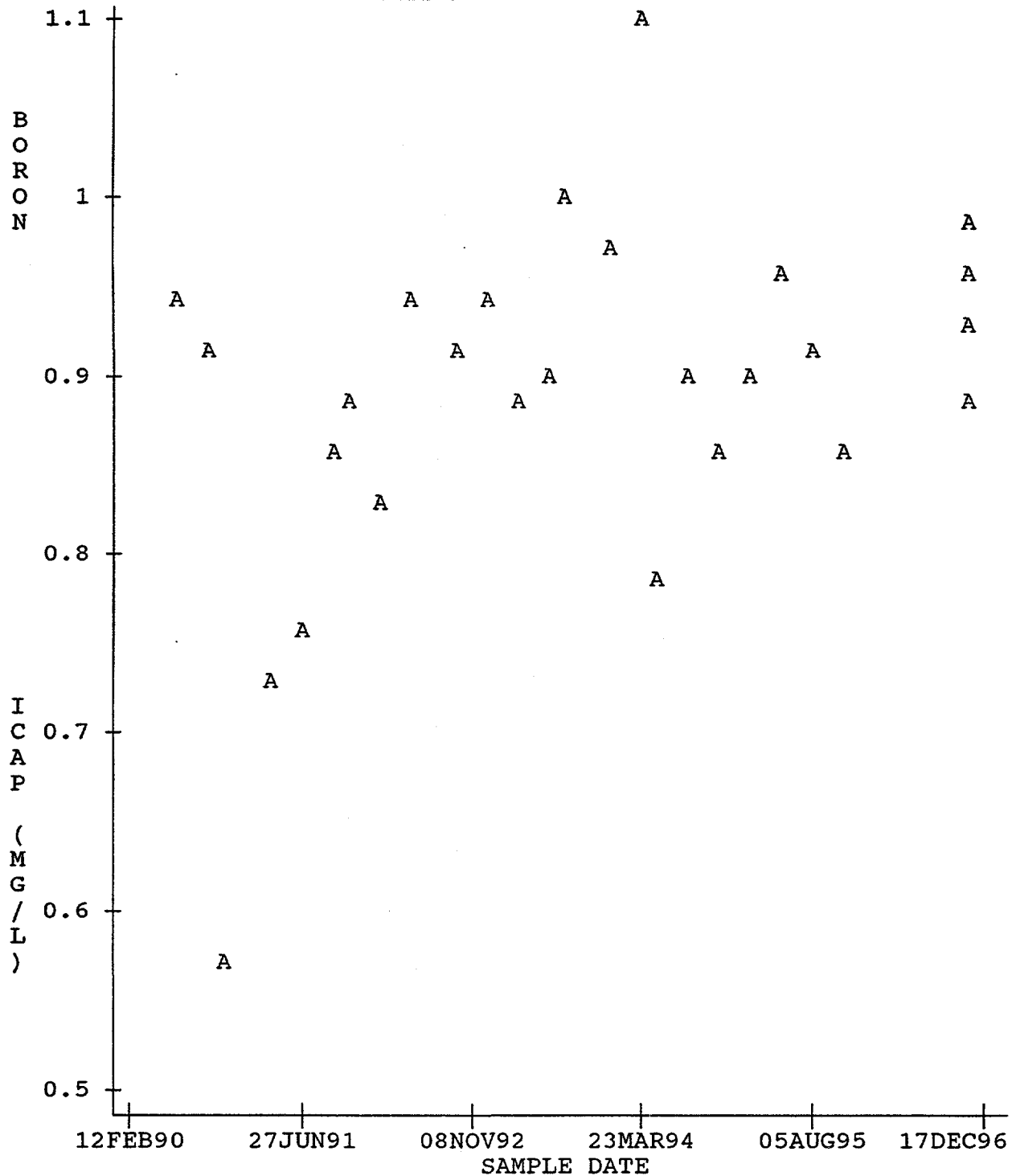
Simple Statistics

Variable	Minimum	Maximum	Label
SAMPLEDT	11122.0	13446.0	SAMPLE DATE
M6	0.5700	1.1000	BORON ICAP (MG/L)
M23	2.2000	3.3000	STRONTIUM ICAP (MG/L)
GAA	0.5520	12.0000	GROSS ALPHA (PCI/L)
GBA	5.7100	33.4000	GROSS BETA (PCI/L)

Kendall Tau b Correlation Coefficients
/ Prob > |R| under Ho: Rho=0 / Number of Observations

	M6	M23	GAA	GBA
SAMPLEDT	0.26303	-0.07299	-0.02564	-0.20228
SAMPLE DATE	0.0572	0.6109	0.8512	0.1388
	27	27	27	27

STATION NAME=GW-143



NOTE: 1 obs had missing values.

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----- STATION NAME=GW-144 -----

Correlation Analysis

1 'WITH' Variables: SAMPLEDT
4 'VAR' Variables: M6 M23 GAA GBA

Simple Statistics

Variable	N	Mean	Std Dev	Median
SAMPLEDT	28	12324	731.373807	12347
M6	27	0.040370	0.036583	0.031000
M23	27	0.097519	0.015448	0.097000
GAA	27	2.696259	2.378879	2.150000
GBA	27	3.088741	2.605531	2.970000

Simple Statistics

Variable	Minimum	Maximum	Label	
SAMPLEDT	11121.0	13446.0	SAMPLE DATE	
M6	0.0160	0.2100	BORON	ICAP (MG/L)
M23	0.0760	0.1400	STRONTIUM	ICAP (MG/L)
GAA	-4.2900	8.4300	GROSS ALPHA	(PCI/L)
GBA	-2.5300	7.4900	GROSS BETA	(PCI/L)

Kendall Tau b Correlation Coefficients
/ Prob. > |R| under Ho: Rho=0 / Number of Observations

	M6	M23	GAA	GBA
SAMPLEDT	0.12122	-0.58033	-0.02564	-0.08262
SAMPLE DATE	0.3802	0.0001	0.8512	0.5455
	27	27	27	27

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----- STATION NAME=GW-145 -----

Correlation Analysis

1 'WITH' Variables: SAMPLEDT
4 'VAR' Variables: M6 M23 GAA GBA

Simple Statistics

Variable	N	Mean	Std Dev	Median
SAMPLEDT	28	12324	730.674129	12346
M6	28	0.253214	0.053821	0.250000
M23	28	7.457143	0.567926	7.400000
GAA	27	11.751481	4.425445	11.700000
GBA	27	16.246926	6.520777	17.380000

Simple Statistics

Variable	Minimum	Maximum	Label
SAMPLEDT	11120.0	13446.0	SAMPLE DATE
M6	0.1500	0.4500	BORON ICAP (MG/L)
M23	6.5000	9.4000	STRONTIUM ICAP (MG/L)
GAA	-0.3500	28.0000	GROSS ALPHA (PCI/L)
GBA	-3.2900	24.4400	GROSS BETA (PCI/L)

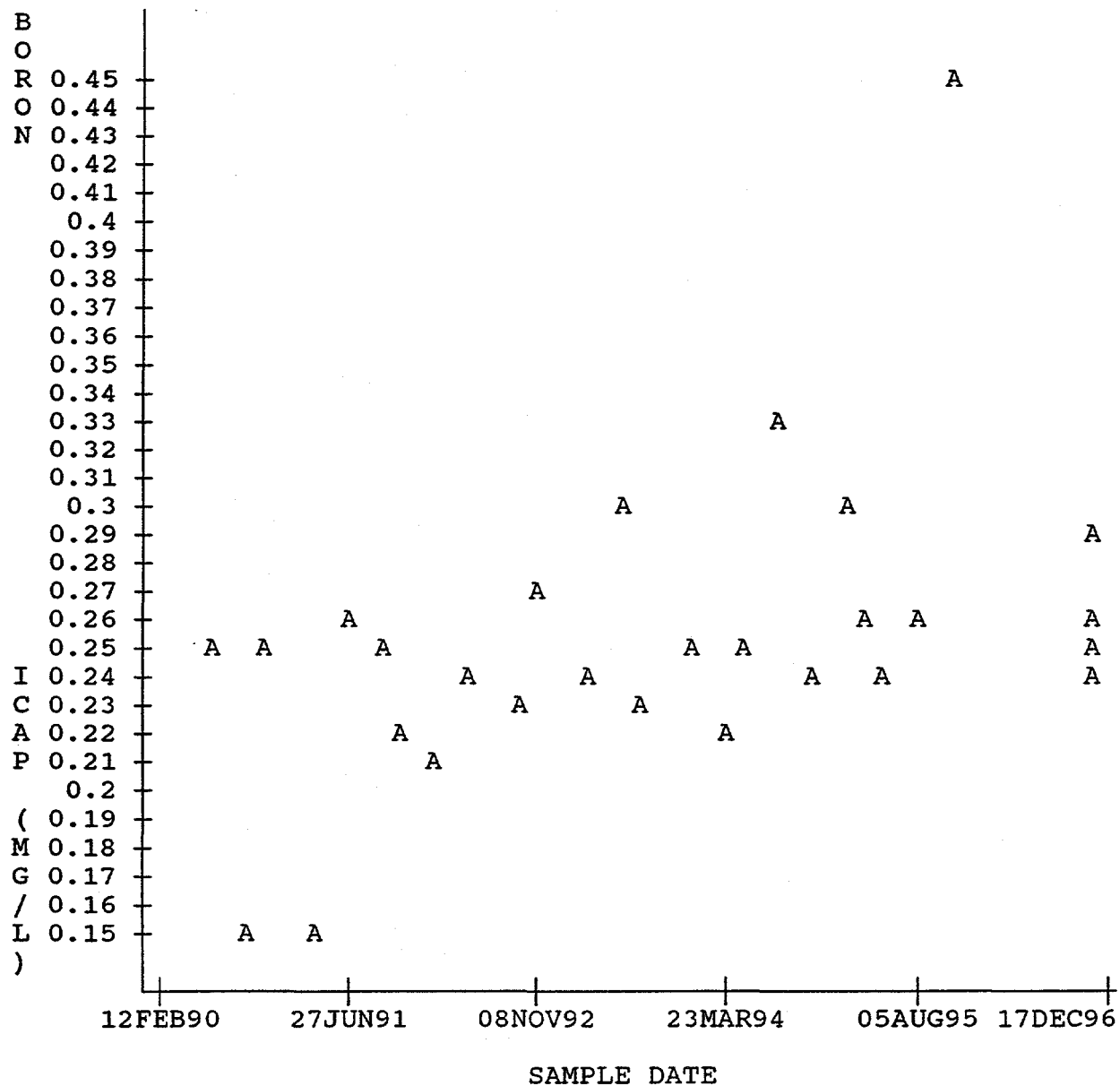
Kendall Tau b Correlation Coefficients

/ Prob > |R| under Ho: Rho=0 / Number of Observations

	M6	M23	GAA	GBA
SAMPLEDT	0.33182	0.01100	0.03714	-0.13695
SAMPLE DATE	0.0166	0.9365	0.7863	0.3169
	28	28	27	27

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----- STATION NAME=GW-145 -----



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----- STATION NAME=GW-231 -----

Correlation Analysis

1 'WITH' Variables: SAMPLEDT
4 'VAR' Variables: M6 M23 GAA GBA

Simple Statistics

Variable	N	Mean	Std Dev	Median
SAMPLEDT	27	12304	734.360268	12289
M6	27	0.028633	0.032889	0.019000
M23	27	0.037741	0.006803	0.038000
GAA	27	0.669652	1.384227	0.801000
GBA	27	0.763111	2.994354	1.140000

Simple Statistics

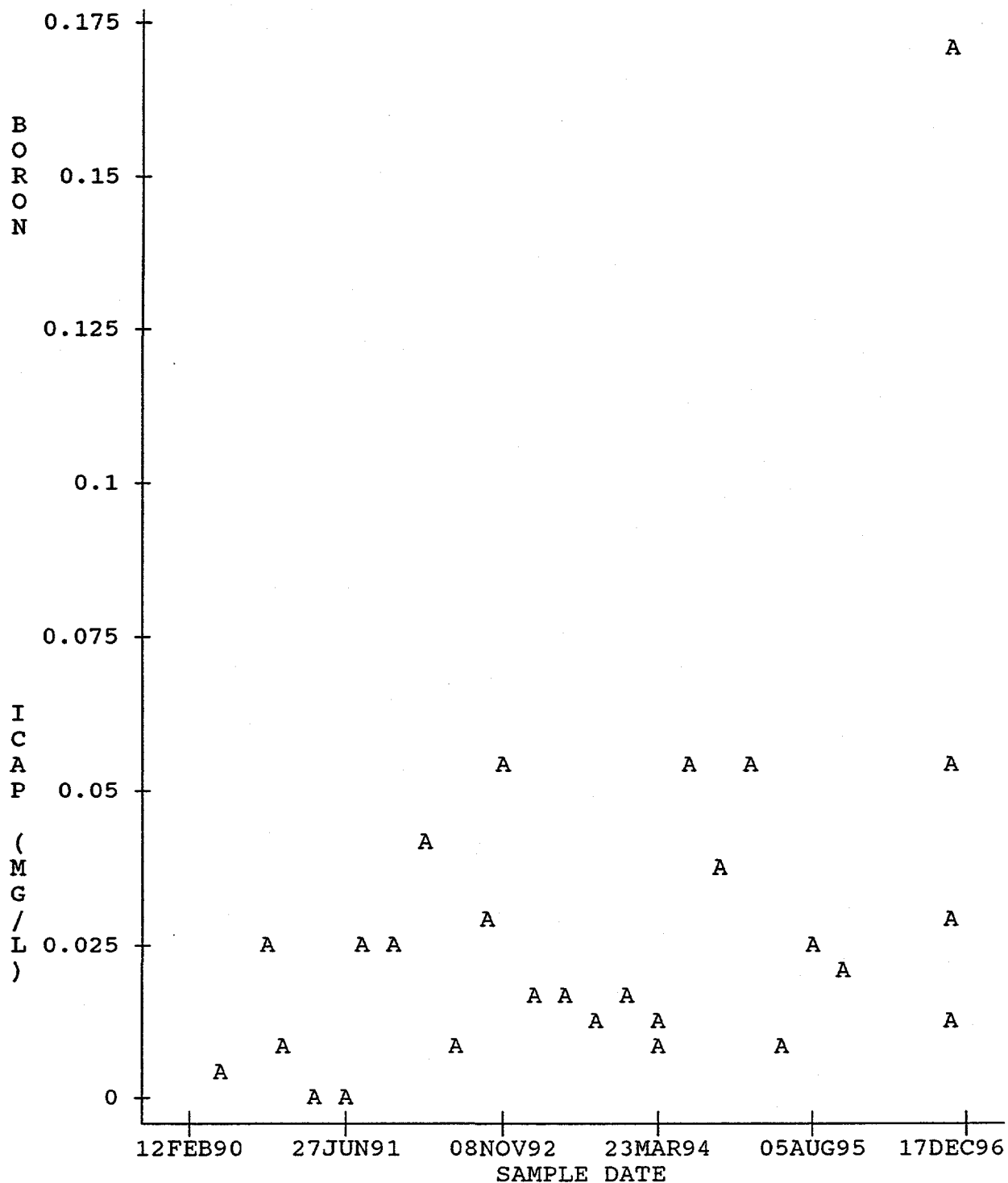
Variable	Minimum	Maximum	Label	
SAMPLEDT	11120.0	13446.0	SAMPLE DATE	
M6	0	0.1700	BORON	ICAP (MG/L)
M23	0.0190	0.0470	STRONTIUM	ICAP (MG/L)
GAA	-2.3500	5.7400	GROSS ALPHA	(PCI/L)
GBA	-4.9200	5.2300	GROSS BETA	(PCI/L)

Kendall Tau b Correlation Coefficients
/ Prob > |R| under Ho: Rho=0 / N = 27

	M6	M23	GAA	GBA
SAMPLEDT	0.32379	0.06331	0.09402	-0.01425
SAMPLE DATE	0.0184	0.6460	0.4915	0.9170

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 Anderson County, Tennessee

----- STATION NAME=GW-231 -----



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