USGS
science for a changing world

Prepared in cooperation with the U.S. Department of the Army Environmental and Natural Resources Management Office of the U.S. Army Signal Center and Fort Gordon

Assessment of Soil-Gas and Soil Contamination at the South Prong Creek Disposal Area, Fort Gordon, Georgia, 2009–2010

Open-File Report 2011–1079

U.S. Department of the Interior
U.S. Geological Survey

Cover photograph. Unnamed dirt road that traverses the South Prong Creek Disposal Area, Fort Gordon, Georgia

Assessment of Soil-Gas and Soil Contamination at the South Prong Creek Disposal Area, Fort Gordon, Georgia, 2009–2010

By Andral W. Caldwell, W. Fred Falls, Wladmir B. Guimaraes, W. Hagan Ratliff, John B. Wellborn, and James E. Landmeyer

Prepared in cooperation with the U.S. Department of the Army Environmental and Natural Resources Management Office of the U.S. Army Signal Center and Fort Gordon

Open-File Report 2011–1079

U.S. Department of the Interior
U.S. Geological Survey

U.S. Department of the Interior
KEN SALAZAR, Secretary

U.S. Geological Survey
Marcia K. McNutt, Director

U.S. Geological Survey, Reston, Virginia: 2011

For more information on the USGS—the Federal source for science about the Earth, its natural and living resources, natural hazards, and the environment, visit http://www.usgs.gov or call 1–888–ASK–USGS.

For an overview of USGS information products, including maps, imagery, and publications, visit http://www.usgs.gov/pubprod

To order this and other USGS information products, visit http://store.usgs.gov

Suggested citation:
Author1, F.N., and Author2, Firstname, 2001, Title of the publication: Place of publication (unless it is a corporate entity), Publisher, number or volume, page numbers; information on how to obtain if it's not from the group above.

Contents

Figures

Tables

Conversion Factors

Inch/Pound to SI

Multiply	By	To obtain
	Length	
inch (in.)	2.54	centimeter (cm)
inch (in.)	25.4	millimeter (mm)
foot (ft)	0.3048	meter (m)
mile (mi)	1.609	kilometer (km)

Horizontal coordinate information is referenced to the North American Datum of 1983 (NAD 83).

Selected acronyms and abbreviations used in this report include:

BTEX	Benzene, toluene, ethylbenzene, and xylene (total)
ICP-MS	Inductively coupled plasma-mass spectrometry
mg/kg	milligram per kilogram
mL	milliliter
µg	microgram
µg/g	microgram per gram
µg/L	microgram per liter
MDL	Method detection level
MTBE	Methyl *tert*-butyl ether
PAH	Polycyclic aromatic hydrocarbon
PCE	Perchloroethylene (also known as tetrachloroethylene)
RCRA	Resource Conservation and Recovery Act
RSL	Regional screening level
SCDHEC	South Carolina Department of Health and Environmental Control
SPDA	South Prong Creek Disposal Area
SVOC	Semivolatile organic compound
TCE	Trichloroethylene
TPH	Total petroleum hydrocarbons
USEPA	U.S. Environmental Protection Agency
USGS	U.S. Geological Survey
VOC	Volatile organic compound

Assessment of Soil-Gas and Soil Contamination at the South Prong Creek Disposal Area, Fort Gordon, Georgia, 2009–2010

By Andral W. Caldwell,[1] W. Fred Falls,[1] Wladmir B. Guimaraes,[1] W. Hagan Ratliff,[2] John B. Wellborn,[3] and James E. Landmeyer[1]

Abstract

Soil gas and soil were assessed for contaminants at the South Prong Creek Disposal Area at Fort Gordon, Georgia, from October 2009 to September 2010. The assessment included identifying and delineating organic contaminants present in soil-gas and inorganic contaminants present in soil samples collected from the area estimated to be the South Prong Creek Disposal Area, including two seeps and the hyporheic zone. This assessment was conducted to provide environmental contamination data to Fort Gordon personnel pursuant to requirements for the Resource Conservation and Recovery Act Part B Hazardous Waste Permit process.

All soil-gas samplers in the two seeps and the hyporheic zone contained total petroleum hydrocarbons above the method detection level. The highest total petroleum hydrocarbon concentration detected from the two seeps was 54.23 micrograms per liter, and the highest concentration in the hyporheic zone was 344.41 micrograms per liter. The soil-gas samplers within the boundary of the South Prong Creek Disposal Area and along the unnamed road contained total petroleum hydrocarbon mass above the method detection level. The highest total petroleum hydrocarbon mass detected was 147.09 micrograms in a soil-gas sampler near the middle of the unnamed road that traverses the South Prong Creek Disposal Area. The highest undecane mass detected was 4.48 micrograms near the location of the highest total petroleum hydrocarbon mass. Some soil-gas samplers detected undecane mass greater than the method detection level of 0.04 micrograms, with the highest detection of toluene mass of 109.72 micrograms in the same location as the highest total petroleum hydrocarbon mass.

Soil-gas samplers installed in areas of high contaminant mass had no detections of explosives and chemical agents above their respective method detection levels.

Inorganic concentrations in five soil samples did not exceed regional screening levels established by the U.S. Environmental Protection Agency. Barium concentrations, however, were up to four times higher than the background concentrations reported in similar Coastal Plain sediments of South Carolina.

Introduction

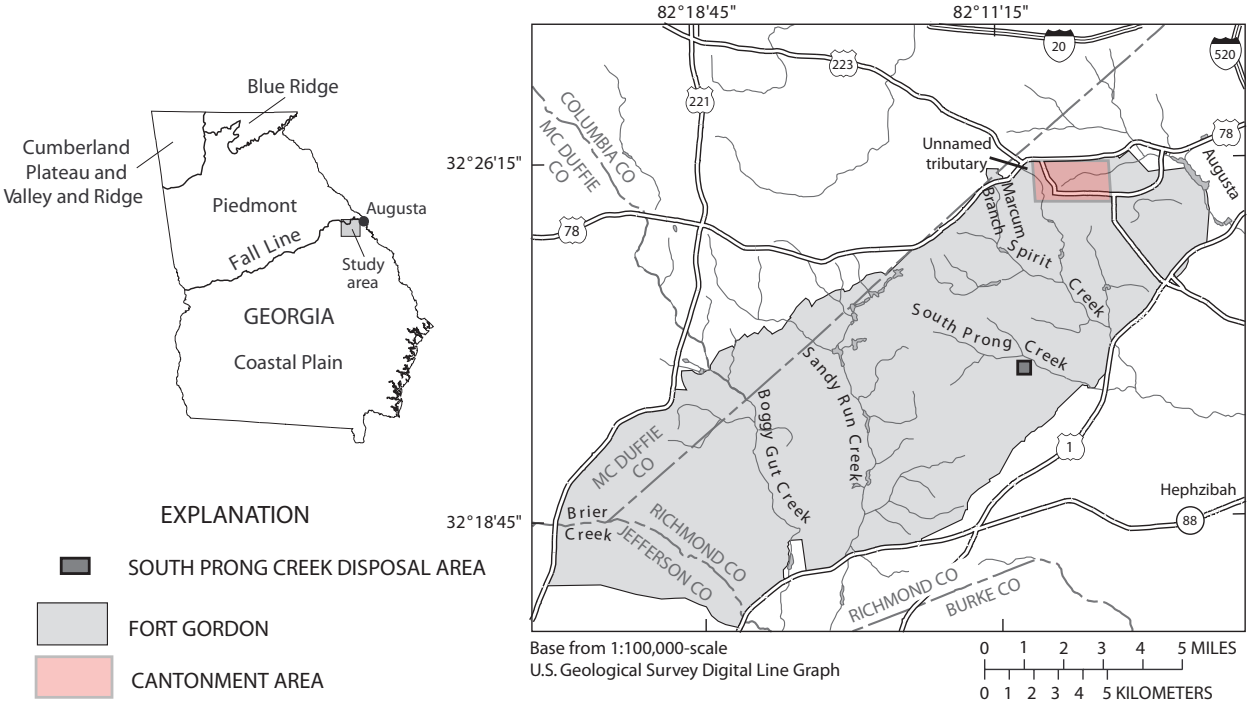
Fort Gordon is a U.S. Department of the Army facility located approximately 10 miles southwest of Augusta in east-central Georgia (fig. 1). A cantonment (military housing) area is located at the northwestern boundary of Fort Gordon. The South Prong Creek Disposal Area (SPDA) is in the south-central sector of Fort Gordon and is adjacent to South Prong Creek on a steeply sloping wooded area. Historically, little information is available about the SPDA other than the knowledge that items were disposed of on the site (Hagan Ratliff, Environmental Branch, Fort Gordon, Georgia, oral commun., November 6, 2009). Presently (2011), there is no physical evidence of disposal activities at this site.

Because of the lack of historical information, the effects of past activities on environmental resources at the SPDA are currently unknown. The current assessment was conducted to provide environmental contamination data to Fort Gordon personnel to comply with the requirements of the Resource Conservation and Recovery Act (RCRA) Part B Hazardous Waste Permit process. An initial investigation to assess potential environmental effects is warranted because the SPDA is located in the outcrop area of the Cretaceous-age aquifer system, which is used for drinking water farther downgradient. Moreover, surface water and groundwater from the SPDA may discharge to South Prong Creek and enable potential contaminants to be transported off of the Fort Gordon property.

[1]U.S. Geological Survey, Columbia, South Carolina.

[2]Environmental Branch, Fort Gordon, Georgia.

[3]Environmental and Natural Resources, Fort Gordon, Georgia.



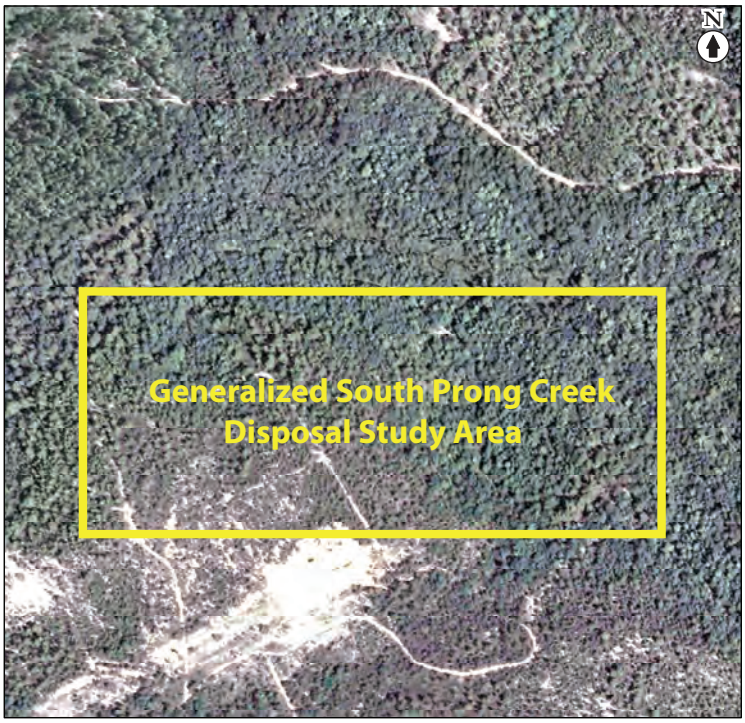


Figure 1. Location of South Prong Creek Disposal Area, Fort Gordon, Georgia.

Purpose and Scope

From October 2009 to September 2010, the U.S. Geological Survey (USGS), in cooperation with the U.S. Department of the Army (U.S. Army) Environmental and Natural Resources Management Office of the U.S. Army Signal Center and Fort Gordon, Georgia, assessed soil gas and soil for contaminants at the SPDA. This assessment was conducted to provide environmental contamination data to the U.S. Army at Fort Gordon. The assessment included the delineation of organic contaminants present in soil-gas samplers from the SPDA along with two groundwater seeps and the hyporheic zone. The assessment also included the delineation of inorganic contaminants in soil samples. This report presents the analytical results of the soil-gas and soil samples and delineates the area of contamination in the study area.

Description of the Study Area

Fort Gordon is a U.S. Army facility located approximately 10 miles southwest of Augusta in east-central Georgia (fig. 1). Fort Gordon is located in the northern part of the Coastal Plain Physiographic Province and south of the Fall Line. Surficial soil and sediment are characterized by unconsolidated sands, indurated sands and semi-consolidated sandstones, and layers of clay that include kaolinite (Gregory and others, 2001; Williams, 2007). The study area is located approximately 374 feet (ft) relative to North American Datum of 1983.

Methods

The methods used in this assessment were selected to provide data to determine the presence or absence of contamination of soil gas and soil at the SPDA. The soil-gas method that was used provides results that are qualitative, and the soil samples provide quantitative data that can be compared to standards.

Passive Hyporheic Zone and Floodplain Survey

The assessment of soil-gas contamination was conducted using a passive soil-gas survey based on the GORE® Module, a commercially available passive diffusion sampler based on GORE-TEX® membrane technology (U.S. Environmental Protection Agency, 1998; W.L. Gore & Associates, Inc., 2004; American Society for Testing and Materials, 2006). The module is an adsorbent material placed inside a shoestring-shaped GORE-TEX® tube (fig. 2A) inside a 20-milliliter (mL) gas-tight vial (fig. 2B). The material can adsorb a wide variety of volatile organic compounds (VOCs), including solvents such as perchloroethylene (PCE; also known as tetrachloroethylene); trichloroethylene (TCE); benzene, toluene, ethylbenzene, and xylenes (collectively referred to as BTEX); methyl tert-butyl ether (MTBE); semivolatile organic compounds (SVOCs); total petroleum hydrocarbons (TPHs); and polycyclic aromatic hydrocarbons (PAHs) such as naphthalene. The modules were tied to a string, attached to a cork plug to prevent the entrance of surface water and ambient surface sources of contamination, and inserted into a shallow borehole. After 5 to 7 days, the modules were removed from the field, placed in their original 20 mL gas-tight vial, and sent to the commercial laboratory (W.L. Gore & Associates, Inc.) for analysis by gas chromatography/mass spectrometry using a modification of U.S. Environmental Protection Agency (USEPA) method 8260/8270 to include thermal desorption of the adsorbed soil gas from the sampler. The laboratory is in compliance with Good Laboratory Practices and ISO Guide 25 (International Organization for Standardization, 1990). The soil-gas contaminant results are expressed as mass of contaminant (micrograms) and provide qualitative screening-level data, whereas the modules placed in water provide contaminant levels expressed as a concentration (micrograms per liter).

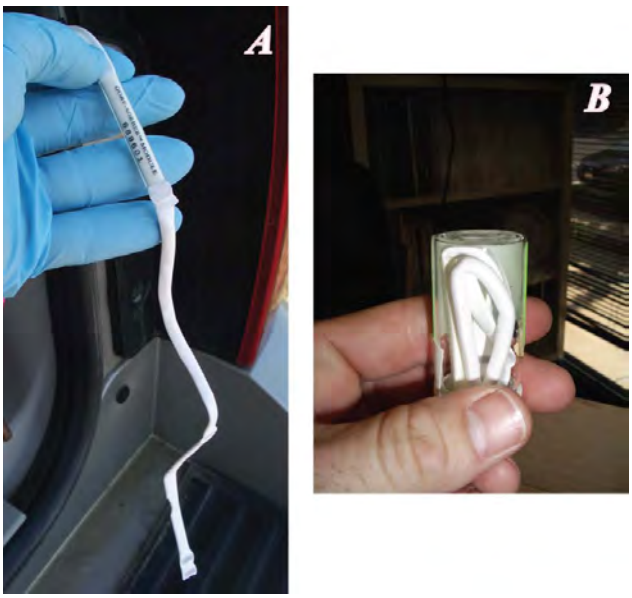


Figure 2. Soil-gas sampler (*A*) prior to being installed in a shallow borehole and (*B*) following retrieval from a borehole and prior to shipping to laboratory for analysis.

Passive soil-gas results can indicate the presence of particular contaminants. The results, however, do not reveal whether the detection was derived from free product, from residual-phase adsorbed material or vapors in the unsaturated zone, or from the dissolved-phase material in shallow and deep groundwater (unless the sampler is placed in water). In general, higher soil-gas mass in a sampler tends to be related to the presence of residual contamination or free product that is close to the land surface where the soil-gas sampler is located (U.S. Environmental Protection Agency, 1998). If

such source material is located at greater depths, however, the soil-gas contaminant mass generally will be lower. A lower value near known sources may be caused by various attenuation processes that affect the soil-gas mass prior to detection. In both cases, however, the samplers help to rapidly indicate the presence or absence of contaminants. The passive soil-gas approach was approved for use at Fort Gordon by the Hazardous Waste Management Branch, Georgia Environmental Protection Division (William Powell, P.E., Environmental Engineer, Department of Defense Remediation Unit, oral commun., December 10, 2008).

The passive soil-gas samplers were installed in the saturated sediments of the hyporheic zone and groundwater seeps in the floodplain of the SPDA on April 30, 2010. These nine soil-gas samplers, two in groundwater seeps and seven in the hyporheic zone (fig. 3), were deployed inside stainless-steel drivepoints with screened openings that allowed the drivepoint to act as a small-diameter well (fig. 4). The drivepoints were installed by hand no more than 1ft into the hyporheic zone or groundwater seep. The water in the drivepoint well exposed to the soil-gas sampler consists of groundwater rather than surface water and, therefore, provides a way to assess the presence of groundwater contamination without conventional monitoring-well installation. The results are then reported in micrograms per liter (µg/L).

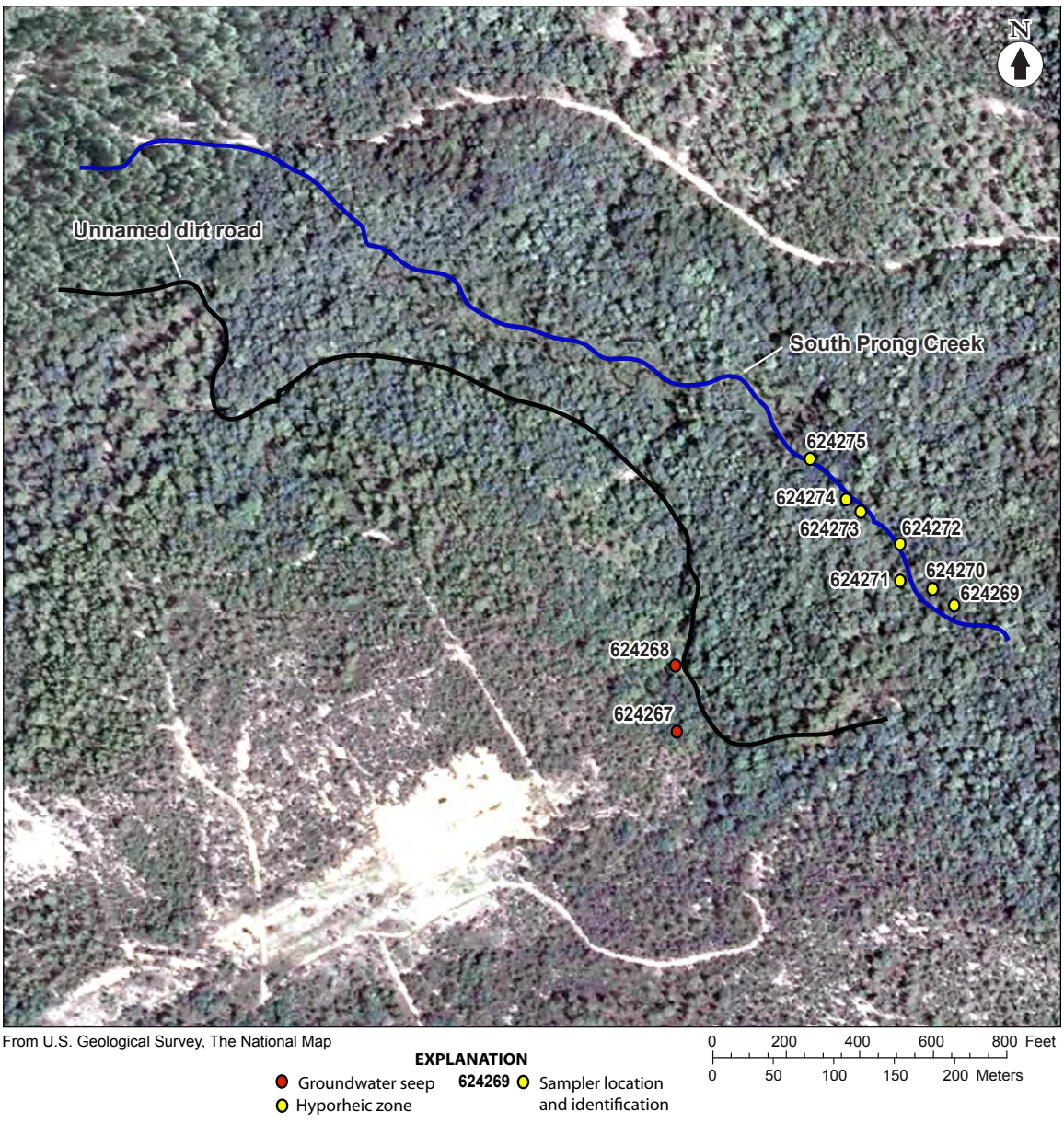


Figure 3. Locations of the hyporheic zone and groundwater seep samplers, South Prong Creek Disposal Area, Fort Gordon, Georgia, 2009–2010.

Figure 4. Photographs of drivepoint sampler (*A*) prior to being installed, and (*B*) installed in the hyporheic zone.

Passive Soil-Gas Survey

A passive soil-gas survey was conducted at the SPDA site during August 2010, when 50 soil-gas samplers were deployed (fig. 5). The soil-gas samplers were placed along an unnamed road that traverses the site from the eastern to the western quadrant of the SPDA. Three additional soil-gas samplers were used as trip-blank samplers and were not deployed. Each sampler was placed in a borehole that was

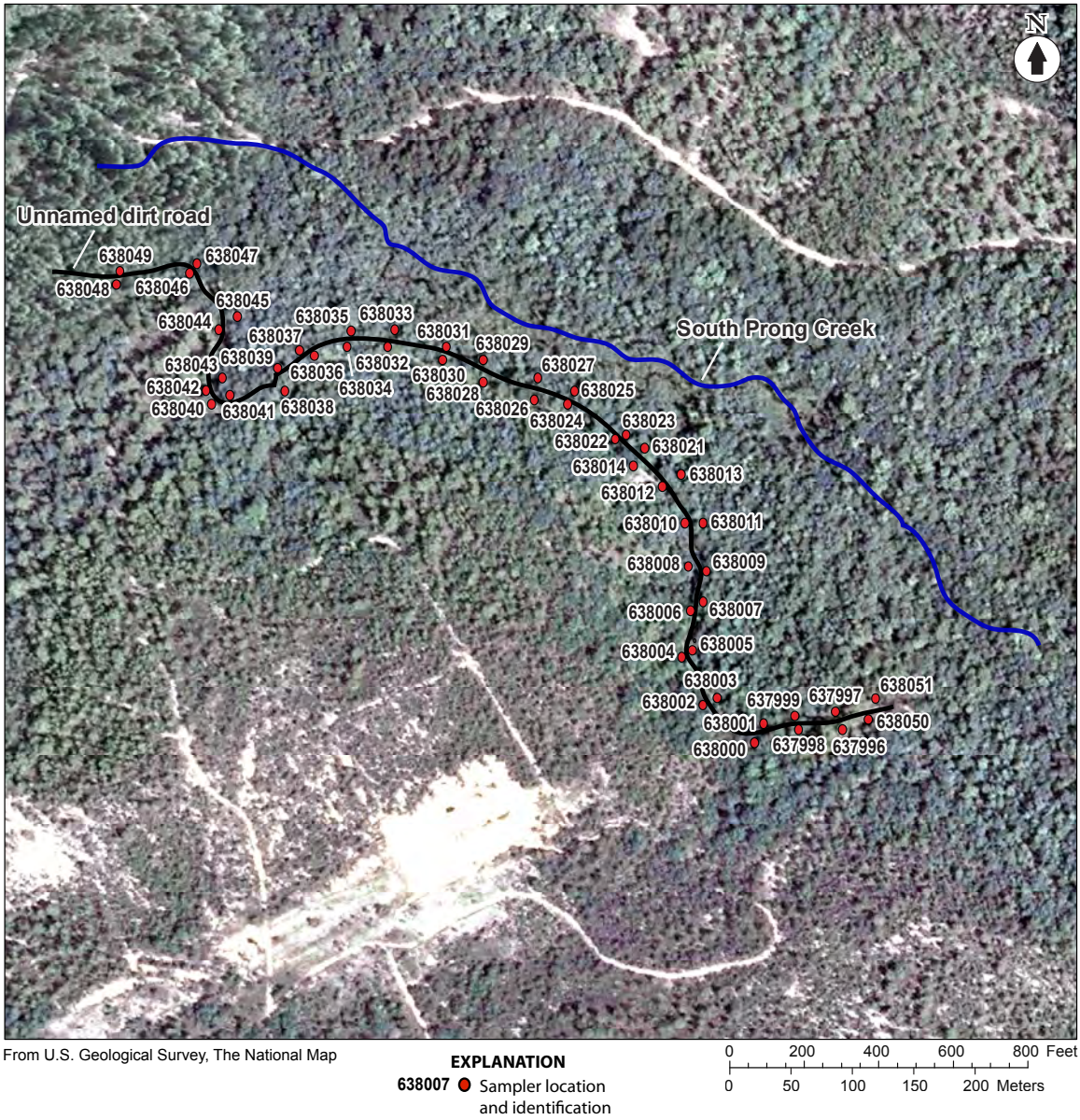


Figure 5. Locations of soil-gas samplers and sampler identification numbers, South Prong Creek Disposal Area, Fort Gordon, Georgia, 2009–2010.

0.5 inch (in.) in diameter and 15 in. long and created by a stainless-steel ship-auger bit attached to a cordless drill. This depth is within the range specified by the USEPA for soil-gas investigations (U.S. Environmental Protection Agency, 1998). The auger was cleaned with a paper towel between each drilling. The 50 modules were installed on August 23, 2010, removed on August 30, 2010, placed in their original 20 mL gas-tight vials, and sent to the W.L. Gore & Associates, Inc., laboratory for analysis.

On September 28, 2010, five soil-gas samplers were installed and retrieved, as previously described, and analyzed for organic compounds classified as explosives and chemical agents (fig. 6). Four of the soil-gas samplers were deployed in areas defined by high contaminant mass as detected in the initial soil-gas survey of August 2010. The remaining sampler was a background sampler deployed in an area where no contaminants were detected. Five additional samplers were used as trip blank samplers and were not deployed.

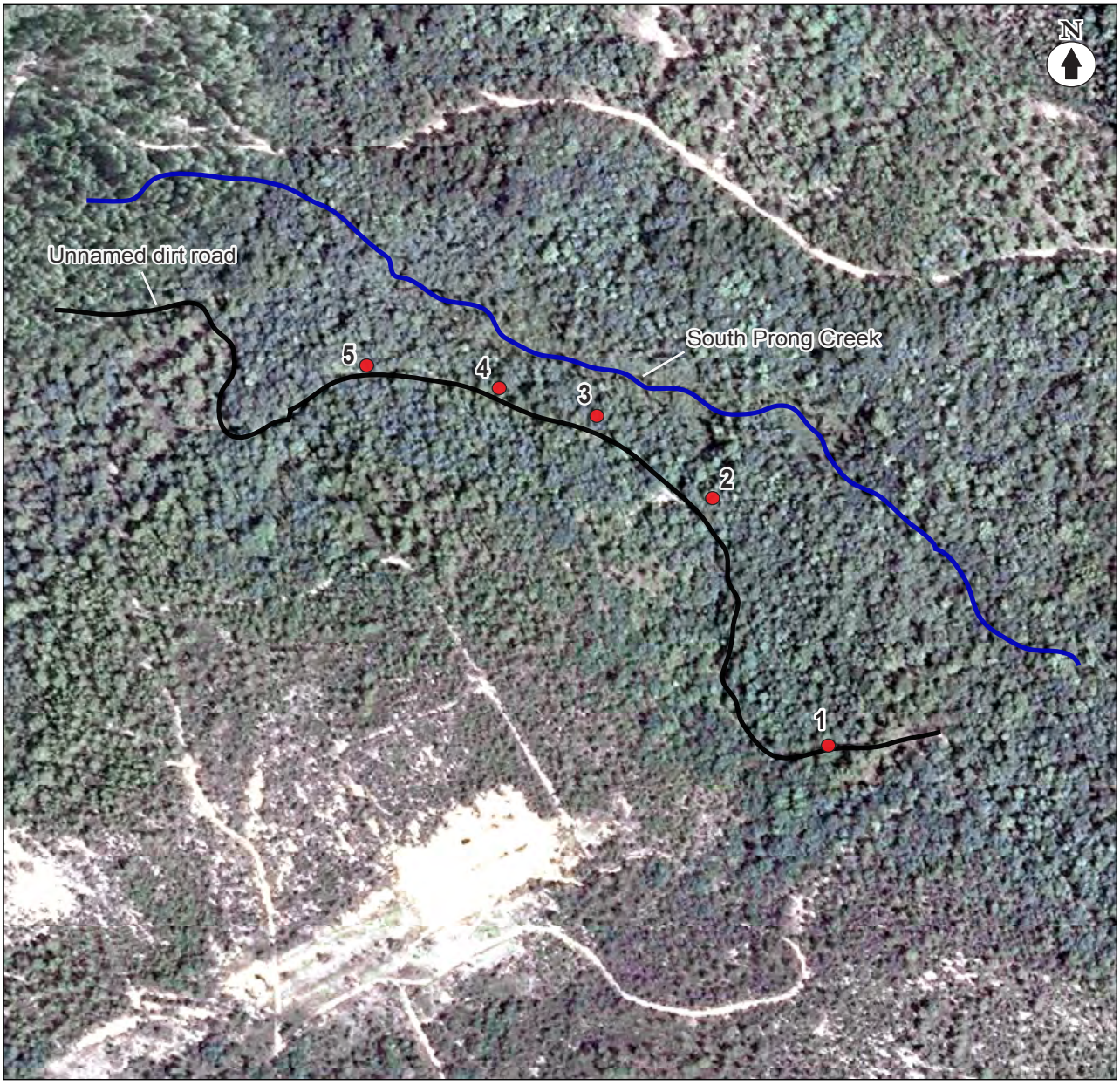


Figure 6. Locations of soil samples, and explosives and chemical agent samplers, South Prong Creek Disposal Area, Fort Gordon, Georgia, 2009–2010.

Soil Samples

Composite soil samples were collected using a stainless-steel hand auger (fig. 7 *A*, *B*) on September 28, 2010, to a depth of 6 in. at five locations (fig. 6). The soil samples were analyzed for 37 inorganic constituents. Soil samples were analyzed by using Inductively Coupled Plasma – Mass Spectrometry (ICP-MS; LaDonna Choate, Research Chemist, U.S. Geological Survey, Denver, Colorado, written commun., February 8, 2009). The samples were ground to powder and processed by a multi-acid digestion technique prior to analysis (Briggs and Meier, 2002). The multi-acid digestion technique combined with ICP-MS is well-suited for the analysis of metals in rocks, soils, and sediments (Briggs and Meier, 2002).

Soil-sample concentrations were compared to USEPA regional screening levels (RSLs) for industrial soils (U.S. Environmental Protection Agency, 2009) to determine the extent of contamination. Soil-sample metal concentrations also were compared to values for ambient, uncontaminated (background) levels determined for soils across the adjacent State of South Carolina (South Carolina Department of Health and Environmental Control, 2002) because no similar values were available for the State of Georgia. The comparison is valid because the geologic features of Georgia and South Carolina are similar and the States share similar physiographic provinces.

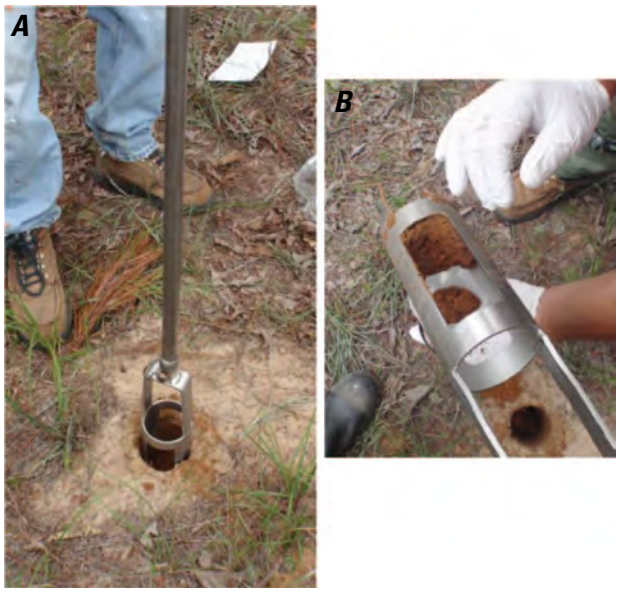


Figure 7. Photographs of soil sample (*A*) extracted with stainless-steel auger, and (*B*) transferred to sample container.

Results

The results of the passive soil-gas survey and soil sample analyses were used to further delineate the area of contamination related to the SPDA. The results of these sampling activities indicate that past activities at the SPDA have resulted in an environmental effect.

Passive Hyporheic Zone and Floodplain Survey

All of the nine soil-gas samplers installed for this study in the hyporheic zone and groundwater seeps at the SPDA detected TPH concentrations greater than the method detection level (MDL) of 2.71 µg/L (fig. 8; table 1 located at the back of this report). TPH concentrations of 8.9 and 54.23 µg/L were detected in the two groundwater seeps located along the unnamed road that traverses the SPDA. TPH concentrations ranging from 91.58 to 344.41 µg/L were detected in the samplers from the hyporheic zone along South Prong Creek. The highest TPH concentration of 344.41 µg/L was from the northernmost sampler deployed along South Prong Creek. The lowest TPH concentration detected along South Prong Creek was 91.58 µg/L, and was from the southernmost sampler along South Prong Creek. Because all nine soil-gas samplers in the hyporheic zone and groundwater seeps contained TPH concentration at levels greater than the MDL, it is possible that the boundary of the SPDA has not been fully assessed with respect to TPH.

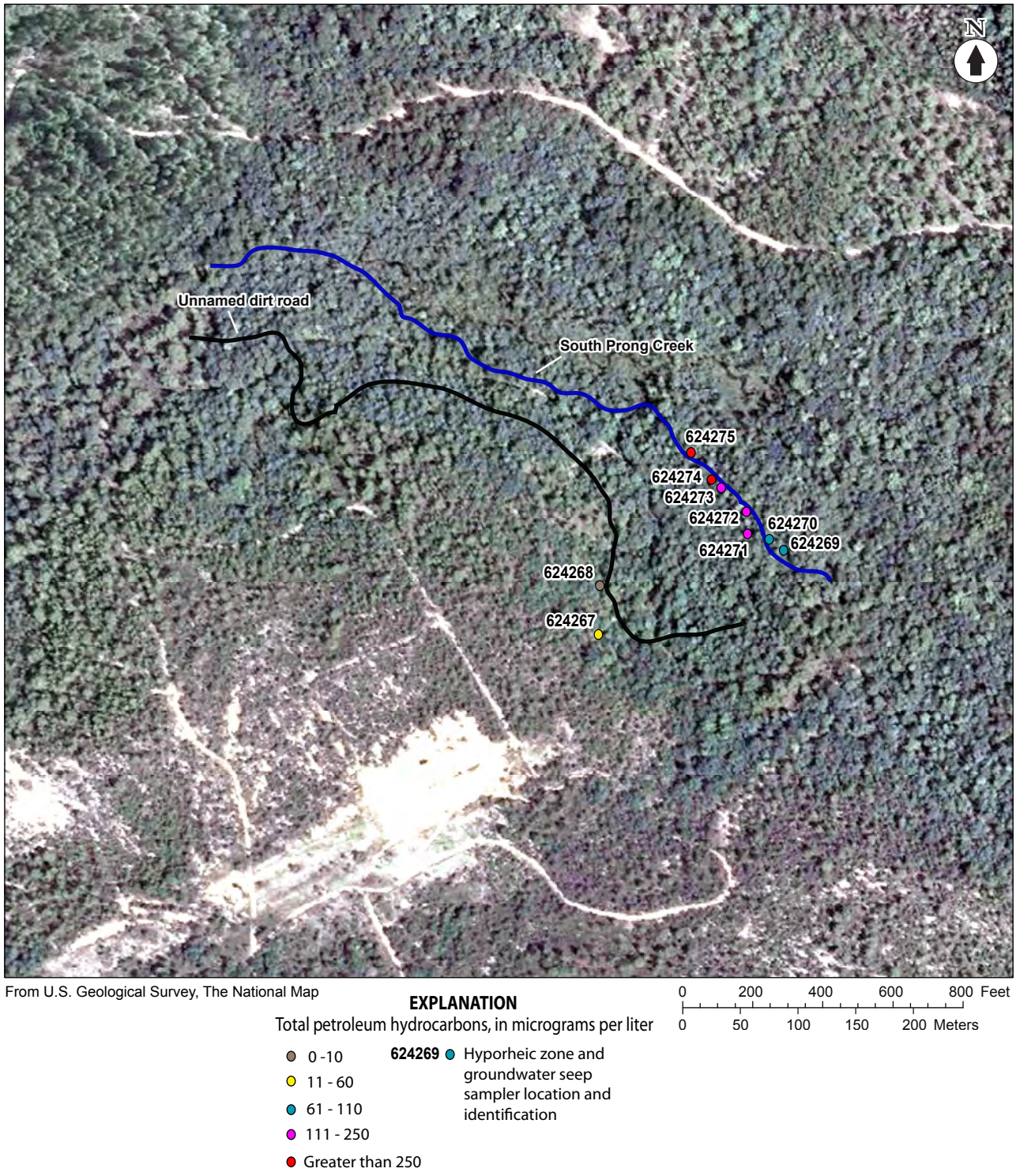


Figure 8. Detections of total petroleum hydrocarbon concentrations in the hyporheic zone and groundwater seep samplers, South Prong Creek Disposal Area, Fort Gordon, Georgia, 2009–2010. Method detection level is 2.71 micrograms per liter.

Passive Soil-Gas Survey

All of the 50 soil-gas samplers installed for this study at the SPDA site detected TPH mass greater than the MDL of 0.02 microgram (µg; fig. 9; table 2 located at the back of this report). The highest detection of soil-gas TPH mass was 147.09 µg from a sampler near the middle of the unnamed road that traverses the SPDA. Soil-gas TPH mass ranging from 51 to 70 µg was detected in several samplers located along the middle of the unnamed road and along the southeastern and northwestern boundary of the SPDA. Because all 50 soil-gas samplers contained TPH mass at

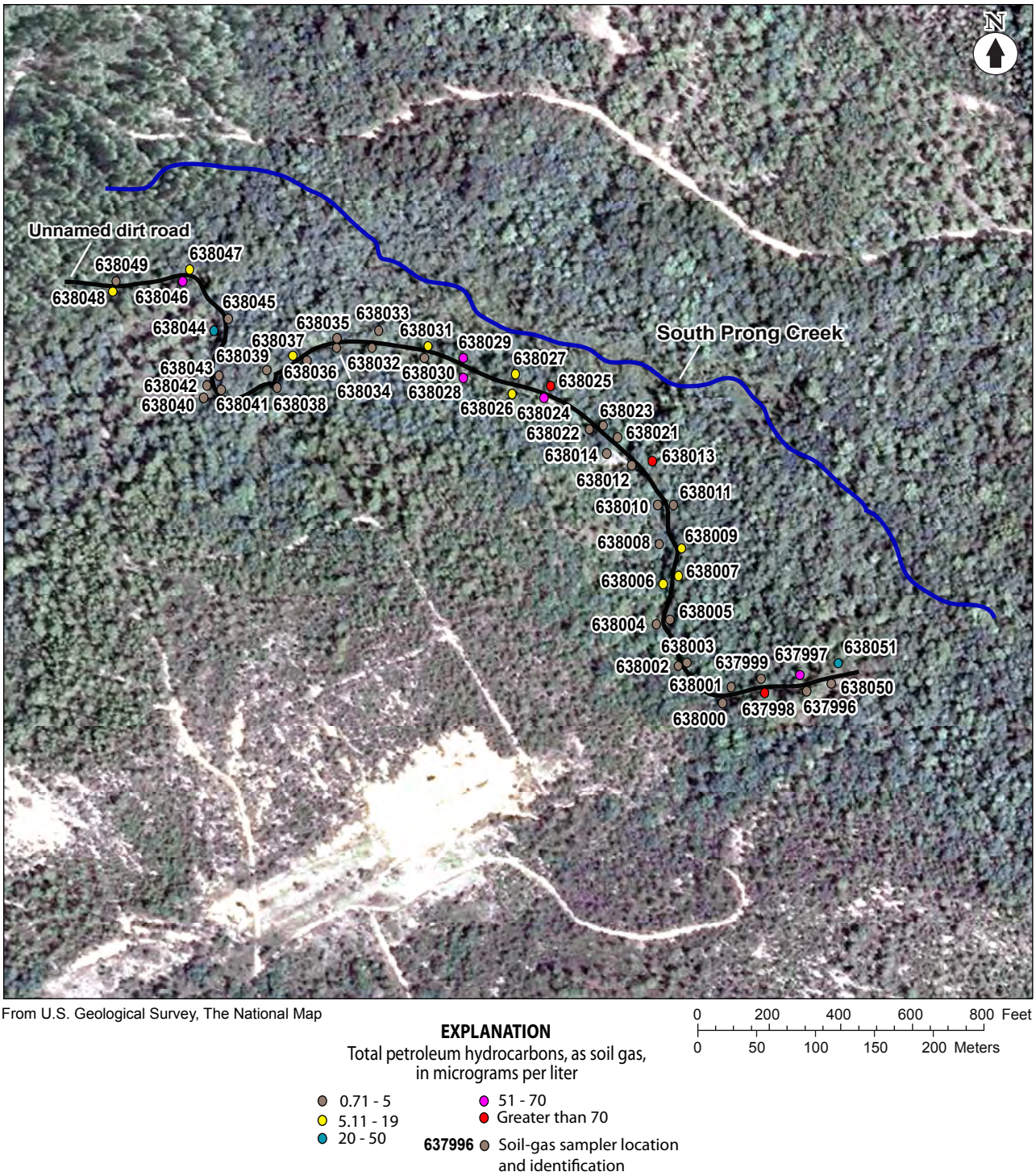


Figure 9. Detections of total petroleum hydrocarbon mass in soil-gas samplers, South Prong Creek Disposal Area, Fort Gordon, Georgia, 2009–2010. Method detection level is 0.02 microgram.

levels greater than the MDL, it is possible that the boundary of the SPDA has not been fully assessed with respect to TPH. The TPH detections in all the samplers were higher than the reported TPH detections in the three trip blanks (0.19, 0.20, and 0.21 µg, table 2).

Fewer than one-third of the soil-gas samplers installed at the SPDA detected toluene mass greater than or equal to the MDL of 0.02 µg (fig. 10; table 2). Detections of toluene mass between 0 and 0.07 µg were in numerous samplers all across the SPDA, whereas toluene mass between 0.1 and 4 µg were detected in four samplers along the middle of the unnamed road. The highest detection of soil-gas toluene mass of (0.92 µg) was collected near the middle of the unnamed road. The location of high toluene soil-gas mass coincides with a location of the highest soil-gas TPH mass (fig. 9). The toluene

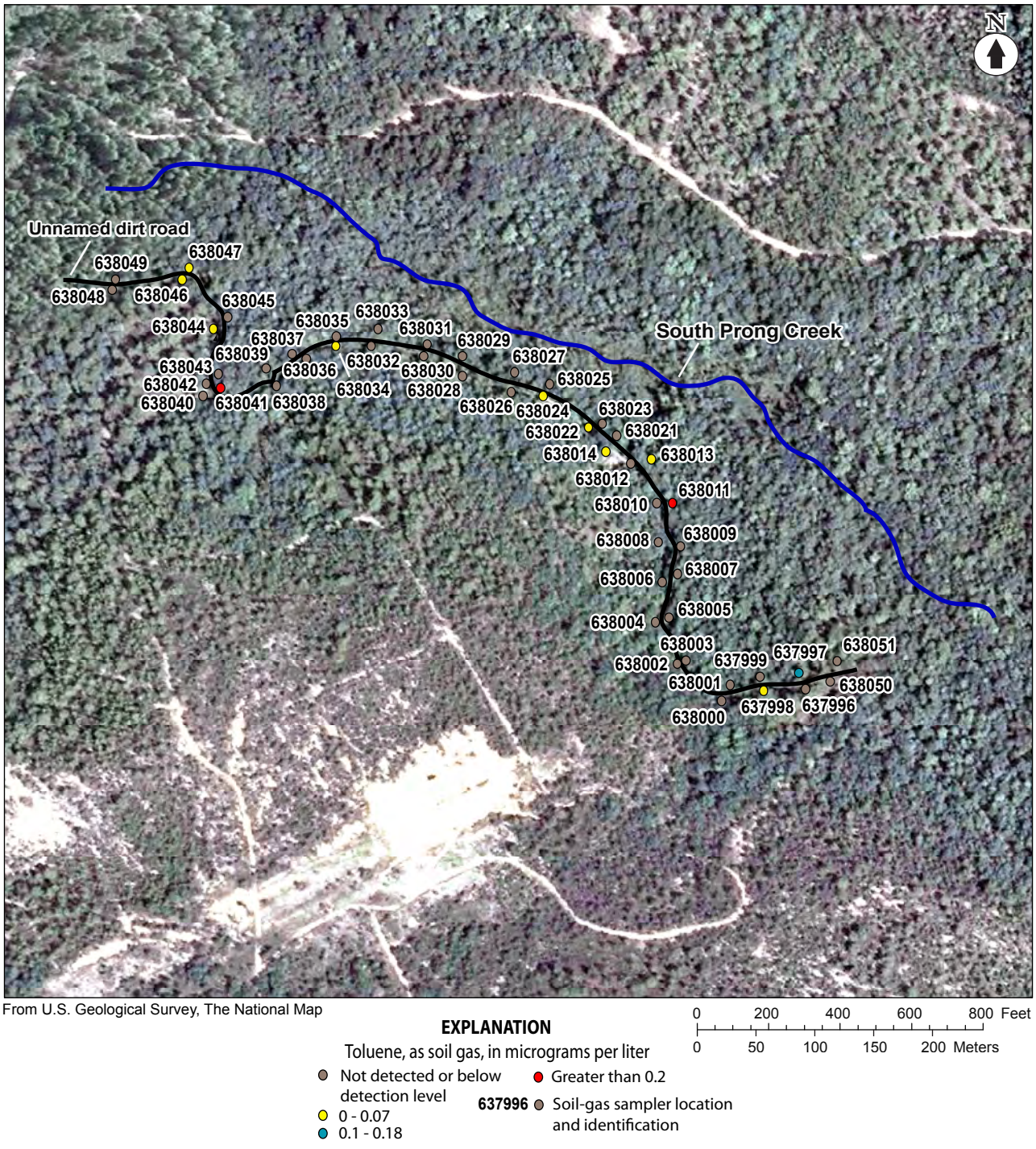


Figure 10. Detections of toluene mass in soil-gas samplers, South Prong Creek Disposal Area, Fort Gordon, Georgia, 2009–2010. Method detection level is 0.02 microgram.

detections also were higher than the reported detection of toluene (no detection) in the trip blanks.

Only 11 of the 50 soil-gas samplers detected undecane (a petroleum derived product) mass greater than the MDL of 0.04 µg (fig. 11; table 2). Detections of undecane soil-gas mass between 0.05 and 0.5 µg were detected in 8 samplers located along the unnamed road of SPDA. Undecane soil-gas masses of 46.44 µg and 50.79 µg were detected in samplers located in the middle of the SPDA. The highest soil-gas mass of undecane (109.72 µg) was detected near the middle of the unnamed road and coincides with the highest soil-gas TPH mass (fig. 9).

Explosives or chemical agents were not detected above their respective MDLs for all soil-gas samplers installed in areas of high contaminant mass at the SPDA site. Some explosive and chemical agents had masses below the MDL but

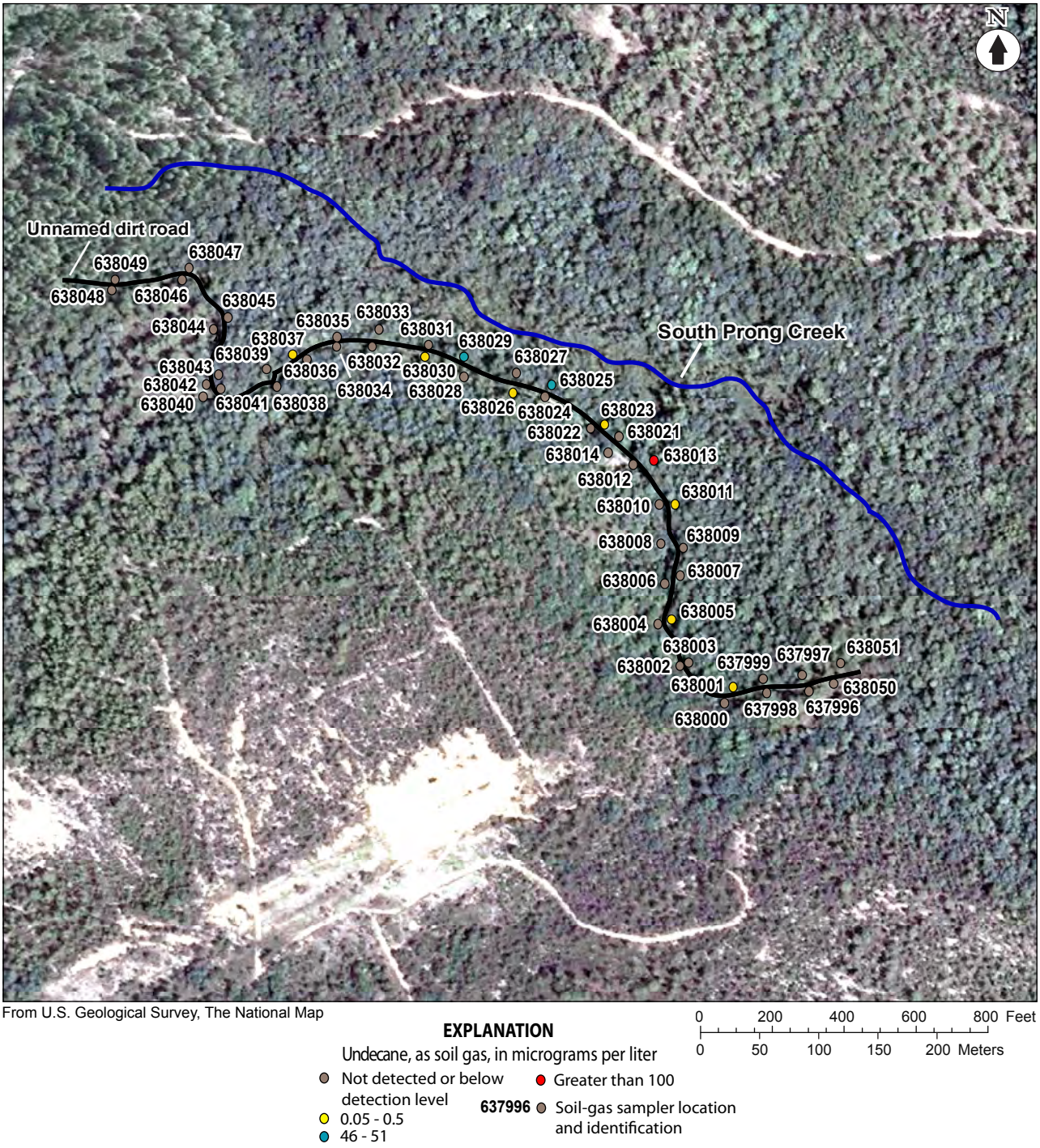


Figure 11. Detections of undecane mass in soil-gas samplers, South Prong Creek Disposal Area, Fort Gordon, Georgia, 2009–2010. Method detection level is 0.04 microgram.

were above the non-detection level, indicating some level of presence (fig. 6; table 3 located at the back of this report).

For all soil-gas analyses, the presence of a contaminant above the MDL at a particular soil-gas sampler location suggests an environmental effect. Moreover, because all soil-gas samplers were installed to the same depth, a higher result for a particular contaminant in soil-gas may indicate a closer proximity to a contaminant source.

Soil Samples

Inorganic concentrations in all five soil samples did not exceed the RSLs (table 4 located at the back of this report). Barium concentrations were, however, 1.6 to 4 times higher than the background concentrations reported for similar South Carolina Coastal Plain sediments (table 4).

Summary

The U.S. Geological Survey, in cooperation with the U.S. Department of the Army Environmental and Natural Resources Management Office of the U.S. Army Signal Center and Fort Gordon, Georgia, assessed soil-gas, groundwater seeps, the hyporheic zone, and soil for contaminants at the South Prong Creek Disposal Area at Fort Gordon, Georgia, from October 2009 to September 2010. All soil-gas samplers for the study contained total petroleum hydrocarbons (TPHs) above the method detection level (MDL). The nine soil-gas samplers in the hyporheic zone and groundwater seeps contained TPH concentrations of 344.41 and 54.23 micrograms per liter, respectively. Of the 50 soil-gas samplers along the unnamed road that traverses the South Prong Creek Disposal Area, the highest detection of soil-gas TPH mass was 147.09 micrograms (µg) and was collected near the middle of the unnamed road. The highest soil-gas toluene mass of 0.92 µg was detected near the middle of the unnamed road. Some soil-gas samplers had undecane mass greater than the MDL, with the highest soil-gas mass of 109.72 µg collected near the middle of the unnamed road. Soil-gas samplers installed in areas of high contaminant mass had no detections of explosives or chemical agents above their respective MDLs.

Inorganic concentrations for the five soil samples did not exceed U.S. Environmental Protection Agency values for their regional screening levels. Barium concentrations, however, were up to four times higher than background concentrations reported for similar Coastal Plain sediments in South Carolina.

References Cited

American Society for Testing and Materials, 2006, Standard guide for soil gas monitoring in the vadose zone: ASTM D5314-92, 36 p.

Briggs, P.H., and Meier, A.L., 2002, The determination of forty-two elements in geological materials by inductively coupled plasma – mass spectrometry, in Taggart, J.E., Jr., ed., 2002, Analytical methods for chemical analysis of geologic and other materials, U.S. Geological Survey: U.S. Geological Survey Open File Report 02-223-I, 14 p.

Gregory, M.B., Stamey, T.C., and Wellborn, J.B., 2001, Ecological characterization of streams, and fish-tissue analysis for mercury and lead at selected locations, Fort Gordon, Georgia, June 1999 to May 2000: U.S. Geological Survey Open-File Report 01-203, 24p.

International Organization for Standardization, 1990, ISO Guide 25. General requirements for the competence of calibration and testing laboratories (3rd ed.): New York, American National Standards Institute.

South Carolina Department of Health and Environmental Control, 2002, Environmental Surveillance and Oversight Program data report, 2002, accessed February 11, 2010, at *http://www.scdhec.gov/environment/envserv/docs/esop_datarpt_02.pdf*.

U.S. Environmental Protection Agency, 1998, Innovative Technology Verification Report Soil Gas Sampling Technology: EPA/600/R-98/095.

U.S. Environmental Protection Agency, 2009, Regional screening level tables, accessed January 12, 2010, at *http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/Generic_Tables/index.htm*

Williams, L.J., 2007, Hydrogeology and potentiometric surface of the Dublin and Midville aquifer systems in Richmond County, Georgia, January 2007: U.S. Geological Survey Scientific Investigations Map 2982, 1 sheet.

W.L. Gore & Associates, Inc., 2004, GORE™ surveys for site assessment & monitoring, accessed February 28, 2011, at *http://www.gore.com/MungoBlobs/239/659/surveys_environmental_brochure.pdf*

Table 1. Concentration of volatile organic compounds detected in soil-gas samplers from the hyporheic zone and groundwater seeps, South Prong Creek Disposal Area, Fort Gordon, Georgia, 2009–2010.

[see figure 3 for sampler locations; µg/L, micrograms per liter; MDL, method detection level; nd, not detected; TPH, total petroleum hydrocarbons; BTEX, benzene, toluene, ethylbenzene, and xylenes; MTBE, methyl *tert*-butyl ether; DCA, dichloroethane; TCA, trichloroethane; TCE, trichloroethylene; DCE, dichloroethylene; PCE, perchloroethylene; DCB, dichlorobenzene; *c,* cis*; t,* trans*; m,* meta*; p,* para*; o,* ortho; CCl_4, carbon tetrachloride; C_{11}, C_{13}, and C_{15}, undecane, tridecane, and pentadecane, respectively; --, not applicable]

Sampler number	TPH (µg/L)	BTEX (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	*m*-,*p*-Xylene (µg/L)	*o*-Xylene (µg/L)
MDL=	2.71	---	2.71	2.71	2.71	4.06	2.71
624267	54.23	nd	nd	nd	nd	nd	nd
624268	8.90	nd	nd	nd	nd	nd	nd
624269	91.58	nd	nd	nd	nd	nd	nd
624270	109.17	nd	nd	nd	nd	nd	nd
624271	134.24	nd	nd	nd	nd	nd	nd
624272	140.28	nd	nd	nd	nd	nd	nd
624273	165.70	nd	nd	nd	nd	nd	nd
624274	252.85	nd	nd	nd	nd	nd	nd
624275	344.41	nd	nd	nd	nd	nd	nd
Trip blanks							
624276	nd	nd	nd	nd	nd	nd	nd
624277	nd	nd	nd	nd	nd	nd	nd

Table 1. Concentration of volatile organic compounds detected in soil-gas samplers from the hyporheic zone and groundwater seeps, South Prong Creek Disposal Area, Fort Gordon, Georgia, 2009–2010—Continued.

[see figure 3 for sampler locations; µg/L, micrograms per liter; MDL, method detection level; nd, not detected; TPH, total petroleum hydrocarbons; BTEX, benzene, toluene, ethylbenzene, and xylenes; MTBE, methyl *tert*-butyl ether; DCA, dichloroethane; TCA, trichloroethane; TCE, trichloroethylene; DCE, dichloroethylene; PCE, perchloroethylene; DCB, dichlorobenzene; *c,* cis*; t,* trans*; m,* meta*; p,* para*; o,* ortho; CCl_4, carbon tetrachloride; C_{11}, C_{13}, and C_{15}, undecane, tridecane, and pentadecane, respectively; --, not applicable]

Sampler number	Naphthalene (µg/L)	2-Methyl-Naphthalene (µg/L)	MTBE (µg/L)	Octane (µg/L)
MDL=	2.71	2.71	8.12	2.71
624267	nd	nd	nd	nd
624268	nd	nd	nd	nd
624269	nd	nd	nd	nd
624270	nd	nd	nd	nd
624271	nd	nd	nd	nd
624272	nd	nd	nd	nd
624273	nd	nd	nd	nd
624274	nd	nd	nd	nd
624275	nd	nd	nd	nd
Trip blanks				
624276	nd	nd	nd	nd
624277	nd	nd	nd	nd

Table 1. Concentration of volatile organic compounds detected in soil-gas samplers from the hyporheic zone and groundwater seeps, South Prong Creek Disposal Area, Fort Gordon, Georgia, 2009–2010—Continued.

[see figure 3 for sampler locations; µg/L, micrograms per liter; MDL, method detection level; nd, not detected; TPH, total petroleum hydrocarbons; BTEX, benzene, toluene, ethylbenzene, and xylenes; MTBE, methyl *tert*-butyl ether; DCA, dichloroethane; TCA, trichloroethane; TCE, trichloroethylene; DCE, dichloroethylene; PCE, perchloroethylene; DCB, dichlorobenzene; *c,* cis*; t,* trans*; m,* meta*; p,* para*; o,* ortho; CCl_4, carbon tetrachloride; C_{11}, C_{13}, and C_{15}, undecane, tridecane, and pentadecane, respectively; --, not applicable]

Sampler number	C_{11}, C_{13}, &C_{15} (µg/L)	Undecane (µg/L)	Tridecane (µg/L)	Pentadecane (µg/L)
MDL=	---	5.41	2.71	2.71
624267	nd	nd	nd	nd
624268	nd	nd	nd	nd
624269	nd	nd	nd	nd
624270	nd	nd	nd	nd
624271	nd	nd	nd	nd
624272	nd	nd	nd	nd
624273	nd	nd	nd	nd
624274	nd	nd	nd	nd
624275	nd	nd	nd	nd
Trip blanks				
624276	nd	nd	nd	nd
624277	nd	nd	nd	nd

Table 1. Concentration of volatile organic compounds detected in soil-gas samplers from the hyporheic zone and groundwater seeps, South Prong Creek Disposal Area, Fort Gordon, Georgia, 2009–2010—Continued.

[see figure 3 for sampler locations; µg/L, micrograms per liter; MDL, method detection level; nd, not detected; TPH, total petroleum hydrocarbons; BTEX, benzene, toluene, ethylbenzene, and xylenes; MTBE, methyl *tert*-butyl ether; DCA, dichloroethane; TCA, trichloroethane; TCE, trichloroethylene; DCE, dichloroethylene; PCE, perchloroethylene; DCB, dichlorobenzene; *c,* cis*; t,* trans*; m,* meta*; p,* para*; o,* ortho; CCl_4, carbon tetrachloride; C_{11}, C_{13}, and C_{15}, undecane, tridecane, and pentadecane, respectively; --, not applicable]

Sampler number	Trimethyl benzenes (µg/L)	1,2,4-Trimethyl benzene (µg/L)	1,3,5-Trimethyl benzene (µg/L)	1,1-DCA (µg/L)	Chloroform (µg/L)	1,1,1-TCA (µg/L)	1,2-DCA (µg/L)
MDL=	---	2.71	4.06	2.71	2.71	4.06	2.71
624267	nd	nd	nd	nd	nd	nd	nd
624268	nd	nd	nd	nd	nd	nd	nd
624269	nd	nd	nd	nd	nd	nd	nd
624270	nd	nd	nd	nd	nd	nd	nd
624271	nd	nd	nd	nd	nd	nd	nd
624272	nd	nd	nd	nd	nd	nd	nd
624273	nd	nd	nd	nd	nd	nd	nd
624274	nd	nd	nd	nd	nd	nd	nd
624275	nd	nd	nd	nd	nd	nd	nd
Trip blanks							
624276	nd	nd	nd	nd	nd	nd	nd
624277	nd	nd	nd	nd	nd	nd	nd

Table 1. Concentration of volatile organic compounds detected in soil-gas samplers from the hyporheic zone and groundwater seeps, South Prong Creek Disposal Area, Fort Gordon, Georgia, 2009–2010—Continued.

[see figure 3 for sampler locations; µg/L, micrograms per liter; MDL, method detection level; nd, not detected; TPH, total petroleum hydrocarbons; BTEX, benzene, toluene, ethylbenzene, and xylenes; MTBE, methyl *tert*-butyl ether; DCA, dichloroethane; TCA, trichloroethane; TCE, trichloroethylene; DCE, dichloroethylene; PCE, perchloroethylene; DCB, dichlorobenzene; *c,* cis*; t,* trans*; m,* meta*; p,* para*; o,* ortho; CCl_4, carbon tetrachloride; C_{11}, C_{13}, and C_{15}, undecane, tridecane, and pentadecane, respectively; --, not applicable]

Sampler number	TCE (µg/L)	*c,t*-1,2-DCE (µg/L)	*t*-1,2-DCE (µg/L)	*c*-1,2-DCE (µg/L)	PCE (µg/L)
MDL=	2.71	---	6.22	4.18	2.71
624267	nd	nd	nd	nd	nd
624268	nd	nd	nd	nd	nd
624269	nd	nd	nd	nd	nd
624270	nd	nd	nd	nd	nd
624271	nd	nd	nd	nd	nd
624272	nd	nd	nd	nd	nd
624273	nd	nd	nd	nd	nd
624274	nd	nd	nd	nd	nd
624275	nd	nd	nd	nd	nd
Trip blanks					
624276	nd	nd	nd	nd	nd
624277	nd	nd	nd	nd	nd

Table 1. Concentration of volatile organic compounds detected in soil-gas samplers from the hyporheic zone and groundwater seeps, South Prong Creek Disposal Area, Fort Gordon, Georgia, 2009–2010—Continued.

[see figure 3 for sampler locations; µg/L, micrograms per liter; MDL, method detection level; nd, not detected; TPH, total petroleum hydrocarbons; BTEX, benzene, toluene, ethylbenzene, and xylenes; MTBE, methyl *tert*-butyl ether; DCA, dichloroethane; TCA, trichloroethane; TCE, trichloroethylene; DCE, dichloroethylene; PCE, perchloroethylene; DCB, dichlorobenzene; *c,* cis*; t,* trans*; m,* meta*; p,* para*; o,* ortho; CCl_4, carbon tetrachloride; C_{11}, C_{13}, and C_{15}, undecane, tridecane, and pentadecane, respectively; --, not applicable]

Sampler number	1,4-DCB (µg/L)	CCl_4 (µg/L)	1,1,2-TCA (µg/L)	Chlorobenzene (µg/L)	1,1,1,2-Tetrachloroethane (µg/L)	1,1,2,2-Tetrachloroethane (µg/L)
MDL=	2.71	4.06	2.71	2.71	4.06	2.71
624267	nd	nd	nd	nd	nd	nd
624268	nd	nd	nd	nd	nd	nd
624269	nd	nd	nd	nd	nd	nd
624270	nd	nd	nd	nd	nd	nd
624271	nd	nd	nd	nd	nd	nd
624272	nd	nd	nd	nd	nd	nd
624273	nd	nd	nd	nd	nd	nd
624274	nd	nd	nd	nd	nd	nd
624275	nd	nd	nd	nd	nd	nd
Trip blanks						
624276	nd	nd	nd	nd	nd	nd
624277	nd	nd	nd	nd	nd	nd

Table 1. Concentration of volatile organic compounds detected in soil-gas samplers from the hyporheic zone and groundwater seeps, South Prong Creek Disposal Area, Fort Gordon, Georgia, 2009–2010—Continued.

[see figure 3 for sampler locations; µg/L, micrograms per liter; MDL, method detection level; nd, not detected; TPH, total petroleum hydrocarbons; BTEX, benzene, toluene, ethylbenzene, and xylenes; MTBE, methyl *tert*-butyl ether; DCA, dichloroethane; TCA, trichloroethane; TCE, trichloroethylene; DCE, dichloroethylene; PCE, perchloroethylene; DCB, dichlorobenzene; *c,* cis*; t,* trans*; m,* meta*; p,* para*; o,* ortho; CCl_4, carbon tetrachloride; C_{11}, C_{13}, and C_{15}, undecane, tridecane, and pentadecane, respectively; --, not applicable]

Sampler number	1,3-Dichlorobenzene (µg/L)	1,2-Dichlorobenzene (µg/L)
MDL=	2.71	2.71
624267	nd	nd
624268	nd	nd
624269	nd	nd
624270	nd	nd
624271	nd	nd
624272	nd	nd
624273	nd	nd
624274	nd	nd
624275	nd	nd
Trip blanks		
624276	nd	nd
624277	nd	nd

Table 2. Mass of volatile organic compounds detected in soil-gas samplers from the South Prong Creek Disposal Area, Fort Gordon, Georgia, 2009–2010.

[see figure 5 for sampler locations; µg, micrograms; MDL, method detection level; nd, not detected; bdl, below detection level; TPH, total petroleum hydrocarbons; BTEX, benzene, toluene, ethylbenzene, and xylenes; MTBE, methyl *tert*-butyl ether; DCA, dichloroethane; TCA, trichloroethane; TCE, trichloroethylene; DCE, dichloroethylene; PCE, perchloroethylene; DCB, dichlorobenzene; *c,* cis*; t,* trans*; m,* meta*; p,* para*; o,* ortho; CCl_4, carbon tetrachloride; C_{11}, C_{13}, and C_{15}, undecane, tridecane, and pentadecane, respectively; --, not applicable]

Sampler number	TPH (µg)	BTEX (µg)	Benzene (µg)	Toluene (µg)	Ethylbenzene (µg)	*m*-,*p*-Xylene (µg)	*o*-Xylene (µg)
MDL=	0.02	---	0.02	0.02	0.02	0.03	0.02
637996	1.31	nd	nd	nd	nd	nd	nd
637997	64.24	0.18	nd	0.18	nd	nd	nd
637998	71.56	0.06	nd	0.06	nd	nd	nd
637999	3.43	nd	nd	nd	nd	nd	nd
638000	1.73	nd	nd	nd	nd	nd	nd
638001	1.81	nd	nd	nd	nd	nd	nd
638002	1.93	0.00	bdl	nd	nd	nd	nd
638003	2.05	nd	nd	nd	nd	nd	nd
638004	5.28	nd	nd	nd	nd	nd	nd
638005	18.98	0.00	bdl	bdl	nd	nd	nd
638006	1.86	nd	nd	nd	nd	nd	nd
638007	6.04	nd	nd	nd	nd	nd	nd
638008	1.26	nd	nd	nd	nd	nd	nd
638009	1.64	nd	nd	nd	nd	nd	nd
638010	2.15	nd	nd	nd	nd	nd	nd
638011	4.09	4.48	0.02	0.92	0.31	2.25	0.98
638012	0.71	nd	nd	nd	nd	nd	nd
638013	147.09	0.02	bdl	0.02	nd	nd	bdl
638014	1.43	0.03	nd	0.03	nd	nd	bdl
638021	2.42	nd	nd	nd	nd	nd	nd
638022	1.76	0.31	0.28	0.02	bdl	bdl	nd
638023	1.92	nd	nd	nd	nd	nd	nd
638024	51.44	0.06	nd	0.06	nd	nd	nd
638025	73.01	nd	nd	nd	nd	nd	nd
638026	9.16	nd	nd	nd	nd	nd	nd
638027	8.27	0.00	nd	bdl	nd	nd	nd
638028	69.32	0.18	nd	0.18	nd	bdl	nd
638029	63.79	nd	nd	nd	nd	nd	nd
638030	3.63	nd	nd	nd	nd	nd	nd
638031	6.37	0.00	bdl	nd	nd	nd	nd
638032	2.00	0.02	0.02	bdl	nd	nd	nd
638033	1.60	0.00	bdl	nd	nd	nd	nd
638034	2.07	0.10	0.06	0.05	bdl	bdl	bdl
638035	1.46	nd	nd	nd	nd	nd	nd
638036	1.61	nd	nd	nd	nd	nd	nd
638037	7.07	nd	nd	nd	nd	nd	nd
638038	1.61	0.00	nd	bdl	nd	nd	nd

Table 2. Mass of volatile organic compounds detected in soil-gas samplers from the South Prong Creek Disposal Area, Fort Gordon, Georgia, 2009–2010—Continued.

[see figure 5 for sampler locations; µg, micrograms; MDL, method detection level; nd, not detected; bdl, below detection level; TPH, total petroleum hydrocarbons; BTEX, benzene, toluene, ethylbenzene, and xylenes; MTBE, methyl *tert*-butyl ether; DCA, dichloroethane; TCA, trichloroethane; TCE, trichloroethylene; DCE, dichloroethylene; PCE, perchloroethylene; DCB, dichlorobenzene; *c,* cis*; t,* trans*; m,* meta*; p,* para*; o,* ortho; CCl_4, carbon tetrachloride; C_{11}, C_{13}, and C_{15}, undecane, tridecane, and pentadecane, respectively; --, not applicable]

Sampler number	TPH (µg)	BTEX (µg)	Benzene (µg)	Toluene (µg)	Ethylbenzene (µg)	*m*-,*p*-Xylene (µg)	*o*-Xylene (µg)
MDL=	0.02	---	0.02	0.02	0.02	0.03	0.02
638039	1.47	nd	nd	nd	nd	nd	nd
638040	1.54	nd	nd	nd	nd	nd	nd
638041	1.93	4.12	bdl	0.76	0.29	2.13	0.94
638042	1.43	0.00	bdl	nd	nd	nd	nd
638043	1.90	nd	nd	nd	nd	nd	nd
638044	32.25	0.02	nd	0.02	nd	nd	nd
638045	1.36	nd	nd	nd	nd	nd	nd
638046	65.38	0.07	nd	0.07	nd	nd	nd
638047	10.43	0.03	nd	0.03	nd	nd	nd
638048	7.64	nd	nd	nd	nd	nd	nd
638049	1.88	nd	nd	nd	nd	nd	nd
638050	1.03	nd	nd	nd	nd	nd	nd
638051	27.48	nd	nd	nd	nd	nd	nd
				Trip blanks			
638052	0.21	nd	nd	nd	nd	nd	nd
638053	0.19	nd	nd	nd	nd	nd	nd
638054	0.20	nd	nd	nd	nd	nd	nd

Table 2. Mass of volatile organic compounds detected in soil-gas samplers from the South Prong Creek Disposal Area, Fort Gordon, Georgia, 2009–2010—Continued.

[see figure 5 for sampler locations; µg, micrograms; MDL, method detection level; nd, not detected; bdl, below detection level; TPH, total petroleum hydrocarbons; BTEX, benzene, toluene, ethylbenzene, and xylenes; MTBE, methyl *tert*-butyl ether; DCA, dichloroethane; TCA, trichloroethane; TCE, trichloroethylene; DCE, dichloroethylene; PCE, perchloroethylene; DCB, dichlorobenzene; *c,* cis*; t,* trans*; m,* meta*; p,* para*; o,* ortho; CCl_4, carbon tetrachloride; C_{11}, C_{13}, and C_{15}, undecane, tridecane, and pentadecane, respectively; --, not applicable]

Sampler number	Naphthalene (µg)	2-Methyl-naphthalene (µg)	MTBE (µg)	Octane (µg)
MDL=	0.02	0.02	0.03	0.02
637996	nd	nd	nd	nd
637997	nd	nd	nd	nd
637998	nd	nd	nd	nd
637999	nd	nd	nd	nd
638000	nd	nd	nd	nd
638001	nd	nd	nd	0.02
638002	nd	nd	nd	nd
638003	nd	nd	nd	nd
638004	nd	nd	nd	nd
638005	bdl	bdl	nd	nd
638006	nd	nd	nd	nd
638007	nd	nd	nd	nd
638008	nd	nd	nd	nd
638009	nd	nd	nd	nd
638010	nd	nd	nd	nd
638011	0.07	bdl	nd	0.07
638012	nd	nd	nd	nd
638013	nd	nd	nd	bdl
638014	nd	nd	nd	nd
638021	nd	nd	nd	nd
638022	nd	nd	bdl	nd
638023	nd	nd	nd	nd
638024	nd	bdl	nd	nd
638025	nd	nd	nd	nd
638026	nd	bdl	nd	nd
638027	nd	nd	nd	nd
638028	bdl	nd	nd	nd
638029	nd	nd	nd	nd
638030	nd	nd	nd	nd
638031	nd	nd	nd	nd
638032	nd	nd	nd	nd
638033	nd	nd	nd	nd
638034	nd	nd	nd	nd
638035	nd	nd	nd	nd
638036	nd	nd	nd	nd

Table 2. Mass of volatile organic compounds detected in soil-gas samplers from the South Prong Creek Disposal Area, Fort Gordon, Georgia, 2009–2010—Continued.

[see figure 5 for sampler locations; µg, micrograms; MDL, method detection level; nd, not detected; bdl, below detection level; TPH, total petroleum hydrocarbons; BTEX, benzene, toluene, ethylbenzene, and xylenes; MTBE, methyl *tert*-butyl ether; DCA, dichloroethane; TCA, trichloroethane; TCE, trichloroethylene; DCE, dichloroethylene; PCE, perchloroethylene; DCB, dichlorobenzene; *c,* cis*; t,* trans*; m,* meta*; p,* para*; o,* ortho; CCl_4, carbon tetrachloride; C_{11}, C_{13}, and C_{15}, undecane, tridecane, and pentadecane, respectively; --, not applicable]

Sampler number	Naphthalene (µg)	2-Methyl-naphthalene (µg)	MTBE (µg)	Octane (µg)
MDL=	0.02	0.02	0.03	0.02
638037	nd	bdl	nd	nd
638038	nd	nd	nd	nd
638039	nd	nd	nd	nd
638040	nd	nd	nd	nd
638041	0.06	bdl	nd	0.06
638042	nd	nd	nd	nd
638043	nd	nd	nd	nd
638044	nd	nd	nd	nd
638045	nd	nd	nd	nd
638046	nd	nd	nd	nd
638047	nd	nd	nd	nd
638048	nd	nd	nd	nd
638049	nd	nd	nd	nd
638050	nd	nd	nd	nd
638051	nd	nd	nd	nd
Trip blanks				
638052	nd	nd	nd	nd
638053	nd	nd	nd	nd
638054	nd	nd	nd	nd

Table 2. Mass of volatile organic compounds detected in soil-gas samplers from the South Prong Creek Disposal Area, Fort Gordon, Georgia, 2009–2010—Continued.

[see figure 5 for sampler locations; µg, micrograms; MDL, method detection level; nd, not detected; bdl, below detection level; TPH, total petroleum hydrocarbons; BTEX, benzene, toluene, ethylbenzene, and xylenes; MTBE, methyl *tert*-butyl ether; DCA, dichloroethane; TCA, trichloroethane; TCE, trichloroethylene; DCE, dichloroethylene; PCE, perchloroethylene; DCB, dichlorobenzene; *c,* cis*; t,* trans*; m,* meta*; p,* para*; o,* ortho; CCl_4, carbon tetrachloride; C_{11}, C_{13}, and C_{15}, undecane, tridecane, and pentadecane, respectively; --, not applicable]

Sampler number	C_{11}, C_{13}, &C_{15} (µg)	Undecane (µg)	Tridecane (µg)	Pentadecane (µg)
MDL=	---	0.04	0.02	0.02
637996	0.00	nd	nd	bdl
637997	nd	nd	nd	nd
637998	0.02	nd	nd	0.02
637999	0.02	bdl	bdl	0.02
638000	nd	nd	nd	nd
638001	0.06	0.06	nd	nd
638002	nd	nd	nd	nd
638003	0.00	bdl	nd	nd
638004	nd	nd	nd	nd
638005	0.08	0.08	bdl	nd
638006	0.00	nd	bdl	nd
638007	0.12	0.12	bdl	nd
638008	0.00	nd	nd	bdl
638009	0.00	nd	nd	bdl
638010	0.00	nd	bdl	nd
638011	0.05	0.05	nd	nd
638012	nd	nd	nd	nd
638013	110.83	109.72	1.11	nd
638014	nd	nd	nd	nd
638021	0.00	nd	bdl	nd
638022	0.00	nd	bdl	bdl
638023	0.05	0.05	bdl	bdl
638024	0.00	nd	bdl	nd
638025	52.61	50.79	1.83	nd
638026	0.06	0.06	bdl	nd
638027	0.00	bdl	bdl	nd
638028	0.04	nd	0.04	nd
638029	46.84	46.44	0.40	nd
638030	0.16	0.16	bdl	nd
638031	0.00	bdl	nd	nd
638032	0.00	bdl	nd	nd
638033	0.00	nd	nd	bdl
638034	0.00	bdl	bdl	bdl
638035	0.00	bdl	nd	bdl
638036	0.00	nd	bdl	nd
638037	0.43	0.43	bdl	bdl

Table 2. Mass of volatile organic compounds detected in soil-gas samplers from the South Prong Creek Disposal Area, Fort Gordon, Georgia, 2009–2010—Continued.

[see figure 5 for sampler locations; µg, micrograms; MDL, method detection level; nd, not detected; bdl, below detection level; TPH, total petroleum hydrocarbons; BTEX, benzene, toluene, ethylbenzene, and xylenes; MTBE, methyl *tert*-butyl ether; DCA, dichloroethane; TCA, trichloroethane; TCE, trichloroethylene; DCE, dichloroethylene; PCE, perchloroethylene; DCB, dichlorobenzene; *c,* cis*; t,* trans*; m,* meta*; p,* para*; o,* ortho; CCl_4, carbon tetrachloride; C_{11}, C_{13}, and C_{15}, undecane, tridecane, and pentadecane, respectively; --, not applicable]

Sampler number	C_{11}, C_{13}, &C_{15} (µg)	Undecane (µg)	Tridecane (µg)	Pentadecane (µg)
MDL=	---	0.04	0.02	0.02
638038	0.00	nd	nd	bdl
638039	0.00	bdl	bdl	bdl
638040	0.00	bdl	nd	bdl
638041	0.00	bdl	nd	bdl
638042	0.00	nd	nd	bdl
638043	0.00	nd	nd	bdl
638044	0.00	nd	bdl	bdl
638045	0.00	nd	nd	bdl
638046	0.00	nd	nd	bdl
638047	0.00	bdl	nd	bdl
638048	0.00	bdl	nd	nd
638049	0.00	nd	bdl	bdl
638050	nd	nd	nd	nd
638051	0.00	nd	bdl	bdl
		Trip blanks		
638052	nd	nd	nd	nd
638053	nd	nd	nd	nd
638054	nd	nd	nd	nd

Table 2. Mass of volatile organic compounds detected in soil-gas samplers from the South Prong Creek Disposal Area, Fort Gordon, Georgia, 2009–2010—Continued.

[see figure 5 for sampler locations; µg, micrograms; MDL, method detection level; nd, not detected; bdl, below detection level; TPH, total petroleum hydrocarbons; BTEX, benzene, toluene, ethylbenzene, and xylenes; MTBE, methyl *tert*-butyl ether; DCA, dichloroethane; TCA, trichloroethane; TCE, trichloroethylene; DCE, dichloroethylene; PCE, perchloroethylene; DCB, dichlorobenzene; *c,* cis*; t,* trans*; m,* meta*; p,* para*; o,* ortho; CCl_4, carbon tetrachloride; C_{11}, C_{13}, and C_{15}, undecane, tridecane, and pentadecane, respectively; --, not applicable]

Sampler number	Trimethyl benzenes (µg)	1,2,4-Trimethyl benzene (µg)	1,3,5-Trimethyl benzene (µg)	1,1-DCA (µg)	Chloroform (µg)	1,1,1-TCA (µg)	1,2-DCA (µg)
MDL=	---	0.02	0.03	0.02	0.02	0.03	0.02
637996	nd	nd	nd	nd	nd	nd	nd
637997	nd	nd	nd	nd	nd	nd	nd
637998	nd	nd	nd	nd	nd	nd	nd
637999	nd	nd	nd	nd	nd	nd	nd
638000	nd	nd	nd	nd	nd	nd	nd
638001	nd	nd	nd	nd	nd	nd	nd
638002	nd	nd	nd	nd	nd	nd	nd
638003	bdl	bdl	nd	nd	nd	nd	nd
638004	nd	nd	nd	nd	nd	nd	nd
638005	nd	nd	nd	nd	nd	nd	nd
638006	nd	nd	nd	nd	nd	nd	nd
638007	nd	nd	nd	nd	nd	nd	nd
638008	nd	nd	nd	nd	nd	nd	nd
638009	nd	nd	nd	nd	nd	nd	nd
638010	nd	nd	nd	nd	bdl	nd	nd
638011	1.84	1.44	0.41	nd	nd	nd	nd
638012	nd	nd	nd	nd	0.02	nd	nd
638013	nd	nd	nd	nd	nd	nd	nd
638014	nd	nd	nd	nd	nd	nd	nd
638021	nd	nd	nd	nd	nd	nd	nd
638022	nd	nd	nd	nd	nd	nd	nd
638023	nd	nd	nd	nd	nd	nd	nd
638024	nd	nd	nd	nd	nd	nd	nd
638025	nd	nd	nd	nd	nd	nd	nd
638026	nd	nd	nd	nd	nd	nd	nd
638027	nd	nd	nd	nd	nd	nd	nd
638028	nd	nd	nd	nd	nd	nd	nd
638029	bdl	nd	bdl	nd	nd	nd	nd
638030	nd	nd	nd	nd	nd	nd	nd
638031	nd	nd	nd	nd	0.02	nd	nd
638032	nd	nd	nd	nd	0.04	nd	nd
638033	nd	nd	nd	nd	nd	nd	nd
638034	nd	nd	nd	nd	nd	nd	nd
638035	nd	nd	nd	nd	nd	nd	nd
638036	nd	nd	nd	nd	nd	nd	nd

Table 2. Mass of volatile organic compounds detected in soil-gas samplers from the South Prong Creek Disposal Area, Fort Gordon, Georgia, 2009–2010—Continued.

[see figure 5 for sampler locations; µg, micrograms; MDL, method detection level; nd, not detected; bdl, below detection level; TPH, total petroleum hydrocarbons; BTEX, benzene, toluene, ethylbenzene, and xylenes; MTBE, methyl *tert*-butyl ether; DCA, dichloroethane; TCA, trichloroethane; TCE, trichloroethylene; DCE, dichloroethylene; PCE, perchloroethylene; DCB, dichlorobenzene; *c,* cis*; t,* trans*; m,* meta*; p,* para*; o,* ortho; CCl_4, carbon tetrachloride; C_{11}, C_{13}, and C_{15}, undecane, tridecane, and pentadecane, respectively; --, not applicable]

Sampler number	Trimethyl benzenes (µg)	1,2,4-Trimethyl benzene (µg)	1,3,5-Trimethyl benzene (µg)	1,1-DCA (µg)	Chloroform (µg)	1,1,1-TCA (µg)	1,2-DCA (µg)
MDL=	---	0.02	0.03	0.02	0.02	0.03	0.02
638037	nd	nd	nd	nd	nd	nd	nd
638038	nd	nd	nd	nd	nd	nd	nd
638039	nd	nd	nd	nd	nd	nd	nd
638040	nd	nd	nd	nd	nd	nd	nd
638041	1.83	1.43	0.40	nd	nd	nd	nd
638042	nd	nd	nd	nd	nd	nd	nd
638043	nd	nd	nd	nd	nd	nd	nd
638044	nd	nd	nd	nd	nd	nd	nd
638045	nd	nd	nd	nd	nd	nd	nd
638046	nd	nd	nd	nd	nd	nd	nd
638047	nd	nd	nd	nd	nd	nd	nd
638048	nd	nd	nd	nd	nd	nd	nd
638049	nd	nd	nd	nd	nd	nd	nd
638050	nd	nd	nd	nd	nd	nd	nd
638051	bdl	bdl	nd	nd	0.11	nd	nd
Trip blanks							
638052	nd	nd	nd	nd	nd	nd	nd
638053	nd	nd	nd	nd	nd	nd	nd
638054	nd	nd	nd	nd	nd	nd	nd

Table 2. Mass of volatile organic compounds detected in soil-gas samplers from the South Prong Creek Disposal Area, Fort Gordon, Georgia, 2009–2010—Continued.

[see figure 5 for sampler locations; µg, micrograms; MDL, method detection level; nd, not detected; bdl, below detection level; TPH, total petroleum hydrocarbons; BTEX, benzene, toluene, ethylbenzene, and xylenes; MTBE, methyl *tert*-butyl ether; DCA, dichloroethane; TCA, trichloroethane; TCE, trichloroethylene; DCE, dichloroethylene; PCE, perchloroethylene; DCB, dichlorobenzene; *c,* cis*; t,* trans*; m,* meta*; p,* para*; o,* ortho; CCl_4, carbon tetrachloride; C_{11}, C_{13}, and C_{15}, undecane, tridecane, and pentadecane, respectively; --, not applicable]

Sampler number	TCE (µg)	*c,t*-1,2-DCE (µg)	*t*-1,2-DCE (µg)	*c*-1,2-DCE (µg)	PCE (µg)
MDL=	0.02	---	0.04	0.03	0.02
637996	nd	nd	nd	nd	nd
637997	nd	nd	nd	nd	nd
637998	nd	nd	nd	nd	nd
637999	0.03	nd	nd	nd	nd
638000	nd	nd	nd	nd	nd
638001	nd	nd	nd	nd	nd
638002	nd	nd	nd	nd	nd
638003	nd	nd	nd	nd	nd
638004	nd	nd	nd	nd	nd
638005	nd	nd	nd	nd	0.11
638006	nd	nd	nd	nd	nd
638007	nd	nd	nd	nd	nd
638008	0.02	nd	nd	nd	0.03
638009	nd	nd	nd	nd	nd
638010	nd	nd	nd	nd	nd
638011	nd	nd	nd	nd	nd
638012	nd	nd	nd	nd	nd
638013	0.06	bdl	nd	bdl	0.16
638014	bdl	nd	nd	nd	nd
638021	0.12	nd	nd	nd	nd
638022	nd	nd	nd	nd	nd
638023	nd	nd	nd	nd	nd
638024	bdl	nd	nd	nd	nd
638025	nd	nd	nd	nd	nd
638026	nd	nd	nd	nd	nd
638027	nd	nd	nd	nd	nd
638028	nd	nd	nd	nd	nd
638029	bdl	nd	nd	nd	nd
638030	nd	nd	nd	nd	0.05
638031	nd	nd	nd	nd	nd
638032	nd	nd	nd	nd	nd
638033	nd	nd	nd	nd	nd
638034	nd	nd	nd	nd	nd
638035	nd	nd	nd	nd	nd
638036	nd	nd	nd	nd	nd
638037	nd	nd	nd	nd	nd

Table 2. Mass of volatile organic compounds detected in soil-gas samplers from the South Prong Creek Disposal Area, Fort Gordon, Georgia, 2009–2010—Continued.

[see figure 5 for sampler locations; µg, micrograms; MDL, method detection level; nd, not detected; bdl, below detection level; TPH, total petroleum hydrocarbons; BTEX, benzene, toluene, ethylbenzene, and xylenes; MTBE, methyl *tert*-butyl ether; DCA, dichloroethane; TCA, trichloroethane; TCE, trichloroethylene; DCE, dichloroethylene; PCE, perchloroethylene; DCB, dichlorobenzene; *c,* cis*; t,* trans*; m,* meta*; p,* para*; o,* ortho; CCl_4, carbon tetrachloride; C_{11}, C_{13}, and C_{15}, undecane, tridecane, and pentadecane, respectively; --, not applicable]

Sampler number	TCE (µg)	*c,t*-1,2-DCE (µg)	*t*-1,2-DCE (µg)	*c*-1,2-DCE (µg)	PCE (µg)
MDL=	0.02	---	0.04	0.03	0.02
638038	nd	nd	nd	nd	nd
638039	nd	nd	nd	nd	0.02
638040	nd	nd	nd	nd	nd
638041	nd	nd	nd	nd	nd
638042	nd	nd	nd	nd	nd
638043	nd	nd	nd	nd	nd
638044	nd	nd	nd	nd	nd
638045	nd	nd	nd	nd	nd
638046	nd	nd	nd	nd	nd
638047	nd	nd	nd	nd	nd
638048	nd	nd	nd	nd	nd
638049	nd	nd	nd	nd	nd
638050	nd	nd	nd	nd	nd
638051	nd	nd	nd	nd	nd
Trip blanks					
638052	nd	nd	nd	nd	nd
638053	nd	nd	nd	nd	nd
638054	nd	nd	nd	nd	nd

Table 2. Mass of volatile organic compounds detected in soil-gas samplers from the South Prong Creek Disposal Area, Fort Gordon, Georgia, 2009–2010—Continued.

[see figure 5 for sampler locations; µg, micrograms; MDL, method detection level; nd, not detected; bdl, below detection level; TPH, total petroleum hydrocarbons; BTEX, benzene, toluene, ethylbenzene, and xylenes; MTBE, methyl *tert*-butyl ether; DCA, dichloroethane; TCA, trichloroethane; TCE, trichloroethylene; DCE, dichloroethylene; PCE, perchloroethylene; DCB, dichlorobenzene; *c,* cis*; t,* trans*; m,* meta*; p,* para*; o,* ortho; CCl_4, carbon tetrachloride; C_{11}, C_{13}, and C_{15}, undecane, tridecane, and pentadecane, respectively; --, not applicable]

Sampler number	1,4-DCB (µg)	CCl_4 (µg)	1,1,2-TCA (µg)	Chlorobenzene (µg)	1,1,1,2-Tetrachloroethane (µg)	1,1,2,2-Tetrachloroethane (µg)
MDL=	0.02	0.03	0.02	0.02	0.03	0.02
637996	nd	nd	nd	nd	nd	nd
637997	nd	nd	nd	nd	nd	nd
637998	nd	nd	nd	nd	nd	nd
637999	nd	nd	nd	nd	nd	nd
638000	nd	nd	nd	nd	nd	nd
638001	nd	nd	nd	nd	nd	nd
638002	nd	nd	nd	nd	nd	nd
638003	nd	nd	nd	nd	nd	nd
638004	nd	nd	nd	nd	nd	nd
638005	nd	nd	nd	nd	nd	nd
638006	nd	nd	nd	nd	nd	nd
638007	nd	nd	nd	nd	nd	nd
638008	nd	nd	nd	nd	nd	nd
638009	nd	nd	nd	nd	nd	nd
638010	nd	nd	nd	nd	nd	nd
638011	nd	nd	nd	nd	nd	nd
638012	nd	nd	nd	nd	nd	nd
638013	nd	nd	nd	nd	nd	nd
638014	nd	nd	nd	nd	nd	nd
638021	nd	nd	nd	nd	nd	nd
638022	nd	nd	nd	nd	nd	nd
638023	nd	nd	nd	nd	nd	nd
638024	nd	nd	nd	nd	nd	nd
638025	nd	nd	nd	nd	nd	nd
638026	nd	nd	nd	nd	nd	nd
638027	nd	nd	nd	nd	nd	nd
638028	nd	nd	nd	nd	nd	nd
638029	nd	nd	nd	nd	nd	nd
638030	nd	nd	nd	nd	nd	nd
638031	nd	nd	nd	nd	nd	nd
638032	nd	nd	nd	nd	nd	nd
638033	nd	nd	nd	nd	nd	nd
638034	nd	nd	nd	nd	nd	nd
638035	nd	nd	nd	nd	nd	nd
638036	nd	nd	nd	nd	nd	nd

Table 2. Mass of volatile organic compounds detected in soil-gas samplers from the South Prong Creek Disposal Area, Fort Gordon, Georgia, 2009–2010—Continued.

[see figure 5 for sampler locations; µg, micrograms; MDL, method detection level; nd, not detected; bdl, below detection level; TPH, total petroleum hydrocarbons; BTEX, benzene, toluene, ethylbenzene, and xylenes; MTBE, methyl *tert*-butyl ether; DCA, dichloroethane; TCA, trichloroethane; TCE, trichloroethylene; DCE, dichloroethylene; PCE, perchloroethylene; DCB, dichlorobenzene; *c,* cis*; t,* trans*; m,* meta*; p,* para*; o,* ortho; CCl_4, carbon tetrachloride; C_{11}, C_{13}, and C_{15}, undecane, tridecane, and pentadecane, respectively; --, not applicable]

Sampler number	1,4-DCB (µg)	CCl_4 (µg)	1,1,2-TCA (µg)	Chlorobenzene (µg)	1,1,1,2-Tetrachloroethane (µg)	1,1,2,2-Tetrachloroethane (µg)
MDL=	0.02	0.03	0.02	0.02	0.03	0.02
638037	nd	nd	nd	nd	nd	nd
638038	nd	nd	nd	nd	nd	nd
638039	nd	nd	nd	nd	nd	nd
638040	nd	nd	nd	nd	nd	nd
638041	nd	nd	nd	nd	nd	nd
638042	nd	nd	nd	nd	nd	nd
638043	nd	nd	nd	nd	nd	nd
638044	nd	nd	nd	nd	nd	nd
638045	nd	nd	nd	nd	nd	nd
638046	nd	nd	nd	nd	nd	nd
638047	nd	nd	nd	nd	nd	nd
638048	nd	nd	nd	nd	nd	nd
638049	nd	nd	nd	nd	nd	nd
638050	nd	nd	nd	nd	nd	nd
638051	nd	nd	nd	nd	nd	nd
Trip blanks						
638052	nd	nd	nd	nd	nd	nd
638053	nd	nd	nd	nd	nd	nd
638054	nd	nd	nd	nd	nd	nd

Table 2. Mass of volatile organic compounds detected in soil-gas samplers from the South Prong Creek Disposal Area, Fort Gordon, Georgia, 2009–2010—Continued.

[see figure 5 for sampler locations; µg, micrograms; MDL, method detection level; nd, not detected; bdl, below detection level; TPH, total petroleum hydrocarbons; BTEX, benzene, toluene, ethylbenzene, and xylenes; MTBE, methyl *tert*-butyl ether; DCA, dichloroethane; TCA, trichloroethane; TCE, trichloroethylene; DCE, dichloroethylene; PCE, perchloroethylene; DCB, dichlorobenzene; *c,* cis*; t,* trans*; m,* meta*; p,* para*; o,* ortho; CCl_4, carbon tetrachloride; C_{11}, C_{13}, and C_{15}, undecane, tridecane, and pentadecane, respectively; --, not applicable]

Sampler number	1,3-Dichlorobenzene (µg)	1,2-Dichlorobenzene (µg)
MDL=	0.02	0.02
637996	nd	nd
637997	nd	nd
637998	nd	nd
637999	nd	nd
638000	nd	nd
638001	nd	nd
638002	nd	nd
638003	nd	nd
638004	nd	nd
638005	nd	nd
638006	nd	nd
638007	nd	nd
638008	nd	nd
638009	nd	nd
638010	nd	nd
638011	nd	nd
638012	nd	nd
638013	nd	nd
638014	nd	nd
638021	nd	nd
638022	nd	nd
638023	nd	nd
638024	nd	nd
638025	nd	nd
638026	nd	nd
638027	nd	nd
638028	nd	nd
638029	nd	nd
638030	nd	nd
638031	nd	nd
638032	nd	nd
638033	nd	nd
638034	nd	nd
638035	nd	nd
638036	nd	nd

Table 2. Mass of volatile organic compounds detected in soil-gas samplers from the South Prong Creek Disposal Area, Fort Gordon, Georgia, 2009–2010—Continued.

[see figure 5 for sampler locations; µg, micrograms; MDL, method detection level; nd, not detected; bdl, below detection level; TPH, total petroleum hydrocarbons; BTEX, benzene, toluene, ethylbenzene, and xylenes; MTBE, methyl *tert*-butyl ether; DCA, dichloroethane; TCA, trichloroethane; TCE, trichloroethylene; DCE, dichloroethylene; PCE, perchloroethylene; DCB, dichlorobenzene; *c,* cis*; t,* trans*; m,* meta*; p,* para*; o,* ortho; CCl_4, carbon tetrachloride; C_{11}, C_{13}, and C_{15}, undecane, tridecane, and pentadecane, respectively; --, not applicable]

Sampler number	1,3-Dichlorobenzene (µg)	1,2-Dichlorobenzene (µg)
MDL=	0.02	0.02
638037	nd	nd
638038	nd	nd
638039	nd	nd
638040	nd	nd
638041	nd	nd
638042	nd	nd
638043	nd	nd
638044	nd	nd
638045	nd	nd
638046	nd	nd
638047	nd	nd
638048	nd	nd
638049	nd	nd
638050	nd	nd
638051	nd	nd
Trip blanks		
638052	nd	nd
638053	nd	nd
638054	nd	nd

Table 3. Mass of explosives and chemical agents detected in soil-gas samplers from the South Prong Creek Disposal Area, Fort Gordon, Georgia, 2009–2010—Continued.

[see figure 6 for sampler locations; µg, micrograms; MDL, method detection level; nd, not detected; bdl, below detection level; *p,* para; --, not applicable]

Sampler number	Site number	Dimethyldisulfide (µg)	Dimethylmethylphosphonate (µg)	1,4-Thioxane (µg)
MDL=		0.10	0.10	0.10
644247	1	nd	nd	nd
644248	2	nd	nd	nd
644249	3	bdl	nd	nd
644250	4	bdl	nd	nd
644251	5	nd	nd	nd
		Trip blanks		
644252	--	nd	nd	nd
644253	--	nd	nd	nd
644254	--	nd	nd	nd
644255	--	nd	nd	nd
644256	--	nd	nd	nd

Table 3. Mass of explosives and chemical agents detected in soil-gas samplers from the South Prong Creek Disposal Area, Fort Gordon, Georgia, 2009–2010—Continued.

[see figure 6 for sampler locations; µg, micrograms; MDL, method detection level; nd, not detected; bdl, below detection level; *p,* para; --, not applicable]

Sample number	Site number	Nitrobenzene (µg)	Diisopropylmethylphosphonate, (µg)	1,4-Dithiane (µg)	2-Nitrotoluene (µg)
MDL=		0.10	0.10	0.10	0.10
644247	1	nd	nd	nd	nd
644248	2	nd	nd	nd	nd
644249	3	nd	nd	nd	nd
644250	4	nd	nd	nd	nd
644251	5	nd	nd	nd	nd
			Trip blanks		
644252	--	nd	nd	nd	nd
644253	--	nd	nd	nd	nd
644254	--	nd	nd	nd	nd
644255	--	nd	nd	nd	nd
644256	--	nd	nd	nd	nd

Table 3. Mass of explosives and chemical agents detected in soil-gas samplers from the South Prong Creek Disposal Area, Fort Gordon, Georgia, 2009–2010—Continued.

[see figure 6 for sampler locations; µg, micrograms; MDL, method detection level; nd, not detected; bdl, below detection level; *p,* para; --, not applicable]

Sampler number	Site number	3-Nitrotoluene (µg)	4-Nitrotoluene (µg)	Thiodiglycol (µg)	Benzothiazole (µg)
MDL=		0.10	0.10	0.20	0.10
644247	1	nd	nd	nd	bdl
644248	2	nd	nd	nd	nd
644249	3	nd	nd	nd	nd
644250	4	nd	nd	nd	nd
644251	5	nd	nd	nd	nd
		Trip blanks			
644252	--	nd	nd	nd	nd
644253	--	nd	nd	nd	nd
644254	--	nd	nd	nd	nd
644255	--	nd	nd	nd	nd
644256	--	nd	nd	nd	nd

Table 3. Mass of explosives and chemical agents detected in soil-gas samplers from the South Prong Creek Disposal Area, Fort Gordon, Georgia, 2009–2010—Continued.

[see figure 6 for sampler locations; µg, micrograms; MDL, method detection level; nd, not detected; bdl, below detection level; *p,* para; --, not applicable]

Sampler number	Site number	Chloroacetophenones (µg)	*p*-Chlorophenyl-methylsulfide (µg)	1,3-Dinitrobenzene (µg)
MDL=		0.10	0.10	0.10
644247	1	nd	nd	nd
644248	2	nd	nd	nd
644249	3	nd	nd	nd
644250	4	nd	nd	nd
644251	5	nd	nd	nd
		Trip blanks		
644252	--	nd	nd	nd
644253	--	nd	nd	nd
644254	--	nd	nd	nd
644255	--	nd	nd	nd
644256	--	nd	nd	nd

Table 3. Mass of explosives and chemical agents detected in soil-gas samplers from the South Prong Creek Disposal Area, Fort Gordon, Georgia, 2009–2010—Continued.

[see figure 6 for sampler locations; µg, micrograms; MDL, method detection level; nd, not detected; bdl, below detection level; *p,* para; --, not applicable]

Sampler number	Site number	2,6-Dinitrotoluene (µg)	2,4-Dinitrotoluene (µg)	1,3,5-Trinitrobenzene (µg)
MDL=		0.10	0.10	0.10
644247	1	nd	bdl	nd
644248	2	nd	nd	nd
644249	3	nd	nd	nd
644250	4	nd	nd	nd
644251	5	nd	nd	nd
		Trip blanks		
644252	--	nd	nd	nd
644253	--	nd	nd	nd
644254	--	nd	nd	nd
644255	--	nd	nd	nd
644256	--	nd	nd	nd

Table 3. Mass of explosives and chemical agents detected in soil-gas samplers from the South Prong Creek Disposal Area, Fort Gordon, Georgia, 2009–2010—Continued.

[see figure 6 for sampler locations; µg, micrograms; MDL, method detection level; nd, not detected; bdl, below detection level; *p,* para; --, not applicable]

Sampler number	Site number	*p*-chlorophenylmethylsulfoxide (µg)	*p*-chlorophenylmethylsulfone (µg)	2,4,6-Trinitrotoluene (µg)
MDL=		0.10	0.10	0.10
644247	1	nd	bdl	nd
644248	2	nd	nd	nd
644249	3	nd	bdl	nd
644250	4	nd	bdl	nd
644251	5	nd	bdl	nd
		Trip blanks		
644252	--	nd	bdl	nd
644253	--	nd	bdl	nd
644254	--	nd	bdl	nd
644255	--	nd	bdl	nd
644256	--	nd	bdl	nd

Table 4. Inorganic constituents detected in soil samples collected at the South Prong Creek Disposal Area from land surface to 6 inches below land surface, Fort Gordon, Georgia, September 28, 2010.

[see figure 6 for site locations; USEPA RSL, U.S. Environmental Protection Agency Regional Screening Level, Industrial Soil; SCDHEC, South Carolina Department of Health and Environmental Control; µg/g, micrograms per gram; mg/kg, milligrams per kilogram; --, not applicable; nr, not reportable; for soil, 1 µg/g is equivalent to 1 mg/kg, and 1 mg/kg is equivalent to 1 part per million (ppm); yellow highlight indicates value higher than SCDHEC background; *, Resource Conservation and Recovery Act (RCRA) metal; <, less than. Note: selenium and mercury were not analyzed]

Constituent	Site 1 (µg/g)	Site 2 (µg/g)	Site 3 (µg/g)	Site 4 (µg/g)	Site 5 (µg/g)	USEPA RSL (mg/kg)	SCDHEC Background (mg/kg)
Aluminum	15,400	18,400	14,800	10,000	12,600	990,000	13,528
Antimony	6.9	0.29	0.35	0.3	0.33	410	--
Arsenic*	1.9	<1	1	<1	<1	260	6.1
Barium*	152	61	63	71.5	73.5	190,000	38
Beryllium	0.45	0.18	0.2	0.13	0.22	2,000	0.6
Bismuth	nr	nr	nr	nr	nr	--	--
Cadmium*	0.04	<0.007	0.009	<0.007	0.009	800	1
Calcium	144	103	<100	201	104	--	699
Cerium	46.4	21.2	30.8	27.7	74.9	--	--
Cesium	1.5	0.52	0.35	0.39	0.34	--	--
Chromium*	14.6	18	15.6	12.3	13.6	1,500,000	16
Cobalt	1	0.9	0.71	0.47	0.67	300	4
Copper	17.3	7.2	8.1	6.8	8.6	41,000	9
Gallium	4.7	6.6	5.7	4.4	5.3	--	--
Iron	5,690	2,230	2,510	1,960	2,400	720,000	15,608
Lanthanium	20	11	15.7	14.3	36.8	--	--
Lead*	109	9.13	15.3	21.1	29.3	800	16
Lithium	8	4	3	2.6	3.5	2,000	--
Magnesium	457	146	162	177	168	--	988
Manganese	60	32.6	29.5	29.7	30.1	23,000	120
Molybdenum	0.45	1	0.94	0.8	2	5,100	--
Nickel	4.8	3.3	2.5	1.7	2.1	47,000	6
Niobium	4.6	10	11	8.8	11	--	--
Phosphorus	224	72.9	119	120	145	--	--
Potassium	883	916	860	554	1,050	--	856
Rubidium	10.4	5.4	4.7	3.3	5.9	--	--
Scandium	2.3	2.7	2.5	1.9	2.4	--	--
Silver*	<0.01	<0.01	0.012	0.024	0.025	5,100	4
Sodium	80.1	110	107	85.8	121	--	194
Strontium	38.5	9.2	9.8	13.2	8.6	610,000	--
Thallium	0.12	0.12	<0.08	0.12	0.1	--	4.5
Thorium	4.04	4.47	5.81	5.38	12.6	--	--
Titanium	1,420	3,560	3,750	2,960	3,480	--	--
Uranium	1.62	1.23	1.35	1.48	2.5	--	--
Vanadium	22.4	22.9	23.3	20.5	20.3	5,200	--
Yttrium	3.7	3	3.5	3.8	5.9	--	--
Zinc	15.9	8.7	9.9	8	8.3	310,000	23

Prepared by

U.S. Geological Survey
Science Publishing Network
Raleigh Publishing Service Center
3916 Sunset Ridge Road
Ralieigh, NC 27607

A PDF version of this publication is available online at
http://pubs.usgs.gov/of/2011/1079