B&W Y-12 technical services LLC

Y-12 NATIONAL SECURITY COMPLEX

Y-12 GROUNDWATER PROTECTION PROGRAM GROUNDWATER AND SURFACE WATER SAMPLING AND ANALYSIS PLAN FOR CALENDAR YEAR 2012

September 2011

Prepared by

Elvado Environmental LLC
Under Subcontract No. 4300073231

for the

Environmental Compliance Department
Environment, Safety, and Health Division
Y-12 National Security Complex
Oak Ridge, Tennessee 37831

Managed by

Babcock & Wilcox Technical Services Y-12, LLC
for the U.S. DEPARTMENT OF ENERGY
under contract No. DE-AC05-00OR22800

MANAGED BY
B&W Y-12, LLC
FOR THE UNITED STATES
DEPARTMENT OF ENERGY

UCN-13672 (1-08)

Y/SUB/11-073231/2

Y-12 GROUNDWATER PROTECTION PROGRAM GROUNDWATER AND SURFACE WATER SAMPLING AND ANALYSIS PLAN FOR CALENDAR YEAR 2012

September 2011

Prepared by

Elvado Environmental LLC
Under Subcontract No. 4300073231

for the

Environmental Compliance Department
Environment, Safety, and Health Division
Y-12 National Security Complex
Oak Ridge, Tennessee 37831

Managed by

Babcock & Wilcox Technical Services Y-12, LLC
for the U.S. DEPARTMENT OF ENERGY
under contract No. DE-AC05-00OR22800

TABLE OF CONTENTS

List of Figures

List of Tables

List of Acronyms and Abbreviations

ACO	Analytical Chemistry Organization
B&W Y-12	Babcock & Wilcox Technical Services Y-12, LLC
Bear Creek Regime	Bear Creek Hydrogeologic Regime
BWXT	BWXT Y-12, L.L.C.
Chestnut Ridge Regime	Chestnut Ridge Hydrogeologic Regime
CY	calendar year
DOE	U.S. Department of Energy
East Fork Regime	Upper East Fork Poplar Creek Hydrogeologic Regime
GWPP	Groundwater Protection Program
GWMS	Groundwater Monitoring Schedule
PDB	passive diffusion bag (sampler)
redox	oxidation-reduction potential
SPM	selective parameter monitoring
VOCs	volatile organic compounds
Y-12	Y-12 National Security Complex

1.0 INTRODUCTION

This plan provides a description of the groundwater and surface water quality monitoring activities planned for calendar year (CY) 2012 at the U.S. Department of Energy (DOE) Y-12 National Security Complex (Y-12) that will be managed by the Y-12 Groundwater Protection Program (GWPP). Groundwater and surface water monitoring performed by the GWPP during CY 2012 is in accordance with the following goals:

- to protect the worker, the public, and the environment;
- to maintain surveillance of existing and potential groundwater contamination sources;
- to provide for the early detection of groundwater contamination and determine the quality of groundwater and surface water where contaminants are most likely to migrate beyond the Oak Ridge Reservation property line;
- to identify and characterize long-term trends in groundwater quality at Y-12; and
- to provide data to support decisions concerning the management and protection of groundwater resources.

Groundwater and surface water monitoring will be performed in three hydrogeologic regimes at Y-12: the Bear Creek Hydrogeologic Regime (Bear Creek Regime), the Upper East Fork Poplar Creek Hydrogeologic Regime (East Fork Regime), and the Chestnut Ridge Hydrogeologic Regime (Chestnut Ridge Regime). The Bear Creek and East Fork regimes are located in Bear Creek Valley and the Chestnut Ridge Regime is located south of Y-12 (Figure A.1). Additional surface water monitoring will be performed north of Pine Ridge along the boundary of the Oak Ridge Reservation.

Modifications to the CY 2012 monitoring program may be necessary during implementation. Changes in programmatic requirements may alter the analytes specified for selected monitoring wells or may add or remove wells from the planned monitoring network. Each modification to the monitoring program will be approved by the Y-12 GWPP manager and documented as an addendum to this sampling and analysis plan.

The following sections of this report provide details regarding the CY 2012 groundwater and surface water monitoring activities. Section 2 describes the monitoring locations in each regime and the processes used to select the sampling locations. A description of the field measurements and laboratory analytes is provided in Section 3. Sample collection methods and procedures are described in Section 4, and Section 5 lists the documents cited for more detailed operational and technical information.

The narrative sections of the report reference several appendices. Figures (maps and diagrams) and tables (excluding a data summary table presented in Section 4) are in Appendix A and Appendix B, respectively. Groundwater Monitoring Schedules (when issued throughout CY 2012) will be inserted in Appendix C, and addenda to this plan (if issued) will be inserted in Appendix D. Laboratory requirements (bottle lists, holding times, etc.) are provided in Appendix E, and an approved Waste Management Plan is provided in Appendix F.

2.0 MONITORING LOCATIONS

The Y-12 GWPP monitoring network for CY 2012 includes 115 monitoring locations (Table B.1): 40 located in the Bear Creek Regime (Figure A.2), 10 located in the Chestnut Ridge Regime (Figure A.3), 62 located in the East Fork Regime (Figure A.4), and three located north of Pine Ridge (Figure A.5). These monitoring locations were selected based on the sampling frequencies defined in the Y-12 GWPP monitoring optimization plan (Babcock & Wilcox Technical Services [B&W] Y-12, LLC 2009a). Changes to sampling frequencies implemented since the monitoring optimization plan was issued (noted on Table B.1) are based on revised programmatic requirements or updated contaminant trends. The sampling frequencies for monitoring locations in CY 2012 include semiannual, annual, biennial (even-numbered CYs), and pentennial (every five years) monitoring.

Groundwater samples will be collected from a total of 101 monitoring wells, including 34 wells in the Bear Creek Regime (Figure A.2), five wells in the Chestnut Ridge Regime (Figure A.3), and 62 wells in the East Fork Regime (Figure A.4). Two of these wells in the East Fork Regime contain a Westbay™ multiport sampling system that allows collection of groundwater samples from several discrete depth intervals (Table B.1). Well GW-722 will have samples collected from five ports (Figure A.6) and well GW-934 will have samples collected from eight ports (Figure A.7).

Samples of groundwater discharging from four natural springs will be collected. Springs SS-4 and SS-5 are located in the Bear Creek Regime (Figure A.2) and springs SCR2.1SP and SCR2.2SP are in the Chestnut Ridge Regime (Figure A.3).

The Y-12 GWPP collects surface water samples from selected locations because of the potential interaction between groundwater and surface water (e.g., gaining and losing reaches of creeks that reflect groundwater discharge and recharge, respectively). During CY 2012, surface water samples will be collected from a total of ten sampling locations, including four locations in the Bear Creek Regime, three locations in the Chestnut Ridge Regime, and three locations north of Pine Ridge. In the Bear Creek Regime, samples will be collected from three stations (BCK-04.55, BCK-09.40, and BCK-11.97) in the main channel of Bear Creek, and from one station (NT-01) in a northern tributary to Bear Creek (Figure A.2). The tributaries located in the Chestnut Ridge Regime have been numbered from west to east (SCR1 through SCR5) and surface water samples will be collected from three of the tributaries at stations (SCR1.5SW, SCR3.5SW, and S17 [located in SCR5]) located along the north side of Bethel Valley Road (Figure A.3). The surface water sampling locations north of Pine Ridge (Figure A.5) include a tributary near the Scarboro Community (NPR12.0SW), a tributary to Mill Branch (NPR23.0SW), and Gum Hollow Branch near Country Club Estates (GHK2.51ESW).

3.0 FIELD MEASUREMENTS AND ANALYTICAL PARAMETERS

Before collecting samples at most monitoring locations, field personnel will record applicable field measurements (Table B.2), including:

- depth to the static water level in monitoring wells;
- pH;
- water temperature;
- conductivity;
- dissolved oxygen; and
- oxidation-reduction potential (redox)

Field measurements will not be obtained at monitoring wells where samples are collected using a passive diffusion bag (PDB) sampler. Field measurement of dissolved oxygen and redox will not be obtained for sampling ports of monitoring wells equipped with a Westbay™ multiport sampling system. Also, the potentiometric head (in ft) will be calculated from subsurface pressure measurements for each Westbay™ sampling zone instead of measuring the depth to the static water level.

For this Sampling and Analysis Plan, specific analytes are grouped by analytical method or by type (e.g., trace metals) and referenced as elementary parameter groups (Table B.1 and Table B.2). In addition to field measurements, most of the groundwater samples and all surface water samples will be analyzed for the following suite of parameters (identified as the Standard Administrative Parameter Group):

- total suspended solids and total dissolved solids;
- major anions;
- trace metals (includes major cations);
- a comprehensive suite of volatile organic compounds (VOCs); and
- gross alpha and gross beta activity.

Selective parameter monitoring (SPM) will be performed on samples from selected monitoring wells with analytical results for at least eight samples obtained since January 1991. Historical data must clearly demonstrate that the selected parameters are the contaminants of concern and provide sufficient data to characterize the other parameters without additional analyses. For example, samples from 30 monitoring wells will be analyzed only for VOCs (Table B.1), and historical data for these locations show consistently low results for inorganic and radiochemical analytes. The SPM elementary parameter groups reflect analytical methods (Table B.2) and are designed to obtain the data necessary to meet requirements of the GWPP monitoring program.

Samples from selected locations will be analyzed for specific radionuclides. The radionuclide analyses will supplement gross alpha and/or gross beta activity results, especially in cases where the gross activity reporting limits are elevated from interferences caused by a high dissolved solid content of the groundwater sample (see Appendix E).

4.0 SAMPLE PLANNING, COLLECTION, AND HANDLING

The monitoring locations to be sampled during CY 2012 are grouped by hydrogeologic regime to provide geographic areas for planning and tracking purposes. The CY quarter for sample collection at each monitoring location is provided in Table B.1.

A Groundwater Monitoring Schedule (GWMS) will be prepared by GWPP personnel for each quarterly sampling event of CY 2012. Each GWMS (four per year) will be issued before sample collection begins, will specify the sequence for collecting samples from the monitoring locations scheduled, and will include information necessary for field personnel to collect the required samples (e.g., containment requirements and previous pumping rates used to sample each well). The GWMS is an integral part of this document, and when issued electronically, the GWMS for each CY 2012 sampling event is to be printed and inserted (Appendix C) by the recipient.

Unfiltered samples will be collected semiannually (16 samples) or annually (118 samples, including 23 biennial samples and one pentennial sample) from the monitoring locations during CY 2012 (Table B.1). As summarized below, the number of samples to be collected during each CY quarter will range from 26 to 44, for an annual total of 134 samples.

HYDROGEOLOGIC REGIME/AREA	NUMBER OF SAMPLES PER QUARTER OF CY 2012			
	1st	2nd	3rd	4th
Bear Creek Regime	16	0	25	0
Chestnut Ridge Regime	0	10	0	0
East Fork Regime	19	19	16	26
North of Pine Ridge	0	0	3	0
Total:	**35**	**29**	**44**	**26**

Personnel from the Environmental Sampling Section of the Y-12 Environment Compliance Department will be responsible for collection, transportation, and chain-of-custody control of all groundwater and surface water samples. Based on the analytical parameters for the CY 2012 monitoring locations (Table B.1 and Table B.2), personnel with the Y-12 Analytical Chemistry Organization (ACO) prepare bottle lists that specify the sample container type, size, preservative, and the laboratory test identification needed for each sampling location (see Appendix E). Additionally, ACO personnel will generate a weekly tracking report to record the sample collection date and time for each monitoring location, the date that analyses are scheduled for completion, or when analyses are completed. Sample collection will be performed in accordance with the most recent version of operating procedures for obtaining groundwater samples (B&W 2011, BWXT Y-12, L.L.C. [BWXT] 2007a, BWXT 2007b, and BWXT 2008) and surface water samples (B&W 2010). All field and laboratory activities will be performed in accordance with applicable requirements of the Y-12 Integrated Safety Management System and task-specific job hazard analyses.

Groundwater samples will be collected using the low-flow minimal drawdown method (low-flow method) during CY 2012 from most of the monitoring wells (Table B.1). A passive (no purging) sampling method will be used to collect samples at selected monitoring wells either by collecting a sample using the dedicated pump without purging (three wells) or by using a PDB sampler (16 wells). Additionally, groundwater samples from two wells (GW-722 and GW-934) that are equipped with a Westbay™ multiport sampling system will be collected following applicable procedures.

For the low-flow method, a bladder pump is permanently installed in each well that is scheduled for sample collection. If well construction prevents permanent installation (e.g., flush-mounted wells), then the pump and tubing will be installed at least 24 hours before sample collection and will be removed when sampling is completed. In accordance with the groundwater sampling procedure for the low-flow method (BWXT 2008), groundwater is purged, and subsequently sampled, from the well at a flow rate (<300 milliliters per minute [ml/min]) which ensures minimal drawdown of the static water level, therefore isolating the stagnant water column above the intake of the pump. Groundwater samples are collected from a well after the water level is in steady-state drawdown (<0.1 ft over a 15-minute interval) and field parameters (pH, conductivity, water temperature, redox, and dissolved oxygen) have stabilized (minimal variation over four consecutive readings).

A "no-purge method" may be used for wells with low-flow sampling histories that consistently demonstrate very low pumping rate (<50 ml/min) to meet the minimal drawdown requirement during purging and sample collection. During CY 2012, the no-purge method will be used to collect groundwater samples from wells GW-065 and GW-623 in the Bear Creek Regime and well GW-275 in the East Fork Regime (Table B.1). For this method, field measurements will be obtained and groundwater samples will be collected after pumping the stagnant water (calculated volume) from the tubing.

A PDB sampler will be used to evaluate VOC concentrations at 16 of the wells selected for VOC SPM, including five wells in the Bear Creek Regime and 11 wells in the East Fork Regime (Table B.1). In addition to meeting the SPM criteria (see Section 3.0) for VOCs only, the selected wells have a monitored interval length of 10 ft or less. A PDB is polyethylene bag (semipermeable membrane) that is filled with deionized water and lowered to the monitored interval of the well. Each PDB will remain in the well for at least four weeks to allow VOC concentrations in the bag to reach equilibrium (passive diffusion) with the surrounding groundwater. After retrieval, sample bottles for VOC analyses will be filled with water from the PDB. Field measurements are not obtained when samples are collected using this method.

Groundwater sampling and pressure profiling using a Westbay™ multiport sampling system at wells GW-722 (Figure A.6) and GW-934 (Figure A.7) will be performed in accordance with the applicable operating procedures (BWXT 2007a and BWXT 2007b). The groundwater samples from each sampling port will be collected in 250-milliliter nonvented stainless steel Westbay™ sample collection bottles filled at the designated depth in the well. Once filled, the bottles will be raised to the surface and the groundwater will be transferred to laboratory sample containers. The sample collection bottles will be lowered, filled, and retrieved as many times as needed to completely fill the laboratory sample bottles. Groundwater in the first sample collection bottles retrieved from each sampling port will be used as a "formation rinse" to obtain field measurements and to condition the sample collection bottle for each zone.

In addition to the groundwater and surface water samples, field blanks and equipment rinsate samples will be collected at the frequencies and analyzed for VOCs (Table B.1). Field blank samples will be collected for at least 1% of the samples. Therefore, two field blank samples will be collected during CY 2012: one in the Bear Creek Regime during first quarter and one in the East Fork Regime during the fourth quarter. Equipment rinsate samples will be collected from each Westbay well immediately after field-cleaning the sampling equipment used to collect samples from the designated sampling port (Table B.1).

Trip blank samples and field duplicate samples will be prepared and handled in accordance with the *Field Quality Control Samples* operating procedure (B&W Y-12 2009b) and will be analyzed using applicable procedures. Trip blank samples will be prepared for each cooler used to transport samples for VOC analyses. Because duplicate samples will be collected from at least 10% of the sampling locations, a total

of 14 field duplicate samples will be collected during CY 2012: six in the Bear Creek Regime, two in the Chestnut Ridge Regime, and six in the East Fork Regime (Table B.1).

All groundwater and surface water samples will be handled in accordance with procedures for chain-of-custody (B&W Y-12 2009c) and relinquished to the appropriate Y-12 ACO laboratory that will perform the analyses. The Y-12 ACO laboratories will perform each analysis within established holding times and deliver results in hard copy and electronic format within established turnaround times (see Appendix E).

5.0 REFERENCES

American Public Health Association. 1992. *Standard Methods for Examination of Water and Wastewater*, 18th Edition. (referenced on Table B.2)

Babcock & Wilcox Technical Services (B&W) Y-12. 2009a. *Y-12 Groundwater Protection Program Monitoring Optimization Plan for Groundwater Monitoring Wells at the U.S. Department of Energy Y-12 National Security Complex, Oak Ridge, Tennessee.* Prepared by Elvado Environmental LLC (Y/TS-2031/R1).

B&W Y-12. 2009b. *Field Quality Control Samples.* B&W Y-12 Management Requirement prepared by the Environment, Safety, and Health Division (Y71-66-EC-003, Rev 09/16/09).

B&W Y-12. 2009c. *Sample Chain of Custody.* B&W Y-12 Management Requirement prepared by the Environment, Safety, and Health Division (Y71-66-EC-004, Rev 09/16/09).

B&W Y-12. 2010. *Liquid Grab Sampling.* B&W Y-12 Management Requirement prepared by the Environment, Safety, and Health Division (Y50-71-005, 10/19/10).

B&W Y-12. 2011. *Measurement of Static Water Level Elevation.* BWXT Y-12, L.L.C. Management Requirement prepared by the Environment, Safety, and Health Division (Y50-71-015, Rev 1.1 06/07/11).

BWXT Y-12, L.L.C. (BWXT). 2007a. *Pressure Profiling of Wells Equipped with Westbay™ Monitoring System Instrumentation.* BWXT Y-12, L.L.C. Management Requirement prepared by the Environment, Safety, and Health Organization (Y50-71-019, Rev.1.1).

BWXT. 2007b. *Groundwater Sampling of Westbay™ Monitoring System Instrumented Wells.* BWXT Y-12, L.L.C. Management Requirement prepared by the Environment, Safety, and Health Organization (Y50-71-018, Rev.2.1).

BWXT. 2008. *Groundwater Sampling.* Oak Ridge Y-12 National Security Complex Procedure prepared by the Environment, Safety, and Health Organization (Y50-71-016, Rev 2.0).

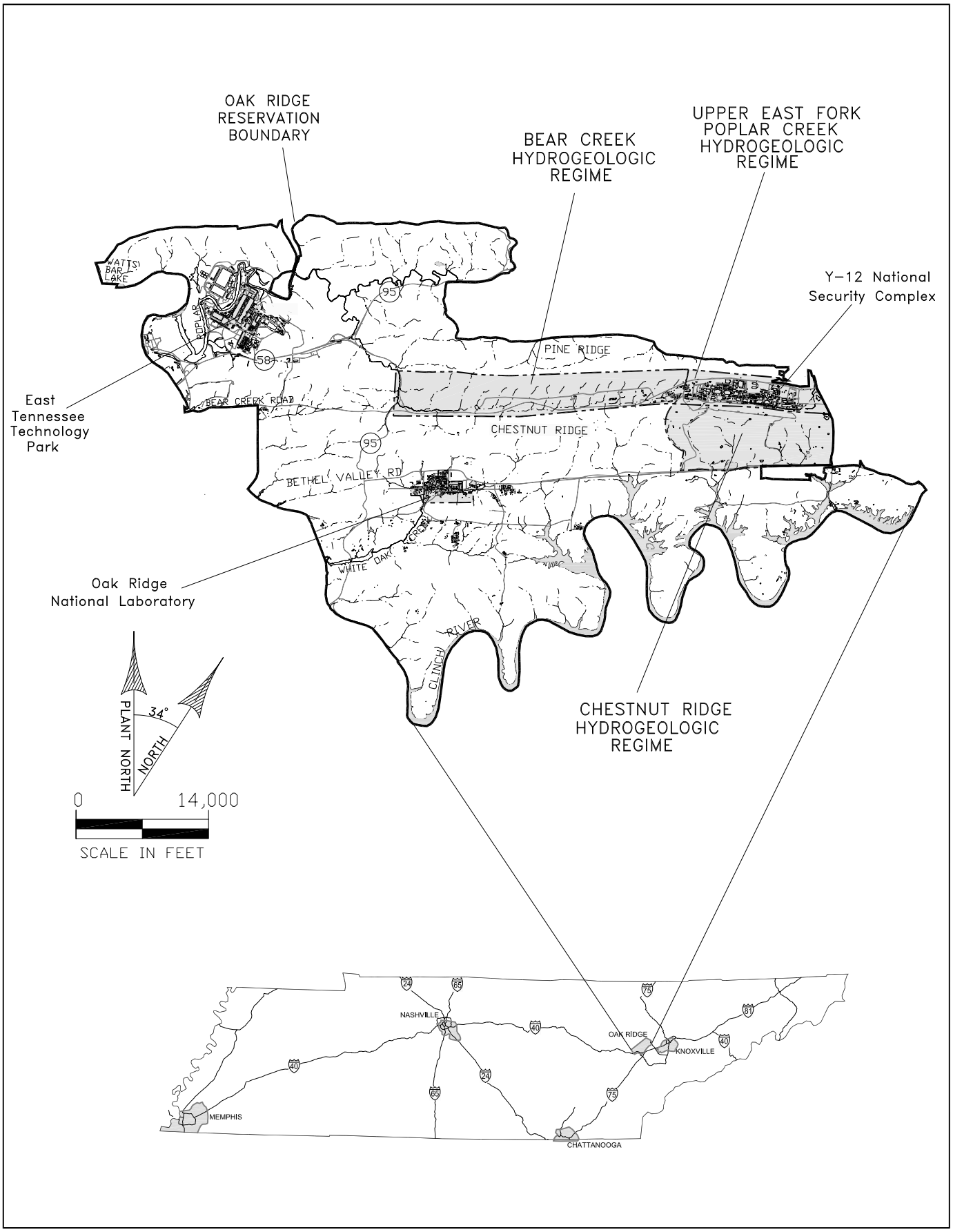
Martin Marietta Energy Systems, Inc. 1990. *Comprehensive Groundwater Monitoring Plan for the Oak Ridge Y-12 Plant*. Prepared by Geraghty & Miller, Inc. (Y/SUB/90-00206C/5) (Grid locations referenced on Table B.1)

U.S. Environmental Protection Agency. 1983. *Methods for Chemical Analysis of Water and Wastes*. (referenced on Table B.2)

U.S. Environmental Protection Agency. 1996. *Test Methods for Evaluating Solid Waste Physical/Chemical Methods.* (referenced on Table B.2)

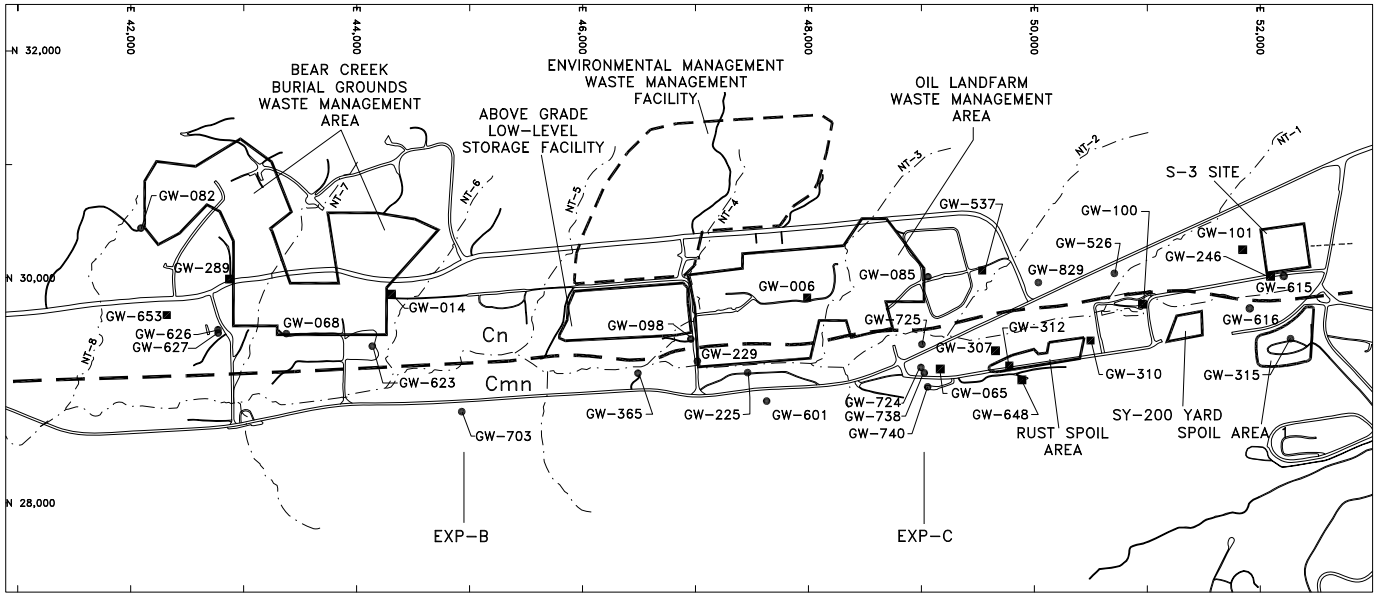
APPENDIX A

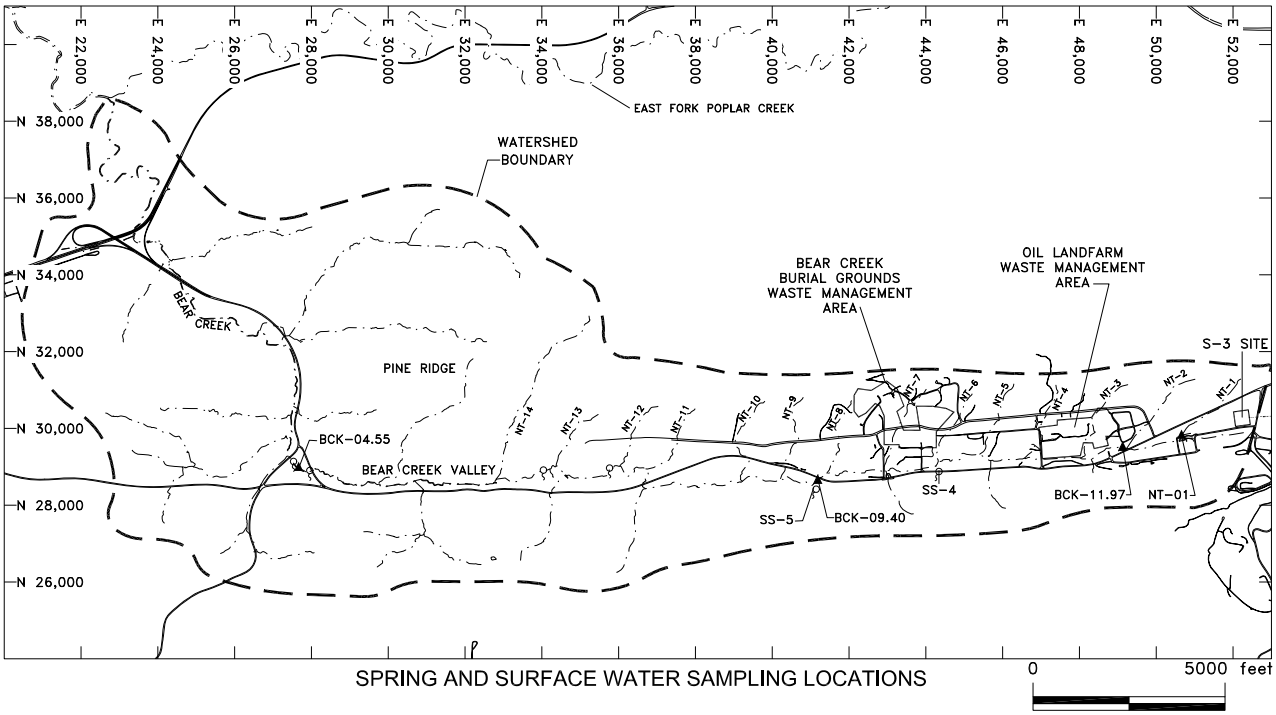
FIGURES



GWPP Fig1 09/23/08

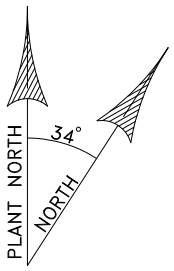
Fig. A.1. Hydrogeologic regimes at the Y-12 National Security Complex.





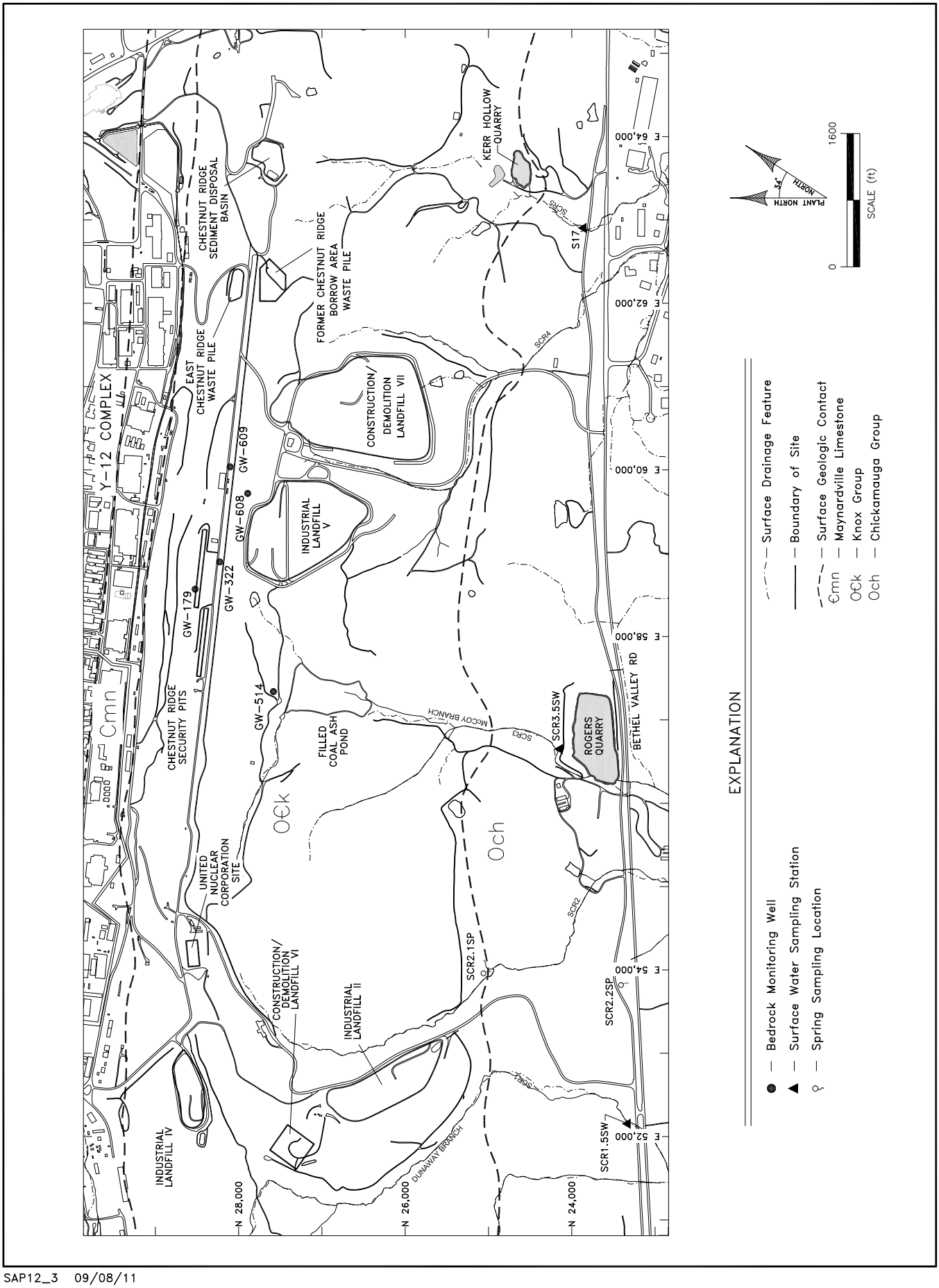
EXPLANATION

- ■ — Water Table Monitoring Well
- ● — Bedrock Monitoring Well
- ◇ — Well With Westbay Multiport Sampling System
- ▲ — Surface Water Sampling Station
- ♀ — Spring Sampling Station
- EXP-C — Exit Pathway, Maynardville Limestone Picket
- — · — · — — Surface Drainage Feature
- NT-5 — North Tributary
- Cn — Nolichucky Shale
- — — — — Approximate Geologic Contact
- Cmn — Maynardville Limestone



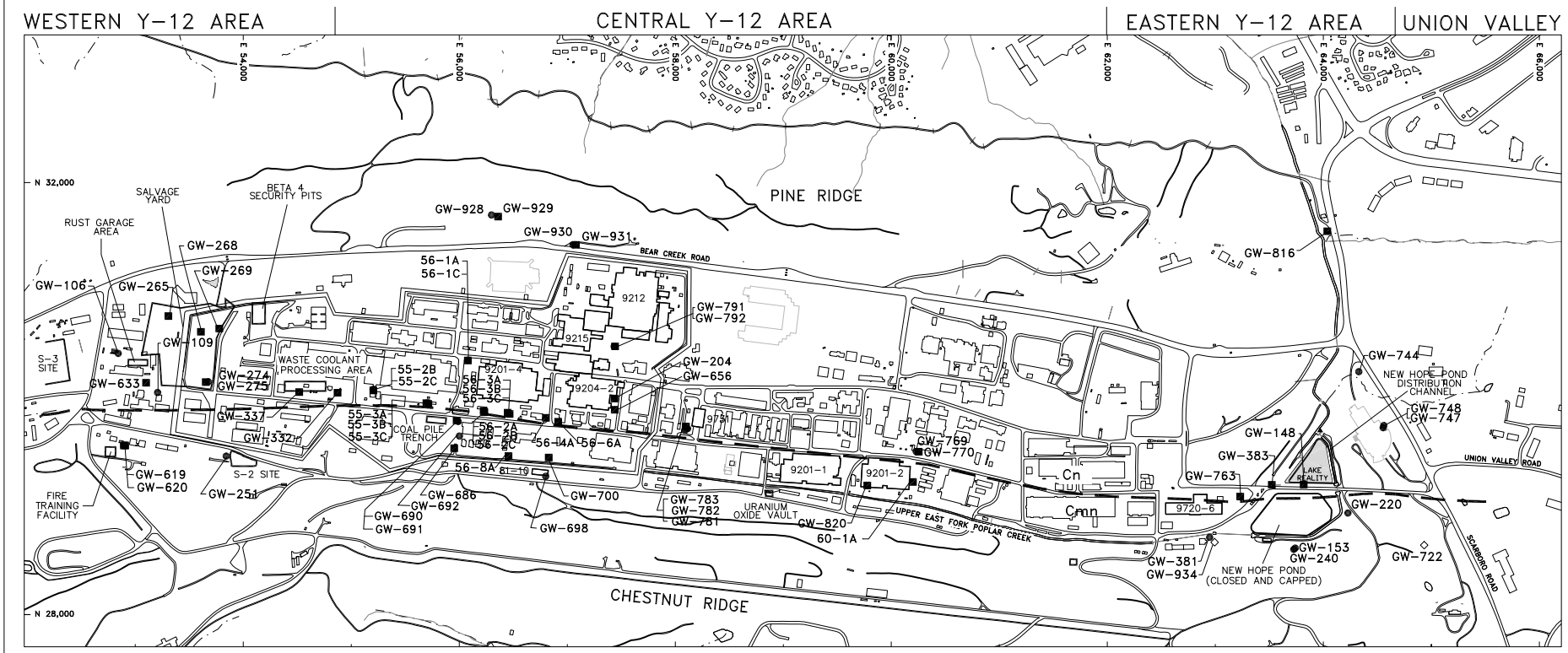
SAP12_2 09/08/11

Fig. A.2. CY 2012 sampling locations in the Bear Creek Hydrogeologic Regime.



SAP12_3 09/08/11

Fig. A.3. CY 2012 sampling locations in the Chestnut Ridge Hydrogeologic Regime.



EXPLANATION

- ■ — Water Table Monitoring Well
- ● — Bedrock Monitoring Well
- ◇ — Well With Westbay Multiport Sampling System
- ▲ — Surface Water Sampling Station
- ♀ — Spring Sampling Station
- Cn — Nolichucky Shale
- — — — Approximate Geologic Contact
- Cmn — Maynardville Limestone

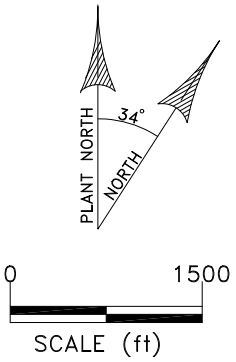
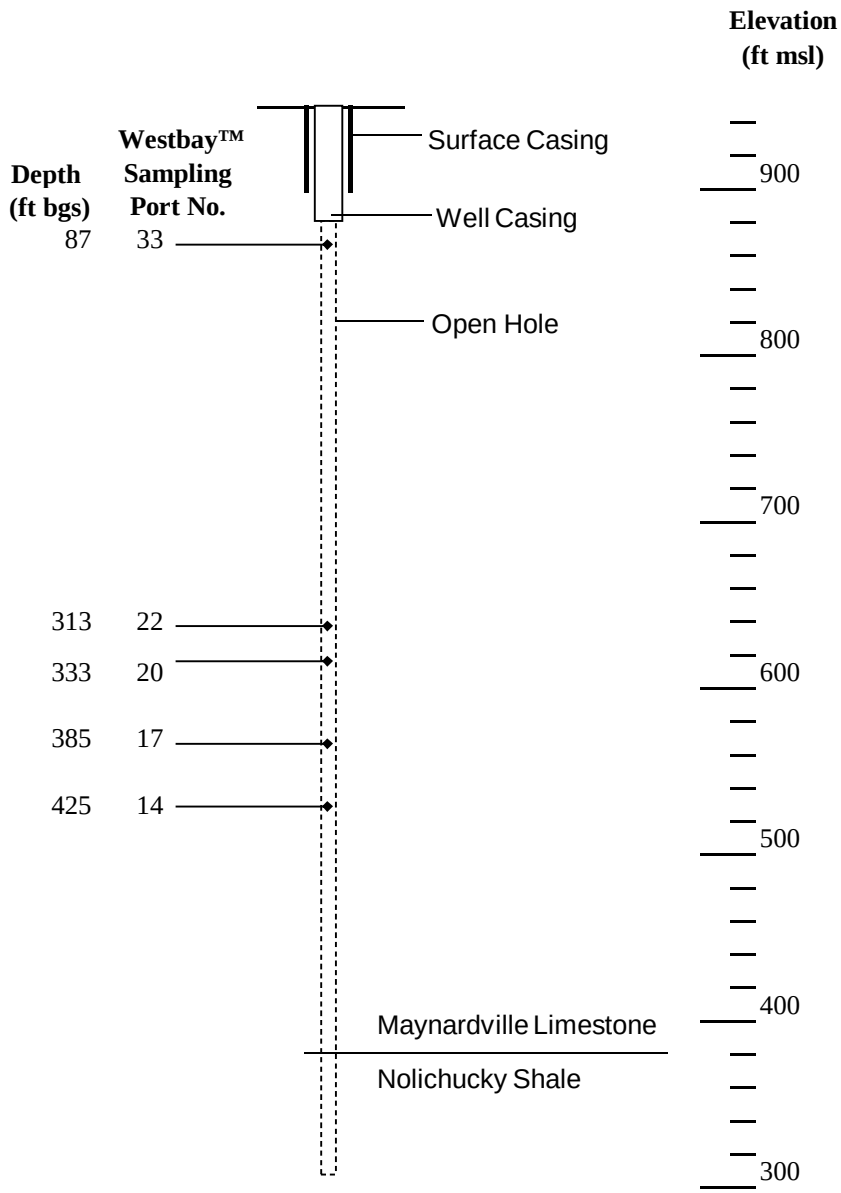


Fig. A.4. CY 2012 sampling locations in the Upper East Fork Poplar Creek Hydrogeologic Regime.

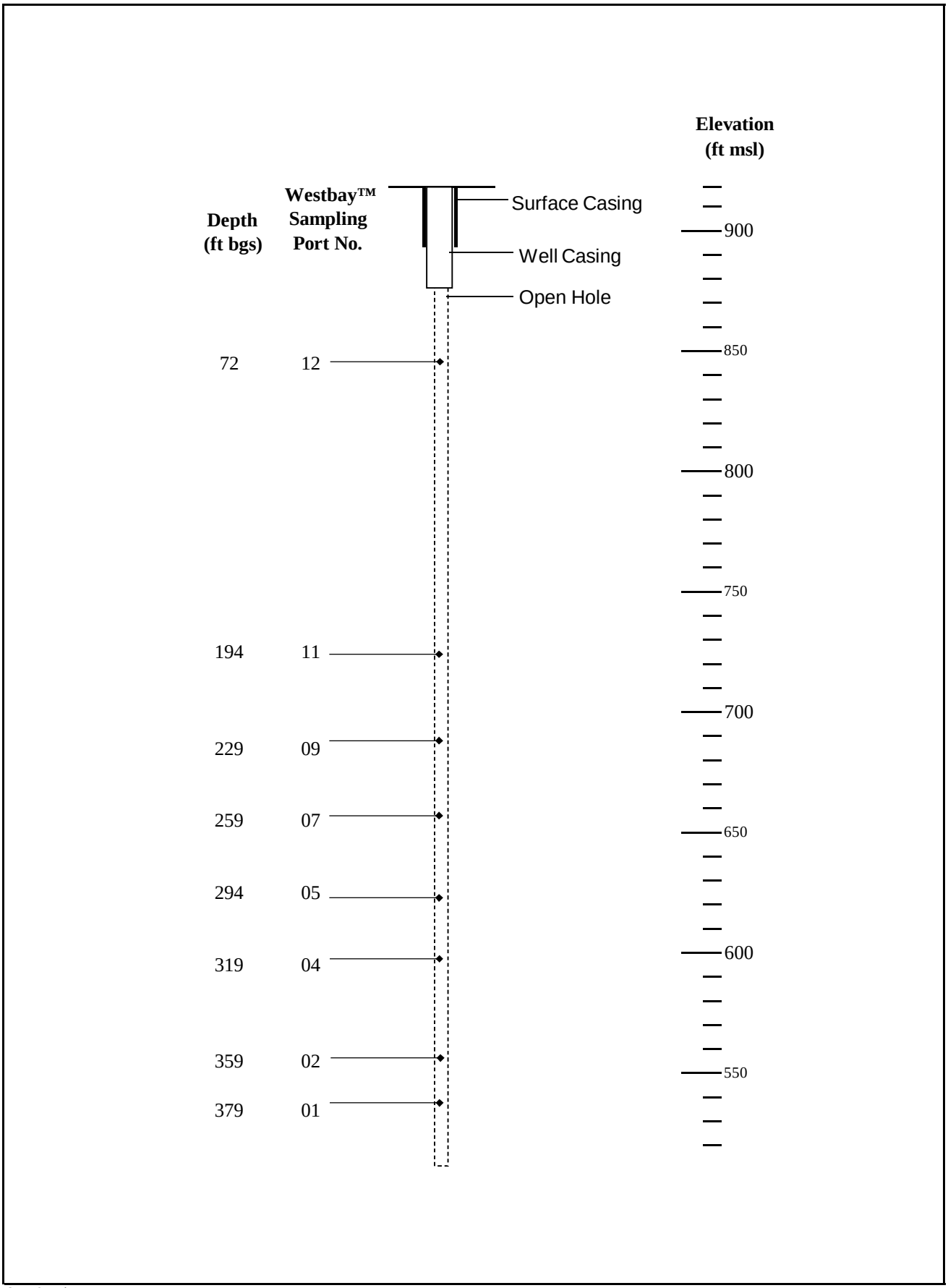
SAP12_5 09/08/11

Fig. A.5. CY 2012 surface water sampling locations north of Pine Ridge.



SAP12_6.xls

Fig. A.6. Westbay™ monitoring system sampling port depths in well GW-722.



SAP12_7.xlsx

Fig. A.7. Westbay™ monitoring system sampling port depths in well GW-934.

APPENDIX B

TABLES

Table B.1 Sampling locations, frequency, and analytical parameters for groundwater and surface water monitoring during CY 2012

Sampling Point [1]	Location [2]	Collection Method [3]	Sampling Frequency [4]	Samples Collected in CY 2012 [5]				Parameters [6]
				Q1	Q2	Q3	Q4	
Bear Creek Hydrogeologic Regime								
GW-006	OLF	PDB	Even			Y		VOC-PDB
GW-014	BG	LFLO	Annual			**D**		STD
GW-065	OLF	NP	Even *	Y				STD
GW-068	BG	PDB	Annual			Y		VOC-PDB
GW-082	BG	LFLO	Annual	Y				VOC(1)
GW-085	OLF	LFLO	Annual			Y		STD
GW-098	OLF	LFLO	Annual			Y		STD
GW-100	S3	LFLO	Annual			Y		STD
GW-101	S3	LFLO	Annual			Y		STD
GW-225	OLF	LFLO	Annual			Y		STD
GW-229	OLF	LFLO	Annual			Y		STD
GW-246	S3	LFLO	Annual	Y				STD, RAD(3,12)
GW-289	BG	LFLO	Annual	Y				STD
GW-307	RS	PDB	Annual			Y		VOC-PDB
GW-310	RS	LFLO	Even	**D**				Anions, VOC(1)
GW-312	RS	LFLO	Even	Y				VOC(1)
GW-315	SPI	LFLO	Annual			Y		STD
GW-365	OLF	LFLO	Annual			Y		STD
GW-526	S3	LFLO	Annual			Y		Anions, RAD(1,12)
GW-537	OLF	LFLO	Annual	**D**				Anions, RAD(1,12)
GW-601	OLF	LFLO	Annual			Y		Anions, VOC(1)
GW-615	S3	LFLO	Annual			Y		STD
GW-616	S3	LFLO	Annual	Y				STD
GW-623	BG	NP	Annual			Y		VOC(1)
GW-626	BG	LFLO	Even			Y		VOC(1), MET-PMS
GW-627	BG	LFLO	Semiannual	Y		Y		VOC(1)
FB-GW-627	BG	.	.	Y				VOC(1)
GW-648	RS	PDB	Even *	Y				VOC-PDB
GW-653	BG	PDB	Annual			**D**		VOC-PDB
GW-703	EXP-B	LFLO	Annual			Y		STD
GW-724	EXP-C	LFLO	Annual			**D**		Anions, VOC(1)
GW-725	EXP-C	LFLO	Annual			Y		STD
GW-738	EXP-C	LFLO	Annual			Y		STD
GW-740	EXP-C	LFLO	Annual			Y		VOC(1)
GW-829	OLF	LFLO	Even			Y		Anions
BCK-04.55	EXP-SW	GRAB	Annual	Y				STD
BCK-09.40	EXP-SW	GRAB	Annual	Y				STD
BCK-11.97	EXP-SW	GRAB	Annual	Y				STD
NT-01	EXP-SW	GRAB	Annual	Y				STD
SS-4	EXP-SW	GRAB	Annual	Y				STD
SS-5	EXP-SW	GRAB	Annual	**D**				STD

Table B.1 (continued)

Sampling Point [1]	Location [2]	Collection Method [3]	Sampling Frequency [4]	Samples Collected in CY 2012 [5]				Parameters [6]
				Q1	Q2	Q3	Q4	
Chestnut Ridge Hydrogeologic Regime								
GW-179	CRSP	LFLO	2012		Y			VOC(1)
GW-322	CRSP	LFLO	Annual		Y			VOC(1)
GW-514	FCAP	LFLO	Even		Y			VOC(1)
GW-608	CRSP	LFLO	Even		**D**			VOC(1)
GW-609	CRSP	LFLO	Even		Y			VOC(1)
S17	EXP-SW	GRAB	Annual		**D**			STD
SCR1.5SW	EXP-SW	GRAB	Annual		Y			STD
SCR2.1SP	EXP-SW	GRAB	Annual		Y			STD
SCR2.2SP	EXP-SW	GRAB	Annual		Y			STD
SCR3.5SW	EXP-SW	GRAB	Annual		Y			STD
Upper East Fork Poplar Creek Hydrogeologic Regime								
55-2B	GRIDB3	LFLO	Annual				**D**	STD
55-2C	GRIDB3	LFLO	Annual				Y	STD
55-3A	B9201-5	PDB	Semiannual		Y		Y	VOC-PDB
55-3B	B9201-5	PDB	Semiannual		Y		Y	VOC-PDB
55-3C	B9201-5	PDB	Semiannual		**D**		Y	VOC-PDB
56-1A	Y12	LFLO	Annual				Y	STD
56-1C	Y12	LFLO	Annual				Y	STD
56-2A	GRIDC3	LFLO	Annual				Y	STD
56-2B	GRIDC3	LFLO	Annual				Y	STD
56-2C	GRIDC3	LFLO	Annual				Y	VOC(1)
FB-56-2C	GRIDC3	.	.				Y	VOC(1)
56-3A	Y12	PDB	Annual				Y	VOC-PDB
56-3B	Y12	LFLO	Annual				**D**	STD
56-3C	Y12	PDB	Annual				Y	VOC-PDB
56-4A	Y12	PDB	Annual				Y	VOC-PDB
56-6A	Y12	LFLO	Even		Y			STD
60-1A	Y12	LFLO	Even		Y			STD
GW-106	S3	LFLO	Even				Y	Anions
GW-109	S3	LFLO	Even				Y	STD
GW-148	NHP	LFLO	Even				Y	VOC(1)
GW-153	NHP	LFLO	Annual	Y				STD
GW-204	T0134	LFLO	Annual			Y		STD, RAD(3)
GW-220	NHP	PDB	Semiannual	Y		Y		VOC-PDB
GW-240	NHP	LFLO	Annual	Y				STD
GW-251	S2	LFLO	Annual			Y		Anions, VOC(1)
GW-265	SY	PDB	Annual *				Y	VOC-PDB
GW-268	SY	LFLO	Annual *				Y	STD
GW-269	SY	LFLO	Annual				Y	VOC(1)
GW-274	SY	LFLO	Annual				Y	STD, RAD(12)
GW-275	SY	NP	Annual				Y	STD
GW-332	WCPA	LFLO	Annual			Y		STD
GW-337	WCPA	LFLO	Annual			Y		Anions, VOC(1)
GW-381	NHP	LFLO	Annual	Y				STD
GW-383	NHP	LFLO	Annual	Y				STD

Table B.1 (continued)

Sampling Point [1]	Location [2]	Collection Method [3]	Sampling Frequency [4]	Samples Collected in CY 2012 [5]				Parameters [6]
				Q1	Q2	Q3	Q4	
Upper East Fork Poplar Creek Hydrogeologic Regime (continued)								
GW-619	FTF	PDB	Even				Y	VOC-PDB
GW-620	FTF	PDB	Even				Y	VOC-PDB
GW-633	RG	LFLO	Annual			Y		STD
GW-656	T0134	PDB	Annual	Y				VOC-PDB
GW-686	CPT	LFLO	Annual			Y		STD
GW-690	CPT	LFLO	Annual			Y		STD
GW-691	CPT	LFLO	Semiannual	Y		Y		STD
GW-692	CPT	LFLO	Annual			**D**		STD
GW-698	B8110	LFLO	Semiannual	Y		Y		STD
GW-700	B8110	LFLO	Annual	Y				STD
GW-722-14	EXP-J	WBAY	Annual			Y		STD
GW-722-17	EXP-J	WBAY	Annual			Y		STD
ER-GW-722-17	EXP-J	.	.			Y		VOC(1)
GW-722-20	EXP-J	WBAY	Annual			Y		STD
GW-722-22	EXP-J	WBAY	Annual			Y		STD
GW-722-33	EXP-J	WBAY	Annual			Y		STD
GW-744	GRIDK1	LFLO	Annual	Y				STD
GW-747	GRIDK2	LFLO	Annual	Y				STD
GW-748	GRIDK2	LFLO	Even	Y				STD
GW-763	GRIDJ3	LFLO	Annual	Y				STD
GW-769	GRIDG3	LFLO	Semiannual		Y		**D**	STD
GW-770	GRIDG3	LFLO	Annual		Y			STD
GW-781	GRIDE3	LFLO	Annual	Y				STD
GW-782	GRIDE3	LFLO	Annual	Y				STD
GW-783	GRIDE3	LFLO	Annual	Y				STD
GW-791	GRIDD2	LFLO	Annual	Y				STD
GW-792	GRIDD2	LFLO	Even	Y				VOC(1)
GW-816	EXP-SR	LFLO	Annual	Y				STD
GW-820	B9201-2	LFLO	Annual				Y	STD
GW-928	GRIDC1	LFLO	Even *		Y			STD
GW-929	GRIDC1	LFLO	Even *		Y			STD
GW-930	GRIDD1	LFLO	Even *		Y			STD
GW-931	GRIDD1	LFLO	Even *		Y			STD
GW-934-12	NHP	WBAY	Annual *		Y			STD
GW-934-11	NHP	WBAY	Annual *		**D**			STD
GW-934-09	NHP	WBAY	Annual *		Y			STD
GW-934-07	NHP	WBAY	Annual *		Y			STD
GW-934-05	NHP	WBAY	Annual *		Y			STD
GW-934-04	NHP	WBAY	Annual *		Y			STD
GW-934-02	NHP	WBAY	Annual *		Y			STD
GW-934-01	NHP	WBAY	Annual *		Y			STD
ER-GW-934-01	NHP	.	.		Y			VOC(1)
GHK2.51WSW	EXP-SW	GRAB	Annual			Y		STD
NPR12.0SW	EXP-SW	GRAB	Annual			Y		STD
NPR23.0SW	EXP-SW	GRAB	Annual			Y		STD

Table B.1 (continued)

Notes:

1
- BCK - Bear Creek Kilometer (surface water station)
- ER - Equipment rinsate sample
- FB - Field blank sample
- GW - Groundwater monitoring well
- GHK - Gum Hollow Kilometer (surface water station)
- NPR - North of Pine Ridge (surface water station)
- NT - North Tributary to Bear Creek (surface water station)
- S17 - Surface water station in SCR5
- SCR - South Chestnut Ridge (spring or surface water station)
- SS - Spring sampling location: South Side of Bear Creek

2
- B8110 - Building 81-10
- B9201-2 - Building 9201-2
- B9201-5 - Building 9201-5
- BG - Bear Creek Burial Grounds Waste Management Area
- CPT - Coal Pile Trench
- CRSP - Chestnut Ridge Security Pits
- EXP-B - Exit Pathway Picket B
- EXP-C - Exit Pathway Picket C
- EXP-J - Maynardville Limestone Exit Pathway Picket J
- EXP-SR - Exit pathway well in the gap through Pine Ridge along Scarboro Road
- EXP-SW - Spring or Surface Water Location
- FCAP - Filled Coal Ash Pond
- FTF - Fire Training Facility
- GRID - Comprehensive Groundwater Monitoring Plan Grid Location (Martin Marietta Energy Systems, Inc. 1990)
- NHP - New Hope Pond
- OLF - Oil Landfarm Waste Management Area
- RG - Rust Garage Area
- RS - Rust Spoil Area
- S2 - S-2 Site
- S3 - S-3 Site
- SPI - Spoil Area I
- SY - Y-12 Salvage Yard
- T0134 - Underground Storage Tank 0134-U
- WCPA - Waste Coolant Processing Area
- Y12 - Y-12 Complex

3 Sample Collection Method
- LFLO - Low-flow minimal drawdown sampling
- NP - No purge before sample collection; history of very low sampling rate (<50 ml/min)
- PDB - Passive diffusion bag
- GRAB - Surface water sample, grab sample
- WBAY - Westbay multiport method

4 Sampling Frequency: As described in the Y-12 GWPP monitoring optimization plan (Babcock & Wilcox Technical Services Y-12, LLC 2009)

- * - Frequency differs from the monitoring optimization plan
  Wells GW-065 and GW-648 were changed from semiannual to even years
  Wells GW-265 (2013) and GW-268 (inactive) were changed to annual
  Wells GW-928, GW-929, GW-930, and GW-931 were installed in December 2009
  Well GW-934 (Westbay) was changed from TBD to annual

Table B.1 (continued)

Notes: (continued)

5 Groundwater Monitoring Schedules (Appendix C) provide the sequence for collecting samples during each quarterly sampling event and include the waste stream identification for groundwater purged from each monitoring well. The Waste Management Plan for sampling activities is in Appendix F.

Y - Sample collection will be performed during the CY 2012 quarter
D - A field duplicate sample will collected in addition to the regular sample

6 Table B.2 provides a comprehensive list of analytes, analytical methods, and the associated parameter group.

STD - Standard administrative parameter group, including all of the analytes in the following elementary parameter groups:

FLD - Field measurements
CHEM - Total dissolved solids, total suspended solids, and anions
MET(1) - Metals
VOC(1) - Volatile organic compounds
RAD(1) - Gross alpha and gross beta activity

Selective Parameter Monitoring groups (subsets of the elementary parameter groups)
Field measurements will be obtained at all locations except when using a PDB sampler

Anions - Chloride, Nitrate, and Sulfate
HG - Mercury
MET-ICP - Metals by method SW846-6010B
MET-PMS - Metals by method SW846-6020
VOC-PDB - Volatile organic compounds reported for Passive Diffusion Bag samples; a subset of the VOC(1) group
RAD(3) - Uranium-234, -235, and -238
RAD(12) - Technetium-99

Table B.2 Field measurements and laboratory analytes that comprise the elementary parameter groups for CY 2012 groundwater and surface water samples

Parameter Group [1]		Measurement or Analyte	Analytical Method [2]	Reporting Limit [3]	Units [4]
FLD		Depth to Water	NA	NA	ft
		Water Temperature	NA	NA	centigrade
		pH	NA	NA	pH units
		Conductivity	NA	NA	µmho/cm
		Dissolved Oxygen	NA	NA	ppm
		Oxidation-Reduction Potential (Redox)	NA	NA	mV
CHEM	TDS	Total Dissolved Solids	SM 2540C 18	1	mg/L
	TSS	Total Suspended Solids	SM 2540D 18	1	mg/L
	Alkalinity	Bicarbonate	SM 2320B 18	1	mg/L
		Carbonate	SM 2320B 18	1	mg/L
	Anions	Chloride	SW846-9056	0.2	mg/L
		Nitrate (as Nitrogen)	EPA-353.2	0.05	mg/L
		Sulfate	SW846-9056	0.25	mg/L
	Fluoride	Fluoride	SM 4500F 18	0.1	mg/L
MET(1)	MET-ICP	Aluminum	SW846-6010B	0.2	mg/L
		Barium	SW846-6010B	0.004	mg/L
		Beryllium	SW846-6010B	0.0005	mg/L
		Boron	SW846-6010B	0.1	mg/L
		Calcium	SW846-6010B	0.2	mg/L
		Cobalt	SW846-6010B	0.02	mg/L
		Copper	SW846-6010B	0.02	mg/L
		Iron	SW846-6010B	0.05	mg/L
		Lithium	SW846-6010B	0.01	mg/L
		Magnesium	SW846-6010B	0.2	mg/L
		Manganese	SW846-6010B	0.005	mg/L
		Molybdenum	SW846-6010B	0.05	mg/L
		Potassium	SW846-6010B	2	mg/L
		Silver	SW846-6010B	0.02	mg/L
		Sodium	SW846-6010B	0.2	mg/L
		Strontium	SW846-6010B	0.005	mg/L
		Thorium	SW846-6010B	0.2	mg/L
		Vanadium	SW846-6010B	0.02	mg/L
		Zinc	SW846-6010B	0.05	mg/L
	MET-PMS	Antimony	SW846-6020	0.0025	mg/L
		Arsenic	SW846-6020	0.005	mg/L
		Cadmium	SW846-6020	0.0025	mg/L
		Chromium	SW846-6020	0.01	mg/L
		Lead	SW846-6020	0.0005	mg/L
		Nickel	SW846-6020	0.005	mg/L
		Selenium	SW846-6020	0.01	mg/L
		Thallium	SW846-6020	0.0005	mg/L
		Uranium	SW846-6020	0.0005	mg/L
	HG	Mercury	SW846-7470A	0.00005	mg/L
VOC(1)		Acetone	SW846-8260B-UP	10	µg/L
		Acetonitrile	SW846-8260B-UP	5	µg/L
		Acrolein	SW846-8260B-UP	10	µg/L
		Acrylonitrile	SW846-8260B-UP	5	µg/L
	VOC-PDB	Benzene	SW846-8260B-UP	5	µg/L
		Bromochloromethane	SW846-8260B-UP	5	µg/L
	VOC-PDB	Bromodichloromethane	SW846-8260B-UP	5	µg/L
	VOC-PDB	Bromoform	SW846-8260B-UP	5	µg/L
		Bromomethane	SW846-8260B-UP	5	µg/L

Table B.2 (continued)

Parameter Group [1]	Measurement or Analyte	Analytical Method [2]	Reporting Limit [3]	Units [4]
VOC(1) (continued) VOC-PDB	2-Butanone	SW846-8260B-UP	5	µg/L
	Carbon disulfide	SW846-8260B-UP	5	µg/L
VOC-PDB	Carbon tetrachloride	SW846-8260B-UP	5	µg/L
VOC-PDB	Chlorobenzene	SW846-8260B-UP	5	µg/L
VOC-PDB	Chloroethane	SW846-8260B-UP	5	µg/L
VOC-PDB	2-Chloroethylvinyl ether	SW846-8260B-UP	10	µg/L
VOC-PDB	Chloroform	SW846-8260B-UP	5	µg/L
VOC-PDB	Chloromethane	SW846-8260B-UP	5	µg/L
VOC-PDB	Dibromochloromethane	SW846-8260B-UP	5	µg/L
	1,2-Dibromo-3-chloropropane	SW846-8260B-UP	10	µg/L
	1,2-Dibromoethane	SW846-8260B-UP	5	µg/L
VOC-PDB	Dibromomethane	SW846-8260B-UP	5	µg/L
VOC-PDB	1,2-Dichlorobenzene	SW846-8260B-UP	5	µg/L
VOC-PDB	1,4-Dichlorobenzene	SW846-8260B-UP	5	µg/L
	1,4-Dichloro-2-butene	SW846-8260B-UP	5	µg/L
	trans-1,4-Dichloro-2-butene	SW846-8260B-UP	5	µg/L
VOC-PDB	Dichlorodifluoromethane	SW846-8260B-UP	5	µg/L
VOC-PDB	1,1-Dichloroethane	SW846-8260B-UP	5	µg/L
VOC-PDB	1,2-Dichloroethane	SW846-8260B-UP	5	µg/L
VOC-PDB	1,1-Dichloroethene	SW846-8260B-UP	5	µg/L
VOC-PDB	cis-1,2-Dichloroethene	SW846-8260B-UP	5	µg/L
VOC-PDB	trans-1,2-Dichloroethene	SW846-8260B-UP	5	µg/L
VOC-PDB	1,2-Dichloropropane	SW846-8260B-UP	5	µg/L
VOC-PDB	cis-1,3-Dichloropropene	SW846-8260B-UP	5	µg/L
VOC-PDB	trans-1,3-Dichloropropene	SW846-8260B-UP	5	µg/L
	Ethanol	SW846-8260B-UP	200	µg/L
VOC-PDB	Ethylbenzene	SW846-8260B-UP	5	µg/L
	Ethyl methacrylate	SW846-8260B-UP	5	µg/L
	2-Hexanone	SW846-8260B-UP	5	µg/L
	Iodomethane	SW846-8260B-UP	5	µg/L
	4-Methyl-2-pentanone	SW846-8260B-UP	5	µg/L
VOC-PDB	Methylene chloride	SW846-8260B-UP	5	µg/L
	Styrene	SW846-8260B-UP	5	µg/L
	1,1,1,2-Tetrachloroethane	SW846-8260B-UP	5	µg/L
VOC-PDB	1,1,2,2-Tetrachloroethane	SW846-8260B-UP	5	µg/L
VOC-PDB	Tetrachloroethene	SW846-8260B-UP	5	µg/L
VOC-PDB	Toluene	SW846-8260B-UP	5	µg/L
VOC-PDB	Total Xylene	SW846-8260B-UP	5	µg/L
VOC-PDB	1,1,1-Trichloroethane	SW846-8260B-UP	5	µg/L
VOC-PDB	1,1,2-Trichloroethane	SW846-8260B-UP	5	µg/L
VOC-PDB	Trichloroethene	SW846-8260B-UP	5	µg/L
VOC-PDB	Trichlorofluoromethane	SW846-8260B-UP	5	µg/L
VOC-PDB	1,2,3-Trichloropropane	SW846-8260B-UP	10	µg/L
VOC-PDB	1,1,2-Trichloro-1,2,2-trifluoroethane	SW846-8260B-UP	5	µg/L
	Vinyl acetate	SW846-8260B-UP	10	µg/L
VOC-PDB	Vinyl chloride	SW846-8260B-UP	2	µg/L
RAD(1)	Gross Alpha Activity	EPA-900.0	5	pCi/L
	Gross Beta Activity	EPA-900.0	10	pCi/L
RAD(3)	Uranium-234, -235, & -238	Y50-AC-65-7061	0.4	pCi/L
RAD(12)	Technetium-99	Y50-AC-65-7060	15	pCi/L

Table B.2 (continued)

Notes:

1 Elementary Parameter Groups for the Standard Parameter Group and Selected Parameter Monitoring:

FLD	-	Field measurements
CHEM	-	Miscellaneous laboratory analytes (e.g., dissolved solids) and anions
Anions	-	Chloride, Nitrate, and Sulfate
MET(1)	-	All Metals (MET-ICP, HG, and MET-PMS)
MET-ICP	-	Metals by method SW846-6010B (19 metals)
HG	-	Mercury
MET-PMS	-	Metals by method SW846-6020 (10 metals)
VOC(1)	-	Volatile organic compounds (54 compounds)
VOC-PDB	-	Volatile organic compounds reported for Passive Diffusion Bag samples (36 compounds)
RAD(1)	-	Gross alpha and gross beta activity
RAD(3)	-	Uranium-234, -235, and -238
RAD(12)	-	Technetium-99

2 Analytical Method:

NA - Not Applicable

Field measurements are performed in accordance with the following B&W Y-12 Management Requirements operating procedures:

Field Measurement	Procedure	Field Measurement	Procedure
Depth to Water	Y50-71-015	Dissolved Oxygen	Y50-71-032
Water Temperature	Y50-71-030, -014	Redox	Y50-71-033
pH	Y50-71-031, -014	Pressure Profile	Y50-71-019
Conductivity	Y50-71-034, -022		

Analytical methods from:

- EPA - Methods for Chemical Analysis of Water and Wastes (U.S. Environmental Protection Agency 1983)
- SM - Standard Methods for the Evaluation of Water and Wastewater, 18th Edition (American Public Health Association 1992)
- SW846 - Test Methods for Evaluating Solid Waste Physical/Chemical Methods (U.S. Environmental Protection Agency 1996)
- B&W Y-12 ACO Procedures and laboratory test names on the table below are applicable to the analytical methods shown above in the main table:

Method	ACO Procedure	ACO Lab Test
EPA-353.2	ASO-TP-7659	NO3-N
EPA-900.0	Y50-AC-65-7074	GROSSAB-ENV
SM 2320B 18	Y/P65-7639	ALKALINITY-I
SM 2540C 18	Y-50-AC-65-7914	SOLIDS-TOT-D
SM 2540D 18	Y/P65-7918	SOLIDS-TOT-S
SM 4500F 18	Y/P65-7602	FLUORIDE
SW846-6010B	Y50-AC-65-0040	ICP6010
SW846-6020	Y50-AC-65-0038	ICPMS6020EXT
SW846-7470A	Y50-AC-65-7470	HGLOWRL
SW846-8260B-UP	Y50-AC-65-7335	VOA8260GW
SW846-8260B-UP	Y50-AC-65-7335	VOAGW-PDB
SW846-9056	Y50-AC-65-7619	ANIONS
Y50-AC-65-7060	Y50-AC-65-7060	TC99LS-ENV
Y50-AC-65-7061	Y50-AC-65-7061	ASPECU-ENV

Table B.2 (continued)

Notes: (continued)

3 Reporting Limits:

- NA - not applicable
- VOC - Reporting limits are contract-required quantitation limits; also report estimated values (with qualifier) below this limit and above the method detection limit.
- RAD - Reporting limits are target minimum detectable activities (MDAs) that may be obtained under optimal analytical conditions; actual MDAs are sample-specific and may vary significantly from the target value.

4 Units:

- mg/L - milligrams per liter
- mV - millivolts
- NTU - nephelometric turbidity units
- ppm - parts per million
- pCi/L - picoCuries per liter

APPENDIX C

CY 2012 GROUNDWATER MONITORING SCHEDULES
(Insert When Issued, Before Each Quarterly Sampling Event)

APPENDIX D

ADDENDA TO THE CY 2012 SAMPLING AND ANALYSIS PLAN
(if issued)

APPENDIX E

LABORATORY REQUIREMENTS
(Bottle Lists, Holding Times, Turnaround Time, Elevated Minimum Activity)

CY 2012 SAP BOTTLE LISTS

STD

Parameter	Lab Tests	Chemical Preservative [1]	Bottle Types/Size
Anions, Fluoride, Carbonate and Bicarbonate	ANIONS, FLUORIDE, ALKALINITY-I	None	1 - 250 mL polyethylene
Nitrate	NO3-N	H_2SO_4 to pH < 2; 4^O+/-2^O	1 – 100 mL polyethylene
Total Suspended Solids	SOLIDS-TOT-S	None	1 - 250 mL polyethylene
Total Dissolved Solids	SOLIDS-TOT-D	None	1 - 250 mL polyethylene
Total Metals (ICP,ICP-MS, and Hg)	ICP6010, ICPMS6020-EXT, HGLOWRL	HNO_3	1 – 500 mL polyethylene
Radiochemistry (UV)	GROSSAB-ENV	HNO_3	1 – 1 L polyethylene
Volatiles	VOA8260GW	None	2 - 40 mL amber glass with Teflon lined septum lids
Trip Blank (VOA) **(one per cooler)**	VOA8260GW	None	1 - 40 mL amber glass with Teflon lined septum lid

STD: **LIMS LAB TEST ID**

CHEM ALKALINITY-I, ANIONS, NO3-N, FLUORIDE, SOLIDS-TOT-S, SOLIDS-TOT-D
MET(1) ICP6010, ICPMS6020-EXT and HGLOWRL
VOC(1) VOA8260GW
RAD(1)GROSSAB-ENV

[1]All samples chilled to 4°C +/- 2°C

CY 2012 SAP BOTTLE LISTS

STD-WESTBAY

Parameter	Lab Tests	Chemical Preservative [1]	Bottle Types/Size
Anions, Fluoride, Carbonate and Bicarbonate	ANIONS, FLUORIDE, ALKALINITY-I	None	1 - 250 mL polyethylene
Nitrate	NO3-N	H_2SO_4 to pH < 2; 4^{O}+/-2^{O}	1 – 100 mL polyethylene
Total Suspended Solids	SOLIDS-TOT-S	None	1 - 250 mL polyethylene
Total Dissolved Solids	SOLIDS-TOT-D	None	1 - 250 mL polyethylene
Total Metals (ICP,ICP-MS, and Hg)	ICP6010, ICPMS6020-EXT, HGLOWRL	HNO_3	1 - 250 mL polyethylene
Radiochemistry (UV)	GROSSAB-ENV	HNO_3	1 – 500 mL polyethylene
Volatiles	VOA8260GW	None	2 - 40 mL amber glass with Teflon lined septum lids
Trip Blank (VOA) **(one per cooler)**	VOA8260GW	None	1 - 40 mL amber glass with Teflon lined septum lid

STD: **LIMS LAB TEST ID**

CHEM ALKALINITY-I, ANIONS, NO3-N, FLUORIDE, SOLIDS-TOT-S, SOLIDS-TOT-D
MET(1) ICP6010, ICPMS6020-EXT and HGLOWRL
VOC(1) VOA8260GW
RAD(1)GROSSAB-ENV

[1]All samples chilled to 4°C +/- 2°C

CY 2012 SAP BOTTLE LISTS

STD, RAD (3)

Parameter	Lab Tests	Chemical Preservative [1]	Bottle Types/Size
Anions, Fluoride, Carbonate and Bicarbonate	ANIONS, FLUORIDE, ALKALINITY-I	None	1 - 250 mL polyethylene
Nitrate	NO3-N	H_2SO_4 to pH < 2; 4^O+/-2^O	1 – 100 mL polyethylene
Total Suspended Solids	SOLIDS-TOT-S	None	1 - 250 mL polyethylene
Total Dissolved Solids	SOLIDS-TOT-D	None	1 - 250 mL polyethylene
Total Metals (ICP,ICP-MS, and Hg)	ICP6010, ICPMS6020-EXT, HGLOWRL	HNO_3	1 – 500 mL polyethylene
Radiochemistry (UV)	GROSSAB-ENV ASPECU-ENV	HNO_3	1 – 1 L polyethylene
Volatiles	VOA8260GW	None	2 - 40 mL amber glass with Teflon lined septum lids
Trip Blank (VOA) **(one per cooler)**	VOA8260GW	None	1 - 40 mL amber glass with Teflon lined septum lid

STD: **LIMS LAB TEST ID**

CHEM ALKALINITY-I, ANIONS, NO3-N, FLUORIDE, SOLIDS-TOT-S, SOLIDS-TOT-D
MET(1) ICP6010, ICPMS6020-EXT and HGLOWRL
VOC(1) VOA8260GW
RAD(1) GROSSAB-ENV
RAD(3) ASPECU-ENV

[1]All samples chilled to 4°C +/- 2°C

CY 2012 SAP BOTTLE LISTS

STD, RAD (12)

Parameter	Lab Tests	Chemical Preservative [1]	Bottle Types/Size
Anions, Fluoride, Carbonate and Bicarbonate	ANIONS, FLUORIDE, ALKALINITY-I	None	1 - 250 mL polyethylene
Nitrate	NO3-N	H_2SO_4 to pH < 2; 4^O+/-2^O	1 – 100 mL polyethylene
Total Suspended Solids	SOLIDS-TOT-S	None	1 - 250 mL polyethylene
Total Dissolved Solids	SOLIDS-TOT-D	None	1 - 250 mL polyethylene
Total Metals (ICP,ICP-MS, and Hg)	ICP6010, ICPMS6020-EXT, HGLOWRL	HNO_3	1 – 500 mL polyethylene
Radiochemistry (UV)	GROSSAB-ENV TC99LS-ENV	HNO_3	1 – 1 L polyethylene
Volatiles	VOA8260GW	None	2 - 40 mL amber glass with Teflon lined septum lids
Trip Blank (VOA) **(one per cooler)**	VOA8260GW	None	1 - 40 mL amber glass with Teflon lined septum lid

STD: **LIMS LAB TEST ID**

CHEM ALKALINITY-I, ANIONS, NO3-N, FLUORIDE, SOLIDS-TOT-S, SOLIDS-TOT-D
MET(1) ICP6010, ICPMS6020-EXT and HGLOWRL
VOC(1) VOA8260GW
RAD(1) GROSSAB-ENV
RAD(12) TC99LS-ENV

[1]All samples chilled to 4°C +/- 2°C

CY 2012 SAP BOTTLE LISTS

STD, RAD (3, 12)

Parameter	Lab Tests	Chemical Preservative [1]	Bottle Types/Size
Anions, Fluoride, Carbonate and Bicarbonate	ANIONS, FLUORIDE, ALKALINITY-I	None	1 - 250 mL polyethylene
Nitrate	NO3-N	H_2SO_4 to pH < 2; 4^O+/-2^O	1 – 100 mL polyethylene
Total Suspended Solids	SOLIDS-TOT-S	None	1 - 250 mL polyethylene
Total Dissolved Solids	SOLIDS-TOT-D	None	1 - 250 mL polyethylene
Total Metals (ICP,ICP-MS, and Hg)	ICP6010, ICPMS6020-EXT, HGLOWRL	HNO_3	1 – 500 mL polyethylene
Radiochemistry (UV)	GROSSAB-ENV TC99LS-ENV ASPECU-ENV	HNO_3	1 – 1 L polyethylene
Volatiles	VOA8260GW	None	2 - 40 mL amber glass with Teflon lined septum lids
Trip Blank (VOA) **(one per cooler)**	VOA8260GW	None	1 - 40 mL amber glass with Teflon lined septum lid

STD: **LIMS LAB TEST ID**

CHEM ALKALINITY-I, ANIONS, NO3-N, FLUORIDE, SOLIDS-TOT-S, SOLIDS-TOT-D
MET(1) ICP6010, ICPMS6020-EXT and HGLOWRL
VOC(1) VOA8260GW
RAD(1) GROSSAB-ENV
RAD(3) ASPECU-ENV
RAD(12) TC99LS-ENV

[1]All samples chilled to 4°C +/- 2°C

CY 2012 SAP BOTTLE LISTS

Anions

Parameter	Lab Tests	Chemical Preservative [1]	Bottle Types/Size
Anions	ANIONS	None	1 - 250 mL polyethylene
Nitrate	NO3-N	H_2SO_4 to pH < 2; 4^O+/-2^O	1 – 100 mL polyethylene

Parameter:	**LIMS LAB TEST ID**
Anions	ANIONS
Nitrate	NO3-N

[1]All samples chilled to 4°C +/- 2°C

CY 2012 SAP BOTTLE LISTS

Anions, VOC (1)

Parameter	Lab Tests	Chemical Preservative [1]	Bottle Types/Size
Anions	ANIONS	None	1 - 250 mL polyethylene
Nitrate	NO3-N	H_2SO_4 to pH < 2; 4^{O}+/-2^{O}	1 – 100 mL polyethylene
Volatiles	VOA8260GW	None	2 - 40 mL amber glass with Teflon lined septum lids

Parameter:	**LIMS LAB TEST ID**
Anions	ANIONS
Nitrate	NO3-N
VOC(1)	VOA8260GW

[1]All samples chilled to 4°C +/- 2°C

CY 2012 SAP BOTTLE LISTS

Anions, RAD (1, 12)

Parameter	Lab Tests	Chemical Preservative [1]	Bottle Types/Size
Anions	ANIONS	None	1 - 250 mL polyethylene
Nitrate	NO3-N	H_2SO_4 to pH < 2; 4^O+/-2^O	1 – 100 mL polyethylene
Gross Alpha/Beta and Tc-99	GROSSAB-ENV TC99LS-ENV	HNO_3	1 – 1 L polyethylene

Parameters:	**LIMS LAB TEST ID**
Anions	ANIONS
Nitrate	NO3-N
RAD(1)	GROSSAB-ENV
RAD(12)	TC99LS-ENV

[1]All samples chilled to 4°C +/- 2°C

CY 2012 SAP BOTTLE LISTS

VOC (1)

Parameter	Lab Tests	Chemical Preservative [1]	Bottle Types/Size
Volatiles	VOA8260GW	None	2 - 40 mL amber glass with Teflon lined septum lids

Parameter:	**LIMS LAB TEST ID**
VOC(1)	VOA8260GW

[1]All samples chilled to 4°C +/- 2°C

CY 2012 SAP BOTTLE LISTS

VOC-PDB

Parameter	Lab Tests	Chemical Preservative [1]	Bottle Types/Size
Volatiles	VOAGW-PDB	None	2 - 40 mL amber glass with Teflon lined septum lids

Parameter:	**LIMS LAB TEST ID**
VOC-PDB	VOAGW-PDB

[1]All samples chilled to 4°C +/- 2°C

CY 2012 SAP BOTTLE LISTS

VOC (1), MET-PMS

Parameter	Lab Tests	Chemical Preservative [1]	Bottle Types/Size
MET-PMS (ICP-MS)	ICPMS6020-EXT	HNO_3	1 - 250 mL polyethylene
Volatiles	VOA8260GW	None	2 - 40 mL amber glass with Teflon lined septum lids

Parameters:	**LIMS LAB TEST ID**
MET(1)	ICPMS6020-EXT
VOC(1)	VOA8260GW

[1]All samples chilled to 4°C +/- 2°C

ESTABLISHED HOLDING TIMES

Parameter	Holding Times
Alkalinity (Carbonate, Bicarbonate)	14 days
Anions (Chloride, Nitrate, and Sulfate)	28 days
Fluoride	28 days
Mercury	28 days
Metals (ICP, ICPMS)	6 months
Radiochemistry	6 months
Solids, Total Dissolved	7 days
Solids, Total Suspended	7 days
VOA	7 days

ESTABLISHED TURNAROUND TIMES

The Groundwater Protection Program and the Analytical Chemistry Organization (ACO) laboratory have agreed upon a turnaround time, such that the analytical data generated from each sampling location will be completed within 35 days of receipt. Every two weeks, data that has been approved since the previous two-week period will be transmitted in the form of hard copy of the approved lab reports for each location, along with an electronic copy in a standardized and compatible format (please see the most recent version of the *Y-12 Plant Groundwater Protection Program Data Management Plan*).

ELEVATED MINIMUM DETECTABLE ACTIVITY

Groundwater samples with high TDS (>1,000 mg/L) typically have elevated minimum detectable activities (MDAs) for gross alpha (> 15 pCi/L) and gross beta (> 50 pCi/L). However, the MDAs for specific isotopic analyses are unaffected by the sample solid content. For samples with gross activity results that are less than an elevated MDA, and specific isotopic analyses have not been requested, the laboratory will issue a request to analyze for the principal alpha- or beta-emitting isotopes. That is, if the gross alpha MDA exceeds 15 pCi/L and the result is less than 15 pCi/L, then the laboratory will request analyses of isotopic uranium (by method Y/P65-7061). Similarly, if a sample has an elevated gross beta MDA (>50 pCi/L) and the result is less than the MDA, then the laboratory would request analysis of technetium-99 activity. These requests will be approved by the Y-12 Groundwater Protection Program manager, or designee, before analyses are performed.

APPENDIX F

MANAGEMENT OF PURGED GROUNDWATER

APPENDIX F.1

WASTE MANAGEMENT PLAN

WASTE MANAGEMENT PLAN
for
Waste Streams generated from
Y-12 Groundwater Protection Program
Sampling Activities

Date Issued – 12/18/06

prepared by:

Y-12 Groundwater Protection Program
Environmental Compliance Department
Y-12 National Security Complex
P.O. Box 2009
Oak Ridge, TN 37831

managed by:

BWXT Y-12, LLC

for the:

U.S. Department of Energy
Under Contract Number:

DE-AC05-00OR22800

This document has been reviewed by a Y-12 DC/ UCNI RO and has been determined to be UNCLASSIFIED and contains no UCNI. This review does not constitute clearance for Public Release.

Name: L. W. McMahon [signature on file]

Date: 12/18/06

Approvals

Don Bohrman [signature on file] 12/18/06
Don Bohrman Date
BWXT Y-12, LLC
Environmental Officer

Mary Wiginton [signature on file] 12/18/06
Mary Wiginton Date
BWXT Y-12, LLC
Waste Engineer

Tom Conrad for D. McCune [signature on file] 12/18/06
Dave McCune Date
Bechtel Jacobs, LLC
Waste Treatment Operations

Mark Burris [signature on file] 12/18/06
Brad E Skaggs or Mark S. Burris Date
BWXT Y-12, LLC
Environmental Compliance

Waste Management Plan for Y-12 Groundwater Protection Program Sampling Activities

12/18/06

Waste stream	Characterization[3]	Segregation Requirements	Packaging	Disposal Path
Purge water[2] that is not contained	Non-hazardous, non-radiological contaminated waters. Analytical results indicate constituents in the water are less than Safe Drinking Water Act Maximum Contaminant Levels (MCL). In addition, historical knowledge of relevant groundwater plumes at the Y-12 National Security Complex confirm the non-detection of contaminants, or the detection of contaminants (J values), but still below the MCL. See the most current GWPP Groundwater Monitoring Data Compendium	Not contained	Not contained	ACO technicians will dispense/dispose of waters directly to ground surface at the well location.

Waste stream	Characterization[3]	Segregation Requirements	Packaging	Disposal Path
SID[1] 2212 purge water [2] (non-regulated and non-hazardous purge water)	Non-hazardous, contaminated waste waters. Analytical results indicate concentration in the water exceed the MCL. These waters can contain nitrate concentration > 100 mg/L, Uranium >0.03 mg/L, and Uranium isotopes > 4% of DCG. Waters commonly contain the following typical halogenated compounds (not inclusive) that exceed the MCL, but are below RCRA TCLP levels, include: Tetrachloroethene, Trichloroethene, cis-1,2-Dichloroethene, Carbon Tetrachloride, 1,1-Dichloroethane, Methylene Chloride, and Vinyl Chloride. Other radioisotopes present consist of Tc-99 and daughter products of Uranium. Although not regulated, this waste water is contained, handled, and sent for disposal as a Best Management Practice (BMP) at Y-12. As a BMP, this contaminated purge water is not place on clean surfaces (soils) or near surface water tributaries. Annual groundwater data evaluation, multiple sampling event, and groundwater plume characteristics provide ample evidence of this classification.	Segregate non-regulated waste waters from other GWPP waste waters that contain a RCRA hazardous waste (SID 2214 and 2216). Waste streams[1] have been characterized and established per well location and are published in GWPP's annual GWPP Sampling and Analysis Plan. Waters can be combined and bulk as necessary in a DOT approved container.	Place in a DOT approved container. The above containers are compatible with the purge water and meet packaging requirements specified in Master Profile WW-01 Label containers in accordance with Y71-310, *Waste Container Labeling*	SID 2212 waste stream meets the waste acceptance criteria of Master Profile WW-01. Sampling data is used to complete Attachment G of UCN 2109. If Uranium is present, above detection levels, then a wt %U235 sample is required to determine enrichment, and a duplicate sample is required if results are >0.93 wt U235. All other constituents listed in WW-01 have been quantified through current analytical results, previous analyses, historical data (prior to 1996), and groundwater plume composition. A Process Knowledge form attached to each UCN 2109 documents the presence of constituents seen in SID 2212 waters and the absence of other such constituents. This waste stream is disposed at Y-12 National Security Complex's onsite treatment facility with authorization from Waste Treatment Operations. Depending on enrichment content, normal disposal would be at either the West End Treatment Facility (WETF) or the Central Pollution Control Facility (CPCF).

Waste Management Plan for Y-12 Groundwater Protection Program Sampling Activities

12/18/06

Waste stream	Characterization[3]	Segregation Requirements	Packaging	Disposal Path
SID[1] 2214 purge water[2] (purge water from multiple F-listed RCRA groundwater wells, along with rinse waters from sampling equipment and disposables, bulked into the same drum. All waste water carries the F039 waste code).	Hazardous waste waters (no radiological contaminants). Characterization based upon well location. Wells located down-gradient of the Bear Creek Burial Grounds between north tributary (NT) 6 and NT 8, and north of Bear Creek. Purge water most likely contains leachate from the BCBGs and is considered RCRA F-listed (40 CFR Part 261.31) based on established documentation (F039 leachate is comprised of F codes: F001, F002, F004, and F005). Typical halogenated volatile organic compounds detected in the SID 2214 waters, which are above the MCL include: Tetrachloroethene, Trichloroethene, 1,2-Dichloroethene, 1,1-Dichloroethene, 1,1,1-Trichloroethane, 1,1-Dichloroethane, Methylene Chloride, and Vinyl Chloride. Typically Benzene and other total petroleum hydrocarbons have also been identified.	Segregate RCRA F-listed waste waters from non-regulated waste waters (SID 2212) and RCRA Characteristic waste waters (SID 2216). Waste waters are bulked/accumulated at RCRA Satellite Accumulation Area (SAA) #SA-993, under the direction of the SAA Operator or Alternate Operator	Place in a DOT approved container. Waste is transported as DOT Class 9 under a Bill of Lading listing the assigned EPA waste code. Transporter has received DOT training. The above containers are compatible with the purge water and meet packaging requirements specified in Master Profile WW-01 Label containers in accordance with Y71-310, *Waste Container Labeling*	Send SID 2214 waste waters to 90-Day Yard for further management. **RCRA F-listed waste are prohibited under Master Profile WW-01,** except under special arrangement with DOE, or approved by Waste Treatment Coordinator for waste that can be treated at CPCF or Groundwater Treatment Facility (GWTF). SID 2214 waste waters have been approved for treatment at GWTF with the following prohibitions: waters with Uranium above detection (based on waste sample analyses) and Nitrates in concentration > 100 mg/L. All other constituents listed in WW-01 have been quantified through current analytical results, previous analyses, historical data (prior to 1996), and groundwater plume composition. A Process Knowledge form attached to each UCN 2109 documents the presence and absence of WW-01 constituents seen in SID 2214 waters. This waste stream is disposed at Y-12 National Security Complex's onsite treatment facility with authorization from Waste Treatment Operations.

Waste stream	Characterization[3]	Segregation Requirements	Packaging	Disposal Path
SID[1] 2216 purge water[2] (purge water from multiple RCRA characteristic wells bulked into the same drum. The EPA waste code is dependent on the well location).	Hazardous waste waters (mixed and non-radiological contaminated). Analytical results indicate that concentrations exceed a RCRA Toxicity Contaminant Leaching Procedure (TCLP - 40 CFR Part 261.24). Annual groundwater data evaluation, plume evaluations, and repeated sampling events give weighted evidence to this classification (wells may receive this classification if concentrations have been consistently approaching the RCRA TCLP levels). SID 2216 waste water can contain the following EPA waste codes: D005 – Barium D006 - Cadmium D018 – Benzene D019 – Carbon Tetrachloride D029 – 1,1-Dichloroethene D039 – Tetrachloroethene D040 – Trichloroethene D043 – Vinyl Chloride In addition to the above, these waters may contain the following volatile organic compounds: 1,2-Dichloroethene, 1,1,2-Trichloro-1,2,2-triflouroethane, 1,1,1-Trichloroethane, 1,1-Dichloroethane, Acetone, Methylene Chloride, Chloroform and other total petroleum hydrocarbons. These waters may can contain trace metals, nitrate concentration > 100 mg/L, Uranium >0.03 mg/L, Uranium isotopes > 4% of DCG, and other radioisotopes (Tc99 and daughter products of Uranium).	Segregate RCRA characteristic waste waters from non-regulated waste waters (SID 2212) and RCRA F-listed waste waters (SID 2216). RCRA characteristic waste waters are bulked/accumulated at RCRA Satellite Accumulation Area (SAA) #SA-992, under the direction of the SAA Operator or Alternate Operator	Place in a DOT approved container. Waste is transported as DOT Class 9 under a Bill of Lading listing the assigned EPA waste code. Transporter has received DOT training. The above containers are compatible with the purge water and meet packaging requirements specified in Master Profile WW-01 Label containers in accordance with Y71-310, *Waste Container Labeling*	Send SID 2216 waste waters to 90-Day Yard for further management. SID 2216 waste waters meet the waste acceptance criteria of Master Profile WW-01. Waters with Uranium above detection (based on waste sample analyses) require a wt %U235 sample to determine enrichment and a duplicate sample is required if results are >0.93 wt U235. Nitrates concentration > 10 mg/L must be indicated. All other constituents listed in WW-01 have been quantified through current analytical results, previous analyses, historical data (prior to 1996), and groundwater plume composition. A Process Knowledge form attached to each UCN 2109 documents the presence and absence of WW-01 constituents seen in SID 2216 waters. This waste stream is disposed at Y-12 National Security Complex's onsite treatment facility with authorization from Waste Treatment Operations. Depending on enrichment content, waste waters are disposed at the West End Treatment Facility (WETF) or the Central Pollution Control Facility (CPCF).

Waste stream	Characterization[3]	Segregation Requirements	Packaging	Disposal Path
Disposables and sampling equipment in contact with RCRA characteristic or F-listed purge water: **Sampling equipmen**t: includes sample pumps, tubing, sample trays, and flow-through cells (all components). These items meet the definition of a "container" under RCRA. **Non-absorbent disposables –** include: gloves, plastic bags, and instrument probes **Absorbent disposables** – includes paper towels, wipes, clothes, litmus paper. **During normal sampling operations these items should not come into contact with RCRA characteristic or F-listed waste waters.**	Non-hazardous solid waste and RCRA empty containers. The sampling equipment and disposables which comes in contact with RCRA purge waters **will not be subject to RCRA if:** **1)** The waste can be sufficiently removed from non-absorbent material (disposables), such as nitrile gloves, plastic surfaces, instrument probes, and external surfaces of sample bottles by rinsing such items. All rinse water must be collected and bulked under the appropriate RCRA waste stream (SID 2216 or 2214). **2)** Sampling equipment that meets the definition of a "container" under RCRA and is **not subject to regulation once the container is "empty" as defined under 40 CFR Part 261.7, paragraph (b).** To meet this requirement all fluids must be sufficiently drained from the equipment, by normal means as possible, and then rinsed at least once to remove residue. All rinse water must be collected and bulked under the appropriate RCRA waste stream (SID 2216 or 2214). **3)** Absorbent disposable such as wipes, paper towels, or clothes that are use to remove/clean/dry any addition liquids/residues RCRA empty containers, once the items are rinsed, are also not subject to RCRA. Litmus paper, if used for its intended purpose, and does not come into contact with F039 waste water, is also not subject to RCRA.	**Segregate non-regulated waste streams from those items subject to RCRA. all** **Sampling equipment:** can be reused as necessary for the multiple sampling events and are not regulated. **Non-absorbent disposables –** once rinsed are not regulated. **Absorbent disposables** –. Items used to wipe/dry/clean RCRA empty containers are not regulated and can also be disposed of into sanitary trash (profile S-020). **If these items do come into contact with RCRA waste water,** the items are subject to regulation. These items must be wrung out as much as possible (water collected) and segregated from non-regulated items.	**ALL non-regulated items** – dispose of into the appropriate sanitary waste receptacle or dumpster, as specified under Master Profile S-020. **Any items subject to RCRA regulation** must be place in a DOT approved container and labeled in accordance with procedure Y71-310, *Waste Container Labeling.* Waste is transported as DOT Class 9 under a Bill of Lading, listing the assigned EPA waste code, to the 90-Day Yard for further management. Transporter has received DOT training.	**All the items listed below require authorization from Y-12 Waste Management prior to disposal in Sanitary Trash** **Sampling equipment** – once the item is no longer of use, or can no longer be used, the item can be disposed of in sanitary trash (Waste Profile No. S-020). **Non-absorbent disposables –** after items are rinsed, collect the rinse solution and bulk with SID 2216 or 2214 purge water, and then dispose of the item in sanitary trash (S-020). **Absorbent disposables – not subject to regulation can** be disposed into sanitary trash (S-020). **Absorbent material that comes into contact with RCRA Characteristic (SID 2216) purge water,** by process knowledge the whole material if tested under the TCLP would not exceed TCLP levels, and therefore the item can be disposed into sanitary trash (S-020). **Absorbent material that** c**omes into contact with RCRA F-listed waste** waters (SID 2214) will be subject to regulation and must be send to the 90-Day Yard for further management (Master Profile HW-01). Final disposal path will be determined by Navarro-GEM to an off-site RCRA TSD.

Waste stream	Characterization[3]	Segregation Requirements	Packaging	Disposal Path
All disposables and equipment used for GWPP purposes (non F-listed wells): Sampling pumps, gloves, wipes, tubing, litmus paper, instrument probes, sample trays, and flow-through cells.	Non-hazardous solid waste. Characterization is not required.	Segregate F-listed contaminated items from non F-listed contaminated items.	N/A	Items not in contact with any F-listed purge water can be disposed in sanitary trash (profile S020) with authorization from Y-12 Waste Management. All sampling equipment is to be reused till the item is no longer of use and then disposed of in sanitary trash. All Sanitary waste placed in the approved on-site Solid Waste Disposal Facility (Industrial Landfill)
Waters/Fluids generated during well development of existing wells (well development is performed on an as needed basis, prior to sampling, to maintain groundwater flow to well. Five to 10 well casing volumes are generated)	Well development of existing wells will utilize the most recent sampling analytical results and will follow the three waste streams (SIDs) for purge water.	Segregate water based on the three existing waste streams for purge water	Based on volume and waste stream ID number. Containers could consist of drums, polytanks, or tankers.	See the three purge water waste streams IDs above

[1] "SID" – "Stream Identification Number" are the pre-established waste streams identification (ID) for purge waters generated at Y-12. These waste streams were established by Y-12 Waste Operations, prior to 1995, and have been utilized to segregate waste waters. The waste stream ID is established for the coming Calendar Year (CY) for each well location to be monitored; based upon characterization of the most recent sampling results for that well location. These are published an appendix to GWPP's annual Sampling and Analysis Plan (published 2-3 months prior the start of the CY), and the waste stream is established for any other wells added during that CY and documented in addenda to this plan.

[2] "Purge Water" – unusable portion of groundwater purged from a well prior to sample collection. Water is in a liquid form,(99.9% liquid) with normally < 100 mg/L of suspended solids. Water contains contaminants that are in solution (dissolved phase) with little sediment load.

[3] Analytical results (past and present) from sampling events are used to characterize purge water. The GWPP uses a standardized parameter list for every sample, which includes:

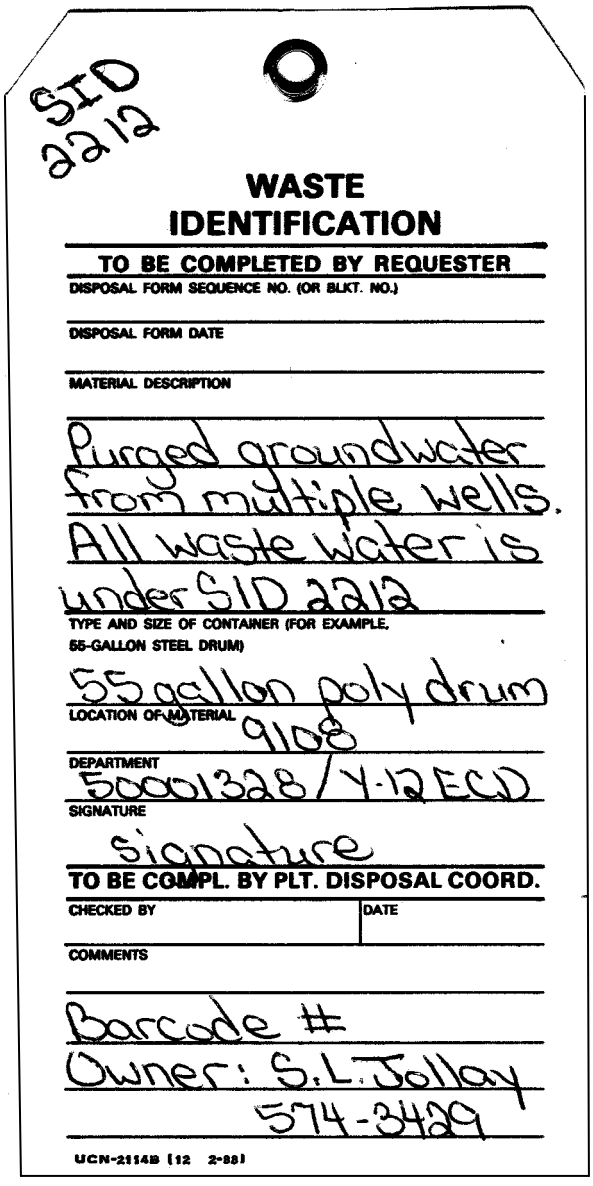
1. ICP metals (SW846- EPA 6010B), ICPMS metals (EPA-200.8), Mercury (SW846 – 7470) – includes Uranium metal (0.0005 mg/L)
2. Anions – Alkalinity, Chloride, Fluoride, Nitrates, Sulfates
3. Volatile Organic Compound – SW846 – EPA 8260B
4. Gross Alpha and Gross Beta (EPA-900.0)

The following radioisotopes have been analyzed for on an as needed basis: Tritium, Tc-99, Isotopic Uranium, Total Uranium and wt% U235, and other heavy radioisotopes (Am241, Np 237, I129, Thorium, Radium).

Appendix F.1

Y-12 GWPP PURGE WATER MANAGEMENT

Example of Waste Identification Tag (UCN 2114B)
SID 2212 purge water



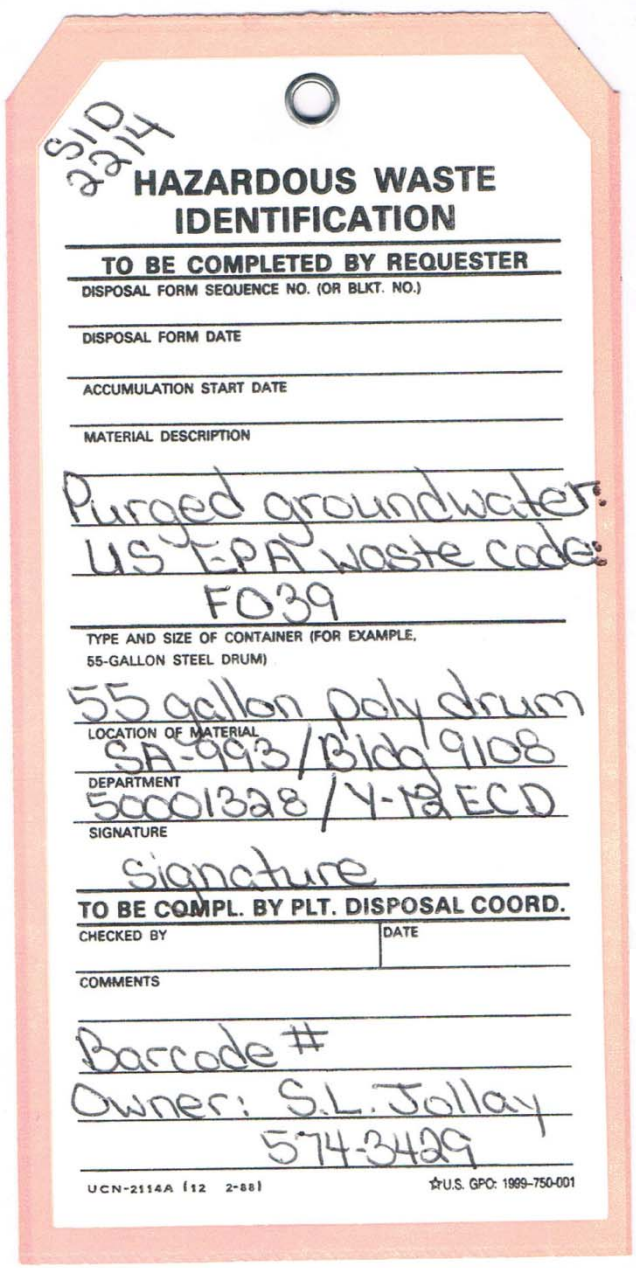
Leave this section blank

Leave this section blank

Appendix F.1

Y-12 GWPP PURGE WATER MANAGEMENT

Example of Waste Identification Tag (UCN 2114A)
SID 2214 purge water



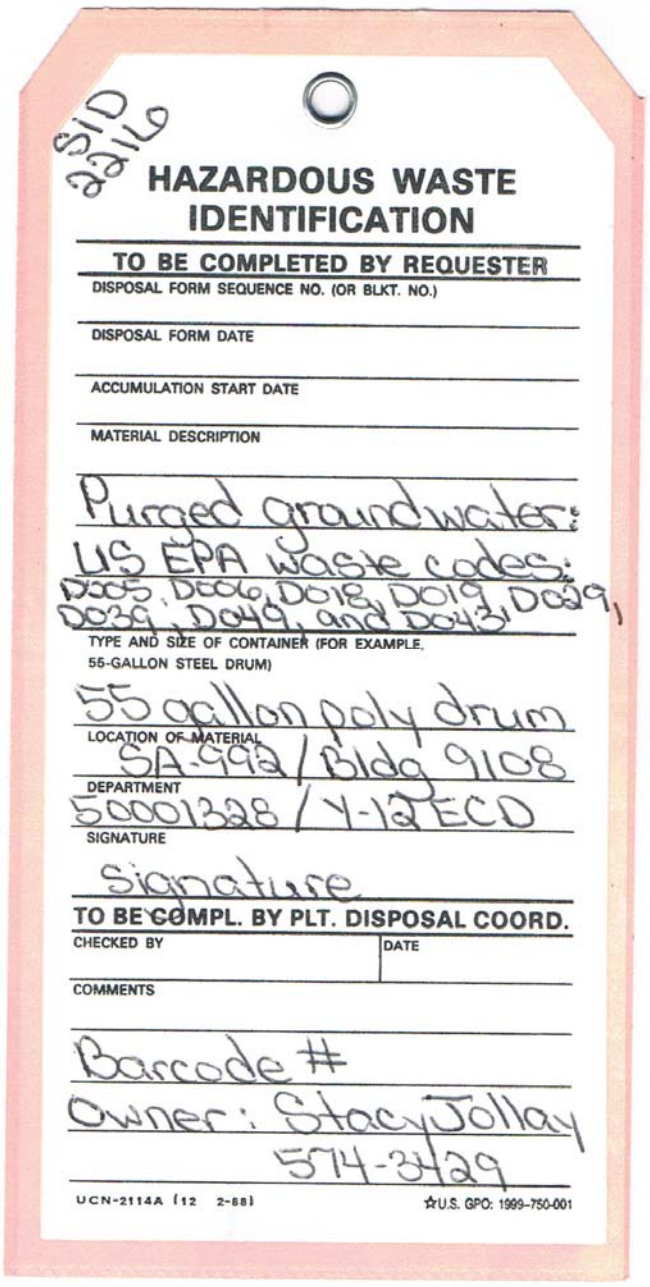
Leave this section blank

Leave this section blank

Appendix F.1

Y-12 GWPP PURGE WATER MANAGEMENT

Example of Waste Identification Tag (UCN 2114A)
SID 2216 purge water


SID 2216

HAZARDOUS WASTE IDENTIFICATION

TO BE COMPLETED BY REQUESTER

DISPOSAL FORM SEQUENCE NO. (OR BLKT. NO.)

DISPOSAL FORM DATE

ACCUMULATION START DATE

MATERIAL DESCRIPTION

Purged groundwater; US EPA waste codes: D005, D006, D018, D019, D029, D039, D049, and D043

TYPE AND SIZE OF CONTAINER (FOR EXAMPLE, 55-GALLON STEEL DRUM)

55 gallon poly drum

LOCATION OF MATERIAL

SA-992 / Bldg 9108

DEPARTMENT

50001328 / Y-12 ECD

SIGNATURE

Signature

TO BE COMPL. BY PLT. DISPOSAL COORD.

CHECKED BY | DATE

COMMENTS

Barcode #

Owner: Stacy Jolley

574-3429

UCN-2114A (12 2-88) ☆U.S. GPO: 1999-750-001

Leave this section blank

Leave this section blank

APPENDIX F.2

WASTEWATER STREAM IDENTIFICATION FOR PURGED GROUNDWATER

Table F.2. Waste stream identification and RCRA waste code for groundwater purged from wells to be sampled during CY 2012

Regime	Location	CY 2012 Sampling Qtr.				Waste Stream Identification (SID #)	RCRA Waste Code
		Q1	Q2	Q3	Q4		
Bear Creek	GW-006			Y		Not Contained	.
	GW-014			Y		***SID 2214***	**F039**
	GW-065	Y				SID 2212	.
	GW-068			Y		***SID 2214***	**F039**
	GW-082	Y				***SID 2214***	**F039**
	GW-085			Y		SID 2212	.
	GW-098			Y		SID 2212	.
	GW-100			Y		SID 2212	.
	GW-101			Y		SID 2212	.
	GW-225			Y		SID 2212	.
	GW-229			Y		SID 2212	.
	GW-246	Y				SID 2212	.
	GW-289	Y				***SID 2214***	**F039**
	GW-307			Y		SID 2212	.
	GW-310	Y				SID 2212	.
	GW-312	Y				SID 2212	.
	GW-315			Y		SID 2212	.
	GW-365			Y		SID 2212	.
	GW-526			Y		SID 2212	.
	GW-537	Y				SID 2212	.
	GW-601			Y		SID 2212	.
	GW-615			Y		**SID 2216**	**D005**
	GW-616	Y				SID 2212	.
	GW-623			Y		***SID 2214***	**F039**
	GW-626			Y		***SID 2214***	**F039**
	GW-627	Y		Y		***SID 2214***	**F039**
	GW-648	Y		Y		SID 2212	.
	GW-653			Y		***SID 2214***	**F039**
	GW-703			Y		SID 2212	.
	GW-724			Y		SID 2212	.
	GW-725			Y		SID 2212	.
	GW-738			Y		SID 2212	.
	GW-740			Y		SID 2212	.
	GW-829			Y		SID 2212	.
Chestnut Ridge	GW-179		Y			SID 2212	.
	GW-322		Y			SID 2212	.
	GW-514		Y			Not Contained	.
	GW-608		Y			Not Contained	.
	GW-609		Y			Not Contained	.
East Fork	55-2B				Y	SID 2212	.
	55-2C				Y	SID 2212	.
	55-3A		Y		Y	**SID 2216**	**D039, D040**
	55-3B		Y		Y	**SID 2216**	**D039, D040, D043**
	55-3C		Y		Y	**SID 2216**	**D039, D040, D043**
	56-1A				Y	Not Contained	.
	56-1C				Y	Not Contained	.
	56-2A				Y	SID 2212	.
	56-2B				Y	**SID 2216**	**D039**
	56-2C				Y	**SID 2216**	**D039, D040**

Table F.2. (continued)

Regime	Location	CY 2012 Sampling Qtr.				Waste Stream Identification (SID #)	RCRA Waste Code
		Q1	Q2	Q3	Q4		
East Fork (continued)	56-3A				Y	SID 2212	.
	56-3B				Y	SID 2212	.
	56-3C				Y	SID 2212	.
	56-4A				Y	SID 2212	.
	56-6A		Y			Not Contained	.
	60-1A		Y			Not Contained	.
	GW-106				Y	SID 2212	.
	GW-109				Y	**SID 2216**	**D005, D006**
	GW-148				Y	SID 2212	.
	GW-153	Y				SID 2212	.
	GW-204			Y		SID 2212	.
	GW-220	Y		Y		**SID 2216**	**D019**
	GW-240	Y				SID 2212	.
	GW-251			Y		SID 2212	.
	GW-265				Y	SID 2212	.
	GW-268				Y	Not Contained	.
	GW-269				Y	SID 2212	.
	GW-274				Y	**SID 2216**	**D039**
	GW-275				Y	**SID 2216**	**D005**
	GW-332			Y		**SID 2216**	**D039**
	GW-337			Y		**SID 2216**	**D039, D040**
	GW-381	Y				SID 2212	.
	GW-383	Y				SID 2212	.
	GW-619				Y	SID 2212	.
	GW-620				Y	Not Contained	.
	GW-633			Y		**SID 2216**	**D018**
	GW-656	Y				**SID 2216**	**D040**
	GW-686			Y		SID 2212	.
	GW-690			Y		SID 2212	.
	GW-691	Y		Y		**SID 2216**	**D039**
	GW-692			Y		SID 2212	.
	GW-698	Y		Y		**SID 2216**	**D040**
	GW-700	Y				SID 2212	.
	GW-722-14			Y		SID 2212	.
	GW-722-17			Y		SID 2212	.
	GW-722-20			Y		SID 2212	.
	GW-722-22			Y		SID 2212	.
	GW-722-33			Y		Not Contained	.
	GW-744	Y				Not Contained	.
	GW-747	Y				Not Contained	.
	GW-748	Y				Not Contained	.
	GW-763	Y				Not Contained	.
	GW-769		Y		Y	SID 2212	.
	GW-770		Y			SID 2212	.
	GW-781	Y				Not Contained	.
	GW-782	Y				SID 2212	.
	GW-783	Y				SID 2212	.
	GW-791	Y				SID 2212	.
	GW-792	Y				Not Contained	
	GW-816	Y				Not Contained	.
	GW-820				Y	**SID 2216**	**D039, D040**

Table F.2. (continued)

Regime	Location	CY 2012 Sampling Qtr.				Waste Stream Identification (SID #)	RCRA Waste Code
		Q1	Q2	Q3	Q4		
East Fork (continued)	GW-928		Y			Not Contained	.
	GW-929		Y			Not Contained	.
	GW-930		Y			Not Contained	.
	GW-931		Y			Not Contained	.
	GW-934-12		Y			SID 2212	.
	GW-934-11		Y			SID 2212	.
	GW-934-09		Y			SID 2212	.
	GW-934-07		Y			SID 2212	.
	GW-934-05		Y			SID 2212	.
	GW-934-04		Y			SID 2212	.
	GW-934-02		Y			SID 2212	.
	GW-934-01		Y			SID 2212	.

DISTRIBUTION

U.S. DEPARTMENT OF ENERGY

J. P. Donnelly *

PROGRAMS & QUALITY

D. R. McDaniel

ENVIRONMENTAL COMPLIANCE DEPARTMENT

S. M. Field
C. C. Hill
S. B. Jones *
S. L. Jollay *
E. R. Schultz
S. E. McNamara
L. O. Vaughan
J. T. Williams*
D. P. McDonald*

ANALYTICAL CHEMISTRY ORGANIZATION

L. K. Rawlins

INFORMATION TECHNOLOGY

S. W. King

Y-12 Central Files *
9114DMC-01971865.6550-RC
Y-12 Records Services (Electronic copy- OSTI)
YDCC - RC *

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION DOE OVERSIGHT

J. E. Sebastian *

ELVADO ENVIRONMENTAL LLC

T. R. Harrison *

RESTORATION SERVICES, INC

H. K. Haase
R. H. Ketelle *
M. Selecman
L. M. Sims *
R. S. Williams
File-EMEF-DMC *

UT-BATTELLE, LLC

D. B. Watson

Note: * = receives hard copy version