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CALENDAR YEAR 1997 ANNUAL GROUNDWATER MONITORING REPORT FOR THE BEAR CREEK HYDROGEOLOGIC REGIME AT THE U.S. DEPARTMENT OF ENERGY Y-12 PLANT, OAK RIDGE, TENNESSEE

RCRA Post-Closure Permit No. TNHW-087
EPA Identification No. TN3 89 009 0001

February 1998

Prepared by

AJA TECHNICAL SERVICES, INC.
Under Subcontract No. 70Y-KDS15V

for the

Surveillance and Maintenance Program
at the Oak Ridge Y-12 Plant,
Project Execution, Environmental Management
and Enrichment Facilities

Managed by

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

MANAGED BY
LOCKHEED MARTIN ENERGY SYSTEMS, INC.
FOR THE UNITED STATES
DEPARTMENT OF ENERGY

UCN-13672 (26 6-95)

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List of Acronyms and Abbreviations

AGLLSF	Above Grade Low-Level Storage Facility
ASO	Analytical Services Organization
BCV	Bear Creek Valley
BCK	Bear Creek kilometer
Bear Creek Regime	Bear Creek Hydrogeologic Regime
BG	Burial Grounds
bgs	below ground surface
CA	Characterization Area
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CY	Calendar Year
DNAPL	dense, non-aqueous phase liquids
DOE	U.S. Department of Energy
DQO	data quality objective
ETTP	East Tennessee Technology Park (formerly the Oak Ridge K-25 Site)
ft	feet
ft/d	feet per day
GWPP	Groundwater Protection Program
GWPS	(RCRA) Groundwater Protection Standard
HCDA	Hazardous Chemical Disposal Area
HWDU	Hazardous Waste Disposal Unit
MCL	maximum contaminant level
MDA	minimum detectable activity
msl	mean sea level
µg/L	micrograms per liter
mg/L	milligrams per liter
NT	North Tributary (of Bear Creek)
ORR	Oak Ridge Reservation
PCE	Tetrachloroethene
pCi/L	picoCuries per liter
PCP	RCRA Post-Closure Permit for the Bear Creek Hydrogeologic Regime
QA/QC	quality assurance/quality control
RCRA	Resource Conservation and Recovery Act
RI	Remedial Investigation (CERCLA)
SS	South Side (of Bear Creek)
TCE	Trichloroethene
TDEC	Tennessee Department of Environment and Conservation
TDS	total dissolved solids
TSD	treatment, storage, and disposal (unit)
VOC	volatile organic compound
WMA	Waste Management Area

List of Acronyms and Abbreviations (cont'd)

1,1-DCA	1,1-dichloroethane
1,1-DCE	1,1-dichloroethene
1,2-DCA	1,2-dichloroethane
1,2-DCE	1,2-dichloroethene
1,1,1-TCA	1,1,1-trichloroethane
^{241}Am	Americium-241
^{129}I	Iodine-129
^{237}Np	Neptunium-237
^{238}Pu	Plutonium-238
^{99}Tc	Technetium-99
^{234}U	Uranium-234
^{235}U	Uranium-235
^{238}U	Uranium-238

Certification Statement

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Lockheed Martin Energy Systems, Inc. Co-Operator	2/25/98 Date Signed

RCRA Facility Information

Facility:	U.S. Department of Energy Oak Ridge Y-12 Plant
Identification No.:	TN3 89 009 0001
Tennessee Permit No.:	TNHW-087
Address:	P.O. Box 2001
	Oak Ridge, Tennessee 37831

Executive Summary

This report contains the groundwater and surface water monitoring data obtained during calendar year (CY) 1997 in compliance with the Resource Conservation and Recovery Act (RCRA) post-closure permit (PCP) for the Bear Creek Hydrogeologic Regime (Bear Creek Regime), and as otherwise required by U.S. Department of Energy (DOE) Order 5400.1. In July 1997, the Tennessee Department of Environment and Conservation (TDEC) approved several modifications to the RCRA post-closure corrective action monitoring requirements specified in the PCP. This report has been prepared in accordance with these modified requirements.

Groundwater and surface water samples were collected semiannually during CY 1997 from three springs, seven surface water stations, and 46 monitoring wells. Twenty-four of these wells were sampled in compliance with RCRA post-closure corrective action monitoring requirements at the S-3 Site, Oil Landfarm, and Bear Creek Burial Grounds/Walk-In Pits. The springs, surface water stations, and remaining 22 monitoring wells were sampled for the purposes of DOE Order 5400.1 surveillance monitoring and exit pathway/perimeter monitoring. Samples from each location were analyzed for a standardized suite of inorganics, organics, and radioanalytes. This suite of analytes includes the RCRA Groundwater Protection Standard (GWPS) constituents listed in site-specific attachments to the PCP. A permit modification request to remove several radionuclides from the respective GWPS lists is currently pending approval by the TDEC.

The RCRA post-closure corrective action monitoring results were evaluated in accordance with the requirements of the PCP. Site-specific conditions of the PCP require an evaluation of the monitoring results for point-of-compliance wells at the S-3 Site, Oil Landfarm, and Bear Creek Burial Grounds/Walk-In Pits to gauge the effectiveness of the low permeability cap at each site, and an evaluation of the monitoring results for designated plume boundary wells to determine if these wells continue to monitor the leading edge of the groundwater contaminant plumes in the Bear Creek Regime. The respective evaluations were performed in accordance with the revised technical approach approved by the TDEC in July 1997, which requires temporal trend analysis of selected GWPS constituents that are the primary components of the groundwater contaminant plumes at each site. Additionally, the PCP requires an annual evaluation of the groundwater flow direction and rate in the uppermost aquifer at each site.

Based on evaluation of the CY 1997 RCRA post-closure corrective action monitoring results, data for the point-of-compliance wells at the S-3 Site, Oil Landfarm, and Bear Creek Burial Grounds/Walk-In Pits do not indicate any significant change in the performance of the low permeability cap at each site. Also, evaluation of the respective monitoring results indicates that the plume boundary wells remain downgradient of the groundwater contaminant plumes in the Bear Creek Regime. Moreover, evaluation of groundwater elevations do not indicate any significant changes in flow directions. Based on horizontal hydraulic gradients determined from the groundwater elevation data for selected monitoring wells at each site and the inherent assumptions associated with the modified Darcy equation, the calculated flow velocities are consistent with historical results indicating a wide range of groundwater flow rates.

1.0 INTRODUCTION

This annual monitoring report contains groundwater and surface water monitoring data obtained in the Bear Creek Hydrogeologic Regime (Bear Creek Regime) during calendar year (CY) 1997. The Bear Creek Regime encompasses a portion of Bear Creek Valley (BCV) west 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) that contains several hazardous and nonhazardous waste management facilities (Figure 1).

This report contains the groundwater monitoring data obtained during CY 1997 in compliance with the Resource Conservation and Recovery Act (RCRA) post-closure permit (PCP) for the Bear Creek Regime (permit number TNHW-087). Issued by the Tennessee Department of Environment and Conservation (TDEC), the PCP defines the post-closure maintenance and groundwater monitoring requirements for three hazardous waste disposal units (HWDUs) in the regime that have been granted RCRA post-closure corrective action status: the S-3 Site, the Oil Landfarm, and the Bear Creek Burial Grounds/Walk-In Pits (Figure 2). Results of RCRA post-closure corrective action groundwater monitoring (hereafter referenced as RCRA monitoring) are reported to the TDEC semiannually. The RCRA monitoring results obtained during the first 180-day reporting period for CY 1997 were submitted to the TDEC before the September 1 deadline specified by the PCP (Lockheed Martin Energy Systems, Inc. 1997). In addition to this previously reported monitoring data, this report contains the RCRA monitoring results obtained during the second 180-day reporting period, the signed certification statement (Page vii) and RCRA facility information (Page viii), and the annual monitoring data evaluations (Section 4.0) that must be submitted to the TDEC before the March 1 reporting deadline specified by condition II.C.6 of the PCP. This report also contains the groundwater and surface water monitoring data obtained during CY 1997 for the purposes of DOE Order 5400.1 surveillance monitoring and DOE Order 5400.1 exit pathway/perimeter monitoring (collectively referenced as DOE Order 5400.1 monitoring).

Site-specific conditions of the PCP for the Bear Creek Regime define the requirements for RCRA monitoring at the S-3 Site, the Oil Landfarm, and the Bear Creek Burial Grounds/Walk-In Pits (Table 1). Modifications to several of these permit conditions were proposed based on RCRA monitoring results obtained during CY 1996 (Table 2). These modifications redefine the monitoring

well network specified for each HWDU, clarify the approach for evaluating the groundwater monitoring data, and update the technical field procedures included as attachments to the PCP (Tennessee Department of Environment and Conservation, 1997).

The following narrative sections of the report provide background information regarding the waste management sites in the Bear Creek Regime, the hydrogeologic framework, and the extent of groundwater and surface water contamination (Section 2.0); summarize the CY 1997 groundwater and surface water sampling and analysis activities, including quality assurance/quality control (QA/QC) sampling and data management (Section 3.0); and describe results of the RCRA monitoring data evaluations required by the PCP (Section 4.0). Documents cited for more detailed operational, regulatory, or technical information regarding the waste management sites and associated monitoring programs in the Bear Creek Regime are listed in Section 5.0.

Narrative sections of this report reference a series of appendices. Illustrations (maps and trend graphs), 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 1997 groundwater and surface water monitoring results that do not meet applicable data quality objectives (DQOs).

2.0 BACKGROUND INFORMATION

The following sections contain background information regarding the waste management sites in the Bear Creek Regime and their current regulatory status, the characteristics of the groundwater and surface water flow systems in the regime, and the extent of groundwater and surface water contamination. This information provides a conceptual framework for the groundwater flow direction/rate and contaminant concentration trend evaluations required for RCRA monitoring (see Section 4.0).

2.1 Waste Management Sites

The Bear Creek Regime encompasses a portion of BCV used since the early 1950s for the treatment, storage, and disposal (TSD) of various hazardous and nonhazardous wastes associated with operation of the Y-12 Plant (Table 3). With the exception of the Above Grade Low-Level Storage Facility (AGLLSF), all of these TSD facilities are closed and currently regulated under RCRA, the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), or both; the AGLLSF is an operating facility that is not regulated under either program.

All the closed TSD facilities in the Bear Creek Regime have been inactive since the late 1980s, and most have undergone some level of engineered closure (e.g., installation of multi-layer, low-permeability caps), including all of the RCRA HWDUs. Many of these sites are confirmed or suspected sources of contamination in the Bear Creek Regime, and the contaminated media (groundwater, surface water, stream sediments in Bear Creek and its tributaries, and Bear Creek floodplain soils) were the primary focus of the CERCLA Remedial Investigation (RI) for the Bear Creek Characterization Area (CA) (Table 3). The S-3 Site, Oil Landfarm Waste Management Area (WMA), and the Bear Creek Burial Grounds WMA are the primary sources of contamination in the regime. Brief descriptions of these sites are provided below.

S-3 Site

The S-3 Site (formerly the S-3 Ponds) is a closed RCRA surface impoundment located near the headwaters of Bear Creek, just west of the groundwater and surface water flow divide between

the Bear Creek Regime and the Upper East Fork Poplar Creek Hydrogeologic Regime (Figure 2). The site consisted of four unlined ponds used between 1951 and 1984 for disposal of acidic, radioactive liquid wastes. Each pond was about 17 feet (ft) deep and had a storage capacity of approximately 2.5 million gallons.

Oil Landfarm WMA

The Oil Landfarm WMA is located north of Bear Creek about one mile west of the Y-12 Plant, and consists of the Oil Landfarm HWDU, the Boneyard/Burnyard/Hazardous Chemical Disposal Area (HCDA), and Sanitary Landfill I (Figure 2). As noted in Section 1.0, the Oil Landfarm is a RCRA HWDU addressed in the PCP. Other sites within the Oil Landfarm WMA are currently regulated under CERCLA.

The Oil Landfarm HWDU was used between 1973 and 1982 for the biodegradation of about one million gallons of waste oil and machine coolants via landfarming. This process involved application of the wastes to nutrient-adjusted surficial soils during the dry months of the year (April to October).

The Boneyard was used for the disposal of magnesium chips and construction debris (e.g., concrete) in unlined shallow trenches. Filled trenches were covered with topsoil and seeded with grass. The Burnyard consisted of two unlined trenches, each about 300 ft long by 40 ft wide, in which various types of refuse (including pesticide containers, metal shavings, solvents, oils, and laboratory chemicals) were burned. Some residues may have been buried in the Boneyard. The HCDA was constructed on top of the Burnyard in 1975, and was used as an area for releasing compressed gas from cylinders with leaking or damaged valves and for disposal of reactive or explosive laboratory chemicals. The chemicals were handled to induce the expected reaction or explosion, and remaining liquids were discharged into a small unlined surface impoundment.

Sanitary Landfill I was used between 1968 and 1980 for disposal of combustible and decomposable solid wastes from the Y-12 Plant, some of which may have included toxic chemicals. Disposal trenches at the landfill were excavated to depths of about 20 ft below ground surface (bgs) and backfilled to about 15 ft above grade. The landfill was graded and capped in 1985.

Bear Creek Burial Grounds WMA

The Bear Creek Burial Grounds WMA is about two miles west of the Y-12 Plant, and consists of several waste disposal areas designated as Burial Grounds (BG)-A, -B, -C, -D, -E, and -J; the Walk-In Pits; the Uranium Vaults; and Oil Retention Ponds No. 1 and No. 2, which were constructed to collect oils seeping from disposal trenches in BG-A South and BG-A North, respectively (Figure 2). Of these, only BG-A (North and South), BG-C (West), and the Walk-In Pits are RCRA HWDUs; the remaining sites are regulated under CERCLA (Table 3). Each waste disposal area consisted of shallow (i.e., <25 ft bgs) trenches. These trenches received a diverse mixture of solid wastes (1955 to 1993) and liquid wastes (1959 to 1979) from the Y-12 Plant, including substantial volumes of borax (hydrated sodium borate) waste water, all or most of which contained varying amounts of radioisotopic contamination.

2.2 Topography and Bedrock Geology

The Bear Creek Regime is bound to the north by Pine Ridge and to the south by Chestnut Ridge, and encompasses the portion of BCV extending from a surface water and shallow groundwater divide at the west end of the Y-12 Plant to the western boundary of the Bear Creek watershed. Surface elevations range from 900 ft above mean sea level (msl) in the Bear Creek channel along the floor of BCV, to about 1,200 ft msl along the crests of Pine Ridge and Chestnut Ridge (Figure 3).

The geology of the Bear Creek Regime is characterized by alternating sequences of clastic and carbonate strata that form the distinctive topography of the Valley and Ridge Physiographic Province. On the Oak Ridge Reservation (ORR), shale and siltstone beds of the Rome Formation form Pine Ridge to the north, limestone and shale formations of the Conasauga Group form BCV, and the primarily dolostone formations of the Knox Group form Chestnut Ridge to the south (Figure 3). Strike and dip of bedding are generally N 55°E and 45°SE, respectively (as referenced to true north). Bedrock is overlain by up to 50 ft of several materials, including man-made fill, alluvium, colluvium, fine-grained residuum from the weathering of the bedrock, and saprolite (weathered bedrock). In some areas the saprolite retains primary textural features of the bedrock.

2.3 Hydrogeologic Framework

The following overview of the hydrogeologic system in the Bear Creek Regime is based on the conceptual hydrologic model described in the CERCLA RI Report for the Bear Creek CA (U.S. Department of Energy 1997). This conceptual model incorporates: (1) the general hydrologic framework and associated nomenclature described in Solomon et al. (1992); (2) groundwater flow characteristics presented in Moore (1988 and 1992) and Moore and Toran (1992); (3) results of hydrologic studies and investigations in BCV, including Dreier et al. (1987), Shevenell (1994), and Turner et al. (1991); and (4) findings of sampling and analysis activities performed specifically for RI purposes. Key aspects of the conceptual model regarding the principal hydrogeologic units and respective groundwater flow characteristics, and the general hydrology of Bear Creek are summarized in the following discussion.

2.3.1 Groundwater System

The Rome Formation, Conasauga Group, and Knox Group comprise two basic hydrogeologic units in the Bear Creek Regime: the Aquifer, consisting of the Maynardville Limestone (upper Conasauga Group) and Copper Ridge Dolomite (lower Knox Group); and the Aquitard, consisting of the remaining Conasauga Group formations (Nolichucky Shale, Maryville Limestone, Rogersville Shale, Rutledge Limestone, and Pumpkin Valley Shale) and the Rome Formation (Figure 3). Components of the Aquifer underlie the axis of BCV (Maynardville Limestone) and the steep flank and crest of Chestnut Ridge (Copper Ridge Dolomite). Formations comprising the Aquitard form the northern slope of BCV (Conasauga Group) and Pine Ridge (Rome Formation). The Aquitard, which underlies the primary contaminant source areas in the Bear Creek Regime, is hydraulically upgradient of the Aquifer, which functions as a hydrologic drain in BCV. Fractures provide the principal groundwater flowpaths in both units, and dissolution of carbonates in the Aquifer has enlarged fractures and produced solution cavities and conduits that greatly enhance its hydraulic conductivity relative to the Aquitard. Although negligible in both units, flow through the porous rock matrix plays an important role in contaminant migration because of matrix diffusion processes.

Groundwater flow in the Aquitard and the Aquifer is primarily parallel to bedding (along strike and dip), which in the Aquitard may or may not coincide with the direction of maximum

hydraulic gradient inferred from water level isopleths. Flow tangent to bedding occurs primarily along permeable zones formed by cross-cutting fractures or fracture zones (and possibly small faults). The northern tributaries of Bear Creek are probably the surficial expression of these cross-cutting structures. Such structures provide preferred flowpaths that channel groundwater from the Aquitard to the Aquifer, or act as barriers to lateral flow, causing groundwater from deeper intervals to upwell and discharge to the shallower flow system in each hydrogeologic unit.

In the Aquitard, most groundwater flow occurs in a highly conductive interval near the bedrock/residuum interface (the water table interval). Flow above the water table occurs in response to precipitation when flowpaths in the residual soils become saturated and rapidly transmit water laterally (stormflow) down slope toward springs and seeps and vertically (recharge) to the water table interval. Recharge to the water table interval promotes strike-parallel groundwater flow toward discharge areas in nearby cross-cutting streams. Although the presence of contaminants in groundwater more than 200 ft bgs in the Nolichucky Shale clearly indicates permeable flowpaths at depth, flow is most active at depths less than 100 ft bgs and only a small percentage of total flow ultimately recharges the deeper bedrock, where upward hydraulic gradients predominate. Overall, about 94% of the available groundwater in the Aquitard discharges to Bear Creek tributaries, about 5% flows along cross-cutting fractures into the Aquifer, and about 1% flows through strike-parallel pathways in the deeper subsurface (U.S. Department of Energy 1997).

Decreasing groundwater flux with depth in the Aquitard also is reflected by distinct changes in groundwater geochemistry. Most water table interval and shallow (i.e., <100 ft bgs) bedrock wells monitor calcium-magnesium-bicarbonate groundwater. A fairly abrupt change to sodium-bicarbonate groundwater occurs at a depth of about 100 ft bgs, which is interpreted to be a function of longer groundwater residence time related to reduced fracture aperture or increased fracture spacing (Solomon et. al. 1992). Further reduced groundwater flux is indicated by the transition from sodium-bicarbonate groundwater to sodium-chloride groundwater that usually occurs at a depth of about 400 ft bgs. The transition to the sodium-chloride groundwater is accompanied by a general increase in total dissolved solids (TDS).

Most groundwater flow in the Aquifer occurs at shallow depths (i.e., <100 ft bgs) in an extensively interconnected network of solution conduits and cavities (karst network). Below the

shallow karst network, fractures provide the primary flowpaths. Also, there are seven stratigraphic zones in the Maynardville Limestone (numbered from bottom to top) that are differentiated by distinct lithologic and hydrologic characteristics (Shevenell et al. 1995). The more permeable zones are at the bottom (Zone 2) and top (Zone 6) of the formation, but the uppermost zones are the most permeable and probably transmit the bulk of the groundwater in the Maynardville Limestone (Goldstrand 1995).

Flow in the shallow karst network in the Aquifer is relatively rapid and occurs as "quickflow" discharge to Bear Creek during rainfall. Active groundwater circulation occurs at greater depth than in the Aquitard, and groundwater from the deeper flow system discharges along major gaining (influent) reaches of Bear Creek. These discharge areas are probably related to large-scale structural (e.g., cross-strike faults) or stratigraphic discontinuities in the Maynardville Limestone. Overall, about 81% of the available groundwater in the Aquifer (Maynardville Limestone) discharges directly to Bear Creek, 16% flows into the creek from spring SS-5, and 3% follows strike-parallel flowpaths in the subsurface (U.S. Department of Energy 1997).

Groundwater geochemistry is more homogeneous in the Aquifer than in the Aquitard; almost every monitoring well in the Maynardville Limestone, regardless of depth, monitors calcium-magnesium-bicarbonate groundwater. Some shallow wells monitor sulfate-enriched groundwater, which probably reflects dissolution of locally disseminated sulfides, and several deep wells monitor calcium-magnesium-sulfate groundwater with very high TDS.

2.3.2 Surface Water System

Surface water in the Bear Creek Regime is drained by Bear Creek and its tributaries (Figure 3). From its headwaters near the west end of the Y-12 Plant, Bear Creek flows southwest for approximately 4.5 miles, where it turns northward to flow into East Fork Poplar Creek. Monitoring locations along the main channel of Bear Creek are specified by the Bear Creek kilometer (BCK) value corresponding to the distance upstream from the confluence with East Fork Poplar Creek (e.g., BCK-09.40). Sections of the main channel are referenced as upper Bear Creek (upstream of BCK-11.97), middle Bear Creek (between BCK-11.97 and BCK-09.40), and lower Bear Creek (downstream of BCK-09.40). Tributaries are designated as north (e.g., NT), or south,

along with a value representing the tributary number counted downstream from the headwaters (e.g., NT-1). Major springs along the south side (SS) of Bear Creek are numbered in ascending order from the headwaters (e.g., SS-1).

Approximately half of the annual precipitation in BCV exits via surface water flow in Bear Creek, and possibly higher proportions during winter and early spring (U.S. Department of Energy 1997). Flow in the creek increases rapidly during rainfall, and afterward reflects the relative contributions of overland flow, stormflow, and groundwater discharge. Flow in the main channel and tributaries generally returns to pre-precipitation levels within one or two days. Major sections of upper and middle Bear Creek are seasonally dry, but flow is perennial in lower Bear Creek.

The main channel of Bear Creek functions as a major conduit of the shallow karst network within the Maynardville Limestone. Discharge from numerous springs located along the Maynardville Limestone/Copper Ridge Dolomite boundary on the north slope of Chestnut Ridge dominate the hydrology of the creek, especially during droughts when they provide most of the flow in the main channel. Additionally, the main channel contains alternating gaining and losing reaches. Each gaining reach generally correlates with a major Aquifer discharge area. Losing reaches in upper and middle Bear Creek, particularly a section of the main channel directly south of Sanitary Landfill I, play an important role in transferring contaminants from Bear Creek to the Aquifer.

2.4 Groundwater Contamination

The following discussion is based on the contaminant transport models for the primary source areas in the Bear Creek Regime (the S-3 Site, the Oil Landfarm WMA, and the Bear Creek Burial Grounds WMA) and the principal contaminant migration pathways (the Maynardville Limestone and Bear Creek) described in the CERCLA RI Report for the Bear Creek CA (U.S. Department of Energy 1997). These models incorporate the bulk of the geologic, hydrologic, and water quality data available for the Y-12 Plant, and essentially represent the culmination of hydrogeologic characterization and contamination assessment efforts performed since the mid-1980's.

S-3 Site

Operation of the former S-3 Ponds emplaced a large reservoir of contamination in the Aquitard (Nolichucky Shale) consisting of a heterogeneous mix of inorganic, organic, and radioactive constituents. The principal groundwater contaminants are nitrate, technetium-99 (^{99}Tc), uranium isotopes (primarily ^{234}U and ^{238} U), trace metals (e.g., cadmium), and volatile organic compounds (VOCs). Contaminant concentrations in the Aquitard nearest the site have probably reached maximum levels, with the center of mass of the plume slowly moving westward. Westward, strike-parallel migration of contaminants in the Aquitard occurs until they encounter a cross-cutting structure that promotes upward discharge into the shallow flow system, or cross-strike flow into the Aquifer.

As indicated by the distribution of nitrate, a highly mobile and chemically stable contaminant that delineates the maximum extent of groundwater transport and effectively traces the principal migration pathways, the S-3 Site groundwater contaminant plume in the Aquitard extends south toward the upper reach of Bear Creek, and along strike in the water table interval and the deeper bedrock for over 3,000 ft to the west (Figure 4). Nitrate (as N) concentrations (hereafter synonymous with "nitrate" concentrations) within the plume exceed 10,000 milligrams per liter (mg/L) in the deep bedrock directly below the S-3 Site, 1,000 mg/L in the shallow groundwater near the site, and 10 mg/L near the plume boundaries.

Gross alpha activity and gross beta activity within the S-3 Site contaminant plume exceed 1,000 picoCuries per liter (pCi/L). Although a diverse population of radioisotopes may be present in the groundwater closest to the site, elevated gross alpha and gross beta activity in the groundwater (Figure 4) probably delineate migration of uranium isotopes and ^{99}Tc, respectively.

Other components of the S-3 Site contaminant plume are trace metals and VOCs. The distribution of trace metals is less extensive than that of nitrate and radioactivity, but the most mobile metals within the plume (e.g., barium) have been transported beyond the acidic groundwater (pH <5) nearest the site. Acetone and tetrachloroethene (PCE) are the principal VOCs within the plume. Concentrations of PCE exceed 5,000 micrograms per liter (µg/L) in wells adjacent to the site, suggesting that dense nonaqueous phase liquids (DNAPLs) are present in the subsurface, but rapidly decrease to less than 50 µg/L about 500 ft downgradient of the site.

The S-3 Site contains varying amounts of sludge produced by denitrification of the waste water during closure of the former S-3 Ponds. Sludge within the saturated zone may release ^{99}Tc and uranium isotopes to the shallow groundwater flow system in the Aquitard, which then may be transported westward through the water table interval toward discharge points in NT-1 (U.S. Department of Energy 1997). Additionally, matrix diffusion and advective transport processes are slowly releasing contaminants (e.g., nitrate) from the deeper reservoir into the more active (shallow) Aquitard flow system.

Oil Landfarm WMA

The primary sources of groundwater contaminants in the Oil Landfarm WMA (listed in order of importance) are the Boneyard/Burnyard/HCDA, the Oil Landfarm HWDU, and Sanitary Landfill I. Each is a source of VOCs in the shallow groundwater, and the Boneyard/Burnyard is a major source of elemental uranium and alpha radioactivity.

Uranium isotopes are the principal groundwater contaminants at the Boneyard/Burnyard. Contamination delineated by soil sampling and geophysical and radiological surveys indicate a major source area located immediately northwest of the HCDA cap. Wastes in the Boneyard/Burnyard are probably within the saturated zone during seasonally high groundwater levels, and uranium isotopes may be leached and transported with the shallow groundwater that discharges into NT-3 or recharges directly into the Maynardville Limestone. Gross alpha and gross beta activity exceed 1,000 pCi/L in the shallow groundwater along NT-3 from the northwest corner of the site to the confluence of NT-3 and Bear Creek (Figure 4).

The Boneyard/Burnyard/HCDA also is the source of a dissolved VOC plume in the shallow groundwater. Primary components of the plume are trichloroethene (TCE), 1,2-dichloroethene (1,2-DCE), and PCE. Concentrations of these VOCs are less than one percent of solubility, indicating that DNAPLs are probably not present in the subsurface. The HCDA is most likely the principal source of these VOCs, as indicated by the lack of these constituents in surface water at NT-3 and their areal distribution relative to the radioactivity plume originating from elsewhere in the Boneyard/Burnyard (Figure 4).

Groundwater contaminants at the Oil Landfarm HWDU are principally VOCs, and two distinct plumes are evident: one to the northeast dominated by 1,1,1-trichloroethane (1,1,1-TCA), 1,1-dichloroethane (1,1-DCA), and 1,1-dichloroethene (1,1-DCE); and one to the south dominated by PCE, 1,2-DCE, trans-1,2-DCE, and TCE. Concentrations of these compounds exceed 1,000 µg/L in the northeast plume, and 100 µg/L in the southern plume. Both plumes appear to be restricted to the shallow flow system. Maximum concentrations within the plumes do not indicate the presence of DNAPLs in the subsurface.

Sanitary Landfill I is a probable source of 1,1-DCA, 1,2-DCE, and trans-1,2-DCE in the shallow groundwater (Aquitard and Aquifer) downgradient to the south of the site (Figure 4). Maximum VOC concentrations are typically less than 50 µg/L. In the Aquifer (Maynardville Limestone), these constituents have intermingled with the VOC plume (primarily TCE and 1,2-DCE) originating from upgradient sources. Sanitary Landfill I also may be a source of boron in the groundwater at several wells immediately downgradient (west) of the site.

Bear Creek Burial Grounds WMA

Groundwater in the Aquitard underlying the Bear Creek Burial Grounds WMA is extensively contaminated with VOCs at both shallow (water table) and deep (bedrock) intervals (Figure 4). There are five primary source areas: BG-A (North and South), BG-C (East and West), and the Walk-In Pits (Figure 2). Dissolved VOC plumes in the shallow groundwater at several of these source areas are probably related to widespread occurrence of DNAPLs in the subsurface. Contamination in the deeper groundwater flow system reflects density-driven, downward migration of DNAPLs.

The disposal trenches comprising BG-A (North and South) received almost two million gallons of waste oils and coolants, and DNAPLs have been encountered at 260 ft and 330 ft bgs in monitoring wells downdip of source trenches in BG-A South. Dissolved VOC plumes in the groundwater underlying both areas are dominated by PCE, TCE, and 1,2-DCE. Other common plume constituents are 1,1,1-TCA, 1,1-DCA, and 1,2-dichloroethane (1,2-DCA). Summed concentrations of these plume constituents exceed 100,000 µg/L. Groundwater in the water table interval transports the plume constituents along strike toward discharge areas in NT-7. Strike-

parallel migration also occurs below the water table interval, as reflected by westward (strike-parallel) transport of PCE indicated by data obtained from deeper bedrock wells at BG-A South.

Separate plumes of dissolved VOCs apparently occur in the shallow groundwater at BG-C East and BG-C West (Figure 4), both dominated by 1,2-DCE with lesser amounts of vinyl chloride. Concentrations within the plume are generally less than 500 µg/L. Groundwater containing these VOCs discharges to the NT-8 catchment on the northwest side of the Burial Grounds WMA. Data for both source areas do not clearly indicate the presence of DNAPLs in the subsurface.

Groundwater near the Walk-In Pits contains a distinct plume of dissolved VOCs dominated by PCE. Concentrations exceed 2,000 µg/L, which is about 1% of the maximum PCE solubility and possibly indicates DNAPLs in the subsurface. Contaminants in the shallow groundwater flow system may not discharge extensively to surface water.

Although large quantities of uranium wastes were disposed in the Bear Creek Burial Grounds WMA, few monitoring wells in the area yield radioactive groundwater samples (Figure 4). However, RI data for soil samples and surface water samples collected from Bear Creek tributaries NT-6, NT-7, and NT-8 indicate that BG-A South and BG-C East are probable sources of radioactivity. Maximum gross alpha and gross beta activities in the samples from these tributaries ranged from about 20 pCi/L to more than 100 pCi/L. The disparity with the groundwater sample data is probably an artifact of the monitoring well network; few of the wells are screened within the shallowest water table interval where radioactive contamination likely occurs (U.S. Department of Energy 1997).

Boron is the primary trace metal contaminant in the groundwater at the Bear Creek Burial Grounds WMA. Elevated boron concentrations occur primarily in the shallow groundwater near BG-A South and BG-C (East and West), and probably resulted from disposal of borax waste waters from the Y-12 Plant. Boron is most likely present in the groundwater as borate [$B(OH)_3$], which is chemically stable and relatively mobile, and is transported toward discharge points in Bear Creek tributaries NT-7 and NT-8.

Maynardville Limestone Exit Pathway

The principal groundwater contaminants in the Maynardville Limestone are nitrate, VOCs, radioactivity, and trace metals. These contaminants primarily originate from the S-3 Site (nitrate, trace metals, and radionuclides), the Boneyard/Burnyard/HCDA (uranium isotopes and VOCs), Sanitary Landfill I (VOCs), the Bear Creek Burial Grounds WMA (VOCs and radionuclides), and the Rust Spoil Area or a nearby unidentified VOC source area in the Bear Creek floodplain. These contaminants enter the Maynardville Limestone through direct recharge, hydrologic communication with surface water in Bear Creek, and inflow of shallow groundwater from the Aquitard. Relative contributions from the source areas and the geochemical characteristics of the contaminants have produced two primary plumes of contamination in the groundwater: one containing nitrate and radioactivity (reflecting the S-3 Site source), and another containing VOCs (reflecting sources within the Oil Landfarm WMA). Trace metal contaminants are more sporadically distributed and chiefly occur close to the primary source areas. These plumes occur in both the shallow karst network and the deeper fracture flowpaths, and are commingled downgradient of the Boneyard/Burnyard/HCDA.

The nitrate plume in the Aquifer essentially delineates the maximum extent of contaminant transport and effectively traces the primary migration pathways in the Maynardville Limestone (Figure 4). The plume is continuous in the deeper bedrock from south of the S-3 Site for about 10,000 ft along strike to the west, whereas attenuation from more active recharge and groundwater flux has reduced nitrate levels and produced a more discontinuous plume in the shallow karst network. Nitrate concentrations within the plume exceed 500 mg/L south of the S-3 Site, but rapidly decrease to less than 50 mg/L south of the Oil Landfarm WMA, and are typically highest in the fracture-dominated groundwater flow system at depths greater than 100 ft bgs.

The distribution of VOCs in the Maynardville Limestone reflects the relative contributions of several source areas and commingling during downgradient transport (Figure 4). Plume constituents in the upper part of BCV are TCE, 1,2-DCE, and PCE; probable source areas are Spoil Area I, the S-3 Site, and possibly the Fire Training Facility located in the Upper East Fork Poplar Creek Hydrogeologic Regime. Additional inputs to the plume occur from the Rust Spoil Area (TCE) or a nearby source in the Bear Creek floodplain, Boneyard/Burnyard/HCDA (TCE and 1,2-DCE),

Sanitary Landfill I (1,1,1-TCA and 1,1-DCA), and discharge from the Bear Creek tributary (NT-7) that traverses BG-A North and A South (1,2-DCE and 1,2-DCA). The highest concentrations within the plume (i.e., >300 μg/L) occur in the deeper groundwater south (down dip) of the Boneyard/Burnyard. These high concentrations coincide with the downward vertical hydraulic gradients in the Maynardville Limestone in this area and the major losing reach of middle Bear Creek south of Sanitary Landfill I.

Radioactivity in the groundwater in the Maynardville Limestone is primarily from uranium isotopes and ^{99}Tc. The extent of these radionuclides are generally delineated by gross alpha activity and gross beta activity, respectively. The distribution of gross beta activity mirror that of nitrate, indicating both a common source of nitrate and ^{99}Tc (the S-3 Site) and migration along common flowpaths (Figure 4). Increased gross alpha activity in the groundwater downstream of the NT-3 catchment reflects inputs of uranium isotopes from sources in the Boneyard/Burnyard/HCDA.

Most trace metal contamination in the Maynardville Limestone occurs in the shallow groundwater near the S-3 Site and the Boneyard/Burnyard/HCDA. Near the S-3 Site, the principal trace metal contaminants are barium, boron, cadmium, copper, lead, mercury, strontium, and uranium. Some of these metals (e.g., cadmium) were entrained in the highly acidic wastes disposed at the site, and others (e.g., strontium) were dissolved from the underlying bedrock. Trace metal contamination is sporadic in the groundwater at the Boneyard/Burnyard/HCDA, and the principal contaminants are beryllium, manganese, mercury, nickel, and uranium. Boron and uranium are the most common trace metal contaminants in the Aquifer downgradient of the S-3 Site and Boneyard/Burnyard/HCDA, which indicates that relatively mobile, ionic species of both metals are present in the groundwater.

2.5 Surface Water Contamination

Many of the principal components of the groundwater contaminant plumes in the Bear Creek Regime, including nitrate, ^{99}Tc, uranium isotopes, several trace metals, and a few VOCs (PCE, TCE, and 1,2-DCE), occur in upper Bear Creek (i.e., upstream of BCK-09.40) and several of its northern tributaries. However, the quality of surface water in Bear Creek improved dramatically after waste disposal at the S-3 Site ceased in 1983. Nitrate concentrations in upper Bear Creek at BCK-12.46,

for example, exceeded 1,000 mg/L in 1983, but were less than 200 mg/L in 1994. Currently, input from several northern tributaries (primarily NT-1, NT-2, NT-3, and NT-8) during seasonally high flow conditions contribute the bulk of the contamination to the creek. During dry periods, contaminant flux into Bear Creek is generally lower, but because of less dilution in the creek channel, concentrations are typically higher and are probably controlled by contaminant levels in the groundwater discharged from springs SS-1, SS-4, and SS-5 (U.S. Department of Energy 1997).

3.0 CY 1997 GROUNDWATER MONITORING

Groundwater and surface water sampling in the Bear Creek Regime during CY 1997 was performed in accordance with the *Sampling and Analysis Plan for Groundwater and Surface Water Monitoring at the Y-12 Plant during Calendar Year 1997* (AJA Technical Services, Inc. 1996), as modified by applicable addenda. The following sections provide an overview of the sampling locations and frequency; sample collection, transportation, and chain of custody control; field measurements and laboratory analytes; QA/QC sampling; and data management.

3.1 Sampling Locations and Frequency

Groundwater and surface water samples were collected semiannually during CY 1997 from three springs, seven surface water stations, and 46 monitoring wells (Figure 5). Semiannual sampling was performed during the first quarter (January 7 - March 5, 1997) and third quarter (July 21 - September 19, 1997) of the year (Table 4). Descriptions of the sampling locations for RCRA monitoring and DOE Order 5400.1 monitoring are provided in the following sections.

3.1.1 RCRA Monitoring

Twenty-four monitoring wells were sampled for the purposes of RCRA monitoring at the S-3 Site, the Oil Landfarm, and the Bear Creek Burial Grounds/Walk-In Pits. These wells include 15 Aquitard wells located hydraulically upgradient of contaminated groundwater at each site (background wells); a total of three point-of-compliance wells, one located downgradient of each respective HWDU; six Aquifer (Maynardville Limestone) wells located downgradient of the groundwater contaminant plumes in the Bear Creek Regime (hereafter referenced as plume boundary wells); and one Aquifer (Knox Group) well (GW-521) in the Chestnut Ridge Hydrogeologic Regime originally designated as the background well for the plume boundary wells. Figure 6 shows the locations of these wells, and information regarding the total depth, geologic formation, and aquifer zone monitored by each well is summarized on Table 5 (complete well construction details are provided in Appendix C).

Semiannual groundwater sampling for RCRA post-closure corrective action monitoring was performed during January 7 - February 3, 1997 and July 21 - September 2, 1997 (Table 4).

Monitoring data from the first semiannual sampling event were submitted to the TDEC before the deadline (September 1) specified in the PCP (Lockheed Martin Energy Systems, Inc. 1997). As noted in Section 1.0, this report contains the monitoring data for the second semiannual sampling event that must be submitted to the TDEC before the corresponding deadline (March 1).

In July 1997 the TDEC approved several modifications to the RCRA corrective action monitoring well network in the Bear Creek Regime (Table 2). These modifications designate Aquitard well GW-115 as the sole background well for the regime, designate additional point-of-compliance wells that monitor contaminated groundwater at the Oil Landfarm and the Bear Creek Burial Grounds/Walk-In Pits, and remove Aquifer wells GW-710 and GW-711 from the network of plume boundary wells because they do not intercept hydraulically active flow paths where groundwater contamination is most likely to be detected (GRAM, Inc. and AJA Technical Services, Inc. 1997). However, approval of these changes came after the first semiannual sampling event during CY 1997 and too late to be effectively implemented for the second semiannual sampling event. Implementation of these modifications will be initiated during CY 1998.

3.1.2 DOE Order 5400.1 Monitoring

As noted in Section 1.0, DOE Order 5400.1 monitoring includes surveillance monitoring and exit pathway/perimeter monitoring. Both are implemented by the Y-12 Plant Groundwater Protection Program (GWPP) to comply with the *ORR Environmental Monitoring Plan* (U.S. Department of Energy 1995), and to provide data needed to evaluate: (1) groundwater quality trends near contaminant source areas and contaminant plume migration within the Bear Creek Regime (surveillance monitoring), and (2) groundwater and surface water quality trends where contaminants are most likely to migrate beyond the boundaries of the ORR (exit pathway/perimeter monitoring).

Groundwater samples were collected from nine monitoring wells for the purposes of DOE Order 5400.1 surveillance monitoring (Table 4). These wells include three Aquitard wells (GW-085, GW-537, and GW-829) located along geologic strike between the S-3 Site and the Oil Landfarm WMA; four Aquitard wells located downgradient of the Bear Creek Burial Grounds WMA (GW-053, GW-287, GW-627, and GW-653); and two Aquifer wells, one (GW-311) downgradient of the Rust Spoil Area and one (GW-315) downgradient of Spoil Area I (Figure 5). Complete well construction details are provided in Appendix C.

Thirteen Aquifer (Maynardville Limestone) wells, seven Bear Creek surface water stations, and three springs that discharge into Bear Creek were sampled for the purposes of DOE Order 5400.1 exit pathway/perimeter monitoring (Table 4). The monitoring wells comprise three of the four Maynardville Limestone Exit Pathway Pickets in the Bear Creek Regime: Picket A (GW-056, GW-683, GW-684, and GW-685) located about 2,500 ft southwest of the Bear Creek Burial Grounds WMA; Picket B (GW-621, GW-695, GW-703, GW-704, and GW-706) located about 1,000 ft southwest of the Oil Landfarm WMA; and Picket C (GW-724, GW-725, GW-738, and GW-740) located about 3,000 ft southwest of the S-3 Site (Figure 5). As illustrated by the former and current RCRA plume boundary wells comprising Picket W (Figure 6), which is the westernmost Exit Pathway Picket in the regime, wells in each Exit Pathway Picket are completed at various depths within different hydrostratigraphic zones along a strike-normal transect across the Maynardville Limestone.

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

Personnel from the Sampling and Environmental Support Department of the Analytical Service Organization (ASO) located at the East Tennessee Technology Park (ETTP), formerly the Oak Ridge K-25 Site, were responsible for collection, transportation, and chain-of-custody control of the groundwater and surface water samples. Sampling was performed in accordance with the *Technical Procedure for Groundwater Sampling* (Lockheed Martin Energy Systems, Inc. 1995), a copy of which is included in Attachment 6 of the PCP. As noted in Section 1.0, the TDEC approved updating Attachment 6 with a revised version of the sampling procedure. In addition to technical updates and modifications, the revised version describes the method for low-flow minimal drawdown sampling. Beginning in CY 1998, the low-flow sampling method will be used to collect groundwater samples from all of the RCRA corrective action monitoring wells in the Bear Creek Regime.

Groundwater samples were obtained using dedicated bladder pumps (Well Wizard™) during both sampling events from 17 monitoring wells; samples from six wells were obtained using portable gas-piston pumps (Bennet Pump™) and disposable bailers during the first sampling event and with dedicated equipment during the second sampling event; and samples from the remaining 23 monitoring wells were obtained using portable equipment during both sampling events (Table 4).

At least three well-volumes of groundwater were purged with the Well Wizard™ or Bennet Pump™ (if the well did not purge dry) before the samples were collected from each well.

Filtered and unfiltered samples were collected from each monitoring well, spring, and surface water station. Groundwater samples collected with Well Wizards™ and Bennet Pumps™ were filtered in the field using in-line 0.45 micron filters. Surface water samples, which were collected using grab sample bottles, and groundwater samples collected with bailers were filtered in the laboratory. All samples were collected in appropriate containers, labeled, logged, placed in ice-filled coolers, and transported to the appropriate ASO 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; the depth-to-water measurements and calculated water-level elevations are included in Appendix D.1. This protocol addresses corresponding PCP conditions for RCRA corrective action monitoring (Table 1). Sampling personnel also recorded field measurements of pH, temperature, conductivity, dissolved oxygen, and oxidation-reduction potential for each groundwater and surface water sample (Table 6). Applicable measurements recorded for each sampling location are presented in Appendix D.1.

Laboratory analyses of the groundwater samples and surface water samples include the following standard suite of analytes: (1) pH, conductivity, turbidity, total suspended solids, 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 6). Unfiltered groundwater and surface water samples were analyzed for all of the standard laboratory analytes; filtered samples were analyzed only for the principal cations and trace metals.

The standard suite of laboratory analytes include the RCRA Groundwater Protection Standard (GWPS) constituents listed in the following site-specific attachments to the PCP (Table 7): Attachment 2, Section E (S-3 Site); Attachment 3, Section F (Oil Landfarm); and Attachment 4, Section F (Bear Creek Burial Grounds/Walk-In Pits). A permit modification request to remove iodine-129 (^{129}I), plutonium-238 (^{238}Pu), and tritium from the GWPS consistuent list for each site

(historical monitoring data show that these radionuclides are not groundwater contaminants in the Bear Creek Regime) is pending approval by the TDEC (GRAM Inc. and AJA Technical Services, Inc. 1997).

Laboratory analyses of the groundwater and surface water samples were performed in accordance with the analytical methods listed in Table 6. Inorganic and miscellaneous laboratory analyses were performed by the ASO laboratories at the ETTP, with organic and radiochemical analyses performed by the Y-12 Plant ASO laboratories. Analytical results are presented in Appendix D.1 (miscellaneous laboratory analytes), Appendix D.2 (inorganic analytes), Appendix D.3 (organic analytes), and Appendix D.4 (radiological analytes).

3.4 Quality Assurance/Quality Control Sampling

Quality assurance/quality control samples include a total of 42 laboratory blanks, 60 trip blanks, two field blanks, 19 equipment rinsate samples, and 15 duplicate groundwater 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 scheduled for VOC analyses. Field blanks were samples of deionized water collected at the well head before 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 Pumps™), and were collected after a sampling team had completed sampling at a site or finished each administrative sampling group (a series of sampling locations grouped for data tracking and management purposes). If more than one Bennet Pump™ was used, an equipment rinsate sample was collected from each. 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 were also analyzed for miscellaneous analytes (e.g., pH), major ions, trace metals, and radioanalytes. Analytical results for the QA/QC blanks and equipment rinsate samples are presented in respective subsections of Appendix E. A summary of organic compounds detected in the blank samples precedes the main body of this appendix.

In addition to the blank samples and equipment rinsates, duplicate groundwater samples were collected for QA/QC purposes from a total of fourteen monitoring wells and one spring (Table 4), including at least one well in each administrative sampling group. The duplicate samples were analyzed for the constituents and parameters specified for the well from which they were collected; analytical results are presented in Appendix D.

3.5 Data Management

Analytical results for the groundwater and surface water samples were downloaded directly into a SAS® groundwater database from data files provided by the ASO laboratories at the ETTP and the Y-12 Plant. The groundwater database management subcontractor also manually input some data from field data sheets. Downloaded and manually input data were verified in accordance with the *Y-12 Plant Groundwater Protection Program - Groundwater Monitoring Program Data Management Plan* (Martin Marietta Energy Systems, Inc. 1993). The groundwater database management subcontractor and the appropriate ASO staff 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 1997 analytical data that do not meet the DQOs defined in the above-referenced data management plan. As described in Appendix F, results that do not meet the applicable DQO criteria include: zinc results for duplicate samples from well GW-627 (Section F.2) and filtered/unfiltered samples from spring SS-5 (Section F.3) that differ by an order-of-magnitude or more; principal ion data for samples from wells GW-287 and GW-710 with ion charge balance errors that exceed 20% (Section F.4); 103 false-positive results for VOCs, most of which probably reflect contamination from the laboratory environment (Section F.5); and 11 radioanalyte results for ten wells (GW-042, GW-043, GW-084, GW-115, GW-162, GW-315, GW-372, GW-711, GW-712, and GW-715) that exceed the respective minimum detectable activity (MDA) but are less than the associated counting errors (Section F.6).

4.0 RCRA MONITORING DATA EVALUATION

The following sections describe results of the RCRA monitoring data evaluations that are required by the PCP (Table 1). Site-specific permit conditions for the S-3 Site, Oil Landfarm, and Bear Creek Burial Grounds/Walk-In Pits specify annual evaluation of: (1) the groundwater flow direction and rate at each site; (2) the performance of the low-permeability cap at each site based on monitoring results for point-of-compliance wells; and (3) contaminant plume migration in the Bear Creek Regime based on monitoring results for the plume boundary wells. In accordance with the TDEC-approved modifications to the PCP conditions that address the latter two data evaluation requirements (Table 2), quantitative trend analysis (if applicable) of results for selected GWPS constituents was used to evaluate the semiannual monitoring data for the point-of-compliance wells and the plume boundary wells. Also, the semiannual monitoring results for wells GW-710 and GW-711 were excluded from evaluation because both were deleted from the RCRA plume boundary monitoring well network.

4.1 Groundwater Flow Direction and Rate

Groundwater elevations determined from depth-to-water measurements obtained from 62 monitoring wells during April 1997 (the seasonally high water table) and 63 wells during October 1997 (the seasonally low water table) were used to evaluate site- and regime-wide groundwater flow directions, and to calculate horizontal hydraulic gradients needed to estimate groundwater flow rates (Table 8). Depth-to-water measurements recorded during the semiannual sampling events were not used for either purpose because they were less contemporaneous and may have been influenced by sampling activities (i.e., purging/sampling adjacent wells).

Groundwater flow rates were estimated for the Aquitard, which directly underlies each HWDU, and the Aquifer, the primary pathway for contaminant transport. Representative flow rates for each hydrogeologic unit were estimated using the modified Darcy equation: $V = KI/\eta$, where K is the hydraulic conductivity of the medium, I is the horizontal hydraulic gradient, η is the effective porosity. The calculated flow rates represent average velocities in the Aquitard and the Aquifer, based on the assumption that saturated regolith and fractured bedrock function as equivalent porous media. 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 would produce an inversely proportional variation in the calculated Darcy flow velocity.

Groundwater Flow Directions

Isopleths of seasonal groundwater surface elevations in the Bear Creek Regime indicate southwesterly (strike-normal) flow in the Aquitard toward the Aquifer (Maynardville Limestone), the hydrologic drain for the groundwater flow system, with more westerly (strike-parallel) flow toward the west end of BCV in the Maynardville Limestone (Figure 7). Seasonal water level fluctuations, which were typically less than 10 ft in most wells (Table 8), influenced the magnitude of horizontal hydraulic gradients but did not significantly alter the overall directions of groundwater flow in the Bear Creek Regime.

Representative horizontal hydraulic gradients in the water table interval were determined from water level data for selected Aquitard and Aquifer monitoring wells. Based on water level data for these wells, horizontal hydraulic gradients range from about 0.009 to 0.073 across strike in the Aquitard, and from about 0.004 to 0.043 along strike in the Aquifer. Horizontal gradients in the water table interval were usually higher during seasonally high water levels in the Aquitard, but gradients in the Aquifer were typically higher during seasonally low water levels. Additionally, review of pre-sampling water-level elevations for selected upgradient/background wells and RCRA point-of-compliance wells do not indicate any reversals of the horizontal hydraulic gradients at the S-3 Site, the Oil Landfarm WMA, or the Bear Creek Burial Grounds WMA (Figure 8).

Groundwater Flow Rates

Rates of groundwater flow were estimated only for the water table and shallow bedrock intervals in the Aquitard, and for the shallow karst network in the Aquifer. Flow rates were not estimated for the stormflow zone in either hydrogeologic unit because most waste sources in the Bear Creek Regime lie below this zone. Rates of groundwater flow in the intermediate and deep bedrock intervals were not estimated for either hydrogeologic unit, but are probably as low as a few centimeters per year (Solomon et al. 1992).

In the Aquitard, estimated rates of groundwater flow in the water table interval range from 0.003 ft per day (ft/d) to about 56 ft/d based on: (1) hydraulic conductivities of 0.03 to 3.25 ft/d for saturated regolith (Connell and Bailey 1989), (2) strike-normal horizontal hydraulic gradients of 0.009 to 0.073, and (3) effective porosity ranging from 0.0042 (Moore 1989) to 0.099 (Dorsch et al. 1996). Estimated rates of groundwater flow in the shallow bedrock interval range from 0.00007 ft/d to about 125 ft/d based on: (1) hydraulic conductivities of 0.0008 ft/d for matrix intervals (Moore 1989), 0.15 ft/d for permeable intervals (Moore 1989), and 0.6 ft/d for the continuum of permeable intervals (Moore and Toran 1992), (2) strike-normal horizontal hydraulic gradients of 0.009 to 0.073, and (3) effective porosity ranging from 0.00035 (Moore and Toran 1992) to 0.099 (Dorsch et al. 1996).

In the Aquifer, estimated rates of groundwater flow in the shallow karst network range from about 1 to 1,577 ft/d based on: (1) an average hydraulic conductivity of 22 ft/d determined from well test results (Geraghty & Miller, Inc. 1989a), (2) strike-parallel horizontal hydraulic gradients of 0.004 to 0.043, and (3) effective porosity ranging from 0.0006 to 0.0813 (Dorsch 1997). The rate of groundwater flow in the shallow karst network is also indicated by results of a dye-tracer study performed in the Bear Creek Regime, which indicated a transport rate of about 200 ft/d in the Maynardville Limestone (Geraghty & Miller, Inc. 1989b).

The wide range of groundwater flow rates estimated for the Aquitard and the Aquifer may occur at various times under various conditions. However, considering the long history of waste disposal operations in the Bear Creek Regime, the relatively limited migration of most groundwater contaminants suggests that the lower flow rates probably dominate (particularly in the Aquitard bedrock intervals), and that attenuation processes (e.g., matrix diffusion) greatly reduce contaminant transport relative to groundwater flow rates.

4.2 Point-of-Compliance Concentration Trends

The following evaluations of the CY 1997 RCRA monitoring results for the point-of-compliance wells at the S-3 Site (GW-276), Oil Landfarm (GW-363), and Bear Creek Burial Grounds/Walk-In Pits (GW-069) are based on the TDEC-approved modification to the data evaluation requirements defined in conditions IV.G.6, V.G.6, and VI.G.6 of the PCP (Table 2). These permit conditions specify trend analysis of results for selected GWPS constituents as the basis

for evaluating point-of-compliance well data with respect to the performance of the low permeability cap at each site.

Monitoring data obtained from each point-of-compliance well since January 1990 (when standardized sampling/analysis protocols were established) were used for trend analysis. Results for the GWPS constituents that are primary components of the groundwater contaminant plumes at the S-3 Site, Oil Landfarm, and Bear Creek Burial Grounds/Walk-In Pits were selected for trending (Table 7). Temporal concentration trends for the selected GWPS constituents were evaluated within the context of the site-specific contaminant transport models described in Section 2.0, whereby plumes of inorganic, organic, and radioactive contaminants in the Aquitard migrate primarily along strike toward discharge areas along the northern tributaries of Bear Creek. Without additional influx of contaminants, continued downgradient migration away from the source areas and natural attenuation in the subsurface should slowly reduce the concentrations of the GWPS in the groundwater at the RCRA point-of-compliance.

4.2.1 S-3 Site

Point-of-compliance well GW-276 is completed at a depth of 18.5 ft bgs in the Nolichucky Shale about 200 ft southeast (downgradient) of the S-3 Site (Figure 6). Filtered and unfiltered groundwater samples were collected from the well on January 28 and August 13, 1997 (Table 4). Analytical results for the samples show that the well monitors acidic (pH<5.0), highly mineralized (TDS >1,000 mg/L), chloride- and nitrate-enriched calcium-magnesium-bicarbonate groundwater. The analytical results for these samples are presented in Appendix D.

The GWPS constituents detected in the groundwater samples from point-of-compliance well GW-276 were barium, cadmium, lead, nickel, nitrate, uranium, acetone, chloroform, PCE, 2-butanone, and each of the radiological analytes except americium-241 (^{241}Am), ^{129}I, ^{238} Pu, strontium-89/90, and tritium (Table 9). All results for the inorganic and radiological constituents meet applicable DQO criteria. However, the acetone and 2-butanone results reported for the sample collected in August 1997 are false positives based on contamination in the associated laboratory blank sample (see Appendix F). Screening these results as false positives had no impact on the RCRA monitoring data evaluation.

Nitrate, cadmium, PCE, ^{99}Tc, and uranium were selected for trend analysis because they represent the most mobile (nitrate and ^{99}Tc), comparably less mobile (PCE and uranium), and relatively immobile (cadmium) components of the groundwater contaminant plume originating from the S-3 Site. The CY 1997 results for these GWPS constituents are consistent with respective historical data showing substantially reduced concentrations in the shallow groundwater at point-of-compliance well GW-276 (Figure 9). Concentrations of these contaminants have decreased at different relative rates, probably as a result of differential retardation in the Aquitard, and the relative rates of concentration decrease have slowed over the past few years. Nitrate levels, for example, decreased about 70% between January 1990 (454 mg/L) and March 1994 (147 mg/L), but only about 15% between March 1994 and August 1997 (125 mg/L). This suggests that the most highly contaminated groundwater has been flushed from the more permeable shallow groundwater flowpaths and that the contaminant concentrations in the shallow flow system are approaching relatively asymptotic levels. Current contaminant levels are controlled by relative rates of molecular diffusion from the bedrock matrix and varying degrees of dilution from recharge of relatively uncontaminated groundwater.

Concentrations of GWPS constituents have decreased in the shallow groundwater at point-of-compliance well GW-276 primarily as a result of substantially reduced contaminant flux following cessation of waste disposal at the former S-3 Ponds in 1984 and flushing of contaminated groundwater during recharge/discharge cycles over the past thirteen years. The decreasing concentration trends and general lack of seasonal or storm-related variability suggest that the low permeability cap effectively retards and moderates influx of contaminants via infiltration of surface water through the sludge remaining in the bottom of the former S-3 Ponds.

4.2.2 Oil Landfarm

Point-of-compliance well GW-363 is completed at a depth of 75 ft bgs in the Nolichucky Shale near the northwest corner of the Oil Landfarm WMA (Figure 6). Filtered and unfiltered groundwater samples were collected from the well on January 28 (including duplicate samples) and August 14, 1997 (Table 4). Analytical results for these samples show that the well yields sodium-bicarbonate groundwater with low proportions (<10%) of calcium, chloride, magnesium, potassium,

and sulfate; carbonate alkalinity above 10 mg/L; low fluoride (<0.5 mg/L) and very low nitrate (<0.05 mg/L) levels (see Appendix D). These results are consistent with historical data for the well.

The GWPS constituents selected for temporal trend analysis are the primary components of the dissolved plumes of chloroethenes and chloroethanes in the shallow groundwater at the Oil Landfarm HWDU: PCE, TCE, and 1,1,1-TCA (see Section 2.4). However, well GW-363 monitors uncontaminated groundwater downgradient to the west (parallel with geologic strike) of the dissolved VOC plume(s), and none of these constituents have been detected in the groundwater at the well. The only GWPS constituents detected in the filtered or unfiltered groundwater samples collected from the well during CY 1997 were acetone, barium, nitrate, ^{234}U, and ^{238}U (Table 10). Results for each of these constituents except acetone meet applicable DQO criteria (see Appendix F).

Acetone, nitrate, and both uranium isotopes were detected only in the groundwater sample collected from well GW-363 in August 1997 (Table 10). None of these results indicate groundwater contamination. The acetone result (2 µg/L) is an estimated value below the analytical reporting limit (10 µg/L) and is a false positive because of contamination in the associated laboratory blank sample (see Appendix F). The nitrate result (0.03 mg/L) just slightly exceeds the analytical detection limit (0.028 mg/L). The high proportional counting errors associated with the ^{234}U (0.28 ± 0.20 pCi/L) and ^{238}U (0.17 ± 0.14 pCi/L) results, both of which just slightly exceed the respective MDAs (Table 10), indicate substantial analytical uncertainty and suggest that both results are analytical artifacts.

Barium is a minor constituent of the groundwater in both the Aquitard and the Aquifer in the Bear Creek Regime and was detected in each of the filtered and unfiltered groundwater samples collected from well GW-363 during CY 1997 (Table 10). The maximum total (0.09 mg/L) and dissolved (0.067 mg/L) barium concentrations reported for these samples are less than the maximum total (0.22 mg/L) and dissolved (0.22 mg/L) barium concentrations reported for samples collected from RCRA background well GW-115 during CY 1997 (see Appendix D.2), and are substantially below the maximum contaminant level (MCL) for drinking water (2 mg/L). These results are consistent with historical data showing ambient barium concentrations in the shallow groundwater at well GW-363.

The overall lack of groundwater contamination at point-of-compliance well GW-363 precludes temporal trend analysis for the purposes of gauging the effectiveness of the low-

permeability cap at the Oil Landfarm. To obtain monitoring data better suited to this purpose, a point-of-compliance well that monitors contaminated groundwater (GW-008) has been selected for semiannual RCRA monitoring at the Oil Landfarm beginning in CY 1998.

4.2.3 Bear Creek Burial Grounds/Walk-In Pits

Point-of-compliance well GW-069 is completed at a depth of 99.2 ft bgs in the Nolichucky Shale about 250 ft south of BG-A South (Figure 6). Filtered and unfiltered groundwater samples were collected from the well on January 22 and August 18, 1997 (Table 4). Analytical results for these samples show that the well yields chloride-enriched (>40 mg/L), sodium-bicarbonate groundwater with fairly basic pH (>8.4); low proportions (<10%) of calcium, magnesium, potassium, and sulfate; low fluoride (<0.2 mg/L) and very low nitrate (<0.06 mg/L) levels (see Appendix D.2). Barium (total and dissolved), cadmium (total), lead (total and dissolved), ^{241}Am, ^{238}Pu, and ^{238}U were the only GWPS constituents detected in the groundwater samples collected from well GW-069 during CY 1997 (Table 11). Results for each of these constituents meet applicable DQO criteria.

Results for the GWPS constituents detected in the groundwater samples collected from well GW-069 during CY 1997 do not indicate groundwater contamination. The ^{241}Am (0.19 ± 0.16 pCi/L), ^{238}Pu (0.4 ± 0.24 pCi/L), and ^{238}U (0.25 ± 0.15 pCi/L) results reported for the sample collected in August 1997 just slightly exceed respective MDAs (Table 11), have high proportional counting errors, and are probably analytical artifacts. Cadmium (0.0035 mg/L) and lead (0.00092 - 0.0033 mg/L) results reported for the well are below the respective drinking water MCL for each trace metal (0.005 and 0.05 mg/L, respectively). Neither metal has been frequently detected in previous samples collected from the well; cadmium was detected in one sample and lead was detected in two of the samples collected from the well since June 1990. In contrast, barium has been detected in all of the filtered and unfiltered groundwater samples collected from the well since June 1990. The CY 1997 barium results reported for well GW-069 (Table 11) nearly equal the total (0.38 mg/L) and dissolved (0.37 mg/L) average concentrations calculated from the historic results for the well. These results show that total and dissolved barium concentrations in well GW-069 are higher than respective background levels indicated by data for RCRA background well GW-115, but are well below the drinking water MCL for barium (2.0 mg/L). As noted previously, barium is a minor component of the groundwater in the Aquitard, and higher barium concentrations in well

GW-069 possibly reflect longer groundwater residence time in the deeper, more sluggish flow system.

The GWPS constituents selected for temporal trend analysis are: PCE and TCE, which are the primary components of the dissolved plumes of VOCs in the shallow groundwater at the site; gross alpha and uranium (total and dissolved), which together serve as contamination indicators for the large volumes of uranium wastes disposed at the site; and barium, which is representative of potential inorganic contaminants that are relatively mobile in groundwater. Of these selected GWPS constituents, only barium was detected in the samples collected from well GW-069 during CY 1997. Historical total and dissolved barium data for the well show generally concurrent short-term temporal fluctuations (Figure 10), with concentration peaks often corresponding to seasonally low groundwater flow conditions (summer and fall). Although a slightly upward long-term trend is indicated by linear regression of the barium data (Figure 10), the low concentrations and seasonal fluctuations suggest ambient barium concentrations in the groundwater at the well.

Results for the GWPS constituents detected in the groundwater samples collected from point-of-compliance well GW-069 do not indicate groundwater contamination and consequently provide little, if any, insight into the effectiveness of the low permeability cap at the Bear Creek Burial Grounds/Walk-In Pits. To obtain monitoring data better suited to this purpose, a shallower point-of-compliance well (GW-046) that monitors contaminated groundwater has been selected for semiannual RCRA monitoring beginning in CY 1998.

4.3 Plume Boundary Concentration Trends

The following evaluation of the CY 1997 RCRA monitoring results for plume boundary wells GW-712, GW-713, GW-714 and GW-715 is based on the TDEC-approved modification to the data evaluation requirements defined under conditions IV.G.4 (S-3 Site), V.G.4 (Oil Landfarm), and VI.G.4 (Bear Creek Burial Grounds/Walk-In Pits) of the PCP (Table 2). These permit conditions originally required comparing the semiannual RCRA monitoring results for the designated plume boundary wells to corresponding background levels determined from semiannual monitoring results for well GW-521. However, this background comparison approach proved technically inappropriate and prone to erroneous indications of contaminant plume migration (GRAM, Inc. and AJA Technical Services, Inc. 1997). Effective July 28, 1997, the applicable conditions of the PCP now specify

temporal trend analysis of the semiannual monitoring results for nitrate, TCE, and ^{99}Tc as the basis for evaluating contaminant plume migration in the Bear Creek Regime. Trend analysis of results for these GWPS is specified because they are representative of the most mobile inorganic, organic, and radiochemical contaminants in the regime. In addition, the approved permit modification removed plume boundary wells GW-710 and GW-711 from the RCRA well network because they do not monitor an active flow zone.

Nitrate, TCE, and ^{99}Tc results obtained since installation of the plume boundary wells in September 1992 were used for trend analysis purposes. Temporal concentration trends for these GWPS constituents were evaluated within the context of the hydrologic and contaminant transport models for the Maynardville Limestone Exit Pathway (see Section 2.0), whereby commingled plumes of nitrate, VOCs, and radionuclides migrate westward (along geologic strike) in the shallow karst network and the deeper fracture flowpaths, as well as southward (across geologic strike) into successively higher hydrostratigraphic zones in the Maynardville Limestone. Continued westward migration of the center of mass of the commingled plume may be indicated by long-term increasing concentrations of these GWPS constituents in the groundwater at the plume boundary wells.

Filtered and unfiltered groundwater samples were collected from plume boundary wells GW-712, GW-713, GW-714, and GW-715 on February 2-3 and August 26-27, 1997 (Table 4). Analytical results for these samples show the distinctive differences in the geochemistry of the calcium-magnesium-bicarbonate groundwater produced by these wells. Samples from the deeper plume boundary wells, GW-712 (457.5 ft bgs) and GW-713 (315.2 ft bgs), are distinguished by enriched sulfate levels (>50% of total anions); fluoride and nitrate concentrations typically below 0.5 mg/L; and total and dissolved strontium concentrations above 1 mg/L. Conversely, samples from the shallower plume boundary wells, GW-714 (145.0 ft bgs) and GW-715 (44.0 ft bgs), are generally characterized by much lower proportions of sulfate (<10%); fluoride levels below or slightly above the 0.1 mg/L analytical reporting limit; nitrate concentrations typically above 0.5 mg/L; and total and dissolved strontium concentrations below 1 mg/L.

The GWPS constituents detected in at least one sample from the plume boundary wells were barium (total and dissolved), chromium (total), lead (total), nickel (total and dissolved), nitrate, uranium (total and dissolved), acetone, 2-butanone, gross alpha activity, neptunium-237 (^{237}Np), ^{99}Tc, ^{234}U, ^{235}U, and ^{238}U (Table 12). However, only barium, nitrate, and uranium (metal and ^{234}U)

were detected in groundwater samples from each of the wells. All the results for acetone and 2-butanone are false positives because both compounds were detected in the laboratory blanks associated with the samples from these wells. Also, the ^{237}Np (GW-715) and ^{235}U (GW-712) activities reported for the samples collected in August 1997 exceed the associated MDAs, but do not exceed the associated counting error and are considered analytical artifacts (see Appendix F). Gross alpha activity exceeded the MDA only for the groundwater sample collected in August from well GW-714 (4.7 ± 2.8 pCi/L). This result slightly exceeds the MDA (Table 12), but has relatively high uncertainty and may be an analytical artifact. The remaining results for the GWPS constituents are consistent with historical monitoring results for these plume boundary wells, including nitrate concentrations that are substantially below the 10 mg/L MCL for drinking water; total and dissolved barium and uranium concentrations that exceed analytical reporting limits; sporadic detection of chromium, lead, and nickel in the unfiltered samples; a lack of VOCs (including TCE); and trace levels of uranium isotopes.

Low levels of nitrate have been detected in several of the groundwater samples collected from plume boundary wells GW-712 and GW-713 since March 1993. Excluding the result for the sample collected from well GW-713 in April 1993 (1.2 mg/L), the nitrate concentrations are below 0.8 mg/L and display both relatively stable (GW-712) and fairly erratic (GW-713) temporal fluctuations (Figure 11). Considering these low nitrate levels in light of the depth of the wells and absence of clearly increasing concentration trends, the CY 1997 RCRA monitoring results for wells GW-712 and GW-713 do not indicate strike parallel migration of the nitrate plume at depth beyond the westernmost Exit Pathway Picket in the Bear Creek Regime.

Similarly low levels of nitrate have been detected in all fourteen groundwater samples collected from well GW-715 since September 1992, including both samples collected during CY 1997 (Table 12). Nitrate results for the well show significant short-term temporal fluctuations preceding a concentration peak of 1.2 mg/L in July 1995 (Figure 11), with higher concentrations evident during summer and fall (seasonally low flow conditions) and lower concentrations typical during winter and spring (seasonally high flow conditions). Following the concentration peak in July 1995, however, nitrate levels steadily decreased through August 1997 (0.34 mg/L) and generally do not show as prominent seasonal concentration fluctuations. The nitrate concentrations remain very low in the groundwater at well GW-715 and do not conclusively indicate strike parallel migration

of the nitrate plume in the Maynardville Limestone. However, the well is located about 250 ft from Bear Creek and nitrate levels in the groundwater at the well may indicate a hydraulic connection with the creek.

Nitrate concentrations above 1 mg/L were reported only for the groundwater samples collected from well GW-714 during CY 1997 (Table 12). Results for these samples are consistent with historical nitrate data for the well, which indicate a slight concentration decrease from more than 4 mg/L in February 1994 to less than 3 mg/L in August 1997 (Figure 11). Unlike the nitrate results for well GW-715, wide temporal concentration fluctuations are less evident before July 1995 and do not consistently correlate with seasonal groundwater flow conditions. However, the three lowest nitrate concentrations were reported for samples collected from the well during summer and fall (low groundwater flow): 3.2 mg/L in November 1993, 2.62 mg/L in August 1997, and 1.2 mg/L in July 1996 (Figure 11). This suggests a seasonally variable flux of nitrate in the groundwater flowpaths intercepted by the well.

Although ^{99}Tc was detected in the groundwater sample collected from well GW-714 in February 1997, this result (8.5 ± 4.8 pCi/L) is only slightly above the associated MDA (6.6 pCi/L), and the high proportional counting error indicates significant analytical uncertainty. Considering the low ^{99}Tc activity and analytical uncertainty, and the very low gross beta reported for the sample (less than the 8.2 pCi/L MDA), this result is probably an analytical artifact. The lack of ^{99}Tc (and gross beta activity) in the groundwater samples collected from the well since January 1995 (when the ASO started reporting sample-specific MDAs) support this interpretation.

Based on the preceding evaluation, the CY 1997 semiannual RCRA post-closure corrective action monitoring results for the plume boundary wells do not indicate westward migration of the contaminant plumes in the Maynardville Limestone beyond the westernmost Exit Pathway Picket in the Bear Creek Regime. These wells, therefore, remain effective for monitoring groundwater quality beyond the downgradient boundary of the groundwater contaminant plumes in regime.

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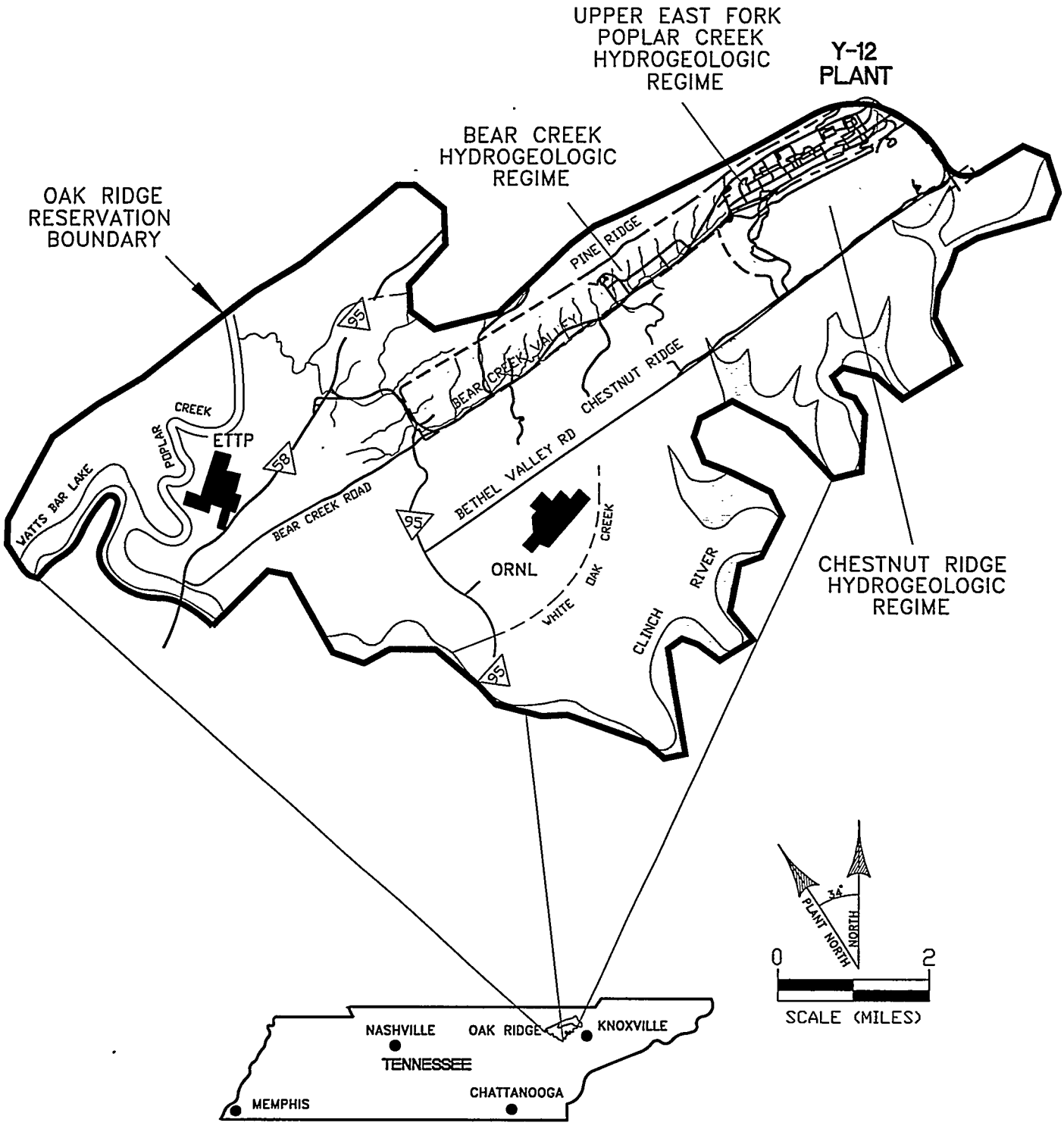
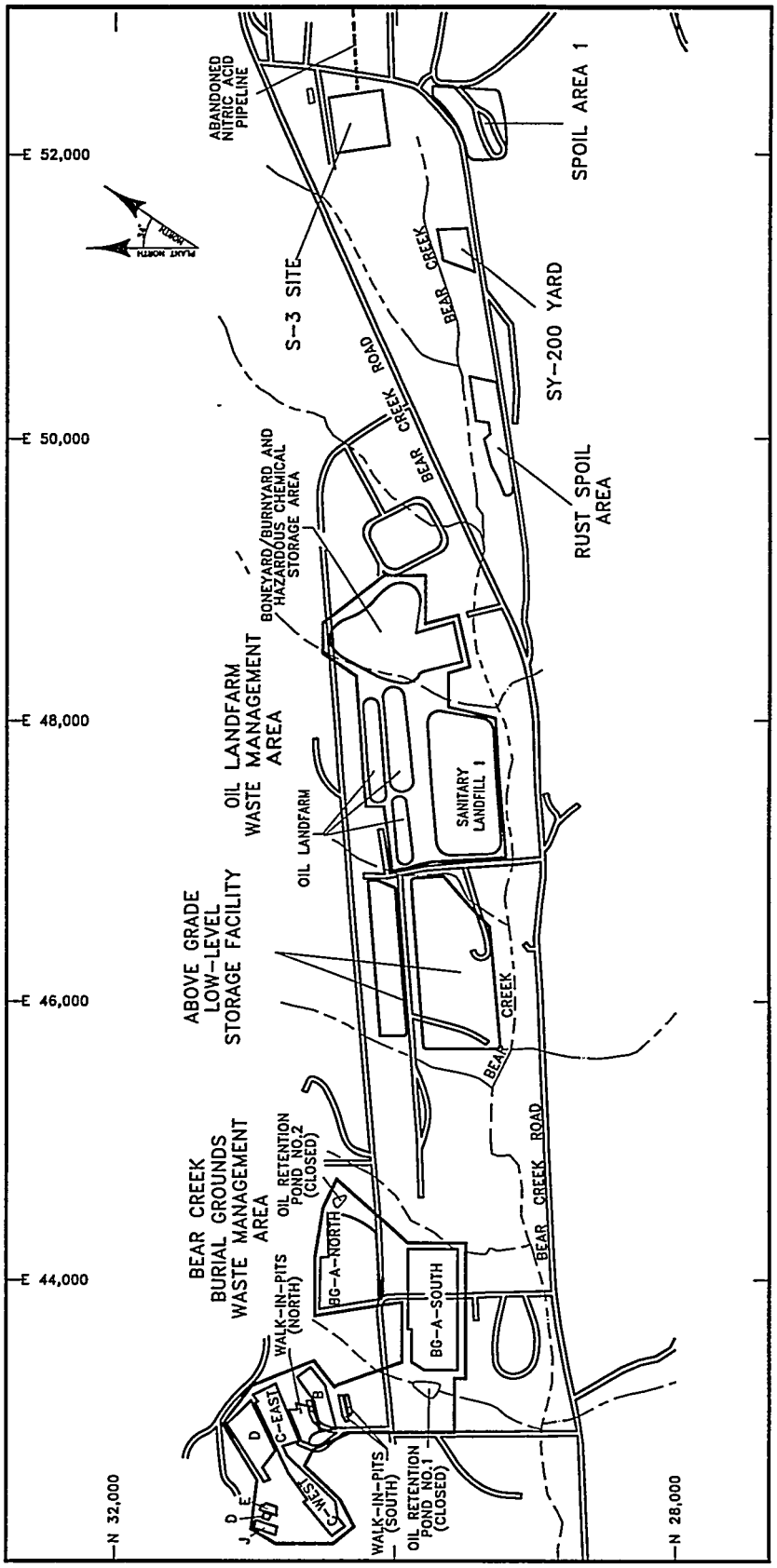
APPENDIX A

FIGURES



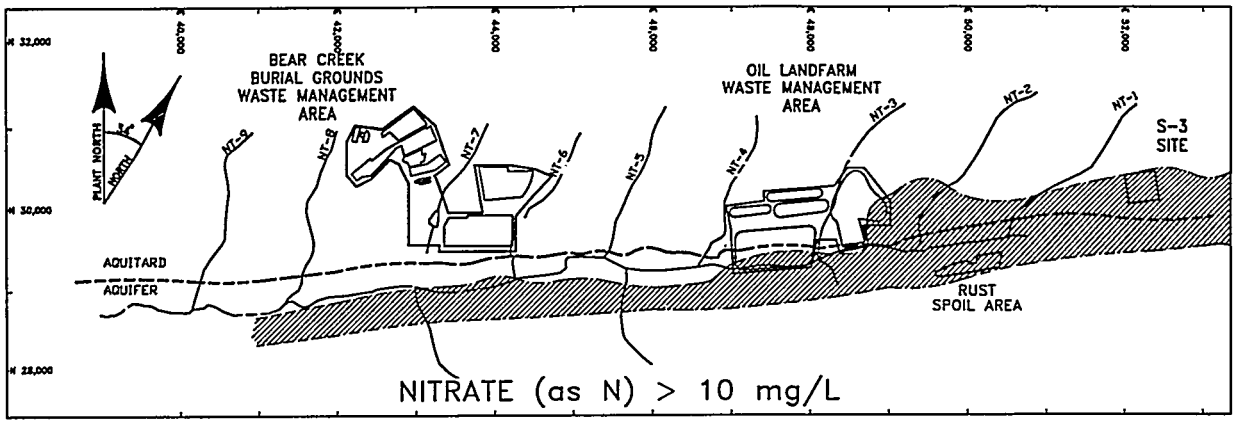
PREPARED FOR: *LOCKHEED MARTIN ENERGY SYSTEMS, INC.*	LOCATION:	Y-12 PLANT OAK RIDGE, TN.	FIGURE 1
PREPARED BY: *AJA TECHNICAL SERVICES, INC.*	DOC NUMBER:	98-D001	HYDROGEOLOGIC REGIMES AT THE Y-12 PLANT
	DWG ID.:	97-007	
	DATE:	2-9-98	

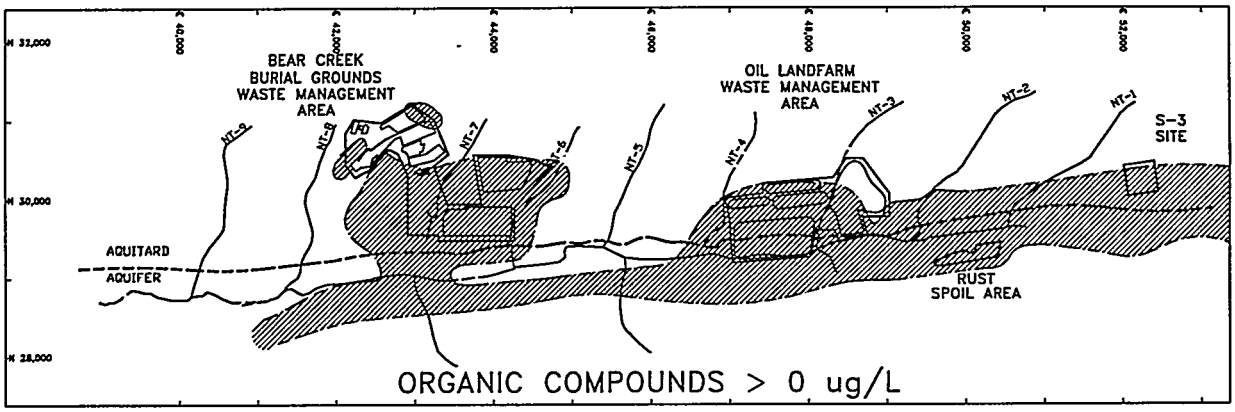


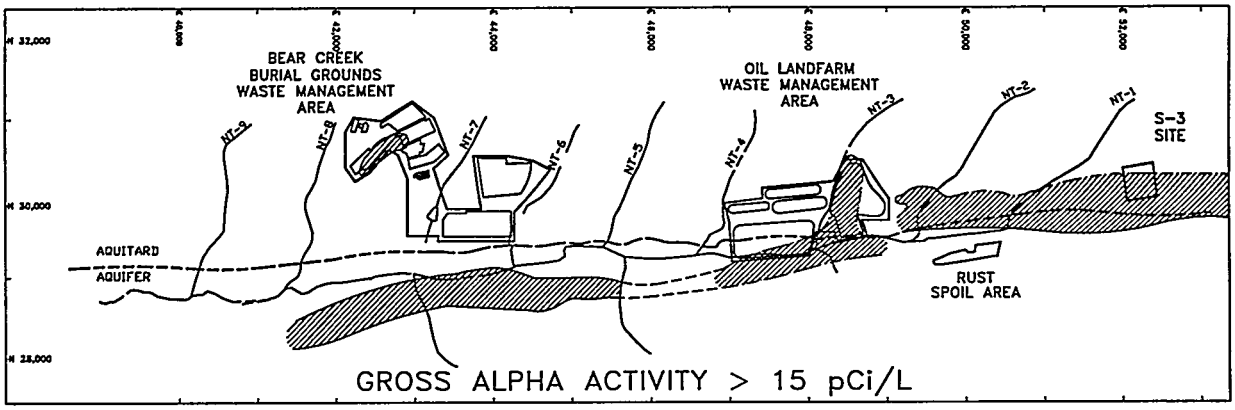
PREPARED FOR: *LOCKHEED MARTIN ENERGY SYSTEMS, INC.*	LOCATION:	Y-12 PLANT OAK RIDGE, TN.	FIGURE 2
PREPARED BY: *AJA TECHNICAL SERVICES, INC.*	DOC NUMBER:	98-D001	WASTE MANAGEMENT SITES AND REGULATED UNITS IN THE BEAR CREEK HYDROGEOLOGIC REGIME
	DWG ID.:	96-035	
	DATE:	2-9-98	

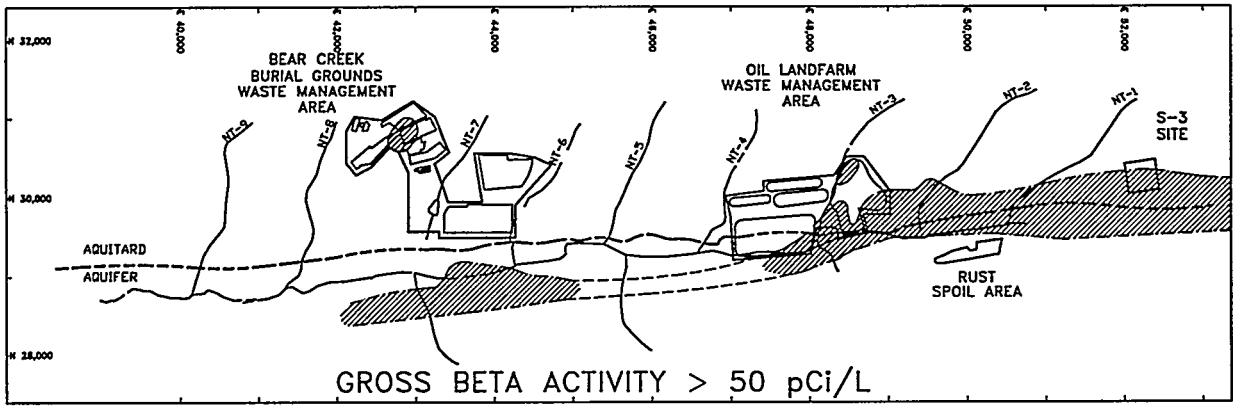
SYSTEM	GROUP	HYDRO UNIT	FORMATION	MAP SYMBOL	THICKNESS (ft)
CAMBRIAN / UPPER	KNOX	KNOX AQUIFER	COPPER RIDGE DOLOMITE	Ock	NOT DETERMINED
CAMBRIAN / MIDDLE	CONASAUGA	ORR AQUITARDS	MAYNARDVILLE LIMESTONE	€mn	418–450
			NOLICHUCKY SHALE	€n	422–550
			MARYVILLE LIMESTONE	€m	346–445
			ROGERSVILLE SHALE	€rg	90–120
			RUTLEDGE LIMESTONE	€rl	90–120
			PUMPKIN VALLEY SHALE	€pv	260–320
CAMBRIAN / LOWER			ROME	€r	NOT DETERMINED

PREPARED FOR: *LOCKHEED MARTIN ENERGY SYSTEMS, INC.*	LOCATION:	Y-12 PLANT OAK RIDGE, TN.	FIGURE 3
PREPARED BY: *AJA TECHNICAL SERVICES, INC.*	DOC NUMBER:	98-D001	TOPOGRAPHY AND BEDROCK GEOLOGY IN THE BEAR CREEK HYDROGEOLOGIC REGIME
	DWG ID.:	96-090	
	DATE:	2-9-98	







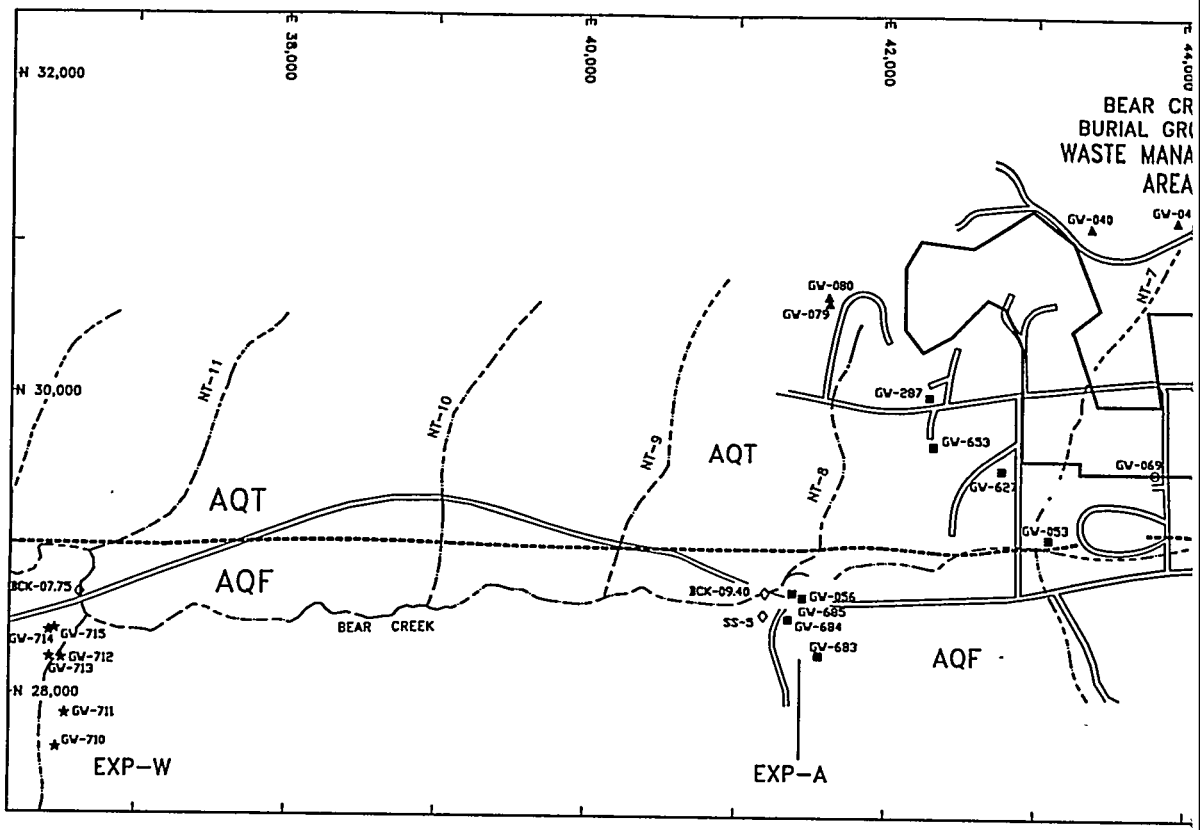


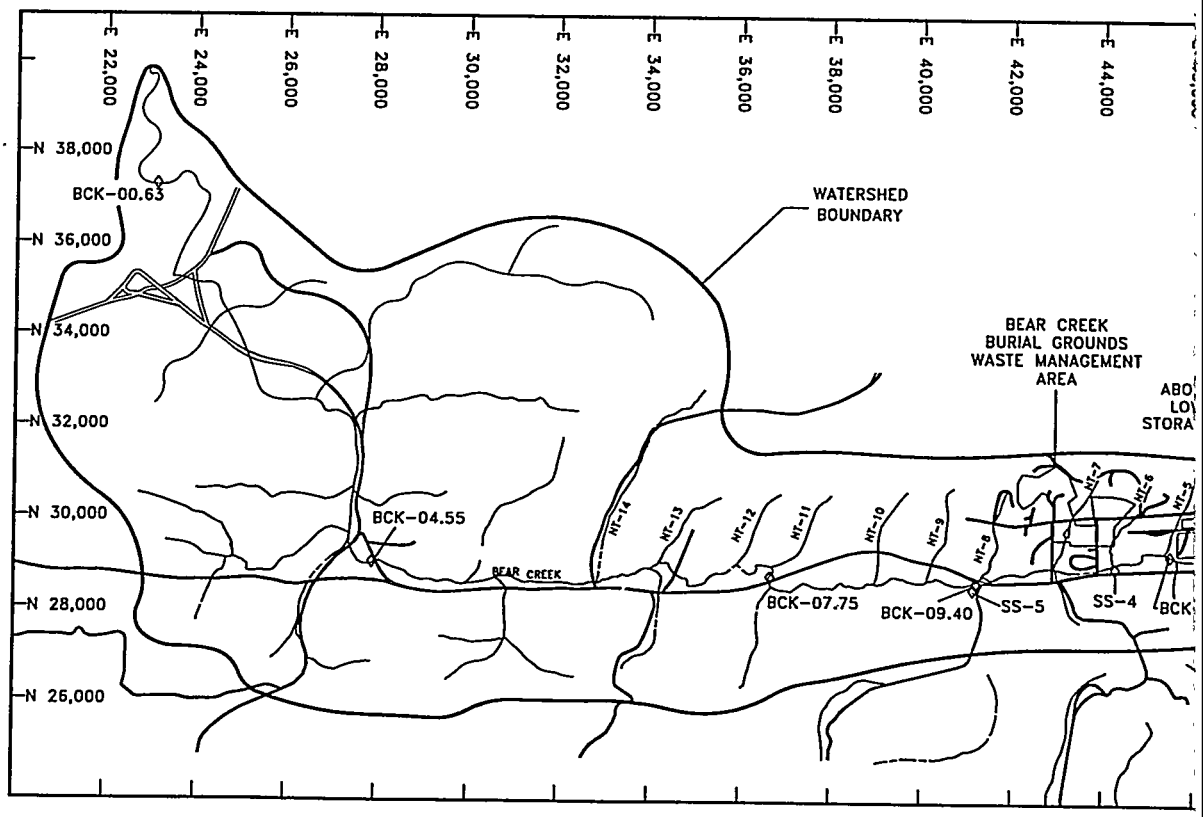
SOURCE: Modified from DOE 1997

0 2000
SCALE (FT)

NOTE: Plume reflects all available data for the water table and bedrock intervals.

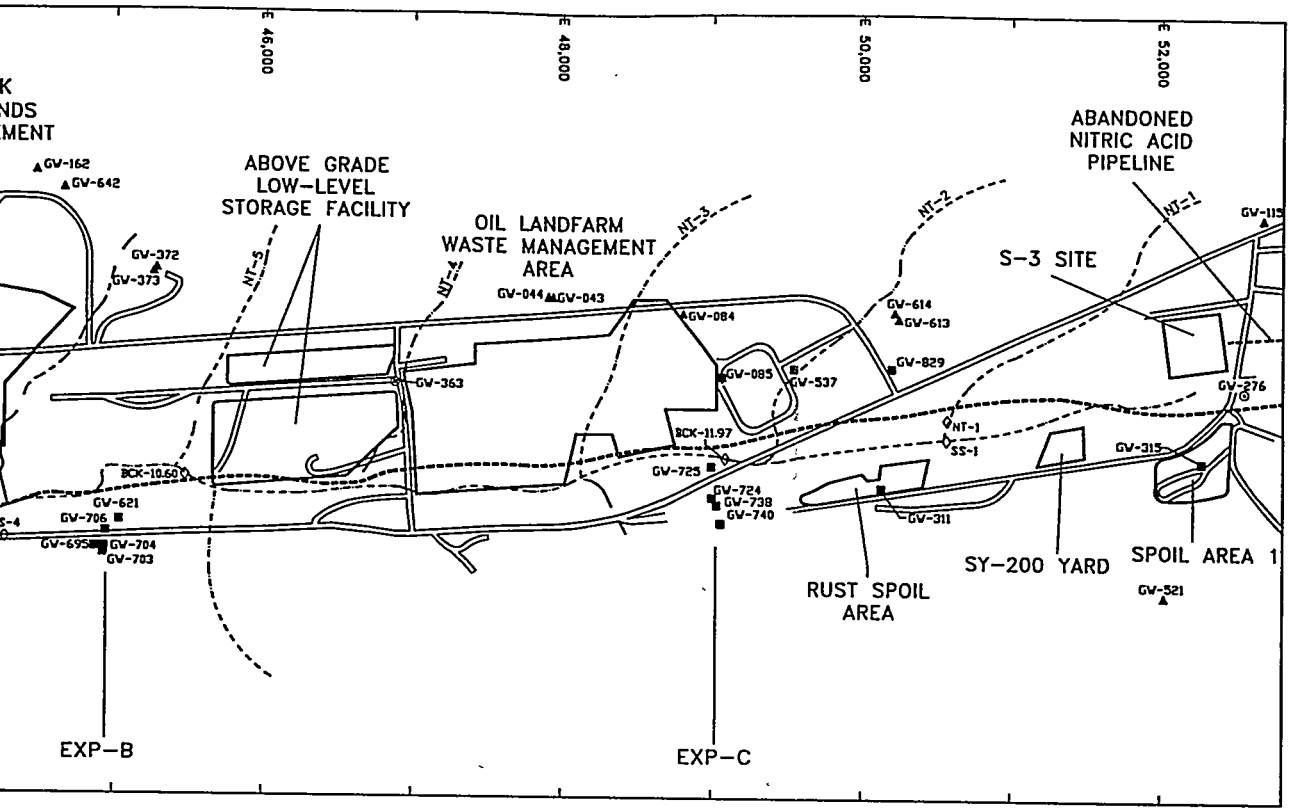
PREPARED FOR: *LOCKHEED MARTIN ENERGY SYSTEMS, INC.*	LOCATION:	Y-12 PLANT OAK RIDGE, TN.	FIGURE 4
PREPARED BY: *AJA TECHNICAL SERVICES, INC.*	DOC NUMBER:	98-D001	GROUNDWATER CONTAMINATION IN THE BEAR CREEK HYDROGEOLOGIC REGIME
	DWG ID.:	96-089	
	DATE:	2-9-98	

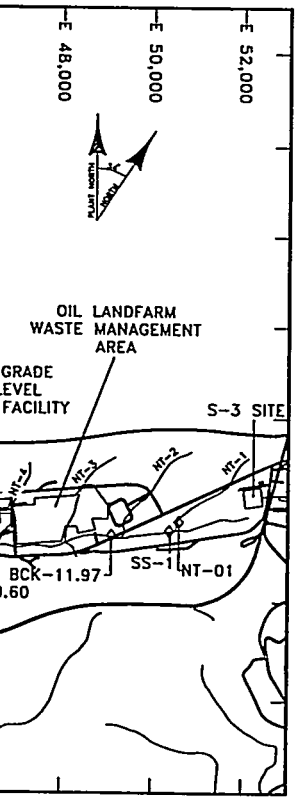


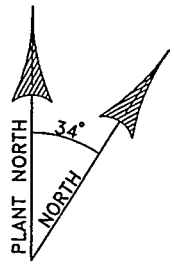


SPRINGS AND SURFACE WATER SAMPLING LOCATIONS

0 4050
SCALE (ft)



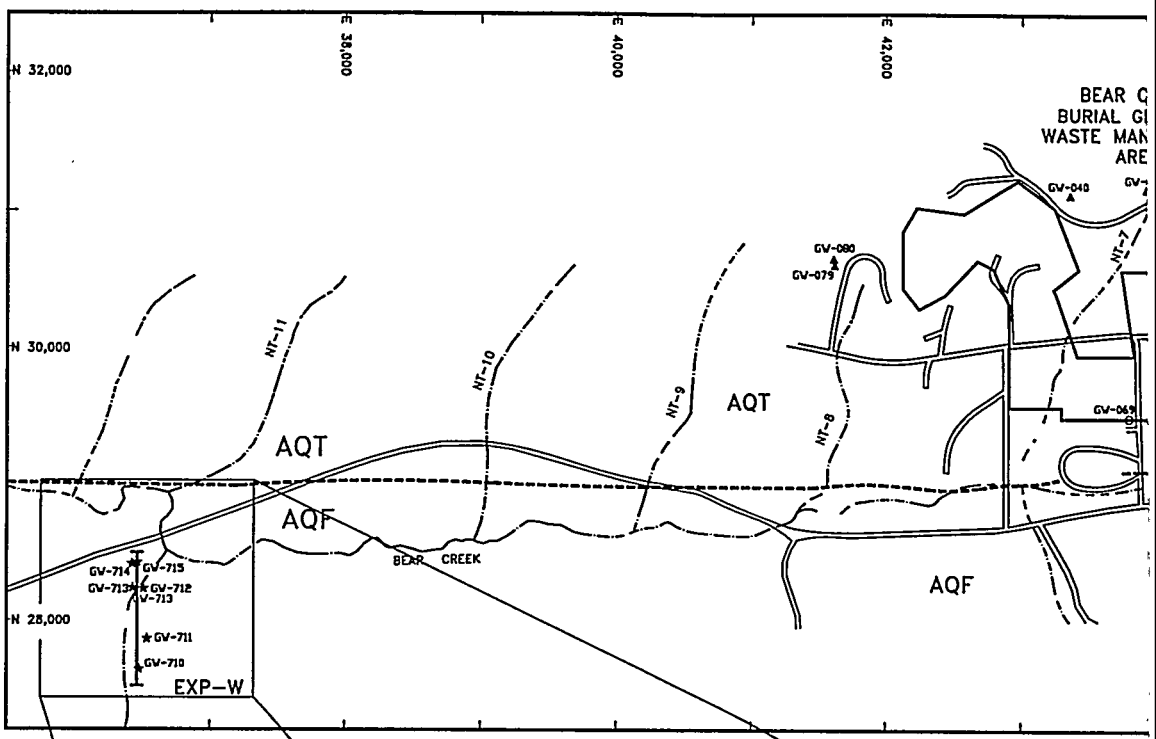


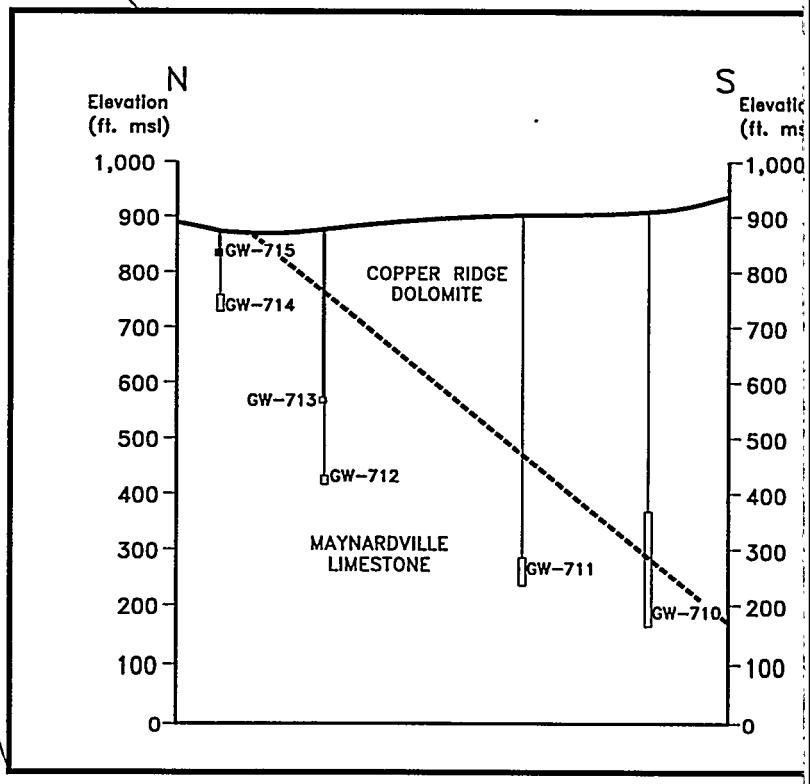


EXPLANATION

- ■ — MONITORING WELL
- ⊙ — RCRA POINT-OF-COMPLIANCE MONITORING WELL
- ▲ — RCRA BACKGROUND/UPGRADIENT MONITORING WELL
- ★ — RCRA PLUME DELINEATION MONITORING WELL
- ◇ — SPRING OR SURFACE WATER SAMPLING LOCATION
- EXP-C — EXIT PATHWAY, MAYNARDVILLE LIMESTONE PICKET
- ---------- — SURFACE DRAINAGE FEATURE
- NT-5 — NORTH TRIBUTARY
- AQT — AQUITARD
- ▬▬▬ — APPROXIMATE NOLICHUCKY SHALE/MAYNARDVILLE LIMESTONE CONTACT AT GROUND SURFACE
- AQF — AQUIFER

PREPARED FOR: *LOCKHEED MARTIN ENERGY SYSTEMS, INC.*	LOCATION:	Y-12 PLANT OAK RIDGE, TN.	FIGURE 5
PREPARED BY: *AJA TECHNICAL SERVICES, INC.*	DOC NUMBER:	98-D001	GROUNDWATER AND SURFACE WATER SAMPLING LOCATIONS FOR CY 1997
	DWG ID.:	96-083	
	DATE:	2-9-98	

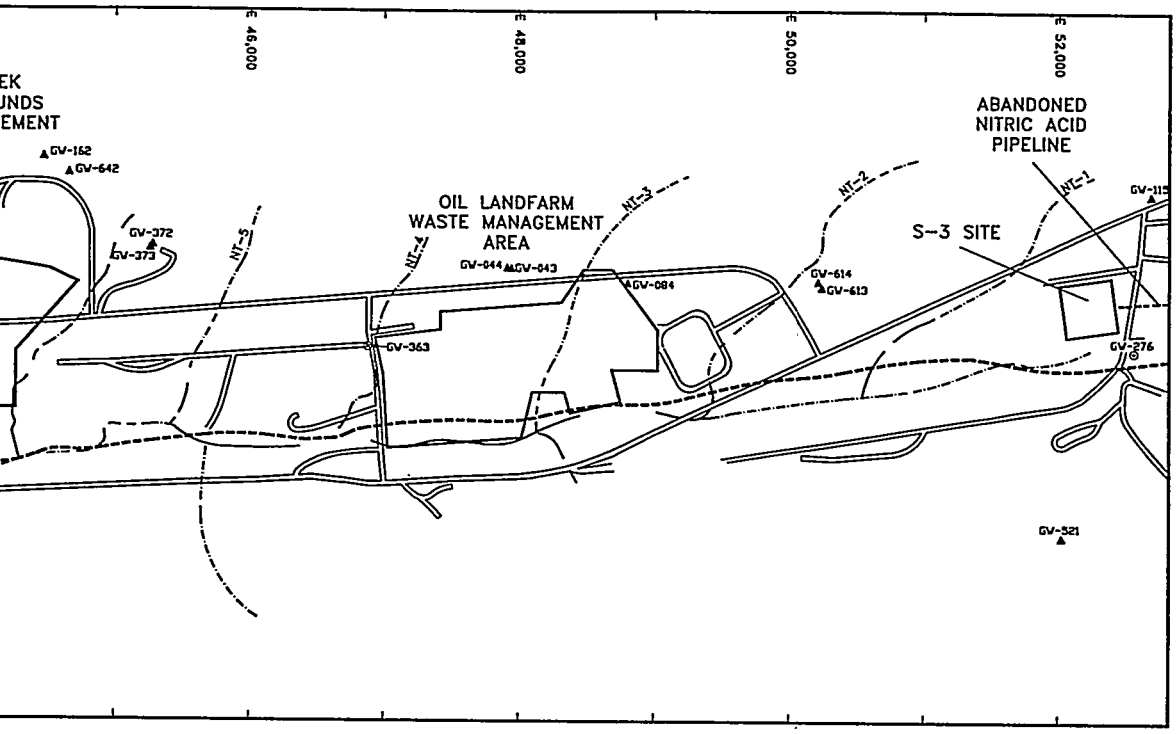


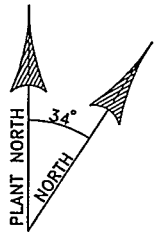


EXPLANATION

SCREENED WELL CONSTRUCTION

OPEN-HOLE WELL CONSTRUCTION





EXPLANATION

⊙ — RCRA POINT-OF-COMPLIANCE MONITORING WELL

▲ — RCRA BACKGROUND/UPGRADIENT MONITORING WELL

★ — RCRA PLUME DELINEATION MONITORING WELL

EXP-W — EXIT PATHWAY, MAYNARDVILLE LIMESTONE PICKET

— SURFACE DRAINAGE FEATURE

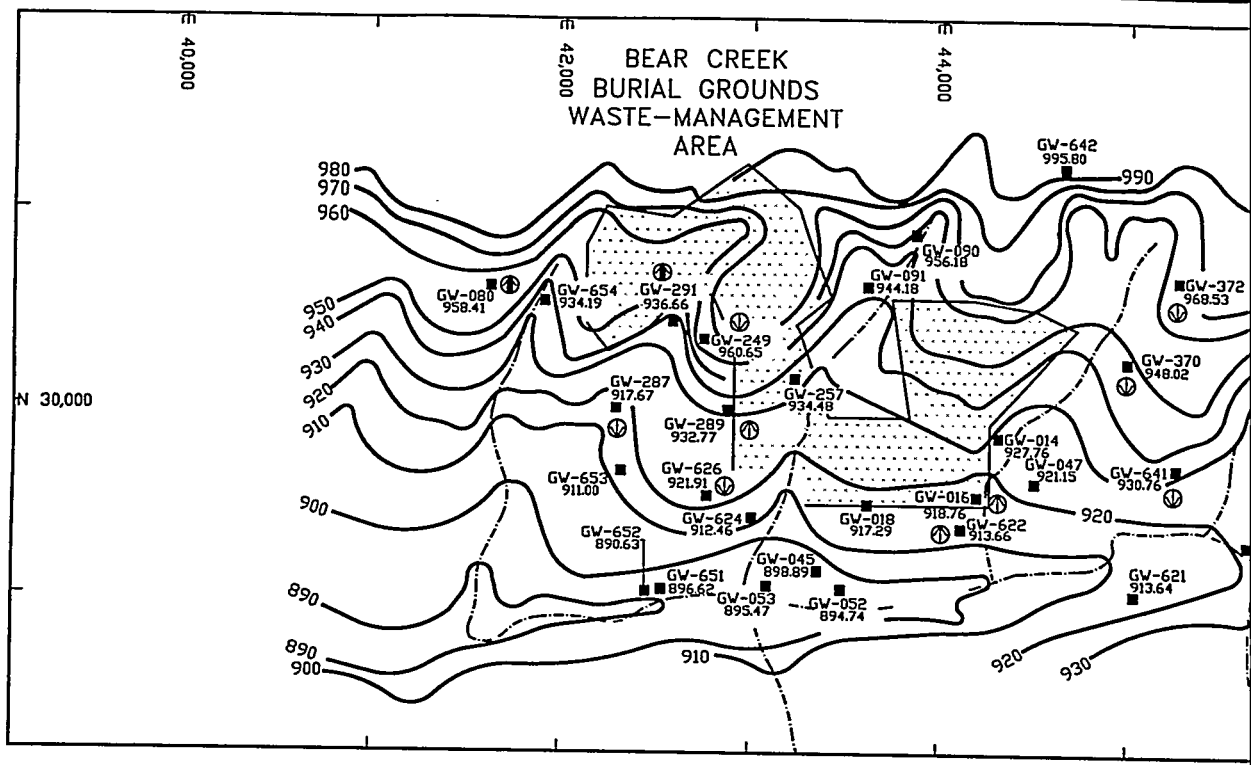
NT-5 — NORTH TRIBUTARY

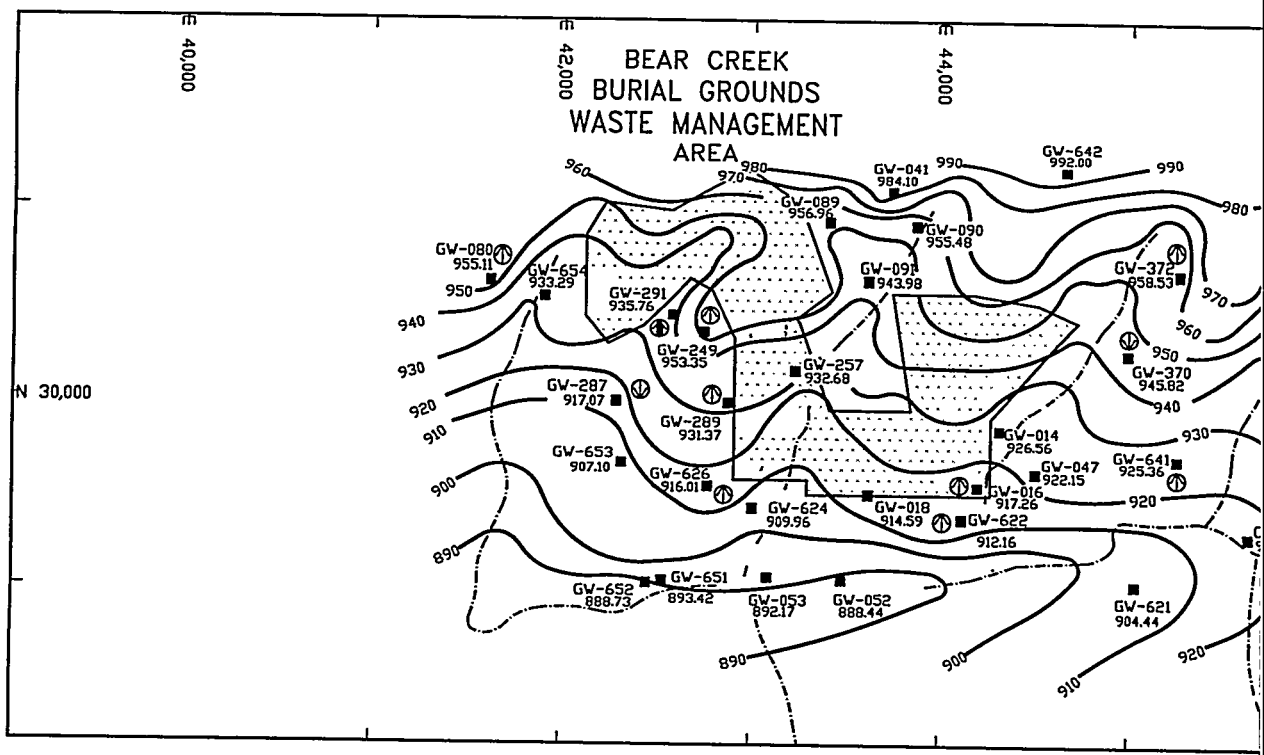
AQT — AQUITARD

— APPROXIMATE NOLICHUCKY SHALE/MAYNARDVILLE LIMESTONE CONTACT AT GROUND SURFACE

AQF — AQUIFER

PREPARED FOR: *LOCKHEED MARTIN ENERGY SYSTEMS, INC.*	LOCATION:	Y-12 PLANT OAK RIDGE, TN.	FIGURE 6
PREPARED BY: *AJA TECHNICAL SERVICES, INC.*	DOC NUMBER:	98-D001	WELL NETWORK FOR RCRA POST-CLOSURE CORRECTIVE ACTION MONITORING IN THE BEAR CREEK HYDROGEOLOGIC REGIME
	DWG ID.:	98-001	
	DATE:	2-9-98	





EXPLANATION

GW-652 890.13 ■ — Water Table Monitoring Well and Groundwater Elevation (ft msl)

— Approximate Water Level Isopleth (ft msl)

— Surface Drainage Feature

Vertical Hydraulic Gradient Determined From Data For Paired Wells

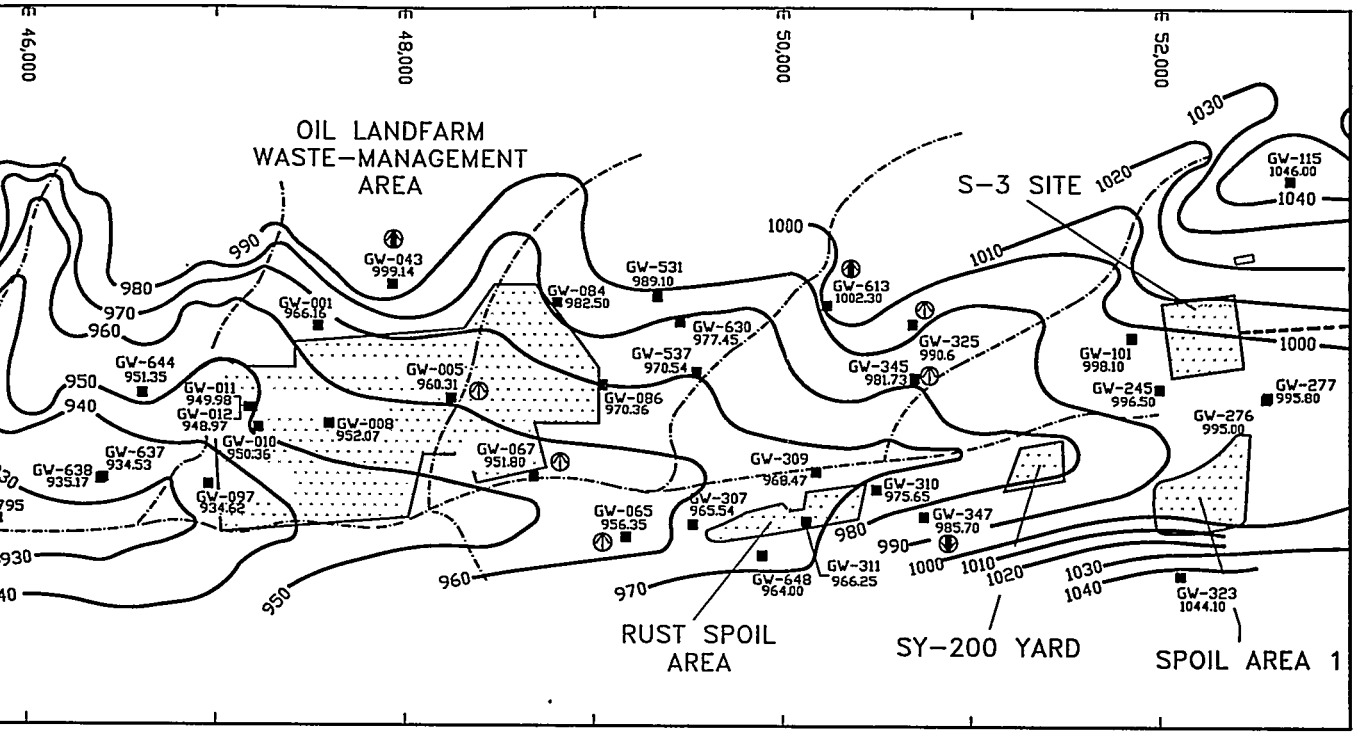
0.01–0.09 0.1–0.9 — Less Than 0.01 was Considered Insignificant

— Upward From Bedrock Interval

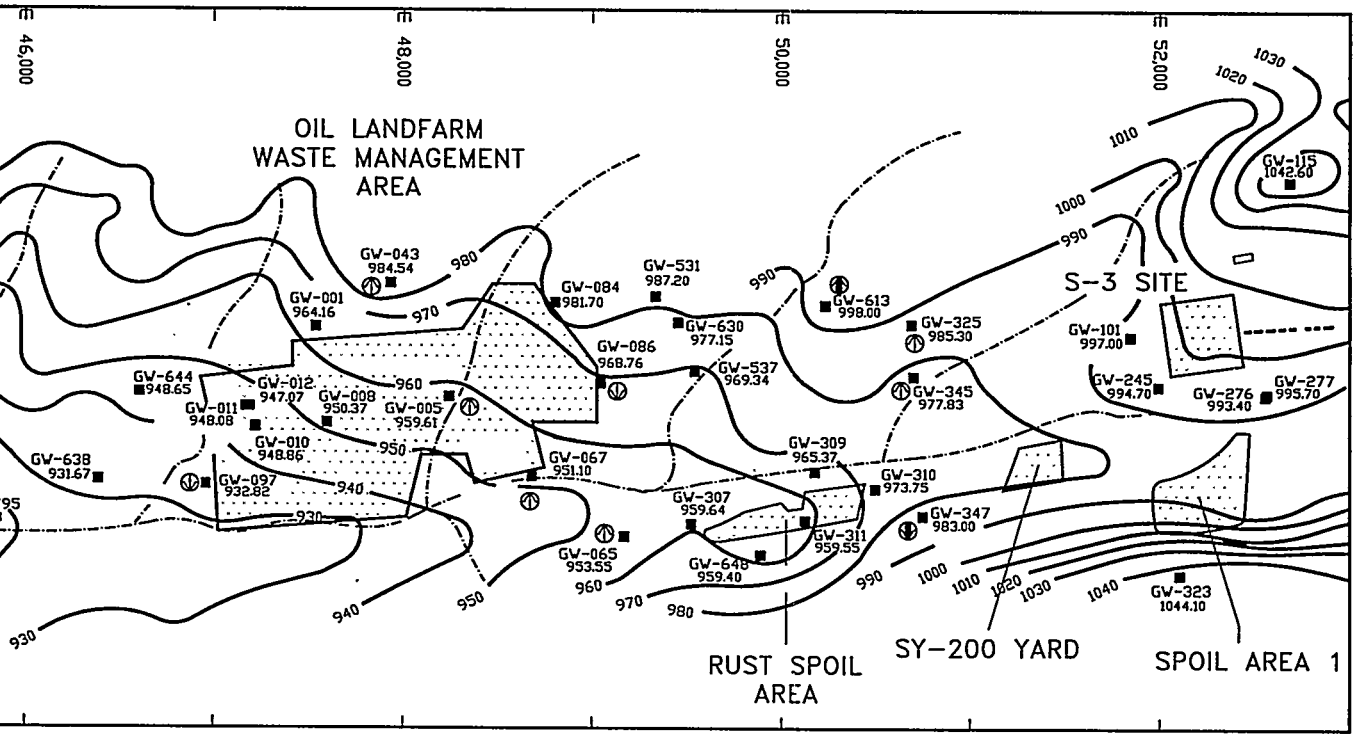
— Downward to Bedrock Interval

PLANT NORTH

0 SCALE



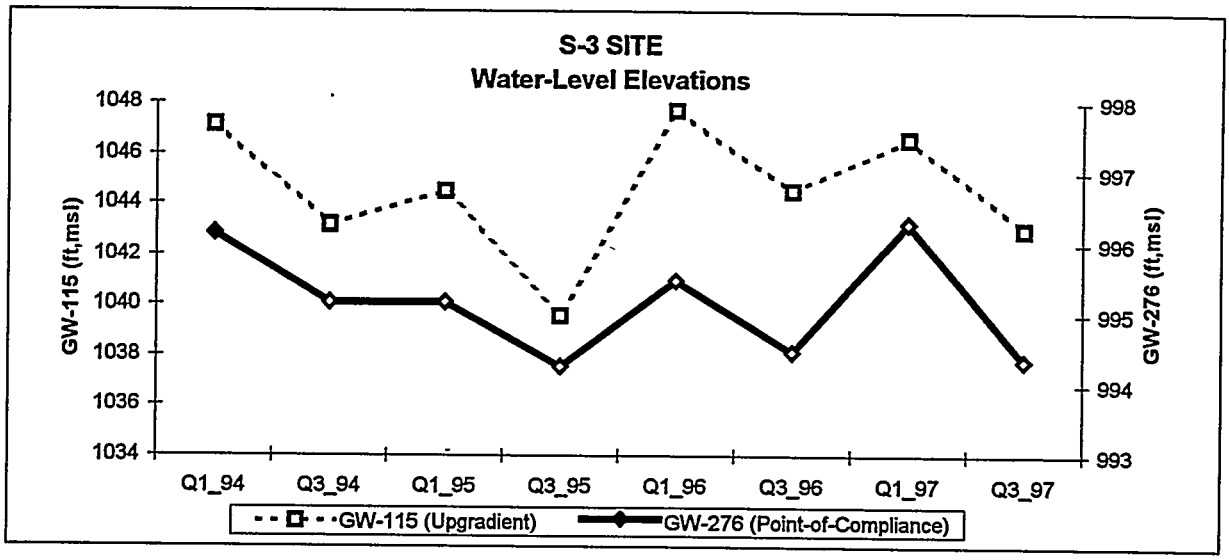
APRIL 1 - 4, 1997

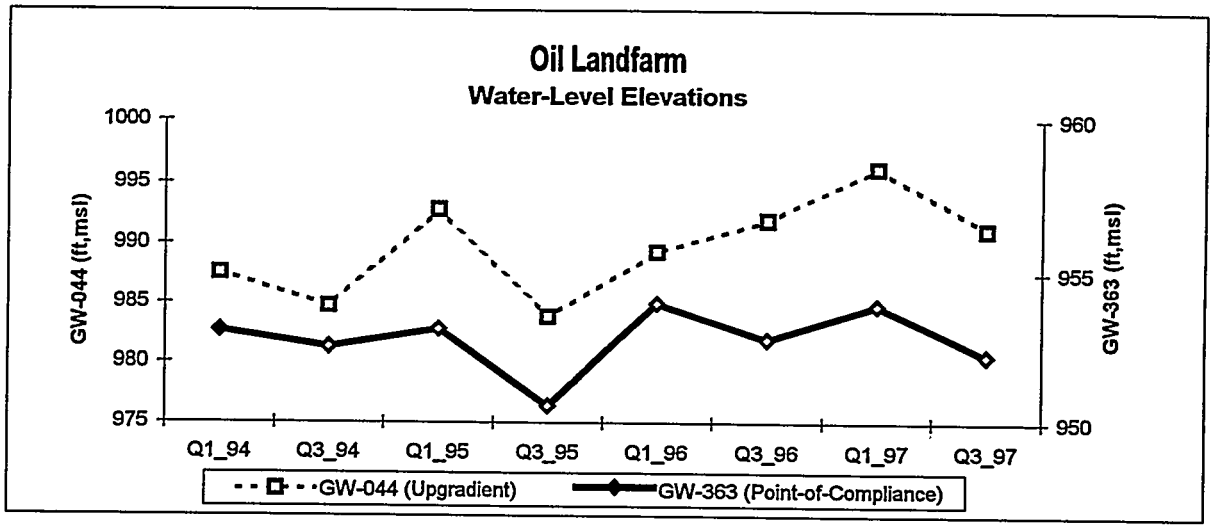


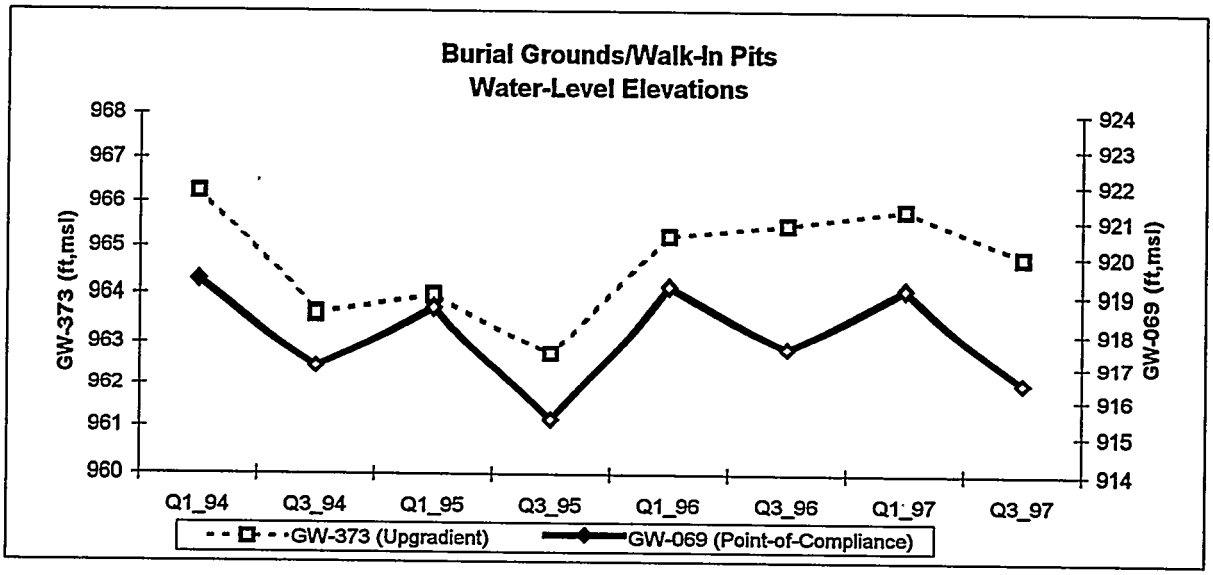
CTOBER 6 - 10, 1997

1000

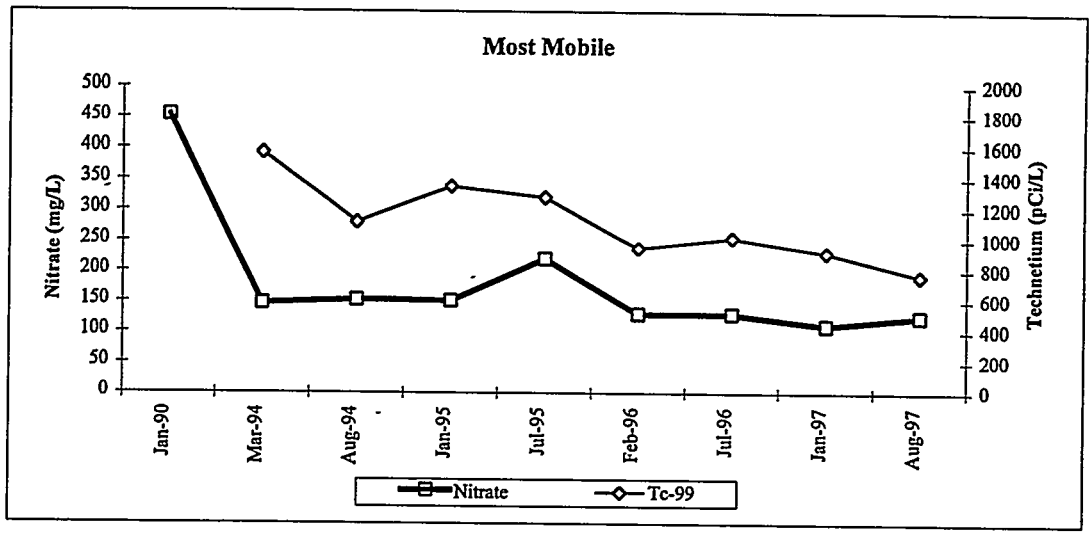
PREPARED FOR: *LOCKHEED MARTIN ENERGY SYSTEMS, INC.*	LOCATION:	Y-12 PLANT OAK RIDGE, TN.	FIGURE 7
PREPARED BY: *AJA TECHNICAL SERVICES, INC.*	DOC NUMBER:	98-D001	SEASONAL GROUNDWATER ELEVATIONS IN THE BEAR CREEK HYDROGEOLOGIC REGIME, 1997
	DWG ID.:	96-082	
	DATE:	2-13-98	

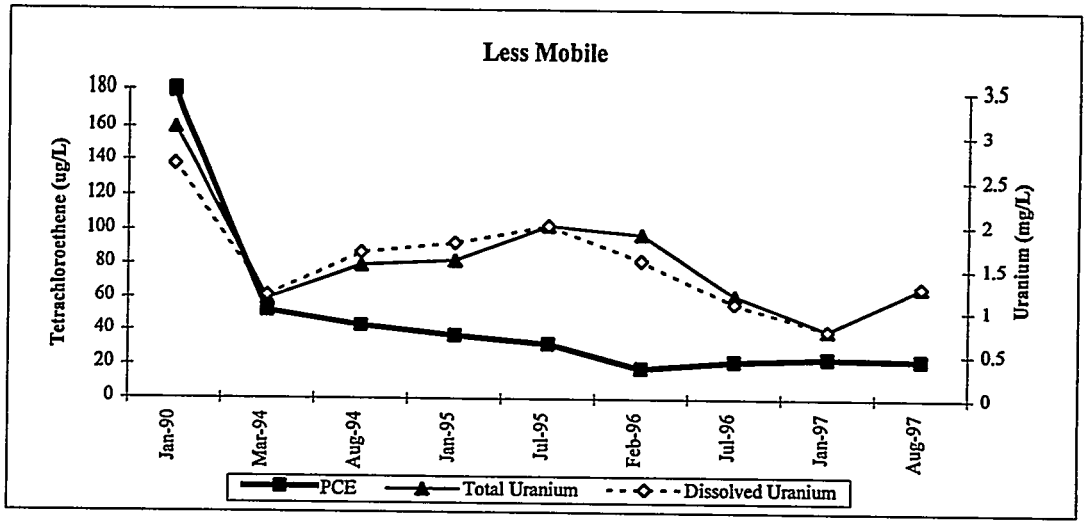


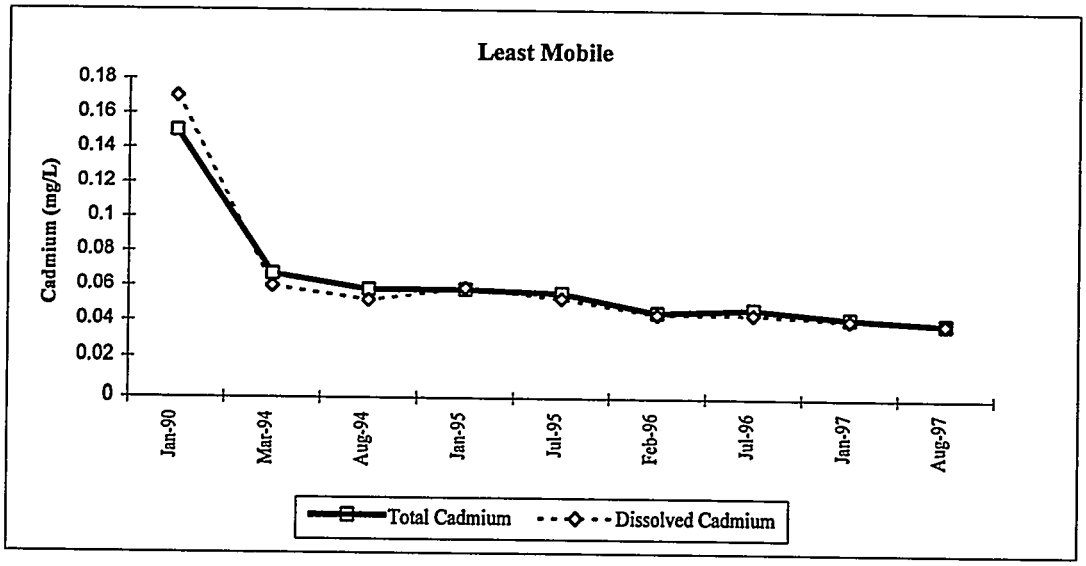




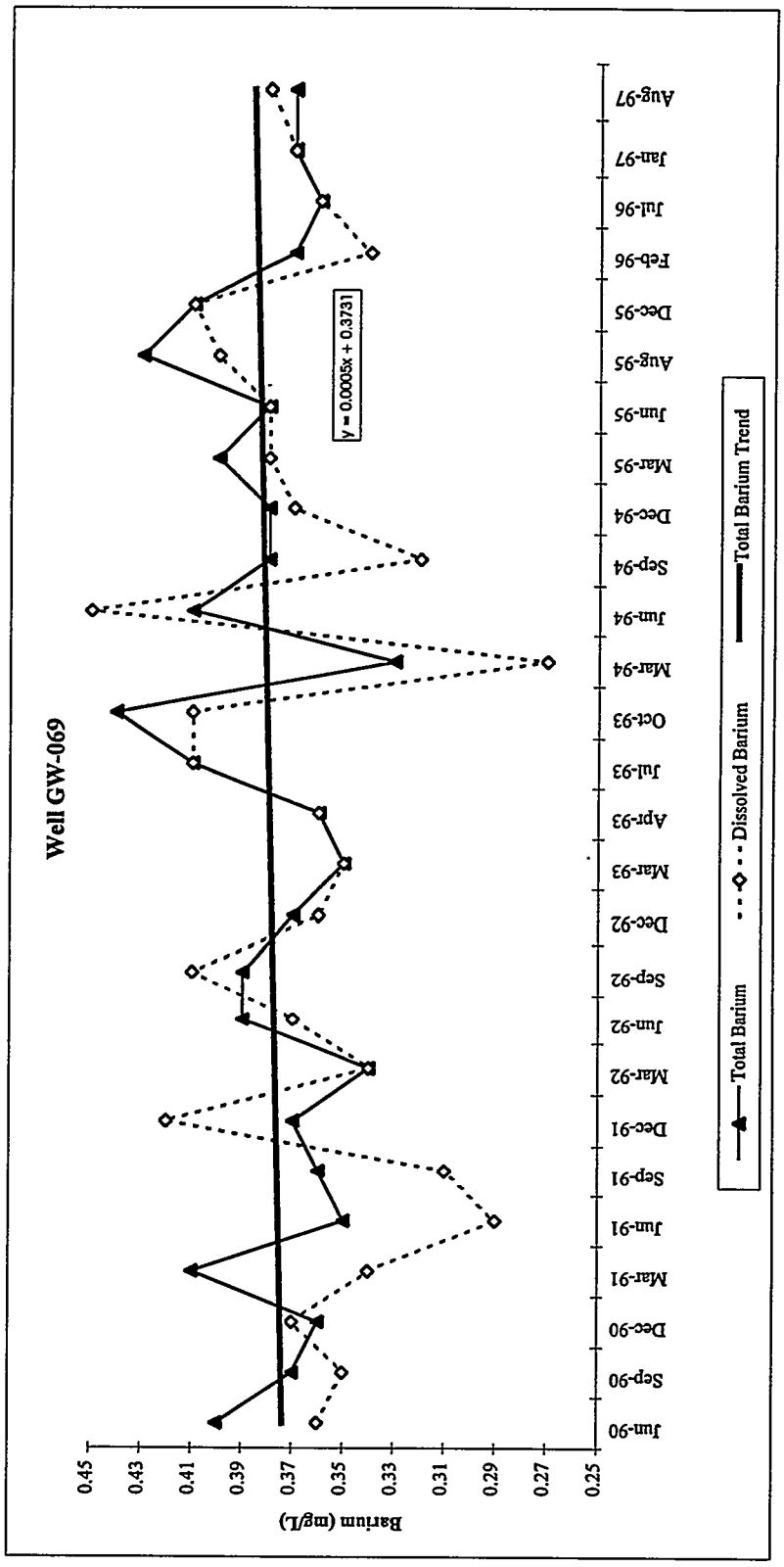
PREPARED FOR: *LOCKHEED MARTIN ENERGY SYSTEMS, INC.*	LOCATION:	Y-12 PLANT OAK RIDGE, TN.	FIGURE 8
PREPARED BY: *AJA TECHNICAL SERVICES, INC.*	DOC No.:	98-D001	GROUNDWATER HYDROGRAPHS FOR SELECTED UPGRADIENT WELLS AND RCRA POINT-OF-COMPLIANCE WELLS IN THE BEAR CREEK HYDROGEOLOGIC REGIME
	DWG ID.:	BC PT197	
	DATE:	12/10/97	



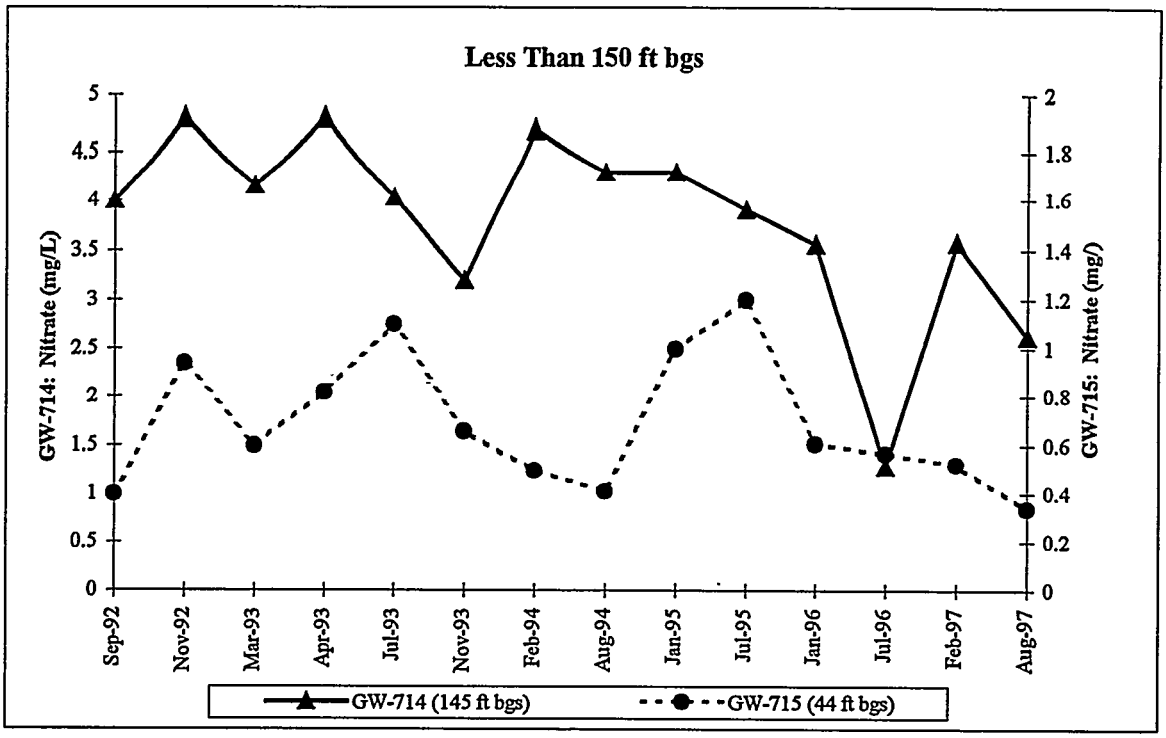


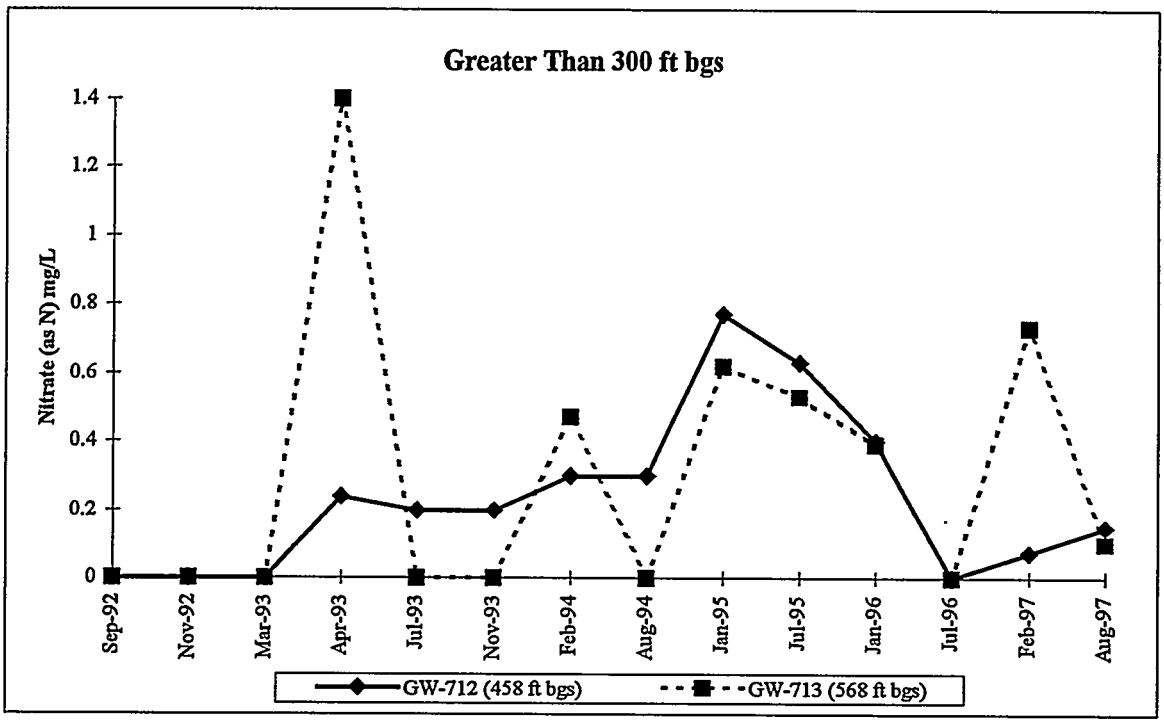


PREPARED FOR: *LOCKHEED MARTIN ENERGY SYSTEMS, INC.*	LOCATION:	Y-12 PLANT OAK RIDGE, TN.	FIGURE 9
PREPARED BY: *AJA TECHNICAL SERVICES, INC.*	DOC No.:	98-D001	CONCENTRATIONS OF SELECTED GWPS CONSTITUENTS IN GROUNDWATER AT THE S-3 SITE POINT-OF-COMPLIANCE WELL GW-276, JANUARY 1990 - AUGUST 1997
	DWG ID.:	BC PT197	
	DATE:	12/10/97	



PREPARED FOR: *LOCKHEED MARTIN ENERGY SYSTEMS, INC.*	LOCATION:	Y-12 PLANT OAK RIDGE, TN.	FIGURE 10
PREPARED BY: *AJA TECHNICAL SERVICES, INC.*	DOC No.:	98-D001	BARIUM CONCENTRATIONS IN GROUNDWATER AT THE BEAR CREEK BURIAL GROUNDS POINT-OF-COMPLIANCE WELL GW-069 JUNE 1990 - AUGUST 1997
	DWG ID.:	BC_PT197	
	DATE:	12/10/97	





Note: Results below the detection limit were assigned the value of 0.
The detection limit was 0.2 mg/L, but changed to 0.028 mg/L in 1997.

PREPARED FOR: *LOCKHEED MARTIN ENERGY SYSTEMS, INC.*	LOCATION:	Y-12 PLANT OAK RIDGE, TN.	FIGURE 11
PREPARED BY: *AJA TECHNICAL SERVICES, INC.*	DOC No.:	98-D001	NITRATE (AS N) CONCENTRATIONS IN GROUNDWATER AT PLUME BOUNDARY WELLS GW-712, GW-713, GW-714, AND GW-715, SEPTEMBER 1992 - AUGUST 1997
	DWG ID.:	BC PT197	
	DATE:	12/10/97	

APPENDIX B

TABLES

Table 1.
Index of Post-Closure Permit Conditions for RCRA Post-Closure Corrective Action Monitoring

Monitoring Requirement	Permit Condition			SECTION OF ANNUAL MONITORING REPORT
	S-3 Site	Oil Landfarm	Burial Grounds/ Walk-In Pits	
Well Network/Sampling Frequency	IV.A and IV.C	V.A and V.C	VI.A and VI.C	3.0
Background Wells	IV.C.1	V.C.1	VI.C.1	3.1.1
Point-of-Compliance Wells	IV.C.1	V.C.1	VI.C.1	3.1.1
Plume Boundary Wells	IV.C.2	V.C.2	VI.C.2	3.1.1
Sampling and Analysis	IV.E	V.E	VI.E	3.0
Sample Collection	IV.E.1	V.E.1	VI.E.1	3.2
Sample Preservation	IV.E.2	V.E.2	VI.E.2	3.2
Sample Transportation	IV.E.3	V.E.3	VI.E.3	3.2
Sample Chain-of-Custody Control	IV.E.4	V.E.4	VI.E.4	3.2
Analytical Parameters	IV.C.1 and 2	V.C.1 and 2	VI.C.1 and 2	3.3
Analytical Methods	IV.E.5	V.E.5	VI.E.5	3.3
Groundwater Surface Elevation	IV.F	V.F	VI.F	3.3
Monitoring Data Evaluation	IV.G	V.G	VI.G	4.0
Groundwater Flow Rate and Direction	IV.G.3	V.G.3	VI.G.3	4.1
Plume Boundary Concentration Trends	IV.G.4	V.G.4	VI.G.4	4.3
Point-of-Compliance Concentration Trends	IV.G.6	V.G.6	VI.G.6	4.2
Annual Reporting				
Certification Statement	II.C.6	II.C.6	II.C.6	Pg. vii
RCRA Facility Information	II.C.6	II.C.6	II.C.6	Pg. viii
Groundwater Monitoring Data	II.C.6	II.C.6	II.C.6	App. D

Table 2.
Summary of Proposed Modifications to the Post-Closure Permit[1]

PROPOSED PERMIT MODIFICATION		CLASSIFICATION OF MODIFICATION[2]						
		40 CFR § 270.42 Appendix I Citation				Class 1	Class 2	Class 3
		Permit Condition						
Type	Description	S-3 Ponds	Oil Landfarm	Burial Grounds				
Technical	Modify selected components of the corrective action monitoring well networks.	IV.A	V.A	VI.A	C.1.a		●	
Technical	Modify sampling requirements for background and plume boundary monitoring wells.	IV.C.1	V.C.1	VI.C.1	C.1.a		●	
Editorial	Clarify criteria for selection of the point-of-compliance well(s) for semiannual sampling.	IV.C.2	V.C.2	VI.C.2	A.1	●		
Editorial	Renumber Permit Conditions (IV,V,VI). D.2 to (IV, V, VI).D.5.	IV.D.2	V.D.2	VI.D.2	A.1	●		
Editorial	Clarify the purpose and objective of the plume boundary monitoring data evaluation.	IV.D.2 (New)	V.D.2 (New)	VI.D.2 (New)	A.1	●		
Editorial	Clarify the purpose and objective of the point-of-compliance monitoring data evaluation.	IV.D.3 (New)	V.D.3 (New)	VI.D.3 (New)	A.1	●		
Editorial/ Technical	Clarify integration of RCRA/CERCLA groundwater monitoring requirements.	IV.D.4 (New)	V.D.4 (New)	VI.D.4 (New)	A.1	●		
Editorial	Clarify reference to analytical requirements.	IV.G.2	V.G.2	VI.G.2	A.1	●		
Editorial	Correct the regulatory citations and/or revise the Permit Condition references.	IV.G.3	V.G.3	VI.G.3	A.1	●		
Technical	Define the trend analysis approach for plume boundary monitoring data evaluation.	IV.G.4	V.G.4	VI.G.4	C.3	●		
Editorial/ Technical	Clarify the response of Permittee to evidence of contaminant plume migration.	IV.G.5	V.G.5	VI.G.5	A.1	●		
Technical	Define the trend analysis approach for point-of-compliance monitoring data evaluation.	IV.G.6	V.G.6	VI.G.6	C.3	●		

Table 2 (cont'd)

PROPOSED PERMIT MODIFICATION		CLASSIFICATION OF MODIFICATION[2]						
		40 CFR § 270.42 Appendix I Citation				Class 1	Class 2	Class 3
Type	Description	Permit Condition						
		S-3 Ponds	Oil Landfarm	Burial Grounds				
Editorial	Clarify when the specified laboratory analyses are performed.	IV.H.3	V.H.3	VI.H.3	A.1	●		
Editorial	Consolidate and clarify annual reporting requirements.	IV.H.4 (New)	V.H.4 (New)	VI.H.4 (New)	A.1	●		
Technical	Update well inspection and well depth measurement procedures.	Attach. 2 Section C	Attach. 3 Section D	Attach. 4 Section D	A.1	●		
Editorial	Modify attachment with well construction details as per revised monitoring well network.	Attach. 2 Section D	Attach. 3 Section E	Attach. 4 Section E	A.1	●		
Technical	Modify the specified Groundwater Protection Standard constituents list.	Attach. 2 Section E	Attach. 3 Section F	Attach. 4 Section F	C.5			●
Editorial	Modify Site Map to show revised monitoring well network.	Attach. 2 Section F	Attach. 3 Section G	Attach. 4 Section G	A.1	●		
Technical	Update the groundwater sampling procedure.	Attach. 6	Attach. 6	Attach. 6	C.2	●		
Technical	Update the well plugging and abandonment procedure.	Attach. 7	Attach. 7	Attach. 7	C.2	●		

Notes:

1. Modified from: *Proposed Modifications to the RCRA Post-Closure Permit for the Bear Creek Regime at the U.S. Department of Energy Y-12 Plant, Oak Ridge, Tennessee* (GRAM, Inc. and AJA Technical Services, Inc. 1997).

2. As specified in the Title 40 Code of Federal Regulations (40 CFR) § 270.42 Appendix I - Classification of Permit Modifications.

Table 3.
Groundwater Monitoring Programs Associated with Waste Management Sites and Regulated Units in the Bear Creek Hydrogeologic Regime

PROGRAM DRIVER		MONITORING PROGRAM					
RCRA Post-Closure Permit for the Bear Creek Regime				RCRA Post-Closure Corrective Action Monitoring			
DOE Order 5400.1				Exit Pathway/Perimeter Monitoring			
				Surveillance Monitoring			
Waste Management Site/ Regulated Unit	Regulatory Classification[1]	General Waste Inventory	Operational Status				
			Closed	Active			
Above Grade Low-Level Storage Facility	NR	Low-level radioactive construction and demolition wastes.		●	●		
Boneyard, Burnyard, and Hazardous Chemical Storage Area	CERCLA	Magnesium chips, construction debris, pesticide containers, metal shavings, solvents, oils, laboratory chemicals, acids, bases, organics, water-reactive compounds, and shock sensitive compounds.	●		●		
Burial Grounds A (North and South)	RCRA/ CERCLA	Waste oils, coolants, and spent solvents.	●		●		●
Burial Grounds C (West)	RCRA/ CERCLA	Waste oils, coolants, and spent solvents.	●		●		●
Burial Grounds B, D, E, and J	CERCLA	Solid wastes including salts, metals (beryllium and uranium) and metal oxides, metal saw fines, and asbestos.	●		●		
Oil Landfarm	RCRA/ CERCLA	Waste oils and coolants containing beryllium compounds, depleted uranium, polychlorinated biphenyls, and spent solvents.	●		●		●
Oil Retention Pond No. 1	CERCLA	Oil seepage from Burial Ground A South.	●		●		
Oil Retention Pond No. 2	CERCLA	Oil seepage from Burial Ground A North.	●		●		
Receptor Media	CERCLA	Contaminated groundwater, surface water, Bear Creek stream sediments, and Bear Creek floodplain soils.	Not Applicable			●	

Table 3 (cont'd)

PROGRAM DRIVER		MONITORING PROGRAM						
RCRA Post-Closure Permit for the Bear Creek Regime		RCRA Post-Closure Corrective Action Monitoring						
DOE Order 5400.1		Exit Pathway/Perimeter Monitoring						
		Surveillance Monitoring						
Waste Management Site/ Regulated Unit	Regulatory Classification[1]	General Waste Inventory	Operational Status					
			Closed	Active				
Rust Spoil Area	CERCLA	Nonradioactive construction debris.	●		●			
Sanitary Landfill I	CERCLA	Nonhazardous solid wastes.	●		●			
Spoil Area I	CERCLA	Nonradioactive construction debris.	●		●			
SY-200 Yard	CERCLA	Temporary storage of equipment, machinery, and miscellaneous items.	●		●			
S-3 Site	RCRA/ CERCLA	Liquid, radioactive, nitric acid wastes and denitrification	●		●			●
Walk-In Pits	RCRA/ CERCLA	Chemical wastes, shock-sensitive reagents, and uranium metal saw fines.	●		●			●

Notes:

1 From: Oak Ridge Reservation Site Management Plan for the Environmental Restoration Program (U.S. Department of Energy 1995). This classification applies only to CERCLA and RCRA regulations and may not reflect other applicable regulations (e.g., solid waste regulations at Spoil Area I).

CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act

RCRA - Resource Conservation and Recovery Act

NR - Not regulated under RCRA or CERCLA.

Table 4.
CY 1997 Sampling Dates for Monitoring Wells, Springs, and Surface Water Stations in the Bear Creek Hydrogeologic Regime

Monitoring Program[1]		RCRA Post-Closure Corrective Action Monitoring DOE Order 5400.1 Exit Pathway/Perimeter Monitoring DOE Order 5400.1 Surveillance Monitoring						
Sampling Point[2]	Sampling Location[3]	Sampling Equipment[4]		Sampling Date[5]				
		Dedicated	Portable	1st Quarter	3rd Quarter			
GW-040	BG	●		01/22/97	09/02/97			●
GW-042	BG	●		01/31/97	09/02/97			●
GW-043	OLF	●		01/23/97	08/13/97			●
GW-044	OLF	●		01/23/97	08/11/97			●
GW-053	BG	●	●	02/06/97	09/03/97	●		
GW-056	EXP-A	●		02/13/97	08/19/97		●	
GW-069	BG	●		01/22/97	08/18/97			●
GW-079	BG		●	01/23/97	08/18/97			●
GW-080	BG	●		01/21/97	08/14/97			●
GW-084	OLF	●		01/27/97	08/13/97			●
GW-085	OLF	●		03/05/97 D	09/17/97	●		
GW-115	S3	●		01/22/97	08/11/97			●
GW-162	BG		●	01/24/97	08/19/97 D			●
GW-276	S3	●		01/28/97	08/13/97			●
GW-287	BG	●	●	02/06/97	09/03/97	●		
GW-311	RS	●	●	03/04/97	09/19/97	●		
GW-315	SPI	●		03/05/97	09/16/97	●		
GW-363	OLF		●	01/28/97 D	08/14/97			●
GW-372	BG	●		01/27/97 D	08/14/97			●
GW-373	BG		●	01/27/97	08/20/97			●
GW-521	LIV		●	01/07/97 D	07/21/97			●
GW-537	OLF	●		03/04/97	09/17/97 D	●		
GW-613	S3	●		01/22/97	08/11/97			●
GW-614	S3		●	01/27/97	08/14/97 D			●
GW-621	EXP-B	●	●	02/17/97	08/21/97		●	
GW-627	BG		●	02/08/97 D	09/09/97 D	●		
GW-642	BG	●		01/21/97	08/14/97			●
GW-653	BG	●	●	02/06/97	09/03/97	●		
GW-683	EXP-A		●	02/17/97	08/21/97		●	
GW-684	EXP-A		●	02/18/97	08/21/97		●	
GW-685	EXP-A		●	02/12/97	08/20/97 D		●	
GW-695	EXP-B	●		02/17/97	08/19/97		●	
GW-703	EXP-B		●	02/19/97	08/27/97		●	
GW-704	EXP-B		●	02/19/97	08/28/97		●	

Table 4 (cont'd)

Monitoring Program[1]		RCRA Post-Closure Corrective Action Monitoring						
		DOE Order 5400.1 Exit Pathway/Perimeter Monitoring						
		DOE Order 5400.1 Surveillance Monitoring						
Sampling Point[2]	Sampling Location[3]	Sampling Equipment[4]		Sampling Date[5]				
		Dedicated	Portable	1st Quarter	3rd Quarter			
GW-706	EXP-B		●	02/21/97	09/03/97		●	
GW-710	EXP-W		●	02/02/97	08/28/97			●
GW-711	EXP-W		●	01/31/97	08/26/97			●
GW-712	EXP-W		●	02/02/97	08/26/97 D			●
GW-713	EXP-W		●	02/02/97 D	08/27/97			●
GW-714	EXP-W		●	02/03/97	08/27/97			●
GW-715	EXP-W	●	●	02/03/97	08/27/97			●
GW-724	EXP-C		●	02/27/97 D	09/05/97		●	
GW-725	EXP-C		●	02/28/97	09/05/97		●	
GW-738	EXP-C		●	02/25/97	09/04/97 D		●	
GW-740	EXP-C		●	02/24/97	09/04/97		●	
GW-829	OLF		●	03/04/97	09/16/97	●		
BCK-00.63	EXP-SW		●	02/04/97	08/28/97		●	
BCK-04.55	EXP-SW		●	02/04/97	08/28/97		●	
BCK-07.75	EXP-SW		●	02/04/97	08/29/97		●	
BCK-09.40	EXP-SW		●	02/04/97	08/29/97		●	
BCK-10.60	EXP-SW		●	02/04/97	08/29/97		●	
BCK-11.97	EXP-SW		●	02/04/97	08/29/97[6]		●	
NT-01	EXP-SW		●	02/03/97	DRY[7]		●	
SS-1	EXP-SW		●	02/03/97	DRY[7]		●	
SS-4	EXP-SW		●	02/03/97	08/29/97 D		●	
SS-5	EXP-SW		●	02/03/97	08/29/97		●	

Notes:

1 See Table 6 for list of field measurements and laboratory analytes.

2 BCK - Bear Creek Kilometer
GW - Groundwater Monitoring Well
NT - Northern Tributary
SS - South Spring

Table 4 (cont'd)

Notes: (cont'd)

3
- BG - Bear Creek Burial Grounds Waste Management Area
- EXP-A - Exit Pathway (Maynardville Limestone) Picket A
- EXP-B - Exit Pathway (Maynardville Limestone) Picket B
- EXP-C - Exit Pathway (Maynardville Limestone) Picket C
- EXP-W - Exit Pathway (Maynardville Limestone) Picket W
- EXP-SW - Exit Pathway (Bear Creek) Surface Water
- LIV - Industrial Landfill IV (Chestnut Ridge Regime)
- OLF - Oil Landfarm Waste Management Area
- RS - Rust Spoil Area
- SPI - Spoil Area I
- S3 - S-3 Site

4 Dedicated: Well Wizard™ (dedicated bladder pump)
Portable: Bennet Pumps™ and disposable bailers (groundwater) and grab bottles (surface water and springs).

Well Wizards™ were removed from wells GW-311 and GW-621, and installed in wells GW-053, GW-287, GW-653, and GW-715 after the first quarter sampling event but before the third quarter sampling event.

5 "D" used to denote sampling locations from which duplicate samples were collected on the specified sampling date.

6 Surface water station BCK-11.97 was resampled on September 12, 1997 for tritium analysis during the third quarter sampling event.

7 Surface water station NT-01 and spring SS-1 were dry during the third quarter sampling period. Samples from each location were subsequently collected on October 13, 1997.

Table 5.
Components of the Well Network Used for RCRA Post-Closure Corrective Action Monitoring During CY 1997

RCRA Monitoring Well Network Component[1]						Former (■)/Current (●) Background Well				
						Point-of-Compliance Well				
						Former (■)/Current (●) Plume Boundary Well				
Well No.	Location	Depth (ft bgs)	Geologic Formation	Aquifer Zone[2]						
				WT	BDR					
GW-040	Bear Creek Burial Grounds WMA	29.0	Pumpkin Valley Shale	●						■
GW-042	Bear Creek Burial Grounds WMA	28.2	Pumpkin Valley Shale	●						■
GW-043	Oil Landfarm WMA	40.0	Maryville Limestone	●						■
GW-044	Oil Landfarm WMA	70.0	Maryville Limestone		●					■
GW-069	Bear Creek Burial Grounds WMA	99.2	Nolichucky Shale		●			●		
GW-079	Bear Creek Burial Grounds WMA	64.9	Rogersville Shale		●					■
GW-080	Bear Creek Burial Grounds WMA	29.7	Rogersville Shale	●						■
GW-084	Oil Landfarm WMA	27.8	Maryville Limestone	●						■
GW-115	S-3 Site	53.0	Maryville Limestone	●						●
GW-162	Bear Creek Burial Grounds WMA	125.0	Pumpkin Valley Shale		●					■
GW-276	S-3 Site	18.5	Nolichucky Shale	●				●		
GW-363	Oil Landfarm WMA	75.0	Nolichucky Shale		●			●		
GW-372	Bear Creek Burial Grounds WMA	51.6	Maryville Limestone	●						■
GW-373	Bear Creek Burial Grounds WMA	158.0	Maryville Limestone		●					■
GW-521	Chestnut Ridge Regime	136.0	Copper Ridge Dolomite		●					■
GW-613	S-3 Site	42.0	Nolichucky Shale	●						■
GW-614	S-3 Site	90.2	Nolichucky Shale		●					■
GW-642	Bear Creek Burial Grounds WMA	36.9	Rogersville Shale	●						■
GW-710	Exit Pathway Picket W	744.5	Maynardville Limestone		●	■				
GW-711	Exit Pathway Picket W	666.2	Maynardville Limestone		●	■				
GW-712	Exit Pathway Picket W	457.5	Maynardville Limestone		●	●				
GW-713	Exit Pathway Picket W	315.2	Maynardville Limestone		●	●				
GW-714	Exit Pathway Picket W	145.0	Maynardville Limestone		●	●				
GW-715	Exit Pathway Picket W	44.0	Maynardville Limestone	●		●				

Note:

1 Components of the RCRA post-closure corrective action monitoring well networks defined in site-specific conditions of the PCP for the Bear Creek Regime (see Table 1), as modified per TDEC approval effective July 28, 1997.

2. WT = Water Table Interval; BDR = Bedrock Interval

Table 6.
Laboratory Analytes and Field Measurements for CY 1997
Groundwater and Surface Water Samples

MONITORING PROGRAM		RCRA Post-Closure Corrective Action Monitoring[1]				
		DOE Order 5400.1 Monitoring[2]				
PRINCIPAL IONS	**Analytical Method[3]**	**GWPS Constituent[4]**	**Sample Type[5]**			
			Filtered	**Unfiltered**		
Alkalinity - HCO3	EPA-310.1	.	.	●	●	●
Alkalinity - CO3	EPA-310.1	.	.	●	●	●
Calcium	EPA-6010A	.	●	●	●	●
Chloride	EPA-300.0	.	.	●	●	●
Fluoride	EPA-340.2	.	.	●	●	●
Magnesium	EPA-6010A	.	●	●	●	●
Nitrate (as N)	EPA-300.0	●	.	●	●	●
Potassium	EPA-6010A	.	●	●	●	●
Sodium	EPA-6010A	.	●	●	●	●
Sulfate	EPA-300.0	.	.	●	●	●
TRACE METALS	**Analytical Method**	**GWPS Constituent**	**Sample Type**			
			Filtered	**Unfiltered**		
Aluminum	EPA-6010A	.	●	●	●	●
Antimony	EPA-6010A	.	●	●	●	●
Arsenic	EPA-200.8	.	●	●	●	●
Barium	EPA-6010A	●	●	●	●	●
Beryllium	EPA-6010A	.	●	●	●	●
Boron	EPA-6010A	.	●	●	●	●
Cadmium	EPA-6010A	●	●	●	●	●
Chromium	EPA-6010A	●	●	●	●	●
Cobalt	EPA-6010A	.	●	●	●	●
Copper	EPA-6010A	.	●	●	●	●
Iron	EPA-6010A	.	●	●	●	●
Lead	EPA-200.8	●	●	●	●	●
Lithium	EPA-6010A	.	●	●	●	●
Manganese	EPA-6010A	.	●	●	●	●
Mercury	EPA-7470	●	●	●	●	●
Molybdenum	EPA-6010A	.	●	●	●	●
Nickel	EPA-6010A	●	●	●	●	●
Selenium	EPA-6010A	.	●	●	●	●
Silver	EPA-6010A	.	●	●	●	●
Strontium	EPA-6010A	.	●	●	●	●
Thallium	EPA-200.8	.	●	●	●	●
Thorium	EPA-6010A	.	●	●	●	●

Table 6 (cont'd)

MONITORING PROGRAM		RCRA Post-Closure Corrective Action Monitoring[1]				
		DOE Order 5400.1 Monitoring[2]				
TRACE METALS (cont'd)	Analytical Method[3]	GWPS Constituent[4]	Sample Type[5]			
			Filtered	Unfiltered		
Uranium	EPA-200.8	●	●	●	●	●
Vanadium	EPA-6010A	.	●	●	●	●
Zinc	EPA-6010A	.	●	●	●	●
VOLATILE ORGANIC COMPOUNDS	Analytical Method	GWPS Constituent	Sample Type			
			Filtered	Unfiltered		
Acetone	EPA-8260	●	.	●	●	●
Acrolein	EPA-8260	.	.	●	●	●
Acrylonitrile	EPA-8260	.	.	●	●	●
Benzene	EPA-8260	●	.	●	●	●
Bromochloromethane	EPA-8260	.	.	●	●	●
Bromodichloromethane	EPA-8260	.	.	●	●	●
Bromoform	EPA-8260	●	.	●	●	●
Bromomethane	EPA-8260	.	.	●	●	●
2-Butanone	EPA-8260	●	.	●	●	●
Carbon disulfide	EPA-8260	.	.	●	●	●
Carbon tetrachloride	EPA-8260	●	.	●	●	●
Chlorobenzene	EPA-8260	.	.	●	●	●
Chloroethane	EPA-8260	.	.	●	●	●
2-Chloroethyl vinyl ether	EPA-8260	.	.	●	●	●
Chloroform	EPA-8260	●	.	●	●	●
Chloromethane	EPA-8260	.	.	●	●	●
Dibromochloromethane	EPA-8260	.	.	●	●	●
1,2-Dibromo-3-chloropropane	EPA-8260	.	.	●	●	●
1,2-Dibromoethane	EPA-8260	.	.	●	●	●
Dibromomethane	EPA-8260	.	.	●	●	●
1,2-Dichlorobenzene	EPA-8260	.	.	●	●	●
1,4-Dichlorobenzene	EPA-8260	.	.	●	●	●
1,4-Dichloro-2-butene	EPA-8260	.	.	●	●	●
trans-1,4-Dichloro-2-butene	EPA-8260	.	.	●	●	●
Dichlorodifluoromethane	EPA-8260	.	.	●	●	●
1,1-Dichloroethane	EPA-8260	.	.	●	●	●
1,2-Dichloroethane	EPA-8260	.	.	●	●	●
1,1-Dichloroethene	EPA-8260	●	.	●	●	●
1,2-Dichloroethene	EPA-8260	.	.	●	●	●
cis-1,2-Dichloroethene	EPA-8260	.	.	●	●	●
trans-1,2-Dichloroethene	EPA-8260	●	.	●	●	●
1,2-Dichloropropane	EPA-8260	.	.	●	●	●

Table 6 (cont'd)

MONITORING PROGRAM		RCRA Post-Closure Corrective Action Monitoring[1]				
		DOE Order 5400.1 Monitoring[2]				
VOLATILE ORGANIC COMPOUNDS (cont'd)	Analytical Method[3]	GWPS Constituent[4]	Sample Type[5]			
			Filtered	Unfiltered		
cis-1,3-Dichloropropene	EPA-8260	.	.	●	●	●
trans-1,3-Dichloropropene	EPA-8260	.	.	●	●	●
Dimethylbenzene	EPA-8260	.	.	●	●	●
Ethanol	EPA-8260	.	.	●	●	●
Ethylbenzene	EPA-8260	.	.	●	●	●
Ethyl methacrylate	EPA-8260	.	.	●	●	●
2-Hexanone	EPA-8260	.	.	●	●	●
Iodomethane	EPA-8260	.	.	●	●	●
4-Methyl-2-pentanone	EPA-8260	●	.	●	●	●
Methylene chloride	EPA-8260	●	.	●	●	●
Styrene	EPA-8260	.	.	●	●	●
1,1,1,2-Tetrachloroethane	EPA-8260	.	.	●	●	●
1,1,2,2-Tetrachloroethane	EPA-8260	.	.	●	●	●
Tetrachloroethene	EPA-8260	●	.	●	●	●
Toluene	EPA-8260	●	.	●	●	●
1,1,1-Trichloroethane	EPA-8260	●	.	●	●	●
1,1,2-Trichloroethane	EPA-8260	.	.	●	●	●
Trichloroethene	EPA-8260	●	.	●	●	●
Trichlorofluoromethane	EPA-8260	.	.	●	●	●
1,2,3-Trichloropropane	EPA-8260	.	.	●	●	●
Vinyl acetate	EPA-8260	.	.	●	●	●
Vinyl chloride	EPA-8260	.	.	●	●	●
RADIOLOGICAL ANALYTES	Analytical Method	GWPS Constituent	Sample Type			
			Filtered	Unfiltered		
Gross Alpha Activity	EPA-900.0	●	.	●	●	●
Gross Beta Activity	EPA-900.0	●	.	●	●	●
Americium-241	AC-MM-2-22012	●	.	●	●	●
Iodine-129	EPA-901.1	●	.	●	●	●
Neptunium-237	Y/P65-7206	●	.	●	●	●
Plutonium-238	AC-MM-2-22012	●	.	●	●	●
Plutonium-239/240	AC-MM-2-22012	.	.	●	●	●
Radium-223/224/226	EPA-903.0	●	.	●	●	●
Strontium-89/90	EPA-905.0	●	.	●	●	●
Technetium-99	Y/P65-7154	●	.	●	●	●
Thorium-228,230,232,234	Y/P65-7206	.	.	●	●	.
Tritium	EPA-906.0	●	.	●	●	●
Total Uranium and % U-235	Y/P65-8044	.	.	●	●	.
Uranium-234,235,238	AC-MM-2-22012	●	.	●	●	●

Table 6 (cont'd)

MONITORING PROGRAM		RCRA Post-Closure Corrective Action Monitoring[1]				
		DOE Order 5400.1 Monitoring[2]				
MISC. LABORATORY ANALYTES	Analytical Method[3]	GWPS Constituent[4]	Sample Type[5] Filtered	Unfiltered		
pH	EPA-150.1	.	.	●	●	●
Conductivity	EPA-129.1	.	.	●	●	●
Total Dissolved Solids	EPA-160.1	.	.	●	●	●
Total Suspended Solids	EPA-160.2	.	.	●	●	●
Turbidity	EPA-180.1	.	.	●	●	●
FIELD MEASUREMENTS	**Analytical Method**	**GWPS Constituent**	**Sample Type Filtered**	**Unfiltered**		
Depth-to-Water	ESP 302-1	.	.	.	●	●
Water Temperature	ESP 307-1	.	.	●	●	●
pH	ESP 307-2	.	.	●	●	●
Conductivity	ESP 307-8	.	.	●	●	●
Dissolved Oxygen	ESP 307-5	.	.	●	●	●
Redox	ESP 307-5	.	.	●	●	●

Notes:

1 Monitoring per the requirements of the Resource Conservation and Recovery Act (RCRA) Post-Closure Permit for the Bear Creek Regime.

2 Surveillance monitoring and exit pathway/perimeter monitoring per the requirements of U.S. Department of Energy (DOE) Order 5400.1. Only samples from surface water station BCK-11.97 were analyzed for radionuclides.

3 Organic analyses were performed using method EPA-8240 during the first semiannual sampling event. Analytical/field methods/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. 1988)
- Analytical Services Organization homepage (radiological methods)

4 Groundwater protection standard (GWPS) constituent specified in the RCRA Post-Closure Permit for the Bear Creek Regime.

5 Groundwater samples for metals analysis collected with dedicated sampling equipment or portable Bennet Pumps™ were filtered in the field; samples collected with bailers and surface water samples were filtered in the laboratory.

Table 7.
GWPS Constituents for the S-3 Site, Oil Landfarm, and Bear Creek Burial Grounds/Walk-In Pits[1]

Constituent		Constituents Selected for Temporal Trend Analysis[2]		
		S-3 Site	Oil Landfarm	Bear Creek Burial Grounds/Walk-In Pits
Inorganics	Barium	.	.	.
	Cadmium	●	.	.
	Chromium	.	.	.
	Lead	.	.	.
	Mercury	.	.	.
	Nickel	.	.	.
	Nitrate (as N)	●	.	.
	Uranium	●	.	●
Organics	Acetone	.	.	.
	Benzene	.	.	.
	Bromoform	.	.	.
	2-Butanone	.	.	.
	Carbon Tetrachloride	.	.	.
	Chloroform	.	.	.
	1,1-Dichloroethene	.	.	.
	Trans-1,2-Dichloroethene	.	.	.
	Methylene Chloride	.	.	.
	4-Methyl-2-Pentanone	.	.	.
	Tetrachloroethene	●	●	●
	Toluene	.	.	.
	1,1,1-Trichloroethane	.	●	.
	Trichloroethene	.	●	●
Radioanalytes[3]	Gross alpha	.	.	●
	Gross beta	.	.	.
	Americium-241	.	.	.
	Iodine-129	.	.	.
	Neptunium-237	.	.	.
	Plutonium-238	.	.	.

Table 7 (cont'd)

Constituent		Constituents Selected for Temporal Trend Analysis[2]		
		S-3 Site	Oil Landfarm	Bear Creek Burial Grounds/Walk-In Pits
Radioanalytes[3] (cont'd)	Radium (total)	.	.	.
	Strontium-89/90	.	.	.
	Technetium-99	●	.	.
	Tritium	.	.	.
	Uranium-234	.	.	.
	Uranium-235	.	.	.
	Uranium-238	.	.	.

Notes:

1 Groundwater Protection Standard (GWPS) constituents listed in Attachment 2, Section E (S-3 Site); Attachment 3, Section F (Oil Landfarm); and Attachment 4, Section F (Bear Creek Burial Grounds/Walk-In Pits) of the post-closure permit for the Bear Creek Hydrogeologic Regime.

2 Primary components of the groundwater contaminant plumes at the specified site that were selected for temporal trend analysis required under applicable conditions of the post-closure permit for the Bear Creek Hydrogeologic Regime (see Table 1).

3 A formal permit modification request to remove iodine-129, plutonium-238, and tritium from the GWPS constituent list for each site is pending approval by the Tennessee Department of Environment and Conservation.

Table 8.
Depth-to-Water Measurements and Water-Level Elevations in the Bear Creek Hydrogeologic Regime, April 1997 and October 1997

Well No.[1]	Location[2]	Hydrogeologic Unit		Top of Casing Elevation[3]	Depth-to-Water (ft below top of well casing)		Water-Level Elevation (ft above mean sea level)		
		Aquifer	Aquitard		April 1 - 4, 1997	October 6 - 10, 1997	Seasonal Fluctuation (+/- ft)	April 1 - 4, 1997	October 6 - 10, 1997
GW-001	OLF		●	980.86	14.7	16.7	-2.0	966.16	964.16
GW-005	OLF		●	967.21	6.9	7.6	-0.7	960.31	959.61
GW-008	OLF		●	966.77	14.7	16.4	-1.7	952.07	950.37
GW-010	OLF		●	952.76	2.4	3.9	-1.5	950.36	948.86
GW-011	OLF		●	953.08	3.1	5.0	-1.9	949.98	948.08
GW-012	OLF		●	954.97	6.0	7.9	-1.9	948.97	947.07
GW-014	BG		●	933.76	6.0	7.2	-1.2	927.76	926.56
GW-016	BG		●	928.06	9.3	10.8	-1.5	918.76	917.26
GW-018	BG		●	924.49	7.2	9.9	-2.7	917.29	914.59
GW-041	BG		●	1007.60	NM[4]	23.5	NA[5]	NA	984.10
GW-043	OLF		●	1013.44	14.3	28.9	-14.6	999.14	984.54
GW-045	BG	●		909.79	10.9	NM	NA	898.89	NA
GW-047	BG		●	928.25	7.1	6.1	1.0	921.15	922.15
GW-052	BG	●		906.04	11.3	17.6	-6.3	894.74	888.44
GW-053	BG	●		902.67	7.2	10.5	-3.3	895.47	892.17
GW-065	OLF	●		982.25	25.9	28.7	-2.8	956.35	953.55
GW-067	OLF	●		961.50	9.7	10.4	-0.7	951.80	951.10
GW-080	BG		●	980.31	21.9	25.2	-3.3	958.41	955.11
GW-084	OLF		●	996.60	14.1	14.9	-0.8	982.50	981.70
GW-086	OLF		●	982.76	12.4	14.0	-1.6	970.36	968.76
GW-087	OLF		●	964.36	NM	7.4	NA	NA	956.96
GW-090	BG		●	961.88	5.7	6.4	-0.7	956.18	955.48
GW-091	BG		●	953.48	9.3	9.5	-0.2	944.18	943.98
GW-097	OLF		●	944.62	10.0	11.8	-1.8	934.62	932.82
GW-101	S3		●	1007.30	9.2	10.3	-1.1	998.10	997.00
GW-115	S3		●	1054.40	8.4	11.8	-3.4	1046.00	1042.60
GW-245	S3		●	1009.10	12.6	14.4	-1.8	996.50	994.70
GW-249	BG		●	991.15	30.5	37.8	-7.3	960.65	953.35
GW-257	BG		●	961.68	27.2	29.0	-1.8	934.48	932.68
GW-276	S3		●	1001.30	6.3	7.9	-1.6	995.00	993.40
GW-277	S3		●	1001.80	6.0	6.1	-0.1	995.80	995.70
GW-287	BG		●	926.87	9.2	9.8	-0.6	917.67	917.07

Table 8 (cont'd)

Well No.[1]	Location[2]	Hydrogeologic Unit: Aquifer	Hydrogeologic Unit: Aquitard	Top of Casing Elevation[3]	Depth-to-Water (ft below top of well casing): April 1 - 4, 1997	Depth-to-Water (ft below top of well casing): October 6 - 10, 1997	Seasonal Fluctuation (+/- ft)	Water-Level Elevation (ft above mean sea level): April 1 - 4, 1997	Water-Level Elevation (ft above mean sea level): October 6 - 10, 1997
GW-289	BG		●	948.47	15.7	17.1	-1.4	932.77	931.37
GW-291	BG		●	948.36	11.7	12.6	-0.9	936.66	935.76
GW-307	RS	●		993.14	27.6	33.5	-5.9	965.54	959.64
GW-309	RS	●		988.17	19.7	22.8	-3.1	968.47	965.37
GW-310	RS	●		995.35	19.7	21.6	-1.9	975.65	973.75
GW-311	RS	●		999.35	33.1	39.8	-6.7	966.25	959.55
GW-323	SPI	●		1130.10	86.0	86.0	0.0	1044.10	1044.10
GW-325	S3		●	1003.00	10.4	17.7	-7.3	992.60	985.30
GW-345	S3		●	997.73	16.0	19.9	-3.9	981.73	977.83
GW-347	S3	●		1001.60	15.9	18.6	-2.7	985.70	983.00
GW-370	BG		●	960.62	12.6	14.8	-2.2	948.02	945.82
GW-372	BG		●	983.53	15.0	25.0	-10.0	968.53	958.53
GW-531	LD		●	1004.60	15.5	17.4	-1.9	989.10	987.20
GW-537	OLF		●	976.24	5.7	6.9	-1.2	970.54	969.34
GW-613	S3		●	1013.40	11.1	15.4	-4.3	1002.30	998.00
GW-621	EXP-B	●		925.24	11.6	20.8	-9.2	913.64	904.44
GW-622	BG		●	924.16	10.5	12.0	-1.5	913.66	912.16
GW-624	BG		●	921.96	9.5	12.0	-2.5	912.46	909.96
GW-626	BG		●	942.61	20.7	26.6	-5.9	921.91	916.01
GW-630	LD		●	986.65	9.2	9.5	-0.3	977.45	977.15
GW-637	OLF		●	941.83	7.3	12.0	-4.7	934.53	929.83
GW-638	OLF		●	941.77	6.6	10.1	-3.5	935.17	931.67
GW-641	BG		●	946.66	15.9	21.3	-5.4	930.76	925.36
GW-642	BG		●	1014.70	18.9	22.7	-3.8	995.80	992.00
GW-644	OLF		●	959.75	8.4	11.1	-2.7	951.35	948.65
GW-648	RS	●		1029.20	65.2	69.8	-4.6	964.00	959.40
GW-651	BG	●		903.12	6.5	9.7	-3.2	896.62	893.42
GW-652	BG	●		900.83	10.2	12.1	-1.9	890.63	888.73
GW-653	BG		●	931.60	20.6	24.5	-3.9	911.00	907.10
GW-654	BG		●	940.79	6.6	7.5	-0.9	934.19	933.29
GW-715	EXP-W	●		874.72	27.7	29.5	-1.8	847.02	845.22
GW-795	AGLLSF		●	925.98	4.4	8.8	-4.4	921.61	917.18

Table 8 (cont'd)

Notes:

1 Well locations are shown on Figure 7.
Wells sampled during CY 1997 are denoted by shading and bold typeface.

2
- AGLLSF - Above Grade Low-Level Storage Facility
- BG - Bear Creek Burial Grounds Waste Management Area
- EXP-B - Exit Pathway (Maynardville Limestone) Picket B
- EXP-W - Exit Pathway (Maynardville Limestone) Picket W
- LD - Lysimeter Demonstration Site
- OLF - Oil Landfarm Waste Management Area
- RS - Rust Spoil Area
- SPI - Spoil Area I
- S3 - S-3 Site

3 Measuring point (top of well casing) elevation (ft above mean sea level).

4 NM - Not Measured

5 NA - Not Applicable

Table 9.
CY 1997 Results for GWPS Constituents in Groundwater Samples from S-3 Site Point-of-Compliance Well GW-276

INORGANIC CONSTITUENTS [1] (mg/L)	Reporting Limit (mg/L)	January 28, 1997		August 13, 1997	
		Total [2]	Dissolved [3]	Total	Dissolved
Barium	0.001	0.4	0.4	0.42	0.41
Cadmium	0.003	0.042	0.041	0.039	0.039
Chromium	0.01	.	.	.	.
Lead	0.0005	0.0028	0.0023	0.003	0.0031
Mercury	0.0002	.	.	.	.
Nickel	0.01	0.44	0.44	0.4	0.39
Nitrate (as N)	0.028	110	NA	125	NA
Uranium	0.0005	0.78	0.77	1.3	1.3
ORGANIC CONSTITUENTS [4] (µg/L)	**Reporting Limit (µg/L)**	**January 28, 1997**		**August 13, 1997**	
Acetone	10	.		4J (FP)	
Benzene	5	.		.	
Bromoform	5	.		.	
2-Butanone	10	.		2J (FP)	
Carbon Tetrachloride	5	.		.	
Chloroform	5	.		1J	
1,1-Dichloroethene	5	.		.	
Trans-1,2-Dichloroethene	5	.		.	
Methylene Chloride	5	.		.	
4-Methyl-2-Pentanone	10	.		.	
Tetrachloroethene	5	24		23	
Toluene	5	.		.	
1,1,1-Trichloroethane	5	.		.	
Trichloroethene	5	.		.	

Table 9 (cont'd)

RADIOLOGICAL CONSTITUENTS [5] (pCi/L)	January 28, 1997		August 13, 1997	
	MDA (pCi/L)	Activity ± Counting Error	MDA (pCi/L)	Activity ± Counting Error
Gross alpha	9	360 ± 50	8.1	340 ± 30
Gross beta	8.2	680 ± 89	15	790 ± 27
Americium-241	0.29	.	0.23	.
Iodine-129	19	.	20	.
Neptunium-237	0.082	20 ± 2	0.27	19 ± 2
Plutonium-238	0.29	.	0.17	.
Radium (total)	0.93	0.94 ± .78	1.3	5.4 ± 2
Strontium-89/90	4	.	6.5	.
Technetium-99	6.5	920 ± 93	12	760 ± 78
Tritium	350	.	840	.
Uranium-234	0.34	190 ± 34	0.016	19 ± 3
Uranium-235	0.42	8.8 ± 2.8	0.02	1.2 ± 0.27
Uranium-238	1	410 ± 73	0.04	46 ± 7

Notes:

1 Analytical results reported in milligrams per liter (mg/L).
- . = Not detected at specified reporting limit (analytical detection limit).
- NA = Not analyzed.

2 Unfiltered groundwater sample.

3 Filtered groundwater sample.

4 Analytical results reported in micrograms per liter (µg/L).
- . = Not detected at specified reporting limit (contract required quantitation limit).
- J = Estimated value below the reporting limit.
- (FP) = False positive result (see Appendix F, Section F.5)

5 Analytical results reported in picoCuries per liter (pCi/L).
- . = Result below the specified minimum detectable activity (MDA)

Table 10.
CY 1997 Results for GWPS Constituents in Groundwater Samples from Oil Landfarm Point-of-Compliance Well GW-363

INORGANIC CONSTITUENTS [1] (mg/L)	Reporting Limit (mg/L)	January 28, 1997		August 14, 1997	
		Total [2]	Dissolved [3]	Total	Dissolved
Barium	0.001	0.09	0.067	0.059	0.055
Cadmium	0.003	.	.	.	.
Chromium	0.01	.	.	.	.
Lead	0.0005	.	.	.	.
Mercury	0.0002	.	.	.	.
Nickel	0.01	.	.	.	.
Nitrate (as N)	0.028	.	NA	0.03	NA
Uranium	0.0005	.	.	.	.
ORGANIC CONSTITUENTS [4] (µg/L)	**Reporting Limit (µg/L)**	**January 28, 1997**		**August 14, 1997**	
Acetone	10	.		2J (FP)	
Benzene	5	.		.	
Bromoform	5	.		.	
2-Butanone	10	.		.	
Carbon Tetrachloride	5	.		.	
Chloroform	5	.		.	
1,1-Dichloroethene	5	.		.	
Trans-1,2-Dichloroethene	5	.		.	
Methylene Chloride	5	.		.	
4-Methyl-2-Pentanone	10	.		.	
Tetrachloroethene	5	.		.	
Toluene	5	.		.	
1,1,1-Trichloroethane	5	.		.	
Trichloroethene	5	.		.	

Table 10 (cont'd)

RADIOLOGICAL CONSTITUENTS [5] (pCi/L)	January 28, 1997		August 14, 1997	
	MDA (pCi/L)	Activity ±Counting Error	MDA (pCi/L)	Activity ± Counting Error
Gross alpha	7.8	.	3.8	.
Gross beta	8.1	.	20	.
Americium-241	0.38	.	0.35	.
Iodine-129	19	.	19	.
Neptunium-237	0.32	.	0.23	.
Plutonium-238	0.33	.	0.29	.
Radium (total)	1	.	2.2	.
Strontium-89/90	3.4	.	4.8	.
Technetium-99	6.5	.	13	.
Tritium	350	.	800	.
Uranium-234	0.27	.	0.24	0.28 ± 0.2
Uranium-235	0.14	.	0.34	.
Uranium-238	0.11	.	0.078	0.17 ± 0.14

Notes:

1 Analytical results reported in milligrams per liter (mg/L).
- . = Not detected at specified reporting limit (analytical detection limit).
- NA = Not analyzed.

2 Unfiltered groundwater sample.

3 Filtered groundwater sample.

4 Analytical results reported in micrograms per liter (µg/L).
- . = Not detected at specified reporting limit (contract required quantitation limit).
- J = Estimated value below the reporting limit.
- (FP) = False positive result (see Appendix F, Section F.5)

5 Analytical results reported in picoCuries per liter (pCi/L).
- . = Result below the specified minimum detectable activity (MDA)

Table 11.
CY 1997 Results for GWPS Constituents in Groundwater Samples from Bear Creek Burial Grounds Point-of-Compliance Well GW-069

INORGANIC CONSTITUENTS [1] (mg/L)	Reporting Limit (mg/L)	January 22, 1997		August 18, 1997	
		Total [2]	Dissolved [3]	Total	Dissolved
Barium	0.001	0.37	0.37	0.37	0.38
Cadmium	0.003	0.0035	.	.	.
Chromium	0.01	.	.	.	.
Lead	0.0005	0.0033	0.00092	0.0014	.
Mercury	0.0002	.	.	.	.
Nickel	0.01	.	.	.	.
Nitrate (as N)	0.028/ 0.056	.	NA	. (2X)	NA
Uranium	0.0005	.	.	.	.
ORGANIC CONSTITUENTS [4] (µg/L)	**Reporting Limit (µg/L)**	**January 22, 1997**		**August 18, 1997**	
Acetone	10	.		.	
Benzene	5	.		.	
Bromoform	5	.		.	
2-Butanone	10	.		.	
Carbon Tetrachloride	5	.		.	
Chloroform	5	.		.	
1,1-Dichloroethene	5	.		.	
Trans-1,2-Dichloroethene	5	.		.	
Methylene Chloride	5	.		.	
4-Methyl-2-Pentanone	10	.		.	
Tetrachloroethene	5	.		.	
Toluene	5	.		.	
1,1,1-Trichloroethane	5	.		.	
Trichloroethene	5	.		.	

Table 11 (cont'd)

RADIOLOGICAL CONSTITUENTS [5] (pCi/L)	January 22, 1997		August 18, 1997	
	MDA (pCi/L)	Activity ±Counting Error	MDA (pCi/L)	Activity ± Counting Error
Gross alpha	7.7	.	6.1	.
Gross beta	17	.	12	.
Americium-241	0.26	.	0.085	0.19 ± 0.16
Iodine-129	18	.	19	.
Neptunium-237	0.4	.	0.18	.
Plutonium-238	0.29	0.4 ± 0.24	0.17	.
Radium (total)	1.3	.	1.7	.
Strontium-89/90	4.1	.	5.9	.
Technetium-99	13	.	13	.
Tritium	350	.	800	.
Uranium-234	0.19	.	0.21	.
Uranium-235	0.24	.	0.076	.
Uranium-238	0.2	.	0.061	0.25 ± 0.15

Notes:

1 Analytical results reported in milligrams per liter (mg/L).
- . = Not detected at specified reporting limit (analytical detection limit).
- NA = Not analyzed.
- (2X) = The elevated detection limit reflects sample dilution (2X) to achieve optimum matrix.

2 Unfiltered groundwater sample.

3 Filtered groundwater sample.

4 Analytical results reported in micrograms per liter (µg/L).
- . = Not detected at specified reporting limit (contract required quantitation limit).

5 Analytical results reported in picoCuries per liter (pCi/L).
- . = Result below the specified minimum detectable activity (MDA)

Table 12.
CY 1997 Results for GWPS Constituents in Groundwater Samples from Plume Boundary Wells GW-712, GW-713, GW-714, and GW-715

GW-712					
INORGANIC CONSTITUENTS [1] (mg/L)	Reporting Limit (mg/L)	February 2, 1997		August 26, 1997	
		Total [2]	Dissolved [3]	Total	Dissolved
Barium	0.001	0.042	0.041	0.044	0.044
Cadmium	0.003	.	.	.	.
Chromium	0.01	0.069	.	.	.
Lead	0.0005	.	.	.	.
Mercury	0.0002	.	.	.	.
Nickel	0.01	0.028	.	.	.
Nitrate (as N)	0.028	0.072	NA	0.15	NA
Uranium	0.0005	0.00094	0.001	0.00055	0.00055
ORGANIC CONSTITUENTS [4] (µg/L)	Reporting Limit (µg/L)	February 2, 1997		August 26, 1997	
Acetone	10	.		.	
Benzene	5	.		.	
Bromoform	5	.		.	
2-Butanone	10	.		11 (FP)	
Carbon Tetrachloride	5	.		.	
Chloroform	5	.		.	
1,1-Dichloroethene	5	.		.	
Trans-1,2-Dichloroethene	5	.		.	
Methylene Chloride	5	.		.	
4-Methyl-2-Pentanone	10	.		.	
Tetrachloroethene	5	.		.	
Toluene	5	.		.	
1,1,1-Trichloroethane	5	.		.	
Trichloroethene	5	.		.	

Table 12 (cont'd)

GW-712				
RADIOLOGICAL CONSTITUENTS[5] (pCi/L)	February 2, 1997		August 26, 1997	
	MDA (pCi/L)	Activity ±Counting Error	MDA (pCi/L)	Activity ± Counting Error
Gross alpha	7.8	.	3.9	.
Gross beta	8.2	.	15	.
Americium-241	0.33	.	0.41	.
Iodine-129	18	.	20	.
Neptunium-237	0.091	.	0.14	.
Plutonium-238	0.21	.	0.2	.
Radium (total)	1.1	.	1.5	.
Strontium-89/90	8.2	.	4.4	.
Technetium-99	6.6	.	13	.
Tritium	330	.	800	.
Uranium-234	0.1	0.67 ± 0.33	0.19	0.72 ± 0.3
Uranium-235	0.13	.	0.096	<CE
Uranium-238	0.1	0.26 ± 0.2	0.077	0.31 ± 0.19

Table 12 (cont'd)

GW-713					
INORGANIC CONSTITUENTS [1] (mg/L)	**Reporting Limit (mg/L)**	**February 2, 1997**		**August 27, 1997**	
		Total [2]	**Dissolved [3]**	**Total**	**Dissolved**
Barium	0.001	0.029	0.031	0.044	0.042
Cadmium	0.003	.	.	.	.
Chromium	0.01	.	.	.	.
Lead	0.0005	.	.	.	.
Mercury	0.0002	.	.	.	.
Nickel	0.01	.	.	.	.
Nitrate (as N)	0.028	0.734	NA	0.1	NA
Uranium	0.0005	0.0052	.	.	.
ORGANIC CONSTITUENTS [4] (µg/L)	**Reporting Limit (µg/L)**	**February 2, 1997**		**August 27, 1997**	
Acetone	10	.		4J (FP)	
Benzene	5	.		.	
Bromoform	5	.		.	
2-Butanone	10	.		7J (FP)	
Carbon Tetrachloride	5	.		.	
Chloroform	5	.		.	
1,1-Dichloroethene	5	.		.	
Trans-1,2-Dichloroethene	5	.		.	
Methylene Chloride	5	.		.	
4-Methyl-2-Pentanone	10	.		.	
Tetrachloroethene	5	.		.	
Toluene	5	.		.	
1,1,1-Trichloroethane	5	.		.	
Trichloroethene	5	.		.	

Table 12 (cont'd)

GW-713				
RADIOLOGICAL CONSTITUENTS[5] (pCi/L)	February 2, 1997		August 27, 1997	
	MDA (pCi/L)	Activity ± Counting Error	MDA (pCi/L)	Activity ± Counting Error
Gross alpha	7.6	.	4.4	.
Gross beta	8.2	.	16	.
Americium-241	0.31	.	0.31	.
Iodine-129	18	.	19	.
Neptunium-237	0.072	.	0.32	.
Plutonium-238	0.33	.	0.21	.
Radium (total)	0.87	.	1.5	.
Strontium-89/90	9.5	.	6.1	.
Technetium-99	6.6	.	13	.
Tritium	330	.	800	.
Uranium-234	0.3	0.42 ± 0.28	0.12	0.47 ± 0.29
Uranium-235	0.12	.	0.35	.
Uranium-238	0.3	.	0.48	.

Table 12 (cont'd)

GW-714					
INORGANIC CONSTITUENTS [1] (mg/L)	Reporting Limit (mg/L)	February 3, 1997		August 27, 1997	
		Total [2]	Dissolved [3]	Total	Dissolved
Barium	0.001	0.057	0.055	0.066	0.065
Cadmium	0.003	.	.	.	.
Chromium	0.01	.	.	.	.
Lead	0.0005	0.0012	.	0.00073	.
Mercury	0.0002	.	.	.	.
Nickel	0.01	.	.	.	.
Nitrate (as N)	0.028	3.57	NA	2.62	NA
Uranium	0.0005	0.0031	0.0032	0.0032	0.0032
ORGANIC CONSTITUENTS [4] (µg/L)	Reporting Limit (µg/L)	February 3, 1997		August 27, 1997	
Acetone	10	.		4J (FP)	
Benzene	5	.		.	
Bromoform	5	.		.	
2-Butanone	10	.		7J (FP)	
Carbon Tetrachloride	5	.		.	
Chloroform	5	.		.	
1,1-Dichloroethene	5	.		.	
Trans-1,2-Dichloroethene	5	.		.	
Methylene Chloride	5	.		.	
4-Methyl-2-Pentanone	10	.		.	
Tetrachloroethene	5	.		.	
Toluene	5	.		.	
1,1,1-Trichloroethane	5	.		.	
Trichloroethene	5	.		.	

Table 12 (cont'd)

GW-714				
RADIOLOGICAL CONSTITUENTS [5] (pCi/L)	February 3, 1997		August 27, 1997	
	MDA (pCi/L)	Activity ± Counting Error	MDA (pCi/L)	Activity ± Counting Error
Gross alpha	7.4	.	2.9	4.7 ± 2.8
Gross beta	8.2	.	13	.
Americium-241	0.39	.	0.21	.
Iodine-129	18	.	20	.
Neptunium-237	0.29	.	0.1	.
Plutonium-238	0.41	.	0.18	.
Radium (total)	0.31	.	2.6	.
Strontium-89/90	4.7	.	6.5	.
Technetium-99	6.6	8.5 ± 4.8	13	.
Tritium	330	.	800	.
Uranium-234	0.11	0.74 ± 0.36	0.1	0.87 ± 0.37
Uranium-235	0.13	.	0.13	.
Uranium-238	0.32	1.3 ± 0.5	0.25	1.3 ± 0.47

Table 12 (cont'd)

GW-715					
INORGANIC CONSTITUENTS [1] (mg/L)	Reporting Limit (mg/L)	February 3, 1997		August 27, 1997	
		Total [2]	Dissolved [3]	Total	Dissolved
Barium	0.001	0.08	0.061	0.071	0.069
Cadmium	0.003	.	.	.	.
Chromium	0.01	1.4	.	.	.
Lead	0.0005	.	.	.	.
Mercury	0.0002	.	.	.	.
Nickel	0.01	0.4	0.068	0.12	0.11
Nitrate (as N)	0.028	0.524	NA	0.34	NA
Uranium	0.0005	0.0007	.	.	.
ORGANIC CONSTITUENTS [4] (µg/L)	Reporting Limit (µg/L)	February 3, 1997		August 27, 1997	
Acetone	10	.		4J (FP)	
Benzene	5	.		.	
Bromoform	5	.		.	
2-Butanone	10	.		8J (FP)	
Carbon Tetrachloride	5	.		.	
Chloroform	5	.		.	
1,1-Dichloroethene	5	.		.	
Trans-1,2-Dichloroethene	5	.		.	
Methylene Chloride	5	.		.	
4-Methyl-2-Pentanone	10	.		.	
Tetrachloroethene	5	.		.	
Toluene	5	.		.	
1,1,1-Trichloroethane	5	.		.	
Trichloroethene	5	.		.	

Table 12 (cont'd)

GW-715				
RADIOLOGICAL CONSTITUENTS [5] (pCi/L)	February 3, 1997		August 27, 1997	
	MDA (pCi/L)	Activity ±Counting Error	MDA (pCi/L)	Activity ± Counting Error
Gross alpha	7.5	.	3.5	.
Gross beta	8.2	.	14	.
Americium-241	0.36	.	0.23	.
Iodine-129	18	.	19	.
Neptunium-237	0.081	.	0.092	<CE
Plutonium-238	0.28	.	0.29	.
Radium (total)	1	.	0.46	.
Strontium-89/90	4.7	.	4.7	.
Technetium-99	6.6	.	13	.
Tritium	330	.	800	.
Uranium-234	0.096	0.25 ± 0.19	0.13	0.23 ± 0.21
Uranium-235	0.29	.	0.47	.
Uranium-238	0.29	0.3 ± 0.24	0.31	0.57 ± 0.35

Notes:

1 Analytical results reported in milligrams per liter (mg/L).
- . = Not detected at specified reporting limit (analytical detection limit).
- NA = Not analyzed.

2 Unfiltered groundwater sample.

3 Filtered groundwater sample.

4 Analytical results reported in micrograms per liter (µg/L).
- . = Not detected at specified reporting limit (contract required quantitation limit).
- J = Estimated value below the reporting limit.
- (FP) = False positive result (see Appendix F, Section F.5)

5 Analytical results reported in picoCuries per liter (pCi/L).
- . = Result below the specified minimum detectable activity (MDA)
- <CE = Result less than the counting error (see Appendix F, Section F.6)

APPENDIX C

MONITORING WELL CONSTRUCTION DETAILS

EXPLANATION

LOCATION:

BG	-	Bear Creek Burial Grounds WMA
EXP	-	Exit Pathway Monitoring Location:
		Maynardville Limestone Picket (-A, -B, -C, -W)
LIV	-	Industrial Landfill IV (Chestnut Ridge Regime)
OLF	-	Oil Landfarm WMA
RS	-	Rust Spoil Area
S3	-	S-3 Site
SPI	-	Spoil Area I

PROGRAM:

CMP	-	RCRA Corrective Action Monitoring
		Background well (-B)
		Point-of-compliance well (-C)
		Plume boundary well (-E)
EXP	-	DOE Order 5400.1 Monitoring: exit pathway
SMP	-	DOE Order 5400.1 Monitoring: surveillance

GENERAL INFORMATION:

Coordinates	-	Y-12 Plant grid system
Elevations	-	Feet above mean sea level
Depths	-	Feet below ground surface
AQF	-	Knox Aquifer
AQT	-	ORR Aquitard
BDR	-	Bedrock Interval
WT	-	Water Table Interval
OCk	-	Knox Group
Cm	-	Maryville Limestone
Cn	-	Nolichucky Shale
Cmn	-	Maynardville Limestone
Cpv	-	Pumpkin Valley Shale
Crg	-	Rogersville Shale
.	-	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
F25/J55	-	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

Well Number	GW-040	GW-042	GW-043	GW-044	GW-053	GW-056	GW-069
Location	BG	BG	OLF	OLF	BG	EXP-A	BG
Program	CMP-B	CMP-B	CMP-B	CMP-B	SMP	EXP	CMP-C
GENERAL INFORMATION	.	.	.	.	.	.	.
	.	.	.	.	.	.	.
East Coordinate	43358.00	43938.00	47932.00	47928.00	43091.00	41384.00	43803.00
North Coordinate	31111.00	31137.00	30522.00	30526.00	29061.00	28698.00	29490.00
Measuring Pt. Elevation	1008.00	1003.40	1011.50	1013.50	902.67	890.71	927.01
Surface Elevation	1004.10	999.95	1009.80	1010.30	900.33	886.65	924.25
Hydrostratigraphic Unit	AQT	AQT	AQT	AQT	AQF	AQF	AQT
Geologic Formation	Cpv	Cpv	Cm	Cm	Cmn	Cmn	Cn
Aquifer Zone	WT	WT	WT	BDR	WT	BDR	BDR
Weathered Rock - Depth	.	3.5	1.0	1.0	4.0	.	3.0
Weathered Rock - Elevation	.	996.45	1008.80	1009.30	896.33	.	921.25
Fresh Rock - Depth	.	.	38.0	38.0	.	6.4	24.0
Fresh Rock - Elevation	.	.	971.80	972.30	.	880.25	900.25
Total Depth Drilled	35.0	30.0	40.0	70.0	39.7	55.2	100.0
	.	.	.	.	.	.	.
SURFACE/CONDUCTOR CASING	.	.	.	.	.	.	.
	.	.	.	.	.	.	.
Casing Depth	.	.	.	.	4.0	32.0	.
Casing Diameter	.	.	.	.	6.50	4.50	.
Casing Material	none	none	none	unknown	PVC/#40	PVC/#40	unknown
	.	.	.	.	.	.	.
WELL CASING	.	.	.	.	.	.	.
	.	.	.	.	.	.	.
Borehole Depth	35.0	30.0	40.0	70.0	39.7	55.2	100.0
Borehole Diameter	6.00	6.00	6.00	4.00	4.00	4.00	7.88
Well Casing Depth	25.7	24.9	22.8	48.0	26.6	53.2	89.0
Well Casing Diameter	2.37	2.37	2.37	2.37	2.37	2.37	2.37
Well Casing Material	SS/#304	SS/#304	SS/#304	SS/#304	SS/#304	SS/#304	SS/#304
	.	.	.	.	.	.	.
MONITORED INTERVAL	.	.	.	.	.	.	.
	.	.	.	.	.	.	.
Top - Depth	21.0	13.4	10.0	42.5	11.4	49.1	79.0
Top - Elevation	983.10	986.55	999.80	967.80	888.93	837.55	845.25
Midpoint - Depth	25.0	20.8	25.0	56.3	22.1	52.2	89.1
Midpoint - Elevation	979.10	979.15	984.80	954.05	878.23	834.50	835.15
Bottom - Depth	29.0	28.2	40.0	70.0	32.8	55.2	99.2
Bottom - Elevation	975.10	971.75	969.80	940.30	867.53	831.45	825.05
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	2.0	2.0	10.0	10.0	5.0	2.0	10.2
Open-Hole Length	.	.	.	.	.	.	.
Open-Hole Diameter	.	.	.	.	.	.	.

(CONTINUED)

APPENDIX C
Monitoring Well Construction Details

Well Number	GW-079	GW-080	GW-084	GW-085	GW-115	GW-162	GW-276
Location	BG	BG	OLF	OLF	S3	BG	S3
Program	CMP-B	CMP-B	CMP-B	SMP	CMP-B	CMP-B	CMP-C
GENERAL INFORMATION	.	.	.	.	.	.	.
East Coordinate	41619.00	41622.00	48801.00	49058.00	52685.00	44480.91	52557.00
North Coordinate	30632.00	30624.00	30421.00	30002.00	31073.00	31330.75	29926.00
Measuring Pt. Elevation	980.50	980.31	996.60	982.87	1054.40	1040.40	1001.30
Surface Elevation	977.14	977.03	994.37	979.82	1051.90	1038.10	998.80
Hydrostratigraphic Unit	AQT	AQT	AQT	AQT	AQT	AQT	AQT
Geologic Formation	Crg	Crg	Cm	Cn	Cm	Cpv	Cn
Aquifer Zone	BDR	WT	WT	BDR	WT	BDR	WT
Weathered Rock - Depth	4.0	3.5	4.0	2.0	.	.	18.5
Weathered Rock - Elevation	973.14	973.53	990.37	977.82	.	.	980.30
Fresh Rock - Depth	26.5	23.5	.	40.0	.	12.0	.
Fresh Rock - Elevation	950.64	953.53	.	939.82	.	1026.10	.
Total Depth Drilled	65.0	30.0	34.0	62.0	53.0	125.0	18.5
SURFACE/CONDUCTOR CASING	.	.	.	.	.	.	.
Casing Depth	.	.	.	.	.	26.0	.
Casing Diameter	.	.	.	.	.	10.75	.
Casing Material	none	none	none	unknown	none	Steel/F25	none
WELL CASING	.	.	.	.	.	.	.
Borehole Depth	65.0	30.0	34.0	62.0	53.0	92.0	18.5
Borehole Diameter	6.50	6.50	6.50	4.00	.	10.00	8.00
Well Casing Depth	59.9	24.7	22.8	53.8	42.0	92.0	13.0
Well Casing Diameter	2.37	2.37	2.37	2.37	2.37	6.62	4.50
Well Casing Material	SS/#304	SS/#304	SS/#304	SS/#304	SS/#304	Steel/F25	SS/#304
MONITORED INTERVAL	.	.	.	.	.	.	.
Top - Depth	49.9	20.8	18.5	48.4	37.6	92.0	11.3
Top - Elevation	927.24	956.23	975.87	931.42	1014.30	946.10	987.50
Midpoint - Depth	57.4	25.3	23.2	53.6	45.3	108.5	14.9
Midpoint - Elevation	919.74	951.78	971.22	926.22	1006.60	929.60	983.90
Bottom - Depth	64.9	29.7	27.8	58.8	53.0	125.0	18.5
Bottom - Elevation	912.24	947.33	966.57	921.02	998.90	913.10	980.30
Screen Material	SS/sw/.01	SS/sw/.01	SS/sw/.01	SS/sw/.01	SS/sw/.01	.	SS/sw/.01
Screen Length	5.0	5.0	5.0	5.0	10.0	.	5.3
Open-Hole Length	.	.	.	.	.	33.0	.
Open-Hole Diameter	.	.	.	.	.	6.00	.

(CONTINUED)

APPENDIX C
Monitoring Well Construction Details

Well Number	GW-287	GW-311	GW-315	GW-363	GW-372	GW-373	GW-521
Location	BG	RS	SPI	OLF	BG	BG	LIV
Program	SMP	SMP	SMP	CMP-C	CMP-B	CMP-B	CMP-B
GENERAL INFORMATION							
East Coordinate	42288.00	50126.00	52268.00	46872.00	45257.00	45271.00	52040.00
North Coordinate	29989.00	29267.00	29455.00	29961.00	30673.00	30679.00	28541.00
Measuring Pt. Elevation	926.87	999.35	1047.30	957.91	983.53	982.80	1182.70
Surface Elevation	924.60	996.43	1044.80	955.41	979.87	980.75	1179.50
Hydrostratigraphic Unit	AQT	AQF	AQF	AQT	AQT	AQT	AQF
Geologic Formation	Cm	Cmn	Cmn	Cn	Cm	Cm	OCk
Aquifer Zone	WT	WT	BDR	BDR	WT	BDR	BDR
Weathered Rock - Depth	4.5	40.3	54.0	9.0	14.5	21.0	.
Weathered Rock - Elevation	920.10	956.13	990.80	946.41	965.37	959.75	.
Fresh Rock - Depth	11.0	.	71.0	21.0	47.0	75.0	54.0
Fresh Rock - Elevation	913.60	.	973.80	934.41	932.87	905.75	1125.50
Total Depth Drilled	12.5	40.3	104.0	75.0	51.6	158.0	136.0
SURFACE/CONDUCTOR CASING							
Casing Depth	.	.	84.4	36.0	.	34.5	60.5
Casing Diameter	.	.	10.75	10.75	.	10.75	10.75
Casing Material	none	none	Steel/F25	unknown	none	unknown	unknown
WELL CASING							
Borehole Depth	12.5	40.3	104.0	50.0	51.6	123.0	136.0
Borehole Diameter	9.00	10.00	10.00	9.50	9.50	9.50	9.50
Well Casing Depth	7.3	29.7	93.3	50.0	41.0	123.0	124.9
Well Casing Diameter	4.50	4.50	4.50	6.62	4.50	6.62	4.50
Well Casing Material	SS/#304	SS/#304	SS/#304	Steel/F25	SS/#304	Steel/F25	SS/#304
MONITORED INTERVAL							
Top - Depth	5.6	25.6	90.0	50.0	39.8	123.0	123.2
Top - Elevation	919.00	970.83	954.80	905.41	940.07	857.75	1056.30
Midpoint - Depth	9.1	33.0	97.0	62.5	45.7	140.5	129.6
Midpoint - Elevation	915.55	963.48	947.80	892.91	934.17	840.25	1049.90
Bottom - Depth	12.5	40.3	104.0	75.0	51.6	158.0	136.0
Bottom - Elevation	912.10	956.13	940.80	880.41	928.27	822.75	1043.50
Screen Material	SS/sw/.01	SS/sw/.01	SS/sw/.01	.	SS/sw/.01	.	SS/sw/.01
Screen Length	5.0	10.6	10.0	.	10.0	.	10.3
Open-Hole Length	.	.	.	25.0	.	35.0	.
Open-Hole Diameter	.	.	.	6.00	.	6.00	.

(CONTINUED)

APPENDIX C
Monitoring Well Construction Details

Well Number	GW-537	GW-613	GW-614	GW-621	GW-627	GW-642	GW-653
Location	OLF	S3	S3	EXP-B	BG	BG	BG
Program	SMP	CMP-B	CMP-B	EXP	SMP	CMP-B	SMP
GENERAL INFORMATION	.	.	.	.	.	.	.
	.	.	.	.	.	.	.
East Coordinate	49539.23	50231.77	50223.05	45032.91	42774.10	44654.05	42317.29
North Coordinate	30057.19	30406.77	30425.77	29023.30	29505.05	31215.27	29660.39
Measuring Pt. Elevation	976.24	1013.40	1012.20	925.24	942.85	1014.70	931.60
Surface Elevation	974.19	1010.20	1009.40	923.07	940.39	1011.90	928.85
Hydrostratigraphic Unit	AQT	AQT	AQT	AQF	AQT	AQT	AQT
Geologic Formation	Cn	Cn	Cn	Cmn	Cn	Crg	Cn
Aquifer Zone	WT	WT	BDR	WT	BDR	WT	WT
Weathered Rock - Depth	14.9	15.0	12.5	22.0	3.0	1.0	3.5
Weathered Rock - Elevation	959.29	995.20	996.90	901.07	937.39	1010.90	925.35
Fresh Rock - Depth	.	.	50.8	.	43.0	20.0	.
Fresh Rock - Elevation	.	.	958.60	.	897.39	991.90	.
Total Depth Drilled	24.5	42.0	90.2	43.0	270.0	36.9	39.0
	.	.	.	.	.	.	.
SURFACE/CONDUCTOR CASING	.	.	.	.	.	.	.
	.	.	.	.	.	.	.
Casing Depth	.	16.8	44.4	24.0	47.5	21.5	.
Casing Diameter	.	10.75	10.75	10.75	11.75	10.75	.
Casing Material	none	Steel/J55	Steel/J55	Steel/J55	Steel/J55	Steel/J55	none
	.	.	.	.	.	.	.
WELL CASING	.	.	.	.	.	.	.
	.	.	.	.	.	.	.
Borehole Depth	24.5	42.0	90.2	43.0	254.0	36.9	39.0
Borehole Diameter	8.75	9.50	9.50	7.88	10.63	9.50	9.50
Well Casing Depth	8.0	31.7	75.2	24.8	254.0	20.3	29.0
Well Casing Diameter	4.50	4.50	4.50	4.50	7.00	4.50	4.50
Well Casing Material	SS/#304	SS/#304	SS/#304	SS/#304	Steel/F25	SS/#304	SS/#304
	.	.	.	.	.	.	.
MONITORED INTERVAL	.	.	.	.	.	.	.
	.	.	.	.	.	.	.
Top - Depth	4.8	30.0	71.6	23.3	254.0	18.5	26.3
Top - Elevation	969.39	980.20	937.80	899.77	686.39	993.40	902.55
Midpoint - Depth	14.1	36.0	80.9	31.9	262.0	27.7	32.7
Midpoint - Elevation	960.14	974.20	928.50	891.17	678.39	984.20	896.20
Bottom - Depth	23.3	42.0	90.2	40.5	270.0	36.9	39.0
Bottom - Elevation	950.89	968.20	919.20	882.57	670.39	975.00	889.85
Screen Material	SS/sw/.01	SS/sw/.01	SS/sw/.01	SS/sw/.01	.	SS/sw/.01	SS/sw/.01
Screen Length	15.0	10.3	15.0	15.7	.	16.2	10.0
Open-Hole Length	.	.	.	.	16.0	.	.
Open-Hole Diameter	.	.	.	.	6.25	.	.

(CONTINUED)

APPENDIX C
Monitoring Well Construction Details

Well Number	GW-683	GW-684	GW-685	GW-695	GW-703	GW-704	GW-706
Location	EXP-A	EXP-A	EXP-A	EXP-B	EXP-B	EXP-B	EXP-B
Program	EXP	EXP	EXP	EXP	EXP	EXP	EXP
GENERAL INFORMATION							
East Coordinate	41552.33	41353.53	41447.78	44868.30	44930.51	44934.98	44943.63
North Coordinate	28281.78	28524.52	28667.40	28844.73	28806.34	28844.67	28946.41
Measuring Pt. Elevation	972.06	898.66	891.51	939.37	954.69	944.73	928.67
Surface Elevation	969.45	895.53	889.28	937.22	951.80	941.99	925.78
Hydrostratigraphic Unit	AQF	AQF	AQF	AQF	AQF	AQF	AQF
Geologic Formation	OCk	Cmn	Cmn	OCk	Cmn	Cmn	Cmn
Aquifer Zone	BDR	BDR	BDR	BDR	BDR	BDR	BDR
Weathered Rock - Depth	22.0	.	5.0	6.0	7.0	16.0	17.0
Weathered Rock - Elevation	947.45	.	884.28	931.22	944.80	925.99	908.78
Fresh Rock - Depth	26.0	9.0	15.5	18.0	10.0	23.0	27.0
Fresh Rock - Elevation	943.45	886.53	873.78	919.22	941.80	918.99	898.78
Total Depth Drilled	197.5	129.6	138.3	62.6	182.0	256.0	182.5
SURFACE/CONDUCTOR CASING							
Casing Depth	82.0	87.0	.	22.5	.	21.0	40.3
Casing Diameter	11.75	11.75	.	11.75	.	11.75	11.75
Casing Material	Steel/J55	Steel/J55	none	Steel/J55	none	Steel/J55	Steel/J55
WELL CASING							
Borehole Depth	197.5	129.6	88.5	62.6	135.0	246.0	157.0
Borehole Diameter	10.63	10.50	10.63	9.88	10.63	10.63	10.60
Well Casing Depth	146.0	113.8	88.3	52.4	133.8	244.5	156.1
Well Casing Diameter	4.50	4.50	7.00	4.50	7.00	7.00	7.00
Well Casing Material	SS/#304	SS/#304	Steel/F25	SS/#304	Steel/F25	Steel/F25	Steel/F25
MONITORED INTERVAL							
Top - Depth	133.9	106.4	88.5	50.6	135.0	246.0	157.0
Top - Elevation	835.55	789.13	800.78	886.62	816.80	695.99	768.78
Midpoint - Depth	165.4	117.4	113.4	56.6	158.5	251.0	169.8
Midpoint - Elevation	804.10	778.13	775.88	880.62	793.30	690.99	756.03
Bottom - Depth	196.8	128.4	138.3	62.6	182.0	256.0	182.5
Bottom - Elevation	772.65	767.13	750.98	874.62	769.80	685.99	743.28
Screen Material	SS/pp/.01	SS/pp/.01	.	SS/sw/.01	.	.	.
Screen Length	50.8	14.6	.	10.0	.	.	.
Open-Hole Length	.	.	49.8	.	47.0	10.0	25.5
Open-Hole Diameter	.	.	6.63	.	6.25	6.50	6.25

(CONTINUED)

APPENDIX C
Monitoring Well Construction Details

Well Number	GW-710	GW-711	GW-712	GW-713	GW-714	GW-715	GW-724
Location	EXP-W	EXP-W	EXP-W	EXP-W	EXP-W	EXP-W	EXP-C
Program	CMP-E	CMP-E	CMP-E	CMP-E	CMP-E	CMP-E	EXP
GENERAL INFORMATION	.	.	.	.	.	.	.
East Coordinate	36470.81	36535.38	36506.87	36434.40	36435.09	36453.11	48995.17
North Coordinate	27645.05	27872.80	28232.52	28235.95	28421.56	28424.58	29198.24
Measuring Pt. Elevation	911.26	905.20	877.09	880.63	875.08	874.72	979.27
Surface Elevation	908.03	901.96	873.61	877.83	872.30	872.17	976.62
Hydrostratigraphic Unit	AQF	AQF	AQF	AQF	AQF	AQF	AQF
Geologic Formation	OCk	Cmn	OCk	Cmn	Cmn	Cmn	Cmn
Aquifer Zone	BDR	BDR	BDR	BDR	BDR	WT	BDR
Weathered Rock - Depth	.	15.0	12.0	26.8	27.0	34.0	33.5
Weathered Rock - Elevation	.	886.96	861.61	851.03	845.30	838.17	943.12
Fresh Rock - Depth	3.5	20.5	66.0	63.8	35.0	.	40.0
Fresh Rock - Elevation	904.53	881.46	807.61	814.03	837.30	.	936.62
Total Depth Drilled	744.5	666.2	457.5	315.2	145.0	44.6	301.6
SURFACE/CONDUCTOR CASING	.	.	.	.	.	.	.
Casing Depth	83.4	17.0	44.8	50.0	40.5	.	40.0
Casing Diameter	11.75	11.75	11.75	11.75	11.75	.	11.75
Casing Material	Steel/J55	Steel/J55	Steel/J55	Steel/J55	Steel/J55	none	Steel/J55
WELL CASING	.	.	.	.	.	.	.
Borehole Depth	539.7	616.0	441.5	305.0	115.1	44.6	289.6
Borehole Diameter	10.60	10.60	10.60	10.60	10.60	10.60	10.60
Well Casing Depth	539.7	616.0	440.2	305.0	115.1	33.1	289.6
Well Casing Diameter	7.00	7.00	7.00	7.00	7.00	4.25	7.00
Well Casing Material	Steel/F25	Steel/F25	Steel/F25	Steel/F25	Steel/F25	SS/#304	Steel/F25
MONITORED INTERVAL	.	.	.	.	.	.	.
Top - Depth	539.7	616.0	441.5	305.0	115.1	32.0	289.6
Top - Elevation	368.33	285.96	432.11	572.83	757.20	840.17	687.02
Midpoint - Depth	642.1	641.1	449.5	310.1	130.1	38.0	295.6
Midpoint - Elevation	265.93	260.86	424.11	567.73	742.25	834.17	681.02
Bottom - Depth	744.5	666.2	457.5	315.2	145.0	44.0	301.6
Bottom - Elevation	163.53	235.76	416.11	562.63	727.30	828.17	675.02
Screen Material	.	.	.	.	.	SS/sw/.01	.
Screen Length	.	.	.	.	.	10.0	.
Open-Hole Length	204.8	50.2	16.0	10.2	29.9	.	12.0
Open-Hole Diameter	6.25	6.25	6.25	6.25	6.25	.	6.25

(CONTINUED)

APPENDIX C
Monitoring Well Construction Details

Well Number	GW-725	GW-738	GW-740	GW-829
Location	EXP-C	EXP-C	EXP-C	OLF
Program	EXP	EXP	EXP	SMP
GENERAL INFORMATION				
East Coordinate	48989.13	49026.00	49055.00	50035.53
North Coordinate	29405.44	29150.00	29027.00	29952.81
Measuring Pt. Elevation	961.05	983.08	1019.60	985.78
Surface Elevation	958.26	980.36	1017.00	981.92
Hydrostratigraphic Unit	AQF	AQF	AQF	AQT
Geologic Formation	Cmn	Cmn	Cmn	Cn
Aquifer Zone	BDR	BDR	BDR	BDR
Weathered Rock - Depth	14.0	12.0	38.1	1.3
Weathered Rock - Elevation	944.26	968.36	978.90	980.62
Fresh Rock - Depth	17.5	15.1	45.1	29.0
Fresh Rock - Elevation	940.76	965.26	971.90	952.92
Total Depth Drilled	142.5	90.1	190.0	115.0
SURFACE/CONDUCTOR CASING				
Casing Depth	21.0	16.5	46.9	.
Casing Diameter	11.75	11.75	11.75	.
Casing Material	Steel/J55	Steel/J55	Steel/J55	none
WELL CASING				
Borehole Depth	132.5	90.1	165.6	115.0
Borehole Diameter	10.60	10.60	10.60	9.87
Well Casing Depth	132.5	67.3	165.6	104.7
Well Casing Diameter	7.00	4.50	7.00	4.50
Well Casing Material	Steel/F25	SS/#304	Steel/F25	SS/#304
MONITORED INTERVAL				
Top - Depth	132.5	63.5	165.6	102.9
Top - Elevation	825.76	916.86	851.40	879.02
Midpoint - Depth	137.5	75.8	177.8	108.8
Midpoint - Elevation	820.76	904.61	839.20	873.17
Bottom - Depth	142.5	88.0	190.0	114.6
Bottom - Elevation	815.76	892.36	827.00	867.32
Screen Material	.	SS/sw/.01	.	SS/sw/.01
Screen Length	.	20.2	.	9.9
Open-Hole Length	10.0	.	24.4	.
Open-Hole Diameter	6.25	.	6.25	.

APPENDIX D

CY 1997 DATA FOR GROUNDWATER AND SURFACE WATER SAMPLES

EXPLANATION

SAMPLING POINT:

BCK - Bear Creek Kilometer
GW - Monitoring Well
NT - Northern Tributary
SS - Spring

PROGRAM:

CMP - RCRA Corrective Action Monitoring
  Background well (-B)
  Point-of-compliance well (-C)
  Plume boundary well (-E)
EXP - DOE Order 5400.1 Monitoring: exit pathway
SMP - DOE Order 5400.1 Monitoring: surveillance

LOCATION:

BG - Bear Creek Burial Grounds WMA
EXP - Exit Pathway Monitoring Location:
  Maynardville Limestone Picket (-A, -B, -C, -W)
  Spring or Surface Water Sampling Location (-SW)
LIV - Industrial Landfill IV (Chestnut Ridge Regime)
OLF - Oil Landfarm WMA
RS - Rust Spoil Area
S3 - S-3 Site
SPI - Spoil Area I

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

EXPLANATION (cont'd)

NOTES:

Bicarbonate (HCO3) and carbonate (CO3) alkalinity are reported as calcium carbonate.

All metals analyses were performed using the inductively coupled plasma (ICP) spectroscopy method unless otherwise noted.

.	-	Not analyzed
CVAA	-	Cold Vapor Atomic Absorption
PMS	-	Plasma Mass Spectroscopy
TDS	-	Total Dissolved Solids
TSS	-	Total Suspended Solids

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
ppm	-	parts per million

ADDITIONAL DATA:

The results for radiological analytes in samples collected from Bear Creek at BCK-11.97 are presented at the end of Appendix D.4 rather than in alphanumeric sequence. Additional radioanalytes reported for the third quarter sample from this location were not analyzed at other locations in the regime.

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)

The following laboratory qualifiers are not presented with results in this appendix:

Miscellaneous Analytes:

The total dissolved solids results for the following samples were associated with an "h" qualifier because the analysis was performed after the sample holding time, or an "f" qualifier based on contamination in associated blank sample.

	Sampling Location	Sampling Date	Result (mg/L)
h	GW-084	01/27/97	190
	GW-276	01/28/97	1,100
	GW-372	01/27/97	230
	GW-372 DUP	01/27/97	220
	GW-373	01/27/97	280
	GW-614	01/27/97	200
	GW-711	01/31/97	5,900
f	GW-044	08/11/97	195
	GW-115	08/11/97	340
	GW-613	08/11/97	136

Inorganic Analytes:

Diluted Samples:

PMS - All samples are diluted before analysis to obtain an optimal matrix; reporting limits were set with a five-fold dilution.

ICP - The following unfiltered and filtered samples were diluted before analysis to obtain accurate results:

Sampling Location	Sampling Date	Dilution Factor
GW-537	03/04/97	5
GW-537	09/17/97	2
GW-537 DUP	09/17/97	2
GW-710	08/28/97	5
GW-711	01/31/97	2
GW-711	08/26/97	2

EXPLANATION (cont'd)

Inorganic Analytes: (cont'd)

The following result for mercury (CVAA) was reported with a "k" qualifier that indicates the sample concentration is greater than four times the spike level for the sample batch:

Sampling Location	Sampling Date	Result (mg/L)
GW-040	09/02/97	0.0068

The groundwater sample collected for filtered metals (ICP and PMS) analyses from well GW-042 on September 2, 1997 was neither filtered nor preserved. This fact was discovered after the analyses were complete, and the results were then flagged with a "p" qualifier.

Organic Analytes:

Eighty-two results were reported with a "B" qualifier, indicating that a compound also was detected in the associated laboratory blank. These results were reported for acetone (39 results), 2-butanone (32 results), iodomethane (5 results), 4-methyl-2-pentanone (1 result), and trichloroethene (5 results). All false-positive results that were screened by data reported for the laboratory blanks or the associated trip blanks (not indicated by a qualifier) are summarized in Appendix F.

Results that are estimated values below the analytical reporting limit were assigned a "J" qualifier by the laboratory. The standard reporting limits for the 54 organic analytes are 5 ug/L (for 37 compounds), 10 ug/L (for 16 compounds), or 500 ug/L (for one compound). Therefore, all results less than 5 ug/L are estimated values. Results that were estimated values greater than or equal to 5 ug/L were reported primarily for acetone (13 results) and 2-butanone (27 results), and most of these results were screened as false positives (see Appendix F). The following results were estimated values greater than or equal to 5 ug/L that were not identified as false positive.

Compound	Reporting Limit (ug/L)	Sampling Location	Date Sampled	Result (ug/L)
Acetone	10	GW-040	09/02/97	7
Ethanol	500	SS-5	08/29/97	6
Vinyl chloride	10	GW-053	02/06/97	6
Vinyl chloride	10	GW-053	09/03/97	6

APPENDIX D.1

FIELD MEASUREMENTS AND MISCELLANEOUS ANALYTES

APPENDIX D.1
Field Measurements and Miscellaneous Analytes, CY 1997

Sampling Point	BCK-00.63		BCK-04.55		BCK-07.75		BCK-09.40		BCK-10.60	
Program	EXP		EXP		EXP		EXP		EXP	
Location	EXP-SW		EXP-SW		EXP-SW		EXP-SW		EXP-SW	
Date Sampled	02/04/97	08/28/97	02/04/97	08/28/97	02/04/97	08/29/97	02/04/97	08/29/97	02/04/97	08/29/97
Sample Type										
FIELD MEASUREMENTS										
Top-of-Casing Elev. (ft)										
Depth to Water (ft)										
Water-Level Elev. (ft)										
Water Temp (degrees C)	11.7	21.6	11.2	21.2	10.6	19	11.8	15.2	12.7	24.2
pH (pH units)	7.8	6.5	7.5	6.7	7.5	7.9	7.6	7.2	8	7.8
Conductivity (umho/cm)	198	426	225	569	268	435	325	424	363	333
Dissolved Oxygen (ppm)	10.6	5.3	10.1	8	10.7	7.9	10.9	3.8	10.8	8.1
Oxidation/Reduction (mV)	183	127	211	136	220	176	214	180	201	148
MISCELLANEOUS ANALYTES										
pH (pH units)	7.61	8.21	7.49	8.05	7.56	8.05	7.94	7.24	7.79	8.18
Conductivity (umho/cm)	237	371	269	401	324	466	396	503	467	240
TDS (mg/L)	160	250	160	245	220	281	360	282	300	133
TSS (mg/L)	3.6	2	8	1	5.6	4	2.8	37	<1	8
Turbidity (NTU)	18.7	1.8	22.4	1.99	21.8	3.65	19	9.34	15.2	16

(CONTINUED)

Sampling Point	BCK-11.97		GW-040		GW-042		GW-043		GW-044	
Program	EXP		CMP-B		CMP-B		CMP-B		CMP-B	
Location	EXP-SW		BG		BG		OLF		OLF	
Date Sampled	02/04/97	08/29/97	01/22/97	09/02/97	01/31/97	09/02/97	01/23/97	08/13/97	01/23/97	08/11/97
Sample Type										
FIELD MEASUREMENTS										
Top-of-Casing Elev. (ft)			1008.00	1008.00	1003.40	1003.40	1011.50	1011.50	1013.50	1013.50
Depth to Water (ft)			17.55	21.54	19.10	21.90	19.90	24.25	17.25	22.29
Water-Level Elev. (ft)			990.45	986.46	984.3	981.5	991.6	987.25	996.25	991.21
Water Temp.(degrees C)	11.9	24.4	14.7	16	14.1	18.2	14.6	15.1	14.2	15.7
pH (pH units)	7.2	7.7	6.5	5.3	6.5	5.5	6.1	5.9	6.6	6.7
Conductivity (umho/cm)	382	1033	128	134	86	79	126	125	261	237
Dissolved Oxygen (ppm)	10.4	8	5.9	1.8	2.5	1.7	4.9	3.3	4.1	4
Oxidation/Reduction (mV)	208	26	166	86	61	-30	226	230	203	63
MISCELLANEOUS ANALYTES										
pH (pH units)	7.34	7.76	6.18	6.24	5.94	6.16	6.18	6.4	7.15	7.23
Conductivity (umho/cm)	507	1560	145.2	140.5	86.9	88.2	124.9	138.2	270	265
TDS (mg/L)	340	1268	350	146	62	53	94	130	166	195
TSS (mg/L)	1.2	<1	2750	181	5.2	1	7.5	22	<1	4
Turbidity (NTU)	15.9	1.97	3243	491	16.7	7.77	23.9	36.7	1.11	1.22

(CONTINUED)

APPENDIX D.1
Field Measurements and Miscellaneous Analytes, CY 1997

Sampling Point	GW-053		GW-056		GW-069		GW-079		GW-080	
Program	SMP		EXP		CMP-C		CMP-B		CMP-B	
Location	BG		EXP-A		BG		BG		BG	
Date Sampled	02/06/97	09/03/97	02/13/97	08/19/97	01/22/97	08/18/97	01/23/97	08/18/97	01/21/97	08/14/97
Sample Type										
FIELD MEASUREMENTS										
Top-of-Casing Elev. (ft)	902.67	902.67	890.71	890.71	927.01	927.01	980.50	980.50	980.31	980.31
Depth to Water (ft)	3.81	10.20	7.63	8.21	7.87	10.50	17.49	22.05	21.00	24.30
Water-Level Elev. (ft)	898.86	892.47	883.08	882.5	919.14	916.51	963.01	958.45	959.31	956.01
Water Temp (degrees C)	11.8	14.9	12.2	15.8	14.5	17.2	12.8	18.4	13.4	14.4
pH (pH units)	7	7	7.5	7.1	8.5	7.8	7.5	7.7	5.9	6
Conductivity (umho/cm)	569	594	511	588	449	330	197	177	98	96
Dissolved Oxygen (ppm)	1.3	0.7	5.2	3.2	0.7	0.6	1.3	0.9	2	1.2
Oxidation/Reduction (mV)	160	-19	130	-32	-68	-149	188	-2	141	129
MISCELLANEOUS ANALYTES										
pH (pH units)	6.88	7.13	7.09	7.25	8.69	8.43	7.8	7.9	6.07	6.13
Conductivity (umho/cm)	672	697	874	775	415	422	227	227	80.9	105.5
TDS (mg/L)	420	438	510	426	268	234	136	114	84	107
TSS (mg/L)	4.8	4	70	182	<1	<1	1.5	4	1206	292
Turbidity (NTU)	6.25	5.02	38	270	1.51	1.07	6.51	4.86	1082	196

(CONTINUED)

Sampling Point	GW-084		GW-085			GW-115		GW-162		
Program	CMP-B		SMP			CMP-B		CMP-B		
Location	OLF		OLF			S3		BG		
Date Sampled	01/27/97	08/13/97	03/05/97		09/17/97	01/22/97	08/11/97	01/24/97	08/19/97	
Sample Type				DUP						DUP
FIELD MEASUREMENTS										
Top-of-Casing Elev. (ft)	996.60	996.60	982.87	982.87	982.87	1054.40	1054.40	1040.40	1040.40	1040.40
Depth to Water (ft)	11.55	15.16	11.32	11.32	15.22	7.80	11.38	17.46	21.00	21.00
Water-Level Elev. (ft)	985.05	981.44	971.55	971.55	967.65	1046.6	1043.02	1022.94	1019.4	1019.4
Water Temp (degrees C)	14.9	16.2	14.9	15.2	16.7	16.2	18.3	11.6	22.5	16.9
pH (pH units)	7.9	7.5	6.6	6.5	7	7	6.2	8	8.1	7.9
Conductivity (umho/cm)	292	277	640	636	652	492	477	202	216	208
Dissolved Oxygen (ppm)	2.8	1.8	8.1	7.9	3.8	2.3	0.8	1.4	2	1.9
Oxidation/Reduction (mV)	209	179	166	165	249	-18	-78	175	122	119
MISCELLANEOUS ANALYTES										
pH (pH units)	7.46	7.56	6.96	6.93	7.07	7.36	7.29	8.02	7.96	7.98
Conductivity (umho/cm)	319	328	882	885	781	523	526	242	264	264
TDS (mg/L)	190	200	666	664	665	308	340	158	141	143
TSS (mg/L)	17.2	29	10	11.2	4.4	1	1	41	7	6
Turbidity (NTU)	11.6	16.2	12.9	12.5	8.68	3.97	5.77	32.8	9.07	13.2

(CONTINUED)

APPENDIX D.1
Field Measurements and Miscellaneous Analytes, CY 1997

Sampling Point	GW-276		GW-287		GW-311		GW-315		GW-363	
Program	CMP-C		SMP		SMP		SMP		CMP-C	
Location	S3		BG		RS		SPI		OLF	
Date Sampled	01/28/97	08/13/97	02/06/97	09/03/97	03/04/97	09/19/97	03/05/97	09/16/97	01/29/97	
Sample Type										DUP
FIELD MEASUREMENTS										
Top-of-Casing Elev. (ft)	1001.30	1001.30	926.87	926.87	999.35	999.35	1047.30	1047.30	957.91	957.91
Depth to Water (ft)	5.00	6.95	7.98	9.52	20.58	39.70	44.64	61.58	4.00	4.00
Water-Level Elev. (ft)	996.3	994.35	918.89	917.35	978.77	959.65	1002.66	985.72	953.91	953.91
Water Temp (degrees C)	14.5	21	7.9	18.1	14.7	15	14.7	17.2	11.2	11.6
pH (pH units)	4.5	4.7	5.5	6.4	7.2	7	6.9	6.3	9.2	9.2
Conductivity (umho/cm)	1504	1380	90	212	268	425	369	521	376	360
Dissolved Oxygen (ppm)	4.2	1.8	4.5	2.4	3.9	6.4	6.5	3.2	6.2	6
Oxidation/Reduction (mV)	302	288	190	195	168	224	165	237	167	173
MISCELLANEOUS ANALYTES										
pH (pH units)	4.18	4.76	5.6	6.02	7.43	7.53	7.35	6.99	8.77	8.82
Conductivity (umho/cm)	1517	1547	73.5	127.2	424	453	515	652	383	382
TDS (mg/L)	1100	1297	190	86	245	266	292	403	240	230
TSS (mg/L)	3.6	12	92.8	2	<1	39	<1	<1	<1	<1
Turbidity (NTU)	11	10.1	50.2	2.82	4	6.05	0.166	0.146	3.33	3.57

(CONTINUED)

Sampling Point	GW-363	GW-372			GW-373		GW-521		GW-537	
Program	CMP-C	CMP-B			CMP-B		SDM/C		SMP	
Location	OLF	BG			BG		LIV		OLF	
Date Sampled	08/14/97	01/27/97		08/14/97	01/27/97	08/20/97	01/07/97	07/21/97	03/04/97	09/17/97
Sample Type			DUP							
FIELD MEASUREMENTS										
Top-of-Casing Elev. (ft)	957.91	983.53	983.53	983.53	982.80	982.80	1182.70	1182.70	976.24	976.24
Depth to Water (ft)	5.69	14.56	14.56	22.32	16.97	18.02	80.54	82.09	4.37	7.34
Water-Level Elev. (ft)	952.22	968.97	968.97	961.21	965.83	964.78	1102.16	1100.61	971.87	968.9
Water Temp (degrees C)	17	13.6	13.9	15.7	14	17.9	12.4	17.5	15.9	17
pH (pH units)	7.7	7.6	7.6	7.5	9.1	9.1	7.7	7.5	6.7	6.9
Conductivity (umho/cm)	421	337	334	319	427	416	252	242	39	4310
Dissolved Oxygen (ppm)	1.8	2	2.1	1.6	2.5	5	8	7.9	3.2	2.5
Oxidation/Reduction (mV)	82	100	98	-5	117	109	220	173	191	258
MISCELLANEOUS ANALYTES										
pH (pH units)	9.14	7.46	7.42	7.62	9.26	9.22	7.96	7.86	6.72	6.67
Conductivity (umho/cm)	458	387	385	390	484	484	288	274	5800	5120
TDS (mg/L)	294	230	220	247	280	286	146	176	4537	4827
TSS (mg/L)	2	<1	<1	<1	8.8	6	<1	<1	<1	<1
Turbidity (NTU)	5.46	0.962	0.927	0.457	10.2	18.4	6.68	7.47	0.509	4.19

(CONTINUED)

APPENDIX D.1
Field Measurements and Miscellaneous Analytes, CY 1997

Sampling Point	GW-537	GW-613		GW-614			GW-621		GW-627	
Program	SMP	CMP-B		CMP-B			EXP		SMP	
Location	OLF	S3		S3			EXP-B		BG	
Date Sampled	09/17/97	01/22/97	08/11/97	01/27/97	08/14/97		02/17/97	08/21/97	02/08/97	
Sample Type	DUP					DUP				DUP
FIELD MEASUREMENTS										
Top-of-Casing Elev. (ft)	976.24	1013.40	1013.40	1012.20	1012.20	1012.20	925.24	925.24	942.85	942.85
Depth to Water (ft)	7.34	11.48	13.96	1.25	5.05	5.05	11.72	11.82	21.95	21.95
Water-Level Elev. (ft)	968.9	1001.92	999.44	1010.95	1007.15	1007.15	913.52	913.42	920.9	920.9
Water Temp (degrees C)	16.7	13.4	14.4	13.9	15	14.9	13.8	14.8	12.5	13.5
pH (pH units)	6.8	6.7	6.8	7.9	7.5	7.3	7.9	7.5	9.1	9.1
Conductivity (umho/cm)	4220	166	165	312	324	350	265	344	1008	1003
Dissolved Oxygen (ppm)	1.9	4.6	3.9	1.8	1.3	1.4	5.5	4.7	2	1.5
Oxidation/Reduction (mV)	251	141	188	166	0	-5	179	209	-33	-33
MISCELLANEOUS ANALYTES										
pH (pH units)	6.68	6.93	7.01	7.52	7.68	7.66	7.51	7.69	9.16	9.16
Conductivity (umho/cm)	5200	174.5	183	346	348	348	359	386	1197	1204
TDS (mg/L)	4932	116	136	200	233	221	210	247	740	730
TSS (mg/L)	<1	<1	2	<1	<1	<1	3	43	<1	<1
Turbidity (NTU)	2.33	0.55	0.384	1.03	1.9	1.5	11.5	55.4	1.48	1.42

(CONTINUED)

Sampling Point	GW-627		GW-642		GW-653		GW-683		GW-684	
Program	SMP		CMP-B		SMP		EXP		EXP	
Location	BG		BG		BG		EXP-A		EXP-A	
Date Sampled	09/09/97		01/21/97	08/14/97	02/06/97	09/03/97	02/17/97	08/21/97	02/18/97	08/21/97
Sample Type		DUP								
FIELD MEASUREMENTS										
Top-of-Casing Elev. (ft)	942.85	942.85	1014.70	1014.70	931.60	931.60	972.06	972.06	898.66	898.66
Depth to Water (ft)	24.00	24.00	18.65	21.96	19.68	23.80	88.65	88.64	15.39	15.35
Water-Level Elev. (ft)	918.85	918.85	996.05	992.74	911.92	907.8	883.41	883.42	883.27	883.31
Water Temp (degrees C)	16.5	15.5	15.9	17	13.8	15.7	13.2	14.9	12.5	14.6
pH (pH units)	8.9	8.9	6.6	5.6	5	4.9	7.4	8.4	7.4	7.4
Conductivity (umho/cm)	978	984	141	134	34	35	236	248	312	412
Dissolved Oxygen (ppm)	0.6	0.7	1.5	0.9	5.7	5.9	3.8	6.8	5.4	4.3
Oxidation/Reduction (mV)	-20	-33	-52	-49	210	230	181	113	172	62
MISCELLANEOUS ANALYTES										
pH (pH units)	9.17	9.09	6.52	6.51	5.3	5.52	7.23	7.31	7.35	7.49
Conductivity (umho/cm)	1193	1194	157.8	164.6	36.4	33.5	353	472	366	464
TDS (mg/L)	727	718	120	126	54	38	200	275	220	282
TSS (mg/L)	2	5	7	<1	6.8	<1	1	<1	2	2
Turbidity (NTU)	1.13	1.01	20.9	0.338	6.71	0.263	0.923	2.33	3.21	3.04

(CONTINUED)

APPENDIX D.1
Field Measurements and Miscellaneous Analytes, CY 1997

Sampling Point	GW-685			GW-695		GW-703		GW-704		GW-706
Program	EXP			EXP		EXP		EXP		EXP
Location	EXP-A			EXP-B		EXP-B		EXP-B		EXP-B
Date Sampled	02/12/97	08/20/97		02/17/97	08/19/97	02/19/97	08/27/97	02/19/97	08/28/97	02/21/97
Sample Type			DUP							
FIELD MEASUREMENTS										
Top-of-Casing Elev. (ft)	891.51	891.51	891.51	939.37	939.37	954.69	954.69	944.73	944.73	928.67
Depth to Water (ft)	7.23	6.35	6.35	25.19	28.42	37.39	43.33	28.60	34.70	10.95
Water-Level Elev. (ft)	884.28	885.16	885.16	914.18	910.95	917.3	911.36	916.13	910.03	917.72
Water Temp (degrees C)	12.3	17.5	16	12.7	14.6	13.8	15.6	15.1	15.3	14.5
pH (pH units)	7.6	7.3	7.2	8.1	8	7.6	8.2	7.4	7.3	7.3
Conductivity (umho/cm)	428	577	572	335	366	499	559	528	550	498
Dissolved Oxygen (ppm)	7.8	8.9	9	6.5	8.5	3.7	7.9	1.8	1.7	8.2
Oxidation/Reduction (mV)	-14	101	104	80	-35	108	111	127	4	167
MISCELLANEOUS ANALYTES										
pH (pH units)	7.42	7.63	7.61	7.86	7.89	7.32	8	7.46	7.67	7.52
Conductivity (umho/cm)	687	641	641	464	442	601	592	646	626	620
TDS (mg/L)	400	383	386	320	249	360	343	390	412	380
TSS (mg/L)	11	2	3	102	57	3	3	2	15	<1
Turbidity (NTU)	67.4	10.6	10	43.1	19.9	1.59	10.8	13.1	43.5	3.98

(CONTINUED)

Sampling Point	GW-706	GW-710		GW-711		GW-712			GW-713	
Program	EXP	CMP-E		CMP-E		CMP-E			CMP-E	
Location	EXP-B	EXP-W		EXP-W		EXP-W			EXP-W	
Date Sampled	09/03/97	02/02/97	08/28/97	01/31/97	08/26/97	02/02/97	08/26/97		02/02/97	
Sample Type								DUP		DUP
FIELD MEASUREMENTS										
Top-of-Casing Elev. (ft)	928.67	911.26	911.26	905.20	905.20	877.09	877.09	877.09	880.63	880.63
Depth to Water (ft)	18.30	62.55	67.70	61.15	66.25	29.95	34.55	34.55	34.50	34.50
Water-Level Elev. (ft)	910.37	848.71	843.56	844.05	838.95	847.14	842.54	842.54	846.13	846.13
Water Temp (degrees C)	16.5	14.3	15.6	12.7	16.3	12.7	13.7	13.5	13.6	13.3
pH (pH units)	7.3	7.6	6.9	8.1	7	7.7	7.8	7.6	7.8	7.7
Conductivity (umho/cm)	660	3380	3790	7150	7140	561	511	516	413	430
Dissolved Oxygen (ppm)	3.8	2.8	3.1	0.8	1	5.8	2.4	1.9	1	0.9
Oxidation/Reduction (mV)	73	-24	-145	-109	-136	13	80	26	60	53
MISCELLANEOUS ANALYTES										
pH (pH units)	7.21	7.02	7.27	7.03	7.24	7.42	7.53	7.53	7.54	7.53
Conductivity (umho/cm)	803	4050	4020	8390	8340	666	638	638	522	525
TDS (mg/L)	515	3700	3668	5900	6110	420	430	412	320	320
TSS (mg/L)	2	345	15	22	4	2	2	3	<1	<1
Turbidity (NTU)	3.77	134	46.5	114	23.2	18.4	10.1	10.1	10.3	12.6

(CONTINUED)

APPENDIX D.1
Field Measurements and Miscellaneous Analytes, CY 1997

Sampling Point	GW-713	GW-714		GW-715		GW-724			GW-725	
Program	CMP-E	CMP-E		CMP-E		EXP			EXP	
Location	EXP-W	EXP-W		EXP-W		EXP-C			EXP-C	
Date Sampled	08/27/97	02/03/97	08/27/97	02/03/97	08/27/97	02/27/97		09/05/97	02/28/97	09/05/97
Sample Type							DUP			
FIELD MEASUREMENTS										
Top-of-Casing Elev. (ft)	880.63	875.08	875.08	874.72	874.72	979.27	979.27	979.27	961.05	961.05
Depth to Water (ft)	40.51	25.50	30.81	25.25	29.17	26.35	26.35	31.43	7.90	13.39
Water-Level Elev. (ft)	840.12	849.58	844.27	849.47	845.55	952.92	952.92	947.84	953.15	947.66
Water Temp (degrees C)	14.6	13.9	17.5	13.7	15.7	14.8	14.6	14.4	14.5	15.3
pH (pH units)	7.7	7	7.9	6.7	7.1	7.5	7.4	7.6	7	6.9
Conductivity (umho/cm)	472	893	371	448	451	831	826	774	1216	983
Dissolved Oxygen (ppm)	1	1.7	6	5.3	2.6	3	3	2.5	1.3	1.2
Oxidation/Reduction (mV)	-118	237	14	127	10	169	164	173	144	69
MISCELLANEOUS ANALYTES										
pH (pH units)	7.57	7.49	7.67	7.03	6.92	7.38	7.33	7.39	7	7.05
Conductivity (umho/cm)	576	475	457	599	558	967	967	963	1415	1164
TDS (mg/L)	362	280	260	320	317	554	557	550	1122	786
TSS (mg/L)	4	<1	6	49.6	<1	<1	<1	21	<1	4
Turbidity (NTU)	17.4	10.5	29.3	175	2.76	1.85	1.89	65.8	3.14	10.9

(CONTINUED)

Sampling Point	GW-738			GW-740		GW-829		NT-01		SS-1
Program	EXP			EXP		SMP		EXP		EXP
Location	EXP-C			EXP-C		OLF		EXP-SW		EXP-SW
Date Sampled	02/25/97	09/04/97		02/24/97	09/04/97	03/04/97	09/16/97	02/03/97	10/13/97	02/03/97
Sample Type			DUP							
FIELD MEASUREMENTS										
Top-of-Casing Elev. (ft)	983.08	983.08	983.08	1019.60	1019.60	985.78	985.78			
Depth to Water (ft)	26.60	31.16	31.16	66.40	71.96	10.80	13.44			
Water-Level Elev. (ft)	956.48	951.92	951.92	953.2	947.64	974.98	972.34			
Water Temp (degrees C)	12.7	14.9	14.7	13.9	14.1	14.3	18.6	10.3	18.4	12.2
pH (pH units)	7.2	7	7.1	7.8	7.4	8.7	7.9	7.1	6.8	7.2
Conductivity (umho/cm)	664	610	613	459	462	590	640	333	3820	986
Dissolved Oxygen (ppm)	3.1	2.2	2.5	3.1	3.9	7.1	5.9	11.7	6.1	7.7
Oxidation/Reduction (mV)	194	169	171	88	-6	103	204	229	244	229
MISCELLANEOUS ANALYTES										
pH (pH units)	7.19	7.14	7.15	7.15	7.42	8.72	8.35	7.02	6.82	7.34
Conductivity (umho/cm)	733	709	709	543	539	641	740	407	3400	1294
TDS (mg/L)	504	447	461	360	315	448	535	290	2858	960
TSS (mg/L)	7.5	21	23	<1	<1	580	248	4.5	13	<1
Turbidity (NTU)	22.1	54	53.6	2.83	2.88	324	104	7.86	9.5	1.87

(CONTINUED)

APPENDIX D.1
Field Measurements and Miscellaneous Analytes, CY 1997

Sampling Point	SS-1	SS-4			SS-5	
Program	EXP	EXP			EXP	
Location	EXP-SW	EXP-SW			EXP-SW	
Date Sampled	10/13/97	02/03/97	08/29/97		02/03/97	08/29/97
Sample Type				DUP		
FIELD MEASUREMENTS						
Top-of-Casing Elev. (ft)						
Depth to Water (ft)						
Water-Level Elev. (ft)						
Water Temp (degrees C)	18.2	11.8	16.5	16.2	12.7	14.7
pH (pH units)	7.5	7.5	7.1	7.3	7.3	7.4
Conductivity (umho/cm)	1187	600	671	701	277	419
Dissolved Oxygen (ppm)	7	8.5	3	3	7.9	5.3
Oxidation/Reduction (mV)	220	201	161	148	202	173
MISCELLANEOUS ANALYTES						
pH (pH units)	7.53	7.3	7.11	7.09	7.12	7.28
Conductivity (umho/cm)	1102	521	828	834	306	511
TDS (mg/L)	752	320	553	554	170	278
TSS (mg/L)	35	8	2	1	<1	2
Turbidity (NTU)	4.49	8.62	1.31	1.39	2.55	2.12

APPENDIX D.2

INORGANIC ANALYTES

APPENDIX D.2
Inorganic Analytes, CY 1997

Sampling Point	BCK-00.63				BCK-04.55				BCK-07.75	
Program	EXP				EXP				EXP	
Location	EXP-SW				EXP-SW				EXP-SW	
Date Sampled	02/04/97		08/28/97		02/04/97		08/28/97		02/04/97	
Sample Type										
	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS
METALS (mg/L)										
Aluminum	0.75	0.074	0.1	0.034	0.97	0.049	0.078	0.035	0.78	0.09
Antimony	<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	<0.005	<0.005
Barium	0.042	0.038	0.063	0.062	0.05	0.042	0.068	0.069	0.057	0.053
Beryllium	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Boron	0.036	0.033	0.045	0.043	0.039	0.034	0.07	0.07	0.047	0.048
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	0.56	0.096	0.068	0.021	0.72	0.066	0.043	0.0097	0.64	0.086
Lead (PMS)	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Lithium	0.01	0.0098	0.0086	0.0082	0.012	0.01	0.013	0.012	0.016	0.016
Manganese	0.027	0.015	0.013	0.013	0.04	0.017	0.0086	0.0097	0.048	0.027
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	0.026	<0.006	<0.006	<0.006	<0.006	<0.006
Strontium	0.065	0.064	0.16	0.16	0.07	0.066	0.12	0.12	0.096	0.095
Thallium (PMS)	<0.0005	<0.0005	<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)	0.019	0.019	0.021	0.021	0.025	0.025	0.046	0.049	0.043	0.043
Vanadium	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc	0.004	0.0066	0.0026	0.0032	0.0051	0.0073	0.0031	0.0026	0.0061	0.012
MAJOR IONS (mg/L)										
Calcium	28	28	51	51	34	32	56	56	40	40
Magnesium	7.1	6.8	15	15	8.1	7.6	13	13	7.7	7.6
Potassium	1.4	1.4	1.9	1.9	1.5	1.2	1.9	1.9	1.5	1.4
Sodium	3.7	3.6	4.3	4.3	4.3	4	5.6	5.8	5.9	5.9
Alkalinity-HCO3	92	.	160	.	110	.	170	.	110	.
Alkalinity-CO3	<1	.	<1	.	<1	.	<1	.	<1	.
Chloride	8.28	.	5.29	.	10	.	9.27	.	15.1	.
Fluoride	0.11	.	0.12	.	0.13	.	0.15	.	0.18	.
Nitrate-N	2.16	.	2.1	.	3.61	.	5.68	.	7.7	.
Sulfate	15.7	.	27.3	.	14.2	.	14.1	.	18.2	.

(CONTINUED)

APPENDIX D.2
Inorganic Analytes, CY 1997

Sampling Point	BCK-07.75		BCK-09.40				BCK-10.60			
Program	EXP		EXP				EXP			
Location	EXP-SW		EXP-SW				EXP-SW			
Date Sampled	08/29/97		02/04/97		08/29/97		02/04/97		08/29/97	
Sample Type										
	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS
METALS (mg/L)										
Aluminum	0.18	0.041	0.64	0.077	2	0.045	0.59	0.065	0.82	0.022
Antimony	<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	<0.005	<0.005
Barium	0.085	0.082	0.066	0.063	0.096	0.085	0.087	0.082	0.038	0.033
Beryllium	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Boron	0.096	0.095	0.04	0.038	0.061	0.056	0.03	0.03	0.049	0.048
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	0.015	<0.004	<0.004	<0.004	<0.004
Iron	0.13	0.013	0.55	0.09	2	0.02	0.5	0.046	0.92	0.14
Lead (PMS)	<0.0005	<0.0005	<0.0005	<0.0005	0.0041	<0.0005	<0.0005	<0.0005	0.00083	<0.0005
Lithium	0.017	0.016	0.01	0.0094	0.014	0.0097	0.0098	0.0078	0.0064	0.0053
Manganese	0.02	0.016	0.06	0.034	0.08	0.014	0.16	0.15	0.024	0.012
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	0.15	0.15	0.13	0.13	0.15	0.14	0.18	0.18	0.09	0.087
Thallium (PMS)	<0.0005	<0.0005	<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)	0.066	0.068	0.061	0.06	0.066	0.066	0.084	0.084	0.041	0.039
Vanadium	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc	<0.002	0.0032	0.0051	0.0061	0.014	0.0038	0.0061	0.012	0.0043	<0.002
MAJOR IONS (mg/L)										
Calcium	66	66	48	49	74	70	59	58	37	35
Magnesium	14	15	8.2	8.2	18	16	9.2	9.1	5.8	5.5
Potassium	2.1	2	1.8	1.7	2.2	1.8	1.9	1.7	2	1.8
Sodium	7.3	7.3	8.5	8.7	7.7	7.5	12	12	4.9	4.7
Alkalinity-HCO3	188	.	118	.	200	.	130	.	120	.
Alkalinity-CO3	<1	.	<1	.	<1	.	<1	.	<1	.
Chloride	11.4	.	20.6	.	12	.	26.3	.	4.45	.
Fluoride	0.17	.	0.27	.	0.24	.	0.39	.	0.17	.
Nitrate-N	9.43	.	10.6	.	10.3	.	17	.	<0.028	.
Sulfate	21.6	.	27.9	.	22.2	.	30.5	.	4.24	.

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Sampling Point	BCK-11.97				GW-040				GW-042	
Program	EXP				CMP-B				CMP-B	
Location	EXP-SW				BG				BG	
Date Sampled	02/04/97		08/29/97		01/22/97		09/02/97		01/31/97	
Sample Type										
	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS
METALS (mg/L)										
Aluminum	0.83	0.058	0.12	0.046	13	0.11	21	0.21	<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 (PMS)	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Barium	0.11	0.1	0.48	0.47	0.24	0.037	0.3	0.041	0.17	0.13
Beryllium	<0.0003	<0.0003	<0.0003	<0.0003	0.00066	<0.0003	0.0013	<0.0003	<0.0003	<0.0003
Boron	0.021	0.022	0.042	0.041	0.032	0.018	0.041	0.02	0.0071	<0.004
Cadmium	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	0.03	0.02
Chromium	<0.01	<0.01	<0.01	<0.01	0.025	<0.01	0.042	<0.01	<0.01	<0.01
Cobalt	<0.005	<0.005	<0.005	<0.005	0.012	0.014	0.017	<0.005	<0.005	<0.005
Copper	0.0092	<0.004	<0.004	<0.004	0.017	<0.004	0.02	<0.004	0.012	<0.004
Iron	0.55	0.038	0.061	0.006	24	0.2	33	0.23	4.5	1.1
Lead (PMS)	<0.0005	<0.0005	<0.0005	<0.0005	0.011	0.00065	0.01	<0.0005	0.022	0.0012
Lithium	0.0042	0.0042	0.0065	0.0062	0.042	0.025	0.052	0.028	0.021	0.02
Manganese	0.3	0.3	0.42	0.42	1.2	0.85	1.2	0.85	0.31	0.28
Mercury (CVAA)	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	0.0068	<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	0.013	0.016	0.029	<0.01	0.041	<0.01	0.014	<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	0.05	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	0.008	<0.006
Strontium	0.18	0.19	0.69	0.69	0.029	0.013	0.035	0.014	0.017	0.016
Thallium (PMS)	<0.0005	<0.0005	<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)	0.03	0.035	0.11	0.11	0.00054	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vanadium	<0.005	<0.005	<0.005	<0.005	0.024	<0.005	0.035	<0.005	<0.005	<0.005
Zinc	0.012	0.009	0.0025	0.0032	0.056	0.012	0.07	0.014	0.063	0.044
MAJOR IONS (mg/L)										
Calcium	61	63	220	220	6.4	5	7.3	5.5	3.8	3.7
Magnesium	7.7	7.9	27	27	9.9	5.7	12	6.5	4.7	4.5
Potassium	1.8	1.7	4.4	4.5	5.1	0.88	9.2	1.5	0.82	0.99
Sodium	12	12	33	34	11	10	12	11	3.5	3.4
Alkalinity-HCO3	114	.	208	.	38	.	36	.	34	.
Alkalinity-CO3	<1	.	<1	.	<1	.	<1	.	<1	.
Chloride	27	.	39.4	.	2.16	.	1.97	.	2	.
Fluoride	0.2	.	0.62	.	0.3	.	0.31	.	0.25	.
Nitrate-N	25.3	.	135	.	<0.028	.	0.07	.	<0.028	.
Sulfate	27.4	.	29.7	.	26.8	.	30	.	5.76	.

(CONTINUED)

APPENDIX D.2
Inorganic Analytes, CY 1997

Sampling Point	GW-042		GW-043				GW-044			
Program	CMP-B		CMP-B				CMP-B			
Location	BG		OLF				OLF			
Date Sampled	09/02/97		01/23/97		08/13/97		01/23/97		08/11/97	
Sample Type										
	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS
METALS (mg/L)										
Aluminum	<0.02	<0.02	0.43	0.11	2	0.36	<0.02	<0.02	<0.02	0.023
Antimony	<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	<0.005	<0.005
Barium	0.16	0.14	0.015	0.013	0.021	0.015	0.24	0.25	0.24	0.22
Beryllium	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Boron	0.011	0.011	0.0085	0.015	0.0086	0.0073	0.009	0.015	0.0055	0.0048
Cadmium	0.0053	0.0044	<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	0.038	<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	0.0053	<0.004
Iron	2.4	1.9	0.52	0.1	1.4	0.16	0.0076	0.011	0.017	<0.005
Lead (PMS)	0.0034	0.0014	0.0028	<0.0005	0.0087	<0.0005	0.00057	0.0011	0.004	<0.0005
Lithium	0.023	0.022	0.0076	0.0071	0.0084	0.0075	0.0068	0.0068	0.0099	0.0091
Manganese	0.31	0.29	0.011	0.0023	0.026	0.0018	0.0031	0.019	0.015	<0.001
Mercury (CVAA)	0.00036	<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	0.016	0.014	<0.01	<0.01	0.019	<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	0.007	<0.006	<0.006	<0.006	<0.006	<0.006
Strontium	0.018	0.017	0.024	0.024	0.034	0.031	0.071	0.073	0.076	0.072
Thallium (PMS)	<0.0005	<0.0005	<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)	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.00062	<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	0.015	0.011	0.0027	0.0048	0.0072	0.0032	0.0053	0.0071	0.013	0.0024
MAJOR IONS (mg/L)										
Calcium	4.2	4	14	14	18	17	44	45	46	44
Magnesium	5.1	4.9	2.5	2.3	3.3	2.8	3	3	3	2.8
Potassium	1.7	1.5	0.81	1.2	1.2	0.78	0.83	0.87	0.65	<0.6
Sodium	3.4	3.3	7	6.7	6.7	6.8	5	5.1	5.1	4.8
Alkalinity-HCO3	34	.	50	.	64	.	132	.	142	.
Alkalinity-CO3	<1	.	<1	.	<1	.	<1	.	<1	.
Chloride	1.76	.	1.08	.	1.01	.	0.83	.	1.15	.
Fluoride	0.19	.	<0.1	.	<0.1	.	<0.1	.	0.1	.
Nitrate-N	0.2	.	<0.028	.	<0.028	.	<0.028	.	0.03	.
Sulfate	6.2	.	9.48	.	6.86	.	6.8	.	6.54	.

(CONTINUED)

APPENDIX D.2
Inorganic Analytes, CY 1997

Sampling Point	GW-053				GW-056				GW-069	
Program	SMP				EXP				CMP-C	
Location	BG				EXP-A				BG	
Date Sampled	02/06/97		09/03/97		02/13/97		08/19/97		01/22/97	
Sample Type										
	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS
METALS (mg/L)										
Aluminum	0.069	<0.02	0.029	<0.02	0.44	<0.02	2	0.076	0.034	0.062
Antimony	<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	0.013	0.017
Barium	0.21	0.2	0.21	0.21	0.1	0.098	0.16	0.087	0.37	0.37
Beryllium	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	0.00048
Boron	0.22	0.21	0.27	0.27	0.021	0.02	0.023	0.023	0.11	0.1
Cadmium	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	0.0035	<0.003
Chromium	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.021	<0.01	<0.01	<0.01
Cobalt	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.0071	<0.005
Copper	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	0.0076	<0.004	0.0074	<0.004
Iron	0.66	0.018	0.44	0.4	1.8	0.041	2.8	0.11	0.19	0.007
Lead (PMS)	0.0059	<0.0005	<0.0005	<0.0005	0.0046	0.00087	0.014	<0.0005	0.0033	0.00092
Lithium	0.3	0.3	0.38	0.38	0.0044	0.0041	0.01	<0.004	0.037	0.037
Manganese	0.09	0.082	0.082	0.08	0.24	0.21	0.37	0.3	0.0037	0.0044
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	0.017	<0.01	0.02	0.019	0.06	0.044	0.07	0.046	<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	0.39	0.38	0.42	0.4	0.15	0.14	0.52	0.15	0.87	0.89
Thallium (PMS)	<0.0005	<0.0005	<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)	0.0013	0.0013	0.0017	0.002	0.0081	0.0069	0.0065	0.0042	<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	0.0029	0.0023	0.0036	0.019	0.0082	0.069	0.0035	0.0097	0.0043
MAJOR IONS (mg/L)										
Calcium	120	110	120	110	96	90	110	94	10	10
Magnesium	13	13	14	14	18	17	20	18	5.7	5.8
Potassium	1.9	1.8	2.8	2.6	1.4	1.5	1.6	1.3	3.9	4.4
Sodium	7.2	7.2	8.2	8	57	56	53	38	64	65
Alkalinity-HCO3	334	.	344	.	304	.	312	.	126	.
Alkalinity-CO3	<1	.	<1	.	<1	.	<1	.	12	.
Chloride	28.4	.	27	.	117	.	65.5	.	46	.
Fluoride	<0.1	.	<0.1	.	0.11	.	<0.1	.	0.11	.
Nitrate-N	0.05	.	<0.028	.	0.137	.	0.2	.	<0.028	.
Sulfate	23.2	.	20.8	.	29.7	.	26.5	.	1.67	.

(CONTINUED)

APPENDIX D.2
Inorganic Analytes, CY 1997

Sampling Point	GW-069		GW-079				GW-080			
Program	CMP-C		CMP-B				CMP-B			
Location	BG		BG				BG			
Date Sampled	08/18/97		01/23/97		08/18/97		01/21/97		08/14/97	
Sample Type										
	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS
METALS (mg/L)										
Aluminum	0.025	<0.02	0.14	0.094	0.093	0.023	8.6	0.14	0.67	0.037
Antimony	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Arsenic (PMS)	0.0054	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Barium	0.37	0.38	0.17	0.17	0.16	0.16	0.11	0.022	0.035	0.022
Beryllium	<0.0003	<0.0003	0.00061	0.00061	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Boron	0.099	0.099	0.0077	0.0093	0.0072	0.0062	0.018	0.014	0.01	0.01
Cadmium	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	0.0047	0.003	<0.003	<0.003
Chromium	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.019	0.015	<0.01	<0.01
Cobalt	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.0059	<0.005	<0.005	<0.005
Copper	<0.004	<0.004	0.0076	<0.004	<0.004	<0.004	0.054	0.021	0.032	0.014
Iron	0.17	0.029	0.051	0.016	0.082	0.0093	10	0.24	0.98	0.24
Lead (PMS)	0.0014	<0.0005	0.0031	0.0017	0.0035	<0.0005	0.015	0.0032	0.0046	<0.0005
Lithium	0.037	0.039	0.0056	0.0052	0.0058	0.0058	0.021	0.012	0.01	0.0099
Manganese	0.0085	0.0082	0.055	0.052	0.047	0.046	0.087	0.048	0.06	0.061
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	0.017	<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	0.015	<0.006	<0.006	<0.006
Strontium	0.89	0.9	0.13	0.13	0.13	0.14	0.025	0.013	0.02	0.016
Thallium (PMS)	<0.0005	<0.0005	<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)	<0.0005	<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	0.011	<0.005	<0.005	<0.005
Zinc	0.0024	<0.002	0.019	0.015	0.0039	0.0024	0.047	0.029	0.021	0.0081
MAJOR IONS (mg/L)										
Calcium	13	13	38	38	36	36	3.8	3.5	4.9	4
Magnesium	6	5.8	3.7	3.7	3.7	3.7	5.4	3.5	4.4	4.2
Potassium	4.5	4.6	0.73	0.65	1.2	1.2	6.5	6.2	3.5	3.6
Sodium	59	64	4.4	4.4	4.8	5	6.5	7.4	7.8	7.4
Alkalinity-HCO3	148	.	110	.	110	.	36	.	38	.
Alkalinity-CO3	<1	.	<1	.	<1	.	<1	.	<1	.
Chloride	56.8	.	0.91	.	0.9	.	0.6	.	1.19	.
Fluoride	0.12	.	<0.1	.	0.11	.	0.1	.	0.14	.
Nitrate-N	<0.056	.	<0.028	.	<0.028	.	<0.028	.	<0.028	.
Sulfate	2.06	.	6.87	.	7.25	.	10.4	.	14.6	.

(CONTINUED)

Sampling Point	GW-084				GW-085					
Program	CMP-B				SMP					
Location	OLF				OLF					
Date Sampled	01/27/97		08/13/97		03/05/97				09/17/97	
Sample Type							DUP			
	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS
METALS (mg/L)										
Aluminum	0.37	0.039	0.75	0.027	0.8	<0.02	0.85	<0.02	0.33	0.062
Antimony	<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	<0.005	<0.005
Barium	0.16	0.15	0.17	0.16	0.4	0.4	0.4	0.4	0.34	0.34
Beryllium	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Boron	0.0066	0.0089	0.0056	0.006	0.014	0.012	0.013	0.012	0.0046	0.0095
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	0.011	<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	0.02	<0.004	<0.004	<0.004	<0.004
Iron	0.63	0.0069	0.64	0.0056	0.61	0.0052	0.65	<0.005	0.22	0.014
Lead (PMS)	0.004	<0.0005	0.003	<0.0005	0.00071	<0.0005	0.00063	<0.0005	0.00055	<0.0005
Lithium	0.01	0.0074	0.0095	0.0091	0.015	0.014	0.017	0.014	0.014	0.014
Manganese	0.054	0.029	0.13	0.0082	0.023	0.0032	0.023	0.0017	0.012	<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	0.075	0.075	0.083	0.084	0.37	0.37	0.36	0.37	0.32	0.31
Thallium (PMS)	<0.0005	<0.0005	<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)	<0.0005	<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	<0.002	0.0022	0.0036	0.0025	0.0041	0.0031	0.0036	<0.002	0.021	0.023
MAJOR IONS (mg/L)										
Calcium	53	52	57	58	150	150	150	150	140	140
Magnesium	3.9	3.8	4.1	4	9.6	9.5	9.6	9.5	8.8	8.8
Potassium	1	1.7	0.76	<0.6	1.9	1.7	1.9	1.6	1.4	1.2
Sodium	5.2	5.4	5.4	5.7	7.3	7.4	7.3	7.3	7.6	7.5
Alkalinity-HCO3	160	.	172	.	170	.	166	.	162	.
Alkalinity-CO3	<1	.	<1	.	<1	.	<1	.	<1	.
Chloride	0.85	.	0.88	.	10.6	.	10.8	.	4.64	.
Fluoride	0.12	.	0.13	.	<0.1	.	<0.1	.	<0.1	.
Nitrate-N	<0.028	.	0.14	.	70.2	.	72.3	.	63	.
Sulfate	7.45	.	7.3	.	9.6	.	10.5	.	5.72	.

(CONTINUED)

APPENDIX D.2
Inorganic Analytes, CY 1997

Sampling Point	GW-115				GW-162					
Program	CMP-B				CMP-B					
Location	S3				BG					
Date Sampled	01/22/97		08/11/97		01/24/97		08/19/97			
Sample Type									DUP	
	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS
METALS (mg/L)										
Aluminum	0.027	<0.02	0.025	0.02	0.52	<0.02	0.028	0.027	0.061	0.026
Antimony	<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	<0.005	<0.005
Barium	0.22	0.22	0.21	0.2	0.27	0.25	0.29	0.25	0.29	0.26
Beryllium	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Boron	0.021	0.017	0.017	0.017	0.043	0.044	0.043	0.043	0.042	0.044
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	0.028	0.0065	<0.004	<0.004	0.0043	<0.004
Iron	0.33	0.31	0.43	0.4	13	0.076	1.7	0.018	3.6	0.04
Lead (PMS)	<0.0005	<0.0005	<0.0005	<0.0005	0.0061	0.0012	0.0057	0.00076	0.00058	<0.0005
Lithium	0.016	0.016	0.018	0.018	0.041	0.041	0.039	0.038	0.038	0.038
Manganese	0.37	0.37	0.41	0.42	0.15	0.079	0.12	0.086	0.12	0.088
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	0.13	0.13	0.14	0.14	0.73	0.75	0.8	0.79	0.79	0.8
Thallium (PMS)	<0.0005	<0.0005	<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)	<0.0005	<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	0.0057	0.0041	0.0026	0.004	0.027	0.0032	0.0024	<0.002	0.0041	<0.002
MAJOR IONS (mg/L)										
Calcium	77	76	81	80	29	29	29	28	29	29
Magnesium	12	12	12	12	4.9	4.9	5	5	5	5
Potassium	2.2	2	1.7	1.9	2.6	2.4	2.9	2.9	2.9	2.9
Sodium	10	10	10	10	14	15	14	14	14	14
Alkalinity-HCO3	240	.	260	.	116	.	128	.	130	.
Alkalinity-CO3	<1	.	<1	.	<1	.	<1	.	<1	.
Chloride	12.4	.	14.4	.	2.88	.	2.95	.	2.87	.
Fluoride	<0.1	.	0.1	.	<0.1	.	0.1	.	<0.1	.
Nitrate-N	0.032	.	<0.028	.	0.094	.	<0.028	.	<0.028	.
Sulfate	16.7	.	17.9	.	8.8	.	8.67	.	8.5	.

(CONTINUED)

APPENDIX D.2
Inorganic Analytes, CY 1997

Sampling Point	GW-276				GW-287				GW-311	
Program	CMP-C				SMP				SMP	
Location	S3				BG				RS	
Date Sampled	01/28/97		08/13/97		02/06/97		09/03/97		03/04/97	
Sample Type										
	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS
METALS (mg/L)										
Aluminum	11	10	11	9.2	3	0.056	0.22	<0.02	0.088	0.029
Antimony	<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	<0.005	<0.005
Barium	0.4	0.4	0.42	0.41	0.089	0.044	0.076	0.11	0.02	0.019
Beryllium	0.0081	0.008	0.0082	0.0079	0.00034	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Boron	0.031	0.047	0.043	0.041	0.015	0.012	0.021	0.013	0.0056	0.0048
Cadmium	0.042	0.041	0.039	0.039	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Chromium	<0.01	<0.01	<0.01	<0.01	1.2	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt	0.17	0.17	0.15	0.14	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Copper	0.023	0.021	0.018	0.016	0.025	<0.004	0.0043	<0.004	<0.004	<0.004
Iron	0.15	0.031	0.34	<0.005	5	<0.005	0.11	0.014	0.15	0.0057
Lead (PMS)	0.0028	0.0023	0.003	0.0031	0.0083	<0.0005	<0.0005	<0.0005	0.00096	<0.0005
Lithium	0.027	0.027	0.031	0.03	<0.004	0.0046	0.0046	0.0052	<0.004	<0.004
Manganese	7.9	7.9	7.4	7.4	0.39	0.034	0.11	0.078	0.0058	0.0021
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	0.019	<0.01	<0.01	<0.01	<0.01	<0.01
Nickel	0.44	0.44	0.4	0.39	0.029	<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	0.26	0.27	0.33	0.35	0.033	0.026	0.048	0.083	0.076	0.075
Thallium (PMS)	<0.0005	<0.0005	0.00094	0.0012	<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)	0.78	0.77	1.3	1.3	0.00098	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vanadium	<0.005	<0.005	<0.005	<0.005	0.0067	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc	0.14	0.14	0.13	0.12	0.083	0.04	0.0074	0.0043	0.0066	0.0042
MAJOR IONS (mg/L)										
Calcium	100	110	140	140	9.1	7.9	20	38	81	79
Magnesium	20	21	23	24	3	2.3	3.8	5.9	6.1	5.9
Potassium	11	11	13	12	1.2	1.5	1.6	1.7	1.7	1.7
Sodium	82	83	81	80	3.6	3.7	5.2	4.7	2.5	2.4
Alkalinity-HCO3	<1	.	16	.	20	.	62	.	222	.
Alkalinity-CO3	<1	.	<1	.	<1	.	<1	.	<1	.
Chloride	264	.	174	.	3.65	.	3.72	.	1.93	.
Fluoride	5.3	.	4.27	.	<0.1	.	<0.1	.	0.11	.
Nitrate-N	110	.	125	.	0.37	.	0.07	.	0.33	.
Sulfate	33	.	73.4	.	8.58	.	7.25	.	3.14	.

(CONTINUED)

APPENDIX D.2
Inorganic Analytes, CY 1997

Sampling Point	GW-311		GW-315				GW-363			
Program	SMP		SMP				CMP-C			
Location	RS		SPI				OLF			
Date Sampled	09/19/97		03/05/97		09/16/97		01/29/97			
Sample Type									DUP	
	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS
METALS (mg/L)										
Aluminum	11	0.064	<0.02	<0.02	0.049	0.044	<0.02	<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 (PMS)	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Barium	0.046	0.02	0.035	0.036	0.052	0.05	0.09	0.067	0.09	0.07
Beryllium	0.00091	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Boron	0.0066	<0.004	0.01	0.01	0.008	<0.004	0.25	0.24	0.25	0.25
Cadmium	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Chromium	0.087	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt	0.013	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Copper	0.096	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Iron	17	0.032	<0.005	0.0067	0.011	<0.005	0.16	0.0072	0.18	0.0082
Lead (PMS)	0.13	0.00061	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Lithium	0.016	<0.004	<0.004	<0.004	<0.004	<0.004	0.036	0.034	0.034	0.035
Manganese	0.51	0.0049	<0.001	0.0025	0.0016	0.0018	0.0019	<0.001	0.0016	<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	0.065	<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	0.092	0.08	0.1	0.1	0.2	0.19	0.12	0.087	0.11	0.092
Thallium (PMS)	<0.0005	<0.0005	<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)	0.0012	0.00086	<0.0005	<0.0005	0.0019	0.002	<0.0005	<0.0005	<0.0005	<0.0005
Vanadium	0.024	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc	0.15	0.019	0.0032	0.0048	0.023	0.021	0.0027	0.0034	<0.002	<0.002
MAJOR IONS (mg/L)										
Calcium	110	91	86	86	120	120	3	2.2	2.9	2.2
Magnesium	7.6	6.1	16	16	12	11	1.3	0.91	1.3	0.96
Potassium	3.2	1.6	1.9	1.8	3.6	3.5	1.6	1.5	1.7	1.5
Sodium	2.3	2.3	1.5	1.6	7.9	7.7	84	85	84	87
Alkalinity-HCO3	232	.	262	.	242	.	180	.	180	.
Alkalinity-CO3	<1	.	<1	.	<1	.	16	.	20	.
Chloride	1.98	.	2.57	.	14.5	.	1.68	.	1.48	.
Fluoride	<0.1	.	<0.1	.	<0.1	.	0.17	.	0.16	.
Nitrate-N	0.45	.	2.24	.	11.4	.	<0.028	.	<0.028	.
Sulfate	3.74	.	5.59	.	39.7	.	7.04	.	6.9	.

(CONTINUED)

APPENDIX D.2
Inorganic Analytes, CY 1997

Sampling Point	GW-363		GW-372						GW-373	
Program	CMP-C		CMP-B						CMP-B	
Location	OLF		BG						BG	
Date Sampled	08/14/97		01/27/97				08/14/97		01/27/97	
Sample Type					DUP					
	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS
METALS (mg/L)										
Aluminum	0.42	<0.02	0.023	<0.02	0.031	<0.02	0.034	0.03	0.19	0.27
Antimony	<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	<0.005	<0.005
Barium	0.059	0.055	0.076	0.067	0.067	0.065	0.067	0.065	0.046	0.039
Beryllium	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Boron	0.3	0.3	0.011	0.0082	0.0073	0.01	0.013	0.012	0.12	0.16
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	0.0065	<0.004	<0.004	<0.004	<0.004	0.015	<0.004
Iron	0.88	0.017	0.15	0.17	0.15	0.26	0.17	0.17	0.54	0.13
Lead (PMS)	<0.0005	<0.0005	0.00076	0.00053	0.00072	<0.0005	<0.0005	<0.0005	0.0018	0.0015
Lithium	0.039	0.04	0.014	0.016	0.013	0.013	0.014	0.013	0.033	0.033
Manganese	0.0069	<0.001	0.03	0.029	0.029	0.028	0.033	0.042	0.0055	0.0028
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	0.01	<0.006	<0.006	<0.006	<0.006
Strontium	0.084	0.08	0.16	0.15	0.15	0.15	0.16	0.15	0.061	0.059
Thallium (PMS)	<0.0005	<0.0005	<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)	<0.0005	<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	<0.002	<0.002	0.009	0.0069	0.002	0.0072	<0.002	<0.002	0.0073	0.0069
MAJOR IONS (mg/L)										
Calcium	2.2	1.9	57	55	55	54	56	56	1.4	1.4
Magnesium	0.83	0.7	10	10	10	9.8	10	10	0.15	0.15
Potassium	1.5	1.4	1	1.1	1	0.84	1.8	1.6	<0.6	<0.6
Sodium	110	110	9.2	8.9	9	8.9	9	8.5	110	110
Alkalinity-HCO3	198	.	172	.	174	.	178	.	176	.
Alkalinity-CO3	40	.	<1	.	<1	.	<1	.	40	.
Chloride	0.92	.	2.31	.	2.36	.	1.95	.	1.91	.
Fluoride	0.27	.	0.19	.	0.19	.	0.18	.	1.53	.
Nitrate-N	0.03	.	<0.028	.	<0.028	.	<0.028	.	<0.028	.
Sulfate	7.44	.	25.9	.	26.1	.	26.2	.	28.7	.

(CONTINUED)

APPENDIX D.2
Inorganic Analytes, CY 1997

Sampling Point	GW-373		GW-521				GW-537			
Program	CMP-B		SDM/C				SMP			
Location	BG		LIV				OLF			
Date Sampled	08/20/97		01/07/97		07/21/97		03/04/97		09/17/97	
Sample Type										
	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS
METALS (mg/L)	.	.	.	.	.	.	.	.	.	.
Aluminum	0.22	<0.02	0.031	<0.02	0.13	0.053	<0.1	<0.1	0.22	0.24
Antimony	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.25	<0.25	<0.1	<0.1
Arsenic (PMS)	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Barium	0.056	0.034	0.0076	0.0063	0.0075	0.0081	2.4	2.3	2	2
Beryllium	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0015	<0.0015	<0.0006	<0.0006
Boron	0.17	0.16	<0.004	<0.004	0.013	0.012	0.026	<0.02	0.021	0.011
Cadmium	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.015	<0.015	<0.006	<0.006
Chromium	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.05	<0.02	<0.02
Cobalt	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.025	<0.025	<0.01	<0.01
Copper	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.02	<0.02	<0.008	<0.008
Iron	2.2	0.28	<0.005	<0.005	0.1	0.013	<0.025	<0.025	0.034	0.013
Lead (PMS)	0.00053	<0.0005	0.00054	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0011
Lithium	0.036	0.035	<0.004	<0.004	<0.004	<0.004	0.043	0.044	0.034	0.035
Manganese	0.013	0.003	<0.001	<0.001	0.0029	<0.001	<0.005	<0.005	<0.002	<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	<0.05	<0.05	<0.02	<0.02
Nickel	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.05	<0.02	<0.02
Selenium	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.25	<0.25	<0.1	<0.1
Silver	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.03	<0.03	<0.012	<0.012
Strontium	0.069	0.059	0.0099	0.0097	0.01	0.01	3	2.9	2.4	2.3
Thallium (PMS)	<0.0005	<0.0005	<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	<1	<1	<0.4	<0.4
Uranium (PMS)	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0012	0.0012	0.0014	0.0015
Vanadium	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.025	<0.025	<0.01	<0.01
Zinc	<0.002	<0.002	0.003	<0.002	0.0086	0.0048	<0.01	<0.01	0.13	0.13
MAJOR IONS (mg/L)	.	.	.	.	.	.	.	.	.	.
Calcium	1.5	1.4	29	29	27	27	930	860	900	890
Magnesium	0.17	0.12	18	17	18	18	72	69	62	61
Potassium	0.94	0.88	1	1	0.69	<0.6	3.9	4.8	2.9	3.1
Sodium	120	120	0.73	0.67	0.86	0.68	35	34	32	33
Alkalinity-HCO3	188	.	158	.	146	.	288	.	278	.
Alkalinity-CO3	40	.	<1	.	<1	.	<1	.	<1	.
Chloride	2.88	.	1.3	.	1.18	.	38.7	.	29.3	.
Fluoride	1.47	.	<0.1	.	<0.1	.	<0.1	.	<0.1	.
Nitrate-N	<0.028	.	0.251	.	0.2	.	782	.	696	.
Sulfate	28.1	.	1.41	.	1.06	.	4.37	.	4.52	.

(CONTINUED)

Sampling Point	GW-537		GW-613				GW-614			
Program	SMP		CMP-B				CMP-B			
Location	OLF		S3				S3			
Date Sampled	09/17/97		01/22/97		08/11/97		01/27/97		08/14/97	
Sample Type	DUP									
	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS
METALS (mg/L)										
Aluminum	0.22	0.32	<0.02	<0.02	0.026	<0.02	0.024	<0.02	0.15	<0.02
Antimony	<0.1	<0.1	<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	2	2	0.056	0.056	0.056	0.054	0.14	0.15	0.16	0.15
Beryllium	<0.0006	<0.0006	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Boron	0.01	0.015	<0.004	0.013	0.0052	0.0047	0.059	0.032	0.021	0.019
Cadmium	<0.006	<0.006	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Chromium	<0.02	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt	<0.01	<0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Copper	<0.008	<0.008	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Iron	0.035	<0.01	<0.005	0.0076	<0.005	<0.005	0.093	0.04	0.12	0.065
Lead (PMS)	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.00076	<0.0005	<0.0005	<0.0005	<0.0005
Lithium	0.036	0.036	0.0042	0.0059	0.0058	0.0056	0.011	0.0093	0.012	0.011
Manganese	<0.002	<0.002	<0.001	0.001	<0.001	<0.001	0.012	0.012	0.014	0.013
Mercury (CVAA)	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum	<0.02	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Nickel	<0.02	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Selenium	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Silver	<0.012	<0.012	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006
Strontium	2.4	2.4	0.044	0.044	0.05	0.049	0.55	0.56	0.61	0.6
Thallium (PMS)	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Thorium	<0.4	<0.4	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Uranium (PMS)	0.0014	0.0014	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vanadium	<0.01	<0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc	0.13	0.13	0.0022	0.005	<0.002	0.0031	0.0055	0.0052	<0.002	0.003
MAJOR IONS (mg/L)										
Calcium	910	910	26	27	29	28	45	47	50	49
Magnesium	62	62	2.7	2.7	2.8	2.7	9.3	9.6	9.9	9.8
Potassium	3.2	3.3	0.74	0.73	<0.6	<0.6	2.1	1.8	1.5	1.5
Sodium	33	33	3.3	3.4	3.5	3.4	9.2	9.5	9.5	9.5
Alkalinity-HCO3	276	.	82	.	92	.	172	.	176	.
Alkalinity-CO3	<1	.	<1	.	<1	.	<1	.	<1	.
Chloride	30.1	.	0.85	.	1.06	.	0.63	.	0.65	.
Fluoride	<0.1	.	<0.1	.	0.12	.	<0.1	.	<0.1	.
Nitrate-N	699	.	0.033	.	0.03	.	<0.028	.	<0.028	.
Sulfate	4.5	.	5.51	.	5.63	.	11.5	.	11.4	.

(CONTINUED)

APPENDIX D.2
Inorganic Analytes, CY 1997

Sampling Point	GW-614		GW-621				GW-627			
Program	CMP-B		EXP				SMP			
Location	S3		EXP-B				BG			
Date Sampled	08/14/97		02/17/97		08/21/97		02/08/97			
Sample Type	DUP								DUP	
	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS
METALS (mg/L)										
Aluminum	0.13	<0.02	0.21	<0.02	5.3	0.021	<0.02	<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 (PMS)	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Barium	0.16	0.16	0.022	0.019	0.045	0.022	0.046	0.044	0.045	0.044
Beryllium	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Boron	0.021	0.02	0.013	0.012	0.031	0.028	0.49	0.49	0.49	0.49
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	0.027	<0.01	0.07	<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	0.0059	<0.004	<0.004	<0.004	<0.004	<0.004
Iron	0.11	0.066	0.48	<0.005	3.8	<0.005	0.61	0.0074	0.3	0.04
Lead (PMS)	<0.0005	<0.0005	0.00087	<0.0005	0.003	<0.0005	0.0022	<0.0005	0.0014	<0.0005
Lithium	0.012	0.012	<0.004	<0.004	0.0078	<0.004	0.088	0.091	0.089	0.089
Manganese	0.014	0.013	0.053	0.001	0.21	<0.001	0.0075	0.0032	0.0053	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	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Nickel	<0.01	<0.01	0.02	<0.01	0.062	<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	0.6	0.61	0.059	0.06	0.075	0.072	0.077	0.076	0.077	0.075
Thallium (PMS)	<0.0005	<0.0005	<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)	<0.0005	<0.0005	0.0024	0.0024	0.0049	0.0046	<0.0005	<0.0005	<0.0005	<0.0005
Vanadium	<0.005	<0.005	<0.005	<0.005	0.0057	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc	<0.002	<0.002	0.0037	0.0029	0.013	<0.002	0.019	0.0025	0.019	0.0021
MAJOR IONS (mg/L)										
Calcium	50	49	54	54	64	62	0.9	0.95	0.9	0.9
Magnesium	10	9.9	9.8	10	11	11	0.21	0.22	0.21	0.21
Potassium	1.5	1.5	0.87	0.85	2.4	0.89	1.1	1.7	1.5	1.5
Sodium	9.6	9.9	1.9	2	3	3	300	300	300	300
Alkalinity-HCO3	178	.	180	.	176	.	564	.	484	.
Alkalinity-CO3	<1	.	<1	.	<1	.	64	.	72	.
Chloride	0.67	.	4.44	.	15.2	.	40	.	38.1	.
Fluoride	<0.1	.	<0.1	.	<0.1	.	5.03	.	5.02	.
Nitrate-N	<0.028	.	4.07	.	5.68	.	<0.028	.	<0.028	.
Sulfate	11.1	.	4.6	.	43.7	.	32.3	.	32.2	.

(CONTINUED)

APPENDIX D.2
Inorganic Analytes, CY 1997

Sampling Point	GW-627				GW-642				GW-653	
Program	SMP				CMP-B				SMP	
Location	BG				BG				BG	
Date Sampled	09/09/97				01/21/97		08/14/97		02/06/97	
Sample Type			DUP							
	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS
METALS (mg/L)										
Aluminum	<0.02	<0.02	<0.02	<0.02	0.024	0.029	0.023	<0.02	0.2	<0.02
Antimony	<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	<0.005	<0.005
Barium	0.042	0.041	0.042	0.04	0.12	0.12	0.14	0.13	0.037	0.033
Beryllium	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Boron	0.48	0.48	0.47	0.47	0.01	0.013	0.014	0.013	0.0042	<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	0.011	<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	0.006	0.0059	<0.004	<0.004	0.0062	<0.004
Iron	0.18	0.03	0.17	0.031	3.1	2.6	4.1	4.1	0.12	<0.005
Lead (PMS)	0.00085	0.0007	0.0012	0.00074	0.0014	0.0017	<0.0005	<0.0005	<0.0005	<0.0005
Lithium	0.087	0.086	0.086	0.084	0.037	0.037	0.038	0.036	<0.004	<0.004
Manganese	0.0059	0.0042	0.0058	0.0046	1.2	1.2	1.3	1.3	0.0065	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	<0.01	<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	0.076	0.076	0.075	0.074	0.023	0.022	0.025	0.025	0.019	0.019
Thallium (PMS)	0.0005	0.00058	<0.0005	0.00053	<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)	0.0006	0.00072	0.00058	0.00071	<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	0.0091	0.022	0.0065	0.0021	0.0053	0.013	0.0022	0.0023	0.0083	0.0061
MAJOR IONS (mg/L)										
Calcium	1	0.99	0.98	0.97	7.6	7.4	7.7	7.6	2.2	2.2
Magnesium	0.22	0.21	0.21	0.21	8	7.7	8.5	8.6	1.2	1.1
Potassium	1.5	1.5	1.4	1.5	2.3	2.1	1.9	1.8	<0.6	<0.6
Sodium	300	290	290	290	7.6	7.4	7.5	7.1	2.6	2.6
Alkalinity-HCO3	520	.	520	.	72	.	68	.	14	.
Alkalinity-CO3	80	.	80	.	<1	.	<1	.	<1	.
Chloride	35.9	.	36.2	.	1.07	.	1.13	.	0.89	.
Fluoride	4.98	.	5.05	.	0.29	.	0.37	.	<0.1	.
Nitrate-N	<0.028	.	<0.028	.	0.066	.	<0.028	.	<0.028	.
Sulfate	30.3	.	31	.	9.36	.	9.51	.	2.36	.

(CONTINUED)

APPENDIX D.2
Inorganic Analytes, CY 1997

Sampling Point	GW-653		GW-683				GW-684			
Program	SMP		EXP				EXP			
Location	BG		EXP-A				EXP-A			
Date Sampled	09/03/97		02/17/97		08/21/97		02/18/97		08/21/97	
Sample Type										
	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS
METALS (mg/L)										
Aluminum	<0.02	<0.02	<0.02	0.054	0.048	<0.02	0.036	<0.02	0.21	<0.02
Antimony	<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	<0.005	<0.005
Barium	0.035	0.03	0.062	0.06	0.092	0.094	0.07	0.072	0.1	0.099
Beryllium	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Boron	0.0048	0.005	0.022	0.022	0.048	0.049	0.025	0.026	0.048	0.047
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	0.009	0.0058	0.034	<0.005	0.038	<0.005	0.091	0.022	0.21	0.06
Lead (PMS)	<0.0005	<0.0005	<0.0005	<0.0005	0.00051	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Lithium	<0.004	<0.004	0.0047	0.0044	0.0076	0.0076	0.014	0.015	0.019	0.019
Manganese	0.0016	0.0031	0.0011	0.001	0.0021	0.0012	0.005	0.0048	0.0083	0.007
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	0.019	0.018	0.072	0.07	0.12	0.12	0.09	0.092	0.14	0.14
Thallium (PMS)	<0.0005	<0.0005	<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)	<0.0005	<0.0005	0.031	0.03	0.034	0.035	0.025	0.025	0.034	0.035
Vanadium	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc	0.0026	0.0047	0.0023	0.0038	<0.002	0.0025	0.0054	0.0038	0.0056	0.0028
MAJOR IONS (mg/L)										
Calcium	2.2	2.2	43	42	62	63	40	41	59	57
Magnesium	1.1	1.1	15	14	17	17	13	14	17	16
Potassium	<0.6	0.66	1.1	1.1	1.9	1.9	7.5	7.6	8.5	8.4
Sodium	2.5	2.5	4	4	6.8	7	4.8	4.9	7.5	7.4
Alkalinity-HCO3	14	.	158	.	190	.	158	.	174	.
Alkalinity-CO3	<1	.	<1	.	<1	.	<1	.	<1	.
Chloride	0.82	.	8.1	.	12.4	.	15.6	.	19.1	.
Fluoride	<0.1	.	0.17	.	0.14	.	0.2	.	0.18	.
Nitrate-N	<0.028	.	3.41	.	10.1	.	3.14	.	9.15	.
Sulfate	2.15	.	14.3	.	29.9	.	12.8	.	31.9	.

(CONTINUED)

APPENDIX D.2
Inorganic Analytes, CY 1997

Sampling Point	GW-685						GW-695			
Program	EXP						EXP			
Location	EXP-A						EXP-B			
Date Sampled	02/12/97		08/20/97				02/17/97		08/19/97	
Sample Type					DUP					
	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS
METALS (mg/L)										
Aluminum	0.4	<0.02	0.18	0.021	0.27	<0.02	4.3	<0.02	0.34	0.21
Antimony	<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	<0.005	<0.005
Barium	0.1	0.094	0.094	0.09	0.097	0.09	0.031	0.026	0.029	0.031
Beryllium	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Boron	0.039	0.038	0.043	0.043	0.043	0.042	0.042	0.037	0.031	0.032
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	0.014	0.018
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	0.0084	<0.004	<0.004
Iron	4.3	0.042	0.57	<0.005	0.87	<0.005	1.2	<0.005	0.14	0.05
Lead (PMS)	0.00093	0.00077	0.001	<0.0005	0.00076	<0.0005	0.0022	<0.0005	0.00097	<0.0005
Lithium	0.0086	0.008	0.0076	0.0074	0.0078	0.0071	0.015	0.013	0.0099	0.011
Manganese	0.15	0.073	0.086	0.036	0.11	0.037	0.004	<0.001	0.0019	0.0063
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	0.11	0.12	0.13	0.13	0.13	0.13	0.06	0.056	0.064	0.065
Thallium (PMS)	<0.0005	<0.0005	<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)	0.0043	0.0038	0.0084	0.0079	0.008	0.0073	0.0037	0.0019	0.0022	0.0016
Vanadium	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc	0.022	0.004	0.0084	<0.002	0.0089	0.0022	0.0061	0.0029	0.0023	0.0032
MAJOR IONS (mg/L)										
Calcium	71	78	81	81	82	80	37	34	39	41
Magnesium	24	24	22	22	23	22	18	17	19	19
Potassium	1.4	1.8	1.8	1.7	1.7	1.8	5.6	5.4	4.6	4.7
Sodium	24	25	21	20	20	21	31	30	18	19
Alkalinity-HCO3	304	.	260	.	260	.	202	.	186	.
Alkalinity-CO3	<1	.	<1	.	<1	.	<1	.	<1	.
Chloride	57.7	.	42.4	.	40.2	.	11.5	.	11.5	.
Fluoride	0.12	.	0.11	.	0.12	.	0.12	.	0.11	.
Nitrate-N	2.21	.	5.89	.	6.03	.	8.81	.	1.5	.
Sulfate	19.9	.	36.6	.	33.4	.	11.9	.	13.5	.

(CONTINUED)

APPENDIX D.2
Inorganic Analytes, CY 1997

Sampling Point	GW-703				GW-704				GW-706	
Program	EXP				EXP				EXP	
Location	EXP-B				EXP-B				EXP-B	
Date Sampled	02/19/97		08/27/97		02/19/97		08/28/97		02/21/97	
Sample Type										
	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS
METALS (mg/L)										
Aluminum	<0.02	<0.02	0.023	0.027	<0.02	<0.02	0.046	0.032	<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 (PMS)	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Barium	0.086	0.083	0.071	0.074	0.087	0.088	0.094	0.084	0.1	0.1
Beryllium	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Boron	0.065	0.065	0.047	0.05	0.079	0.078	0.074	0.073	0.042	0.041
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	0.28	0.057	0.75	0.0085	1.5	0.067	5.6	0.029	0.16	<0.005
Lead (PMS)	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Lithium	0.014	0.014	0.015	0.016	0.017	0.018	0.017	0.017	0.013	0.012
Manganese	0.029	0.014	0.034	0.016	0.013	0.0093	0.03	0.013	0.0078	0.0041
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	0.21	0.21	0.22	0.23	0.43	0.44	0.44	0.43	0.24	0.23
Thallium (PMS)	<0.0005	<0.0005	<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)	0.0051	0.0049	0.0048	0.0047	0.001	0.001	0.001	0.0011	0.13	0.12
Vanadium	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc	0.0075	0.0075	0.0055	0.0039	0.0074	<0.002	0.013	0.003	0.0026	0.0052
MAJOR IONS (mg/L)										
Calcium	65	62	62	65	63	64	64	64	81	80
Magnesium	29	28	28	29	31	32	31	31	17	16
Potassium	1.5	1.7	2	2.6	1.5	1.5	1.7	1.7	2.6	2.4
Sodium	9.4	9.1	9.6	10	13	14	14	14	11	10
Alkalinity-HCO3	202	.	212	.	208	.	218	.	182	.
Alkalinity-CO3	<1	.	<1	.	<1	.	<1	.	<1	.
Chloride	22	.	17.3	.	32.6	.	30	.	23.5	.
Fluoride	0.16	.	0.17	.	0.19	.	0.19	.	0.4	.
Nitrate-N	16.5	.	15.6	.	17.2	.	16.5	.	18.1	.
Sulfate	22.2	.	21.6	.	24.5	.	21.3	.	39	.

(CONTINUED)

APPENDIX D.2
Inorganic Analytes, CY 1997

Sampling Point	GW-706		GW-710				GW-711			
Program	EXP		CMP-E				CMP-E			
Location	EXP-B		EXP-W				EXP-W			
Date Sampled	09/03/97		02/02/97		08/28/97		01/31/97		08/26/97	
Sample Type										
	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS
METALS (mg/L)										
Aluminum	0.05	<0.02	<0.02	0.045	0.24	0.23	<0.04	<0.04	0.14	0.17
Antimony	<0.05	<0.05	<0.05	<0.05	<0.25	<0.25	<0.1	<0.1	0.1	<0.25
Arsenic (PMS)	<0.005	<0.005	0.034	0.03	0.01	0.011	0.055	0.063	0.036	0.037
Barium	0.14	0.16	0.0035	0.0034	0.0072	0.0077	0.0094	0.0089	0.011	0.013
Beryllium	<0.0003	<0.0003	<0.0003	<0.0003	<0.0015	<0.0015	<0.0006	<0.0006	<0.0006	<0.0015
Boron	0.11	0.12	0.34	0.33	0.25	0.27	1.2	1.2	1.2	1.3
Cadmium	<0.003	<0.003	<0.003	<0.003	<0.015	<0.015	<0.006	<0.006	<0.006	<0.015
Chromium	<0.01	<0.01	<0.01	<0.01	<0.05	<0.05	<0.02	<0.02	<0.02	<0.05
Cobalt	<0.005	<0.005	<0.005	<0.005	<0.025	<0.025	<0.01	<0.01	<0.01	<0.025
Copper	<0.004	<0.004	<0.004	<0.004	<0.02	<0.02	0.012	<0.008	<0.008	<0.02
Iron	0.7	0.61	23	8.3	9.5	9.1	18	14	4.3	4.5
Lead (PMS)	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.00075	<0.0005	<0.0005
Lithium	0.018	0.02	0.14	0.13	0.14	0.13	0.7	0.69	0.68	0.7
Manganese	0.026	0.031	0.33	0.27	0.23	0.24	0.34	0.33	0.024	0.028
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	<0.05	<0.05	<0.02	<0.02	<0.02	<0.05
Nickel	<0.01	<0.01	<0.01	<0.01	<0.05	<0.05	<0.02	<0.02	<0.02	<0.05
Selenium	<0.05	<0.05	<0.05	<0.05	<0.25	<0.25	<0.1	<0.1	<0.1	<0.25
Silver	<0.006	<0.006	<0.006	<0.006	<0.03	<0.03	<0.012	<0.012	0.017	<0.03
Strontium	0.28	0.32	7.6	7.5	8.9	8.9	12	12	12	13
Thallium (PMS)	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0065	0.00086
Thorium	<0.2	<0.2	<0.2	<0.2	<1	<1	<0.4	<0.4	<0.4	<1
Uranium (PMS)	0.11	0.11	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.00061	<0.0005	<0.0005
Vanadium	<0.005	<0.005	<0.005	<0.005	<0.025	<0.025	<0.01	<0.01	<0.01	<0.025
Zinc	0.005	0.0051	0.0071	0.0038	0.088	0.09	<0.004	<0.004	0.071	0.091
MAJOR IONS (mg/L)										
Calcium	96	110	510	510	600	590	430	420	490	510
Magnesium	20	24	170	170	180	180	190	190	200	210
Potassium	3.1	3.6	9.8	9.9	8.4	9.8	23	21	23	25
Sodium	13	15	200	200	230	230	1100	1100	1200	1200
Alkalinity-HCO3	252	.	170	.	164	.	160	.	162	.
Alkalinity-CO3	<1	.	<1	.	<1	.	<1	.	<1	.
Chloride	29.2	.	408	.	1750	.	2020	.	1990	.
Fluoride	0.35	.	1.5	.	1.73	.	1.54	.	1.71	.
Nitrate-N	33.1	.	<1.13	.	<2.8	.	<11.3	.	<2.8	.
Sulfate	27.8	.	1970	.	8970	.	1870	.	1570	.

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APPENDIX D.2
Inorganic Analytes, CY 1997

Sampling Point	GW-712						GW-713			
Program	CMP-E						CMP-E			
Location	EXP-W						EXP-W			
Date Sampled	02/02/97		08/26/97				02/02/97			
Sample Type					DUP				DUP	
	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS
METALS (mg/L)										
Aluminum	<0.02	<0.02	0.035	0.025	0.19	0.024	<0.02	<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 (PMS)	0.008	0.0067	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Barium	0.042	0.041	0.044	0.044	0.044	0.042	0.029	0.031	0.03	0.033
Beryllium	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Boron	0.085	0.082	0.086	0.083	0.082	0.082	0.071	0.075	0.071	0.072
Cadmium	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Chromium	0.069	<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	0.0053	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Iron	1.4	0.43	1.1	0.38	0.97	0.38	0.72	0.15	0.92	0.15
Lead (PMS)	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Lithium	0.012	0.0085	0.014	0.014	0.015	0.013	0.0099	0.01	0.011	0.011
Manganese	0.035	0.026	0.018	0.016	0.018	0.015	0.023	0.025	0.026	0.028
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	0.028	<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	1.2	1.2	1.3	1.3	1.3	1.2	1.1	1.2	1.1	1.2
Thallium (PMS)	<0.0005	<0.0005	0.0014	0.00094	0.0011	0.00096	<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)	0.00094	0.001	0.00055	0.00055	0.00053	0.00065	0.0052	<0.0005	0.0018	<0.0005
Vanadium	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc	<0.002	<0.002	0.0024	0.0031	0.0041	0.003	0.0066	0.0073	0.0078	0.006
MAJOR IONS (mg/L)										
Calcium	71	71	70	68	69	67	51	54	51	52
Magnesium	34	34	34	33	34	32	25	26	25	25
Potassium	1.3	1.6	2.1	2.3	2	2	2	2	1.9	1.8
Sodium	17	17	17	17	17	17	7.7	8.3	7.8	8
Alkalinity-HCO3	194	.	212	.	202	.	218	.	226	.
Alkalinity-CO3	<1	.	<1	.	<1	.	<1	.	<1	.
Chloride	21.5	.	14.2	.	13.9	.	15.3	.	13.8	.
Fluoride	0.48	.	0.53	.	0.53	.	0.5	.	0.51	.
Nitrate-N	0.072	.	0.15	.	0.14	.	0.734	.	0.666	.
Sulfate	129	.	139	.	141	.	67.2	.	68.3	.

(CONTINUED)

Sampling Point	GW-713		GW-714				GW-715			
Program	CMP-E		CMP-E				CMP-E			
Location	EXP-W		EXP-W				EXP-W			
Date Sampled	08/27/97		02/03/97		08/27/97		02/03/97		08/27/97	
Sample Type										
	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS
METALS (mg/L)										
Aluminum	0.026	0.027	0.059	<0.02	0.24	<0.02	0.074	<0.02	<0.02	0.025
Antimony	<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	<0.005	<0.005
Barium	0.044	0.042	0.057	0.055	0.066	0.065	0.08	0.061	0.071	0.069
Beryllium	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Boron	0.059	0.06	0.072	0.071	0.059	0.055	0.023	0.02	<0.004	0.0058
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	1.4	<0.01	<0.01	<0.01
Cobalt	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.012	<0.005	<0.005	<0.005
Copper	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	0.07	0.0041	<0.004	<0.004
Iron	1.2	0.89	1.6	0.013	1.2	0.0054	21	0.037	0.21	0.06
Lead (PMS)	<0.0005	<0.0005	0.0012	<0.0005	0.00073	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Lithium	0.013	0.012	0.0082	0.0076	0.0093	0.0077	<0.004	<0.004	<0.004	<0.004
Manganese	0.035	0.036	0.026	0.018	0.015	0.01	0.095	0.0054	0.014	0.012
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	0.4	0.068	0.12	0.11
Selenium	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Silver	0.007	0.0077	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	0.0069	0.0084
Strontium	1.5	1.5	0.19	0.19	0.2	0.2	0.086	0.078	0.086	0.084
Thallium (PMS)	<0.0005	<0.0005	<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)	<0.0005	<0.0005	0.0031	0.0032	0.0032	0.0032	0.0007	<0.0005	<0.0005	<0.0005
Vanadium	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.0063	<0.005	<0.005	<0.005
Zinc	0.0066	0.006	0.0069	0.0037	0.0081	0.0023	0.0086	0.0024	0.0036	0.0047
MAJOR IONS (mg/L)										
Calcium	60	58	55	54	57	56	74	68	79	78
Magnesium	30	29	21	21	22	22	15	15	12	12
Potassium	2.6	2.2	1.1	1	1.3	1.2	1.8	1.6	2	1.8
Sodium	11	11	3.3	3.3	3.8	3.8	16	17	17	17
Alkalinity-HCO3	206	.	236	.	214	.	268	.	252	.
Alkalinity-CO3	<1	.	<1	.	<1	.	<1	.	<1	.
Chloride	14.2	.	11	.	9.3	.	48.1	.	35.1	.
Fluoride	0.53	.	0.14	.	0.18	.	<0.1	.	<0.1	.
Nitrate-N	0.1	.	3.57	.	2.62	.	0.524	.	0.34	.
Sulfate	84.2	.	21	.	25.4	.	6.68	.	6.54	.

(CONTINUED)

APPENDIX D.2
Inorganic Analytes, CY 1997

Sampling Point	GW-724						GW-725			
Program	EXP						EXP			
Location	EXP-C						EXP-C			
Date Sampled	02/27/97				09/05/97		02/28/97		09/05/97	
Sample Type			DUP							
	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS
METALS (mg/L)										
Aluminum	0.063	0.021	0.046	<0.02	0.033	0.042	<0.02	<0.02	0.055	0.047
Antimony	<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	<0.005	<0.005
Barium	0.17	0.17	0.17	0.17	0.19	0.17	0.31	0.31	0.27	0.26
Beryllium	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Boron	0.069	0.075	0.071	0.064	0.078	0.1	0.048	0.047	0.024	0.043
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	0.14	0.039	0.14	0.032	10	0.042	0.081	0.01	1.3	0.034
Lead (PMS)	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Lithium	0.02	0.021	0.017	0.017	0.019	0.017	0.0067	0.0071	0.0056	0.0068
Manganese	0.0082	0.0069	0.007	0.0073	0.11	0.066	0.23	0.23	0.39	0.38
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	0.0069	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006
Strontium	1.2	1.3	1.2	1.2	1.4	1.3	0.83	0.83	0.67	0.66
Thallium (PMS)	<0.0005	<0.0005	<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)	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0044	0.0044	0.0058	0.006
Vanadium	0.0052	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc	0.0041	0.0036	0.0034	0.0036	0.023	0.018	0.0033	0.005	0.025	0.026
MAJOR IONS (mg/L)										
Calcium	96	97	95	96	100	99	190	190	170	170
Magnesium	42	43	42	42	43	41	40	40	32	31
Potassium	2.7	2.3	2.1	2.3	1.7	1.9	3	3.3	3	3
Sodium	25	25	24	25	28	27	25	25	23	23
Alkalinity-HCO3	238	.	242	.	236	.	328	.	326	.
Alkalinity-CO3	<1	.	<1	.	<1	.	<1	.	<1	.
Chloride	87.6	.	83.5	.	85.6	.	113	.	67.9	.
Fluoride	0.23	.	0.22	.	0.21	.	0.12	.	0.17	.
Nitrate-N	35.7	.	36.1	.	36.3	.	76.1	.	47.5	.
Sulfate	24	.	23.4	.	25.1	.	34.7	.	39.3	.

(CONTINUED)

Sampling Point	GW-738						GW-740			
Program	EXP						EXP			
Location	EXP-C						EXP-C			
Date Sampled	02/25/97		09/04/97				02/24/97		09/04/97	
Sample Type					DUP					
	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS
METALS (mg/L)										
Aluminum	0.67	<0.02	4.3	0.025	4.2	0.032	0.03	<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 (PMS)	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Barium	0.051	0.046	0.063	0.05	0.058	0.049	0.08	0.08	0.09	0.092
Beryllium	<0.0003	<0.0003	0.00036	<0.0003	0.00038	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Boron	0.017	0.018	0.035	0.032	0.034	0.031	0.015	0.0081	0.027	0.028
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	0.99	0.024	2.9	0.0068	2.6	0.018	0.28	0.11	0.24	0.13
Lead (PMS)	0.0011	<0.0005	0.0023	<0.0005	0.0028	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Lithium	0.0059	0.0048	0.0091	0.0041	0.0091	<0.004	0.014	0.016	0.015	0.015
Manganese	0.029	0.0012	0.056	<0.001	0.05	<0.001	0.012	0.011	0.0091	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	<0.01	<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	0.06	<0.006
Strontium	0.11	0.11	0.12	0.12	0.11	0.11	0.048	0.048	0.055	0.056
Thallium (PMS)	<0.0005	<0.0005	<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)	0.0022	0.0022	0.0021	0.002	0.002	0.0021	<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	0.0065	0.0044	0.017	0.0021	0.014	0.003	0.0029	0.0031	0.0051	0.006
MAJOR IONS (mg/L)										
Calcium	110	110	120	110	110	110	61	61	65	67
Magnesium	24	24	26	25	24	25	31	31	33	34
Potassium	2.5	2	3.3	2.1	2.9	2.1	1.5	2	1.5	1.6
Sodium	6.1	5.9	6.6	6.4	5.8	6.3	1.8	1.8	2	2.1
Alkalinity-HCO3	324	.	326	.	324	.	272	.	272	.
Alkalinity-CO3	<1	.	<1	.	<1	.	<1	.	<1	.
Chloride	13.7	.	10.8	.	10.9	.	12.9	.	6.86	.
Fluoride	<0.1	.	<0.1	.	<0.1	.	0.17	.	0.22	.
Nitrate-N	11	.	10.4	.	10.7	.	3.41	.	3.64	.
Sulfate	28.1	.	24.6	.	26.4	.	7.64	.	13.2	.

(CONTINUED)

APPENDIX D.2
Inorganic Analytes, CY 1997

Sampling Point	GW-829				NT-01				SS-1	
Program	SMP				EXP				EXP	
Location	OLF				EXP-SW				EXP-SW	
Date Sampled	03/04/97		09/16/97		02/03/97		10/13/97		02/03/97	
Sample Type										
	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS
METALS (mg/L)										
Aluminum	18	0.11	1.4	0.056	0.43	0.044	0.21	<0.02	0.066	0.14
Antimony	<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	<0.005	<0.005
Barium	0.83	0.53	0.69	1	0.094	0.092	1.2	1.2	0.075	0.072
Beryllium	0.0011	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Boron	0.28	0.27	0.26	0.25	0.019	0.018	0.061	0.058	0.054	0.055
Cadmium	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	0.043	0.034	<0.003	<0.003
Chromium	0.027	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01
Cobalt	0.0078	<0.005	<0.005	<0.005	<0.005	<0.005	0.013	0.012	<0.005	<0.005
Copper	0.015	<0.004	0.0056	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Iron	9.1	0.076	0.75	0.016	0.3	0.0093	0.05	<0.005	0.033	0.026
Lead (PMS)	0.0065	<0.0005	0.001	<0.0005	<0.0005	<0.0005	0.0012	0.0007	<0.0005	<0.0005
Lithium	0.07	0.059	0.061	0.069	<0.004	<0.004	0.006	0.0046	0.0052	0.0058
Manganese	0.14	0.0023	0.022	0.0075	0.44	0.44	9.2	8.3	0.03	0.022
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	0.018	<0.01	<0.01	<0.01	0.011	0.016	0.16	0.15	<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	1.4	1.2	1.3	1.9	0.15	0.15	1.3	1.2	0.81	0.77
Thallium (PMS)	<0.0005	<0.0005	<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)	0.0025	0.0014	0.0012	0.0012	0.004	0.004	0.32	0.35	0.047	0.046
Vanadium	0.011	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc	0.033	0.0027	0.0093	0.007	0.01	0.059	0.043	0.037	0.01	0.028
MAJOR IONS (mg/L)										
Calcium	33	19	23	31	50	50	520	490	220	210
Magnesium	12	7	7.9	11	7.8	7.8	62	59	17	16
Potassium	8.9	5.4	5.3	5.7	1.7	1.5	8.4	8.1	3.9	3.8
Sodium	110	110	120	120	7.2	7.3	78	75	27	25
Alkalinity-HCO3	180	.	180	.	84	.	258	.	310	.
Alkalinity-CO3	<1	.	<1	.	<1	.	<1	.	<1	.
Chloride	3.16	.	3.3	.	9.75	.	103	.	95.5	.
Fluoride	0.48	.	0.34	.	0.32	.	1.37	.	0.22	.
Nitrate-N	33.9	.	54.1	.	25.3	.	382	.	12.4	.
Sulfate	15.137	.	17.5	.	13.7	.	39	.	258	.

(CONTINUED)

APPENDIX D.2
Inorganic Analytes, CY 1997

Sampling Point	SS-1		SS-4						SS-5	
Program	EXP		EXP						EXP	
Location	EXP-SW		EXP-SW						EXP-SW	
Date Sampled	10/13/97		02/03/97		08/29/97				02/03/97	
Sample Type							DUP			
	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS
METALS (mg/L)										
Aluminum	0.14	<0.02	0.25	0.062	0.059	0.049	0.058	0.023	0.094	0.036
Antimony	<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	<0.005	<0.005
Barium	0.078	0.075	0.09	0.083	0.17	0.17	0.18	0.17	0.044	0.044
Beryllium	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Boron	0.054	0.052	0.036	0.039	0.11	0.12	0.12	0.11	0.022	0.023
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	0.011
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	0.26	<0.005	0.41	0.012	0.1	0.0077	0.098	0.0095	0.047	0.032
Lead (PMS)	0.0019	0.0007	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Lithium	0.0072	0.0051	0.012	0.012	0.024	0.024	0.024	0.023	0.0042	0.0042
Manganese	0.086	0.021	0.24	0.0043	0.02	0.0065	0.018	0.0038	0.0036	0.0097
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	0.78	0.77	0.17	0.17	0.32	0.32	0.32	0.32	0.052	0.053
Thallium (PMS)	<0.0005	<0.0005	<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)	0.039	0.039	0.1	0.091	0.13	0.13	0.13	0.13	0.019	0.019
Vanadium	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc	0.0034	<0.002	0.0078	0.04	0.0032	0.0025	0.0025	<0.002	0.0027	0.057
MAJOR IONS (mg/L)										
Calcium	170	160	66	65	110	120	110	110	36	36
Magnesium	14	13	15	15	22	23	23	22	12	12
Potassium	4.4	4.1	1.7	1.6	3.1	3	3.1	3.1	0.94	0.8
Sodium	31	31	8.8	8.8	15	15	16	15	3.1	3.2
Alkalinity-HCO3	336	.	198	.	234	.	236	.	146	.
Alkalinity-CO3	<1	.	<1	.	<1	.	<1	.	<1	.
Chloride	101	.	22.8	.	26	.	24.6	.	7.42	.
Fluoride	0.49	.	0.35	.	0.43	.	0.44	.	0.15	.
Nitrate-N	14.6	.	11.3	.	42	.	41.6	.	2.09	.
Sulfate	66.1	.	31.6	.	23.3	.	23.7	.	9.92	.

(CONTINUED)

APPENDIX D.2
Inorganic Analytes, CY 1997

Sampling Point	SS-5	
Program	EXP	
Location	EXP-SW	
Date Sampled	08/29/97	
Sample Type		
	TOT	DIS
METALS (mg/L)	.	.
Aluminum	0.13	0.046
Antimony	<0.05	<0.05
Arsenic (PMS)	<0.005	<0.005
Barium	0.088	0.086
Beryllium	<0.0003	<0.0003
Boron	0.06	0.059
Cadmium	<0.003	<0.003
Chromium	<0.01	<0.01
Cobalt	<0.005	<0.005
Copper	<0.004	<0.004
Iron	0.086	0.0067
Lead (PMS)	<0.0005	<0.0005
Lithium	0.01	0.01
Manganese	0.0049	0.0057
Mercury (CVAA)	<0.0002	<0.0002
Molybdenum	<0.01	<0.01
Nickel	<0.01	<0.01
Selenium	<0.05	<0.05
Silver	<0.006	<0.006
Strontium	0.15	0.15
Thallium (PMS)	<0.0005	<0.0005
Thorium	<0.2	<0.2
Uranium (PMS)	0.07	0.071
Vanadium	<0.005	<0.005
Zinc	0.0037	0.003
MAJOR IONS (mg/L)	.	.
Calcium	72	72
Magnesium	16	16
Potassium	1.8	1.8
Sodium	7.7	7.7
Alkalinity-HCO3	200	.
Alkalinity-CO3	<1	.
Chloride	12.8	.
Fluoride	0.19	.
Nitrate-N	11.4	.
Sulfate	24.1	.

APPENDIX D.3

ORGANIC ANALYTES

APPENDIX D.3
Organic Analytes, CY 1997

Sampling Point	BCK-00.63		BCK-04.55		BCK-07.75		BCK-09.40	
Program	EXP		EXP		EXP		EXP	
Location	EXP-SW		EXP-SW		EXP-SW		EXP-SW	
Date Sampled	02/04/97	08/28/97	02/04/97	08/28/97	02/04/97	08/29/97	02/04/97	08/29/97
ORGANIC COMPOUNDS (ug/L)								
Acetone	10U	4	10U	4	10U	10U	10U	10U
Acrolein	10U	10U	10U	10U	10U	10U	10U	10U
Acrylonitrile	10U	10U	10U	10U	10U	10U	10U	10U
Benzene	5U	5U	5U	5U	5U	5U	5U	5U
Bromochloromethane	.	10U	.	10U	.	10U	.	10U
Bromodichloromethane	5U	5U	5U	5U	5U	5U	5U	5U
Bromoform	5U	5U	5U	5U	5U	5U	5U	5U
Bromomethane	10U	10U	10U	10U	10U	10U	10U	10U
2-Butanone	10U	9	10U	8	10U	5	10U	10U
Carbon disulfide	5U	5U	5U	5U	5U	5U	5U	5U
Carbon tetrachloride	5U	5U	5U	5U	5U	5U	5U	5U
Chlorobenzene	5U	5U	5U	5U	5U	5U	5U	5U
Chloroethane	10U	10U	10U	10U	10U	10U	10U	10U
2-Chloroethyl vinyl ether	10U	10U	10U	10U	10U	10U	10U	10U
Chloroform	5U	5U	5U	5U	5U	5U	5U	5U
Chloromethane	10U	10U	10U	10U	10U	10U	10U	10U
Dibromochloromethane	5U	5U	5U	5U	5U	5U	5U	5U
1,2-Dibromo-3-chloropropane	.	10U	.	10U	.	10U	.	10U
1,2-Dibromoethane	5U	5U	5U	5U	5U	5U	5U	5U
Dibromomethane	10U	10U	10U	10U	10U	10U	10U	10U
1,2-Dichlorobenzene	.	5U	.	5U	.	5U	.	5U
1,4-Dichlorobenzene	.	5U	.	5U	.	5U	.	5U
1,4-Dichloro-2-butene	5U	5U	5U	5U	5U	5U	5U	5U
trans-1,4-Dichloro-2-butene	5U	5U	5U	5U	5U	5U	5U	5U
Dichlorodifluoromethane	5U	5U	5U	5U	5U	5U	5U	5U
1,1-Dichloroethane	5U	5U	5U	5U	5U	5U	5U	5U
1,2-Dichloroethane	5U	5U	5U	5U	5U	5U	5U	5U
1,1-Dichloroethene	5U	5U	5U	5U	5U	5U	5U	5U
1,2-Dichloroethene	5U	5U	5U	5U	3	5U	5	5U
cis-1,2-Dichloroethene	5U	5U	5U	5U	3	5U	5	5U
trans-1,2-Dichloroethene	5U	5U	5U	5U	5U	5U	5U	5U
1,2-Dichloropropane	5U	5U	5U	5U	5U	5U	5U	5U
cis-1,3-Dichloropropene	5U	5U	5U	5U	5U	5U	5U	5U
trans-1,3-Dichloropropene	5U	5U	5U	5U	5U	5U	5U	5U
Dimethylbenzene	5U	5U	5U	5U	5U	5U	5U	5U
Ethanol	500U	500U	500U	500U	500U	500U	500U	500U
Ethylbenzene	5U	5U	5U	5U	5U	5U	5U	5U
Ethyl methacrylate	5U	5U	5U	5U	5U	5U	5U	5U
2-Hexanone	10U	10U	10U	10U	10U	10U	10U	10U
Iodomethane	5U	5U	5U	5U	5U	5U	5U	5U
4-Methyl-2-pentanone	10U	10U	10U	10U	10U	10U	10U	10U
Methylene chloride	5U	5U	5U	5U	5U	5U	5U	5U
Styrene	5U	5U	5U	5U	5U	5U	5U	5U
1,1,1,2-Tetrachloroethane	10U	10U	10U	10U	10U	10U	10U	10U
1,1,2,2-Tetrachloroethane	5U	5U	5U	5U	5U	5U	5U	5U
Tetrachloroethene	5U	5U	5U	5U	5U	5U	1	5U
Toluene	5U	5U	5U	5U	5U	5U	5U	5U
1,1,1-Trichloroethane	5U	5U	5U	5U	5U	5U	5U	5U
1,1,2-Trichloroethane	5U	5U	5U	5U	5U	5U	5U	5U
Trichloroethene	5U	5U	5U	5U	5U	5U	5U	5U
Trichlorofluoromethane	5U	5U	5U	5U	5U	5U	5U	5U
1,2,3-Trichloropropane	5U	5U	5U	5U	5U	5U	5U	5U
Vinyl acetate	10U	10U	10U	10U	10U	10U	10U	10U
Vinyl chloride	10U	10U	10U	10U	10U	10U	10U	10U

(CONTINUED)

APPENDIX D.3
Organic Analytes, CY 1997

Sampling Point	BCK-10.60		BCK-11.97		GW-040		GW-042	
Program	EXP		EXP		CMP-B		CMP-B	
Location	EXP-SW		EXP-SW		BG		BG	
Date Sampled	02/04/97	08/29/97	02/04/97	08/29/97	01/22/97	09/02/97	01/31/97	09/02/97
ORGANIC COMPOUNDS (ug/L)								
Acetone	10U	10U	10U	10U	10U	7	10U	10U
Acrolein	10U	10U	10U	10U	10U	10U	10U	10U
Acrylonitrile	10U	10U	10U	10U	10U	10U	10U	10U
Benzene	5U	5U	5U	5U	5U	5U	5U	5U
Bromochloromethane		10U		10U		10U		10U
Bromodichloromethane	5U	5U	5U	5U	5U	5U	5U	5U
Bromoform	5U	5U	5U	5U	5U	5U	5U	5U
Bromomethane	10U	10U	10U	10U	10U	10U	10U	10U
2-Butanone	10U	5	10U	10U	10U	3	10U	10U
Carbon disulfide	5U	5U	5U	5U	5U	5U	5U	5U
Carbon tetrachloride	5U	5U	5U	5U	5U	5U	5U	5U
Chlorobenzene	5U	5U	5U	5U	5U	5U	5U	5U
Chloroethane	10U	10U	10U	10U	10U	10U	10U	10U
2-Chloroethyl vinyl ether	10U	10U	10U	10U	10U	10U	10U	10U
Chloroform	5U	5U	5U	5U	5U	5U	5U	5U
Chloromethane	10U	10U	10U	10U	10U	10U	10U	10U
Dibromochloromethane	5U	5U	5U	5U	5U	5U	5U	5U
1,2-Dibromo-3-chloropropane		10U		10U		10U		10U
1,2-Dibromoethane	5U	5U	5U	5U	5U	5U	5U	5U
Dibromomethane	10U	10U	10U	10U	10U	10U	10U	10U
1,2-Dichlorobenzene		5U		5U		5U		5U
1,4-Dichlorobenzene		5U		5U		5U		5U
1,4-Dichloro-2-butene	5U	5U	5U	5U	5U	5U	5U	5U
trans-1,4-Dichloro-2-butene	5U	5U	5U	5U	5U	5U	5U	5U
Dichlorodifluoromethane	5U	5U	5U	5U	5U	5U	5U	5U
1,1-Dichloroethane	5U	5U	5U	5U	5U	5U	5U	5U
1,2-Dichloroethane	5U	5U	5U	5U	5U	5U	5U	5U
1,1-Dichloroethene	5U	5U	5U	5U	5U	5U	5U	5U
1,2-Dichloroethene	5U	5U	5U	5U	5U	5U	5U	5U
cis-1,2-Dichloroethene	5U	5U	5U	5U	5U	5U	5U	5U
trans-1,2-Dichloroethene	5U	5U	5U	5U	5U	5U	5U	5U
1,2-Dichloropropane	5U	5U	5U	5U	5U	5U	5U	5U
cis-1,3-Dichloropropene	5U	5U	5U	5U	5U	5U	5U	5U
trans-1,3-Dichloropropene	5U	5U	5U	5U	5U	5U	5U	5U
Dimethylbenzene	5U	5U	5U	5U	5U	5U	5U	5U
Ethanol	500U	500U	500U	500U	500U	500U	500U	500U
Ethylbenzene	5U	5U	5U	5U	5U	5U	5U	5U
Ethyl methacrylate	5U	5U	5U	5U	5U	5U	5U	5U
2-Hexanone	10U	10U	10U	10U	10U	10U	10U	10U
Iodomethane	5U	5U	5U	5U	5U	5U	5U	5U
4-Methyl-2-pentanone	10U	10U	10U	10U	10U	10U	10U	10U
Methylene chloride	5U	5U	5U	5U	5U	5U	5U	5U
Styrene	5U	5U	5U	5U	5U	5U	5U	5U
1,1,1,2-Tetrachloroethane	10U	10U	10U	10U		10U	10U	10U
1,1,2,2-Tetrachloroethane	5U	5U	5U	5U	5U	5U	5U	5U
Tetrachloroethene	5U	5U	5U	5U	5U	5U	5U	5U
Toluene	5U	5U	5U	5U	5U	5U	5U	5U
1,1,1-Trichloroethane	5U	5U	5U	5U	5U	5U	5U	5U
1,1,2-Trichloroethane	5U	5U	5U	5U	5U	5U	5U	5U
Trichloroethene	5U	5U	5U	5U	5U	5U	5U	5U
Trichlorofluoromethane	5U	5U	5U	5U	5U	5U	5U	5U
1,2,3-Trichloropropane	5U	5U	5U	5U	5U	5U	5U	5U
Vinyl acetate	10U	10U	10U	10U	10U	10U	10U	10U
Vinyl chloride	10U	10U	10U	10U	10U	10U	10U	10U

(CONTINUED)

APPENDIX D.3
Organic Analytes, CY 1997

Sampling Point	GW-043		GW-044		GW-053		GW-056	
Program	CMP-B		CMP-B		SMP		EXP	
Location	OLF		OLF		BG		EXP-A	
Date Sampled	01/23/97	08/13/97	01/23/97	08/11/97	02/06/97	09/03/97	02/13/97	08/19/97
ORGANIC COMPOUNDS (ug/L)								
Acetone	10U	2	10U	1	10U	4	10U	10U
Acrolein	10U	10U	10U	10U	10U	10U	10U	10U
Acrylonitrile	10U	10U	10U	10U	10U	10U	10U	10U
Benzene	5U	5U	5U	5U	5U	5U	5U	5U
Bromochloromethane		10U		10U		10U		10U
Bromodichloromethane	5U	5U	5U	5U	5U	5U	5U	5U
Bromoform	5U	5U	5U	5U	5U	5U	5U	5U
Bromomethane	10U	10U	10U	10U	10U	10U	10U	10U
2-Butanone	10U	10U	10U	10U	10U	8	10U	10U
Carbon disulfide	5U	5U	5U	5U	5U	5U	5U	5U
Carbon tetrachloride	5U	5U	5U	5U	5U	5U	5U	5U
Chlorobenzene	5U	5U	5U	5U	5U	5U	5U	5U
Chloroethane	10U	10U	10U	10U	10U	10U	10U	10U
2-Chloroethyl vinyl ether	10U	10U	10U	10U	10U	10U	10U	10U
Chloroform	5U	5U	5U	5U	5U	5U	5U	5U
Chloromethane	10U	10U	10U	10U	10U	10U	10U	10U
Dibromochloromethane	5U	5U	5U	5U	5U	5U	5U	5U
1,2-Dibromo-3-chloropropane		10U		10U		10U		10U
1,2-Dibromoethane	5U	5U	5U	5U	5U	5U	5U	5U
Dibromomethane	10U	10U	10U	10U	10U	10U	10U	10U
1,2-Dichlorobenzene		5U		5U		5U		5U
1,4-Dichlorobenzene		5U		5U		5U		5U
1,4-Dichloro-2-butene	5U	5U	5U	5U	5U	5U	5U	5U
trans-1,4-Dichloro-2-butene	5U	5U	5U	5U	5U	5U	5U	5U
Dichlorodifluoromethane	5U	5U	5U	5U	5U	5U	5U	5U
1,1-Dichloroethane	5U	5U	5U	5U	7	7	5U	5U
1,2-Dichloroethane	5U	5U	5U	5U	5U	5U	5U	5U
1,1-Dichloroethene	5U	5U	5U	5U	5U	5U	5U	5U
1,2-Dichloroethene	5U	5U	5U	5U	11	15	5U	5U
cis-1,2-Dichloroethene	5U	5U	5U	5U	11	15	5U	5U
trans-1,2-Dichloroethene	5U	5U	5U	5U	5U	5U	5U	5U
1,2-Dichloropropane	5U	5U	5U	5U	5U	5U	5U	5U
cis-1,3-Dichloropropene	5U	5U	5U	5U	5U	5U	5U	5U
trans-1,3-Dichloropropene	5U	5U	5U	5U	5U	5U	5U	5U
Dimethylbenzene	5U	5U	5U	5U	5U	5U	5U	5U
Ethanol	500U	500U	500U	500U	500U	500U	500U	500U
Ethylbenzene	5U	5U	5U	5U	5U	5U	5U	5U
Ethyl methacrylate	5U	5U	5U	5U	5U	5U	5U	5U
2-Hexanone	10U	10U	10U	10U	10U	10U	10U	10U
Iodomethane	5U	5U	5U	5U	5U	5U	5U	5U
4-Methyl-2-pentanone	10U	10U	10U	10U	10U	10U	10U	10U
Methylene chloride	5U	5U	5U	5U	5U	5U	5U	5U
Styrene	5U	5U	5U	5U	5U	5U	5U	5U
1,1,1,2-Tetrachloroethane		10U		10U	10U	10U	10U	10U
1,1,2,2-Tetrachloroethane	5U	5U	5U	5U	5U	5U	5U	5U
Tetrachloroethene	5U	5U	5U	5U	1	5U	5U	5U
Toluene	5U	5U	5U	5U	5U	5U	5U	5U
1,1,1-Trichloroethane	5U	5U	5U	5U	5U	5U	5U	5U
1,1,2-Trichloroethane	5U	5U	5U	5U	5U	5U	5U	5U
Trichloroethene	5U	5U	5U	5U	3	2	5U	5U
Trichlorofluoromethane	5U	5U	5U	5U	5U	5U	5U	5U
1,2,3-Trichloropropane	5U	5U	5U	5U	5U	5U	5U	5U
Vinyl acetate	10U	10U	10U	10U	10U	10U	10U	10U
Vinyl chloride	10U	10U	10U	10U	6	6	10U	10U

(CONTINUED)

APPENDIX D.3
Organic Analytes, CY 1997

Sampling Point	GW-069		GW-079		GW-080		GW-084	
Program	CMP-C		CMP-B		CMP-B		CMP-B	
Location	BG		BG		BG		OLF	
Date Sampled	01/22/97	08/18/97	01/23/97	08/18/97	01/21/97	08/14/97	01/27/97	08/13/97
ORGANIC COMPOUNDS (ug/L)								
Acetone	10U	10U	10U	10U	10U	10U	10U	2
Acrolein	10U	10U	10U	10U	10U	10U	10U	10U
Acrylonitrile	10U	10U	10U	10U	10U	10U	10U	10U
Benzene	5U	5U	5U	5U	5U	5U	5U	5U
Bromochloromethane		10U		10U		10U		10U
Bromodichloromethane	5U	5U	5U	5U	5U	5U	5U	5U
Bromoform	5U	5U	5U	5U	5U	5U	5U	5U
Bromomethane	10U	10U	10U	10U	10U	10U	10U	10U
2-Butanone	10U	10U	10U	10U	10U	10U	10U	10U
Carbon disulfide	5U	5U	5U	5U	5U	5U	5U	5U
Carbon tetrachloride	5U	5U	5U	5U	5U	5U	5U	5U
Chlorobenzene	5U	5U	5U	5U	5U	5U	5U	5U
Chloroethane	10U	10U	10U	10U	10U	10U	10U	10U
2-Chloroethyl vinyl ether	10U	10U	10U	10U	10U	10U	10U	10U
Chloroform	5U	5U	5U	5U	5U	5U	5U	5U
Chloromethane	10U	10U	10U	10U	10U	10U	10U	10U
Dibromochloromethane	5U	5U	5U	5U	5U	5U	5U	5U
1,2-Dibromo-3-chloropropane		10U		10U		10U		10U
1,2-Dibromoethane	5U	5U	5U	5U	5U	5U	5U	5U
Dibromomethane	10U	10U	10U	10U	10U	10U	10U	10U
1,2-Dichlorobenzene		5U		5U		5U		5U
1,4-Dichlorobenzene		5U		5U		5U		5U
1,4-Dichloro-2-butene	5U	5U	5U	5U	5U	5U	5U	5U
trans-1,4-Dichloro-2-butene	5U	5U	5U	5U	5U	5U	5U	5U
Dichlorodifluoromethane	5U	5U	5U	5U	5U	5U	5U	5U
1,1-Dichloroethane	5U	5U	5U	5U	5U	5U	5U	5U
1,2-Dichloroethane	5U	5U	5U	5U	5U	5U	5U	5U
1,1-Dichloroethene	5U	5U	5U	5U	5U	5U	5U	5U
1,2-Dichloroethene	5U	5U	5U	5U	5U	5U	5U	5U
cis-1,2-Dichloroethene	5U	5U	5U	5U	5U	5U	5U	5U
trans-1,2-Dichloroethene	5U	5U	5U	5U	5U	5U	5U	5U
1,2-Dichloropropane	5U	5U	5U	5U	5U	5U	5U	5U
cis-1,3-Dichloropropene	5U	5U	5U	5U	5U	5U	5U	5U
trans-1,3-Dichloropropene	5U	5U	5U	5U	5U	5U	5U	5U
Dimethylbenzene	5U	5U	5U	5U	5U	5U	5U	5U
Ethanol	500U	500U	500U	500U	500U	500U	500U	500U
Ethylbenzene	5U	5U	5U	5U	5U	5U	5U	5U
Ethyl methacrylate	5U	5U	5U	5U	5U	5U	5U	5U
2-Hexanone	10U	10U	10U	10U	10U	10U	10U	10U
Iodomethane	5U	5U	5U	5U	5U	5U	5U	5U
4-Methyl-2-pentanone	10U	10U	10U	10U	10U	10U	10U	10U
Methylene chloride	5U	5U	5U	5U	5U	5U	5U	5U
Styrene	5U	5U	5U	5U	5U	5U	5U	5U
1,1,1,2-Tetrachloroethane		10U		10U		10U	10U	10U
1,1,2,2-Tetrachloroethane	5U	5U	5U	5U	5U	5U	5U	5U
Tetrachloroethene	5U	5U	5U	5U	5U	5U	5U	5U
Toluene	5U	5U	5U	5U	5U	5U	5U	5U
1,1,1-Trichloroethane	5U	5U	5U	5U	5U	5U	5U	5U
1,1,2-Trichloroethane	5U	5U	5U	5U	5U	5U	5U	5U
Trichloroethene	5U	5U	5U	5U	5U	5U	5U	5U
Trichlorofluoromethane	5U	5U	5U	5U	5U	5U	5U	5U
1,2,3-Trichloropropane	5U	5U	5U	5U	5U	5U	5U	5U
Vinyl acetate	10U	10U	10U	10U	10U	10U	10U	10U
Vinyl chloride	10U	3	10U	10U	10U	10U	10U	10U

(CONTINUED)

APPENDIX D.3
Organic Analytes, CY 1997

Sampling Point	GW-085			GW-115		GW-162		
Program	SMP			CMP-B		CMP-B		
Location	OLF			S3		BG		
Date Sampled	03/05/97		09/17/97	01/22/97	08/11/97	01/24/97	08/19/97	
		DUP						DUP
ORGANIC COMPOUNDS (ug/L)								
Acetone	10U	10U	2	10U	10U	10U	10U	10U
Acrolein	10U	10U	10U	10U	10U	10U	10U	10U
Acrylonitrile	10U	10U	10U	10U	10U	10U	10U	10U
Benzene	5U	5U	5U	5U	5U	5U	5U	5U
Bromochloromethane			10U		10U		10U	10U
Bromodichloromethane	5U	5U	5U	5U	5U	5U	5U	5U
Bromoform	5U	5U	5U	5U	5U	5U	5U	5U
Bromomethane	10U	10U	10U	10U	10U	10U	10U	10U
2-Butanone	10U	10U	6	10U	10U	10U	10U	10U
Carbon disulfide	5U	5U	5U	5U	5U	5U	5U	5U
Carbon tetrachloride	5U	5U	5U	5U	5U	5U	5U	5U
Chlorobenzene	5U	5U	5U	5U	5U	5U	5U	5U
Chloroethane	10U	10U	10U	10U	10U	10U	10U	10U
2-Chloroethyl vinyl ether	10U	10U	10U	10U	10U	10U	10U	10U
Chloroform	5U	5U	2	5U	5U	5U	5U	5U
Chloromethane	10U	10U	10U	10U	10U	10U	10U	10U
Dibromochloromethane	5U	5U	5U	5U	5U	5U	5U	5U
1,2-Dibromo-3-chloropropane			10U		10U		10U	10U
1,2-Dibromoethane	5U	5U	5U	5U	5U	5U	5U	5U
Dibromomethane	10U	10U	10U	10U	10U	10U	10U	10U
1,2-Dichlorobenzene			5U		5U		5U	5U
1,4-Dichlorobenzene			5U		5U		5U	5U
1,4-Dichloro-2-butene	5U	5U	5U	5U	5U	5U	5U	5U
trans-1,4-Dichloro-2-butene	5U	5U	5U	5U	5U	5U	5U	5U
Dichlorodifluoromethane	5U	5U	5U	5U	5U	5U	5U	5U
1,1-Dichloroethane	5U	5U	5U	5U	5U	5U	5U	5U
1,2-Dichloroethane	5U	5U	5U	5U	5U	5U	5U	5U
1,1-Dichloroethene	5U	5U	5U	5U	5U	5U	5U	5U
1,2-Dichloroethene	5U	5U	5U	5U	5U	5U	5U	5U
cis-1,2-Dichloroethene	5U	5U	5U	5U	5U	5U	5U	5U
trans-1,2-Dichloroethene	5U	5U	5U	5U	5U	5U	5U	5U
1,2-Dichloropropane	5U	5U	5U	5U	5U	5U	5U	5U
cis-1,3-Dichloropropene	5U	5U	5U	5U	5U	5U	5U	5U
trans-1,3-Dichloropropene	5U	5U	5U	5U	5U	5U	5U	5U
Dimethylbenzene	5U	5U	5U	5U	5U	5U	5U	5U
Ethanol	500U	500U	500U	500U	500U	500U	500U	500U
Ethylbenzene	5U	5U	5U	5U	5U	5U	5U	5U
Ethyl methacrylate	5U	5U	5U	5U	5U	5U	5U	5U
2-Hexanone	10U	10U	10U	10U	10U	10U	10U	10U
Iodomethane	5U	5U	5U	5U	5U	5U	5U	5U
4-Methyl-2-pentanone	10U	10U	10U	10U	10U	10U	10U	10U
Methylene chloride	5U	5U	5U	5U	5U	5U	5U	5U
Styrene	5U	5U	5U	5U	5U	5U	5U	5U
1,1,1,2-Tetrachloroethane	10U	10U	10U		10U	10U	10U	10U
1,1,2,2-Tetrachloroethane	5U	5U	5U	5U	5U	5U	5U	5U
Tetrachloroethene	5U	5U	5U	5U	5U	5U	5U	5U
Toluene	5U	5U	5U	5U	5U	5U	5U	5U
1,1,1-Trichloroethane	5U	5U	5U	5U	5U	5U	5U	5U
1,1,2-Trichloroethane	5U	5U	5U	5U	5U	5U	5U	5U
Trichloroethene	5U	5U	5U	5U	5U	5U	5U	5U
Trichlorofluoromethane	5U	5U	5U	5U	5U	5U	5U	5U
1,2,3-Trichloropropane	5U	5U	5U	5U	5U	5U	5U	5U
Vinyl acetate	10U	10U	10U	10U	10U	10U	10U	10U
Vinyl chloride	10U	10U	10U	10U	10U	10U	10U	10U

(CONTINUED)

APPENDIX D.3
Organic Analytes, CY 1997

Sampling Point	GW-276		GW-287		GW-311		GW-315	
Program	CMP-C		SMP		SMP		SMP	
Location	S3		BG		RS		SPI	
Date Sampled	01/28/97	08/13/97	02/06/97	09/03/97	03/04/97	09/19/97	03/05/97	09/16/97
ORGANIC COMPOUNDS (ug/L)								
Acetone	10U	4	10U	10U	7	18	10U	47
Acrolein	10U	10U	10U	10U	10U	10U	10U	10U
Acrylonitrile	10U	10U	10U	10U	10U	10U	10U	10U
Benzene	5U	5U	5U	5U	5U	5U	5U	5U
Bromochloromethane		10U		10U		10U		10U
Bromodichloromethane	5U	5U	5U	5U	5U	5U	5U	5U
Bromoform	5U	5U	5U	5U	5U	5U	5U	5U
Bromomethane	10U	10U	10U	10U	10U	10U	10U	10U
2-Butanone	10U	2	10U	10U	10U	6	10U	3
Carbon disulfide	5U	5U	5U	5U	5U	5U	5U	5U
Carbon tetrachloride	5U	5U	5U	5U	1	1	5U	5U
Chlorobenzene	5U	5U	5U	5U	5U	5U	5U	5U
Chloroethane	10U	10U	10U	10U	10U	10U	10U	10U
2-Chloroethyl vinyl ether	10U	10U	10U	10U	10U	10U	10U	10U
Chloroform	5U	1	5U	5U	5U	1	5U	1
Chloromethane	10U	10U	10U	10U	10U	10U	10U	10U
Dibromochloromethane	5U	5U	5U	5U	5U	5U	5U	5U
1,2-Dibromo-3-chloropropane		10U		10U		10U		10U
1,2-Dibromoethane	5U	5U	5U	5U	5U	5U	5U	5U
Dibromomethane	10U	10U	10U	10U	10U	10U	10U	10U
1,2-Dichlorobenzene		5U		5U		5U		5U
1,4-Dichlorobenzene		5U		5U		5U		5U
1,4-Dichloro-2-butene	5U	5U	5U	5U	5U	5U	5U	5U
trans-1,4-Dichloro-2-butene	5U	5U	5U	5U	5U	5U	5U	5U
Dichlorodifluoromethane	5U	5U	5U	5U	5U	5U	5U	5U
1,1-Dichloroethane	5U	5U	5U	5U	5U	5U	5U	5U
1,2-Dichloroethane	5U	5U	5U	5U	5U	5U	5U	5U
1,1-Dichloroethene	5U	5U	5U	5U	5U	5U	5U	5U
1,2-Dichloroethene	5U	5U	5U	5U	5U	5U	4	5
cis-1,2-Dichloroethene	5U	5U	5U	5U	5U	5U	4	5
trans-1,2-Dichloroethene	5U	5U	5U	5U	5U	5U	5U	5U
1,2-Dichloropropane	5U	5U	5U	5U	5U	5U	5U	5U
cis-1,3-Dichloropropene	5U	5U	5U	5U	5U	5U	5U	5U
trans-1,3-Dichloropropene	5U	5U	5U	5U	5U	5U	5U	5U
Dimethylbenzene	5U	5U	5U	5U	5U	5U	5U	5U
Ethanol	500U	500U	500U	500U	500U	500U	500U	500U
Ethylbenzene	5U	5U	5U	5U	5U	5U	5U	5U
Ethyl methacrylate	5U	5U	5U	5U	5U	5U	5U	5U
2-Hexanone	10U	10U	10U	10U	10U	10U	10U	10U
Iodomethane	5U	5U	5U	5U	5U	5U	5U	5U
4-Methyl-2-pentanone	10U	10U	10U	10U	10U	10U	10U	10U
Methylene chloride	5U	5U	5U	5U	5U	5U	5U	5U
Styrene	5U	5U	5U	5U	5U	5U	5U	5U
1,1,1,2-Tetrachloroethane	10U	10U	10U	10U	10U	10U	10U	10U
1,1,2,2-Tetrachloroethane	5U	5U	5U	5U	5U	5U	5U	5U
Tetrachloroethene	24	23	5	3	5U	5U	14	19
Toluene	5U	5U	5U	5U	5U	5U	5U	5U
1,1,1-Trichloroethane	5U	5U	5U	5U	5U	5U	5U	5U
1,1,2-Trichloroethane	5U	5U	5U	5U	5U	5U	5U	5U
Trichloroethene	5U	5U	5U	5U	10	12	6	7
Trichlorofluoromethane	5U	5U	5U	5U	5U	5U	5U	5U
1,2,3-Trichloropropane	5U	5U	5U	5U	5U	5U	5U	5U
Vinyl acetate	10U	10U	10U	10U	10U	10U	10U	10U
Vinyl chloride	10U	10U	10U	10U	10U	10U	10U	10U

(CONTINUED)

APPENDIX D.3
Organic Analytes, CY 1997

Sampling Point	GW-363			GW-372			GW-373	
Program	CMP-C			CMP-B			CMP-B	
Location	OLF			BG			BG	
Date Sampled	01/29/97		08/14/97	01/27/97		08/14/97	01/27/97	08/20/97
		DUP			DUP			
ORGANIC COMPOUNDS (ug/L)								
Acetone	10U	10U	2	10U	10U	10U	10U	10U
Acrolein	10U	10U	10U	10U	10U	10U	10U	10U
Acrylonitrile	10U	10U	10U	10U	10U	10U	10U	10U
Benzene	5U	5U	5U	5U	5U	5U	5U	5U
Bromochloromethane			10U			10U		10U
Bromodichloromethane	5U	5U	5U	5U	5U	5U	5U	5U
Bromoform	5U	5U	5U	5U	5U	5U	5U	5U
Bromomethane	10U	10U	10U	10U	10U	10U	10U	10U
2-Butanone	10U	10U	10U	10U	10U	10U	10U	10U
Carbon disulfide	5U	5U	5U	5U	5U	5U	5U	5U
Carbon tetrachloride	5U	5U	5U	5U	5U	5U	5U	5U
Chlorobenzene	5U	5U	5U	5U	5U	5U	5U	5U
Chloroethane	10U	10U	10U	10U	10U	10U	10U	10U
2-Chloroethyl vinyl ether	10U	10U	10U	10U	10U	10U	10U	10U
Chloroform	5U	5U	5U	5U	5U	5U	5U	5U
Chloromethane	10U	10U	10U	10U	10U	10U	10U	10U
Dibromochloromethane	5U	5U	5U	5U	5U	5U	5U	5U
1,2-Dibromo-3-chloropropane			10U			10U		10U
1,2-Dibromoethane	5U	5U	5U	5U	5U	5U	5U	5U
Dibromomethane	10U	10U	10U	10U	10U	10U	10U	10U
1,2-Dichlorobenzene			5U			5U		5U
1,4-Dichlorobenzene			5U			5U		5U
1,4-Dichloro-2-butene	5U	5U	5U	5U	5U	5U	5U	5U
trans-1,4-Dichloro-2-butene	5U	5U	5U	5U	5U	5U	5U	5U
Dichlorodifluoromethane	5U	5U	5U	5U	5U	5U	5U	5U
1,1-Dichloroethane	5U	5U	5U	5U	5U	5U	5U	5U
1,2-Dichloroethane	5U	5U	5U	5U	5U	5U	5U	5U
1,1-Dichloroethene	5U	5U	5U	5U	5U	5U	5U	5U
1,2-Dichloroethene	5U	5U	5U	5U	5U	5U	5U	5U
cis-1,2-Dichloroethene	5U	5U	5U	5U	5U	5U	5U	5U
trans-1,2-Dichloroethene	5U	5U	5U	5U	5U	5U	5U	5U
1,2-Dichloropropane	5U	5U	5U	5U	5U	5U	5U	5U
cis-1,3-Dichloropropene	5U	5U	5U	5U	5U	5U	5U	5U
trans-1,3-Dichloropropene	5U	5U	5U	5U	5U	5U	5U	5U
Dimethylbenzene	5U	5U	5U	5U	5U	5U	5U	5U
Ethanol	500U	500U	500U	500U	500U	500U	500U	500U
Ethylbenzene	5U	5U	5U	5U	5U	5U	5U	5U
Ethyl methacrylate	5U	5U	5U	5U	5U	5U	5U	5U
2-Hexanone	10U	10U	10U	10U	10U	10U	10U	10U
Iodomethane	5U	5U	5U	5U	5U	5U	5U	5U
4-Methyl-2-pentanone	10U	10U	10U	10U	10U	10U	10U	10U
Methylene chloride	5U	5U	5U	5U	5U	5U	5U	5U
Styrene	5U	5U	5U	5U	5U	5U	5U	5U
1,1,1,2-Tetrachloroethane	10U	10U	10U	10U	10U	10U	10U	10U
1,1,2,2-Tetrachloroethane	5U	5U	5U	5U	5U	5U	5U	5U
Tetrachloroethene	5U	5U	5U	5U	5U	5U	5U	5U
Toluene	5U	5U	5U	5U	5U	5U	5U	5U
1,1,1-Trichloroethane	5U	5U	5U	5U	5U	5U	5U	5U
1,1,2-Trichloroethane	5U	5U	5U	5U	5U	5U	5U	5U
Trichloroethene	5U	5U	5U	5U	5U	5U	5U	5U
Trichlorofluoromethane	5U	5U	5U	5U	5U	5U	5U	5U
1,2,3-Trichloropropane	5U	5U	5U	5U	5U	5U	5U	5U
Vinyl acetate	10U	10U	10U	10U	10U	10U	10U	10U
Vinyl chloride	10U	10U	10U	10U	10U	10U	10U	10U

(CONTINUED)

APPENDIX D.3
Organic Analytes, CY 1997

Sampling Point	GW-521		GW-537			GW-613		GW-614
Program	SDM/C		SMP			CMP-B		CMP-B
Location	LIV		OLF			S3		S3
Date Sampled	01/07/97	07/21/97	03/04/97	09/17/97		01/22/97	08/11/97	01/27/97
					DUP			
ORGANIC COMPOUNDS (ug/L)								
Acetone	10U	4	6	6	3	10U	10U	10U
Acrolein	10U	10U	10U	10U	10U	10U	10U	10U
Acrylonitrile	10U	10U	10U	10U	10U	10U	10U	10U
Benzene	5U	5U	5U	5U	5U	5U	5U	5U
Bromochloromethane	10U	10U		10U	10U		10U	
Bromodichloromethane	5U	5U	5U	5U	5U	5U	5U	5U
Bromoform	5U	5U	5U	5U	5U	5U	5U	5U
Bromomethane	10U	10U	10U	10U	10U	10U	10U	10U
2-Butanone	10U	6	10U	5	6	10U	10U	10U
Carbon disulfide	5U	5U	5U	5U	5U	5U	5U	5U
Carbon tetrachloride	5U	5U	5U	5U	5U	5U	5U	5U
Chlorobenzene	5U	5U	5U	5U	5U	5U	5U	5U
Chloroethane	10U	10U	10U	10U	10U	10U	10U	10U
2-Chloroethyl vinyl ether	10U	10U	10U	10U	10U	10U	10U	10U
Chloroform	5U	5U	2	2	2	5U	5U	5U
Chloromethane	10U	10U	10U	10U	10U	10U	10U	10U
Dibromochloromethane	5U	5U	5U	5U	5U	5U	5U	5U
1,2-Dibromo-3-chloropropane	10U	10U		10U	10U		10U	
1,2-Dibromoethane	5U	5U	5U	5U	5U	5U	5U	5U
Dibromomethane	10U	10U	10U	10U	10U	10U	10U	10U
1,2-Dichlorobenzene	5U	5U		5U	5U		5U	
1,4-Dichlorobenzene	5U	5U		5U	5U		5U	
1,4-Dichloro-2-butene	5U	5U	5U	5U	5U	5U	5U	5U
trans-1,4-Dichloro-2-butene	5U	5U	5U	5U	5U	5U	5U	5U
Dichlorodifluoromethane	5U	5U	5U	5U	5U	5U	5U	5U
1,1-Dichloroethane	5U	5U	5U	5U	5U	5U	5U	5U
1,2-Dichloroethane	5U	5U	5U	5U	5U	5U	5U	5U
1,1-Dichloroethene	5U	5U	5U	5U	5U	5U	5U	5U
1,2-Dichloroethene	5U	5U	5U	5U	5U	5U	5U	5U
cis-1,2-Dichloroethene	5U	5U	5U	5U	5U	5U	5U	5U
trans-1,2-Dichloroethene	5U	5U	5U	5U	5U	5U	5U	5U
1,2-Dichloropropane	5U	5U	5U	5U	5U	5U	5U	5U
cis-1,3-Dichloropropene	5U	5U	5U	5U	5U	5U	5U	5U
trans-1,3-Dichloropropene	5U	5U	5U	5U	5U	5U	5U	5U
Dimethylbenzene	5U	5U	5U	5U	5U	5U	5U	5U
Ethanol	500U	500U	500U	500U	500U	500U	500U	500U
Ethylbenzene	5U	5U	5U	5U	5U	5U	5U	5U
Ethyl methacrylate	5U	5U	5U	5U	5U	5U	5U	5U
2-Hexanone	10U	10U	10U	10U	10U	10U	10U	10U
Iodomethane	5U	5U	5U	5U	5U	5U	5U	5U
4-Methyl-2-pentanone	10U	10U	10U	10U	10U	10U	10U	10U
Methylene chloride	5U	5U	5U	5U	5U	5U	5U	5U
Styrene	5U	5U	5U	5U	5U	5U	5U	5U
1,1,1,2-Tetrachloroethane	10U	10U	10U	10U	10U		10U	10U
1,1,2,2-Tetrachloroethane	5U	5U	5U	5U	5U	5U	5U	5U
Tetrachloroethene	5U	5U	5U	5U	5U	5U	5U	5U
Toluene	5U	5U	5U	5U	5U	5U	5U	5U
1,1,1-Trichloroethane	5U	5U	5U	5U	5U	5U	5U	5U
1,1,2-Trichloroethane	5U	5U	5U	5U	5U	5U	5U	5U
Trichloroethene	5U	5U	5U	5U	5U	5U	5U	5U
Trichlorofluoromethane	5U	5U	5U	5U	5U	5U	5U	5U
1,2,3-Trichloropropane	5U	5U	5U	5U	5U	5U	5U	5U
Vinyl acetate	10U	10U	10U	10U	10U	10U	10U	10U
Vinyl chloride	10U	10U	10U	10U	10U	10U	10U	10U

(CONTINUED)

APPENDIX D.3
Organic Analytes, CY 1997

Sampling Point	GW-614		GW-621		GW-627			
Program	CMP-B		EXP		SMP			
Location	S3		EXP-B		BG			
Date Sampled	08/14/97		02/17/97	08/21/97	02/08/97		09/09/97	
		DUP				DUP		DUP
ORGANIC COMPOUNDS (ug/L)								
Acetone	3	10U	10U	2	77	59	10U	10U
Acrolein	10U	10U	10U	10U	10U	10U	10U	10U
Acrylonitrile	10U	10U	10U	10U	10U	10U	10U	10U
Benzene	5U	5U	5U	5U	5U	5U	5U	5U
Bromochloromethane	10U	10U		10U			10U	10U
Bromodichloromethane	5U	5U	5U	5U	5U	5U	5U	5U
Bromoform	5U	5U	5U	5U	5U	5U	5U	5U
Bromomethane	10U	10U	10U	10U	10U	10U	10U	10U
2-Butanone	10U	10U	10U	6	10U	10U	10U	10U
Carbon disulfide	5U	5U	5U	5U	5U	5U	5U	5U
Carbon tetrachloride	5U	5U	5U	5U	5U	5U	5U	5U
Chlorobenzene	5U	5U	5U	5U	5U	5U	5U	5U
Chloroethane	10U	10U	10U	10U	10U	10U	10U	10U
2-Chloroethyl vinyl ether	10U	10U	10U	10U	10U	10U	10U	10U
Chloroform	5U	5U	5U	5U	5U	5U	5U	5U
Chloromethane	10U	10U	10U	10U	10U	10U	10U	10U
Dibromochloromethane	5U	5U	5U	5U	5U	5U	5U	5U
1,2-Dibromo-3-chloropropane	10U	10U		10U			10U	10U
1,2-Dibromoethane	5U	5U	5U	5U	5U	5U	5U	5U
Dibromomethane	10U	10U	10U	10U	10U	10U	10U	10U
1,2-Dichlorobenzene	5U	5U		5U			5U	5U
1,4-Dichlorobenzene	5U	5U		5U			5U	5U
1,4-Dichloro-2-butene	5U	5U	5U	5U	5U	5U	5U	5U
trans-1,4-Dichloro-2-butene	5U	5U	5U	5U	5U	5U	5U	5U
Dichlorodifluoromethane	5U	5U	5U	5U	5U	5U	5U	5U
1,1-Dichloroethane	5U	5U	5U	5U	8	9	7	8
1,2-Dichloroethane	5U	5U	5U	5U	5U	5U	5U	5U
1,1-Dichloroethene	5U	5U	5U	5U	3	3	1	5U
1,2-Dichloroethene	5U	5U	5U	5U	5U	5U	5U	5U
cis-1,2-Dichloroethene	5U	5U	5U	5U	5U	5U	5U	5U
trans-1,2-Dichloroethene	5U	5U	5U	5U	5U	5U	5U	5U
1,2-Dichloropropane	5U	5U	5U	5U	5U	5U	5U	5U
cis-1,3-Dichloropropene	5U	5U	5U	5U	5U	5U	5U	5U
trans-1,3-Dichloropropene	5U	5U	5U	5U	5U	5U	5U	5U
Dimethylbenzene	5U	5U	5U	5U	5U	5U	5U	5U
Ethanol	500U	500U	500U	500U	500U	500U	500U	500U
Ethylbenzene	5U	5U	5U	5U	5U	5U	5U	5U
Ethyl methacrylate	5U	5U	5U	5U	5U	5U	5U	5U
2-Hexanone	10U	10U	10U	10U	10U	10U	10U	10U
Iodomethane	5U	5U	5U	5U	5U	5U	5U	5U
4-Methyl-2-pentanone	10U	10U	10U	10U	10U	10U	10U	10U
Methylene chloride	5U	5U	5U	5U	5U	5U	5U	5U
Styrene	5U	5U	5U	5U	5U	5U	5U	5U
1,1,1,2-Tetrachloroethane	10U	10U	10U	10U	10U	10U	10U	10U
1,1,2,2-Tetrachloroethane	5U	5U	5U	5U	5U	5U	5U	5U
Tetrachloroethene	5U	5U	5U	5U	83	82	84	90
Toluene	5U	5U	5U	5U	5U	5U	5U	5U
1,1,1-Trichloroethane	5U	5U	5U	5U	5U	5U	5U	5U
1,1,2-Trichloroethane	5U	5U	5U	5U	5U	5U	5U	5U
Trichloroethene	5U	5U	5U	5U	16	16	15	17
Trichlorofluoromethane	5U	5U	5U	5U	5U	5U	5U	5U
1,2,3-Trichloropropane	5U	5U	5U	5U	5U	5U	5U	5U
Vinyl acetate	10U	10U	10U	10U	10U	10U	10U	10U
Vinyl chloride	10U	10U	10U	10U	10U	10U	1	1

(CONTINUED)

APPENDIX D.3
Organic Analytes, CY 1997

Sampling Point	GW-642		GW-653		GW-683		GW-684	
Program	CMP-B		SMP		EXP		EXP	
Location	BG		BG		EXP-A		EXP-A	
Date Sampled	01/21/97	08/14/97	02/06/97	09/03/97	02/17/97	08/21/97	02/18/97	08/21/97
ORGANIC COMPOUNDS (ug/L)								
Acetone	10U	2	10U	2	10U	3	10U	3
Acrolein	10U	10U	10U	10U	10U	10U	10U	10U
Acrylonitrile	10U	10U	10U	10U	10U	10U	10U	10U
Benzene	5U	5U	5U	5U	5U	5U	5U	5U
Bromochloromethane		10U		10U		10U		10U
Bromodichloromethane	5U	5U	5U	5U	5U	5U	5U	5U
Bromoform	5U	5U	5U	5U	5U	5U	5U	5U
Bromomethane	10U	10U	10U	10U	10U	10U	10U	10U
2-Butanone	10U	10U	10U	6	10U	6	10U	6
Carbon disulfide	5U	5U	5U	5U	5U	5U	5U	5U
Carbon tetrachloride	5U	5U	5U	5U	5U	5U	5U	5U
Chlorobenzene	5U	5U	5U	5U	5U	5U	5U	5U
Chloroethane	10U	10U	10U	10U	10U	10U	10U	10U
2-Chloroethyl vinyl ether	10U	10U	10U	10U	10U	10U	10U	10U
Chloroform	5U	5U	5U	5U	5U	5U	5U	5U
Chloromethane	10U	10U	10U	10U	10U	10U	10U	10U
Dibromochloromethane	5U	5U	5U	5U	5U	5U	5U	5U
1,2-Dibromo-3-chloropropane		10U		10U		10U		10U
1,2-Dibromoethane	5U	5U	5U	5U	5U	5U	5U	5U
Dibromomethane	10U	10U	10U	10U	10U	10U	10U	10U
1,2-Dichlorobenzene		5U		5U		5U		5U
1,4-Dichlorobenzene		5U		5U		5U		5U
1,4-Dichloro-2-butene	5U	5U	5U	5U	5U	5U	5U	5U
trans-1,4-Dichloro-2-butene	5U	5U	5U	5U	5U	5U	5U	5U
Dichlorodifluoromethane	5U	5U	5U	5U	5U	5U	5U	5U
1,1-Dichloroethane	5U	5U	2	5U	5U	5U	5U	5U
1,2-Dichloroethane	5U	5U	5U	5U	5U	5U	5U	5U
1,1-Dichloroethene	5U	5U	1	5U	5U	5U	5U	5U
1,2-Dichloroethene	5U	5U	26	6	5U	5U	5U	5U
cis-1,2-Dichloroethene	5U	5U	26	6	5U	5U	5U	5U
trans-1,2-Dichloroethene	5U	5U	5U	5U	5U	5U	5U	5U
1,2-Dichloropropane	5U	5U	5U	5U	5U	5U	5U	5U
cis-1,3-Dichloropropene	5U	5U	5U	5U	5U	5U	5U	5U
trans-1,3-Dichloropropene	5U	5U	5U	5U	5U	5U	5U	5U
Dimethylbenzene	5U	5U	5U	5U	5U	5U	5U	5U
Ethanol	500U	500U	500U	500U	500U	500U	500U	500U
Ethylbenzene	5U	5U	5U	5U	5U	5U	5U	5U
Ethyl methacrylate	5U	5U	5U	5U	5U	5U	5U	5U
2-Hexanone	10U	10U	10U	10U	10U	10U	10U	10U
Iodomethane	5U	5U	5U	5U	5U	5U	5U	5U
4-Methyl-2-pentanone	10U	10U	10U	10U	10U	10U	10U	10U
Methylene chloride	5U	5U	5U	5U	5U	5U	5U	5U
Styrene	5U	5U	5U	5U	5U	5U	5U	5U
1,1,1,2-Tetrachloroethane		10U	10U	10U	10U	10U	10U	10U
1,1,2,2-Tetrachloroethane	5U	5U	5U	5U	5U	5U	5U	5U
Tetrachloroethene	5U	5U	3	5U	5U	5U	5U	5U
Toluene	5U	5U	5U	5U	5U	5U	5U	5U
1,1,1-Trichloroethane	5U	5U	1	5U	5U	5U	5U	5U
1,1,2-Trichloroethane	5U	5U	5U	5U	5U	5U	5U	5U
Trichloroethene	5U	5U	2	5U	5U	5U	5U	5U
Trichlorofluoromethane	5U	5U	5U	5U	5U	5U	5U	5U
1,2,3-Trichloropropane	5U	5U	5U	5U	5U	5U	5U	5U
Vinyl acetate	10U	10U	10U	10U	10U	10U	10U	10U
Vinyl chloride	10U	10U	10U	10U	10U	10U	10U	10U

(CONTINUED)

APPENDIX D.3
Organic Analytes, CY 1997

Sampling Point	GW-685			GW-695		GW-703		GW-704
Program	EXP			EXP		EXP		EXP
Location	EXP-A			EXP-B		EXP-B		EXP-B
Date Sampled	02/12/97	08/20/97		02/17/97	08/19/97	02/19/97	08/27/97	02/19/97
			DUP					
ORGANIC COMPOUNDS (ug/L)								
Acetone	9	10U	10U	94	9	12	5	9
Acrolein	10U	10U	10U	10U	10U	10U	10U	10U
Acrylonitrile	10U	10U	10U	10U	10U	10U	10U	10U
Benzene	5U	5U	5U	5U	5U	5U	5U	5U
Bromochloromethane		10U	10U		10U		10U	
Bromodichloromethane	5U	5U	5U	5U	5U	5U	5U	5U
Bromoform	5U	5U	5U	5U	5U	5U	5U	5U
Bromomethane	10U	10U	10U	10U	10U	10U	10U	10U
2-Butanone	10U	5	4	10U	10U	10U	9	10U
Carbon disulfide	5U	5U	5U	5U	5U	5U	5U	5U
Carbon tetrachloride	5U	5U	5U	5U	5U	5U	5U	2
Chlorobenzene	5U	5U	5U	5U	5U	5U	5U	5U
Chloroethane	10U	10U	10U	10U	10U	10U	10U	10U
2-Chloroethyl vinyl ether	10U	10U	10U	10U	10U	10U	10U	10U
Chloroform	5U	5U	5U	5U	5U	5U	5U	5U
Chloromethane	10U	10U	10U	10U	10U	10U	10U	10U
Dibromochloromethane	5U	5U	5U	5U	5U	5U	5U	5U
1,2-Dibromo-3-chloropropane		10U	10U		10U		10U	
1,2-Dibromoethane	5U	5U	5U	5U	5U	5U	5U	5U
Dibromomethane	10U	10U	10U	10U	10U	10U	10U	10U
1,2-Dichlorobenzene		5U	5U		5U		5U	
1,4-Dichlorobenzene		5U	5U		5U		5U	
1,4-Dichloro-2-butene	5U	5U	5U	5U	5U	5U	5U	5U
trans-1,4-Dichloro-2-butene	5U	5U	5U	5U	5U	5U	5U	5U
Dichlorodifluoromethane	5U	5U	5U	5U	5U	5U	5U	5U
1,1-Dichloroethane	5U	5U	5U	5U	5U	5U	5U	1
1,2-Dichloroethane	5U	5U	5U	5U	5U	5U	5U	5U
1,1-Dichloroethene	5U	5U	5U	5U	5U	3	5U	8
1,2-Dichloroethene	1	1	1	3	5U	5	3	3
cis-1,2-Dichloroethene	1	1	1	3	5U	5	3	3
trans-1,2-Dichloroethene	5U	5U	5U	5U	5U	5U	5U	5U
1,2-Dichloropropane	5U	5U	5U	5U	5U	5U	5U	5U
cis-1,3-Dichloropropene	5U	5U	5U	5U	5U	5U	5U	5U
trans-1,3-Dichloropropene	5U	5U	5U	5U	5U	5U	5U	5U
Dimethylbenzene	5U	5U	5U	5U	5U	13	5U	2
Ethanol	500U	500U	500U	500U	500U	500U	500U	500U
Ethylbenzene	5U	5U	5U	5U	5U	2	5U	5U
Ethyl methacrylate	5U	5U	5U	5U	5U	5U	5U	5U
2-Hexanone	10U	10U	10U	10U	10U	10U	10U	10U
Iodomethane	5U	5U	5U	5U	5U	2	5U	1
4-Methyl-2-pentanone	10U	10U	10U	10U	10U	1	10U	10U
Methylene chloride	5U	5U	5U	1	5U	5U	5U	5U
Styrene	5U	5U	5U	5U	5U	5U	5U	5U
1,1,1,2-Tetrachloroethane	10U	10U	10U	10U	10U	10U	10U	10U
1,1,2,2-Tetrachloroethane	5U	5U	5U	5U	5U	5U	5U	5U
Tetrachloroethene	5U	5U	5U	5U	5U	5U	5U	5U
Toluene	5U	5U	5U	5U	5U	15	5U	3
1,1,1-Trichloroethane	5U	5U	5U	5U	5U	5U	5U	2
1,1,2-Trichloroethane	5U	5U	5U	5U	5U	5U	5U	5U
Trichloroethene	5U	1	1	7	5	61	14	100
Trichlorofluoromethane	5U	5U	5U	5U	5U	5U	5U	5U
1,2,3-Trichloropropane	5U	5U	5U	5U	5U	5U	5U	5U
Vinyl acetate	10U	10U	10U	10U	10U	10U	10U	10U
Vinyl chloride	10U	10U	10U	10U	10U	10U	10U	10U

(CONTINUED)

APPENDIX D.3
Organic Analytes, CY 1997

Sampling Point	GW-704	GW-706		GW-710		GW-711		GW-712
Program	EXP	EXP		CMP-E		CMP-E		CMP-E
Location	EXP-B	EXP-B		EXP-W		EXP-W		EXP-W
Date Sampled	08/28/97	02/21/97	09/03/97	02/02/97	08/28/97	01/31/97	08/26/97	02/02/97
ORGANIC COMPOUNDS (ug/L)								
Acetone	4	3	4	1	10	10U	10U	10U
Acrolein	10U	10U	10U	10U	10U	10U	10U	10U
Acrylonitrile	10U	10U	10U	10U	10U	10U	10U	10U
Benzene	5U	5U	5U	5U	5U	5U	5U	5U
Bromochloromethane	10U		10U		10U		10U	
Bromodichloromethane	5U	5U	5U	5U	5U	5U	5U	5U
Bromoform	5U	5U	5U	5U	5U	5U	5U	5U
Bromomethane	10U	10U	10U	10U	10U	10U	10U	10U
2-Butanone	8	10U	5	10U	9	10U	11	10U
Carbon disulfide	5U	5U	5U	5U	5U	5U	5U	5U
Carbon tetrachloride	2	5U	5U	5U	5U	5U	5U	5U
Chlorobenzene	5U	5U	5U	5U	5U	5U	5U	5U
Chloroethane	10U	10U	10U	10U	10U	10U	10U	10U
2-Chloroethyl vinyl ether	10U	10U	10U	10U	10U	10U	10U	10U
Chloroform	5U	5U	5U	5U	5U	5U	5U	5U
Chloromethane	10U	10U	10U	10U	10U	10U	10U	10U
Dibromochloromethane	5U	5U	5U	5U	5U	5U	5U	5U
1,2-Dibromo-3-chloropropane	10U		10U		10U		10U	
1,2-Dibromoethane	5U	5U	5U	5U	5U	5U	5U	5U
Dibromomethane	10U	10U	10U	10U	10U	10U	10U	10U
1,2-Dichlorobenzene	5U		5U		5U		5U	
1,4-Dichlorobenzene	5U		5U		5U		5U	
1,4-Dichloro-2-butene	5U	5U	5U	5U	5U	5U	5U	5U
trans-1,4-Dichloro-2-butene	5U	5U	5U	5U	5U	5U	5U	5U
Dichlorodifluoromethane	5U	5U	5U	5U	5U	5U	5U	5U
1,1-Dichloroethane	1	5U	5U	5U	5U	5U	5U	5U
1,2-Dichloroethane	5U	5U	5U	5U	5U	5U	5U	5U
1,1-Dichloroethene	7	5U	5U	5U	5U	5U	5U	5U
1,2-Dichloroethene	3	2	5	5U	5U	5U	5U	5U
cis-1,2-Dichloroethene	3	2	5	5U	5U	5U	5U	5U
trans-1,2-Dichloroethene	5U	5U	5U	5U	5U	5U	5U	5U
1,2-Dichloropropane	5U	5U	5U	5U	5U	5U	5U	5U
cis-1,3-Dichloropropene	5U	5U	5U	5U	5U	5U	5U	5U
trans-1,3-Dichloropropene	5U	5U	5U	5U	5U	5U	5U	5U
Dimethylbenzene	5U	5U	5U	5U	5U	5U	5U	5U
Ethanol	500U	500U	500U	500U	500U	500U	500U	500U
Ethylbenzene	5U	5U	5U	5U	5U	5U	5U	5U
Ethyl methacrylate	5U	5U	5U	5U	5U	5U	5U	5U
2-Hexanone	10U	10U	10U	10U	10U	10U	10U	10U
Iodomethane	5U	1	5U	5U	5U	5U	5U	5U
4-Methyl-2-pentanone	10U	10U	10U	10U	10U	10U	10U	10U
Methylene chloride	5U	5U	5U	5U	5U	5U	5U	5U
Styrene	5U	5U	5U	5U	5U	5U	5U	5U
1,1,1,2-Tetrachloroethane	10U	10U	10U	10U	10U	10U	10U	10U
1,1,2,2-Tetrachloroethane	5U	5U	5U	5U	5U	5U	5U	5U
Tetrachloroethene	5U	5U	5U	5U	5U	5U	5U	5U
Toluene	5U	5U	5U	5U	5U	5U	5U	5U
1,1,1-Trichloroethane	2	5U	5U	5U	5U	5U	5U	5U
1,1,2-Trichloroethane	5U	5U	5U	5U	5U	5U	5U	5U
Trichloroethene	100	4	11	5U	5U	5U	5U	5U
Trichlorofluoromethane	5U	5U	5U	5U	5U	5U	5U	5U
1,2,3-Trichloropropane	5U	5U	5U	5U	5U	5U	5U	5U
Vinyl acetate	10U	10U	10U	10U	10U	10U	10U	10U
Vinyl chloride	10U	10U	10U	10U	10U	10U	10U	10U

(CONTINUED)

APPENDIX D.3
Organic Analytes, CY 1997

Sampling Point	GW-712		GW-713			GW-714		GW-715
Program	CMP-E		CMP-E			CMP-E		CMP-E
Location	EXP-W		EXP-W			EXP-W		EXP-W
Date Sampled	08/26/97		02/02/97		08/27/97	02/03/97	08/27/97	02/03/97
		DUP		DUP				
ORGANIC COMPOUNDS (ug/L)								
Acetone	10U	10U	10U	10U	4	10U	4	10U
Acrolein	10U	10U	10U	10U	10U	10U	10U	10U
Acrylonitrile	10U	10U	10U	10U	10U	10U	10U	10U
Benzene	5U	5U	5U	5U	5U	5U	5U	5U
Bromochloromethane	10U	10U			10U		10U	
Bromodichloromethane	5U	5U	5U	5U	5U	5U	5U	5U
Bromoform	5U	5U	5U	5U	5U	5U	5U	5U
Bromomethane	10U	10U	10U	10U	10U	10U	10U	10U
2-Butanone	11	8	10U	10U	7	10U	7	10U
Carbon disulfide	5U	5U	5U	5U	5U	5U	5U	5U
Carbon tetrachloride	5U	5U	5U	5U	5U	5U	5U	5U
Chlorobenzene	5U	5U	5U	5U	5U	5U	5U	5U
Chloroethane	10U	10U	10U	10U	10U	10U	10U	10U
2-Chloroethyl vinyl ether	10U	10U	10U	10U	10U	10U	10U	10U
Chloroform	5U	5U	5U	5U	5U	5U	5U	5U
Chloromethane	10U	10U	10U	10U	10U	10U	10U	10U
Dibromochloromethane	5U	5U	5U	5U	5U	5U	5U	5U
1,2-Dibromo-3-chloropropane	10U	10U			10U		10U	
1,2-Dibromoethane	5U	5U	5U	5U	5U	5U	5U	5U
Dibromomethane	10U	10U	10U	10U	10U	10U	10U	10U
1,2-Dichlorobenzene	5U	5U			5U		5U	
1,4-Dichlorobenzene	5U	5U			5U		5U	
1,4-Dichloro-2-butene	5U	5U	5U	5U	5U	5U	5U	5U
trans-1,4-Dichloro-2-butene	5U	5U	5U	5U	5U	5U	5U	5U
Dichlorodifluoromethane	5U	5U	5U	5U	5U	5U	5U	5U
1,1-Dichloroethane	5U	5U	5U	5U	5U	5U	5U	5U
1,2-Dichloroethane	5U	5U	5U	5U	5U	5U	5U	5U
1,1-Dichloroethene	5U	5U	5U	5U	5U	5U	5U	5U
1,2-Dichloroethene	5U	5U	5U	5U	5U	5U	5U	5U
cis-1,2-Dichloroethene	5U	5U	5U	5U	5U	5U	5U	5U
trans-1,2-Dichloroethene	5U	5U	5U	5U	5U	5U	5U	5U
1,2-Dichloropropane	5U	5U	5U	5U	5U	5U	5U	5U
cis-1,3-Dichloropropene	5U	5U	5U	5U	5U	5U	5U	5U
trans-1,3-Dichloropropene	5U	5U	5U	5U	5U	5U	5U	5U
Dimethylbenzene	5U	5U	5U	5U	5U	5U	5U	5U
Ethanol	500U	500U	500U	500U	500U	500U	500U	500U
Ethylbenzene	5U	5U	5U	5U	5U	5U	5U	5U
Ethyl methacrylate	5U	5U	5U	5U	5U	5U	5U	5U
2-Hexanone	10U	10U	10U	10U	10U	10U	10U	10U
Iodomethane	5U	5U	5U	5U	5U	5U	5U	5U
4-Methyl-2-pentanone	10U	10U	10U	10U	10U	10U	10U	10U
Methylene chloride	5U	5U	5U	5U	5U	5U	5U	5U
Styrene	5U	5U	5U	5U	5U	5U	5U	5U
1,1,1,2-Tetrachloroethane	10U	10U	10U	10U	10U	10U	10U	10U
1,1,2,2-Tetrachloroethane	5U	5U	5U	5U	5U	5U	5U	5U
Tetrachloroethene	5U	5U	5U	5U	5U	5U	5U	5U
Toluene	5U	5U	5U	5U	5U	5U	5U	5U
1,1,1-Trichloroethane	5U	5U	5U	5U	5U	5U	5U	5U
1,1,2-Trichloroethane	5U	5U	5U	5U	5U	5U	5U	5U
Trichloroethene	5U	5U	5U	5U	5U	5U	5U	5U
Trichlorofluoromethane	5U	5U	5U	5U	5U	5U	5U	5U
1,2,3-Trichloropropane	5U	5U	5U	5U	5U	5U	5U	5U
Vinyl acetate	10U	10U	10U	10U	10U	10U	10U	10U
Vinyl chloride	10U	10U	10U	10U	10U	10U	10U	10U

(CONTINUED)

APPENDIX D.3
Organic Analytes, CY 1997

Sampling Point	GW-715	GW-724			GW-725		GW-738	
Program	CMP-E	EXP			EXP		EXP	
Location	EXP-W	EXP-C			EXP-C		EXP-C	
Date Sampled	08/27/97	02/27/97		09/05/97	02/28/97	09/05/97	02/25/97	09/04/97
			DUP					
ORGANIC COMPOUNDS (ug/L)								
Acetone	4	6	10	10U	3	10U	3	6
Acrolein	10U	10U	10U	10U	10U	10U	10U	10U
Acrylonitrile	10U	10U	10U	10U	10U	10U	10U	10U
Benzene	5U	5U	5U	5U	5U	5U	5U	5U
Bromochloromethane	10U			10U		10U		10U
Bromodichloromethane	5U	5U	5U	5U	5U	5U	5U	5U
Bromoform	5U	5U	5U	5U	5U	5U	5U	5U
Bromomethane	10U	10U	10U	10U	10U	10U	10U	10U
2-Butanone	8	10U	10U	10U	10U	3	10U	6
Carbon disulfide	5U	5U	5U	5U	5U	5U	5U	5U
Carbon tetrachloride	5U	5U	5U	5U	5U	5U	5U	1
Chlorobenzene	5U	5U	5U	5U	5U	5U	5U	5U
Chloroethane	10U	10U	10U	10U	10U	10U	10U	10U
2-Chloroethyl vinyl ether	10U	10U	10U	10U	10U	10U	10U	10U
Chloroform	5U	5U	5U	5U	5U	5U	1	1
Chloromethane	10U	10U	10U	10U	10U	10U	10U	10U
Dibromochloromethane	5U	5U	5U	5U	5U	5U	5U	5U
1,2-Dibromo-3-chloropropane	10U			10U		10U		10U
1,2-Dibromoethane	5U	5U	5U	5U	5U	5U	5U	5U
Dibromomethane	10U	10U	10U	10U	10U	10U	10U	10U
1,2-Dichlorobenzene	5U			5U		5U		5U
1,4-Dichlorobenzene	5U			5U		5U		5U
1,4-Dichloro-2-butene	5U	5U	5U	5U	5U	5U	5U	5U
trans-1,4-Dichloro-2-butene	5U	5U	5U	5U	5U	5U	5U	5U
Dichlorodifluoromethane	5U	5U	5U	5U	5U	5U	5U	5U
1,1-Dichloroethane	5U	5U	5U	5U	5U	5U	5U	5U
1,2-Dichloroethane	5U	5U	5U	5U	5U	5U	5U	5U
1,1-Dichloroethene	5U	5U	5U	5U	5U	5U	5U	5U
1,2-Dichloroethene	5U	1	5U	5U	5U	5U	2	2
cis-1,2-Dichloroethene	5U	1	5U	5U	5U	5U	2	2
trans-1,2-Dichloroethene	5U	5U	5U	5U	5U	5U	5U	5U
1,2-Dichloropropane	5U	5U	5U	5U	5U	5U	5U	5U
cis-1,3-Dichloropropene	5U	5U	5U	5U	5U	5U	5U	5U
trans-1,3-Dichloropropene	5U	5U	5U	5U	5U	5U	5U	5U
Dimethylbenzene	5U	2	5U	5U	5U	5U	5U	5U
Ethanol	500U	500U	500U	500U	500U	500U	500U	500U
Ethylbenzene	5U	5U	5U	5U	5U	5U	5U	5U
Ethyl methacrylate	5U	5U	5U	5U	5U	5U	5U	5U
2-Hexanone	10U	10U	10U	10U	10U	10U	10U	10U
Iodomethane	5U	5U	5U	5U	5U	5U	2	5U
4-Methyl-2-pentanone	10U	10U	10U	10U	10U	10U	10U	10U
Methylene chloride	5U	5U	5U	5U	2	5U	5U	5U
Styrene	5U	5U	5U	5U	5U	5U	5U	5U
1,1,1,2-Tetrachloroethane	10U	10U	10U	10U	10U	10U	10U	10U
1,1,2,2-Tetrachloroethane	5U	5U	5U	5U	5U	5U	5U	5U
Tetrachloroethene	5U	5U	5U	5U	5U	5U	5U	5U
Toluene	5U	5	5U	5U	5U	5U	5U	5U
1,1,1-Trichloroethane	5U	5U	5U	5U	5U	5U	5U	5U
1,1,2-Trichloroethane	5U	5U	5U	5U	5U	5U	5U	5U
Trichloroethene	5U	35	33	45	7	16	43	36
Trichlorofluoromethane	5U	5U	5U	5U	5U	5U	5U	5U
1,2,3-Trichloropropane	5U	5U	5U	5U	5U	5U	5U	5U
Vinyl acetate	10U	10U	10U	10U	10U	10U	10U	10U
Vinyl chloride	10U	10U	10U	10U	10U	10U	10U	10U

(CONTINUED)

APPENDIX D.3
Organic Analytes, CY 1997

Sampling Point	GW-738	GW-740		GW-829		NT-01		SS-1
Program	EXP	EXP		SMP		EXP		EXP
Location	EXP-C	EXP-C		OLF		EXP-SW		EXP-SW
Date Sampled	09/04/97	02/24/97	09/04/97	03/04/97	09/16/97	02/03/97	10/13/97	02/03/97
	DUP							
ORGANIC COMPOUNDS (ug/L)								
Acetone	6	8	4	3	10U	10U	5	10U
Acrolein	10U	10U	10U	10U	10U	10U	10U	10U
Acrylonitrile	10U	10U	10U	10U	10U	10U	10U	10U
Benzene	5U	5U	5U	5U	2	5U	5U	5U
Bromochloromethane	10U		10U		10U		10U	
Bromodichloromethane	5U	5U	5U	5U	5U	5U	5U	5U
Bromoform	5U	5U	5U	5U	5U	5U	5U	5U
Bromomethane	10U	10U	10U	10U	10U	10U	10U	10U
2-Butanone	5	10U	7	10U	10U	10U	10U	10U
Carbon disulfide	5U	5U	5U	5U	5U	5U	5U	5U
Carbon tetrachloride	1	2	2	5U	5U	5U	5U	5U
Chlorobenzene	5U	5U	5U	5U	1	5U	5U	5U
Chloroethane	10U	10U	10U	10U	10U	10U	10U	10U
2-Chloroethyl vinyl ether	10U	10U	10U	10U	10U	10U	10U	10U
Chloroform	1	1	2	5U	5U	5U	5U	5U
Chloromethane	10U	10U	10U	10U	10U	10U	10U	10U
Dibromochloromethane	5U	5U	5U	5U	5U	5U	5U	5U
1,2-Dibromo-3-chloropropane	10U		10U		10U		10U	
1,2-Dibromoethane	5U	5U	5U	5U	5U	5U	5U	5U
Dibromomethane	10U	10U	10U	10U	10U	10U	10U	10U
1,2-Dichlorobenzene	5U		5U		5U		5U	
1,4-Dichlorobenzene	5U		5U		5U		5U	
1,4-Dichloro-2-butene	5U	5U	5U	5U	5U	5U	5U	5U
trans-1,4-Dichloro-2-butene	5U	5U	5U	5U	5U	5U	5U	5U
Dichlorodifluoromethane	5U	5U	5U	5U	5U	5U	5U	5U
1,1-Dichloroethane	5U	5U	5U	5U	5U	5U	5U	5U
1,2-Dichloroethane	5U	5U	5U	5U	5U	5U	5U	5U
1,1-Dichloroethene	5U	5U	5U	5U	5U	5U	5U	5U
1,2-Dichloroethene	2	3	3	5U	5U	5U	1	5U
cis-1,2-Dichloroethene	2	3	3	5U	5U	5U	1	5U
trans-1,2-Dichloroethene	5U	5U	5U	5U	5U	5U	5U	5U
1,2-Dichloropropane	5U	5U	5U	5U	5U	5U	5U	5U
cis-1,3-Dichloropropene	5U	5U	5U	5U	5U	5U	5U	5U
trans-1,3-Dichloropropene	5U	5U	5U	5U	5U	5U	5U	5U
Dimethylbenzene	5U	1	5U	5U	5U	5U	5U	5U
Ethanol	500U	500U	500U	500U	500U	500U	500U	500U
Ethylbenzene	5U	5U	5U	5U	5U	5U	5U	5U
Ethyl methacrylate	5U	5U	5U	5U	5U	5U	5U	5U
2-Hexanone	10U	10U	10U	10U	10U	10U	10U	10U
Iodomethane	5U	2	5U	5U	5U	5U	5U	5U
4-Methyl-2-pentanone	10U	10U	10U	10U	10U	10U	10U	10U
Methylene chloride	5U	5U	5U	5U	5U	5U	5U	5U
Styrene	5U	5U	5U	5U	5U	5U	5U	5U
1,1,1,2-Tetrachloroethane	10U	10U	10U	10U	10U	10U	10U	10U
1,1,2,2-Tetrachloroethane	5U	5U	5U	5U	5U	5U	5U	5U
Tetrachloroethene	5U	5U	5U	5U	5U	5U	19	2
Toluene	5U	5	5U	5U	2	5U	5U	5U
1,1,1-Trichloroethane	5U	5U	5U	5U	5U	5U	5U	5U
1,1,2-Trichloroethane	5U	5U	5U	5U	5U	5U	5U	5U
Trichloroethene	37	65	73	5U	5U	5U	1	5U
Trichlorofluoromethane	5U	5U	5U	5U	5U	5U	5U	5U
1,2,3-Trichloropropane	5U	5U	5U	5U	5U	5U	5U	5U
Vinyl acetate	10U	10U	10U	10U	10U	10U	10U	10U
Vinyl chloride	10U	10U	10U	10U	10U	10U	10U	10U

(CONTINUED)

APPENDIX D.3
Organic Analytes, CY 1997

Sampling Point	SS-1	SS-4			SS-5	
Program	EXP	EXP			EXP	
Location	EXP-SW	EXP-SW			EXP-SW	
Date Sampled	10/13/97	02/03/97	08/29/97		02/03/97	08/29/97
				DUP		
ORGANIC COMPOUNDS (ug/L)						
Acetone	1	10U	10U	10U	10U	10U
Acrolein	10U	10U	10U	10U	10U	10U
Acrylonitrile	10U	10U	10U	10U	10U	10U
Benzene	5U	5U	5U	5U	5U	5U
Bromochloromethane	10U		10U	10U		10U
Bromodichloromethane	5U	5U	5U	5U	5U	5U
Bromoform	5U	5U	5U	5U	5U	5U
Bromomethane	10U	10U	10U	10U	10U	10U
2-Butanone	3	10U	6	6	10U	4
Carbon disulfide	5U	5U	5U	5U	5U	5U
Carbon tetrachloride	5U	5U	5U	5U	5U	5U
Chlorobenzene	5U	5U	5U	5U	5U	5U
Chloroethane	10U	10U	10U	10U	10U	10U
2-Chloroethyl vinyl ether	10U	10U	10U	10U	10U	10U
Chloroform	5U	5U	5U	5U	5U	5U
Chloromethane	10U	10U	10U	10U	10U	10U
Dibromochloromethane	5U	5U	5U	5U	5U	5U
1,2-Dibromo-3-chloropropane	10U		10U	10U		10U
1,2-Dibromoethane	5U	5U	5U	5U	5U	5U
Dibromomethane	10U	10U	10U	10U	10U	10U
1,2-Dichlorobenzene	5U		5U	5U		5U
1,4-Dichlorobenzene	5U		5U	5U		5U
1,4-Dichloro-2-butene	5U	5U	5U	5U	5U	5U
trans-1,4-Dichloro-2-butene	5U	5U	5U	5U	5U	5U
Dichlorodifluoromethane	5U	5U	5U	5U	5U	5U
1,1-Dichloroethane	5U	5U	5U	5U	5U	5U
1,2-Dichloroethane	5U	5U	5U	5U	5U	5U
1,1-Dichloroethene	5U	5U	5U	5U	5U	5U
1,2-Dichloroethene	5U	5U	5	5	5U	5U
cis-1,2-Dichloroethene	5U	5U	5	5	5U	5U
trans-1,2-Dichloroethene	5U	5U	5U	5U	5U	5U
1,2-Dichloropropane	5U	5U	5U	5U	5U	5U
cis-1,3-Dichloropropene	5U	5U	5U	5U	5U	5U
trans-1,3-Dichloropropene	5U	5U	5U	5U	5U	5U
Dimethylbenzene	5U	5U	5U	5U	5U	5U
Ethanol	500U	500U	500U	500U	500U	6
Ethylbenzene	5U	5U	5U	5U	5U	5U
Ethyl methacrylate	5U	5U	5U	5U	5U	5U
2-Hexanone	10U	10U	10U	10U	10U	10U
Iodomethane	5U	5U	5U	5U	5U	5U
4-Methyl-2-pentanone	10U	10U	10U	10U	10U	10U
Methylene chloride	5U	5U	5U	5U	5U	5U
Styrene	5U	5U	5U	5U	5U	5U
1,1,1,2-Tetrachloroethane	10U	10U	10U	10U	10U	10U
1,1,2,2-Tetrachloroethane	5U	5U	5U	5U	5U	5U
Tetrachloroethene	5U	5U	5U	5U	5U	5U
Toluene	5U	5U	5U	5U	5U	5U
1,1,1-Trichloroethane	5U	5U	5U	5U	5U	5U
1,1,2-Trichloroethane	5U	5U	5U	5U	5U	5U
Trichloroethene	5U	4	10	10	5U	3
Trichlorofluoromethane	5U	5U	5U	5U	5U	5U
1,2,3-Trichloropropane	5U	5U	5U	5U	5U	5U
Vinyl acetate	10U	10U	10U	10U	10U	10U
Vinyl chloride	10U	10U	10U	10U	10U	10U

APPENDIX D.4

RADIOLOGICAL ANALYTES

APPENDIX D.4
Radiological Analytes, CY 1997

Sampling Point	BCK-00.63						BCK-04.55		
Program	EXP						EXP		
Location	EXP-SW						EXP-SW		
Date Sampled	02/04/97			08/28/97			02/04/97		
Sample Type									
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)									
Gross Alpha	6.9	5.7	7.2	11	4	3	13	6.4	7.2
Gross Beta	9	5.5	8	7.5	3.9	21	17	6.2	8
Americium 241									
Iodine 129									
Neptunium 237									
Plutonium 238									
Plutonium 239									
Radium 223/224/226									
Strontium 89/90									
Technetium 99									
Tritium									
Uranium 234									
Uranium 235									
Uranium 238									

(CONTINUED)

Sampling Point	BCK-04.55			BCK-07.75					
Program	EXP			EXP					
Location	EXP-SW			EXP-SW					
Date Sampled	08/28/97			02/04/97			08/29/97		
Sample Type									
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)									
Gross Alpha	19	6	4	22	7.6	7.3	21	6	1
Gross Beta	20	5	24	20	6.5	8	29	6	23
Americium 241									
Iodine 129									
Neptunium 237									
Plutonium 238									
Plutonium 239									
Radium 223/224/226									
Strontium 89/90									
Technetium 99									
Tritium									
Uranium 234									
Uranium 235									
Uranium 238									

(CONTINUED)

APPENDIX D.4
Radiological Analytes, CY 1997

Sampling Point	BCK-09.40						BCK-10.60		
Program	EXP						EXP		
Location	EXP-SW						EXP-SW		
Date Sampled	02/04/97			08/29/97			02/04/97		
Sample Type									
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)	.	.	.	.	.	.	.	.	.
Gross Alpha	32	9	7.3	28	7	3	48	11	7.4
Gross Beta	27	7.3	8	37	7	24	45	9.2	8
Americium 241	.	.	.	.	.	.	.	.	.
Iodine 129	.	.	.	.	.	.	.	.	.
Neptunium 237	.	.	.	.	.	.	.	.	.
Plutonium 238	.	.	.	.	.	.	.	.	.
Plutonium 239	.	.	.	.	.	.	.	.	.
Radium 223/224/226	.	.	.	.	.	.	.	.	.
Strontium 89/90	.	.	.	.	.	.	.	.	.
Technetium 99	.	.	.	.	.	.	.	.	.
Tritium	.	.	.	.	.	.	.	.	.
Uranium 234	.	.	.	.	.	.	.	.	.
Uranium 235	.	.	.	.	.	.	.	.	.
Uranium 238	.	.	.	.	.	.	.	.	.

(CONTINUED)

Sampling Point	BCK-10.60			GW-040					
Program	EXP			CMP-B					
Location	EXP-SW			BG					
Date Sampled	08/29/97			01/22/97			09/02/97		
Sample Type									
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)	.	.	.	.	.	.	.	.	.
Gross Alpha	18	5	4.4	13	7.4	8.7	2.8	2	0.96
Gross Beta	2.4	3.6	16	35	14	18	5.7	3.6	10
Americium 241	.	.	.	0.4	0.24	0.29	-0.045	0.13	0.35
Iodine 129	.	.	.	-12	9	13	1	11	20
Neptunium 237	.	.	.	0.028	0.057	0.077	-0.022	0.045	0.21
Plutonium 238	.	.	.	0.018	0.15	0.4	0.031	0.12	0.26
Plutonium 239	.	.	.	0	0	0.16	0.041	0.1	0.21
Radium 223/224/226	.	.	.	8.2	2.8	1.2	0.32	0.63	1.4
Strontium 89/90	.	.	.	1	3	5.1	-0.1	2.3	4
Technetium 99	.	.	.	3	9.7	13	-6	11	13
Tritium	.	.	.	120	160	350	-400	500	800
Uranium 234	.	.	.	0.32	0.35	0.49	0.17	0.15	0.18
Uranium 235	.	.	.	0.12	0.29	0.61	-0.048	0.068	0.28
Uranium 238	.	.	.	0.24	0.32	0.49	0.17	0.14	0.075

(CONTINUED)

APPENDIX D.4
Radiological Analytes, CY 1997

Sampling Point	GW-042						GW-043		
Program	CMP-B						CMP-B		
Location	BG						OLF		
Date Sampled	01/31/97			09/02/97			01/23/97		
Sample Type									
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)									
Gross Alpha	1.9	4.2	7.5	0.27	1.5	4.1	-0.62	3.4	7.2
Gross Beta	0	0.05	8.2	-2.9	3.1	13	-5.9	6.6	17
Americium 241	0.67	0.95	1.6	0.088	0.089	0.06	0.1	0.11	0.071
Iodine 129	0.84	11	18	6	11	20	5.1	11	18
Neptunium 237	-0.026	0.051	0.24	-0.012	0.084	0.24	0.01	0.079	0.21
Plutonium 238	-0.13	0.16	0.48	0.32	0.23	0.28	-0.18	0.23	0.69
Plutonium 239	0	0	0.11	0.047	0.12	0.24	0.11	0.16	0.15
Radium 223/224/226	0.02	0.26	0.81	0.74	0.87	1.5	0.72	0.93	1.6
Strontium 89/90	0.62	2.6	4.8	-0.1	2.2	3.9	1.2	2.8	4.9
Technetium 99	0	4.4	6.6	-2	7.8	13	10	9.5	13
Tritium	220	140	330	-80	500	800	200	160	350
Uranium 234	0.1	0.12	0.093	-0.01	0.14	0.35	-0.066	0.19	0.58
Uranium 235	0	0	0.12	-0.032	0.065	0.31	-0.053	0.11	0.5
Uranium 238	0.034	0.069	0.093	0.05	0.12	0.25	0.12	0.17	0.17

(CONTINUED)

Sampling Point	GW-043			GW-044					
Program	CMP-B			CMP-B					
Location	OLF			OLF					
Date Sampled	08/13/97			01/23/97			08/11/97		
Sample Type									
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)									
Gross Alpha	-0.4	1.2	4.2	-2.1	2.8	7.4	0.4	1.5	3.8
Gross Beta	2.1	3.4	14	-6.5	11	15	4.4	3.2	13
Americium 241	0.005	0.11	0.26	0.1	0.18	0.33	0.28	0.2	0.24
Iodine 129	1	13	20	-7	11	17	6.1	13	20
Neptunium 237	0.007	0.056	0.15	0.03	0.059	0.08	-0.06	0.11	0.35
Plutonium 238	0.008	0.06	0.16	-0.055	0.16	0.48	-0.15	0.13	0.4
Plutonium 239	0	0	0.067	-0.035	0.071	0.33	-0.011	0.078	0.23
Radium 223/224/226	1	0.9	0.47	0.51	0.85	1.7	1.3	0.9	0.44
Strontium 89/90	0.6	2.2	3.9	1.4	7.3	13	-0.3	1.8	3.3
Technetium 99	5	7.1	12	6	10	13	11	8.3	13
Tritium	230	500	840	130	150	350	90	530	840
Uranium 234	0.14	0.13	0.078	0.12	0.3	0.61	0.033	0.081	0.17
Uranium 235	0	0	0.097	0	0	0.25	-0.022	0.044	0.21
Uranium 238	0.057	0.081	0.078	0	0	0.2	0.31	0.18	0.07

(CONTINUED)

APPENDIX D.4
Radiological Analytes, CY 1997

Sampling Point	GW-053						GW-056		
Program	SMP						EXP		
Location	BG						EXP-A		
Date Sampled	02/06/97			09/03/97			02/13/97		
Sample Type									
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)	.	.	.	.	.	.	.	.	.
Gross Alpha	-2.8	0.21	8.3	1.1	2.2	4.9	4.7	5.9	8.6
Gross Beta	2.6	5	8.1	3.6	3.5	12	10	5.4	8.6
Americium 241	.	.	.	.	.	.	.	.	.
Iodine 129	.	.	.	.	.	.	.	.	.
Neptunium 237	.	.	.	.	.	.	.	.	.
Plutonium 238	.	.	.	.	.	.	.	.	.
Plutonium 239	.	.	.	.	.	.	.	.	.
Radium 223/224/226	.	.	.	.	.	.	.	.	.
Strontium 89/90	.	.	.	.	.	.	.	.	.
Technetium 99	.	.	.	.	.	.	.	.	.
Tritium	.	.	.	.	.	.	.	.	.
Uranium 234	.	.	.	.	.	.	.	.	.
Uranium 235	.	.	.	.	.	.	.	.	.
Uranium 238	.	.	.	.	.	.	.	.	.

(CONTINUED)

Sampling Point	GW-056			GW-069					
Program	EXP			CMP-C					
Location	EXP-A			BG					
Date Sampled	08/19/97			01/22/97			08/18/97		
Sample Type									
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)	.	.	.	.	.	.	.	.	.
Gross Alpha	5	3.6	5.7	0.2	1.3	7.7	-0.1	2.2	6.1
Gross Beta	4.9	4	16	2.7	66	17	2.4	3.2	12
Americium 241	.	.	.	0.13	0.16	0.26	0.19	0.16	0.085
Iodine 129	.	.	.	3.2	11	18	2.8	11	19
Neptunium 237	.	.	.	-0.089	0.1	0.4	0.037	0.09	0.18
Plutonium 238	.	.	.	0.4	0.24	0.29	0.034	0.083	0.17
Plutonium 239	.	.	.	0.067	0.11	0.21	0.026	0.052	0.071
Radium 223/224/226	.	.	.	0.91	0.99	1.3	1.4	1.1	1.7
Strontium 89/90	.	.	.	0.22	2.2	4.1	-0.4	3.3	5.9
Technetium 99	.	.	.	9	9.3	13	-1	8.7	13
Tritium	.	.	.	9.6	210	350	-180	480	800
Uranium 234	.	.	.	0	0	0.19	-0.024	0.071	0.21
Uranium 235	.	.	.	0	0	0.24	0	0	0.076
Uranium 238	.	.	.	0.072	0.14	0.2	0.25	0.15	0.061

(CONTINUED)

APPENDIX D.4
Radiological Analytes, CY 1997

Sampling Point	GW-079						GW-080		
Program	CMP-B						CMP-B		
Location	BG						BG		
Date Sampled	01/23/97			08/18/97			01/21/97		
Sample Type									
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)									
Gross Alpha	-0.65	3.5	7.1	1.8	1.6	0.95	0.77	4.7	7.5
Gross Beta	-6.9	9.4	15	3.5	3.6	13	-0.54	3.9	15
Americium 241	0.09	0.12	0.18	-0.17	0.21	0.59	0.081	0.19	0.37
Iodine 129	-2	12	18	2	11	19	12	12	19
Neptunium 237	-0.052	0.074	0.31	0	0	0.09	0	0	0.094
Plutonium 238	-0.06	0.17	0.52	0.012	0.067	0.16	0.065	0.092	0.087
Plutonium 239	0	0	0.15	0	0	0.053	0.01	0.079	0.21
Radium 223/224/226	0.67	0.86	1.3	-0.57	0.41	2.2	5.1	2.3	2
Strontium 89/90	0.89	2.7	4.6	0.9	3.1	5.4	0.6	2.3	4.1
Technetium 99	7	10	13	4	7.5	13	13	9	13
Tritium	78	140	350	-300	480	800	180	160	350
Uranium 234	0.017	0.13	0.36	0.12	0.13	0.18	-0.023	0.17	0.49
Uranium 235	-0.096	0.14	0.56	-0.024	0.048	0.23	0	0	0.2
Uranium 238	0.05	0.23	0.51	0.29	0.19	0.18	0.078	0.19	0.39

(CONTINUED)

Sampling Point	GW-080			GW-084					
Program	CMP-B			CMP-B					
Location	BG			OLF					
Date Sampled	08/14/97			01/27/97			08/13/97		
Sample Type									
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)									
Gross Alpha	2.2	2	3.1	-4.6	0.18	7.3	2.6	2.5	4.7
Gross Beta	0.4	3.3	22	2.1	4.8	8	7.2	4	13
Americium 241	0.15	0.35	0.69	0.086	0.2	0.4	-0.06	0.12	0.31
Iodine 129	5	12	19	-2	12	18	5	11	19
Neptunium 237	0.04	0.11	0.22	0.068	0.17	0.33	-0.009	0.067	0.2
Plutonium 238	-0.15	0.18	0.51	0.043	0.11	0.22	-0.018	0.035	0.17
Plutonium 239	0.022	0.12	0.29	-0.036	0.1	0.31	0.008	0.062	0.17
Radium 223/224/226	0.51	0.98	2.2	0.12	0.68	2	0.46	0.66	1.3
Strontium 89/90	1.6	3.1	5.2	-0.008	2.1	3.8	2.8	2.4	3.7
Technetium 99	-6	7.8	13	1	4.4	6.5	0	0	12
Tritium	50	520	800	180	160	350	570	520	840
Uranium 234	0.02	0.1	0.23	0.033	0.067	0.09	0.12	0.13	0.084
Uranium 235	0.12	0.12	0.081	0.013	0.1	0.27	-0.027	0.054	0.26
Uranium 238	0.37	0.21	0.2	0	0	0.09	0.13	0.15	0.2

(CONTINUED)

APPENDIX D.4
Radiological Analytes, CY 1997

Sampling Point	GW-085								
Program	SMP								
Location	OLF								
Date Sampled	03/05/97						09/17/97		
Sample Type				DUP					
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)									
Gross Alpha	-1.7	2	7	0.75	1.5	3.2	1.4	1.5	2.9
Gross Beta	38	7	14	35	6.4	13	38	5	11
Americium 241									
Iodine 129									
Neptunium 237									
Plutonium 238									
Plutonium 239									
Radium 223/224/226									
Strontium 89/90									
Technetium 99									
Tritium									
Uranium 234									
Uranium 235									
Uranium 238									

(CONTINUED)

Sampling Point	GW-115						GW-162		
Program	CMP-B						CMP-B		
Location	S3						BG		
Date Sampled	01/22/97			08/11/97			01/24/97		
Sample Type									
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)									
Gross Alpha	-2.1	2.8	7.6	-0.08	0.82	3.1	-1	0.18	7.3
Gross Beta	-13	8.6	15	0.2	3.3	16	2.7	4.8	8
Americium 241	0.064	0.15	0.29	0.34	0.29	0.43	0.12	0.12	0.083
Iodine 129	1	12	18	5.3	13	20	6	12	18
Neptunium 237	-0.016	0.033	0.16	0.05	0.12	0.26	-0.022	0.043	0.2
Plutonium 238	-0.11	0.16	0.64	0.055	0.14	0.28	-0.073	0.15	0.41
Plutonium 239	-0.031	0.22	0.64	-0.013	0.095	0.28	-0.023	0.047	0.22
Radium 223/224/226	1.1	1.1	1.3	0.35	0.79	1.9	0.48	1.1	2.6
Strontium 89/90	0.1	2.4	4.3	-0.2	1.9	3.4	0.71	2.5	4.3
Technetium 99	8	9	13	-2	8.8	13	-0.5	4.4	6.5
Tritium	270	160	350	-30	500	840	57	150	350
Uranium 234	-0.096	0.14	0.56	0.065	0.11	0.21	0.09	0.15	0.28
Uranium 235	0.17	0.24	0.23	0	0	0.085	-0.03	0.06	0.28
Uranium 238	0.21	0.24	0.19	0.073	0.13	0.24	0.16	0.18	0.28

(CONTINUED)

APPENDIX D.4
Radiological Analytes, CY 1997

Sampling Point	GW-162						GW-276		
Program	CMP-B						CMP-C		
Location	BG						S3		
Date Sampled	08/19/97						01/28/97		
Sample Type				DUP					
ACTIVITY (pCi/L)	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
Gross Alpha	0.4	1.2	3.2	2.1	1.9	2.8	360	50	9
Gross Beta	3.1	3.7	14	4.7	3.8	14	680	89	8.2
Americium 241	-0.005	0.14	0.33	0.22	0.24	0.38	0.25	0.21	0.29
Iodine 129	-1	11	19	-2	11	19	5.1	12	19
Neptunium 237	-0.01	0.075	0.22	0.05	0.11	0.23	20	2	0.082
Plutonium 238	0.019	0.039	0.052	0.051	0.082	0.14	0.11	0.16	0.29
Plutonium 239	0.039	0.055	0.052	0.066	0.076	0.06	0	0	0.068
Radium 223/224/226	0.18	0.75	2	0.58	0.83	1.6	0.94	0.78	0.93
Strontium 89/90	-1.6	3.8	6.9	-2	3.2	5.9	3.6	2.6	4
Technetium 99	-3	14	13	2	8	13	920	93	6.5
Tritium	110	500	800	280	510	800	170	160	350
Uranium 234	0.009	0.069	0.19	0.086	0.15	0.28	190	34	0.34
Uranium 235	0.035	0.07	0.095	0.037	0.074	0.1	8.8	2.8	0.42
Uranium 238	0.2	0.2	0.3	0.21	0.16	0.08	410	73	1

(CONTINUED)

Sampling Point	GW-276			GW-287					
Program	CMP-C			SMP					
Location	S3			BG					
Date Sampled	08/13/97			02/06/97			09/03/97		
Sample Type									
ACTIVITY (pCi/L)	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
Gross Alpha	340	30	8.1	1.7	5.2	7.6	-0.29	0.76	3
Gross Beta	790	27	15	9.9	5.6	8	4.9	3.7	12
Americium 241	0.12	0.14	0.23	.	.	.	.	.	.
Iodine 129	3	11	20	.	.	.	.	.	.
Neptunium 237	19	2	0.27	.	.	.	.	.	.
Plutonium 238	0.008	0.064	0.17	.	.	.	.	.	.
Plutonium 239	0	0	0.071	.	.	.	.	.	.
Radium 223/224/226	5.4	2	1.3	.	.	.	.	.	.
Strontium 89/90	1.4	3.8	6.5	.	.	.	.	.	.
Technetium 99	760	78	12	.	.	.	.	.	.
Tritium	80	500	840	.	.	.	.	.	.
Uranium 234	19	3	0.016	.	.	.	.	.	.
Uranium 235	1.2	0.27	0.02	.	.	.	.	.	.
Uranium 238	46	7	0.04	.	.	.	.	.	.

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APPENDIX D.4
Radiological Analytes, CY 1997

Sampling Point	GW-311						GW-315		
Program	SMP						SMP		
Location	RS						SPI		
Date Sampled	03/04/97			09/19/97			03/05/97		
Sample Type									
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)									
Gross Alpha	1.4	2	1.9	5	2.1	2.2	1.1	1.3	1
Gross Beta	14	8	25	6	2.8	9.8	4.4	3.6	12
Americium 241									
Iodine 129									
Neptunium 237									
Plutonium 238									
Plutonium 239									
Radium 223/224/226									
Strontium 89/90									
Technetium 99									
Tritium									
Uranium 234									
Uranium 235									
Uranium 238									

(CONTINUED)

Sampling Point	GW-315			GW-363					
Program	SMP			CMP-C					
Location	SPI			OLF					
Date Sampled	09/16/97			01/29/97					
Sample Type							DUP		
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)									
Gross Alpha	2.3	2.1	3	-2.6	0.19	7.8	-1.7	0.19	7.9
Gross Beta	25	6	13	-2.3	0.05	8.1	-0.21	0.05	8.1
Americium 241				0.21	0.23	0.38	0.21	0.18	0.22
Iodine 129				9.9	12	19	0.73	11	18
Neptunium 237				-0.071	0.083	0.32	0	0	0.078
Plutonium 238				0.007	0.14	0.33	-0.078	0.098	0.3
Plutonium 239				0.031	0.062	0.084	-0.017	0.034	0.16
Radium 223/224/226				-0.03	0.27	1	0.28	0.63	1.5
Strontium 89/90				2.6	2.2	3.4	1.5	3.1	5.2
Technetium 99				0	4.4	6.5	0	4.4	6.5
Tritium				140	150	350	-36	210	350
Uranium 234				0.053	0.13	0.27	-0.059	0.17	0.52
Uranium 235				0.051	0.1	0.14	0.068	0.14	0.18
Uranium 238				0.041	0.082	0.11	0.055	0.11	0.15

(CONTINUED)

APPENDIX D.4
Radiological Analytes, CY 1997

Sampling Point	GW-363			GW-372					
Program	CMP-C			CMP-B					
Location	OLF			BG					
Date Sampled	08/14/97			01/27/97					
Sample Type							DUP		
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)									
Gross Alpha	0	1.3	3.8	0	0.18	7.4	-5.6	0.18	7.6
Gross Beta	0.4	3.3	20	0.31	4.7	8	-2.6	0.05	8
Americium 241	0.14	0.2	0.35	0.11	0.15	0.25	0.008	0.062	0.17
Iodine 129	-3	11	19	4	12	18	1	11	17
Neptunium 237	-0.011	0.08	0.23	-0.038	0.054	0.22	0.064	0.091	0.087
Plutonium 238	0.059	0.14	0.29	-0.003	0.14	0.36	0.086	0.15	0.27
Plutonium 239	-0.043	0.061	0.26	-0.079	0.092	0.36	-0.023	0.046	0.22
Radium 223/224/226	0.42	0.95	2.2	39	5	1	0.31	0.37	0.58
Strontium 89/90	-0.3	2.6	4.8	-1.4	1.9	3.7	-1.8	2.2	4.2
Technetium 99	-3	6.3	13	-0.5	4.4	6.5	-3	4.2	6.5
Tritium	-60	500	800	180	160	350	190	160	350
Uranium 234	0.28	0.2	0.24	0.22	0.24	0.33	0.38	0.28	0.13
Uranium 235	-0.075	0.087	0.34	-0.044	0.088	0.41	0.06	0.12	0.16
Uranium 238	0.17	0.14	0.078	0.17	0.22	0.33	0	0	0.13

(CONTINUED)

Sampling Point	GW-372			GW-373					
Program	CMP-B			CMP-B					
Location	BG			BG					
Date Sampled	08/14/97			01/27/97			08/20/97		
Sample Type									
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)									
Gross Alpha	1.2	1.3	1	-3.3	0.2	8	0	1.6	4.8
Gross Beta	3.4	3.6	22	2.1	4.9	8.1	-0.2	3.2	12
Americium 241	0.2	0.21	0.33	0.08	0.11	0.11	0.017	0.11	0.24
Iodine 129	11	12	19	-1	12	18	1	11	19
Neptunium 237	0.016	0.091	0.22	0.023	0.047	0.063	-0.024	0.047	0.22
Plutonium 238	0.17	0.17	0.25	0.025	0.17	0.37	-0.013	0.12	0.3
Plutonium 239	-0.021	0.043	0.2	-0.042	0.06	0.25	-0.01	0.075	0.22
Radium 223/224/226	0.36	0.83	2	0.95	0.72	0.81	-0.21	0.63	2.1
Strontium 89/90	3.5	3.5	5.6	2.7	2.1	3.3	0.2	3.7	6.5
Technetium 99	-2	7.2	13	0	4.4	6.5	-4	9.2	13
Tritium	-80	500	800	22	210	350	250	520	800
Uranium 234	0.25	0.21	0.3	0.15	0.14	0.083	0.038	0.092	0.19
Uranium 235	-0.023	0.046	0.22	0.038	0.077	0.1	0	0	0.098
Uranium 238	0.29	0.18	0.072	0.15	0.14	0.084	0.15	0.15	0.19

(CONTINUED)

Sampling Point	GW-521						GW-537		
Program	SDM/C						SMP		
Location	LIV						OLF		
Date Sampled	01/07/97			07/21/97			03/04/97		
Sample Type									
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)									
Gross Alpha	-0.56	2.1	5.9	0.8	1.4	3.1	-2.3	6.8	23
Gross Beta	4.7	19	14	1.5	3.4	15	420	28	23
Americium 241	0.11	0.15	0.25	-0.01	0.07	0.2			
Iodine 129	1	11	18	-14	12	18			
Neptunium 237	-0.056	0.08	0.33	0	0	0.089			
Plutonium 238	0	0	0.11	0.026	0.063	0.13			
Plutonium 239	-0.28	0.056	0.26	-0.028	0.039	0.16			
Radium 223/224/226	0.61	0.86	1.7	0.5	0.84	1.8			
Strontium 89/90	3.5	5.7	13	3	4.4	7.4			
Technetium 99	9	7.9	13	0.5	4.2	6.3			
Tritium	26	54	370	80	530	850			
Uranium 234	0.093	0.23	0.47	0.35	0.22	0.086			
Uranium 235	0	0	0.19	-0.04	0.079	0.29			
Uranium 238	0.058	0.12	0.16	0.29	0.21	0.23			

(CONTINUED)

Sampling Point	GW-537						GW-613		
Program	SMP						CMP-B		
Location	OLF						S3		
Date Sampled	09/17/97						01/22/97		
Sample Type				DUP					
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)									
Gross Alpha	18	13	19	4.1	7.6	17	-2.5	2.8	7.4
Gross Beta	550	60	110	350	40	70	-14	8.6	15
Americium 241							0.11	0.12	0.16
Iodine 129							2.5	12	18
Neptunium 237							0.065	0.092	0.088
Plutonium 238							0.12	0.2	0.36
Plutonium 239							-0.048	0.14	0.42
Radium 223/224/226							0.41	0.69	1.3
Strontium 89/90							1.4	4.1	6.8
Technetium 99							-1	8.3	13
Tritium							99	140	350
Uranium 234							0.11	0.15	0.15
Uranium 235							0	0	0.18
Uranium 238							-0.075	0.11	0.44

(CONTINUED)

Sampling Point	GW-613			GW-614					
Program	CMP-B			CMP-B					
Location	S3			S3					
Date Sampled	08/11/97			01/27/97			08/14/97		
Sample Type									
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)									
Gross Alpha	1.3	1.6	2.7	-3.5	0.18	7.4	-0.4	1.1	4.1
Gross Beta	8.2	4.2	16	-0.21	0.05	8	0.2	4	24
Americium 241	0.18	0.18	0.27	0.14	0.13	0.17	0.07	0.23	0.46
Iodine 129	1.6	14	21	17	12	20	6	12	18
Neptunium 237	0.07	0.17	0.35	-0.046	0.065	0.027	0.067	0.095	0.091
Plutonium 238	0.04	0.11	0.23	-0.13	0.11	0.41	0.13	0.22	0.4
Plutonium 239	0.01	0.083	0.23	0.047	0.11	0.24	-0.021	0.043	0.2
Radium 223/224/226	1.2	1.1	1.6	0.28	0.5	1.1	0.21	0.62	1.6
Strontium 89/90	-0.67	2.1	3.8	1.7	2.2	3.6	0.3	4.1	7.3
Technetium 99	14	8.5	13	-0.5	4.4	6.5	1	8.6	13
Tritium	-360	500	840	100	150	350	-300	500	800
Uranium 234	0.12	0.11	0.067	0.038	0.091	0.19	0.01	0.08	0.22
Uranium 235	0	0	0.084	0	0	0.097	0.066	0.16	0.33
Uranium 238	0.36	0.2	0.16	0.058	0.082	0.078	0.26	0.19	0.089

(CONTINUED)

Sampling Point	GW-614			GW-621					
Program	CMP-B			EXP					
Location	S3			EXP-B					
Date Sampled	08/14/97			02/17/97			08/21/97		
Sample Type	DUP								
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)									
Gross Alpha	0.4	1.5	3.9	5.5	3.9	1.9	2.8	2.8	5.5
Gross Beta	4.8	3.6	19	14	8	29	12	4	22
Americium 241	0.072	0.22	0.44	.	.	.	.	.	.
Iodine 129	5	11	19	.	.	.	.	.	.
Neptunium 237	0.033	0.066	0.09	.	.	.	.	.	.
Plutonium 238	-0.1	0.1	0.38	.	.	.	.	.	.
Plutonium 239	0.011	0.089	0.24	.	.	.	.	.	.
Radium 223/224/226	1.2	1	1.4	.	.	.	.	.	.
Strontium 89/90	-5.3	5.8	11	.	.	.	.	.	.
Technetium 99	0	8.6	13	.	.	.	.	.	.
Tritium	-260	500	800	.	.	.	.	.	.
Uranium 234	0.15	0.12	0.068	.	.	.	.	.	.
Uranium 235	0.031	0.063	0.085	.	.	.	.	.	.
Uranium 238	0.3	0.18	0.068	.	.	.	.	.	.

(CONTINUED)

APPENDIX D.4
Radiological Analytes, CY 1997

Sampling Point	GW-627								
Program	SMP								
Location	BG								
Date Sampled	02/08/97						09/09/97		
Sample Type				DUP					
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)	.	.	.	.	.	.	.	.	.
Gross Alpha	-4.8	0.25	10	0.66	5.7	8	1.8	3.5	8
Gross Beta	5	5.3	8.4	0.11	4.7	8.1	-2.6	3.2	18
Americium 241	.	.	.	.	.	.	.	.	.
Iodine 129	.	.	.	.	.	.	.	.	.
Neptunium 237	.	.	.	.	.	.	.	.	.
Plutonium 238	.	.	.	.	.	.	.	.	.
Plutonium 239	.	.	.	.	.	.	.	.	.
Radium 223/224/226	.	.	.	.	.	.	.	.	.
Strontium 89/90	.	.	.	.	.	.	.	.	.
Technetium 99	.	.	.	.	.	.	.	.	.
Tritium	.	.	.	.	.	.	.	.	.
Uranium 234	.	.	.	.	.	.	.	.	.
Uranium 235	.	.	.	.	.	.	.	.	.
Uranium 238	.	.	.	.	.	.	.	.	.

(CONTINUED)

Sampling Point	GW-627			GW-642					
Program	SMP			CMP-B					
Location	BG			BG					
Date Sampled	09/09/97			01/21/97			08/14/97		
Sample Type	DUP								
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)	.	.	.	.	.	.	.	.	.
Gross Alpha	0.13	3	8.3	15	6.7	7.2	0.4	1.2	3
Gross Beta	-3.8	3.2	20	1.3	9.2	16	-2.4	3	22
Americium 241	.	.	.	0.022	0.1	0.23	-0.088	0.18	0.47
Iodine 129	.	.	.	-7	20	30	7	12	19
Neptunium 237	.	.	.	0.051	0.13	0.26	-0.013	0.091	0.26
Plutonium 238	.	.	.	-0.025	0.05	0.24	0.19	0.21	0.33
Plutonium 239	.	.	.	-0.025	0.05	0.24	-0.04	0.057	0.24
Radium 223/224/226	.	.	.	-0.21	0.08	1.6	0.83	1.1	2.1
Strontium 89/90	.	.	.	-0.22	2	3.7	-0.2	3.1	5.6
Technetium 99	.	.	.	13	9	13	-1	8.6	13
Tritium	.	.	.	140	160	350	-100	500	800
Uranium 234	.	.	.	0.11	0.16	0.15	0.082	0.11	0.16
Uranium 235	.	.	.	-0.027	0.19	0.56	0	0	0.084
Uranium 238	.	.	.	0.13	0.21	0.36	0.2	0.14	0.069

(CONTINUED)

Sampling Point	GW-653						GW-683		
Program	SMP						EXP		
Location	BG						EXP-A		
Date Sampled	02/06/97			09/03/97			02/17/97		
Sample Type									
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)	.	.	.	.	.	.	.	.	.
Gross Alpha	-6.7	0.17	6.9	-0.7	1	4.1	16	7	5
Gross Beta	2.4	4.8	7.9	2.9	3.2	11	20	8	28
Americium 241	.	.	.	.	.	.	.	.	.
Iodine 129	.	.	.	.	.	.	.	.	.
Neptunium 237	.	.	.	.	.	.	.	.	.
Plutonium 238	.	.	.	.	.	.	.	.	.
Plutonium 239	.	.	.	.	.	.	.	.	.
Radium 223/224/226	.	.	.	.	.	.	.	.	.
Strontium 89/90	.	.	.	.	.	.	.	.	.
Technetium 99	.	.	.	.	.	.	.	.	.
Tritium	.	.	.	.	.	.	.	.	.
Uranium 234	.	.	.	.	.	.	.	.	.
Uranium 235	.	.	.	.	.	.	.	.	.
Uranium 238	.	.	.	.	.	.	.	.	.

(CONTINUED)

Sampling Point	GW-683			GW-684					
Program	EXP			EXP					
Location	EXP-A			EXP-A					
Date Sampled	08/21/97			02/18/97			08/21/97		
Sample Type									
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)	.	.	.	.	.	.	.	.	.
Gross Alpha	19	5	1	13	6	4	13	5	4.9
Gross Beta	26	6	24	17	8	32	38	7	23
Americium 241	.	.	.	.	.	.	.	.	.
Iodine 129	.	.	.	.	.	.	.	.	.
Neptunium 237	.	.	.	.	.	.	.	.	.
Plutonium 238	.	.	.	.	.	.	.	.	.
Plutonium 239	.	.	.	.	.	.	.	.	.
Radium 223/224/226	.	.	.	.	.	.	.	.	.
Strontium 89/90	.	.	.	.	.	.	.	.	.
Technetium 99	.	.	.	.	.	.	.	.	.
Tritium	.	.	.	.	.	.	.	.	.
Uranium 234	.	.	.	.	.	.	.	.	.
Uranium 235	.	.	.	.	.	.	.	.	.
Uranium 238	.	.	.	.	.	.	.	.	.

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APPENDIX D.4
Radiological Analytes, CY 1997

Sampling Point	GW-685								
Program	EXP								
Location	EXP-A								
Date Sampled	02/12/97			08/20/97					
Sample Type							DUP		
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)	.	.	.	.	.	.	.	.	.
Gross Alpha	0	0.19	7.9	5.5	3.3	4.2	5.2	3.1	3.5
Gross Beta	7.7	5.3	8.1	15	5	13	12	5	12
Americium 241	.	.	.	.	.	.	.	.	.
Iodine 129	.	.	.	.	.	.	.	.	.
Neptunium 237	.	.	.	.	.	.	.	.	.
Plutonium 238	.	.	.	.	.	.	.	.	.
Plutonium 239	.	.	.	.	.	.	.	.	.
Radium 223/224/226	.	.	.	.	.	.	.	.	.
Strontium 89/90	.	.	.	.	.	.	.	.	.
Technetium 99	.	.	.	.	.	.	.	.	.
Tritium	.	.	.	.	.	.	.	.	.
Uranium 234	.	.	.	.	.	.	.	.	.
Uranium 235	.	.	.	.	.	.	.	.	.
Uranium 238	.	.	.	.	.	.	.	.	.

(CONTINUED)

Sampling Point	GW-695						GW-703		
Program	EXP						EXP		
Location	EXP-B						EXP-B		
Date Sampled	02/17/97			08/19/97			02/19/97		
Sample Type									
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)	.	.	.	.	.	.	.	.	.
Gross Alpha	2.7	4.1	8.7	5.4	3.2	4.1	5.2	4.4	6.5
Gross Beta	18	8	27	18	5	14	27	9	28
Americium 241	.	.	.	.	.	.	.	.	.
Iodine 129	.	.	.	.	.	.	.	.	.
Neptunium 237	.	.	.	.	.	.	.	.	.
Plutonium 238	.	.	.	.	.	.	.	.	.
Plutonium 239	.	.	.	.	.	.	.	.	.
Radium 223/224/226	.	.	.	.	.	.	.	.	.
Strontium 89/90	.	.	.	.	.	.	.	.	.
Technetium 99	.	.	.	.	.	.	.	.	.
Tritium	.	.	.	.	.	.	.	.	.
Uranium 234	.	.	.	.	.	.	.	.	.
Uranium 235	.	.	.	.	.	.	.	.	.
Uranium 238	.	.	.	.	.	.	.	.	.

(CONTINUED)

APPENDIX D.4
Radiological Analytes, CY 1997

Sampling Point	GW-703			GW-704					
Program	EXP			EXP					
Location	EXP-B			EXP-B					
Date Sampled	08/27/97			02/19/97			08/28/97		
Sample Type									
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)									
Gross Alpha	3.5	2.9	4.9	-2.1	0.6	7.5	0.8	1.5	3.4
Gross Beta	40	6	11	7.1	6.7	29	10	4	24
Americium 241									
Iodine 129									
Neptunium 237									
Plutonium 238									
Plutonium 239									
Radium 223/224/226									
Strontium 89/90									
Technetium 99									
Tritium									
Uranium 234									
Uranium 235									
Uranium 238									

(CONTINUED)

Sampling Point	GW-706						GW-710		
Program	EXP						CMP-E		
Location	EXP-B						EXP-W		
Date Sampled	02/21/97			09/03/97			02/02/97		
Sample Type									
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)									
Gross Alpha	45	11	5	29	7	4	-20	3.8	150
Gross Beta	73	13	29	67	8	13	-23	1.1	160
Americium 241							0.1	0.18	0.33
Iodine 129							-2	11	18
Neptunium 237							0.01	0.079	0.21
Plutonium 238							0.08	0.2	0.41
Plutonium 239							0.15	0.17	0.13
Radium 223/224/226							4	1.3	0.71
Strontium 89/90							-2.4	5.8	10
Technetium 99							2	4.7	6.6
Tritium							88	110	330
Uranium 234							-0.08	0.093	0.36
Uranium 235							0	0	0.13
Uranium 238							0	0	0.1

(CONTINUED)

APPENDIX D.4
Radiological Analytes, CY 1997

Sampling Point	GW-710			GW-711					
Program	CMP-E			CMP-E					
Location	EXP-W			EXP-W					
Date Sampled	08/28/97			01/31/97			08/26/97		
Sample Type									
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)									
Gross Alpha	15	22	21	-100	4	160	2	24	75
Gross Beta	63	7	26	-52	1	160	-40	63	320
Americium 241	0.05	0.12	0.25	0.3	0.029	0.43	0.02	0.14	0.33
Iodine 129	24	26	34	-9.7	12	17	16	11	20
Neptunium 237	-0.076	0.11	0.45	0.1	0.12	0.09	0	0	0.13
Plutonium 238	-0.19	0.39	1.1	0.28	0.29	0.45	0.17	0.24	0.42
Plutonium 239	0.14	0.35	0.72	0.12	0.21	0.39	-0.02	0.041	0.19
Radium 223/224/226	8.6	2.5	2	2.8	1.1	1	4.7	1.8	1.3
Strontium 89/90	2.5	6.5	11	2.3	3.9	6.5	-0.4	4.6	8.4
Technetium 99	-9	8	13	-0.5	4.4	6.6	-11	8.6	13
Tritium	-90	500	800	150	130	330	-80	490	800
Uranium 234	0.044	0.35	0.94	0.038	0.077	0.1	0.077	0.13	0.22
Uranium 235	0.055	0.43	1.2	0	0	0.13	-0.029	0.058	0.28
Uranium 238	-0.1	0.2	0.94	0	0	0.1	0.2	0.17	0.091

(CONTINUED)

Sampling Point	GW-712								
Program	CMP-E								
Location	EXP-W								
Date Sampled	02/02/97			08/26/97					
Sample Type							DUP		
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)									
Gross Alpha	4.2	4.8	7.8	1	1.8	3.9	0.8	1.9	4.4
Gross Beta	-0.84	0.05	8.2	0.9	3.4	15	-2	3.3	17
Americium 241	0.071	0.17	0.33	0.16	0.23	0.41	-0.05	0.14	0.37
Iodine 129	4.9	12	18	3	11	20	8.8	11	19
Neptunium 237	0	0	0.091	0.05	0.1	0.14	0	0	0.1
Plutonium 238	0.073	0.12	0.21	0.13	0.14	0.2	0.07	0.16	0.31
Plutonium 239	0	0	0.086	0.039	0.094	0.2	0	0	0.07
Radium 223/224/226	0.01	0.39	1.1	1.1	1	1.5	0.34	0.77	1.8
Strontium 89/90	2.8	4.9	8.2	0.1	2.5	4.4	3.7	3.7	5.9
Technetium 99	-0.5	4.4	6.6	-6	8.7	13	-10	8.3	13
Tritium	190	140	330	780	530	800	70	510	800
Uranium 234	0.67	0.33	0.1	0.72	0.3	0.19	0.49	0.31	0.29
Uranium 235	0.047	0.094	0.13	0.11	0.12	0.096	0	0	0.15
Uranium 238	0.26	0.2	0.1	0.31	0.19	0.077	0.24	0.25	0.36

(CONTINUED)

APPENDIX D.4
Radiological Analytes, CY 1997

Sampling Point	GW-713								
Program	CMP-E								
Location	EXP-W								
Date Sampled	02/02/97						08/27/97		
Sample Type				DUP					
ACTIVITY (pCi/L)	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
Gross Alpha	1.9	4.3	7.6	2.1	4.3	7.5	-1.2	0.4	4.4
Gross Beta	1.6	5.1	8.2	0	0.05	8.2	2.9	4.1	16
Americium 241	0.036	0.14	0.31	-0.15	0.16	0.5	0.063	0.15	0.31
Iodine 129	-1.6	12	18	2.7	12	18	3	11	19
Neptunium 237	0.027	0.053	0.072	0	0	0.087	-0.015	0.11	0.32
Plutonium 238	0.032	0.15	0.33	0.076	0.12	0.22	-0.025	0.071	0.21
Plutonium 239	-0.024	0.049	0.23	0	0	0.089	-0.009	0.064	0.19
Radium 223/224/226	0.36	0.47	0.87	-0.23	0.49	1.7	0.54	0.77	1.5
Strontium 89/90	0.7	5.4	9.5	8.1	4.7	7	-1.8	3.3	6.1
Technetium 99	3	4.6	6.6	-1.5	3.6	6.6	-7	8.5	13
Tritium	230	140	330	200	140	330	-200	500	800
Uranium 234	0.42	0.28	0.3	0.5	0.28	0.26	0.47	0.29	0.12
Uranium 235	0.091	0.13	0.12	0	0	0.11	0.016	0.13	0.35
Uranium 238	0.059	0.15	0.3	0.094	0.16	0.3	0.11	0.25	0.48

(CONTINUED)

Sampling Point	GW-714						GW-715		
Program	CMP-E						CMP-E		
Location	EXP-W						EXP-W		
Date Sampled	02/03/97			08/27/97			02/03/97		
Sample Type									
ACTIVITY (pCi/L)	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
Gross Alpha	3.1	4.4	7.4	4.7	2.8	2.9	3	4.4	7.5
Gross Beta	5.4	5.4	8.2	7.2	3.8	13	3.7	5.3	8.2
Americium 241	-0.12	0.13	0.39	0.021	0.096	0.21	0.19	0.22	0.36
Iodine 129	0.34	11	18	6	11	20	-0.96	11	18
Neptunium 237	-0.034	0.098	0.29	0	0	0.1	0	0	0.081
Plutonium 238	-0.028	0.17	0.41	0.036	0.089	0.18	0.17	0.18	0.28
Plutonium 239	0.02	0.11	0.26	0.074	0.094	0.15	0.24	0.16	0.072
Radium 223/224/226	0.23	0.32	0.31	0.6	1.2	2.6	-0.05	0.3	1
Strontium 89/90	-0.62	2.6	4.7	-3.5	3.3	6.5	-0.35	2.6	4.7
Technetium 99	8.5	4.8	6.6	2	8.9	13	1.5	5.3	6.6
Tritium	310	150	330	-200	500	800	170	120	330
Uranium 234	0.74	0.36	0.11	0.87	0.37	0.1	0.25	0.19	0.096
Uranium 235	0.049	0.097	0.13	0.047	0.095	0.13	0.013	0.11	0.29
Uranium 238	1.3	0.5	0.32	1.3	0.47	0.25	0.3	0.24	0.29

(CONTINUED)

APPENDIX D.4
Radiological Analytes, CY 1997

Sampling Point	GW-715			GW-724					
Program	CMP-E			EXP					
Location	EXP-W			EXP-C					
Date Sampled	08/27/97			02/27/97					
Sample Type							DUP		
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)									
Gross Alpha	1.2	1.8	3.5	0.6	3.6	9.5	4.6	4.3	6.7
Gross Beta	-1.4	3.2	14	47	11	28	39	10	23
Americium 241	-0.027	0.078	0.23						
Iodine 129	-2	11	19						
Neptunium 237	0.1	0.12	0.092						
Plutonium 238	0.064	0.15	0.29						
Plutonium 239	0.023	0.11	0.24						
Radium 223/224/226	0.34	0.48	0.46						
Strontium 89/90	1	2.7	4.7						
Technetium 99	-8	8.1	13						
Tritium	-160	500	800						
Uranium 234	0.23	0.21	0.13						
Uranium 235	0.035	0.2	0.47						
Uranium 238	0.57	0.35	0.31						

(CONTINUED)

Sampling Point	GW-724			GW-725					
Program	EXP			EXP					
Location	EXP-C			EXP-C					
Date Sampled	09/05/97			02/28/97			09/05/97		
Sample Type									
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)									
Gross Alpha	1.8	2.7	5.7	2.4	3.9	8.4	2.2	2.8	5.6
Gross Beta	30	6	11	27	9	23	28	5.8	12
Americium 241									
Iodine 129									
Neptunium 237									
Plutonium 238									
Plutonium 239									
Radium 223/224/226									
Strontium 89/90									
Technetium 99									
Tritium									
Uranium 234									
Uranium 235									
Uranium 238									

(CONTINUED)

APPENDIX D.4
Radiological Analytes, CY 1997

Sampling Point	GW-738								
Program	EXP								
Location	EXP-C								
Date Sampled	02/25/97			09/04/97					
Sample Type							DUP		
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)	.	.	.	.	.	.	.	.	.
Gross Alpha	-0.42	0.28	4.4	3.9	3	4.8	0.8	1.9	4.4
Gross Beta	20	9	30	22	6	13	25	5	12
Americium 241	.	.	.	.	.	.	.	.	.
Iodine 129	.	.	.	.	.	.	.	.	.
Neptunium 237	.	.	.	.	.	.	.	.	.
Plutonium 238	.	.	.	.	.	.	.	.	.
Plutonium 239	.	.	.	.	.	.	.	.	.
Radium 223/224/226	.	.	.	.	.	.	.	.	.
Strontium 89/90	.	.	.	.	.	.	.	.	.
Technetium 99	.	.	.	.	.	.	.	.	.
Tritium	.	.	.	.	.	.	.	.	.
Uranium 234	.	.	.	.	.	.	.	.	.
Uranium 235	.	.	.	.	.	.	.	.	.
Uranium 238	.	.	.	.	.	.	.	.	.

(CONTINUED)

Sampling Point	GW-740						GW-829		
Program	EXP						SMP		
Location	EXP-C						OLF		
Date Sampled	02/24/97			09/04/97			03/04/97		
Sample Type									
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)	.	.	.	.	.	.	.	.	.
Gross Alpha	-2.2	1.6	8.9	0.8	1.1	1	6.1	4.3	2.1
Gross Beta	9	6.9	26	13	4	10	12	7	23
Americium 241	.	.	.	.	.	.	.	.	.
Iodine 129	.	.	.	.	.	.	.	.	.
Neptunium 237	.	.	.	.	.	.	.	.	.
Plutonium 238	.	.	.	.	.	.	.	.	.
Plutonium 239	.	.	.	.	.	.	.	.	.
Radium 223/224/226	.	.	.	.	.	.	.	.	.
Strontium 89/90	.	.	.	.	.	.	.	.	.
Technetium 99	.	.	.	.	.	.	.	.	.
Tritium	.	.	.	.	.	.	.	.	.
Uranium 234	.	.	.	.	.	.	.	.	.
Uranium 235	.	.	.	.	.	.	.	.	.
Uranium 238	.	.	.	.	.	.	.	.	.

(CONTINUED)

APPENDIX D.4
Radiological Analytes, CY 1997

Sampling Point	GW-829			NT-01					
Program	SMP			EXP					
Location	OLF			EXP-SW					
Date Sampled	09/16/97			02/03/97			10/13/97		
Sample Type									
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)									
Gross Alpha	0	1.8	5.5	-2	0.19	7.3	100	40	30
Gross Beta	4	4.4	14	71	12	8	920	90	140
Americium 241	.	.	.	.	.	.	.	.	.
Iodine 129	.	.	.	.	.	.	.	.	.
Neptunium 237	.	.	.	.	.	.	.	.	.
Plutonium 238	.	.	.	.	.	.	.	.	.
Plutonium 239	.	.	.	.	.	.	.	.	.
Radium 223/224/226	.	.	.	.	.	.	.	.	.
Strontium 89/90	.	.	.	.	.	.	.	.	.
Technetium 99	.	.	.	.	.	.	.	.	.
Tritium	.	.	.	.	.	.	.	.	.
Uranium 234	.	.	.	.	.	.	.	.	.
Uranium 235	.	.	.	.	.	.	.	.	.
Uranium 238	.	.	.	.	.	.	.	.	.

(CONTINUED)

Sampling Point	SS-1						SS-4		
Program	EXP						EXP		
Location	EXP-SW						EXP-SW		
Date Sampled	02/03/97			10/13/97			02/03/97		
Sample Type									
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)									
Gross Alpha	20	8	9.3	14	5	4	43	10	8
Gross Beta	20	6.9	8.4	42	7	13	32	8	8.3
Americium 241	.	.	.	.	.	.	.	.	.
Iodine 129	.	.	.	.	.	.	.	.	.
Neptunium 237	.	.	.	.	.	.	.	.	.
Plutonium 238	.	.	.	.	.	.	.	.	.
Plutonium 239	.	.	.	.	.	.	.	.	.
Radium 223/224/226	.	.	.	.	.	.	.	.	.
Strontium 89/90	.	.	.	.	.	.	.	.	.
Technetium 99	.	.	.	.	.	.	.	.	.
Tritium	.	.	.	.	.	.	.	.	.
Uranium 234	.	.	.	.	.	.	.	.	.
Uranium 235	.	.	.	.	.	.	.	.	.
Uranium 238	.	.	.	.	.	.	.	.	.

(CONTINUED)

APPENDIX D.4
Radiological Analytes, CY 1997

Sampling Point	SS-4						SS-5		
Program	EXP						EXP		
Location	EXP-SW						EXP-SW		
Date Sampled	08/29/97						02/03/97		
Sample Type				DUP					
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)	.	.	.	.	.	.	.	.	.
Gross Alpha	50	9	6	48	9	3	9.3	6	7.2
Gross Beta	100	10	25	100	10	22	11	5.6	8
Americium 241	.	.	.	.	.	.	.	.	.
Iodine 129	.	.	.	.	.	.	.	.	.
Neptunium 237	.	.	.	.	.	.	.	.	.
Plutonium 238	.	.	.	.	.	.	.	.	.
Plutonium 239	.	.	.	.	.	.	.	.	.
Radium 223/224/226	.	.	.	.	.	.	.	.	.
Strontium 89/90	.	.	.	.	.	.	.	.	.
Technetium 99	.	.	.	.	.	.	.	.	.
Tritium	.	.	.	.	.	.	.	.	.
Uranium 234	.	.	.	.	.	.	.	.	.
Uranium 235	.	.	.	.	.	.	.	.	.
Uranium 238	.	.	.	.	.	.	.	.	.

(CONTINUED)

Sampling Point	SS-5		
Program	EXP		
Location	EXP-SW		
Date Sampled	08/29/97		
Sample Type			
	ACT	ERR	MDA
ACTIVITY (pCi/L)	.	.	.
Gross Alpha	18	7	12
Gross Beta	34	6	25
Americium 241	.	.	.
Iodine 129	.	.	.
Neptunium 237	.	.	.
Plutonium 238	.	.	.
Plutonium 239	.	.	.
Radium 223/224/226	.	.	.
Strontium 89/90	.	.	.
Technetium 99	.	.	.
Tritium	.	.	.
Uranium 234	.	.	.
Uranium 235	.	.	.
Uranium 238	.	.	.

APPENDIX D.4
Radiological Analytes, CY 1997

Sampling Point	BCK-11.97								
Program	EXP								
Location	EXP-SW								
Date Sampled	02/04/97			08/29/97			09/12/97		
Sample Type									
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)	.	.	.	.	.	.	.	.	.
	.	.	.	.	.	.	.	.	.
Gross Alpha	12	6.5	7.4	21	7	5.7	.	.	.
Gross Beta	36	8.2	8	270	15	15	.	.	.
Americium 241	.	.	.	0.064	0.15	0.3	.	.	.
Iodine 129	.	.	.	-1	11	19	.	.	.
Neptunium 237	.	.	.	0.42	0.28	0.27	.	.	.
Plutonium 238	.	.	.	-0.002	0.11	0.27	.	.	.
Plutonium 239	.	.	.	-0.02	0.04	0.19	.	.	.
Radium 223/224/226	.	.	.	-0.04	0.82	2.4	.	.	.
Strontium 89/90	.	.	.	1.9	2.7	4.5	.	.	.
Technetium 99	.	.	.	450	20	18	.	.	.
Thorium 228	.	.	.	-0.076	0.087	0.27	.	.	.
Thorium 230	.	.	.	0.068	0.17	0.27	.	.	.
Thorium 232	.	.	.	0.036	0.071	0.096	.	.	.
Thorium 234	.	.	.	32	5.2	0.47	.	.	.
Tritium	.	.	.	.	.	.	110	600	880
Uranium 234	.	.	.	17	3.1	0.58	.	.	.
Uranium 235	.	.	.	1.3	0.71	0.24	.	.	.
Uranium 238	.	.	.	32	5.2	0.47	.	.	.
Total Uranium (mg/L)	.	.	.	0.11	0.01	.	.	.	.
Uranium 235 (Wt. %)	.	.	.	0.39	0.05	.	.	.	.

APPENDIX E

CY 1997 DATA FOR QUALITY ASSURANCE/QUALITY CONTROL SAMPLES

EXPLANATION

SAMPLING POINT:

BCK	-	Bear Creek Kilometer
GW	-	Monitoring Well
NT	-	Northern Tributary
SS	-	Spring
D	-	Field Duplicate Sample

LOCATION:

BG	-	Bear Creek Burial Grounds WMA
EXP	-	Exit Pathway Monitoring Location: Maynardville Limestone Picket (-A, -B, -C, -W) Spring or Surface Water Sampling Location (-SW)
LIV	-	Industrial Landfill IV (Chestnut Ridge Regime)
OLF	-	Oil Landfarm WMA
RS	-	Rust Spoil Area
S3	-	S-3 Site
SPI	-	Spoil Area I

UNITS:

ug/L	-	micrograms per liter (all samples)
umho/cm	-	micromhos per centimeter (equipment rinsates)
mg/L	-	milligrams per liter (equipment rinsates)
NTU	-	Nephelometric Turbidity Units (equipment rinsates)
pCi/L	-	picoCuries per liter (equipment rinsates)

SAMPLE TYPE (radiological results in equipment rinsates):

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

NOTES:

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

.	-	Not analyzed
U	-	Organic compound not detected at the reporting limit.
<	-	Inorganic compound not detected at the reporting limit.
CVAA	-	Cold Vapor Atomic Absorption
PMS	-	Plasma Mass Spectroscopy
TDS	-	Total Dissolved Solids
TSS	-	Total Suspended Solids

Organic Compounds Detected in QA/QC Samples, CY 1997

Trip Blank Samples	Quarter of CY 1997		Annual
	First	Third	Total
Total Number of Samples	30	30	60
Samples With VOCs	29	24	53
Percent Contaminated	97	80	88
Acetone	10	16	26
Acrylonitrile	0	1	1
2-Butanone	0	15	15
Chloroform	25	11	36
1,2-Dichloroethane	0	2	2
Dimethylbenzene	3	0	3
Ethylbenzene	1	0	1
Iodomethane	4	0	4
4-Methyl-2-pentanone	1	0	1
Toluene	6	2	8
Trichloroethene	4	1	5

Laboratory Blank Samples	Quarter of CY 1997		Annual
	First	Third	Total
Total Number of Samples	18	24	42
Samples With VOCs	5	23	28
Percent Contaminated	28	96	67
Acetone	4	16	20
2-Butanone	0	13	13
Carbon disulfide	0	1	1
Dimethylbenzene	0	7	7
Ethanol	0	2	2
Ethylbenzene	0	2	2
2-Hexanone	5	4	9
Iodomethane	2	0	2
4-Methyl-2-pentanone	5	0	5
Trichloroethene	1	2	3

Equipment Rinsate Samples	Quarter of CY 1997		Annual
	First	Third	Total
Total Number of Samples	9	10	19
Samples With VOCs	9	10	19
Percent Contaminated	100	100	100
Acetone	4	5	9
2-Butanone	2	5	7
. Chloroform	9	5	14
Iodomethane	1	0	1
Methylene chloride	1	0	1
Toluene	1	1	2

Field Blank Samples	Quarter of CY 1997		Annual
	First	Third	Total
Total Number of Samples	1	1	2
Samples With VOCs	1	1	2
Percent Contaminated	100	100	100
Acetone	0	1	1
Chloroform	1	1	2

APPENDIX E.1

CORRELATION WITH GROUNDWATER AND SURFACE WATER SAMPLES

APPENDIX E.1
Correlation of Samples to Associated Blanks
First Quarter 1997

Sampling Point	Location	Date Sampled	Sample No.	Trip Blank No.	Lab Blank No.
BCK-00.63	EXP-SW	02/04/97	A970360059	A970360052	Q970410001
BCK-04.55	EXP-SW	02/04/97	A970360053	A970360052	Q970410001
BCK-07.75	EXP-SW	02/04/97	A970360050	A970360052	Q970410001
BCK-09.40	EXP-SW	02/04/97	A970360057	A970360052	Q970410001
BCK-10.60	EXP-SW	02/04/97	A970360055	A970360052	Q970410001
BCK-11.97	EXP-SW	02/04/97	A970360061	A970360052	Q970410001
GW-040	BG	01/22/97	A970220034	A970220036	Q970350014
GW-042	BG	01/31/97	A970330018	A970330017	Q970440019
GW-043	OLF	01/23/97	A970230034	A970230033	Q970350014
GW-044	OLF	01/23/97	A970230031	A970230033	Q970350014
GW-053	BG	02/06/97	A970380003	A970380000	Q970430022
GW-056	EXP-A	02/13/97	A970440012	A970440011	Q970580026
GW-069	BG	01/22/97	A970220037	A970220036	Q970350014
GW-079	BG	01/23/97	A970230041	A970230043	Q970350014
GW-080	BG	01/21/97	A970210036	A970210037	Q970360011
GW-084	OLF	01/27/97	A970280002	A970280004	Q970340016
GW-085	OLF	03/05/97	A970640060	A970640059	Q970710009
GW-085 D	OLF	03/05/97	A970640061	A970640059	Q970710009
GW-115	S3	01/22/97	A970220039	A970220041	Q970350014
GW-162	BG	01/24/97	A970240013	A970240012	Q970340016
GW-276	S3	01/28/97	A970280045	A970280047	Q970350009
GW-287	BG	02/06/97	A970380001	A970380000	Q970430022
GW-311	RS	03/04/97	A970640003	A970640000	Q970660028
GW-315	SPI	03/05/97	A970640062	A970640059	Q970710009
GW-363	OLF	01/29/97	A970290047	A970290046	Q970440014
GW-363 D	OLF	01/29/97	A970290048	A970290046	Q970440014
GW-372	BG	01/27/97	A970280006	A970280008	Q970340016
GW-372 D	BG	01/27/97	A970280009	A970280008	Q970350009
GW-373	BG	01/27/97	A970280011	A970280008	Q970350009
GW-521	LIV	01/07/97	A970080000	A970080004	Q970370011
GW-537	OLF	03/04/97	A970640008	A970640000	Q970660028
GW-613	S3	01/22/97	A970220042	A970220041	Q970350014
GW-614	S3	01/27/97	A970280000	A970280004	Q970350009
GW-621	EXP-B	02/17/97	A970490002	A970490001	Q970580029
GW-627	BG	02/08/97	A970410020	A970410019	Q970430022
GW-627 D	BG	02/08/97	A970410027	A970410019	Q970430022
GW-642	BG	01/21/97	A970210039	A970210037	Q970360011
GW-653	BG	02/06/97	A970380004	A970380000	Q970430022
GW-683	EXP-A	02/17/97	A970490006	A970490001	Q970580029
GW-684	EXP-A	02/18/97	A970500001	A970500000	Q970580029
GW-685	EXP-A	02/12/97	A970430038	A970430037	Q970580026
GW-695	EXP-B	02/17/97	A970490007	A970490001	Q970580029
GW-703	EXP-B	02/19/97	A970510004	A970510003	Q970560005
GW-704	EXP-B	02/19/97	A970510005	A970510003	Q970560005
GW-706	EXP-B	02/21/97	A970520041	A970520038	Q970560005
GW-710	EXP-W	02/02/97	A970340013	A970340012	Q970440024
GW-711	EXP-W	01/31/97	A970330020	A970330017	Q970440019
GW-712	EXP-W	02/02/97	A970340009	A970340011	Q970440019

APPENDIX E.1
Correlation of Samples to Associated Blanks
First Quarter 1997

Sampling Point	Location	Date Sampled	Sample No.	Trip Blank No.	Lab Blank No.
GW-713	EXP-W	02/02/97	A970340018	A970330017	Q970440019
GW-713 D	EXP-W	02/02/97	A970340019	A970330017	Q970440019
GW-714	EXP-W	02/03/97	A970350002	A970350004	Q970360008
GW-715	EXP-W	02/03/97	A970350005	A970350004	Q970360008
GW-724	EXP-C	02/27/97	A970590008	A970590007	Q970640011
GW-724 D	EXP-C	02/27/97	A970590010	A970590007	Q970640011
GW-725	EXP-C	02/28/97	A970590138	A970590137	Q970640011
GW-738	EXP-C	02/25/97	A970570001	A970570000	Q970590042
GW-740	EXP-C	02/24/97	A970560001	A970560000	Q970590042
GW-829	OLF	03/04/97	A970640001	A970640000	Q970660028
NT-01	EXP-SW	02/03/97	A970350016	A970350004	Q970360008
SS-1	EXP-SW	02/03/97	A970350014	A970350004	Q970360008
SS-4	EXP-SW	02/03/97	A970350015	A970350004	Q970360008
SS-5	EXP-SW	02/03/97	A970350017	A970350004	Q970360008

APPENDIX E.1
Correlation of Samples to Associated Blanks
Third Quarter 1997

Sampling Point	Location	Date Sampled	Sample No.	Trip Blank No.	Lab Blank No.
BCK-00.63	EXP-SW	08/28/97	A972400114	A972400110	Q972480177
BCK-04.55	EXP-SW	08/28/97	A972400115	A972400110	Q972480177
BCK-07.75	EXP-SW	08/29/97	A972410040	A972410039	Q972470141
BCK-09.40	EXP-SW	08/29/97	A972410042	A972410039	Q972470141
BCK-10.60	EXP-SW	08/29/97	A972410098	A972410097	Q972470141
BCK-11.97	EXP-SW	08/29/97	A972410099	A972410097	Q972520000
GW-040	BG	09/02/97	A972450125	A972450124	Q972520000
GW-042	BG	09/02/97	A972450126	A972450124	Q972520000
GW-043	OLF	08/13/97	A972250047	A972250046	Q972300076
GW-044	OLF	08/11/97	A972230133	A972230131	Q972260135
GW-053	BG	09/03/97	A972470002	A972470000	Q972480189
GW-056	EXP-A	08/19/97	A972310059	A972310058	Q972370114
GW-069	BG	08/18/97	A972300182	A972300181	Q972390065
GW-079	BG	08/18/97	A972300183	A972300181	Q972390065
GW-080	BG	08/14/97	A972260239	A972260238	Q972330055
GW-084	OLF	08/13/97	A972250048	A972250046	Q972330049
GW-085	OLF	09/17/97	A972600046	A972600045	Q972680077
GW-115	S3	08/11/97	A972230134	A972230131	Q972260135
GW-162	BG	08/19/97	A972310049	A972310047	Q972370114
GW-162 D	BG	08/19/97	A972310051	A972310047	Q972370114
GW-276	S3	08/13/97	A972250049	A972250046	Q972330049
GW-287	BG	09/03/97	A972470001	A972470000	Q972520000
GW-311	RS	09/19/97	A972620128	A972620127	Q972650064
GW-315	SPI	09/16/97	A972590078	A972590077	Q972620015
GW-363	OLF	08/14/97	A972260278	A972260274	Q972370114
GW-372	BG	08/14/97	A972260241	A972260238	Q972330055
GW-373	BG	08/20/97	A972320147	A972320146	Q972410058
GW-521	LIV	07/21/97	A972030004	A972030001	Q972060080
GW-537	OLF	09/17/97	A972600047	A972600045	Q972650064
GW-537 D	OLF	09/17/97	A972600048	A972600045	Q972650064
GW-613	S3	08/11/97	A972230132	A972230131	Q972260135
GW-614	S3	08/14/97	A972260276	A972260274	Q972370111
GW-614 D	S3	08/14/97	A972260277	A972260274	Q972370111
GW-621	EXP-B	08/21/97	A972340002	A972340000	Q972480149
GW-627	BG	09/09/97	A972530001	A972530000	Q972600027
GW-627 D	BG	09/09/97	A972530002	A972530000	Q972600027
GW-642	BG	08/14/97	A972260240	A972260238	Q972330055
GW-653	BG	09/03/97	A972470003	A972470000	Q972480189
GW-683	EXP-A	08/21/97	A972340004	A972340000	Q972480149
GW-684	EXP-A	08/21/97	A972340006	A972340000	Q972480149
GW-685	EXP-A	08/20/97	A972320166	A972320165	Q972410058
GW-685 D	EXP-A	08/20/97	A972320167	A972320165	Q972410058
GW-695	EXP-B	08/19/97	A972310060	A972310058	Q972370114
GW-703	EXP-B	08/27/97	A972400060	A972400059	Q972450323
GW-704	EXP-B	08/28/97	A972410001	A972410000	Q972480177
GW-706	EXP-B	09/03/97	A972460111	A972460110	Q972480189
GW-710	EXP-W	08/28/97	A972400111	A972400110	Q972450323
GW-711	EXP-W	08/26/97	A972390006	A972390005	Q972450065

APPENDIX E.1
Correlation of Samples to Associated Blanks
Third Quarter 1997

Sampling Point	Location	Date Sampled	Sample No.	Trip Blank No.	Lab Blank No.
GW-712	EXP-W	08/26/97	A972380037	A972380036	Q972450065
GW-712 D	EXP-W	08/26/97	A972380038	A972380036	Q972450065
GW-713	EXP-W	08/27/97	A972400031	A972400030	Q972450323
GW-714	EXP-W	08/27/97	A972400032	A972400030	Q972450323
GW-715	EXP-W	08/27/97	A972400033	A972400030	Q972450323
GW-724	EXP-C	09/05/97	A972480137	A972480136	Q972540000
GW-725	EXP-C	09/05/97	A972480141	A972480140	Q972540000
GW-738	EXP-C	09/04/97	A972480017	A972480015	Q972480189
GW-738 D	EXP-C	09/04/97	A972480018	A972480015	Q972480189
GW-740	EXP-C	09/04/97	A972480016	A972480015	Q972480189
GW-829	OLF	09/16/97	A972590079	A972590077	Q972740053
NT-01	EXP-SW	10/13/97	A972860068	A972860067	Q972900004
SS-1	EXP-SW	10/13/97	A972860069	A972860067	Q972930120
SS-4	EXP-SW	08/29/97	A972410043	A972410039	Q972470141
SS-4 D	EXP-SW	08/29/97	A972410044	A972410039	Q972470141
SS-5	EXP-SW	08/29/97	A972410041	A972410039	Q972470141

APPENDIX E.2

TRIP BLANK DATA SUMMARY

APPENDIX E.2
Organic Analytes Detected in Trip Blank Samples, First Quarter 1997

Sample Number	A970080004	A970210037	A970220036	A970220041	A970230033	A970230043	A970240012	A970280004
ORGANICS (ug/L)								
Acetone	10U	10U	10U	10U	10U	10U	10U	3
Chloroform	5U	13	15	16	19	15	11	1
Dimethylbenzene	5U	5U	5U	5U	5U	5U	5U	5U
Ethylbenzene	5U	5U	5U	5U	5U	5U	5U	5U
Iodomethane	5U	5U	5U	5U	5U	5U	5U	5U
4-Methyl-2-pentanone	10U	10U	10U	10U	10U	10U	10U	10U
Toluene	5U	5U	5U	5U	5U	5U	5U	5U
Trichloroethene	5U	5U	5U	5U	5U	5U	5U	5U

(CONTINUED)

Sample Number	A970280008	A970280047	A970290046	A970330017	A970340011	A970340012	A970350004	A970360052
ORGANICS (ug/L)								
Acetone	10U	10U	10U	10U	10U	10U	10U	10U
Chloroform	1	15	13	19	14	14	15	15
Dimethylbenzene	5U	5U	5U	5U	5U	5U	5U	5U
Ethylbenzene	5U	5U	5U	5U	5U	5U	5U	5U
Iodomethane	5U	5U	5U	5U	5U	5U	5U	5U
4-Methyl-2-pentanone	10U	10U	10U	10U	10U	10U	10U	10U
Toluene	5U	5U	5U	5U	5U	5U	5U	5U
Trichloroethene	5U	5U	5U	5U	5U	5U	5U	5U

(CONTINUED)

Sample Number	A970380000	A970410019	A970430037	A970440011	A970490001	A970500000	A970510003	A970520038
ORGANICS (ug/L)								
Acetone	10U	10U	18	10U	10U	10U	5	11
Chloroform	13	13	15	12	13	14	8	18
Dimethylbenzene	5U	5U	5U	5U	5U	5U	9	5U
Ethylbenzene	5U	5U	5U	5U	5U	5U	2	5U
Iodomethane	5U	5U	5U	5U	5U	5U	1	1
4-Methyl-2-pentanone	10U	10U	10U	10U	10U	10U	2	10U
Toluene	5U	5U	5U	5U	5U	5U	14	5U
Trichloroethene	5U	5U	5U	5U	5U	5U	22	5U

(CONTINUED)

Sample Number	A970560000	A970570000	A970590007	A970590137	A970640000	A970640059
ORGANICS (ug/L)						
Acetone	4	3	4	4	3	13
Chloroform	15	5U	5U	5U	5U	2
Dimethylbenzene	2	5U	2	5U	5U	5U
Ethylbenzene	5U	5U	5U	5U	5U	5U
Iodomethane	1	1	5U	5U	5U	5U
4-Methyl-2-pentanone	10U	10U	10U	10U	10U	10U
Toluene	4	1	3	2	2	5U
Trichloroethene	7	5U	4	5U	3	5U

APPENDIX E.2
Organic Analytes Detected in Trip Blank Samples, Third Quarter 1997

Sample Number	A972030001	A972230131	A972250046	A972260238	A972260274	A972300181	A972310047	A972310058
ORGANICS (ug/L)								
Acetone	7	3	5	11	3	5	3	3
Acrylonitrile	10U	10U	1	10U	10U	10U	10U	10U
2-Butanone	6	10U	1	10U	10U	10U	10U	10U
Chloroform	5U	19	5U	2	5U	6	5U	5U
1,2-Dichloroethane	5U	5U	5U	4	5U	5U	5U	5U
Toluene	2	5U	2	5U	5U	5U	5U	5U
Trichloroethene	5U	5U	5U	5U	5U	5U	5U	5U

(CONTINUED)

Sample Number	A972320146	A972320165	A972340000	A972380036	A972390005	A972400030	A972400059	A972400110
ORGANICS (ug/L)								
Acetone	10U	10U	8	4	10U	4	5	5
Acrylonitrile	10U	10U	10U	10U	10U	10U	10U	10U
2-Butanone	10U	10U	6	8	8	8	10	9
Chloroform	5U	1	5U	11	15	5U	5U	5U
1,2-Dichloroethane	5U	5U	3	5U	5U	5U	5U	5U
Toluene	5U	5U	5U	5U	5U	5U	5U	5U
Trichloroethene	5U	5U	5U	5	5U	5U	5U	5U

(CONTINUED)

Sample Number	A972410000	A972410039	A972410097	A972450124	A972460110	A972470000	A972480015	A972480136
ORGANICS (ug/L)								
Acetone	5	10U	10U	10U	10U	10U	4	10U
Acrylonitrile	10U	10U	10U	10U	10U	10U	10U	10U
2-Butanone	9	3	3	10U	3	10U	7	2
Chloroform	5U	2	5U	5U	4	5U	7	5U
1,2-Dichloroethane	5U	5U	5U	5U	5U	5U	5U	5U
Toluene	5U	5U	5U	5U	5U	5U	5U	5U
Trichloroethene	5U	5U	5U	5U	5U	5U	5U	5U

(CONTINUED)

Sample Number	A972480140	A972530000	A972590077	A972600045	A972620127	A972860067
ORGANICS (ug/L)						
Acetone	10U	10U	10U	10U	3	10U
Acrylonitrile	10U	10U	10U	10U	10U	10U
2-Butanone	10U	10U	10U	10U	5	10U
Chloroform	5U	15	9	5U	5U	5U
1,2-Dichloroethane	5U	5U	5U	5U	5U	5U
Toluene	5U	5U	5U	5U	5U	5U
Trichloroethene	5U	5U	5U	5U	5U	5U

APPENDIX E.3

LABORATORY BLANK DATA SUMMARY

APPENDIX E.3
Organics Detected in Laboratory Blank Samples, First Quarter 1997

Sample Number	Q970340016	Q970350009	Q970350014	Q970360008	Q970360011	Q970370011	Q970410001	Q970430022
ORGANICS (ug/L)								
Acetone	10U	10U	10U	10U	10U	10U	10U	10U
2-Hexanone	10U	10U	10U	10U	9	10U	10U	10U
Iodomethane	5U	5U	5U	5U	5U	5U	5U	5U
4-Methyl-2-pentanone	10U	10U	10U	10U	6	10U	10U	10U
Trichloroethene	5U	5U	5U	5U	5U	5U	5U	5U

(CONTINUED)

Sample Number	Q970440014	Q970440019	Q970440024	Q970560005	Q970580026	Q970580029	Q970590042	Q970640011
ORGANICS (ug/L)								
Acetone	10U	10U	10U	3	10U	10U	2	1
2-Hexanone	10U	10U	10U	4	10U	10U	4	3
Iodomethane	5U	5U	5U	1	5U	5U	1	5U
4-Methyl-2-pentanone	10U	10U	10U	3	10U	10U	2	1
Trichloroethene	5U	5U	5U	1	5U	5U	5U	5U

(CONTINUED)

Sample Number	Q970660028	Q970710009
ORGANICS (ug/L)		
Acetone	2	10U
2-Hexanone	4	10U
Iodomethane	5U	5U
4-Methyl-2-pentanone	2	10U
Trichloroethene	5U	5U

APPENDIX E.3
Organic Analytes Detected in Laboratory Blank Samples, Third Quarter 1997

Sample Number	Q972060080	Q972260135	Q972300076	Q972330049	Q972330055	Q972370111	Q972370114	Q972390065
ORGANICS (ug/L)								
Acetone	4	7	7	14	10U	6	3	10
2-Butanone	7	10U	10U	10U	10U	10U	10U	10U
Carbon disulfide	5U	5U	5U	2	5U	5U	5U	5U
Dimethylbenzene	5U	5U	5U	1	1	5U	5U	5U
Ethanol	500U	500U	500U	500U	500U	500U	500U	500U
Ethylbenzene	5U	1	1	5U	5U	5U	5U	5U
2-Hexanone	10U	1	1	10U	1	10U	10U	10U
Trichloroethene	5U	5U	5U	5U	5U	5U	5U	5U

(CONTINUED)

Sample Number	Q972410058	Q972450065	Q972450323	Q972470141	Q972480149	Q972480177	Q972480189	Q972520000
ORGANICS (ug/L)								
Acetone	10U	10U	3	10U	2	3	3	10U
2-Butanone	4	7	7	5	4	6	6	4
Carbon disulfide	5U	5U	5U	5U	5U	5U	5U	5U
Dimethylbenzene	5U	5U	5U	1	5U	5U	5U	1
Ethanol	500U	500U	500U	500U	500U	500U	500U	500U
Ethylbenzene	5U	5U	5U	5U	5U	5U	5U	5U
2-Hexanone	10U	10U	10U	10U	10U	10U	10U	10U
Trichloroethene	5U	5	5U	5U	5U	5U	5U	5U

(CONTINUED)

Sample Number	Q972540000	Q972600027	Q972620015	Q972650064	Q972680077	Q972740053	Q972900004	Q972930120
ORGANICS (ug/L)								
Acetone	10U	10U	10U	2	2	39	6	1
2-Butanone	10U	10U	10U	6	7	17	10U	3
Carbon disulfide	5U	5U	5U	5U	5U	5U	5U	5U
Dimethylbenzene	1	5U	5U	5U	5U	2	1	5U
Ethanol	500U	500U	500U	130	260	500U	500U	500U
Ethylbenzene	5U	5U	5U	5U	5U	5U	5U	5U
2-Hexanone	10U	10U	10U	10U	10U	10U	1	10U
Trichloroethene	5U	1	5U	5U	5U	5U	5U	5U

APPENDIX E.4

EQUIPMENT RINSATE DATA SUMMARY

APPENDIX E.4
Organic Analytes Detected in Equipment Rinsate Samples, CY 1997

Associated Well	GW-363		GW-373		GW-627		GW-706		GW-710	
Date Sampled	01/29/97	08/14/97	01/27/97	08/20/97	02/08/97	09/09/97	02/21/97	09/03/97	02/02/97	08/28/97
Pump Number	10	7	8	10	2	7	5	7	2	2
ORGANICS (ug/L)										
Acetone	10U	3	14	10U	10U	10U	4	34	10U	4
2-Butanone	10U	10U	1	4	10U	4	10U	8	10U	6
Chloroform	11	14	7	8	23	5U	16	1	14	5U
Iodomethane	5U	5U	5U	5U	5U	5U	1	5U	5U	5U
Methylene chloride	5U	5U	5U	5U	5U	5U	5U	5U	5U	5U
Toluene	5U	5U	5U	5U	5U	5U	5U	5U	5U	5U

(CONTINUED)

Associated Well	GW-711	GW-713	GW-714	GW-715	GW-724	GW-725		GW-829	
Date Sampled	08/26/97	02/02/97	08/27/97	02/03/97	09/05/97	02/28/97	09/05/97	03/04/97	09/16/97
Pump Number	10	11	11	5	6	2	7	10	6
ORGANICS (ug/L)									
Acetone	10U	10U	5	10U	10U	4	10U	23	2
2-Butanone	10U	10U	9	10U	10U	10U	10U	4	10U
Chloroform	12	14	5U	13	6	15	5U	9	5U
Iodomethane	5U	5U	5U	5U	5U	5U	5U	5U	5U
Methylene chloride	5U	5U	5U	5U	5U	2	5U	5U	5U
Toluene	5U	5U	5U	5U	5U	5U	1	1	5U

APPENDIX E.4
Inorganic Analytes in Equipment Rinsate Samples, CY 1997

Associated Well	GW-363		GW-373		GW-627		GW-706		GW-710	
Date Sampled	01/29/97	08/14/97	01/27/97	08/20/97	02/08/97	09/09/97	02/21/97	09/03/97	02/02/97	08/28/97
Pump Number	10	7	8	10	2	7	5	7	2	2
METALS (mg/L)										
Aluminum	<0.02	<0.02	0.024	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.029
Antimony	<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	<0.005	<0.005
Barium	0.0082	0.046	0.0063	0.015	0.036	<0.001	0.0011	0.0084	<0.001	<0.001
Beryllium	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Boron	0.032	<0.004	<0.004	<0.004	0.012	<0.004	<0.004	<0.004	<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	0.011	<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	0.0055	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Iron	<0.005	<0.005	0.011	0.033	0.072	0.01	0.06	0.078	0.92	1.6
Lead (PMS)	<0.0005	<0.0005	<0.0005	<0.0005	0.00062	<0.0005	<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	<0.001	0.0027	<0.001	<0.001	0.0024	<0.001	0.001	0.0028	0.005	0.013
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	0.0047	0.0078	0.0059	0.012	0.028	<0.0004	0.0012	0.0036	0.04	0.021
Thallium (PMS)	<0.0005	<0.0005	<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)	<0.0005	<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	<0.002	0.0028	0.0027	0.0025	0.0034	0.0029	0.0027	0.0031	0.0045	0.0063
MAJOR IONS (mg/L)										
Calcium	0.13	0.13	0.27	0.23	0.27	0.065	0.29	0.24	1.2	0.95
Magnesium	0.028	0.024	0.017	0.018	0.036	0.015	0.033	0.026	0.069	0.046
Potassium	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6
Sodium	0.09	0.034	<0.02	0.16	0.073	0.085	<0.02	<0.02	0.055	<0.02
Alkalinity-HCO3	6	2	4	2	4	2	4	2	8	4
Alkalinity-CO3	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Chloride	<0.05	0.062	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.06	0.05
Fluoride	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrate-N	<0.028	<0.028	<0.028	<0.028	<0.028	<0.028	<0.028	<0.028	<0.028	<0.028
Sulfate	<0.25	<0.25	<0.25	0.28	<0.25	<0.25	<0.25	<0.25	1.93	0.53
MISC. ANALYTES										
Conductivity (umho/cm)	1.4	1.7	1.1	3	7	1	31.5	4.8	12.9	3.8
pH (pH units)	7.24	5.85	7.05	6.97	7.46	5.96	7.51	6.86	7.36	6.93
TDS (mg/L)	<5	13	<5	<1	15	<1	11	<1	18	<1
TSS (mg/L)	<1	<1	<1	4	<1	1	<1	<1	200	<1
Turbidity (NTU)	0.882	0.253	0.769	1.83	26.7	0.074	1.41	2.55	21.7	1.22

(CONTINUED)

APPENDIX E.4
Inorganic Analytes in Equipment Rinsate Samples, CY 1997

Associated Well	GW-711	GW-713	GW-714	GW-715	GW-724	GW-725		GW-829	
Date Sampled	08/26/97	02/02/97	08/27/97	02/03/97	09/05/97	02/28/97	09/05/97	03/04/97	09/16/97
Pump Number	10	11	11	5	6	2	7	10	6
METALS (mg/L)									
Aluminum	0.056	<0.02	<0.02	<0.02	0.026	<0.02	<0.02	0.037	1.5
Antimony	<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	<0.005
Barium	<0.001	<0.001	0.018	0.0019	<0.001	0.0036	0.0089	0.013	0.017
Beryllium	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Boron	<0.004	<0.004	<0.004	<0.004	0.013	0.0054	<0.004	<0.004	<0.004
Cadmium	<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	0.1	<0.01	<0.01	<0.01	0.017	<0.01
Cobalt	<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
Iron	0.027	0.12	0.07	0.87	0.059	0.25	0.035	0.11	0.89
Lead (PMS)	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.00082
Lithium	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Manganese	0.0011	<0.001	0.0028	0.0051	0.0011	0.0031	0.0063	0.0012	0.019
Mercury (CVAA)	<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
Nickel	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.019	<0.01
Selenium	<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
Strontium	0.026	0.0084	0.0073	0.001	0.0018	0.0032	0.0055	0.012	0.0076
Thallium (PMS)	0.0013	<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
Uranium (PMS)	<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
Zinc	0.0036	0.0033	0.0026	0.0039	0.0029	0.006	0.0028	0.0033	0.0092
MAJOR IONS (mg/L)									
Calcium	0.55	0.83	0.72	0.61	<5	0.38	<5	0.25	<5
Magnesium	0.03	0.052	0.038	0.04	0.048	0.038	0.045	0.065	0.37
Potassium	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	0.9
Sodium	<0.02	<0.02	<0.02	0.15	0.044	<0.02	0.028	0.035	0.081
Alkalinity-HCO3	6	4	4	6	2	6	4	4	8
Alkalinity-CO3	<1	<1	<1	<1	<1	<1	<1	<1	<1
Chloride	0.14	0.1	<0.05	<0.05	<0.05	0.109	<0.05	0.09	<0.05
Fluoride	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrate-N	<0.028	<0.028	<0.028	<0.028	<0.028	<0.028	<0.028	<0.028	<0.028
Sulfate	1.14	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25
MISC. ANALYTES									
Conductivity (umho/cm)	4.4	2.1	4.4	10.8	8.6	2.7	1.7	11.2	8.9
pH (pH units)	7.05	6.91	6.52	6.97	6.95	7.35	6.58	6.65	9.13
TDS (mg/L)	<1	15	<1	17	<1	1	<1	5	28
TSS (mg/L)	1	<1	<1	2	3	<1	2	<1	27.6
Turbidity (NTU)	0.316	1.85	0.964	53.2	1.07	1.86	0.355	0.856	21.8

APPENDIX E.4
Radiological Analytes in Equipment Rinsate Samples, 1997

Associated Well	GW-363						GW-373		
Date Sampled	01/29/97			08/14/97			01/27/97		
Pump Number	10			7			8		
Sample Type	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)									
Gross Alpha	0.38	4.8	6.8	-0.6	1.2	4.3	-2.4	0.17	6.8
Gross Beta	3.1	4.8	7.9	-1.5	2.8	19	0.51	4.6	7.9
Americium 241	-0.11	0.16	0.42	0.072	0.49	1.1	0.058	0.21	0.43
Iodine 129	9.7	11	18	7	11	19	-1	11	18
Neptunium 237	0	0	0.076	-0.026	0.076	0.23	0.032	0.064	0.086
Plutonium 238	-0.11	0.29	0.71	-0.054	0.16	0.47	-0.065	0.13	0.37
Plutonium 239	-0.019	0.14	0.41	0	0	0.13	-0.042	0.059	0.25
Radium 223/224/226	0.02	0.26	0.81	0.23	0.37	1	0.16	0.31	0.7
Strontium 89/90	0.1	1.7	3	2.2	2.8	4.6	1	1.9	3.2
Technetium 99	-1	3.8	6.5	-2	7.2	13	0.5	4.4	6.5
Tritium	430	160	350	100	500	800	550	170	350
Uranium 234	0	0	0.15	0.09	0.21	0.43	0.021	0.12	0.29
Uranium 235	0	0	0.18	0	0	0.22	0.013	0.11	0.29
Uranium 238	-0.075	0.11	0.44	0.35	0.34	0.43	0.07	0.1	0.095

(CONTINUED)

Associated Well	GW-373			GW-627					
Date Sampled	08/20/97			02/08/97			09/09/97		
Pump Number	10			2			7		
Sample Type	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)									
Gross Alpha	0.7	1.5	3.5	-3.3	0.17	7	0.66	1.5	3.6
Gross Beta	5	3.6	12	0.83	4.7	8	-1.7	2.6	17
Americium 241	-0.002	0.084	0.21	.	.	.	.	.	.
Iodine 129	3	11	19	.	.	.	.	.	.
Neptunium 237	-0.02	0.04	0.19	.	.	.	.	.	.
Plutonium 238	0.14	0.15	0.24	.	.	.	.	.	.
Plutonium 239	-0.009	0.064	0.19	.	.	.	.	.	.
Radium 223/224/226	0	0.64	1.9	.	.	.	.	.	.
Strontium 89/90	-0.1	3.1	5.5	.	.	.	.	.	.
Technetium 99	1	4.7	13	.	.	.	.	.	.
Tritium	540	530	800	.	.	.	.	.	.
Uranium 234	0.12	0.15	0.24	.	.	.	.	.	.
Uranium 235	0.063	0.089	0.086	.	.	.	.	.	.
Uranium 238	0.1	0.1	0.069	.	.	.	.	.	.

(CONTINUED)

APPENDIX E.4
Radiological Analytes in Equipment Rinsate Samples, 1997

Associated Well	GW-706						GW-710		
Date Sampled	02/21/97			09/03/97			02/02/97		
Pump Number	5			7			2		
Sample Type	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)									
Gross Alpha	0	0	1.8	2	1.8	2.6	-64	3.5	140
Gross Beta	7	6.8	28	2.5	3.1	11	-74	1.1	160
Americium 241							-0.002	0.1	0.26
Iodine 129							-2.6	11	18
Neptunium 237							0	0	0.091
Plutonium 238							0.32	0.22	0.29
Plutonium 239							0.19	0.16	0.21
Radium 223/224/226							-0.27	0.23	1.2
Strontium 89/90							1.7	2.3	4.1
Technetium 99							2	4.4	6.6
Tritium							530	160	330
Uranium 234							0.042	0.083	0.11
Uranium 235							0	0	0.14
Uranium 238							0.096	0.16	0.27

(CONTINUED)

Associated Well	GW-710			GW-711			GW-713		
Date Sampled	08/28/97			08/26/97			02/02/97		
Pump Number	2			10			11		
Sample Type	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)									
Gross Alpha	-0.1	1.8	5	1.3	1.8	3.5	0.76	3.6	6.8
Gross Beta	1.8	3.6	23	2.5	3.7	16	-2.9	0.05	8.1
Americium 241	0.15	0.18	0.29	0.11	0.15	0.26	-0.043	0.16	0.38
Iodine 129	5	17	30	-2.3	11	19	-0.16	12	18
Neptunium 237	0	0	0.096	-0.01	0.08	0.25	0.03	0.061	0.082
Plutonium 238	0.028	0.13	0.29	0.1	0.11	0.15	-0.16	0.14	0.52
Plutonium 239	0.061	0.086	0.083	-0.016	0.032	0.15	0.046	0.091	0.12
Radium 223/224/226	-0.41	0.56	2.3	0.24	0.7	1.8	-0.16	0.23	1.1
Strontium 89/90	2.1	7.7	13	0.2	2.9	5.1	1	2.6	4.8
Technetium 99	-12	8.4	13	-9	8.1	13	0.5	4.4	6.6
Tritium	-400	500	800	240	540	800	570	160	330
Uranium 234	0.029	0.13	0.29	0.025	0.05	0.067	0	0	0.1
Uranium 235	0.078	0.11	0.11	0.031	0.062	0.084	0.047	0.094	0.13
Uranium 238	0.31	0.2	0.085	0.1	0.1	0.068	-0.015	0.11	0.31

(CONTINUED)

APPENDIX E.4
Radiological Analytes in Equipment Rinsate Samples, 1997

Associated Well	GW-714			GW-715			GW-724		
Date Sampled	08/27/97			02/03/97			09/05/97		
Pump Number	11			5			6		
Sample Type	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)									
Gross Alpha	0.27	0.97	2.6	-1.1	0.23	6.7	0.74	1.4	3
Gross Beta	1.9	2.9	12	-4.4	0.05	8.1	2.6	3.5	12
Americium 241	0.054	0.13	0.26	0.023	0.1	0.23	.	.	.
Iodine 129	1	11	19	-4.4	12	18	.	.	.
Neptunium 237	-0.11	0.099	0.36	0	0	0.069	.	.	.
Plutonium 238	0.11	0.13	0.21	-0.008	0.2	0.43	.	.	.
Plutonium 239	-0.031	0.044	0.18	-0.011	0.085	0.25	.	.	.
Radium 223/224/226	-0.38	0.42	2	0.22	0.45	1	.	.	.
Strontium 89/90	1.6	2.6	4.4	-0.096	2.1	3.7	.	.	.
Technetium 99	-13	8.1	13	-0.5	4.4	6.6	.	.	.
Tritium	-270	500	800	1700	250	330	.	.	.
Uranium 234	0.054	0.11	0.15	0.042	0.085	0.12	.	.	.
Uranium 235	0.041	0.23	0.55	-0.037	0.074	0.35	.	.	.
Uranium 238	0.38	0.29	0.15	0	0	0.12	.	.	.

(CONTINUED)

Associated Well	GW-725						GW-829		
Date Sampled	02/28/97			09/05/97			03/04/97		
Pump Number	2			7			10		
Sample Type	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)									
Gross Alpha	-0.78	0.37	5.1	-0.59	0.23	2.9	0.5	1.9	5.2
Gross Beta	-5	5.6	24	-1.7	3.2	13	2.6	6.2	23
Americium 241	.	.	.	.	.	.	.	.	.
Iodine 129	.	.	.	.	.	.	.	.	.
Neptunium 237	.	.	.	.	.	.	.	.	.
Plutonium 238	.	.	.	.	.	.	.	.	.
Plutonium 239	.	.	.	.	.	.	.	.	.
Radium 223/224/226	.	.	.	.	.	.	.	.	.
Strontium 89/90	.	.	.	.	.	.	.	.	.
Technetium 99	.	.	.	.	.	.	.	.	.
Tritium	.	.	.	.	.	.	.	.	.
Uranium 234	.	.	.	.	.	.	.	.	.
Uranium 235	.	.	.	.	.	.	.	.	.
Uranium 238	.	.	.	.	.	.	.	.	.

(CONTINUED)

APPENDIX E.4
Radiological Analytes in Equipment Rinsate Samples, 1997

Associated Well	GW-829		
Date Sampled	09/16/97		
Pump Number	6		
Sample Type	ACT	ERR	MDA
ACTIVITY (pCi/L)	.	.	.
Gross Alpha	-1.3	0.3	3.9
Gross Beta	-0.5	2.9	11
Americium 241	.	.	.
Iodine 129	.	.	.
Neptunium 237	.	.	.
Plutonium 238	.	.	.
Plutonium 239	.	.	.
Radium 223/224/226	.	.	.
Strontium 89/90	.	.	.
Technetium 99	.	.	.
Tritium	.	.	.
Uranium 234	.	.	.
Uranium 235	.	.	.
Uranium 238	.	.	.

APPENDIX E.5

FIELD BLANK DATA SUMMARY

APPENDIX E.5
Organic Analytes Detected in Field Blank Samples, CY 1997

Associated Well	GW-363	GW-614
Date Sampled	01/29/97	08/14/97
ORGANICS (ug/L)		
Acetone	10U	4
Chloroform	13	16

APPENDIX F
DATA SCREENING PROCESS AND DQO CRITERIA

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List of Acronyms and Abbreviations

Bear Creek Regime	Bear Creek Hydrogeologic Regime
BQR	blank qualification result
CY	calendar year
DOE	U.S. Department of Energy
DQO	data quality objective
MDA	minimum detectable activity
µg/L	micrograms per liter
mg/L	milligrams per liter
pCi/L	picoCuries per liter
RCRA	Resource Conservation and Recovery Act
RPD	relative percent difference
VOC	volatile organic compound

F.1 INTRODUCTION

The following sections describe the process used to identify groundwater and surface water quality data that do not meet data quality objectives (DQOs) of the Resource Conservation and Recovery Act (RCRA) monitoring program in the Bear Creek Hydrogeologic Regime (Bear Creek Regime), as defined in the *Y-12 Plant Groundwater Protection Program - Groundwater Monitoring Program Data Management Plan* (Martin Marietta Energy Systems, Inc. 1993). The DQOs apply to the groundwater and surface water quality data obtained during calendar year (CY) 1997 for the purposes of RCRA post-closure corrective action monitoring (RCRA monitoring) and U.S. Department of Energy (DOE) Order 5400.1 surveillance monitoring and exit pathway/perimeter monitoring (DOE Order 5400.1 monitoring). 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 (total suspended solids, total dissolved solids, and turbidity); see Table 6 in Appendix B for the 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 Results	.	●	●	.	.	.
Ion Charge Balance Errors	●	●	.	.	.	.
False-Positive Results	.	.	.	●	.	.
MDAs/Counting Errors	.	.	.	.	●	.

Results for the specified groups of analytes that do not meet the specified DQO criteria were replaced with a designated surrogate value (i.e., screened) for data evaluation purposes. Details regarding the data screening process and summary tables of the CY 1997 groundwater and surface water quality data that do not meet applicable DQOs are provided in the following sections.

F.2 SCREENED RESULTS FOR DUPLICATE SAMPLES

Duplicate groundwater samples were collected from 14 monitoring wells during CY 1997, including six wells (GW-162, GW-363, GW-372, GW-521, GW-712, and GW-713) used for RCRA monitoring. 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 replaced with a missing value (i.e., no analytical result). Total zinc concentrations reported for the duplicate filtered groundwater samples collected from well GW-627 in September 1997 show such a difference: 0.022 milligrams per liter (mg/L) and 0.0021 mg/L.

F.3 SCREENED RESULTS FOR FILTERED/UNFILTERED SAMPLES

Filtered and unfiltered groundwater and surface water samples were analyzed for the principal cations and trace metals. Results were replaced with missing values if the dissolved (filtered) concentration exceeded the corresponding total (unfiltered) concentration by an order-of-magnitude or more. The zinc concentrations reported for the filtered (0.057 mg/L) and unfiltered (0.0027 mg/L) surface water samples collected from spring SS-5 in February 1997 were the only results to show such a difference.

F.4 SCREENED RESULTS FOR PRINCIPAL IONS

Analytical results 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) between respective summed milliequivalent concentrations (i.e., molecular weight of the ion divided by the net ionic charge) of the dissolved (filtered sample) cations (which exclude digested cations) and the total (unfiltered sample) anions is equal to or greater than 20%, results for all the principal ions were considered qualitative (i.e., excluded from quantitative evaluation). Such large ion charge balance errors are indicated by the principal ion results reported for the groundwater samples collected from wells GW-287 (+27%) and GW-710 (-63%) in February and September 1997, respectively. Based on review of historical data for each well, the unusually low bicarbonate alkalinity (62 mg/L) is the probable source of the positive charge balance error for well GW-287, and extremely high chloride (1,750 mg/L) and sulfate (8,970 mg/L) concentrations potentially account

for the strongly negative charge balance error for well GW-710. Although both were sampled for RCRA monitoring purposes, screening the principal ion results for these wells did not impact the required evaluation of the monitoring data.

F.5 SCREENED RESULTS FOR VOLATILE ORGANIC COMPOUNDS

Results for the laboratory blank and trip blank samples associated with each groundwater and surface water sample were used to calculate blank qualification results (BQRs) and identify false-positive results (i.e., sampling and/or analytical artifacts) for VOCs; these results were replaced with zero as a surrogate value. A false-positive result is defined as a VOC concentration, reported in micrograms per liter (µg/L), that is less than the BQR for the respective compound. The BQRs for acetone, methylene chloride, toluene, and 2-butanone (common laboratory reagents) represent the highest concentration in either associated blank sample multiplied by a factor of 10; BQRs for all other VOCs are similarly calculated using a factor of 5 (U.S. Environmental Protection Agency 1988).

As shown in Table F-2, a total of 103 false-positive results for nine VOCs were reported for the groundwater and surface water samples collected during CY 1997 in the Bear Creek Regime, the bulk of which (77%) were reported for acetone and 2-butanone (i.e., common laboratory reagents).

Table F-2. Summary of False-Positive VOC Results in the Bear Creek Regime

Compound	Number of Detected Results	Number of False Positives
Acetone	50	44
2-Butanone	37	35
Chloroform	12	5
Iodomethane	5	5
Dimethylbenzene	4	4
Toluene	5	4
Trichloroethene	35	4
Ethylbenzene	1	1
4-Methyl-2-Pentanone	1	1

The preponderance of false-positive results for laboratory reagents suggest contamination during laboratory analysis. However, many of the false-positive results reflect contamination of the trip blank samples, which suggests contamination from the laboratory environment where the samples are stored before analyses are performed.

Twenty-two false-positive VOC results were reported for groundwater samples collected for RCRA monitoring purposes. As shown below in Table F-3, all of these results were during the third quarter sampling event for acetone or 2-butanone, neither of which are major components of the dissolved plumes of VOCs in the groundwater at the S-3 Site, the Oil Landfarm, or the Bear Creek Burial Grounds/Walk-In Pits.

Table F-3. False-Positive VOC Results for RCRA Monitoring Wells

Compound	Sampling Location	Date Sampled	Result (µg/L)	BQR	
				Lab. Blank	Trip Blank
Acetone	GW-043	08/13/97	2 J	70	.
Acetone	GW-044	08/11/97	1 J	70	.
Acetone	GW-084	08/13/97	2 J	140	.
Acetone	GW-276	08/13/97	4 J	140	.
Acetone	GW-363	08/14/97	2 J	30	.
Acetone	GW-521	07/21/97	4 J	.	70
Acetone	GW-614	08/14/97	3 J	60	.
Acetone	GW-642	08/14/97	2 J	.	110
Acetone	GW-710	08/28/97	10	.	50
Acetone	GW-713	08/27/97	4 J	.	40
Acetone	GW-714	08/27/97	4 J	.	40
Acetone	GW-715	08/27/97	4 J	.	40
2-Butanone	GW-040	09/02/97	3 J	40	.
2-Butanone	GW-276	08/13/97	2 J	.	10
2-Butanone	GW-521	07/21/97	6 J	70	.
2-Butanone	GW-710	08/28/97	9 J	.	90
2-Butanone	GW-711	08/26/97	11	.	80
2-Butanone	GW-712	08/26/97	11	.	80
2-Butanone	GW-712	08/26/97 D	8 J	.	80
2-Butanone	GW-713	08/27/97	7 J	.	80
2-Butanone	GW-714	08/27/97	7 J	.	80
2-Butanone	GW-715	08/27/97	8 J	.	80

J = Estimated value below reporting limit; D = Duplicate sample

Six of these wells are located hydraulically upgradient of the dissolved VOC plumes in the groundwater. Moreover, none of these false-positive results impacted the required evaluations of the RCRA monitoring data for each site.

F.6 SCREENED RESULTS FOR RADIOANALYTES

Results for radioanalytes (gross alpha, gross beta, and radioisotopes) 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 standard deviation for sample activity. Results were replaced with missing values if the reported activity for each radioanalyte exceeded the specified minimum detectable activity (MDA), but were less than the reported counting error. Such results are summarized in Table F-4.

Table F-4. Screened Results for Radioanalytes

Monitoring Program			RCRA Monitoring			
			DOE Order 5400.1 Monitoring			
Radioanalyte	Sampling Location	Date Sampled	MDA (pCi/L)	Activity ± Counting Error (pCi/L)		
Uranium-234	GW-042	01/31/97	0.093	0.1 ± 0.12		●
Americium-241	GW-042	09/02/97	0.06	0.088 ± 0.089		●
Americium-241	GW-043	01/23/97	0.071	0.1 ± 0.11		●
Uranium-234	GW-084	08/13/97	0.084	0.12 ± 0.13		●
Uranium-238	GW-115	01/22/97	0.19	0.21 ± 0.24		●
Plutonium-239/240	GW-162	08/19/97 D	0.06	0.006 ± 0.076		●
Gross alpha	GW-315	03/05/97	1	1.1 ± 1.3	●	
Gross alpha	GW-372	08/14/97	1	1.2 ± 1.3		●
Neptunium-237	GW-711	01/31/97	0.09	0.1 ± 0.12		●
Uranium-235	GW-712	08/26/97	0.096	0.11 ± 0.12		●
Neptunium-237	GW-715	08/27/97	0.092	0.1 ± 0.12		●
D = Duplicate sample						

These results are probably analytical artifacts. Although all but one of these results were reported for RCRA monitoring wells, each of these wells except GW-711, GW-712, and GW-715 are located hydraulically upgradient of all reported sources of radiological contamination in the Bear Creek Regime. Moreover, screening these results had no impact on the required evaluation of the RCRA monitoring data.

F.7 REFERENCES

Martin Marietta Energy Systems, Inc. 1993. *Y-12 Plant Groundwater Protection Program-Groundwater Monitoring Program Data Management Plan.* (Y/SUB/93-TK532C/1).

U.S. Environmental Protection Agency. 1988. *Laboratory Data Validation Functional Guidelines for Evaluating Organics Analyses.* U.S. EPA, Office of Solid Waste.

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