Y-12

OAK RIDGE Y-12 PLANT

LOCKHEED MARTIN

DISTRIBUTION OF ANTHROPOGENIC FILL MATERIAL WITHIN THE Y-12 PLANT AREA, OAK RIDGE, TENNESSEE

G. E. Sutton Jr.
S. M. Field

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Prepared for the
Environmental Management Department
Health, Safety, Environment, and Accountability
Organization
Oak Ridge Y-12 Plant
Oak Ridge, Tennessee 38731

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Prepared by:

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LIST OF ACRONYMS

GIS - Geographic Information System
mg/L - milligrams per liter
UEFPC - Upper East Fork Poplar Creek
ug/L - micrograms per liter
VOCs - volatile organic compounds

1.0 INTRODUCTION

Widespread groundwater contamination in the vicinity of the Oak Ridge Y-12 Plant has been documented through a variety of monitoring efforts since the late 1970s. Various contaminants, most notably volatile organic compounds (VOCs), have migrated through the subsurface and formed extensive contaminant plumes within the Knox Aquifer/Maynardville Limestone, the primary exit pathway for groundwater transport within the Bear Creek Valley.

In 1991, an integrated, comprehensive effort (Upper East Fork Poplar Creek [UEFPC] Phase I monitoring network) was initiated in order to (1) identify contaminant source areas within the industrialized portions of the plant and (2) define contamination migration pathways existing between the source areas and the Knox Aquifer/Maynardville Limestone (Geraghty and Miller, Inc. 1990). Data obtained during previous studies have indicated that extensive zones of fill and buried utility trenches may serve as preferred migration pathways. In addition, portions of UEFPC were rerouted, with several of its tributaries being filled during the initial construction of the plant. These filled surface drainage features are also believed to serve as preferred migration pathways. The identification of preferred contaminant migration pathways within the Y-12 Plant area is essential and required to refine the current Bear Creek Valley groundwater conceptual model and to assist in the selection of technically feasible and cost effective remedial strategies.

This report presents the results of an initial investigation of the occurrence of manmade (anthropogenic) fill and its effect upon groundwater movement within the plant area. These interpretations are subject to revision and improvement as further investigation of the effects of the fill upon contaminant migration progresses.

2.0 METHODOLOGY

2.1 GEOLOGY OF THE Y-12 PLANT AREA

The Y-12 Plant is located in Bear Creek Valley within the Valley and Ridge Province in eastern Tennessee (Fig. 2-1). Several northwest-trending, southeast-dipping thrust sheets characterize the structure of the region (Hatcher et al. 1992; Fig. 2-2), from which a series of parallel valleys and ridges have formed. Bear Creek Valley is flanked by Pine Ridge to the north and Chestnut Ridge to the south (Hatcher et al. 1992). These ridges serve as the primary sources of recharge for the Upper East Fork Poplar Creek Hydrogeologic Regime (East Fork Regime), within which the industrialized portion of the Y-12 Plant is almost entirely confined (HSW 1994).

Pine Ridge is formed primarily of shale and siltstone strata of the Cambrian age Rome Formation (Fig. 2-2). The strata forming Chestnut Ridge are primarily the dolostones of the Knox Group and are of upper Cambrian to lower Ordovician age. Bear Creek Valley is underlain by limestone and shale formations of the Conasauga Group of middle to upper Cambrian age and overlain by varying thicknesses of unconsolidated material, exceeding 30 ft in some places (Hatcher et al. 1992). Three major joint sets have been identified in the Bear Creek Valley: one set generally trends parallel to bedding planes, a second set that is steeply dipping and trending parallel to geologic strike, and a third set that is also steeply dipping but trends perpendicular to strike (HSW 1994). The Knox Group and Maynardville Limestone of the Conasauga Group comprise the Knox Aquifer; these two units function as a single hydrologic unit (Solomon et al. 1992). The remainder of the Conasauga Group and Rome Formation, in part, form the Oak Ridge Reservation Aquitards (Solomon et al. 1992).

The bedrock in the vicinity of the Y-12 Plant is overlain by varying thicknesses of unconsolidated deposits. The typical soils range from clayey silts to silty clays (IT 1986). Alluvium, colluvium, residuum, and anthropogenic fill are all present, with a typical combined thickness throughout the East Fork Regime of less than 40 ft (Solomon et al. 1992). The anthropogenic fill is of varying composition, with material ranging from reworked silty clay to building construction debris (Appendix). Previous studies of the fill in the Y-12 Plant area showed that during two periods of construction, fill material was deposited in two different layers with void space being found throughout (Solomon et al. 1992). The void space is caused by the variety of sizes and types of fill materials; as a result, the fill is highly anisotropic in regard to hydraulic properties. Detailed review of boring logs (this study) confirm the heterogeneity of fill types.

2.2 OVERVIEW OF THE INVESTIGATION

An investigation to determine the extent of anthropogenic zones of fill material and the content of the fill was initiated by the Oak Ridge Y-12 Plant Groundwater Protection Program in May 1995. The identification of fill zones is important as they may serve as preferred migration pathways for groundwater and contaminants from source areas to the Knox Aquifer. The Maynardville Limestone is of particular importance due to the presence of prevalent solution features that allow this unit to function as the primary conduit for groundwater in the Bear Creek Valley (HSW 1994). Also, a number of potential contaminant source areas within the Y-12 Plant area overlie the Maynardville Limestone, making it a prime concern of groundwater investigations.

Figure 2-1. Regional Location of the Y-12 Plant

0 2000
SCALE (ft)

ORR AQUITARDS

KNOX AQUIFER

SYSTEM	GROUP	HYDRO UNIT	FORMATION	MAP SYMBOL	THICKNESS (ft)
CAMBRIAN	UPPER	KNOX AQUIFER	COPPER RIDGE DOLOMITE	Ock	NOT DETERMINED
			MAYNARDVILLE LIMESTONE	Cmn	418-450
	MIDDLE	ORR AQUITARDS	NOLICHUCKY SHALE	Cn	422-550
			MARYVILLE LIMESTONE	Cm	346-445
			ROGERSVILLE SHALE	Crg	90-120
			RUTLEDGE LIMESTONE	Crf	90-120
			PUMPKIN VALLEY SHALE	Cpv	260-320
	LOWER		ROME FORMATION	Cr	NOT DETERMINED

Figure 2-2. Topography and Bedrock Geology of the Y-12 Plant Area

A working area corresponding to approximate Y-12 Plant grid easting coordinates from 50,000 to 65,000 ft and northing coordinates from 28,500 to 31,500 ft was selected, incorporating all of the plant within the East Fork Regime (Fig. 2-3). Point source data within the working area, in the form of monitoring well logs and soil boring logs, were gathered. Those data reflecting the presence of fill were placed in separate data bases for wells and soil borings, from which condensed data tables were generated. These data tables were imported into MapInfo geographic information systems (GIS) software and were entered as separate GIS layers to facilitate specific query. Maps showing cut and fill zones within the Y-12 Plant area, generated by K-25 Site engineering personnel using topographic data, were digitized using AutoCad and were entered as a GIS layer. Additional layers consisting of building layouts, roads, and utility line locations were obtained and entered into the GIS data base. The layers were combined to produce a working map of the Y-12 Plant area showing the distribution of the defined cut and fill zones and the point source data. Hand-contouring of the fill thickness values resulted in an interpreted fill thickness (isopach) map. Because of the limited distribution of the data points, the accuracy of contours was checked against pre- and post-plant construction topographic maps, aerial photographs, and the cut and fill maps. This process allowed any topographic or physiographic controls that would assist in the accuracy of the interpretation of the contouring to be seen. The final interpreted fill thickness isopach map was compared with maps of contaminant plumes and other sources of information in attempts to see any influences of the fill upon groundwater and contaminant migration in the shallow subsurface. Observations and interpretations were then made in regard to all the data.

2.3 GATHERING OF POINT SOURCE DATA

Initially, the *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, Revision 2* (Jones et al. 1994) was consulted for the purpose of selecting monitoring well locations within the study area from which lithologic log data could be extracted. Only those wells having lithologic descriptions of definite or presumed fill material were considered. From these data, a working data base was compiled in tabular spreadsheet format using Microsoft Excel software (Appendix Tables A1 and A2). Similarly, soil boring logs from geotechnical reports on file at both the Y-12 Plant and the K-25 Site were reviewed. Condensed data taken from these logs were placed in separate spreadsheets (Appendix Tables A3 and A4) to allow individual queries to be made of the two main data types.

2.4 POPULATION AND EXPLANATION OF DATA TABLE FIELDS

The following point source data fields, taken from the well installation and soil boring logs, are populated in the Appendix tables: location identification (LOCATION_ID), northing (NORTHING), easting (EASTING), ground elevation (GNDELEV), depth to the top of weathered rock (TOWR), depth to the top of fresh rock (TOFR), fill thickness (FILLTHK), bottom of fill layer (BOTLYR), description of the fill (DESLYR), thickness of the unconsolidated interval (UNCONSOL), functional area within the Y-12 Plant (FUNCTLAREA), the geologic unit(s) penetrated by the well (GEOFORMPEN), a relative data confidence ranking (FILLCONFID), the reference cited (REFERENCE), and pertinent comments (COMMENTS).

The names of most of the data table fields are self-explanatory; however, the point source data within the field LOCATION_ID are named using a convention to permit the unique identification of each data point and require additional explanation. In the case of

Figure 2-3. Y-12 Plant Anthropogenic Fill Study Area Boundary

monitoring well data, prefixes of "GW" , "55" , "56" , or "59" have been assigned. Soil borings follow a different convention, with XXXX_AB-C_MMDDYY representing the general format where XXXX corresponds to the name of the drilling or boring contractor, AB-C represents the boring name used by the contractor, and MMDDYY represents the month/day/year the boring was finished (if available). If the soil boring completion date was not available, the date indicated on the boring plan or elsewhere within the cited reference was used. This convention of naming soil borings was necessary as numerous borings were frequently given the same identifier. Table 2-1 lists the names of the boring contractors and their corresponding identification prefix.

Table 2-1. Contractor Identification Prefixes for Soil Boring Point Source Data

Identification Prefix	Name of Boring Contractor
GA	Geological Associates, Inc.
GE	Geotek Engineering, Inc.
GM	Geraghty and Miller, Inc.
OE	Ogden Environmental and Energy Services Co., Inc.
S&ME	Soil and Material Engineers, Inc.
ERCE	ERCE, Inc.
EDGe	EDGe Group, Inc.
ERC	ERC/EDGe, Inc.
SAIC	Science Applications International Corp., Inc.

The field name NORTHING refers to the north coordinate for the borehole or well location, measured in feet, and referenced to the Y-12 Plant grid. The field name EASTING corresponds to the east coordinate, also in feet and in the Y-12 Plant grid system.

The field name GNDELEV is the ground elevation at the well or borehole, expressed in feet above mean sea level.

The field name TOWR represents the top of weathered bedrock and is given in feet below the ground surface at which in situ bedrock is first reached. The field name TOFR is the top of fresh bedrock, given in feet below ground surface; it represents the base of appreciable bedrock weathering. However, during one project in 1988, the depth to the top of fresh bedrock was arbitrarily defined by Geological Associates, Inc., as having a blow-count value (N-value) of greater than 100 (Appendix).

The field name UNCONSOL is the thickness of the unconsolidated interval, measured in feet. It represents the total thickness of the unconsolidated material present at the data point site and may include alluvium, colluvium, residuum, and anthropogenic fill material.

The field name FILLTHK is the thickness of the fill at the data point site in feet; it represents the total thickness of the anthropogenic fill material. In addition, the fill may include earth that has been cut and borrowed from other locations within the plant area.

The field name FILLCONFID represents a relative confidence factor expressing the confidence the data base compiler had in the reported fill thickness (the certainty of it being fill and the certainty of the thickness) as determined from the examination of lithologic and soil boring logs. A value of "1" represents absolutely no confidence; a value of "5" represents high confidence. This factor was decided after comparing the presumed fill interval as reported in the logs with the defined fill areas identified on the cut and fill maps (Plate 1). If the coordinates of the boring in question did not match with any fill area on the cut and fill maps, the confidence was lower than if there had been a match. In addition, the fill description was considered; if it was accompanied by a descriptor such as "possible fill" or "probable fill", the confidence was lower than had the descriptor "definite fill" or simply "fill" been indicated. This component of the confidence factor attempted to capture the confidence the boring logger had in the fill interval in hopes of providing a more accurate assessment of the fill at the data point sites.

In order to permit special queries of the types of fill material occurring at various depths below ground surface, additional fields delineating separate fill "layers" were incorporated within the data tables. A more accurate assessment of the fill material, and any hydraulic effects that separate fill layers may exert upon the groundwater in the water table interval may be realized from these fields. However, the fill material was at times described collectively for an entire section of the boring, preventing the identification of individual fill layers and their corresponding fill material. Even so, the recording of the additional information where available was convenient as the logs were being reviewed. The various depth ranges equate to individual fill layers, with each layer having a unique name and description. The field name BOTLYR1 (the bottom of fill layer 1) represents the distance from the ground surface to the bottom of fill layer 1 and is expressed in feet. The field name DESLYR1, indicating the description of fill layer 1, contains a brief description of material comprising the fill layer as reported in the lithologic and soil boring logs. The field name BOTLYR2 (the bottom of fill layer 2) is the distance from the bottom of fill layer 1 to the bottom of fill layer 2, expressed in feet. DESLYR2 is the description of fill layer 2. The remaining fill layers are named and described consecutively in the same manner.

The lowermost geologic formation penetrated by the borehole or well, when given in the logs, is provided in the field name GEOFORMPEN.

The field name FUNCTLAREA is the geographical or operational region within the Y-12 Plant in which the borehole or well is located.

The field name REFERENCE is the reference document from which the information and data were taken. The references consist primarily of geotechnical investigations and related documents for the soil borings and the Subsurface Data Base (Jones et al. 1994) for the well data.

Periodically, brief and general comments concerning the borehole or well data were found to be of interest and were placed within the field name COMMENTS.

At times, the terms "weathered" and "decomposed" shale are used in the fill layer descriptions. A distinction between the two terms is made, where "decomposed shale" refers to blow-count values (N-values) of less than 100 blows per foot. "Weathered shale", being the more competent of the two, refers to N-values of greater than 100 blows per foot.

2.5 METHOD OF CONTOURING OF POINT SOURCE DATA

The fill thickness isopach map was hand-contoured using the available monitoring well and soil boring point source data. The preliminary contouring interpretation was further refined by comparison of the data distribution with the defined cut and fill zone maps, topographic maps, and aerial photographs as discussed below. The completed fill thickness contours were digitized as a GIS layer in order to produce the final map.

2.6 UTILIZATION OF DEFINED CUT AND FILL ZONE MAPS

The defined cut and fill zone maps were generated by engineering personnel at the K-25 Site during 1986. These maps were generated by plotting comparative differences between points on 1942 preconstruction topographic maps and 1979 postconstruction topographic maps. The process provided the areal boundaries that encompass the defined fill zones (Plate 1). Areas outside of the defined fill zones remained either at the same elevation or represent cut areas. The point source data were checked against the defined fill zones; data sites lying within the zones and having confidence factors of 4 and 5 strengthened the evidence for existence of the fill zones. Data sites lying outside of fill zones with the same confidence factors served to suggest that the areal extent of the fill zones could be increased to contain the data sites.

In some regions of the cut and fill zone maps, defined fill zones exist with no available data points. An example of this is the filled area centered approximately at 30,370 N; 51,230 E, which encompasses Bear Creek Road (Plate 1). No point source data of either type were determined to exist here, and no consideration could be given to the actual extent of this fill zone. A 5-ft contour is drawn around the area as it is assumed that at least 5 ft of fill would be present where previous road construction has undoubtedly taken place. Many other cut and fill zone areas have no associated data points; they had to be considered using a similar line of reasoning, usually with the assistance of topographic maps and aerial photographs.

2.7 UTILIZATION OF TOPOGRAPHIC MAPS

Topographic maps representing both preconstruction and present day topographies were used as tools to provide additional sources of control information during the contouring of the fill thickness data. The preconstruction maps were of 1942 vintage, and the present day topography was represented by 1979 maps.

2.8 UTILIZATION OF AERIAL PHOTOGRAPHS

Aerial photographs taken of the Y-12 Plant area prior to initial construction were helpful during the fill thickness contouring process in several areas. They provided the most assistance during contouring of the area of the Y-12 Plant referred to as Spoil Area I, located in the general region of 29,500 N; 52,000 E (Plate 1). Modern aerial photographs were used to show the current topography in the Spoil Area I, New Hope Pond, and Lake Reality areas. The photographs were also frequently used to confirm topographic features such as drainage channels and roads that were shown on the preconstruction topographic maps.

3.0 RESULTS, OBSERVATIONS, AND INTERPRETATIONS

3.1 MAJOR FILL ZONES WITHIN THE Y-12 PLANT AREA

The fill zones, as defined by the cut and fill maps and shown on the fill thickness isopach map (Plate 1), occur primarily in areas of the Y-12 Plant where preconstruction surface drainage features were located. These areas represent valleys and topographic lows which were filled and altered to reroute the water flowing toward the UEFPC. The thickness of fill varies from less than 1 ft to as much as 38 ft (Appendix) and probably exceeds this in locations throughout the Y-12 Plant area. Many different types of material have been used as fill: crushed stone and gravel; clayey silt containing cinders; coal fines, bricks, wood, roofing shingles, and other various types of construction material (Appendix). The available fill data are nonuniform and distributed as closely spaced clusters of borings across the entire Y-12 Plant area.

Several major areas of thick fill were identified, many of which were associated with waste management sites. Thick deposits of fill are present in the Rust Spoil Area and the SY-200 Yard sites; with 18 ft of fill observed at boring data point SAIC_SB-34_102093 and 17.5 ft observed at SAIC_SB-08_111693 (Appendix, Plate 1). Fill thickness up to 38 ft is present in the Spoil Area I Site at well data point GW-315 (Appendix, Plate 1); fill is present in the surrounding region as well, although in amounts less than 38 ft. Another major area where thick fill occurs is in the vicinity of the S2 Site, with boring data point OE_2-A_011093 just south of a filled channel showing 16.5 ft of fill (Appendix, Plate 1). At the Waste Coolant Processing Area, fill ranges from a few feet to 29 ft in thickness, primarily near the location of a filled stream channel (Plate 1). Along the length of the UEFPC channel, fill is generally less than 10 ft, according to the available data (Appendix, Plate 1). Thick fill exists in the Building 9212 vicinity. Well GW-784 penetrates 18.5 ft of fill west of the area, boring data point S&ME_WC-6_042589 shows 31 ft of fill east of the area, and boring data point GA_103_020689 indicates fill of 25 ft thickness in the southern portion of the area (Appendix, Plate 1). The Ravine Disposal Area also contains several fill deposits. The easternmost zone has 17 ft of fill emplaced (boring data point ERCE_B-4_102491, Appendix, Plate 1); the zone located in the western portion of the Ravine Disposal Area has 18.8 ft (well data point GW-768); and 19.5 ft (boring data point ERCE_VC-4_072490) represents the maximum thickness of fill (Appendix, Plate 1).

3.2 INTERPRETATION OF FILL ZONES

3.2.1 Western Plant Area

Monitoring well GW-310 at the Rust Spoil Area, with a fill thickness of 14 ft and a confidence factor of 5 (Appendix, Plate 1), indicates that the cut and fill zone near which it is located could be extended to the southeast by several feet. The well is located 20 ft southeast of the zone boundary in a drainage ditch that is not shown on preconstruction topographic maps. The ditch is probably the result of a cut operation as the 1979 topography indicates considerable changes have been made. Accordingly, a 5-ft fill thickness contour is drawn south of this well to recognize it as a useful point. Likewise, the 6 ft of fill (5 confidence factor) at well GW-100 would appear to allow the areal extent of the cut and fill zone to be increased toward the north to contain this point. However, no additional supporting data are present as extensive drilling has not occurred in the area. In addition, the topography of the surrounding area has changed relatively little since 1942. Therefore, a 5-ft contour was not drawn to encompass this point. Also, soil borings in the

vicinity of boring OE_WETF-7_081992, with fill thicknesses ranging from 5 to 10.5 ft and having a high confidence factor, suggest that the cut and fill boundary could be extended to contain these points. A 5-ft contour was drawn to surround the group of boring points, and a 10-ft contour was added to relate these points within the group.

Preconstruction aerial photographs of the Y-12 Plant area were used to help determine the placement of contours in the Spoil Area I region, located in the vicinity of coordinates of 29,500 N; 52,000 E (Plate 1). Here, monitoring wells GW-313, GW-314, GW-315, and GW-316 showed fill thickness ranging from 6 to 38 ft. Soil boring SAIC_P-1_100593 is located just east of well GW-315 and has 37.5 ft of fill. There is no doubt that fill operations were performed here in the past, as descriptions of the fill include wood, brick, nails, particle board fragments, and clear plastic (Appendix). However, no zone of fill has previously been defined in this area. The preconstruction photographs allowed the general relief of the area to be studied, although with difficulty due to the relatively small scale of the photographs. Larger scale photos of the same area were available and served to assist in the verification of features determined using the small scale photos, but were of little added value. Gently rolling topography with poorly defined drainage features was observed in the photos; this was verified by examination of the preconstruction topographic maps. When then compared with the modern topography, it appeared that a cut operation had been performed prior to fill emplacement. A 5-ft contour was drawn to envelope the Spoil Area I locality based on the information gathered from the photos, topographic maps, and defined cut and fill zone maps. Similarly, 10 through 35-ft contours were also placed where appropriate. However, more data are required to improve this interpretation and to provide a more accurate assessment of the fill activities that have occurred here.

3.2.2 UEFPC and Tributary System

The UEFPC channel was significantly modified during the construction of the Y-12 Plant. The channel was altered in a more linear fashion along the southeastern part of the Y-12 Plant area, and its headwaters were captured and diverted vertically downward by the addition of an underground storm sewer system (HSW 1994; Rothschild et al. 1984). The portion of the creek that was straightened is shown on the southeastern portion of Plate 1. The meandering of the original creek indicated that the region was originally of relatively low relief and gentle slope; this was shown to be true from analysis of the preconstruction aerial photographs and topographic maps. Soil borings GE_B-2_051486 and GE_B-3_051486 indicate the presence of 10 ft and 5 ft of fill, respectively, immediately north of a relatively straight portion of the original creek; thus, a 10-ft contour was drawn about these points. To the east of these points, monitoring wells GW-380, GW-381, and GW-382 penetrate fill thickness ranging from 0.5 to 0.6 ft. A moderate confidence factor of 3 was assigned due to the material description and the existence outside a fill zone (Appendix). Due to lack of other data points in the area, these wells were considered in the drawing of a 5-ft contour along the filled creek channel north of their vicinity. To the southwest of boring GE_B-2_051486, soil borings, OE_B-1_081093 and OE_B-2_080693 show fill to be 16.5 and 17.7 ft, respectively (Appendix). Although the fill description of these data points contained wood and black sand, they were not considered in the contouring process as they lie well south of UEFPC. The borings penetrate a manmade bench in the vicinity of a sharp switchback turn created during construction of East Patrol Road (Jago, personal communication, 1995).

All of the north-south tributaries/stream channels of UEFPC were either filled or replaced with storm drains during the initial construction of the Y-12 Plant (Rothschild et al. 1984;

HSW 1994). These filled stream channels are shown on Plate 1, and their potential impact on the groundwater contamination is discussed in a following section of this report. In some places, data points are located such that a relatively accurate fill thickness could be determined, as is shown by monitoring wells GW-633, GW-108, and GW-109 (Appendix, Plate 1). The fill thicknesses indicated by these data points are, respectively, 8.5, 4, and 5 ft. A 5-ft contour is drawn to encircle the filled channel at this site and generally follow its trend until control is taken by other data points. Another filled stream channel with data supporting a reasonably accurate fill thickness occurs south of the junction of three filled channels at approximately 29,900 N; 60,680 E (Plate 1). Soil boring EDGe_B-3_080288 indicates the fill in the channel to be 5 ft in thickness (Appendix). However, no additional data points are available to substantiate this observation; without their presence, control for contouring is lost, and other sources of data and information must be used. An additional filled channel trends northwest to southeast and is centered at approximately 30,300 N; 62,500 E, in the Ravine Disposal Area (Plate 1). Here, monitoring well GW-768, with data showing fill to be 18.8 ft near the channel, allows a 15-ft contour to be drawn to contain the point. Control is once again lost due to the absence of additional data points, and other sources must be relied upon for a more accurate extension of contouring in the region of this filled channel.

An example of the application of the topography comparisons is observed at the filled stream channel having its origin at approximately 30,450 N; 58,700 E (Plate 1). The site of the stream channel origin was found to have a present ground elevation of approximately 985 ft and a preconstruction elevation of 975 ft. The difference between the two values results in an estimated 10 ft of fill material having been placed in this location. The defined cut and fill zone boundary through which the stream channel passed indicated that the source of the channel was not within a fill zone (Plate 1). The comparison, therefore, suggested that the zone could be extended further to the north than was previously determined. This value served as a control point for contouring, with a 10-ft contour being brought northward to encircle several soil boring data points with high confidence ranking. These soil borings included S&ME_B-22_090287, S&ME_23A_090287, S&ME_24_090187, S&ME_25A_090187, S&ME_26_090187, and S&ME_27A_083187. The first three points show respective fill thicknesses of 12, 12.5, and 12 ft. The latter three showed respective fill thicknesses of 15, 5, and 6 ft. All of these points were considered in the drawing of the 10-ft contour as they had high confidence factors. A soil boring data point located a short distance to the north of these, S&ME_B-15_091587, was not used in the contouring process as it was shown not to lie within a zone of fill.

A filled stream channel with its origin at approximately 31,270 N; 56,990 E was shown on the topographic map to lie within an asymmetrical valley, with the eastern side of the channel having a more gentle slope than the western side. This observation was used to construct a 5-ft contour around the filled channel, with the contour encompassing a wider area away from the channel origin as it approached the west (Plate 1). Two monitoring well data points, GW-784 and GW-785, had respective fill values of 18.5 and 8.5 ft, with the greater of the two being closer to the portion of the channel with the greater relief.

The filled channel with its origin at approximately 30,850 N; 62,800 E received around 5 ft of fill at its origin according to the difference in elevation between the preconstruction and postconstruction topography. The origin of this stream is shown to lie outside of a cut and fill zone, allowing not only the addition of a 5-ft contour to be drawn around the channel but the extension of the cut and fill zone boundary toward the north as well. Further to the south, two channels are seen to combine to form a northwest-southeast trending channel. About 10 ft of fill are present at the junction, as the preconstruction elevation was

near 930 ft, whereas the present elevation is close to 940 ft. Thus, the comparison resulted in the addition of a control point about which a 10-ft contour was drawn (Plate 1). A 5-ft contour was drawn around the northernmost portion of the channel directly to the west of these points, including the channel origin. Another filled stream channel, with an origin close to 30,650 N; 61,200 E within a cut and fill zone, has approximately 15 ft of fill in place. The elevation of the origin, about 978 ft on the preconstruction map, is given as about 993 ft on the present map, resulting in a 15 ft fill value.

3.2.3 Eastern Plant Area

In the region of New Hope Pond and Lake Reality (Plate 1), preconstruction photographs indicated that several minor stream drainages were once present, and that many meanders were located along the section of UEFPC passing through the area. Several roads existed prior to the initial Y-12 Plant construction. Less relief is now present due to episodes of construction, including installation of the plant rail line. Fill was emplaced, probably to build up the low lying areas and create a suitable grade for the railway. The fill at soil boring data point GE_B-1_033187, located within the present Lake Reality (Appendix, Plate 1), indicates a thickness of 11.4 ft of mainly silty clay and organic material. The surrounding data points show a range in fill thickness between 3 and 11.4 ft with similar material descriptions. In view of the high confidence factor, a 10-ft contour was placed through them. A 5-ft contour was drawn around the perimeter of Lake Reality but could not be brought around the entire fill zone due to the thickness of fill at the available data points being less than 5 ft. The described fill thickness within Lake Reality represents fill that existed prior to its construction in 1987-1988. This fill is no longer present as the lake was excavated to a depth of around 13 ft (Jago, personal communication, 1995).

3.3 POTENTIAL IMPACTS ON CONTAMINANT DISTRIBUTION

Groundwater contaminant plume distributions (HSW 1994; Fig. 3-1 and 3-2) were compared with the defined areal extent of the fill zones to provide insight as to the influences of the fill upon the transport and migration of contaminants in the shallow subsurface (water table interval). Hydraulic influences due to the presence of fill material and buried (filled) drainage channels are observed at several places within the study area. A filled stream channel located between wells GW-105 and GW-505 (Fig. 3-1, Plate 1) is believed to influence the migration of nitrates in this portion of the Y-12 Plant (HSW 1994). The overall trend of the nitrate plume in the water table interval follows the general trend of a buried channel that exists at this point (Fig. 3-1, Plate 1). The channel, prior to being filled during the initial Y-12 Plant construction, served as a tributary of the UEFPC; its existence is well documented on preconstruction topographic maps and aerial photographs. Analytical evidence supporting the control of the fill zone upon nitrate migration between the two wells consists of an observed, rapid decrease in concentration levels from 921 milligrams per liter (mg/L) to 1.1 mg/L over the approximately 200 ft distance separating the wells (HSW 1994). The channel probably serves as a hydraulic conduit and possesses a high degree of permeability due to the various fill types and the varying degrees of consolidation found within the fill zones (Rothschild et al. 1984; Appendix). The filled channel may allow nitrate and other contaminants to migrate along with meteoric waters from the vicinity of well GW-105 in a generally southeasterly direction toward well GW-633 and ultimately well GW-108. Samples of the latter two wells showed nitrate concentrations of 3,629 and 13,100 mg/L, respectively (HSW 1994).

EXPLANATION	
▲ — SURFACE-WATER SAMPLING LOCATION	172 — SUMMED AVERAGE VOC CONCENTRATION (ug/L)
■ — WATER TABLE INTERVAL MONITORING WELL	≤ — QUALITATIVE VOC CONCENTRATION (ug/L)
● — BEDROCK INTERVAL MONITORING WELL	ND — NOT DETECTED
— Cn — NOLICHUCKY SHALE — ORR AQUITARD	■ — INDICATES A WELL SAMPLED BEFORE 1994
— Cmn — MAYNARDVILLE LIMESTONE	ND — ND
— Ock — KNOX GROUP — KNOX AQUIFER	0-100 ug/L
	>100 ug/L

Source: HSW, Inc. 1994

Figure 3-1. Nitrate in Groundwater in the Upper East Fork Poplar Creek Hydrogeologic Regime

Source: HSW, Inc. 1994

Figure 3-2. VOCs in Groundwater in the Upper East Fork Poplar Creek Hydrogeologic Regime

Groundwater recharge both along Pine Ridge and downslope away from the ridge may serve to effectively dilute the contaminant concentrations in the northwest part of the plume, west of the stream channel, and allow the plume to be pushed toward the southeast via rapid flow through the fill material.

An apparent influence exists on VOC migration in the water table interval from a filled stream channel lying between wells GW-191 and GW-192, located east of the channel, and wells GW-194 and GW-197, both of which are located west of the channel and are presumably upgradient. Analysis of groundwater samples collected from wells GW-191, GW-194, and GW-197 did not indicate the presence of VOCs in this portion of the VOC contaminant plume; however, well GW-192 samples indicated a concentration of 19 ug/L (HSW 1994). This well is located approximately 8 ft south of well GW-191 and presumably downgradient. This observation may be indicative of a preferential flow path within the fill material in the adjacent stream channel, permitting VOCs to migrate from an upgradient source.

The location of monitoring well GW-656 does not lie within a previously defined fill zone; however, examination of the lithologic log indicates that 6 ft of fill are present at this site (Appendix). A summed chlorinated solvent concentration level of 12,075 ug/L was detected in calendar year 1993 in samples collected from the well (HSW 1994). A filled utility trench or other anthropogenic flow path may exist in the area, as groundwater samples from well GW-204, located upgradient and 70 ft to the northwest of well GW-656, indicated only the presence of petroleum hydrocarbons and not chlorinated solvents (HSW 1994). The absence of chlorinated solvents in well GW-204 is indicative of an upgradient source of VOC contamination with a fill trench or channel serving to allow the transport of VOCs toward well GW-656 (HSW 1994). The existence of trench or channel is likely because the well penetrates 6 ft of unconsolidated fill material that could readily serve as a highly permeable pathway for the transport of contaminants. An alternative explanation for the discrepancy in chlorinated solvents levels in the two wells is that an unidentified source exists between the wells (HSW 1994).

4.0 SUMMARY AND RECOMMENDATIONS

The extent of the fill material within the Y-12 Plant area is widespread, with most of the fill being located in the vicinity of former surface drainage features. General comparison of contaminant plume distributions and cut and fill maps suggests that the location of fill zones does influence the direction of contaminant migration. The influence of fill on groundwater flow and contaminant transport will need to be considered in future revisions of the groundwater conceptual model in the Bear Creek Valley portion of the Oak Ridge Reservation.

The observations and interpretations offered in this report have been made considering currently available data. The findings presented must be considered preliminary due to the lack of point source data in many areas. As additional data become available, a more definite and accurate assessment of the findings will be possible. Suggestions and precautions that may help improve future studies of fill within the Y-12 Plant area are as follows:

1. Increase the quantity of point source data by determining the locations of any buried channels and trenches that may be present within the fill zones. Possible sources of this information are construction plans that may indicate subsurface utility trenches and similar buried features. These points may allow the areal extent of the fill zones to be broadened, and may assist in defining additional preferred migration pathways.
2. Recognize the uncertainties that exist when working in the Bear Creek Valley. The stratigraphy of the region is complex, and knowledge of the lithology may help in the interpretation of fill that may be present. As an example, the Maynardville Limestone is soluble and has weathered to produce a bedrock surface of varying relief. The depth to weathered bedrock may, therefore, dramatically change within a small area, with the thickness of the overlying unconsolidated deposits changing as well.
3. Reference the most recently prepared topographic maps for the greatest accuracy of contouring and delineation of topographic features.
4. Conduct a detailed review of contaminant data to refine relationships between source areas and potential migration pathways within fill zones. Signature contaminants may potentially be used to identify filled tributaries that function as preferred flow paths for specific source areas.

5.0 REFERENCES

- Geraghty and Miller, Inc. 1990. *Comprehensive Groundwater Monitoring Plan for the Oak Ridge Y-12 Plant*, Y/SUB/90-00206C/5, for Martin Marietta Energy Services, Inc., Oak Ridge Y-12 Plant.
- Hatcher, R. D., Lemiszki, P. J., Dreier, R. B., Ketelle, R. H., Lee, R. R., Leitzke, D. A., McMaster, W. M., Foreman, J. L., and Lee, S. Y. 1992. *Status Report on the Geology of the Oak Ridge Reservation*, ORNL/TM-12074, Martin Marietta Energy Systems, Inc., Oak Ridge National Laboratory.
- HSW 1994. *Calendar Year 1993 Groundwater Quality Report for the Upper East Fork Poplar Creek Hydrogeologic Regime, Y-12 Plant, Oak Ridge, Tennessee: 1993 Groundwater Quality Data and Interpretations and Proposed Program Modifications*, Y/SUB/94-EAQ10C/2/P2, HSW Environmental Consultants, Inc., for Martin Marietta Energy Systems, Inc., Oak Ridge Y-12 Plant.
- IT 1986. *Geohydrological Investigation of the Diesel Spill at the Y-12 Plant Service Station*, Contract No. 408927.01, IT Corporation for Martin Marietta Energy Systems, Inc., Oak Ridge Y-12 Plant.
- Jago, W. K. 1995. Lockheed Martin Energy Systems, Inc., personal communication to G. E. Sutton Jr. concerning fill descriptions of data points within the East Patrol Road portion of the Y-12 Plant, July 1995.
- Jones, S. B., Thompson, B. K., and Field, S. M. 1994. *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*, Y/TS-881/R2, Martin Marietta Energy Systems, Inc., Oak Ridge Y-12 Plant.
- Rothschild, E. R., Turner, R. R., Stow, S. H., Bogle, M. A., Hyder, L. K., Sealand, O. M., and Wyrick, H. J. 1984. *Investigation of Subsurface Mercury at the Oak Ridge Y-12 Plant*, ORNL/TM-9092, Martin Marietta Energy Systems, Inc., Oak Ridge National Laboratory.
- Solomon, D. K., Moore, G. K., Toran, L. E., Dreier, R. B., and McMaster, W. M. 1992. *Status Report: A hydrologic Framework for the Oak Ridge Reservation*, ORNL/TM-12026, Martin Marietta Energy Systems, Inc., Oak Ridge National Laboratory

APPENDIX

Tabulation of Monitoring Well and Soil Boring Point Source Data

Table A1. Monitoring Wells Selected for Point Source Data

LOCATION ID	NORTHING	EASTING	GNDELEV	TOWR	TOFFI	GEOFORMPEN	FUNCTLAREA	REFERENCE	COMMENTS
55-1B	30469.00	55010.00	986.05	8.00	0.00	CON: Nollchucky	Building 9204-4	Rothschild et al. (1984)	
55-2A	30085.00	55195.00	976.17	11.50	0.00	CON: Nollchucky	Building 9201-5	Rothschild et al. (1984)	
55-2C	30085.00	55203.00	976.10	14.50	47.20	CON: Nollchucky	Building 9201-5	Rothschild et al. (1984)	
55-3C	29959.00	55703.00	971.76	6.00	0.00	CON: Nollchucky	Building 9201-5	Rothschild et al. (1984)	
56-2C	29885.00	56231.00	962.40	11.50	17.00	CON: Nollchucky	Building 9201-4	Rothschild et al. (1984)	
56-3C	29859.00	56449.00	962.36	5.00	0.00	CON: Nollchucky	Building 9201-4	Rothschild et al. (1984)	
56-4C	29815.00	56804.00	959.05	14.50	28.50	CON: Nollchucky	Building 9201-4	Rothschild et al. (1984)	
56-5C	29375.00	56819.00	966.34	17.00	30.20	CON: Maynardville	Building 81-10	Rothschild et al. (1984)	
59-1C	29834.00	59882.00	945.12	22.00	60.00	CON: Nollchucky	Building 9202	Rothschild et al. (1984)	
GW-100	29758.00	50957.00	984.43	14.00	0.00	CON: Maynardville	S3 Ponds	Bechtel (1984)	
GW-101	30241.00	51845.00	1006.00	14.00	17.50	CON: Nollchucky	S3 Ponds	Bechtel (1984)	
GW-103	30057.00	52291.00	1007.70	8.50	0.00	CON: Nollchucky	S3 Ponds	Bechtel (1984)	
GW-104	30059.00	52303.00	1007.80	1.00	0.00	CON: Nollchucky	S3 Ponds	Bechtel (1984)	
GW-105	30416.00	52833.00	1014.10	10.00	0.00	CON: Nollchucky	S3 Ponds	Bechtel (1984)	
GW-106	30417.00	52844.00	1014.30	12.50	0.00	CON: Nollchucky	S3 Ponds	Bechtel (1984)	
GW-107	30079.00	53207.00	995.73	5.00	0.00	CON: Nollchucky	S3 Ponds	Bechtel (1984)	
GW-108	30069.00	53207.00	995.61	4.00	0.00	CON: Nollchucky	S3 Ponds	Bechtel (1984)	
GW-109	30055.00	53207.00	994.54	5.00	16.00	CON: Nollchucky	S3 Ponds	Bechtel (1984)	
GW-183	29658.59	61954.52	943.01	1.50	0.00	CON	Y-12 Fuel Station	ERCE (1991c)	
GW-190	30776.49	53254.42	1030.20	8.00	0.00	CON	Y-12 Plant Site	ERCE (1991c)	
GW-193	29343.93	59536.17	931.11	2.50	0.00	CON	Y-12 Plant Site	ERCE (1991c)	
GW-218	29136.00	58878.00	932.77	6.00	0.00	CON: Maynardville	Uranium Oxide Vault	Geraghty and Miller (1988)	
GW-265	30763.00	53308.00	1030.90	10.00	22.00	CON: Maryville	Y-12 Salvage Yard	Geraghty and Miller (1987)	
GW-266	30699.00	53392.00	1028.90	5.00	0.00	CON: Maryville	Y-12 Salvage Yard	Geraghty and Miller (1987)	
GW-267	30700.00	53464.00	1028.80	5.00	27.00	CON: Maryville	Y-12 Salvage Yard	Geraghty and Miller (1987)	
GW-268	30616.00	53608.00	1024.10	2.50	35.00	CON: Maryville	Y-12 Salvage Yard	Geraghty and Miller (1987)	
GW-269	30649.00	53779.00	1025.40	10.00	0.00	CON: Maryville	Y-12 Salvage Yard	Geraghty and Miller (1987)	
GW-270	30424.00	53236.00	1006.40	5.00	11.00	CON: Nollchucky	Y-12 Salvage Yard	Geraghty and Miller (1987)	
GW-271	30435.00	53234.00	1006.50	5.00	11.00	CON: Nollchucky	Y-12 Salvage Yard	Geraghty and Miller (1987)	
GW-272	30485.00	53737.00	1006.60	5.00	15.00	CON: Nollchucky	Y-12 Salvage Yard	Geraghty and Miller (1987)	
GW-276	29926.00	52557.00	998.80	18.50	0.00	CON: Nollchucky	S3 Ponds	Geraghty and Miller (1987)	
GW-277	29937.00	52565.00	999.05	17.50	65.00	CON: Nollchucky	S3 Ponds	Geraghty and Miller (1987)	
GW-278	29649.00	53593.00	994.66	21.00	0.00	CON: Maynardville	S2 Site	Geraghty and Miller (1987)	
GW-280	29630.00	53589.00	995.42	25.00	115.00	CON: Maynardville	S2 Site	Geraghty and Miller (1987)	
GW-282	29747.00	62002.00	944.69	16.00	0.00	CON: Nollchucky	Y-12 Fuel Station	IT Corp. (1986)	
GW-284	29590.00	61925.00	942.30	18.00	0.00	CON: Nollchucky	Y-12 Fuel Station	IT Corp. (1986)	
GW-285	29595.00	61856.00	942.88	21.00	0.00	CON: Nollchucky	Y-12 Fuel Station	IT Corp. (1986)	
GW-292	28141.00	62146.00	1070.10	32.00	59.50	KNOX	East CR Waste Pile	Geraghty and Miller (1988)	
GW-294	27958.00	62483.00	1081.70	62.00	67.00	KNOX	East CR Waste Pile	Geraghty and Miller (1988)	
GW-295	27802.00	62184.00	1090.40	62.00	94.00	KNOX	Landfill III	Geraghty and Miller (1988)	
GW-309	29530.00	50176.00	985.77	20.00	0.00	CON: Maynardville	Rust Spoil Area	Geraghty and Miller (1988)	

Table A1. Monitoring Wells Selected for Point Source Data (Continued)

LOCATION ID	NORTHING	EASTING	GNDELEV	TOWR	TOFR	GEOFORMPEN	FUNCTLAREA	REFERENCE	COMMENTS
GW-310	29437.00	50497.00	992.40	27.10	0.00	CON: Maynardville	Rust Spoil Area	Geraghty and Miller (1988)	
GW-311	29267.00	50126.00	996.43	40.30	0.00	CON: Maynardville	Rust Spoil Area	Geraghty and Miller (1988)	
GW-313	29351.00	52016.00	1056.60	30.00	34.50	CON: Maynardville	Spoil Area I	Geraghty and Miller (1988)	
GW-314	29419.00	52125.00	1047.20	47.00	49.00	CON: Maynardville	Spoil Area I	Geraghty and Miller (1988)	
GW-315	29455.00	52268.00	1044.80	54.00	71.00	CON: Maynardville	Spoil Area I	Geraghty and Miller (1988)	
GW-316	29336.00	52412.00	1044.70	55.00	0.00	KNOX/CON: Maynardville	Spoil Area I	Geraghty and Miller (1988)	
GW-322	28241.00	58912.00	1131.80	49.00	120.00	KNOX	Chestnut Ridge Security Pit	Geraghty and Miller (1988)	
GW-331	30054.00	54827.00	980.79	11.00	0.00	CON: Nolichucky	Waste Coolant Facilities	Geraghty and Miller (1988)	
GW-332	30058.00	54882.00	979.55	6.00	0.00	CON: Nolichucky	Waste Coolant Facilities	Geraghty and Miller (1988)	
GW-333	30090.00	54878.00	980.12	14.00	0.00	CON: Nolichucky	Waste Coolant Facilities	Geraghty and Miller (1988)	
GW-335	30123.00	54692.00	981.10	6.00	0.00	CON: Nolichucky	Waste Coolant Facilities	Geraghty and Miller (1988)	
GW-336	30057.00	54694.00	981.56	4.00	0.00	CON: Nolichucky	Waste Coolant Facilities	Geraghty and Miller (1988)	
GW-338	30134.00	54430.00	984.02	6.00	0.00	CON: Nolichucky	Waste Coolant Facilities	Geraghty and Miller (1988)	
GW-345	30029.00	50700.00	994.93	9.00	26.30	CON: Nolichucky	S3 Ponds	EGDe (1989)	
GW-346	30030.00	50703.00	995.08	11.00	22.80	CON: Nolichucky	S3 Ponds	EDGe (1989)	
GW-350	29764.00	53595.00	991.00	18.00	0.00	CON: Maynardville	S2 Site	EDGe (1989)	
GW-380	28714.00	62938.00	913.66	15.50	0.00	CON: Maynardville	New Hope Pond	EDGe (1989)	
GW-381	28715.00	62947.00	913.40	13.50	26.00	CON: Maynardville	New Hope Pond	EDGe (1989)	
GW-382	28718.00	62956.00	913.16	12.70	17.00	CON: Maynardville	New Hope Pond	EDGe (1989)	
GW-383	29201.00	63522.00	906.00	11.50	0.00	CON: Nolichucky	New Hope Pond	EDGe (1989)	
GW-384	29216.00	63530.00	905.38	12.00	0.00	CON: Nolichucky	New Hope Pond	EDGe (1989)	
GW-385	29208.00	63526.00	905.87	11.00	0.00	CON: Nolichucky	New Hope Pond	EDGe (1989)	
GW-526	30033.00	50708.00	995.34	3.50	23.60	CON: Nolichucky	S3 Ponds	EDGe (1989)	
GW-608	27889.43	59724.35	1071.00	113.00	140.00	KNOX	Chestnut Ridge Security Pits	ERCE (1991c)	
GW-610	28549.31	59471.94	1056.80	39.00	50.00	KNOX	Chestnut Ridge Security Pits	ERCE (1991c)	
GW-613	30406.77	50231.77	1010.20	15.00	0.00	CON: Nolichucky	S3 Ponds	ERCE (1991c)	
GW-614	30425.77	50223.05	1009.40	12.50	50.80	CON: Nolichucky	S3 Ponds	ERCE (1991c)	
GW-615	30009.32	52223.78	1014.20	15.00	40.00	CON: Nolichucky	S3 Ponds	ERCE (1991c)	
GW-616	29723.83	51906.92	1009.80	35.00	42.00	CON: Maynardville/Nolichucky	S3 Ponds	ERCE (1991c)	
GW-618	29798.46	54738.12	982.64	27.00	0.00	CON: Maynardville	S3 Ponds	ERCE (1991c)	
GW-632	30236.97	53077.90	1006.00	8.50	0.00	CON: Nolichucky	Rust Garage Area	Eaton and Van Ryn (1991)	
GW-633	30144.44	53100.64	996.47	8.50	0.00	CON: Nolichucky	Rust Garage Area	Eaton and Van Ryn (1991)	
GW-634	30222.38	53256.62	1007.30	5.00	0.00	CON: Nolichucky	Rust Garage Area	Eaton and Van Ryn (1991)	
GW-635	30147.85	53288.91	994.85	8.00	0.00	CON: Nolichucky	Rust Garage Site	Eaton and Van Ryn (1991)	
GW-649	30364.58	50142.75	981.01	7.00	0.00	CON: Nolichucky	Oil Landfarm	ERCE (1991c)	
GW-656	29894.69	57439.12	954.90	12.00	0.00	CON: Nolichucky	Y-12 Plant Site	ERCE (1991c)	
GW-658	29638.24	62146.20	942.04	3.50	0.00	CON: Nolichucky	Y-12 Fuel Station	ERCE (1991c)	
GW-659	29614.54	62100.46	941.79	3.40	0.00	CON: Nolichucky	Y-12 Fuel Station	ERCE (1991c)	
GW-686	29540.20	55956.31	964.43	17.00	0.00	CON: Maynardville	Coal Pile Trench	Earth Technology Corporation (1991)	
GW-687	29551.29	55650.67	964.59	32.00	0.00	CON: Maynardville	Coal Pile Trench	Earth Technology Corporation (1991)	
GW-692	29653.12	56001.20	964.55	23.00	0.00	CON: Maynardville	Coal Pile Trench	Earth Technology Corporation (1991)	

Table A1. Monitoring Wells Selected for Point Source Data (Continued)

LOCATION ID	NORTHING	EASTING	GND ELEV	TOWR	TOFR	GEOFORMPEN	FUNCTLAREA	REFERENCE	COMMENTS
GW-697	29276.59	56806.01	969.81	21.00	0.00	CON: Maynardville	Building 8110	Earth Technology Corporation (1991)	
GW-700	29452.50	56827.67	957.78	31.00	0.00	CON: Maynardville	Building 8110	Earth Technology Corporation (1991)	
GW-701	29461.34	56712.13	958.20	25.00	0.00	CON: Maynardville	Building 8110	Earth Technology Corporation (1991)	
GW-702	29429.50	56969.62	955.55	21.00	0.00	CON: Maynardville	Building 8110	Earth Technology Corporation (1991)	
GW-707	29319.23	59578.51	931.16	20.00	0.00	CON: Maynardville	Y-12 Plant Site	ERCE (1991c)	
GW-735	28867.00	64872.00	921.34	19.00	77.50	CON: Maynardville/Nolichucky 75.5	Exit Pathway - Traverse J	SAIC (1992)	
GW-747	29729.81	64569.57	918.33	10.50	12.00	CON: Maryville	Y-12 Grid Well	SAIC (1992)	
GW-748	29740.86	64579.38	918.89	8.00	11.80	CON: Maryville	Y-12 Grid Well	SAIC (1992)	
GW-751	29310.00	63248.80	909.38	10.00	12.00	CON: Nolichucky	Y-12 Grid Well	SAIC (1992)	
GW-752	29312.53	63226.77	909.76	11.50	12.50	CON: Nolichucky	Y-12 Grid Well	SAIC (1992)	
GW-753	29638.00	63208.59	924.73	1.00	22.50	CON: Maryville/Nolichucky 61 (?)	Y-12 Grid Well	SAIC (1992)	
GW-754	29644.34	63190.57	925.63	1.00	17.50	CON: Nolichucky	Y-12 Grid Well	SAIC (1992)	
GW-755	30203.59	63266.73	927.41	14.80	22.00	CON: Maryville/Rogersville (?)	Y-12 Grid Well	SAIC (1992)	
GW-756	30195.42	63288.31	924.89	13.00	16.00	CON: Maryville	Y-12 Grid Well	SAIC (1992)	
GW-762	29114.91	63192.53	911.85	12.00	14.50	CON: Nolichucky	Y-12 Grid Well	SAIC (1992)	
GW-763	29117.17	63219.76	911.38	17.00	0.00	CON: Nolichucky	Y-12 Grid Well	SAIC (1992)	
GW-764	31026.68	58461.86	1006.70	24.90	33.90	CON: Rogersville	Y-12 Grid Well	SAIC (1992)	
GW-765	31025.53	58481.71	1005.50	24.50	0.00	CON: Rogersville	Y-12 Grid Well	SAIC (1992)	
GW-766	29717.66	62312.08	944.67	9.00	22.00	CON: Nolichucky/Maryville 20 (?)	Y-12 Grid Well	SAIC (1992)	
GW-768	30330.21	62445.04	956.65	28.00	29.80	CON: Rogersville	Y-12 Grid Well	SAIC (1992)	
GW-769	29510.42	60230.01	941.53	14.20	0.00	CON: Nolichucky	Y-12 Grid Well	SAIC (1992)	
GW-770	29504.56	60255.00	941.67	12.00	16.50	CON: Nolichucky	Y-12 Grid Well	SAIC (1992)	
GW-771	31331.05	56360.67	1008.30	17.40	21.90	CON: Rogersville	Y-12 Grid Well	SAIC (1992)	
GW-772	31310.43	56356.69	1009.60	19.00	0.00	CON: Rutledge	Y-12 Grid Well	SAIC (1992)	
GW-776	29271.39	61309.10	931.44	14.50	19.30	CON: Nolichucky	Y-12 Grid Well	SAIC (1992)	
GW-779	30225.86	59246.82	959.73	7.20	18.20	CON: Maryville	Y-12 Grid Well	SAIC (1992)	
GW-780	30222.02	59267.14	960.22	10.00	19.50	CON: Nolichucky	Y-12 Grid Well	SAIC (1992)	
GW-784	31251.62	57036.50	1005.80	3.00	27.00	CON: Rogersville	Y-12 Grid Well	SAIC (1992)	
GW-785	31246.88	57050.04	1005.90	8.50	25.50	CON: Maryville	Y-12 Grid Well	SAIC (1992)	
GW-788	29617.94	59043.21	933.84	5.40	9.00	CON: Nolichucky	Y-12 Grid Well	SAIC (1992)	
GW-791	30482.73	57423.24	988.51	14.70	26.00	CON: Maryville	Y-12 Grid Well	SAIC (1992)	
GW-792	30481.15	57442.11	989.60	14.50	0.00	CON: Maryville	Y-12 Grid Well	SAIC (1992)	
GW-803	29558.70	62217.30	939.29	2.50	15.50	CON: Nolichucky	East End Fuel Station	SAIC (1993)	
GW-805	29884.80	57402.70	955.25	11.00	13.80	CON: Maynardville	Building 9204-2	SAIC (1993)	
GW-806	29899.70	57461.00	952.16	9.00	12.90	CON: Maynardville	Building 9204-2	SAIC (1993)	
GW-807	29866.00	57458.90	951.52	8.00	11.30	CON: Maynardville	Building 9204-2	SAIC (1993)	
GW-809	29316.60	59548.40	931.27	0.00	6.80	CON: Maynardville	Building 9201-1	SAIC (1993)	TOWR missing

Table A2. Monitoring Well Point Source Data Fill Characteristics

LOCATION ID	UNCONSO	FILL THK	FILL CONFD	BOTLYR1	DESLYR1	BOTLYR2	DESLYR2	BOTLYR3	DESLYR3
55-1B	8.00	1.50	5	1.50	Fill, not described in log (possibly road gravel and soil)				
55-2A	11.50	9.50	5	9.50	Road gravel, clay				
55-2C	14.50	12.00	5	12.00	Unconsol. clay, gravel, asphalt, compacted clay				
55-3C	8.00	7.00	5	7.00	Clay, shale/limestone clasts				
56-2C	11.50	6.00	5	6.00	Dolomitic gravel, coarse sand				
56-3C	5.00	4.50	5	4.50	Compact clay, dolomite road gravel, shale clasts				
56-4C	14.50	5.50	5	5.50	Compact clay, dolomite road gravel, shale clasts				
56-5C	17.00	17.00	5	17.00	Compact clay, gravel, asphalt, wood, brick, copper wire				
59-1C	22.00	3.50	5	3.50	Soil, hard clay				
GW-100	14.00	6.00	5	6.00	Concrete, sand, silt				
GW-101	14.00	8.00	5	8.00	Sand, silt, pebbles, clay, red brick, styrofoam				
GW-103	8.50	0.50	5	0.50	Clay				
GW-104	1.00	1.00	5	1.00	Clay, gravel, soft fill				
GW-105	10.00	2.50	5	2.50	Silt, sand				
GW-106	12.50	3.00	5	3.00	Clay, sand, gravel				
GW-107	5.00	5.00	5	5.00	Silt, sand, shale/limestone clasts (1-in.). (1-2ft:asphalt)				
GW-108	4.00	4.00	5	0.50	Road bed gravel	4.00	Clay, sand, gravel		
GW-109	5.00	5.00	5	0.50	Road bed gravel	5.00	Silty clay, gravel, sand		
GW-183	1.50	1.50	5	0.50	Asphalt	1.50	Gravel		
GW-190	8.00	1.50	5	1.50	Gravel				
GW-193	2.50	1.00	5	0.50	Asphalt	1.00	Gravel		
GW-218	6.00	6.00	5	6.00	Gravel, clay				
GW-265	10.00	10.00	5	10.00	Limestone gravel, clay, weathered shale				
GW-266	5.00	5.00	5	5.00	Limestone gravel, clay, silty weathered shale				
GW-267	5.00	5.00	5	5.00	Limestone gravel, silt				
GW-268	2.50	2.50	5	2.50	Limestone gravel, silt				
GW-269	10.00	10.00	5	10.00	Limestone gravel, clay, silt				
GW-270	5.00	5.00	5	5.00	Limestone gravel, clay, silt				
GW-271	5.00	5.00	5	5.00	Limestone gravel, silt				
GW-272	5.00	5.00	5	5.00	Limestone gravel, clay, silt				
GW-276	18.50	2.00	5	2.00	Limestone gravel, silt, clay				
GW-277	17.50	5.00	5	5.00	Limestone gravel, silt, clay				
GW-278	21.00	4.00	5	4.00	Limestone gravel, silt				
GW-280	25.00	2.50	5	2.50	Limestone gravel, silt				
GW-282	16.00	3.00	4	3.00	Silt, sand, gravel				
GW-284	18.00	6.50	4	6.50	Silt, clay, gravel, limestone fragments				
GW-285	21.00	6.50	4	6.50	Soil backfill, silt, clayey gravel				
GW-292	32.00	4.00	5	4.00	Fill (not described in log)				
GW-294	62.00	5.00	5	5.00	Clay, silt, rock fragments				
GW-295	62.00	5.00	5	5.00	Clay, silt, sand, gravel, chert clasts				
GW-309	20.00	4.00	5	4.00	Clay, sand, gravel				
GW-310	27.10	14.00	5	14.00	Clay, sand, gravel				
GW-311	40.30	4.00	5	4.00	Clay, sand, gravel				
GW-313	30.00	14.00	5	14.00	Gravel, sand				
GW-314	47.00	27.00	5	27.00	Clay, sand, limestone gravel, wood, shingles, metal				
GW-315	54.00	36.00	5	36.00	Clay, gravel, fly-ash, wood, plastic, brick				
GW-316	55.00	6.00	5	6.00	Gravel sand, clay				
GW-322	49.00	2.00	5	2.00	Gravel, silt, organic matter				
GW-331	11.00	4.00	5	4.00	Clay sand, gravel				
GW-332	6.00	4.00	5	4.00	Clay sand, gravel				
GW-333	14.00	7.00	5	7.00	Clay sand, gravel				
GW-335	6.00	4.00	5	4.00	Clay sand, gravel				
GW-336	4.00	4.00	5	4.00	Clay sand, gravel				
GW-338	6.00	2.00	5	2.00	Clay, silt, sand				

Table A2. Monitoring Well Point Source Data Fill Characteristics (Continued)

LOCATION ID	BOTLYR4	DESLYR4	BOTLYR5	DESLYR5	BOTLYR6	DESLYR6
55-1B						
55-2A						
55-2C						
55-3C						
56-2C						
56-3C						
56-4C						
56-5C						
59-1C						
GW-100						
GW-101						
GW-103						
GW-104						
GW-105						
GW-106						
GW-107						
GW-108						
GW-109						
GW-183						
GW-190						
GW-193						
GW-218						
GW-265						
GW-266						
GW-267						
GW-268						
GW-269						
GW-270						
GW-271						
GW-272						
GW-276						
GW-277						
GW-278						
GW-280						
GW-282						
GW-284						
GW-285						
GW-292						
GW-294						
GW-295						
GW-309						
GW-310						
GW-311						
GW-313						
GW-314						
GW-315						
GW-316						
GW-322						
GW-331						
GW-332						
GW-333						
GW-335						
GW-336						
GW-338						

Table A2. Monitoring Well Point Source Data Fill Characteristics (Continued)

LOCATION ID	UNCONSO	FILL THK	FILL CONFID	BOTLYR1	DESLYR1	BOTLYR2	DESLYR2	BOTLYR3	DESLYR3
GW-345	9.00	0.50	4	0.50	Gravel				
GW-346	11.00	1.00	4	1.00	Gravel				
GW-350	18.00	0.50	5	0.50	Gravel				
GW-380	15.50	0.60	3	0.60	Gravel pad and topsoil				
GW-381	13.50	0.50	3	0.50	Gravel and topsoil				
GW-382	12.70	0.50	3	0.50	Gravel and topsoil				
GW-383	11.50	5.40	5	0.80	Gravel pad	1.50	Clay, grass, roots	5.40	Clay, gravel, red brick fragments
GW-384	12.00	0.90	5	0.90	Gravel pad				
GW-385	11.00	2.00	5	2.00	Gravel pad and clay soil				
GW-526	3.50	0.50	4	0.50	Gravel				
GW-608	113.00	1.00	4	1.00	Gravel pad				
GW-610	39.00	2.00	4	2.00	Gravel, road bed clay				
GW-613	15.00	0.60	4	0.60	Gravel pad				
GW-614	12.50	0.50	4	0.50	Gravel pad				
GW-615	15.00	13.50	5	4.80	Soil, bricks, boulders, metal, etc.	13.50	Clay, fill material		
GW-616	35.00	10.00	5	3.00	Gravel, clay, debris, limestone boulder	10.00	Clay, fill material		
GW-618	27.00	1.00	5	1.00	Gravel				
GW-632	8.50	3.00	5	3.00	Limestone gravel				
GW-633	8.50	8.50	5	8.50	Clayey gravel (1-70mm), wood fragments				
GW-634	5.00	5.00	5	5.00	Clayey gravel				
GW-635	8.00	5.00	5	5.00	Clayey gravel	8.00	Alluvial valley fill (clayey silt, rock clasts)		
GW-649	7.00	0.50	4	0.50	Crushed rock pad				
GW-656	12.00	6.00	5	1.30	Concrete	3.50	Crushed stone, silt	5.00	Firm clay
GW-658	3.50	0.80	5	0.30	Asphaltic concrete	0.80	Gravel		
GW-659	3.40	1.40	5	0.40	Asphaltic concrete	1.40	Gravel		
GW-686	17.00	15.00	5	5.00	Gravel	10.00	Clay	15.00	Clay, gravel
GW-687	32.00	3.00	5	3.00	Coal, gravel				
GW-692	23.00	6.00	5	0.50	Asphalt: N.B.: SEE NOTE ON BOREHOLE WN4-D:	6.00	NOTE :Concrete pipe @6ft BGS, 4ft from GW-692		
GW-697	21.00	0.50	5	0.50	Concrete				
GW-700	31.00	11.50	5	1.00	Gravel, sand	4.00	Gravel, clay	10.50	Silty to pebbly clay
GW-701	25.00	12.00	5	12.00	Graveliferous clay with chert, shale, limestone fragments				
GW-702	21.00	7.00	5	2.00	Gravel, road bed clay	7.00	Pebbly clay; culvert at 7ft.BGS		
GW-707	20.00	20.00	5	1.00	Asphalt	4.00	Cresoted timber	20.00	Possible concrete
GW-735	19.00	6.00	3	6.00	Subsoil/fill				
GW-747	10.50	4.00	5	0.80	Soil, gravel, coal	4.00	Shale, coal fragments		
GW-748	8.00	0.50	5	0.50	Soil, gravel, coal				
GW-751	10.00	3.00	5	3.00	Loamy soil, coarse brick fragments, gravel				
GW-752	11.50	1.50	5	1.50	Shale clasts, coarse gravel, large brick fragments				
GW-753	1.00	1.00	5	1.00	Clayey soil, weathered shale clasts, gravel road fill				
GW-754	1.00	1.00	5	1.00	Soil, gravel fragments				
GW-755	14.60	6.50	5	3.50	Gravel, shale clasts	6.50	Wood, shale fragments		
GW-756	13.00	3.50	5	0.50	Compacted dirt road gravel	3.50	Gravel, shale fragments		
GW-762	12.00	7.50	5	1.00	Asphalt	2.00	1-to5-in. limestone aggregate, soil fill	3.50	Silty clay fill
GW-763	17.00	5.00	5	0.50	Asphalt	2.00	Limestone gravel	4.00	Gravel, coal fines, sand
GW-764	24.90	19.90	5	19.90	Soil, fill material, gravel				
GW-765	24.50	16.00	5	16.00	Clayey soil, fill material, gravel				
GW-766	9.00	6.50	5	0.50	Soil	2.00	Clayey soil fill, gravel, red clay pipe/tile fragments	6.50	Clayey soil, fill material
GW-768	28.00	18.80	5	0.50	Gravel road base	18.80	Natural residuum		
GW-769	14.20	8.00	5	2.00	Railroad ballast, limestone gravel (2-to-3in.)	8.00	Clay fill with shale		
GW-770	12.00	12.00	5	4.00	Railroad base and sub-base, limestone gravel	12.00	Compacted clay fill		
GW-771	17.40	7.50	5	5.00	Loamy soil, fill material, gravel	7.50	Clayey soil, fill material		
GW-772	19.00	10.00	5	1.50	Gravel fill mixed with topsoil	10.00	Clay fill with residual silty shale		
GW-776	14.50	5.70	3	0.60	Asphalt	1.20	Limestone aggregate (1-to-3in.), soil in fillings		
GW-779	7.20	2.50	5	2.20	Hard soil, gravel fragments	2.50	Coarse gravel bed		

Table A2. Monitoring Well Point Source Data Fill Characteristics (Continued)

LOCATION ID	BOTLYR4	DESLYR4	BOTLYR5	DESLYR5	BOTLYR6	DESLYR6
GW-345						
GW-346						
GW-350						
GW-380						
GW-381						
GW-382						
GW-383						
GW-384						
GW-385						
GW-526						
GW-608						
GW-610						
GW-613						
GW-614						
GW-615						
GW-616						
GW-618						
GW-632						
GW-633						
GW-634						
GW-635						
GW-649						
GW-656	6.00	Fill to natural				
GW-658						
GW-659						
GW-666						
GW-667						
GW-692						
GW-697						
GW-700	11.50	Limestone gravel				
GW-701						
GW-702						
GW-707						
GW-735						
GW-747						
GW-748						
GW-751						
GW-752						
GW-753						
GW-754						
GW-755						
GW-756						
GW-762	5.00	Bituminous coal (1-3in.), coal fines	7.50	Silty clay		
GW-763	5.00	Coal fines, sandy clay	10.00	Natural residuum		
GW-764						
GW-765						
GW-766						
GW-768						
GW-769						
GW-770						
GW-771						
GW-772						
GW-776						
GW-779						

Table A2. Monitoring Well Point Source Data Fill Characteristics (Continued)

LOCATION ID	UNCONSO	FILLTHK	FILLCONFID	BOTLYR1	DESLYR1	BOTLYR2	DESLYR2	BOTLYR3	DESLYR3
GW-780	10.00	7.20	5	1.50	Soil, gravel (1-to-30cm)	3.00	Soil, gravel (shale, limestone)	7.20	Fill of shale, limestone clasts
GW-784	3.00	18.50	5	0.90	Asphalt	3.00	Clayey fill, gravel	5.00	Weathered rock fill
GW-785	8.50	8.50	5	0.80	Asphalt	1.10	Sandy/silty soil, gravel	4.20	Gravel (shale/limestone), loam
GW-788	5.40	2.80	5	2.80	Coarse gravel (2in.), soil fill				
GW-791	14.70	14.70	5	1.50	Soil, organic detritus	2.50	Clayey soil	10.00	Clay fill, rock, boulders, gravel, shale
GW-792	14.50	4.60	5	1.00	Soil	2.00	Clayey fill, gravel, red clay brick/tile	4.60	Gravelly fill material
GW-803	2.50	2.50	5	2.50	Fill clay w/large angular limestone fragments				
GW-805	11.00	2.50	5	0.50	Asphalt	2.50	Clay w/angular limestone, brick fragments		
GW-806	9.00	3.00	5	0.50	Asphalt	3.00	Crusher run limestone gravel		
GW-807	8.00	4.00	5	4.00	Fill clay w/large angular limestone fragments				
GW-809	6.80	6.20	5	0.5	Asphalt	1.6	Clay w/limestone fragments, asphalt fragments	6.2	Clay w/limestone fragments

Table A2. Monitoring Well Point Source Data Fill Characteristics (Continued)

LOCATION ID	BOTLYR4	DESLYR4	BOTLYR5	DESLYR5	BOTLYR6	DESLYR6
GW-780						
GW-784	11.10	Clayey fill, coarse gravel (2in.), shale clasts	12.40	Clayey soil fill, weathered shale	18.50	Wood (roots or branches), construction material (roofing paper)
GW-785	8.50	Crumbly clay, large fill fragments (1in.)				
GW-788						
GW-791	14.70	Clayey fill, rock, gravel, red clay tile/brick				
GW-792						
GW-803						
GW-805						
GW-806						
GW-807						
GW-809						

Table A3. Soil Borings Selected for Point Source Data

LOCATION ID	NORTHING	EASTING	GNDELEV	TOWR	TOFR	GEOFORMPEN	FUNCTLAREA	REFERENCE	COMMENTS
SAIC_SB-01_091693	29307.90	49746.90	993.90	18.00	0.00		RUST SPOIL AREA	SAIC (1994)	BCV OU 2 RI Appendix A
SAIC_SB-03_092193	29402.10	49991.90	992.70	36.90	0.00		RUST SPOIL AREA	SAIC (1994)	BCV OU 2 RI Appendix A
SAIC_SB-04_092293	29417.60	50218.90	990.30	10.90	0.00		RUST SPOIL AREA	SAIC (1994)	BCV OU 2 RI Appendix A
SAIC_SB-08_111693	29681.50	51452.30	1004.10	18.00	0.00		RUST SPOIL AREA	SAIC (1994)	BCV OU 2 RI Appendix A
SAIC_SB-11_102693	29609.60	51146.50	1008.20	11.30	0.00		RUST SPOIL AREA	SAIC (1994)	BCV OU 2 RI Appendix A
SAIC_SB-14_112993	29665.90	51476.50	1004.40	21.10	0.00		RUST SPOIL AREA	SAIC (1994)	BCV OU 2 RI Appendix A
SAIC_SB-18_111893	29652.00	51501.90	1004.10	12.00	0.00		RUST SPOIL AREA	SAIC (1994)	BCV OU 2 RI Appendix A
SAIC_SB-21_101893	29557.60	51107.50	998.90	12.30	0.00		RUST SPOIL AREA	SAIC (1994)	BCV OU 2 RI Appendix A
SAIC_SB-22_101193	29566.90	51130.10	998.70	10.60	0.00		RUST SPOIL AREA	SAIC (1994)	BCV OU 2 RI Appendix A
SAIC_SB-26_101893	29544.00	51093.20	998.80	14.30	0.00		RUST SPOIL AREA	SAIC (1994)	BCV OU 2 RI Appendix A
SAIC_SB-33_102593	29502.50	51009.20	997.60	12.50	0.00		RUST SPOIL AREA	SAIC (1994)	BCV OU 2 RI Appendix A
SAIC_SB-34_102093	29512.70	51060.70	998.80	18.00	0.00		RUST SPOIL AREA	SAIC (1994)	BCV OU 2 RI Appendix A
SAIC_SB-44_101593	29505.30	51125.80	998.90	14.00	0.00		RUST SPOIL AREA	SAIC (1994)	BCV OU 2 RI Appendix A
SAIC_SB-45_101493	29500.50	51098.10	999.10	10.20	0.00		RUST SPOIL AREA	SAIC (1994)	BCV OU 2 RI Appendix A
SAIC_SB-47_120293	29562.40	51497.70	1004.80	11.00	0.00		RUST SPOIL AREA	SAIC (1994)	BCV OU 2 RI Appendix A
SAIC_P-1_100593	29443.20	52324.60	1044.60	63.80	0.00		RUST SPOIL AREA	SAIC (1994)	BCV OU 2 RI Appendix A
ERCE_VC-1_072490	30287.00	62871.00	942.10	12.00	0.00	CON: shale	NEW HOPE CEMETERY	ERCE (1990a)	
ERCE_VC-2_072490	30282.00	62904.00	941.70	20.00	0.00	CON: shale	NEW HOPE CEMETERY	ERCE (1990a)	
ERCE_VC-3_072490	30237.00	62861.00	940.50	17.50	0.00	CON: shale	NEW HOPE CEMETERY	ERCE (1990a)	
ERCE_VC-4_072490	30232.00	62894.00	940.00	19.50	0.00	CON: shale	NEW HOPE CEMETERY	ERCE (1990a)	
ERCE_VC-5_072490	30222.00	62985.00	937.90	18.50	0.00	CON: shale	NEW HOPE CEMETERY	ERCE (1990a)	
ERCE_VC-6_072490	30200.00	62841.00	939.80	17.50	0.00	CON: shale	NEW HOPE CEMETERY	ERCE (1990a)	
ERCE_VC-7_072490	30192.00	62889.00	938.40	18.00	0.00	CON: shale	NEW HOPE CEMETERY	ERCE (1990a)	
ERCE_VC-8_072490	30184.00	62938.00	936.70	18.50	0.00	CON: shale	NEW HOPE CEMETERY	ERCE (1990a)	
ERCE_VC-9_072490	30172.00	62996.00	935.40	20.50	0.00	CON: shale	NEW HOPE CEMETERY	ERCE (1990a)	
ERCE_VC-10_072490	30151.00	62890.00	935.70	15.00	0.00	CON: shale	NEW HOPE CEMETERY	ERCE (1990a)	
ERCE_VC-11_072490	30142.00	62934.00	935.10	19.50	0.00	CON: shale	NEW HOPE CEMETERY	ERCE (1990a)	
ERCE_VC-12_072490	30128.00	62995.00	932.70	20.00	0.00	CON: shale	NEW HOPE CEMETERY	ERCE (1990a)	
OE_EE-2_120992	30294.00	63540.00	920.50	15.00	0.00	CON	EAST END SANITARY SEWER	OGDEN (1992d)	
OE_EE-3_120892	30230.00	63587.00	911.20	15.00	0.00	CON	EAST END SANITARY SEWER	OGDEN (1992d)	
OE_EE-7_120992	29913.00	63816.00	907.00	14.00	0.00	CON	EAST END SANITARY SEWER	OGDEN (1992d)	
OE_EE-8_120992	29851.00	63858.00	903.10	9.50	0.00	CON	EAST END SANITARY SEWER	OGDEN (1992d)	
OE_EE-9_120992	29768.00	63913.00	899.90	9.50	0.00	CON	EAST END SANITARY SEWER	OGDEN (1992d)	
OE_PS-5_052992	30563.00	61616.00	969.90	13.00	0.00		ELZA SWITCHYARD	OGDEN (1992b)	
OE_PS-12_052992	30540.00	61245.00	994.80	11.50	0.00		ELZA SWITCHYARD	OGDEN (1992b)	
OE_PS-13_052992	30529.00	61316.00	994.80	8.50	0.00		ELZA SWITCHYARD	OGDEN (1992b)	
OE_PS-14_052892	30518.00	61387.00	994.40	20.50	0.00		ELZA SWITCHYARD	OGDEN (1992b)	
OE_PS-15_052892	30511.00	61433.00	994.30	25.50	0.00		ELZA SWITCHYARD	OGDEN (1992b)	
OE_PS-16_052992	30493.00	61544.00	992.20	26.00	0.00		ELZA SWITCHYARD	OGDEN (1992b)	
ERCE_PSO-1_092290	30359.50	59190.00	973.00	8.00	0.00		Y-12 PLANT SUPRT./BLDG. 9115	ERCE (1990d)	
ERCE_PSO-3_092290	30385.00	59295.00	974.70	25.00	0.00		Y-12 PLANT SUPRT./BLDG. 9115	ERCE (1990d)	
ERCE_PSO-4_092290	30342.00	59245.00	970.70	22.00	0.00		Y-12 PLANT SUPRT./BLDG. 9115	ERCE (1990d)	
ERCE_PSO-5_092290	30356.00	59291.00	972.30	25.00	0.00		Y-12 PLANT SUPRT./BLDG. 9115	ERCE (1990d)	

Table A3. Soil Borings Selected for Point Source Data (Continued)

LOCATION ID	NORTHING	EASTING	GNDELEV	TOWR	TOFR	GEOFORMPEN	FUNCTLAREA	REFERENCE	COMMENTS
ERCE_PSO-6_092290	30326.00	59287.50	969.80	20.00	0.00		Y-12 PLANT SUPRT./BLDG. 9115	ERCE (1990d)	
ERCE_PSO-7_092290	30314.40	59194.40	968.70	10.50	0.00		Y-12 PLANT SUPRT./BLDG. 9115	ERCE (1990d)	
ERCE_PSO-8_092290	30307.00	59239.00	967.50	25.00	0.00		Y-12 PLANT SUPRT./BLDG. 9115	ERCE (1990d)	
ERCE_PSO-9_092290	30301.60	59283.50	967.60	17.50	0.00		Y-12 PLANT SUPRT./BLDG. 9115	ERCE (1990d)	
GA_B-3_080288	29659.00	60733.00	942.14	17.00	0.00	CON: shale	CHANGE HOUSE/BLDG. 9723-28	GA (1988c)	
OE_B-1_080693	28499.00	61702.00	980.70	53.20	0.00		Y-12 PLANT/EAST PATROL ROAD	OGDEN (1993b)	
OE_B-2_081093	28503.00	61677.00	980.10	42.20	0.00		Y-12 PLANT/EAST PATROL ROAD	OGDEN (1993b)	
OE_B-3_081093	28519.00	61760.00	977.70	36.10	0.00		Y-12 PLANT/EAST PATROL ROAD	OGDEN (1993b)	
OE_MG-2_030492	30407.00	60309.00	959.00	3.80	0.00	CON: Maryville	MOLECULAR GENETICS/BLDG. 9210	OGDEN (1992a)	Shale unit of Maryville LS
OE_MG-3_030492	30391.00	60279.00	959.20	2.80	0.00	CON: Maryville	MOLECULAR GENETICS/BLDG. 9210	OGDEN (1992a)	Shale unit of Maryville LS
ERCE_A-1_102491	29972.00	61675.00	960.90	6.00	0.00	CON: shale	FUEL STATION RELOCATION/9755	ERCE (1991b)	Weathered shale unit
ERCE_A-2_102491	29922.00	61665.00	958.80	7.00	0.00	CON: shale	FUEL STATION RELOCATION/9755	ERCE (1991b)	Weathered shale unit
ERCE_A-3_102491	29873.00	61656.00	955.70	6.50	0.00	CON: shale	FUEL STATION RELOCATION/9755	ERCE (1991b)	Weathered shale unit
ERCE_A-4_102491	29864.00	61705.00	952.40	13.00	0.00	CON: shale	FUEL STATION RELOCATION/9755	ERCE (1991b)	Weathered shale unit
ERCE_A-5_102491	29912.00	61715.00	954.60	6.50	0.00	CON: shale	FUEL STATION RELOCATION/9755	ERCE (1991b)	Weathered shale unit
ERCE_B-2_102491	30015.00	61808.00	958.00	14.00	0.00	CON: shale	FUEL STATION RELOCATION/9755	ERCE (1991b)	Weathered shale unit
ERCE_B-3_102491	29967.00	61797.00	955.80	16.50	0.00	CON: shale	FUEL STATION RELOCATION/9755	ERCE (1991b)	Weathered shale unit
ERCE_B-4_102491	29957.00	61846.00	953.80	22.00	0.00	CON: shale	FUEL STATION RELOCATION/9755	ERCE (1991b)	Weathered shale unit
ERCE_B-5A_102491	30005.00	61859.00	956.00	20.00	0.00	CON: shale	FUEL STATION RELOCATION/9755	ERCE (1991b)	Weathered shale unit
ERCE_B-6_102491	30054.00	61868.00	958.80	19.00	0.00	CON: shale	FUEL STATION RELOCATION/9755	ERCE (1991b)	Weathered shale unit
ERCE_B-7_102491	30044.00	61916.00	959.60	24.00	0.00	CON: shale	FUEL STATION RELOCATION/9755	ERCE (1991b)	Weathered shale unit
ERCE_B-8_102491	29996.00	61908.00	956.00	16.00	0.00	CON: shale	FUEL STATION RELOCATION/9755	ERCE (1991b)	Weathered shale unit
ERCE_B-9_102491	29946.00	61896.00	953.60	22.00	0.00	CON: shale	FUEL STATION RELOCATION/9755	ERCE (1991b)	Weathered shale unit
OE_WETF-1_082092	29961.00	51190.00	998.70	25.00	0.00	CON: Nollchuckey	WETF HEAD END MODS/S3 PONDS	OGDEN (1992c)	
OE_WETF-2_082092	29989.00	51252.00	1000.30	30.00	0.00	CON: Nollchuckey	WETF HEAD END MODS/S3 PONDS	OGDEN (1992c)	
OE_WETF-4_081992	29948.00	51233.00	994.30	14.50	0.00	CON: Nollchuckey	WETF HEAD END MODS/S3 PONDS	OGDEN (1992c)	
OE_WETF-5_082092	29974.00	51289.00	996.60	29.50	0.00	CON: Nollchuckey	WETF HEAD END MODS/S3 PONDS	OGDEN (1992c)	
OE_WETF-6_082092	29913.00	51212.00	995.80	20.00	0.00	CON: Nollchuckey	WETF HEAD END MODS/S3 PONDS	OGDEN (1992c)	
OE_WETF-7_081992	29935.00	51277.00	998.30	23.70	0.00	CON: Nollchuckey	WETF HEAD END MODS/S3 PONDS	OGDEN (1992c)	
OE_WETF-8_082092	29958.00	51327.00	1001.80	15.00	0.00	CON: Nollchuckey	WETF HEAD END MODS/S3 PONDS	OGDEN (1992c)	
GA_DA-1_060789	29557.50	51052.50	987.65	23.30	0.00	CON: Maynardville	ENVIRON SUPPORT FACIL/S3 PONDS	GA (1989c)	Bedrock corehole
GA_DA-2_060789	29582.50	51207.50	992.00	28.20	0.00		ENVIRON SUPPORT FACIL/S3 PONDS	GA (1989c)	
GA_DA-3_060789	29607.50	51370.00	993.15	26.80	0.00		ENVIRON SUPPORT FACIL/S3 PONDS	GA (1989c)	
GA_DA-4_060789	29622.50	51462.50	992.56	25.60	0.00	CON: Maynardville	ENVIRON SUPPORT FACIL/S3 PONDS	GA (1989c)	Bedrock corehole
GA_DA-5_060789	29497.50	51062.50	987.57	20.30	0.00		ENVIRON SUPPORT FACIL/S3 PONDS	GA (1989c)	
GA_DA-6_060789	29502.50	51212.50	993.90	26.00	0.00		ENVIRON SUPPORT FACIL/S3 PONDS	GA (1989c)	
GA_DA-7_060789	29530.00	51380.00	994.87	34.90	0.00	CON: Maynardville	ENVIRON SUPPORT FACIL/S3 PONDS	GA (1989c)	Bedrock corehole
GA_DA-8_060789	29565.00	51472.50	995.47	31.10	0.00		ENVIRON SUPPORT FACIL/S3 PONDS	GA (1989c)	
GA_B-1_060789	29565.00	51107.50	988.79	20.50	0.00		ENVIRON SUPPORT FACIL/S3 PONDS	GA (1989c)	
GA_101_020689	30454.70	57682.10	1002.80	26.10	0.00	CON: shale	CHANGE HOUSE 12-A/BLDG 9996	GA (1989a)	Weathered shale
GA_102_020689	30450.00	57826.00	1005.80	26.00	0.00	CON: shale	CHANGE HOUSE 12-A/BLDG 9996	GA (1989a)	Weathered shale
GA_103_020689	30449.10	57758.60	1006.70	36.00	0.00	CON: shale	CHANGE HOUSE 12-A/BLDG 9996	GA (1989a)	Weathered shale
GA_104_020689	30499.00	57727.00	1009.10	26.80	0.00	CON: shale	CHANGE HOUSE 12-A/BLDG 9996	GA (1989a)	Weathered shale

Table A3. Soil Borings Selected for Point Source Data (Continued)

LOCATION ID	NORTHING	EASTING	GNDELEV	TOWR	TOFR	GEORFORMPEN	FUNCTLAREA	REFERENCE	COMMENTS
GE_B-1_033187	29468.00	63983.00	905.24	11.40	0.00		NEW HOPE POND CLOSURE	GEOTEK (1987b)	
GE_B-2_040187	29491.63	63950.72	905.64	13.50	0.00		NEW HOPE POND CLOSURE	GEOTEK (1987b)	
GE_B-3_040187	29515.25	63918.45	905.14	12.70	0.00		NEW HOPE POND CLOSURE	GEOTEK (1987b)	
GE_B-5_033187	29419.58	63947.56	906.23	13.00	0.00		NEW HOPE POND CLOSURE	GEOTEK (1987b)	
GE_B-6_040187	29443.21	63915.28	905.99	14.00	0.00		NEW HOPE POND CLOSURE	GEOTEK (1987b)	
GE_B-7_040187	29466.83	63883.01	905.41	13.50	0.00		NEW HOPE POND CLOSURE	GEOTEK (1987b)	
GE_B-9_033187	29371.17	63912.12	906.64	13.20	0.00		NEW HOPE POND CLOSURE	GEOTEK (1987b)	
GE_B-10_033187	29394.80	63879.84	905.71	14.50	0.00		NEW HOPE POND CLOSURE	GEOTEK (1987b)	
GE_B-11_040187	29418.42	63847.57	905.34	13.00	0.00		NEW HOPE POND CLOSURE	GEOTEK (1987b)	
GE_B-13_033087	29332.75	63876.68	905.95	13.50	0.00		NEW HOPE POND CLOSURE	GEOTEK (1987b)	
GE_B-14_033187	29346.38	63844.40	905.41	13.50	0.00		NEW HOPE POND CLOSURE	GEOTEK (1987b)	
GE_B-17_033087	29274.34	63841.25	905.30	11.70	0.00		NEW HOPE POND CLOSURE	GEOTEK (1987b)	
ERC_CH-5_110289	30685.00	56623.00	997.40	17.00	0.00	CON	CHANGE HOUSE 7-A/BLDG 9723-31	ERC (1990)	
ERCE_C5-8_092890	30550.00	55414.00	984.90	18.00	0.00	CON	CHANGE HOUSE 5-A/BLDG 9723-19	ERCE (1990b)	Weathered shale
ERCE_C5-10_092890	30556.00	55364.00	984.30	29.00	0.00	CON	CHANGE HOUSE 5-A/BLDG 9723-19	ERCE (1990b)	Weathered shale
GA_B-1_031888	30726.00	56079.00	989.70	8.00	0.00	CON: Rogersville ?	Bldg. ● N.1st.St./H ROAD	GA (1988b)	Interbedded Limestone/Shale
GA_B-2_031888	30723.00	56125.00	990.10	2.00	11.40	CON	Bldg. ● N.1st.St./H ROAD	GA (1988b)	Refusal on unweathered shale
GA_B-10_031888	30667.00	56070.00	984.80	6.50	13.00	CON	Bldg. ● N.1st.St./H ROAD	GA (1988b)	Refusal on unweathered shale
GA_B-12_031888	30655.00	56183.00	983.90	7.00	0.00	CON	Bldg. ● N.1st.St./H ROAD	GA (1988b)	
GA_B-13_031888	30647.00	56241.00	983.00	8.00	10.00	CON	Bldg. ● N.1st.St./H ROAD	GA (1988b)	Refusal on unweathered shale
OE_WSF-1_113092	29781.00	53942.00	987.90	18.00	0.00	CON: Maynardville	BLDG 9720-59/32	OGDEN (1993a)	Refusal on presumed bedrock
OE_WSF-2_113092	29777.00	53991.00	987.60	19.00	0.00	CON: Maynardville	BLDG 9720-59/32	OGDEN (1993a)	Refusal on presumed bedrock
OE_WSF-3_120192	29772.00	54052.00	987.30	18.00	0.00	CON: Maynardville	BLDG 9720-59/32	OGDEN (1993a)	Refusal on presumed bedrock
OE_WSF-4_120192	29768.00	54087.00	987.40	17.50	0.00	CON: Maynardville	BLDG 9720-59/32	OGDEN (1993a)	Refusal on presumed bedrock
OE_WSF-5_120192	29763.00	54136.00	987.60	19.00	0.00	CON: Maynardville	BLDG 9720-59/32	OGDEN (1993a)	Refusal on presumed bedrock
OE_WSF-6_120392	29753.00	53963.00	988.80	18.70	0.00	CON: Maynardville	BLDG 9720-59/32	OGDEN (1993a)	Refusal on presumed bedrock
OE_WSF-7_120292	29746.00	54011.00	988.80	23.00	0.00	CON: Maynardville	BLDG 9720-59/32	OGDEN (1993a)	Refusal on presumed bedrock
OE_WSF-8_120192	29742.00	54059.00	988.60	19.00	0.00	CON: Maynardville	BLDG 9720-59/32	OGDEN (1993a)	Refusal on presumed bedrock
OE_WSF-9_120292	29737.00	54106.00	988.80	23.00	0.00	CON: Maynardville	BLDG 9720-59/32	OGDEN (1993a)	Refusal on presumed bedrock
OE_WSF-10_120392	29724.00	53942.00	990.50	24.50	0.00	CON: Maynardville	BLDG 9720-59/32	OGDEN (1993a)	Refusal on presumed bedrock
OE_WSF-11_120392	29719.00	53985.00	990.80	23.00	0.00	CON: Maynardville	BLDG 9720-59/32	OGDEN (1993a)	Refusal on presumed bedrock
OE_WSF-12_120292	29714.00	54044.00	990.50	18.50	0.00	CON: Maynardville	BLDG 9720-59/32	OGDEN (1993a)	Refusal on presumed bedrock
OE_WSF-13_120292	29709.00	54082.00	990.70	19.00	0.00	CON: Maynardville	BLDG 9720-59/32	OGDEN (1993a)	Refusal on presumed bedrock
OE_1-A_010993	29675.00	53965.00	992.00	26.50	0.00	CON: Maynardville	BLDG 9720-59/32	OGDEN (1993a)	Assumed elevation
OE_2-A_011093	29689.00	54029.00	992.00	19.20	0.00	CON: Maynardville	BLDG 9720-59/32	OGDEN (1993a)	Assumed elevation
OE_3-A_011093	29682.00	54088.00	992.00	11.60	0.00	CON: Maynardville	BLDG 9720-59/32	OGDEN (1993a)	Assumed elevation
OE_6-A_011093	29618.00	53969.00	992.00	25.50	0.00	CON: Maynardville	BLDG 9720-59/32	OGDEN (1993a)	Assumed elevation
OE_7-A_011093	29606.00	54080.00	992.00	26.20	0.00	CON: Maynardville	BLDG 9720-59/32	OGDEN (1993a)	Assumed elevation
S&ME_B-15_091587	30661.20	58667.96	1012.32	19.50	33.50	CON	CENTRAL SERVICES FACIL/9704-2	S&ME (1987)	Hard calcareous shale
S&ME_B-17_091487	30635.95	50791.16	1011.60	17.50	0.00	CON	CENTRAL SERVICES FACIL/9704-2	S&ME (1987)	
S&ME_B-22_090287	30614.33	58669.49	1011.86	24.00	38.00	CON	CENTRAL SERVICES FACIL/9704-2	S&ME (1987)	Hard gray shale
S&ME_B-23A_090287	30601.07	58724.92	1010.97	29.50	38.50	CON	CENTRAL SERVICES FACIL/9704-2	S&ME (1987)	
S&ME_B-24_090187	30593.06	58785.47	1010.36	28.50	36.00	CON	CENTRAL SERVICES FACIL/9704-2	S&ME (1987)	

Table A3. Soil Borings Selected for Point Source Data (Continued)

LOCATION ID	NORTHING	EASTING	GNDELEV	TOWR	TOFR	GEOFORMPEN	FUNCTLAREA	REFERENCE	COMMENTS
S&ME_B-25A_090187	30584.02	58842.95	1009.65	15.00	35.50	CON	CENTRAL SERVICES FACIL/9704-2	S&ME (1987)	
S&ME_B-26_090187	30576.33	58903.06	1008.45	15.00	39.80	CON	CENTRAL SERVICES FACIL/9704-2	S&ME (1987)	
S&ME_B-27A_083187	30567.09	58961.60	1006.02	25.00	37.00	CON	CENTRAL SERVICES FACIL/9704-2	S&ME (1987)	
GE_B-3_121886	29563.00	56919.30	954.97	11.10	0.00		SODIUM HYPOCHLOR/BLD 9422-10	GEOTEK (1987a)	
GE_TB-2_112984	30778.26	55891.68	1013.15	20.25	35.70		BLDG 9103 ADDITION	GEOTEK (1985)	
GE_TB-3_120784	30782.75	55862.57	1013.49	16.25	22.00		BLDG 9103 ADDITION	GEOTEK (1985)	
GE_TB-9_113084	30686.44	55883.93	989.29	4.00	21.50		BLDG 9103 ADDITION	GEOTEK (1985)	
GA_B-1_112487	29565.35	51107.16	988.79	12.00	21.50		ENVIRON SUPPORT FACILITY	GA (1988a)	
ERCE_ESF-11_082991	29333.00	51277.00	1003.80	27.10	0.00		ENVIRON SUPPORT FACILITY SITE 2	ERCE (1991a)	
ERCE_ESF-15_082991	29351.00	51490.00	1006.60	24.20	0.00		ENVIRON SUPPORT FACILITY SITE 2	ERCE (1991a)	
ERCE_ESF-16_082991	29360.00	51544.00	1008.00	35.50	0.00		ENVIRON SUPPORT FACILITY SITE 2	ERCE (1991a)	
GE_B-2_051486	28780.50	62306.30	921.10	10.90	0.00		TRUCK SCALE	GEOTEK (1986)	
GE_B-3_051486	28773.00	62345.60	920.90	12.50	0.00		TRUCK SCALE	GEOTEK (1986)	
GA_CN-1_021589	30377.00	59719.00	983.00	21.20	0.00	CON	Y-12 OROICN BUILDING/9106 AREA	GA (1989b)	
GA_CN-2_021589	30374.00	59773.00	982.10	19.00	0.00	CON	Y-12 OROICN BUILDING/9106 AREA	GA (1989b)	
GA_CN-3_021589	30371.00	59832.00	981.50	21.70	0.00	CON	Y-12 OROICN BUILDING/9106 AREA	GA (1989b)	
GA_CN-4_021589	30351.00	59694.00	979.80	17.20	0.00	CON	Y-12 OROICN BUILDING/9106 AREA	GA (1989b)	
GA_CN-5_021589	30347.00	59800.00	977.60	22.30	0.00	CON	Y-12 OROICN BUILDING/9106 AREA	GA (1989b)	
GA_CN-6_021589	30333.00	59746.00	976.60	16.30	0.00	CON	Y-12 OROICN BUILDING/9106 AREA	GA (1989b)	
GA_CN-7_021589	30319.00	59832.00	972.70	18.10	0.00	CON	Y-12 OROICN BUILDING/9106 AREA	GA (1989b)	
GA_CN-8_021589	30306.00	59796.00	973.60	17.80	0.00	CON	Y-12 OROICN BUILDING/9106 AREA	GA (1989b)	
GA_CN-10_021589	30265.00	59729.00	967.80	14.60	0.00	CON	Y-12 OROICN BUILDING/9106 AREA	GA (1989b)	
GA_CN-11_021589	30261.00	59768.00	967.40	13.70	0.00	CON	Y-12 OROICN BUILDING/9106 AREA	GA (1989b)	
GA_CN-17_021589	30423.00	59710.00	988.70	24.50	0.00	CON	Y-12 OROICN BUILDING/9106 AREA	GA (1989b)	
GA_CN-18_021589	30409.00	59790.00	988.00	24.70	0.00	CON	Y-12 OROICN BUILDING/9106 AREA	GA (1989b)	
GA_CN-19_021589	30405.00	59841.00	988.30	24.80	0.00	CON	Y-12 OROICN BUILDING/9106 AREA	GA (1989b)	
S&ME_WC-2-B_042689	31143.50	57943.50	1010.21	28.00	34.50		WASTE COOLANT/9409-23	S&ME (1989b)	Calcareous shale
S&ME_WC-3-B_050389	31121.80	57958.10	1010.55	35.00	38.50		WASTE COOLANT/9409-23	S&ME (1989b)	Calcareous shale
S&ME_WC-5_042689	31131.40	57961.40	1010.39	30.00	36.00		WASTE COOLANT/9409-23	S&ME (1989b)	
S&ME_WC-6_042589	31133.00	57990.80	1010.33	31.00	35.00		WASTE COOLANT/9409-23	S&ME (1989b)	
S&ME_FH-1_030889	30280.00	57538.00	958.30	3.00	6.00		Y-12 FIREHALL/9710-2	S&ME (1989a)	Shale w/ limestone lenses
ERCE_IP-1_091990	29003.00	54107.02	1058.61	53.01	0.00	KNOX	ISOSTATIC PRESS BUILDING	ERCE (1990c)	
ERCE_IP-5_091990	28976.00	54097.50	1060.55	27.35	0.00	KNOX	ISOSTATIC PRESS BUILDING	ERCE (1990c)	
ERCE_IP-11_091990	28948.00	54128.00	1064.25	60.05	0.00	KNOX	ISOSTATIC PRESS BUILDING	ERCE (1990c)	

Table A4. Soil Boring Point Source Data Fill Characteristics

LOCATION ID	UNCONSO	FILLTHK	FILLCONFID	BOTLYR1	DESLYR1	BOTLYR2	DESLYR2
SAIC_SB-01_091693	18.00	10.00	5	6.00	Clay w/chert fragments	10.00	Clay w/ concrete and chert
SAIC_SB-03_092193	36.90	30.00	5	1.50	Topsoil fill w/ crushed gravel	6.00	Clay w/ organics, chert
SAIC_SB-04_092293	10.90	8.00	5	0.75	Crushed gravel	8.00	Clay, weathered rock frags, brick frags, plant detritus, black organics
SAIC_SB-08_111693	18.00	17.50	5	3.00	No sample	8.00	Clay, shale/chert/limestone fragments
SAIC_SB-11_102693	11.30	11.30	5	3.00	No sample	9.50	Clay with chert/limestone fragments
SAIC_SB-14_112993	21.10	11.00	5	3.00	No sample	9.00	Clay, chert/lms/shale frags, plant detritus, mercury
SAIC_SB-18_111893	12.00	12.00	5	3.00	No sample	5.00	Clay, lms/chert fragments
SAIC_SB-21_101893	12.30	10.50	4	3.00	No sample	8.00	Clay, crusher run, lms/chert fragments
SAIC_SB-22_101193	10.60	10.60	5	3.00	No sample	10.00	Clay, chert/shale fragments, organics, plant detritus, concrete
SAIC_SB-26_101893	14.30	12.50	5	3.00	No sample	3.25	Crusher run gravel
SAIC_SB-33_102593	12.50	12.50	5	3.00	No sample	9.50	Clay, lms/chert/shale fragments
SAIC_SB-34_102093	18.00	18.00	5	3.00	No sample	9.50	Clay, chert/lms/shale frags
SAIC_SB-44_101593	14.00	14.00	5	3.00	No sample	7.50	Clay, limestone, chert
SAIC_SB-45_101493	10.20	10.20	5	3.00	No sample	7.50	Clay, chert/lms fragments
SAIC_SB-47_120293	11.00	11.00	4	3.00	No sample	7.00	Clay, chert/shale/lms frags
SAIC_P-1_100593	63.80	37.50	5	9.00	Clay, lms/shale/chert frags	10.00	Clay, lms/shale/chert/wood fragments
ERCE_VC-1_072490	12.00	10.00	5	5.50	Silt, Clay, rock frags	10.00	Silty, Clay, shale frags
ERCE_VC-2_072490	20.00	15.00	5	15.00	Clayey silt w/crushed stone		
ERCE_VC-3_072490	17.50	17.50	5	5.50	Clayey silt, crushed stone	10.50	Clayey Silt, weathered shale
ERCE_VC-4_072490	19.50	19.50	5	5.50	Clayey silt, crushed stone	10.50	Clayey Silt, weathered shale frags
ERCE_VC-5_072490	12.00	12.00	5	5.50	Clayey silt, rock fragments	12.00	Clayey Silt, weathered shale
ERCE_VC-6_072490	17.50	15.00	5	10.50	Clayey silt, rock fragments	15.00	Clayey Silt, shale
ERCE_VC-7_072490	18.00	14.50	5	5.00	Clayey silt, crushed stone	9.50	Clayey Silt, weathered shale
ERCE_VC-8_072490	18.50	14.00	5	5.50	Clayey silt, crushed stone	10.50	Silt, shale fragments
ERCE_VC-9_072490	20.50	13.50	5	5.00	silt, crushed stone	8.00	Silt, weathered shale, crushed stone
ERCE_VC-10_072490	15.00	13.00	5	3.00	silt, crushed stone, roots	5.50	Silt, chert frags, roots
ERCE_VC-11_072490	19.50	11.50	5	5.00	silt, crushed stone, roots	7.50	Silt, crushed stone
ERCE_VC-12_072490	20.00	12.00	5	3.00	silt, crushed stone, chert	10.00	Silt, roots, shale frags
OE_EE-2_120992	15.00	2.50	5	2.50	topsoil, Clay, shale clasts		
OE_EE-3_120892	15.00	2.50	5	2.50	topsoil, decomposed shale		
OE_EE-7_120992	14.00	2.50	5	2.50	Clay w/wea. shale frags		
OE_EE-8_120992	9.50	2.50	5	2.50	Clay w/ wea. shale frags		
OE_EE-9_120992	9.50	2.50	5	2.50	Clay w/ wea. shale frags		
OE_PS-5_052992	13.00	8.00	5	8.00	Clayey silt w/rock frags		
OE_PS-12_052992	11.50	11.50	5	3.50	Silt w/rock fragments	6.00	Clay with rock fragments
OE_PS-13_052992	8.50	6.00	5	6.00	Gravelly clay w/rock frags, roots		
OE_PS-14_052892	20.50	12.00	5	6.00	Silt w/rock frags, roots	12.00	Clay w/rock fragments
OE_PS-15_052892	25.50	13.50	5	3.50	No sample	13.50	Clay with rock fragments
OE_PS-16_052992	26.00	24.00	5	15.50	Clay with roots, rock fragments	24.00	Clay with rock fragments
ERCE_PSO-1_092290	8.00	8.00	5	8.00	Silt with shale fragments		
ERCE_PSO-3_092290	25.00	21.00	5	5.00	Silt with shale	10.00	Silt with shale, small wood fragments
ERCE_PSO-4_092290	22.00	22.00	5	7.00	Silt with shale/brick fragments	17.00	Silt with organics, wood, shale fragments
ERCE_PSO-5_092290	25.00	20.00	5	15.00	Silt with shale/brick fragments	20.00	Silt with shale fragments
ERCE_PSO-6_092290	20.00	20.00	5	12.00	Silt, limestone/shale fragments	17.00	Silt with grass, roots
ERCE_PSO-7_092290	10.50	3.00	5	3.00	Silt with rock fragments		
ERCE_PSO-8_092290	25.00	21.50	5	6.50	Silt with shale fragments	11.50	Silt with shale/wood fragments
ERCE_PSO-9_092290	17.50	17.50	5	6.50	Silt with shale	17.50	Silt with wood/shale fragments (probable rock at 17.5 BGS)
GA_B-3_080288	17.50	5.00	5	5.00	Clayey silt		
OE_B-1_080693	53.20	16.50	5	1.00	Asphalt, crushed stone	3.00	Crushed stone, silt, clay, rock/wood fragments
OE_B-2_081093	42.20	17.70	5	2.00	Topsoil, crushed stone, clay, wood	7.50	Clay, weathered shale fragments, wood chips

Table A4. Soil Boring Point Source Data Fill Characteristics (Continued)

LOCATION ID	BOTLYR3	DESLYR3	BOTLYR4	DESLYR4
SAIC_SB-01_091693				
SAIC_SB-03_092193	15.50	Clay, black sand, large brick fragments, mortar, copper wire	30.50	Clay, brick fragments, shale clasts, organics
SAIC_SB-04_092293				
SAIC_SB-08_111693	13.00	Clay, shale/limestone frags, brick frags, plant detritus	17.50	Clay, shale/limestone frags, wood frags, nail
SAIC_SB-11_102693	11.30	Clay, brick frags, limestone/shale frags, plant detritus		
SAIC_SB-14_112993	11.00	Clay, plant detritus, nails, mercury, lms/shale fragments		
SAIC_SB-18_111893	9.50	Clay w/50% shale, plant detritus, wood, brick frags, nail	11.00	Clay, 30% shale
SAIC_SB-21_101893	9.00	Clay, shale/lms/chert frags, asphalt, metal fragments	9.50	Clay, 10% chert
SAIC_SB-22_101193	10.50	Clay, chert, shale, limestone fragments	11.50	Clay, plant detritus, black organics, weathered shale
SAIC_SB-26_101893				
SAIC_SB-33_102593	12.50	Clay, 75% lms frags, asphalt frags, metal shavings		
SAIC_SB-34_102093	11.00	Clay, 70% lms frags, shale, brick	13.00	Clay, shale/chert/lms/70% rock frags, asphalt
SAIC_SB-44_101593	9.00	Clay, lms/shale/chert frags, large brick fragments	12.50	Clay, shale, possible calcareous mortar
SAIC_SB-45_101493	10.20	Clay, lms/chert frags, brick, possible mortar		
SAIC_SB-47_120293	9.00	Limestone fragments and crushed limestone powder	11.00	Clay, wood frags, shale/lms frags
SAIC_P-1_100593	17.00	Clay, wood, chert, shale, limestone, bricks	18.00	Clay, limestone fragments
ERCE_VC-1_072490				
ERCE_VC-2_072490				
ERCE_VC-3_072490	17.50	Clayey Silt, roots		
ERCE_VC-4_072490	15.00	Silt, shale frags, roots	19.50	Silt, shale frags
ERCE_VC-5_072490				
ERCE_VC-6_072490				
ERCE_VC-7_072490	14.50	Silt, weathered shale		
ERCE_VC-8_072490	14.00	Silt, shale fragments		
ERCE_VC-9_072490	10.50	Weathered shale	13.50	Clayey silt, chert/shale fragments
ERCE_VC-10_072490	13.00	Silt, shale frags		
ERCE_VC-11_072490	11.50	Silt, weathered shale		
ERCE_VC-12_072490	12.00	Silt, weathered shale		
OE_EE-2_120992				
OE_EE-3_120892				
OE_EE-7_120992				
OE_EE-8_120992				
OE_EE-9_120992				
OE_PS-5_052992				
OE_PS-12_052992	11.50	Probable fill material		
OE_PS-13_052992				
OE_PS-14_052892				
OE_PS-15_052892				
OE_PS-16_052992				
ERCE_PSO-1_092290				
ERCE_PSO-3_092290	17.00	Silt with shale	21.00	Silty clay
ERCE_PSO-4_092290	22.00	Silt with roots, shale fragments		
ERCE_PSO-5_092290				
ERCE_PSO-6_092290	20.00	Silt		
ERCE_PSO-7_092290				
ERCE_PSO-8_092290	16.50	Silt with shale fragments	21.50	Silt with wood/shale fragments
ERCE_PSO-9_092290				
GA_B-3_080288				
OE_B-1_080693	4.50	Clay, rock fragments	6.50	Crushed stone, silt
OE_B-2_081093	9.90	Black sand	15.40	Clay with roots, rock fragments

Table A4. Soil Boring Point Source Data Fill Characteristics (Continued)

LOCATION ID	BOTLYR5	DESLYR5	BOTLYR6	DESLYR6
SAIC_SB-01_091693				
SAIC_SB-03_092193	34.00	Clay, black organics, chert frags	36.90	No recovery
SAIC_SB-04_092293				
SAIC_SB-08_111693	18.00	Limestone to dolostone		
SAIC_SB-11_102693				
SAIC_SB-14_112993				
SAIC_SB-18_111893	12.00	Clay, 20% shale, wood, concrete w/quartz pebbles		
SAIC_SB-21_101893	10.50	Clay, lmst/shale/chert frags, apparent asbestos fibers		
SAIC_SB-22_101193	12.50	Clay with asphalt, chert fragments		
SAIC_SB-26_101893				
SAIC_SB-33_102593				
SAIC_SB-34_102093	14.50	Clay, shale/chert/lmst/rock frags, mortar, asphalt, wood frags	15.00	Clay, shale, lmst frags
SAIC_SB-44_101593	14.00	Clay, chert/lmst frags, brick, concrete, wood		
SAIC_SB-45_101493				
SAIC_SB-47_120293				
SAIC_P-1_100593	21.50	Limestone, sparse wood fragments	26.00	Clay, wood/lmst/shale frags, nail
ERCE_VC-1_072490				
ERCE_VC-2_072490				
ERCE_VC-3_072490				
ERCE_VC-4_072490				
ERCE_VC-5_072490				
ERCE_VC-6_072490				
ERCE_VC-7_072490				
ERCE_VC-8_072490				
ERCE_VC-9_072490				
ERCE_VC-10_072490				
ERCE_VC-11_072490				
ERCE_VC-12_072490				
OE_EE-2_120992				
OE_EE-3_120892				
OE_EE-7_120992				
OE_EE-8_120992				
OE_EE-9_120992				
OE_PS-5_052992				
OE_PS-12_052992				
OE_PS-13_052992				
OE_PS-14_052892				
OE_PS-15_052892				
OE_PS-16_052992				
ERCE_PSO-1_092290				
ERCE_PSO-3_092290				
ERCE_PSO-4_092290				
ERCE_PSO-5_092290				
ERCE_PSO-6_092290				
ERCE_PSO-7_092290				
ERCE_PSO-8_092290				
ERCE_PSO-9_092290				
GA_B-3_080288				
OE_B-1_080693	8.50	Black sand	15.00	Black sand w/rock fragments
OE_B-2_081093	15.50	Sandstone fragments	16.40	Clay with rock fragments

Table A4. Soil Boring Point Source Data Fill Characteristics (Continued)

LOCATION ID	BOTLYR7	DESLYR7	BOTLYR8	DESLYR8	BOTLYR9	DESLYR9
SAIC_SB-01_091693						
SAIC_SB-03_092193						
SAIC_SB-04_092293						
SAIC_SB-08_111693						
SAIC_SB-11_102693						
SAIC_SB-14_112993						
SAIC_SB-18_111893						
SAIC_SB-21_101893						
SAIC_SB-22_101193						
SAIC_SB-26_101893						
SAIC_SB-33_102593						
SAIC_SB-34_102093	17.00	Clay, shale, knst frags, apparent roofing shingle	18.00	Clay, sh/knst frags, plant detritus, brick frags, black shale		
SAIC_SB-44_101593						
SAIC_SB-45_101493						
SAIC_SB-47_120293						
SAIC_P-1_100593	32.50	Clay, brick, particle board frags, concrete, metal frags	37.50	Clay, limestone, two (2) pieces clear plastic, wood frags		
ERCE_VC-1_072490						
ERCE_VC-2_072490						
ERCE_VC-3_072490						
ERCE_VC-4_072490						
ERCE_VC-5_072490						
ERCE_VC-6_072490						
ERCE_VC-7_072490						
ERCE_VC-8_072490						
ERCE_VC-9_072490						
ERCE_VC-10_072490						
ERCE_VC-11_072490						
ERCE_VC-12_072490						
OE_EE-2_120992						
OE_EE-3_120892						
OE_EE-7_120992						
OE_EE-8_120992						
OE_EE-9_120992						
OE_PS-5_052992						
OE_PS-12_052992						
OE_PS-13_052992						
OE_PS-14_052892						
OE_PS-15_052892						
OE_PS-16_052992						
ERCE_PSO-1_092290						
ERCE_PSO-3_092290						
ERCE_PSO-4_092290						
ERCE_PSO-5_092290						
ERCE_PSO-6_092290						
ERCE_PSO-7_092290						
ERCE_PSO-8_092290						
ERCE_PSO-9_092290						
GA_B-3_080288						
OE_B-1_080693	16.50	Clay with chert				
OE_B-2_081093	17.00	Black sand	17.20	Clay with rock fragments	17.70	Black sand

Table A4. Soil Boring Point Source Data Fill Characteristics (Continued)

LOCATION ID	UNCONSO	FILL THK	FILLCONFID	BOTLYR1	DESLYR1	BOTLYR2	DESLYR2
OE_B-3_081093	36.10	19.00	5	1.00	Asphalt, crushed stone	3.00	Crushed stone, clay, rock fragments
OE_MG-2_030492	3.80	2.50	5	2.50	Topsoil, silt, roots, wea. shale frags, crushed stone		
OE_MG-3_030492	2.80	2.50	5	2.50	Topsoil, silt, roots, wea. shale frags, crushed stone		
ERCE_A-1_102491	6.00	2.00	5	2.00	Topsoil, silt, shale/limestone fragments		
ERCE_A-2_102491	7.00	2.00	5	2.00	Topsoil, silt, shale/limestone fragments		
ERCE_A-3_102491	6.50	2.00	5	2.00	Topsoil, silt, shale/limestone fragments		
ERCE_A-4_102491	13.00	11.00	5	11.00	Topsoil, silt, crushed stone, shale fragments		
ERCE_A-5_102491	6.50	1.00	5	1.00	Topsoil, silt, limestone fragments		
ERCE_B-2_102491	14.00	3.00	5	2.00	Asphalt, crushed stone	3.00	Silt, shale fragments
ERCE_B-3_102491	16.50	16.50	5	1.50	Asphalt, crushed stone	10.50	Silt, shale fragments
ERCE_B-4_102491	22.00	17.00	5	2.00	Crushed stone	13.00	Silt with weathered shale
ERCE_B-5A_102491	20.00	14.50	5	1.50	Crushed stone	14.50	Silt, shale fragments
ERCE_B-6_102491	19.00	14.00	5	2.00	Crushed stone	14.00	Silt, shale fragments, roots
ERCE_B-7_102491	24.00	14.50	5	2.50	Crushed stone	14.50	Silt, shale fragments
ERCE_B-8_102491	16.00	16.00	5	2.50	Crushed stone	11.00	Silt, shale fragments
ERCE_B-9_102491	22.00	14.00	5	2.00	Crushed stone	8.00	Silt, shale/limestone fragments
OE_WETF-1_082092	25.00	12.50	5	3.00	Crushed stone, sand, clay, rock fragments	5.00	Clayey sand, rock fragments, weathered shale fragments
OE_WETF-2_082092	30.00	8.50	5	2.50	Topsoil, clay, rock/brick fragments, roots	4.00	Decomposed shale, weathered shale fragments
OE_WETF-4_081992	14.50	5.00	5	2.50	Clay, rock fragments	5.00	Clay, rock fragments, roots
OE_WETF-5_082092	29.50	9.00	5	5.00	Clay, rock fragments, roots, grass	7.50	Clay, rock fragments, roots, grass, wood
OE_WETF-6_082092	20.00	12.50	5	3.00	Clay, rock fragments, crushed stone	5.00	Clayey gravel
OE_WETF-7_081992	23.70	10.50	5	7.50	Clayey sand, rock fragments, crushed stone, roots	10.50	Sandy clay, rock fragments, wood
OE_WETF-8_082092	15.00	10.00	5	1.10	Asphalt, crushed stone	10.00	Clay, rock fragments, straw
GA_DA-1_060789	23.30	11.00	5	3.50	Silt w/cinders, limestone/shale fragments	6.50	Silty clay w/ limestone fragments
GA_DA-2_060789	28.20	12.50	5	12.50	Silty clay w/shale/limestone fragments		
GA_DA-3_060789	26.80	11.00	5	5.50	Clayey silt w/shale fragments	11.00	Silty clay w/limestone/shale fragments, vegetation traces
GA_DA-4_060789	25.60	10.00	5	8.00	Silty clay w/shale/limestone fragments	10.00	Shale/wood fragments w/clay
GA_DA-5_060789	20.30	10.50	5	3.00	Decomposed shale w/limestone fragments	7.00	Clay with slag
GA_DA-6_060789	26.00	12.50	5	5.00	Decomposed shale, clayey silt	7.50	Silty clay with shale fragments
GA_DA-7_060789	34.90	10.00	5	3.00	Decomposed shale with clay	10.00	Silty clay with shale/chert fragments
GA_DA-8_060789	31.10	9.00	5	9.00	Silty clay w/limestone/shale/chert frags, vegetation		
GA_B-1_060789	20.50	11.50	5	3.50	Topsoil, silty clay with rock fragments	8.50	Silty clay with rock fragments, organic material
GA_101_020689	26.10	15.50	5	2.00	Topsoil, crushed stone	7.00	Clayey silt with rock fragments
GA_102_020689	26.00	16.50	5	2.00	Topsoil, crushed stone, silt	15.50	Silty clay with weathered shale fragments
GA_103_020689	36.00	25.00	5	4.00	Silty clay with weathered rock fragments	13.50	Silty clay with rock fragments
GA_104_020689	26.80	18.50	5	8.00	Clayey silt with rock/shale fragments	12.50	Silty clay
GE_B-1_033187	11.40	11.40	5	2.00	Organic material	10.00	Silty clay with chert fragments, organic silt
GE_B-2_040187	13.50	9.00	5	5.00	Clay with chert fragments, organic silt	7.50	Silty clay
GE_B-3_040187	12.70	6.00	5	6.00	Silty clay with chert fragments		
GE_B-5_033187	13.00	7.00	5	7.00	Silty clay with weathered shale, chert, organics		
GE_B-6_040187	14.00	5.00	5	5.00	Silty clay with weathered shale, chert, asphalt frags		
GE_B-7_040187	13.50	3.00	5	3.00	Silty clay with chert, topsoil		
GE_B-9_033187	13.20	9.50	5	5.00	Silty clay with weathered shale, roots	8.00	Clay with chert
GE_B-10_033187	14.50	10.00	5	4.00	Silty clay with weathered shale	10.00	Silty clay with chert
GE_B-11_040187	13.00	7.50	5	7.50	Silty clay with chert, roots		
GE_B-13_033087	13.50	3.00	5	3.00	Organic material with silty clay, chert, topsoil		
GE_B-14_033187	13.50	9.50	5	4.00	Clay with chert	7.00	Silty clay with chert
GE_B-17_033087	11.70	4.00	5	4.00	Silty clay, chert, organic material		
ERC_CH-5_110289	17.00	4.50	4	4.50	Probable fill of sandy silt with chert fragments		
ERCE_C5-8_092890	18.00	18.00	4	5.00	Concrete, crushed stone	18.00	Shale fragments

Table A4. Soil Boring Point Source Data Fill Characteristics (Continued)

LOCATION ID	BOTLYR3	DESLYR3	BOTLYR4	DESLYR4
OE_B-3_081093	6.50	Clay, rock fragments	18.10	Black sand, rock fragments
OE_MG-2_030492				
OE_MG-3_030492				
ERCE_A-1_102491				
ERCE_A-2_102491				
ERCE_A-3_102491				
ERCE_A-4_102491				
ERCE_A-5_102491				
ERCE_B-2_102491				
ERCE_B-3_102491	16.50	Silt		
ERCE_B-4_102491	17.00	Silt with roots		
ERCE_B-5A_102491				
ERCE_B-6_102491				
ERCE_B-7_102491				
ERCE_B-8_102491	16.00	Weathered shale, large gravel		
ERCE_B-9_102491	14.00	Silt, weathered shale		
OE_WETF-1_082092	12.50	Clay, rock fragments		
OE_WETF-2_082092	6.50	Crushed stone		
OE_WETF-4_081892				
OE_WETF-5_082092	9.00	Clay, rock fragments, roots, grass, weathered shale		
OE_WETF-6_082092	10.00	Clay, rock fragments	12.50	Sandy clay, rock fragments, wood
OE_WETF-7_081892				
OE_WETF-8_082092				
GA_DA-1_060789	9.00	Decomposed shale, limestone, cinders w/clayey silt	11.00	Silty clay w/shale fragments
GA_DA-2_060789				
GA_DA-3_060789				
GA_DA-4_060789				
GA_DA-5_060789	9.50	Silty clay w/limestone/wood fragments	10.50	Clayey silt with ashes
GA_DA-6_060789	11.00	Decomposed shale, clayey silt with limestone fragments	12.50	Concrete fragments
GA_DA-7_060789				
GA_DA-8_060789				
GA_B-1_060789	11.50	Silty clay with weathered shale fragments		
GA_101_020689	13.00	Silty clay with rock fragments	15.50	Silty clay with wood/rock fragments
GA_102_020689	16.50	Silty clay with organic material		
GA_103_020689	20.50	Silty clay with rock fragments, organic material	25.00	Silty clay with rock fragments, wood
GA_104_020689	18.50	Silty clay with crushed stone fragments		
GE_B-1_033187	11.40	Silty clay with weathered shale, small roots		
GE_B-2_040187	9.00	Silty clay with small roots		
GE_B-3_040187				
GE_B-5_033187				
GE_B-6_040187				
GE_B-7_040187				
GE_B-9_033187	9.50	Silty clay with chert		
GE_B-10_033187				
GE_B-11_040187				
GE_B-13_033087				
GE_B-14_033187	9.50	Silty clay with weathered shale		
GE_B-17_033087				
ERC_CH-5_110289				
ERCE_C5-8_092890				

Table A4. Soil Boring Point Source Data Fill Characteristics (Continued)

LOCATION ID	BOTLYR5	DESLYR5	BOTLYR6	DESLYR6
OE_B-3_081093	19.00	Clay, rock fragments		
OE_MG-2_030492				
OE_MG-3_030492				
ERCE_A-1_102491				
ERCE_A-2_102491				
ERCE_A-3_102491				
ERCE_A-4_102491				
ERCE_A-5_102491				
ERCE_B-2_102491				
ERCE_B-3_102491				
ERCE_B-4_102491				
ERCE_B-5A_102491				
ERCE_B-6_102491				
ERCE_B-7_102491				
ERCE_B-8_102491				
ERCE_B-9_102491				
OE_WETF-1_082092				
OE_WETF-2_082092				
OE_WETF-4_081992				
OE_WETF-5_082092				
OE_WETF-6_082092				
OE_WETF-7_081992				
OE_WETF-8_082092				
GA_DA-1_060789				
GA_DA-2_060789				
GA_DA-3_060789				
GA_DA-4_060789				
GA_DA-5_060789				
GA_DA-6_060789				
GA_DA-7_060789				
GA_DA-8_060789				
GA_B-1_060789				
GA_101_020689				
GA_102_020689				
GA_103_020689				
GA_104_020689				
GE_B-1_033187				
GE_B-2_040187				
GE_B-3_040187				
GE_B-5_033187				
GE_B-6_040187				
GE_B-7_040187				
GE_B-9_033187				
GE_B-10_033187				
GE_B-11_040187				
GE_B-13_033087				
GE_B-14_033187				
GE_B-17_033087				
ERC_CH-5_110289				
ERCE_C5-8_092890				

Table A4. Soil Boring Point Source Data Fill Characteristics (Continued)

LOCATION ID	BOTLYR7	DESLYR7	BOTLYR8	DESLYR8	BOTLYR9	DESLYR9
OE_B-3_081093						
OE_MG-2_030492						
OE_MG-3_030492						
ERCE_A-1_102491						
ERCE_A-2_102491						
ERCE_A-3_102491						
ERCE_A-4_102491						
ERCE_A-5_102491						
ERCE_B-2_102491						
ERCE_B-3_102491						
ERCE_B-4_102491						
ERCE_B-5A_102491						
ERCE_B-6_102491						
ERCE_B-7_102491						
ERCE_B-8_102491						
ERCE_B-9_102491						
OE_WETF-1_082092						
OE_WETF-2_082092						
OE_WETF-4_081992						
OE_WETF-5_082092						
OE_WETF-6_082092						
OE_WETF-7_081992						
OE_WETF-8_082092						
GA_DA-1_060789						
GA_DA-2_060789						
GA_DA-3_060789						
GA_DA-4_060789						
GA_DA-5_060789						
GA_DA-6_060789						
GA_DA-7_060789						
GA_DA-8_060789						
GA_B-1_060789						
GA_101_020689						
GA_102_020689						
GA_103_020689						
GA_104_020689						
GE_B-1_033187						
GE_B-2_040187						
GE_B-3_040187						
GE_B-5_033187						
GE_B-6_040187						
GE_B-7_040187						
GE_B-9_033187						
GE_B-10_033187						
GE_B-11_040187						
GE_B-13_033087						
GE_B-14_033187						
GE_B-17_033087						
ERC_CH-5_110289						
ERCE_C5-8_092890						

Table A4. Soil Boring Point Source Data Fill Characteristics (Continued)

LOCATION ID	UNCONSO	FILLTHK	FILLCONFID	BOTLYR1	DESLYR1	BOTLYR2	DESLYR2
ERCE_C5-9_092890	18.00	18.00	4	4.00	Concrete, crushed stone	18.00	Shale fragments
ERCE_C5-10_092890	29.00	29.00	4	6.00	Silt with shale fragments	17.00	Silty clay with shale fragments
GA_B-1_031888	8.00	8.00	5	8.00	Clay with gravel, wood fragments, black organics		
GA_B-2_031888	2.00	2.00	5	2.00	Clay and weathered shale with gravel		
GA_B-10_031888	6.50	6.50	5	6.50	Clay with wood/rock/coal/shale fragments		
GA_B-12_031888	7.00	7.00	5	7.00	Silty clay with gravel, wood fragments		
GA_B-13_031888	8.00	8.00	5	5.00	Silty clay with shale fragments	6.00	Silty clay with weathered shale, small roots
OE_WSF-1_113092	18.00	10.00	5	1.50	Asphalt, crushed stone	5.00	Clay with weathered shale/limestone fragments
OE_WSF-2_113092	19.00	11.00	5	1.50	Asphalt, crushed stone	6.50	Silty clay with weathered shale/limestone fragments
OE_WSF-3_120192	18.00	10.00	5	1.50	Asphalt, crushed stone	4.00	Weathered clayey shale
OE_WSF-4_120192	17.50	8.50	5	1.50	Asphalt, crushed stone	6.50	Weathered clayey shale
OE_WSF-5_120192	19.00	11.00	5	1.50	Asphalt, crushed stone	4.00	Weathered clayey shale
OE_WSF-6_120392	18.70	13.00	5	1.50	Crushed stone, clay	2.50	Clay
OE_WSF-7_120292	23.00	11.50	5	3.00	Crushed stone with clay	10.00	Silty clay with rock/shale fragments
OE_WSF-8_120192	19.00	13.00	5	1.50	Crushed stone with clay, brick fragments	7.50	Silty clay with weathered shale
OE_WSF-9_120292	23.00	14.00	5	2.50	Crushed stone, clay	7.00	Silty clay with rock fragments, weathered shale, crushed stone
OE_WSF-10_120392	24.50	15.00	5	2.50	Silty clay, crushed stone, wire pieces	5.00	Crushed stone with clay
OE_WSF-11_120392	23.00	11.50	5	2.50	Silty clay, crushed stone	5.00	Weathered shale, clay, crushed stone
OE_WSF-12_120292	18.50	15.00	5	2.50	Silty clay, crushed stone, coal, weathered shale	5.00	Crushed stone, clay, brick fragments
OE_WSF-13_120292	19.00	13.50	5	5.00	Crushed stone, clay, weathered shale	13.50	Silty clay with weathered shale fragments
OE_1-A_010993	28.50	13.00	5	0.40	Concrete	3.00	Crushed stone
OE_2-A_011093	19.20	16.50	5	0.50	Concrete	6.10	Crushed stone
OE_3-A_011093	11.60	10.00	5	0.50	Concrete	1.00	NO SAMPLE
OE_6-A_011093	25.50	7.00	5	0.50	Concrete	1.50	Crushed stone
OE_7-A_011093	26.20	8.50	5	0.50	Concrete	2.00	Crushed stone
S&ME_B-15_091587	19.50	5.00	4	0.20	Grass, roots, topsoil	5.00	Possible fill of sandy clayey silt or highly weathered shale
S&ME_B-17_091487	17.50	6.00	3	1.00	Concrete, gravel	6.00	Possible fill of sandy clayey silt
S&ME_B-22_090287	24.00	12.00	4	1.00	Asphaltic concrete, gravel base	7.00	Clayey silt with shale/limestone fragments
S&ME_B-23A_090287	29.50	12.50	5	1.00	Asphaltic concrete, gravel base	12.50	Sandy clayey silt with shale/limestone fragments
S&ME_B-24_090187	28.50	12.00	5	1.00	Asphaltic concrete, gravel base	12.00	Sandy clayey silt with shale fragments
S&ME_B-25A_090187	15.00	15.00	5	1.00	Asphaltic concrete, gravel base	15.00	Sandy clayey silt
S&ME_B-26_090187	15.00	5.00	5	1.00	Asphaltic concrete, gravel base	5.00	Sandy clayey silt with shale fragments
S&ME_B-27A_083187	25.00	6.00	4	1.00	Asphaltic concrete, gravel base	6.00	Possible sandy clayey silt fill
GE_B-3_121886	11.10	6.50	4	0.50	Gravel	6.50	Clay with silt, weathered shale, limestone gravel
GE_TB-2_112984	20.25	18.00	3	4.75	Topsoil, clayey silt with weathered shale	7.75	Clayey silt with chert
GE_TB-3_120784	16.25	15.00	3	0.50	Asphaltic concrete, limestone gravel	4.75	Clayey silt with weathered shale
GE_TB-9_113084	4.00	4.00	3	0.60	Topsoil	4.00	Clayey silt with weathered shale, organic material
GA_B-1_112487	12.00	12.00	4	8.50	Topsoil, silty clay with rock fragments, some organics	12.00	Silty clay, weathered shale
ERCE_ESF-11_082991	27.10	5.00	5	5.00	Silty clay with rock fragments, roots		
ERCE_ESF-15_082991	24.20	5.00	4	5.00	Possible fill of silty clay w/chert frags, black specks		
ERCE_ESF-16_082991	35.50	5.00	5	5.00	Silty clay with crushed stone, chert fragments		
GE_B-2_051486	10.90	10.00	5	1.00	Concrete, gravel	5.00	Silt with clay
GE_B-3_051486	12.50	9.00	5	1.00	Concrete, gravel	5.00	Clay with silt and shale
GA_CN-1_021589	21.20	2.00	5	2.00	Topsoil, clayey silt with rock fragments		
GA_CN-2_021589	19.00	2.00	5	2.00	Topsoil, clayey silt with rock fragments		
GA_CN-3_021589	21.70	2.00	5	2.00	Topsoil, clayey silt with rock fragments		
GA_CN-4_021589	17.20	5.00	5	5.00	Topsoil, clayey silt with rock fragments		
GA_CN-5_021589	22.30	2.00	5	2.00	Topsoil, clayey silt with rock fragments		
GA_CN-6_021589	16.30	7.00	5	7.00	Topsoil, clayey silt with shale fragments		
GA_CN-7_021589	18.10	2.00	5	2.00	Topsoil, silty clay with rock fragments		

Table A4. Soil Boring Point Source Data Fill Characteristics (Continued)

LOCATION ID	BOTLYR3	DESLYR3	BOTLYR4	DESLYR4
ERCE_C5-9_092890				
ERCE_C5-10_092890	26.00	Shale fragments	29.00	Silt with shale fragments
GA_B-1_031888				
GA_B-2_031888				
GA_B-10_031888				
GA_B-12_031888				
GA_B-13_031888	8.00	Rock fragments grading to weathered shale fragments		
OE_WSF-1_113092	10.00	Clayey weathered shale		
OE_WSF-2_113092	9.00	Weathered shale	11.00	Silty clay with rock fragments
OE_WSF-3_120192	10.00	Silty clay with weathered shale fragments		
OE_WSF-4_120192	8.50	Silty clay with rock fragments		
OE_WSF-5_120192	6.50	Silty clay with weathered shale fragments	9.00	Weathered clayey shale
OE_WSF-6_120392	5.00	Weathered clayey shale with limestone fragments	10.00	Weathered clayey shale
OE_WSF-7_120292	11.50	Weathered clayey shale with roots		
OE_WSF-8_120192	10.00	Weathered clayey shale	13.00	Silty clay with roots
OE_WSF-9_120292	10.00	Weathered clayey shale	14.00	Silty clay with weathered shale fragments
OE_WSF-10_120392	7.00	NO SAMPLE	15.00	Silty clay with weathered shale fragments
OE_WSF-11_120392	7.50	Clay with crushed stone, weathered shale	11.50	Silty clay with weathered shale
OE_WSF-12_120292	10.00	Silty clay, weathered shale, crushed stone, wire piece	15.00	Silty clay with weathered shale
OE_WSF-13_120292				
OE_1-A_010993	5.50	Crushed stone, clay	10.50	Clayey silt, shale fragments, rock fragments
OE_2-A_011093	8.50	Clayey silt with wire, rock fragments	9.10	Rock fragments
OE_3-A_011093	3.50	Crushed stone	5.00	Clayey silt with shale
OE_6-A_011093	3.00	Weathered shale, clayey silt	5.00	Clayey silt
OE_7-A_011093	3.50	Decomposed shale	4.50	Weathered shale, silty clay
S&ME_B-15_091587				
S&ME_B-17_091487				
S&ME_B-22_090287	12.00	Probable fill of sandy clayey silt		
S&ME_B-23A_090287				
S&ME_B-24_090187				
S&ME_B-25A_090187				
S&ME_B-26_090187				
S&ME_B-27A_083187				
GE_B-3_121886				
GE_TB-2_112984	10.00	Silty clay with organic material	18.00	Clayey silt with weathered shale, organic material
GE_TB-3_120784	10.00	Clayey silt with weathered shale	15.00	Silty clay with weathered shale, organic material
GE_TB-9_113084				
GA_B-1_112487				
ERCE_ESF-11_082991				
ERCE_ESF-15_082991				
ERCE_ESF-16_082991				
GE_B-2_051486	8.00	Clay with silt and chert	10.00	Clay with silt, wood, weathered shale
GE_B-3_051486	7.50	Clay with silt	9.00	Clay with silt, organic material
GA_CN-1_021589				
GA_CN-2_021589				
GA_CN-3_021589				
GA_CN-4_021589				
GA_CN-5_021589				
GA_CN-6_021589				
GA_CN-7_021589				

Table A4. Soil Boring Point Source Data Fill Characteristics (Continued)

LOCATION ID	BOTLYR5	DESLYR5	BOTLYR6	DESLYR6
ERCE_C5-9_092890				
ERCE_C5-10_092890				
GA_B-1_031888				
GA_B-2_031888				
GA_B-10_031888				
GA_B-12_031888				
GA_B-13_031888				
OE_WSF-1_113092				
OE_WSF-2_113092				
OE_WSF-3_120192				
OE_WSF-4_120192				
OE_WSF-5_120192	11.00	Silty clay with rock and weathered shale fragments		
OE_WSF-6_120392	13.00	Silty clay with weathered shale and rock fragments		
OE_WSF-7_120292				
OE_WSF-8_120192				
OE_WSF-9_120292				
OE_WSF-10_120392				
OE_WSF-11_120392				
OE_WSF-12_120292				
OE_WSF-13_120292				
OE_1-A_010993	12.50	Silty clay with rock/shale fragments, roots	13.00	Clayey silt, topsoil @13-14
OE_2-A_011093	10.00	Sandy silt	15.50	Silty clay with rock/brick fragments, wood
OE_3-A_011093	8.50	Sandy silty clay with shale fragments	10.00	Clayey silt, weathered shale fragments
OE_6-A_011093	7.00	Silty clay with rock fragments		
OE_7-A_011093	5.50	Clay with weathered shale fragments	8.50	Silty clay with shale fragments
S&ME_B-15_091587				
S&ME_B-17_091487				
S&ME_B-22_090287				
S&ME_B-23A_090287				
S&ME_B-24_090187				
S&ME_B-25A_090187				
S&ME_B-26_090187				
S&ME_B-27A_083187				
GE_B-3_121886				
GE_TB-2_112984				
GE_TB-3_120784				
GE_TB-9_113084				
GA_B-1_112487				
ERCE_ESF-11_082991				
ERCE_ESF-15_082991				
ERCE_ESF-16_082991				
GE_B-2_051486				
GE_B-3_051486				
GA_CN-1_021589				
GA_CN-2_021589				
GA_CN-3_021589				
GA_CN-4_021589				
GA_CN-5_021589				
GA_CN-6_021589				
GA_CN-7_021589				

Table A4. Soil Boring Point Source Data Fill Characteristics (Continued)

LOCATION ID	BOTLYR7	DESLYR7	BOTLYR8	DESLYR8	BOTLYR9	DESLYR9
ERCE_C5-9_092890						
ERCE_C5-10_092890						
GA_B-1_031888						
GA_B-2_031888						
GA_B-10_031888						
GA_B-12_031888						
GA_B-13_031888						
OE_WSF-1_113092						
OE_WSF-2_113092						
OE_WSF-3_120192						
OE_WSF-4_120192						
OE_WSF-5_120192						
OE_WSF-6_120392						
OE_WSF-7_120292						
OE_WSF-8_120192						
OE_WSF-9_120292						
OE_WSF-10_120392						
OE_WSF-11_120392						
OE_WSF-12_120292						
OE_WSF-13_120292						
OE_1-A_010993						
OE_2-A_011093	16.50	Silty clay with rock fragments				
OE_3-A_011093						
OE_6-A_011093						
OE_7-A_011093						
S&ME_B-15_091587						
S&ME_B-17_091487						
S&ME_B-22_090287						
S&ME_B-23A_090287						
S&ME_B-24_090187						
S&ME_B-25A_090187						
S&ME_B-26_090187						
S&ME_B-27A_083187						
GE_B-3_121886						
GE_TB-2_112984						
GE_TB-3_120784						
GE_TB-9_113084						
GA_B-1_112487						
ERCE_ESF-11_082991						
ERCE_ESF-15_082991						
ERCE_ESF-16_082991						
GE_B-2_051486						
GE_B-3_051486						
GA_CN-1_021589						
GA_CN-2_021589						
GA_CN-3_021589						
GA_CN-4_021589						
GA_CN-5_021589						
GA_CN-6_021589						
GA_CN-7_021589						

Table A4. Soil Boring Point Source Data Fill Characteristics (Continued)

LOCATION ID	UNCONSOL	FILLTHK	FILLCONFID	BOTLYR1	DESLYR1	BOTLYR2	DESLYR2
GA_CN-8_021589	17.80	2.00	5	2.00	Topsoil, clayey silt with rock fragments		
GA_CN-10_021589	14.60	2.00	5	2.00	Topsoil, clayey silt with rock fragments		
GA_CN-11_021589	13.70	1.50	5	1.50	Topsoil, clayey silt with rock fragments		
GA_CN-17_021589	24.50	6.50	5	6.50	Topsoil, clayey silt with rock fragments		
GA_CN-18_021589	24.70	1.00	5	1.00	Topsoil, clayey silt with rock fragments		
GA_CN-19_021589	24.80	1.50	5	1.50	Topsoil, silty clay with shale fragments		
S&ME_WC-2-B_042689	28.00	28.00	4	2.50	Gravel	7.50	Clay with shale fragments
S&ME_WC-3-B_050389	35.00	30.00	4	0.70	Gravel	8.00	Clay with shale fragments, sand
S&ME_WC-5_042689	30.00	27.00	4	0.60	Gravel	12.00	Clay with shale fragments
S&ME_WC-6_042589	31.00	31.00	4	0.50	Gravel	31.00	Fill to possible alluvial silty clay with rock fragments
S&ME_FH-1_030889	3.00	3.00	5	0.50	Concrete	3.00	Shale/limestone fragments
ERCE_IP-1_091990	53.01	6.00	3	6.00	Silt with rock fragments		
ERCE_IP-5_091990	27.35	5.00	3	5.00	Silt with shale/rock fragments		
ERCE_IP-11_091990	60.05	7.50	3	7.50	Silt with chert fragments		

Table A4. Soil Boring Point Source Data Fill Characteristics (Continued)

LOCATION ID	BOTLYR3	DESLYR3	BOTLYR4	DESLYR4
GA_CN-8_021589				
GA_CN-10_021589				
GA_CN-11_021589				
GA_CN-17_021589				
GA_CN-18_021589				
GA_CN-19_021589				
S&ME_WC-2-B_042689	10.00	Silty clay with rock fragments	18.00	Clayey sand with shale fragments
S&ME_WC-3-B_050389	12.50	Sandy clay with shale fragments	18.00	Clayey sand with shale fragments
S&ME_WC-5_042689	27.00	Fill to possible alluvial sandy clay with rock fragments		
S&ME_WC-6_042589				
S&ME_FH-1_030889				
ERCE_IP-1_091990				
ERCE_IP-5_091990				
ERCE_IP-11_091990				

Table A4. Soil Boring Point Source Data Fill Characteristics (Continued)

LOCATION ID	BOTLYR5	DESLYR5	BOTLYR6	DESLYR6
GA_CN-8_021589				
GA_CN-10_021589				
GA_CN-11_021589				
GA_CN-17_021589				
GA_CN-18_021589				
GA_CN-19_021589				
S&ME_WC-2-B_042689	20.00	Sndy clay with rock fragments, woody organics	28.00	Fill or alluvial silty clay w/shale fragments
S&ME_WC-3-B_050389	20.00	Fill or alluvial sandy clay with rock fragments	30.00	Fill or alluvial silty clay
S&ME_WC-5_042689				
S&ME_WC-6_042589				
S&ME_FH-1_030889				
ERCE_IP-1_091990				
ERCE_IP-5_091990				
ERCE_IP-11_091990				

Table A4. Soil Boring Point Source Data Fill Characteristics (Continued)

LOCATION ID	BOTLYR7	DESLYR7	BOTLYR8	DESLYR8	BOTLYR9	DESLYR9
GA_CN-8_021589						
GA_CN-10_021589						
GA_CN-11_021589						
GA_CN-17_021589						
GA_CN-18_021589						
GA_CN-19_021589						
S&ME_WC-2-B_042689						
S&ME_WC-3-B_050389						
S&ME_WC-5_042689						
S&ME_WC-6_042589						
S&ME_FH-1_030889						
ERCE_IP-1_091990						
ERCE_IP-5_091990						
ERCE_IP-11_091990						

DATA SOURCES

- Bechtel 1984. *Geologic Data on Twenty Monitoring Wells Installed in Bear Creek Valley In September and October, 1984*, Y/SUB/84B-47974C/12, Bechtel National Corp., for Martin Marietta Energy Systems, Inc., Oak Ridge Y-12 Plant.
- Eaton, J. M. and Van Ryn, F.R. 1991. *Site Investigation Report for Underground Storage Tanks 1219-U, 1222-U, 2068-U, and 2082-U at the Rust Garage Facility, Oak Ridge Y-12 Plant, Oak Ridge, Tennessee*, Y/SUB/91B-TJ997C/3, Martin Marietta Energy Systems, Inc., Oak Ridge Y-12 Plant.
- Earth Technology Corporation. 1991. *RCRA Facility Investigation for the Group 2 Sites at Oak Ridge Y-12 Plant, Tennessee, Site Characterization Summary (Draft Report)*, Contract No. 22B-99785C, for Martin Marietta Energy Systems, Inc., Oak Ridge Y-12 Plant.
- EDGE 1989. *1988 Monitor-Well Installations at the Oak Ridge Y-12 Plant, Oak Ridge, Tennessee*, Y/SUB/89B-99005V/2, EDGE Group, Inc., for Martin Marietta Energy Systems, Inc., Oak Ridge Y-12 Plant.
- ERC 1990. *Geotechnical Study for the Proposed FCAP Changehouse 7-A, Y-12 Plant, Oak Ridge, Tennessee*, ERC/EDGE File No. C129, MMES Purchase Order No. EB-332, ERC/EDGE, Inc., for Martin Marietta Energy Systems, Inc., Oak Ridge Y-12 Plant.
- ERCE 1990a. *Proposed Visitor Control Center, Y-12 Plant, Oak Ridge, Tennessee*, ERCE File No. 90-J408, MMES Purchase Order No. EB-363, ERCE, Inc., for Martin Marietta Energy Systems, Inc., Oak Ridge Y-12 Plant.
- ERCE 1990b. *Proposed FCAP 89 Changehouse 5-A, Y-12 Plant, Oak Ridge, Tennessee*, ERCE File No. J392, MMES Purchase Order No. EB-353, ERCE, Inc., for Martin Marietta Energy Systems, Inc., Oak Ridge Y-12 Plant.
- ERCE 1990c. *Proposed Isostatic Press Building, Y-12 Plant, Oak Ridge, Tennessee*, ERCE File No. J393, MMES Purchase Order No. EB-355, ERCE, Inc., for Martin Marietta Energy Systems, Inc., Oak Ridge Y-12 Plant.
- ERCE 1990d. *Proposed Plant Support Office Building, Y-12 Plant, Oak Ridge, Tennessee*, ERCE File No. 90-J394, MMES Purchase Order No. EB-352, ERCE, Inc., for Martin Marietta Energy Systems, Inc., Oak Ridge Y-12 Plant.
- ERCE 1991a. *Interim Geotechnical Study for the Proposed Environmental Support Facility, Site #2, Y-12 Plant, Oak Ridge, Tennessee*, MMES Purchase Order No. 88B-99977V, Rel. C-11, ERCE, Inc., for Martin Marietta Energy Systems, Inc., Oak Ridge Y-12 Plant.
- ERCE 1991b. *Geotechnical Study for the Proposed Fueling Station Relocation at the Y-12 Plant, Oak Ridge, Tennessee*, ERCE File No. C290, ERCE, Inc., for Martin Marietta Energy Systems, Inc., Oak Ridge Y-12 Plant.

- ERCE 1991c. *Calendar Years 1989 and 1990 Monitoring Well Installation Program, Y-12 Plant, Oak Ridge, Tennessee*, Y/TS-760, ERCE, Inc., for Martin Marietta Energy Systems, Inc., Oak Ridge Y-12 Plant.
- GA 1988a. *Geotechnical Study for the Proposed Environmental Support Facility, Y-12 Plant, Oak Ridge, Tennessee*, GA File No. 87-0618K, MMES Purchase Order No. EB-274, Geological Associates Division, EDGe Group, Inc., for Martin Marietta Energy Systems, Inc., Oak Ridge Y-12 Plant.
- GA 1988b. *Proposed FCAP Building, North First Street at "H" Road, Y-12 Plant, Oak Ridge, Tennessee*, GA File No. 87-0369K, MMES Purchase Order No. EB-264, Geological Associates Division, EDGe Group, Inc., for Martin Marietta Energy Systems, Inc., Oak Ridge Y-12 Plant.
- GA 1988c. *Changehouse and Medical Staging Depot, Y-12 Plant, Oak Ridge, Tennessee*, GA File No. 88-X654, MMES Purchase Order No. EB-275, Geological Associates Division, EDGe Group, Inc., for Martin Marietta Energy Systems, Inc., Oak Ridge Y-12 Plant.
- GA 1989a. *Slope Study for the Proposed Changehouse 12-A, Y-12 Plant, Oak Ridge, Tennessee*, EDGE File No. 88-X683, MMES Purchase Order No. EB-288, Geological Associates Division, EDGe Group, Inc., for Martin Marietta Energy Systems, Inc., Oak Ridge Y-12 Plant.
- GA 1989b. *Proposed OROICN Buildings at the Y-12 and K-25 Plants, MMES, Inc.*, GA File No. 88-X896, MMES Purchase Order No. EB-305, Geological Associates Division, EDGe Group, Inc., for Martin Marietta Energy Systems, Inc., Oak Ridge Y-12 Plant.
- GA 1989c. *Supplemental Geotechnical Study for the Proposed Environmental Support Facility, Y-12 Plant, Oak Ridge, Tennessee*, ERCE File No. B429 and 87-0618K, MMES Purchase Order No. EB-317, Geological Associates Division, EDGe Group, Inc., for Martin Marietta Energy Systems, Inc., Oak Ridge Y-12 Plant.
- GEOTEK 1985. *Geotechnical Investigation for the Proposed Addition to the South Side of Building 9103, Y-12 Plant, Oak Ridge, Tennessee*, Geotek Project No. 83-1370, MMES Purchase Order No. 86B-47970V Rel. Y-26, Geotek Engineering, Inc., for Martin Marietta Energy Systems, Inc., Oak Ridge Y-12 Plant.
- GEOTEK 1986. *Geotechnical Investigation for the Proposed Truck Scale, Y-12 Plant, Oak Ridge, Tennessee*, Geotek Project No. 83-1370, MMES Purchase Order No. 86B-47970V Rel. Y-89, Geotek Engineering, Inc., for Martin Marietta Energy Systems, Inc., Oak Ridge Y-12 Plant.
- GEOTEK 1987a. *Geotechnical Investigation for the Proposed Sodium Hypochlorite Station, Y-12 Plant, Oak Ridge, Tennessee*, MMES Purchase Order No. 86B-47970V Rel. J-33, Geotek Engineering, Inc., for Martin Marietta Energy Systems, Inc., Oak Ridge Y-12 Plant.

- GEOTEK 1987b. *Geotechnical Investigation for the Proposed New Containment Pond for Closure of New Hope Pond, Y-12 Plant, Oak Ridge, Tennessee*, Geotek Project No. 83-1370, MMES Purchase Order No. 86B-47970V Rel. J-45, Geotek Engineering, Inc., for Martin Marietta Energy Systems, Inc., Oak Ridge Y-12 Plant.
- Geraghty and Miller 1987. *Installation of Monitor Wells at the Salvage Yard and Burial Grounds Area of the Y-12 Plant*, Y/SUB/86B-00206C/3, Geraghty and Miller, Inc., for Martin Marietta Energy Systems, Inc., Oak Ridge Y-12 Plant.
- Geraghty and Miller 1988. *Monitor Well Documentation Report for the 1987 Drilling Program at the Y-12 Plant*, Y/SUB/87B-00206C/20, Geraghty and Miller, Inc., for Martin Marietta Energy Systems, Inc., Oak Ridge Y-12 Plant.
- IT Corporation 1986. *Geohydrological Investigation of the Diesel Spill at the Y-12 Plant Service Station*, IT Corporation Contract No. 408927.01, for Martin Marietta Energy Systems, Inc., Oak Ridge Y-12 Plant.
- OGDEN 1992a. *Interim Geotechnical Study for the Proposed Molecular Genetics Laboratory Expansion, Y-12 Plant, Oak Ridge, Tennessee*, MMES Purchase Order No. 88B-99977V, Rel. C-23, Ogden Environmental and Energy Services, Inc., for Martin Marietta Energy Systems, Inc., Oak Ridge Y-12 Plant.
- OGDEN 1992b. *FCAP 1991 Renovate Power Supply System Upgrade Project, Y-12 Plant, Oak Ridge, Tennessee*, Ogden File No. 0-4267-0041, Ogden Environmental and Energy Services, Inc., for Martin Marietta Energy Systems, Inc., Oak Ridge Y-12 Plant.
- OGDEN 1992c. *WETF Head End Modifications, Y-12 Plant, Oak Ridge, Tennessee*, Ogden File No. 0-4267-0045, MMES Purchase Order No. 88B-99977V, Rel. C-42, Ogden Environmental and Energy Services, Inc., for Martin Marietta Energy Systems, Inc., Oak Ridge Y-12 Plant.
- OGDEN 1992d. *Geotechnical Study for the Proposed East End Sanitary Sewer Monitoring Station, Y-12 Plant, Oak Ridge, Tennessee*, Ogden File No. 0-4267-0054, MMES Purchase Order No. 88B-99977V, Rel. C-51, Ogden Environmental and Energy Services, Inc., for Martin Marietta Energy Systems, Inc., Oak Ridge Y-12 Plant.
- OGDEN 1993a. *Geotechnical Study for the Proposed Classified Waste Storage Facility 9720-59 and 9720-32, Y-12 Plant, Oak Ridge, Tennessee*, Ogden File No. 0-4267-0053/0057, MMES Purchase Order No. 88B-99977V Rel. C-50/002, Ogden Environmental and Energy Services, Inc., for Martin Marietta Energy Systems, Inc., Oak Ridge Y-12 Plant.
- OGDEN 1993b. *Subsurface Investigation and Environmental Sampling Ammonium Nitrate Study, Y-12 Plant, Oak Ridge, Tennessee*, Ogden File No. 0-4267-0074, MMES Purchase Order No. 88B-99977, Rel. C-70, Ogden Environmental and Energy Services, Inc., for Martin Marietta Energy Systems, Inc., Oak Ridge Y-12 Plant.

- Rothschild, E. R., Turner, R. R., Stow, S. H., Bogle, M. A., Hyder, L. K., Sealand, O. M., and Wyrick, H. J. 1984. *Investigation of Subsurface Mercury at the Oak Ridge Y-12 Plant*, ORNL/TM-9092, Martin Marietta Energy Systems, Inc., Oak Ridge National Laboratory.
- S&ME 1987. *Report of Subsurface Investigation for the Proposed Central Services Facility, Y-12 Plant, Oak Ridge, Tennessee*, S&ME Job No. 1401-87-108-A, Soil and Material Engineers, Inc., for Martin Marietta Energy Systems, Inc., Oak Ridge Y-12 Plant.
- S&ME 1989a. *Report of Subsurface Investigation for the Fire Protection Upgrade, Y-12 Fire Hall Improvement, Y-12 Plant, Oak Ridge, Tennessee*, S&ME Job No. 1401-89-049-A, Soil and Material Engineers, Inc., for Martin Marietta Energy Systems, Inc., Oak Ridge Y-12 Plant.
- S&ME 1989b. *Report of Subsurface Investigation for the Waste Coolant Centralized Collection Facility at Y-12, Oak Ridge, Tennessee*, S&ME Job No. 1401-89-048-A, Soil and Material Engineers, Inc., for Martin Marietta Energy Systems, Inc., Oak Ridge Y-12 Plant.
- SAIC 1992. *Fiscal Year 1992 Monitoring Well Installation Program, Y-12 Plant, Oak Ridge, Tennessee*, Y/SUB/92-99928c(Y11)/2, Science Applications International Corporation for Martin Marietta Energy Systems, Inc., Oak Ridge Y-12 Plant.
- SAIC 1993. *Fiscal Year 1993 Monitoring Well Installation Program, Y-12 Plant, Oak Ridge, Tennessee*, Y/SUB/93-99928c(Y22)/1, Science Applications International Corporation for Martin Marietta Energy Systems, Inc., Oak Ridge Y-12 Plant.
- SAIC 1994. *Remedial Investigation Report on Bear Creek Valley Operable Unit 2 (Rust Spoil Area, Spoil Area 1, and SY-200 Yard) at the Oak Ridge, Y-12 Plant, Oak Ridge, Tennessee, Vol. 2: Appendixes*, DOE/OR/01-1273/V2&D1, Y/ER-182/V1&D1, Science Applications International Corporation for Martin Marietta Energy Systems, Inc., Oak Ridge Y-12 Plant.

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