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SITE INVESTIGATION REPORT

Hazardous Material Site

SMOKEY MOUNTAIN SMELTERS
KNOX COUNTY, TENNESSEE 37920
TN DIVISION OF SUPERFUND SITE # 47559
EPA ID # TN0002318277 ?

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EXECUTIVE SUMMARY
SITE INVESTIGATION REPORT
SMOKEY MOUNTAIN SMELTERS
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TN DIVISION OF SUPERFUND SITE # 47559
U.S. EPA TN0002318277

This Preliminary Assessment Report presents the findings of a study conducted at the Smokey Mountain Smelters (SMS) Site, 1508 Maryville Pike, Knox County, Tennessee. The Site is located in Knox County, just outside the Knoxville City Limits. The former manufacturing operations are inactive, and the Site is abandoned and unused.

Concern for the potential release of hazardous substances at the site is due to the nature of the former manufacturing operations (secondary aluminum smelting; agricultural chemical manufacturing), and past environmental violations.

The probable point of entry to surface water is believed to be the surface drainage to the nearby unnamed tributary of Flenniken Branch. The Stream is classified for Fish and Aquatic Life, Recreation, Irrigation, and Livestock Watering and Wildlife. At approximately 1.6 miles along the surface water pathway is the Flenniken Branch embayment of the Tennessee River (Fort Loudoun Lake) where the remainder of the surface water pathway is additionally classified for Domestic Water Supply, Industrial Water Supply, and Navigation.

Additional investigatory efforts are required to determine the type, depth, and quantity of hazardous substances and to determine the threats posed by air emissions from the wastes, by potentially contaminated groundwater, by potentially contaminated water and sediment in the surface water pathway, and by potentially contaminated soil on and off the Site.

The site is recommended for further investigation through the CERCLA process.

SITE INVESTIGATION REPORT
SMOKEY MOUNTAIN SMELTERS
KNOX COUNTY, TENNESSEE 37920
TN DIVISION OF SUPERFUND SITE # 47559
U.S. EPA ID # TN0002318277

1. INTRODUCTION

Under authority of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), the Tennessee Division of Superfund (TDSF), under contract with the United States Environmental Protection Agency (U.S. EPA), conducted a Site Investigation at the Smokey Mountain Smelters, 1508 Maryville Pike, Knoxville, Tennessee, 37920. This site was assigned the identification number of TN0002318277 by the U.S. EPA (U.S. EPA 1998), and 47-559 by the State of Tennessee Department of Environment and Conservation. The purpose of this Site Investigation was to collect, analyze, and report the results of environmental samples, to collect information on the conditions at the site, to assess the potential threat to human health and the environment posed by the site, and to determine if this site requires further investigation and remediation under CERCLA. The information gathered was utilized to support evaluation of the site under the Hazard Ranking System (HRS). The site investigation included a review of hazardous substances potentially present at the Site, a review of previous site assessment data, gathering information and supporting documentation to characterize the human population and adjacent environment that could be impacted by any contamination present at the site, and interpretation of analytical results.

2. SITE DESCRIPTION AND REGULATORY HISTORY

2.1 Location

The Smokey Mountain Smelters Site is an inactive (White 1997; White 1995) secondary aluminum smelter (KCDAPC 1980) and agricultural chemical manufacturing facility (Appendix 1, Book 1819, page 689; TDC/DG 1956, page 251; USGS 1966) located just outside of the city limits of Knoxville, in Knox County, Tennessee, on Maryville Pike, State Secondary Route 33 (Vicinity Map, Figure 1). The geographic coordinates of this facility are 35 degrees, 55 minutes, and 9 seconds North Latitude, and 83 degrees, 55 minutes, and 36 seconds West Longitude (Site Plan, Figure 2), placing it in the fifth nth of the Knoxville Quadrangle (0147NW). The immediate area surrounding the facility is medium commercial and dense residential development. The property location, 1508 Maryville Pike, is that listed for the largest parcel, upon which the process building lies (Appendix 1, Ownership Card, Parcel 1).

Smokey Mountain Smelters, Inc., 1455 Maryville Pike, was issued the ID # TND098071061 by the U.S. EPA Office of Air and Radiation. The 1455 Maryville Pike address is believed to have been erroneously declared to be the address at which the aluminum smelter air contaminant source was to be operated (KCDAPC 1980). A contaminant source is not known to exist at 1455 Maryville Pike.

2.2 Site Description

The Smokey Mountain Smelters Site, as observed during October 1997 and August 1998, consists of one large industrial process building and several smaller outlying buildings, located on five parcels of real estate. The property (Property Map, Figure 3) totals approximately 13 acres (see Ownership Cards, Appendix 1), ranging in elevation from 890 to 940 feet. The largest building is approximately 100 feet wide, 300 feet long, and 50 feet high. It houses two natural gas fired rotary furnaces, one casting furnace, a large overhead crane, and provides dry storage for process raw materials. Large air ducts lead to two small outside baghouses near the southwest corner of the building. A portion of the north wall of the building has collapsed. Features outlying the main building include a small transformer area to the north, a burned office building or house across a paved driveway with truck scales farther to the north, a concrete building foundation to the northeast, two curious jumbled concrete slabs farther to the northeast, Site railroad tracks and a related building to the east, a 25 feet by 100 feet lagoon holding water to the southeast, a maintenance building to the south, and large continuous gray-colored waste piles covering most of the remaining property to the south. These features are shown in Figure 4 and in the photographs.

Some evidence indicates that the facility was also engaged in primary (White 1995) production of aluminum.

2.3 Operational History, Site Regulatory Status, and Waste Characteristics

A property deed (Appendix 1, Book 1691, Page 646) indicates part of the Site had been owned by American Agricultural Chemical Company. An on-site or nearby (Maupin 1997e) industrial well is named for Knoxville Fertilizer Company (TDC/DG 1956, page 251). It is believed the property operated prior to 1979 as an agricultural chemical manufacturing facility, which may have used settling ponds (USGS 1966) in it's manufacturing operations.

Smokey Mountain Smelters, a.k.a. Rotary Furnace, Inc., of 1455 [SIC] Maryville Pike, was established in 1979 (White 1995). In September 1979, (b) (6)
(b) (6) purchased the several tracts of the Site's property (Appendix 1, Book 1691, Page 646). The 1455 street number was submitted by Mr. Johnson to the Knox County Department of Air Pollution Control (KCDAPC) on a permit application (KCDAPC 1980), and the facility's address was always referred to as 1455 Maryville Pike thereafter by KCDAPC.

Raw materials included aluminum dross; the product was aluminum ingots (White 1995). Unapproved materials were sometimes charged to the rotary furnaces (KCDAPC 1989). Wastes included baghouse dust and slag from the furnaces. One estimate of the waste generation rate was 90-120 cubic yards per week (TDHE/DSWM 1990) approved as a special waste for disposal at a permitted solid waste disposal facility. It is unknown if any of this waste was ever taken to such a facility. Much of the waste was dumped on-site, and some of this may have been buried (KCDAPC 1983, Burress 1994). The dump had an ammonia odor, was not fenced in on all sides, and often was burning (KCDAPC 1983). The Knox County Department of Air Pollution Control received numerous complaints about the facility, performed many inspections, and cited many violations (KCDAPC 85, KCDAPC 1989).

Evidence indicates that the facility was also engaged in primary (White 1995) production of aluminum. No primary aluminum production cells, or "pots", and related heavy electrical equipment were observed during inspections at the facility. Large blocks of materials, stored inside the building, resemble spent anode or cathode materials from primary aluminum production. Such materials might contain recoverable aluminum.

Operations ceased sometime after May 1994 (Burress 1994; White 1995; White 1997).

Information regarding the facility's regulatory status has been found in the EPA's Facility Index System (FINDS). The facility was listed with EPA's Office of Air and Radiation with the Identification Number TND098071061.

The facility was entered into the Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS), with August 6, 1997, as the discovery date (Maupin 1997f).

2.4 Climatology (TDC/DG 1956)

East Tennessee does not lie directly within any of the principle storm tracks that cross the country. The area is influenced primarily by storms that pass along the Gulf Coast and thence up the Atlantic Coast, and to a lesser extent by those that pass northeastward from Oklahoma to Maine.

TEMPERATURE

The difference in elevation between mountain top and valley in East Tennessee causes a considerable variation in temperature. The mean annual temperature of East Tennessee, based upon records from Chattanooga, Knoxville, and Bristol is between 57 and 58 F. Temperature extremes of -32 F in Johnson City and 111 F in Blount County have been recorded. July is the hottest month and January is the coldest. The usual date of the last killing frost ranges from March 30 in Hamilton County to May 10 in Johnson and Carter Counties. The usual date of the first killing frost ranges from October 5 in Johnson and Carter Counties to October 30 in Hamilton County. The growing season varies from 150 to 210 days, depending upon latitude and elevation.

PRECIPITATION

Precipitation in East Tennessee is controlled in part by topography. It is heavier on the Cumberland Plateau and in the Unaka Mountains than in the Valley and Ridge province. Moist air masses reach the Valley and Ridge province comparatively dry because, in passing over the mountain on either side, their moisture is condensed and precipitated.

Rainfall is well distributed in the study area throughout the year. Knoxville's wettest months are January, February, and March (averaging 4.66, 4.51, and 5.05 inches, respectively) and the driest are September, October, and November (averaging 2.68, 2.62, and 3.07 inches, respectively). Snow occurs only occasionally and lightly in the lowland or valley land, and usually melts within a few hours or days except in shaded areas or near the tops of some of the highest ridges. The 2-year 24-hour rainfall is 3.2 inches (USDC 1993).

The topography largely controls the prevailing wind direction. The prevailing winds are from the northeast (15% of the time) and the southwest (12% of the time), but they are relatively light (mean speed is approximately 7.5 mph). Calm conditions exist 11% of the time (USDC/NOAA 1968).

3.0 SOURCE IDENTIFICATION

3.1 Potential Source Materials

The 1942 USGS topographic map shows an ordinary drainage swale south of the same large building which is presently at the Site; the 1966 USGS topographic map shows an on-site water tank and two settling ponds in series at the head of a stream in the swale (USGS 1966); and the 1978 USGS topographic map shows the settling pond berms, but no water in the settling pond locations or in the swale (USGS 1978).

Records indicate part of the property had been owned by American Agricultural Chemical Company (Appendix 1, Book 1691, Page 646) and an on-site or nearby (Maupin 1997e) industrial well, probably installed prior to 1943, was named for Knoxville Fertilizer Company (TDC/DG 1956). Thus, the facility may have operated as a commercial agricultural chemical manufacturing facility several years ago. Agricultural chemical manufacturing includes establishments primarily engaged in manufacturing nitrogenous and phosphatic basic fertilizers, mixed fertilizers, pesticides, and other agricultural chemicals (OMB 1987).

A suspected mixture of baghouse dust and dross/slag (Hawley 1981) from secondary aluminum smelting and casting, and anode/cathode wastes and dross/slag from primary aluminum production, was observed at the Site in October 1997 and August 1998. An ammonia odor coming from the waste mixture was noticed and, in 1997, the presence of ammonia in the atmosphere was measured (Table 6).

The atmospheric reactions of trace ammonia gases are known to include formation of ammonium sulfate and oxidation to nitrate (Wark/Warner 1981). Lithium and fluoride compounds, and, thus, lithium and fluoride, may be present due to the use of lithium carbonate, aluminum fluoride, and cryolite (Na_3AlF_6) in aluminum production (Hawley 1981).

3.2 Waste Sample Locations

Eight on-site waste samples were collected by the State of Tennessee, Division of Superfund in October 1997 and August 1998. The sample locations are shown in Figure 4 and in the photographs. Sample #WA-01 was collected from an outside waste pile containing a blue granular substance. Sample #WA-02 was a composite sample of baghouse dust collected from several of the collection hoppers underneath the baghouses. Sample #WA-03 was a composite sample of the loose material at the waste blocks inside the south end of the main building. Sample #WA-04 was collected from the subsurface of an outside waste pile. Sample #WA-05 and Sample #WA-06, a duplicate, were collected from a depression at the maintenance shed, which may be an old settling pond used prior to operations by Smokey Mountain Smelters (USGS 1966). Sample #WA-07 was collected from the casting furnace. Sample #WA-08 was collected from a depressed area inside the south end of the main building. These sample descriptions are summarized in

Table 7 and the locations are shown in Figure 4, "Site Sketch". All sample locations are shown in the Photographs.

3.3 Waste Analytical Results

The air monitoring results are presented in Table 6, "Air Monitoring Results". Other analytical results are summarized in Table 1, "Waste Analytical Results", and in Appendix 2. All analytical results, requests, and sample chain-of-custody information is in Appendix 3.

The analytical results of waste samples indicated the presence of several hazardous substances. The air monitoring results indicated the presence of ammonia at two locations. Ammonia, not a standard TAL/TCL parameter, was detected in each waste sample. The observed release criteria for chemical analysis (40CFR300) were satisfied for inorganic, extractable organic, volatile organic, and radiochemical contaminants. The most observed releases occurred for inorganic substances. Observed releases in each waste sample were indicated for the following:

antimony	calcium	copper
magnesium	nickel	selenium
sodium	zinc	

High values of aluminum (13.5 % in an outside waste pile) were found, as would be expected. Chromium and lead were found at potentially RCRA-characteristically-toxic levels. The greatest occurrence of polynuclear aromatic hydrocarbons appears to be in baghouse dust and the casting furnace. Potentially RCRA-characteristically-toxic levels of pesticides (chlordane, heptachlor, and heptachlor epoxide) were found in both of the samples at one of the old settling ponds, first used prior to start-up of operations at Smokey Mountain Smelters. An observed release of dieldrin was also indicated in both of these samples. The presence of aldrin inside the building was indicated.

3.4 Source Conclusions

Wastes containing hazardous substances related to agricultural chemical and secondary aluminum smelting operations are present on the surface at the Site. Large quantities of all substances detected in wastes may have been managed and disposed of at the Site for many years, and some may be buried (Burress 1994). Buried wastes, if present, were not investigated. Some surface waste samples indicated pesticides and metals contamination at levels which may be RCRA-characteristically-toxic.

4.0 GROUND WATER PATHWAY

4.1 Geology and Hydrogeology

The Smokey Mountain Smelters Site is located in the Valley and Ridge physiographic province and the nonglaciated central region hydrogeologic setting. The land surface in the Valley and Ridge physiographic region is characterized by numerous ridges and intervening valleys, all trending in the northeast-southwest direction. This orientation is the result of folding and fracturing (TDC/DG 1956). Elevations in the area of the facility range between 813 (slightly

lower during Fort Loudoun Reservoir drawdown) and 1160 (Rodgers Ridge) feet above mean sea level (Figure 2, Site Plan). A detailed geologic map is presented as Figure 5.

The rocks underlying the area of the Site are Middle Ordovician Ottosee shale. This formation is characterized by extensive Karst development (TDC/Division of Geology 1956).

Groundwater within formations of this group is restricted to fractures (TDC/Division of Geology 1956). The numerous fractures that have been created through the folding and faulting experienced by these formations are largely interconnected. The groundwater yield ranges from small to moderate quantities of water to wells and springs.

4.2 Groundwater Targets

It is estimated that the amount of groundwater used in the Knoxville area exceeds 10 million gallons per day (TDC/DG 1956).

The 1990 Census revealed that in the Knoxville Metropolitan Statistical Area there were 2.56 persons per occupied housing unit (USBC 1990).

The 1990 Census revealed that in Knox County, individual wells were the source of water for 6026 housing units (USBC 1990). This amounts to 15,400 persons, in the entire county, or, proportionally, approximately 1500 in the 4 miles radius, or 50.3 square miles, study area (Maupin 1997a).

4.3 Groundwater Sample Locations

Groundwater in a nearby well was sampled. This well is no longer used as a drinking water source. A nearby spring was sampled as the groundwater background. These sample descriptions are summarized in Table 7. The off-site, background sample location is shown in the Site Screening Investigation (Maupin 1998a). The off-site, Mary Knox Tavern well location is shown in Figure 4 as the "nearest well". The background groundwater sample location is shown in the Photographs.

4.4 Groundwater Sample Analytical Results

The analytical results are summarized in Table 4, "Groundwater Analytical Results", and in Appendix 2. All analytical results, requests, and sample chain-of-custody information is in Appendix 3. The analytical results of groundwater samples indicated the presence of several hazardous substances. The observed release criteria for chemical analysis (40CFR300) were satisfied for inorganic, volatile organic, and radiochemical contaminants. The most observed releases occurred for inorganic substances. Observed releases in groundwater were indicated for the following:

aluminum	iron	lead
manganese	sodium	zinc
methylene chloride	Pb-214	Bi-214

Observed releases in wastes, on-site contaminated soil, and groundwater (Table 8) were indicated for the following:

aluminum	iron
lead	sodium
zinc	methylene chloride

Other primary drinking water contaminants found above background levels included nitrate, fluoride, and copper.

Ammonia, detected in all waste samples, was not detected in the background sample, but was not analyzed in the other groundwater sample.

4.5 Groundwater Pathway Conclusions

Releases of contaminants to groundwater from on-site wastes and contaminated soils is indicated by analytical data. On-site disposal of commercial agricultural and aluminum smelting wastes in an uncontained manner on permeable soil in a Karst region of shallow ground water has occurred. An unlined on-site lagoon receives surface water drainage from some of the disposal area. Heavy precipitation occurs in the area. The subsurface is permeable. There are several drinking water wells in the area. Nitrate, fluoride, and metals contaminants are mobile in groundwater. Since there is usage of groundwater resources in the area of the Site, the soil at the Site is porous, and the aquifer is shallow, further investigation is warranted.

5.0 SURFACE WATER PATHWAY

5.1 Hydrology

The Smokey Mountain Smelters Site is adjacent to an unnamed tributary of Flenniken Branch (Figures 2 and 4). Surface water flowed from on-site settling ponds across the Site and into the unnamed tributary of Flenniken Branch (USGS 1966) before the on-site stream and ponds were dewatered and partially covered with waste and/or soil (Burress 1994, USGS 1978). Presently, the only surface water flow on the Site is due to stormwater runoff. Some of the stormwater runoff flows to an on-site lagoon. The Site is not in the 100-year floodplain. Stormwater run-on to the Site is believed to be insignificant.

A small portion of the on-site stormwater run-off probably flows to the on-site surface impoundment. The impoundment has never been observed to be dry, nor has the water level been observed to fluctuate significantly. The general direction of stormwater runoff flow from the Site is to the southwest to an unnamed tributary of Flenniken Branch. The first parts of the 15 mile surface water pathway from the Site. the unnamed tributary of Flenniken Branch, Flenniken Branch, and Knob Creek, are classified for Fish and Aquatic Life, Recreation, Irrigation, and Livestock Watering and Wildlife by the State of Tennessee (TDEC/DWPC 1995). The remaining thirteen and four-tenths miles of the fifteen mile surface water pathway is the Knob Creek and Flenniken Branch embayment of the Tennessee River (Fort Loudoun Lake) and the Tennessee River (Fort Loudoun Lake) from River Mile 637.5 to 625.6. It is classified for Domestic Water

Supply, Industrial Water Supply, Fish and Aquatic Life, Recreation, Irrigation, Livestock Watering and Wildlife, and Navigation by the State of Tennessee (TDEC/DWPC 1995).

5.2 Surface Water Targets

There are many surface water targets along the 15-mile surface water pathway. These targets include users of 13.4 miles of the Tennessee River (Fort Loudoun Lake) fishery and recreation areas, numerous wetland areas (Figure 7 - Wetlands Maps), livestock, and wildlife.

The I.C. King County Park surrounds the Knob Creek embayment. A boat launch, automobile access to both sides of the embayment, and a hiking/biking trail around the embayment is provided to the public. The automobile access on one side of the Knob Creek embayment also provides access to the Flenniken Branch embayment of Fort Loudoun Lake. The access to the Flenniken Branch embayment is enhanced by an unrestricted railway along one side of the Flenniken Branch embayment (Figure 2).

5.2.1 Public Drinking Water Intakes

There are no public drinking water intakes along the 15-mile surface water pathway associated with the Site.

5.2.2 Fisheries

The 13.4 mile portion of the Tennessee River (Fort Loudoun Lake) in the 15-mile surface water pathway associated with the Site is classified for Fish and Aquatic Life (TDEC/DWPC 1995) and is used extensively for fishing (TWRA 1993). The most commonly harvested fish species are largemouth, smallmouth, and white bass, along with bluegill and white and black crappie. The estimated weight of fish harvested from Fort Loudoun Reservoir in 1993 was 19,600 pounds, which translates to 4,240 pounds along the 11.9 mile length of surface water pathway of the reservoir associated with the Site.

5.2.3 Sensitive Environments

The sensitive environments in or adjacent to the 15-mile surface water pathway include several wetlands (Figure 7 - Wetlands Maps). The closest wetland appears to be approximately 1.6 mile downstream of the Site, in the Flenniken Branch embayment of Fort Loudoun Lake.

Endangered species and critical or sensitive habitat are as reported in the "Project review information for endangered species and critical or sensitive habitat" (TDEC/Division of Natural Heritage 1997). Records indicate threatened and/or endangered species within an approximate four miles radius.

The I.C. King County Park surrounds the Knob Creek embayment.

5.3 Surface Water Sample Locations

These surface water and sediment sample descriptions are summarized in Table 7. The off-site sample locations are shown in the Site Screening Investigation (Maupin 1998a). On-site sample locations are shown in Figure 4. All sample locations are shown in the Photographs.

The background surface water and sediment samples were collected from the unnamed tributary of Flenniken Branch approximately one-third mile upstream of the probable point of entry (Figure 2) from the Site. Surface water and sediment samples were collected from the on-site lagoon. Surface water and sediment samples were collected from the first occurrence of surface water on the unnamed tributary of Flenniken Branch, downstream of the probable point of entry from the Site on the adjacent property approximately 100 feet from the Site (the stream apparently sinks below the ground between this location and the background location). Surface water and sediment samples were collected from Flenniken Branch at the beginning of the Flenniken Branch embayment of Fort Loudoun Lake (the first occurrence of a fishery) approximately 1.6 miles downstream of the Site. Two on-site sediment samples were collected from well defined, but dry, drainways near the southwest property boundary approximately 20 yards downgradient from the outer edge of the waste piles.

5.4 Surface Water Sample Analytical Results

The surface water analytical results are summarized in Table 5, "Surface Water Analytical Results", and in Appendix 2. The sediment analytical results are summarized in Table 3, "Sediment Analytical Results", and in Appendix 2. All analytical results, requests, and sample chain-of-custody information is in Appendix 3. The analytical results of the surface water and sediment samples indicated the presence of several hazardous substances. The observed release criteria for chemical analysis (40CFR300) were satisfied for inorganic, extractable organic, volatile organic, and radiochemical contaminants. The most observed releases occurred for inorganic substances. Observed releases in surface water or sediment (Table 8) were indicated for the following:

aluminum	ammonia	antimony	barium
beryllium	cadmium	calcium	chromium
copper	fluoride	cyanide	iron
lead	magnesium	manganese	mercury
nickel	nitrite nitrogen	NO_3 & NO_2 nitrogen	potassium
selenium	silver	sodium	vanadium
zinc	BEHP	diethyl phthalate	benz(a)anthracene
benzo(a)pyrene	benzo(b)fluoranthene	benzo(k)fluoranthene	fluoranthene
phenanthrene	pyrene	chrysene	alpha-chlordane
gamma-chlordane	dieldrin	methylene chloride	tetrachloroethene
trichloroethene	GROSS BETA	K-40	Tl-208
Cs-137			

Observed releases in wastes, on-site contaminated soil, and surface water or sediment (Table 8) were indicated for the following:

aluminum	alpha-chlordane	ammonia	antimony	arsenic
BEHP	benzo(a)pyrene	benzo(b)fluoranthene	beryllium	cadmium
calcium	chromium	chrysene	copper	cyanide
dieldrin	diethyl phthalate	fluoranthene	gamma-chlordane	gross beta
heptachlor	heptachlor epoxide	iron	lead	magnesium
mercury	nickel	potassium	selenium	silver
sodium	toluene	vanadium	zinc	

Fluoride, nitrate nitrogen, nitrite nitrogen, and sulfate were not analyzed in waste and soil samples. Other primary drinking water contaminants found above background levels included nitrate nitrogen.

Ammonia was not analyzed in the surface water sample collected in the Flenniken Branch embayment of Fort Loudoun Lake.

Observed releases of tetrachloroethene and trichloroethene in surface water at the unnamed tributary of Flenniken Branch and at the Flenniken Branch embayment of Fort Loudoun Lake are apparently not Site-related.

5.5 Surface Water Conclusions

Releases of contaminants to surface water from on-site wastes and contaminated soils is indicated by analytical data. On-site disposal of commercial agricultural and aluminum smelting wastes in an uncontained manner has occurred. Most surface water from the Site flows to an unnamed tributary of Flenniken Branch which is adjacent to the Site, and only 1.6 miles from a heavily used fishery. An estimated 1000 cubic yards of uncontained waste is located in an area where precipitation is sometimes heavy. Hazardous substances found in the wastes, on-site soils, and in the sediment and surface water include contaminants harmful to humans and the environment. Some of the detected hazardous substances are bioaccumulative.

Further investigation is warranted.

6.0 SOIL EXPOSURE

6.1 Physical Conditions

The Smokey Mountain Smelters Site lies in a medium commercial and dense residential area adjacent to the Knoxville City Limit. The Site can be accessed by people because the Site property boundaries are not completely fenced to prevent access to the facility. There are many entrances to the main building. It is believed that unauthorized entries into the building and onto the disposal area have occurred.

An estimated 1000 cubic yards of uncontained wastes are on-site. Particulate migration could occur. A large portion of the wastes is baghouse dust. Historical emissions could have caused

migration of particulates to off-site locations, mostly to the northeast and southwest (USDC/NOAA 1968).

Site soil types identified by the Soil Conservation Service on Figure 6 include Armuchee and Litz soil materials (G_E), Leadvale and Whitesburg silt loams undulating phases (L_D), Lindside silt loam (L_G), and Sequoia silty clay loam eroded rolling phase (S_K). A general description of the soil types is provided in the Knox County Soil Survey (USDA/SCS 1955).

6.2 Soil Exposure Targets

An estimated 64,408 people live within four miles of the Site, based on the 1990 census data (U. S. EPA 1990). There is no resident population. The nearest residence (Figure 2) is less than 200 feet away from an off-site source of contaminated soil near the Site. The nearest presently operating daycare facility and school (Maupin 1997d (Table 2), Figure 2) are over 200 feet away from confirmed areas of contamination at or near the Site.

Access to the site is unrestricted, thus, soil exposure could occur if unauthorized persons enter the facility. Potential targets along the on-site soil pathway appear to be adults and children from area neighborhoods, and vagrants.

6.3 Soil Sample Locations

The soil sample descriptions are summarized in Table 7. The off-site soil sample locations are shown in the Site Screening Investigation (Maupin 1998a). On-site soil sample locations are shown in Figure 4. All soil sample locations are shown in the Photographs.

Five surface (0-6 inches depth) and four subsurface (6-24 inches depth) soil samples were collected. The background surface and subsurface soil samples were collected 1.5 miles distant from the Site at an undisturbed and relatively inaccessible location having a soil association similar to that on-site. Three on-site soil sample sets were collected, one set at the concrete pad of a transformer station, one set at a pair of concrete supports for a missing cylindrical, horizontal tank, and one set at a pile of approximately 50 visible drums. One surface soil sample, only, was collected at the Montgomery Village residence across the railroad tracks to the east of the Site, less than 200 feet from the Site. All soil samples were visually confirmed to be soil, not waste.

6.4 Soil Sample Analytical Results

The soil sample analytical results are summarized in Table 2, "Soil Analytical Results", and in Appendix 2. All analytical results, requests, and sample chain-of-custody information are in Appendix 3.

The analytical results of the soil samples indicated the presence of several hazardous substances. The observed release criteria for chemical analysis (40CFR300) were satisfied for inorganic, extractable organic, volatile organic, and radiochemical contaminants. The most observed releases occurred for inorganic substances.

Observed releases in soil were indicated for the following:

aluminum	ammonia	antimony	beryllium
cadmium	calcium	chromium	copper
cyanide	iron	lead	magnesium
mercury	nickel	potassium	selenium
silver	sodium	vanadium	zinc
BEHP	diethyl phthalate	benzo(a)pyrene	benzo(b)fluoranthene
fluoranthene	chrysene	alpha-chlordane	gamma-chlordane
p,p-DDT	dieldrin	heptachlor	heptachlor epoxide
Methylene chloride	Toluene	gross alpha	gross beta
K-40			

Observed releases in wastes and on-site contaminated soil (Table 8) were indicated for the following:

aluminum	ammonia	antimony	beryllium
cadmium	calcium	chromium	copper
cyanide	lead	magnesium	mercury
nickel	potassium	selenium	silver
sodium	vanadium	zinc	BEHP
diethyl phthalate	benzo(a)pyrene	benzo(b)fluoranthene	fluoranthene
chrysene	alpha-chlordane	gamma-chlordane	dieldrin
heptachlor	heptachlor epoxide	toluene	

Observed releases in wastes, on-site contaminated soil, and off-site soil (Appendix 2) were indicated for the following:

antimony	calcium	copper	potassium	vanadium	zinc

Fluoride, nitrate nitrogen, nitrite nitrogen, and sulfate were not analyzed in soil samples.

6.5 Conclusions

Access to the site is not controlled. Hazardous substances are present, so exposure can occur when unauthorized entry to the site occurs. The presence of hazardous substances contaminating the soil at this site has been confirmed, but definition of the threats posed by the soil exposure pathway is not complete.

Releases of contaminants to both on-site and off-site soil from on-site wastes is indicated by analytical data. On-site disposal of agricultural chemical and aluminum smelting wastes in an uncontained manner has occurred and caused migration of contaminants to both on-site and off-site soil.

There is no resident population. The nearest school and child care facility are more than 200 feet away from confirmed areas of contamination, however, not all areas have been investigated. The nearest residences are in Montgomery Village, a group of multiple housing units, slightly less

than 200 feet to the east. The surface soil sample collected at Montgomery Village confirms that a contamination source is located within 200 feet of several residences.

The nearest residences to the northeast are more than 200 feet away from areas of confirmed contamination, however, one residence appears to be on or very near to Parcel #6, which may have been previously owned by the Site owner.

Hazardous substances were found in the main building and scattered throughout the southern half of the property. Particulate migration via the air pathway could occur, especially from the active facility, which would increase the possibility of exposure via the soil pathway. The air migration pathway is primarily to the northeast and southwest, the directions of the prevailing winds.

7. AIR PATHWAY

7.1 Physical Conditions

The Smokey Mountain Smelters Site lies in a dense commercial and residential area adjacent to the Knoxville City Limit. It is believed that unauthorized entries into the building and onto the disposal area have occurred.

An estimated 1000 cubic yards of uncontained wastes are on-site. By observation and air monitoring, the waste has been found to be emitting ammonia to the atmosphere. Particulate migration could occur, especially since a large portion of the wastes is baghouse dust. The prevailing winds are to the southwest and northeast (USDC/NOAA 1968), where there are primary targets.

7.2 Air Targets

An estimated 64,408 people live within four miles of the Site, based on the 1990 census data (U. S. EPA 1990). 207 persons (primary targets) reside within ¼ mile. Access to the site is unrestricted, thus, exposure via air could occur if unauthorized persons enter the facility. Potential targets along the on-site air pathway appear to be adults and children from area neighborhoods, and vagrants.

The nearest school (Maupin 1997d(Table 2), Figure 2) and presently operating child care facility are over 200 feet away from suspected areas of contamination at the Site. The nearest residence (Figure 2) is less than 200 feet from the Site boundary.

7.3 Air Monitoring Locations

Air sample locations are shown in Figure IV of the Preliminary Assessment Report and in the photographs. Passive dosimeter tubes were placed at seven on-site locations, and readings were taken after four hours. Sample #PDT-01 was collected at ground level at a disturbed waste pile. Sample #PDT-02 was collected near Sample #PDT-01, but at 3 feet elevation above the waste pile. Sample #PDT-03 was collected at the water level in the lagoon. Sample #PDT-04 was collected at a pile of waste blocks inside the main building. Sample #PDT-05 was collected inside the boring formed by collection of Sample #WA-04 eight days previously. Sample #PDT-06 was

collected near Sample #PDT-05, but at the waste pile surface. Sample #PDT-07 was collected at the Sample #WA-02 location. All sample locations are shown in the Photographs. The air monitoring results are presented in Table 6, "Air Monitoring Results".

The odor of ammonia was detected by more than one TDSF employee during Site inspections. The odor threshold for ammonia in air is 46.8 ppm (Wark/Warner 1981).

7.4 Air Monitoring Results

The analytical results are summarized in Table 6, "Air Monitoring Results", and in Appendix 2.

7.5 Air Pathway Conclusions

The Smokey Mountain Smelters Site appears to pose a threat to human health and/or the environment via the air pathway. Air monitoring was performed at the site and ammonia was detected. The large quantity of wastes, uncontrolled access to the Site, the possibility of particulate emissions, and the presence of primary targets make further investigation of exposure via the air pathway of importance.

8. SUMMARY AND CONCLUSIONS

The large quantity of uncontained hazardous substances known to be present at Smokey Mountain Smelters, and indicated to be migrating to soil, surface water, groundwater, and air, necessitates further investigation, and, possibly, interim remedial action.

Water and sediment quality, as well as a fishery, downstream of the Site is a concern. The wastes have been found to contain several bioaccumulative hazardous substances.

A high potential for human exposure may exist through the soil exposure and air pathways, due to a lack of containment at the Site which is in a densely populated area. The site is probably entered by unauthorized persons; and is located within ¼ mile of approximately 207 people and several residences, within ½ mile of a child care center, and approximately one mile from an elementary school.

Potential for human exposure may exist through the groundwater pathway. Primary targets are estimated to number 6 persons, and a total of 1500 persons within the four miles radius are estimated to use groundwater.

The Smokey Mountain Smelters Site appears to have the potential to be placed on the National Priorities List. Therefore, the property is recommended for an immediate Site Investigation through the CERCLA process.

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WASTE ANALYTICAL RESULTS

SMOKEY MOUNTAIN SMELTERS KNOX COUNTY, TN 37920

	PARAMETER (detected in at least one sample)	SAMPLE NUMBER AND LOCATION							
		01 BLUE MTL	02 BAGHOUSE	03 BLDG PILE	04 OUTSIDE	05 MTNC SHED	06 MTNC SHED	07 FURNACE	08 BLDG FLOOR
INORGANICS	aluminum, Al	96700	65500	88800	135000	8200	48900	113000	74800
	ammonia, NH_3	331	1026	132	135	38.7	49.3	2530	5290
	antimony, Sb	13	9	5	9	13.0	9.6	9.4	3.5
	arsenic, As	6	6	7	11	9.8	7.2	8.8	7.1
	barium, Ba	52	30	111	222	88	94	446	95
	beryllium, Be	U	U	2	1	2	3	3	4
	cadmium, Cd	U	15.6	U	1.4	3.2	2.8	4.6	1.3
	calcium, Ca	5630	11400	5850	9680	22600	21500	13800	31800
	chromium, Cr	79	6	52	93	46	107	72	112
	cobalt, Co	3	4	6	13	9	66	11	8
	copper, Cu	42900	754	1080	576	1690	1970	1380	634
	cyanide	U	U	U	U	1.22	U	U	U
	iron, Fe	9920	4860	14800	15400	12400	15000	29500	14100
	lead, Pb	291	129	53	96	100	85	213	36
	magnesium, Mg	5410	24600	9060	6240	8710	6820	11800	7130
	manganese, Mn	384	144	388	339	500	486	673	434
	mercury, Hg	U	0.73	U	U	0.12	0.11	U	U
	nickel, Ni	240	551	169	326	776	745	695	379
	potassium, K	695	4230	15000	5250	1290	1320	145	232
	selenium, Se	8	2	1	2	5.5	6.0	6.9	2.7
	silver, Ag	2	1	U	U	1	1	U	U
	sodium, Na	17100	107000	47400	9880	6910	5920	19100	28100
	vanadium, V	38	U	49	76	43	46	53	53
	zinc, Zn	2330	4020	1350	1140	906	803	1050	549
EXTRACTABLE ORGANICS	bis(2-ethylhexyl)phthalate	J 477	541	572	U	B 246	B 322	2370	B 304
	diethyl phthalate	B,J 157	U	U	B,J 125	B 135	B 457	2710	B 137
	benz(a)anthracene	U	239	U	U	U	U	69.7	U
	benzo(a)pyrene	U	609	U	U	U	U	55.6	U
	benzo(b)fluoranthene	U	1440	U	U	130	148	143	50.7
	benzo(ghi)perylene	U	2100	U	U	U	U	J 93.7	U
	benzo(k)fluoranthene	U	279	U	U	U	U	44.8	U
	fluoranthene	U	396	U	U	J 39.7	J 53.7	195	76.1
	indeno(1,2,3-cd)pyrene	U	2170	U	U	U	U	J 108	U
	phenanthrene	U	143	J 79.9	U	U	U	79.6	53.4
	pyrene	U	288	U	U	U	U	155	56.2
	chrysene	U	408	U	U	U	U	138	J 29.9
PESTICIDES/PCBS	aldrin	U	U	U	U	U	U	U	J 2.26
	alpha-chlordane	U	U	U	U	489	249	U	3.33
	gamma-chlordane	U	U	U	U	3450	1980	U	3.83
	dieldrin	U	U	U	U	280	183	U	U
	heptachlor	U	U	U	U	3110	1210	U	U
	heptachlor epoxide	U	U	U	U	499	371	U	U
VOLATILES	Acetone	U	U	U	U	U	U	U	65
	Benzene	U	J 0.8	U	U	U	U	U	U
	Camphene	U	U	U	U	U	U	X	U
	Chloromethane	U	U	U	U	U	U	J 1.9	U
	Hexane	U	U	U	U	U	U	U	X
	Methylene chloride	U	U	U	U	B 9.8	B 9.7	B 33	B 27
	Pentane	U	U	U	U	U	U	U	X
	Propene	U	U	U	U	U	U	X	U
	Propyne,1-	U	U	U	U	U	U	X	U
	Toluene	J 1.4	3.6	2.3	4.7	J 0.8	4.8	11	J 0.5
RADIOLOGICAL	GROSS ALPHA	0.79	0.36	0.65	0.78	0.86	0.56	0.92	2.98
	GROSS BETA	2.72	7.4	21.7	11.3	8.3	8.0	12.0	38.8
	GAMMA RADIONUCLIDES: K-40	-	4.46	11.93	5.52	-	5.32	6.49	20.85
	GAMMA RADIONUCLIDES: Pb-214	0.219	-	-	-	0.732	0.529	0.777	2.68
	GAMMA RADIONUCLIDES: Bi-214	0.242	-	-	-	0.549	0.579	1.076	2.45
	GAMMA RADIONUCLIDES: Pb-212	-	-	-	-	0.558	0.615	0.388	0.872
	GAMMA RADIONUCLIDES: Be-7	-	-	-	-	1.28	-	-	-
	GAMMA RADIONUCLIDES: Ac-228	-	-	-	-	-	0.551	0.550	1.07
	GAMMA RADIONUCLIDES: Cs-137	-	-	-	-	-	0.083	-	-
	GAMMA RADIONUCLIDES: Tl-208	-	-	-	-	-	-	-	0.303

B - analyte in blank as well as sample
J - estimated value--result is less than sample quantitation limit but greater than zero
U - analyte requested but not detected (TAL/TCL parameters not listed were not detected in any samples)
X - presence confirmed by GCMS

OBSERVED RELEASES WHICH MAY EXHIBIT TOXICITY CHARACTERISTIC

OBSERVED RELEASES

UNITS: INORGANICS: mg/kg VOLATILE ORGANICS: µg/kg EXTRACTIBLE ORGANICS: µg/kg RADIOLOGICAL: pC/g

GROUNDWATER ANALYTICAL RESULTS

SMOKEY MOUNTAIN SMELTERS
KNOX COUNTY, TENNESSEE 37920

		PARAMETER (detected in at least one sample)		SAMPLE NUMBER AND LOCATION 01 BACKGROUND	02 [illegible]
INORGANICS		aluminum, Al		U	0.920
		calcium, Ca		70.8	133
		copper, Cu		0.001	0.002
		fluoride		0.1	0.2
		iron, Fe		0.204	0.620
		lead, Pb		U	0.007
		magnesium, Mg		5.66	14.2
		manganese, Mn		0.045	0.492
		nitrate nitrogen		1.60	1.97
		nitrite nitrogen		0.02	U
		NO_2 & NO_3 nitrogen		1.62	1.97
		potassium, K		0.56	0.64
		sodium, Na		5.18	17.2
		sulfate, $SO_4^{=}$		8	20
		zinc, Zn		0.008	0.046
ORG	EX	bis(2-ethylhexyl)phthalate		B,J 0.48	U
	VOL	Chloroform		0.5	U
		Ethyl benzene		J 0.1	U
		Methylene chloride		U	B 1.0
		Xylene, m- & p-		J 0.2	U
RAD		GROSS ALPHA		2.6	0.4
		GROSS BETA		6.1	1.8
		GAMMA RADIONUCLIDES	Pb-214	-	74.1
			Bi-214	27.3	83.7

B - analyte in blank as well as sample
U - analyte requested but not detected (TAL/TCL parameters not listed were not detected in any samples)
J - estimated value--result is less than sample quantitation limit but greater than zero
X - presence confirmed by GCMS

UNITS: INORGANICS: mg/l XTRACTIBLE ORGANICS: µg/l
RADIOLOGICAL: pC/l OLATILE ORGANICS: µg/l

OBSERVED RELEASES

SURFACE WATER ANALYTICAL RESULTS

SMOKEY MOUNTAIN SMELTERS
KNOX COUNTY, TENNESSEE 37920

	PARAMETER (detected in at least one sample)		SAMPLE NUMBER AND LOCATION			
			01 BACK-GROUND	02 ON-SITE LAGOON	03 TRIB-UTARY	04 FLENNIKEN BRANCH
INORGANICS	aluminum, Al		U	2.160	0.365	U
	ammonia, NH_3		U	28.1	192	N/A
	antimony, Sb		U	U	0.016	U
	arsenic, As		U	0.005	U	U
	cadmium, Cd		U	0.001	U	U
	calcium, Ca		67.0	39.1	18.9	125
	chromium, Cr		U	U	0.001	U
	copper, Cu		U	0.082	0.120	0.001
	fluoride		U	105	30.7	0.4
	iron, Fe		U	352	0.206	0.194
	lead, Pb		U	0.004	U	0.001
	magnesium, Mg		4.40	4.21	U	10.1
	manganese, Mn		U	0.406	0.364	0.138
	nitrate nitrogen		1.14	U	U	1.90
	nitrite nitrogen		U	15.28	2.22	U
	NO_3 & NO_2 nitrogen		1.14	13.6	0.91	1.90
	potassium, K		0.43	99.9	505	1.78
	sodium, Na		1.92	416	10400	81.4
	sulfate, $SO_4^{=}$		4	52	120	17
	vanadium, V		U	0.003	U	U
	zinc, Zn		U	0.063	0.017	0.008
ORGANICS EXTRACTABLE	bis(2-ethylhexyl)phthalate		B,J 0.48	B 1.90	B 9.50	U
	diethyl phthalate		B 0.56	U	U	U
	naphthalene		2.25	U	U	U
ORGANICS VOLATILE	Chloromethane		U	J 0.5	U	U
	Methylene chloride		B 6.9	B 3.4	B 0.8	B 0.7
	Tetrachloroethene		U	U	U	1.2
	Trichloroethene		J 0.4	U	1.8	0.5
RADIOLOGICAL	GROSS ALPHA		1.0	-13	-129	1.5
	GROSS BETA		-0.4	296	323	-0.3
	GAMMA RADIONUCLIDES	K-40	-	741	574	-
		Pb-214	76.1	-	-	17.1
		Bi-214	90.9	19.2	19.2	20.3

B - analyte in blank as well as sample
U - analyte requested but not detected (TAL/TCL parameters not listed were not detected in any samples)
J - estimated value--result is less than sample quantitation limit but greater than zero
X - presence confirmed by GCMS

UNITS: INORGANICS: mg/l VOLATILE ORGANICS: µg/l EXTRACTIBLE ORGANICS: µg/l RADIOLOGICAL: pC/L

OBSERVED RELEASES

SEDIMENT ANALYTICAL RESULTS

SMOKEY MOUNTAIN SMELTERS
KNOX COUNTY, TENNESSEE 37920

	PARAMETER (detected in at least one sample)	SAMPLE NUMBER AND LOCATION					
		01 ON-SITE	02 BACK-GROUND	03 LAGOON	04 ON-SITE	05 TRIB	06 FUNSTON BRANCH
INORGANICS	aluminum, Al	7130	3710	64000	80900	15600	3840
	ammonia, NH_3	121	U	38.5	35.4	69.2	46.8
	antimony, Sb	3	U	13.2	6.8	0.7	U
	arsenic, As	6	4.1	6.8	11.0	5.0	3.8
	barium, Ba	63	15	156	96	70	32
	beryllium, Be	1	U	3	2.7	1	U
	cadmium, Cd	0.8	U	4.5	5.0	U	U
	calcium, Ca	8000	175	10700	12300	2500	3380
	chromium, Cr	44	10	33	64	14	6
	cobalt, Co	10	4	11	11	16	7
	copper, Cu	809	4	155	1380	72	13
	cyanide	1.08	U	U	U	U	U
	iron, Fe	12500	9830	16800	10300	192000	12600
	lead, Pb	47	8	64	133	18	16
	magnesium, Mg	2860	259	3280	2510	1070	581
	manganese, Mn	511	295	584	637	1000	503
	mercury, Hg	U	U	0.10	0.23	U	U
	nickel, Ni	233	U	143	294	27	3
	potassium, K	889	201	2610	143	1640	274
	selenium, Se	U	U	U	3.4	U	0.5
	silver, Ag	U	U	U	2	U	U
	sodium, Na	7200	42	7050	3820	5570	121
	vanadium, V	32	U	46	46	25	U
	zinc, Zn	523	18.8	486	788	135	59.8
ORGANICS	bis(2-ethylhexyl)phthalate	288	BJ 51.0	B 218	B 310	3000	B 67.7
	diethyl phthalate	U	B 78.1	B 557	5630	B 167	B 97.1
	benzo(a)anthracene	138	U	157	118	U	J 45.1
	benzo(a)pyrene	155	U	239	179	U	58.7
	benzo(b)fluoranthene	168	U	300	352	U	98.2
	benzo(ghi)perylene	U	U	J 295	J 397	U	U
	benzo(k)fluoranthene	U	U	J 109	104	U	J 38.4
	fluoranthene	252	U	218	179	U	128
	indeno(1,2,3-cd)pyrene	U	U	J 326	J 372	U	U
	phenanthrene	137	U	J 21.2	J 27.0	U	J 29.3
	pyrene	239	U	167	123	U	80.1
	chrysene	107	U	185	152	U	58.7
	alpha-chlordane	U	U	U	3.54	J 1.05	U
	gamma-chlordane	U	U	J 2.68	12.4	J 0.937	U
	dieldrin	3.26	U	5.48	U	6.01	U
	PCB 1254	U	U	U	J 178	U	U
	PCB 1260	U	U	U	J 137 Y	U	U
VOLATILES	Methylene chloride	U	B 12	B 10	B 31	B 10	B 37
	Toluene	J 0.6	U	U	U	U	U
	Trichloroethene	U	U	U	U	U	J 0.5
RADIOLOGICALS	GROSS ALPHA	1.42	0.83	2.18	1.24	1.79	0.74
	GROSS BETA	12.4	4.8	22.3	12.8	18.3	5.9
	GAMMA RADIO-NUCLIDES: K-40	8.05	5.52	13.53	8.51	8.89	3.95
	Pb-214	-	0.515	1.226	1.15	0.887	0.529
	Bi-214	-	0.489	1.147	1.092	0.831	0.523
	Pb-212	-	0.631	1.492	0.856	1.266	0.609
	Be-7	-	0.657	-	1.17	1.48	0.731
	Ac-228	-	-	1.78	-	0.129	0.057
	Cs-137	-	-	0.107	0.319	0.459	0.188
	Tl-208	-	0.37	0.501	-	1.01	-

B - analyte in blank as well as sample
U - analyte requested but not detected (TAL/TCL parameters not listed were not detected in any samples)
J - estimated value--result is less than sample quantitation limit but greater than zero
X - presence confirmed by GCMS
Y- PCB 1262 not analyzed. Peaks measured as PCB 1260.

UNITS: INORGANICS: mg/kg
VOLATILE ORGANICS: µg/kg
EXTRACTIBLE ORGANICS: µg/kg
RADIOLOGICAL: pC/g

OBSERVED RELEASES

SOIL ANALYTICAL RESULTS

SMOKEY MOUNTAIN SMELTERS
KNOX COUNTY, TENNESSEE 37920

	PARAMETER (detected in at least one sample)	SAMPLE NUMBER AND LOCATION								
		SURFACE					SUBSURFACE			
		01 BLACKSMITH	02 TENNESSEE	03 TILEY	04 BROWN	05 KNOX VILLAGE	01 BLACKSMITH	02 TENNESSEE	03 TILEY	04 BROWN
INORGANICS	aluminum, Al	8820	23900	15500	74100	14600	7680	20100	20400	73500
	ammonia, NH_3	26.3	40.9	157	14.8	46.5	U	13.7	30.0	26.5
	antimony, Sb	U	U	1.1	4.4	1.0	U	U	1.2	3.0
	arsenic, As	6.7	4.2	8.3	13.2	10.2	6.1	4.3	11.6	2.0
	barium, Ba	81	94	81	59	66	64	53	73	63
	beryllium, Be	U	2	1	2	U	U	2	2	4
	cadmium, Cd	U	1.2	2.7	U	U	U	U	1.3	U
	calcium, Ca	1100	18900	22500	6430	5400	364	14500	16200	8360
	chromium, Cr	12	39	26	31	22	10	36	33	50
	cobalt, Co	11	18	10	11	17	10	10	10	7
	copper, Cu	11	116	108	1070	34	6	40	76	1770
	cyanide	U	U	3.77	U	U	U	U	U	U
	iron, Fe	12600	18600	13900	18300	22100	5060	44000	47100	14800
	lead, Pb	25	50	355	61	28	21	26	158	70
	magnesium, Mg	876	3910	2020	4430	1410	529	2250	1950	4780
	manganese, Mn	1920	645	691	548	912	1060	265	547	467
	mercury, Hg	U	0.18	0.42	U	U	U	U	0.18	U
	nickel, Ni	6	30	18	277	8	U	19	21	238
	potassium, K	210	2320	2420	556	716	246	1240	3050	704
	selenium, Se	U	U	41.6	1.8	U	U	U	13.4	U
	silver, Ag	U	U	U	U	U	U	U	U	1
	sodium, Na	47	171	700	11200	75	68	118	1070	10300
	vanadium, V	U	33	25	44	25	U	35	49	37
	zinc, Zn	39.2	208	283	776	472	22.1	118	299	761
ORGANICS	butyl benzyl phthalate	U	U	U	U	B,J 55.1	U	U	U	U
	bis(2-ethylhexyl)phthalate	B 62.6	B 303	B 134	B 68.0	B 583	B 75.8	B 58.2	B 55.9	B 63.1
	diethyl phthalate	B 59.7	B 243	B 285	B 215	B 176	B 57.8	B 116	B 146	B,J 46.7
	benz(a)anthracene	U	J 62.6	J 58.1	J 16.5	J 25.8	U	U	J 28.5	U
	benzo(a)pyrene	U	81.1	J 75.8	J 26.8	52.4	U	U	J 42.2	U
	benzo(b)fluoranthene	U	165	197	J 52.3	80.8	U	U	79.0	U
	benzo(ghi)perylene	U	U	U	U	J 107	U	U	U	U
	benzo(k)fluoranthene	U	J 51.2	U	J 15.5	J 25.9	U	U	J 28.5	U
	fluoranthene	U	104	177	J,M 21.6	J 42.6	U	U	J 47.4	U
	indeno(1,2,3-cd)pyrene	U	J 142	U	U	U	U	U	U	U
	pyrene	U	J 65.4	J 96.0	U	J 24.0	U	U	J 23.2	U
	chrysene	U	78.2	J 124	U	J 42.6	U	U	J 30.6	U
	alpha-chlordane	U	127	6.62	U	U	U	11.2	J 2.19	U
	gamma-chlordane	U	61.0	16.7	U	U	U	81.8	6.07	U
	p,p-DDT	U	4.74	14.2	U	U	U	U	U	U
	dieldrin	U	515	20.2	U	U	U	602	5.71	U
	heptachlor	U	11.9	4.05	U	U	U	27.8	U	U
	heptachlor epoxide	U	41.5	12.0	U	U	U	54.3	J 3.28	U
VOLATILES	Acetone	100	U	J 20	U	U	U	U	U	U
	Camphene	U	U	U	U	U	X	U	U	U
	Hexane	U	U	U	U	X	U	U	U	U
	Methylene chloride	B 9.3	B 51	B 23	B 35	B 24	B 9.0	B 21	B 16	B 19
	Pentane	U	U	U	U	X	U	U	U	U
	Pinene, alpha-	U	U	U	U	U	X	U	U	U
	Toluene	U	U	2.1	U	U	U	7.5	U	6.5
RADIOLOGICS	GROSS ALPHA	2.7/2.40	5.8	3.34	9.99	3.8	2.13	14.4	5.0	1.27/1.31
	GROSS BETA	16.2/18.0	54.7	37.5	12.0	26.6	13.3	86.0	48.3	13.1/12.
	GAMMA RADIONUCLIDES K-40	8.39	25.2	17.7	13.50	15.31	6.41	24.69	22.72	1.20
	GAMMA RADIONUCLIDES Pb-214	1.396	2.73	2.89	0.815	1.168	1.44	2.97	1.96	0.637
	GAMMA RADIONUCLIDES Bi-214	1.444	2.65	2.40	0.739	1.078	1.489	2.45	2.05	0.580
	GAMMA RADIONUCLIDES Pb-212	1.463	1.922	1.838	1.023	1.641	1.536	1.880	1.917	0.910
	GAMMA RADIONUCLIDES Ac-228	1.43	1.89	2.31	1.16	1.79	1.50	1.85	2.36	0.968
	GAMMA RADIONUCLIDES Cs-137	0.429	0.183	0.423	-	0.178	0.106	-	0.203	-
	GAMMA RADIONUCLIDES Tl-208	0.508	0.587	0.877	0.356	0.591	0.578	0.639	0.598	-
	GAMMA RADIONUCLIDES Bi-212	0.91	-	1.58	0.73	1.25	0.91	1.21	1.24	7.02

B - analyte in blank as well as sample
U - analyte requested but not detected (TAL/TCL parameters not listed were not detected in any samples)
J - estimated value--result is less than sample quantitation limit but greater than zero
X - presence confirmed by GCMS

UNITS: INORGANICS: mg/kg; VOLATILE ORGANICS: µg/kg; EXTRACTIBLE ORGANICS: µg/kg; RADIOLOGICAL: pC/g

OBSERVED RELEASES

TABLE 6

PASSIVE DOSIMETER TUBE

AIR MONITORING RESULTS

AMMONIA (NH_3)

SMOKEY MOUNTAIN SMELTERS
KNOX COUNTY, TN - 10-29-97

STATION	STATION LOCATION DESCRIPTION	RESULT
PDT-01	SURFACE OF DISTURBED WASTE PILE	15 PPM
PDT-02	3 FEET ELEVATION ABOVE WASTE PILE	0 PPM
PDT-03	SURFACE OF LAGOON	0 PPM
PDT-04	SURFACE OF WASTE PILE INSIDE MAIN BUILDING	0 PPM
PDT-05	INSIDE AUGER HOLE AT WA-04	20 PPM
PDT-06	SURFACE OF WASTE PILE NEAR WA-04	0 PPM
PDT-07	SURFACE OF WASTE PILE AT WA-01	0 PPM

TABLE 7
LIST OF SAMPLES' CODES, TYPES, LOCATIONS, and JUSTIFICATIONS
SMOKEY MOUNTAIN SMELTERS - SITE INVESTIGATION

SAMPLE TYPE	SAMPLE ID	LOCATION/JUSTIFICATION
WASTE	SMS-WA-01	Blue Substance On Outside Waste Pile/Presence of hazardous substance
	SMS-WA-02	Baghouse Dust/Presence of hazardous substance
	SMS-WA-03	Waste Pile In Main Bldg/Presence of hazardous substance
	SMS-WA-04	Outside Waste Pile/Presence of hazardous substance
	SMS-WA-05	Basin Behind Maintenance Shed/Presence of hazardous substance
	SMS-WA-06	Basin Behind Maintenance Shed/Presence of hazardous substance (duplicate)
	SMS-WA-07	Casting Furnace Trough /Presence of hazardous substance
	SMS-WA-08	Main Building Depression/Presence of hazardous substance
SURFACE SOIL	SMS-SS-01	Gullied Land, Armuchee and Litz Soil Materials - Vulcan/ Background
	SMS-SS-02	On-site transformer station/Presence of hazardous substance
	SMS-SS-03	On-site tank farm/Presence of hazardous substance
	SMS-SS-04	On-site drum storage-disposal/Presence of hazardous substance
	SMS-SS-05	Gullied Land, Armuchee and Litz Soil Materials at Montgomery Village Apartments/ Presence of hazardous substance
SUBSURFACE SOIL	SMS-SB-01	Gullied Land, Armuchee and Litz Soil Materials - Vulcan / Background
	SMS-SB-02	On-site transformer station/Presence of hazardous substance
	SMS-SB-03	On-site tank farm/Presence of hazardous substance
	SMS-SB-04	On-site drum storage-disposal/Presence of hazardous substance
SEDIMENT	SMS-SD-01	On-site drainway/ Presence of hazardous substance
	SMS-SD-02	Unnamed Tributary of Flenniken Branch /Background
	SMS-SD-03	On-site lagoon/ Presence of hazardous substance
	SMS-SD-04	On-site drainway/ Presence of hazardous substance
	SMS-SD-05	At First Occurrence of Water in the Unnamed Tributary of Flenniken Branch /Presence of hazardous substance
	SMS-SD-06	At First Occurrence of Fishery in Flenniken Branch / Presence of hazardous substance
GROUND WATER	SMS-GW-01	Spring/Background
	SMS-GW-02	Mary Knox Tavern/Presence of hazardous substance
SURFACE WATER	SMS-SW-01	Unnamed Tributary of Flenniken Branch/Background
	SMS-SW-02	On-site lagoon/ Presence of hazardous substance
	SMS-SW-03	At First Occurrence of Water in the Unnamed Tributary of Flenniken Branch/Presence of hazardous substance
	SMS-SW-04	At First Occurrence of Fishery in Flenniken Branch / Presence of hazardous substance

TABLE 8
OBSERVED RELEASES

SMOKEY MOUNTAIN SMELTERS KNOX COUNTY, TENNESSEE 37920

CONTAMINANT	WASTE	SOIL	SEDIMENT	GROUND-WATER	SURFACE WATER
aluminum, Al	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX
ammonia, NH_3	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX		XXXXXXXXXX
antimony, Sb	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX		XXXXXXXXXX
barium, Ba	XXXXXXXXXX		XXXXXXXXXX		XXXXXXXXXX
beryllium, Be	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX		XXXXXXXXXX
cadmium, Cd	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX		
calcium, Ca	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX		
chromium, Cr	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX		XXXXXXXXXX
cobalt, Co	XXXXXXXXXX				
copper, Cu	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX		XXXXXXXXXX
fluoride					XXXXXXXXXX
cyanide	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX		
iron, Fe		XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX
lead, Pb	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX
magnesium, Mg	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX		
manganese, Mn			XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX
mercury, Hg	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX		
nickel, Ni	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX		
nitrite nitrogen					XXXXXXXXXX
NO_3 & NO_2 nitrogen					XXXXXXXXXX
potassium, K	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX		XXXXXXXXXX
selenium, Se	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX		XXXXXXXXXX
silver, Ag	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX		XXXXXXXXXX
sodium, Na	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX
vanadium, V	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX		
zinc, Zn	XXXXXXXXXX	XXXXXXXXXX		XXXXXXXXXX	XXXXXXXXXX
bis(2-ethylhexyl)phthalate	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX		XXXXXXXXXX
diethyl phthalate	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX		
benz(a)anthracene	XXXXXXXXXX		XXXXXXXXXX		
benzo(a)pyrene	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX		
benzo(b)fluoranthene	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX		
benzo(ghi)perylene	XXXXXXXXXX				
benzo(k)fluoranthene	XXXXXXXXXX		XXXXXXXXXX		
fluoranthene	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX		
indeno(1,2,3-cd)pyrene	XXXXXXXXXX				
phenanthrene	XXXXXXXXXX		XXXXXXXXXX		
pyrene	XXXXXXXXXX		XXXXXXXXXX		
chrysene	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX		
alpha-chlordane	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX		
gamma-chlordane	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX		
p,p-DDT		XXXXXXXXXX			
dieldrin	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX		
heptachlor	XXXXXXXXXX	XXXXXXXXXX			
heptachlor epoxide	XXXXXXXXXX	XXXXXXXXXX			
Toluene	XXXXXXXXXX	XXXXXXXXXX			
Methylene chloride		XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	
Tetrachloroethene					XXXXXXXXXX
Trichloroethene					XXXXXXXXXX
GROSS ALPHA		XXXXXXXXXX			
GROSS BETA		XXXXXXXXXX	XXXXXXXXXX		XXXXXXXXXX
K-40		XXXXXXXXXX			XXXXXXXXXX
Be-7	XXXXXXXXXX				
Pb-214				XXXXXXXXXX	
Bi-212		XXXXXXXXXX			
Bi-214				XXXXXXXXXX	
Tl-208			XXXXXXXXXX		
Cs-137			XXXXXXXXXX		

LIST OF REFERENCES

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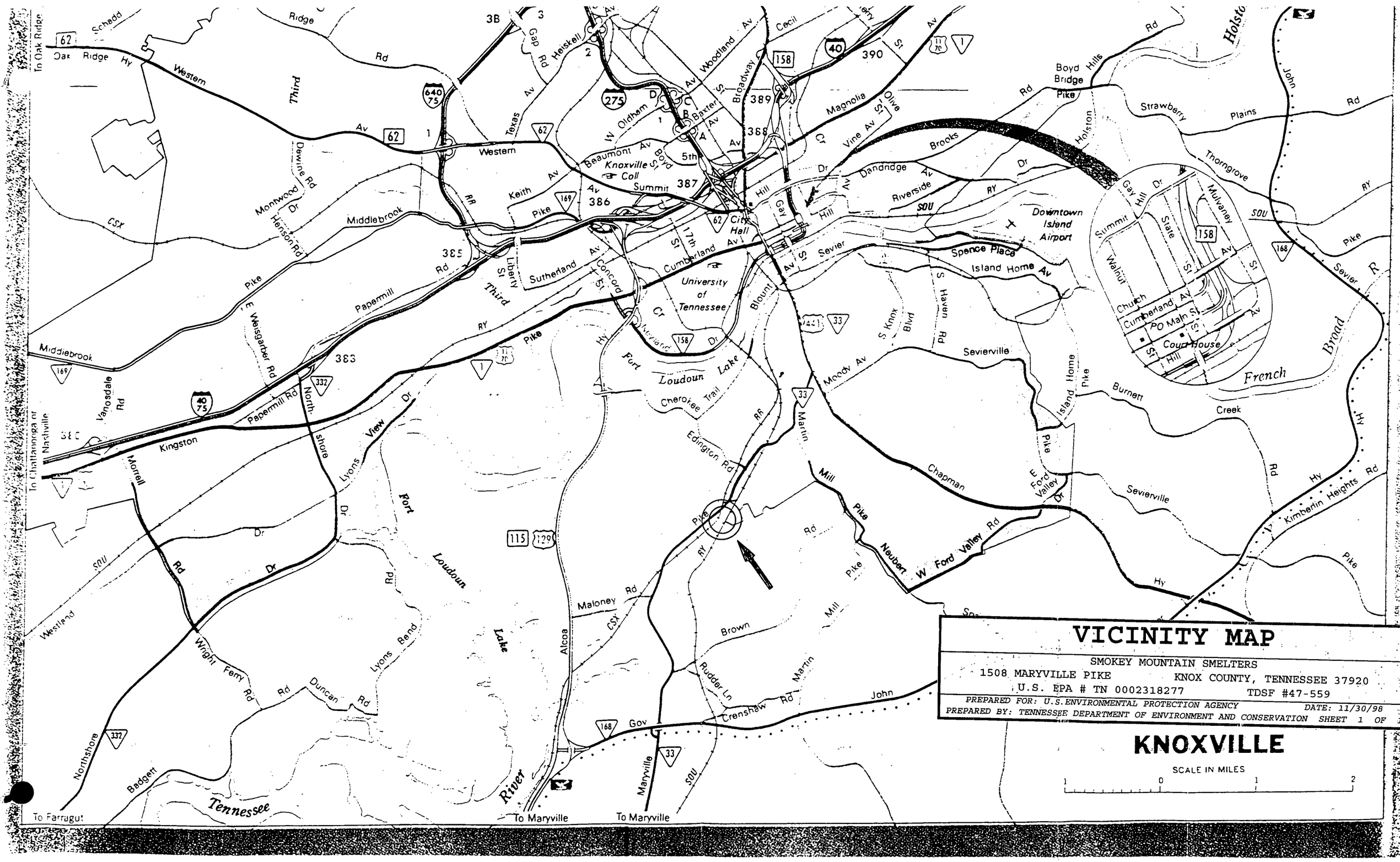
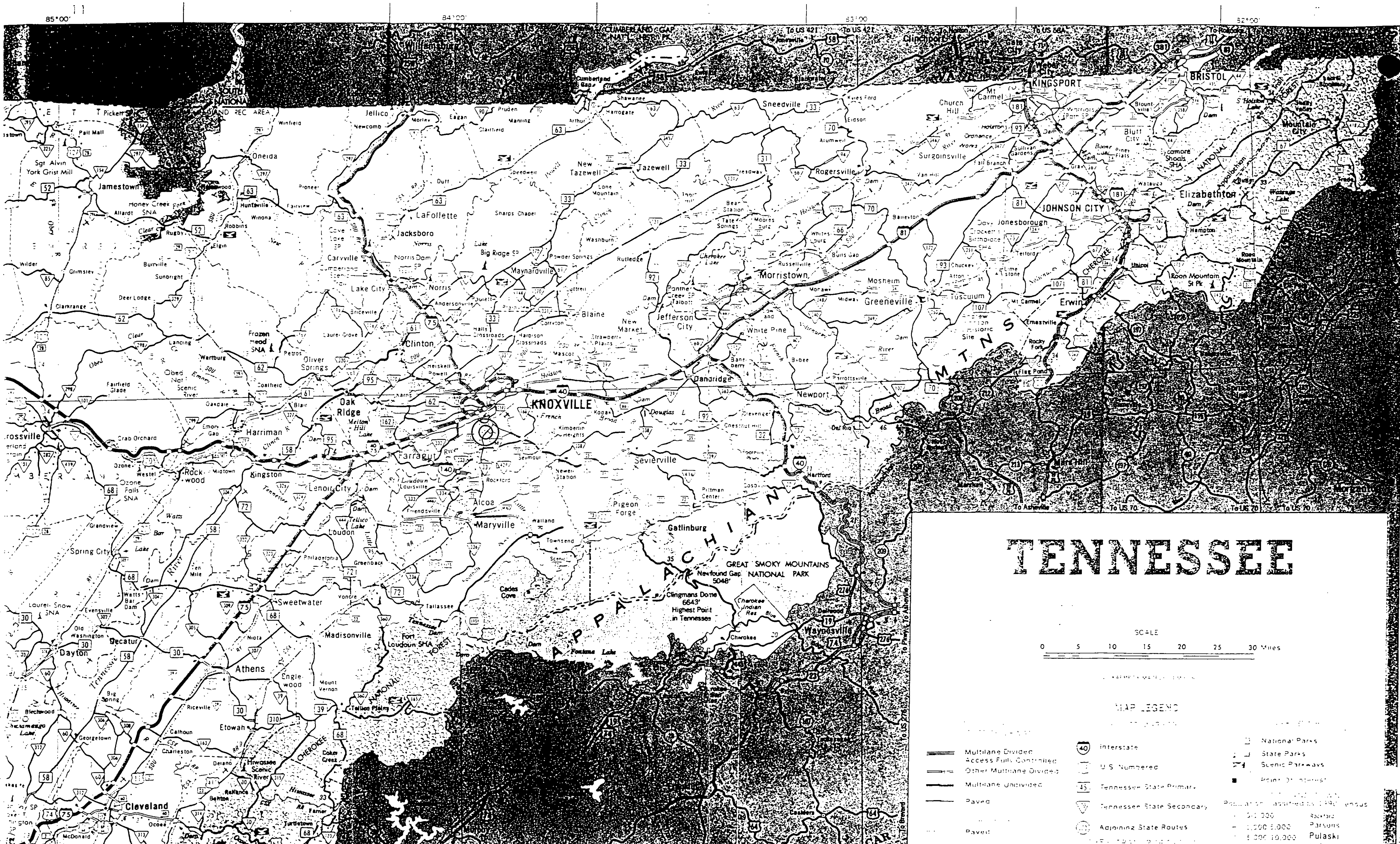
VICINITY MAP

FIGURE 1


VICINITY MAP
SMOKEY MOUNTAIN SMELTERS
1508 MARYVILLE PIKE KNOX COUNTY, TENNESSEE 37920
U.S. EPA # TN 0002318277 TDSF #47-559
PREPARED FOR: U.S. ENVIRONMENTAL PROTECTION AGENCY DATE: 11/30/98
PREPARED BY: TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION SHEET 1 OF 1
KNOXVILLE
SCALE IN MILES
1 0 1 2
To Oak Ridge
To Chattanooga or Nashville
To Farragut
To Maryville
To Maryville
Knoxville Coll
City Hall
University of Tennessee
Downtown Island Airport
Fort Loudoun Lake
Tennessee River
French Broad
Sevierville
Kingston
Western
Third
Papermill
Middlebrook
Sutherland
Cumberland
Sevier
Broadway
Woodland
Magnolia
Olive
Vine
Brooks
Dandridge
Riverside
Spence Place
Island Home
Moody
Martin
Mill
Chapman
Neubert
W Ford Valley
Maloney
Brown
Rudder
Crenshaw
Gov
Maryville
Alcoa
Kimberlin Heights
Strawberry Plains
Thorngrove
Boyd Hills
Bridge
Pike
Burnett Creek
Lyons View
Lyons Bend
Wright Ferry
Duncan
Badgett
Westland
Northshore
Morrell
Kingston
Vanosdale
Middlebrook
Papermill
Weisgarber
Henson
Montwood
Dewine
Keith
Texas
Heiskell
Gap
Schadd
Ridge
Oak Ridge Hy
Beaumont
Summit
Oldham
Baxter
Boyd
Liberty
Concord
Cecil
Holston
John
Gay
Hill
Summit
State
Mulvaney
Walnut
Church
Cumberland
PO Main St
Court House
Edington
Cherokee Trail
Blount
Martin
S Knox Blvd
S Haven Rd
Island Home Pike
E Ford Valley Dr
Kimberlin Heights Rd
CSX
SOU
RR
RY
Hy
Rd
Dr
Av
St
Cr
Pike
5th
17th
62
640
75
275
158
40
441
33
11
70
1
169
168
332
115
129
390
389
388
387
386
385
384
383
382



TENNESSEE
SCALE
0 5 10 15 20 25 30 Miles
MAP LEGEND
Multilane Divided Access Fully Controlled
Other Multilane Divided
Multilane Undivided
Paved
Interstate
U.S. Numbered
Tennessee State Primary
Tennessee State Secondary
Adjoining State Routes
National Parks
State Parks
Scenic Parkways
KNOXVILLE
JOHNSON CITY
KINGSPORT
BRISTOL
Oak Ridge
Maryville
Alcoa
Cleveland
Athens
Morristown
Greeneville
Elizabethton
Jonesborough
Erwin
Sevierville
Gatlinburg
Pigeon Forge
Newport
Dandridge
Jefferson City
Harriman
Kingston
Lenoir City
Loudon
Sweetwater
Madisonville
Clinton
LaFollette
Jacksboro
Tazewell
Sneedville
Rogersville
Jamestown
Oneida
Crossville
Dayton
Decatur
Spring City
Etowah
GREAT SMOKY MOUNTAINS NATIONAL PARK
Newfound Gap 5048'
Clingmans Dome 6643' Highest Point in Tennessee
Cherokee Indian Res.
APPALACHIAN MTNS
CUMBERLAND GAP NAT'L HIST. PK
Cumberland Gap
85°00'
84°00'
83°00'
82°00'

SITE PLAN

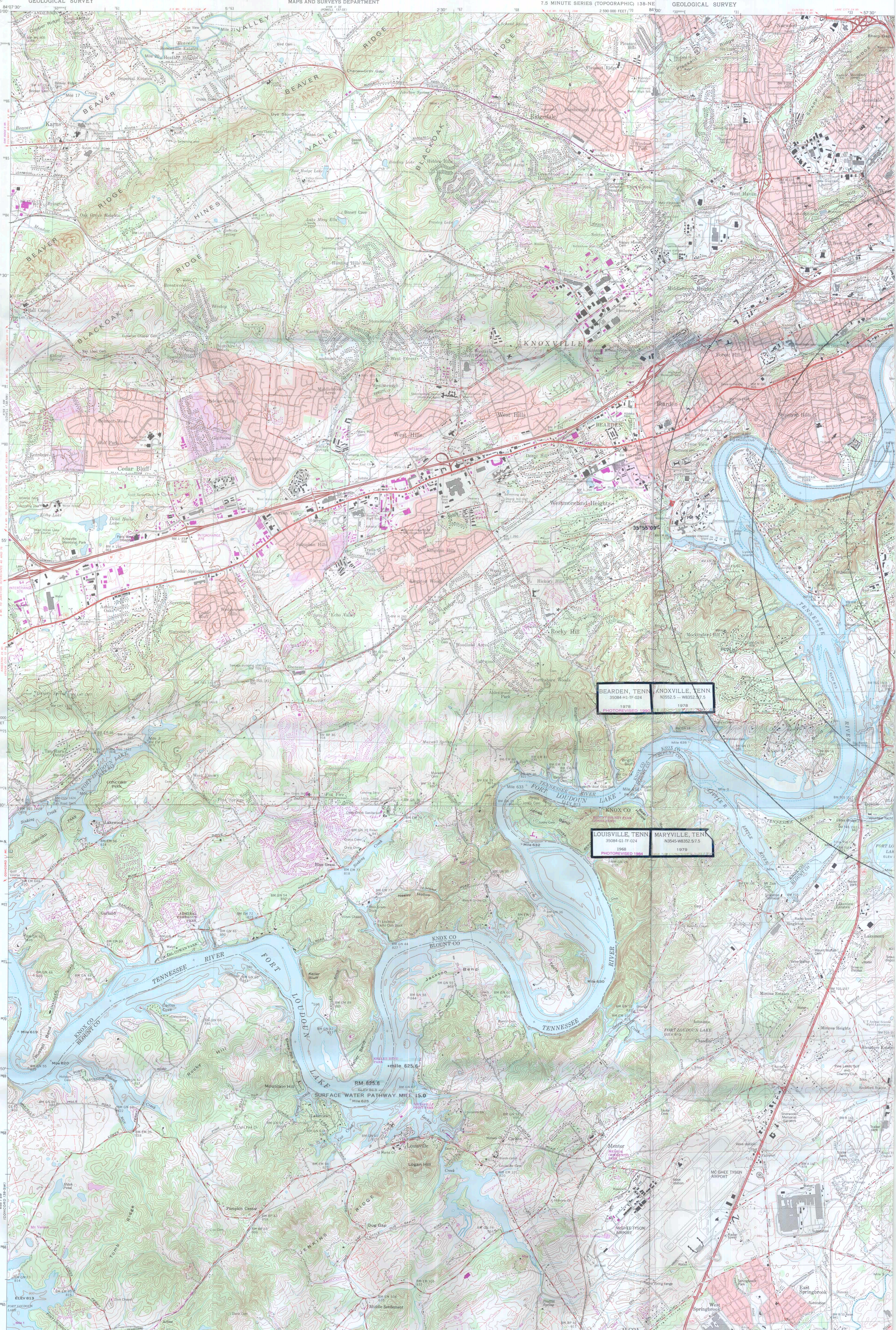
FIGURE 2

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

UNITED STATES
TENNESSEE VALLEY AUTHORITY
MAPS AND SURVEYS DEPARTMENT

BEARDEN QUADRANGLE
TENNESSEE
7.5 MINUTE SERIES (TOPOGRAPHIC) 138-NE

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

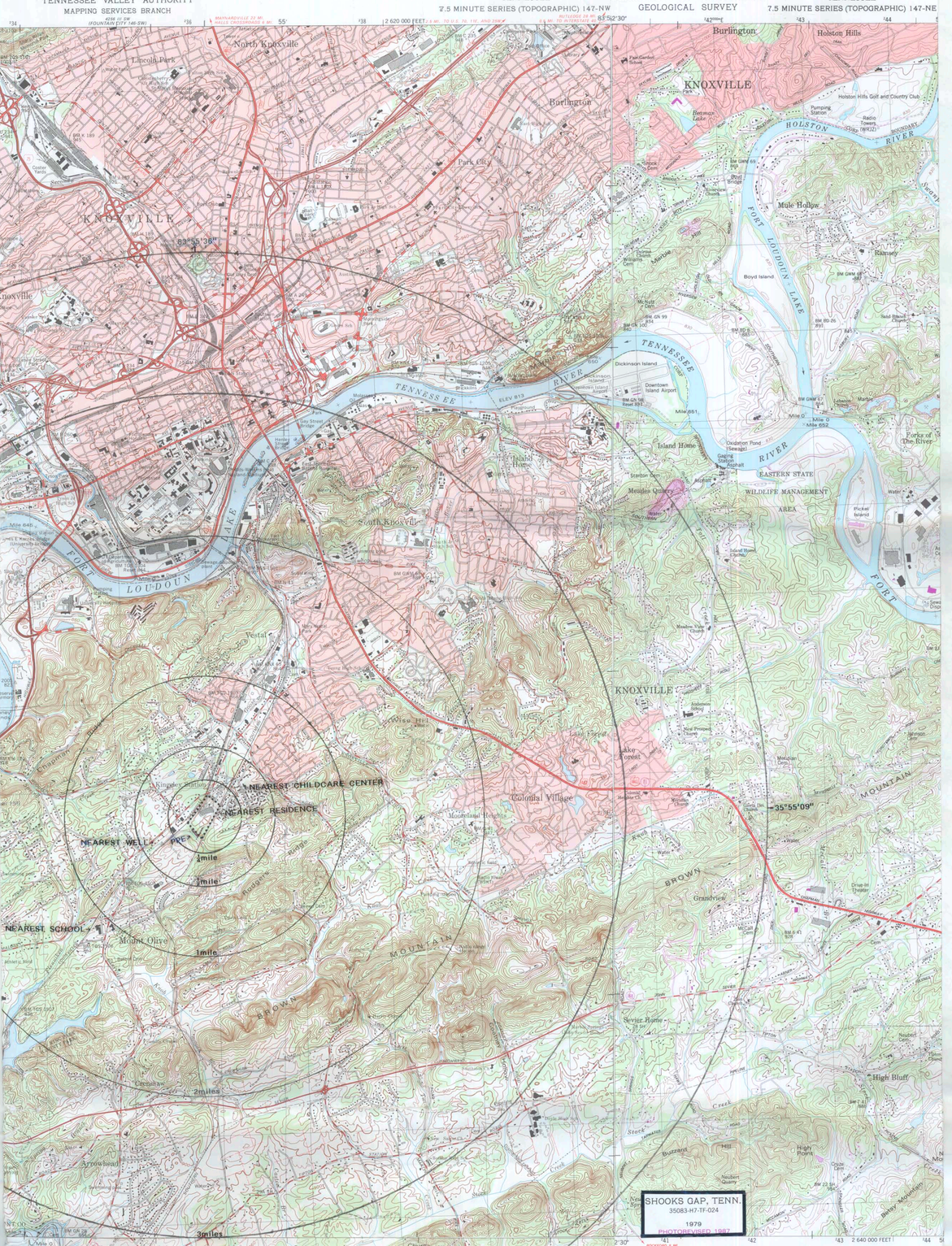


UNITED STATES
TENNESSEE VALLEY AUTHORITY
MAPPING SERVICES BRANCH

KNOXVILLE QUADRANGLE
TENNESSEE
7.5 MINUTE SERIES (TOPOGRAPHIC) 147-NW

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

SHOOKS GAP QUADRANGLE
TENNESSEE
7.5 MINUTE SERIES (TOPOGRAPHIC) 147-NE



SHOOKS GAP, TENN.
35083-H7-TF-024
1979
PHOTOREVISED 1987

Mapped and edited by Tennessee Valley Authority
Published by the Geological Survey

Control by NOS/NOAA, USGS, and TVA

Revised by TVA in 1977 by photogrammetric methods using aerial photographs taken 1975 and by reference to TVA-USGS quadrangle dated 1966. Map field checked by TVA, 1978
Map edited 1979

Polyconic projection. 10,000-foot grid ticks based on Tennessee coordinate system
1000-meter Universal Transverse Mercator grid, zone 17
1927 North American Datum

To place on the predicted North American Datum 1983 move the projection lines 7 meters south and 8 meters west as shown by dashed corner ticks

Fine red dashed lines indicate selected fence and field lines where generally visible on aerial photographs. This information is unchecked

UTM GRID AND 1987 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

Revisions shown in purple and woodland compiled by the Tennessee Valley Authority from aerial photographs taken 1984 and other sources. This information not field checked. Map edited 1987

SMOKEY MOUNTAIN SMELTERS
1508 MARYVILLE PIKE KNOX COUNTY, TENNESSEE 37920
U.S. EPA # TN0002318277 TDSF #47-559

SITE PLAN

SCALE: 1:24 000

PREPARED FOR: U.S.ENVIRONMENTAL PROTECTION AGENCY DATE: 11/30/98
PREPARED BY: TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION SHEET 1 OF 1

SCALE 1:24 000
1 MILE
1000 0 1000 2000 3000 4000 5000 6000 7000 FEET
1 KILOMETER

CONTOUR INTERVAL 20 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS
FOR SALE BY U. S. GEOLOGICAL SURVEY, RESTON, VIRGINIA 22092,
TENNESSEE DEPARTMENT OF CONSERVATION, DIVISION OF GEOLOGY, NASHVILLE, TENN., 37219
AND U. S. TENNESSEE VALLEY AUTHORITY, CHATTANOOGA, TENN. 37401 OR KNOXVILLE, TENN., 37902.
A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST

UTM GRID AND 1978 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

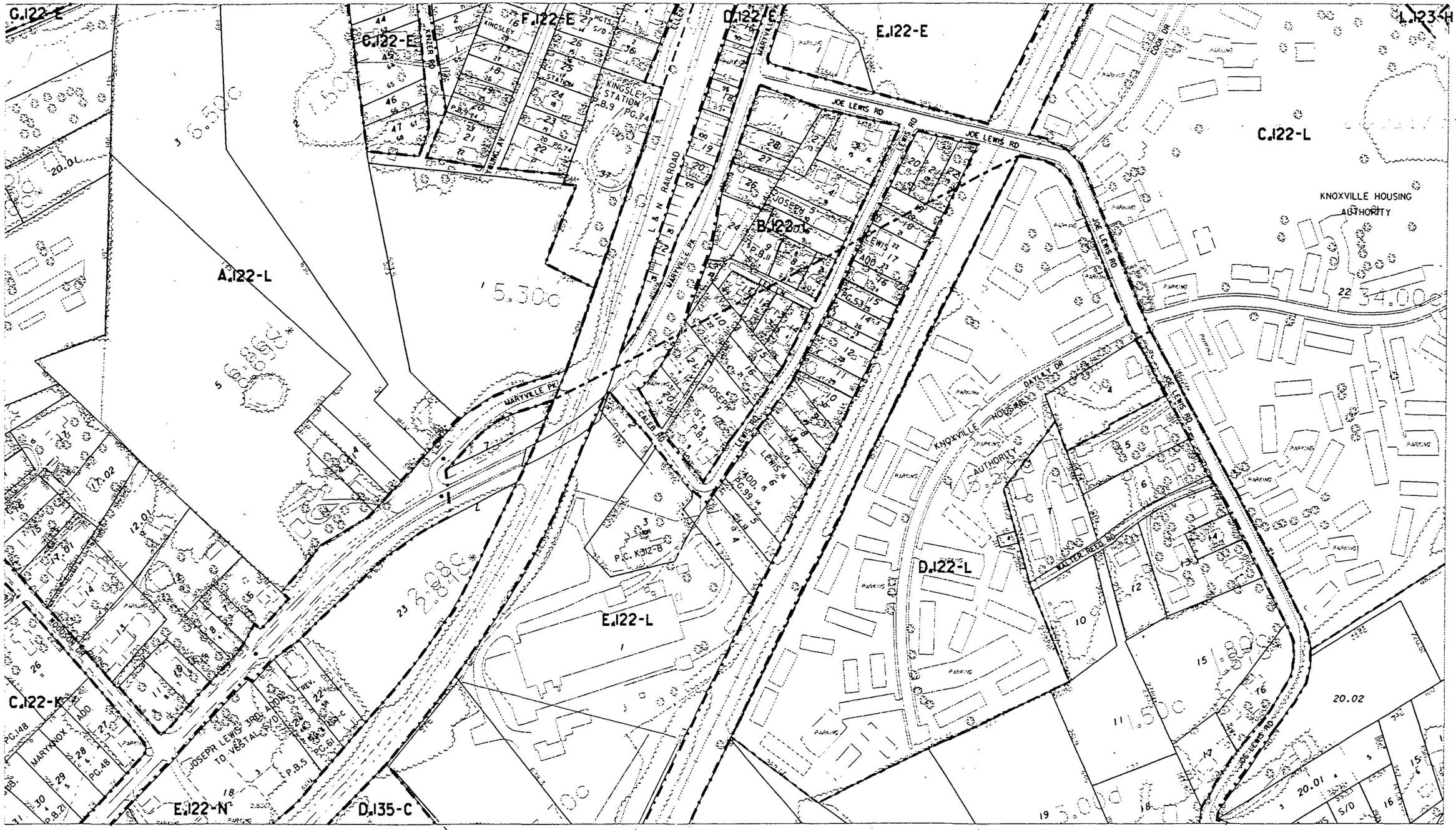
QUADRANGLE LOCATION
KENTUCKY VA MO ILL TENNESSEE NC MISS ALA GA SC

Red tint indicates areas in which only landmark buildings are shown

ROAD CLASSIFICATION
Heavy-duty — Poor motor road
Medium-duty — Wagon and jeep track
Light-duty — Foot trail
Interstate Route — U. S. Route — State Route
In developed areas, only through roads are classified

PROPERTY MAP

FIGURE 3



122-F	122-E	123-H
122-K	122-L	123-I
122-N	122-M	123-P

PROPERTY ASSESSORS OFFICE			
KNOX	COUNTY	TN	MAP No.
SCALE: 1" = 100'	DISTRICT 9		122-L
PLOTTED APR 1986	WARD 25		

Realty EYES™
INFOCODE CORPORATION
615-269-6930

SITE SKETCH

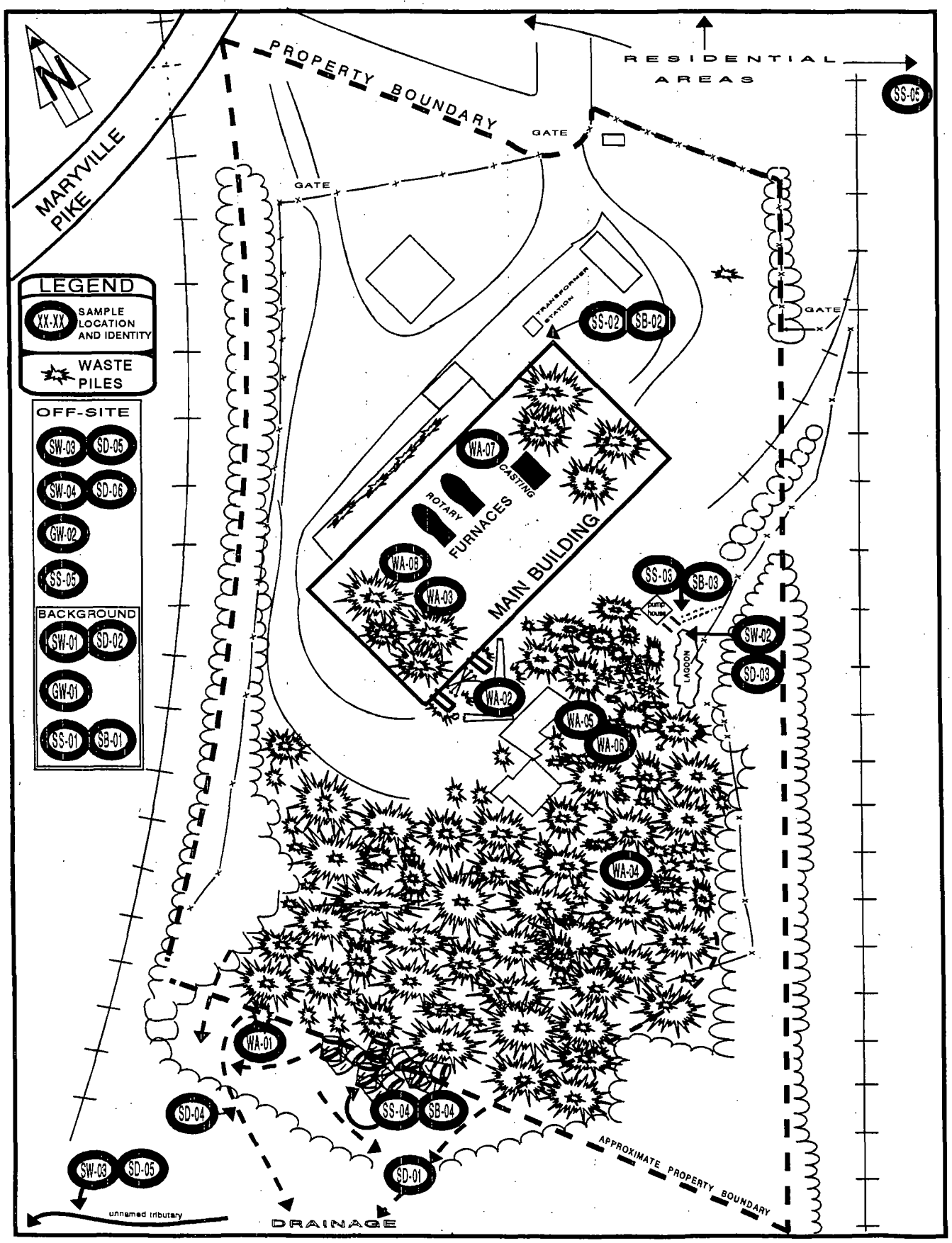
showing

SAMPLE LOCATIONS

FIGURE 4

Figure 4

SITE INVESTIGATION
SMOKEY MOUNTAIN SMELTERS
Site Sketch / Sample Locations
Knox County, TN TDSF # 47-559



NOT TO SCALE. BASED ON OBSERVATIONS MADE IN OCTOBER 1997 and AUGUST 1998.

GEOLOGIC MAP

FIGURE 5

(Very cherty limestone, weathering to chert)

Grainger formation
(Siltstone, sandstone, and shale)

Chattanooga shale
(Black shale)

Basal Mississippian and Devonian shale
(Black shale above and below, silty shale and sandstone between)

Hancock limestone
(Sandy limestone and dolomite)

Sr, Rockwood formation
(Shale and siltstone, with beds of iron ore; some sandstone to southeast)
Sc, Clinch sandstone
(White thick-bedded sandstone)

Silurian sandstone and shale, undivided
(Sandstone, siltstone, and shale, with beds of iron ore in upper part)

SILURIAN DEVONIAN

CARBONIF

Upper Ordovician

Sequatchie formation
(Maroon and blue shaly limestone and limy shale)

Reedsville shale
(Bluish calcareous shale)

Juniata formation
(Maroon siltstone and shale)

Upper part of Chickamauga limestone
(Blue crystalline well-bedded limestone; upper part shaly limestone)

Chickamauga limestone, unit 4
(Blue crystalline well-bedded limestone)

Martinsburg shale
(Bluish calcareous shale)

Middle Ordovician

Chickamauga limestone, unit 3
(Blue flaggy limestone and yellow silty limestone)

Moccasin formation
(Maroon limy shale, shaly limestone, and blue flaggy limestone)

Bays formation
(Maroon siltstone and shale)

Lower and middle parts of Chickamauga limestone, undivided
(Blue limestone of several kinds and yellow silty limestone)

Chickamauga limestone, unit 2
(Blue limestone, mostly nodular and shaly; some shale to southeast)

Ottosee shale
(Bluish calcareous shale with crystalline limestone lenses)

Chickamauga limestone, unit 1
(Blue cherty, massive, and silty limestone)

Holston formation
(Red crystalline limestone ("marble"), quartzose crystalline limestone, and limy sandstone)

Sevier shale
(Bluish calcareous shale with sandstone beds; blue limestone at base)

Lenoir limestone
(Blue nodular and massive limestone)

Athens shale
(Bluish calcareous shale and shaly limestone; some sandstone to southeast; blue limestone at base)

ORDOVICIAN

Lower Ordovician

Knox group

Mascot dolomite
(Siliceous dolomite)

Kingsport formation
(Siliceous dolomite; thick limestone bed near base)

Newala formation
(Siliceous dolomite; some limestone beds)

Longview dolomite
(Very siliceous dolomite; limestone beds near top)

Chepultepec dolomite
(Siliceous dolomite; sandstone beds near base)

Chepultepec and Longview dolomite, undivided
(Very siliceous dolomite; sandstone beds near base)

Chepultepec, Longview, and Newala formations, undivided
(Siliceous dolomite; sandstone beds near base)

Knox dolomite or group, undivided
(Siliceous dolomite to northwest, limestone to southeast)

Jonesboro limestone
(Blue limestone; some dolomite beds; sandstone beds near base)

Base compiled and materials assembled by C. H. Heins, G. D. DeBuchananne and R. M. Richardson of the U. S. Geological Survey

Maps prepared for printing by N. B. Johnson, C. E. James, J. B. Canter, and others of the U. S. Geological Survey

and siltstone)

Chilhowee group

Nebo sandstone
(White sandstone)

Nichols shale
(Greenish silty shale)

Hampton formation
(Greenish silty shale and siltstone, with feldspathic sandstone layers)

Cochran conglomerate
(Feldspathic sandstone and conglomerate)

Unicoi formation
(Feldspathic sandstone and conglomerate; some siltstone and shale)

Ocoee series

Sandsuck shale
(Argillaceous shale and silty shale, with conglomerate and sandstone lenses)

Fine grained part of Ocoee series
(Shale and siltstone, with conglomerate and sandstone lenses)

Nantahala slate
(Dark slate)

Pigeon siltstone
(Massive greenish siltstone and fine-grained sandstone)

Great Smoky conglomerate
(Graywacke and graywacke conglomerate, in graded beds)

Snowbird formation
(Shale, siltstone, arkose, and conglomerate)

Lowest part of Ocoee series
(Graywacke and slate, in graded beds)

Mount Rogers volcanic group
(Purple and green metavolcanic rocks)

Pre-Cambrian crystalline complex
(Granitic and gneissic rocks with inclusions of mica and hornblende schist)

Contact

Fault

Fault
Dashed where approximately located

Doubtful or probable fault

Well showing location
The first number indicates the number within the county, the second the well number in group

Spring showing location

Geology compiled by John Rodgers, U. S. Geo
(For Description of sources see text)

Locations of wells and springs listed in the te
R. M. Richardson, and others of the U. S. G

GEOLOGIC MAP OF EAST TENNESSEE: ASHEVILLE, AND MASTER EXPLANATION SHOWING LOCATION OF WELLS AND SPRINGS

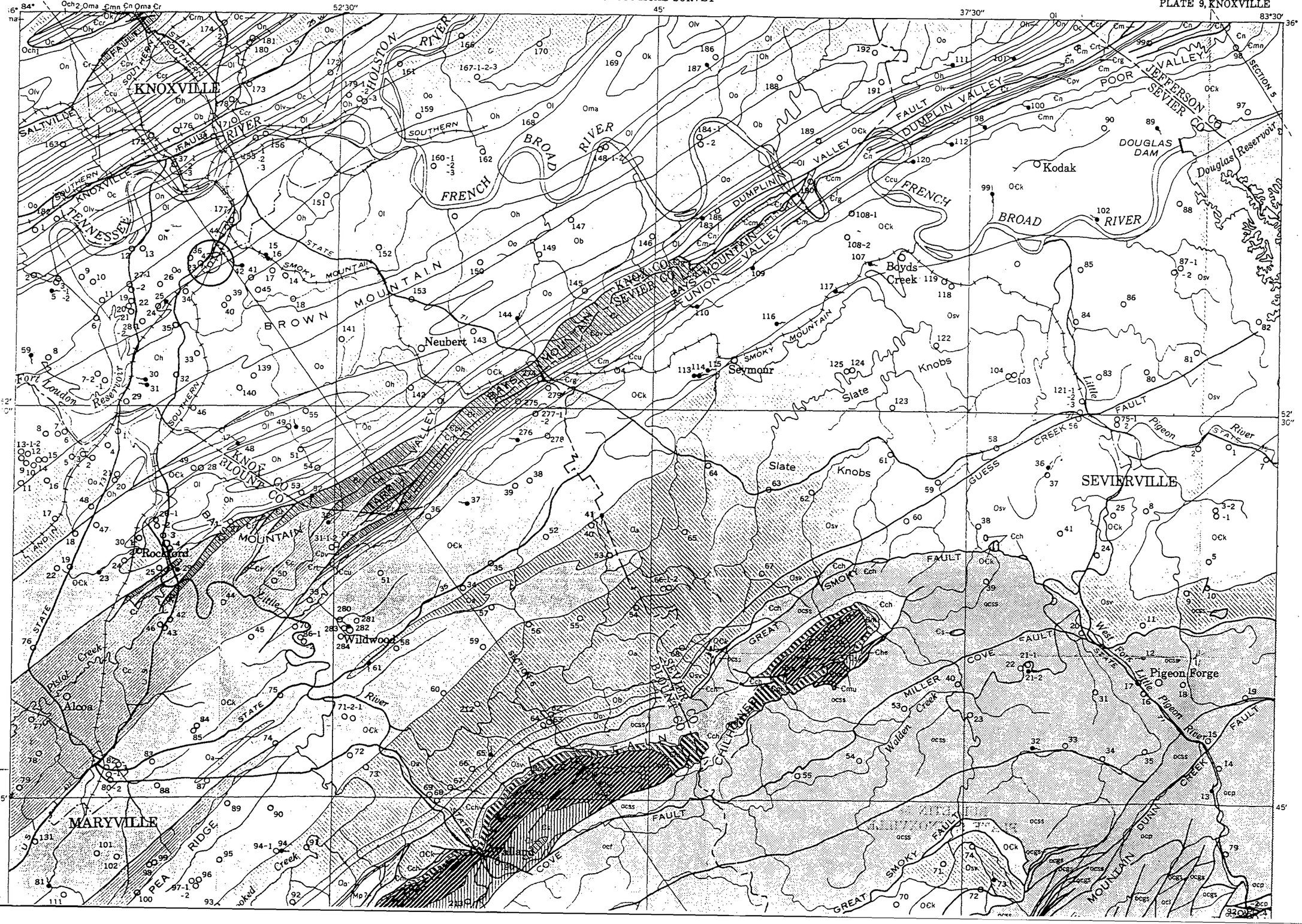
Scale $\frac{1}{125,000}$

1 0 5 10 Miles

STATE OF TENNESSEE
DEPARTMENT OF CONSERVATION
DIVISION OF GEOLOGY

PREPARED IN COOPERATION WITH
UNITED STATES DEPARTMENT OF INTERIOR
GEOLOGICAL SURVEY

BULLETIN 58
PLATE 9, KNOXVILLE



EXPLANA

- ig — Paleozoic intrusive rocks
- Mp — Pennington formation
- Mn — Newman limestone
- Mg — Grainger Formation
- Mbc — Chattanooga shale
- Ob — Bays formation
- Och 2 — Chickamauga limestone, unit 2
- Oo — Ottosee shale
- Och 1 — Chickamauga limestone, unit 1
- Oh — Holston formation
- Ol — Lenoir limestone
- Oa — Athens shale
- Osv — Sevier shale
- OCk — Knox dolomite or group, undivided
- Oma — Mascot dolomite
- Ok — Kingsport formation
- On — Newala formation
- Olv — Longview dolomite

GEOLOGIC MAP
OF THE
KNOXVILLE QUADRANGLE, TENNESSEE

By

J. Mark Cattermole

Scale 1:24000

1 ½ 0 1 Mile

Contour interval 20 feet
Datum is mean sea level

1958

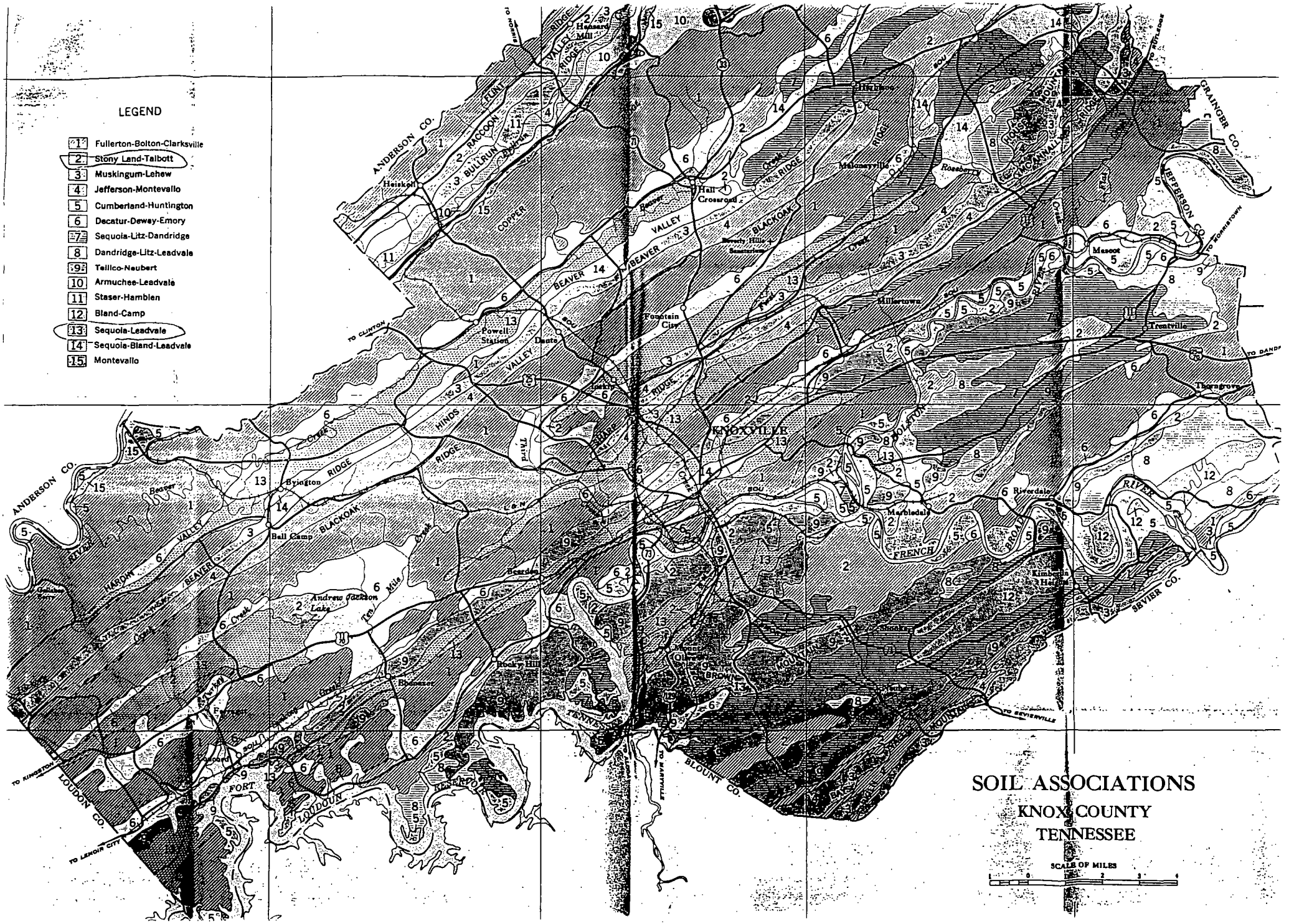
SOIL MAP

FIGURE 6

KNOX COUNTY, TENN., SOILS: SUMMARY OF IMPORTANT CHARACTERISTICS—Continued

Soil	Map symbol	Management requirement group [1]	Dominant slope range	Soil profile: Color of surface soil [2]	Soil profile: Color, texture, and consistence of subsoil or substratum [3]	Depth [4]	Nature of parent rock or parent material	Permeability: Surface soil	Permeability: Subsoil	Runoff	Moisture relations [6]	Erosion hazard [7]	Use suitability group [8]
			Percent			*Feet*							
Ar land: Cruchee and Litz soil materials	Gs	3-A	12-50	Surface soil largely lacking; exposed soil material variable (see text description).	Variable (see text description)	½-2	Shale and interbedded limestone and shale.	Slow	Slow	Very high	Very poor	Extremely great	5
Fullerton and Talbott soil materials	Gr	3-A	12-50	do	do	1-30	Limestone and cherty limestone	do	do	do	do	do	5
Sequoia and Montevallo soil materials	Gv	3-A	4-12	do	do		Shale	Moderately slow	Moderately slow	do	do	do	5
Talbott and Decatur soil materials	Gw	3-A	4-12	do	do	1-30	High grade and clayey (argillaceous) limestones.	Very slow	Very slow	do	do	do	5
Colbert and Muskingum soil materials	Gx	3-A	12-50	do	do	1-10	Acid and calcareous sandstones	Moderately slow	Moderately slow	do	do	do	5
Silt loam	Gt	2-E	0-2	Gray	Gray mottled, very firm clay	10-30	Local alluvium chiefly from Fullerton, Talbott, Colbert, and Sequoia soil areas.	do	Very slow	None	Poor	None (overflows)	4
Fine sandy loam	Ha	1-B	0-3	Brownish to reddish brown	Yellowish-brown to reddish-brown silt loam or sandy loam, mottled below 20 inches.	5-30	General alluvium containing much sand.	Moderately rapid	Moderate	do	Very good	do	2
Silt loam	Hb	1-B	0-2	Light yellowish brown	Yellowish-brown to reddish-brown silt loam or silty clay loam, mottled below 20 inches.	5-30	General alluvium, much from shale.	Moderate	do	do	do	do	2
Silt loam	Hc	1-A	0-2	Brown or dark brown	Brown or light-brown friable silt or silty clay loam.	15-40	General alluvium, strongly influenced by limestone.	do	do	do	do	do	1
Low-bottom phase	Hb	1-A	0-2	Brown or dark grayish brown	Brown or dark grayish-brown silt loam or loam.	10-30	do	do	do	do	do	do	1
Loam, eroded rolling phase	Je	1-H	5-12	Yellowish gray	Brownish-yellow friable firm sandy clay loam.	2-12	Colluvium from sandy rocks	Moderately rapid	Moderately slow	Medium	Fair	Great	3
Jefferson and Montevallo loams: Eroded undulating phases	Jc	1-G	2-5	Grayish yellow (Jefferson) and yellowish gray (Montevallo).	Brownish-yellow friable sandy clay loam (Jefferson) and brownish-yellow friable shaly clay loam—lacking in places (Montevallo).	1-2 (Jefferson) and ½-2 (Montevallo)	Colluvium from sandy rocks (Jefferson) and acid shale (Montevallo).	Moderate	do	Low	do	Moderate	2
Eroded rolling phases	Je	1-H	5-12	do	do	1-2 (Jefferson) and ½-2 (Montevallo)	do	Moderately slow	do	High	Poor	Great	3
Jefferson and Montevallo clay loams, severely eroded rolling phases.	Ja	2-A	5-12	Brownish yellow (both soils)	do	1-2 (Jefferson) and ½-2 (Montevallo)	do	do	do	do	Very poor	Very great	4
Lead and Cotaco loams: Undulating phases	La	1-D	0-7	Yellowish gray	Yellowish grading to mottled, friable (Cotaco) and firm (Leadvale) clay loam.	4-15	Mixed colluvium and local alluvium from sandstone and shale.	Moderate	do	Very low	Very good	Very little	3
Rolling phases	Lb	1-D	7-16	do	do	2-10	do	do	do	Low	Good	Little	3
Lead and Whitesburg silt loams: Undulating phases	Lc	1-D	0-7	Brownish gray (Whitesburg) and yellowish gray (Leadvale).	Yellowish grading to mottled, firm silty clay loam (both soils).	4-15	Colluvium and local alluvium chiefly from acid shale (Leadvale) and calcareous shale (Whitesburg).	do	do	Very low	Very good	Very little	2
Rolling phases	Ld	1-D	5-12	do	do	2-10	do	do	do	Low	Good	Little	3
Limestone rockland: Rolling and hilly	Le	2-A	2-25	Limestone rock exposed	Limestone rock	0	Limestone			Very high	Very poor	Extremely great	5
Steep	Lf	2-A	25+	do	do	0	do			do	do	do	5
Lindside silt loam	Lg	1-B	0-2	Brown	Mottled friable to firm silt or silty clay loam.	5-40	General alluvium strongly influenced by limestone.	Moderate	Moderately slow	None	Very good	None (overflows)	2
Made land	Ma	2-A	0-15	Variable	Variable	Variable	Variable						5
Main silt loam	Mb	2-E	0-2	Brownish gray, mottled	Mottled firm to plastic silty clay	5-40	General alluvium strongly influenced by limestone.	do	Slow	None	Variable	None (overflows)	4
Montevallo silt loam, steep phase	Mc	2-A	25+	Grayish yellow or gray	Brownish-yellow friable shaly silt loam or shaly silty clay loam.	1-2	Acid shale	Moderately slow	Moderately slow	Very high	Poor	Extremely great	5
Montevallo shaly silt loam:													
Eroded steep phase	Md	2-A	25+	do	Variegated partly disintegrated shale	0-1	do	do	do	do	do	do	5
Eroded hilly phase	Me	2-A	12-25	Yellowish gray	Brownish-yellow friable shaly silt loam or shaly silty clay loam.	1-2	do	do	do	do	do	Very great	5
Eroded rolling phase	Mf	2-A	5-12	Grayish yellow	Brownish-yellow friable shaly silt loam or shaly silty clay loam for	½-1½	do	do	do	High	Fair to poor	Great	4

Undulating phase	Rs	1-C	2-5	Reddish brown	Brownish-red friable clay loam	3-20	Local alluvium and colluvium from Talbot soils.	Moderately rapid	do	Very low	Very good	Very little	1
Rolling phase	Na	1-C	5-16	do	do	3-20	do	do	do	Low	Good	Little	2
chucky gravelly loam, eroded rolling phase	No	1-H	5-12	Pale brown or gray	Reddish-yellow firm sandy clay	5-40	Mixed alluvium	do	do	do	Fair	Moderate	3
ewah silt loam	Oa	1-B	0-2	Grayish brown	Mottled friable to firm silty clay loam	10-20	Local alluvium from soils over limestone.	Moderate	Moderately slow	None	Very good	None (overflows)	2
ler silt loam	Pa	2-E	0-2	Light gray, mottled	Mottled gray firm to compact clay	5-30	General alluvium chiefly from shale.	do	Slow	do	Poor	do	4
ne silt loam	Ra	1-C	0-2	Grayish brown	Yellowish brown or yellowish-gray friable silty clay loam underlain by light-gray cherty matrix.	4-15	General alluvium from cherty limestone.	Moderately rapid	Moderate to variable.	Very low	Fair to poor	Very little	2
atchie fine sandy loam	Sa	1-C	2-12	do	Yellowish-brown friable sandy clay loam.	10-40	Moderately young general alluvium, sandy.	do	do	do	Good	do	2
ola silt loam, undulating phase	Sm	1-J	2-5	Brownish gray	Reddish-yellow very firm silty clay	1½-3½	Interbedded shale and limestone or calcareous (limy) shale.	Moderate	Slow	Medium	do	Moderate	2
ola silty clay loam:													
Eroded undulating phase	Sl	1-J	2-5	Brownish gray to grayish yellow	do	1-2	do	do	do	do	Fair	do	2
Severely eroded undulating phase	Sx	1-L	2-5	Reddish yellow	do	½-2	do	Slow	do	High	Poor	Great	3
ola silt loam, rolling phase	So	1-K	5-12	Brownish gray	do	1½-2½	do	Moderate	do	do	Fair	do	2
quoia silty clay loam:													
Eroded rolling phase	Sk	1-K	5-12	Brownish yellow	do	1-3	do	Moderately slow	do	do	do	do	3
Severely eroded rolling phase	Sm	2-A	5-12	Reddish yellow	do	½-1½	do	Slow	do	Very high	Very poor	Very great	4
ola-Bland silty clay loams:													
Eroded undulating phases	Sb	1-J	2-5	Grayish yellow (Sequoia) and weak red (Bland).	Reddish-yellow (Sequoia) and dusky-red (Bland) firm silty clay.	1-3½	Interbedded shale and limestone (Sequoia) and dusky red shaly limestone (Bland).	Moderate	do	Medium	Fair	Moderate	2
Eroded rolling phases	Sc	1-K	5-12	do	do	½-2	do	Moderately slow	do	High	do	Great	3
Severely eroded rolling phases	Sr	2-A	5-12	Reddish yellow (Sequoia) and dusky red (Bland).	do	½-1½	do	Slow	do	Very high	Very poor	Very great	4
Eroded hilly phases	Sn	2-C	12-25	Grayish yellow (Sequoia) and weak red (Bland).	do	½-2	do	Moderately slow	do	do	Fair	do	4
Severely eroded hilly phases	Sn	2-C	12-25	Reddish yellow (Sequoia) and dusky red (Bland).	do	½-1½	do	Slow	do	do	Very poor	Extremely great	4
r silt loam	Sa	1-A	0-2	Grayish brown	Light-brown friable silt loam	5-20	General alluvium; much from shale.	Moderate	Moderate	None	Very good	None (overflows)	1
r fine sandy loam	So	1-A	0-3	Light brown	Light-brown friable fine sandy loam	25-35	General alluvium; contains much sand.	Rapid	Rapid	do	Good	do	2
Low-bottom phase	Sp	1-A	0-3	Grayish brown or brown	do	3-25	do	do	do	do	Very good	do	1
y rolling land, Colbert and Talbott soil aterials.	Sr	2-A	7-15	Limestone outcrops with grayish-brown silty clay loam over plastic clay between.		0-3	Limestone, chiefly clayey (argillaceous).	Slow	Very slow	High	Fair	Very great	4
y hilly and steep land, Colbert and Talbott soil materials.	Sn	2-C	15-45	do		0-3	do	Very slow	do	Very high	Poor	Extremely great	4
y very steep land, Muskingum soil aterial.	Su	3-A	60+	Sandstone outcrops with light-yellow sandy material between		0-1½	Sandstone	do	do	do	do	do	5
ott silty clay loam:													
Eroded undulating phase	Ta	1-J	2-5	Grayish brown	Red plastic clay	2-6	Clayey (argillaceous) limestone.	Moderately slow	Slow	Medium	Fair	Great	2
Eroded rolling phase	Ta	1-K	5-12	do	do	2-6	do	do	do	High	do	do	2
Severely eroded rolling phase	Tb	2-A	5-12	Red	do	1½-5	do	Slow	do	Very high	Very poor	Very great	4
Severely eroded hilly phase	Tc	2-C	12-25	do	do	1-4	do	do	do	do	do	Extremely great	4
ico loam:													
Hilly phase	Tm	1-N	12-25	Light reddish brown	Dark-red friable to firm sandy clay	3-12	Calcareous sandstone	Moderately rapid	Moderate	Medium	Fair	Moderate	3
Eroded hilly phase	Tn	1-N	12-25	do	do	3-12	do	do	do	High	do	do	3
ico clay loam, severely eroded hilly phase	Tn	2-B	12-25	Dark red	do	2-10	do	Moderate	do	Very high	Poor	Great	4
ico loam:													
Steep phase	To	3-A	25+	Light reddish brown	do	2-9	do	Moderately rapid	do	do	do	Very great	5
Eroded steep phase	Tl	3-A	25+	do	do	1½-6	do	do	do	do	do	do	5
ico clay loam, severely eroded steep phase	Tn	3-A	25+	Dark red	do	1-8	do	Moderate	do	do	Very poor	Extremely great	5
ico loam:													
Rolling phase	Tw	1-H	5-12	Light reddish brown	do	4-12	do	Moderately rapid	do	Medium	Good	Little	2
Eroded rolling phase	Tx	1-H	5-12	Reddish brown	do	4-12	do	do	do	do	do	Moderate	2
ico clay loam, severely eroded rolling phase	Tr	1-I	5-12	Dark red	do	3-10	do	Moderate	do	High	Poor	Very great	3
r silt loam	Tp	2-E	0-2	Gray	Gray, mottled with yellow, very firm silty clay.	5-40	Mixed general alluvium	do	Very slow	None	do	Moderate	4
reshore loam:													
Eroded undulating phase	Wb	1-E	2-5	Grayish brown	Red firm sandy clay	5-40	do	Moderately rapid	Moderately slow	Low	Good	Little	2
Eroded rolling phase	Wc	1-F	5-12	do	do	4-30	do	Moderate	do	Medium	Fair	Moderate	3
Eroded hilly phase	Wn	1-N	12-25	do	do	3-20	do	do	do	High	do	Great	3
reshore clay loam, severely eroded hilly ase	Wa	3-B	12-25	Red	do	3-15	do	Moderately slow	do	Very high	Poor	Very great	4
ewer silty clay loam:													
Eroded undulating phase	Wr	1-E	2-5	Light brown	Yellowish-brown, grading to mottled, very firm silty clay.	10-40	do	Moderate	Slow	Medium	Fair	Moderate	2



SOIL ASSOCIATIONS
KNOX COUNTY
TENNESSEE

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

LEGEND
KNOX CO
TENN

SOIL MANAGEMENT GROUPING

NEARLY LEVEL WELL-DRAINED SOILS ON BOTTOM LANDS AND IN DEPRESSIONS; SUITED TO INTENSIVE CROPPING, BUT SUBJECT TO OVERFLOW

MANAGEMENT GROUP 1-A

- Congaree fine sandy loam
- Congaree fine sandy loam, low-bottom phase
- Congaree silt loam
- Congaree silt loam, low-bottom phase
- Emory and Abscotville silt loams
- Huntington silt loam
- Huntington silt loam, low-bottom phase
- Stonar fine sandy loam
- Stonar fine sandy loam, low-bottom phase
- Stonar silt loam

NEARLY LEVEL IMPERFECTLY DRAINED SOILS ON BOTTOM LANDS AND IN DEPRESSIONS; SUITED TO INTENSIVE CROPPING, BUT SUBJECT TO OVERFLOW

MANAGEMENT GROUP 1-B

- Chewacla silt loam
- Hamblen fine sandy loam
- Hamblen silt loam
- Lindside silt loam
- Outlook silt loam

UNDULATING AND ROLLING, DEEP, WELL-DRAINED SOILS ON LOW STREAM TERRACES OR LOCAL ALLUVIUM; SUITED TO RELATIVELY INTENSIVE CROPPING UNDER GOOD MANAGEMENT

MANAGEMENT GROUP 1-C

- Corno silt loam
- Emory silt loam, rolling phase
- Emory silt loam, undulating phase
- Greenbrier shorty silt loam, undulating phase
- Greenbrier silt loam, undulating phase
- Newport loam, rolling phase
- Newport loam, undulating phase
- Pewee silt loam
- Sequatchie fine sandy loam

IMPERFECTLY DRAINED SOILS ON COLLUVIUM OR LOCAL ALLUVIUM; BEST SUITED TO GENERAL FARM CROPS INCLUDING PASTURE LEGUMES AND GRASSES

MANAGEMENT GROUP 1-D

- Landrum and Colmer loams, rolling phases
- Landrum and Colmer loams, undulating phases
- Landrum and Whitesburg silt loams, rolling phases
- Landrum and Whitesburg silt loams, undulating phases

UNDULATING WELL-DRAINED CHIEFLY RED SOILS OF LIMESTONE VALLEYS, COLLUVIAL SLOPES, AND STREAM TERRACES; SUITED TO A WIDE RANGE OF CROPS

MANAGEMENT GROUP 1-E

- Alcoa silt loam, eroded undulating phase
- Cumberland silty clay loam, eroded undulating phase
- Decatur silt loam, eroded rolling phase
- Decatur silty clay loam, eroded undulating phase
- Dickson silt loam, undulating phase
- Dickson silty clay loam, eroded undulating phase
- Elbavale silt loam, undulating phase
- Elbavale silty clay loam, eroded undulating phase
- Farragut silty clay loam, eroded undulating phase
- Waynesboro loam, eroded undulating phase
- Waynesboro silty clay loam, eroded undulating phase

ROLLING WELL-DRAINED RED SOILS OF LIMESTONE VALLEYS, COLLUVIAL SLOPES, AND STREAM TERRACES; SUITED TO A FAIRLY WIDE RANGE OF CROPS

MANAGEMENT GROUP 1-F

- Alcoa silt loam, eroded rolling phase
- Bolton silt loam, eroded rolling phase
- Cumberland gravelly fine sandy loam, eroded rolling phase
- Cumberland silty clay loam, eroded rolling phase
- Decatur silt loam, rolling phase
- Decatur silty clay loam, eroded rolling phase
- Dickson silt loam, rolling phase
- Dickson silty clay loam, eroded rolling phase
- Elbavale silty clay loam, eroded rolling phase
- Farragut silty clay loam, eroded rolling phase
- Waynesboro loam, eroded rolling phase

UNDULATING, WELL-DRAINED, LIGHT-COLORED SOILS DEEP OR MODERATELY DEEP TO BEDROCK; SUITED TO A WIDE RANGE OF CROPS UNDER GOOD MANAGEMENT

MANAGEMENT GROUP 1-G

- Fullerton loam, eroded undulating phase
- Fullerton loam, undulating phase
- Fullerton silt loam, eroded undulating phase
- Fullerton silt loam, undulating phase
- Jefferson and Montevallo loams, eroded undulating phases

ROLLING, WELL-DRAINED, LIGHT-COLORED SOILS DEEP OR MODERATELY DEEP TO BEDROCK; SUITED TO A WIDE RANGE OF CROPS UNDER VERY CAREFUL MANAGEMENT

MANAGEMENT GROUP 1-H

- Clarksville shorty silt loam, eroded rolling phase
- Clarksville shorty silt loam, rolling phase
- Fullerton shorty silt loam, eroded rolling phase
- Fullerton shorty silt loam, rolling phase
- Fullerton loam, eroded rolling phase
- Fullerton loam, rolling phase
- Fullerton silt loam, eroded rolling phase
- Fullerton silt loam, rolling phase
- Greenbrier shorty silt loam, rolling phase
- Greenbrier silt loam, rolling phase
- Jefferson and Montevallo loams, eroded rolling phases
- Jefferson loam, eroded rolling phase
- Montevallo gravelly loam, eroded rolling phase

HILLY RED SOILS OF LIMESTONE VALLEYS AND HIGH STREAM TERRACES, DEEP TO BEDROCK; SUITED TO GENERAL CROPS AND PASTURE, BUT DIFFICULT TO MAINTAIN

MANAGEMENT GROUP 1-M

- Bolton silt loam, eroded hilly phase
- Cumberland silty clay loam, eroded hilly phase
- Decatur silty clay loam, eroded hilly phase
- Dickson silty clay loam, eroded hilly phase
- Elbavale silty clay loam, eroded hilly phase

HILLY LIGHT-COLORED SOILS, DEEP OR MODERATELY DEEP TO BEDROCK; LIMITED SUITABILITY FOR TILLED CROPS

MANAGEMENT GROUP 1-N

- Fullerton loam, eroded hilly phase
- Fullerton loam, hilly phase
- Fullerton silt loam, eroded hilly phase
- Fullerton silt loam, hilly phase
- Talbott loam, eroded hilly phase
- Talbott loam, hilly phase
- Waynesboro loam, eroded hilly phase

ROLLING SOILS VERY SHALLOW TO CLAYEY SUBSOIL, BEDROCK, OR BOTH; POORLY SUITED TO TILLED CROPS

MANAGEMENT GROUP 2-A

- Colbert silty clay, severely eroded rolling phase
- Fullerton shorty silty clay loam, severely eroded rolling phase
- Jefferson and Montevallo clay loams, severely eroded rolling phases
- Montevallo shorty silt loam, eroded rolling phase
- Sequatchie - Bland silty clay loams, severely eroded rolling phases
- Sequatchie silty clay loam, severely eroded rolling phase
- Stony rolling land, Colbert and Talbott soil materials
- Talbott silty clay loam, severely eroded rolling phase

HILLY AND STEEP RED SOILS, MODERATELY TO SEVERELY ERODED, DROUGHTY; POORLY SUITED TO TILLED CROPS AND LIMITED SUITABILITY FOR PASTURE

MANAGEMENT GROUP 2-B

- Bolton silt loam, eroded steep phase
- Bolton silty clay loam, severely eroded hilly phase
- Bolton silty clay loam, severely eroded steep phase
- Cumberland silty clay loam, severely eroded hilly phase
- Decatur silty clay loam, severely eroded hilly phase
- Dickson silty clay loam, eroded steep phase
- Dickson silty clay loam, severely eroded hilly phase
- Elbavale silty clay loam, severely eroded hilly phase
- Farragut silty clay loam, severely eroded hilly phase
- Waynesboro silty clay loam, severely eroded hilly phase

HILLY AND STEEP SOILS, SHALLOW TO BEDROCK WHICH IS USUALLY CALCAREOUS; UNSUITED TO TILLED CROPS, FAIR TO GOOD FOR PASTURE

MANAGEMENT GROUP 2-C

- Armuchee silt loam, steep phase
- Armuchee silty clay loam, eroded hilly phase
- Armuchee silty clay loam, eroded steep phase
- Bland silty clay loam, eroded hilly phase
- Colbert silty clay, severely eroded hilly phase
- Dandridge and Lily shaly silt loams, eroded hilly phases
- Dandridge and Lily silt loams, hilly phases
- Dandridge and Lily silt loams, steep phases
- Dandridge shaly silt loam, eroded hilly phase
- Dandridge shaly silt loam, eroded steep phase
- Dandridge silt loam, steep phase
- Farragut silty clay loam, eroded hilly phase
- Sequatchie - Bland silty clay loams, eroded hilly phases
- Sequatchie - Bland silty clay loams, severely eroded hilly phases
- Stony hilly and steep land, Colbert and Talbott soil materials
- Talbott silty clay loam, severely eroded hilly phase

HILLY LIGHT-COLORED SOILS DEEP TO BEDROCK, CHIEFLY OR SEVERELY ERODED, DROUGHTY; POORLY SUITED TO MOST CROPS, FAIR FOR PASTURE

MANAGEMENT GROUP 2-D

- Clarksville shorty silt loam, eroded hilly phase
- Clarksville shorty silt loam, hilly phase
- Fullerton shorty silt loam, eroded hilly phase
- Fullerton shorty silt loam, hilly phase
- Fullerton shorty silty clay loam, severely eroded hilly phase
- Fullerton silty clay loam, severely eroded hilly phase

POORLY DRAINED SOILS; POORLY SUITED TO CROPS, FAIRLY GOOD FOR PASTURE WHEN DRAINED AND WELL MANAGED

MANAGEMENT GROUP 2-E

- Guthrie silt loam
- Mahan silt loam
- Pickett silt loam
- Tyler silt loam

SOILS POORLY SUITED TO CROPS OR PASTURE

MANAGEMENT GROUP 3-A

- Bland silt loam, steep phase
- Bland silty clay loam, eroded steep phase
- Clarksville shorty silt loam, eroded steep phase
- Clarksville shorty silt loam, steep phase
- Dandridge and Lily shaly silt loams, eroded steep phases
- Fullerton shorty silt loam, eroded steep phase
- Fullerton shorty silt loam, steep phase
- Fullerton shorty silty clay loam, severely eroded steep phase
- Guthrie loam, Armuchee and Lily soil materials
- Guthrie loam, Fullerton and Talbott soil materials
- Guthrie loam, Sequatchie and Montevallo soil materials
- Guthrie loam, Talbott and Dickson soil materials
- Guthrie loam, Talbott and Elbavale soil materials
- Limestone outcrops, rocky and [illegible]

Alcoa silt loam, eroded rolling phase
Colbert silty clay, severely eroded rolling phase
Alcoa silt loam, eroded undulating phase
Colbert silty clay loam, eroded rolling phase
Armuchee silt loam, steep phase
Colbert silty clay loam, eroded rolling phase
Armuchee silty clay loam, eroded hilly phase
Congaree fine sandy loam, low-bottom phase
Armuchee silty clay loam, eroded steep phase
Congaree silt loam, low-bottom phase
Bland silt loam, rolling phase
Congaree silt loam, low-bottom phase
Bland silt loam, steep phase
Bland silty clay loam, eroded hilly phase
Cumberland gravelly fine sandy loam, eroded rolling phase
Bland silty clay loam, eroded rolling phase
Cumberland silty clay loam, eroded hilly phase
Bland silty clay loam, eroded steep phase
Cumberland silty clay loam, eroded rolling phase
Bolton silt loam, eroded hilly phase
Cumberland silty clay loam, severely eroded hilly phase
Bolton silt loam, eroded rolling phase
Cumberland silty clay loam, severely eroded rolling phase
Bolton silt loam, eroded steep phase
Cumberland silty clay loam, severely eroded rolling phase
Bolton silty clay loam, severely eroded hilly phase
Dandridge and Lily shaly silt loams, eroded hilly phases
Bolton silty clay loam, severely eroded rolling phase
Dandridge and Lily shaly silt loams, eroded steep phases
Bolton silty clay loam, severely eroded steep phase
Dandridge and Lily silt loams, eroded hilly phases
Cumberland silt loam
Dandridge and Lily silt loams

Landrum and Colmer loams, undulating phases
Landrum and Whitesburg silt loams, rolling phases
Landrum and Whitesburg silt loams, undulating phases

UNDULATING WELL-DRAINED CHIEFLY RED SOILS OF LIMESTONE VALLEYS, COLLUVIAL SLOPES, AND STREAM TERRACES; SUITED TO A WIDE RANGE OF CROPS

MANAGEMENT GROUP 1-E

Alaga silt loam, eroded undulating phase
Cumberland silty clay loam, eroded undulating phase
Decatur silt loam, undulating phase
Decatur silty clay loam, eroded undulating phase
Dewey silt loam, undulating phase
Dewey silty clay loam, eroded undulating phase
Etowah silt loam, undulating phase
Etowah silty clay loam, eroded undulating phase
Farragut silty clay loam, eroded undulating phase
Waynesboro silty clay loam, eroded undulating phase
Wolftever silty clay loam, eroded undulating phase

ROLLING WELL-DRAINED RED SOILS OF LIMESTONE VALLEYS, COLLUVIAL SLOPES, AND STREAM TERRACES; SUITED TO A FAIRLY WIDE RANGE OF CROPS

MANAGEMENT GROUP 1-F

Alaga silt loam, eroded rolling phase
Bolton silt loam, eroded rolling phase
Cumberland gravelly fine sandy loam, eroded rolling phase
Cumberland silty clay loam, eroded rolling phase
Decatur silt loam, rolling phase
Decatur silty clay loam, eroded rolling phase
Dewey silt loam, rolling phase
Dewey silty clay loam, eroded rolling phase
Etowah silty clay loam, eroded rolling phase
Farragut silty clay loam, eroded rolling phase
Waynesboro loam, eroded rolling phase

UNDULATING, WELL-DRAINED, LIGHT-COLORED SOILS DEEP OR MODERATELY DEEP TO BEDROCK; SUITED TO A WIDE RANGE OF CROPS UNDER GOOD MANAGEMENT

MANAGEMENT GROUP 1-G

Fullerton loam, eroded undulating phase
Fullerton loam, undulating phase
Fullerton silt loam, eroded undulating phase
Fullerton silt loam, undulating phase
Jefferson and Mandeville loams, eroded undulating phases

ROLLING, WELL-DRAINED, LIGHT-COLORED SOILS DEEP OR MODERATELY DEEP TO BEDROCK; SUITED TO A WIDE RANGE OF CROPS UNDER VERY CAREFUL MANAGEMENT

MANAGEMENT GROUP 1-H

Clarksville cherty silt loam, eroded rolling phase
Clarksville cherty silt loam, rolling phase
Fullerton cherty silt loam, eroded rolling phase
Fullerton cherty silt loam, rolling phase
Fullerton loam, eroded rolling phase
Fullerton loam, rolling phase
Fullerton silt loam, eroded rolling phase
Fullerton silt loam, rolling phase
Greenville cherty silt loam, rolling phase
Greenville silt loam, rolling phase
Jefferson and Mandeville loams, eroded rolling phases
Jefferson loam, eroded rolling phase
Nathalie gravelly loam, eroded rolling phase
Tellico loam, eroded rolling phase
Tellico loam, rolling phase

ROLLING WELL-DRAINED RED SOILS WITH HEAVY PLOW LAYERS AND SUBSOILS; BEST SUITED TO CLOSE-GROWING CROPS AND PASTURE

MANAGEMENT GROUP 1-I

Bolton silty clay loam, severely eroded rolling phase
Cumberland silty clay loam, severely eroded rolling phase
Decatur silty clay loam, severely eroded rolling phase
Dewey silty clay loam, severely eroded rolling phase
Fullerton silty clay loam, severely eroded rolling phase
Tellico clay loam, severely eroded rolling phase
Wolftever silty clay loam, eroded rolling phase

UNDULATING SOILS WITH HEAVY SUBSOILS, MODERATELY SHALLOW TO BEDROCK WHICH IS USUALLY CALCAREOUS; BEST SUITED TO CLOSE-GROWING CROPS AND PASTURE

MANAGEMENT GROUP 1-J

Colbert silty clay loam, eroded undulating phase
Sequoia-Bland silty clay loams, eroded undulating phases
Sequoia silt loam, undulating phase
Sequoia silty clay loam, eroded undulating phase
Talbott silty clay loam, eroded undulating phase

ROLLING SOILS WITH HEAVY SUBSOILS, MODERATELY SHALLOW TO BEDROCK WHICH IS USUALLY CALCAREOUS; BEST SUITED TO CLOSE-GROWING CROPS

MANAGEMENT GROUP 1-K

Bland silt loam, rolling phase
Bland silty clay loam, eroded rolling phase
Colbert silty clay loam, eroded rolling phase
Sequoia-Bland silty clay loams, eroded rolling phases
Sequoia silt loam, rolling phase
Sequoia silty clay loam, eroded rolling phase
Talbott silty clay loam, eroded rolling phase

UNDULATING SOILS VERY SHALLOW TO BEDROCK SHALE; LOW IN FERTILITY, DROUGHTY, AND OF LIMITED SUITABILITY FOR CROPS

MANAGEMENT GROUP 1-L

Mandeville shaly silt loam, eroded undulating phase
Sequoia silty clay loam, severely eroded undulating phase

Dewey silty clay loam, severely eroded hilly phase
Etowah silty clay loam, severely eroded hilly phase
Tellico clay loam, severely eroded hilly phase
Waynesboro clay loam, severely eroded hilly phase

HILLY AND STEEP SOILS, SHALLOW TO BEDROCK WHICH IS USUALLY CALCAREOUS; UNSUITED TO TILLED CROPS, FAIR TO GOOD FOR PASTURE

MANAGEMENT GROUP 2-C

Armuchee silt loam, steep phase
Armuchee silty clay loam, eroded hilly phase
Armuchee silty clay loam, eroded steep phase
Bland silty clay loam, eroded hilly phase
Colbert silty clay, severely eroded hilly phase
Dandridge and Litz shaly silt loams, eroded hilly phases
Dandridge and Litz silt loams, hilly phases
Dandridge and Litz silt loams, steep phases
Dandridge shaly silt loam, eroded hilly phase
Dandridge shaly silt loam, eroded steep phase
Dandridge silt loam, steep phase
Farragut silty clay loam, eroded hilly phase
Sequoia-Bland silty clay loams, eroded hilly phases
Sequoia-Bland silty clay loams, severely eroded hilly phases
Stony hilly and steep land, Colbert and Talbott soil materials
Talbott silty clay loam, severely eroded hilly phase

HILLY LIGHT-COLORED SOILS DEEP TO BEDROCK, CHERTY OR SEVERELY ERODED, DROUGHTY; POORLY SUITED TO MOST CROPS, FAIR FOR PASTURE

MANAGEMENT GROUP 2-D

Clarksville cherty silt loam, eroded hilly phase
Clarksville cherty silt loam, hilly phase
Fullerton cherty silt loam, eroded hilly phase
Fullerton cherty silt loam, hilly phase
Fullerton cherty silty clay loam, severely eroded hilly phase
Fullerton silty clay loam, severely eroded hilly phase

POORLY DRAINED SOILS; POORLY SUITED TO CROPS, FAIRLY GOOD FOR PASTURE WHEN DRAINED AND WELL MANAGED

MANAGEMENT GROUP 2-E

Guthrie silt loam
Mahale silt loam
Pryder silt loam
Tyler silt loam

SOILS POORLY SUITED TO CROPS OR PASTURE

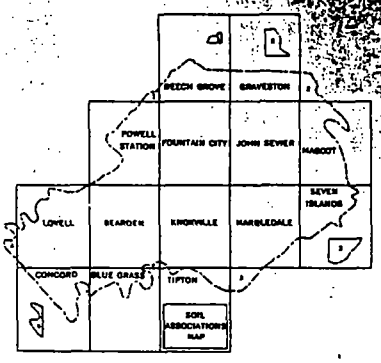
MANAGEMENT GROUP 2-A

Bland silt loam, steep phase
Bland silty clay loam, eroded steep phase
Clarksville cherty silt loam, eroded steep phase
Clarksville cherty silt loam, steep phase
Dandridge and Litz shaly silt loams, eroded steep phases
Fullerton cherty silt loam, eroded steep phase
Fullerton cherty silt loam, steep phase
Fullerton cherty silty clay loam, severely eroded steep phase
Gullied land, Armuchee and Litz soil materials
Gullied land, Fullerton and Talbott soil materials
Gullied land, Sequoia and Mandeville soil materials
Gullied land, Talbott and Decatur soil materials
Gullied land, Talbott and Washington soil materials
Limestone rockland, rolling and hilly phases
Limestone rockland, steep phase
Made land
Mandeville shaly silt loam, eroded hilly phase
Mandeville shaly silt loam, eroded steep phase
Mandeville silt loam, steep phase
Muskingum-Lehew fine sandy loams, eroded hilly phases
Muskingum-Lehew fine sandy loams, eroded steep phases
Muskingum-Lehew fine sandy loams, hilly phases
Muskingum-Lehew fine sandy loams, steep phases
Muskingum stony fine sandy loam, steep phase
Stony very steep land, Muskingum soil materials
Tellico clay loam, severely eroded steep phase
Tellico loam, eroded steep phase
Tellico loam, steep phase

Bland silty clay loam, eroded hilly phase
Bland silty clay loam, eroded rolling phase
Bland silty clay loam, eroded steep phase
Bolton silty clay loam, eroded hilly phase
Bolton silt loam, eroded rolling phase
Bolton silt loam, eroded steep phase
Bolton silty clay loam, severely eroded hilly phase
Bolton silty clay loam, severely eroded rolling phase
Bolton silty clay loam, severely eroded steep phase
Camp silt loam
Chenoweth silt loam, eroded hilly phase
Clarksville cherty silt loam, eroded hilly phase
Clarksville cherty silt loam, eroded rolling phase
Clarksville cherty silt loam, eroded steep phase
Clarksville cherty silt loam, hilly phase
Clarksville cherty silt loam, rolling phase
Clarksville cherty silt loam, steep phase
Colbert silty clay, severely eroded hilly phase

Dandridge and shaly silt loams, eroded hilly phase
Dandridge and shaly silt loams, eroded steep phase
Decatur silt loam, rolling phase
Decatur silty clay loam, eroded hilly phase
Decatur silty clay loam, eroded steep phase

DIAGRAM
Showing arrangement of sheets



H. H. Kenneth Absitter, Chief Soil Correlator.
G. F. Barnes, Chief Analyst, Soil Uses and Productivity.
Ray W. Simonson, Principal Soil Correlator, Southern States.
Correlation and Inspection by H. J. Edwards, Soil Scientist.

SOIL MAP
KNOX COUNTY - TENNESSEE
KNOXVILLE QUADRANGLE

WETLANDS MAPS

FIGURES 7,8,9,10

10598150

NATIONAL WETLANDS INVENTORY

UNITED STATES DEPARTMENT OF THE INTERIOR

BEARDEN, TENN.

2CHN-1

CHATTANOOGA NE
WATTS BAR LAKE

BEARDEN, TENN.

SCALE 1:24000

1 acre — 10 acres — 20 acres

ACREAGE GUIDE

Other information including a narrative report concerning the wetland resources depicted on this document may be available. For information, contact

Regional Director (ARDE) Region IV
U.S. Fish and Wildlife Service
75 Spring Street S.W.
Atlanta, Georgia 30303

SPECIAL NOTE

This document was prepared primarily by stereoscopic analysis of high altitude aerial photographs. Wetlands were identified on the photographs based on vegetation, visible hydrology, and geography in accordance with **Classification of Wetlands and Deepwater Habitats of the United States** (FWS OBS 79/31 December 1979). The aerial photographs typically reflect conditions during the specific year and season when they were taken. In addition, there is a margin of error inherent in the use of the aerial photographs. Thus, a detailed on-the-ground and historical analysis of a single site may result in a revision of the wetland boundaries established through photographic interpretation. In addition, some small wetlands and those obscured by dense forest cover may not be included on this document.

Federal, State and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, State or local government or to establish the geographical scope of the regulatory programs of government agencies. **Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate Federal, State or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.**

SYMBOLOGY EXAMPLE

L2EM2F

R2OWH

U – Primarily represents **upland** areas but may include unclassified wetlands such as man modified areas, non photo identifiable areas and or unintentional omissions

NOTES TO THE USER

- Wetlands which have been field examined are indicated on the map by an asterisk (*)
- Additions or corrections to the wetlands information displayed on this map are solicited. Please forward such information to the address indicated.
- Subsystems, Classes, Subclasses, and Water Regimes in *italics* were developed specifically for NATIONAL WETLANDS INVENTORY mapping.
- Some areas designated as R4SB, R4SBW, OR R4SBJ (INTERMITTENT STREAMS) may not meet the definition of wetland.
- This map uses the class Unconsolidated Shore (US). On earlier NWI maps that class was designated Beach Bar (BB) or Flat (FL). Subclasses remain the same in both versions.

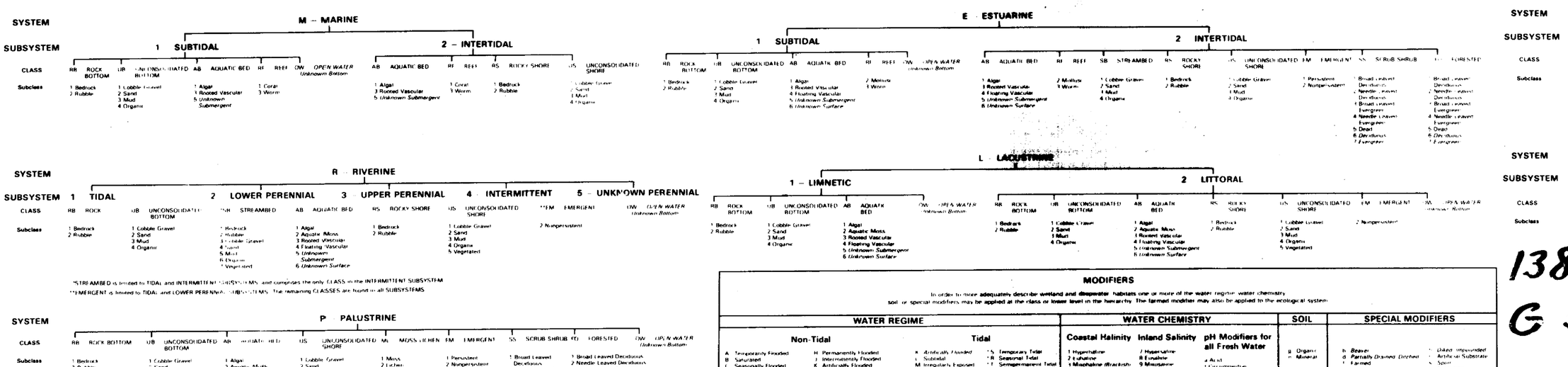
U.S. DEPARTMENT OF THE INTERIOR

FISH AND WILDLIFE SERVICE

Prepared by National Wetlands Inventory

AERIAL PHOTOGRAPHY

DATE	3 81	DATE	
SCALE	1:58 000	SCALE	
TYPE	CIR	TYPE	



MODIFIERS

In order to more adequately describe wetland and deepwater habitats one or more of the water regime, water chemistry, soil, or special modifiers may be applied at the class or lower level in the hierarchy. The farmed modifier may also be applied to the ecological system.

WATER REGIME			WATER CHEMISTRY			SOIL	SPECIAL MODIFIERS	
Non-Tidal		Tidal	Coastal Halinity	Inland Salinity	pH Modifiers for all Fresh Water			
A Temporarily Flooded	H Permanently Flooded	*J Artificially Flooded	1 Hyperhaline	7 Hypersaline	a Acid	g Organic	b Beaver	; Diked/Impounded
B Saturated	J Intermittently Flooded	*S Temporary Tidal	2 Euhaline	8 Euhaline	1 Circumneutral	m Mineral	d Partially Drained/Ditched	^ Artificial Substrate
C Seasonally Flooded	K Artificially Flooded	*R Seasonal Tidal	3 Mesohaline (Brackish)	9 Mesohaline	Alkaline		f Farmed	s Spoil
D Seasonally Flooded/Well Drained	W Intermittently Flooded/Temporary	*T Semipermanent Tidal	4 Polyhaline	0 Fresh				x Excavated
E Seasonally Flooded/Saturated	Y Saturated/Semipermanent/Seasonal	*V Permanent Tidal	5 Marinehaline					
F Semipermanently Flooded	Z Intermittently Exposed/Permanent	U Unknown	6 Oligohaline					
G Intermittently Exposed	U Unknown		0 Fresh					

*These water regimes are only used in tidally influenced freshwater systems.

138 NE
G 5!

10598150

NATIONAL WETLANDS INVENTORY

UNITED STATES DEPARTMENT OF THE INTERIOR

KNOXVILLE, TENN.

KNOXVILLE NW
KNOXVILLE

KNOXVILLE, TENN.

SCALE 1:24 000

1 MILE — 1000 0 1000 2000 3000 4000 5000 6000 7000 FEET — 1 KILOMETER

1 acre — 10 acres — 20 acres

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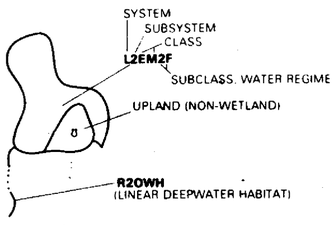

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AERIAL PHOTOGRAPHY

DATE:	4/ /85	DATE:	
SCALE:	1:58 000	SCALE:	
TYPE:	CIR	TYPE:	

U.S. DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
Prepared by National Wetlands Inventory

1989

M — MARINE

SYSTEM: M — MARINE
SUBSYSTEM: 1 — SUBTIDAL; 2 — INTERTIDAL
CLASS: RB — ROCK BOTTOM; UB — UNCONSOLIDATED BOTTOM; AB — AQUATIC BED; RF — REEF; OW — *OPEN WATER/ Unknown Bottom*; AB — AQUATIC BED; RF — REEF; RS — ROCKY SHORE; US — UNCONSOLIDATED SHORE
Subclass: 1 Bedrock, 2 Rubble; 1 Cobble-Gravel, 2 Sand, 3 Mud, 4 Organic; 1 Algal, 3 Rooted Vascular, 5 *Unknown Submergent*; 1 Coral, 3 Worm; 1 Algal, 3 Rooted Vascular, 5 *Unknown Submergent*; 1 Coral, 3 Worm; 1 Bedrock, 2 Rubble; 1 Cobble-Gravel, 2 Sand, 3 Mud, 4 Organic

E — ESTUARINE

SYSTEM: E — ESTUARINE
SUBSYSTEM: 1 — SUBTIDAL; 2 — INTERTIDAL
CLASS: RB — ROCK BOTTOM; UB — UNCONSOLIDATED BOTTOM; AB — AQUATIC BED; RF — REEF; OW — *OPEN WATER/ Unknown Bottom*; AB — AQUATIC BED; RF — REEF; SB — STREAMBED; RS — ROCKY SHORE; US — UNCONSOLIDATED SHORE; EM — EMERGENT; SS — SCRUB-SHRUB; FO — FORESTED
Subclass: 1 Bedrock, 2 Rubble; 1 Cobble-Gravel, 2 Sand, 3 Mud, 4 Organic; 1 Algal, 3 Rooted Vascular, 4 Floating Vascular, 5 *Unknown Submergent*, 6 *Unknown Surface*; 2 Mollusc, 3 Worm; 1 Algal, 3 Rooted Vascular, 4 Floating Vascular, 5 *Unknown Submergent*, 6 *Unknown Surface*; 2 Mollusc, 3 Worm; 1 Cobble-Gravel, 2 Sand, 3 Mud, 4 Organic; 1 Bedrock, 2 Rubble; 1 Cobble-Gravel, 2 Sand, 3 Mud, 4 Organic; 1 Persistent, 2 Nonpersistent; 1 Broad-Leaved Deciduous, 2 Needle-Leaved Deciduous, 3 Broad-Leaved Evergreen, 4 Needle-Leaved Evergreen, 5 Dead, *6 Deciduous*, *7 Evergreen*; 1 Broad-Leaved Deciduous, 2 Needle-Leaved Deciduous, 3 Broad-Leaved Evergreen, 4 Needle-Leaved Evergreen, 5 Dead, 6 *Deciduous*, 7 *Evergreen*

R — RIVERINE

SYSTEM: R — RIVERINE
SUBSYSTEM: 1 — TIDAL; 2 — LOWER PERENNIAL; 3 — UPPER PERENNIAL; 4 — INTERMITTENT; 5 — UNKNOWN PERENNIAL
CLASS: RB — ROCK; UB — UNCONSOLIDATED BOTTOM; *SB — STREAMBED; AB — AQUATIC BED; RS — ROCKY SHORE; US — UNCONSOLIDATED SHORE; **EM — EMERGENT; OW — *OPEN WATER/ Unknown Bottom*
Subclass: 1 Bedrock, 2 Rubble; 1 Cobble-Gravel, 2 Sand, 3 Mud, 4 Organic; 1 Bedrock, 2 Rubble, 3 Cobble-Gravel, 4 Sand, 5 Mud, 6 Organic, 7 Vegetated; 1 Algal, 2 Aquatic Moss, 3 Rooted Vascular, 4 Floating Vascular, 5 *Unknown Submergent*, 6 *Unknown Surface*; 1 Bedrock, 2 Rubble; 1 Cobble-Gravel, 2 Sand, 3 Mud, 4 Organic, 5 Vegetated; 2 Nonpersistent

*STREAMBED is limited to TIDAL and INTERMITTENT SUBSYSTEMS, and comprises the only CLASS in the INTERMITTENT SUBSYSTEM
**EMERGENT is limited to TIDAL and LOWER PERENNIAL SUBSYSTEMS. The remaining CLASSES are found in all SUBSYSTEMS.

L — LACUSTRINE

SYSTEM: L — LACUSTRINE
SUBSYSTEM: 1 — LIMNETIC; 2 — LITTORAL
CLASS: RB — ROCK BOTTOM; UB — UNCONSOLIDATED BOTTOM; AB — AQUATIC BED; OW — *OPEN WATER/ Unknown Bottom*; RB — ROCK BOTTOM; UB — UNCONSOLIDATED BOTTOM; AB — AQUATIC BED; RS — ROCKY SHORE; US — UNCONSOLIDATED SHORE; EM — EMERGENT; OW — *OPEN WATER/ Unknown Bottom*
Subclass: 1 Bedrock, 2 Rubble; 1 Cobble-Gravel, 2 Sand, 3 Mud, 4 Organic; 1 Algal, 2 Aquatic Moss, 3 Rooted Vascular, 4 Floating Vascular, 5 *Unknown Submergent*, 6 *Unknown Surface*; 1 Bedrock, 2 Rubble; 1 Cobble-Gravel, 2 Sand, 3 Mud, 4 Organic; 1 Algal, 2 Aquatic Moss, 3 Rooted Vascular, 4 Floating Vascular, 5 *Unknown Submergent*, 6 *Unknown Surface*; 2 Nonpersistent

P — PALUSTRINE

SYSTEM: P — PALUSTRINE
CLASS: RB — ROCK BOTTOM; UB — UNCONSOLIDATED BOTTOM; AB — AQUATIC BED; US — UNCONSOLIDATED SHORE; ML — MOSS-LICHEN; EM — EMERGENT; SS — SCRUB-SHRUB; FO — FORESTED; OW — *OPEN WATER/ Unknown Bottom*
Subclass: 1 Bedrock, 2 Rubble; 1 Cobble-Gravel, 2 Sand, 3 Mud, 4 Organic; 1 Algal, 2 Aquatic Moss, 3 Rooted Vascular, 4 Floating Vascular, 5 *Unknown Submergent*, 6 *Unknown Surface*; 1 Cobble-Gravel, 2 Sand, 3 Mud, 4 Organic, 5 Vegetated; 1 Moss, 2 Lichen; 1 Persistent, 2 Nonpersistent; 1 Broad-Leaved Deciduous, 2 Needle-Leaved Deciduous, 3 Broad-Leaved Evergreen, 4 Needle-Leaved Evergreen, 5 Dead, 6 *Deciduous*, 7 *Evergreen*; 1 Broad-Leaved Deciduous, 2 Needle-Leaved Deciduous, 3 Broad-Leaved Evergreen, 4 Needle-Leaved Evergreen, 5 Dead, 6 *Deciduous*, 7 *Evergreen*

MODIFIERS

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WATER REGIME

Non-Tidal:
A Temporarily Flooded
B Saturated
C Seasonally Flooded
D *Seasonally Flooded/ Well Drained*
E *Seasonally Flooded/ Saturated*
F Semipermanently Flooded
G Intermittently Exposed
H Permanently Flooded
J Intermittently Flooded
K Artificially Flooded
W Intermittently Flooded/Temporary
Y Saturated/Semipermanent/ Seasonal
Z Intermittently Exposed/Permanent
U *Unknown*

Tidal:
K *Artificially Flooded*
L Subtidal
M Irregularly Exposed
N Regularly Flooded
P Irregularly Flooded
*S Temporary-Tidal
*R Seasonal-Tidal
*T Semipermanent-Tidal
*V Permanent-Tidal
U *Unknown*

*These water regimes are only used in tidally influenced, freshwater systems.

WATER CHEMISTRY

Coastal Halinity:
1 Hyperhaline
2 Euhaline
3 Mesohaline *(Brackish)*
4 Polyhaline
5 Mesohaline
6 Oligohaline
0 Fresh

Inland Salinity:
7 Hypersaline
8 Eusaline
9 Mixosaline
0 Fresh

pH Modifiers for all Fresh Water:
a Acid
t Circumneutral
i Alkaline

SOIL
g Organic
n Mineral

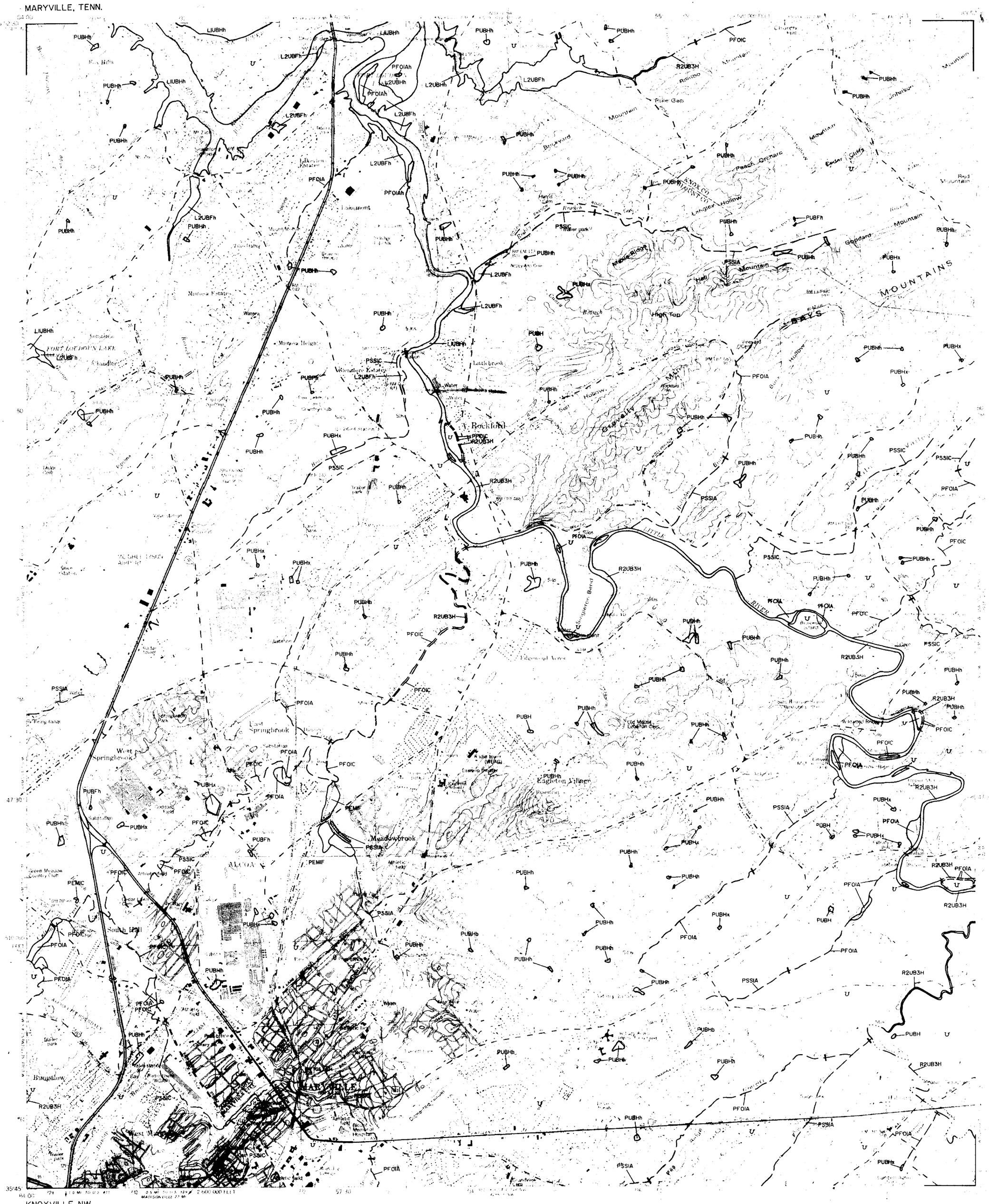
SPECIAL MODIFIERS
b *Beaver*
d *Partially Drained/Ditched*
f Farmed
h *Diked/Impounded*
r Artificial Substrate
s *Spoil*
x Excavated

10598150

NATIONAL WETLANDS INVENTORY

UNITED STATES DEPARTMENT OF THE INTERIOR

MARYVILLE, TENN.



KNOXVILLE NW
KNOXVILLE

MARYVILLE, TENN.

SCALE 1:24 000

1 MILE — 1000 0 1000 2000 3000 4000 5000 6000 7000 FEET — 1 KILOMETER

1 acre — 10 acres — 20 acres

ACREAGE GUIDE

Other information including a narrative report concerning the wetland resources depicted on this document may be available. For information, contact:

Regional Director (ARDE) Region IV
U.S. Fish and Wildlife Service
75 Spring Street S.W.
Atlanta, Georgia 30303

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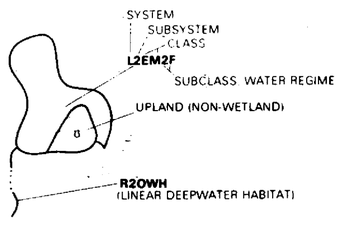

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AERIAL PHOTOGRAPHY

DATE:	4/ /85	DATE:	
SCALE:	1:58 000	SCALE:	
TYPE:	CIR	TYPE:	

U.S. DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
Prepared by National Wetlands Inventory
1989

SYSTEM: M — MARINE
SUBSYSTEM: 1 — SUBTIDAL; 2 — INTERTIDAL
CLASS: RB — ROCK BOTTOM; UB — UNCONSOLIDATED BOTTOM; AB — AQUATIC BED; RF — REEF; OW — *OPEN WATER/ Unknown Bottom*; AB — AQUATIC BED; RF — REEF; RS — ROCKY SHORE; US — UNCONSOLIDATED SHORE
Subclass: 1 Bedrock, 2 Rubble; 1 Cobble-Gravel, 2 Sand, 3 Mud, 4 Organic; 1 Algal, 3 Rooted Vascular, 5 *Unknown Submergent*; 1 Coral, 3 Worm; 1 Algal, 3 Rooted Vascular, 5 *Unknown Submergent*; 1 Coral, 3 Worm; 1 Bedrock, 2 Rubble; 1 Cobble-Gravel, 2 Sand, 3 Mud, 4 Organic

SYSTEM: E — ESTUARINE
SUBSYSTEM: 1 — SUBTIDAL; 2 — INTERTIDAL
CLASS: RB — ROCK BOTTOM; UB — UNCONSOLIDATED BOTTOM; AB — AQUATIC BED; RF — REEF; OW — *OPEN WATER/ Unknown Bottom*; AB — AQUATIC BED; RF — REEF; SB — STREAMBED; RS — ROCKY SHORE; US — UNCONSOLIDATED SHORE; EM — EMERGENT; SS — SCRUB-SHRUB; FO — FORESTED
Subclass: 1 Bedrock, 2 Rubble; 1 Cobble-Gravel, 2 Sand, 3 Mud, 4 Organic; 1 Algal, 3 Rooted Vascular, 4 Floating Vascular, 5 *Unknown Submergent*, 6 *Unknown Surface*; 2 Mollusc, 3 Worm; 1 Algal, 3 Rooted Vascular, 4 Floating Vascular, 5 *Unknown Submergent*, 6 *Unknown Surface*; 2 Mollusc, 3 Worm; 1 Cobble-Gravel, 2 Sand, 3 Mud, 4 Organic; 1 Bedrock, 2 Rubble; 1 Cobble-Gravel, 2 Sand, 3 Mud, 4 Organic; 1 Persistent, 2 Nonpersistent; 1 Broad-Leaved Deciduous, 2 Needle-Leaved Deciduous, 3 Broad-Leaved Evergreen, 4 Needle-Leaved Evergreen, 5 Dead, 6 *Deciduous*, 7 *Evergreen*; 1 Broad-Leaved Deciduous, 2 Needle-Leaved Deciduous, 3 Broad-Leaved Evergreen, 4 Needle-Leaved Evergreen, 5 Dead, 6 *Deciduous*, 7 *Evergreen*

SYSTEM: R — RIVERINE
SUBSYSTEM: 1 — TIDAL; 2 — LOWER PERENNIAL; 3 — UPPER PERENNIAL; 4 — INTERMITTENT; 5 — UNKNOWN PERENNIAL
CLASS: RB — ROCK; UB — UNCONSOLIDATED BOTTOM; *SB — STREAMBED; AB — AQUATIC BED; RS — ROCKY SHORE; US — UNCONSOLIDATED SHORE; **EM — EMERGENT; OW — *OPEN WATER/ Unknown Bottom*
Subclass: 1 Bedrock, 2 Rubble; 1 Cobble-Gravel, 2 Sand, 3 Mud, 4 Organic; 1 Bedrock, 2 Rubble, 3 Cobble-Gravel, 4 Sand, 5 Mud, 6 Organic, 7 Vegetated; 1 Algal, 2 Aquatic Moss, 3 Rooted Vascular, 4 Floating Vascular, 5 *Unknown Submergent*, 6 *Unknown Surface*; 1 Bedrock, 2 Rubble; 1 Cobble-Gravel, 2 Sand, 3 Mud, 4 Organic, 5 Vegetated; 2 Nonpersistent

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SYSTEM: L — LACUSTRINE
SUBSYSTEM: 1 — LIMNETIC; 2 — LITTORAL
CLASS: RB — ROCK BOTTOM; UB — UNCONSOLIDATED BOTTOM; AB — AQUATIC BED; OW — *OPEN WATER/ Unknown Bottom*; RB — ROCK BOTTOM; UB — UNCONSOLIDATED BOTTOM; AB — AQUATIC BED; RS — ROCKY SHORE; US — UNCONSOLIDATED SHORE; EM — EMERGENT; OW — *OPEN WATER/ Unknown Bottom*
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SYSTEM: P — PALUSTRINE
CLASS: RB — ROCK BOTTOM; UB — UNCONSOLIDATED BOTTOM; AB — AQUATIC BED; US — UNCONSOLIDATED SHORE; ML — MOSS-LICHEN; EM — EMERGENT; SS — SCRUB-SHRUB; FO — FORESTED; OW — *OPEN WATER/ Unknown Bottom*
Subclass: 1 Bedrock, 2 Rubble; 1 Cobble-Gravel, 2 Sand, 3 Mud, 4 Organic; 1 Algal, 2 Aquatic Moss, 3 Rooted Vascular, 4 Floating Vascular, 5 *Unknown Submergent*, 6 *Unknown Surface*; 1 Cobble-Gravel, 2 Sand, 3 Mud, 4 Organic, 5 Vegetated; 1 Moss, 2 Lichen; 1 Persistent, 2 Nonpersistent; 1 Broad-Leaved Deciduous, 2 Needle-Leaved Deciduous, 3 Broad-Leaved Evergreen, 4 Needle-Leaved Evergreen, 5 Dead, 6 *Deciduous*, 7 *Evergreen*; 1 Broad-Leaved Deciduous, 2 Needle-Leaved Deciduous, 3 Broad-Leaved Evergreen, 4 Needle-Leaved Evergreen, 5 Dead, 6 *Deciduous*, 7 *Evergreen*

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WATER REGIME			WATER CHEMISTRY			SOIL	SPECIAL MODIFIERS	
Non-Tidal		Tidal	Coastal Halinity	Inland Salinity	pH Modifiers for all Fresh Water			
A Temporarily Flooded	H Permanently Flooded	K *Artificially Flooded*	1 Hyperhaline	7 Hypersaline	a Acid	g Organic	b *Beaver*	h *Diked/Impounded*
B Saturated	J Intermittently Flooded	L Subtidal	2 Euhaline	8 Euhaline	i Circumneutral	n Mineral	d *Partially Drained/Ditched*	r Artificial Substrate
C Seasonally Flooded	K Artificially Flooded	M Irregularly Exposed	3 Mesohaline (Brackish)	9 Mixohaline	t Alkaline		f *Farmed*	s *Spoil*
D *Seasonally Flooded/ Well Drained*	W Intermittently Flooded/Temporary	N Regularly Flooded	4 Polyhaline	0 Fresh				x Excavated
E *Seasonally Flooded/ Saturated*	Y Saturated/Semipermanent/ Seasonal	P Irregularly Flooded	5 Mesohaline					
F Semipermenently Flooded	Z Intermittently Exposed/Permanent	*S Temporary-Tidal	6 Oligohaline					
G Intermittently Exposed	U *Unknown*	*R Seasonal-Tidal	0 Fresh					
		*T Semipermanent-Tidal						
		*V Permanent-Tidal						
		U *Unknown*						

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10598150

NATIONAL WETLANDS INVENTORY

UNITED STATES DEPARTMENT OF THE INTERIOR

LOUISVILLE, TENN.

SCALE 1:24 000

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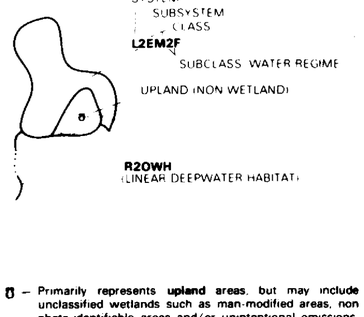

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U.S. DEPARTMENT OF THE INTERIOR

FISH AND WILDLIFE SERVICE

Prepared by National Wetlands Inventory

AERIAL PHOTOGRAPHY

DATE	3/ /81	DATE	/ /
SCALE	1:58 000	SCALE	
TYPE	CIR	TYPE	

M – MARINE

SYSTEM / SUBSYSTEM / CLASS / Subclass

1 – SUBTIDAL: RB ROCK BOTTOM (1 Bedrock, 2 Rubble); UB UNCONSOLIDATED BOTTOM (1 Cobble-Gravel, 2 Sand, 3 Mud, 4 Organic); AB AQUATIC BED (1 Algal, 3 Rooted Vascular, 5 Unknown Submergent); RF REEF (1 Coral, 3 Worm); OW OPEN WATER Unknown Bottom

2 – INTERTIDAL: AB AQUATIC BED (1 Algal, 3 Rooted Vascular, 5 Unknown Submergent); RF REEF (1 Coral, 3 Worm); RS ROCKY SHORE (1 Bedrock, 2 Rubble); US UNCONSOLIDATED SHORE (1 Cobble-Gravel, 2 Sand, 3 Mud, 4 Organic)

E – ESTUARINE

1 – SUBTIDAL: RB ROCK BOTTOM (1 Bedrock, 2 Rubble); UB UNCONSOLIDATED BOTTOM (1 Cobble-Gravel, 2 Sand, 3 Mud, 4 Organic); AB AQUATIC BED (1 Algal, 3 Rooted Vascular, 4 Floating Vascular, 5 Unknown Submergent, 6 Unknown Surface); RF REEF (2 Mollusk, 3 Worm); OW OPEN WATER Unknown Bottom

2 – INTERTIDAL: AB AQUATIC BED (1 Algal, 3 Rooted Vascular, 4 Floating Vascular, 5 Unknown Submergent, 6 Unknown Surface); RF REEF (2 Mollusk, 3 Worm); SB STREAMBED (1 Cobble-Gravel, 2 Sand, 3 Mud, 4 Organic); RS ROCKY SHORE (1 Bedrock, 2 Rubble); US UNCONSOLIDATED SHORE (1 Cobble-Gravel, 2 Sand, 3 Mud, 4 Organic); EM EMERGENT (1 Persistent, 2 Nonpersistent); SS SCRUB-SHRUB (1 Broad-Leaved Deciduous, 2 Needle-Leaved Deciduous, 3 Broad-Leaved Evergreen, 4 Needle-Leaved Evergreen, 5 Dead, 6 Deciduous, 7 Evergreen); FO FORESTED (1 Broad-Leaved Deciduous, 2 Needle-Leaved Deciduous, 3 Broad-Leaved Evergreen, 4 Needle-Leaved Evergreen, 5 Dead, 6 Deciduous, 7 Evergreen)

R – RIVERINE

1 – TIDAL: RB ROCK (1 Bedrock, 2 Rubble); UB UNCONSOLIDATED BOTTOM (1 Cobble-Gravel, 2 Sand, 3 Mud, 4 Organic)

2 – LOWER PERENNIAL: *SB STREAMBED (1 Bedrock, 2 Rubble, 3 Cobble-Gravel, 4 Sand, 5 Mud, 6 Organic, 7 Vegetated); AB AQUATIC BED (1 Algal, 2 Aquatic Moss, 3 Rooted Vascular, 4 Floating Vascular, 5 Unknown Submergent, 6 Unknown Surface); RS ROCKY SHORE (1 Bedrock, 2 Rubble); US UNCONSOLIDATED SHORE (1 Cobble-Gravel, 2 Sand, 3 Mud, 4 Organic, 5 Vegetated); **EM EMERGENT (2 Nonpersistent)

3 – UPPER PERENNIAL

4 – INTERMITTENT

5 – UNKNOWN PERENNIAL

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L – LACUSTRINE

1 – LIMNETIC: RB ROCK BOTTOM (1 Bedrock, 2 Rubble); UB UNCONSOLIDATED BOTTOM (1 Cobble-Gravel, 2 Sand, 3 Mud, 4 Organic); AB AQUATIC BED (1 Algal, 2 Aquatic Moss, 3 Rooted Vascular, 4 Floating Vascular, 5 Unknown Submergent, 6 Unknown Surface); OW OPEN WATER Unknown Bottom

2 – LITTORAL: RB ROCK BOTTOM (1 Bedrock, 2 Rubble); UB UNCONSOLIDATED BOTTOM (1 Cobble-Gravel, 2 Sand, 3 Mud, 4 Organic); AB AQUATIC BED (1 Algal, 2 Aquatic Moss, 3 Rooted Vascular, 4 Floating Vascular, 5 Unknown Submergent, 6 Unknown Surface); RS ROCKY SHORE (1 Bedrock, 2 Rubble); US UNCONSOLIDATED SHORE (1 Cobble-Gravel, 2 Sand, 3 Mud, 4 Organic, 5 Vegetated); EM EMERGENT (2 Nonpersistent); OW OPEN WATER Unknown Bottom

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CLASS / Subclass: RB ROCK BOTTOM (1 Bedrock, 2 Rubble); UB UNCONSOLIDATED BOTTOM (1 Cobble-Gravel, 2 Sand, 3 Mud, 4 Organic); AB AQUATIC BED (1 Algal, 2 Aquatic Moss, 3 Rooted Vascular, 4 Floating Vascular, 5 Unknown Submergent, 6 Unknown Surface); US UNCONSOLIDATED SHORE (1 Cobble-Gravel, 2 Sand, 3 Mud, 4 Organic, 5 Vegetated); MI MOSS-LICHEN (1 Moss, 2 Lichen); EM EMERGENT (1 Persistent, 2 Nonpersistent); SS SCRUB-SHRUB (1 Broad-Leaved Deciduous, 2 Needle-Leaved Deciduous, 3 Broad-Leaved Evergreen, 4 Needle-Leaved Evergreen, 5 Dead, 6 Deciduous, 7 Evergreen); FO FORESTED (1 Broad-Leaved Deciduous, 2 Needle-Leaved Deciduous, 3 Broad-Leaved Evergreen, 4 Needle-Leaved Evergreen, 5 Dead, 6 Deciduous, 7 Evergreen); OW OPEN WATER Unknown Bottom

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Non-Tidal		Tidal	Coastal Halinity	Inland Salinity	pH Modifiers for all Fresh Water			
A Temporarily Flooded	H Permanently Flooded	K Artificially Flooded	1 Hyperhaline	7 Hypersaline	a Acid	g Organic	b Beaver	h Diked/Impounded
B Saturated	J Intermittently Flooded	L Subtidal	2 Euhaline	8 Eusaline	t Circumneutral	n Mineral	d Partially Drained/Ditched	r Artificial Substrate
C Seasonally Flooded	K Artificially Flooded	M Irregularly Exposed	3 Mixohaline (Brackish)	9 Mixosaline	i Alkaline		f Farmed	s Spoil
D Seasonally Flooded Well Drained	W Intermittently Flooded Temporary	N Regularly Flooded	4 Polyhaline	0 Fresh				x Excavated
E Seasonally Flooded Saturated	Y Saturated Semipermanent Seasonal	P Irregularly Flooded	5 Mesohaline					
F Semipermanently Flooded	Z Intermittently Exposed Permanent	*S Temporary Tidal	6 Oligohaline					
G Intermittently Exposed	U Unknown	*R Seasonal Tidal	0 Fresh					
		*T Semipermanent Tidal						
		*V Permanent Tidal						
		U Unknown						

*These water regimes are only used in tidally influenced freshwater systems

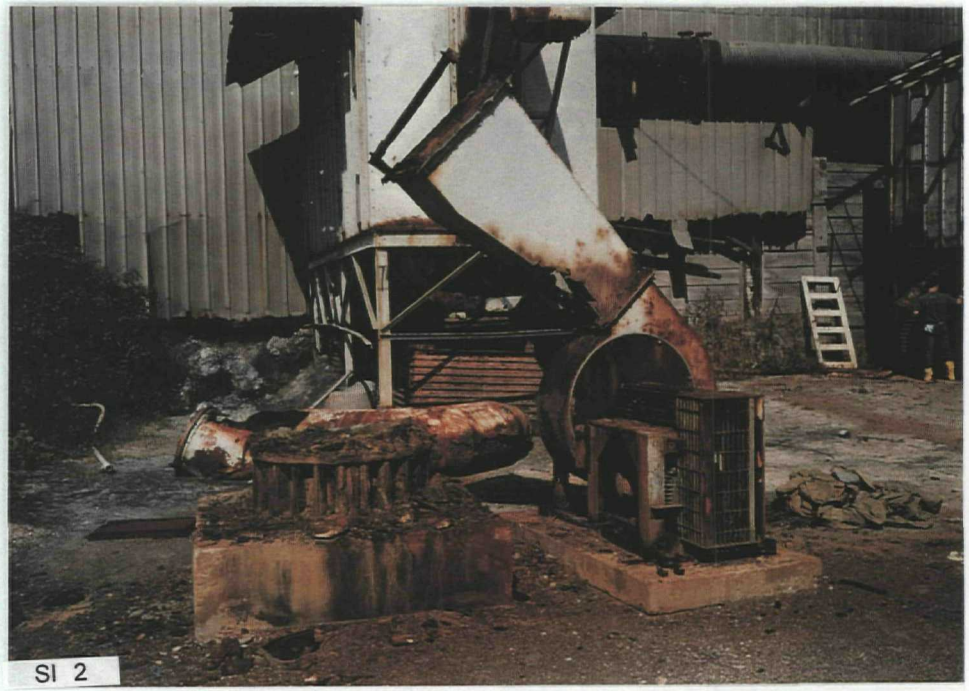
138 SE
H 51

• LIST OF SELECTED PHOTOGRAPHS •

SMOKEY MOUNTAIN SMELTERS
1508 MARYVILLE PIKE KNOXVILLE, TENNESSEE 37920 U.S. EPA # TN0002318277 TSDF #47-559

1	*View of main building, taken from north entrance.*
2	*Baghouse smokestack base (smokestack has fallen away), fan, and baghouse.*
3	*Close-up view of one of the metal hoppers beneath one of the two baghouses at SE side of S corner of main building. A composite sample of baghouse dust was collected from the metal hoppers beneath the baghouses (Sample WA-02).*
4	*Close-up view of two baghouses at SE side of S corner of main building. A composite sample of baghouse dust was collected from the metal hoppers beneath the baghouses (WA-02).*
5	*Lagoon and surrounding area. Locations of Samples PDT-01, PDT-02, and PDT-03*
6	*SSW view of waste piles from the lagoon area. Location of Sample WA-04, PDT-05, and PDT-06.*
7	*Two baghouses at SE side of S corner of main building.*
8	*NW waste pile near NW drainage at SW edge of Site. Location of Sample PDT-07.*
9	*Blue substance in NW waste pile near NW drainage at SW edge of Site. Location of Sample WA-01.*
10	*Looking downstream in NW drainage at SW edge of Site.*
11	*Pile of drums at SW edge of Site, looking downstream in SW drainage - location of Sample SD-01*
12	*NW edge of pile of drums at SW edge of Site.*
13	*SE edge of pile of drums at SW edge of Site.*
14	*Waste pile inside southwest end of main building. Location of Samples WA-03 and PDT-04.*
15	*One of the two gas-fired rotary furnaces.*
16	*The casting furnace and, in the background, a waste pile inside the northeast end of the main building.*
17	*Children's toy in parking lot near Site entrance*
18	*Children's toy in parking lot near Site entrance*
19	*On-site lagoon. Location of surface water and sediment samples, SMS-SW-02 and SMS-SD-03.*
20	*On-site lagoon. Location of surface water and sediment samples, SMS-SW-02 and SMS-SD-03*
21	*Area of depression near the maintenance building. Location of samples SMS-WA-05 and SMS-WA-06.*
22	*Casting furnace trough. Location of waste sample SMS-WA-07.*
23	*Looking S-SW inside main building. Depressed area in center background is location of waste sample SMS-WA-08.*
24	*Waste in west storage area of main building. Baghouse bags in foreground; carbon blocks in background. No samples were collected here.*
25	*Baghouses.*
26	*Looking south beyond edge of maintenance building at waste piles.*
27	*Back yard of Montgomery Village Apartments. Location of surface soil sample SMS-SS-05*
28	*Unnamed tributary of Flenniken Branch on Rimmer property, south of Site. Location of surface water and sediment samples (SMS-SW-03;SMS-SD-05)at first occurrence of water.*
29	*Flenniken Branch at Fort Loudoun Lake embayment. Location of SMS-SW-04 and SMS-SD-06.*
30	*Background spring located at the SW corner of the intersection of Alcoa Highway and Maloney Road.*
31	*Exact location of the background soil sample on Vulcan Materials Company property at 3001 Alcoa Hwy.*
32	*Unnamed tributary of Flenniken Branch, upstream of Site. Location of background surface water and sediment samples, SMS-SW-01 and SMS-SD-02.*

SI 1



SI 2

SI 3

DIVISION OF SUPERFUND

DATE OF PHOTO: October 20, 1997
PHOTO NUMBER: 6 PHOTO TAKEN BY: Burl H. Maupin

LOCATION/NAME: **SMOKEY MOUNTAIN SMELTERS**
1508 MARYVILLE PIKE
KNOXVILLE, TENNESSEE 37920

PERSONS PRESENT: Chris A. Andel
REMARKS: Baghouse smokestack base (smokestack has fallen away), fan, and baghouse.

SIGNATURE: Burl H Maupin

DIVISION OF SUPERFUND

DATE OF PHOTO: October 20, 1997
PHOTO NUMBER: 2
PHOTO TAKEN BY: Burl H. Maupin
LOCATION/NAME: **SMOKEY MOUNTAIN SMELTERS**
1508 MARYVILLE PIKE
KNOXVILLE, TENNESSEE 37920

PERSONS PRESENT: Chris A. Andel
REMARKS: View of main building, taken from north entrance.

SIGNATURE: Burl H Maupin

DIVISION OF SUPERFUND

DATE OF PHOTO: October 20, 1997
PHOTO NUMBER: 9 PHOTO TAKEN BY: Burl H. Maupin
LOCATION/NAME: **SMOKEY MOUNTAIN SMELTERS**
1508 MARYVILLE PIKE
KNOXVILLE, TENNESSEE 37920

PERSONS PRESENT: Chris A. Andel
REMARKS: Close-up view of two baghouses at SE side of S corner of main building. A composite sample of baghouse dust was collected from the metal hoppers beneath the baghouses (# WA-02).

SIGNATURE: Burl H Maupin

DIVISION OF SUPERFUND

DATE OF PHOTO: October 20, 1997
PHOTO NUMBER: 8 PHOTO TAKEN BY: Burl H. Maupin
LOCATION/NAME: **SMOKEY MOUNTAIN SMELTERS**
1508 MARYVILLE PIKE
KNOXVILLE, TENNESSEE 37920

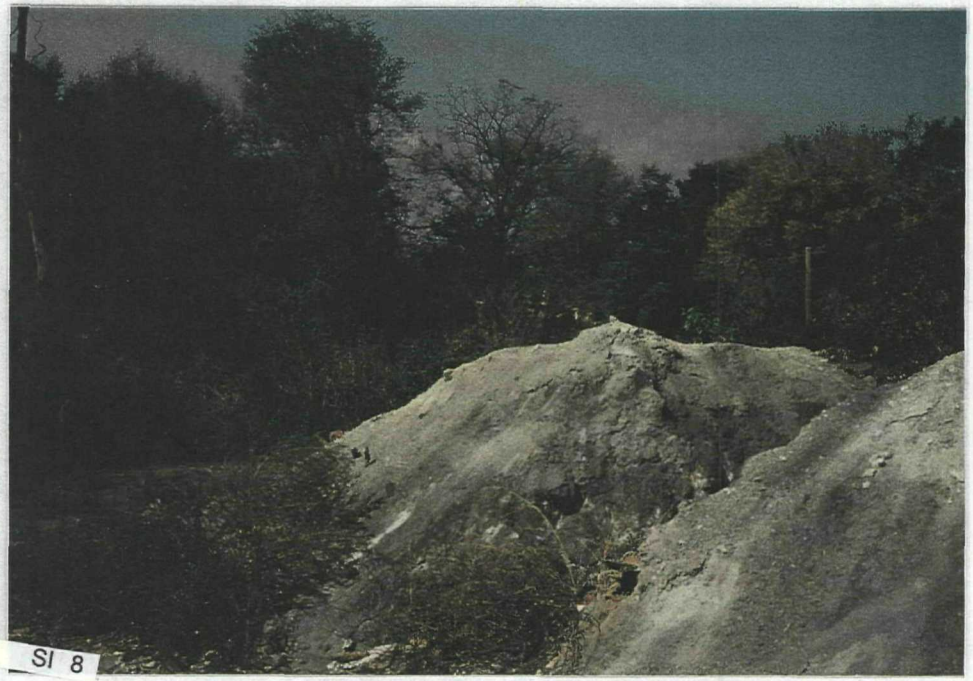
PERSONS PRESENT: Chris A. Andel
REMARKS: Close-up view of one of the metal hoppers beneath one of the two baghouses at SE side of S corner of main building. A composite sample of baghouse dust was collected from the metal hoppers beneath the baghouses (Sample # WA-02).

SIGNATURE: Burl H Maupin

SI 5

SI 6

SI 7



SI 8

DIVISION OF SUPERFUND

DATE OF PHOTO: October 20, 1997
PHOTO NUMBER: 11 PHOTO TAKEN BY: Burl H. Maupin
LOCATION/NAME: SMOKEY MOUNTAIN SMELTERS
1508 MARYVILLE PIKE
KNOXVILLE, TENNESSEE 37920
PERSONS PRESENT: Chris A. Andel
REMARKS: SSW view of waste piles from the lagoon area. Location of Sample # WA-04, PDT-05, and PDT-06.
SIGNATURE: Burl H Maupin

DIVISION OF SUPERFUND

DATE OF PHOTO: October 20, 1997
PHOTO NUMBER: 10
PHOTO TAKEN BY: Burl H. Maupin
LOCATION/NAME: SMOKEY MOUNTAIN SMELTERS
1508 MARYVILLE PIKE
KNOXVILLE, TENNESSEE 37920
PERSONS PRESENT: Chris A. Andel
REMARKS: Lagoon and surrounding area. Locations of Samples PDT-01, PDT-02, and PDT-03.
SIGNATURE: Burl H Maupin

DIVISION OF SUPERFUND

DATE OF PHOTO: October 20, 1997
PHOTO NUMBER: 13
PHOTO TAKEN BY: Burl H. Maupin
LOCATION/NAME: SMOKEY MOUNTAIN SMELTERS
1508 MARYVILLE PIKE
KNOXVILLE, TENNESSEE 37920
PERSONS PRESENT: Chris A. Andel
REMARKS: NW waste pile near NW drainage at SW edge of Site. Location of Sample # PDT-07
SIGNATURE: Burl H Maupin

DIVISION OF SUPERFUND

DATE OF PHOTO: October 20, 1997
PHOTO NUMBER: 12 PHOTO TAKEN BY: Burl H. Maupin
LOCATION/NAME: SMOKEY MOUNTAIN SMELTERS
1508 MARYVILLE PIKE
KNOXVILLE, TENNESSEE 37920
PERSONS PRESENT: Chris A. Andel
REMARKS: Two baghouses at SE side of S corner of main building.
SIGNATURE: Burl H Maupin

SI 9

SI 10

SI 11

SI 12

DIVISION OF SUPERFUND

DATE OF PHOTO: October 20, 1997
PHOTO NUMBER: 15
PHOTO TAKEN BY: Burl H. Maupin
LOCATION/NAME: **SMOKEY MOUNTAIN SMELTERS**
1508 MARYVILLE PIKE
KNOXVILLE, TENNESSEE 37920
PERSONS PRESENT: Chris A. Andel
REMARKS: Looking downstream in NW drainage at SW edge of Site.

SIGNATURE: Burl H Maupin

DIVISION OF SUPERFUND

DATE OF PHOTO: October 20, 1997
PHOTO NUMBER: 14
PHOTO TAKEN BY: Burl H. Maupin
LOCATION/NAME: **SMOKEY MOUNTAIN SMELTERS**
1508 MARYVILLE PIKE
KNOXVILLE, TENNESSEE 37920
PERSONS PRESENT: Chris A. Andel
REMARKS: Blue substance in NW waste pile near NW drainage at SW edge of Site. Location of Sample # WA-01.

SIGNATURE: Burl H Maupin

DIVISION OF SUPERFUND

DATE OF PHOTO: October 20, 1997
PHOTO NUMBER: 18
PHOTO TAKEN BY: Burl H. Maupin
LOCATION/NAME: **SMOKEY MOUNTAIN SMELTERS**
1508 MARYVILLE PIKE
KNOXVILLE, TENNESSEE 37920
PERSONS PRESENT: Chris A. Andel
REMARKS: NW edge of pile of drums at SW edge of Site.

SIGNATURE: Burl H Maupin

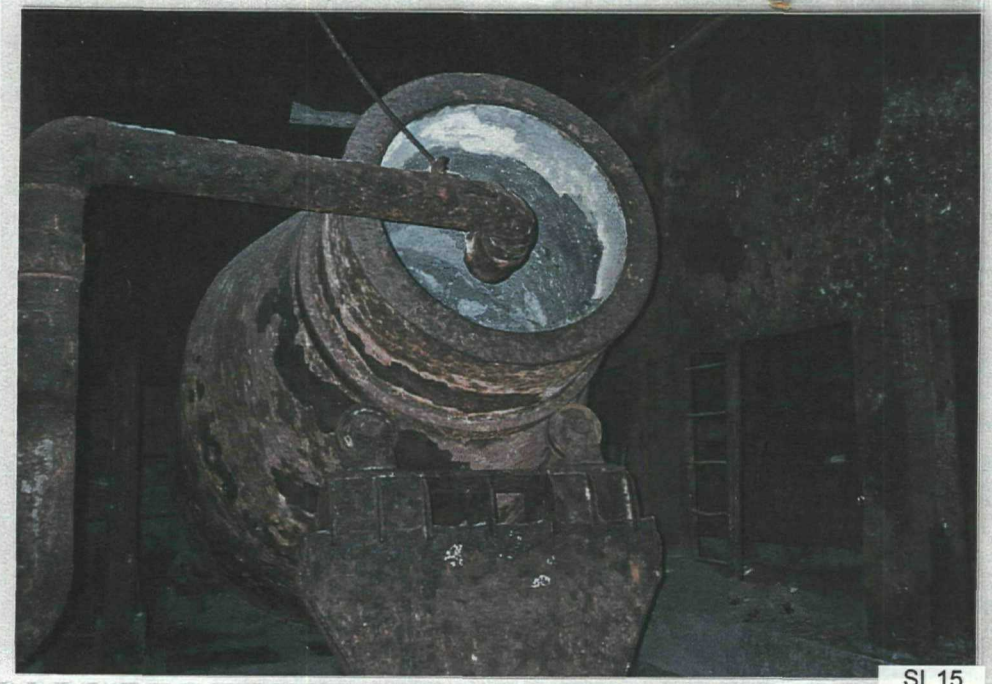
DIVISION OF SUPERFUND

DATE OF PHOTO: October 20, 1997
PHOTO NUMBER: 17
PHOTO TAKEN BY: Burl H. Maupin
LOCATION/NAME: **SMOKEY MOUNTAIN SMELTERS**
1508 MARYVILLE PIKE
KNOXVILLE, TENNESSEE 37920
PERSONS PRESENT: Chris A. Andel
REMARKS: Pile of drums at SW edge of Site, looking downstream in SW drainage - location of Sample # SD-01

SIGNATURE: Burl H Maupin

SI 13

SI 14



SI 15

DIVISION OF SUPERFUND

DATE OF PHOTO: October 29, 1997
PHOTO NUMBER: 3
PHOTO TAKEN BY: Burl H. Maupin
LOCATION/NAME: SMOKEY MOUNTAIN SMELTERS
1508 MARYVILLE PIKE
KNOXVILLE, TENNESSEE 37920
PERSONS PRESENT: Adam DeWeese
REMARKS: Waste pile inside southwest end of main building. Location of Samples WA-03 and PDT-04.

SIGNATURE: Burl H. Maupin

DIVISION OF SUPERFUND

DATE OF PHOTO: October 20, 1997
PHOTO NUMBER: 21
PHOTO TAKEN BY: Burl H. Maupin
LOCATION/NAME: SMOKEY MOUNTAIN SMELTERS
1508 MARYVILLE PIKE
KNOXVILLE, TENNESSEE 37920
PERSONS PRESENT: Chris A. Andel
REMARKS: SE edge of pile of drums at SW edge of Site.

SIGNATURE: Burl H. Maupin

DIVISION OF SUPERFUND

DATE OF PHOTO: October 29, 1997
PHOTO NUMBER: 10
PHOTO TAKEN BY: Burl H. Maupin
LOCATION/NAME: SMOKEY MOUNTAIN SMELTERS
1508 MARYVILLE PIKE
KNOXVILLE, TENNESSEE 37920
PERSONS PRESENT: Adam DeWeese
REMARKS: The casting furnace and, in the background, a waste pile inside the northeast end of the main building.

SIGNATURE: Burl H. Maupin

DIVISION OF SUPERFUND

DATE OF PHOTO: October 29, 1997
PHOTO NUMBER: 7
PHOTO TAKEN BY: Burl H. Maupin
LOCATION/NAME: SMOKEY MOUNTAIN SMELTERS
1508 MARYVILLE PIKE
KNOXVILLE, TENNESSEE 37920
PERSONS PRESENT: Adam DeWeese
REMARKS: One of the two gas-fired rotary furnaces.

SIGNATURE: Burl H. Maupin

DIVISION OF SUPERFUND

DATE OF PHOTO: August 25, 1998

PHOTO NUMBER: 4 PHOTO TAKEN BY: Burl H. Maupin

SITE NAME: **SMOKEY MOUNTAIN SMELTERS**
1508 MARYVILLE PIKE
KNOXVILLE, TENNESSEE 3792

PERSONS PRESENT: Lee Barron

REMARKS: *Children's toy in parking lot near Site entrance.*

SIGNATURE: Burl H. Maupin

SI 18

4

DIVISION OF SUPERFUND

DATE OF PHOTO: August 25, 1998

PHOTO NUMBER: 5 PHOTO TAKEN BY: Burl H. Maupin

SITE NAME: **SMOKEY MOUNTAIN SMELTERS**
1508 MARYVILLE PIKE
KNOXVILLE, TN 37920

PERSONS PRESENT: Lee Barron

REMARKS: *Children's toy in parking lot near Site entrance.*

SIGNATURE: Burl H. Maupin

SI 17

5

DIVISION OF SUPERFUND

DATE OF PHOTO: August 25, 1998

PHOTO NUMBER:8 PHOTO TAKEN BY: Burl H. Maupin

SITE NAME: **SMOKEY MOUNTAIN SMELTERS**
1508 MARYVILLE PIKE
KNOXVILLE, TN 37920

PERSONS PRESENT: Lee Barron

REMARKS: *On-site lagoon. Location of surface water and sediment samples, SMS-SW-02 and SMS-SD-03.*

SIGNATURE: Burl H. Maupin

SI 20

8

DIVISION OF SUPERFUND

DATE OF PHOTO: August 25, 1998

PHOTO NUMBER: 6 PHOTO TAKEN BY: Burl H. Maupin

SITE NAME: **SMOKEY MOUNTAIN SMELTERS**
1508 MARYVILLE PIKE
KNOXVILLE, TN 37920

PERSONS PRESENT: Lee Barron

REMARKS: *On-site lagoon. Location of surface water and sediment samples, SMS-SW-02 and SMS-SD-03.*

SIGNATURE: Burl H. Maupin

SI 19

6

DIVISION OF SUPERFUND

DATE OF PHOTO: August 31, 1998

PHOTO NUMBER: 15 PHOTO TAKEN BY: Burl H. Maupin

SITE NAME: **SMOKEY MOUNTAIN SMELTERS**
1508 MARYVILLE PIKE
KNOXVILLE, TN 37920

PERSONS PRESENT: Lee Barron

REMARKS: *Casting furnace trough. Location of waste sample SMS-WA-07.*

SIGNATURE: Burl H. Maupin

SI 22

15

DIVISION OF SUPERFUND

DATE OF PHOTO: August 31, 1998

PHOTO NUMBER: 10 PHOTO TAKEN BY: Burl H. Maupin

SITE NAME: **SMOKEY MOUNTAIN SMELTERS**
1508 MARYVILLE PIKE
KNOXVILLE, TENNESSEE 3792

PERSONS PRESENT: Lee Barron

REMARKS: *Area of depression near the maintenance building. Location of samples SMS-WA-05 and SMS-WA-06.*

SIGNATURE: Burl H. Maupin

SI 21

DIVISION OF SUPERFUND

DATE OF PHOTO: August 31, 1998

PHOTO NUMBER:14 PHOTO TAKEN BY: Burl H. Maupin

SITE NAME: **SMOKEY MOUNTAIN SMELTERS**
1508 MARYVILLE PIKE
KNOXVILLE, TENNESSEE 3792

PERSONS PRESENT: Lee Barron

REMARKS: *Waste in west storage area of main building. Baghouse bags in foreground; carbon blocks in background. No samples were collected here.*

SIGNATURE: Burl H. Maupin

SI 24

14

DIVISION OF SUPERFUND

DATE OF PHOTO: August 31, 1998

PHOTO NUMBER:19 PHOTO TAKEN BY: Burl H. Maupin

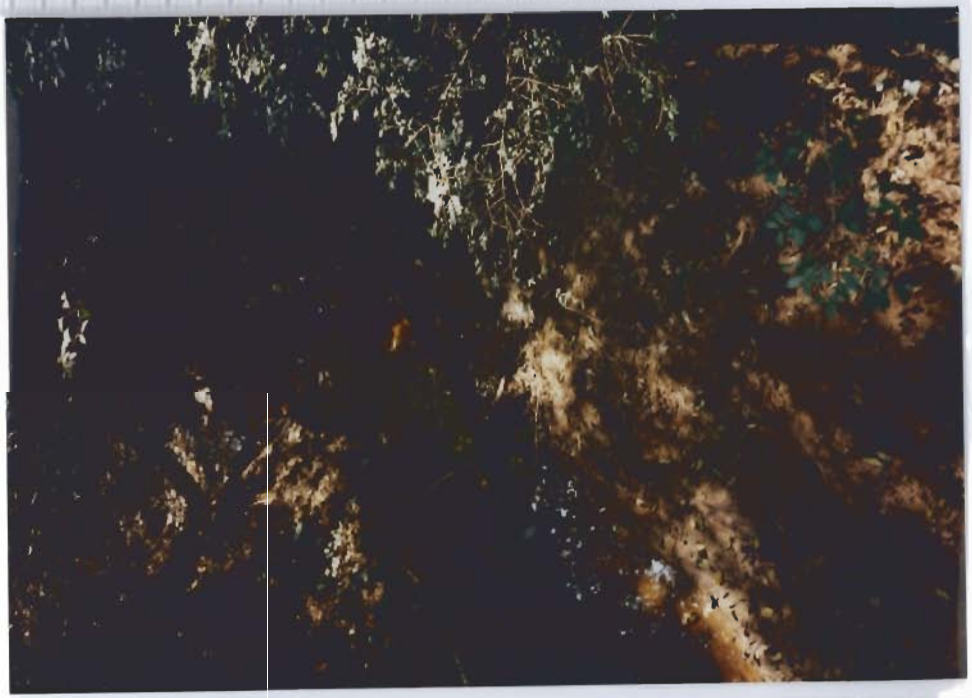
SITE NAME: **SMOKEY MOUNTAIN SMELTERS**
1508 MARYVILLE PIKE
KNOXVILLE, TN 37920

PERSONS PRESENT: Lee Barron

REMARKS: *Looking S-SW inside main building. Depressed are in center background is location of waste sample SMS-WA-08.*

SIGNATURE: Burl H. Maupin

SI 23



DIVISION OF SUPERFUND

DATE OF PHOTO: August 31, 1998

PHOTO NUMBER: 21 PHOTO TAKEN BY: Burl H. Maupin

SITE NAME: **SMOKEY MOUNTAIN SMELTERS**
1508 MARYVILLE PIKE
KNOXVILLE, TN 37920

PERSONS PRESENT: Lee Barron

REMARKS: *Looking south beyond edge of maintenance buildin at waste piles*

SIGNATURE: Burl H. Maupin

PERSONS PRESENT: Lee Barron

SI 26

21

DIVISION OF SUPERFUND

DATE OF PHOTO: August 31, 1998

PHOTO NUMBER:20 PHOTO TAKEN BY: Burl H. Maupin

SITE NAME: **SMOKEY MOUNTAIN SMELTERS**
1508 MARYVILLE PIKE
KNOXVILLE, TENNESSEE 3792

PERSONS PRESENT: Lee Barron

REMARKS: *Baghouses.*

SIGNATURE: Burl H. Maupin

SI 25

20

DIVISION OF SUPERFUND

DATE OF PHOTO: August 25, 1998

PHOTO NUMBER: 1 PHOTO TAKEN BY: Burl H. Maupin

SITE NAME: **SMOKEY MOUNTAIN SMELTERS**
1508 MARYVILLE PIKE
KNOXVILLE, TENNESSEE 3792

PERSONS PRESENT: Lee Barron

REMARKS: *Unnamed tributary of Flenniken Branch on Rimmer property, south of Site. Location of surface water and sediment samples (SMS-SW-03;SMS-SD-05)at first occurrence of water.*

SIGNATURE: Burl H. Maupin

SI 28

DIVISION OF SUPERFUND

DATE OF PHOTO: August 31, 1998

PHOTO NUMBER:22 PHOTO TAKEN BY: Burl H. Maupin

SITE NAME: **SMOKEY MOUNTAIN SMELTERS**
1508 MARYVILLE PIKE
KNOXVILLE, TN 37920

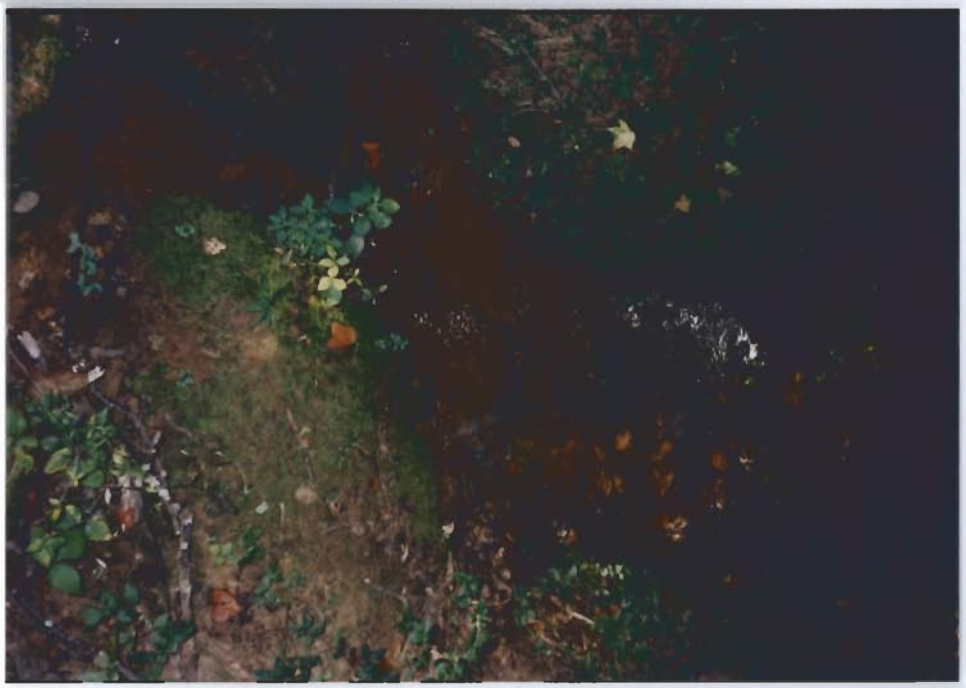
PERSONS PRESENT: Lee Barron

REMARKS: *Back yard of Montgomery Village Apartments. Location of surface soil sample SMS-SS-05*

SIGNATURE: Burl H. Maupin

SI 27

22



DIVISION OF SUPERFUND

DATE OF PHOTO: September 28, 1998

PHOTO NUMBER: 2 PHOTO TAKEN BY: Burl H. Maupin

LOCATION **SMOKEY MOUNTAIN SMELTERS**

/NAME: **1508 MARYVILLE PIKE**

KNOXVILLE, TENNESSEE 37920

PERSONS PRESENT: Adam DeWeese

REMARKS: Background spring located at the SW corner of the intersection of Alcoa Highway and Maloney Road.

SIGNATURE: Burl H. Maupin

SI 30

DIVISION OF SUPERFUND

DATE OF PHOTO: August 31, 1998

PHOTO NUMBER:25 PHOTO TAKEN BY: Burl H. Maupin

SITE **SMOKEY MOUNTAIN SMELTERS**

NAME: **1508 MARYVILLE PIKE**

KNOXVILLE, TENNESSEE 3792

PERSONS PRESENT: Lee Barron

REMARKS: *Flenniken Branch at Fort Loudoun Lake embayment. Location of SMS-SW-04 and SMS-SD-06.*

SIGNATURE: Burl H. Maupin

SI 29

DIVISION OF SUPERFUND

DATE OF PHOTO: August 31, 1998

PHOTO NUMBER: 23 PHOTO TAKEN BY: Burl H. Maupin

SITE **SMOKEY MOUNTAIN SMELTERS**

NAME: **1508 MARYVILLE PIKE**

KNOXVILLE, TN 37920

PERSONS PRESENT: Lee Barron

REMARKS: *Unnamed tributary of Flenniken Branch, upstream of Site. Location of background surface water and sediment samples, SMS-SW-01 and SMS-SD-02.*

SIGNATURE: Burl H. Maupin

SI 32

DIVISION OF SUPERFUND

DATE OF PHOTO: September 8, 1998

PHOTO NUMBER: 3 PHOTO TAKEN BY: Burl H. Maupin

LOCATION **SMOKEY MOUNTAIN SMELTERS**

/NAME: **1508 MARYVILLE PIKE**

KNOXVILLE, TENNESSEE 37920

PERSONS PRESENT: Adam DeWeese

REMARKS: Exact location of the background soil sample on Vulcan Materials Company property at 3001 Alcoa Hwy.

SIGNATURE: Burl H. Maupin

SI 31

PROPERTY DEEDS
AND
OWNERSHIP CARDS

APPENDIX 1

SMOKEY MOUNTAIN SMELTERS

1508 MARYVILLE PIKE

KNOXVILLE, TENNESSEE 37920

U.S. EPA # TN0002318277

TDSF #47-559

PROPERTY ASSESSOR'S OFFICE - KNOX COUNTY, TENNESSEE
MAP DEPARTMENT - OWNERSHIP CARD

KGIS NORMAL 1-Jul-1997

District	Map	Insert	Group	Parcel	Ward	Property Location
D9	122	L	E	1		1508 MARYVILLE PK

Owner	Deed Date	Book	Page	IRS	Mailing Address
(b) (6)	9/28/79	1691	646		0 P O BOX 2704 KNOXVILLE, TN 37901
	5/25/84	1819	688		

Previous Parcel (Split From)				Next Parcel (Merged Into)	
Subdivision	Block	Lot	Plat	Dimensions (shown in ft.)	Acreage
	-	-	-	234.7 X 763.3 X IRR	0.00 - A.C. Deeded
		-			7.75 - A.C. Calculate

PROPERTY ASSESSOR'S OFFICE - KNOX COUNTY, TENNESSEE
MAP DEPARTMENT - OWNERSHIP CARD

KGIS NORMAL 1-Jul-1997

District	Map	Insert	Group	Parcel	Ward	Property Location
D9	122	L	E	2		CALEB RD

Owner	Deed Date	Book	Page	IRS	Mailing Address
(b) (6)	9/28/79	1691	646		0 P O BOX 2704 KNOXVILLE, TN 37901
	5/25/84	1819	688		

Previous Parcel (Split From)	Next Parcel (Merged Into)

Subdivision	Block	Lot	Plat	Dimensions (shown in ft.)	Acreage
JOSEPH LEWIS 1ST ADD	-	1-	7-99	166.4 X 57 X IRR	0.00 - A.C. Deeded
			-		0.00 - A.C. Calculate

PROPERTY ASSESSOR'S OFFICE - KNOX COUNTY, TENNESSEE
MAP DEPARTMENT - OWNERSHIP CARD

KGIS NORMAL 1-Jul-1997

District	Map	Insert	Group	Parcel	Ward	Property Location
D9	122	L	E	3		1500 MARYVILLE PK

Owner	Deed Date	Book	Page	IRS	Mailing Address
(b) (6)	9/28/79	1691	646		0 P O BOX 2704 KNOXVILLE, TN 37901
	5/25/84	1819	688		

Previous Parcel (Split From)				Next Parcel (Merged Into)	
Subdivision	**Block**	**Lot**	**Plat**	**Dimensions (shown in ft.)**	**Acreage**
JOSEPH LEWIS 1ST ADD	-	-	7-99	144.67 X 304.52 X IRR	1.02 - A.C. Deeded
REV		10R-	K312-B		0.00 - A.C. Calculate

PROPERTY ASSESSOR'S OFFICE - KNOX COUNTY, TENNESSEE
MAP DEPARTMENT - OWNERSHIP CARD

KGIS NORMAL 1-Jul-1997

District	Map	Insert	Group	Parcel	Ward	Property Location
D9	122	L	E	4		LEWIS AV

Owner	Deed Date	Book	Page	IRS	Mailing Address
(b) (6)	9/28/79	1691	646		0 P O BOX 2704 KNOXVILLE, TN 37901
	5/25/84	1819	688		

Previous Parcel (Split From)	Next Parcel (Merged Into)

Subdivision	Block	Lot	Plat	Dimensions (shown in ft)	Acreage
JOSEPH LEWIS 1ST ADD	-	12-	-	90 X 234.7 X IRR	0.00 - A.C. Deeded
		11-			0.48 0.00 - A.C. Calculate

ATTORNEY AT LAW
2928 MAGNOLIA AVENUE
KNOXVILLE, TN 37914
523-7793

INSTRUMENT NO. 26229

THIS INDENTURE, made this 25TH. day of MAY A. D. 1984

between DAVID A. WITHERSPOON, JR. OF KNOX COUNTY in the State of TENNESSEE of the first part, and DANIEL E. JOHNSON

of KNOX COUNTY, TENNESSEE of the second part.

01* *1200
08* *15600
09* *050
*16850
*16850
*16850
A *000
06-12-84
2 7177

WITNESSETH: That the said party of the first part, for and in consideration of the sum of ONE ($1.00) DOLLAR and other good and valuable consideration to him in hand paid by the said party of the second part, the receipt of which is hereby acknowledged,

I certify that the consideration for on the within Deed has been paid. Witness my hand this

JUN 12 1984

State Tax 156.00
Clerk Fee .50
156.50

Steve Hall
REGISTER OF DEEDS

COUNTERSIGNED
JUN 12 1984
PARK M. (Forkey) STRADER
KNOX COUNTY
PROPERTY ASSESSOR
BY 2B

STEVE HALL
JUN 12 1 49 PM '84
NOTE BOOK

RECEIVED FOR

has bargained, sold, remised, released, and QUIT-CLAIMED, and does hereby bargain, sell remise, release, and QUIT-CLAIM unto the said party of the second part,

the following described premises, to wit, situated in District No. Nine of Knox County, TN

Tract 1: The following described property and premises, to wit,

SITUATED, LYING AND BEING in the NINTH (9th) Civil District of Knox County, Tennessee, without the corporate limits of the City of Knoxville, Tennessee, and being known and designated as all of Lots 1, 10, 11 and 12 in the JOSEPH LEWIS 1ST ADDITION TO VESTAL as shown by Map of said Addition of record in Map Book 7 at Page 99 in the Register's Office of Knox County, Tennessee, all of said lots being more particularly bounded and described as shown on the map of said Addition aforesaid, to which Map reference is made for more particular description of said lots and as shown by survey of W. E. Lack, Engineer, Knoxville, Tennessee, bearing date of October 23, 1958.

Tract 2: The following described property and premises, to wit,

SITUATED, LYING AND BEING in the NINTH (9th) Civil District of Knox County, Tennessee, and without the corporate limits of the City of Knoxville, Tennessee, and being known and designated as all of Lots No. 14 and 15 and the greater portion of Lot No. 16 in JOSEPH LEWIS 1ST ADDITION TO VESTAL as shown by Map of said Addition of record in Map Book 7 at Page 99 in the Register's Office of Knox County, Tennessee, said lots and portion of lot lying adjacent forming one boundary situated and being on the Southeastern side of Lewis Avenue, having a combined frontage of 140 feet thereon and being more particularly bounded and described as follows to-wit:

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BEGINNING at an iron pin in the Southeastern line of Lewis Avenue distant in a Northeasterly direction 50 feet from the point of intersection of the Southwestern line of Lewis Avenue with the Northeastern line of Bridge Street, extended to it's point of intersection with said South eastern line of Lewis Avenue, said point of beginning marking common corner to Lots No. 12

and 14 in said Addition; thence in a Northeasterly direction along the Southeastern line of Lewis Avenue 140 feet to an iron pin; thence in a Southeasterly direction on a line parallel with the common dividing line between Lots No. 16 and 17 and distant 10 feet Southwestwardly therefrom 191.72 feet to a cut in concrete in the Northwestern right-of-way line of the Southern Railroad; thence with said Railroad right-of-way line Southwestwardly 146.4 feet to an iron pin marking common corner to Lots No. 13 and 14; thence in a Northwesterly direction along the common dividing line between Lots No. 13 and 14, 212.2 feet to an iron pin in the Southeastern line of Lewis Avenue, the place of BEGINNING, as shown by survey of W. E. Lack, Engineer, Knoxville, Tennessee, bearing date October 23, 1958.

Tract 3: The following described property and premises, to wit,

SITUATED, LYING AND BEING in the NINTH (9th.) Civil District of Knox County, Tennessee, and without the corporate limits of the City of Knoxville, Tennessee, and being generally bounded as follows: on the Northeast by the Joseph Lewis 1st Addition to Vestal, on the Southeast by the right-of-way of the Southern Railroad Company, on the Northwest by the right-of-way of the L & N Railroad Company and on the Southwest by property known, on March 3, 1959, as the Mrs. Margaret Flenniken Flenniken land, said property being more particularly bounded and described to-wit:

BEGINNING at an iron pin in the Northwestern line of the Southern Railroad Company property, said point of Beginning marking the most Southern corner of Lot No. 11 of the Joseph Lewis 1st Addition to Vestal; thence North 36 degrees West along the Southwestern line of said Addition and continuing along the Southwestern line of a driveway hereinafter described, a total distance of 608.46 feet to a point to a point in the Southeastern right-of-way line of the L & N Railroad Company property; thence with said Railroad property the following chord calls and distances, to wit: South 22 degrees 39 minutes West 70.37 feet to a point, South 24 degrees 33 minutes West 101.68 feet to a point, * South 28 degrees 28 minutes West 101.68 feet to a point, South 30 degrees 23 minutes West 101.74 feet to a point, South 32 degrees 28 minutes West 101.83 feet to a point, South 34 degrees 35 minutes West 101.68 feet to a point, South 36 degrees 05 minutes West 63.30 feet to a point marking the most Northern corner of said Mrs. Margaret Flenniken Flenniken tract; thence with said Northeastern line of said tract South 35 degrees 09 minutes East 638.30 feet to a point in the Northwestern right-of-way line of the Southern Railroad Company property; thence with said Railroad right-of-way line North 27 degrees 40 minutes East 763.3 feet to an iron pin, the place of BEGINNING

*South 26 degrees 31 minutes West 101.69 feet to a point,

Together with a right-of-way extending from the most Northern portion of the above described property Northeastwardly to Bridge Street and Maryville Pike, said right-of-way being bounded on the Northwest by the L & N Railroad Company right-of-way, on the Southeast by Lot No. 1 of the Joseph Lewis 1st Addition to Vestal and Bridge Street, said right-of-way being approximately 21 feet in width and some 100 feet in length, all as shown by survey of W. E. Lack, Engineer, Knoxville, Tennessee, bearing date October 23, 1958.

Tract 5:

BEGINNING at a point on the northwest side of Knoxville and Augusta Railway, southeast corner of the property now owned by the American Agricultural Chemical Company; thence northeast alongside Knoxville and Augusta Railway property 53 feet more or less to a stake; thence in a northwest direction 213.14 feet, parallel to the northeast line of the American Agricultural Chemical Company's property to a stake; thence southwest running parallel with the said Knoxville and Augusta railway, 50 feet to a stake; the southeast corner of Bridge Street (now Calab St.); thence southeast alongside line of said American Agricultural Chemical Co., 220.8 feet to the point of BEGINNING, This being a part of the same property conveyed to Joseph Lewis, widower, by deed dated December 22, 1910, recorded in Book 246, page 240 of the Register's Office of Knox County, Tennessee.

This conveyance is made subject to a Southern Railway spur track across Tract 3; Easement for drainage ditches and water run-off in favor of the L & N Railroad Company and certain Restrictive Covenants applicable to Lots 14, 15 and 16, in the Joseph Lewis 1st Addition to Vestal.

A tract of land located in Knox County, Tennessee, and being more fully described as follows:

An undivided one-fifth (1/5) interest in and to the following described property and premises, to-wit:

SITUATED, LYING AND BEING in the NINTH (9th) Civil District of Knox County, Tennessee, adjoining the last described tract herein on the Southwest, being known as a portion of the tract known on March 3, 1959, as the Mrs. Margaret Flenniken Flenniken tract, and being more particularly bounded and described , to-wit:

BEGINNING at a point in the Northwestern right-of-way line of the Southern RR Co. property, distant South 27 degrees 40 minutes West measured along said RR right-of-way line 763.3 feet from an iron pin marking the most Southern corner of Lot 11 of the Joseph Lewis 1st Addition to Vestal; thence North 35 degrees 09 minutes West 638.30 feet to a point in the Southeastern right-of-way line of the L & N RR Co. property; thence with said RR Co. right-of-way line the following chord calls and distances, to-wit: South 36 degrees 05 minutes West 38.38 feet, South 38 degrees 30 minutes West 101.86 feet, South 40 degrees 24 minutes West 119.76 feet to an iron pin marking the most Northern corner of Lot 6 of the Joseph Lewis 3rd Addition to Vestal; thence along the Northeastern line of said Addition South 36 degrees 43 minutes East 686.44 feet to an iron pin in the Northwestern right-of-way line of the Southern RR Co. property; thence with said right-of-way North 27 degrees 40 minutes East 260 feet to a point, the place of BEGINNING, as shown by survey of W. E. Lack, Engineer, Knoxville, Tennessee, bearing date October 23, 1958.

This conveyance is made subject to right-of-way along the Southwest line of this tract of land.

and all the estate, right, title and interest of the party of the First part therein, with the hereditaments and appurtenances thereto appertaining, hereby releasing all claim to Homestead and Dower therein To have and to hold the said premises to the said part y of the second part, heirs and assigns forever.

IN WITNESS WHEREOF, The said party of the first part has hereunto set his hand and seal the day and year first above written.

Signed, sealed and delivered in presence of _____ [signature] (L. S.)

_____ _____ (L. S.)

_____ _____ (L. S.)

_____ _____ (L. S.)

Person or Agency Responsible
For Payment of Taxes:

Name Daniel E. Johnson
Suite 1600
Address 912 S. Gay St.
Knoxville, Tenn. 37902

I hereby swear or affirm that the actual consideration or true value of this transfer, whichever is greater, is $ 60,000.00 Affiant Don Johnson
Subscribed and sworn to before me this 31st day of May 19 84
Notary Public Edward L. Summers

EDWARD L. SUMMERS NOTARY PUBLIC KNOX COUNTY

STATE OF TENNESSEE
KNOX COUNTY. } SS.

Personally appeared before me ~~E. MICHAEL ELLIS~~ Edward L. Summers, a Notary Public in and for said County, the within named bargainors, DAVID A. WITHERSPOON, JR.

with whom I am personally acquainted, and who acknowledged that he executed the within instrument for the purposes therein contained.

Witness my hand and official seal at office this 25TH day of MAY 1984

Edward L. Summers, Notary Public.

My commission expires 10-3-84

STATE OF TENNESSEE,
_____ COUNTY. } SS.

Personally appeared before me _____, a Notary Public in and for said County, the within named bargainors, _____

with whom I am personally acquainted, and who acknowledged that he executed the within instrument for the purposes therein contained. And _____, wife of the said _____ having appeared before me privately and apart from her husband, the said _____ acknowledged the execution of the said Deed to have been done by her freely, voluntarily and understandingly, without compulsion or constraint from her said husband, and for the purposes therein expressed.

Witness my hand and official seal at office in _____ Tennessee, this _____ day of _____ A. D. _____

_____, Notary Public.

BOOK 1819 PAGE 691

Quit Claim Deed

—TO—

REGISTER'S OFFICE } SS.
State of Tennessee
County of _____

Received for record the _____ day _____ A. D. Nineteen Hundred _____ at _____ o'clock _____ M.
and _____ recorded in Note Book _____ Page _____ and _____ recorded in Book of Deeds _____ Page _____

Witness my hand.

Fee Paid _____ Register.

State Tax - - - - - $ _____
County Tax - - - - - _____
Clerk's Fee - - - - - _____
Total - - - - - - - - _____

INSTRUMENT NO. 3314

WARRANTY DEED—Form 14. This Instrument Prepared By Max M. Morrison, Attorney, ~~716 Market St., Knoxville,~~ Tenn.

THIS INDENTURE, made this 28 day of September

A. D., 19 79 between Jerry V. Sternberg, Single

of Asheville, in the State of North Carolina

of the first part, and David A. Witherspoon, Jr., and Daniel E. Johnson

of Knoxville, Tennessee the second part.

WITNESSETH, that the said part y of the first part, for and in consideration of the sum

of One Dollar ($1.00) and other good and valuable consideration

01* *1.00
to him in hand paid by the said part ies of the second part, the receipt of which is hereby acknowledged,
16552
10-30-79
2 000

~~and as security the payment of said note a special lien is hereby retained on the property herein conveyed,~~
has granted, bargained, sold, conveyed, and do es hereby grant, bargain, sell and convey unto the said part ies of the second part, the following described premises, to wit, situated in District No. Nine of Knox County, Tennessee

All property described in the attached "Exhibit A" and "Exhibit A-1"

08* *390
09* *0
A *390
16562
10-30-
2 0001

I hereby swear or affirm that the actual consideration or value of this transfer, whichever is greater, is $150,000.00 [signature]
Subscribed and sworn to before me this 30 day of Oct 1979
Deputy Register [signature]

RESPONSIBLE TAXPAYER
[signature] 12206 Prominent PT
Knoxville, TN 37922
ADDRESS

COUNTERSIGNED
OCT 30 1979
PARK M. (Parkey) STRADER
KNOX COUNTY
PROPERTY ASSESSOR
BY [initials]

I certify that the ... on the within ... Witness my hand ...
OCT 30 1979
Du..

... 390.00
... .50
... 390.50

BOOK 1691 PAGE 646

For further and more complete description and for Title, reference is here made to the following Deeds of Record in the Register's Office in and for said County and State, in Deed Book

Vol. , Page , Book , Vol. , Page , Book ,

Vol. , Page ;

with the hereditaments and appurtenances thereto appertaining, hereby releasing all claims to Homestead and Dower therein. TO HAVE AND TO HOLD the said premises to the said parties of the second part, their heirs and assigns forever.

And the said party of the first part for himself and for his Heirs, Executors and Administrators does hereby covenant with the said parties of the second part their heirs and assigns that they will lawfully seized in fee simple of the premises above conveyed and they have full power, authority and right to convey the same, that said premises are free from all incumbrances

and that he will forever warrant and defend the said premises and the title thereto against the lawful claims of all persons whomsoever.

IN WITNESS WHEREOF, The said party of the first part has hereunto set his hand and seal the day and year first above written.

Signed, sealed and delivered in the presence of

Jerry V. Sternberg (L. S.)
JERRY V. STERNBERG

_____ _____ (L. S.)

_____ _____ (L. S.)

_____ _____ (L. S.)

EXHIBIT "A"

Tracts of land located in Knox County, Tennessee, and being more fully described as follows:

Tract 1:

The following described property and premises, to-wit:

SITUATED, LYING AND BEING in the NINTH (9th) Civil District of Knox County, Tennessee, without the corporate limits of the City of Knoxville, Tennessee, and being known and designated as all of Lots 1, 10, 11, and 12 in the JOSEPH LEWIS 1ST ADDITION TO VESTAL as shown by Map of said Addition of record in Map Book 7 at Page 99 in the Register's Office of Knox County, Tennessee, all of said lots being more particularly bounded and described as shown on the map of said Addition aforesaid, to which Map reference is made for more particular description of said lots and as shown by survey of W. E. Lack, Engineer, Knoxville, Tennessee, bearing date of October 23, 1958.

Tract 2:

The following described property and premises to-wit:

SITUATED, LYING, AND BEING in the NINTH (9th) Civil District of Knox County, Tennessee, and without the corporate limits of the City of Knoxville, Tennessee, and being known and designated as all of Lots No. 14 and 15 and the greater portion of Lot No. 16 in the JOSEPH LEWIS 1ST ADDITION TO VESTAL as shown by Map of said Addition of record in Map Book 7 at Page 99 in the Register's Office of Knox County, Tennessee, said lots and portion of lot lying adjacent forming one boundary situated and being on the Southeastern side of Lewis Avenue, having a combined frontage of 140 feet thereon and being more particularly bounded and described as follows to-wit:

BEGINNING at an iron pin in the Southeastern line of Lewis Avenue distant in a Northeasterly direction 50 feet from the point of intersection of the Southeastern line of Lewis Avenue with the Northeastern line of Bridge Street, extended to its point of intersection with said Southeastern line of Lewis Avenue, said point of beginning, marking common corner to Lots No. 13 and 14 in said Addition; thence in a Northeasterly direction along the Southeastern line of Lewis Avenue 140 feet to an iron pin; thence in a Southeasterly direction on a line parallel with the common dividing line between Lots No. 16 and 17 and distant 10 feet Southwestwardly therefrom 191.72 feet to a cut in concrete in the Northwestern right-of-way line of the Southern Railroad; thence with said Railroad right-of-way line Southwestwardly 146.4 feet to an iron pin marking common corner to Lots No. 13 and 14; thence in a Northwesterly direction along the common dividing line between Lots No. 13 and 14, 212.7 feet to an iron pin in the Southeastern line of Lewis Avenue, the place of BEGINNING; as shown by survey of W. E. Lack, Engineer, Knoxville, Tennessee, bearing date October 23, 1958.

Tract 3:

The following described property and premises to-wit:

SITUATED, LYING, AND BEING in the NINTH (9th) Civil District of Knox County, Tennessee, and without the corporate limits of the City of Knoxville, Tennessee, and being generally bounded as follows: on the Northeast by the Joseph Lewis 1st Addition to Vestal, on the Southeast by the right-of-way of the Southern Railroad Company, on the Northwest by the right-of-way of the L. & N. Railroad Company and on the Southwest by property known, on March 3, 1959 as the Mrs. Margaret Hensiker Hensiker tract, said property being more particularly bounded and described to-wit:

POOR ORIGINAL

BEGINNING at an iron pin in the Northwestern line of the Southern Railroad Company property, said point of beginning marking the most Southern corner of Lot No. 11 of the Joseph Lewis 1st Addition to Vestal; thence North 36 degrees West along the Southwestern line of said Addition and continuing along the Southwestern line of a driveway hereinafter described, a total distance of 603.46 feet to a point in the Southeastern right-of-way line of the L & N Railroad Company property; thence with said Railroad property the following chord calls and distances, to-wit: South 22 degrees 37 minutes West 70.37 feet to a point, South 24 degrees 33 minutes West 101.63 feet to a point, South 26 degrees 31 minutes West 101.69 feet to a point, South 28 degrees 29 minutes West 101.68 feet to a point, South 30 degrees 23 minutes West 101.74 feet to a point, South 32 degrees 28 minutes West 101.83 feet to a point, South 34 degrees 35 minutes West 101.68 feet to a point, South 36 degrees 05 minutes West 63.30 feet to a point marking the most Northern corner of said Mrs. Margaret Flenniken Flenniken tract; thence with said Northeastern line of said tract South 35 degrees 09 minutes East 630.30 feet to a point in the Northwestern right-of-way line of the Southern Railroad Company property; thence with said Railroad right-of-way line North 27 degrees 40 minutes East 763.3 feet to an iron pin, the place of BEGINNING.

Together with a right-of-way extending from the most Northern portion of the above described property Northeastwardly to Bridge Street and Maryville Pike, said right-of-way being bounded on the Northwest by the L & N Railroad Company right-of-way, on the Southeast by Lot No. 1 of the Joseph Lewis 1st Addition to Vestal and Bridge Street, said right-of-way being approximately 21 feet in width and some 100 feet in length, all as shown by survey of W. E. Lock, Engineer, Knoxville, Tennessee, bearing date October 23, 1958.

Tract 5

BEGINNING at a point on the northwest side of Knoxville and Augusta Railway, southeast corner of the property now owned by the American Agricultural Chemical Company; thence northeast alongside Knoxville and Augusta railway property 53 feet more or less to a stake; thence in a northwest direction 213.14 feet, parallel to the northeast line of the American Agricultural Chemical Company's property to a stake; thence southwest running parallel with the said Knoxville and Augusta railway, 50 feet to a stake; the southeast corner of Bridge Street (now Calab St.); thence southeast alongside line of said American Agricultural Chemical Co., 220.8 feet to the point of the BEGINNING. This being a part of the same property conveyed to Joseph Lewis, widower, by deed dated December 22, 1910, recorded in Book 246, page 240 of the Register's Office of Knox County, Tennessee.

This conveyance is made subject to a Southern Railway spur track across Tract 3; Easement for drainage ditches and water run-off in favor of the L & N Railroad Company and certain Restrictive Covenants applicable to Lots 14, 15, and 16, in the Joseph Lewis 1st Addition to Vestal.

POOR ORIGINAL

EXHIBIT "A-1"

A tract of land located in Knox County, Tennessee, and being more fully described as follows:

An undivided one-fifth (1/5) interest in and to the following described property and premises, to-wit:

SITUATED, LYING, AND BEING in the NINTH (9th) Civil District of Knox County, Tennessee, adjoining the last described tract herein on the Southwest, being known as a portion of the tract known on March 3, 1959, as the Mrs. Margaret Flenniken Flenniken tract, and being more particularly bounded and described, to-wit:

BEGINNING at a point in the Northwestern right-of-way line of the Southern Railroad Company property, distant South 27 degrees 40 minutes West measured along said Railroad right-of-way line 763.3 feet from an iron pin marking the most Southern corner of Lot No. 11 of the Joseph Lewis 1st Addition to Vestal; thence North 35 degrees 09 minutes West 638.30 feet to a point in the Southeastern right-of-way line of the L & N Railroad Company property; thence with said Railroad Company right-of-way line the following chord calls and distances, to-wit: South 36 degrees 05 minutes West 38.38 feet, South 39 degrees 30 minutes West 101.86 feet, South 40 degrees 24 minutes West 119.76 feet to an iron pin marking the most Northern corner of Lot No. 6 of the Joseph Lewis 3rd Addition to Vestal; thence along the Northeastern line of said Addition South 36 degrees 43 minutes East 686.44 feet to an iron pin in the Northwestern right-of-way line of the Southern Railroad Company property; thence with said right-of-way line North 27 degrees 40 minutes East 260 feet to a point, the place of BEGINNING, as shown by survey of W. E. Lock, Engineer, Knoxville, Tennessee, bearing date October 23, 1958.

This conveyance is made subject to right-of-way along the Southwest line of this tract of land.

POOR ORIGINAL

STATE OF TENNESSEE,

County of KNOX } ss.

Personally appeared before me, the undersigned authority, a Notary Public of said County and State, the within named bargainor Jerry V. Sternberg

with whom I am personally acquainted, and who ac[illegible]ged that he executed the within instrument for the purposes therein contained.

Witness my hand and official seal at office this 28 day of SEPTEMBER A. D. 1979

My Commission Expires 6-28-82 [signature] Notary Public.

STATE OF TENNESSEE,

County of _____ } ss.

Personally appeared before me, _____, a Notary Public of said County and State, the within named bargainor _____

with whom I am personally acquainted, and who acknowledged that he executed the within instrument for the purposes therein contained.

Witness my hand and official seal at office this _____ day of _____ A. D. 19 ___

My Commission Expires _____ _____ Notary Public.

STATE OF TENNESSEE
COUNTY OF _____

I, or we, hereby swear or affirm that the actual consideration for this transfer, or value of the property transferred, whichever is greater, is $ _____, which amount is equal to or greater than the amount which the property transferred would command at a fair, voluntary sale.

_____

Subscribed and sworn to before me this _____ day of _____, 19 ___

My Commission Expires _____ _____ Notary Public.

DURWA[illegible] SHARP
REGIS[illegible]
NOTE BOOK 84
OCT 30 11 08 AM '79
RECEIVED FOR
RECORDING

PROPERTY ASSESSOR'S OFFICE - KNOX COUNTY, TENNESSEE
MAP DEPARTMENT - OWNERSHIP CARD

KGIS NORMAL 1-Jul-1997

District	Map	Insert	Group	Parcel	Ward	Property Location
D9	122	L	E	1.01		MARYVILLE PK

Owner	Deed Date	Book	Page	IRS	Mailing Address
(b) (6)	6/29/85	1856	26		0 P O BOX 2704 KNOXVILLE, TN 37901

Previous Parcel (Split From)	Next Parcel (Merged Into)

Subdivision	Block	Lot	Plat	Dimensions (shown in ft.)	Acreage
	-	-	-	638.3 X 260 X IRR	0.00 - A.C. Deeded
		-			3.70 - A.C. Calculate

This Instrument Prepared by: Edward L. Summers
910 Andrew Johnson Plaza
Knoxville, Tennessee 37902

C1 * *60C
CE *33188 030
CS 0.00
*4680

WARRANTY DEED

THIS INDENTURE, made this 29 day of JUNE, A.D., 1985, between William Emil Nichols and wife, Vernette S. Nichols, and Maude Flenniken Nichols, mother of William Emil Nichols, all of Naperville, Illinois, First Parties, and Daniel E. Johnson of Knox County, Tennessee, Second Party.

WITNESSETH: that said First Parties, for and in consideration of the sum of Ten and no/100 Dollars ($10.00) to us in hand paid by Second Parties, the receipt of which is hereby acknowledged,

have granted, bargained, sold and conveyed, and do hereby grant, bargain, sell and convey unto the said Second Party the following:

An undivided four-fifths (4/5) interest in and to the following described property and premises to wit:

Situated, lying, and being in the ninth (formerly fourteenth) Civil District of Knox County, Tennessee, being a 3.7 acre tract, described as follows:

BEGINNING at a point in the Northwestern right-of-way line of the Southern Railroad Company property, distant South 27 deg. 40 min. West measured along said Railroad right-of-way line 763.3 feet from an iron pin marking the most Southern corner of Lot No. 11 of the Joseph Lewis 1st Addition to Vestal; thence North 35 deg. 09 min. West 638.30 feet to a point in the Southeastern right-of-way line of the L & N Railroad Company property; thence with said Railroad Company right-of-way in the following chord calls and distances, to-wit: South 36 deg. 05 min. West 38.38 feet, South 38 deg. 30 min. West 101.86 feet, South 40 deg. 24 min. West 119.76 feet to an iron pin marking the most Northern corner of Lot No. 6 of the Joseph Lewis 3rd Addition to Vestal; thence along the Northeastern line of said Addition South 36 deg. 43 min. East 686.44 feet to an iron pin in the Northwestern right-of-way line of the Southern Railroad Company property; thence with said right-of-way line North 27 deg. 40 min. East 260 feet to a point, the place of BEGINNING, as shown by survey of W. E. Lack, Engineer, Knoxville, Tennessee, bearing date October 23, 1958.

Being the same property in which William Emil Nichols acquired a one-fifth (1/5) undivided interest from Thomas W. Flenniken, Sr. by deed dated August 16, 1950, of record in Warranty Deed book 840, Page 77, in the Register's Office for Knox County, Tennessee.

Also being the same property in which William Emil Nichols acquired an undivided one-fifth (1/5) interest, and an undivided one-tenth (1/10) interest from Mabel Flenniken by deed dated September 8, 1978, of record in Warranty Deed book 1654, Page 701, in the Register's Office for Knox County, Tennessee.

Also being the same property in which Maude Flenniken Nichols acquired an undivided one-fifth (1/5) interest by inheritance from her mother, Margaret Flenniken Flenniken, and an undivided one-tenth (1/10) interest from Sara Drake Flenniken by deed dated March 10, 1966, of record in Warranty Deed Book 1317, at page 319, in the Register's Office for Knox County, Tennessee.

COUNTERSIGNED
AUG - 1 1985
ARK M. (Park...)
KNOX COU...
PROPERTY ASS...

BOOK 1856 PAGE 026

with the hereditaments and appurtenances thereto appertaining, hereby releasing all claims to homestead and dower therein. TO HAVE AND TO HOLD THE said premises to the said Second Party, his heirs and assigns forever.

And said First Parties, for themselves and for their heirs, executors and administrators do hereby covenant with said Party, his heirs, and assigns, that they are lawfully seized in fee simple of the premises above conveyed and have full power, authority and right to convey the same, and that said premises are free from all incumbrances except all real estate taxes which Second Party shall assume and pay, and all easements, rights of way, and restrictions of record and that they will forever warrant and defend the said premises and the title thereto against the lawful claims of all persons whomsoever.

The designation of the parties to this instrument in either the plural or singular shall be applied to, and mean, either number and whenever a pronoun is used it shall be construed to represent either singular or plural as the case may demand.

IN WITNESS WHEREOF the said First Parties hereunder set their hands and seals the day and year first above written.

William Emil Nichols (L.S.) Maude Flenniken Nichols (L.S.)

Vernette S. Nichols (L.S.) _____ (L.S.)

STATE OF ILLINOIS
COUNTY OF DuPage

Personally appeared before me, the undersigned authority, a Notary Public in and for said County and State William Emil Nichols, Vernette S. Nichols and Maude Flenniken Nichols the within named bargainors, with whom I am personally acquainted, and who acknowledged that they executed the within instrument for the purposes therein contained.

Witness my hand and official seal at office, in DuPage County, this 29th day of June, 1985.

Notary Public

My Commission Expires: My Commission Expires June 13, 1987

I certify that the consideration on the within Deed has been paid. Witness my hand this AUG 1 1985

STATE OF ILLINOIS
COUNTY OF

Personally appeared before me, the undersigned authority, a Notary Public in and for said County and State _____ the within named bargainors, with whom I am personally acquainted, and who acknowledged that they executed the within instrument for the purposes therein contained.

Witness my hand and official seal at office, in _____ County, this _____ day of _____ 1985

Notary Public

My Commission Expires: _____

I hereby swear or affirm that the actual consideration or true value of this transfer, whichever is greater, is $_____.
Affiant _____
Subscribed and sworn to before me this 1 day of August, 1985.
Notary Public

BOOK 1856 PAGE 027

My Commission Expires: October 20, 1987

TABULAR PRESENTATION OF CONTAMINANTS

BY TYPE AND BY MEDIA

INORGANICS *EXTRACTIBLE ORGANICS* *VOLATILE ORGANICS* *RADIOLOGICAL*	*ALL SAMPLES* *WASTE* *SOIL* *SEDIMENT* *GROUNDWATER* *SURFACE WATER*

APPENDIX 2

SMOKEY MOUNTAIN SMELTERS

1508 MARYVILLE PIKE

KNOXVILLE, TENNESSEE 37920

U.S. EPA # TN0002318277

TDSF #47-559

THE OCCURRENCE OF INORGANICS IN ENVIRONMENTAL SAMPLES

SMOKEY MOUNTAIN SMELTERS KNOX COUNTY, TENNESSEE 37920

PARAMETER (detected in at leas one sample)	WASTE								SOIL									SEDIMENT						GROUND-WATER		SURFACE WATER			
									SURFACE					SUBSURFACE															
	01	02	03	04	05	06	07	08	01	02	03	04	05	01	02	03	04	01	02	03	04	05	06	01	02	01	02	03	04
aluminum, Al	96700	65500	88800	13500	8200	48900	11300	74600	8820	23900	15500	74100	14600	7680	20100	20400	73500	7130	3710	64000	80900	15600	3840	U	0.920	U	2.160	0.365	U
ammonia, NH_3	331	1926	132	135	36.7	49.3	2530	5290	26.3	40.9	157	14.8	46.5	U	13.7	30.0	26.5	121	U	38.5	35.4	63.2	46.8	U	N/A	U	28.1	192	N/A
antimony, Sb	13	9	5	9	13.0	9.6	9.4	3.5	U	U	1.1	4.4	1.0	U	U	1.2	3.0	3	U	13.2	6.8	0.7	U	U	U	U	U	0.016	U
arsenic, As	6	6	7	11	9.8	7.2	8.8	7.1	6.7	4.2	8.3	13.2	10.2	6.1	4.3	11.6	2.0	6	4.1	6.8	11.0	5.0	3.8	U	U	U	0.005	U	U
barium, Ba	52	30	111	222	86	94	446	95	81	94	81	59	66	64	53	73	63	63	15	156	96	70	32	U	U	U	U	U	U
beryllium, Be	U	U	2	1	2	3	3	4	U	2	1	2	U	U	2	2	4	1	U	3	2.7	1	U	U	U	U	U	U	U
cadmium, Cd	U	15.6	U	1.4	3.2	2.8	4.6	1.3	U	1.2	2.7	U	U	U	U	1.3	U	0.8	U	4.5	5.0	U	U	U	U	U	0.001	U	U
calcium, Ca	5630	11400	5850	9680	22600	21500	13800	31800	1100	18900	22500	6430	5400	364	14500	16200	8360	8000	175	10700	12300	2500	3390	70.8	133	67.0	39.1	18.9	125
chromium, Cr	79	6	52	93	46	107	72	112	12	39	26	31	22	10	36	33	50	44	10	33	64	14	6	U	U	U	U	0.001	U
cobalt, Co	3	4	6	13	9	66	11	8	11	18	10	11	17	10	10	10	7	10	4	11	11	16	7	U	U	U	U	U	U
copper, Cu	42900	754	1080	576	1690	1970	1380	634	11	116	108	1070	34	6	40	76	1770	809	4	155	1380	72	13	0.001	0.002	U	0.082	0.120	0.001
cyanide	U	U	U	U	1.22	U	U	U	U	U	3.77	U	U	U	U	U	U	1.08	U	U	U	U	U	U	U	U	U	U	U
fluoride	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.1	0.2	U	105	30.7	0.4
iron, Fe	9920	4860	14800	15400	12400	15000	29500	14100	12690	18600	13900	18300	22100	5060	44000	47100	14800	12500	9630	16800	10300	19290	12600	0.204	0.620	U	352	0.206	0.194
lead, Pb	291	129	53	96	100	85	213	36	25	50	355	61	28	21	26	158	70	47	6	64	133	18	16	U	0.007	U	0.004	U	0.001
magnesium, Mg	5410	24600	9060	8240	8710	8820	11800	7130	876	3910	2020	4430	1410	529	2250	1950	4780	2860	259	3280	2510	1070	581	5.66	14.2	4.40	4.21	U	10.1
manganese, Mn	384	144	388	339	500	486	673	434	1920	645	691	548	912	1060	265	547	467	511	295	584	837	1000	503	0.045	0.492	U	0.406	0.364	0.138
mercury, Hg	U	0.73	U	U	0.12	0.11	U	U	U	0.18	0.42	U	U	U	U	0.18	U	U	U	0.10	0.23	U	U	U	U	U	U	U	U
nickel, Ni	240	551	169	326	776	745	695	379	6	30	18	277	8	U	19	21	238	233	U	143	294	27	3	U	U	U	U	U	U
nitrate nitrogen	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1.60	1.97	1.14	U	U	1.90
nitrite nitrogen	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.02	U	U	15.28	2.22	U
NO_3 & NO_2 nitrogen	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1.62	1.97	1.14	13.6	0.91	1.90
potassium, K	695	4230	15000	5250	1290	1320	145	232	210	2320	2420	556	716	246	1240	3050	704	869	201	2610	143	1640	274	0.56	0.64	0.43	99.9	505	1.78
selenium, Se	8	2	1	2	5.5	6.0	6.9	2.7	U	U	41.6	1.8	U	U	U	13.4	U	U	U	U	3.4	U	0.5	U	U	U	U	U	U
silver, Ag	2	1	U	U	1	1	U	U	U	U	U	U	U	U	U	U	1	U	U	U	2	U	U	U	U	U	U	U	U
sodium, Na	17100	10700	47400	9880	6910	5920	19100	28100	47	171	700	11200	75	68	118	1070	10300	7200	42	7050	3820	5570	121	5.18	17.2	1.92	416	10400	81.4
sulfate, $SO_4^=$	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	8	20	4	52	120	17
vanadium, V	38	U	49	76	43	46	53	53	U	33	25	44	25	U	35	49	37	32	U	46	46	25	U	U	U	U	0.003	U	U
zinc, Zn	2330	4020	1350	1140	906	803	1050	549	39.2	208	283	776	472	22.1	118	299	761	523	18.8	486	738	135	59.8	0.008	0.046	U	0.063	0.017	0.008

U - analyte requested but not detected (TAL/TCL parameters not listed were not detected in any samples)

N/A - not analyzed UNITS: waste/sediment/soil in mg/kg; water in mg/l

OBSERVED RELEASE

OBSERVED RELEASE AND MAY EXHIBIT TOXICITY CHARACTERISTIC (40CFR261.24)

THE OCCURRENCE OF INORGANICS IN WASTE SAMPLES

SMOKEY MOUNTAIN SMELTERS KNOX COUNTY, TENNESSEE 37920

PARAMETER (detected in at least one sample)	WASTE SAMPLE NUMBERS							
	01 BLUE	02 BAGHOUSE	03 BLDG PILE	04 OUTSIDE	05 MNTN SHED	06 MNTN SHED	07 FURNACE	08 BLD FLOOR
aluminum, Al	96700	65500	88800	135000	8200	48900	113000	74600
ammonia, NH_3	331	1026	132	135	36.7	49.3	2530	5290
antimony, Sb	13	9	5	9	13.0	9.6	9.4	3.5
arsenic, As	6	6	7	11	9.8	7.2	8.8	7.1
barium, Ba	52	30	111	222	86	94	446	95
beryllium, Be	U	U	2	1	2	3	3	4
cadmium, Cd	U	15.6	U	1.4	3.2	2.8	4.6	1.3
calcium, Ca	5630	11400	5850	9680	22600	21500	13800	31800
chromium, Cr	79	6	52	93	46	107	72	112
cobalt, Co	3	4	6	13	9	66	11	8
copper, Cu	42900	754	1080	576	1690	1970	1380	634
cyanide	U	U	U	U	1.22	U	U	U
iron, Fe	9920	4860	14800	15400	12400	15000	29500	14100
lead, Pb	291	129	53	96	100	85	213	36
magnesium, Mg	5410	24600	9060	8240	8710	8820	11800	7130
manganese, Mn	384	144	388	339	500	486	673	434
mercury, Hg	U	0.73	U	U	0.12	0.11	U	U
nickel, Ni	240	551	169	326	776	745	695	379
potassium, K	695	4230	15000	5250	1290	1320	145	232
selenium, Se	8	2	1	2	5.5	6.0	6.9	2.7
silver, Ag	2	1	U	U	1	1	U	U
sodium, Na	17100	107000	47400	9880	6910	5920	19100	28100
vanadium, V	38	U	49	76	43	46	53	53
zinc, Zn	2330	4020	1350	1140	906	803	1050	549

U - analyte requested but not detected (TAL/TCL parameters not listed were not detected in any samples)

OBSERVED RELEASE

UNITS: mg/kg

OBSERVED RELEASE AND MAY EXHIBIT TOXICITY CHARACTERISTIC (40CFR261.24)

THE OCCURRENCE OF INORGANICS IN SOIL SAMPLES

SMOKEY MOUNTAIN SMELTERS
KNOX COUNTY, TENNESSEE 37920

PARAMETER (detected in at least one sample	SOIL SAMPLE NUMBER								
	SURFACE					SUBSURFACE			
	01 BACKGROUND	02 TRANSFORMER	03 TANK	04 DRUMS	05 MAGAZINE	01 BACKGROUND	02 TRANSFORMER	03 TANK	04 DRUMS
aluminum, Al	8820	23900	15500	74100	14800	7680	20100	20400	73500
ammonia, NH_3	26.3	40.9	157	14.8	46.5	U	13.7	30.0	26.5
antimony, Sb	U	U	1.1	4.4	1.0	U	U	1.2	3.0
arsenic, As	6.7	4.2	8.3	13.2	10.2	6.1	4.3	11.6	2.0
barium, Ba	81	94	81	59	68	64	53	73	63
beryllium, Be	U	2	1	2	U	U	2	2	4
cadmium, Cd	U	1.2	2.7	U	U	U	U	1.3	U
calcium, Ca	1100	18900	22500	6430	5400	364	14500	16200	8360
chromium, Cr	12	39	26	31	22	10	36	33	50
cobalt, Co	11	18	10	11	17	10	10	10	7
copper, Cu	11	116	108	1070	34	6	40	76	1770
cyanide	U	U	3.77	U	U	U	U	U	U
iron, Fe	12600	18600	13900	18300	22100	5060	44000	47100	14800
lead, Pb	25	50	355	61	28	21	26	158	70
magnesium, Mg	876	3910	2020	4430	1410	529	2250	1950	4780
manganese, Mn	1920	645	691	548	912	1060	285	547	467
mercury, Hg	U	0.18	0.42	U	U	U	U	0.18	U
nickel, Ni	6	30	18	277	8	U	19	21	238
potassium, K	210	2320	2420	556	716	246	1240	3050	704
selenium, Se	U	U	41.6	1.8	U	U	U	13.4	U
silver, Ag	U	U	U	U	U	U	U	U	1
sodium, Na	47	171	700	11200	75	68	118	1070	10300
vanadium, V	U	33	25	44	25	U	35	49	37
zinc, Zn	39.2	208	283	776	472	22.1	118	299	761

U - analyte requested but not detected (TAL/TCL parameters not listed were not detected in any samples)
N/A - not analyzed

UNITS: mg/kg

OBSERVED RELEASE

OBSERVED RELEASE AND MAY EXHIBIT TOXICITY CHARACTERISTIC (40CFR261.24)

THE OCCURRENCE OF INORGANICS IN SEDIMENT SAMPLES

SMOKEY MOUNTAIN SMELTERS
KNOX COUNTY, TENNESSEE 37920

PARAMETER (detected in at least one sample)	SEDIMENT SAMPLE NUMBER					
	01 ON-SITE	02 BACKGROUND	03 LAGOON	04 ON-SITE	05 TRIB	06 FLNSKN BR
aluminum, Al	7130	3710	64000	80900	15600	3840
ammonia, NH_3	121	U	38.5	35.4	63.2	46.8
antimony, Sb	3	U	13.2	6.8	0.7	U
arsenic, As	6	4.1	6.8	11.0	5.0	3.8
barium, Ba	63	15	156	96	70	32
beryllium, Be	1	U	3	2.7	1	U
cadmium, Cd	0.8	U	4.5	5.0	U	U
calcium, Ca	8900	175	10700	12300	2500	3390
chromium, Cr	44	10	33	64	14	6
cobalt, Co	10	4	11	11	16	7
copper, Cu	809	4	155	1380	72	13
cyanide	108	U	U	U	U	U
iron, Fe	12500	9630	16800	10300	192000	12600
lead, Pb	47	6	64	133	18	16
magnesium, M	2860	259	3280	2510	1070	581
manganese, Mn	511	295	584	837	1000	503
mercury, Hg	U	U	0.10	0.23	U	U
nickel, Ni	233	6	143	294	27	3
potassium, K	869	201	2610	143	1648	274
selenium, Se	U	U	U	3.4	U	0.5
silver, Ag	U	U	U	2	U	U
sodium, Na	7200	42	7050	3820	5570	121
vanadium, V	32	U	46	46	25	U
zinc, Zn	523	18.8	486	738	135	59.8

U - analyte requested but not detected (TAL/TCL parameters not listed were not detected in any samples)
N/A - not analyzed

UNITS: mg/kg

OBSERVED RELEASE

OBSERVED RELEASE AND MAY EXHIBIT TOXICITY CHARACTERISTIC (40CFR261.24)

THE OCCURRENCE OF INORGANICS IN GROUNDWATER SAMPLES

SMOKEY MOUNTAIN SMELTERS
KNOX COUNTY, TENNESSEE 37920

PARAMETER (detected in at least one sample)	GROUND WATER SAMPLE NUMBER	
	01 BACKGROUND	02 MARYKNOX TAVERN
aluminum, Al	U	0.920
calcium, Ca	70.8	133
copper, Cu	0.001	0.002
fluoride	0.1	0.2
iron, Fe	0.204	0.620
lead, Pb	U	0.007
magnesium, Mg	5.66	14.2
manganese, Mn	0.045	0.492
nitrate nitrogen	1.60	1.97
nitrite nitrogen	0.02	U
NO_3 & NO_2 nitrogen	1.62	1.97
potassium, K	0.56	0.64
sodium, Na	5.18	17.2
sulfate, $SO_4^{=}$	8	20
zinc, Zn	0.008	0.046

U - analyte requested but not detected (TAL/TCL parameters not listed were not detected in any samples)
N/A - not analyzed

UNITS: mg/l

OBSERVED RELEASE

THE OCCURRENCE OF INORGANICS IN SURFACE WATER SAMPLES

SMOKEY MOUNTAIN SMELTERS
KNOX COUNTY, TENNESSEE 37920

PARAMETER (detected in at least one sample)	SURFACE WATER SAMPLE NUMBER			
	01 BACKGROUND	02 LAGOON	03 TRIB	04 FLNNKN BR
aluminum, Al	U	2.160	0.365	U
ammonia, NH_3	U	28.1	192	N/A
antimony, Sb	U	U	0.016	U
arsenic, As	U	0.005	U	U
cadmium, Cd	U	0.001	U	U
calcium, Ca	67.0	39.1	18.9	125
chromium, Cr	U	U	0.001	U
copper, Cu	U	0.082	0.120	0.001
fluoride	U	105	30.7	0.4
iron, Fe	U	352	0.206	0.194
lead, Pb	U	0.004	U	0.001
magnesium, Mg	4.40	4.21	U	10.1
manganese, Mn	U	0.406	0.364	0.138
nitrate nitrogen	1.14	U	U	1.90
nitrite nitrogen	U	15.28	2.22	U
NO_3 & NO_2 nitrogen	1.14	13.6	0.91	1.90
potassium, K	0.43	99.9	505	1.78
sodium, Na	1.92	416	10400	81.4
sulfate, $SO_4^{=}$	4	52	120	17
vanadium, V	U	0.083	U	U
zinc, Zn	U	0.063	0.017	0.008

U - analyte requested but not detected (TAL/TCL parameters not listed were not detected in any samples)
N/A - not analyzed
UNITS: mg/l

OBSERVED RELEASE

THE OCCURRENCE OF EXTRACTABLE ORGANICS IN ENVIRONMENTAL SAMPLES

SMOKEY MOUNTAIN SMELTERS KNOX COUNTY, TENNESSEE 37920

PARAMETER (detected in at least one sample)	WASTE								SOIL									SEDIMENT						GROUND WATER		SURFACE WATER			
									SURFACE					SUBSURFACE															
	01 BLUE	02 BACKGROUND	03 BLDG PILE	04 OUTSIDE	05 MOTA SHED	06 MOTA SHED	07 FURNACE	08 BLD FLOOR	01 BACKGROUND	02 TRANSFORM	03 TANK	04 DRUMS	05 MOTA SHED	01 BACKGROUND	02 TRANSFORM	03 TANK	04 DRUMS	01 ON SITE	02 BACKGROUND	03 LAGOON	04 ON SITE	05 TRIB	06 TRANSFORM	01 BACKGROUND	02 MOTA	01 BACKGROUND	02 LAGOON	03 TRIB	04 TRANSFORM
butyl benzyl phthalate	U	U	U	U	U	U	U	U	U	U	U	U	BJ 55.1	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
bis(2-ethylhexyl)phthalate	J 477	541	572	U	B 246	B 322	2370	B 304	B 82.8	B 303	B 134	B 68.0	B 583	B 75.8	B 58.2	B 55.9	B 63.1	288	BJ 51.0	B 218	B 310	3000	B 67.7	BJ 0.48	U	BJ 0.48	B 1.90	B 9.5	U
diethyl phthalate	BJ 157	U	U	BJ 125	B 135	B 457	2710	B 137	B 59.7	B 243	B 285	B 215	B 176	B 57.8	B 116	B 146	BJ 46.7	U	B 78.1	B 557	5630	B 167	B 97.1	U	U	B 0.56	U	U	U
benz(a)anthracene	U	239	U	U	U	U	69.7	U	U	J 62.6	J 58.1	J 16.5	J 25.8	U	U	J 28.5	U	136	U	157	116	U	J 45.1	U	U	U	U	U	U
benzo(a)pyrene	U	689	U	U	U	U	55.6	U	U	81.1	J 75.8	J 26.8	52.4	U	U	J 42.2	U	155	U	239	173	U	58.7	U	U	U	U	U	U
benzo(b)fluoranthene	U	1440	U	U	138	148	143	50.7	U	165	197	J 52.3	80.8	U	U	79.0	U	188	U	300	352	U	98.2	U	U	U	U	U	U
benzo(ghi)perylene	U	2100	U	U	U	U	J 93.7	U	U	U	U	U	J 107	U	U	U	U	U	U	J 295	J 397	U	U	U	U	U	U	U	U
benzo(k)fluoranthene	U	279	U	U	U	U	44.8	U	U	J 51.2	U	J 15.5	J 25.9	U	U	J 28.5	U	U	U	J 109	104	U	J 38.4	U	U	U	U	U	U
fluoranthene	U	396	U	U	J 39.7	J 53.7	195	76.1	U	184	177	J,N 21.6	J 42.6	U	U	J 47.4	U	252	U	218	179	U	129	U	U	U	U	U	U
indeno(1,2,3-cd)pyrene	U	2170	U	U	U	U	J 108	U	U	J 142	U	U	U	U	U	U	U	U	U	J 326	J 372	U	U	U	U	U	U	U	U
naphthalene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	2.25	U	U	U
phenanthrene	U	143	J 79.9	U	U	U	79.8	53.4	U	U	U	U	U	U	U	U	U	137	U	J 21.2	J 27.0	U	J 29.3	U	U	U	U	U	U
pyrene	U	288	U	U	U	U	155	56.2	U	J 65.4	J 96.0	U	J 24.0	U	U	J 23.2	U	239	U	167	123	U	88.1	U	U	U	U	U	U
chrysene	U	408	U	U	U	U	138	J 29.9	U	78.2	J 124	U	J 42.6	U	U	J 30.6	U	107	U	165	152	U	58.7	U	U	U	U	U	U
aldrin	U	U	U	U	U	U	U	J 2.26	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
alpha-chlordane	U	U	U	U	489	249	U	3.33	U	127	6.62	U	U	U	11.2	J 2.19	U	U	U	U	3.54	J 1.05	U	U	U	U	U	U	U
gamma-chlordane	U	U	U	U	345	1980	U	3.83	U	61.0	16.7	U	U	U	81.8	6.07	U	U	U	J 2.68	12.4	J 0.937	U	U	U	U	U	U	U
p,p-DDT	U	U	U	U	U	U	U	U	U	4.74	14.2	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
dieldrin	U	U	U	U	280	183	U	U	U	515	20.2	U	U	U	602	5.71	U	3.26	U	5.48	U	6.01	U	U	U	U	U	U	U
heptachlor	U	U	U	U	3110	1210	U	U	U	11.9	4.05	U	U	U	27.8	U	U	U	U	U	U	U	U	U	U	U	U	U	U
heptachlor epoxide	U	U	U	U	499	371	U	U	U	41.5	12.0	U	U	U	54.3	J 3.28	U	U	U	U	U	U	U	U	U	U	U	U	U
PCB 1254	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	J 179	U	U	U	U	U	U	U	U
PCB 1260	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	J 137 Y	U	U	U	U	U	U	U	U

B - analyte in blank as well as sample
J - estimated value--result is less than sample quantitation limit but greater than zero
N - uncertainty in result other than "J" flag
U - analyte requested but not detected
Y - PCB 1262 not analyzed. Peaks measured as PCB 1260.

UNITS: waste/sediment/soil in µg/kg; water in µg/l

OBSERVED RELEASE

OBSERVED RELEASE AND MAY EXHIBIT TOXICITY CHARACTERISTIC (40CFR261.24)

THE OCCURRENCE OF EXTRACTABLE ORGANICS IN WASTE SAMPLES

SMOKEY MOUNTAIN SMELTERS
KNOX COUNTY, TENNESSEE 37920

PARAMETER (detected in at least one sample)	WASTE SAMPLE AND LOCATION							
	01 BLEF	02 BAGHOUSE	03 BLDG PILE	04 OUTSIDE	05 MSTN SHED	06 MSTN SHED	07 FURNACE	08 BLD FLOOR
bis(2-ethylhexyl)phthalate	J 471	541	572	U	B 245	B 322	2370	B 304
diethyl phthalate	B,J 157	U	U	B,J 125	B 135	B 457	2710	B 137
benz(a)anthracene	U	239	U	U	U	U	69.7	U
benzo(a)pyrene	U	609	U	U	U	U	55.6	U
benzo(b)fluoranthene	U	1440	U	U	138	148	143	50.7
benzo(ghi)perylene	U	2100	U	U	U	U	J 93.7	U
benzo(k)fluoranthene	U	279	U	U	U	U	44.8	U
fluoranthene	U	396	U	U	J 39.7	J 53.7	195	76.1
indeno(1,2,3-cd)pyrene	U	2170	U	U	U	U	J 108	U
phenanthrene	U	143	J 79.9	U	U	U	79.6	53.4
pyrene	U	288	U	U	U	U	155	56.2
chrysene	U	408	U	U	U	U	138	J 29.9
aldrin	U	U	U	U	U	U	U	J 2.26
alpha-chlordane	U	U	U	U	489	249	U	3.33
gamma-chlordane	U	U	U	U	3450	1980	U	3.83
dieldrin	U	U	U	U	280	183	U	U
heptachlor	U	U	U	U	3110	1210	U	U
heptachlor epoxide	U	U	U	U	499	371	U	U

UNITS: µg/kg

B - analyte in blank as well as sample

J - estimated value--result is less than sample quantitation limit but greater than zero

U - analyte requested but not detected

OBSERVED RELEASE

OBSERVED RELEASE AND MAY EXHIBIT TOXICITY CHARACTERISTIC (40CFR261.24)

THE OCCURRENCE OF EXTRACTABLE ORGANICS IN SOIL SAMPLES

SMOKEY MOUNTAIN SMELTERS
KNOX COUNTY, TENNESSEE 37920

PARAMETER (detected in at least one sample)	SOIL SAMPLES AND LOCATIONS								
	SURFACE					SUBSURFACE			
	01 BACKGROUND	02 TRANSFORMER	03 TANK	04 DRUMS	05 SMELTER	01 BACKGROUND	02 TRANSFORMER	03 TANK	04 DRUMS
butyl benzyl phthalate	U	U	U	U	BJ 55.1	U	U	U	U
bis(2-ethylhexyl)phthalate	B 82.6	B 303	B 134	B 68.0	B 583	B 75.8	B 58.2	B 55.9	B 63.1
diethyl phthalate	B 59.7	B 243	B 285	B 215	B 176	B 57.8	B 116	B 146	BJ 46.7
benz(a)anthracene	U	J 62.6	J 58.1	J 16.5	J 25.8	U	U	J 28.5	U
benzo(a)pyrene	U	81.1	J 75.8	J 26.8	52.4	U	U	J 42.2	U
benzo(b)fluoranthene	U	165	197	J 52.3	80.8	U	U	79.0	U
benzo(ghi)perylene	U	U	U	U	J 107	U	U	U	U
benzo(k)fluoranthene	U	J 51.2	U	J 15.5	J 25.9	U	U	J 28.5	U
fluoranthene	U	104	177	JN 21.6	J 42.6	U	U	J 47.4	U
indeno(1,2,3-cd)pyrene	U	J 142	U	U	U	U	U	U	U
pyrene	U	J 65.4	J 96.0	U	J 24.0	U	U	J 23.2	U
chrysene	U	78.2	J 124	U	J 42.6	U	U	J 30.6	U
alpha-chlordane	U	127	6.62	U	U	U	11.2	J 2.19	U
gamma-chlordane	U	61.0	16.7	U	U	U	81.8	6.07	U
p,p-DDT	U	4.74	14.2	U	U	U	U	U	U
dieldrin	U	515	20.2	U	U	U	602	5.71	U
heptachlor	U	11.9	4.05	U	U	U	27.8	U	U
heptachlor epoxide	U	41.5	12.0	U	U	U	54.3	J 3.28	U

B - analyte in blank as well as sample
J - estimated value--result is less than sample quantitation limit but greater than zero
N - uncertainty in result other than "J" flag
U - analyte requested but not detected
UNITS: µg/kg

OBSERVED RELEASES

THE OCCURRENCE OF EXTRACTABLE ORGANICS IN SEDIMENT SAMPLES

SMOKEY MOUNTAIN SMELTERS
KNOX COUNTY, TENNESSEE 37920

PARAMETER (detected in at least one sample)	SEDIMENT SAMPLES AND LOCATIONS					
	01 ON SITE	02 BACKGROUND	03 LAGOON	04 ON SITE	05 TRIB	06 FLASKER
bis(2-ethylhexyl)phthalate	288	BJ 51.0	B 218	B 310	3000	B 67.7
diethyl phthalate	U	B 78.1	B 557	5630	B 167	B 97.1
benz(a)anthracene	136	U	157	116	U	J 45.1
benzo(a)pyrene	155	U	239	173	U	58.7
benzo(b)fluoranthene	188	U	300	352	U	98.2
benzo(ghi)perylene	U	U	J 295	J 397	U	U
benzo(k)fluoranthene	U	U	J 109	104	U	J 38.4
fluoranthene	252	U	218	179	U	129
indeno(1,2,3-cd)pyrene	U	U	J 326	J 372	U	U
phenanthrene	137	U	J 21.2	J 27.0	U	J 29.3
pyrene	239	U	167	123	U	80.1
chrysene	107	U	165	152	U	58.7
alpha-chlordane	U	U	U	3.54	J 1.05	U
gamma-chlordane	U	U	J 2.68	12.4	J 0.937	U
dieldrin	3.26	U	5.48	U	6.01	U
PCB 1254	U	U	U	J 179	U	U
PCB 1260	U	U	U	J 137 Y	U	U

UNITS: µg/kg

B - analyte in blank as well as sample

J - estimated value--result is less than sample quantitation limit but greater than zero

U - analyte requested but not detected

Y - PCB 1262 not analyzed. Peaks measured as PCB 1260.

OBSERVED RELEASES

THE OCCURRENCE OF EXTRACTABLE ORGANICS IN GROUNDWATER SAMPLES

SMOKEY MOUNTAIN SMELTERS KNOX COUNTY, TENNESSEE 37920

PARAMETER (detected in at least one sample)	GROUNDWATER SAMPLES AND LOCATIONS	
	01 BACKGROUND	02 MARYVILLE TAVERN
bis(2-ethylhexyl)phthalate	B,J 0.48	U

UNITS: µg/l

B - analyte in blank as well as sample

J - estimated value--result is less than sample quantitation limit but greater than zero

U - analyte requested but not detected

THE OCCURRENCE OF EXTRACTABLE ORGANICS IN SURFACE WATER SAMPLES

SMOKEY MOUNTAIN SMELTERS
KNOX COUNTY, TENNESSEE 37920

PARAMETER (detected in at least one sample)	SURFACE WATER			
	01 BACKGROUND	02 ON-SITE LAGOON	03 TRIBUTARY	04 FLENNIKEN DR.
bis(2-ethylhexyl)phthalate	BJ 0.48	B 1.90	B 9.50	U
diethyl phthalate	B 0.56	U	U	U
naphthalene	2.25	U	U	U

UNITS: µg/l

B - analyte in blank as well as sample

J - estimated value--result is less than sample quantitation limit but greater than zero

U - analyte requested but not detected

OBSERVED RELEASES

THE OCCURRENCE OF VOLATILE ORGANICS IN ENVIRONMENTAL SAMPLES

SMOKEY MOUNTAIN SMELTERS KNOX COUNTY, TENNESSEE 37920

PARAMETER (detected in at leas one sample)	WASTE								SOIL									SEDIMENT						GROUND WATER		SURFACE WATER			
									SURFACE					SUBSURFACE															
	01 BULK	02 RAGHOUSE	03 BLDG PILE	04 OUTSIDE	05 MNTN SHLD	06 MNTN SHLD	07 FURNACE	08 BLD FLOOR	01 BACKGROUN	02 TRNSFRMR	03 TANK	04 DRUMS	05 MNTG VIL	01 BACKGROUN	02 TRNSFRMR	03 TANK	04 DRUMS	01 ON SITE	02 BACKGROUN	03 LAGOON	04 ON SITE	05 TRIB	06 TENNSN RR	01 BACKGROUN	02 MRKNX	01 BACKGROUN	02 LAGOON	03 TRIB	04 TENNSN RR
Acetone	U	U	U	U	U	U	U	65	100	U	J 20	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Benzene	U	J 0.8	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Camphene	U	U	U	U	U	U	X	U	U	U	U	U	U	X	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Chloroform	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	0.5	U	U	U	U	U
Chloromethane	U	U	U	U	U	U	J 1.9	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	J 0.5	U	U
Ethyl benzene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	J 0.1	U	U	U	U	U
Hexane	U	U	U	U	U	U	U	X	U	U	U	U	X	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Methylene chloride	U	U	U	U	B 9.8	B 9.7	B 33	B 27	B 9.3	B 51	B 23	B 35	B 24	B 9.0	B 21	B 16	B 19	U	B 12	B 10	B 31	B 10	B 37	U	B 1.0	B 6.9	B 3.4	B 0.8	B 0.7
Pentane	U	U	U	U	U	U	U	X	U	U	U	U	X	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Pinene, alpha-	U	U	U	U	U	U	U	U	U	U	U	U	U	X	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Propene	U	U	U	U	U	U	X	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Propyne, 1-	U	U	U	U	U	U	X	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Tetrachloroethene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	1.2
Toluene	J 1.4	3.6	2.3	4.7	J 0.8	4.8	11	J 0.5	U	U	2.1	U	U	U	7.5	U	6.5	J 0.6	U	U	U	U	U	U	U	U	U	U	U
Trichloroethene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	J 0.5	U	U	J 0.4	U	1.8	0.5
Xylene, m- & p-	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	J 0.2	U	U	U	U	U

B - analyte in blank as well as sample
U - analyte requested but not detected (TAL/TCL parameters not listed were not detected in any samples)
J - estimated value--result is less than sample quantitation limit but greater than zero
X - presence confirmed by GCMS
UNITS: waste/sediment/soil in µg/kg; water in µg/l

OBSERVED RELEASES

THE OCCURRENCE OF VOLATILE ORGANICS IN WASTE SAMPLES

SMOKEY MOUNTAIN SMELTERS
KNOX COUNTY, TENNESSEE 37920

PARAMETER (detected in at least one sample)	WASTE SAMPLE NUMBER							
	01 BLUE	02 BAGHOUSE	03 BLDG PILE	04 OUTSIDE	05 MNTN SHED	06 MNTN SHED	07 FURNACE	08 BLD FLOO
Acetone	U	U	U	U	U	U	U	65
Benzene	U	J 0.8	U	U	U	U	U	U
Camphene	U	U	U	U	U	U	X	U
Chloromethane	U	U	U	U	U	U	J 1.9	U
Hexane	U	U	U	U	U	U	U	X
Methylene chloride	U	U	U	U	B 9.8	B 9.7	B 33	B 27
Pentane	U	U	U	U	U	U	U	X
Propene	U	U	U	U	U	U	X	U
Propyne, 1-	U	U	U	U	U	U	X	U
Toluene	J 1.4	3.6	2 3	4.7	J 0.8	4.8	11	J 0.5

B - analyte in blank as well as sample
J - estimated value--result is less than sample quantitation limit but greater than zero
U - analyte requested but not detected (TAL/TCL parameters not listed were not detected in any samples)
X - presence confirmed by GCMS

UNITS: ug/kg

OBSERVED RELEASES

THE OCCURRENCE OF VOLATILE ORGANICS IN SOIL SAMPLES

SMOKEY MOUNTAIN SMELTERS
KNOX COUNTY, TENNESSEE 37920

PARAMETER (detected in at least one sample)	SOIL SAMPLE NUMBER								
	SURFACE					SUBSURFACE			
	01 BACKGROUND	02 TRANSFORMER	03 TANK	04 DRUMS	05 MITIGATION	01 BACKGROUND	02 TRANSFORMER	03 TANK	04 DRUMS
Acetone	100	U	J 20	U	U	U	U	U	U
Camphene	U	U	U	U	U	X	U	U	U
Hexane	U	U	U	U	X	U	U	U	U
Methylene chloride	B 9.3	B 51	B 23	B 35	B 24	B 9.0	B 21	B 16	B 19
Pentane	U	U	U	U	X	U	U	U	U
Pinene, alpha-	U	U	U	U	U	X	U	U	U
Toluene	U	U	2.1	U	U	U	7.5	U	6.5

B - analyte in blank as well as sample
J - estimated value--result is less than sample quantitation limit but greater than zero
U - analyte requested but not detected (TAL/TCL parameters not listed were not detected in any samples)
X - presence confirmed by GCMS

UNITS: µg/kg

OBSERVED RELEASES

THE OCCURRENCE OF VOLATILE ORGANICS IN SEDIMENT SAMPLES

SMOKEY MOUNTAIN SMELTERS
KNOX COUNTY, TENNESSEE 37920

PARAMETER (detected in at leas one sample)	SEDIMENT SAMPLE NUMBER					
	01 ON-SITE	02 BACKGROUND	03 LAGOON	04 ON-SITE	05 LRIB	06 [illegible]
Methylene chloride	U	B 12	B 10	B 31	B 10	B 37
Toluene	J 0.6	U	U	U	U	U
Trichloroethene	U	U	U	U	U	J 0.5

B - analyte in blank as well as sample
J - estimated value--result is less than sample quantitation limit but greater than zero
U - analyte requested but not detected (TAL/TCL parameters not listed were not detected in any samples)
X - presence confirmed by GCMS
UNITS: µg/kg

OBSERVED RELEASES

THE OCCURRENCE OF VOLATILE ORGANICS IN GROUNDWATER SAMPLES

SMOKEY MOUNTAIN SMELTERS
KNOX COUNTY, TENNESSEE 37920

PARAMETER (detected in at leas one sample)	GROUNDWATER SAMPLE NUMBER	
	01 BACKGROUND	02 MARY KNOX TAVERN
Chloroform	0.5	U
Ethyl benzene	J 0.1	U
Methylene chloride	U	B 1.0
Xylene, m- & p-	J 0.2	U

B - analyte in blank as well as sample
U - analyte requested but not detected (TAL/TCL parameters not listed were not detected in any samples)
J - estimated value--result is less than sample quantitation limit but greater than zero
UNITS: µg/l

OBSERVED RELEASES

THE OCCURRENCE OF VOLATILE ORGANICS IN SURFACE WATER SAMPLES

SMOKEY MOUNTAIN SMELTERS
KNOX COUNTY, TENNESSEE 37920

PARAMETER (detected in at leas one sample)	SURFACE WATER SAMPLE NUMBER			
	01 BACKGROUND	02 LAGOON	03 TRIBUTARY	04 FLENNIKEN BR
Chloromethane	U	J 0.5	U	U
Methylene chloride	B 6.9	B 3.4	B 0.8	B 0.7
Tetrachloroethene	U	U	U	1.2
Trichloroethene	J 0.4	U	1.8	0.5

B - analyte in blank as well as sample
U - analyte requested but not detected (TAL/TCL parameters not listed were not detected in any samples)
J - estimated value--result is less than sample quantitation limit but greater than zero

UNITS: µg/l

OBSERVED RELEASES

THE OCCURRENCE OF RADIOCHEMICAL PARAMETERS IN ENVIRONMENTAL SAMPLES

SMOKEY MOUNTAIN SMELTERS KNOX COUNTY, TENNESSEE 37920

PARAMETER (detected in at least one sample)		WASTE								SOIL									SEDIMENT						GROUND-WATER		SURFACE WATER			
										SURFACE					SUBSURFACE															
		01	02	03	04	05	06	07	08	01	02	03	04	05	01	02	03	04	01	02	03	04	05	06	01	02	01	02	03	04
GROSS ALPHA		0.79	0.36	0.65	0.78	0.86	0.56	0.92	2.98	2.7/2.40	5.8	3.34	0.99	3.8	2.13	14.4	5.0	1.27/1.31	1.42	0.83	2.18	1.24	1.79	0.74	2.6	0.4	1.0	-13	-129	1.5
GROSS BETA		2.72	7.4	21.7	11.3	8.3	8.0	12.0	38.8	16.2/18.0	54.7	37.5	12.0	26.6	13.3	86.0	48.3	13.1/12.	12.4	4.9	22.3	12.8	18.3	5.9	6.1	1.8	-0.4	296	323	-0.3
GAMMA RADIO-NU-CLIDES	K-40	-	4.46	11.93	5.52	-	5.32	6.49	20.85	8.39	25.2	17.7	13.50	15.3	6.41	24.69	22.72	1.20	8.05	5.52	13.53	8.51	9.89	3.95	-	-	-	741	574	-
	Pb-214	0.219	-	-	-	0.732	0.529	0.777	2.68	1.396	2.73	2.89	0.815	1.16	1.44	2.97	1.96	0.637	-	0.515	1.226	1.15	0.887	0.529	-	74.	76.1	-	-	17.1
	Bi-214	0.242	-	-	-	0.549	0.579	1.076	2.45	1.444	2.65	2.40	0.739	1.07	1.489	2.45	2.05	0.580	-	0.489	1.147	1.092	0.831	0.523	27.3	83.	90.9	19.2	19.2	20.3
	Pb-212	-	-	-	-	0.558	0.615	0.388	0.872	1.463	1.922	1.836	1.023	1.64	1.536	1.880	1.917	0.910	-	0.631	1.492	0.856	1.266	0.609	-	-	-	-	-	-
	Be-7	-	-	-	-	1.28	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Ac-228	-	-	-	-	-	0.551	0.550	1.07	1.43	1.89	2.31	1.16	1.79	1.50	1.85	2.36	0.968	-	0.657	1.78	1.17	1.48	0.731	-	-	-	-	-	-
	Cs-137	-	-	-	-	-	0.083	-	-	0.429	0.183	0.423	-	0.17	0.106	-	0.203	-	-	-	0.10	-	0.12	0.05	-	-	-	-	-	-
	Tl-208	-	-	-		-	-	-	0.303	0.508	0.587	0.677	0.356	0.59	0.578	0.639	0.598	-	-	-	0.50	0.31	0.45	0.18	-	-	-	-	-	-
	Bi-212	-	-	-	-	-	-	-	-	0.91	-	1.58	0.73	1.25	0.91	1.21	1.24	7.02	-	0.37	-	-	1.01	-	-	-	-	-	-	-

UNITS: water, pC/L waste/soil/sediment, pC/g

OBSERVED RELEASE

THE OCCURRENCE OF RADIOCHEMICAL PARAMETERS IN WASTE SAMPLES

SMOKEY MOUNTAIN SMELTERS
KNOX COUNTY, TENNESSEE 37920

PARAMETER (detected in at least one sample)		WASTE SAMPLE NUMBER							
		01 BLUE	02 BAGHOUSE	03 SLDG PILE	04 OUTSIDE	05 MSTS SHED	06 MSTS SHED	07 FURNACE	08 SLDG FLOOR
GROSS ALPHA		0.79	0.36	0.65	0.78	0.86	0.56	0.92	2.98
GROSS BETA		2.72	7.4	21.7	11.3	8.3	8.0	12.0	38.8
GAMMA RADIO-NUCLIDES	K-40	-	4.46	11.93	5.52	-	5.32	6.49	20.85
	Pb-214	0.219	-	-	-	0.732	0.529	0.777	2.68
	Bi-214	0.242	-	-	-	0.549	0.579	1.076	2.45
	Pb-212	-	-	-	-	0.558	0.615	0.388	0.872
	Be-7	-	-	-	-	1.28	-	-	-
	Ac-228	-	-	-	-	-	0.551	0.550	1.07
	Cs-137	-	-	-	-	-	0.083	-	-
	Tl-208	-	-	-		-	-	-	0.303

UNITS: pC/g

OBSERVED RELEASE

THE OCCURRENCE OF RADIOCHEMICAL PARAMETERS IN SOIL SAMPLES

SMOKEY MOUNTAIN SMELTERS
KNOX COUNTY, TENNESSEE 37920

PARAMETER (detected in at least one sample)		SOIL SAMPLE NUMBER								
		SURFACE					SUBSURFACE			
		01 BACKGROUND	02 TRANSFORMER	03 TANK	04 DRUMS	05 MISTGATE	01 BACKGROUND	02 TRANSFORMER	03 TANK	04 DRUMS
GROSS ALPHA		2.7/2.40	5.8	3.34	0.99	3.8	2.13	14.4	5.0	1.27/1.31
GROSS BETA		16.2/18.	54.7	37.5	12.0	26.6	13.3	86.0	48.3	13.1/12.8
GAMMA RADIO-NUCLIDES	K-40	8.39	25.2	17.7	13.50	15.3	6.41	24.69	22.72	1.20
	Pb-214	1.396	2.73	2.89	0.815	1.16	1.44	2.97	1.96	0.637
	Bi-214	1.444	2.65	2.40	0.739	1.07	1.489	2.45	2.05	0.580
	Pb-212	1.463	1.922	1.836	1.023	1.64	1.536	1.880	1.917	0.910
	Ac-228	1.43	1.89	2.31	1.16	1.79	1.50	1.85	2.36	0.968
	Cs-137	0.429	0.183	0.423	-	0.17	0.106	-	0.203	-
	Tl-208	0.508	0.587	0.677	0.356	0.59	0.578	0.639	0.598	-
	Bi-212	0.91	-	1.58	0.73	1.25	0.91	1.21	1.24	7.02

UNITS: pC/g

OBSERVED RELEASE

THE OCCURRENCE OF RADIOCHEMICAL PARAMETERS IN SEDIMENT SAMPLES

SMOKEY MOUNTAIN SMELTERS
KNOX COUNTY, TENNESSEE 37920

PARAMETER (detected in at least one sample)		SEDIMENT SAMPLE NUMBER					
		01 ON-SITE	02 BACKGROUND	03 LAGOON	04 ON-SITE	05 TRIB	06 DOWNSTREAM
GROSS ALPHA		1.42	0.83	2.18	1.24	1.79	0.74
GROSS BETA		12.4	4.9	22.3	12.8	18.3	5.9
GAMMA RADIO-NUCLIDES	K-40	8.05	5.52	13.53	8.51	9.89	3.95
	Pb-214	-	0.515	1.226	1.15	0.887	0.529
	Bi-214	-	0.489	1.147	1.092	0.831	0.523
	Pb-212	-	0.631	1.492	0.856	1.266	0.609
	Ac-228	-	0.657	1.78	1.17	1.48	0.731
	Cs-137	-	-	0.10	-	0.129	0.057
	Tl-208	-	-	0.50	0.31	0.459	0.188
	Bi-212	-	0.37	-	-	1.01	-

UNITS: pC/g

OBSERVED RELEASE

THE OCCURRENCE OF RADIOCHEMICAL PARAMETERS IN GROUNDWATER SAMPLES

SMOKEY MOUNTAIN SMELTERS
KNOX COUNTY, TENNESSEE 37920

PARAMETER (detected in at least one sample)		GROUNDWATER SAMPLE NUMBER	
		01 BACKGROUND	02 SMOKEY
GROSS ALPHA		2.6	0.4
GROSS BETA		6.1	1.8
GAMMA RADIONUCLIDES	Pb-214	-	74.1
	Bi-214	27.3	83.7

UNITS: pC/L

OBSERVED RELEASE

THE OCCURRENCE OF RADIOCHEMICAL PARAMETERS IN SURFACE WATER SAMPLES

SMOKEY MOUNTAIN SMELTERS
KNOX COUNTY, TN 37920

PARAMETER (detected in at least one sample)		SURFACE WATER SAMPLE NUMBER			
		01 BACKGROUND	02 LAGOON	03 TRIB	04 DOWNRIVER
GROSS ALPHA		1.0	-13	-129	1.5
GROSS BETA		-0.4	296	323	-0.3
GAMMA RADIO-NUCLIDES	K-40	-	741	574	-
	Pb-214	76.1	-	-	17.1
	Bi-214	90.9	19.2	19.2	20.3

UNITS: pC/L

OBSERVED RELEASE

ANALYTICAL RESULTS
ANALYTICAL REQUESTS
AND
CHAIN OF CUSTODY FORMS

APPENDIX 3

SMOKEY MOUNTAIN SMELTERS

1508 MARYVILLE PIKE

KNOXVILLE, TENNESSEE 37920

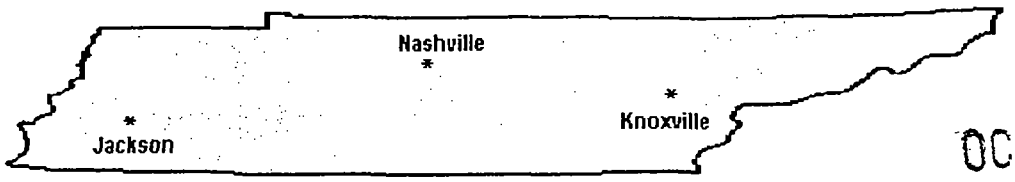
U.S. EPA # TN0002318277

TDSF #47-559

" Laboratory Forms - Waste Samples "

TDH/Division of Laboratory Services (DLS). 1997-8. "Laboratory Reports, Requests, and Chain-of-Custody Forms - Waste Samples". Tennessee Department of Health/Division of Laboratory Services.

SMOKEY MOUNTAIN SMELTERS
KNOXVILLE, TENNESSEE 37920
U.S. EPA # TN0002318277
TSDF #47-559



OCT 21 1998

STATE OF TENNESSEE

ENVIRONMENTAL LABORATORIES

JACKSON LABORATORY
295 SUMMAR AVENUE
JACKSON, TN 38302-0849
PH: (901)423-6600

NASHVILLE LABORATORY
630 BEN ALLEN ROAD
NASHVILLE, TN 37247-0801
PH: (615)262-6300

KNOXVILLE LABORATORY
1522 CHEROKEE TRAIL
KNOXVILLE, TN 37920
PH: (423)549-5201

SENT TO: **HWM - PA/SI, KFO**
2700 MIDDLEBROOK PIKE
KNOXVILLE, TN 37921

C. ANDEL/B. MAUPIN/L. BARRON
(423)594-6035

Lab ID: 9808248
Sampling Agency: HWM_11_KFO

Billing Code: 327.38-11

OCT 20 1998

This is to certify that the following results were determined using good laboratory practices and in accordance with federal or state approved methodologies.

Edward McGrary
Analytical Supervisor

Definition of Data Qualifiers

U- Analyte requested but not detected
J- Estimated value--result is less than sample quantitation limit but greater than zero
B- Analyte in blank as well as sample
E- Analyte concentration exceeds the calbration range of instrument
N- Uncertainty in result other than "J" flag
X,Y,Z- Other flags used to define results as needed

Printed: October 20, 1998

Project/Site No.: 47-559
Project Name: SMOKEY MTN. SMELTERS
Description: NW WASTE PILE
Station No.: SMS-WA-01
Collected: 10/21/97 09:40:00 By WLB
County: 47

Lab Number: 9710216-02
Matrix: WASTE
Received: 10/21/97 12:45:00 By LAB
Sampling Agency: HWM_05_KFO
Priority: 11_21_97

DEC 03 1997

TEST	RESULT	UNITS	LIMIT	ANALYZED	BY	METHOD
AMMONIA	331	mg/kg	10	10/31/97	LKS	A.18.2
CYANIDE	U	mg/kg	1.0	10/31/97	SAL	A.9
ALUMINUM	96700	mg/kg	10	11/13/97	JAH	
ANTIMONY	13	mg/kg	1	11/19/97	JAH	
ARSENIC	6	mg/kg	1	11/21/97	JAH	
BARIUM	52	mg/kg	10	11/13/97	JAH	
BERYLLIUM	U	mg/kg	1	11/17/97	JAH	
CADMIUM	U	mg/kg	0.5	11/05/97	JAH	
CALCIUM	5630	mg/kg	10	11/07/97	JAH	
CHROMIUM	79	mg/kg	1	11/04/97	JAH	
COBALT	3	mg/kg	1	11/06/97	JAH	
COPPER	42900	mg/kg	1	11/04/97	JAH	
DIGESTION-METALS	COMPLETED	COMPLETED		10/29/97	EAM	
IRON	9920	mg/kg	5	11/04/97	JAH	
LEAD	291	mg/kg	4	11/04/97	JAH	
MAGNESIUM	5410	mg/kg	10	11/07/97	JAH	
MANGANESE	384	mg/kg	1	11/04/97	JAH	
MERCURY	U	mg/kg	0.1	11/18/97	EBS	EPA 245.5
METALS PREP-SOLIDS/WASTES	COMPLETED	COMPLETED		10/23/97	EAM	
NICKEL	240	mg/kg	2	11/04/97	JAH	
PERCENT SOLIDS	67.0	%		11/14/97	JAH	
POTASSIUM	695	mg/kg	10	11/06/97	JAH	
SELENIUM	8	mg/kg	1	11/20/97	JAH	

DEC 08 1997

Project/Site No.: 47-559
Project Name: SMOKEY MTN. SMELTERS
Description: NW WASTE PILE
Station No.: SMS-WA-01
Collected: 10/21/97 09:40:00 By WLB
County: 47

Lab Number: 9710216-02
Matrix: WASTE
Received: 10/21/97 12:45:00 By LAB
Sampling Agency: HWM_05_KFO
Priority: 11_21_97

TEST	RESULT	UNITS	LIMIT	ANALYZED	BY	METHOD
SILVER	2	mg/kg	1	11/06/97	JAH	
SODIUM	17100	mg/kg	10	11/06/97	JAH	
THALLIUM	U	mg/kg	5	11/06/97	JAH	
VANADIUM	38	mg/kg	20	11/17/97	JAH	
ZINC	2330	mg/kg	0.5	11/05/97	JAH	

State of Tennessee - Environmental Laboratories
PLEASE PRINT LEGIBLY

Inorganic Analysis

PROJECT/SITE NO. 4-7-659	PROJECT NAME SMOKEY MTN. SHELTERS
STATION NUMBER SMS-WA-01	COUNTY KNOX
DESCRIPTION AVM WASTE PILE	
STREAM MILE N/A	DEPTH 0" to 10" MATRIX WASTE
COLLECTED: DATE 10-21-97	TIME 09:40
SAMPLER'S NAME(printed) WILLIAM LEE BARRON	
SAMPLING AGENCY TDSF	BILLING CODE 327 38.05
IF PRIORITY, DATE NEEDED 11-28-97	
SEND REPORT TO: BURL MAUPIN TDSF KNOXVILLE ENVIRONMENTAL FIELD OFFICE	
CONTACT HAZARD UNKNOWN	

*	Metals
X	aluminum, Al
X	antimony, Sb
X	arsenic, As
X	barium, Ba
X	beryllium, Be
X	cadmium, Cd
X	calcium, Ca
X	chromium, Cr
X	cobalt, Co
X	copper, Cu
X	iron, Fe
X	lead, Pb
X	magnesium, Mg
X	manganese, Mn
X	mercury, Hg
X	nickel, Ni
X	potassium, K
X	selenium, Se
X	silver, Ag
X	sodium, Na
X	thallium, Tl
X	vanadium, V
X	zinc, Zn

*	Env. Microbiology	*	General Inorganics		Gen. Inorganics (con't)
	coliform, fecal*		acidity as $CaCO_3$*		oil and grease
	coliform, total*		alkalinity as $CaCO_3$*		orthophosphate, total*
	strep, fecal*		alkalinity, phen. as $CaCO_3$*		oxygen, dissolved*
			BOD, 5-day*		pH
			CBOD, 5-day*		phenols, total
			boron		phosphate, total
*	**Ambient Parameters**		chloride*		residue, dissolved*
	COD*		chlorine, residual*		residue, settleable*
	coliform, fecal		chromium, hexavalent		residue, suspended*
	conductivity*		COD*		residue, total*
	hardness, total as $CaCO_3$*		color, apparent*		silica*
	nitrogen, ammonia		color, true*		sulfate*
	nitrogen, NO_3 & NO_2		conductivity*		sulfide, total*
	nitrogen, total Kjeldahl	X	cyanide		TOC*
	phosphate, total		flash point*		turbidity*
	pH		fluoride*		percent solids
	residue, dissolved*		hardness, Ca as $CaCO_3$*	*	**Other**
	residue, suspended*		hardness, total as $CaCO_3$*		
	arsenic, As		hydrocarbons, total		
	cadmium, Cd		MBAS*		
	chromium, Cr	X	nitrogen, ammonia		
	copper, Cu		nitrogen, nitrate*		
	lead, Pb		nitrogen, nitrite*		
	mercury, Hg		nitrogen, NO_3 & NO_2		
	nickel, Ni		nitrogen, total Kjeldahl		
	zinc, Zn		nitrogen, total organic		

*	TCLP
	arsenic, As
	barium, Ba
	cadmium, Cd
	chromium, Cr
	lead, Pb
	mercury, Hg
	nickel, Ni
	selenium, Se
	silver, Ag

*** denotes analyses performed only on water**

FIELD DETERMINATIONS	Temperature
pH	Chlorine, residual
Conductivity	Other
Dissolved Oxygen	

Laboratory Number

Branch Lab Number

Chain of Custody and Supplemental Information

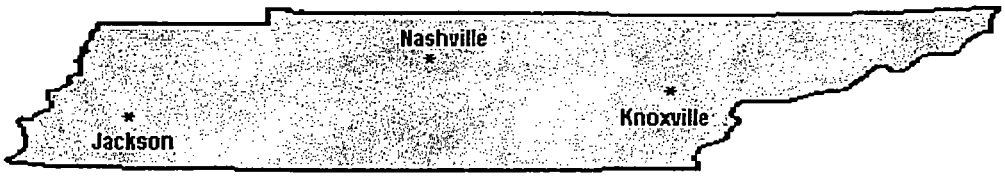
Only one chain of custody form is required per sample set or point (if all collected at the same time)

1. Collected by W.F. B. & J.W.V.
   Date 10-21-97 Time 09:40
   Delivered to KNOXVILLE STATE LAB
   Date 10-21-97 Time 12:45 p.m.
2. Received by
   Date Time
   Delivered to
   Date Time
3. Received by
   Date Time
   Delivered to
   Date Time
4. Received in Lab by [illegible]
   Date 10-21-97 Time 12:45
   Logged in by
   Date Time

Additional Information

1. Approximate volume of sample 16 oz
2. Nearest town or city KNOXVILLE
3. Others present at collection BHM & ADD
4. Number of other samples collected at same time at this point THREE
5. Field collection procedure, handling and/or preservation of this sample ACCORDING TO U.S. EPA PROCEDURES AND PROTOCOLS
6. Mode of transportation to lab ON ICE, IN AN ICE CHEST, IN A STATE VEHICLE
7. Sample sealed by
8. Date sample sealed
9. Remarks

NOV 09 1998



STATE OF TENNESSEE

ENVIRONMENTAL LABORATORIES

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PH: (615)262-6300

KNOXVILLE LABORATORY
1522 CHEROKEE TRAIL
KNOXVILLE, TN 37920
PH: (423)549-5201

SENT TO: **HWM-STATE SUPERFUND, KFO**
2700 MIDDLEBROOK PIKE
KNOXVILLE, TN 37921

BURL H. MAUPIN
(423)594-6035

Lab ID: **9810007**
Sampling Agency: **HWM_05_KFO**

Billing Code: **327.38-05**

This is to certify that the following results were determined using good laboratory practices and in accordance with federal or state approved methodologies.

Analytical Supervisor

Definition of Data Qualifiers

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J- Estimated value--result is less than sample quantitation limit but greater than zero
B- Analyte in blank as well as sample
E- Analyte concentration exceeds the calbration range of instrument
N- Uncertainty in result other than "J" flag
X Y,Z- Other flags used to define results as needed

Printed: October 30, 1998

DEC 0 0 1997

Project/Site No.: 47-559
Project Name: SMOKEY MOUNTAIN SMELTERS
Description: NW WASTE PILE
Station No.: SMS-WA-01
Collected: 10/21/97 09:40:00 By WLB
County: 47

Lab Number: 9710238-02A
Matrix: SEDIMENT
Received: 10/23/97 08:30:00 By LJB
Sampling Agency: HWM_05_KFO
Priority: 11_21_97

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
B/N/A EXTR+PESTS,PCBS-SOIL						MS+ECD
BUTYL BENZYL PHTHALATE	U	PPB	500	11/14/97	MAC	
BIS(2-ETHYLHEXYL)PHTHALATE	J 477	PPB	500	11/14/97	MAC	
DI-n-BUTYL PHTHALATE	U	PPB	500	11/14/97	MAC	
DI-n-OCTYL PHTHALATE	U	PPB	1300	11/14/97	MAC	
DIETHYL PHTHALATE	B,J 157	PPB	250	11/14/97	MAC	
DIMETHYL PHTHALATE	U	PPB	250	11/14/97	MAC	
n-NITROSODIMETHYLAMINE	U	PPB	1300	11/14/97	MAC	
n-NITROSODIPHENYLAMINE	U	PPB	500	11/14/97	MAC	
n-NITROSO-di-n-PROPYLAMINE	U	PPB	500	11/14/97	MAC	
ISOPHORONE	U	PPB	250	11/14/97	MAC	
NITROBENZENE	U	PPB	500	11/14/97	MAC	
2,4-DINITROTOLUENE	U	PPB	1300	11/14/97	MAC	
2,6-DINITROTOLUENE	U	PPB	1300	11/14/97	MAC	
ACENAPTHENE	U	PPB	250	11/14/97	MAC	
ACENAPHTHYLENE	U	PPB	250	11/14/97	MAC	
ANTHRACENE	U	PPB	250	11/14/97	MAC	
BENZO(a)ANTHRACENE	U	PPB	250	11/14/97	MAC	
BENZO(a)PYRENE	U	PPB	250	11/14/97	MAC	
BENZO(b)FLUORANTHENE	U	PPB	250	11/14/97	MAC	
BENZO(ghi)PERYLENE	U	PPB	500	11/14/97	MAC	
BENZO(k)FLUORANTHENE	U	PPB	250	11/14/97	MAC	
DIBENZO(a,h)ANTHRACENE	U	PPB	1300	11/14/97	MAC	
FLUORANTHENE	U	PPB	130	11/14/97	MAC	
FLUORENE	U	PPB	130	11/14/97	MAC	
INDENO(1,2,3-cd)PYRENE	U	PPB	1300	11/14/97	MAC	
NAPHTHALENE	U	PPB	130	11/14/97	MAC	
PHENANTHRENE	U	PPB	130	11/14/97	MAC	
PYRENE	U	PPB	130	11/14/97	MAC	
CHRYSENE	U	PPB	250	11/14/97	MAC	
BIS(2-CHLOROETHYL)ETHER	U	PPB	500	11/14/97	MAC	
BIS(2-CHLOROETHOXY)METHANE	U	PPB	500	11/14/97	MAC	
BIS(2-CHLOROISOPROPYL)ETHER	U	PPB	500	11/14/97	MAC	
4-BROMOPHENYLPHENYL ETHER	U	PPB	500	11/14/97	MAC	
4-CHLOROPHENYLPHENYL ETHER	U	PPB	500	11/14/97	MAC	
HEXACHLOROCYCLOPENTADIENE	U	PPB	1300	11/14/97	MAC	
HEXACHLOROBUTADIENE	U	PPB	500	11/14/97	MAC	
HEXACHLOROBENZENE	U	PPB	500	11/14/97	MAC	
HEXACHLOROETHANE	U	PPB	500	11/14/97	MAC	
1,2,4-TRICHLOROBENZENE	U	PPB	500	11/14/97	MAC	
2-CHLORONAPHTHALENE	U	PPB	250	11/14/97	MAC	
4-CHLORO-3-METHYLPHENOL	U	PPB	500	11/14/97	MAC	
2-CHLOROPHENOL	U	PPB	500	11/14/97	MAC	
2,4-DICHLOROPHENOL	U	PPB	500	11/14/97	MAC	
2,4-DIMETHYLPHENOL	U	PPB	500	11/14/97	MAC	
2,4-DINITROPHENOL	U	PPB	2500	11/14/97	MAC	
2-METHYL-4,6-DINITROPHENOL	U	PPB	1300	11/14/97	MAC	
2-NITROPHENOL	U	PPB	1300	11/14/97	MAC	
4-NITROPHENOL	U	PPB	1300	11/14/97	MAC	
PENTACHLOROPHENOL	U	PPB	1300	11/14/97	MAC	
PHENOL	U	PPB	500	11/14/97	MAC	
2,4,6-TRICHLOROPHENOL	U	PPB	500	11/14/97	MAC	
2,4,5-TRICHLOROPHENOL	U	PPB	500	11/14/97	MAC	
O-CRESOL	U	PPB	500	11/14/97	MAC	
M- & P-CRESOL	U	PPB	500	11/14/97	MAC	
2-METHYLNAPHTHALENE	U	PPB	250	11/14/97	MAC	
BENZOIC ACID	U	PPB	2500	11/14/97	MAC	
BENZYL ALCOHOL	U	PPB	500	11/14/97	MAC	
4-CHLOROANILINE	U	PPB	500	11/14/97	MAC	
DIBENZOFURAN	U	PPB	130	11/14/97	MAC	
3,3-DICHLOROBENZIDINE	U	PPB	1300	11/14/97	MAC	
2-NITROANILINE	U	PPB	1300	11/14/97	MAC	
3-NITROANILINE	U	PPB	1300	11/14/97	MAC	
4-NITROANILINE	U	PPB	1300	11/14/97	MAC	
ALDRIN	U	PPB	7.0	11/14/97	MAC	
alpha-BHC	U	PPB	13	11/14/97	MAC	
ta-BHC	U	PPB	18	11/14/97	MAC	
ta-BHC	U	PPB	18	11/14/97	MAC	
gamma-BHC (LINDANE)	U	PPB	7.0	11/14/97	MAC	
alpha-CHLORDANE	U	PPB	9.7	11/14/97	MAC	
gamma-CHLORDANE	U	PPB	7.0	11/14/97	MAC	
TECHNICAL CHLORDANE	U	PPB	100	11/14/97	MAC	
p,p-DDD	U	PPB	13	11/14/97	MAC	
p,p-DDE	U	PPB	11	11/14/97	MAC	

DEC 08 1997

Project/Site No.:	47-559	Lab Number:	9710238-02A
Project Name:	SMOKEY MOUNTAIN SMELTERS	Matrix:	SEDIMENT
Description:	NW WASTE PILE	Received:	10/23/97 08:30:00 By LJB
Station No.:	SMS-WA-01	Sampling Agency:	HWM_05_KFO
Collected:	10/21/97 09:40:00 By WLB	Priority:	11_21_97
County:	47		

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
B/N/A EXTR+PESTS,PCBS-SOIL						MS+ECD
p,p-DDT	U	PPB	12	11/14/97	MAC	
DIELDRIN	U	PPB	7.3	11/14/97	MAC	
ENDOSULFAN I	U	PPB	12	11/14/97	MAC	
ENDOSULFAN II	U	PPB	13	11/14/97	MAC	
ENDOSULFAN SULFATE	U	PPB	13	11/14/97	MAC	
ENDRIN	U	PPB	13	11/14/97	MAC	
ENDRIN ALDEHYDE	U	PPB	11	11/14/97	MAC	
ENDRIN KETONE	U	PPB	13	11/14/97	MAC	
HEPTACHLOR	U	PPB	8.6	11/14/97	MAC	
HEPTACHLOR EPOXIDE	U	PPB	9.1	11/14/97	MAC	
TOXAPHENE	U	PPB	770	11/14/97	MAC	
METHOXYCHLOR	U	PPB	51	11/14/97	MAC	
PCB 1016/1242	U	PPB	820	11/14/97	MAC	
PCB 1221	U	PPB	900	11/14/97	MAC	
PCB 1232	U	PPB	1000	11/14/97	MAC	
PCB 1248	U	PPB	690	11/14/97	MAC	
PCB 1254	U	PPB	450	11/14/97	MAC	
PCB 1260	U	PPB	400	11/14/97	MAC	
PCB 1262	U	PPB	320	11/14/97	MAC	

*-Water, uG/L; Sediment, uG/kG

Printed: December 1, 1997

State of Tennessee - Environmental Laboratories
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Organic Analysis
Base/Neutral/Acid Extractables

PROJECT/SITE NO. 47 559	PROJECT NAME SMOKEMONT SUITES
STATION NUMBER SMS-INA-01	COUNTY KNOX
DESCRIPTION N W WASTE PILE	
STREAM MILE N/A	DEPTH 0"-10" MATRIX WASTE
COLLECTED: DATE 10-21-97	TIME 09:40
SAMPLER'S NAME(printed) WILLIAM LEE BARRON	
SAMPLING AGENCY TDSF	BILLING CODE 327.38.05
IF PRIORITY, DATE NEEDED 10-28-97	
SEND REPORT TO: RURL MAUPIN, TDSF, KNOXVILLE ENVIRONMENTAL FIELD OFFICE	
CONTACT HAZARD UNKNOWN	

*	NPDES Extractables	*	NPDES Extractables(con't)	*	TAL Semivolatiles
	butylbenzylphthalate	X	2-chlorophenol	X	dimethylphthalate
	bis(2-ethylhexyl)phthalate		2,4-dichlorophenol	X	4,6-dinitro-2-methylphenol
	di-n-butylphthalate		2,4-dimethylphenol	X	2,4-dinitrophenol
	di-n-octylphthalate		2,4-dinitrophenol	X	2,4-dinitrotoluene
	diethylphthalate		4,6-dinitro-o-cresol	X	2,6-dinitrotoluene
	dimethylphthalate		2-nitrophenol	X	fluoranthene
X	n-nitrosodimethylamine		4-nitrophenol	X	fluorene
	n-nitrosodiphenylamine		pentachlorophenol	X	hexachlorobenzene
	n-nitrosodi-n-propylamine		phenol	X	hexachlorobutadiene
	isophorone		2,4,6-trichlorophenol	X	hexachlorocyclopentadiene
	nitrobenzene	*	TAL Semivolatiles	X	hexachloroethane
	2,4-dinitrotoluene	X	acenaphthene	X	indeno(1,2,3-cd)pyrene
	acenaphthene	X	acenaphthylene	X	isophorone
	acenaphthylene	X	anthracene	X	2-methylnaphthalene
	anthracene	X	benzo(a)anthracene	X	2-methylphenol
	benzo(a)anthracene	X	benzo(a)pyrene	X	4-methylphenol
	benzo(a)pyrene	X	benzo(b)fluoranthene	X	n-nitrosodiphenylamine
	benzo(b)fluoranthene	X	benzo(g,h,i)perylene	X	n-nitroso-n-dipropylamine
	benzo(g,h,i)perylene	X	benzo(k)fluoranthene	X	naphthalene
	benzo(k)fluoranthene	X	benzoic acid	X	2-nitroaniline
	chrysene	X	benzyl alcohol	X	3-nitroaniline
	dibenzo(a,h)anthracene	X	bis(2-chloroethoxy)methane	X	4-nitroaniline
	fluoranthene	X	bis(2-chloroethyl) ether	X	nitrobenzene
	fluorene	X	bis(2-chloroisopropyl)ether	X	2-nitrophenol
	indeno(1,2,3-c,d)pyrene	X	bis(2-ethylhexyl)phthalate	X	4-nitrophenol
	naphthalene	X	4-bromophenylphenylether	X	pentachlorophenol
	phenanthrene	X	butylbenzylphthalate	X	phenanthrene
	pyrene	X	4-chloroaniline	X	phenol
	bis(2-chloroethyl)ether	X	4-chloro-3-methyl phenol	X	pyrene
	bis(2-chloroethoxy)methane	X	2-chloronaphthalene	X	1,2,4-trichlorobenzene
	bis(2-chloroisopropyl)ether	X	4-chlorophenylphenylether	X	2,4,5-trichlorophenol
	4-bromophenylphenylether	X	chrysene	X	2,4,6-trichlorophenol
	4-chlorophenylphenylether	X	di-n-butylphthalate	*	Nitrobodies
	hexachlorocyclopentadiene	X	di-n-octylphthalate		RDX
	hexachlorobutadiene	X	dibenzo(a,h)anthracene		2,4,6-TNT
	hexachlorobenzene	X	dibenzofuran		2,4-dinitrotoluene
	hexachloroethane	X	3,3'-dichlorobenzidine		2,6-dinitrotoluene
	1,2,4-trichlorobenzene	X	2,4-dichlorophenol		nitrobenzene
	2-chloronaphthalene	X	diethylphthalate		1,3,5-TNB
	4-chloro-3-methyl phenol	X	2,4-dimethylphenol		

*	TCLP Semivolatiles
	chlordane
	o-cresol
	m-cresol
	p-cresol
	cresol
	2,4-D
	2,4-dinitrotoluene
	endrin
	heptachlor
	heptachlor epoxide
	hexachlorobenzene
	hexachlorobutadiene
	hexachloroethane
	lindane
	methoxychlor
	nitrobenzene
	pentachlorophenol
	pyridine
	toxaphene
	2,4,5-trichlorophenol
	2,4,6-trichlorophenol
	2,4,5-TP (Silvex)
*	Pesticides/PCBs
X	aldrin
X	alpha-BHC
X	beta-BHC
X	delta-BHC
X	gamma-BHC (lindane)
X	technical chlordane
X	alpha-chlordane
X	gamma-chlordane
X	4,4'-DDD
X	4,4'-DDE
X	4,4'-DDT
X	dieldrin
X	endosulfan I
X	endosulfan II
X	endosulfan sulfate
X	endrin
X	endrin aldehyde
X	endrin ketone
X	heptachlor
X	heptachlor epoxide
X	toxaphene
X	methoxychlor
X	PCB 1016/1242
X	PCB 1221
X	PCB 1232
X	PCB 1248
X	PCB 1254
X	PCB 1260
X	PCB 1262

Laboratory Number

Branch Lab Number

Chain of Custody and Supplemental Information

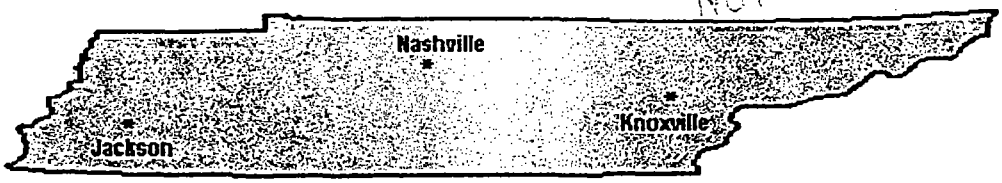
Only one chain of custody form is required per sample set or point (if all collected at the same time)

1. Collected by W.L.B. & J.W.W.
   Date 10-21-97 Time 09:40
   Delivered to KNOXVILLE STATE LAB
   Date 10-21-97 Time 12:45 p.m.
2. Received by
   Date Time
   Delivered to
   Date Time
3. Received by
   Date Time
   Delivered to
   Date Time
4. Received in Lab by [illegible]
   Date 10-21-97 Time 12:45
   Logged in by
   Date Time

Additional Information

1. Approximate volume of sample 500 ML
2. Nearest town or city KNOXVILLE
3. Others present at collection B.H.M. & A.D.D.
4. Number of other samples collected at same time at this point THREE
5. Field collection procedure, handling and/or preservation of this sample ACCORDING TO U.S. EPA PROCEDURES AND PROTOCOLS
6. Mode of transportation to lab ON ICE IN AN ICE CHEST, IN A STATE VEHICLE.
7. Sample sealed by
8. Date sample sealed
9. Remarks

NOV 0 9 1998



STATE OF TENNESSEE

ENVIRONMENTAL LABORATORIES

JACKSON LABORATORY
295 SUMMAR AVENUE
JACKSON, TN 38302-0849
PH: (901)423-6600

NASHVILLE LABORATORY
630 BEN ALLEN ROAD
NASHVILLE, TN 37247-0801
PH: (615)262-6300

KNOXVILLE LABORATORY
1522 CHEROKEE TRAIL
KNOXVILLE, TN 37920
PH: (423)549-5201

SENT TO: **HWM - PA/SI, KFO**
2700 MIDDLEBROOK PIKE
KNOXVILLE, TN 37921

BURL H. MAUPIN/WM. LEE BARRON
(423)594-6035

Lab ID: 9808257
Sampling Agency: HWM_11_KFO

Billing Code: 327.38-11

This is to certify that the following results were determined using good laboratory practices and in accordance with federal or state approved methodologies.

Jerry W. Bingaman
Analytical Supervisor

Definition of Data Qualifiers

U- Analyte requested but not detected
J- Estimated value--result is less than sample quantitation limit but greater than zero
B- Analyte in blank as well as sample
E- Analyte concentration exceeds the calbration range of instrument
N- Uncertainty in result other than "J" flag
X,Y,Z- Other flags used to define results as needed

Printed: September 4, 1998

Project/Site No.:	47-559	Lab Number:	9710216-02E
Project Name:	SMOKEY MTN. SMELTERS	Matrix:	WASTE
Site Description:	NW WASTE PILE	Received:	10/21/97 12:45:00 By LAB
Station No.:	SMS-WA-01	Sampling Agency:	HWM_05_KFO
lected:	10/21/97 09:40:00 By WLB	Priority:	11_21_97
County:	47		

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
VOLATILES-TAL SEDIMENTS						8260A
ACETONE	U	PPB	25	10/24/97	HMG	
BENZENE	U	PPB	2.5	10/24/97	HMG	
BROMODICHLOROMETHANE	U	PPB	2.5	10/24/97	HMG	
BROMOFORM	U	PPB	2.5	10/24/97	HMG	
BROMOMETHANE	U	PPB	5.0	10/24/97	HMG	
2-BUTANONE (MEK)	U	PPB	25	10/24/97	HMG	
CARBON DISULFIDE	U	PPB	5.0	10/24/97	HMG	
CARBON TETRACHLORIDE	U	PPB	2.5	10/24/97	HMG	
VINYL ACETATE	U	PPB	5.0	10/24/97	HMG	
CHLOROBENZENE	U	PPB	2.5	10/24/97	HMG	
CHLOROETHANE	U	PPB	5.0	10/24/97	HMG	
CHLOROFORM	U	PPB	2.5	10/24/97	HMG	
CHLOROMETHANE	U	PPB	5.0	10/24/97	HMG	
DIBROMOCHLOROMETHANE	U	PPB	2.5	10/24/97	HMG	
1,2-DICHLOROBENZENE	U	PPB	2.5	10/24/97	HMG	
1,3-DICHLOROBENZENE	U	PPB	2.5	10/24/97	HMG	
1,4-DICHLOROBENZENE	U	PPB	2.5	10/24/97	HMG	
DICHLORODIFLUOROMETHANE	U	PPB	5.0	10/24/97	HMG	
1,1-DICHLOROETHANE	U	PPB	2.5	10/24/97	HMG	
1,2-DICHLOROETHANE	U	PPB	2.5	10/24/97	HMG	
1,1-DICHLOROETHENE	U	PPB	2.5	10/24/97	HMG	
CIS-1,2-DICHLOROETHENE	U	PPB	2.5	10/24/97	HMG	
TRANS-1,2-DICHLOROETHENE	U	PPB	2.5	10/24/97	HMG	
1,2-DICHLOROPROPANE	U	PPB	2.5	10/24/97	HMG	
CIS-1,3-DICHLOROPROPENE	U	PPB	2.5	10/24/97	HMG	
TRANS-1,3-DICHLOROPROPENE	U	PPB	2.5	10/24/97	HMG	
ETHYLBENZENE	U	PPB	2.5	10/24/97	HMG	
METHYLENE CHLORIDE	U	PPB	2.5	10/24/97	HMG	
4-METHYL-2-PENTANONE (MIBK)	U	PPB	25	10/24/97	HMG	
STYRENE	U	PPB	2.5	10/24/97	HMG	
2-HEXANONE	U	PPB	5.0	10/24/97	HMG	
1,1,2,2-TETRACHLOROETHANE	U	PPB	2.5	10/24/97	HMG	
TETRACHLOROETHENE	U	PPB	2.5	10/24/97	HMG	
TOLUENE	J 1.4	PPB	2.5	10/24/97	HMG	
1,1,1-TRICHLOROETHANE	U	PPB	2.5	10/24/97	HMG	
1,1,2-TRICHLOROETHANE	U	PPB	2.5	10/24/97	HMG	
TRICHLOROETHENE	U	PPB	2.5	10/24/97	HMG	
TRICHLOROFLUOROMETHANE	U	PPB	5.0	10/24/97	HMG	
VINYL CHLORIDE	U	PPB	5.0	10/24/97	HMG	
o-XYLENE	U	PPB	2.5	10/24/97	HMG	
m&p-XYLENE	U	PPB	2.5	10/24/97	HMG	

*-Water, uG/L; Sediment, uG/kG

Printed: October 27, 1997

State of Tennessee - Environmental Laboratories

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Organic Analysis

Volatiles and Petroleum Hydrocarbons

PROJECT/SITE NO. 47 S 59	PROJECT NAME SMOKEY MTN SMELTER
STATION NUMBER SMS-WA-01	COUNTY KNOX
DESCRIPTION NW WASTE PILE	
STREAM MILE N/A	DEPTH 0" to 10" MATRIX WASTE
COLLECTED: DATE 10-21-97	TIME 09:40
SAMPLER'S NAME(printed) WILLIAM LEE BARRON	
SAMPLING AGENCY TDSF	BILLING CODE 327.38.05
IF PRIORITY, DATE NEEDED 11-28-97	
SEND REPORT TO: KARL MAUPIN, TDSF, KNOXVILLE ENVIRONMENTAL FIELD OFFICE	
CONTACT HAZARD UNKNOWN	

*	NPDES Volatiles - 624	*	TAL Volatiles - 8260A	*	TCLP Volatiles
	Bromoform	X	Chloromethane		Benzene
	Bromodichloromethane	X	Bromomethane		Carbon tetrachloride
	Carbon Tetrachloride	X	Vinyl chloride		Chlorobenzene
	Chlorobenzene	X	Chloroethane		Chloroform
	Chloroethane	X	Methylene chloride		1,2-Dichloroethane
X	2-Chloroethylvinyl ether	X	Acetone		1,1-Dichloroethane
	Chloroform	X	Carbon disulfide		Methyl ethyl ketone
	Chloromethane	X	1,1-Dichloroethene		Tetrachloroethene
	Dibromochloromethane	X	1,1-Dichloroethane		Trichloroethene
X	1,2-Dichlorobenzene	X	Cis-1,2-dichloroethene		Vinyl chloride
X	1,3-Dichlorobenzene	X	Trans-1,2-dichloroethene	*	**BTEX - 8260A - UST**
X	1,4-Dichlorobenzene	X	1,2-Dichloroethane		Benzene
X	Dichlorodifluoromethane	X	Chloroform		Toluene
	1,1-Dichloroethane	X	2-Butanone		Ethyl benzene
	1,2-Dichloroethane	X	1,1,1-Trichloroethane		o-Xylene
	1,1-Dichloroethene	X	Carbon tetrachloride		m-Xylene
	Cis-1,2-dichloroethene	X	Vinyl acetate		p-Xylene
	Trans-1,2-dichloroethene	X	Bromodichloromethane		Methyl t-butyl ether
	1,2-Dichloropropane	X	1,2-Dichloropropane		Diisopropyl ether
	Cis-1,3-dichloropropene	X	Cis-1,3-dichloropropane	*	**TPH by GC**
	Trans-1,2-dichloroethene	X	Trichloroethene		Gasoline Range Organics
	Methylene chloride	X	Dibromochloromethane		Diesel Range Organics
	1,1,2,2-Tetrachloroethane	X	1,1,2-Trichloroethane	*	**TPH by IR (418.1)**
	Tetrachloroethene	X	Benzene		418.1 - Waste Oil
	1,1,1-Trichloroethane	X	Trans-1,3-dichloropropene	*	**Other**
	1,1,2-Trichloroethane	X	Bromoform		
	Trichloroethene	X	4-Methyl-2-pentanone		
X	Trichlorofluoromethane	X	2-Hexanone		
	Vinyl chloride	X	Tetrachloroethene		
	Benzene	X	Toluene		
	Ethylbenzene	X	1,1,2,2-Tetrachloroethane		
	Toluene	X	Chlorobenzene		
	o-Xylene	X	Ethyl benzene		
	m-Xylene	X	Styrene		
	p-Xylene	X	o-Xylene		
		X	m-Xylene		
		X	p-Xylene		

Laboratory Number

Branch Lab Number

Chain of Custody and Supplemental Information

Only one chain of custody form is required per sample set or point (if all collected at the same time)

1. Collected by W. L. B. & J. W. W.
   Date 10-21-97 Time 09:40
   Delivered to KNOXVILLE STATE LAB
   Date 10-21-97 Time 12:45 p.m.
2. Received by
   Date Time
   Delivered to
   Date Time
3. Received by
   Date Time
   Delivered to
   Date Time
4. Received in Lab by [illegible]
   Date 10-21-97 Time 12:45
   Logged in by
   Date Time

Additional Information

1. Approximate volume of sample 120 ML
2. Nearest town or city KNOXVILLE
3. Others present at collection B.H.M. & A.D.D.
4. Number of other samples collected at same time at this point THREE
5. Field collection procedure, handling and/or preservation of this sample ACCORDING TO U.S. EPA PROCEDURES AND PROTOCOLS
6. Mode of transportation to lab ON ICE, IN AN ICE CHEST, IN A STATE VEHICLE
7. Sample sealed by
8. Date sample sealed
9. Remarks

NOV 21 1997

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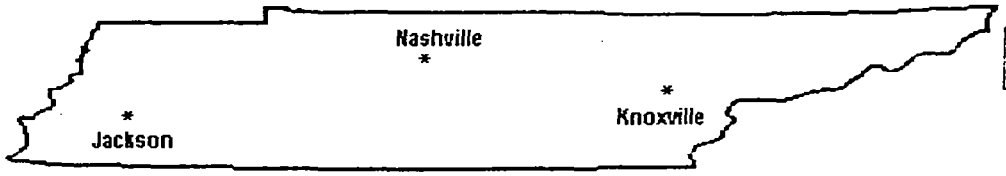

STATE OF TENNESSEE

ENVIRONMENTAL LABORATORIES

JACKSON LABORATORY
295 SUMMAR AVENUE
JACKSON, TN 38302-0849
PH: (901)423-6600

NASHVILLE LABORATORY
630 BEN ALLEN ROAD
NASHVILLE, TN 37247-0801
PH: (615)262-6300

KNOXVILLE LABORATORY
1522 CHEROKEE TRAIL
KNOXVILLE, TN 37920
PH: (423)549-5201

SENT TO: **HWM-STATE SUPERFUND, KFO**
2700 MIDDLEBROOK PIKE
KNOXVILLE, TN 37921

BURL MAUPIN,WM. LEE BARRON
(423)594-6035

Lab ID: 9710216
Sampling Agency: HWM_05_KFO

Billing Code: 327.38-05

This is to certify that the following results were determined using good laboratory practices and in accordance with federal or state approved methodologies.

Bob Read

Analytical Supervisor

Printed: October 30, 1997

NOV 21 1997

Project/Site No.:	47-559	Lab Number:	9710216-02F
Project Name:	SMOKEY MTN. SMELTERS	Matrix:	WASTE
Description:	NW WASTE PILE	Received:	10/21/97 12:45:00 By LAB
Station No.:	SMS-WA-01	Sampling Agency:	HWM_05_KFO
Collected:	10/21/97 09:40:00 By WLB	Priority:	11_21_97
County:	47		

TEST	RESULT	*ERROR	UNITS	ANALYZED	BY	METHOD
GAMMA RADIONUCLIDES						R.6
Pb-214	0.219	0.040	pCi/g dry wt	10/28/97	RJR	
Bi-214	0.242	0.050	pCi/g dry wt	10/28/97	RJR	
GROSS ALPHA & BETA						R.1.3
GROSS ALPHA	0.79	0.55	pCi/g DRY WT.	10/29/97	NLF	
GROSS BETA	2.72	0.89	pCi/g DRY WT.	10/29/97	NLF	

*--Represents +/- error value

Printed: October 30, 1997

State of Tennessee - Environmental Laboratories

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Radiochemical Analysis

PROJECT/SITE NO. 47-559	PROJECT NAME SMOKEY MTN. SMELTERS
STATION NUMBER SMS-WA-01	COUNTY KNOX
DESCRIPTION NW WASTE PILE	
STREAM MILE N/A	DEPTH 0" to 10"
COLLECTED: DATE 10-21-97	TIME 09:40
PICK-UP DATE: N/A	
CONTACT HAZARD UNKNOWN	mR/hr Reading <0.1 mR/hr
SAMPLER'S NAME (printed) WM. LEE BARRON	
SAMPLING AGENCY TDSF	BILLING CODE 32738.05
IF PRIORITY, DATE NEEDED 11-28-97	
SEND REPORT TO: BURL MAHPIN, TDSF, KNOXVILLE ENVIRONMENTAL FIELD OFFICE	

Laboratory Number

Branch Lab Number

Date Received

Time Received **By**

Sample Type

___Air ___Milk ___Swipe
___Water ___Tissue ___Liquid
___Sludge ___Soil ✓Solid
___Vegetation ___Sediment

Other WASTE

Field Comments:

Air Samples
Volume
Total Hours

___Sample Filtration
___Sample Acidification
___Send to RESL

REQUESTED ANALYSES:

✓	GROSS ALPHA (TOTAL)		STRONTIUM 89
	GROSS ALPHA (SUSPENDED)		STRONTIUM 90
	GROSS ALPHA (DISSOLVED)		TRITIUM (H-3)
✓	GROSS BETA (TOTAL)		THORIUM (TOTAL)
	GROSS BETA (SUSPENDED)		URANIUM (TOTAL)
	GROSS BETA (DISSOLVED)	✓	GAMMA RADIONUCLIDES
			ADDITIONAL ANALYSES:

Chain of Custody and Supplemental Information

Only one chain of custody form is required per sample set or point (if all collected at the same time)

1. Collected by W.L.B. & J.W.W.
   Date 10-21-97 Time 09:40
   Delivered to KNOXVILLE STATE LAB
   Date 10-21-97 Time 12:45 p.m.
2. Collected by
   Date Time
   Delivered to
   Date Time
3. Collected by
   Date Time
   Delivered to
   Date Time
4. Received in Lab by [signature]
   Date 10-21-97 Time 12:45
   Logged in by
   Date Time

Additional Information

1. Approximate volume of sample 16 OZ
2. Nearest town or city KNOXVILLE
3. Others present at collection B.H.M. & A.D.D.
4. Number of other samples collected at same time at this point THREE
5. Field collection procedure, handling and/or preservation of this sample ACCORDING TO U.S. EPA PROCEEDURES AND PROTOCOLS
6. Mode of transportation to lab ON ICE, IN AN ICE CHEST, IN A STATE VEHICLE
7. Sample sealed by
8. Date sample sealed
9. Remarks

Project/Site No.: 47-559
Project Name: SMOKEY MTN. SMELTERS
Description: BAGHOUSE DUST
Station No.: SMS-WA-02
lected: 10/21/97 10:20:00 By WLB
unty: 47

Lab Number: 9710216-03
Matrix: WASTE
Received: 10/21/97 12:45:00 By LAB
Sampling Agency: HWM_05_KFO
Priority: 11_21_97

DEC 03 1997

TEST	RESULT	UNITS	LIMIT	ANALYZED	BY	METHOD
AMMONIA	1026	mg/kg	10	10/31/97	LKS	A.18.2
CYANIDE	U	mg/kg	1.0	10/31/97	SAL	A.9
ALUMINUM	65500	mg/kg	10	11/13/97	JAH	
ANTIMONY	9	mg/kg	1	11/19/97	JAH	
ARSENIC	6	mg/kg	1	11/21/97	JAH	
BARIUM	30	mg/kg	10	11/13/97	JAH	
BERYLLIUM	U	mg/kg	1	11/17/97	JAH	
CADMIUM	15.6	mg/kg	0.5	11/05/97	JAH	
CALCIUM	11400	mg/kg	10	11/07/97	JAH	
CHROMIUM	6	mg/kg	1	11/04/97	JAH	
COBALT	4	mg/kg	1	11/06/97	JAH	
COPPER	754	mg/kg	1	11/04/97	JAH	
DIGESTION-METALS	COMPLETED	COMPLETED		10/29/97	EAM	
IRON	4860	mg/kg	5	11/04/97	JAH	
LEAD	129	mg/kg	4	11/04/97	JAH	
MAGNESIUM	24600	mg/kg	10	11/07/97	JAH	
MANGANESE	144	mg/kg	1	11/04/97	JAH	
MERCURY	0.73	mg/kg	0.1	11/18/97	EBS	EPA 245.5
METALS PREP-SOLIDS/WASTES	COMPLETED	COMPLETED		10/23/97	EAM	
NICKEL	551	mg/kg	2	11/04/97	JAH	
PERCENT SOLIDS	75.2	%		11/14/97	JAH	
POTASSIUM	4230	mg/kg	10	11/06/97	JAH	
ENIUM	2	mg/kg	1	11/20/97	JAH	

DEC 06 1997

Project/Site No.: 47-559
Project Name: SMOKEY MTN. SMELTERS
Description: BAGHOUSE DUST
Station No.: SMS-WA-02
Collected: 10/21/97 10:20:00 By WLB
County: 47

Lab Number: 9710216-03
Matrix: WASTE
Received: 10/21/97 12:45:00 By LAB
Sampling Agency: HWM_05_KFO
Priority: 11_21_97

TEST	RESULT	UNITS	LIMIT	ANALYZED	BY	METHOD
SILVER	1	mg/kg	1	11/06/97	JAH	
SODIUM	107000	mg/kg	10	11/06/97	JAH	
THALLIUM	U	mg/kg	5	11/06/97	JAH	
VANADIUM	U	mg/kg	20	11/17/97	JAH	
ZINC	4020	mg/kg	0.5	11/05/97	JAH	

State of Tennessee - Environmental Laboratories
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Inorganic Analysis

PROJECT/SITE NO. 47-55-7	PROJECT NAME SMOKEY MTN SMELTERS
STATION NUMBER SMS-WA-02	COUNTY KNOX
DESCRIPTION BAGHOUSE DUST	
STREAM MILE N/A	DEPTH 0" to 10" MATRIX WASTE
COLLECTED: DATE 10-21-97	TIME 10:20
SAMPLER'S NAME(printed) WILLIAM LEE BARRON	
SAMPLING AGENCY TDSF	BILLING CODE 327.38.05
IF PRIORITY, DATE NEEDED 11-25-97	
SEND REPORT TO: DIRK MAHRIN TDSF KNOXVILLE ENVIRONMENTAL FIELD OFFICE.	
CONTACT HAZARD UNKNOWN	

*	Metals
X	aluminum, Al
X	antimony, Sb
X	arsenic, As
X	barium, Ba
X	beryllium, Be
X	cadmium, Cd
X	calcium, Ca
X	chromium, Cr
X	cobalt, Co
X	copper, Cu
X	iron, Fe
X	lead, Pb
X	magnesium, Mg
X	manganese, Mn
X	mercury, Hg
X	nickel, Ni
X	potassium, K
X	selenium, Se
X	silver, Ag
X	sodium, Na
X	thallium, Tl
X	vanadium, V
X	zinc, Zn

*	Env. Microbiology	*	General Inorganics		Gen. Inorganics (con't)
	coliform, fecal*		acidity as $CaCO_3$*		oil and grease
	coliform, total*		alkalinity as $CaCO_3$*		orthophosphate, total*
	strep, fecal*		alkalinity, phen. as $CaCO_3$*		oxygen, dissolved*
			BOD, 5-day*		pH
			CBOD, 5-day*		phenols, total
			boron		phosphate, total
*	**Ambient Parameters**		chloride*		residue, dissolved*
	COD*		chlorine, residual*		residue, settleable*
	coliform, fecal		chromium, hexavalent		residue, suspended*
	conductivity*		COD*		residue, total*
	hardness, total as $CaCO_3$*		color, apparent*		silica*
	nitrogen, ammonia		color, true*		sulfate*
	nitrogen, NO_3 & NO_2		conductivity*		sulfide, total*
	nitrogen, total Kjeldahl	X	cyanide		TOC*
	phosphate, total		flash point*		turbidity*
	pH		fluoride*		percent solids
	residue, dissolved*		hardness, Ca as $CaCO_3$*	*	**Other**
	residue, suspended*		hardness, total as $CaCO_3$*		
	arsenic, As		hydrocarbons, total		
	cadmium, Cd		MBAS*		
	chromium, Cr	X	nitrogen, ammonia		
	copper, Cu		nitrogen, nitrate*		
	lead, Pb		nitrogen, nitrite*		
	mercury, Hg		nitrogen, NO_3 & NO_2		
	nickel, Ni		nitrogen, total Kjeldahl		
	zinc, Zn		nitrogen, total organic		

*	TCLP
	arsenic, As
	barium, Ba
	cadmium, Cd
	chromium, Cr
	lead, Pb
	mercury, Hg
	nickel, Ni
	selenium, Se
	silver, Ag

***denotes analyses performed only on water**

FIELD DETERMINATIONS	Temperature
pH	Chlorine, residual
Conductivity	Other
Dissolved Oxygen	

Laboratory Number

Branch Lab Number

Chain of Custody and Supplemental Information

Only one chain of custody form is required per sample set or point (if all collected at the same time)

1. Collected by W.L.B. & J.W.W
   Date 10-21-97 Time 10:20
   Delivered to KNOXVILLE STATE LAB
   Date 10-21-97 Time 12:45p
2. Received by
   Date Time
   Delivered to
   Date Time
3. Received by
   Date Time
   Delivered to
   Date Time
4. Received in Lab by [signature]
   Date 10-21-97 Time 12:45
   Logged in by
   Date Time

Additional Information

1. Approximate volume of sample 16 oz
2. Nearest town or city KNOXVILLE
3. Others present at collection BHM & ABD
4. Number of other samples collected at same time at this point THREE
5. Field collection procedure, handling and/or preservation of this sample ACCORDING TO U.S. EPA PROCEDURES AND PROTOCOLS
6. Mode of transportation to lab ON ICE IN AN ICE CHEST IN A STATE VEHICLE.
7. Sample sealed by
8. Date sample sealed
9. Remarks

DEC 08 1997

Project/Site No.: 47-559
Project Name: SMOKEY MOUNTAIN SMELTERS
Description: BAGHOUSE DUST
Station No.: SMS-WA-02
Collected: 10/21/97 10:20:00 By WLB
County: 47

Lab Number: 9710238-03A
Matrix: SEDIMENT
Received: 10/23/97 08:30:00 By LJB
Sampling Agency: HWM_05_KFO
Priority: 11_21_97

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
B/N/A EXTR+PESTS,PCBS-SOIL						MS+ECD
BUTYL BENZYL PHTHALATE	U	PPB	470	11/14/97	MAC	
BIS(2-ETHYLHEXYL)PHTHALATE	541	PPB	-	11/14/97	MAC	
DI-n-BUTYL PHTHALATE	U	PPB	470	11/14/97	MAC	
DI-n-OCTYL PHTHALATE	U	PPB	1200	11/14/97	MAC	
DIETHYL PHTHALATE	U	PPB	230	11/14/97	MAC	
DIMETHYL PHTHALATE	U	PPB	230	11/14/97	MAC	
n-NITROSODIMETHYLAMINE	U	PPB	1200	11/14/97	MAC	
n-NITROSODIPHENYLAMINE	U	PPB	470	11/14/97	MAC	
n-NITROSO-di-n-PROPYLAMINE	U	PPB	470	11/14/97	MAC	
ISOPHORONE	U	PPB	230	11/14/97	MAC	
NITROBENZENE	U	PPB	470	11/14/97	MAC	
2,4-DINITROTOLUENE	U	PPB	1200	11/14/97	MAC	
2,6-DINITROTOLUENE	U	PPB	1200	11/14/97	MAC	
ACENAPTHENE	U	PPB	230	11/14/97	MAC	
ACENAPHTHYLENE	U	PPB	230	11/14/97	MAC	
ANTHRACENE	U	PPB	230	11/14/97	MAC	
BENZO(a)ANTHRACENE	239	PPB	-	11/14/97	MAC	
BENZO(a)PYRENE	609	PPB	-	11/14/97	MAC	
BENZO(b)FLUORANTHENE	1440	PPB	-	11/14/97	MAC	
BENZO(ghi)PERYLENE	2100	PPB	-	11/14/97	MAC	
BENZO(k)FLUORANTHENE	279	PPB	-	11/14/97	MAC	
DIBENZO(a,h)ANTHRACENE	U	PPB	1200	11/14/97	MAC	
FLUORANTHENE	396	PPB	-	11/14/97	MAC	
FLUORENE	U	PPB	120	11/14/97	MAC	
INDENO(1,2,3-cd)PYRENE	2170	PPB	-	11/14/97	MAC	
NAPHTHALENE	U	PPB	120	11/14/97	MAC	
PHENANTHRENE	143	PPB	-	11/14/97	MAC	
PYRENE	288	PPB	-	11/14/97	MAC	
CHRYSENE	408	PPB	-	11/14/97	MAC	
BIS(2-CHLOROETHYL)ETHER	U	PPB	470	11/14/97	MAC	
BIS(2-CHLOROETHOXY)METHANE	U	PPB	470	11/14/97	MAC	
BIS(2-CHLOROISOPROPYL)ETHER	U	PPB	470	11/14/97	MAC	
4-BROMOPHENYLPHENYL ETHER	U	PPB	470	11/14/97	MAC	
4-CHLOROPHENYLPHENYL ETHER	U	PPB	470	11/14/97	MAC	
HEXACHLOROCYCLOPENTADIENE	U	PPB	1200	11/14/97	MAC	
HEXACHLOROBUTADIENE	U	PPB	470	11/14/97	MAC	
HEXACHLOROBENZENE	U	PPB	470	11/14/97	MAC	
HEXACHLOROETHANE	U	PPB	470	11/14/97	MAC	
1,2,4-TRICHLOROBENZENE	U	PPB	470	11/14/97	MAC	
2-CHLORONAPHTHALENE	U	PPB	230	11/14/97	MAC	
4-CHLORO-3-METHYLPHENOL	U	PPB	470	11/14/97	MAC	
2-CHLOROPHENOL	U	PPB	470	11/14/97	MAC	
2,4-DICHLOROPHENOL	U	PPB	470	11/14/97	MAC	
2,4-DIMETHYLPHENOL	U	PPB	470	11/14/97	MAC	
2,4-DINITROPHENOL	U	PPB	2300	11/14/97	MAC	
2-METHYL-4,6-DINITROPHENOL	U	PPB	1200	11/14/97	MAC	
2-NITROPHENOL	U	PPB	1200	11/14/97	MAC	
4-NITROPHENOL	U	PPB	1200	11/14/97	MAC	
PENTACHLOROPHENOL	U	PPB	1200	11/14/97	MAC	
PHENOL	U	PPB	470	11/14/97	MAC	
2,4,6-TRICHLOROPHENOL	U	PPB	470	11/14/97	MAC	
2,4,5-TRICHLOROPHENOL	U	PPB	470	11/14/97	MAC	
O-CRESOL	U	PPB	470	11/14/97	MAC	
M- & P-CRESOL	U	PPB	470	11/14/97	MAC	
2-METHYLNAPHTHALENE	U	PPB	230	11/14/97	MAC	
BENZOIC ACID	U	PPB	2300	11/14/97	MAC	
BENZYL ALCOHOL	U	PPB	470	11/14/97	MAC	
4-CHLOROANILINE	U	PPB	470	11/14/97	MAC	
DIBENZOFURAN	U	PPB	120	11/14/97	MAC	
3,3-DICHLOROBENZIDINE	U	PPB	1200	11/14/97	MAC	
2-NITROANILINE	U	PPB	1200	11/14/97	MAC	
3-NITROANILINE	U	PPB	1200	11/14/97	MAC	
4-NITROANILINE	U	PPB	1200	11/14/97	MAC	
ALDRIN	U	PPB	6.4	11/14/97	MAC	
alpha-BHC	U	PPB	11	11/14/97	MAC	
beta-BHC	U	PPB	16	11/14/97	MAC	
delta-BHC	U	PPB	16	11/14/97	MAC	
gamma-BHC (LINDANE)	U	PPB	6.4	11/14/97	MAC	
alpha-CHLORDANE	U	PPB	8.8	11/14/97	MAC	
gamma-CHLORDANE	U	PPB	6.3	11/14/97	MAC	
TECHNICAL CHLORDANE	U	PPB	95	11/14/97	MAC	
p,p-DDD	U	PPB	12	11/14/97	MAC	
p,p-DDE	U	PPB	10	11/14/97	MAC	

DEC 0 8 1997

Project/Site No.: 47-559
Project Name: SMOKEY MOUNTAIN SMELTERS
Description: BAGHOUSE DUST
ation No.: SMS-WA-02
llected: 10/21/97 10:20:00 By WLB
County: 47

Lab Number: 9710238-03A
Matrix: SEDIMENT
Received: 10/23/97 08:30:00 By LJB
Sampling Agency: HWM_05_KFO
Priority: 11_21_97

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
B/N/A EXTR+PESTS,PCBS-SOIL						MS+ECD
p,p-DDT	U	PPB	11	11/14/97	MAC	
DIELDRIN	U	PPB	6.6	11/14/97	MAC	
ENDOSULFAN I	U	PPB	10	11/14/97	MAC	
ENDOSULFAN II	U	PPB	12	11/14/97	MAC	
ENDOSULFAN SULFATE	U	PPB	12	11/14/97	MAC	
ENDRIN	U	PPB	12	11/14/97	MAC	
ENDRIN ALDEHYDE	U	PPB	20	11/14/97	MAC	
ENDRIN KETONE	U	PPB	24	11/14/97	MAC	
HEPTACHLOR	U	PPB	7.8	11/14/97	MAC	
HEPTACHLOR EPOXIDE	U	PPB	8.3	11/14/97	MAC	
TOXAPHENE	U	PPB	700	11/14/97	MAC	
METHOXYCHLOR	U	PPB	46	11/14/97	MAC	
PCB 1016/1242	U	PPB	740	11/14/97	MAC	
PCB 1221	U	PPB	810	11/14/97	MAC	
PCB 1232	U	PPB	920	11/14/97	MAC	
PCB 1248	U	PPB	620	11/14/97	MAC	
PCB 1254	U	PPB	410	11/14/97	MAC	
PCB 1260	U	PPB	370	11/14/97	MAC	
PCB 1262	U	PPB	300	11/14/97	MAC	

*-Water, uG/L; Sediment, uG/kG

Printed: December 1, 1997

State of Tennessee - Environmental Laboratories
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Organic Analysis
Base/Neutral/Acid Extractables

PROJECT/SITE NO. [illegible]	PROJECT NAME SMOKEY MTN. SMELTERS
STATION NUMBER SMS-WA-02	COUNTY KNOX
DESCRIPTION RAGHOUSE DUST	
STREAM MILE N/A	DEPTH 0' to 10" MATRIX WASTE
COLLECTED: DATE 10-21-97	TIME 10:20
SAMPLER'S NAME(printed) WILLIAM LEE BARRON	
SAMPLING AGENCY TDSF	BILLING CODE 37.7, 38.05
IF PRIORITY, DATE NEEDED 11-28-97	
SEND REPORT TO: RAHL MAHAFFEY TDSF KNOXVILLE ENVIRONMENTAL FIELD OFFICE	
CONTACT HAZARD UNKNOWN	

*	NPDES Extractables	*	NPDES Extractables(con't)	*	TAL Semivolatiles
	butylbenzylphthalate	X	2-chlorophenol	X	dimethylphthalate
	bis(2-ethylhexyl)phthalate		2,4-dichlorophenol	X	4,6-dinitro-2-methylphenol
	di-n-butylphthalate		2,4-dimethylphenol	X	2,4-dinitrophenol
	di-n-octylphthalate		2,4-dinitrophenol	X	2,4-dinitrotoluene
	diethylphthalate		4,6-dinitro-o-cresol	X	2,6-dinitrotoluene
	dimethylphthalate		2-nitrophenol	X	fluoranthene
X	n-nitrosodimethylamine		4-nitrophenol	X	fluorene
	n-nitrosodiphenylamine		pentachlorophenol	X	hexachlorobenzene
	n-nitrosodi-n-propylamine		phenol	X	hexachlorobutadiene
	isophorone		2,4,6-trichlorophenol	X	hexachlorocyclopentadiene
	nitrobenzene	*	TAL Semivolatiles	X	hexachloroethane
	2,4-dinitrotoluene	X	acenaphthene	X	indeno(1,2,3-cd)pyrene
	acenaphthene	X	acenaphthylene	X	isophorone
	acenaphthylene	X	anthracene	X	2-methylnaphthalene
	anthracene	X	benzo(a)anthracene	X	2-methylphenol
	benzo(a)anthracene	X	benzo(a)pyrene	X	4-methylphenol
	benzo(a)pyrene	X	benzo(b)fluoranthene	X	n-nitrosodiphenylamine
	benzo(b)fluoranthene	X	benzo(g,h,i)perylene	X	n-nitroso-n-dipropylamine
	benzo(g,h,i)perylene	X	benzo(k)fluoranthene	X	naphthalene
	benzo(k)fluoranthene	X	benzoic acid	X	2-nitroaniline
	chrysene	X	benzyl alcohol	X	3-nitroaniline
	dibenzo(a,h)anthracene	X	bis(2-chloroethoxy)methane	X	4-nitroaniline
	fluoranthene	X	bis(2-chloroethyl) ether	X	nitrobenzene
	fluorene	X	bis(2-chloroisopropyl)ether	X	2-nitrophenol
	indeno(1,2,3-c,d)pyrene	X	bis(2-ethylhexyl)phthalate	X	4-nitrophenol
	naphthalene	X	4-bromophenylphenylether	X	pentachlorophenol
	phenanthrene	X	butylbenzylphthalate	X	phenanthrene
	pyrene	X	4-chloroaniline	X	phenol
	bis(2-chloroethyl)ether	X	4-chloro-3-methyl phenol	X	pyrene
	bis(2-chloroethoxy)methane	X	2-chloronaphthalene	X	1,2,4-trichlorobenzene
	bis(2-chloroisopropyl)ether	X	4-chlorophenylphenylether	X	2,4,5-trichlorophenol
	4-bromophenylphenylether	X	chrysene	X	2,4,6-trichlorophenol
	4-chlorophenylphenylether	X	di-n-butylphthalate	*	Nitrobodies
	hexachlorocyclopentadiene	X	di-n-octylphthalate		RDX
	hexachlorobutadiene	X	dibenzo(a,h)anthracene		2,4,6-TNT
	hexachlorobenzene	X	dibenzofuran		2,4-dinitrotoluene
	hexachloroethane	X	3,3'-dichlorobenzidine		2,6-dinitrotoluene
	1,2,4-trichlorobenzene	X	2,4-dichlorophenol		nitrobenzene
	2-chloronaphthalene	X	diethylphthalate		1,3,5-TNB
	4-chloro-3-methyl phenol	X	2,4-dimethylphenol		

*	TCLP Semivolatiles	*	Pesticides/PCBs
	chlordane	X	aldrin
	o-cresol	X	alpha-BHC
	m-cresol	X	beta-BHC
	p-cresol	X	delta-BHC
	cresol	V	gamma-BHC (lindane)
	2,4-D	X	technical chlordane
	2,4-dinitrotoluene	X	alpha-chlordane
	endrin	X	gamma-chlordane
	heptachlor	X	4,4'-DDD
	heptachlor epoxide	X	4,4'-DDE
	hexachlorobenzene	X	4,4'-DDT
	hexachlorobutadiene	X	dieldrin
	hexachloroethane	X	endosulfan I
	lindane	X	endosulfan II
	methoxychlor	X	endosulfan sulfate
	nitrobenzene	X	endrin
	pentachlorophenol	X	endrin aldehyde
	pyridine	X	endrin ketone
	toxaphene	X	heptachlor
	2,4,5-trichlorophenol	X	heptachlor epoxide
	2,4,6-trichlorophenol	X	toxaphene
	2,4,5-TP (Silvex)	X	methoxychlor
		X	PCB 1016/1242
		X	PCB 1221
		X	PCB 1232
		X	PCB 1248
		X	PCB 1254
		X	PCB 1260
		X	PCB 1262

Laboratory Number

Branch Lab Number

Chain of Custody and Supplemental Information

Only one chain of custody form is required per sample set or point (if all collected at the same time)

1. Collected by M.L.B. & T.W.W.
   Date 10-21-97 Time 10:20
   Delivered to KNOXVILLE STATE LAB
   Date 10-21-97 Time 12:45p
2. Received by
   Date Time
   Delivered to
   Date Time
3. Received by
   Date Time
   Delivered to
   Date Time
4. Received in Lab by [signature]
   Date 10-21-97 Time 12:45
   Logged in by
   Date Time

Additional Information

1. Approximate volume of sample 500 ML
2. Nearest town or city KNOXVILLE
3. Others present at collection OHM & ADD
4. Number of other samples collected at same time at this point THREE
5. Field collection procedure, handling and/or preservation of this sample ACCORDING TO U.S. EPA PROCEDURES AND PROTOCOLS.
6. Mode of transportation to lab ON TCE, IN AN ICE CHEST, IN A STATE VEHICLE.
7. Sample sealed by
8. Date sample sealed
9. Remarks

PH-3014 (rev 1/96)

RDA-1527

Project/Site No.: 47-559
Project Name: SMOKEY MTN. SMELTERS
Site Description: BAGHOUSE DUST
Station No.: SMS-WA-02
'lected: 10/21/97 10:20:00 By WLB
.nty: 47

Lab Number: 9710216-03E
Matrix: WASTE
Received: 10/21/97 12:45:00 By LAB
Sampling Agency: HWM_05_KFO
Priority: 11_21_97

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
VOLATILES-TAL SEDIMENTS						8260A
ACETONE	U	PPB	25	10/24/97	HMG	
BENZENE	J 0.8	PPB	2.5	10/24/97	HMG	
BROMODICHLOROMETHANE	U	PPB	2.5	10/24/97	HMG	
BROMOFORM	U	PPB	2.5	10/24/97	HMG	
BROMOMETHANE	U	PPB	5.0	10/24/97	HMG	
2-BUTANONE (MEK)	U	PPB	25	10/24/97	HMG	
CARBON DISULFIDE	U	PPB	5.0	10/24/97	HMG	
CARBON TETRACHLORIDE	U	PPB	2.5	10/24/97	HMG	
VINYL ACETATE	U	PPB	5.0	10/24/97	HMG	
CHLOROBENZENE	U	PPB	2.5	10/24/97	HMG	
CHLOROETHANE	U	PPB	5.0	10/24/97	HMG	
CHLOROFORM	U	PPB	2.5	10/24/97	HMG	
CHLOROMETHANE	U	PPB	5.0	10/24/97	HMG	
DIBROMOCHLOROMETHANE	U	PPB	2.5	10/24/97	HMG	
1,2-DICHLOROBENZENE	U	PPB	2.5	10/24/97	HMG	
1,3-DICHLOROBENZENE	U	PPB	2.5	10/24/97	HMG	
1,4-DICHLOROBENZENE	U	PPB	2.5	10/24/97	HMG	
DICHLORODIFLUOROMETHANE	U	PPB	5.0	10/24/97	HMG	
1,1-DICHLOROETHANE	U	PPB	2.5	10/24/97	HMG	
1,2-DICHLOROETHANE	U	PPB	2.5	10/24/97	HMG	
1,1-DICHLOROETHENE	U	PPB	2.5	10/24/97	HMG	
CIS-1,2-DICHLOROETHENE	U	PPB	2.5	10/24/97	HMG	
TRANS-1,2-DICHLOROETHENE	U	PPB	2.5	10/24/97	HMG	
1,2-DICHLOROPROPANE	U	PPB	2.5	10/24/97	HMG	
CIS-1,3-DICHLOROPROPENE	U	PPB	2.5	10/24/97	HMG	
TRANS-1,3-DICHLOROPROPENE	U	PPB	2.5	10/24/97	HMG	
ETHYLBENZENE	U	PPB	2.5	10/24/97	HMG	
METHYLENE CHLORIDE	U	PPB	2.5	10/24/97	HMG	
4-METHYL-2-PENTANONE (MIBK)	U	PPB	25	10/24/97	HMG	
STYRENE	U	PPB	2.5	10/24/97	HMG	
2-HEXANONE	U	PPB	5.0	10/24/97	HMG	
1,1,2,2-TETRACHLOROETHANE	U	PPB	2.5	10/24/97	HMG	
TETRACHLOROETHENE	U	PPB	2.5	10/24/97	HMG	
TOLUENE	3.6	PPB	2.5	10/24/97	HMG	
1,1,1-TRICHLOROETHANE	U	PPB	2.5	10/24/97	HMG	
1,1,2-TRICHLOROETHANE	U	PPB	2.5	10/24/97	HMG	
TRICHLOROETHENE	U	PPB	2.5	10/24/97	HMG	
TRICHLOROFLUOROMETHANE	U	PPB	5.0	10/24/97	HMG	
VINYL CHLORIDE	U	PPB	5.0	10/24/97	HMG	
o-XYLENE	U	PPB	2.5	10/24/97	HMG	
m&p-XYLENE	U	PPB	2.5	10/24/97	HMG	

*-Water, uG/L; Sediment, uG/kG

Printed: October 27, 1997

State of Tennessee - Environmental Laboratories

PLEASE PRINT LEGIBLY

Organic Analysis

Volatiles and Petroleum Hydrocarbons

PROJECT/SITE NO. 47-559	PROJECT NAME SMOKEY MTN, SMLR
STATION NUMBER SMS-WA-02	COUNTY KNOX
DESCRIPTION BAGHOUSE DUST	
STREAM MILE N/A	DEPTH 0 to 10' MATRIX WASTE
COLLECTED: DATE 10-21-97	TIME 10:20
SAMPLER'S NAME(printed) WILLIAM LEE BARRON	
SAMPLING AGENCY TDSF	BILLING CODE 327.38.05
IF PRIORITY, DATE NEEDED 11-28-97	
SEND REPORT TO: DARL MAUPIN, TDSF, KNOXVILLE ENVIRONMENTAL FIELD OFFICE	
CONTACT HAZARD UNKNOWN	

*	NPDES Volatiles - 624	*	TAL Volatiles - 8260A	*	TCLP Volatiles
	Bromoform	X	Chloromethane		Benzene
	Bromodichloromethane	X	Bromomethane		Carbon tetrachloride
	Carbon Tetrachloride	X	Vinyl chloride		Chlorobenzene
	Chlorobenzene	X	Chloroethane		Chloroform
	Chloroethane	X	Methylene chloride		1,2-Dichloroethane
X	2-Chloroethylvinyl ether	X	Acetone		1,1-Dichloroethane
	Chloroform	X	Carbon disulfide		Methyl ethyl ketone
	Chloromethane	X	1,1-Dichloroethene		Tetrachloroethene
	Dibromochloromethane	X	1,1-Dichloroethane		Trichloroethene
X	1,2-Dichlorobenzene	X	Cis-1,2-dichloroethene		Vinyl chloride
X	1,3-Dichlorobenzene	X	Trans-1,2-dichloroethene	*	BTEX - 8260A - UST
X	1,4-Dichlorobenzene	X	1,2-Dichloroethane		Benzene
X	Dichlorodifluoromethane	X	Chloroform		Toluene
	1,1-Dichloroethane	X	2-Butanone		Ethyl benzene
	1,2-Dichloroethane	X	1,1,1-Trichloroethane		o-Xylene
	1,1-Dichloroethene	X	Carbon tetrachloride		m-Xylene
	Cis-1,2-dichloroethene	X	Vinyl acetate		p-Xylene
	Trans-1,2-dichloroethene	X	Bromodichloromethane		Methyl t-butyl ether
	1,2-Dichloropropane	X	1,2-Dichloropropane		Diisopropyl ether
	Cis-1,3-dichloropropene	X	Cis-1,3-dichloropropane	*	TPH by GC
	Trans-1,2-dichloroethene	X	Trichloroethene		Gasoline Range Organics
	Methylene chloride	X	Dibromochloromethane		Diesel Range Organics
	1,1,2,2-Tetrachloroethane	X	1,1,2-Trichloroethane	*	TPH by IR (418.1)
	Tetrachloroethene	X	Benzene		418.1 - Waste Oil
	1,1,1-Trichloroethane	X	Trans-1,3-dichloropropene	*	Other
	1,1,2-Trichloroethane	X	Bromoform		
	Trichloroethene	X	4-Methyl-2-pentanone		
X	Trichlorofluoromethane	X	2-Hexanone		
	Vinyl chloride	X	Tetrachloroethene		
	Benzene	X	Toluene		
	Ethylbenzene	X	1,1,2,2-Tetrachloroethane		
	Toluene	X	Chlorobenzene		
	o-Xylene	X	Ethyl benzene		
	m-Xylene	X	Styrene		
	p-Xylene	X	o-Xylene		
		X	m-Xylene		
		X	p-Xylene		

Laboratory Number

Branch Lab Number

Chain of Custody and Supplemental Information

Only one chain of custody form is required per sample set or point (if all collected at the same time)

1. Collected by W.L.B. & J.W.W.
   Date 10-21-97 Time 10:20
   Delivered to KNOXVILLE STATE LAB
   Date 10-21-97 Time 12:45p
2. Received by
   Date Time
   Delivered to
   Date Time
3. Received by
   Date Time
   Delivered to
   Date Time
4. Received in Lab by [signature]
   Date 10-21-97 Time 12:45
   Logged in by
   Date Time

Additional Information

1. Approximate volume of sample 120 mL
2. Nearest town or city KNOXVILLE
3. Others present at collection BHM & [illegible]
4. Number of other samples collected at same time at this point THREE
5. Field collection procedure, handling and/or preservation of this sample ACCORDING TO U.S. EPA PROCEDURES AND PROTOCOLS
6. Mode of transportation to lab ON ICE, IN AN ICE CHEST, IN A STATE VEHICLE.
7. Sample sealed by
8. Date sample sealed
9. Remarks

NOV 21 1997

Project/Site No.: 47-559
Project Name: SMOKEY MTN. SMELTERS
Description: BAGHOUSE DUST
Station No.: SMS-WA-02
Collected: 10/21/97 10:20:00 By WLB
County: 47

Lab Number: 9710216-03F
Matrix: WASTE
Received: 10/21/97 12:45:00 By LAB
Sampling Agency: HWM_05_KFO
Priority: 11_21_97

TEST	RESULT	*ERROR	UNITS	ANALYZED	BY	METHOD
GAMMA RADIONUCLIDES						R.6
K-40	4.46	0.53	pCi/g dry wt	10/29/97	RJR	
GROSS ALPHA & BETA						R.1.3
GROSS ALPHA	0.36	0.39	pCi/g DRY WT.	10/29/97	NLF	
GROSS BETA	7.4	1.1	pCi/g DRY WT.	10/29/97	NLF	

*--Represents +/- error value

Printed: October 30, 1997

State of Tennessee - Environmental Laboratories

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Radiochemical Analysis

PROJECT/SITE NO. 47-559	PROJECT NAME SMOKEY MTN. SMELTERS
STATION NUMBER SMS-WA-02	COUNTY KNOX
DESCRIPTION BAGHOUSE DUST	
STREAM MILE N/A	DEPTH 0" to 10"
COLLECTED: DATE 10-21-97	TIME 10:20
PICK-UP DATE: N/A	
CONTACT HAZARD UNKNOWN	mR/hr Reading <0.1 mR/hr
SAMPLER'S NAME (printed) WILLIAM LEE BARRON	
SAMPLING AGENCY TDSF	BILLING CODE 527.38.05
IF PRIORITY, DATE NEEDED 11-28-97	
SEND REPORT TO: BURL MAUPIN, TDSF, KNOXVILLE ENVIRONMENTAL FIELD OFFICE	

Sample Type

___Air ___Milk ___Swipe
___Water ___Tissue ___Liquid
___Sludge ___Soil X Solid
___Vegetation ___Sediment

Other WASTE

Field Comments:

Air Samples
Volume ___
Total Hours ___

___Sample Filtration
___Sample Acidification
___Send to RESL

REQUESTED ANALYSES:

X	GROSS ALPHA (TOTAL)		STRONTIUM 89
	GROSS ALPHA (SUSPENDED)		STRONTIUM 90
	GROSS ALPHA (DISSOLVED)		TRITIUM (H-3)
X	GROSS BETA (TOTAL)		THORIUM (TOTAL)
	GROSS BETA (SUSPENDED)		URANIUM (TOTAL)
	GROSS BETA (DISSOLVED)	X	GAMMA RADIONUCLIDES
			ADDITIONAL ANALYSES:

Laboratory Number

Branch Lab Number

Date Received

Time Received **By**

Chain of Custody and Supplemental Information

Only one chain of custody form is required per sample set or point (if all collected at the same time)

1. Collected by Z.L.B. & J.W.W.
   Date 10-21-97 Time 10:20
   Delivered to KNOXVILLE STATE LAB
   Date 10-21-97 Time 12:45p
2. Collected by
   Date Time
   Delivered to
   Date Time
3. Collected by
   Date Time
   Delivered to
   Date Time
4. Received in Lab by [signature]
   Date 10-21-97 Time 12:45
   Logged in by
   Date Time

Additional Information

1. Approximate volume of sample 16 oz
2. Nearest town or city KNOXVILLE
3. Others present at collection BHM & A.D.D.
4. Number of other samples collected at same time at this point THREE
5. Field collection procedure, handling and/or preservation of this sample ACCORDING TO U.S. EPA PROCEDURES AND PROTOCOLS.
6. Mode of transportation to lab ON ICE, IN AN ICE CHEST, IN A STATE VEHICLE.
7. Sample sealed by
8. Date sample sealed
9. Remarks

PH-3009 (rev 1/96)

RDA 1527

Project/Site No.: 47-559
Project Name: SMOKEY MTN. SMELTERS
Description: WASTE AREA INSIDE BLDG.
Station No.: WA-03
llected: 10/21/97 10:30:00 By ADD
unty: 47

Lab Number: 9710216-04
Matrix: SOIL
Received: 10/21/97 12:45:00 By LAB
Sampling Agency: HWM_05_KFO
Priority: 11_21_97

DEC 03 1997

TEST	RESULT	UNITS	LIMIT	ANALYZED	BY	METHOD
AMMONIA	132	mg/kg	10	10/31/97	LKS	A.18.2
CYANIDE	U	mg/kg	1.0	10/31/97	SAL	A.9
ALUMINUM	88800	mg/kg	10	11/13/97	JAH	
ANTIMONY	5	mg/kg	1	11/19/97	JAH	
ARSENIC	7	mg/kg	1	11/21/97	JAH	
BARIUM	111	mg/kg	10	11/13/97	JAH	
BERYLLIUM	2	mg/kg	1	11/17/97	JAH	
CADMIUM	U	mg/kg	0.5	11/05/97	JAH	
CALCIUM	5850	mg/kg	10	11/07/97	JAH	
CHROMIUM	52	mg/kg	1	11/04/97	JAH	
COBALT	6	mg/kg	1	11/06/97	JAH	
COPPER	1080	mg/kg	1	11/04/97	JAH	
DIGESTION-METALS	COMPLETED	COMPLETED		10/29/97	EAM	
IRON	14800	mg/kg	5	11/04/97	JAH	
LEAD	53	mg/kg	4	11/04/97	JAH	
MAGNESIUM	9060	mg/kg	10	11/07/97	JAH	
MANGANESE	388	mg/kg	1	11/04/97	JAH	
MERCURY	U	mg/kg	0.1	11/18/97	EBS	EPA 245.5
METALS PREP-SOLIDS/WASTES	COMPLETED	COMPLETED		10/23/97	EAM	
NICKEL	169	mg/kg	2	11/04/97	JAH	
PERCENT SOLIDS	90.4	%		11/14/97	JAH	
POTASSIUM	15000	mg/kg	10	11/06/97	JAH	
LENIUM	1	mg/kg	1	11/20/97	JAH	

DEC 0 1997

Project/Site No.: 47-559
Project Name: SMOKEY MTN. SMELTERS
Description: WASTE AREA INSIDE BLDG.
Station No.: WA-03
llected: 10/21/97 10:30:00 By ADD
unty: 47

Lab Number: 9710216-04
Matrix: SOIL
Received: 10/21/97 12:45:00 By LAB
Sampling Agency: HWM_05_KFO
Priority: 11_21_97

TEST	RESULT	UNITS	LIMIT	ANALYZED	BY	METHOD
SILVER	U	mg/kg	1	11/06/97	JAH	
SODIUM	47400	mg/kg	10	11/06/97	JAH	
THALLIUM	U	mg/kg	5	11/06/97	JAH	
VANADIUM	49	mg/kg	20	11/17/97	JAH	
ZINC	1350	mg/kg	0.5	11/05/97	JAH	

Inorganic Analysis

State of Tennessee - Environmental Laboratories

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PROJECT/SITE NO. 47-059	PROJECT NAME [illegible]
STATION NUMBER [illegible]	COUNTY Knox
DESCRIPTION [illegible]	
STREAM MILE	DEPTH / MATRIX Soil
COLLECTED: DATE 10-21-97	TIME 10:20
SAMPLER'S NAME(printed)	
SAMPLING AGENCY UCF	BILLING CODE [illegible]
IF PRIORITY, DATE NEEDED 11/21/97	
SEND REPORT TO: KFO	
CONTACT HAZARD	

*	Metals
X	aluminum, Al
X	antimony, Sb
X	arsenic, As
X	barium, Ba
X	beryllium, Be
X	cadmium, Cd
X	calcium, Ca
X	chromium, Cr
X	cobalt, Co
X	copper, Cu
X	iron, Fe
X	lead, Pb
X	magnesium, Mg
X	manganese, Mn
X	mercury, Hg
X	nickel, Ni
X	potassium, K
X	selenium, Se
X	silver, Ag
X	sodium, Na
X	thallium, Tl
X	vanadium, V
X	zinc, Zn

*	Env. Microbiology
	coliform, fecal*
	coliform, total*
	strep, fecal*
*	**Ambient Parameters**
	COD*
	coliform, fecal
	conductivity*
	hardness, total as $CaCO_3$*
X	nitrogen, ammonia
	nitrogen, NO_3 & NO_2
	nitrogen, total Kjeldahl
	phosphate, total
	pH
	residue, dissolved*
	residue, suspended*
	arsenic, As
	cadmium, Cd
	chromium, Cr
	copper, Cu
	lead, Pb
	mercury, Hg
	nickel, Ni
	zinc, Zn

*	General Inorganics
	acidity as $CaCO_3$*
	alkalinity as $CaCO_3$*
	alkalinity, phen. as $CaCO_3$*
	BOD, 5-day*
	CBOD, 5-day*
	boron
	chloride*
	chlorine, residual*
	chromium, hexavalent
	COD*
	color, apparent*
	color, true*
	conductivity*
X	cyanide
	flash point*
	fluoride*
	hardness, Ca as $CaCO_3$*
	hardness, total as $CaCO_3$*
	hydrocarbons, total
	MBAS*
X	nitrogen, ammonia
	nitrogen, nitrate*
	nitrogen, nitrite*
	nitrogen, NO_3 & NO_2
	nitrogen, total Kjeldahl
	nitrogen, total organic

	Gen. Inorganics (con't)
	oil and grease
	orthophosphate, total*
	oxygen, dissolved*
	pH
	phenols, total
	phosphate, total
	residue, dissolved*
	residue, settleable*
	residue, suspended*
	residue, total*
	silica*
	sulfate*
	sulfide, total*
	TOC*
	turbidity*
	percent solids
*	**Other**

*	TCLP
	arsenic, As
	barium, Ba
	cadmium, Cd
	chromium, Cr
	lead, Pb
	mercury, Hg
	nickel, Ni
	selenium, Se
	silver, Ag

*** denotes analyses performed only on water**

FIELD DETERMINATIONS	Temperature
pH	Chlorine, residual
Conductivity	Other
Dissolved Oxygen	fac = [illegible]

Laboratory Number

Branch Lab Number

Chain of Custody and Supplemental Information

Only one chain of custody form is required per sample set or point (if all collected at the same time)

1. Collected by BHM
   Date 10-21-97 Time 10:20
   Delivered to KRL
   Date 10-21-97 Time 12:45
2. Received by
   Date Time
   Delivered to
   Date Time
3. Received by
   Date Time
   Delivered to
   Date Time
4. Received in Lab by [signature]
   Date 10-21-97 Time 12:45
   Logged in by
   Date Time

Additional Information

1. Approximate volume of sample
   500 ml
2. Nearest town or city Knoxville
3. Others present at collection
   WLF, AJP, JWW
4. Number of other samples collected at same time at this point >
5. Field collection procedure, handling and/or preservation of this sample
   standard
6. Mode of transportation to lab state vehicle
7. Sample sealed by
8. Date sample sealed
9. Remarks

RDA 1527

PH-3011 (rev 1/96)

DEC 1997

Project/Site No.: 47-559
Project Name: SMOKEY MOUNTAIN SMELTERS
Description: WASTE AREA INSIDE BLDS.
Station No.: WA-03
lected: 10/21/97 10:30:00 By WLB
County: 47

Lab Number: 9710238-04A
Matrix: SEDIMENT
Received: 10/23/97 08:30:00 By LJB
Sampling Agency: HWM_05_KFO
Priority: 11_21_97

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
B/N/A EXTR+PESTS,PCBS-SOIL						MS+ECD
BUTYL BENZYL PHTHALATE	U	PPB	410	11/14/97	MAC	
BIS(2-ETHYLHEXYL)PHTHALATE	572	PPB	-	11/14/97	MAC	
DI-n-BUTYL PHTHALATE	U	PPB	410	11/14/97	MAC	
DI-n-OCTYL PHTHALATE	U	PPB	1000	11/14/97	MAC	
DIETHYL PHTHALATE	U	PPB	200	11/14/97	MAC	
DIMETHYL PHTHALATE	U	PPB	200	11/14/97	MAC	
n-NITROSODIMETHYLAMINE	U	PPB	100	11/14/97	MAC	
n-NITROSODIPHENYLAMINE	U	PPB	410	11/14/97	MAC	
n-NITROSO-di-n-PROPYLAMINE	U	PPB	410	11/14/97	MAC	
ISOPHORONE	U	PPB	100	11/14/97	MAC	
NITROBENZENE	U	PPB	410	11/14/97	MAC	
2,4-DINITROTOLUENE	U	PPB	1000	11/14/97	MAC	
2,6-DINITROTOLUENE	U	PPB	1000	11/14/97	MAC	
ACENAPTHENE	U	PPB	200	11/14/97	MAC	
ACENAPHTHYLENE	U	PPB	200	11/14/97	MAC	
ANTHRACENE	U	PPB	200	11/14/97	MAC	
BENZO(a)ANTHRACENE	U	PPB	200	11/14/97	MAC	
BENZO(a)PYRENE	U	PPB	200	11/14/97	MAC	
BENZO(b)FLUORANTHENE	U	PPB	200	11/14/97	MAC	
BENZO(ghi)PERYLENE	U	PPB	410	11/14/97	MAC	
BENZO(k)FLUORANTHENE	U	PPB	200	11/14/97	MAC	
DIBENZO(a,h)ANTHRACENE	U	PPB	1000	11/14/97	MAC	
FLUORANTHENE	U	PPB	100	11/14/97	MAC	
FLUORENE	U	PPB	100	11/14/97	MAC	
INDENO(1,2,3-cd)PYRENE	U	PPB	1000	11/14/97	MAC	
NAPHTHALENE	U	PPB	100	11/14/97	MAC	
PHENANTHRENE	J 79.9	PPB	100	11/14/97	MAC	
PYRENE	U	PPB	100	11/14/97	MAC	
CHRYSENE	U	PPB	200	11/14/97	MAC	
BIS(2-CHLOROETHYL)ETHER	U	PPB	410	11/14/97	MAC	
BIS(2-CHLOROETHOXY)METHANE	U	PPB	410	11/14/97	MAC	
BIS(2-CHLOROISOPROPYL)ETHER	U	PPB	410	11/14/97	MAC	
4-BROMOPHENYLPHENYL ETHER	U	PPB	410	11/14/97	MAC	
4-CHLOROPHENYLPHENYL ETHER	U	PPB	410	11/14/97	MAC	
HEXACHLOROCYCLOPENTADIENE	U	PPB	1000	11/14/97	MAC	
HEXACHLOROBUTADIENE	U	PPB	410	11/14/97	MAC	
HEXACHLOROBENZENE	U	PPB	410	11/14/97	MAC	
HEXACHLOROETHANE	U	PPB	410	11/14/97	MAC	
1,2,4-TRICHLOROBENZENE	U	PPB	410	11/14/97	MAC	
2-CHLORONAPHTHALENE	U	PPB	200	11/14/97	MAC	
4-CHLORO-3-METHYLPHENOL	U	PPB	410	11/14/97	MAC	
2-CHLOROPHENOL	U	PPB	410	11/14/97	MAC	
2,4-DICHLOROPHENOL	U	PPB	410	11/14/97	MAC	
2,4-DIMETHYLPHENOL	U	PPB	410	11/14/97	MAC	
2,4-DINITROPHENOL	U	PPB	2000	11/14/97	MAC	
2-METHYL-4,6-DINITROPHENOL	U	PPB	1000	11/14/97	MAC	
2-NITROPHENOL	U	PPB	1000	11/14/97	MAC	
4-NITROPHENOL	U	PPB	1000	11/14/97	MAC	
PENTACHLOROPHENOL	U	PPB	1000	11/14/97	MAC	
PHENOL	U	PPB	410	11/14/97	MAC	
2,4,6-TRICHLOROPHENOL	U	PPB	410	11/14/97	MAC	
2,4,5-TRICHLOROPHENOL	U	PPB	410	11/14/97	MAC	
O-CRESOL	U	PPB	410	11/14/97	MAC	
M- & P-CRESOL	U	PPB	410	11/14/97	MAC	
2-METHYLNAPHTHALENE	U	PPB	200	11/14/97	MAC	
BENZOIC ACID	U	PPB	2000	11/14/97	MAC	
BENZYL ALCOHOL	U	PPB	410	11/14/97	MAC	
4-CHLOROANILINE	U	PPB	410	11/14/97	MAC	
DIBENZOFURAN	U	PPB	100	11/14/97	MAC	
3,3-DICHLOROBENZIDINE	U	PPB	1000	11/14/97	MAC	
2-NITROANILINE	U	PPB	1000	11/14/97	MAC	
3-NITROANILINE	U	PPB	1000	11/14/97	MAC	
4-NITROANILINE	U	PPB	1000	11/14/97	MAC	
ALDRIN	U	PPB	10	11/14/97	MAC	
alpha-BHC	U	PPB	19	11/14/97	MAC	
a-BHC	U	PPB	27	11/14/97	MAC	
beta-BHC	U	PPB	27	11/14/97	MAC	
gamma-BHC (LINDANE)	U	PPB	10	11/14/97	MAC	
alpha-CHLORDANE	U	PPB	14	11/14/97	MAC	
gamma-CHLORDANE	U	PPB	10	11/14/97	MAC	
TECHNICAL CHLORDANE	U	PPB	78	11/14/97	MAC	
p,p-DDD	U	PPB	9.7	11/14/97	MAC	
p,p-DDE	U	PPB	17	11/14/97	MAC	

DEC 0 8 1997

Project/Site No.:	47-559	Lab Number:	9710238-04A
Project Name:	SMOKEY MOUNTAIN SMELTERS	Matrix:	SEDIMENT
Description:	WASTE AREA INSIDE BLDS.	Received:	10/23/97 08:30:00 By LJB
Station No.:	WA-03	Sampling Agency:	HWM_05_KFO
Collected:	10/21/97 10:30:00 By WLB	Priority:	11_21_97
County:	47		

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
B/N/A EXTR+PESTS,PCBS-SOIL						MS+ECD
p,p-DDT	U	PPB	9.1	11/14/97	MAC	
DIELDRIN	U	PPB	11	11/14/97	MAC	
ENDOSULFAN I	U	PPB	17	11/14/97	MAC	
ENDOSULFAN II	U	PPB	9.8	11/14/97	MAC	
ENDOSULFAN SULFATE	U	PPB	9.8	11/14/97	MAC	
ENDRIN	U	PPB	9.8	11/14/97	MAC	
ENDRIN ALDEHYDE	U	PPB	8.2	11/14/97	MAC	
ENDRIN KETONE	U	PPB	10	11/14/97	MAC	
HEPTACHLOR	U	PPB	13	11/14/97	MAC	
HEPTACHLOR EPOXIDE	U	PPB	14	11/14/97	MAC	
TOXAPHENE	U	PPB	570	11/14/97	MAC	
METHOXYCHLOR	U	PPB	38	11/14/97	MAC	
PCB 1016/1242	U	PPB	610	11/14/97	MAC	
PCB 1221	U	PPB	670	11/14/97	MAC	
PCB 1232	U	PPB	760	11/14/97	MAC	
PCB 1248	U	PPB	520	11/14/97	MAC	
PCB 1254	U	PPB	340	11/14/97	MAC	
PCB 1260	U	PPB	300	11/14/97	MAC	
PCB 1262	U	PPB	240	11/14/97	MAC	

*-Water, uG/L; Sediment, uG/kG

Printed: December 1, 1997

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Organic Analysis
Base/Neutral/Acid Extractables

PROJECT/SITE NO.	PROJECT NAME
STATION NUMBER	COUNTY
DESCRIPTION	
STREAM MILE	DEPTH / MATRIX
COLLECTED: DATE	TIME
SAMPLER'S NAME(printed)	
SAMPLING AGENCY	BILLING CODE
IF PRIORITY, DATE NEEDED	
SEND REPORT TO:	
CONTACT HAZARD	

	NPDES Extractables		NPDES Extractables(con't)		TAL Semivolatiles
	butylbenzylphthalate	X	2-chlorophenol	X	dimethylphthalate
	bis(2-ethylhexyl)phthalate		2,4-dichlorophenol	X	4,6-dinitro-2-methylphenol
	di-n-butylphthalate		2,4-dimethylphenol	X	2,4-dinitrophenol
	di-n-octylphthalate		2,4-dinitrophenol	X	2,4-dinitrotoluene
	diethylphthalate		4,6-dinitro-o-cresol	X	2,6-dinitrotoluene
	dimethylphthalate		2-nitrophenol	X	fluoranthene
X	n-nitrosodimethylamine		4-nitrophenol	X	fluorene
	n-nitrosodiphenylamine		pentachlorophenol	X	hexachlorobenzene
	n-nitrosodi-n-propylamine		phenol	X	hexachlorobutadiene
	isophorone		2,4,6-trichlorophenol	X	hexachlorocyclopentadiene
	nitrobenzene		**TAL Semivolatiles**	X	hexachloroethane
	2,4-dinitrotoluene	X	acenaphthene	X	indeno(1,2,3-cd)pyrene
	acenaphthene	X	acenaphthylene	X	isophorone
	acenaphthylene	X	anthracene	X	2-methylnaphthalene
	anthracene	X	benzo(a)anthracene	X	2-methylphenol
	benzo(a)anthracene	X	benzo(a)pyrene	X	4-methylphenol
	benzo(a)pyrene	X	benzo(b)fluoranthene	X	n-nitrosodiphenylamine
	benzo(b)fluoranthene	X	benzo(g,h,i)perylene	X	n-nitroso-n-dipropylamine
	benzo(g,h,i)perylene	X	benzo(k)fluoranthene	X	naphthalene
	benzo(k)fluoranthene	X	benzoic acid	X	2-nitroaniline
	chrysene	X	benzyl alcohol	X	3-nitroaniline
	dibenzo(a,h)anthracene	X	bis(2-chloroethoxy)methane	X	4-nitroaniline
	fluoranthene	X	bis(2-chloroethyl) ether	X	nitrobenzene
	fluorene	X	bis(2-chloroisopropyl)ether	X	2-nitrophenol
	indeno(1,2,3-c,d)pyrene	X	bis(2-ethylhexyl)phthalate	X	4-nitrophenol
	naphthalene	X	4-bromophenylphenylether	X	pentachlorophenol
	phenanthrene	X	butylbenzylphthalate	X	phenanthrene
	pyrene	X	4-chloroaniline	X	phenol
	bis(2-chloroethyl)ether	X	4-chloro-3-methyl phenol	X	pyrene
	bis(2-chloroethoxy)methane	X	2-chloronaphthalene	X	1,2,4-trichlorobenzene
	bis(2-chloroisopropyl)ether	X	4-chlorophenylphenylether	X	2,4,5-trichlorophenol
	4-bromophenylphenylether	X	chrysene	X	2,4,6-trichlorophenol
	4-chlorophenylphenylether	X	di-n-butylphthalate		**Nitrobodies**
	hexachlorocyclopentadiene	X	di-n-octylphthalate		RDX
	hexachlorobutadiene	X	dibenzo(a,h)anthracene		2,4,6-TNT
	hexachlorobenzene	X	dibenzofuran		2,4-dinitrotoluene
	hexachloroethane	X	3,3'-dichlorobenzidine		2,6-dinitrotoluene
	1,2,4-trichlorobenzene	X	2,4-dichlorophenol		nitrobenzene
	2-chloronaphthalene	X	diethylphthalate		1,3,5-TNB
	4-chloro-3-methyl phenol	X	2,4-dimethylphenol		

	TCLP Semivolatiles
	chlordane
	o-cresol
	m-cresol
	p-cresol
	cresol
	2,4-D
	2,4-dinitrotoluene
	endrin
	heptachlor
	heptachlor epoxide
	hexachlorobenzene
	hexachlorobutadiene
	hexachloroethane
	lindane
	methoxychlor
	nitrobenzene
	pentachlorophenol
	pyridine
	toxaphene
	2,4,5-trichlorophenol
	2,4,6-trichlorophenol
	2,4,5-TP (Silvex)
	Pesticides/PCBs
X	aldrin
X	alpha-BHC
X	beta-BHC
X	delta-BHC
X	gamma-BHC (lindane)
X	technical chlordane
X	alpha-chlordane
X	gamma-chlordane
X	4,4'-DDD
X	4,4'-DDE
X	4,4'-DDT
X	dieldrin
X	endosulfan I
X	endosulfan II
X	endosulfan sulfate
X	endrin
X	endrin aldehyde
X	endrin ketone
X	heptachlor
X	heptachlor epoxide
X	toxaphene
X	methoxychlor
X	PCB 1016/1242
X	PCB 1221
X	PCB 1232
X	PCB 1248
X	PCB 1254
X	PCB 1260
X	PCB 1262

Laboratory Number

Branch Lab Number

Chain of Custody and Supplemental Information

Only one chain of custody form is required per sample set or point (if all collected at the same time)

1. Collected by ADD
   Date 10-21-97 Time 10:30
   Delivered to KDL
   Date 10-21-97 Time 12:45
2. Received by
   Date Time
   Delivered to
   Date Time
3. Received by
   Date Time
   Delivered to
   Date Time
4. Received in Lab by [illegible]
   Date 10-21-97 Time 12:45
   Logged in by
   Date Time

Additional Information

1. Approximate volume of sample ~~[illegible]~~ 500 ml
2. Nearest town or city Knoxville
3. Others present at collection
   [illegible]
4. Number of other samples collected at same time at this point 7
5. Field collection procedure, handling and/or preservation of this sample
   Standard
6. Mode of transportation to lab
   Private Vehicle
7. Sample sealed by
8. Date sample sealed
9. Remarks

PH-3014 (rev 1/96)

RDA 1527

Project/Site No.: 47-559
Project Name: SMOKEY MTN. SMELTERS
Site Description: WASTE AREA INSIDE BLDG.
Station No.: WA-03
C ected: 10/21/97 10:30:00 By ADD
C ty: 47

Lab Number: 9710216-04E
Matrix: SOIL
Received: 10/21/97 12:45:00 By LAB
Sampling Agency: HWM_05_KFO
Priority: 11_21_97

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
VOLATILES-TAL SEDIMENTS						8260A
ACETONE	U	PPB	25	10/24/97	HMG	
BENZENE	U	PPB	2.5	10/24/97	HMG	
BROMODICHLOROMETHANE	U	PPB	2.5	10/24/97	HMG	
BROMOFORM	U	PPB	2.5	10/24/97	HMG	
BROMOMETHANE	U	PPB	5.0	10/24/97	HMG	
2-BUTANONE (MEK)	U	PPB	25	10/24/97	HMG	
CARBON DISULFIDE	U	PPB	5.0	10/24/97	HMG	
CARBON TETRACHLORIDE	U	PPB	2.5	10/24/97	HMG	
VINYL ACETATE	U	PPB	5.0	10/24/97	HMG	
CHLOROBENZENE	U	PPB	2.5	10/24/97	HMG	
CHLOROETHANE	U	PPB	5.0	10/24/97	HMG	
CHLOROFORM	U	PPB	2.5	10/24/97	HMG	
CHLOROMETHANE	U	PPB	5.0	10/24/97	HMG	
DIBROMOCHLOROMETHANE	U	PPB	2.5	10/24/97	HMG	
1,2-DICHLOROBENZENE	U	PPB	2.5	10/24/97	HMG	
1,3-DICHLOROBENZENE	U	PPB	2.5	10/24/97	HMG	
1,4-DICHLOROBENZENE	U	PPB	2.5	10/24/97	HMG	
DICHLORODIFLUOROMETHANE	U	PPB	5.0	10/24/97	HMG	
1,1-DICHLOROETHANE	U	PPB	2.5	10/24/97	HMG	
1,2-DICHLOROETHANE	U	PPB	2.5	10/24/97	HMG	
1,1-DICHLOROETHENE	U	PPB	2.5	10/24/97	HMG	
CIS-1,2-DICHLOROETHENE	U	PPB	2.5	10/24/97	HMG	
TRANS-1,2-DICHLOROETHENE	U	PPB	2.5	10/24/97	HMG	
1,2-DICHLOROPROPANE	U	PPB	2.5	10/24/97	HMG	
CIS-1,3-DICHLOROPROPENE	U	PPB	2.5	10/24/97	HMG	
TRANS-1,3-DICHLOROPROPENE	U	PPB	2.5	10/24/97	HMG	
ETHYLBENZENE	U	PPB	2.5	10/24/97	HMG	
METHYLENE CHLORIDE	U	PPB	2.5	10/24/97	HMG	
4-METHYL-2-PENTANONE (MIBK)	U	PPB	25	10/24/97	HMG	
STYRENE	U	PPB	2.5	10/24/97	HMG	
2-HEXANONE	U	PPB	5.0	10/24/97	HMG	
1,1,2,2-TETRACHLOROETHANE	U	PPB	2.5	10/24/97	HMG	
TETRACHLOROETHENE	U	PPB	2.5	10/24/97	HMG	
TOLUENE	2.3	PPB	2.5	10/24/97	HMG	
1,1,1-TRICHLOROETHANE	U	PPB	2.5	10/24/97	HMG	
1,1,2-TRICHLOROETHANE	U	PPB	2.5	10/24/97	HMG	
TRICHLOROETHENE	U	PPB	2.5	10/24/97	HMG	
TRICHLOROFLUOROMETHANE	U	PPB	5.0	10/24/97	HMG	
VINYL CHLORIDE	U	PPB	5.0	10/24/97	HMG	
o-XYLENE	U	PPB	2.5	10/24/97	HMG	
m&p-XYLENE	U	PPB	2.5	10/24/97	HMG	

*-Water, uG/L; Sediment, uG/kG

Printed: October 27, 1997

State of Tennessee - Environmental Laboratories

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Organic Analysis

Volatiles and Petroleum Hydrocarbons

PROJECT/SITE NO. 97-559	PROJECT NAME Smoky Mtn Smelting
STATION NUMBER WA-03	COUNTY Knox
DESCRIPTION Waste Area Side Bldg	
STREAM MILE	DEPTH — MATRIX SOIL
COLLECTED: DATE 10-21-97	TIME 10:20
SAMPLER'S NAME(printed) Adam DeWeese	
SAMPLING AGENCY DSF	BILLING CODE 3272801
IF PRIORITY, DATE NEEDED 11-21-97	
SEND REPORT TO: KFO	
CONTACT HAZARD ammonia, metals, radioactivity	

*	NPDES Volatiles - 624	*	TAL Volatiles - 8260A	*	TCLP Volatiles
	Bromoform	X	Chloromethane		Benzene
	Bromodichloromethane		Bromomethane		Carbon tetrachloride
	Carbon Tetrachloride		Vinyl chloride		Chlorobenzene
	Chlorobenzene		Chloroethane		Chloroform
	Chloroethane		Methylene chloride		1,2-Dichloroethane
X	2-Chloroethylvinyl ether		Acetone		1,1-Dichloroethane
	Chloroform		Carbon disulfide		Methyl ethyl ketone
	Chloromethane		1,1-Dichloroethene		Tetrachloroethene
	Dibromochloromethane		1,1-Dichloroethane		Trichloroethene
X	1,2-Dichlorobenzene		Cis-1,2-dichloroethene		Vinyl chloride
X	1,3-Dichlorobenzene		Trans-1,2-dichloroethene	*	BTEX - 8260A - UST
X	1,4-Dichlorobenzene		1,2-Dichloroethane		Benzene
X	Dichlorodifluoromethane		Chloroform		Toluene
	1,1-Dichloroethane		2-Butanone		Ethyl benzene
	1,2-Dichloroethane		1,1,1-Trichloroethane		o-Xylene
	1,1-Dichloroethene		Carbon tetrachloride		m-Xylene
	Cis-1,2-dichloroethene		Vinyl acetate		p-Xylene
	Trans-1,2-dichloroethene		Bromodichloromethane		Methyl t-butyl ether
	1,2-Dichloropropane		1,2-Dichloropropane		Diisopropyl ether
	Cis-1,3-dichloropropene		Cis-1,3-dichloropropane	*	TPH by GC
	Trans-1,2-dichloroethene		Trichloroethene		Gasoline Range Organics
	Methylene chloride		Dibromochloromethane		Diesel Range Organics
	1,1,2,2-Tetrachloroethane		1,1,2-Trichloroethane	*	TPH by IR (418.1)
	Tetrachloroethene		Benzene		418.1 - Waste Oil
	1,1,1-Trichloroethane		Trans-1,3-dichloropropene	*	Other
	1,1,2-Trichloroethane		Bromoform		
	Trichloroethene		4-Methyl-2-pentanone		
X	Trichlorofluoromethane		2-Hexanone		
	Vinyl chloride		Tetrachloroethene		
	Benzene		Toluene		
	Ethylbenzene		1,1,2,2-Tetrachloroethane		
	Toluene		Chlorobenzene		
	o-Xylene		Ethyl benzene		
	m-Xylene		Styrene		
	p-Xylene		o-Xylene		
			m-Xylene		
		X	p-Xylene		

Laboratory Number

Branch Lab Number

Chain of Custody and Supplemental Information

Only one chain of custody form is required per sample set or point (if all collected at the same time)

1. Collected by ADD
   Date 10-21-97 Time 10:20
   Delivered to KPL
   Date 10-21-97 Time 12:45
2. Received by
   Date Time
   Delivered to
   Date Time
3. Received by
   Date Time
   Delivered to
   Date Time
4. Received in Lab by [signature]
   Date 10-21-97 Time 12:45
   Logged in by
   Date Time

Additional Information

1. Approximate volume of sample 4 oz
2. Nearest town or city Knoxville
3. Others present at collection WLB, PHM, JWW
4. Number of other samples collected at same time at this point 3
5. Field collection procedure, handling and/or preservation of this sample Standard
6. Mode of transportation to lab State Vehicle
7. Sample sealed by
8. Date sample sealed
9. Remarks

PH-3013 (rev 1/96)

RDA 1527

NOV 21 1997

Project/Site No.:	47-559	Lab Number:	9710216-04F
Project Name:	SMOKEY MTN. SMELTERS	Matrix:	SOIL
Description:	WASTE AREA INSIDE BLDG.	Received:	10/21/97 12:45:00 By LAB
Station No.:	WA-03	Sampling Agency:	HWM_05_KFO
Collected:	10/21/97 10:30:00 By ADD	Priority:	11_21_97
County:	47		

TEST	RESULT	*ERROR	UNITS	ANALYZED	BY	METHOD
GAMMA RADIONUCLIDES						R.6
K-40	11.93	0.59	pCi/g dry wt	10/29/97	RJR	
GROSS ALPHA & BETA						R.1.3
GROSS ALPHA	0.65	0.73	pCi/g DRY WT.	10/29/97	NLF	
GROSS BETA	21.7	1.7	pCi/g DRY WT.	10/29/97	NLF	

*--Represents +/- error value

Printed: October 30, 1997

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Radiochemical Analysis

PROJECT/SITE NO. 47-559	PROJECT NAME Smoky Mtn Smelters
STATION NUMBER WA-03	COUNTY Knox
DESCRIPTION Waste area inside Bldg	
STREAM MILE	DEPTH
COLLECTED: DATE 10-21-97	TIME 10:30
PICK-UP DATE:	
CONTACT HAZARD Ammonia metal	mR/hr Reading ≥ .02
SAMPLER'S NAME (printed) Adam DeWeele	
SAMPLING AGENCY DSF	BILLING CODE 327.38.01
IF PRIORITY, DATE NEEDED 11-21-97	
SEND REPORT TO: KFO	

Laboratory Number

Branch Lab Number

Date Received

Time Received **By**

Sample Type

___Air ___Milk ___Swipe
___Water ___Tissue ___Liquid
___Sludge X Soil ___Solid
___Vegetation ___Sediment

Other_____

Field Comments:

Air Samples
Volume _____
Total Hours _____

___Sample Filtration
___Sample Acidification
___Send to RESL

Chain of Custody and Supplemental Information

Only one chain of custody form is required per sample set or point (if all collected at the same time)

1. Collected by ADD
   Date 10-21-97 Time 10:30
   Delivered to KPL
   Date 10-21-97 Time 12:45
2. Collected by
   Date Time
   Delivered to
   Date Time
3. Collected by
   Date Time
   Delivered to
   Date Time
4. Received in Lab by Laura A. Baker
   Date 11-21-97 Time 12:45
   Logged in by
   Date Time

REQUESTED ANALYSES:

X	GROSS ALPHA (TOTAL)		STRONTIUM 89
	GROSS ALPHA (SUSPENDED)		STRONTIUM 90
	GROSS ALPHA (DISSOLVED)		TRITIUM (H-3)
X	GROSS BETA (TOTAL)		THORIUM (TOTAL)
	GROSS BETA (SUSPENDED)		URANIUM (TOTAL)
	GROSS BETA (DISSOLVED)	X	GAMMA RADIONUCLIDES
			ADDITIONAL ANALYSES:

Additional Information

1. Approximate volume of sample 500 ml
2. Nearest town or city Knoxville
3. Others present at collection WLB RHM TWW
4. Number of other samples collected at same time at this point 2
5. Field collection procedure, handling and/or preservation of this sample Standard
6. Mode of transportation to lab State Vehicle
7. Sample sealed by
8. Date sample sealed
9. Remarks

DEC 03 1997

Project/Site No.: 47-559
Project Name: SMOKEY MTN. SMELTERS
Description: OUTSIDE WASTE PILE
ation No.: WA-04
llected: 10/21/97 11:05:00 By WLB
County: 47

Lab Number: 9710216-05
Matrix: SOIL
Received: 10/21/97 12:45:00 By LAB
Sampling Agency: HWM_05_KFO
Priority: 11_21_97

TEST	RESULT	UNITS	LIMIT	ANALYZED	BY	METHOD
AMMONIA	135	mg/kg	10	10/31/97	LKS	A.18.2
CYANIDE	U	mg/kg	1.0	10/31/97	SAL	A.9
ALUMINUM	135000	mg/kg	10	11/13/97	JAH	
ANTIMONY	9	mg/kg	1	11/19/97	JAH	
ARSENIC	11	mg/kg	1	11/21/97	JAH	
BARIUM	222	mg/kg	10	11/13/97	JAH	
BERYLLIUM	1	mg/kg	1	11/17/97	JAH	
CADMIUM	1.4	mg/kg	0.5	11/05/97	JAH	
CALCIUM	9680	mg/kg	10	11/07/97	JAH	
CHROMIUM	93	mg/kg	1	11/04/97	JAH	
COBALT	13	mg/kg	1	11/06/97	JAH	
COPPER	576	mg/kg	1	11/04/97	JAH	
DIGESTION-METALS	COMPLETED	COMPLETED		10/29/97	EAM	
IRON	15400	mg/kg	5	11/04/97	JAH	
LEAD	96	mg/kg	4	11/04/97	JAH	
MAGNESIUM	8240	mg/kg	10	11/07/97	JAH	
MANGANESE	339	mg/kg	1	11/04/97	JAH	
MERCURY	U	mg/kg	0.1	11/18/97	EBS	EPA 245.5
METALS PREP-SOLIDS/WASTES	COMPLETED	COMPLETED		10/23/97	EAM	
NICKEL	326	mg/kg	2	11/04/97	JAH	
PERCENT SOLIDS	78.6	%		11/14/97	JAH	
POTASSIUM	5250	mg/kg	10	11/06/97	JAH	
SELENIUM	2	mg/kg	1	11/20/97	JAH	

DEC 08 1997

Project/Site No.: 47-559
Project Name: SMOKEY MTN. SMELTERS
Description: OUTSIDE WASTE PILE
Station No.: WA-04
Collected: 10/21/97 11:05:00 By WLB
County: 47

Lab Number: 9710216-05
Matrix: SOIL
Received: 10/21/97 12:45:00 By LAB
Sampling Agency: HWM_05_KFO
Priority: 11_21_97

TEST	RESULT	UNITS	LIMIT	ANALYZED	BY	METHOD
SILVER	U	mg/kg	1	11/06/97	JAH	
SODIUM	9880	mg/kg	10	11/06/97	JAH	
THALLIUM	U	mg/kg	5	11/06/97	JAH	
VANADIUM	76	mg/kg	20	11/17/97	JAH	
ZINC	1140	mg/kg	0.5	11/05/97	JAH	

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Inorganic Analysis

PROJECT/SITE NO. 47-559	PROJECT NAME Smoky Mtn. Smelter
STATION NUMBER W904	COUNTY Knox
DESCRIPTION Outside Waste Pile	
STREAM MILE	DEPTH / MATRIX
COLLECTED: DATE 10/21/97	TIME 11:05
SAMPLER'S NAME(printed) Lee Barron	
SAMPLING AGENCY DSF	BILLING CODE 329.38.01
IF PRIORITY, DATE NEEDED 11/21/97	
SEND REPORT TO: KFO - BHM	
CONTACT HAZARD Radioactivity, NH3, metals	

*	Metals
x	aluminum, Al
x	antimony, Sb
x	arsenic, As
x	barium, Ba
x	beryllium, Be
x	cadmium, Cd
x	calcium, Ca
x	chromium, Cr
x	cobalt, Co
x	copper, Cu
x	iron, Fe
x	lead, Pb
x	magnesium, Mg
x	manganese, Mn
x	mercury, Hg
x	nickel, Ni
x	potassium, K
x	selenium, Se
x	silver, Ag
x	sodium, Na
x	thallium, Tl
x	vanadium, V
x	zinc, Zn

*	Env. Microbiology	*	General Inorganics		Gen. Inorganics (con't)
	coliform, fecal*		acidity as $CaCO_3$*		oil and grease
	coliform, total*		alkalinity as $CaCO_3$*		orthophosphate, total*
	strep, fecal*		alkalinity, phen. as $CaCO_3$*		oxygen, dissolved*
			BOD, 5-day*		pH
			CBOD, 5-day*		phenols, total
			boron		phosphate, total
*	**Ambient Parameters**		chloride*		residue, dissolved*
	COD*		chlorine, residual*		residue, settleable*
	coliform, fecal		chromium, hexavalent		residue, suspended*
	conductivity*		COD*		residue, total*
	hardness, total as $CaCO_3$*		color, apparent*		silica*
x	nitrogen, ammonia		color, true*		sulfate*
	nitrogen, NO_3 & NO_2		conductivity*		sulfide, total*
	nitrogen, total Kjeldahl	x	cyanide		TOC*
	phosphate, total		flash point*		turbidity*
	pH		fluoride*		percent solids
	residue, dissolved*		hardness, Ca as $CaCO_3$*	*	**Other**
	residue, suspended*		hardness, total as $CaCO_3$*		
	arsenic, As		hydrocarbons, total		
	cadmium, Cd		MBAS*		
	chromium, Cr	x	nitrogen, ammonia		
	copper, Cu		nitrogen, nitrate*		
	lead, Pb		nitrogen, nitrite*		
	mercury, Hg		nitrogen, NO_3 & NO_2		
	nickel, Ni		nitrogen, total Kjeldahl		
	zinc, Zn		nitrogen, total organic		

*	TCLP
	arsenic, As
	barium, Ba
	cadmium, Cd
	chromium, Cr
	lead, Pb
	mercury, Hg
	nickel, Ni
	selenium, Se
	silver, Ag

** denotes analyses performed only on water*

FIELD DETERMINATIONS	Temperature
pH	Chlorine, residual
Conductivity	Other
Dissolved Oxygen	rad < 0.1 mR/hr

Laboratory Number

Branch Lab Number

Chain of Custody and Supplemental Information

Only one chain of custody form is required per sample set or point (if all collected at the same time)

1. Collected by Lee Barron
   Date 10/21/97 Time 11:05a
   Delivered to KBL
   Date 10/21/97 Time 12:45p
2. Received by
   Date Time
   Delivered to
   Date Time
3. Received by
   Date Time
   Delivered to
   Date Time
4. Received in Lab by [illegible]
   Date 10-21-97 Time 12:45
   Logged in by
   Date Time

Additional Information

1. Approximate volume of sample
   500 ml
2. Nearest town or city Knoxville
3. Others present at collection BHM, ADD, WLB & JWW
4. Number of other samples collected at same time at this point 3
5. Field collection procedure, handling and/or preservation of this sample Standard
6. Mode of transportation to lab State vehicle
7. Sample sealed by JWW
8. Date sample sealed
9. Remarks

Project/Site No.: 47-559
Project Name: SMOKEY MOUNTAIN SMELTERS
Description: OUTSIDE WASTE PILE
Station No.: WA-04
lected: 10/21/97 11:05:00 By WLB
County: 47

Lab Number: 9710238-05A
Matrix: SEDIMENT
Received: 10/23/97 08:30:00 By LJB
Sampling Agency: HWM_05_KFO
Priority: 11_21_97

DEC 1997

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
B/N/A EXTR+PESTS,PCBS-SOIL						MS+ECD
BUTYL BENZYL PHTHALATE	U	PPB	460	11/14/97	MAC	
BIS(2-ETHYLHEXYL)PHTHALATE	U	PPB	460	11/14/97	MAC	
DI-n-BUTYL PHTHALATE	U	PPB	460	11/14/97	MAC	
DI-n-OCTYL PHTHALATE	U	PPB	1200	11/14/97	MAC	
DIETHYL PHTHALATE	B,J 125	PPB	230	11/14/97	MAC	
DIMETHYL PHTHALATE	U	PPB	230	11/14/97	MAC	
n-NITROSODIMETHYLAMINE	U	PPB	1200	11/14/97	MAC	
n-NITROSODIPHENYLAMINE	U	PPB	460	11/14/97	MAC	
n-NITROSO-di-n-PROPYLAMINE	U	PPB	460	11/14/97	MAC	
ISOPHORONE	U	PPB	230	11/14/97	MAC	
NITROBENZENE	U	PPB	460	11/14/97	MAC	
2,4-DINITROTOLUENE	U	PPB	1200	11/14/97	MAC	
2,6-DINITROTOLUENE	U	PPB	1200	11/14/97	MAC	
ACENAPTHENE	U	PPB	230	11/14/97	MAC	
ACENAPHTHYLENE	U	PPB	230	11/14/97	MAC	
ANTHRACENE	U	PPB	230	11/14/97	MAC	
BENZO(a)ANTHRACENE	U	PPB	230	11/14/97	MAC	
BENZO(a)PYRENE	U	PPB	230	11/14/97	MAC	
BENZO(b)FLUORANTHENE	U	PPB	230	11/14/97	MAC	
BENZO(ghi)PERYLENE	U	PPB	460	11/14/97	MAC	
BENZO(k)FLUORANTHENE	U	PPB	230	11/14/97	MAC	
DIBENZO(a,h)ANTHRACENE	U	PPB	1200	11/14/97	MAC	
FLUORANTHENE	U	PPB	120	11/14/97	MAC	
FLUORENE	U	PPB	120	11/14/97	MAC	
INDENO(1,2,3-cd)PYRENE	U	PPB	1200	11/14/97	MAC	
NAPHTHALENE	U	PPB	120	11/14/97	MAC	
PHENANTHRENE	U	PPB	120	11/14/97	MAC	
PYRENE	U	PPB	120	11/14/97	MAC	
CHRYSENE	U	PPB	230	11/14/97	MAC	
BIS(2-CHLOROETHYL)ETHER	U	PPB	460	11/14/97	MAC	
BIS(2-CHLOROETHOXY)METHANE	U	PPB	460	11/14/97	MAC	
BIS(2-CHLOROISOPROPYL)ETHER	U	PPB	460	11/14/97	MAC	
4-BROMOPHENYLPHENYL ETHER	U	PPB	460	11/14/97	MAC	
4-CHLOROPHENYLPHENYL ETHER	U	PPB	460	11/14/97	MAC	
HEXACHLOROCYCLOPENTADIENE	U	PPB	1200	11/14/97	MAC	
HEXACHLOROBUTADIENE	U	PPB	460	11/14/97	MAC	
HEXACHLOROBENZENE	U	PPB	460	11/14/97	MAC	
HEXACHLOROETHANE	U	PPB	460	11/14/97	MAC	
1,2,4-TRICHLOROBENZENE	U	PPB	460	11/14/97	MAC	
2-CHLORONAPHTHALENE	U	PPB	230	11/14/97	MAC	
4-CHLORO-3-METHYLPHENOL	U	PPB	460	11/14/97	MAC	
2-CHLOROPHENOL	U	PPB	460	11/14/97	MAC	
2,4-DICHLOROPHENOL	U	PPB	460	11/14/97	MAC	
2,4-DIMETHYLPHENOL	U	PPB	460	11/14/97	MAC	
2,4-DINITROPHENOL	U	PPB	2300	11/14/97	MAC	
2-METHYL-4,6-DINITROPHENOL	U	PPB	1200	11/14/97	MAC	
2-NITROPHENOL	U	PPB	1200	11/14/97	MAC	
4-NITROPHENOL	U	PPB	1200	11/14/97	MAC	
PENTACHLOROPHENOL	U	PPB	1200	11/14/97	MAC	
PHENOL	U	PPB	460	11/14/97	MAC	
2,4,6-TRICHLOROPHENOL	U	PPB	460	11/14/97	MAC	
2,4,5-TRICHLOROPHENOL	U	PPB	460	11/14/97	MAC	
O-CRESOL	U	PPB	460	11/14/97	MAC	
M- & P-CRESOL	U	PPB	460	11/14/97	MAC	
2-METHYLNAPHTHALENE	U	PPB	230	11/14/97	MAC	
BENZOIC ACID	U	PPB	2300	11/14/97	MAC	
BENZYL ALCOHOL	U	PPB	460	11/14/97	MAC	
4-CHLOROANILINE	U	PPB	460	11/14/97	MAC	
DIBENZOFURAN	U	PPB	120	11/14/97	MAC	
3,3-DICHLOROBENZIDINE	U	PPB	1200	11/14/97	MAC	
2-NITROANILINE	U	PPB	1200	11/14/97	MAC	
3-NITROANILINE	U	PPB	1200	11/14/97	MAC	
4-NITROANILINE	U	PPB	1200	11/14/97	MAC	
ALDRIN	U	PPB	6.2	11/14/97	MAC	
alpha-BHC	U	PPB	11	11/14/97	MAC	
a-BHC	U	PPB	16	11/14/97	MAC	
beta-BHC	U	PPB	16	11/14/97	MAC	
gamma-BHC (LINDANE)	U	PPB	6.2	11/14/97	MAC	
alpha-CHLORDANE	U	PPB	8.6	11/14/97	MAC	
gamma-CHLORDANE	U	PPB	6.2	11/14/97	MAC	
TECHNICAL CHLORDANE	U	PPB	93	11/14/97	MAC	
p,p-DDD	U	PPB	12	11/14/97	MAC	
p,p-DDE	U	PPB	10	11/14/97	MAC	

DEC 08 1997

Project/Site No.:	47-559	Lab Number:	9710238-05A
Project Name:	SMOKEY MOUNTAIN SMELTERS	Matrix:	SEDIMENT
Description:	OUTSIDE WASTE PILE	Received:	10/23/97 08:30:00 By LJB
Station No.:	WA-04	Sampling Agency:	HWM_05_KFO
Collected:	10/21/97 11:05:00 By WLB	Priority:	11_21_97
County:	47		

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
B/N/A EXTR+PESTS,PCBS-SOIL						MS+ECD
p,p-DDT	U	PPB	11	11/14/97	MAC	
DIELDRIN	U	PPB	6.5	11/14/97	MAC	
ENDOSULFAN I	U	PPB	10	11/14/97	MAC	
ENDOSULFAN II	U	PPB	12	11/14/97	MAC	
ENDOSULFAN SULFATE	U	PPB	12	11/14/97	MAC	
ENDRIN	U	PPB	12	11/14/97	MAC	
ENDRIN ALDEHYDE	U	PPB	9.8	11/14/97	MAC	
ENDRIN KETONE	U	PPB	12	11/14/97	MAC	
HEPTACHLOR	U	PPB	7.7	11/14/97	MAC	
HEPTACHLOR EPOXIDE	U	PPB	8.1	11/14/97	MAC	
TOXAPHENE	U	PPB	680	11/14/97	MAC	
METHOXYCHLOR	U	PPB	45	11/14/97	MAC	
PCB 1016/1242	U	PPB	730	11/14/97	MAC	
PCB 1221	U	PPB	800	11/14/97	MAC	
PCB 1232	U	PPB	900	11/14/97	MAC	
PCB 1248	U	PPB	610	11/14/97	MAC	
PCB 1254	U	PPB	400	11/14/97	MAC	
PCB 1260	U	PPB	360	11/14/97	MAC	
PCB 1262	U	PPB	290	11/14/97	MAC	

*-Water, uG/L; Sediment, uG/kG

Printed: December 1, 1997

State of Tennessee - Environmental Laboratories
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Organic Analysis
Base/Neutral/Acid Extractables

PROJECT/SITE NO. 47-559	PROJECT NAME Smelter Main Smelter
STATION NUMBER WA04	COUNTY Knox
DESCRIPTION Outside Waste Pile	
STREAM MILE	DEPTH / MATRIX
COLLECTED: DATE 10/21/97	TIME 11:05
SAMPLER'S NAME(printed) Joe Barron	
SAMPLING AGENCY DSF	BILLING CODE 327.38.01
IF PRIORITY, DATE NEEDED 11/21/97	
SEND REPORT TO: KFO - BHM	
CONTACT HAZARD	

Laboratory Number

Branch Lab Number

Chain of Custody and Supplemental Information

Only one chain of custody form is required per sample set or point (if all collected at the same time)

1. Collected by Joe Barron - WCB
   Date 10/21/97 Time 11:05a
   Delivered to KBL
   Date 10/21/97 Time 12:45p
2. Received by
   Date Time
   Delivered to
   Date Time
3. Received by
   Date Time
   Delivered to
   Date Time
4. Received in Lab by [illegible]
   Date 10-21-97 Time 12:45
   Logged in by
   Date Time

Additional Information

1. Approximate volume of sample 500 ml
2. Nearest town or city Knoxville
3. Others present at collection TWO ADD - BHM
4. Number of other samples collected at same time at this point 3
5. Field collection procedure, handling and/or preservation of this sample standard
6. Mode of transportation to lab state vehicle
7. Sample sealed by
8. Date sample sealed
9. Remarks

*	NPDES Extractables	*	NPDES Extractables(con't)	*	TAL Semivolatiles
	butylbenzylphthalate	X	2-chlorophenol	X	dimethylphthalate
	bis(2-ethylhexyl)phthalate		2,4-dichlorophenol	X	4,6-dinitro-2-methylphenol
	di-n-butylphthalate		2,4-dimethylphenol	X	2,4-dinitrophenol
	di-n-octylphthalate		2,4-dinitrophenol	X	2,4-dinitrotoluene
	diethylphthalate		4,6-dinitro-o-cresol	X	2,6-dinitrotoluene
	dimethylphthalate		2-nitrophenol	X	fluoranthene
X	n-nitrosodimethylamine		4-nitrophenol	X	fluorene
	n-nitrosodiphenylamine		pentachlorophenol	X	hexachlorobenzene
	n-nitrosodi-n-propylamine		phenol	X	hexachlorobutadiene
	isophorone		2,4,6-trichlorophenol	X	hexachlorocyclopentadiene
	nitrobenzene	*	TAL Semivolatiles	X	hexachloroethane
	2,4-dinitrotoluene	X	acenaphthene	X	indeno(1,2,3-cd)pyrene
	acenaphthene	X	acenaphthylene	X	isophorone
	acenaphthylene	X	anthracene	X	2-methylnaphthalene
	anthracene	X	benzo(a)anthracene	X	2-methylphenol
	benzo(a)anthracene	X	benzo(a)pyrene	X	4-methylphenol
	benzo(a)pyrene	X	benzo(b)fluoranthene	X	n-nitrosodiphenylamine
	benzo(b)fluoranthene	X	benzo(g,h,i)perylene	X	n-nitroso-n-dipropylamine
	benzo(g,h,i)perylene	X	benzo(k)fluoranthene	X	naphthalene
	benzo(k)fluoranthene	X	benzoic acid	X	2-nitroaniline
	chrysene	X	benzyl alcohol	X	3-nitroaniline
	dibenzo(a,h)anthracene	X	bis(2-chloroethoxy)methane	X	4-nitroaniline
	fluoranthene	X	bis(2-chloroethyl) ether	X	nitrobenzene
	fluorene	X	bis(2-chloroisopropyl)ether	X	2-nitrophenol
	indeno(1,2,3-c,d)pyrene	X	bis(2-ethylhexyl)phthalate	X	4-nitrophenol
	naphthalene	X	4-bromophenylphenylether	X	pentachlorophenol
	phenanthrene	X	butylbenzylphthalate	X	phenanthrene
	pyrene	X	4-chloroaniline	X	phenol
	bis(2-chloroethyl)ether	X	4-chloro-3-methyl phenol	X	pyrene
	bis(2-chloroethoxy)methane	X	2-chloronaphthalene	X	1,2,4-trichlorobenzene
	bis(2-chloroisopropyl)ether	X	4-chlorophenylphenylether	X	2,4,5-trichlorophenol
	4-bromophenylphenylether	X	chrysene	X	2,4,6-trichlorophenol
	4-chlorophenylphenylether	X	di-n-butylphthalate	*	Nitrobodies
	hexachlorocyclopentadiene	X	di-n-octylphthalate		RDX
	hexachlorobutadiene	X	dibenzo(a,h)anthracene		2,4,6-TNT
	hexachlorobenzene	X	dibenzofuran		2,4-dinitrotoluene
	hexachloroethane	X	3,3'-dichlorobenzidine		2,6-dinitrotoluene
	1,2,4-trichlorobenzene	X	2,4-dichlorophenol		nitrobenzene
	2-chloronaphthalene	X	diethylphthalate		1,3,5-TNB
	4-chloro-3-methyl phenol	X	2,4-dimethylphenol		

*	TCLP Semivolatiles	*	Pesticides/PCBs
	chlordane	X	aldrin
	o-cresol	X	alpha-BHC
	m-cresol	X	beta-BHC
	p-cresol	X	delta-BHC
	cresol	X	gamma-BHC (lindane)
	2,4-D	X	technical chlordane
	2,4-dinitrotoluene	X	alpha-chlordane
	endrin	X	gamma-chlordane
	heptachlor	X	4,4'-DDD
	heptachlor epoxide	X	4,4'-DDE
	hexachlorobenzene	X	4,4'-DDT
	hexachlorobutadiene	X	dieldrin
	hexachloroethane	X	endosulfan I
	lindane	X	endosulfan II
	methoxychlor	X	endosulfan sulfate
	nitrobenzene	X	endrin
	pentachlorophenol	X	endrin aldehyde
	pyridine	X	endrin ketone
	toxaphene	X	heptachlor
	2,4,5-trichlorophenol	X	heptachlor epoxide
	2,4,6-trichlorophenol	X	toxaphene
	2,4,5-TP (Silvex)	X	methoxychlor
		X	PCB 1016/1242
		X	PCB 1221
		X	PCB 1232
		X	PCB 1248
		X	PCB 1254
		X	PCB 1260
		X	PCB 1262

Project/Site No.: 47-559
Project Name: SMOKEY MTN. SMELTERS
Site Description: OUTSIDE WASTE PILE
Station No.: WA-04
lected: 10/21/97 11:05:00 By WLB
County: 47

Lab Number: 9710216-05E
Matrix: SOIL
Received: 10/21/97 12:45:00 By LAB
Sampling Agency: HWM_05_KFO
Priority: 11_21_97

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
VOLATILES-TAL SEDIMENTS						8260A
ACETONE	U	PPB	25	10/24/97	HMG	
BENZENE	U	PPB	2.5	10/24/97	HMG	
BROMODICHLOROMETHANE	U	PPB	2.5	10/24/97	HMG	
BROMOFORM	U	PPB	2.5	10/24/97	HMG	
BROMOMETHANE	U	PPB	5.0	10/24/97	HMG	
2-BUTANONE (MEK)	U	PPB	25	10/24/97	HMG	
CARBON DISULFIDE	U	PPB	5.0	10/24/97	HMG	
CARBON TETRACHLORIDE	U	PPB	2.5	10/24/97	HMG	
VINYL ACETATE	U	PPB	5.0	10/24/97	HMG	
CHLOROBENZENE	U	PPB	2.5	10/24/97	HMG	
CHLOROETHANE	U	PPB	5.0	10/24/97	HMG	
CHLOROFORM	U	PPB	2.5	10/24/97	HMG	
CHLOROMETHANE	U	PPB	5.0	10/24/97	HMG	
DIBROMOCHLOROMETHANE	U	PPB	2.5	10/24/97	HMG	
1,2-DICHLOROBENZENE	U	PPB	2.5	10/24/97	HMG	
1,3-DICHLOROBENZENE	U	PPB	2.5	10/24/97	HMG	
1,4-DICHLOROBENZENE	U	PPB	2.5	10/24/97	HMG	
DICHLORODIFLUOROMETHANE	U	PPB	5.0	10/24/97	HMG	
1,1-DICHLOROETHANE	U	PPB	2.5	10/24/97	HMG	
1,2-DICHLOROETHANE	U	PPB	2.5	10/24/97	HMG	
1,1-DICHLOROETHENE	U	PPB	2.5	10/24/97	HMG	
CIS-1,2-DICHLOROETHENE	U	PPB	2.5	10/24/97	HMG	
TRANS-1,2-DICHLOROETHENE	U	PPB	2.5	10/24/97	HMG	
1,2-DICHLOROPROPANE	U	PPB	2.5	10/24/97	HMG	
CIS-1,3-DICHLOROPROPENE	U	PPB	2.5	10/24/97	HMG	
TRANS-1,3-DICHLOROPROPENE	U	PPB	2.5	10/24/97	HMG	
ETHYLBENZENE	U	PPB	2.5	10/24/97	HMG	
METHYLENE CHLORIDE	U	PPB	2.5	10/24/97	HMG	
4-METHYL-2-PENTANONE (MIBK)	U	PPB	25	10/24/97	HMG	
STYRENE	U	PPB	2.5	10/24/97	HMG	
2-HEXANONE	U	PPB	5.0	10/24/97	HMG	
1,1,2,2-TETRACHLOROETHANE	U	PPB	2.5	10/24/97	HMG	
TETRACHLOROETHENE	U	PPB	2.5	10/24/97	HMG	
TOLUENE	4.7	PPB	2.5	10/24/97	HMG	
1,1,1-TRICHLOROETHANE	U	PPB	2.5	10/24/97	HMG	
1,1,2-TRICHLOROETHANE	U	PPB	2.5	10/24/97	HMG	
TRICHLOROETHENE	U	PPB	2.5	10/24/97	HMG	
TRICHLOROFLUOROMETHANE	U	PPB	5.0	10/24/97	HMG	
VINYL CHLORIDE	U	PPB	5.0	10/24/97	HMG	
o-XYLENE	U	PPB	2.5	10/24/97	HMG	
m&p-XYLENE	U	PPB	2.5	10/24/97	HMG	

*-Water, uG/L; Sediment, uG/kG

Printed: October 27, 1997

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Organic Analysis

Volatiles and Petroleum Hydrocarbons

PROJECT/SITE NO. 47-559	PROJECT NAME Smokey Mtn Smelter
STATION NUMBER WA04	COUNTY Knox
DESCRIPTION Outside Waste Pile	
STREAM MILE	DEPTH / MATRIX
COLLECTED: DATE 10/21/97	TIME 11:05
SAMPLER'S NAME(printed) Lee Barron	
SAMPLING AGENCY DSF	BILLING CODE 327.28.01
IF PRIORITY, DATE NEEDED 11/21/97	
SEND REPORT TO: KFO - BAM	
CONTACT HAZARD	

Laboratory Number

Branch Lab Number

Chain of Custody and Supplemental Information

Only one chain of custody form is required per sample set or point (if all collected at the same time)

1. Collected by WCB
   Date 10/21/97 Time 11:05a
   Delivered to KBL
   Date 10/21/97 Time 12:45p
2. Received by
   Date Time
   Delivered to
   Date Time
3. Received by
   Date Time
   Delivered to
   Date Time
4. Received in Lab by [illegible]
   Date 10-21-97 Time 12:45
   Logged in by [illegible]
   Date Time

*	NPDES Volatiles - 624	*	TAL Volatiles - 8260A	*	TCLP Volatiles
	Bromoform	X	Chloromethane		Benzene
	Bromodichloromethane		Bromomethane		Carbon tetrachloride
	Carbon Tetrachloride		Vinyl chloride		Chlorobenzene
	Chlorobenzene		Chloroethane		Chloroform
	Chloroethane		Methylene chloride		1,2-Dichloroethane
X	2-Chloroethylvinyl ether		Acetone		1,1-Dichloroethane
	Chloroform		Carbon disulfide		Methyl ethyl ketone
	Chloromethane		1,1-Dichloroethene		Tetrachloroethene
	Dibromochloromethane		1,1-Dichloroethane		Trichloroethene
X	1,2-Dichlorobenzene		Cis-1,2-dichloroethene		Vinyl chloride
X	1,3-Dichlorobenzene		Trans-1,2-dichloroethene	*	**BTEX - 8260A - UST**
X	1,4-Dichlorobenzene		1,2-Dichloroethane		Benzene
X	Dichlorodifluoromethane		Chloroform		Toluene
X	1,1-Dichloroethane		2-Butanone		Ethyl benzene
	1,2-Dichloroethane		1,1,1-Trichloroethane		o-Xylene
	1,1-Dichloroethene		Carbon tetrachloride		m-Xylene
	Cis-1,2-dichloroethene		Vinyl acetate		p-Xylene
	Trans-1,2-dichloroethene		Bromodichloromethane		Methyl t-butyl ether
	1,2-Dichloropropane		1,2-Dichloropropane		Diisopropyl ether
	Cis-1,3-dichloropropene		Cis-1,3-dichloropropane	*	**TPH by GC**
	Trans-1,2-dichloroethene		Trichloroethene		Gasoline Range Organics
	Methylene chloride		Dibromochloromethane		Diesel Range Organics
	1,1,2,2-Tetrachloroethane		1,1,2-Trichloroethane	*	**TPH by IR (418.1)**
	Tetrachloroethene		Benzene		418.1 - Waste Oil
	1,1,1-Trichloroethane		Trans-1,3-dichloropropene	*	**Other**
	1,1,2-Trichloroethane		Bromoform		
	Trichloroethene		4-Methyl-2-pentanone		
X	Trichlorofluoromethane		2-Hexanone		
	Vinyl chloride		Tetrachloroethene		
	Benzene		Toluene		
	Ethylbenzene		1,1,2,2-Tetrachloroethane		
	Toluene		Chlorobenzene		
	o-Xylene		Ethyl benzene		
	m-Xylene		Styrene		
	p-Xylene		o-Xylene		
			m-Xylene		
		X	p-Xylene		

Additional Information

1. Approximate volume of sample 4 oz.
2. Nearest town or city Knoxville
3. Others present at collection JWW, ADD, BHM
4. Number of other samples collected at same time at this point 3
5. Field collection procedure, handling and/or preservation of this sample Standard
6. Mode of transportation to lab State vehicle
7. Sample sealed by
8. Date sample sealed
9. Remarks

NOV 21 1997

Project/Site No.:	47-559	Lab Number:	9710216-05F
Project Name:	SMOKEY MTN. SMELTERS	Matrix:	SOIL
Description:	OUTSIDE WASTE PILE	Received:	10/21/97 12:45:00 By LAB
Station No.:	WA-04	Sampling Agency:	HWM_05_KFO
`lected:	10/21/97 11:05:00 By ADD	Priority:	11_21_97
.nty:	47		

TEST	RESULT	*ERROR	UNITS	ANALYZED	BY	METHOD
GAMMA RADIONUCLIDES						R.6
K-40	5.52	0.39	pCi/g dry wt	10/29/97	RJR	
GROSS ALPHA & BETA						R.1.3
GROSS ALPHA	0.78	0.55	pCi/g DRY WT.	10/29/97	NLF	
GROSS BETA	11.3	1.4	pCi/g DRY WT.	10/29/97	NLF	

*--Represents +/- error value

Printed: October 30, 1997

NOV 21 1997

Project/Site No.:	47-559	Lab Number:	9710216-06A
Project Name:	SMOKEY MTN. SMELTERS	Matrix:	SOIL
Description:	OUTSIDE WASTE PILE DUP.	Received:	10/21/97 12:45:00 By LAB
Station No.:	WA-04	Sampling Agency:	HWM_05_KFO
Collected:	10/21/97 11:05:00 By ADD	Priority:	11_21_97
ity:	47		

TEST	RESULT	*ERROR	UNITS	ANALYZED	BY	METHOD
GROSS ALPHA & BETA						R.1.3
GROSS ALPHA	1.08	0.61	pCi/g DRY WT.	10/29/97	NLF	
GROSS BETA	11.5	1.3	pCi/g DRY WT.	10/29/97	NLF	

*--Represents +/- error value

Printed: October 30, 1997

State of Tennessee - Environmental Laboratories

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Radiochemical Analysis

PROJECT/SITE NO. 47-559	PROJECT NAME Smoky Mtn Smelters
STATION NUMBER WA04	COUNTY Knox
DESCRIPTION Outside Waste Pile	
STREAM MILE	DEPTH
COLLECTED: DATE 10/21/97	TIME 11:05
PICK-UP DATE:	
CONTACT HAZARD NH3 & Metals	mR/hr Reading <0.1
SAMPLER'S NAME (printed) Joe Carson	
SAMPLING AGENCY DSF	BILLING CODE 327.38.01
IF PRIORITY, DATE NEEDED 11/21/97	
SEND REPORT TO: KFO-BHM	

Sample Type

___Air ___Milk ___Swipe
___Water ___Tissue ___Liquid
___Sludge ___Soil X Solid
___Vegetation ___Sediment

Other _____

Field Comments:

Air Samples
Volume _____
Total Hours _____

___Sample Filtration
___Sample Acidification
___Send to RESL

REQUESTED ANALYSES:

X	GROSS ALPHA (TOTAL)		STRONTIUM 89
	GROSS ALPHA (SUSPENDED)		STRONTIUM 90
	GROSS ALPHA (DISSOLVED)		TRITIUM (H-3)
X	GROSS BETA (TOTAL)		THORIUM (TOTAL)
	GROSS BETA (SUSPENDED)		URANIUM (TOTAL)
	GROSS BETA (DISSOLVED)	X	GAMMA RADIONUCLIDES
			ADDITIONAL ANALYSES:

Laboratory Number

Branch Lab Number

Date Received

Time Received **By**

Chain of Custody and Supplemental Information

Only one chain of custody form is required per sample set or point (if all collected at the same time)

1. Collected by WCB
   Date 10/21/97 Time 11:05a
   Delivered to KBL
   Date 10/21/97 Time 12:45p
2. Collected by
   Date Time
   Delivered to
   Date Time
3. Collected by
   Date Time
   Delivered to
   Date Time
4. Received in Lab by [illegible]
   Date 10-27-97 Time 2:45
   Logged in by
   Date Time

Additional Information

1. Approximate volume of sample 500 ml
2. Nearest town or city Knoxville
3. Others present at collection JWW, ADD, BHM
4. Number of other samples collected at same time at this point #3
5. Field collection procedure, handling and/or preservation of this sample Standard
6. Mode of transportation to lab State vehicle
7. Sample sealed by
8. Date sample sealed
9. Remarks

OCT 13 1998

Project/Site No.: 47-559
Project Name: SMOKEY MOUNTAIN SMELTERS
Description: SMS-WA-05/WASTE/SMOKEY MTN
Station No.: SMS-WA-05
Collected: 08/25/98 15:30:00 By LB
County: 47

Lab Number: 9808249-01
Matrix: WASTE
Received: 08/26/98 10:00:00 By PMB
Sampling Agency: HWM_11_KFO
Priority:

TEST	RESULT	UNITS	LIMIT	ANALYZED	BY	METHOD
AMMONIA	36.7	mg/kg	10	09/15/98	SAL	A.18.2
CYANIDE	1.22	mg/kg	1.0	09/23/98	SAL	A.9
ALUMINUM	8200	mg/kg	10	10/01/98	JAH	
ANTIMONY	13.0	mg/kg	0.6	10/09/98	JAH	
ARSENIC	9.8	mg/kg	0.2	10/05/98	JAH	
BARIUM	86	mg/kg	10	10/01/98	JAH	
BERYLLIUM	2	mg/kg	1	09/30/98	JAH	
CADMIUM	3.2	mg/kg	0.5	09/11/98	JAH	
CALCIUM	22600	mg/kg	3	10/02/98	JAH	
CHROMIUM	46	mg/kg	1	09/15/98	JAH	
COBALT	9	mg/kg	1	09/15/98	JAH	
COPPER	1690	mg/kg	1	09/16/98	JAH	
DIGESTION-METALS	COMPLETED	COMPLETED		09/10/98	EAM	
IRON	12400	mg/kg	5	09/16/98	JAH	
LEAD	100	mg/kg	4	09/15/98	JAH	
MAGNESIUM	8710	mg/kg	2	10/02/98	JAH	
MANGANESE	500	mg/kg	1	09/16/98	JAH	
MERCURY	0.12	mg/kg	0.1	09/11/98	ATB	EPA 245.5
METALS PREP-SOLIDS/WASTES	COMPLETED	COMPLETED		08/28/98	EAM	
NICKEL	776	mg/kg	2	09/11/98	JAH	
PERCENT SOLIDS	74.0	%		09/08/98	SDS	
POTASSIUM	1290	mg/kg	2	10/02/98	JAH	
SELENIUM	5.5	mg/kg	0.4	10/07/98	JAH	

OCT 13 1998

Project/Site No.: 47-559
Project Name: SMOKEY MOUNTAIN SMELTERS
Description: SMS-WA-05/WASTE/SMOKEY MTN
Station No.: SMS-WA-05
Collected: 08/25/98 15:30:00 By LB
County: 47

Lab Number: 9808249-01
Matrix: WASTE
Received: 08/26/98 10:00:00 By PMB
Sampling Agency: HWM_11_KFO
Priority:

TEST	RESULT	UNITS	LIMIT	ANALYZED	BY	METHOD
SILVER	1	mg/kg	1	09/15/98	JAH	
SODIUM	6910	mg/kg	10	10/02/98	JAH	
THALLIUM	U	mg/kg	5	09/15/98	JAH	
VANADIUM	43	mg/kg	20	10/01/98	JAH	
ZINC	906	mg/kg	0.5	09/15/98	JAH	

State of Tennessee - Environmental Laboratories

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Inorganic Analysis

PROJECT/SITE NO. 47-559	PROJECT NAME Smokey Mountain Smelters
STATION NUMBER SMS-WA-05	COUNTY Knox
DESCRIPTION waste	
STREAM MILE	DEPTH / MATRIX waste
COLLECTED: DATE August 25, 1998	TIME 15:30
SAMPLER'S NAME(printed) Lee Barron	
SAMPLING AGENCY Division of Superfund	BILLING CODE 327.38-10
IF PRIORITY, DATE NEEDED September 25, 1998	
SEND REPORT TO: Knoxville Environmental Assistance Center	
Burl H. Maupin	
CONTACT HAZARD metals, radiochemical, unknown	

*	Env. Microbiology	*	General Inorganics		Gen. Inorganics (con't)	*	Metals
	coliform, fecal*		acidity as $CaCO_3$*		oil and grease	x	aluminum, Al
	coliform, total*		alkalinity as $CaCO_3$*		orthophosphate, total*	x	antimony, Sb
	strep, fecal*		alkalinity, phen. as $CaCO_3$*		oxygen, dissolved*	x	arsenic, As
			BOD, 5-day*		pH	x	barium, Ba
			CBOD, 5-day*		phenols, total	x	beryllium, Be
			boron		phosphate, total	x	cadmium, Cd
*	Ambient Parameters		chloride*		residue, dissolved*	x	calcium, Ca
	COD*		chlorine, residual*		residue, settleable*	x	chromium, Cr
	coliform, fecal		chromium, hexavalent		residue, suspended*	x	cobalt, Co
	conductivity*		COD*		residue, total*	x	copper, Cu
	hardness, total as $CaCO_3$*		color, apparent*		silica*	x	iron, Fe
	nitrogen, ammonia		color, true*		sulfate*	x	lead, Pb
	nitrogen, NO_3 & NO_2		conductivity*		sulfide, total*	x	magnesium, Mg
	nitrogen, total Kjeldahl	x	cyanide		TOC*	x	manganese, Mn
	phosphate, total		flash point*		turbidity*	x	mercury, Hg
	pH		fluoride*		percent solids	x	nickel, Ni
	residue, dissolved*		hardness, Ca as $CaCO_3$*	*	Other	x	potassium, K
	residue, suspended*		hardness, total as $CaCO_3$*			x	selenium, Se
	arsenic, As		hydrocarbons, total			x	silver, Ag
	cadmium, Cd		MBAS*			x	sodium, Na
	chromium, Cr	x	nitrogen, ammonia			x	thallium, Tl
	copper, Cu		nitrogen, nitrate*			x	vanadium, V
	lead, Pb		nitrogen, nitrite*			x	zinc, Zn
	mercury, Hg		nitrogen, NO_3 & NO_2				
	nickel, Ni		nitrogen, total Kjeldahl				
	zinc, Zn		nitrogen, total organic				

*** denotes analyses performed only on water**

FIELD DETERMINATIONS	Temperature
pH	Chlorine, residual
Conductivity	Other
Dissolved Oxygen	

Laboratory Number

Branch Lab Number

Chain of Custody and Supplemental Information

Only one chain of custody form is required per sample set or point (if all collected at the same time)

1. Collected by Lee Barron
   Date August 25, 1998 Time 15:30
   Delivered to Knoxville Basin Laboratory
   Date August 25, 1998 Time 10:00
2. Received by
   Date Time
   Delivered to
   Date Time
3. Received by
   Date Time
   Delivered to
   Date Time
4. Received in Lab by [illegible]
   Date 9/24/98 Time 1000
   Logged in by
   Date Time

Additional Information

1. Approximate volume of sample
   16 oz.
2. Nearest town or city Knoxville
3. Others present at collection Burl H. Maupin
4. Number of other samples collected at same time at this point 3
5. Field collection procedure, handling and/or preservation of this sample
   According to standard operating procedure
6. Mode of transportation to lab
   State vehicle; on ice
7. Sample sealed by Lee Barron
8. Date sample sealed
9. Remarks

PH-3011 (rev 1/96)

RDA 1527

OCT 13 1998

Project/Site No.: 47-559
Project Name: SMOKEY MOUNTAIN SMELTERS
Description: SMS-WA-05/WASTE/SMOKEY MTN
Station No.: SMS-WA-05
lected: 08/25/98 15:30:00 By LB
nty: 47

Lab Number: 9808249-01F
Matrix: WASTE
Received: 08/26/98 10:00:00 By PMB
Sampling Agency: HWM_11_KFO
Priority:

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
B/N/A EXTR+PESTS,PCBS-SOIL						MS+ECD
BUTYL BENZYL PHTHALATE	U	PPB	260	09/29/98	MAC	
BIS(2-ETHYLHEXYL)PHTHALATE	B 246	PPB	-	09/29/98	MAC	
DI-n-BUTYL PHTHALATE	U	PPB	260	09/29/98	MAC	
DI-n-OCTYL PHTHALATE	U	PPB	530	09/29/98	MAC	
DIETHYL PHTHALATE	B 135	PPB	-	09/29/98	MAC	
DIMETHYL PHTHALATE	U	PPB	130	09/29/98	MAC	
n-NITROSODIMETHYLAMINE	U	PPB	530	09/29/98	MAC	
n-NITROSODIPHENYLAMINE	U	PPB	260	09/29/98	MAC	
n-NITROSO-di-n-PROPYLAMINE	U	PPB	260	09/29/98	MAC	
ISOPHORONE	U	PPB	130	09/29/98	MAC	
NITROBENZENE	U	PPB	260	09/29/98	MAC	
2,4-DINITROTOLUENE	U	PPB	530	09/29/98	MAC	
2,6-DINITROTOLUENE	U	PPB	530	09/29/98	MAC	
ACENAPTHENE	U	PPB	130	09/29/98	MAC	
ACENAPHTHYLENE	U	PPB	130	09/29/98	MAC	
ANTHRACENE	U	PPB	130	09/29/98	MAC	
BENZO(a)ANTHRACENE	U	PPB	130	09/29/98	MAC	
BENZO(a)PYRENE	U	PPB	130	09/29/98	MAC	
BENZO(b)FLUORANTHENE	130	PPB	-	09/29/98	MAC	
BENZO(ghi)PERYLENE	U	PPB	530	09/29/98	MAC	
BENZO(k)FLUORANTHENE	U	PPB	130	09/29/98	MAC	
DIBENZO(a,h)ANTHRACENE	U	PPB	530	09/29/98	MAC	
FLUORANTHENE	J 39.7	PPB	130	09/29/98	MAC	
FLUORENE	U	PPB	530	09/29/98	MAC	
INDENO(1,2,3-cd)PYRENE	U	PPB	130	09/29/98	MAC	
NAPHTHALENE	U	PPB	130	09/29/98	MAC	
PHENANTHRENE	U	PPB	130	09/29/98	MAC	
PYRENE	U	PPB	130	09/29/98	MAC	
CHRYSENE	U	PPB	130	09/29/98	MAC	
BIS(2-CHLOROETHYL)ETHER	U	PPB	260	09/29/98	MAC	
BIS(2-CHLOROETHOXY)METHANE	U	PPB	130	09/29/98	MAC	
BIS(2-CHLOROISOPROPYL)ETHER	U	PPB	530	09/29/98	MAC	
4-BROMOPHENYLPHENYL ETHER	U	PPB	530	09/29/98	MAC	
4-CHLOROPHENYLPHENYL ETHER	U	PPB	260	09/29/98	MAC	
HEXACHLOROCYCLOPENTADIENE	U	PPB	1300	09/29/98	MAC	
HEXACHLOROBUTADIENE	U	PPB	260	09/29/98	MAC	
HEXACHLOROBENZENE	U	PPB	260	09/29/98	MAC	
HEXACHLOROETHANE	U	PPB	260	09/29/98	MAC	
1,2,4-TRICHLOROBENZENE	U	PPB	260	09/29/98	MAC	
2-CHLORONAPHTHALENE	U	PPB	130	09/29/98	MAC	
4-CHLORO-3-METHYLPHENOL	U	PPB	260	09/29/98	MAC	
2-CHLOROPHENOL	U	PPB	130	09/29/98	MAC	
2,4-DICHLOROPHENOL	U	PPB	260	09/29/98	MAC	
2,4-DIMETHYLPHENOL	U	PPB	260	09/29/98	MAC	
2,4-DINITROPHENOL	U	PPB	2600	09/29/98	MAC	
2-METHYL-4,6-DINITROPHENOL	U	PPB	1300	09/29/98	MAC	
2-NITROPHENOL	U	PPB	530	09/29/98	MAC	
4-NITROPHENOL	U	PPB	1300	09/29/98	MAC	
PENTACHLOROPHENOL	U	PPB	530	09/29/98	MAC	
PHENOL	U	PPB	130	09/29/98	MAC	
2,4,6-TRICHLOROPHENOL	U	PPB	260	09/29/98	MAC	
2,4,5-TRICHLOROPHENOL	U	PPB	260	09/29/98	MAC	
O-CRESOL	U	PPB	260	09/29/98	MAC	
M- & P-CRESOL	U	PPB	130	09/29/98	MAC	
2-METHYLNAPHTHALENE	U	PPB	130	09/29/98	MAC	
BENZOIC ACID	U	PPB	530	09/29/98	MAC	
BENZYL ALCOHOL	U	PPB	530	09/29/98	MAC	
4-CHLOROANILINE	U	PPB	260	09/29/98	MAC	
DIBENZOFURAN	U	PPB	130	09/29/98	MAC	
3,3-DICHLOROBENZIDINE	U	PPB	530	09/29/98	MAC	
2-NITROANILINE	U	PPB	530	09/29/98	MAC	
3-NITROANILINE	U	PPB	530	09/29/98	MAC	
4-NITROANILINE	U	PPB	1300	09/29/98	MAC	
HEXACHLOROBENZENE	U	PPB	5.7	09/29/98	MAC	
ALDRIN	U	PPB	7.6	09/29/98	MAC	
[illegible]ha-BHC	U	PPB	14	09/29/98	MAC	
[illegible]-BHC	U	PPB	20	09/29/98	MAC	
delta-BHC	U	PPB	20	09/29/98	MAC	
gamma-BHC (LINDANE)	U	PPB	7.6	09/29/98	MAC	
alpha-CHLORDANE	489	PPB	-	09/29/98	MAC	
gamma-CHLORDANE	3450	PPB	-	09/29/98	MAC	
TECHNICAL CHLORDANE	U	PPB	230	09/29/98	MAC	
p,p-DDD	U	PPB	14	09/29/98	MAC	

OCT 13 1998

Project/Site No.: 47-559
Project Name: SMOKEY MOUNTAIN SMELTERS
Description: SMS-WA-05/WASTE/SMOKEY MTN
Station No.: SMS-WA-05
Collected: 08/25/98 15:30:00 By LB
ity: 47

Lab Number: 9808249-01F
Matrix: WASTE
Received: 08/26/98 10:00:00 By PMB
Sampling Agency: HWM_11_KFO
Priority:

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
B/N/A EXTR+PESTS,PCBS-SOIL						MS+ECD
p,p-DDE	U	PPB	12	09/29/98	MAC	
p,p-DDT	U	PPB	13	09/29/98	MAC	
DIELDRIN	280	PPB	-	09/29/98	MAC	
ENDOSULFAN I	U	PPB	160	09/29/98	MAC	
ENDOSULFAN II	U	PPB	14	09/29/98	MAC	
ENDOSULFAN SULFATE	U	PPB	14	09/29/98	MAC	
ENDRIN	U	PPB	14	09/29/98	MAC	
ENDRIN ALDEHYDE	U	PPB	12	09/29/98	MAC	
ENDRIN KETONE	U	PPB	15	09/29/98	MAC	
HEPTACHLOR	3110	PPB	-	09/29/98	MAC	
HEPTACHLOR EPOXIDE	499	PPB	-	09/29/98	MAC	
TOXAPHENE	U	PPB	400	09/29/98	MAC	
METHOXYCHLOR	U	PPB	55	09/29/98	MAC	
PCB 1016/1242	U	PPB	890	09/29/98	MAC	
PCB 1221	U	PPB	980	09/29/98	MAC	
PCB 1232	U	PPB	1100	09/29/98	MAC	
PCB 1248	U	PPB	750	09/29/98	MAC	
PCB 1254	U	PPB	370	09/29/98	MAC	
PCB 1260	U	PPB	330	09/29/98	MAC	
PCB 1262	U	PPB	350	09/29/98	MAC	

*-Water, uG/L; Sediment, uG/kG

Printed: October 2, 1998

State of Tennessee - Environmental Laboratories
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Organic Analysis
Base/Neutral/Acid Extractables

PROJECT/SITE NO. 47559	PROJECT NAME Smokey Mtn Smelters
STATION NUMBER SMS-WA-05	COUNTY Knox
DESCRIPTION WASTE AT MAINTENANCE SHED	
STREAM MILE	DEPTH MATRIX soil
COLLECTED: DATE 8-25-98	TIME 15:30
SAMPLER'S NAME(printed) Lee Barron	
SAMPLING AGENCY DSF	BILLING CODE 3273811
IF PRIORITY, DATE NEEDED 9-25-98	
SEND REPORT TO: KEAC	
CONTACT HAZARD metals, radiochemical	

*	NPDES Extractables	*	NPDES Extractables(con't)	*	TAL Semivolatiles
	butylbenzylphthalate	X	2-chlorophenol	X	dimethylphthalate
	bis(2-ethylhexyl)phthalate		2,4-dichlorophenol	X	4,6-dinitro-2-methylphenol
	di-n-butylphthalate		2,4-dimethylphenol	X	2,4-dinitrophenol
	di-n-octylphthalate		2,4-dinitrophenol	X	2,4-dinitrotoluene
	diethylphthalate		4,6-dinitro-o-cresol	X	2,6-dinitrotoluene
	dimethylphthalate		2-nitrophenol	X	fluoranthene
X	n-nitrosodimethylamine		4-nitrophenol	X	fluorene
	n-nitrosodiphenylamine		pentachlorophenol	X	hexachlorobenzene
	n-nitrosodi-n-propylamine		phenol	X	hexachlorobutadiene
	isophorone		2,4,6-trichlorophenol	X	hexachlorocyclopentadiene
	nitrobenzene	*	TAL Semivolatiles	X	hexachloroethane
	2,4-dinitrotoluene	X	acenaphthene	X	indeno(1,2,3-cd)pyrene
	acenaphthene	X	acenaphthylene	X	isophorone
	acenaphthylene	X	anthracene	X	2-methylnaphthalene
	anthracene	X	benzo(a)anthracene	X	2-methylphenol
	benzo(a)anthracene	X	benzo(a)pyrene	X	4-methylphenol
	benzo(a)pyrene	X	benzo(b)fluoranthene	X	n-nitrosodiphenylamine
	benzo(b)fluoranthene	X	benzo(g,h,i)perylene	X	n-nitroso-n-dipropylamine
	benzo(g,h,i)perylene	X	benzo(k)fluoranthene	X	naphthalene
	benzo(k)fluoranthene	X	benzoic acid	X	2-nitroaniline
	chrysene	X	benzyl alcohol	X	3-nitroaniline
	dibenzo(a,h)anthracene	X	bis(2-chloroethoxy)methane	X	4-nitroaniline
	fluoranthene	X	bis(2-chloroethyl) ether	X	nitrobenzene
	fluorene	X	bis(2-chloroisopropyl)ether	X	2-nitrophenol
	indeno(1,2,3-c,d)pyrene	X	bis(2-ethylhexyl)phthalate	X	4-nitrophenol
	naphthalene	X	4-bromophenylphenylether	X	pentachlorophenol
	phenanthrene	X	butylbenzylphthalate	X	phenanthrene
	pyrene	X	4-chloroaniline	X	phenol
	bis(2-chloroethyl)ether	X	4-chloro-3-methyl phenol	X	pyrene
	bis(2-chloroethoxy)methane	X	2-chloronaphthalene	X	1,2,4-trichlorobenzene
	bis(2-chloroisopropyl)ether	X	4-chlorophenylphenylether	X	2,4,5-trichlorophenol
	4-bromophenylphenylether	X	chrysene	X	2,4,6-trichlorophenol
	4-chlorophenylphenylether	X	di-n-butylphthalate	*	Nitrobodies
	hexachlorocyclopentadiene	X	di-n-octylphthalate		RDX
	hexachlorobutadiene	X	dibenzo(a,h)anthracene		2,4,6-TNT
	hexachlorobenzene	X	dibenzofuran		2,4-dinitrotoluene
	hexachloroethane	X	3,3'-dichlorobenzidine		2,6-dinitrotoluene
	1,2,4-trichlorobenzene	X	2,4-dichlorophenol		nitrobenzene
	2-chloronaphthalene	X	diethylphthalate		1,3,5-TNB
	4-chloro-3-methyl phenol	X	2,4-dimethylphenol		

*	TCLP Semivolatiles
	chlordane
	o-cresol
	m-cresol
	p-cresol
	cresol
	2,4-D
	2,4-dinitrotoluene
	endrin
	heptachlor
	heptachlor epoxide
	hexachlorobenzene
	hexachlorobutadiene
	hexachloroethane
	lindane
	methoxychlor
	nitrobenzene
	pentachlorophenol
	pyridine
	toxaphene
	2,4,5-trichlorophenol
	2,4,6-trichlorophenol
	2,4,5-TP (Silvex)

*	Pesticides/PCBs
X	aldrin
X	alpha-BHC
X	beta-BHC
X	delta-BHC
X	gamma-BHC (lindane)
X	technical chlordane
X	alpha-chlordane
X	gamma-chlordane
X	4,4'-DDD
X	4,4'-DDE
X	4,4'-DDT
X	dieldrin
X	endosulfan I
X	endosulfan II
X	endosulfan sulfate
X	endrin
X	endrin aldehyde
X	endrin ketone
X	heptachlor
X	heptachlor epoxide
X	toxaphene
X	methoxychlor
X	PCB 1016/1242
X	PCB 1221
X	PCB 1232
X	PCB 1248
X	PCB 1254
X	PCB 1260
X	PCB 1262

Laboratory Number

Branch Lab Number

Chain of Custody and Supplemental Information

Only one chain of custody form is required per sample set or point (if all collected at the same time)

1. Collected by Lee Barron
   Date 8-25-98 Time 15:30
   Delivered to KBL
   Date 8-26-98 Time 10:00
2. Received by
   Date Time
   Delivered to
   Date Time
3. Received by
   Date Time
   Delivered to
   Date Time
4. Received in Lab by [signature]
   Date 8/26/98 Time 1000
   Logged in by
   Date Time

Additional Information

1. Approximate volume of sample 16 oz
2. Nearest town or city Knoxville
3. Others present at collection Burl Mauzin
4. Number of other samples collected at same time at this point 3
5. Field collection procedure, handling and/or preservation of this sample according to EPA procedures and protocol
6. Mode of transportation to lab in State vehicle, in cooler, on ice
7. Sample sealed by
8. Date sample sealed
9. Remarks

SEP 14 1998

Project/Site No.: 47-559
Project Name: SMOKEY MOUNTAIN SMELTERS
Site Description: SMS-WA-05/WASTE/SMOKEY MTN
Station No.: SMS-WA-05
Collected: 08/25/98 15:30:00 By LB
unty: 47

Lab Number: 9808249-01E
Matrix: WASTE
Received: 08/26/98 10:00:00 By PMB
Sampling Agency: HWM_11_KFO
Priority:

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
VOLATILES-TAL SEDIMENTS						8260A
ACETONE	U	PPB	25	09/04/98	HMG	
BENZENE	U	PPB	2.5	09/04/98	HMG	
BROMODICHLOROMETHANE	U	PPB	2.5	09/04/98	HMG	
BROMOFORM	U	PPB	2.5	09/04/98	HMG	
BROMOMETHANE	U	PPB	5.0	09/04/98	HMG	
2-BUTANONE (MEK)	U	PPB	25	09/04/98	HMG	
CARBON DISULFIDE	U	PPB	5.0	09/04/98	HMG	
CARBON TETRACHLORIDE	U	PPB	2.5	09/04/98	HMG	
VINYL ACETATE	U	PPB	5.0	09/04/98	HMG	
CHLOROBENZENE	U	PPB	2.5	09/04/98	HMG	
CHLOROETHANE	U	PPB	5.0	09/04/98	HMG	
CHLOROFORM	U	PPB	2.5	09/04/98	HMG	
CHLOROMETHANE	U	PPB	5.0	09/04/98	HMG	
DIBROMOCHLOROMETHANE	U	PPB	2.5	09/04/98	HMG	
1,2-DICHLOROBENZENE	U	PPB	2.5	09/04/98	HMG	
1,3-DICHLOROBENZENE	U	PPB	2.5	09/04/98	HMG	
1,4-DICHLOROBENZENE	U	PPB	2.5	09/04/98	HMG	
DICHLORODIFLUOROMETHANE	U	PPB	5.0	09/04/98	HMG	
1,1-DICHLOROETHANE	U	PPB	2.5	09/04/98	HMG	
1,2-DICHLOROETHANE	U	PPB	2.5	09/04/98	HMG	
1,1-DICHLOROETHENE	U	PPB	2.5	09/04/98	HMG	
CIS-1,2-DICHLOROETHENE	U	PPB	2.5	09/04/98	HMG	
TRANS-1,2-DICHLOROETHENE	U	PPB	2.5	09/04/98	HMG	
1,2-DICHLOROPROPANE	U	PPB	2.5	09/04/98	HMG	
CIS-1,3-DICHLOROPROPENE	U	PPB	2.5	09/04/98	HMG	
TRANS-1,3-DICHLOROPROPENE	U	PPB	2.5	09/04/98	HMG	
ETHYLBENZENE	U	PPB	2.5	09/04/98	HMG	
METHYLENE CHLORIDE	B 9.8	PPB	2.5	09/04/98	HMG	
4-METHYL-2-PENTANONE (MIBK)	U	PPB	25	09/04/98	HMG	
STYRENE	U	PPB	2.5	09/04/98	HMG	
2-HEXANONE	U	PPB	5.0	09/04/98	HMG	
1,1,2,2-TETRACHLOROETHANE	U	PPB	2.5	09/04/98	HMG	
TETRACHLOROETHENE	U	PPB	2.5	09/04/98	HMG	
TOLUENE	J 0.8	PPB	2.5	09/04/98	HMG	
1,1,1-TRICHLOROETHANE	U	PPB	2.5	09/04/98	HMG	
1,1,2-TRICHLOROETHANE	U	PPB	2.5	09/04/98	HMG	
TRICHLOROETHENE	U	PPB	2.5	09/04/98	HMG	
TRICHLOROFLUOROMETHANE	U	PPB	5.0	09/04/98	HMG	
VINYL CHLORIDE	U	PPB	5.0	09/04/98	HMG	
o-XYLENE	U	PPB	2.5	09/04/98	HMG	
m&p-XYLENE	U	PPB	2.5	09/04/98	HMG	

*-Water, uG/L; Sediment, uG/kG

Printed: September 8, 1998

State of Tennessee - Environmental Laboratories

PLEASE PRINT LEGIBLY

Organic Analysis

Volatiles and Petroleum Hydrocarbons

PROJECT/SITE NO.	47-559	PROJECT NAME	SMOKEY MOUNTAIN SMELTERS
STATION NUMBER	SMS-WA-05	COUNTY	KNOX
DESCRIPTION	WASTE AT MAINTENANCE SHED		
STREAM MILE		DEPTH	MATRIX Soil
COLLECTED: DATE	AUGUST 25, 1998	TIME	15:30
SAMPLER'S NAME(printed)	LEE BARRON		
SAMPLING AGENCY	DIVISION OF SUPERFUND	BILLING CODE	327.38-11
IF PRIORITY, DATE NEEDED	SEPTEMBER 25		
SEND REPORT TO:	KNOXVILLE ENVIRONMENTAL ASSISSTANCE CENTER		
	BURL H. MAUPIN		
CONTACT HAZARD	METALS, RADIOCHEMICAL, UNKNOWN		

*	NPDES Volatiles - 624	*	TAL Volatiles - 8260A	*	TCLP Volatiles
	Bromoform		Chloromethane		Benzene
	Bromodichloromethane		Bromomethane		Carbon tetrachloride
	Carbon Tetrachloride		Vinyl chloride		Chlorobenzene
	Chlorobenzene		Chloroethane		Chloroform
	Chloroethane		Methylene chloride		1,2-Dichloroethane
	2-Chloroethylvinyl ether		Acetone		1,1-Dichloroethane
	Chloroform		Carbon disulfide		Methyl ethyl ketone
	Chloromethane		1,1-Dichloroethene		Tetrachloroethene
	Dibromochloromethane		1,1-Dichloroethane		Trichloroethene
	1,2-Dichlorobenzene		Cis-1,2-dichloroethene		Vinyl chloride
	1,3-Dichlorobenzene		Trans-1,2-dichloroethene	*	BTEX - 8260A - UST
	1,4-Dichlorobenzene		1,2-Dichloroethane		Benzene
	Dichlorodifluoromethane		Chloroform		Toluene
	1,1-Dichloroethane		2-Butanone		Ethyl benzene
	1,2-Dichloroethane		1,1,1-Trichloroethane		o-Xylene
	1,1-Dichloroethene		Carbon tetrachloride		m-Xylene
	Cis-1,2-dichloroethene		Vinyl acetate		p-Xylene
	Trans-1,2-dichloroethene		Bromodichloromethane		Methyl t-butyl ether
	1,2-Dichloropropane		1,2-Dichloropropane		Diisopropyl ether
	Cis-1,3-dichloropropene		Cis-1,3-dichloropropane	*	TPH by GC
	Trans-1,2-dichloroethene		Trichloroethene		Gasoline Range Organics
	Methylene chloride		Dibromochloromethane		Diesel Range Organics
	1,1,2,2-Tetrachloroethane		1,1,2-Trichloroethane	*	TPH by IR (418.1)
	Tetrachloroethene		Benzene		418.1 - Waste Oil
	1,1,1-Trichloroethane		Trans-1,3-dichloropropene	*	Other
	1,1,2-Trichloroethane		Bromoform		
	Trichloroethene		4-Methyl-2-pentanone		
	Trichlorofluoromethane		2-Hexanone		
	Vinyl chloride		Tetrachloroethene		
	Benzene		Toluene		
	Ethylbenzene		1,1,2,2-Tetrachloroethane		
	Toluene		Chlorobenzene		
	o-Xylene		Ethyl benzene		
	m-Xylene		Styrene		
	p-Xylene		o-Xylene		
			m-Xylene		
			p-Xylene		

Laboratory Number

Branch Lab Number

Chain of Custody and Supplemental Information

Only one chain of custody form is required per sample set or point (if all collected at the same time)

1. Collected by LEE BARRON
   Date AUGUST 25, 1998 Time 15:30
   Delivered to Knoxville Basin Laboratory
   Date 8-26-98 Time 10:00
2. Received by
   Date Time
   Delivered to
   Date Time
3. Received by
   Date Time
   Delivered to
   Date Time
4. Received in Lab by [illegible]
   Date 8/26/98 Time 1000
   Logged in by
   Date Time

Additional Information

1. Approximate volume of sample 4 oz.
2. Nearest town or city KNOXVILLE
3. Others present at collection BURL H. MAUPIN
4. Number of other samples collected at same time at this point *One other sample each for INORGANICS, RADIOCHEMICAL, AND EXTRACTABLE ORGANICS were collected for a total of three other samples.*
5. Field collection procedure, handling and/or preservation of this sample *according to EPA procedures and protocol*
6. Mode of transportation to lab *in State vehicle, in cooler, and on ice*
7. Sample sealed by
8. Date sample sealed
9. Remarks

SEP 30 1998

Project/Site No.: 47-559
Project Name: SMOKEY MOUNTAIN SMELTERS
Description: SMS-WA-05/WASTE/SMOKEY MTN
Station No.: SMS-WA-05
Collected: 08/25/98 15:30:00 By LB
County: 47

Lab Number: 9808249-01G
Matrix: WASTE
Received: 08/26/98 10:00:00 By PMB
Sampling Agency: HWM_11_KFO
Priority:

TEST	RESULT	*ERROR	UNITS	ANALYZED	BY	METHOD
GAMMA RADIONUCLIDES						R.6
Pb-214	0.732	0.090	pCi/g dry wt	09/01/98	AK	
Bi-214	0.549	0.070	pCi/g dry wt	09/01/98	AK	
Pb-212	0.558	0.050	pCi/g dry wt	09/01/98	AK	
Be-7	1.28	0.32	pCi/g dry wt	09/01/98	AK	
GROSS ALPHA & BETA						R.1.3
GROSS ALPHA	0.86	0.84	pCi/g DRY WT.	09/09/98	NLF	
GROSS BETA	8.3	1.2	pCi/g DRY WT.	09/09/98	NLF	

*--Represents +/- error value

Printed: September 10, 1998

State of Tennessee - Environmental Laboratories

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Radiochemical Analysis

PROJECT/SITE NO. 4T-559	PROJECT NAME SMOKEY MTN SMELTERS
STATION NUMBER SMS-WA-05	COUNTY KNOX
DESCRIPTION WASTE AT MAINTENANCE SHED	
STREAM MILE	DEPTH
COLLECTED: DATE 8-25-98	TIME 15:30
PICK-UP DATE:	
CONTACT HAZARD metals, radiochemical	mR/hr Reading < 0.1
SAMPLER'S NAME (printed) ~~Burl M~~ Lee Barron	
SAMPLING AGENCY DSF	BILLING CODE 3273811
IF PRIORITY, DATE NEEDED 9-25-98	
SEND REPORT TO: KEAC	

Sample Type

___Air ___Milk ___Swipe
___Water ___Tissue ___Liquid
___Sludge ___Soil ✓Solid
___Vegetation ___Sediment

Other_____

Field Comments:

Air Samples
Volume _____
Total Hours _____

___Sample Filtration
___Sample Acidification
___Send to RESL

REQUESTED ANALYSES:

✓	GROSS ALPHA (TOTAL)		STRONTIUM 89
	GROSS ALPHA (SUSPENDED)		STRONTIUM 90
	GROSS ALPHA (DISSOLVED)		TRITIUM (H-3)
✓	GROSS BETA (TOTAL)		THORIUM (TOTAL)
	GROSS BETA (SUSPENDED)		URANIUM (TOTAL)
	GROSS BETA (DISSOLVED)	✓	GAMMA RADIONUCLIDES
			ADDITIONAL ANALYSES:

Laboratory Number

Date Received

Time Received **By**

Chain of Custody and Supplemental Information

Only one chain of custody form is required per sample set or point (if all collected at the same time)

1. Collected by Lee Barron
   Date 8-25-98 Time 15:30
   Delivered to KBL
   Date 8-26-98 Time 10:00
2. Collected by
   Date Time
   Delivered to
   Date Time
3. Collected by
   Date Time
   Delivered to
   Date Time
4. Received in Lab by [illegible]
   Date 8/26/98 Time 1000
   Logged in by
   Date Time

Additional Information

1. Approximate volume of sample 16 oz
2. Nearest town or city Knoxville
3. Others present at collection Burl Moupin
4. Number of other samples collected at same time at this point 3
5. Field collection procedure, handling and/or preservation of this sample according to EPA procedures and protocol
6. Mode of transportation to lab in State vehicle, in cooler on ice
7. Sample sealed by
8. Date sample sealed
9. Remarks

PH-3009 (rev 2/98)

RDA 1527

OCT 13 1998

Project/Site No.: 47-559
Project Name: SMOKEY MOUNTAIN SMELTERS
Description: SMS-WA-06/BASIN-MAINT.SHED
Station No.: SMS-WA-06
Collected: 08/25/98 15:50:00 By LB
County: 47

Lab Number: 9808249-02
Matrix: WASTE
Received: 08/26/98 10:00:00 By PMB
Sampling Agency: HWM_11_KFO
Priority:

TEST	RESULT	UNITS	LIMIT	ANALYZED	BY	METHOD
AMMONIA	49.3	mg/kg	10	09/15/98	SAL	A.18.2
CYANIDE	U	mg/kg	1.0	09/23/98	SAL	A.9
ALUMINUM	48900	mg/kg	10	10/01/98	JAH	
ANTIMONY	9.6	mg/kg	0.6	10/09/98	JAH	
ARSENIC	7.2	mg/kg	0.2	10/05/98	JAH	
BARIUM	94	mg/kg	10	10/01/98	JAH	
BERYLLIUM	3	mg/kg	1	09/30/98	JAH	
CADMIUM	2.8	mg/kg	0.5	09/11/98	JAH	
CALCIUM	21500	mg/kg	3	10/02/98	JAH	
CHROMIUM	107	mg/kg	1	09/23/98	JAH	
COBALT	66	mg/kg	1	09/15/98	JAH	
COPPER	1970	mg/kg	1	09/16/98	JAH	
DIGESTION-METALS	COMPLETED	COMPLETED		09/10/98	EAM	
IRON	15000	mg/kg	5	09/16/98	JAH	
LEAD	85	mg/kg	4	09/15/98	JAH	
MAGNESIUM	8820	mg/kg	2	10/02/98	JAH	
MANGANESE	486	mg/kg	1	09/16/98	JAH	
MERCURY	0.11	mg/kg	0.1	09/11/98	ATB	EPA 245.5
METALS PREP-SOLIDS/WASTES	COMPLETED	COMPLETED		08/28/98	EAM	
NICKEL	745	mg/kg	2	09/11/98	JAH	
PERCENT SOLIDS	72.7	%		09/08/98	SDS	
POTASSIUM	1320	mg/kg	2	10/02/98	JAH	
SELENIUM	6.0	mg/kg	0.4	10/08/98	JAH	

Project/Site No.: 47-559
Project Name: SMOKEY MOUNTAIN SMELTERS
Description: SMS-WA-06/BASIN-MAINT.SHED
Station No.: SMS-WA-06
Collected: 08/25/98 15:50:00 By LB
County: 47

Lab Number: 9808249-02
Matrix: WASTE
Received: 08/26/98 10:00:00 By PMB
Sampling Agency: HWM_11_KFO
Priority:

TEST	RESULT	UNITS	LIMIT	ANALYZED	BY	METHOD
SILVER	1	mg/kg	1	09/15/98	JAH	
SODIUM	5920	mg/kg	10	10/02/98	JAH	
THALLIUM	U	mg/kg	5	09/15/98	JAH	
VANADIUM	46	mg/kg	20	10/01/98	JAH	
ZINC	803	mg/kg	0.5	09/15/98	JAH	

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Inorganic Analysis

PROJECT/SITE NO.	47-559
PROJECT NAME	Smokey Mountain Smelters
STATION NUMBER	SMS-WA-06
COUNTY	Knox
DESCRIPTION	waste in basin at maintenance shed
STREAM MILE	
DEPTH	
MATRIX	waste
COLLECTED: DATE	August 25, 1998
TIME	15:50
SAMPLER'S NAME(printed)	Lee Barron
SAMPLING AGENCY	Division of Superfund
BILLING CODE	327.38-10
IF PRIORITY, DATE NEEDED	September 25, 1998
SEND REPORT TO:	Knoxville Environmental Assisstance Center
	Burl H. Maupin
CONTACT HAZARD	metals, radiochemical, unknown

*	Metals
x	aluminum, Al
x	antimony, Sb
x	arsenic, As
x	barium, Ba
x	beryllium, Be
x	cadmium, Cd
x	calcium, Ca
x	chromium, Cr
x	cobalt, Co
x	copper, Cu
x	iron, Fe
x	lead, Pb
x	magnesium, Mg
x	manganese, Mn
x	mercury, Hg
x	nickel, Ni
x	potassium, K
x	selenium, Se
x	silver, Ag
x	sodium, Na
x	thallium, Tl
x	vanadium, V
x	zinc, Zn

*	Env. Microbiology	*	General Inorganics		Gen. Inorganics (con't)
	coliform, fecal*		acidity as $CaCO_3$*		oil and grease
	coliform, total*		alkalinity as $CaCO_3$*		orthophosphate, total*
	strep, fecal*		alkalinity, phen. as $CaCO_3$*		oxygen, dissolved*
			BOD, 5-day*		pH
			CBOD, 5-day*		phenols, total
			boron		phosphate, total
*	**Ambient Parameters**		chloride*		residue, dissolved*
	COD*		chlorine, residual*		residue, settleable*
	coliform, fecal		chromium, hexavalent		residue, suspended*
	conductivity*		COD*		residue, total*
	hardness, total as $CaCO_3$*		color, apparent*		silica*
	nitrogen, ammonia		color, true*		sulfate*
	nitrogen, NO_3 & NO_2		conductivity*		sulfide, total*
	nitrogen, total Kjeldahl	X	cyanide		TOC*
	phosphate, total		flash point*		turbidity*
	pH		fluoride*		percent solids
	residue, dissolved*		hardness, Ca as $CaCO_3$*	*	**Other**
	residue, suspended*		hardness, total as $CaCO_3$*		
	arsenic, As		hydrocarbons, total		
	cadmium, Cd		MBAS*		
	chromium, Cr	X	nitrogen, ammonia		
	copper, Cu		nitrogen, nitrate*		
	lead, Pb		nitrogen, nitrite*		
	mercury, Hg		nitrogen, NO_3 & NO_2		
	nickel, Ni		nitrogen, total Kjeldahl		
	zinc, Zn		nitrogen, total organic		

*	TCLP
	arsenic, As
	barium, Ba
	cadmium, Cd
	chromium, Cr
	lead, Pb
	mercury, Hg
	nickel, Ni
	selenium, Se
	silver, Ag

** denotes analyses performed only on water*

FIELD DETERMINATIONS	Temperature
pH	Chlorine, residual
Conductivity	Other
Dissolved Oxygen	

Laboratory Number

Branch Lab Number

Chain of Custody and Supplemental Information

Only one chain of custody form is required per sample set or point (if all collected at the same time)

1. Collected by Lee Barron
   Date August 25, 1998 Time 15:50
   Delivered to Knoxville Basin Laboratory.
   Date August 25, 1998 Time
2. Received by
   Date Time
   Delivered to
   Date Time
3. Received by
   Date Time
   Delivered to
   Date Time
4. Received in Lab by [illegible]
   Date 8/26/98 Time 1000
   Logged in by
   Date Time

Additional Information

1. Approximate volume of sample 16 oz.
2. Nearest town or city Knoxville
3. Others present at collection Burl Maupin
4. Number of other samples collected at same time at this point ~~split samples~~
5. Field collection procedure, handling and/or preservation of this sample
   According to standard operating procedure
6. Mode of transportation to lab State vehicle
7. Sample sealed by ~~Lee Barron~~
8. Date sample sealed
9. Remarks

PH-3011 (rev 1/96)

RDA 1527

OCT 13 1998

Project/Site No.: 47-559
Project Name: SMOKEY MOUNTAIN SMELTERS
Description: SMS-WA-06/BASIN-MAINT.SHED
Station No.: SMS-WA-06
lected: 08/25/98 15:50:00 By LB
nty: 47

Lab Number: 9808249-02F
Matrix: WASTE
Received: 08/26/98 10:00:00 By PMB
Sampling Agency: HWM_11_KFO
Priority:

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
B/N/A EXTR+PESTS,PCBS-SOIL						MS+ECD
BUTYL BENZYL PHTHALATE	U	PPB	270	09/29/98	MAC	
BIS(2-ETHYLHEXYL)PHTHALATE	B 322	PPB	-	09/29/98	MAC	
DI-n-BUTYL PHTHALATE	U	PPB	270	09/29/98	MAC	
DI-n-OCTYL PHTHALATE	U	PPB	540	09/29/98	MAC	
DIETHYL PHTHALATE	B 457	PPB	-	09/29/98	MAC	
DIMETHYL PHTHALATE	U	PPB	130	09/29/98	MAC	
n-NITROSODIMETHYLAMINE	U	PPB	540	09/29/98	MAC	
n-NITROSODIPHENYLAMINE	U	PPB	270	09/29/98	MAC	
n-NITROSO-di-n-PROPYLAMINE	U	PPB	270	09/29/98	MAC	
ISOPHORONE	U	PPB	130	09/29/98	MAC	
NITROBENZENE	U	PPB	270	09/29/98	MAC	
2,4-DINITROTOLUENE	U	PPB	540	09/29/98	MAC	
2,6-DINITROTOLUENE	U	PPB	540	09/29/98	MAC	
ACENAPTHENE	U	PPB	130	09/29/98	MAC	
ACENAPHTHYLENE	U	PPB	130	09/29/98	MAC	
ANTHRACENE	U	PPB	130	09/29/98	MAC	
BENZO(a)ANTHRACENE	U	PPB	130	09/29/98	MAC	
BENZO(a)PYRENE	U	PPB	130	09/29/98	MAC	
BENZO(b)FLUORANTHENE	148	PPB	-	09/29/98	MAC	
BENZO(ghi)PERYLENE	U	PPB	540	09/29/98	MAC	
BENZO(k)FLUORANTHENE	U	PPB	130	09/29/98	MAC	
DIBENZO(a,h)ANTHRACENE	U	PPB	540	09/29/98	MAC	
FLUORANTHENE	J 53.7	PPB	130	09/29/98	MAC	
FLUORENE	U	PPB	130	09/29/98	MAC	
INDENO(1,2,3-cd)PYRENE	U	PPB	540	09/29/98	MAC	
NAPHTHALENE	U	PPB	130	09/29/98	MAC	
PHENANTHRENE	U	PPB	130	09/29/98	MAC	
PYRENE	U	PPB	130	09/29/98	MAC	
CHRYSENE	U	PPB	130	09/29/98	MAC	
BIS(2-CHLOROETHYL)ETHER	U	PPB	270	09/29/98	MAC	
BIS(2-CHLOROETHOXY)METHANE	U	PPB	130	09/29/98	MAC	
BIS(2-CHLOROISOPROPYL)ETHER	U	PPB	540	09/29/98	MAC	
4-BROMOPHENYLPHENYL ETHER	U	PPB	540	09/29/98	MAC	
4-CHLOROPHENYLPHENYL ETHER	U	PPB	270	09/29/98	MAC	
HEXACHLOROCYCLOPENTADIENE	U	PPB	1300	09/29/98	MAC	
HEXACHLOROBUTADIENE	U	PPB	270	09/29/98	MAC	
HEXACHLOROBENZENE	U	PPB	270	09/29/98	MAC	
HEXACHLOROETHANE	U	PPB	270	09/29/98	MAC	
1,2,4-TRICHLOROBENZENE	U	PPB	270	09/29/98	MAC	
2-CHLORONAPHTHALENE	U	PPB	130	09/29/98	MAC	
4-CHLORO-3-METHYLPHENOL	U	PPB	270	09/29/98	MAC	
2-CHLOROPHENOL	U	PPB	130	09/29/98	MAC	
2,4-DICHLOROPHENOL	U	PPB	270	09/29/98	MAC	
2,4-DIMETHYLPHENOL	U	PPB	270	09/29/98	MAC	
2,4-DINITROPHENOL	U	PPB	2700	09/29/98	MAC	
2-METHYL-4,6-DINITROPHENOL	U	PPB	1300	09/29/98	MAC	
2-NITROPHENOL	U	PPB	540	09/29/98	MAC	
4-NITROPHENOL	U	PPB	1300	09/29/98	MAC	
PENTACHLOROPHENOL	U	PPB	540	09/29/98	MAC	
PHENOL	U	PPB	130	09/29/98	MAC	
2,4,6-TRICHLOROPHENOL	U	PPB	270	09/29/98	MAC	
2,4,5-TRICHLOROPHENOL	U	PPB	270	09/29/98	MAC	
O-CRESOL	U	PPB	270	09/29/98	MAC	
M- & P-CRESOL	U	PPB	130	09/29/98	MAC	
2-METHYLNAPHTHALENE	U	PPB	130	09/29/98	MAC	
BENZOIC ACID	U	PPB	540	09/29/98	MAC	
BENZYL ALCOHOL	U	PPB	540	09/29/98	MAC	
4-CHLOROANILINE	U	PPB	270	09/29/98	MAC	
DIBENZOFURAN	U	PPB	130	09/29/98	MAC	
3,3-DICHLOROBENZIDINE	U	PPB	540	09/29/98	MAC	
2-NITROANILINE	U	PPB	540	09/29/98	MAC	
3-NITROANILINE	U	PPB	540	09/29/98	MAC	
4-NITROANILINE	U	PPB	1300	09/29/98	MAC	
HEXACHLOROBENZENE	U	PPB	4.9	09/29/98	MAC	
ALDRIN	U	PPB	6.5	09/29/98	MAC	
ha-BHC	U	PPB	12	09/29/98	MAC	
a-BHC	U	PPB	17	09/29/98	MAC	
eta-BHC	U	PPB	17	09/29/98	MAC	
gamma-BHC (LINDANE)	U	PPB	6.5	09/29/98	MAC	
alpha-CHLORDANE	249	PPB	-	09/29/98	MAC	
gamma-CHLORDANE	1980	PPB	-	09/29/98	MAC	
TECHNICAL CHLORDANE	U	PPB	190	09/29/98	MAC	
p,p-DDD	U	PPB	12	09/29/98	MAC	

OCT 13 1998

Project/Site No.: 47-559
Project Name: SMOKEY MOUNTAIN SMELTERS
Description: SMS-WA-06/BASIN-MAINT.SHED
Station No.: SMS-WA-06
Collected: 08/25/98 15:50:00 By LB
County: 47

Lab Number: 9808249-02F
Matrix: WASTE
Received: 08/26/98 10:00:00 By PMB
Sampling Agency: HWM_11_KFO
Priority:

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
B/N/A EXTR+PESTS,PCBS-SOIL						MS+ECD
p,p-DDE	U	PPB	11	09/29/98	MAC	
p,p-DDT	U	PPB	11	09/29/98	MAC	
DIELDRIN	183	PPB	-	09/29/98	MAC	
ENDOSULFAN I	U	PPB	140	09/29/98	MAC	
ENDOSULFAN II	U	PPB	12	09/29/98	MAC	
ENDOSULFAN SULFATE	U	PPB	12	09/29/98	MAC	
ENDRIN	U	PPB	12	09/29/98	MAC	
ENDRIN ALDEHYDE	U	PPB	10	09/29/98	MAC	
ENDRIN KETONE	U	PPB	12	09/29/98	MAC	
HEPTACHLOR	1210	PPB	-	09/29/98	MAC	
HEPTACHLOR EPOXIDE	371	PPB	-	09/29/98	MAC	
TOXAPHENE	U	PPB	340	09/29/98	MAC	
METHOXYCHLOR	U	PPB	47	09/29/98	MAC	
PCB 1016/1242	U	PPB	760	09/29/98	MAC	
PCB 1221	U	PPB	830	09/29/98	MAC	
PCB 1232	U	PPB	940	09/29/98	MAC	
PCB 1248	U	PPB	640	09/29/98	MAC	
PCB 1254	U	PPB	310	09/29/98	MAC	
PCB 1260	U	PPB	280	09/29/98	MAC	
PCB 1262	U	PPB	300	09/29/98	MAC	

*-Water, uG/L; Sediment, uG/kG

Printed: October 2, 1998

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Organic Analysis
Base/Neutral/Acid Extractables

PROJECT/SITE NO.	47559
PROJECT NAME	SMOKEY MTN SMELTERS
STATION NUMBER	SMS-WA-06
COUNTY	KNOX
DESCRIPTION	WASTE IN BASIN AT MAINTENANCE SHED
STREAM MILE	
DEPTH	
MATRIX	Soil
COLLECTED: DATE	AUGUST 25, 1998
TIME	15:50
SAMPLER'S NAME(printed)	Lee Bonner
SAMPLING AGENCY	DSE
BILLING CODE	22173811
IF PRIORITY, DATE NEEDED	9-25-98
SEND REPORT TO:	KEAC
CONTACT HAZARD	metals, [illegible]

*	NPDES Extractables	*	NPDES Extractables(con't)	*	TAL Semivolatiles
	butylbenzylphthalate	X	2-chlorophenol	X	dimethylphthalate
	bis(2-ethylhexyl)phthalate		2,4-dichlorophenol	X	4,6-dinitro-2-methylphenol
	di-n-butylphthalate		2,4-dimethylphenol	X	2,4-dinitrophenol
	di-n-octylphthalate		2,4-dinitrophenol	X	2,4-dinitrotoluene
	diethylphthalate		4,6-dinitro-o-cresol	X	2,6-dinitrotoluene
	dimethylphthalate		2-nitrophenol	X	fluoranthene
X	*n-nitrosodimethylamine*		*4-nitrophenol*	X	*fluorene*
	n-nitrosodiphenylamine		pentachlorophenol	X	hexachlorobenzene
	n-nitrosodi-n-propylamine		phenol	X	hexachlorobutadiene
	isophorone		2,4,6-trichlorophenol	X	hexachlorocyclopentadiene
	nitrobenzene	*	**TAL Semivolatiles**	X	hexachloroethane
	2,4-dinitrotoluene	X	acenaphthene	X	indeno(1,2,3-cd)pyrene
	acenaphthene	X	acenaphthylene	X	isophorone
	acenaphthylene	X	anthracene	X	2-methylnaphthalene
	anthracene	X	benzo(a)anthracene	X	2-methylphenol
	benzo(a)anthracene	X	benzo(a)pyrene	X	4-methylphenol
	benzo(a)pyrene	X	benzo(b)fluoranthene	X	n-nitrosodiphenylamine
	benzo(b)fluoranthene	X	benzo(g,h,i)perylene	X	n-nitroso-n-dipropylamine
	benzo(g,h,i)perylene	X	benzo(k)fluoranthene	X	naphthalene
	benzo(k)fluoranthene	X	benzoic acid	X	2-nitroaniline
	chrysene	X	benzyl alcohol	X	3-nitroaniline
	dibenzo(a,h)anthracene	X	bis(2-chloroethoxy)methane	X	4-nitroaniline
	fluoranthene	X	bis(2-chloroethyl) ether	X	nitrobenzene
	fluorene	X	bis(2-chloroisopropyl)ether	X	2-nitrophenol
	indeno(1,2,3-c,d)pyrene	X	bis(2-ethylhexyl)phthalate	X	4-nitrophenol
	naphthalene	X	4-bromophenylphenylether	X	pentachlorophenol
	phenanthrene	X	butylbenzylphthalate	X	phenanthrene
	pyrene	X	4-chloroaniline	X	phenol
	bis(2-chloroethyl)ether	X	4-chloro-3-methyl phenol	X	pyrene
	bis(2-chloroethoxy)methane	X	2-chloronaphthalene	X	1,2,4-trichlorobenzene
	bis(2-chloroisopropyl)ether	X	4-chlorophenylphenylether	X	2,4,5-trichlorophenol
	4-bromophenylphenylether	X	chrysene	X	2,4,6-trichlorophenol
	4-chlorophenylphenylether	X	di-n-butylphthalate	*	**Nitrobodies**
	hexachlorocyclopentadiene	X	di-n-octylphthalate		RDX
	hexachlorobutadiene	X	dibenzo(a,h)anthracene		2,4,6-TNT
	hexachlorobenzene	X	dibenzofuran		2,4-dinitrotoluene
	hexachloroethane	X	3,3'-dichlorobenzidine		2,6-dinitrotoluene
	1,2,4-trichlorobenzene	X	2,4-dichlorophenol		nitrobenzene
	2-chloronaphthalene	X	diethylphthalate		1,3,5-TNB
	4-chloro-3-methyl phenol	X	2,4-dimethylphenol		

*	TCLP Semivolatiles
	chlordane
	o-cresol
	m-cresol
	p-cresol
	cresol
	2,4-D
	2,4-dinitrotoluene
	endrin
	heptachlor
	heptachlor epoxide
	hexachlorobenzene
	hexachlorobutadiene
	hexachloroethane
	lindane
	methoxychlor
	nitrobenzene
	pentachlorophenol
	pyridine
	toxaphene
	2,4,5-trichlorophenol
	2,4,6-trichlorophenol
	2,4,5-TP (Silvex)
*	**Pesticides/PCBs**
X	aldrin
X	alpha-BHC
X	beta-BHC
X	delta-BHC
X	gamma-BHC (lindane)
X	technical chlordane
X	alpha-chlordane
X	gamma-chlordane
X	4,4'-DDD
X	4,4'-DDE
X	4,4'-DDT
X	dieldrin
X	endosulfan I
X	endosulfan II
X	endosulfan sulfate
X	endrin
X	endrin aldehyde
X	endrin ketone
X	heptachlor
X	heptachlor epoxide
X	toxaphene
X	methoxychlor
X	PCB 1016/1242
X	PCB 1221
X	PCB 1232
X	PCB 1248
X	PCB 1254
X	PCB 1260
X	PCB 1262

Laboratory Number

Branch Lab Number

Chain of Custody and Supplemental Information

Only one chain of custody form is required per sample set or point (if all collected at the same time)

1. Collected by [illegible]
   Date [illegible] Time
   Delivered to [illegible] 15:50
   Date 8/26/98 Time 10:00
2. Received by [illegible]
   Date Time
   Delivered to
   Date Time
3. Received by
   Date Time
   Delivered to
   Date Time
4. Received in Lab by [illegible]
   Date 8/26/98 Time 1000
   Logged in by
   Date Time

Additional Information

1. Approximate volume of sample
   1 oz
2. Nearest town or city
3. Others present at collection [illegible]ville
   Burl Maynie
4. Number of other samples collected at same time at this point
   3
5. Field collection procedure, handling and/or preservation of this sample
   according to EPA procedures and
6. Mode of transportation to lab
   in state vehicle, in cooler, on ice
7. Sample sealed by
8. Date sample sealed
9. Remarks

PH-3014 (rev 1/96)

RDA 1527

SEP 14 1998

Project/Site No.: 47-559
Project Name: SMOKEY MOUNTAIN SMELTERS
Site Description: SMS-WA-06/BASIN-MAINT.SHED
Station No.: SMS-WA-06
Collected: 08/25/98 15:50:00 By LB
unty: 47

Lab Number: 9808249-02E
Matrix: WASTE
Received: 08/26/98 10:00:00 By PMB
Sampling Agency: HWM_11_KFO
Priority:

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
VOLATILES-TAL SEDIMENTS						8260A
ACETONE	U	PPB	25	09/04/98	HMG	
BENZENE	U	PPB	2.5	09/04/98	HMG	
BROMODICHLOROMETHANE	U	PPB	2.5	09/04/98	HMG	
BROMOFORM	U	PPB	2.5	09/04/98	HMG	
BROMOMETHANE	U	PPB	5.0	09/04/98	HMG	
2-BUTANONE (MEK)	U	PPB	25	09/04/98	HMG	
CARBON DISULFIDE	U	PPB	5.0	09/04/98	HMG	
CARBON TETRACHLORIDE	U	PPB	2.5	09/04/98	HMG	
VINYL ACETATE	U	PPB	5.0	09/04/98	HMG	
CHLOROBENZENE	U	PPB	2.5	09/04/98	HMG	
CHLOROETHANE	U	PPB	5.0	09/04/98	HMG	
CHLOROFORM	U	PPB	2.5	09/04/98	HMG	
CHLOROMETHANE	U	PPB	5.0	09/04/98	HMG	
DIBROMOCHLOROMETHANE	U	PPB	2.5	09/04/98	HMG	
1,2-DICHLOROBENZENE	U	PPB	2.5	09/04/98	HMG	
1,3-DICHLOROBENZENE	U	PPB	2.5	09/04/98	HMG	
1,4-DICHLOROBENZENE	U	PPB	2.5	09/04/98	HMG	
DICHLORODIFLUOROMETHANE	U	PPB	5.0	09/04/98	HMG	
1,1-DICHLOROETHANE	U	PPB	2.5	09/04/98	HMG	
1,2-DICHLOROETHANE	U	PPB	2.5	09/04/98	HMG	
1,1-DICHLOROETHENE	U	PPB	2.5	09/04/98	HMG	
CIS-1,2-DICHLOROETHENE	U	PPB	2.5	09/04/98	HMG	
TRANS-1,2-DICHLOROETHENE	U	PPB	2.5	09/04/98	HMG	
1,2-DICHLOROPROPANE	U	PPB	2.5	09/04/98	HMG	
CIS-1,3-DICHLOROPROPENE	U	PPB	2.5	09/04/98	HMG	
TRANS-1,3-DICHLOROPROPENE	U	PPB	2.5	09/04/98	HMG	
ETHYLBENZENE	U	PPB	2.5	09/04/98	HMG	
METHYLENE CHLORIDE	B 9.7	PPB	2.5	09/04/98	HMG	
4-METHYL-2-PENTANONE (MIBK)	U	PPB	25	09/04/98	HMG	
STYRENE	U	PPB	2.5	09/04/98	HMG	
2-HEXANONE	U	PPB	5.0	09/04/98	HMG	
1,1,2,2-TETRACHLOROETHANE	U	PPB	2.5	09/04/98	HMG	
TETRACHLOROETHENE	U	PPB	2.5	09/04/98	HMG	
TOLUENE	4.8	PPB	2.5	09/04/98	HMG	
1,1,1-TRICHLOROETHANE	U	PPB	2.5	09/04/98	HMG	
1,1,2-TRICHLOROETHANE	U	PPB	2.5	09/04/98	HMG	
TRICHLOROETHENE	U	PPB	2.5	09/04/98	HMG	
TRICHLOROFLUOROMETHANE	U	PPB	5.0	09/04/98	HMG	
VINYL CHLORIDE	U	PPB	5.0	09/04/98	HMG	
o-XYLENE	U	PPB	2.5	09/04/98	HMG	
m&p-XYLENE	U	PPB	2.5	09/04/98	HMG	

*-Water, uG/L; Sediment, uG/kG

Printed: September 8, 1998

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Organic Analysis

Volatiles and Petroleum Hydrocarbons

PROJECT/SITE NO.	47-559	PROJECT NAME	SMOKY MOUNTAIN SMELTERS
STATION NUMBER	SMS-WA-06	COUNTY	KNOX
DESCRIPTION	WASTE AT MAINTENANCE SHED		
STREAM MILE		DEPTH	MATRIX SOIL
COLLECTED: DATE	AUGUST 25, 1998	TIME	15:50
SAMPLER'S NAME(printed)	LEE BARRON		
SAMPLING AGENCY	DIVISION OF SUPERFUND	BILLING CODE	327.38-11
IF PRIORITY, DATE NEEDED	SEPTEMBER 25		
SEND REPORT TO:	KNOXVILLE ENVIRONMENTAL ASSISSTANCE CENTER BURL H. MAUPIN		
CONTACT HAZARD	METALS, RADIOCHEMICAL, UNKNOWN		

*	NPDES Volatiles - 624	*	TAL Volatiles - 8260A	*	TCLP Volatiles
	Bromoform		Chloromethane		Benzene
	Bromodichloromethane		Bromomethane		Carbon tetrachloride
	Carbon Tetrachloride		Vinyl chloride		Chlorobenzene
	Chlorobenzene		Chloroethane		Chloroform
	Chloroethane		Methylene chloride		1,2-Dichloroethane
	2-Chloroethylvinyl ether		Acetone		1,1-Dichloroethane
	Chloroform		Carbon disulfide		Methyl ethyl ketone
	Chloromethane		1,1-Dichloroethene		Tetrachloroethene
	Dibromochloromethane		1,1-Dichloroethane		Trichloroethene
	1,2-Dichlorobenzene		Cis-1,2-dichloroethene		Vinyl chloride
	1,3-Dichlorobenzene		Trans-1,2-dichloroethene	*	BTEX - 8260A - UST
	1,4-Dichlorobenzene		1,2-Dichloroethane		Benzene
	Dichlorodifluoromethane		Chloroform		Toluene
	1,1-Dichloroethane		2-Butanone		Ethyl benzene
	1,2-Dichloroethane		1,1,1-Trichloroethane		o-Xylene
	1,1-Dichloroethene		Carbon tetrachloride		m-Xylene
	Cis-1,2-dichloroethene		Vinyl acetate		p-Xylene
	Trans-1,2-dichloroethene		Bromodichloromethane		Methyl t-butyl ether
	1,2-Dichloropropane		1,2-Dichloropropane		Diisopropyl ether
	Cis-1,3-dichloropropene		Cis-1,3-dichloropropane	*	TPH by GC
	Trans-1,2-dichloroethene		Trichloroethene		Gasoline Range Organics
	Methylene chloride		Dibromochloromethane		Diesel Range Organics
	1,1,2,2-Tetrachloroethane		1,1,2-Trichloroethane	*	TPH by IR (418.1)
	Tetrachloroethene		Benzene		418.1 - Waste Oil
	1,1,1-Trichloroethane		Trans-1,3-dichloropropene	*	Other
	1,1,2-Trichloroethane		Bromoform		
	Trichloroethene		4-Methyl-2-pentanone		
	Trichlorofluoromethane		2-Hexanone		
	Vinyl chloride		Tetrachloroethene		
	Benzene		Toluene		
	Ethylbenzene		1,1,2,2-Tetrachloroethane		
	Toluene		Chlorobenzene		
	o-Xylene		Ethyl benzene		
	m-Xylene		Styrene		
	p-Xylene		o-Xylene		
			m-Xylene		
			p-Xylene		

Laboratory Number

Branch Lab Number

Chain of Custody and Supplemental Information

Only one chain of custody form is required per sample set or point (if all collected at the same time)

1. Collected by ~~Burl H. Maupin~~ Lee Barron
   Date AUGUST 25, 1998 Time 15:50
   Delivered to Knoxville Basin Laboratory
   Date 8-26-98 Time 10:00
2. Received by
   Date Time
   Delivered to
   Date Time
3. Received by
   Date Time
   Delivered to
   Date Time
4. Received in Lab by
   Date 8/26/98 Time 1000
   Logged in by
   Date Time

Additional Information

1. Approximate volume of sample 4 oz.
2. Nearest town or city KNOXVILLE
3. Others present at collection BURL H. MAUPIN
4. Number of other samples collected at same time at this point *One other sample each for INORGANICS, RADIOCHEMICAL, AND EXTRACTABLE ORGANICS were collected for a total of three other samples.*
5. Field collection procedure, handling and/or preservation of this sample *according to EPA procedures and protocol*
6. Mode of transportation to lab *in State vehicle, in cooler, and on ice*
7. Sample sealed by
8. Date sample sealed
9. Remarks

SEP 30 1998

Project/Site No.:	47-559	Lab Number:	9808249-02G
Project Name:	SMOKEY MOUNTAIN SMELTERS	Matrix:	WASTE
Description:	SMS-WA-06/BASIN-MAINT.SHED	Received:	08/26/98 10:00:00 By PMB
Station No.:	SMS-WA-06	Sampling Agency:	HWM_11_KFO
Collected:	08/25/98 15:50:00 By LB	Priority:	
nty:	47		

TEST	RESULT	*ERROR	UNITS	ANALYZED	BY	METHOD
GAMMA RADIONUCLIDES						R.6
K-40	5.32	0.46	pCi/g dry wt	09/01/98	AK	
Pb-214	0.529	0.070	pCi/g dry wt	09/01/98	AK	
Bi-214	0.579	0.070	pCi/g dry wt	09/01/98	AK	
Pb-212	0.615	0.050	pCi/g dry wt	09/01/98	AK	
Ac-228	0.551	0.090	pCi/g dry wt	09/01/98	AK	
Cs-137	0.083	0.020	pCi/g dry wt	09/01/98	AK	
GROSS ALPHA & BETA						R.1.3
GROSS ALPHA	0.56	0.52	pCi/g DRY WT.	09/09/98	NLF	
GROSS BETA	8.0	1.3	pCi/g DRY WT.	09/09/98	NLF	

*--Represents +/- error value

Printed: September 10, 1998

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Radiochemical Analysis

PROJECT/SITE NO. 47559	PROJECT NAME SMOKEY MTN SMELTERS
STATION NUMBER SMS-WA-06	COUNTY KNOX
DESCRIPTION WASTE AT MAINTENANCE SHED BASIN	
STREAM MILE	DEPTH
COLLECTED: DATE 8-25-98	TIME 15:50
PICK-UP DATE:	
CONTACT HAZARD metals, radiochemical	mR/hr Reading <0.1
SAMPLER'S NAME (printed) ~~Burl Maupin~~ Les Barron	
SAMPLING AGENCY DSF	BILLING CODE 3273811
IF PRIORITY, DATE NEEDED 9-25-98	
SEND REPORT TO: KEAC	

Laboratory Number

Date Received

Time Received By

Sample Type

___Air ___Milk ___Swipe
___Water ___Tissue ___Liquid
___Sludge ___Soil ✓Solid
___Vegetation ___Sediment

Other_____

Field Comments:

Air Samples
Volume _____
Total Hours _____

___Sample Filtration
___Sample Acidification
___Send to RESL

REQUESTED ANALYSES:

✓	GROSS ALPHA (TOTAL)		STRONTIUM 89
	GROSS ALPHA (SUSPENDED)		STRONTIUM 90
	GROSS ALPHA (DISSOLVED)		TRITIUM (H-3)
✓	GROSS BETA (TOTAL)		THORIUM (TOTAL)
	GROSS BETA (SUSPENDED)		URANIUM (TOTAL)
	GROSS BETA (DISSOLVED)	✓	GAMMA RADIONUCLIDES
			ADDITIONAL ANALYSES:

Chain of Custody and Supplemental Information

Only one chain of custody form is required per sample set or point (if all collected at the same time)

1. Collected by Les Barron
   Date 8-25-98 Time 15:50
   Delivered to KBL
   Date 8-26-98 Time 10:00
2. Collected by
   Date Time
   Delivered to
   Date Time
3. Collected by
   Date Time
   Delivered to
   Date Time
4. Received in Lab by P Baker
   Date 8/26/98 Time 1000
   Logged in by
   Date Time

Additional Information

1. Approximate volume of sample 16 oz
2. Nearest town or city Knoxville
3. Others present at collection Burl Maupin
4. Number of other samples collected at same time at this point 3
5. Field collection procedure, handling and/or preservation of this sample EPA procedures and protocol
6. Mode of transportation to lab in State vehicle in cooler on ice
7. Sample sealed by
8. Date sample sealed
9. Remarks

OCT 15 1998

Project/Site No.: 47-559
Project Name: SMOKEY MOUNTAIN SMELTERS
Description: SMS-WA-07/FURNACE TROUGH
Station No.: SMS-WA-07
Collected: 08/31/98 11:15:00 By WLB
County: 47

Lab Number: 9809002-02
Matrix: WASTE
Received: 09/01/98 09:05:00 By FMM
Sampling Agency: HWM_11_KFO
Priority:

TEST	RESULT	UNITS	LIMIT	ANALYZED	BY	METHOD
AMMONIA	2530	mg/kg	10	09/18/98	SAL	A.18.2
CYANIDE	U	mg/kg	1.0	09/23/98	SAL	A.9
NITRATE & NITRITE NITROGEN	7.09	mg/kg	0.5	09/15/98	SAL	A.18.5
ALUMINUM	113000	mg/kg	10	10/01/98	JAH	
ANTIMONY	9.4	mg/kg	0.6	10/09/98	JAH	
ARSENIC	8.8	mg/kg	0.2	10/05/98	JAH	
BARIUM	446	mg/kg	10	10/01/98	JAH	
BERYLLIUM	3	mg/kg	1	09/30/98	JAH	
CADMIUM	4.6	mg/kg	0.5	09/11/98	JAH	
CALCIUM	13800	mg/kg	3	10/02/98	JAH	
CHROMIUM	72	mg/kg	1	09/23/98	JAH	
COBALT	11	mg/kg	1	09/15/98	JAH	
COPPER	1380	mg/kg	1	09/16/98	JAH	
DIGESTION-METALS	COMPLETED	COMPLETED		09/10/98	EAM	
IRON	29500	mg/kg	5	09/16/98	JAH	
LEAD	213	mg/kg	4	09/15/98	JAH	
MAGNESIUM	11800	mg/kg	2	10/02/98	JAH	
MANGANESE	673	mg/kg	1	09/16/98	JAH	
MERCURY	U	mg/kg	0.1	09/11/98	ATB	EPA 245.5
METALS PREP-SOLIDS/WASTES	COMPLETED	COMPLETED		09/02/98	EAM	
NICKEL	695	mg/kg	2	09/11/98	JAH	
PERCENT SOLIDS	91.7	%		09/08/98	SDS	
POTASSIUM	145	mg/kg	2	10/02/98	JAH	

OCT 19 1998

Project/Site No.: 47-559
Project Name: SMOKEY MOUNTAIN SMELTERS
Description: SMS-WA-07/FURNACE TROUGH
Station No.: SMS-WA-07
Collected: 08/31/98 11:15:00 By WLB
County: 47

Lab Number: 9809002-02
Matrix: WASTE
Received: 09/01/98 09:05:00 By FMM
Sampling Agency: HWM_11_KFO
Priority:

TEST	RESULT	UNITS	LIMIT	ANALYZED	BY	METHOD
SELENIUM	6.9	mg/kg	0.4	10/07/98	JAH	
SILVER	U	mg/kg	1	09/15/98	JAH	
SODIUM	19100	mg/kg	10	10/02/98	JAH	
THALLIUM	U	mg/kg	5	09/15/98	JAH	
VANADIUM	53	mg/kg	20	10/01/98	JAH	
ZINC	1050	mg/kg	0.5	09/15/98	JAH	

State of Tennessee - Environmental Laboratories

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Inorganic Analysis

PROJECT/SITE NO. 4755-9	PROJECT NAME SMOKEY MTN. SMELTERS
STATION NUMBER SMS-WA-07	COUNTY KNOX
DESCRIPTION FURNACE TROUGH	
STREAM MILE —	DEPTH — MATRIX WASTE
COLLECTED: DATE 08-31-98	TIME 11:15
SAMPLER'S NAME(printed) WM. LEE BARKER + ADAM D. DEWEESE	
SAMPLING AGENCY TDSF	BILLING CODE 327 38:11
IF PRIORITY, DATE NEEDED 09-30-98	
SEND REPORT TO: BURL H. MAUPIN TDSF. KNOXVILLE LWIR ASSIST. CENTER	
CONTACT HAZARD UNKNOWN	

*	Metals
X	aluminum, Al
X	antimony, Sb
X	arsenic, As
X	barium, Ba
X	beryllium, Be
X	cadmium, Cd
X	calcium, Ca
X	chromium, Cr
X	cobalt, Co
X	copper, Cu
X	iron, Fe
X	lead, Pb
X	magnesium, Mg
X	manganese, Mn
X	mercury, Hg
X	nickel, Ni
X	potassium, K
X	selenium, Se
X	silver, Ag
X	sodium, Na
X	thallium, Tl
X	vanadium, V
X	zinc, Zn

*	Env. Microbiology	*	General Inorganics		Gen. Inorganics (con't)
	coliform, fecal*		acidity as $CaCO_3$*		oil and grease
	coliform, total*		alkalinity as $CaCO_3$*		orthophosphate, total*
	strep, fecal*		alkalinity, phen. as $CaCO_3$*		oxygen, dissolved*
			BOD, 5-day*		pH
			CBOD, 5-day*		phenols, total
			boron		phosphate, total
*	**Ambient Parameters**		chloride*		residue, dissolved*
	COD*		chlorine, residual*		residue, settleable*
	coliform, fecal		chromium, hexavalent		residue, suspended*
	conductivity*		COD*		residue, total*
	hardness, total as $CaCO_3$*		color, apparent*		silica*
	nitrogen, ammonia		color, true*		sulfate*
	nitrogen, NO_3 & NO_2		conductivity*		sulfide, total*
	nitrogen, total Kjeldahl	X	cyanide		TOC*
	phosphate, total		flash point*		turbidity*
	pH		fluoride*		percent solids
	residue, dissolved*		hardness, Ca as $CaCO_3$*	*	**Other**
	residue, suspended*		hardness, total as $CaCO_3$*		
	arsenic, As		hydrocarbons, total		
	cadmium, Cd		MBAS*		
	chromium, Cr	X	nitrogen, ammonia		
	copper, Cu		nitrogen, nitrate*		
	lead, Pb		nitrogen, nitrite*		
	mercury, Hg	X	nitrogen, NO_3 & NO_2		
	nickel, Ni		nitrogen, total Kjeldahl		
	zinc, Zn		nitrogen, total organic		

*	TCLP
	arsenic, As
	barium, Ba
	cadmium, Cd
	chromium, Cr
	lead, Pb
	mercury, Hg
	nickel, Ni
	selenium, Se
	silver, Ag

** denotes analyses performed only on water*

FIELD DETERMINATIONS	Temperature
pH	Chlorine, residual
Conductivity	Other
Dissolved Oxygen	

Laboratory Number

Branch Lab Number

Chain of Custody and Supplemental Information

Only one chain of custody form is required per sample set or point (if all collected at the same time)

1. Collected by W.L.B. + A.D.D
   Date 08-31-98 Time 11:15
   Delivered to BURL H. MAUPIN
   Date 08-31-98 Time 15:00
2. Received by [illegible]
   Date 8-31-98 Time 1500
   Delivered to KNOXVILLE STATE LAB
   Date 9-1-98 Time 9:00
3. Received by
   Date Time
   Delivered to
   Date Time
4. Received in Lab by [illegible]
   Date 9-1-98 Time 9:15
   Logged in by
   Date Time

Additional Information

1. Approximate volume of sample
2. Nearest town or city
3. Others present at collection
4. Number of other samples collected at same time at this point
5. Field collection procedure, handling and/or preservation of this sample
6. Mode of transportation to lab
7. Sample sealed by
8. Date sample sealed
9. Remarks

Project/Site No.: 47-559
Project Name: SMOKEY MOUNTAIN SMELTERS
Description: SMS-WA-07/FURNACE TROUGH
Station No.: SMS-WA-07
Collected: 08/31/98 11:15:00 By WLB
Quantity: 47

Lab Number: 9809002-02F
Matrix: WASTE
Received: 09/01/98 09:05:00 By FMM
Sampling Agency: HWM_11_KFO
Priority:

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
B/N/A EXTR+PESTS,PCBS-SOIL						MS+ECD
BUTYL BENZYL PHTHALATE	U	PPB	83	10/09/98	MAC	
BIS(2-ETHYLHEXYL)PHTHALATE	2370	PPB	-	10/09/98	MAC	
DI-n-BUTYL PHTHALATE	U	PPB	83	10/09/98	MAC	
DI-n-OCTYL PHTHALATE	U	PPB	170	10/09/98	MAC	
DIETHYL PHTHALATE	2710	PPB	-	10/09/98	MAC	
DIMETHYL PHTHALATE	U	PPB	41	10/09/98	MAC	
n-NITROSODIMETHYLAMINE	U	PPB	170	10/09/98	MAC	
n-NITROSODIPHENYLAMINE	U	PPB	83	10/09/98	MAC	
n-NITROSO-di-n-PROPYLAMINE	U	PPB	83	10/09/98	MAC	
ISOPHORONE	U	PPB	41	10/09/98	MAC	
NITROBENZENE	U	PPB	83	10/09/98	MAC	
2,4-DINITROTOLUENE	U	PPB	170	10/09/98	MAC	
2,6-DINITROTOLUENE	U	PPB	170	10/09/98	MAC	
ACENAPTHENE	U	PPB	41	10/09/98	MAC	
ACENAPHTHYLENE	U	PPB	41	10/09/98	MAC	
ANTHRACENE	U	PPB	41	10/09/98	MAC	
BENZO(a)ANTHRACENE	69.7	PPB	-	10/09/98	MAC	
BENZO(a)PYRENE	55.6	PPB	-	10/09/98	MAC	
BENZO(b)FLUORANTHENE	143	PPB	-	10/09/98	MAC	
BENZO(ghi)PERYLENE	J 93.7	PPB	170	10/09/98	MAC	
BENZO(k)FLUORANTHENE	44.8	PPB	-	10/09/98	MAC	
DIBENZO(a,h)ANTHRACENE	U	PPB	170	10/09/98	MAC	
FLUORANTHENE	195	PPB	-	10/09/98	MAC	
FLUORENE	U	PPB	41	10/09/98	MAC	
INDENO(1,2,3-cd)PYRENE	J 108	PPB	170	10/09/98	MAC	
NAPHTHALENE	U	PPB	41	10/09/98	MAC	
PHENANTHRENE	79.6	PPB	-	10/09/98	MAC	
PYRENE	155	PPB	-	10/09/98	MAC	
CHRYSENE	138	PPB	-	10/09/98	MAC	
BIS(2-CHLOROETHYL)ETHER	U	PPB	83	10/09/98	MAC	
BIS(2-CHLOROETHOXY)METHANE	U	PPB	41	10/09/98	MAC	
BIS(2-CHLOROISOPROPYL)ETHER	U	PPB	170	10/09/98	MAC	
4-BROMOPHENYLPHENYL ETHER	U	PPB	170	10/09/98	MAC	
4-CHLOROPHENYLPHENYL ETHER	U	PPB	83	10/09/98	MAC	
HEXACHLOROCYCLOPENTADIENE	U	PPB	410	10/09/98	MAC	
HEXACHLOROBUTADIENE	U	PPB	83	10/09/98	MAC	
HEXACHLOROBENZENE	U	PPB	83	10/09/98	MAC	
HEXACHLOROETHANE	U	PPB	83	10/09/98	MAC	
1,2,4-TRICHLOROBENZENE	U	PPB	83	10/09/98	MAC	
2-CHLORONAPHTHALENE	U	PPB	41	10/09/98	MAC	
4-CHLORO-3-METHYLPHENOL	U	PPB	83	10/09/98	MAC	
2-CHLOROPHENOL	U	PPB	41	10/09/98	MAC	
2,4-DICHLOROPHENOL	U	PPB	83	10/09/98	MAC	
2,4-DIMETHYLPHENOL	U	PPB	83	10/09/98	MAC	
2,4-DINITROPHENOL	U	PPB	830	10/09/98	MAC	
2-METHYL-4,6-DINITROPHENOL	U	PPB	420	10/09/98	MAC	
2-NITROPHENOL	U	PPB	170	10/09/98	MAC	
4-NITROPHENOL	U	PPB	410	10/09/98	MAC	
PENTACHLOROPHENOL	U	PPB	170	10/09/98	MAC	
PHENOL	U	PPB	41	10/09/98	MAC	
2,4,6-TRICHLOROPHENOL	U	PPB	83	10/09/98	MAC	
2,4,5-TRICHLOROPHENOL	U	PPB	83	10/09/98	MAC	
O-CRESOL	U	PPB	83	10/09/98	MAC	
M- & P-CRESOL	U	PPB	41	10/09/98	MAC	
2-METHYLNAPHTHALENE	U	PPB	41	10/09/98	MAC	
BENZOIC ACID	U	PPB	170	10/09/98	MAC	
BENZYL ALCOHOL	U	PPB	170	10/09/98	MAC	
4-CHLOROANILINE	U	PPB	83	10/09/98	MAC	
DIBENZOFURAN	U	PPB	41	10/09/98	MAC	
3,3-DICHLOROBENZIDINE	U	PPB	170	10/09/98	MAC	
2-NITROANILINE	U	PPB	170	10/09/98	MAC	
3-NITROANILINE	U	PPB	170	10/09/98	MAC	
4-NITROANILINE	U	PPB	410	10/09/98	MAC	
ALDRIN	U	PPB	4.3	10/09/98	MAC	
alpha-BHC	U	PPB	7.6	10/09/98	MAC	
beta-BHC	U	PPB	11	10/09/98	MAC	
ı-BHC	U	PPB	11	10/09/98	MAC	
ma-BHC (LINDANE)	U	PPB	4.3	10/09/98	MAC	
alpha-CHLORDANE	U	PPB	5.9	10/09/98	MAC	
gamma-CHLORDANE	U	PPB	4.2	10/09/98	MAC	
TECHNICAL CHLORDANE	U	PPB	80	10/09/98	MAC	
p,p-DDD	U	PPB	7.9	10/09/98	MAC	
p,p-DDE	U	PPB	6.9	10/09/98	MAC	

Project/Site No.: 47-559
Project Name: SMOKEY MOUNTAIN SMELTERS
Description: SMS-WA-07/FURNACE TROUGH
Station No.: SMS-WA-07
Collected: 08/31/98 11:15:00 By WLB
nty: 47

Lab Number: 9809002-02F
Matrix: WASTE
Received: 09/01/98 09:05:00 By FMM
Sampling Agency: HWM_11_KFO
Priority:

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
B/N/A EXTR+PESTS,PCBS-SOIL						MS+ECD
p,p-DDT	U	PPB	7.4	10/09/98	MAC	
DIELDRIN	U	PPB	4.4	10/09/98	MAC	
ENDOSULFAN I	U	PPB	7.0	10/09/98	MAC	
ENDOSULFAN II	U	PPB	8.0	10/09/98	MAC	
ENDOSULFAN SULFATE	U	PPB	8.0	10/09/98	MAC	
ENDRIN	U	PPB	8.0	10/09/98	MAC	
ENDRIN ALDEHYDE	U	PPB	6.7	10/09/98	MAC	
ENDRIN KETONE	U	PPB	16	10/09/98	MAC	
HEPTACHLOR	U	PPB	5.3	10/09/98	MAC	
HEPTACHLOR EPOXIDE	U	PPB	5.6	10/09/98	MAC	
TOXAPHENE	U	PPB	470	10/09/98	MAC	
METHOXYCHLOR	U	PPB	62	10/09/98	MAC	
PCB 1016/1242	U	PPB	400	10/09/98	MAC	
PCB 1221	U	PPB	530	10/09/98	MAC	
PCB 1232	U	PPB	480	10/09/98	MAC	
PCB 1248	U	PPB	290	10/09/98	MAC	
PCB 1254	U	PPB	370	10/09/98	MAC	
PCB 1260	U	PPB	230	10/09/98	MAC	
PCB 1262	U	PPB	230	10/09/98	MAC	

*-Water, uG/L; Sediment, uG/kG

Printed: October 13, 1998

State of Tennessee - Environmental Laboratories
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Organic Analysis
Base/Neutral/Acid Extractables

PROJECT/SITE NO. 47-559	PROJECT NAME SHOCKEY MTN. SMELTERS
STATION NUMBER SMS-WA-07	COUNTY KNOX
DESCRIPTION FURNACE TROUGH	
STREAM MILE —	DEPTH — MATRIX WASTE
COLLECTED: DATE 08-31-98	TIME 1115
SAMPLER'S NAME(printed) WM. LEE KARREN & ADAM D DEWESE	
SAMPLING AGENCY TDSF	BILLING CODE 327.38.11
IF PRIORITY, DATE NEEDED 09-30-98	
SEND REPORT TO: BURL H. MAUPIN, TDSF KNOXVILLE FAUNA ASSEST. CENTER	
CONTACT HAZARD	

*	NPDES Extractables	*	NPDES Extractables(con't)	*	TAL Semivolatiles
	butylbenzylphthalate	X	2-chlorophenol	X	dimethylphthalate
	bis(2-ethylhexyl)phthalate		2,4-dichlorophenol	X	4,6-dinitro-2-methylphenol
	di-n-butylphthalate		2,4-dimethylphenol	X	2,4-dinitrophenol
	di-n-octylphthalate		2,4-dinitrophenol	X	2,4-dinitrotoluene
	diethylphthalate		4,6-dinitro-o-cresol	X	2,6-dinitrotoluene
	dimethylphthalate		2-nitrophenol	X	fluoranthene
X	n-nitrosodimethylamine		4-nitrophenol	X	fluorene
	n-nitrosodiphenylamine		pentachlorophenol	X	hexachlorobenzene
	n-nitrosodi-n-propylamine		phenol	X	hexachlorobutadiene
	isophorone		2,4,6-trichlorophenol	X	hexachlorocyclopentadiene
	nitrobenzene	*	TAL Semivolatiles	X	hexachloroethane
	2,4-dinitrotoluene	X	acenaphthene	X	indeno(1,2,3-cd)pyrene
	acenaphthene	X	acenaphthylene	X	isophorone
	acenaphthylene	X	anthracene	X	2-methylnaphthalene
	anthracene	X	benzo(a)anthracene	X	2-methylphenol
	benzo(a)anthracene	X	benzo(a)pyrene	X	4-methylphenol
	benzo(a)pyrene	X	benzo(b)fluoranthene	X	n-nitrosodiphenylamine
	benzo(b)fluoranthene	X	benzo(g,h,i)perylene	X	n-nitroso-n-dipropylamine
	benzo(g,h,i)perylene	X	benzo(k)fluoranthene	X	naphthalene
	benzo(k)fluoranthene	X	benzoic acid	X	2-nitroaniline
	chrysene	X	benzyl alcohol	X	3-nitroaniline
	dibenzo(a,h)anthracene	X	bis(2-chloroethoxy)methane	X	4-nitroaniline
	fluoranthene	X	bis(2-chloroethyl) ether	X	nitrobenzene
	fluorene	X	bis(2-chloroisopropyl)ether	X	2-nitrophenol
	indeno(1,2,3-c,d)pyrene	X	bis(2-ethylhexyl)phthalate	X	4-nitrophenol
	naphthalene	X	4-bromophenylphenylether	X	pentachlorophenol
	phenanthrene	X	butylbenzylphthalate	X	phenanthrene
	pyrene	X	4-chloroaniline	X	phenol
	bis(2-chloroethyl)ether	X	4-chloro-3-methyl phenol	X	pyrene
	bis(2-chloroethoxy)methane	X	2-chloronaphthalene	X	1,2,4-trichlorobenzene
	bis(2-chloroisopropyl)ether	X	4-chlorophenylphenylether	X	2,4,5-trichlorophenol
	4-bromophenylphenylether	X	chrysene	X	2,4,6-trichlorophenol
	4-chlorophenylphenylether	X	di-n-butylphthalate	*	Nitrobodies
	hexachlorocyclopentadiene	X	di-n-octylphthalate		RDX
	hexachlorobutadiene	X	dibenzo(a,h)anthracene		2,4,6-TNT
	hexachlorobenzene	X	dibenzofuran		2,4-dinitrotoluene
	hexachloroethane	X	3,3'-dichlorobenzidine		2,6-dinitrotoluene
	1,2,4-trichlorobenzene	X	2,4-dichlorophenol		nitrobenzene
	2-chloronaphthalene	X	diethylphthalate		1,3,5-TNB
	4-chloro-3-methyl phenol	X	2,4-dimethylphenol		

*	TCLP Semivolatiles
	chlordane
	o-cresol
	m-cresol
	p-cresol
	cresol
	2,4-D
	2,4-dinitrotoluene
	endrin
	heptachlor
	heptachlor epoxide
	hexachlorobenzene
	hexachlorobutadiene
	hexachloroethane
	lindane
	methoxychlor
	nitrobenzene
	pentachlorophenol
	pyridine
	toxaphene
	2,4,5-trichlorophenol
	2,4,6-trichlorophenol
	2,4,5-TP (Silvex)
*	Pesticides/PCBs
X	aldrin
X	alpha-BHC
X	beta-BHC
X	delta-BHC
X	gamma-BHC (lindane)
X	technical chlordane
X	alpha-chlordane
X	gamma-chlordane
X	4,4'-DDD
X	4,4'-DDE
X	4,4'-DDT
X	dieldrin
X	endosulfan I
X	endosulfan II
X	endosulfan sulfate
X	endrin
X	endrin aldehyde
X	endrin ketone
X	heptachlor
X	heptachlor epoxide
X	toxaphene
X	methoxychlor
X	PCB 1016/1242
X	PCB 1221
X	PCB 1232
X	PCB 1248
X	PCB 1254
X	PCB 1260
X	PCB 1262

Laboratory Number

Branch Lab Number

Chain of Custody and Supplemental Information

Only one chain of custody form is required per sample set or point (if all collected at the same time)

1. Collected by G.H.B. & A.D.D
   Date 08-31-98 Time 1115
   Delivered to BURL H. MAUPIN
   Date 08-31-98 Time 1500
2. Received by BURL H. MAUPIN
   Date 8-31-98 Time 1500
   Delivered to KNOXVILLE STATE LAB
   Date 9-1-98 Time 8:00
3. Received by
   Date Time
   Delivered to
   Date Time
4. Received in Lab by [illegible]
   Date 9-1-98 Time 9:05
   Logged in by
   Date Time

Additional Information

1. Approximate volume of sample 16 OZ
2. Nearest town or city KNOXVILLE
3. Others present at collection NONE
4. Number of other samples collected at same time at this point THREE
5. Field collection procedure, handling and/or preservation of this sample ACCORDING TO U.S. EPA PROCEDURES AND PROTOCOLS.
6. Mode of transportation to lab ON ICE AND ICE CHEST TO A STATE LABORATORY
7. Sample sealed by
8. Date sample sealed
9. Remarks

PH-3014 (rev 1/96)

RDA 1527

SEP 11 1998

Project/Site No.: 47-559
Project Name: SMOKEY MOUNTAIN SMELTERS
Site Description: SMS-WA-07/FURNACE TROUGH
Station No.: SMS-WA-07
Collected: 08/31/98 11:15:00 By WLB
unty: 47

Lab Number: 9809002-02E
Matrix: WASTE
Received: 09/01/98 09:05:00 By FMM
Sampling Agency: HWM_11_KFO
Priority:

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
VOLATILES-TAL SEDIMENTS						8260A
ACETONE	U	PPB	25	09/04/98	HMG	
BENZENE	U	PPB	2.5	09/04/98	HMG	
BROMODICHLOROMETHANE	U	PPB	2.5	09/04/98	HMG	
BROMOFORM	U	PPB	2.5	09/04/98	HMG	
BROMOMETHANE	U	PPB	5.0	09/04/98	HMG	
2-BUTANONE (MEK)	U	PPB	25	09/04/98	HMG	
CARBON DISULFIDE	U	PPB	5.0	09/04/98	HMG	
CARBON TETRACHLORIDE	U	PPB	2.5	09/04/98	HMG	
VINYL ACETATE	U	PPB	5.0	09/04/98	HMG	
CHLOROBENZENE	U	PPB	2.5	09/04/98	HMG	
CHLOROETHANE	U	PPB	5.0	09/04/98	HMG	
CHLOROFORM	U	PPB	2.5	09/04/98	HMG	
CHLOROMETHANE	J 1.9	PPB	5.0	09/04/98	HMG	
DIBROMOCHLOROMETHANE	U	PPB	2.5	09/04/98	HMG	
1,2-DICHLOROBENZENE	U	PPB	2.5	09/04/98	HMG	
1,3-DICHLOROBENZENE	U	PPB	2.5	09/04/98	HMG	
1,4-DICHLOROBENZENE	U	PPB	2.5	09/04/98	HMG	
DICHLORODIFLUOROMETHANE	U	PPB	5.0	09/04/98	HMG	
1,1-DICHLOROETHANE	U	PPB	2.5	09/04/98	HMG	
1,2-DICHLOROETHANE	U	PPB	2.5	09/04/98	HMG	
1,1-DICHLOROETHENE	U	PPB	2.5	09/04/98	HMG	
CIS-1,2-DICHLOROETHENE	U	PPB	2.5	09/04/98	HMG	
TRANS-1,2-DICHLOROETHENE	U	PPB	2.5	09/04/98	HMG	
1,2-DICHLOROPROPANE	U	PPB	2.5	09/04/98	HMG	
CIS-1,3-DICHLOROPROPENE	U	PPB	2.5	09/04/98	HMG	
TRANS-1,3-DICHLOROPROPENE	U	PPB	2.5	09/04/98	HMG	
ETHYLBENZENE	U	PPB	2.5	09/04/98	HMG	
METHYLENE CHLORIDE	B 33	PPB	2.5	09/04/98	HMG	
4-METHYL-2-PENTANONE (MIBK)	U	PPB	25	09/04/98	HMG	
STYRENE	U	PPB	2.5	09/04/98	HMG	
2-HEXANONE	U	PPB	5.0	09/04/98	HMG	
1,1,2,2-TETRACHLOROETHANE	U	PPB	2.5	09/04/98	HMG	
TETRACHLOROETHENE	U	PPB	2.5	09/04/98	HMG	
TOLUENE	11	PPB	2.5	09/04/98	HMG	
1,1,1-TRICHLOROETHANE	U	PPB	2.5	09/04/98	HMG	
1,1,2-TRICHLOROETHANE	U	PPB	2.5	09/04/98	HMG	
TRICHLOROETHENE	U	PPB	2.5	09/04/98	HMG	
TRICHLOROFLUOROMETHANE	U	PPB	5.0	09/04/98	HMG	
VINYL CHLORIDE	U	PPB	5.0	09/04/98	HMG	
o-XYLENE	U	PPB	2.5	09/04/98	HMG	
m&p-XYLENE	U	PPB	2.5	09/04/98	HMG	

*-Water, uG/L; Sediment, uG/kG

Printed: September 8, 1998

ALSO CONFIRMED BY GCMS: CAMPHENE
PROPENE
1-PROPYNE

State of Tennessee - Environmental Laboratories

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Organic Analysis

Volatiles and Petroleum Hydrocarbons

PROJECT/SITE NO. 47-559 PROJECT NAME SMOKEY MTN SMELTER
STATION NUMBER SMS-WA-07 COUNTY KNOX
DESCRIPTION FURNACE TROUGH
STREAM MILE — DEPTH — MATRIX WASTE
COLLECTED: DATE 08-31-98 TIME 11:15
SAMPLER'S NAME(printed) WM. LEE BARRON & ADAM D. DRUEL
SAMPLING AGENCY TDSE BILLING CODE 327.38.11
IF PRIORITY, DATE NEEDED 09-30-98
SEND REPORT TO: BURL H. HAUPIN TTDSE KNOXVILLE FIELD ASSIST CENTER
CONTACT HAZARD UNKNOWN

*	NPDES Volatiles - 624	*	TAL Volatiles - 8260A	*	TCLP Volatiles
	Bromoform	X	Chloromethane		Benzene
	Bromodichloromethane	X	Bromomethane		Carbon tetrachloride
	Carbon Tetrachloride	X	Vinyl chloride		Chlorobenzene
	Chlorobenzene	X	Chloroethane		Chloroform
	Chloroethane	X	Methylene chloride		1,2-Dichloroethane
X	2-Chloroethylvinyl ether	X	Acetone		1,1-Dichloroethane
	Chloroform	X	Carbon disulfide		Methyl ethyl ketone
	Chloromethane	X	1,1-Dichloroethene		Tetrachloroethene
	Dibromochloromethane	X	1,1-Dichloroethane		Trichloroethene
X	1,2-Dichlorobenzene	X	Cis-1,2-dichloroethene		Vinyl chloride
X	1,3-Dichlorobenzene	X	Trans-1,2-dichloroethene	*	**BTEX - 8260A - UST**
X	1,4-Dichlorobenzene	X	1,2-Dichloroethane		Benzene
X	Dichlorodifluoromethane	X	Chloroform		Toluene
	1,1-Dichloroethane	X	2-Butanone		Ethyl benzene
	1,2-Dichloroethane	X	1,1,1-Trichloroethane		o-Xylene
	1,1-Dichloroethene	X	Carbon tetrachloride		m-Xylene
	Cis-1,2-dichloroethene	X	Vinyl acetate		p-Xylene
	Trans-1,2-dichloroethene	X	Bromodichloromethane		Methyl t-butyl ether
	1,2-Dichloropropane	X	1,2-Dichloropropane		Diisopropyl ether
	Cis-1,3-dichloropropene	X	Cis-1,3-dichloropropane	*	**TPH by GC**
	Trans-1,2-dichloroethene	X	Trichloroethene		Gasoline Range Organics
	Methylene chloride	X	Dibromochloromethane		Diesel Range Organics
	1,1,2,2-Tetrachloroethane	X	1,1,2-Trichloroethane	*	**TPH by IR (418.1)**
	Tetrachloroethene	X	Benzene		418.1 - Waste Oil
	1,1,1-Trichloroethane	X	Trans-1,3-dichloropropene	*	**Other**
	1,1,2-Trichloroethane	X	Bromoform		
	Trichloroethene	X	4-Methyl-2-pentanone		
X	Trichlorofluoromethane	X	2-Hexanone		
	Vinyl chloride	X	Tetrachloroethene		
	Benzene	X	Toluene		
	Ethylbenzene	X	1,1,2,2-Tetrachloroethane		
	Toluene	X	Chlorobenzene		
	o-Xylene	X	Ethyl benzene		
	m-Xylene	X	Styrene		
	p-Xylene	X	o-Xylene		
		X	m-Xylene		
		X	p-Xylene		

Laboratory Number

Branch Lab Number

Chain of Custody and Supplemental Information

Only one chain of custody form is required per sample set or point (if all collected at the same time)

1. Collected by W. L. B. & A. D. D.
   Date 08-31-98 Time 11:15
   Delivered to BURL H. HAUPIN
   Date 08-31-98 Time 15:00
2. Received by [illegible]
   Date 8-31-98 Time 1500
   Delivered to KNOXVILLE STATE LAB
   Date ~~08-31-98~~ Time 9-1-98 9:05
3. Received by
   Date Time
   Delivered to
   Date Time
4. Received in Lab by [illegible]
   Date 9-1-98 Time 9:05
   Logged in by
   Date Time

Additional Information

1. Approximate volume of sample 4 OZ
2. Nearest town or city KNOXVILLE
3. Others present at collection NONE
4. Number of other samples collected at same time at this point THREE
5. Field collection procedure, handling and/or preservation of this sample ACCORDING TO TDS LAB PROCEDURES AND PROCESS.
6. Mode of transportation to lab ON ICE IN AN ICE CHEST IN A STATE VEHICLE.
7. Sample sealed by
8. Date sample sealed
9. Remarks

PH-3013 (rev 1/96)

RDA 1527

SEP 30 1998

Project/Site No.: 47-559
Project Name: SMOKEY MOUNTAIN SMELTERS
Description: SMS-WA-07/FURNACE TROUGH
Station No.: SMS-WA-07
Collected: 08/31/98 11:15:00 By WLB
nty: 47

Lab Number: 9809002-02G
Matrix: WASTE
Received: 09/01/98 09:05:00 By FMM
Sampling Agency: HWM_11_KFO
Priority:

TEST	RESULT	*ERROR	UNITS	ANALYZED	BY	METHOD
GAMMA RADIONUCLIDES						R.6
K-40	6.49	0.45	pCi/g dry wt	09/03/98	AK	
Pb-214	0.777	0.070	pCi/g dry wt	09/03/98	AK	
Bi-214	1.076	0.070	pCi/g dry wt	09/03/98	AK	
Pb-212	0.388	0.040	pCi/g dry wt	09/03/98	AK	
Ac-228	0.550	0.080	pCi/g dry wt	09/03/98	AK	
GROSS ALPHA & BETA						R.1.3
GROSS ALPHA	0.92	0.85	pCi/g DRY WT.	09/10/98	NLF	
GROSS BETA	12.0	1.4	pCi/g DRY WT.	09/10/98	NLF	

*--Represents +/- error value

Printed: September 10, 1998

State of Tennessee - Environmental Laboratories

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Radiochemical Analysis

PROJECT/SITE NO. 47.55 9	PROJECT NAME SMOKEY MTN. SMELTERS
STATION NUMBER SMS-WA-07	COUNTY KNOX
DESCRIPTION FURNACE TROUGH	
STREAM MILE —	DEPTH —
COLLECTED: DATE 08-31-98	TIME 11:15
PICK-UP DATE:	
CONTACT HAZARD UNKNOWN	mR/hr Reading 2.6
SAMPLER'S NAME (printed) WM. LEE BARRON & ADAM D. DEWESE	
SAMPLING AGENCY TDSF	BILLING CODE 327.38.11
IF PRIORITY, DATE NEEDED 09-30-98	
SEND REPORT TO: BURL H. MAUPIN, TDSF, KNOXVILLE ENVIR ASSIST CENTER	

Laboratory Number

Date Received

Time Received **By**

Sample Type

___Air ___Milk ___Swipe
___Water ___Tissue ___Liquid
___Sludge ___Soil ___Solid
___Vegetation ___Sediment

Other WASTE

Field Comments:

Air Samples
Volume _____
Total Hours _____

___Sample Filtration
___Sample Acidification
___Send to RESL

REQUESTED ANALYSES:

X	GROSS ALPHA (TOTAL)		STRONTIUM 89
	GROSS ALPHA (SUSPENDED)		STRONTIUM 90
	GROSS ALPHA (DISSOLVED)		TRITIUM (H-3)
X	GROSS BETA (TOTAL)		THORIUM (TOTAL)
	GROSS BETA (SUSPENDED)		URANIUM (TOTAL)
	GROSS BETA (DISSOLVED)	X	GAMMA RADIONUCLIDES
			ADDITIONAL ANALYSES:

Chain of Custody and Supplemental Information

Only one chain of custody form is required per sample set or point (if all collected at the same time)

1. Collected by W.L.B. & A.D.D.
   Date 08-31-98 Time 11:15
   Delivered to BURL H. MAUPIN
   Date 08-31-98 Time 15:00
2. Collected by Burl H. Maupin
   Date 8-31-98 Time 1500
   Delivered to KNOXVILLE STATE LAB
   Date 9-1-98 Time 9:00
3. Collected by
   Date Time
   Delivered to
   Date Time
4. Received in Lab by [signature]
   Date 9-1-98 Time 9:05
   Logged in by
   Date Time

Additional Information

1. Approximate volume of sample 16 OZ
2. Nearest town or city KNOXVILLE
3. Others present at collection NONE
4. Number of other samples collected at same time at this point THREE
5. Field collection procedure, handling and/or preservation of this sample ACCORDING TO U.S. EPA PROCEDURES AND PROTOCOLS
6. Mode of transportation to lab ON ICE IN AN ICE CHEST, IN A STATE VEHICLE
7. Sample sealed by
8. Date sample sealed
9. Remarks

OCT 13 1998

Project/Site No.: 47-559
Project Name: SMOKEY MOUNTAIN SMELTERS
Description: SMS-WA-08/HOT DEPRESSION
Station No.: SMS-WA-08
Collected: 08/31/98 11:35:00 By WLB
County: 47

Lab Number: 9809002-03
Matrix: SOIL
Received: 09/01/98 09:05:00 By FMM
Sampling Agency: HWM_11_KFO
Priority:

TEST	RESULT	UNITS	LIMIT	ANALYZED	BY	METHOD
AMMONIA	5290	mg/kg	10	09/18/98	SAL	A.18.2
CYANIDE	U	mg/kg	1.0	09/23/98	SAL	A.9
NITRATE & NITRITE NITROGEN	634	mg/kg	0.5	09/18/98	SAL	A.18.5
ALUMINUM	74600	mg/kg	10	10/01/98	JAH	
ANTIMONY	3.5	mg/kg	0.6	10/09/98	JAH	
ARSENIC	7.1	mg/kg	0.2	10/05/98	JAH	
BARIUM	95	mg/kg	10	10/01/98	JAH	
BERYLLIUM	4	mg/kg	1	09/30/98	JAH	
CADMIUM	1.3	mg/kg	0.5	09/11/98	JAH	
CALCIUM	31800	mg/kg	3	10/02/98	JAH	
CHROMIUM	112	mg/kg	1	09/23/98	JAH	
COBALT	8	mg/kg	1	09/15/98	JAH	
COPPER	634	mg/kg	1	09/16/98	JAH	
DIGESTION-METALS	COMPLETED	COMPLETED		09/10/98	EAM	
IRON	14100	mg/kg	5	09/16/98	JAH	
LEAD	36	mg/kg	4	09/15/98	JAH	
MAGNESIUM	7130	mg/kg	2	10/02/98	JAH	
MANGANESE	434	mg/kg	1	09/16/98	JAH	
MERCURY	U	mg/kg	0.1	09/11/98	ATB	EPA 245.5
METALS PREP-SOLIDS/WASTES	COMPLETED	COMPLETED		09/02/98	EAM	
NICKEL	379	mg/kg	2	09/11/98	JAH	
PERCENT SOLIDS	79.6	%		09/08/98	SDS	
POTASSIUM	232	mg/kg	2	10/02/98	JAH	

OCT 13 1998

Project/Site No.: 47-559
oject Name: SMOKEY MOUNTAIN SMELTERS
scription: SMS-WA-08/HOT DEPRESSION
Station No.: SMS-WA-08
Collected: 08/31/98 11:35:00 By WLB
County: 47

Lab Number: 9809002-03
Matrix: SOIL
Received: 09/01/98 09:05:00 By FMM
Sampling Agency: HWM_11_KFO
Priority:

TEST	RESULT	UNITS	LIMIT	ANALYZED	BY	METHOD
SELENIUM	2.7	mg/kg	0.4	10/08/98	JAH	
SILVER	U	mg/kg	1	09/15/98	JAH	
SODIUM	28100	mg/kg	10	10/02/98	JAH	
THALLIUM	U	mg/kg	5	09/15/98	JAH	
VANADIUM	53	mg/kg	20	10/01/98	JAH	
ZINC	549	mg/kg	0.5	09/15/98	JAH	

State of Tennessee - Environmental Laboratories

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Inorganic Analysis

PROJECT/SITE NO. 47-559	PROJECT NAME SMOKEY MTN. SMELTERS
STATION NUMBER SMS-WA-08	COUNTY KNOX
DESCRIPTION HOT DEPRESSION	
STREAM MILE ✓	DEPTH 0"-6" MATRIX SOIL
COLLECTED: DATE 08-31-98	TIME 11:35
SAMPLER'S NAME(printed) WM. LEE BARRON & ADAM D. DELHERST	
SAMPLING AGENCY TDSF	BILLING CODE 327 38.11
IF PRIORITY, DATE NEEDED 09-30-98	
SEND REPORT TO: BURL H. MAUPIN, TDSF KNOXVILLE ENVIR. ASSIST. CENTER	
CONTACT HAZARD UNKNOWN	

*	Env. Microbiology	*	General Inorganics		Gen. Inorganics (con't)	*	Metals
	coliform, fecal*		acidity as $CaCO_3$*		oil and grease	X	aluminum, Al
	coliform, total*		alkalinity as $CaCO_3$*		orthophosphate, total*	X	antimony, Sb
	strep, fecal*		alkalinity, phen. as $CaCO_3$*		oxygen, dissolved*	X	arsenic, As
			BOD, 5-day*		pH	X	barium, Ba
			CBOD, 5-day*		phenols, total	X	beryllium, Be
			boron		phosphate, total	X	cadmium, Cd
*	**Ambient Parameters**		chloride*		residue, dissolved*	X	calcium, Ca
	COD*		chlorine, residual*		residue, settleable*	X	chromium, Cr
	coliform, fecal		chromium, hexavalent		residue, suspended*	X	cobalt, Co
	conductivity*		COD*		residue, total*	X	copper, Cu
	hardness, total as $CaCO_3$*		color, apparent*		silica*	X	iron, Fe
	nitrogen, ammonia		color, true*		sulfate*	X	lead, Pb
	nitrogen, NO_3 & NO_2		conductivity*		sulfide, total*	X	magnesium, Mg
	nitrogen, total Kjeldahl	X	cyanide		TOC*	X	manganese, Mn
	phosphate, total		flash point*		turbidity*	X	mercury, Hg
	pH		fluoride*		percent solids	X	nickel, Ni
	residue, dissolved*		hardness, Ca as $CaCO_3$*	*	**Other**	X	potassium, K
	residue, suspended*		hardness, total as $CaCO_3$*			X	selenium, Se
	arsenic, As		hydrocarbons, total			X	silver, Ag
	cadmium, Cd		MBAS*			X	sodium, Na
	chromium, Cr	X	nitrogen, ammonia			X	thallium, Tl
	copper, Cu		nitrogen, nitrate*			X	vanadium, V
	lead, Pb		nitrogen, nitrite*			X	zinc, Zn
	mercury, Hg	X	nitrogen, NO_3 & NO_2				
	nickel, Ni		nitrogen, total Kjeldahl				
	zinc, Zn		nitrogen, total organic				

*	TCLP
	arsenic, As
	barium, Ba
	cadmium, Cd
	chromium, Cr
	lead, Pb
	mercury, Hg
	nickel, Ni
	selenium, Se
	silver, Ag

denotes analyses performed only on water

FIELD DETERMINATIONS	Temperature
pH	Chlorine, residual
Conductivity	Other
Dissolved Oxygen	

Laboratory Number

Branch Lab Number

Chain of Custody and Supplemental Information

Only one chain of custody form is required per sample set or point (if all collected at the same time)

1. Collected by W. L. B. & ADD
   Date 08-31-98 Time 11:35
   Delivered to BURL H. MAUPIN
   Date 08-31-98 Time 15:00
2. Received by [illegible]
   Date 8-31-98 Time 1500
   Delivered to KNOXVILLE STATE LAB
   Date 9-1-98 Time [illegible]
3. Received by
   Date Time
   Delivered to
   Date Time
4. Received in Lab by [illegible]
   Date 9-1-98 Time 9:08
   Logged in by
   Date Time

Additional Information

1. Approximate volume of sample 16 OZ
2. Nearest town or city KNOXVILLE
3. Others present at collection NONE
4. Number of other samples collected at same time at this point THREE
5. Field collection procedure, handling and/or preservation of this sample ACCORDING TO U.S. EPA PROCEDURES AND PROTOCOLS.
6. Mode of transportation to lab ON ICE IN AN ICE CHEST IN A STATE VEHICLE
7. Sample sealed by
8. Date sample sealed
9. Remarks

PH-3011 (rev 1/96)

RDA 1527

Project/Site No.: 47-559
Project Name: SMOKEY MOUNTAIN SMELTERS
Description: SMS-WA-08/HOT DEPRESSION
Station No.: SMS-WA-08
Collected: 08/31/98 11:35:00 By WLB
County: 47

Lab Number: 9809002-03F
Matrix: SOIL
Received: 09/01/98 09:05:00 By FMM
Sampling Agency: HWM_11_KFO
Priority:

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
B/N/A EXTR+PESTS,PCBS-SOIL						MS+ECD
BUTYL BENZYL PHTHALATE	U	PPB	91	10/09/98	MAC	
BIS(2-ETHYLHEXYL)PHTHALATE	B 304	PPB	-	10/09/98	MAC	
DI-n-BUTYL PHTHALATE	U	PPB	91	10/09/98	MAC	
DI-n-OCTYL PHTHALATE	U	PPB	180	10/09/98	MAC	
DIETHYL PHTHALATE	B 137	PPB	-	10/09/98	MAC	
DIMETHYL PHTHALATE	U	PPB	45	10/09/98	MAC	
n-NITROSODIMETHYLAMINE	U	PPB	180	10/09/98	MAC	
n-NITROSODIPHENYLAMINE	U	PPB	91	10/09/98	MAC	
n-NITROSO-di-n-PROPYLAMINE	U	PPB	91	10/09/98	MAC	
ISOPHORONE	U	PPB	45	10/09/98	MAC	
NITROBENZENE	U	PPB	91	10/09/98	MAC	
2,4-DINITROTOLUENE	U	PPB	180	10/09/98	MAC	
2,6-DINITROTOLUENE	U	PPB	180	10/09/98	MAC	
ACENAPTHENE	U	PPB	45	10/09/98	MAC	
ACENAPHTHYLENE	U	PPB	45	10/09/98	MAC	
ANTHRACENE	U	PPB	45	10/09/98	MAC	
BENZO(a)ANTHRACENE	U	PPB	45	10/09/98	MAC	
BENZO(a)PYRENE	U	PPB	45	10/09/98	MAC	
BENZO(b)FLUORANTHENE	50.7	PPB	-	10/09/98	MAC	
BENZO(ghi)PERYLENE	U	PPB	180	10/09/98	MAC	
BENZO(k)FLUORANTHENE	U	PPB	45	10/09/98	MAC	
DIBENZO(a,h)ANTHRACENE	U	PPB	180	10/09/98	MAC	
FLUORANTHENE	76.1	PPB	-	10/09/98	MAC	
FLUORENE	U	PPB	45	10/09/98	MAC	
INDENO(1,2,3-cd)PYRENE	U	PPB	180	10/09/98	MAC	
NAPHTHALENE	U	PPB	45	10/09/98	MAC	
PHENANTHRENE	53.4	PPB	-	10/09/98	MAC	
PYRENE	56.2	PPB	-	10/09/98	MAC	
CHRYSENE	J 29.9	PPB	45	10/09/98	MAC	
BIS(2-CHLOROETHYL)ETHER	U	PPB	91	10/09/98	MAC	
BIS(2-CHLOROETHOXY)METHANE	U	PPB	45	10/09/98	MAC	
BIS(2-CHLOROISOPROPYL)ETHER	U	PPB	180	10/09/98	MAC	
4-BROMOPHENYLPHENYL ETHER	U	PPB	180	10/09/98	MAC	
4-CHLOROPHENYLPHENYL ETHER	U	PPB	91	10/09/98	MAC	
HEXACHLOROCYCLOPENTADIENE	U	PPB	450	10/09/98	MAC	
HEXACHLOROBUTADIENE	U	PPB	91	10/09/98	MAC	
HEXACHLOROBENZENE	U	PPB	91	10/09/98	MAC	
HEXACHLOROETHANE	U	PPB	91	10/09/98	MAC	
1,2,4-TRICHLOROBENZENE	U	PPB	91	10/09/98	MAC	
2-CHLORONAPHTHALENE	U	PPB	45	10/09/98	MAC	
4-CHLORO-3-METHYLPHENOL	U	PPB	91	10/09/98	MAC	
2-CHLOROPHENOL	U	PPB	45	10/09/98	MAC	
2,4-DICHLOROPHENOL	U	PPB	94	10/09/98	MAC	
2,4-DIMETHYLPHENOL	U	PPB	91	10/09/98	MAC	
2,4-DINITROPHENOL	U	PPB	910	10/09/98	MAC	
2-METHYL-4,6-DINITROPHENOL	U	PPB	450	10/09/98	MAC	
2-NITROPHENOL	U	PPB	180	10/09/98	MAC	
4-NITROPHENOL	U	PPB	450	10/09/98	MAC	
PENTACHLOROPHENOL	U	PPB	180	10/09/98	MAC	
PHENOL	U	PPB	45	10/09/98	MAC	
2,4,6-TRICHLOROPHENOL	U	PPB	91	10/09/98	MAC	
2,4,5-TRICHLOROPHENOL	U	PPB	91	10/09/98	MAC	
O-CRESOL	U	PPB	91	10/09/98	MAC	
M- & P-CRESOL	U	PPB	45	10/09/98	MAC	
2-METHYLNAPHTHALENE	U	PPB	45	10/09/98	MAC	
BENZOIC ACID	U	PPB	180	10/09/98	MAC	
BENZYL ALCOHOL	U	PPB	180	10/09/98	MAC	
4-CHLOROANILINE	U	PPB	91	10/09/98	MAC	
DIBENZOFURAN	U	PPB	45	10/09/98	MAC	
3,3-DICHLOROBENZIDINE	U	PPB	180	10/09/98	MAC	
2-NITROANILINE	U	PPB	180	10/09/98	MAC	
3-NITROANILINE	U	PPB	180	10/09/98	MAC	
4-NITROANILINE	U	PPB	450	10/09/98	MAC	
ALDRIN	J 2.26	PPB	2.4	10/09/98	MAC	
alpha-BHC	U	PPB	4.3	10/09/98	MAC	
beta-BHC	U	PPB	6.2	10/09/98	MAC	
ta-BHC	U	PPB	6.2	10/09/98	MAC	
nma-BHC (LINDANE)	U	PPB	2.4	10/09/98	MAC	
alpha-CHLORDANE	3.33	PPB	-	10/09/98	MAC	
gamma-CHLORDANE	3.83	PPB	-	10/09/98	MAC	
TECHNICAL CHLORDANE	U	PPB	38	10/09/98	MAC	
p,p-DDD	U	PPB	4.5	10/09/98	MAC	
p,p-DDE	U	PPB	3.9	10/09/98	MAC	

Project/Site No.:	47-559	Lab Number:	9809002-03F
Project Name:	SMOKEY MOUNTAIN SMELTERS	Matrix:	SOIL
Description:	SMS-WA-08/HOT DEPRESSION	Received:	09/01/98 09:05:00 By FMM
Station No.:	SMS-WA-08	Sampling Agency:	HWM_11_KFO
Collected:	08/31/98 11:35:00 By WLB	Priority:	
County:	47		

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
B/N/A EXTR+PESTS,PCBS-SOIL						MS+ECD
p,p-DDT	U	PPB	4.2	10/09/98	MAC	
DIELDRIN	U	PPB	5.0	10/09/98	MAC	
ENDOSULFAN I	U	PPB	4.0	10/09/98	MAC	
ENDOSULFAN II	U	PPB	4.5	10/09/98	MAC	
ENDOSULFAN SULFATE	U	PPB	4.5	10/09/98	MAC	
ENDRIN	U	PPB	4.5	10/09/98	MAC	
ENDRIN ALDEHYDE	U	PPB	3.8	10/09/98	MAC	
ENDRIN KETONE	U	PPB	4.6	10/09/98	MAC	
HEPTACHLOR	U	PPB	3.0	10/09/98	MAC	
HEPTACHLOR EPOXIDE	U	PPB	3.1	10/09/98	MAC	
TOXAPHENE	U	PPB	260	10/09/98	MAC	
METHOXYCHLOR	U	PPB	17	10/09/98	MAC	
PCB 1016/1242	U	PPB	230	10/09/98	MAC	
PCB 1221	U	PPB	300	10/09/98	MAC	
PCB 1232	U	PPB	270	10/09/98	MAC	
PCB 1248	U	PPB	170	10/09/98	MAC	
PCB 1254	U	PPB	210	10/09/98	MAC	
PCB 1260	U	PPB	130	10/09/98	MAC	
PCB 1262	U	PPB	130	10/09/98	MAC	

*-Water, uG/L; Sediment, uG/kG

Printed: October 13, 1998

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Organic Analysis
Base/Neutral/Acid Extractables

PROJECT/SITE NO. 47-559	PROJECT NAME SMOKY MTN. SHELTERS
STATION NUMBER SMS-WA-08	COUNTY KNOX
DESCRIPTION HOT DEPRESSION	
STREAM MILE —	DEPTH 0'-6" MATRIX SOIL
COLLECTED: DATE 08-31-98	TIME 11:35
SAMPLER'S NAME(printed) WM. LEE BARROW + ADAM D. DEWEESE	
SAMPLING AGENCY TDSF	BILLING CODE 32 7 38.11
IF PRIORITY, DATE NEEDED 09-30-98	
SEND REPORT TO: BURL H. MAUPIN TDSF, KNOXVILLE STATE LAB. FIELD OFFICE	
CONTACT HAZARD UNKNOWN	

*	NPDES Extractables	*	NPDES Extractables(con't)	*	TAL Semivolatiles
	butylbenzylphthalate	X	2-chlorophenol	X	dimethylphthalate
	bis(2-ethylhexyl)phthalate		2,4-dichlorophenol	X	4,6-dinitro-2-methylphenol
	di-n-butylphthalate		2,4-dimethylphenol	X	2,4-dinitrophenol
	di-n-octylphthalate		2,4-dinitrophenol	X	2,4-dinitrotoluene
	diethylphthalate		4,6-dinitro-o-cresol	X	2,6-dinitrotoluene
	dimethylphthalate		2-nitrophenol	X	fluoranthene
X	n-nitrosodimethylamine		4-nitrophenol	X	fluorene
	n-nitrosodiphenylamine		pentachlorophenol	X	hexachlorobenzene
	n-nitrosodi-n-propylamine		phenol	X	hexachlorobutadiene
	isophorone		2,4,6-trichlorophenol	X	hexachlorocyclopentadiene
	nitrobenzene	*	TAL Semivolatiles	X	hexachloroethane
	2,4-dinitrotoluene	X	acenaphthene	X	indeno(1,2,3-cd)pyrene
	acenaphthene	X	acenaphthylene	X	isophorone
	acenaphthylene	X	anthracene	X	2-methylnaphthalene
	anthracene	X	benzo(a)anthracene	X	2-methylphenol
	benzo(a)anthracene	X	benzo(a)pyrene	X	4-methylphenol
	benzo(a)pyrene	X	benzo(b)fluoranthene	X	n-nitrosodiphenylamine
	benzo(b)fluoranthene	X	benzo(g,h,i)perylene	X	n-nitroso-n-dipropylamine
	benzo(g,h,i)perylene	X	benzo(k)fluoranthene	X	naphthalene
	benzo(k)fluoranthene	X	benzoic acid	X	2-nitroaniline
	chrysene	X	benzyl alcohol	X	3-nitroaniline
	dibenzo(a,h)anthracene	X	bis(2-chloroethoxy)methane	X	4-nitroaniline
	fluoranthene	X	bis(2-chloroethyl) ether	X	nitrobenzene
	fluorene	X	bis(2-chloroisopropyl)ether	X	2-nitrophenol
	indeno(1,2,3-c,d)pyrene	X	bis(2-ethylhexyl)phthalate	X	4-nitrophenol
	naphthalene	X	4-bromophenylphenylether	X	pentachlorophenol
	phenanthrene	X	butylbenzylphthalate	X	phenanthrene
	pyrene	X	4-chloroaniline	X	phenol
	bis(2-chloroethyl)ether	X	4-chloro-3-methyl phenol	X	pyrene
	bis(2-chloroethoxy)methane	X	2-chloronaphthalene	X	1,2,4-trichlorobenzene
	bis(2-chloroisopropyl)ether	X	4-chlorophenylphenylether	X	2,4,5-trichlorophenol
	4-bromophenylphenylether	X	chrysene	X	2,4,6-trichlorophenol
	4-chlorophenylphenylether	X	di-n-butylphthalate	*	Nitrobodies
	hexachlorocyclopentadiene	X	di-n-octylphthalate		RDX
	hexachlorobutadiene	X	dibenzo(a,h)anthracene		2,4,6-TNT
	hexachlorobenzene	X	dibenzofuran		2,4-dinitrotoluene
	hexachloroethane	X	3,3'-dichlorobenzidine		2,6-dinitrotoluene
	1,2,4-trichlorobenzene	X	2,4-dichlorophenol		nitrobenzene
	2-chloronaphthalene	X	diethylphthalate		1,3,5-TNB
	4-chloro-3-methyl phenol	X	2,4-dimethylphenol		

*	TCLP Semivolatiles	*	Pesticides/PCBs
	chlordane	X	aldrin
	o-cresol	X	alpha-BHC
	m-cresol	X	beta-BHC
	p-cresol	X	delta-BHC
	cresol	X	gamma-BHC (lindane)
	2,4-D	X	technical chlordane
	2,4-dinitrotoluene	X	alpha-chlordane
	endrin	X	gamma-chlordane
	heptachlor	X	4,4'-DDD
	heptachlor epoxide	X	4,4'-DDE
	hexachlorobenzene	X	4,4'-DDT
	hexachlorobutadiene	X	dieldrin
	hexachloroethane	X	endosulfan I
	lindane	X	endosulfan II
	methoxychlor	X	endosulfan sulfate
	nitrobenzene	X	endrin
	pentachlorophenol	X	endrin aldehyde
	pyridine	X	endrin ketone
	toxaphene	X	heptachlor
	2,4,5-trichlorophenol	X	heptachlor epoxide
	2,4,6-trichlorophenol	X	toxaphene
	2,4,5-TP (Silvex)	X	methoxychlor
		X	PCB 1016/1242
		X	PCB 1221
		X	PCB 1232
		X	PCB 1248
		X	PCB 1254
		X	PCB 1260
		X	PCB 1262

Laboratory Number

Branch Lab Number

Chain of Custody and Supplemental Information

Only one chain of custody form is required per sample set or point (if all collected at the same time)

1. Collected by TED B. FAUD
   Date 08-31-98 Time 11:35
   Delivered to BURL H. MAUPIN
   Date 08-31-98 Time 15:00
2. Received by [illegible]
   Date 9-31-98 Time 1505
   Delivered to KNOXVILLE STATE LAB
   Date 9-1-98 Time [illegible]
3. Received by
   Date Time
   Delivered to
   Date Time
4. Received in Lab by [illegible]
   Date 9-1-98 Time 9:05
   Logged in by
   Date Time

Additional Information

1. Approximate volume of sample 16 OZ
2. Nearest town or city KNOXVILLE
3. Others present at collection NONE
4. Number of other samples collected at same time at this point THREE
5. Field collection procedure, handling and/or preservation of this sample ACCORDING TO U.S. EPA PROCEDURES AND PROTOCOLS.
6. Mode of transportation to lab ON ICE IN AN ICE CHEST IN A STATE VEHICLE
7. Sample sealed by
8. Date sample sealed
9. Remarks

PH-3014 (rev 1/96)

RDA 1527

SEP 11 1998

Project/Site No.: 47-559
Project Name: SMOKEY MOUNTAIN SMELTERS
Site Description: SMS-WA-08/HOT DEPRESSION
Station No.: SMS-WA-08
Collected: 08/31/98 11:35:00 By WLB
County: 47

Lab Number: 9809002-03E
Matrix: SOIL
Received: 09/01/98 09:05:00 By FMM
Sampling Agency: HWM_11_KFO
Priority:

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
VOLATILES-TAL SEDIMENTS						8260A
ACETONE	65	PPB	25	09/04/98	HMG	
BENZENE	U	PPB	2.5	09/04/98	HMG	
BROMODICHLOROMETHANE	U	PPB	2.5	09/04/98	HMG	
BROMOFORM	U	PPB	2.5	09/04/98	HMG	
BROMOMETHANE	U	PPB	5.0	09/04/98	HMG	
2-BUTANONE (MEK)	U	PPB	25	09/04/98	HMG	
CARBON DISULFIDE	U	PPB	5.0	09/04/98	HMG	
CARBON TETRACHLORIDE	U	PPB	2.5	09/04/98	HMG	
VINYL ACETATE	U	PPB	5.0	09/04/98	HMG	
CHLOROBENZENE	U	PPB	2.5	09/04/98	HMG	
CHLOROETHANE	U	PPB	5.0	09/04/98	HMG	
CHLOROFORM	U	PPB	2.5	09/04/98	HMG	
CHLOROMETHANE	U	PPB	5.0	09/04/98	HMG	
DIBROMOCHLOROMETHANE	U	PPB	2.5	09/04/98	HMG	
1,2-DICHLOROBENZENE	U	PPB	2.5	09/04/98	HMG	
1,3-DICHLOROBENZENE	U	PPB	2.5	09/04/98	HMG	
1,4-DICHLOROBENZENE	U	PPB	2.5	09/04/98	HMG	
DICHLORODIFLUOROMETHANE	U	PPB	5.0	09/04/98	HMG	
1,1-DICHLOROETHANE	U	PPB	2.5	09/04/98	HMG	
1,2-DICHLOROETHANE	U	PPB	2.5	09/04/98	HMG	
1,1-DICHLOROETHENE	U	PPB	2.5	09/04/98	HMG	
CIS-1,2-DICHLOROETHENE	U	PPB	2.5	09/04/98	HMG	
TRANS-1,2-DICHLOROETHENE	U	PPB	2.5	09/04/98	HMG	
1,2-DICHLOROPROPANE	U	PPB	2.5	09/04/98	HMG	
CIS-1,3-DICHLOROPROPENE	U	PPB	2.5	09/04/98	HMG	
TRANS-1,3-DICHLOROPROPENE	U	PPB	2.5	09/04/98	HMG	
ETHYLBENZENE	U	PPB	2.5	09/04/98	HMG	
METHYLENE CHLORIDE	B 27	PPB	2.5	09/04/98	HMG	
4-METHYL-2-PENTANONE (MIBK)	U	PPB	25	09/04/98	HMG	
STYRENE	U	PPB	2.5	09/04/98	HMG	
2-HEXANONE	U	PPB	5.0	09/04/98	HMG	
1,1,2,2-TETRACHLOROETHANE	U	PPB	2.5	09/04/98	HMG	
TETRACHLOROETHENE	U	PPB	2.5	09/04/98	HMG	
TOLUENE	J 0.5	PPB	2.5	09/04/98	HMG	
1,1,1-TRICHLOROETHANE	U	PPB	2.5	09/04/98	HMG	
1,1,2-TRICHLOROETHANE	U	PPB	2.5	09/04/98	HMG	
TRICHLOROETHENE	U	PPB	2.5	09/04/98	HMG	
TRICHLOROFLUOROMETHANE	U	PPB	5.0	09/04/98	HMG	
VINYL CHLORIDE	U	PPB	5.0	09/04/98	HMG	
o-XYLENE	U	PPB	2.5	09/04/98	HMG	
m&p-XYLENE	U	PPB	2.5	09/04/98	HMG	

*-Water, uG/L; Sediment, uG/kG

Printed: September 8, 1998

ALSO CONFIRMED BY GCMS: PENTANE
HEXANE

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Organic Analysis

Volatiles and Petroleum Hydrocarbons

PROJECT/SITE NO. 47559	PROJECT NAME GUIDER MAN SMELTERS
STATION NUMBER SMS-WA-08	COUNTY KNOX
DESCRIPTION HOT DEPRESSION	
STREAM MILE —	DEPTH 0"-6" MATRIX SOIL
COLLECTED: DATE 08-31-98	TIME 11:35
SAMPLER'S NAME(printed) WM. LEE BARROW & REAH D. DUNCAN	
SAMPLING AGENCY TDSF	BILLING CODE 32238.11
IF PRIORITY, DATE NEEDED 09-30-98	
SEND REPORT TO: BURL H. MAUPIN, TDSF, KNOXVILLE FIELD ASSIST. CENTER	
CONTACT HAZARD UNKNOWN	

Laboratory Number

Branch Lab Number

Chain of Custody and Supplemental Information

Only one chain of custody form is required per sample set or point (if all collected at the same time)

1. Collected by W.L.B. & R.D.
   Date 08-31-98 Time 11:35
   Delivered to BURL H. MAUPIN
   Date 08-31-98 Time 15:00
2. Received by [illegible]
   Date 8-31-98 Time 1600
   Delivered to KNOXVILLE STATE LAB
   Date 9-1-98 Time [illegible]
3. Received by
   Date Time
   Delivered to
   Date Time
4. Received in Lab by [illegible]
   Date 9-1-98 Time 9:05
   Logged in by
   Date Time

*	NPDES Volatiles - 624	*	TAL Volatiles - 8260A	*	TCLP Volatiles
	Bromoform	X	Chloromethane		Benzene
	Bromodichloromethane	X	Bromomethane		Carbon tetrachloride
	Carbon Tetrachloride	X	Vinyl chloride		Chlorobenzene
	Chlorobenzene	X	Chloroethane		Chloroform
	Chloroethane	X	Methylene chloride		1,2-Dichloroethane
X	2-Chloroethylvinyl ether	X	Acetone		1,1-Dichloroethane
	Chloroform	X	Carbon disulfide		Methyl ethyl ketone
	Chloromethane	X	1,1-Dichloroethene		Tetrachloroethene
	Dibromochloromethane	X	1,1-Dichloroethane		Trichloroethene
X	1,2-Dichlorobenzene	X	Cis-1,2-dichloroethene		Vinyl chloride
X	1,3-Dichlorobenzene	X	Trans-1,2-dichloroethene	*	**BTEX - 8260A - UST**
X	1,4-Dichlorobenzene	X	1,2-Dichloroethane		Benzene
X	Dichlorodifluoromethane	X	Chloroform		Toluene
	1,1-Dichloroethane	X	2-Butanone		Ethyl benzene
	1,2-Dichloroethane	X	1,1,1-Trichloroethane		o-Xylene
	1,1-Dichloroethene	X	Carbon tetrachloride		m-Xylene
	Cis-1,2-dichloroethene	X	Vinyl acetate		p-Xylene
	Trans-1,2-dichloroethene	X	Bromodichloromethane		Methyl t-butyl ether
	1,2-Dichloropropane	X	1,2-Dichloropropane		Diisopropyl ether
	Cis-1,3-dichloropropene	X	Cis-1,3-dichloropropane	*	**TPH by GC**
	Trans-1,2-dichloroethene	X	Trichloroethene		Gasoline Range Organics
	Methylene chloride	X	Dibromochloromethane		Diesel Range Organics
	1,1,2,2-Tetrachloroethane	X	1,1,2-Trichloroethane	*	**TPH by IR (418.1)**
	Tetrachloroethene	X	Benzene		418.1 - Waste Oil
	1,1,1-Trichloroethane	X	Trans-1,3-dichloropropene	*	**Other**
	1,1,2-Trichloroethane	X	Bromoform		
	Trichloroethene	X	4-Methyl-2-pentanone		
X	Trichlorofluoromethane	X	2-Hexanone		
	Vinyl chloride	X	Tetrachloroethene		
	Benzene	X	Toluene		
	Ethylbenzene	X	1,1,2,2-Tetrachloroethane		
	Toluene	X	Chlorobenzene		
	o-Xylene	X	Ethyl benzene		
	m-Xylene	X	Styrene		
	p-Xylene	X	o-Xylene		
		X	m-Xylene		
		X	p-Xylene		

Additional Information

1. Approximate volume of sample 4 OZ
2. Nearest town or city KNOXVILLE STATE LAB
3. Others present at collection NONE
4. Number of other samples collected at same time at this point THREE
5. Field collection procedure, handling and/or preservation of this sample ACCORDING TO U.S. EPA PROCEDURES AND PROTOCOLS
6. Mode of transportation to lab ON ICE, IN AN ICE CHEST, IN A STATE VEHICLE.
7. Sample sealed by
8. Date sample sealed
9. Remarks

SEP 30 1998

Project/Site No.: 47-559
Project Name: SMOKEY MOUNTAIN SMELTERS
Description: SMS-WA-08/HOT DEPRESSION
Station No.: SMS-WA-08
Collected: 08/31/98 11:35:00 By WLB
unty: 47

Lab Number: 9809002-03G
Matrix: SOIL
Received: 09/01/98 09:05:00 By FMM
Sampling Agency: HWM_11_KFO
Priority:

TEST	RESULT	*ERROR	UNITS	ANALYZED	BY	METHOD
GAMMA RADIONUCLIDES						R.6
K-40	20.85	0.86	pCi/g dry wt	09/03/98	AK	
Pb-214	2.68	0.11	pCi/g dry wt	09/03/98	AK	
Bi-214	2.45	0.11	pCi/g dry wt	09/03/98	AK	
Pb-212	0.872	0.050	pCi/g dry wt	09/03/98	AK	
Ac-228	1.07	0.14	pCi/g dry wt	09/03/98	AK	
Tl-208	0.303	0.040	pCi/g dry wt	09/03/98	AK	
GROSS ALPHA & BETA						R.1.3
GROSS ALPHA	2.98	0.93	pCi/g DRY WT.	09/10/98	NLF	
GROSS BETA	38.8	2.3	pCi/g DRY WT.	09/10/98	NLF	

*--Represents +/- error value

Printed: September 10, 1998

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Radiochemical Analysis

PROJECT/SITE NO. 47.559	PROJECT NAME SMOKEY MTN. SMELTERS
STATION NUMBER SMS-WA-08	COUNTY KNOX
DESCRIPTION HOT DEPRESSION	
STREAM MILE —	DEPTH 0" - 6"
COLLECTED: DATE 08-31-98	TIME 11:35
PICK-UP DATE:	
CONTACT HAZARD UNKNOWN	mR/hr Reading 2.0
SAMPLER'S NAME (printed) WM. LEE BARRON & ADAM D. DENEESE	
SAMPLING AGENCY TDSF	BILLING CODE 327.38.11
IF PRIORITY, DATE NEEDED 09-30-98	
SEND REPORT TO: BURL H. MAUPIN, TDSF KNOXVILLE ENVIR. ASSIST. CENTER	

Laboratory Number

Date Received

Time Received By

Sample Type

___Air ___Milk ___Swipe
___Water ___Tissue ___Liquid
___Sludge X Soil ___Solid
___Vegetation ___Sediment

Other_____

Field Comments:

Air Samples
Volume _____
Total Hours _____

___Sample Filtration
___Sample Acidification
___Send to RESL

Chain of Custody and Supplemental Information

Only one chain of custody form is required per sample set or point (if all collected at the same time)

1. Collected by W.L.B. & A.D.D.
   Date 08-31-98 Time 11:35
   Delivered to BURL H. MAUPIN
   Date 08-31-98 Time 15:00
2. Collected by [illegible]
   Date 8-31-98 Time 1500
   Delivered to KNOXVILLE STATE LAB
   Date 9-1-98 Time 9:00 am
3. Collected by
   Date Time
   Delivered to
   Date Time
4. Received in Lab by [illegible]
   Date 9-1-98 Time 9:05
   Logged in by
   Date Time

REQUESTED ANALYSES:

X	GROSS ALPHA (TOTAL)		STRONTIUM 89
	GROSS ALPHA (SUSPENDED)		STRONTIUM 90
	GROSS ALPHA (DISSOLVED)		TRITIUM (H-3)
X	GROSS BETA (TOTAL)		THORIUM (TOTAL)
	GROSS BETA (SUSPENDED)		URANIUM (TOTAL)
	GROSS BETA (DISSOLVED)	X	GAMMA RADIONUCLIDES
			ADDITIONAL ANALYSES:

Additional Information

1. Approximate volume of sample 16 OZ
2. Nearest town or city KNOXVILLE
3. Others present at collection NONE
4. Number of other samples collected at same time at this point THREE
5. Field collection procedure, handling and/or preservation of this sample ACCORDING TO U.S. EPA PROCEDURES AND PROTOCOLS.
6. Mode of transportation to lab ON ICE IN AN ICE CHEST IN A STATE VEHICLE
7. Sample sealed by
8. Date sample sealed
9. Remarks

" Laboratory Forms - Soil Samples "

TDH/Division of Laboratory Services (DLS). 1998. "Laboratory Reports, Requests, and Chain-of-Custody Forms - Soil Samples". Tennessee Department of Health/Division of Laboratory Services.

SMOKEY MOUNTAIN SMELTERS
KNOXVILLE, TENNESSEE 37920
U.S. EPA # TN0002318277
TSDF #47-559

Project/Site No.: 47-559
Project Name: SMOKEY MTN SMELTERS
Description: SMS-SS-01/BACKGROUND SURF.
Station No.: SMS-SS-01
Collected: 08/31/98 11:40:00 By BHM
County: 47

Lab Number: 9808275-03
Matrix: SOIL
Received: 08/31/98 14:15:00 By LAB
Sampling Agency: HWM_11_KFO
Priority: 9_30_98

TEST	RESULT	UNITS	LIMIT	ANALYZED	BY	METHOD
AMMONIA	26.3	mg/kg	10	09/15/98	SAL	A.18.2
CYANIDE	U	mg/kg	1.0	09/23/98	SAL	A.9
ALUMINUM	8820	mg/kg	10	10/01/98	JAH	
ANTIMONY	U	mg/kg	0.6	10/09/98	JAH	
ARSENIC	6.7	mg/kg	0.2	10/05/98	JAH	
BARIUM	81	mg/kg	10	10/01/98	JAH	
BERYLLIUM	U	mg/kg	1	09/30/98	JAH	
CADMIUM	U	mg/kg	0.5	09/11/98	JAH	
CALCIUM	1100	mg/kg	3	10/02/98	JAH	
CHROMIUM	12	mg/kg	1	09/23/98	JAH	
COBALT	11	mg/kg	1	09/15/98	JAH	
COPPER	11	mg/kg	1	09/16/98	JAH	
DIGESTION-METALS	COMPLETED	COMPLETED		09/10/98	EAM	
IRON	12600	mg/kg	5	09/16/98	JAH	
LEAD	25	mg/kg	4	09/15/98	JAH	
MAGNESIUM	876	mg/kg	2	10/02/98	JAH	
MANGANESE	1920	mg/kg	1	09/16/98	JAH	
MERCURY	U	mg/kg	0.1	09/11/98	ATB	EPA 245.5
METALS PREP-SOLIDS/WASTES	COMPLETED	COMPLETED		09/02/98	EAM	
NICKEL	6	mg/kg	2	09/11/98	JAH	
PERCENT SOLIDS	77.5	%		09/08/98	SDS	
POTASSIUM	210	mg/kg	2	10/02/98	JAH	
SELENIUM	U	mg/kg	0.4	10/07/98	JAH	

Project/Site No.: 47-559
Project Name: SMOKEY MTN SMELTERS
Description: SMS-SS-01/BACKGROUND SURF.
Station No.: SMS-SS-01
Collected: 08/31/98 11:40:00 By BHM
County: 47

Lab Number: 9808275-03
Matrix: SOIL
Received: 08/31/98 14:15:00 By LAB
Sampling Agency: HWM_11_KFO
Priority: 9_30_98

TEST	RESULT	UNITS	LIMIT	ANALYZED	BY	METHOD
SILVER	U	mg/kg	1	09/15/98	JAH	
SODIUM	47	mg/kg	10	10/02/98	JAH	
THALLIUM	U	mg/kg	5	09/15/98	JAH	
VANADIUM	U	mg/kg	20	10/01/98	JAH	
ZINC	39.2	mg/kg	0.5	09/15/98	JAH	

State of Tennessee - Environmental Laboratories

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Inorganic Analysis

PROJECT/SITE NO. 47559	PROJECT NAME Smky Mtn Smelters
STATION NUMBER SMS-SS-01	COUNTY Knox
DESCRIPTION background surface soil	
STREAM MILE	DEPTH MATRIX SOIL
COLLECTED: DATE 8-31-98	TIME 11:40
SAMPLER'S NAME(printed) Burl H. Maupin	
SAMPLING AGENCY DSF	BILLING CODE 3273811
IF PRIORITY, DATE NEEDED 9-30-98	
SEND REPORT TO: KEAC	
CONTACT HAZARD unknown	

*	Env. Microbiology	*	General Inorganics		Gen. Inorganics (con't)	*	Metals
	coliform, fecal*		acidity as $CaCO_3$*		oil and grease		aluminum, Al
	coliform, total*		alkalinity as $CaCO_3$*		orthophosphate, total*		antimony, Sb
	strep, fecal*		alkalinity, phen. as $CaCO_3$*		oxygen, dissolved*		arsenic, As
			BOD, 5-day*		pH		barium, Ba
			CBOD, 5-day*		phenols, total		beryllium, Be
			boron		phosphate, total		cadmium, Cd
*	Ambient Parameters		chloride*		residue, dissolved*		calcium, Ca
	COD*		chlorine, residual*		residue, settleable*		chromium, Cr
	coliform, fecal		chromium, hexavalent		residue, suspended*		cobalt, Co
	conductivity*		COD*		residue, total*		copper, Cu
	hardness, total as $CaCO_3$*		color, apparent*		silica*		iron, Fe
	nitrogen, ammonia		color, true*		sulfate*		lead, Pb
	nitrogen, NO_3 & NO_2		conductivity*		sulfide, total*		magnesium, Mg
	nitrogen, total Kjeldahl	X	cyanide		TOC*		manganese, Mn
	phosphate, total		flash point*		turbidity*		mercury, Hg
	pH		fluoride*		percent solids		nickel, Ni
	residue, dissolved*		hardness, Ca as $CaCO_3$*	*	Other	*	TCLP
	residue, suspended*		hardness, total as $CaCO_3$*				arsenic, As
	arsenic, As		hydrocarbons, total				barium, Ba
	cadmium, Cd		MBAS*				cadmium, Cd
	chromium, Cr	X	nitrogen, ammonia				chromium, Cr
	copper, Cu		nitrogen, nitrate*				lead, Pb
	lead, Pb		nitrogen, nitrite*				mercury, Hg
	mercury, Hg		nitrogen, NO_3 & NO_2				nickel, Ni
	nickel, Ni		nitrogen, total Kjeldahl				selenium, Se
	zinc, Zn		nitrogen, total organic				silver, Ag

*denotes analyses performed only on water

FIELD DETERMINATIONS	Temperature
pH	Chlorine, residual
Conductivity	Other
Dissolved Oxygen	

Laboratory Number

Branch Lab Number

Chain of Custody and Supplemental Information

Only one chain of custody form is required per sample set or point (if all collected at the same time)

1. Collected by BHM
   Date 8-31-98 Time 11:40
   Delivered to KBL
   Date 8-31-98 Time 2:15
2. Received by
   Date Time
   Delivered to
   Date Time
3. Received by
   Date Time
   Delivered to
   Date Time
4. Received in Lab by [illegible]
   Date 8-31-98 Time 14:15
   Logged in by
   Date Time

Additional Information

1. Approximate volume of sample 16 oz
2. Nearest town or city Knoxville
3. Others present at collection Beth Walker
4. Number of other samples collected at same time at this point 3
5. Field collection procedure, handling and/or preservation of this sample
   EPA procedures and protocol
6. Mode of transportation to lab
   State vehicle, in cooler, on ice
7. Sample sealed by
8. Date sample sealed
9. Remarks

Project/Site No.: 47-559
Project Name: SMOKEY MTN SMELTERS
Description: SMS-SS-01/BACKGROUND SURF.
Station No.: SMS-SS-01
Collected: 08/31/98 11:40:00 By BHM
inty: 47

Lab Number: 9808275-03F
Matrix: SOIL
Received: 08/31/98 14:15:00 By LAB
Sampling Agency: HWM_11_KFO
Priority: 9_30_98

OCT 13 1998

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
B/N/A EXTR+PESTS,PCBS-SOIL						MS+ECD
BUTYL BENZYL PHTHALATE	U	PPB	100	09/28/98	MAC	
BIS(2-ETHYLHEXYL)PHTHALATE	B 82.6	PPB	-	09/28/98	MAC	
DI-n-BUTYL PHTHALATE	U	PPB	100	09/28/98	MAC	
DI-n-OCTYL PHTHALATE	U	PPB	200	09/28/98	MAC	
DIETHYL PHTHALATE	B 59.7	PPB	-	09/28/98	MAC	
DIMETHYL PHTHALATE	U	PPB	50	09/28/98	MAC	
n-NITROSODIMETHYLAMINE	U	PPB	200	09/28/98	MAC	
n-NITROSODIPHENYLAMINE	U	PPB	100	09/28/98	MAC	
n-NITROSO-di-n-PROPYLAMINE	U	PPB	100	09/28/98	MAC	
ISOPHORONE	U	PPB	50	09/28/98	MAC	
NITROBENZENE	U	PPB	100	09/28/98	MAC	
2,4-DINITROTOLUENE	U	PPB	200	09/28/98	MAC	
2,6-DINITROTOLUENE	U	PPB	200	09/28/98	MAC	
ACENAPTHENE	U	PPB	50	09/28/98	MAC	
ACENAPHTHYLENE	U	PPB	50	09/28/98	MAC	
ANTHRACENE	U	PPB	50	09/28/98	MAC	
BENZO(a)ANTHRACENE	U	PPB	50	09/28/98	MAC	
BENZO(a)PYRENE	U	PPB	50	09/28/98	MAC	
BENZO(b)FLUORANTHENE	U	PPB	50	09/28/98	MAC	
BENZO(ghi)PERYLENE	U	PPB	200	09/28/98	MAC	
BENZO(k)FLUORANTHENE	U	PPB	50	09/28/98	MAC	
DIBENZO(a,h)ANTHRACENE	U	PPB	200	09/28/98	MAC	
FLUORANTHENE	U	PPB	50	09/28/98	MAC	
FLUORENE	U	PPB	50	09/28/98	MAC	
INDENO(1,2,3-cd)PYRENE	U	PPB	200	09/28/98	MAC	
NAPHTHALENE	U	PPB	50	09/28/98	MAC	
PHENANTHRENE	U	PPB	50	09/28/98	MAC	
PYRENE	U	PPB	50	09/28/98	MAC	
CHRYSENE	U	PPB	50	09/28/98	MAC	
BIS(2-CHLOROETHYL)ETHER	U	PPB	100	09/28/98	MAC	
BIS(2-CHLOROETHOXY)METHANE	U	PPB	50	09/28/98	MAC	
BIS(2-CHLOROISOPROPYL)ETHER	U	PPB	200	09/28/98	MAC	
4-BROMOPHENYLPHENYL ETHER	U	PPB	200	09/28/98	MAC	
4-CHLOROPHENYLPHENYL ETHER	U	PPB	100	09/28/98	MAC	
HEXACHLOROCYCLOPENTADIENE	U	PPB	500	09/28/98	MAC	
HEXACHLOROBUTADIENE	U	PPB	100	09/28/98	MAC	
HEXACHLOROBENZENE	U	PPB	100	09/28/98	MAC	
HEXACHLOROETHANE	U	PPB	100	09/28/98	MAC	
1,2,4-TRICHLOROBENZENE	U	PPB	100	09/28/98	MAC	
2-CHLORONAPHTHALENE	U	PPB	50	09/28/98	MAC	
4-CHLORO-3-METHYLPHENOL	U	PPB	100	09/28/98	MAC	
2-CHLOROPHENOL	U	PPB	50	09/28/98	MAC	
2,4-DICHLOROPHENOL	U	PPB	100	09/28/98	MAC	
2,4-DIMETHYLPHENOL	U	PPB	100	09/28/98	MAC	
2,4-DINITROPHENOL	U	PPB	1000	09/28/98	MAC	
2-METHYL-4,6-DINITROPHENOL	U	PPB	500	09/28/98	MAC	
2-NITROPHENOL	U	PPB	200	09/28/98	MAC	
4-NITROPHENOL	U	PPB	500	09/28/98	MAC	
PENTACHLOROPHENOL	U	PPB	200	09/28/98	MAC	
PHENOL	U	PPB	50	09/28/98	MAC	
2,4,6-TRICHLOROPHENOL	U	PPB	100	09/28/98	MAC	
2,4,5-TRICHLOROPHENOL	U	PPB	100	09/28/98	MAC	
O-CRESOL	U	PPB	100	09/28/98	MAC	
M- & P-CRESOL	U	PPB	50	09/28/98	MAC	
2-METHYLNAPHTHALENE	U	PPB	50	09/28/98	MAC	
BENZOIC ACID	U	PPB	200	09/28/98	MAC	
BENZYL ALCOHOL	U	PPB	200	09/28/98	MAC	
4-CHLOROANILINE	U	PPB	100	09/28/98	MAC	
DIBENZOFURAN	U	PPB	50	09/28/98	MAC	
3,3-DICHLOROBENZIDINE	U	PPB	200	09/28/98	MAC	
2-NITROANILINE	U	PPB	200	09/28/98	MAC	
3-NITROANILINE	U	PPB	200	09/28/98	MAC	
4-NITROANILINE	U	PPB	500	09/28/98	MAC	
HEXACHLOROBENZENE	U	PPB	2.0	09/28/98	MAC	
ALDRIN	U	PPB	2.6	09/28/98	MAC	
alpha-BHC	U	PPB	4.7	09/28/98	MAC	
·ta-BHC	U	PPB	6.8	09/28/98	MAC	
ta-BHC	U	PPB	6.8	09/28/98	MAC	
amma-BHC (LINDANE)	U	PPB	2.6	09/28/98	MAC	
alpha-CHLORDANE	U	PPB	3.7	09/28/98	MAC	
gamma-CHLORDANE	U	PPB	2.6	09/28/98	MAC	
TECHNICAL CHLORDANE	U	PPB	41	09/28/98	MAC	
p,p-DDD	U	PPB	4.9	09/28/98	MAC	

Project/Site No.:	47-559	Lab Number:	9808275-03F
Project Name:	SMOKEY MTN SMELTERS	Matrix:	SOIL
Description:	SMS-SS-01/BACKGROUND SURF.	Received:	08/31/98 14:15:00 By LAB
Station No.:	SMS-SS-01	Sampling Agency:	HWM_11_KFO
Collected:	08/31/98 11:40:00 By BHM	Priority:	9_30_98
nty:	47		

OCT 13 1998

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
B/N/A EXTR+PESTS,PCBS-SOIL						MS+ECD
p,p-DDE	U	PPB	4.3	09/28/98	MAC	
p,p-DDT	U	PPB	4.6	09/28/98	MAC	
DIELDRIN	U	PPB	2.8	09/28/98	MAC	
ENDOSULFAN I	U	PPB	4.3	09/28/98	MAC	
ENDOSULFAN II	U	PPB	5.0	09/28/98	MAC	
ENDOSULFAN SULFATE	U	PPB	5.0	09/28/98	MAC	
ENDRIN	U	PPB	5.0	09/28/98	MAC	
ENDRIN ALDEHYDE	U	PPB	4.1	09/28/98	MAC	
ENDRIN KETONE	U	PPB	5.0	09/28/98	MAC	
HEPTACHLOR	U	PPB	3.3	09/28/98	MAC	
HEPTACHLOR EPOXIDE	U	PPB	3.4	09/28/98	MAC	
TOXAPHENE	U	PPB	290	09/28/98	MAC	
METHOXYCHLOR	U	PPB	19	09/28/98	MAC	
PCB 1016/1242	U	PPB	250	09/28/98	MAC	
PCB 1221	U	PPB	330	09/28/98	MAC	
PCB 1232	U	PPB	300	09/28/98	MAC	
PCB 1248	U	PPB	180	09/28/98	MAC	
PCB 1254	U	PPB	230	09/28/98	MAC	
PCB 1260	U	PPB	140	09/28/98	MAC	
PCB 1262	U	PPB	140	09/28/98	MAC	

*-Water, uG/L; Sediment, uG/kG

Printed: October 5, 1998

State of Tennessee - Environmental Laboratories
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Organic Analysis
Base/Neutral/Acid Extractables

PROJECT/SITE NO. 47-559	PROJECT NAME Smokey Mtn Smelters
STATION NUMBER SMS-SS-01	COUNTY Knox
DESCRIPTION Background Soil - Surface	
STREAM MILE	DEPTH 0-6 in MATRIX Soil
COLLECTED: DATE 08/31/98	TIME 11:40
SAMPLER'S NAME(printed) Burl Maupin	
SAMPLING AGENCY TDSF	BILLING CODE 327, 38, 11
IF PRIORITY, DATE NEEDED 09/30/98	
SEND REPORT TO: Burl Maupin	
KEMC - Super Fund	
CONTACT HAZARD UNKNOWN	

*	NPDES Extractables	*	NPDES Extractables(con't)	*	TAL Semivolatiles
	butylbenzylphthalate	X	2-chlorophenol	X	dimethylphthalate
	bis(2-ethylhexyl)phthalate		2,4-dichlorophenol	X	4,6-dinitro-2-methylphenol
	di-n-butylphthalate		2,4-dimethylphenol	X	2,4-dinitrophenol
	di-n-octylphthalate		2,4-dinitrophenol	X	2,4-dinitrotoluene
	diethylphthalate		4,6-dinitro-o-cresol	X	2,6-dinitrotoluene
	dimethylphthalate		2-nitrophenol	X	fluoranthene
X	n-nitrosodimethylamine		4-nitrophenol	X	fluorene
	n-nitrosodiphenylamine		pentachlorophenol	X	hexachlorobenzene
	n-nitrosodi-n-propylamine		phenol	X	hexachlorobutadiene
	isophorone		2,4,6-trichlorophenol	X	hexachlorocyclopentadiene
	nitrobenzene	*	TAL Semivolatiles	X	hexachloroethane
	2,4-dinitrotoluene	X	acenaphthene	X	indeno(1,2,3-cd)pyrene
	acenaphthene	X	acenaphthylene	X	isophorone
	acenaphthylene	X	anthracene	X	2-methylnaphthalene
	anthracene	X	benzo(a)anthracene	X	2-methylphenol
	benzo(a)anthracene	X	benzo(a)pyrene	X	4-methylphenol
	benzo(a)pyrene	X	benzo(b)fluoranthene	X	n-nitrosodiphenylamine
	benzo(b)fluoranthene	X	benzo(g,h,i)perylene	X	n-nitroso-n-dipropylamine
	benzo(g,h,i)perylene	X	benzo(k)fluoranthene	X	naphthalene
	benzo(k)fluoranthene	X	benzoic acid	X	2-nitroaniline
	chrysene	X	benzyl alcohol	X	3-nitroaniline
	dibenzo(a,h)anthracene	X	bis(2-chloroethoxy)methane	X	4-nitroaniline
	fluoranthene	X	bis(2-chloroethyl) ether	X	nitrobenzene
	fluorene	X	bis(2-chloroisopropyl)ether	X	2-nitrophenol
	indeno(1,2,3-c,d)pyrene	X	bis(2-ethylhexyl)phthalate	X	4-nitrophenol
	naphthalene	X	4-bromophenylphenylether	X	pentachlorophenol
	phenanthrene	X	butylbenzylphthalate	X	phenanthrene
	pyrene	X	4-chloroaniline	X	phenol
	bis(2-chloroethyl)ether	X	4-chloro-3-methyl phenol	X	pyrene
	bis(2-chloroethoxy)methane	X	2-chloronaphthalene	X	1,2,4-trichlorobenzene
	bis(2-chloroisopropyl)ether	X	4-chlorophenylphenylether	X	2,4,5-trichlorophenol
	4-bromophenylphenylether	X	chrysene	X	2,4,6-trichlorophenol
	4-chlorophenylphenylether	X	di-n-butylphthalate	*	Nitrobodies
	hexachlorocyclopentadiene	X	di-n-octylphthalate		RDX
	hexachlorobutadiene	X	dibenzo(a,h)anthracene		2,4,6-TNT
	hexachlorobenzene	X	dibenzofuran		2,4-dinitrotoluene
	hexachloroethane	X	3,3'-dichlorobenzidine		2,6-dinitrotoluene
	1,2,4-trichlorobenzene	X	2,4-dichlorophenol		nitrobenzene
	2-chloronaphthalene	X	diethylphthalate		1,3,5-TNB
	4-chloro-3-methyl phenol	X	2,4-dimethylphenol		

*	TCLP Semivolatiles	*	Pesticides/PCBs
	chlordane	X	aldrin
	o-cresol	X	alpha-BHC
	m-cresol	X	beta-BHC
	p-cresol	X	delta-BHC
	cresol	X	gamma-BHC (lindane)
	2,4-D		technical chlordane
	2,4-dinitrotoluene	X	alpha-chlordane
	endrin	X	gamma-chlordane
	heptachlor	X	4,4'-DDD
	heptachlor epoxide	X	4,4'-DDE
	hexachlorobenzene	X	4,4'-DDT
	hexachlorobutadiene	X	dieldrin
	hexachloroethane	X	endosulfan I
	lindane	X	endosulfan II
	methoxychlor	X	endosulfan sulfate
	nitrobenzene	X	endrin
	pentachlorophenol	X	endrin aldehyde
	pyridine	X	endrin ketone
	toxaphene	X	heptachlor
	2,4,5-trichlorophenol	X	heptachlor epoxide
	2,4,6-trichlorophenol	X	toxaphene
	2,4,5-TP (Silvex)	X	methoxychlor
		X	PCB 1016/1242
		X	PCB 1221
		X	PCB 1232
		X	PCB 1248
		X	PCB 1254
		X	PCB 1260
		X	PCB 1262

Laboratory Number

Branch Lab Number

Chain of Custody and Supplemental Information

Only one chain of custody form is required per sample set or point (if all collected at the same time)

1. Collected by BHM and BHK
   Date 8-31-98 Time 11:40
   Delivered to KBL
   Date 8-31-98 Time 2:15
2. Received by
   Date Time
   Delivered to
   Date Time
3. Received by
   Date Time
   Delivered to
   Date Time
4. Received in Lab by [illegible]
   Date 8-31-98 Time 14:15
   Logged in by
   Date Time

Additional Information

1. Approximate volume of sample 1 gallon
2. Nearest town or city Knoxville
3. Others present at collection no
4. Number of other samples collected at same time at this point 3
5. Field collection procedure, handling and/or preservation of this sample According to EPA procedures
6. Mode of transportation to lab on coolers, on Ice, in State vehicle
7. Sample sealed by
8. Date sample sealed
9. Remarks

SEP 14 1998

Project/Site No.: 47-559
Project Name: SMOKEY MTN SMELTERS
Site Description: SMS-SS-01/BACKGROUND SURF.
Station No.: SMS-SS-01
Collected: 08/31/98 11:40:00 By BHM
County: 47

Lab Number: 9808275-03E
Matrix: SOIL
Received: 08/31/98 14:15:00 By LAB
Sampling Agency: HWM_11_KFO
Priority: 9_30_98

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
VOLATILES-TAL SEDIMENTS						8260A
ACETONE	100	PPB	25	09/04/98	HMG	
BENZENE	U	PPB	2.5	09/04/98	HMG	
BROMODICHLOROMETHANE	U	PPB	2.5	09/04/98	HMG	
BROMOFORM	U	PPB	2.5	09/04/98	HMG	
BROMOMETHANE	U	PPB	5.0	09/04/98	HMG	
2-BUTANONE (MEK)	U	PPB	25	09/04/98	HMG	
CARBON DISULFIDE	U	PPB	5.0	09/04/98	HMG	
CARBON TETRACHLORIDE	U	PPB	2.5	09/04/98	HMG	
VINYL ACETATE	U	PPB	5.0	09/04/98	HMG	
CHLOROBENZENE	U	PPB	2.5	09/04/98	HMG	
CHLOROETHANE	U	PPB	5.0	09/04/98	HMG	
CHLOROFORM	U	PPB	2.5	09/04/98	HMG	
CHLOROMETHANE	U	PPB	5.0	09/04/98	HMG	
DIBROMOCHLOROMETHANE	U	PPB	2.5	09/04/98	HMG	
1,2-DICHLOROBENZENE	U	PPB	2.5	09/04/98	HMG	
1,3-DICHLOROBENZENE	U	PPB	2.5	09/04/98	HMG	
1,4-DICHLOROBENZENE	U	PPB	2.5	09/04/98	HMG	
DICHLORODIFLUOROMETHANE	U	PPB	5.0	09/04/98	HMG	
1,1-DICHLOROETHANE	U	PPB	2.5	09/04/98	HMG	
1,2-DICHLOROETHANE	U	PPB	2.5	09/04/98	HMG	
1,1-DICHLOROETHENE	U	PPB	2.5	09/04/98	HMG	
CIS-1,2-DICHLOROETHENE	U	PPB	2.5	09/04/98	HMG	
TRANS-1,2-DICHLOROETHENE	U	PPB	2.5	09/04/98	HMG	
1,2-DICHLOROPROPANE	U	PPB	2.5	09/04/98	HMG	
CIS-1,3-DICHLOROPROPENE	U	PPB	2.5	09/04/98	HMG	
TRANS-1,3-DICHLOROPROPENE	U	PPB	2.5	09/04/98	HMG	
ETHYLBENZENE	U	PPB	2.5	09/04/98	HMG	
METHYLENE CHLORIDE	B 9.3	PPB	2.5	09/04/98	HMG	
4-METHYL-2-PENTANONE (MIBK)	U	PPB	25	09/04/98	HMG	
STYRENE	U	PPB	2.5	09/04/98	HMG	
2-HEXANONE	U	PPB	5.0	09/04/98	HMG	
1,1,2,2-TETRACHLOROETHANE	U	PPB	2.5	09/04/98	HMG	
TETRACHLOROETHENE	U	PPB	2.5	09/04/98	HMG	
TOLUENE	U	PPB	2.5	09/04/98	HMG	
1,1,1-TRICHLOROETHANE	U	PPB	2.5	09/04/98	HMG	
1,1,2-TRICHLOROETHANE	U	PPB	2.5	09/04/98	HMG	
TRICHLOROETHENE	U	PPB	2.5	09/04/98	HMG	
TRICHLOROFLUOROMETHANE	U	PPB	5.0	09/04/98	HMG	
VINYL CHLORIDE	U	PPB	5.0	09/04/98	HMG	
o-XYLENE	U	PPB	2.5	09/04/98	HMG	
m&p-XYLENE	U	PPB	2.5	09/04/98	HMG	

*-Water, uG/L; Sediment, uG/kG

Printed: September 8, 1998

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Organic Analysis

Volatiles and Petroleum Hydrocarbons

PROJECT/SITE NO. 47059	PROJECT NAME Solo Mtn. Sediment
STATION NUMBER SMS-55-01	COUNTY Knox
DESCRIPTION background surface soil	
STREAM MILE /	DEPTH / MATRIX SOIL
COLLECTED: DATE 8-31-98	TIME 11:40
SAMPLER'S NAME(printed) Buel H. Maupin	
SAMPLING AGENCY DSF	BILLING CODE 3272811
IF PRIORITY, DATE NEEDED 9-30-98	
SEND REPORT TO: Buel Maupin KEAC	
CONTACT HAZARD ~~[illegible]~~ unknown	

*	NPDES Volatiles - 624	*	TAL Volatiles - 8260A	*	TCLP Volatiles
	Bromoform	X	Chloromethane		Benzene
	Bromodichloromethane	X	Bromomethane		Carbon tetrachloride
	Carbon Tetrachloride	X	Vinyl chloride		Chlorobenzene
	Chlorobenzene	X	Chloroethane		Chloroform
	Chloroethane	X	Methylene chloride		1,2-Dichloroethane
X	2-Chloroethylvinyl ether	X	Acetone		1,1-Dichloroethane
	Chloroform	X	Carbon disulfide		Methyl ethyl ketone
	Chloromethane	X	1,1-Dichloroethene		Tetrachloroethene
	Dibromochloromethane	X	1,1-Dichloroethane		Trichloroethene
X	1,2-Dichlorobenzene	X	Cis-1,2-dichloroethene		Vinyl chloride
X	1,3-Dichlorobenzene	X	Trans-1,2-dichloroethene	*	BTEX - 8260A - UST
X	1,4-Dichlorobenzene	X	1,2-Dichloroethane		Benzene
X	Dichlorodifluoromethane	X	Chloroform		Toluene
	1,1-Dichloroethane	X	2-Butanone		Ethyl benzene
	1,2-Dichloroethane	X	1,1,1-Trichloroethane		o-Xylene
	1,1-Dichloroethene	X	Carbon tetrachloride		m-Xylene
	Cis-1,2-dichloroethene	X	Vinyl acetate		p-Xylene
	Trans-1,2-dichloroethene	X	Bromodichloromethane		Methyl t-butyl ether
	1,2-Dichloropropane	X	1,2-Dichloropropane		Diisopropyl ether
	Cis-1,3-dichloropropene	X	Cis-1,3-dichloropropane	*	TPH by GC
	Trans-1,2-dichloroethene	X	Trichloroethene		Gasoline Range Organics
	Methylene chloride	X	Dibromochloromethane		Diesel Range Organics
	1,1,2,2-Tetrachloroethane	X	1,1,2-Trichloroethane	*	TPH by IR (418.1)
	Tetrachloroethene	X	Benzene		418.1 - Waste Oil
	1,1,1-Trichloroethane	X	Trans-1,3-dichloropropene	*	Other
	1,1,2-Trichloroethane	X	Bromoform		
	Trichloroethene	X	4-Methyl-2-pentanone		
X	Trichlorofluoromethane	X	2-Hexanone		
	Vinyl chloride	X	Tetrachloroethene		
	Benzene	X	Toluene		
	Ethylbenzene	X	1,1,2,2-Tetrachloroethane		
	Toluene	X	Chlorobenzene		
	o-Xylene	X	Ethyl benzene		
	m-Xylene	X	Styrene		
	p-Xylene	X	o-Xylene		
		X	m-Xylene		
		X	p-Xylene		

Laboratory Number

Branch Lab Number

Chain of Custody and Supplemental Information

Only one chain of custody form is required per sample set or point (if all collected at the same time)

1. Collected by BHM
   Date 8-31-98 Time 11:40
   Delivered to KBL
   Date 8-31-98 Time 2:15
2. Received by
   Date Time
   Delivered to
   Date Time
3. Received by
   Date Time
   Delivered to
   Date Time
4. Received in Lab by [illegible]
   Date 9-3-98 Time 14:15
   Logged in by
   Date Time

Additional Information

1. Approximate volume of sample 4 oz
2. Nearest town or city Knoxville
3. Others present at collection Beth Walker
4. Number of other samples collected at same time at this point 3
5. Field collection procedure, handling and/or preservation of this sample
   EPA procedures and protocol
6. Mode of transportation to lab State vehicle, in cooler on ice
7. Sample sealed by
8. Date sample sealed
9. Remarks

Project/Site No.:	47-559	Lab Number:	9808275-03G SEP 30 1998
Project Name:	SMOKEY MTN SMELTERS	Matrix:	SOIL
Description:	SMS-SS-01/BACKGROUND SURF.	Received:	08/31/98 14:15:00 By LAB
Station No.:	SMS-SS-01	Sampling Agency:	HWM_11_KFO
Collected:	08/31/98 11:40:00 By BHM	Priority:	9_30_98
County:	47		

TEST	RESULT	*ERROR	UNITS	ANALYZED	BY	METHOD
GAMMA RADIONUCLIDES						R.6
K-40	8.39	0.50	pCi/g dry wt	09/03/98	AK	
Pb-214	1.396	0.080	pCi/g dry wt	09/03/98	AK	
Bi-214	1.444	0.080	pCi/g dry wt	09/03/98	AK	
Pb-212	1.463	0.070	pCi/g dry wt	09/03/98	AK	
Ac-228	1.43	0.12	pCi/g dry wt	09/03/98	AK	
Tl-208	0.508	0.050	pCi/g dry wt	09/03/98	AK	
Bi-212	0.91	0.17	pCi/g dry wt	09/03/98	AK	
Cs-137	0.429	0.040	pCi/g dry wt	09/03/98	AK	
GROSS ALPHA & BETA						R.1.3
GROSS ALPHA	2.7	1.1	pCi/g DRY WT.	09/10/98	NLF	
GROSS BETA	16.2	1.5	pCi/g DRY WT.	09/10/98	NLF	

*--Represents +/- error value

Printed: September 10, 1998

SEP 30 1998

Project/Site No.:	47-559	Lab Number:	9808275-08A
Project Name:	SMOKEY MTN SMELTERS	Matrix:	SOIL
Description:	SMS-SS-01/BKG SURF. DUP.	Received:	08/31/98 14:15:00 By JWB
Station No.:	SMS-SS-01	Sampling Agency:	HWM_11_KFO
Collected:	08/31/98 11:40:00 By BHM	Priority:	9_30_98
Quantity:	47		

TEST	RESULT	*ERROR	UNITS	ANALYZED	BY	METHOD
GROSS ALPHA & BETA						R.1.3
GROSS ALPHA	2.40	0.85	pCi/G DRY WT.	09/10/98	NLF	
GROSS BETA	18.0	1.7	pCi/G DRY WT.	09/10/98	NLF	

*--Represents +/- error value

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Radiochemical Analysis

PROJECT/SITE NO. 47-559	PROJECT NAME Smokey Mountain Smelters
STATION NUMBER SMS-SS-01	COUNTY Knox
DESCRIPTION Background Surface Soil	
STREAM MILE	DEPTH 0-6 inches
COLLECTED: DATE 08/31/98	TIME 11:40
PICK-UP DATE:	
CONTACT HAZARD unknown	mR/hr Reading 0.01
SAMPLER'S NAME (printed) Burl Maupin	
SAMPLING AGENCY TDSF	BILLING CODE 327,38,11
IF PRIORITY, DATE NEEDED 09/30/98	
SEND REPORT TO: Burl Maupin	
KCAC - Super Fund	

Laboratory Number

Branch Lab Number

Date Received

Time Received **By**

Sample Type

___Air ___Milk ___Swipe
___Water ___Tissue ___Liquid
___Sludge X Soil ___Solid
___Vegetation ___Sediment

Other_____

Field Comments:

Air Samples
Volume _____
Total Hours _____

___Sample Filtration
___Sample Acidification
___Send to RESL

REQUESTED ANALYSES:

X	GROSS ALPHA (TOTAL)		STRONTIUM 89
	GROSS ALPHA (SUSPENDED)		STRONTIUM 90
	GROSS ALPHA (DISSOLVED)		TRITIUM (H-3)
X	GROSS BETA (TOTAL)		THORIUM (TOTAL)
	GROSS BETA (SUSPENDED)		URANIUM (TOTAL)
	GROSS BETA (DISSOLVED)	X	GAMMA RADIONUCLIDES
			ADDITIONAL ANALYSES:

Chain of Custody and Supplemental Information

Only one chain of custody form is required per sample set or point (if all collected at the same time)

1. Collected by BHM + BHW
   Date 8/31/98 Time 11:40
   Delivered to Knoxville LAB
   Date 8/31/98 Time 2:15
2. Collected by
   Date Time
   Delivered to
   Date Time
3. Collected by
   Date Time
   Delivered to
   Date Time
4. Received in Lab by [illegible]
   Date 8-31-98 Time 14:15
   Logged in by
   Date Time

Additional Information

1. Approximate volume of sample 1602
2. Nearest town or city Knoxville
3. Others present at collection No
4. Number of other samples collected at same time at this point 3
5. Field collection procedure, handling and/or preservation of this sample
   According to EPA procedures
6. Mode of transportation to lab in cooler on ice, in State vehicle
7. Sample sealed by
8. Date sample sealed
9. Remarks

Project/Site No.: 47-559
Project Name: SMOKEY MOUNTAIN SMELTERS
Description: SMS-SS-02/TRANSFORMER STA.
Station No.: SMS-SS-02
Collected: 08/25/98 10:40:00 By CA
County: 47

Lab Number: 9808248-01
Matrix: SOIL
Received: 08/26/98 10:00:00 By FMM
Sampling Agency: HWM_11_KFO
Priority:

TEST	RESULT	UNITS	LIMIT	ANALYZED	BY	METHOD
AMMONIA	40.9	mg/kg	10	09/15/98	SAL	A.18.2
CYANIDE	U	mg/kg	1.0	09/18/98	LKS	A.9
ALUMINUM	23900	mg/kg	10	10/01/98	JAH	
ANTIMONY	U	mg/kg	0.6	10/08/98	JAH	
ARSENIC	4.2	mg/kg	0.2	10/05/98	JAH	
BARIUM	94	mg/kg	10	10/01/98	JAH	
BERYLLIUM	2	mg/kg	1	09/30/98	JAH	
CADMIUM	1.2	mg/kg	0.5	09/11/98	JAH	
CALCIUM	18900	mg/kg	3	10/02/98	JAH	
CHROMIUM	39	mg/kg	1	09/23/98	JAH	
COBALT	18	mg/kg	1	09/15/98	JAH	
COPPER	116	mg/kg	1	09/16/98	JAH	
DIGESTION-METALS	COMPLETED	COMPLETED		09/10/98	EAM	
IRON	18600	mg/kg	5	09/16/98	JAH	
LEAD	50	mg/kg	4	09/15/98	JAH	
MAGNESIUM	3910	mg/kg	2	10/02/98	JAH	
MANGANESE	645	mg/kg	1	09/16/98	JAH	
MERCURY	0.18	mg/kg	0.1	09/11/98	ATB	EPA 245.5
METALS PREP-SOLIDS/WASTES	COMPLETED	COMPLETED		08/28/98	EAM	
NICKEL	30	mg/kg	2	09/11/98	JAH	
PERCENT SOLIDS	79.2	%		09/08/98	SDS	
POTASSIUM	2320	mg/kg	2	10/02/98	JAH	
SELENIUM	U	mg/kg	0.4	10/07/98	JAH	

Project/Site No.: 47-559
Project Name: SMOKEY MOUNTAIN SMELTERS
Description: SMS-SS-02/TRANSFORMER STA.
Station No.: SMS-SS-02
Collected: 08/25/98 10:40:00 By CA
County: 47

Lab Number: 9808248-01
Matrix: SOIL
Received: 08/26/98 10:00:00 By FMM
Sampling Agency: HWM_11_KFO
Priority:

TEST	RESULT	UNITS	LIMIT	ANALYZED	BY	METHOD
SILVER	U	mg/kg	1	09/15/98	JAH	
SODIUM	171	mg/kg	10	10/02/98	JAH	
THALLIUM	U	mg/kg	5	09/15/98	JAH	
VANADIUM	33	mg/kg	20	10/01/98	JAH	
ZINC	208	mg/kg	0.5	09/15/98	JAH	

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Inorganic Analysis

PROJECT/SITE NO. 47-559	PROJECT NAME Smokey Mountain Smelters
STATION NUMBER SMS-SS-02	COUNTY KNOX
DESCRIPTION Surface Soil at transformer station	
STREAM MILE	DEPTH 0-6 in MATRIX Soil
COLLECTED: DATE 8/25/98	TIME 10:40
SAMPLER'S NAME(printed) Chris ANDEL	
SAMPLING AGENCY TDSF	BILLING CODE 327.38.10
IF PRIORITY, DATE NEEDED 9/26/98	
SEND REPORT TO: Burl Maupin	
KEAC, Superfund	
CONTACT HAZARD UNKNOWN	

*	Metals
X	aluminum, Al
X	antimony, Sb
X	arsenic, As
X	barium, Ba
X	beryllium, Be
X	cadmium, Cd
X	calcium, Ca
X	chromium, Cr
X	cobalt, Co
X	copper, Cu
X	iron, Fe
X	lead, Pb
X	magnesium, Mg
X	manganese, Mn
X	mercury, Hg
X	nickel, Ni
X	potassium, K
X	selenium, Se
X	silver, Ag
X	sodium, Na
X	thallium, Tl
X	vanadium, V
X	zinc, Zn

*	Env. Microbiology	*	General Inorganics		Gen. Inorganics (con't)
	coliform, fecal*		acidity as $CaCO_3$*		oil and grease
	coliform, total*		alkalinity as $CaCO_3$*		orthophosphate, total*
	strep, fecal*		alkalinity, phen. as $CaCO_3$*		oxygen, dissolved*
			BOD, 5-day*		pH
			CBOD, 5-day*		phenols, total
			boron		phosphate, total
*	Ambient Parameters		chloride*		residue, dissolved*
	COD*		chlorine, residual*		residue, settleable*
	coliform, fecal		chromium, hexavalent		residue, suspended*
	conductivity*		COD*		residue, total*
	hardness, total as $CaCO_3$*		color, apparent*		silica*
	nitrogen, ammonia		color, true*		sulfate*
	nitrogen, NO_3 & NO_2		conductivity*		sulfide, total*
	nitrogen, total Kjeldahl	X	cyanide		TOC*
	phosphate, total		flash point*		turbidity*
	pH		fluoride*		percent solids
	residue, dissolved*		hardness, Ca as $CaCO_3$*	*	Other
	residue, suspended*		hardness, total as $CaCO_3$*		
	arsenic, As		hydrocarbons, total		
	cadmium, Cd		MBAS*		
	chromium, Cr	X	nitrogen, ammonia		
	copper, Cu		nitrogen, nitrate*		
	lead, Pb		nitrogen, nitrite*		
	mercury, Hg		nitrogen, NO_3 & NO_2		
	nickel, Ni		nitrogen, total Kjeldahl		
	zinc, Zn		nitrogen, total organic		

*	TCLP
	arsenic, As
	barium, Ba
	cadmium, Cd
	chromium, Cr
	lead, Pb
	mercury, Hg
	nickel, Ni
	selenium, Se
	silver, Ag

** denotes analyses performed only on water*

FIELD DETERMINATIONS	Temperature
pH	Chlorine, residual
Conductivity	Other
Dissolved Oxygen	

Laboratory Number

Branch Lab Number

Chain of Custody and Supplemental Information

Only one chain of custody form is required per sample set or point (if all collected at the same time)

1. Collected by CAA + BHW
   Date 8/25/98 Time 10:40
   Delivered to Knoxville LAB
   Date 8-26-98 Time 10:05
2. Received by
   Date Time
   Delivered to
   Date Time
3. Received by
   Date Time
   Delivered to
   Date Time
4. Received in Lab by [illegible]
   Date 8-26-98 Time 10:00 AM
   Logged in by
   Date Time

Additional Information

1. Approximate volume of sample 16 oz
2. Nearest town or city Knoxville
3. Others present at collection BHW
4. Number of other samples collected at same time at this point Volatiles, semi-vol, rad.
5. Field collection procedure, handling and/or preservation of this sample
   According to EPA procedures and protocols
6. Mode of transportation to lab in cooler on ice, in State vehicle
7. Sample sealed by
8. Date sample sealed
9. Remarks

PH-3011 (rev 1/96)

RDA 1527

OCT 19 1998

Project/Site No.: 47-559
Project Name: SMOKEY MOUNTAIN SMELTERS
Description: SMS-SS-02/TRANSFORMER STA.
Station No.: SMS-SS-02
Collected: 08/25/98 10:40:00 By CA
ıty: 47

Lab Number: 9808248-01F
Matrix: SOIL
Received: 08/26/98 10:00:00 By FMM
Sampling Agency: HWM_11_KFO
Priority:

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
B/N/A EXTR+PESTS,PCBS-SOIL						MS+ECD
BUTYL BENZYL PHTHALATE	U	PPB	140	10/01/98	MAC	
BIS(2-ETHYLHEXYL)PHTHALATE	B 303	PPB	-	10/01/98	MAC	
DI-n-BUTYL PHTHALATE	U	PPB	140	10/01/98	MAC	
DI-n-OCTYL PHTHALATE	U	PPB	280	10/01/98	MAC	
DIETHYL PHTHALATE	B 243	PPB	-	10/01/98	MAC	
DIMETHYL PHTHALATE	U	PPB	71	10/01/98	MAC	
n-NITROSODIMETHYLAMINE	U	PPB	280	10/01/98	MAC	
n-NITROSODIPHENYLAMINE	U	PPB	140	10/01/98	MAC	
n-NITROSO-di-n-PROPYLAMINE	U	PPB	140	10/01/98	MAC	
ISOPHORONE	U	PPB	71	10/01/98	MAC	
NITROBENZENE	U	PPB	140	10/01/98	MAC	
2,4-DINITROTOLUENE	U	PPB	280	10/01/98	MAC	
2,6-DINITROTOLUENE	U	PPB	280	10/01/98	MAC	
ACENAPTHENE	U	PPB	71	10/01/98	MAC	
ACENAPHTHYLENE	U	PPB	71	10/01/98	MAC	
ANTHRACENE	U	PPB	71	10/01/98	MAC	
BENZO(a)ANTHRACENE	J 62.6	PPB	71	10/01/98	MAC	
BENZO(a)PYRENE	81.1	PPB	-	10/01/98	MAC	
BENZO(b)FLUORANTHENE	165	PPB	-	10/01/98	MAC	
BENZO(ghi)PERYLENE	U	PPB	280	10/01/98	MAC	
BENZO(k)FLUORANTHENE	J 51.2	PPB	71	10/01/98	MAC	
DIBENZO(a,h)ANTHRACENE	U	PPB	280	10/01/98	MAC	
FLUORANTHENE	104	PPB	-	10/01/98	MAC	
FLUORENE	U	PPB	71	10/01/98	MAC	
INDENO(1,2,3-cd)PYRENE	J 142	PPB	280	10/01/98	MAC	
NAPHTHALENE	U	PPB	71	10/01/98	MAC	
PHENANTHRENE	U	PPB	71	10/01/98	MAC	
PYRENE	J 65.4	PPB	71	10/01/98	MAC	
CHRYSENE	78.2	PPB	-	10/01/98	MAC	
BIS(2-CHLOROETHYL)ETHER	U	PPB	140	10/01/98	MAC	
BIS(2-CHLOROETHOXY)METHANE	U	PPB	71	10/01/98	MAC	
BIS(2-CHLOROISOPROPYL)ETHER	U	PPB	280	10/01/98	MAC	
4-BROMOPHENYLPHENYL ETHER	U	PPB	280	10/01/98	MAC	
4-CHLOROPHENYLPHENYL ETHER	U	PPB	140	10/01/98	MAC	
HEXACHLOROCYCLOPENTADIENE	U	PPB	710	10/01/98	MAC	
HEXACHLOROBUTADIENE	U	PPB	140	10/01/98	MAC	
HEXACHLOROBENZENE	U	PPB	140	10/01/98	MAC	
HEXACHLOROETHANE	U	PPB	140	10/01/98	MAC	
1,2,4-TRICHLOROBENZENE	U	PPB	140	10/01/98	MAC	
2-CHLORONAPHTHALENE	U	PPB	71	10/01/98	MAC	
4-CHLORO-3-METHYLPHENOL	U	PPB	140	10/01/98	MAC	
2-CHLOROPHENOL	U	PPB	71	10/01/98	MAC	
2,4-DICHLOROPHENOL	U	PPB	140	10/01/98	MAC	
2,4-DIMETHYLPHENOL	U	PPB	140	10/01/98	MAC	
2,4-DINITROPHENOL	U	PPB	1400	10/01/98	MAC	
2-METHYL-4,6-DINITROPHENOL	U	PPB	710	10/01/98	MAC	
2-NITROPHENOL	U	PPB	280	10/01/98	MAC	
4-NITROPHENOL	U	PPB	710	10/01/98	MAC	
PENTACHLOROPHENOL	U	PPB	280	10/01/98	MAC	
PHENOL	U	PPB	71	10/01/98	MAC	
2,4,6-TRICHLOROPHENOL	U	PPB	140	10/01/98	MAC	
2,4,5-TRICHLOROPHENOL	U	PPB	140	10/01/98	MAC	
O-CRESOL	U	PPB	140	10/01/98	MAC	
M- & P-CRESOL	U	PPB	71	10/01/98	MAC	
2-METHYLNAPHTHALENE	U	PPB	71	10/01/98	MAC	
BENZOIC ACID	U	PPB	280	10/01/98	MAC	
BENZYL ALCOHOL	U	PPB	280	10/01/98	MAC	
4-CHLOROANILINE	U	PPB	140	10/01/98	MAC	
DIBENZOFURAN	U	PPB	71	10/01/98	MAC	
3,3-DICHLOROBENZIDINE	U	PPB	280	10/01/98	MAC	
2-NITROANILINE	U	PPB	280	10/01/98	MAC	
3-NITROANILINE	U	PPB	280	10/01/98	MAC	
4-NITROANILINE	U	PPB	710	10/01/98	MAC	
HEXACHLOROBENZENE	U	PPB	2.5	10/01/98	MAC	
ALDRIN	U	PPB	3.4	10/01/98	MAC	
alpha-BHC	U	PPB	6.0	10/01/98	MAC	
·ɛ-BHC	U	PPB	8.7	10/01/98	MAC	
a-BHC	U	PPB	8.7	10/01/98	MAC	
ɛamma-BHC (LINDANE)	U	PPB	3.4	10/01/98	MAC	
alpha-CHLORDANE	127	PPB	-	10/01/98	MAC	
gamma-CHLORDANE	61.0	PPB	-	10/01/98	MAC	
TECHNICAL CHLORDANE	U	PPB	100	10/01/98	MAC	
p,p-DDD	U	PPB	6.2	10/01/98	MAC	

OCT 1 2 1998

Project/Site No.: 47-559
Project Name: SMOKEY MOUNTAIN SMELTERS
Description: SMS-SS-02/TRANSFORMER STA.
Station No.: SMS-SS-02
Collected: 08/25/98 10:40:00 By CA
ity: 47

Lab Number: 9808248-01F
Matrix: SOIL
Received: 08/26/98 10:00:00 By FMM
Sampling Agency: HWM_11_KFO
Priority:

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
B/N/A EXTR+PESTS,PCBS-SOIL						MS+ECD
p,p-DDE	U	PPB	5.5	10/01/98	MAC	
p,p-DDT	4.74	PPB	-	10/01/98	MAC	
DIELDRIN	515	PPB	-	10/01/98	MAC	
ENDOSULFAN I	U	PPB	22	10/01/98	MAC	
ENDOSULFAN II	U	PPB	6.3	10/01/98	MAC	
ENDOSULFAN SULFATE	U	PPB	6.3	10/01/98	MAC	
ENDRIN	U	PPB	6.3	10/01/98	MAC	
ENDRIN ALDEHYDE	U	PPB	5.3	10/01/98	MAC	
ENDRIN KETONE	U	PPB	6.4	10/01/98	MAC	
HEPTACHLOR	11.9	PPB	-	10/01/98	MAC	
HEPTACHLOR EPOXIDE	41.5	PPB	-	10/01/98	MAC	
TOXAPHENE	U	PPB	180	10/01/98	MAC	
METHOXYCHLOR	U	PPB	24	10/01/98	MAC	
PCB 1016/1242	U	PPB	390	10/01/98	MAC	
PCB 1221	U	PPB	430	10/01/98	MAC	
PCB 1232	U	PPB	490	10/01/98	MAC	
PCB 1248	U	PPB	330	10/01/98	MAC	
PCB 1254	U	PPB	160	10/01/98	MAC	
PCB 1260	U	PPB	150	10/01/98	MAC	
PCB 1262	U	PPB	160	10/01/98	MAC	

*-Water, uG/L; Sediment, uG/kG

Printed: October 5, 1998

State of Tennessee - Environmental Laboratories
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Organic Analysis
Base/Neutral/Acid Extractables

PROJECT/SITE NO. 47-559	PROJECT NAME Smokey Mountain Smelters
STATION NUMBER SMS-55-02	COUNTY KNOX
DESCRIPTION Surface soil at transformer station	
STREAM MILE	DEPTH 0-6 in MATRIX Soil
COLLECTED: DATE 8/25/98	TIME 10:40
SAMPLER'S NAME(printed) CHRIS ANDEL	
SAMPLING AGENCY TDSE	BILLING CODE 327038.10
IF PRIORITY, DATE NEEDED 9/26/98	
SEND REPORT TO: Burl Maupin KFO - Superfund	
CONTACT HAZARD UNKNOWN	

*	NPDES Extractables	*	NPDES Extractables(con't)	*	TAL Semivolatiles
	butylbenzylphthalate	X	2-chlorophenol	X	dimethylphthalate
	bis(2-ethylhexyl)phthalate		2,4-dichlorophenol	X	4,6-dinitro-2-methylphenol
	di-n-butylphthalate		2,4-dimethylphenol	X	2,4-dinitrophenol
	di-n-octylphthalate		2,4-dinitrophenol	X	2,4-dinitrotoluene
	diethylphthalate		4,6-dinitro-o-cresol	X	2,6-dinitrotoluene
	dimethylphthalate		2-nitrophenol	X	fluoranthene
X	n-nitrosodimethylamine		4-nitrophenol	X	fluorene
	n-nitrosodiphenylamine		pentachlorophenol	X	hexachlorobenzene
	n-nitrosodi-n-propylamine		phenol	X	hexachlorobutadiene
	isophorone		2,4,6-trichlorophenol	X	hexachlorocyclopentadiene
	nitrobenzene	*	TAL Semivolatiles	X	hexachloroethane
	2,4-dinitrotoluene	X	acenaphthene	X	indeno(1,2,3-cd)pyrene
	acenaphthene	X	acenaphthylene	X	isophorone
	acenaphthylene	X	anthracene	X	2-methylnaphthalene
	anthracene	X	benzo(a)anthracene	X	2-methylphenol
	benzo(a)anthracene	X	benzo(a)pyrene	X	4-methylphenol
	benzo(a)pyrene	X	benzo(b)fluoranthene	X	n-nitrosodiphenylamine
	benzo(b)fluoranthene	X	benzo(g,h,i)perylene	X	n-nitroso-n-dipropylamine
	benzo(g,h,i)perylene	X	benzo(k)fluoranthene	X	naphthalene
	benzo(k)fluoranthene	X	benzoic acid	X	2-nitroaniline
	chrysene	X	benzyl alcohol	X	3-nitroaniline
	dibenzo(a,h)anthracene	X	bis(2-chloroethoxy)methane	X	4-nitroaniline
	fluoranthene	X	bis(2-chloroethyl) ether	X	nitrobenzene
	fluorene	X	bis(2-chloroisopropyl)ether	X	2-nitrophenol
	indeno(1,2,3-c,d)pyrene	X	bis(2-ethylhexyl)phthalate	X	4-nitrophenol
	naphthalene	X	4-bromophenylphenylether	X	pentachlorophenol
	phenanthrene	X	butylbenzylphthalate	X	phenanthrene
	pyrene	X	4-chloroaniline	X	phenol
	bis(2-chloroethyl)ether	X	4-chloro-3-methyl phenol	X	pyrene
	bis(2-chloroethoxy)methane	X	2-chloronaphthalene	X	1,2,4-trichlorobenzene
	bis(2-chloroisopropyl)ether	X	4-chlorophenylphenylether	X	2,4,5-trichlorophenol
	4-bromophenylphenylether	X	chrysene	X	2,4,6-trichlorophenol
	4-chlorophenylphenylether	X	di-n-butylphthalate	*	Nitrobodies
	hexachlorocyclopentadiene	X	di-n-octylphthalate		RDX
	hexachlorobutadiene	X	dibenzo(a,h)anthracene		2,4,6-TNT
	hexachlorobenzene	X	dibenzofuran		2,4-dinitrotoluene
	hexachloroethane	X	3,3'-dichlorobenzidine		2,6-dinitrotoluene
	1,2,4-trichlorobenzene	X	2,4-dichlorophenol		nitrobenzene
	2-chloronaphthalene	X	diethylphthalate		1,3,5-TNB
	4-chloro-3-methyl phenol	X	2,4-dimethylphenol		

*	TCLP Semivolatiles	*	Pesticides/PCBs
	chlordane	X	aldrin
	o-cresol	X	alpha-BHC
	m-cresol	X	beta-BHC
	p-cresol	X	delta-BHC
	cresol	X	gamma-BHC (lindane)
	2,4-D		technical chlordane
	2,4-dinitrotoluene	X	alpha-chlordane
	endrin	X	gamma-chlordane
	heptachlor	X	4,4'-DDD
	heptachlor epoxide	X	4,4'-DDE
	hexachlorobenzene	X	4,4'-DDT
	hexachlorobutadiene	X	dieldrin
	hexachloroethane	X	endosulfan I
	lindane	X	endosulfan II
	methoxychlor	X	endosulfan sulfate
	nitrobenzene	X	endrin
	pentachlorophenol	X	endrin aldehyde
	pyridine	X	endrin ketone
	toxaphene	X	heptachlor
	2,4,5-trichlorophenol	X	heptachlor epoxide
	2,4,6-trichlorophenol	X	toxaphene
	2,4,5-TP (Silvex)	X	methoxychlor
	hexachloroethane	X	PCB 1016/1242
	indeno(1,2,3-cd)pyrene	X	PCB 1221
	isophorone	X	PCB 1232
	2-methylnaphthalene	X	PCB 1248
	2-methylphenol	X	PCB 1254
	4-methylphenol	X	PCB 1260
	n-nitrosodiphenylamine	X	PCB 1262

Laboratory Number

Branch Lab Number

Chain of Custody and Supplemental Information

Only one chain of custody form is required per sample set or point (if all collected at the same time)

1. Collected by CAA
   Date 8/25/98 Time 10:40
   Delivered to Knoxville LAB
   Date 8-26-98 Time 10:50
2. Received by
   Date Time
   Delivered to
   Date Time
3. Received by
   Date Time
   Delivered to
   Date Time
4. Received in Lab by [illegible]
   Date 8-26-98 Time 10:50 AM
   Logged in by
   Date Time

Additional Information

1. Approximate volume of sample 16 oz.
2. Nearest town or city Knoxville
3. Others present at collection BHW
4. Number of other samples collected at same time at this point volatiles, inorganics + radiological solids
5. Field collection procedure, handling and/or preservation of this sample According to EPA procedures + protocols
6. Mode of transportation to lab in cooler on ice, in state vehicle
7. Sample sealed by
8. Date sample sealed
9. Remarks

SEP 08 1998

Project/Site No.: 47-559
Project Name: SMOKEY MOUNTAIN SMELTERS
Site Description: SMS-SS-02/TRANSFORMER STA.
Station No.: SMS-SS-02
lected: 08/25/98 10:40:00 By CA
County: 47

Lab Number: 9808248-01E
Matrix: SOIL
Received: 08/26/98 10:00:00 By FMM
Sampling Agency: HWM_11_KFO
Priority:

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
VOLATILES-TAL SEDIMENTS						8260A
ACETONE	U	PPB	25	09/03/98	HMG	
BENZENE	U	PPB	2.5	09/03/98	HMG	
BROMODICHLOROMETHANE	U	PPB	2.5	09/03/98	HMG	
BROMOFORM	U	PPB	2.5	09/03/98	HMG	
BROMOMETHANE	U	PPB	5.0	09/03/98	HMG	
2-BUTANONE (MEK)	U	PPB	25	09/03/98	HMG	
CARBON DISULFIDE	U	PPB	5.0	09/03/98	HMG	
CARBON TETRACHLORIDE	U	PPB	2.5	09/03/98	HMG	
VINYL ACETATE	U	PPB	5.0	09/03/98	HMG	
CHLOROBENZENE	U	PPB	2.5	09/03/98	HMG	
CHLOROETHANE	U	PPB	5.0	09/03/98	HMG	
CHLOROFORM	U	PPB	2.5	09/03/98	HMG	
CHLOROMETHANE	U	PPB	5.0	09/03/98	HMG	
DIBROMOCHLOROMETHANE	U	PPB	2.5	09/03/98	HMG	
1,2-DICHLOROBENZENE	U	PPB	2.5	09/03/98	HMG	
1,3-DICHLOROBENZENE	U	PPB	2.5	09/03/98	HMG	
1,4-DICHLOROBENZENE	U	PPB	2.5	09/03/98	HMG	
DICHLORODIFLUOROMETHANE	U	PPB	5.0	09/03/98	HMG	
1,1-DICHLOROETHANE	U	PPB	2.5	09/03/98	HMG	
1,2-DICHLOROETHANE	U	PPB	2.5	09/03/98	HMG	
1,1-DICHLOROETHENE	U	PPB	2.5	09/03/98	HMG	
CIS-1,2-DICHLOROETHENE	U	PPB	2.5	09/03/98	HMG	
TRANS-1,2-DICHLOROETHENE	U	PPB	2.5	09/03/98	HMG	
1,2-DICHLOROPROPANE	U	PPB	2.5	09/03/98	HMG	
CIS-1,3-DICHLOROPROPENE	U	PPB	2.5	09/03/98	HMG	
TRANS-1,3-DICHLOROPROPENE	U	PPB	2.5	09/03/98	HMG	
ETHYLBENZENE	U	PPB	2.5	09/03/98	HMG	
METHYLENE CHLORIDE	B 51	PPB	2.5	09/03/98	HMG	
4-METHYL-2-PENTANONE (MIBK)	U	PPB	25	09/03/98	HMG	
STYRENE	U	PPB	2.5	09/03/98	HMG	
2-HEXANONE	U	PPB	5.0	09/03/98	HMG	
1,1,2,2-TETRACHLOROETHANE	U	PPB	2.5	09/03/98	HMG	
TETRACHLOROETHENE	U	PPB	2.5	09/03/98	HMG	
TOLUENE	U	PPB	2.5	09/03/98	HMG	
1,1,1-TRICHLOROETHANE	U	PPB	2.5	09/03/98	HMG	
1,1,2-TRICHLOROETHANE	U	PPB	2.5	09/03/98	HMG	
TRICHLOROETHENE	U	PPB	2.5	09/03/98	HMG	
TRICHLOROFLUOROMETHANE	U	PPB	5.0	09/03/98	HMG	
VINYL CHLORIDE	U	PPB	5.0	09/03/98	HMG	
o-XYLENE	U	PPB	2.5	09/03/98	HMG	
m&p-XYLENE	U	PPB	2.5	09/03/98	HMG	

*-Water, uG/L; Sediment, uG/kG

Printed: September 4, 1998

State of Tennessee - Environmental Laboratories

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Organic Analysis

Volatiles and Petroleum Hydrocarbons

PROJECT/SITE NO. 47-559	PROJECT NAME Smokey Mountain Smelters
STATION NUMBER SMS-SS-02	COUNTY KNOX
DESCRIPTION Surface Soil at transformer station	
STREAM MILE	DEPTH MATRIX Soil
COLLECTED: DATE 08/25/98	TIME 10:40
SAMPLER'S NAME(printed) Chris Andel	
SAMPLING AGENCY TDSF	BILLING CODE 327.38.18
IF PRIORITY, DATE NEEDED 09/26/98	
SEND REPORT TO: Burl Maupin KFAC - Superfund	
CONTACT HAZARD unknown	

*	NPDES Volatiles - 624	*	TAL Volatiles - 8260A	*	TCLP Volatiles
	Bromoform	X	Chloromethane		Benzene
	Bromodichloromethane	X	Bromomethane		Carbon tetrachloride
	Carbon Tetrachloride	X	Vinyl chloride		Chlorobenzene
	Chlorobenzene	X	Chloroethane		Chloroform
	Chloroethane	X	Methylene chloride		1,2-Dichloroethane
X	2-Chloroethylvinyl ether	X	Acetone		1,1-Dichloroethane
	Chloroform	X	Carbon disulfide		Methyl ethyl ketone
	Chloromethane	X	1,1-Dichloroethene		Tetrachloroethene
X	Dibromochloromethane	X	1,1-Dichloroethane		Trichloroethene
X	1,2-Dichlorobenzene	X	Cis-1,2-dichloroethene		Vinyl chloride
X	1,3-Dichlorobenzene	X	Trans-1,2-dichloroethene	*	**BTEX - 8260A - UST**
X	1,4-Dichlorobenzene	X	1,2-Dichloroethane		Benzene
	Dichlorodifluoromethane	X	Chloroform		Toluene
	1,1-Dichloroethane	X	2-Butanone		Ethyl benzene
	1,2-Dichloroethane	X	1,1,1-Trichloroethane		o-Xylene
	1,1-Dichloroethene	X	Carbon tetrachloride		m-Xylene
	Cis-1,2-dichloroethene	X	Vinyl acetate		p-Xylene
	Trans-1,2-dichloroethene	X	Bromodichloromethane		Methyl t-butyl ether
	1,2-Dichloropropane	X	1,2-Dichloropropane		Diisopropyl ether
	Cis-1,3-dichloropropene	X	Cis-1,3-dichloropropane	*	**TPH by GC**
	Trans-1,2-dichloroethene	X	Trichloroethene		Gasoline Range Organics
	Methylene chloride	X	Dibromochloromethane		Diesel Range Organics
	1,1,2,2-Tetrachloroethane	X	1,1,2-Trichloroethane	*	**TPH by IR (418.1)**
	Tetrachloroethene	X	Benzene		418.1 - Waste Oil
	1,1,1-Trichloroethane	X	Trans-1,3-dichloropropene	*	**Other**
	1,1,2-Trichloroethane	X	Bromoform		
	Trichloroethene	X	4-Methyl-2-pentanone		
X	Trichlorofluoromethane	X	2-Hexanone		
	Vinyl chloride	X	Tetrachloroethene		
	Benzene	X	Toluene		
	Ethylbenzene	X	1,1,2,2-Tetrachloroethane		
	Toluene	X	Chlorobenzene		
	o-Xylene	X	Ethyl benzene		
	m-Xylene	X	Styrene		
	p-Xylene	X	o-Xylene		
		X	m-Xylene		
		X	p-Xylene		

Laboratory Number

Branch Lab Number

Chain of Custody and Supplemental Information

Only one chain of custody form is required per sample set or point (if all collected at the same time)

1. Collected by CAM
   Date 8/25/98 Time 10:40
   Delivered to Knoxville LAB
   Date 8-26-98 Time 10:00
2. Received by
   Date Time
   Delivered to
   Date Time
3. Received by
   Date Time
   Delivered to
   Date Time
4. Received in Lab by Frances Dixie
   Date 8-26-98 Time 10:00 AM
   Logged in by
   Date Time

Additional Information

1. Approximate volume of sample 4 oz
2. Nearest town or city Knoxville
3. Others present at collection BHW
4. Number of other samples collected at same time at this point 3 - extractables, radiologicals & inorganics
5. Field collection procedure, handling and/or preservation of this sample according to EPA procedures + protocols
6. Mode of transportation to lab in cooler on ice in state vehicle
7. Sample sealed by
8. Date sample sealed
9. Remarks

PH-3013 (rev 1/96)

RDA 1527

Project/Site No.: 47-559
Project Name: SMOKEY MOUNTAIN SMELTERS
Description: SMS-SS-02/TRANSFORMER STA.
Station No.: SMS-SS-02
Collected: 08/25/98 10:40:00 By CA
nty: 47

Lab Number: 9808248-01G
Matrix: SOIL
Received: 08/26/98 10:00:00 By FMM
Sampling Agency: HWM_11_KFO
Priority:

SEP 30 1998

TEST	RESULT	*ERROR	UNITS	ANALYZED	BY	METHOD
GAMMA RADIONUCLIDES						R.6
K-40	25.2	1.0	pCi/g dry wt	09/01/98	AK	
Pb-214	2.73	0.12	pCi/g dry wt	09/01/98	AK	
Bi-214	2.65	0.12	pCi/g dry wt	09/01/98	AK	
Pb-212	1.922	0.080	pCi/g dry wt	09/01/98	AK	
Ac-228	1.89	0.15	pCi/g dry wt	09/01/98	AK	
Tl-208	0.587	0.060	pCi/g dry wt	09/01/98	AK	
Cs-137	0.183	0.030	pCi/g dry wt	09/01/98	AK	
GROSS ALPHA & BETA						R.1.3
GROSS ALPHA	5.8	1.3	pCi/g DRY WT.	09/09/98	NLF	
GROSS BETA	54.7	2.7	pCi/g DRY WT.	09/09/98	NLF	

*--Represents +/- error value

Printed: September 10, 1998

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Radiochemical Analysis

PROJECT/SITE NO. 47-559	PROJECT NAME Smokey Mountain Smelters
STATION NUMBER SMS-SS-02	COUNTY Knox
DESCRIPTION Surface soil at transformer station	
STREAM MILE	DEPTH 0-6 inches
COLLECTED: DATE 08/25/98	TIME 10:40
PICK-UP DATE:	
CONTACT HAZARD UNKNOWN	mR/hr Reading 0.01
SAMPLER'S NAME (printed) Chris Andel	
SAMPLING AGENCY TDSF	BILLING CODE 327,38,18
IF PRIORITY, DATE NEEDED 09/26/98	
SEND REPORT TO: Burl Maupin KEAC - Superfund	

Laboratory Number

Branch Lab Number

Date Received

Time Received **By**

Sample Type

___Air ___Milk ___Swipe
___Water ___Tissue ___Liquid
___Sludge X Soil ___Solid
___Vegetation ___Sediment

Other ___

Field Comments:

Air Samples
Volume ___
Total Hours ___

___Sample Filtration
___Sample Acidification
___Send to RESL

REQUESTED ANALYSES:

X	GROSS ALPHA (TOTAL)		STRONTIUM 89
	GROSS ALPHA (SUSPENDED)		STRONTIUM 90
	GROSS ALPHA (DISSOLVED)		TRITIUM (H-3)
X	GROSS BETA (TOTAL)		THORIUM (TOTAL)
	GROSS BETA (SUSPENDED)		URANIUM (TOTAL)
	GROSS BETA (DISSOLVED)	X	GAMMA RADIONUCLIDES
			ADDITIONAL ANALYSES:

Chain of Custody and Supplemental Information

Only one chain of custody form is required per sample set or point (if all collected at the same time)

1. Collected by CAA
   Date 8/25/98 Time 10:40
   Delivered to Knoxville LAB
   Date 8-26-98 Time 10:00
2. Collected by
   Date Time
   Delivered to
   Date Time
3. Collected by
   Date Time
   Delivered to
   Date Time
4. Received in Lab by [illegible]
   Date 8-26-98 Time 10:00 am
   Logged in by
   Date Time

Additional Information

1. Approximate volume of sample 16 oz
2. Nearest town or city Knoxville
3. Others present at collection EHW
4. Number of other samples collected at same time at this point 3 - Volatiles, Semivol + inorg.
5. Field collection procedure, handling and/or preservation of this sample
   According to EPA procedures
6. Mode of transportation to lab in cooler on ice in State Vehicle
7. Sample sealed by
8. Date sample sealed
9. Remarks

Project/Site No.: 47-559
Project Name: SMOKEY MOUNTAIN SMELTERS
Description: SMS-SS-03/AT TANK SUPPORT
Station No.: SMS-SS-03
Collected: 08/25/98 12:40:00 By CA
County: 47

Lab Number: 9808248-02
Matrix: SOIL
Received: 08/26/98 10:00:00 By PMB
Sampling Agency: HWM_11_KFO
Priority:

TEST	RESULT	UNITS	LIMIT	ANALYZED	BY	METHOD
AMMONIA	157	mg/kg	10	09/15/98	SAL	A.18.2
CYANIDE	3.77	mg/kg	1.0	09/23/98	SAL	A.9
ALUMINUM	15500	mg/kg	10	10/01/98	JAH	
ANTIMONY	1.1	mg/kg	0.6	10/08/98	JAH	
ARSENIC	8.3	mg/kg	0.2	10/05/98	JAH	
BARIUM	81	mg/kg	10	10/01/98	JAH	
BERYLLIUM	1	mg/kg	1	09/30/98	JAH	
CADMIUM	2.7	mg/kg	0.5	09/11/98	JAH	
CALCIUM	22500	mg/kg	3	10/02/98	JAH	
CHROMIUM	26	mg/kg	1	09/23/98	JAH	
COBALT	10	mg/kg	1	09/15/98	JAH	
COPPER	108	mg/kg	1	09/16/98	JAH	
DIGESTION-METALS	COMPLETED	COMPLETED		09/10/98	EAM	
IRON	13900	mg/kg	5	09/16/98	JAH	
LEAD	355	mg/kg	4	09/15/98	JAH	
MAGNESIUM	2020	mg/kg	2	10/02/98	JAH	
MANGANESE	691	mg/kg	1	09/16/98	JAH	
MERCURY	0.42	mg/kg	0.1	09/11/98	ATB	EPA 245.5
METALS PREP-SOLIDS/WASTES	COMPLETED	COMPLETED		08/28/98	EAM	
NICKEL	18	mg/kg	2	09/11/98	JAH	
PERCENT SOLIDS	67.1	%		09/08/98	SDS	
POTASSIUM	2420	mg/kg	2	10/02/98	JAH	
SELENIUM	41.6	mg/kg	0.4	10/07/98	JAH	

Project/Site No.: 47-559
Project Name: SMOKEY MOUNTAIN SMELTERS
Description: SMS-SS-03/AT TANK SUPPORT
Station No.: SMS-SS-03
Collected: 08/25/98 12:40:00 By CA
County: 47

Lab Number: 9808248-02
Matrix: SOIL
Received: 08/26/98 10:00:00 By PMB
Sampling Agency: HWM_11_KFO
Priority:

TEST	RESULT	UNITS	LIMIT	ANALYZED	BY	METHOD
SILVER	U	mg/kg	1	09/15/98	JAH	
SODIUM	700	mg/kg	10	10/02/98	JAH	
THALLIUM	U	mg/kg	5	09/15/98	JAH	
VANADIUM	25	mg/kg	20	10/01/98	JAH	
ZINC	283	mg/kg	0.5	09/15/98	JAH	

State of Tennessee - Environmental Laboratories
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Inorganic Analysis

PROJECT/SITE NO. 47-559	PROJECT NAME Smokey Mountain Smelters
STATION NUMBER SMS-SS-03	COUNTY Knox
DESCRIPTION at tank support	
STREAM MILE	DEPTH / MATRIX soil
COLLECTED: DATE August 25, 1998	TIME 12:40
SAMPLER'S NAME(printed) Chris A. Andel	
SAMPLING AGENCY Division of Superfund	BILLING CODE 327.38-11
IF PRIORITY, DATE NEEDED September 25, 1998	
SEND REPORT TO: Knoxville Environmental Assisstance Center	
Burl H. Maupin	
CONTACT HAZARD metals, radiochemical, unknown	

*	Env. Microbiology	*	General Inorganics		Gen. Inorganics (con't)
	coliform, fecal*		acidity as $CaCO_3$*		oil and grease
	coliform, total*		alkalinity as $CaCO_3$*		orthophosphate, total*
	strep, fecal*		alkalinity, phen. as $CaCO_3$*		oxygen, dissolved*
			BOD, 5-day*		pH
			CBOD, 5-day*		phenols, total
			boron		phosphate, total
*	Ambient Parameters		chloride*		residue, dissolved*
	COD*		chlorine, residual*		residue, settleable*
	coliform, fecal		chromium, hexavalent		residue, suspended*
	conductivity*		COD*		residue, total*
	hardness, total as $CaCO_3$*		color, apparent*		silica*
	nitrogen, ammonia		color, true*		sulfate*
	nitrogen, NO_3 & NO_2		conductivity*		sulfide, total*
	nitrogen, total Kjeldahl	x	cyanide		TOC*
	phosphate, total		flash point*		turbidity*
	pH		fluoride*		percent solids
	residue, dissolved*		hardness, Ca as $CaCO_3$*	*	Other
	residue, suspended*		hardness, total as $CaCO_3$*		
	arsenic, As		hydrocarbons, total		
	cadmium, Cd		MBAS*		
	chromium, Cr	x	nitrogen, ammonia		
	copper, Cu		nitrogen, nitrate*		
	lead, Pb		nitrogen, nitrite*		
	mercury, Hg		nitrogen, NO_3 & NO_2		
	nickel, Ni		nitrogen, total Kjeldahl		
	zinc, Zn		nitrogen, total organic		

*	Metals	*	TCLP
x	aluminum, Al		arsenic, As
x	antimony, Sb		barium, Ba
x	arsenic, As		cadmium, Cd
x	barium, Ba		chromium, Cr
x	beryllium, Be		lead, Pb
x	cadmium, Cd		mercury, Hg
x	calcium, Ca		nickel, Ni
x	chromium, Cr		selenium, Se
x	cobalt, Co		silver, Ag
x	copper, Cu		
x	iron, Fe		
x	lead, Pb		
x	magnesium, Mg		
x	manganese, Mn		
x	mercury, Hg		
x	nickel, Ni		
x	potassium, K		
x	selenium, Se		
x	silver, Ag		
x	sodium, Na		
x	thallium, Tl		
x	vanadium, V		
x	zinc, Zn		

denotes analyses performed only on water

FIELD DETERMINATIONS	Temperature
pH	Chlorine, residual
Conductivity	Other
Dissolved Oxygen	

Laboratory Number

Branch Lab Number

Chain of Custody and Supplemental Information

Only one chain of custody form is required per sample set or point (if all collected at the same time)

1. Collected by Chris A. Andel
   Date August 25, 1998 Time 12:40
   Delivered to Knoxville Basin Laboratory
   Date August 26, 1998 Time 15:50
2. Received by
   Date Time
   Delivered to
   Date Time
3. Received by
   Date Time
   Delivered to
   Date Time
4. Received in Lab by [signature]
   Date 8/26/98 Time 1000
   Logged in by
   Date Time

Additional Information

1. Approximate volume of sample 16 oz.
2. Nearest town or city Knoxville
3. Others present at collection Beth H. Walker
4. Number of other samples collected at same time at this point 3
5. Field collection procedure, handling and/or preservation of this sample
   According to standard operating procedure
6. Mode of transportation to lab State vehicle; on ice
7. Sample sealed by
8. Date sample sealed
9. Remarks

PH-3011 (rev 1/96)

RDA 1527

Project/Site No.: 47-559
Project Name: SMOKEY MOUNTAIN SMELTERS
Description: SMS-SS-03/AT TANK SUPPORT
Station No.: SMS-SS-03
Collected: 08/25/98 12:40:00 By CA
ınty: 47

Lab Number: 9808248-02F
Matrix: SOIL
Received: 08/26/98 10:00:00 By PMB
Sampling Agency: HWM_11_KFO
Priority:

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
B/N/A EXTR+PESTS,PCBS-SOIL						MS+ECD
BUTYL BENZYL PHTHALATE	U	PPB	250	10/01/98	MAC	
BIS(2-ETHYLHEXYL)PHTHALATE	B 134	PPB	-	10/01/98	MAC	
DI-n-BUTYL PHTHALATE	U	PPB	250	10/01/98	MAC	
DI-n-OCTYL PHTHALATE	U	PPB	510	10/01/98	MAC	
DIETHYL PHTHALATE	B 285	PPB	-	10/01/98	MAC	
DIMETHYL PHTHALATE	U	PPB	130	10/01/98	MAC	
n-NITROSODIMETHYLAMINE	U	PPB	510	10/01/98	MAC	
n-NITROSODIPHENYLAMINE	U	PPB	250	10/01/98	MAC	
n-NITROSO-di-n-PROPYLAMINE	U	PPB	250	10/01/98	MAC	
ISOPHORONE	U	PPB	130	10/01/98	MAC	
NITROBENZENE	U	PPB	250	10/01/98	MAC	
2,4-DINITROTOLUENE	U	PPB	510	10/01/98	MAC	
2,6-DINITROTOLUENE	U	PPB	510	10/01/98	MAC	
ACENAPTHENE	U	PPB	130	10/01/98	MAC	
ACENAPHTHYLENE	U	PPB	130	10/01/98	MAC	
ANTHRACENE	U	PPB	130	10/01/98	MAC	
BENZO(a)ANTHRACENE	J 58.1	PPB	130	10/01/98	MAC	
BENZO(a)PYRENE	J 75.8	PPB	130	10/01/98	MAC	
BENZO(b)FLUORANTHENE	197	PPB	-	10/01/98	MAC	
BENZO(ghi)PERYLENE	U	PPB	510	10/01/98	MAC	
BENZO(k)FLUORANTHENE	U	PPB	130	10/01/98	MAC	
DIBENZO(a,h)ANTHRACENE	U	PPB	510	10/01/98	MAC	
FLUORANTHENE	177	PPB	-	10/01/98	MAC	
FLUORENE	U	PPB	130	10/01/98	MAC	
INDENO(1,2,3-cd)PYRENE	U	PPB	510	10/01/98	MAC	
NAPHTHALENE	U	PPB	130	10/01/98	MAC	
PHENANTHRENE	U	PPB	130	10/01/98	MAC	
PYRENE	J 96.0	PPB	130	10/01/98	MAC	
CHRYSENE	J 124	PPB	130	10/01/98	MAC	
BIS(2-CHLOROETHYL)ETHER	U	PPB	250	10/01/98	MAC	
BIS(2-CHLOROETHOXY)METHANE	U	PPB	130	10/01/98	MAC	
BIS(2-CHLOROISOPROPYL)ETHER	U	PPB	510	10/01/98	MAC	
4-BROMOPHENYLPHENYL ETHER	U	PPB	510	10/01/98	MAC	
4-CHLOROPHENYLPHENYL ETHER	U	PPB	250	10/01/98	MAC	
HEXACHLOROCYCLOPENTADIENE	U	PPB	1300	10/01/98	MAC	
HEXACHLOROBUTADIENE	U	PPB	250	10/01/98	MAC	
HEXACHLOROBENZENE	U	PPB	250	10/01/98	MAC	
HEXACHLOROETHANE	U	PPB	250	10/01/98	MAC	
1,2,4-TRICHLOROBENZENE	U	PPB	250	10/01/98	MAC	
2-CHLORONAPHTHALENE	U	PPB	130	10/01/98	MAC	
4-CHLORO-3-METHYLPHENOL	U	PPB	250	10/01/98	MAC	
2-CHLOROPHENOL	U	PPB	130	10/01/98	MAC	
2,4-DICHLOROPHENOL	U	PPB	250	10/01/98	MAC	
2,4-DIMETHYLPHENOL	U	PPB	250	10/01/98	MAC	
2,4-DINITROPHENOL	U	PPB	2500	10/01/98	MAC	
2-METHYL-4,6-DINITROPHENOL	U	PPB	1300	10/01/98	MAC	
2-NITROPHENOL	U	PPB	510	10/01/98	MAC	
4-NITROPHENOL	U	PPB	1300	10/01/98	MAC	
PENTACHLOROPHENOL	U	PPB	510	10/01/98	MAC	
PHENOL	U	PPB	130	10/01/98	MAC	
2,4,6-TRICHLOROPHENOL	U	PPB	250	10/01/98	MAC	
2,4,5-TRICHLOROPHENOL	U	PPB	250	10/01/98	MAC	
O-CRESOL	U	PPB	250	10/01/98	MAC	
M- & P-CRESOL	U	PPB	130	10/01/98	MAC	
2-METHYLNAPHTHALENE	U	PPB	130	10/01/98	MAC	
BENZOIC ACID	U	PPB	510	10/01/98	MAC	
BENZYL ALCOHOL	U	PPB	510	10/01/98	MAC	
4-CHLOROANILINE	U	PPB	250	10/01/98	MAC	
DIBENZOFURAN	U	PPB	130	10/01/98	MAC	
3,3-DICHLOROBENZIDINE	U	PPB	510	10/01/98	MAC	
2-NITROANILINE	U	PPB	510	10/01/98	MAC	
3-NITROANILINE	U	PPB	510	10/01/98	MAC	
4-NITROANILINE	U	PPB	1300	10/01/98	MAC	
HEXACHLOROBENZENE	U	PPB	2.8	10/01/98	MAC	
ALDRIN	U	PPB	3.8	10/01/98	MAC	
alpha-BHC	U	PPB	6.8	10/01/98	MAC	
eta-BHC	U	PPB	9.8	10/01/98	MAC	
lta-BHC	U	PPB	9.8	10/01/98	MAC	
gamma-BHC (LINDANE)	U	PPB	3.8	10/01/98	MAC	
alpha-CHLORDANE	6.62	PPB	-	10/01/98	MAC	
gamma-CHLORDANE	16.7	PPB	-	10/01/98	MAC	
TECHNICAL CHLORDANE	U	PPB	57	10/01/98	MAC	
p,p-DDD	U	PPB	7.0	10/01/98	MAC	

Project/Site No.: 47-559
Project Name: SMOKEY MOUNTAIN SMELTERS
Description: SMS-SS-03/AT TANK SUPPORT
Station No.: SMS-SS-03
Collected: 08/25/98 12:40:00 By CA
ity: 47

Lab Number: 9808248-02F
Matrix: SOIL
Received: 08/26/98 10:00:00 By PMB
Sampling Agency: HWM_11_KFO
Priority:

OCT 1998

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
B/N/A EXTR+PESTS,PCBS-SOIL						MS+ECD
p,p-DDE	U	PPB	6.2	10/01/98	MAC	
p,p-DDT	14.2	PPB	-	10/01/98	MAC	
DIELDRIN	20.2	PPB	-	10/01/98	MAC	
ENDOSULFAN I	U	PPB	12	10/01/98	MAC	
ENDOSULFAN II	U	PPB	7.1	10/01/98	MAC	
ENDOSULFAN SULFATE	U	PPB	7.1	10/01/98	MAC	
ENDRIN	U	PPB	7.1	10/01/98	MAC	
ENDRIN ALDEHYDE	U	PPB	5.9	10/01/98	MAC	
ENDRIN KETONE	U	PPB	7.2	10/01/98	MAC	
HEPTACHLOR	4.05	PPB	-	10/01/98	MAC	
HEPTACHLOR EPOXIDE	12.0	PPB	-	10/01/98	MAC	
TOXAPHENE	U	PPB	200	10/01/98	MAC	
METHOXYCHLOR	U	PPB	27	10/01/98	MAC	
PCB 1016/1242	U	PPB	440	10/01/98	MAC	
PCB 1221	U	PPB	480	10/01/98	MAC	
PCB 1232	U	PPB	550	10/01/98	MAC	
PCB 1248	U	PPB	370	10/01/98	MAC	
PCB 1254	U	PPB	180	10/01/98	MAC	
PCB 1260	U	PPB	160	10/01/98	MAC	
PCB 1262	U	PPB	180	10/01/98	MAC	

*-Water, uG/L; Sediment, uG/kG

Printed: October 5, 1998

State of Tennessee - Environmental Laboratories
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PROJECT/SITE NO.	47-55P
PROJECT NAME	Smokey Mtn Smelters
STATION NUMBER	SMS-SS-03
COUNTY	Knox
DESCRIPTION	at tank support
STREAM MILE / DEPTH	
MATRIX	soil
COLLECTED: DATE	8-25-98
TIME	12:45p
SAMPLER'S NAME(printed)	Chris A. Arnold
SAMPLING AGENCY	DSF
BILLING CODE	327.58-11
IF PRIORITY, DATE NEEDED	9-25-98
SEND REPORT TO:	KEAC BUDI MAUPIN
CONTACT HAZARD	metals, radiochemical, unknown

*	NPDES Extractables	*	NPDES Extractables(con't)	*	TAL Semivolatiles
	butylbenzylphthalate	X	2-chlorophenol	X	dimethylphthalate
	bis(2-ethylhexyl)phthalate		2,4-dichlorophenol	X	4,6-dinitro-2-methylphenol
	di-n-butylphthalate		2,4-dimethylphenol	X	2,4-dinitrophenol
	di-n-octylphthalate		2,4-dinitrophenol	X	2,4-dinitrotoluene
	diethylphthalate		4,6-dinitro-o-cresol	X	2,6-dinitrotoluene
	dimethylphthalate		2-nitrophenol	X	fluoranthene
X	n-nitrosodimethylamine		4-nitrophenol	X	fluorene
	n-nitrosodiphenylamine		pentachlorophenol	X	hexachlorobenzene
	n-nitrosodi-n-propylamine		phenol	X	hexachlorobutadiene
	isophorone		2,4,6-trichlorophenol	X	hexachlorocyclopentadiene
	nitrobenzene	*	TAL Semivolatiles	X	hexachloroethane
	2,4-dinitrotoluene	X	acenaphthene	X	indeno(1,2,3-cd)pyrene
	acenaphthene	X	acenaphthylene	X	isophorone
	acenaphthylene	X	anthracene	X	2-methylnaphthalene
	anthracene	X	benzo(a)anthracene	X	2-methylphenol
	benzo(a)anthracene	X	benzo(a)pyrene	X	4-methylphenol
	benzo(a)pyrene	X	benzo(b)fluoranthene	X	n-nitrosodiphenylamine
	benzo(b)fluoranthene	X	benzo(g,h,i)perylene	X	n-nitroso-n-dipropylamine
	benzo(g,h,i)perylene	X	benzo(k)fluoranthene	X	naphthalene
	benzo(k)fluoranthene	X	benzoic acid	X	2-nitroaniline
	chrysene	X	benzyl alcohol	X	3-nitroaniline
	dibenzo(a,h)anthracene	X	bis(2-chloroethoxy)methane	X	4-nitroaniline
	fluoranthene	X	bis(2-chloroethyl) ether	X	nitrobenzene
	fluorene	X	bis(2-chloroisopropyl)ether	X	2-nitrophenol
	indeno(1,2,3-c,d)pyrene	X	bis(2-ethylhexyl)phthalate	X	4-nitrophenol
	naphthalene	X	4-bromophenylphenylether	X	pentachlorophenol
	phenanthrene	X	butylbenzylphthalate	X	phenanthrene
	pyrene	X	4-chloroaniline	X	phenol
	bis(2-chloroethyl)ether	X	4-chloro-3-methyl phenol	X	pyrene
	bis(2-chloroethoxy)methane	X	2-chloronaphthalene	X	1,2,4-trichlorobenzene
	bis(2-chloroisopropyl)ether	X	4-chlorophenylphenylether	X	2,4,5-trichlorophenol
	4-bromophenylphenylether	X	chrysene	X	2,4,6-trichlorophenol
	4-chlorophenylphenylether	X	di-n-butylphthalate	*	Nitrobodies
	hexachlorocyclopentadiene	X	di-n-octylphthalate		RDX
	hexachlorobutadiene	X	dibenzo(a,h)anthracene		2,4,6-TNT
	hexachlorobenzene	X	dibenzofuran		2,4-dinitrotoluene
	hexachloroethane	X	3,3'-dichlorobenzidine		2,6-dinitrotoluene
	1,2,4-trichlorobenzene	X	2,4-dichlorophenol		nitrobenzene
	2-chloronaphthalene	X	diethylphthalate		1,3,5-TNB
	4-chloro-3-methyl phenol	X	2,4-dimethylphenol		

*	TCLP Semivolatiles	*	Pesticides/PCBs
	chlordane	X	aldrin
	o-cresol	X	alpha-BHC
	m-cresol	X	beta-BHC
	p-cresol	X	delta-BHC
	cresol	X	gamma-BHC (lindane)
	2,4-D	X	technical chlordane
	2,4-dinitrotoluene	X	alpha-chlordane
	endrin	X	gamma-chlordane
	heptachlor	X	4,4'-DDD
	heptachlor epoxide	X	4,4'-DDE
	hexachlorobenzene	X	4,4'-DDT
	hexachlorobutadiene	X	dieldrin
	hexachloroethane	X	endosulfan I
	lindane	X	endosulfan II
	methoxychlor	X	endosulfan sulfate
	nitrobenzene	X	endrin
	pentachlorophenol	X	endrin aldehyde
	pyridine	X	endrin ketone
	toxaphene	X	heptachlor
	2,4,5-trichlorophenol	X	heptachlor epoxide
	2,4,6-trichlorophenol	X	toxaphene
	2,4,5-TP (Silvex)	X	methoxychlor
		X	PCB 1016/1242
		X	PCB 1221
		X	PCB 1232
		X	PCB 1248
		X	PCB 1254
		X	PCB 1260
		X	PCB 1262

Organic Analysis
Base/Neutral/Acid Extractables

Laboratory Number

Branch Lab Number

Chain of Custody and Supplemental Information

Only one chain of custody form is required per sample set or point (if all collected at the same time)

1. Collected by CAA
   Date 8-25-98 Time 12:40p
   Delivered to K.B.I.
   Date 8-26-98 Time 10:00
2. Received by
   Date Time
   Delivered to
   Date Time
3. Received by
   Date Time
   Delivered to
   Date Time
4. Received in Lab by P. Chapman
   Date 8/26/98 Time 1000
   Logged in by
   Date Time

Additional Information

1. Approximate volume of sample 16 oz
2. Nearest town or city Knoxville
3. Others present at collection Beth Walker
4. Number of other samples collected at same time at this point 3
5. Field collection procedure, handling and/or preservation of this sample according to EPA procedures and protocol
6. Mode of transportation to lab in state vehicle, in coolers, on ice
7. Sample sealed by
8. Date sample sealed
9. Remarks

PH-3014 (rev 1/96)

RDA 1527

SEP 08 1998

Project/Site No.: 47-559
Project Name: SMOKEY MOUNTAIN SMELTERS
Site Description: SMS-SS-03/AT TANK SUPPORT
Station No.: SMS-SS-03
lected: 08/25/98 12:40:00 By CA
unty: 47

Lab Number: 9808248-02E
Matrix: SOIL
Received: 08/26/98 10:00:00 By PMB
Sampling Agency: HWM_11_KFO
Priority:

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
VOLATILES-TAL SEDIMENTS						8260A
ACETONE	J 20	PPB	25	09/03/98	HMG	
BENZENE	U	PPB	2.5	09/03/98	HMG	
BROMODICHLOROMETHANE	U	PPB	2.5	09/03/98	HMG	
BROMOFORM	U	PPB	2.5	09/03/98	HMG	
BROMOMETHANE	U	PPB	5.0	09/03/98	HMG	
2-BUTANONE (MEK)	U	PPB	25	09/03/98	HMG	
CARBON DISULFIDE	U	PPB	5.0	09/03/98	HMG	
CARBON TETRACHLORIDE	U	PPB	2.5	09/03/98	HMG	
VINYL ACETATE	U	PPB	5.0	09/03/98	HMG	
CHLOROBENZENE	U	PPB	2.5	09/03/98	HMG	
CHLOROETHANE	U	PPB	5.0	09/03/98	HMG	
CHLOROFORM	U	PPB	2.5	09/03/98	HMG	
CHLOROMETHANE	U	PPB	5.0	09/03/98	HMG	
DIBROMOCHLOROMETHANE	U	PPB	2.5	09/03/98	HMG	
1,2-DICHLOROBENZENE	U	PPB	2.5	09/03/98	HMG	
1,3-DICHLOROBENZENE	U	PPB	2.5	09/03/98	HMG	
1,4-DICHLOROBENZENE	U	PPB	2.5	09/03/98	HMG	
DICHLORODIFLUOROMETHANE	U	PPB	5.0	09/03/98	HMG	
1,1-DICHLOROETHANE	U	PPB	2.5	09/03/98	HMG	
1,2-DICHLOROETHANE	U	PPB	2.5	09/03/98	HMG	
1,1-DICHLOROETHENE	U	PPB	2.5	09/03/98	HMG	
CIS-1,2-DICHLOROETHENE	U	PPB	2.5	09/03/98	HMG	
TRANS-1,2-DICHLOROETHENE	U	PPB	2.5	09/03/98	HMG	
1,2-DICHLOROPROPANE	U	PPB	2.5	09/03/98	HMG	
CIS-1,3-DICHLOROPROPENE	U	PPB	2.5	09/03/98	HMG	
TRANS-1,3-DICHLOROPROPENE	U	PPB	2.5	09/03/98	HMG	
ETHYLBENZENE	U	PPB	2.5	09/03/98	HMG	
METHYLENE CHLORIDE	B 23	PPB	2.5	09/03/98	HMG	
4-METHYL-2-PENTANONE (MIBK)	U	PPB	25	09/03/98	HMG	
STYRENE	U	PPB	2.5	09/03/98	HMG	
2-HEXANONE	U	PPB	5.0	09/03/98	HMG	
1,1,2,2-TETRACHLOROETHANE	U	PPB	2.5	09/03/98	HMG	
TETRACHLOROETHENE	U	PPB	2.5	09/03/98	HMG	
TOLUENE	2.1	PPB	2.5	09/03/98	HMG	
1,1,1-TRICHLOROETHANE	U	PPB	2.5	09/03/98	HMG	
1,1,2-TRICHLOROETHANE	U	PPB	2.5	09/03/98	HMG	
TRICHLOROETHENE	U	PPB	2.5	09/03/98	HMG	
TRICHLOROFLUOROMETHANE	U	PPB	5.0	09/03/98	HMG	
VINYL CHLORIDE	U	PPB	5.0	09/03/98	HMG	
o-XYLENE	U	PPB	2.5	09/03/98	HMG	
m&p-XYLENE	U	PPB	2.5	09/03/98	HMG	

*-Water, uG/L; Sediment, uG/kG

Printed: September 4, 1998

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Organic Analysis

Volatiles and Petroleum Hydrocarbons

PROJECT/SITE NO.	47-559	PROJECT NAME	BUCKEYE MOUNTAIN SMELTERS
STATION NUMBER	SMS-SS-03	COUNTY	KNOX
DESCRIPTION	AT TANK SUPPORT		
STREAM MILE		DEPTH	MATRIX Soil
COLLECTED: DATE	AUGUST 25, 1998	TIME	12:40
SAMPLER'S NAME(printed)	CHRIS A. ANDEL		
SAMPLING AGENCY	DIVISION OF SUPERFUND	BILLING CODE	327.38-11
IF PRIORITY, DATE NEEDED	SEPTEMBER 25		
SEND REPORT TO:	KNOXVILLE ENVIRONMENTAL ASSISSTANCE CENTER BURL H. MAUPIN		
CONTACT HAZARD	METALS, RADIOCHEMICAL, UNKNOWN		

*	NPDES Volatiles - 624	*	TAL Volatiles - 8260A	*	TCLP Volatiles
	Bromoform		Chloromethane		Benzene
	Bromodichloromethane		Bromomethane		Carbon tetrachloride
	Carbon Tetrachloride		Vinyl chloride		Chlorobenzene
	Chlorobenzene		Chloroethane		Chloroform
	Chloroethane		Methylene chloride		1,2-Dichloroethane
	2-Chloroethylvinyl ether		Acetone		1,1-Dichloroethane
	Chloroform		Carbon disulfide		Methyl ethyl ketone
	Chloromethane		1,1-Dichloroethene		Tetrachloroethene
	Dibromochloromethane		1,1-Dichloroethane		Trichloroethene
	1,2-Dichlorobenzene		Cis-1,2-dichloroethene		Vinyl chloride
	1,3-Dichlorobenzene		Trans-1,2-dichloroethene	*	BTEX - 8260A - UST
	1,4-Dichlorobenzene		1,2-Dichloroethane		Benzene
	Dichlorodifluoromethane		Chloroform		Toluene
	1,1-Dichloroethane		2-Butanone		Ethyl benzene
	1,2-Dichloroethane		1,1,1-Trichloroethane		o-Xylene
	1,1-Dichloroethene		Carbon tetrachloride		m-Xylene
	Cis-1,2-dichloroethene		Vinyl acetate		p-Xylene
	Trans-1,2-dichloroethene		Bromodichloromethane		Methyl t-butyl ether
	1,2-Dichloropropane		1,2-Dichloropropane		Diisopropyl ether
	Cis-1,3-dichloropropene		Cis-1,3-dichloropropane	*	TPH by GC
	Trans-1,2-dichloroethene		Trichloroethene		Gasoline Range Organics
	Methylene chloride		Dibromochloromethane		Diesel Range Organics
	1,1,2,2-Tetrachloroethane		1,1,2-Trichloroethane	*	TPH by IR (418.1)
	Tetrachloroethene		Benzene		418.1 - Waste Oil
	1,1,1-Trichloroethane		Trans-1,3-dichloropropene	*	Other
	1,1,2-Trichloroethane		Bromoform		
	Trichloroethene		4-Methyl-2-pentanone		
	Trichlorofluoromethane		2-Hexanone		
	Vinyl chloride		Tetrachloroethene		
	Benzene		Toluene		
	Ethylbenzene		1,1,2,2-Tetrachloroethane		
	Toluene		Chlorobenzene		
	o-Xylene		Ethyl benzene		
	m-Xylene		Styrene		
	p-Xylene		o-Xylene		
			m-Xylene		
			p-Xylene		

Laboratory Number

Branch Lab Number

Chain of Custody and Supplemental Information

Only one chain of custody form is required per sample set or point (if all collected at the same time)

1. Collected by CHRIS A. ANDEL
   Date AUGUST 25, 1998 Time 12:40
   Delivered to Knoxville Basin Laboratory
   Date 8-26-98 Time 10:00
2. Received by
   Date Time
   Delivered to
   Date Time
3. Received by
   Date Time
   Delivered to
   Date Time
4. Received in Lab by J. Baker
   Date 8/26/98 Time 1000
   Logged in by
   Date Time

Additional Information

1. Approximate volume of sample 4 oz.
2. Nearest town or city KNOXVILLE
3. Others present at collection BETH WALKER
4. Number of other samples collected at same time at this point *One other sample each for INORGANICS, RADIOCHEMICAL, AND EXTRACTABLE ORGANICS were collected for a total of three other samples.*
5. Field collection procedure, handling and/or preservation of this sample *according to EPA procedures and protocol*
6. Mode of transportation to lab *in State vehicle, in cooler, and on ice*
7. Sample sealed by
8. Date sample sealed
9. Remarks

SEP 30 1998

Project/Site No.: 47-559
Project Name: SMOKEY MOUNTAIN SMELTERS
Description: SMS-SS-03/AT TANK SUPPORT
Station No.: SMS-SS-03
Collected: 08/25/98 12:40:00 By CA
nty: 47

Lab Number: 9808248-02G
Matrix: SOIL
Received: 08/26/98 10:00:00 By PMB
Sampling Agency: HWM_11_KFO
Priority:

TEST	RESULT	*ERROR	UNITS	ANALYZED	BY	METHOD
GAMMA RADIONUCLIDES						R.6
K-40	17.7	1.1	pCi/g dry wt	09/01/98	AK	
Pb-214	2.89	0.15	pCi/g dry wt	09/01/98	AK	
Bi-214	2.40	0.14	pCi/g dry wt	09/01/98	AK	
Pb-212	1.836	0.090	pCi/g dry wt	09/01/98	AK	
Ac-228	2.31	0.21	pCi/g dry wt	09/01/98	AK	
Tl-208	0.677	0.070	pCi/g dry wt	09/01/98	AK	
Bi-212	1.58	0.29	pCi/g dry wt	09/01/98	AK	
Cs-137	0.423	0.050	pCi/g dry wt	09/01/98	AK	
GROSS ALPHA & BETA						R.1.3
GROSS ALPHA	3.34	0.97	pCi/g DRY WT.	09/09/98	NLF	
GROSS BETA	37.5	2.2	pCi/g DRY WT.	09/09/98	NLF	

*--Represents +/- error value

Printed: September 10, 1998

State of Tennessee - Environmental Laboratories

Radiochemical Analysis

PLEASE PRINT LEGIBLY

PROJECT/SITE NO. 47-559	PROJECT NAME Smokey Mountain Smelters
STATION NUMBER SMS-SS-03	COUNTY Knox
DESCRIPTION Surface soil near tank	
STREAM MILE	DEPTH 0-6 inches
COLLECTED: DATE 08/25/98	TIME 12:40
PICK-UP DATE:	
CONTACT HAZARD UNKNOWN	mR/hr Reading 0.01
SAMPLER'S NAME (printed) Chris ANDEL	
SAMPLING AGENCY TDSF	BILLING CODE 327.38.10
IF PRIORITY, DATE NEEDED 09/26/98	
SEND REPORT TO: Burl Maupin	
KEAC - Superfund	

Sample Type

___Air ___Milk ___Swipe
___Water ___Tissue ___Liquid
___Sludge X Soil ___Solid
___Vegetation ___Sediment

Other_____

Field Comments:

Air Samples
Volume _____
Total Hours _____

___Sample Filtration
___Sample Acidification
___Send to RESL

REQUESTED ANALYSES:

X	GROSS ALPHA (TOTAL)		STRONTIUM 89
	GROSS ALPHA (SUSPENDED)		STRONTIUM 90
	GROSS ALPHA (DISSOLVED)		TRITIUM (H-3)
X	GROSS BETA (TOTAL)		THORIUM (TOTAL)
	GROSS BETA (SUSPENDED)		URANIUM (TOTAL)
	GROSS BETA (DISSOLVED)	X	GAMMA RADIONUCLIDES
			ADDITIONAL ANALYSES:

Laboratory Number

Date Received

Time Received **By**

Chain of Custody and Supplemental Information

Only one chain of custody form is required per sample set or point (if all collected at the same time)

1. Collected by CAA
   Date 08/25/98 Time 12:40
   Delivered to Knoxville LAB
   Date 08/26/98 Time 10:05
2. Collected by
   Date Time
   Delivered to
   Date Time
3. Collected by
   Date Time
   Delivered to
   Date Time
4. Received in Lab by [illegible]
   Date 8/26/98 Time 1000
   Logged in by
   Date Time

Additional Information

1. Approximate volume of sample 16 oz
2. Nearest town or city Knoxville
3. Others present at collection BHW
4. Number of other samples collected at same time at this point 3 - vol, ext + inorganics
5. Field collection procedure, handling and/or preservation of this sample According to EPA procedures
6. Mode of transportation to lab in cooler on ice, in State vehicle
7. Sample sealed by
8. Date sample sealed
9. Remarks

Project/Site No.: 47-559
Project Name: SMOKEY MOUNTAIN SMELTERS
Description: SMS-SS-04/DRUM STOR./DISP.
Station No.: SMS-SS-04
Collected: 08/25/98 15:30:00 By CA
County: 47

Lab Number: 9808248-03
Matrix: SOIL
Received: 08/26/98 10:00:00 By FMM
Sampling Agency: HWM_11_KFO
Priority:

TEST	RESULT	UNITS	LIMIT	ANALYZED	BY	METHOD
AMMONIA	14.8	mg/kg	10	09/15/98	SAL	A.18.2
CYANIDE	U	mg/kg	1.0	09/23/98	SAL	A.9
ALUMINUM	74100	mg/kg	10	10/01/98	JAH	
ANTIMONY	4.4	mg/kg	0.6	10/09/98	JAH	
ARSENIC	13.2	mg/kg	0.2	10/05/98	JAH	
BARIUM	59	mg/kg	10	10/01/98	JAH	
BERYLLIUM	2	mg/kg	1	09/30/98	JAH	
CADMIUM	U	mg/kg	0.5	09/11/98	JAH	
CALCIUM	6430	mg/kg	3	10/02/98	JAH	
CHROMIUM	31	mg/kg	1	09/23/98	JAH	
COBALT	11	mg/kg	1	09/15/98	JAH	
COPPER	1070	mg/kg	1	09/16/98	JAH	
DIGESTION-METALS	COMPLETED	COMPLETED		09/10/98	EAM	
IRON	18300	mg/kg	5	09/16/98	JAH	
LEAD	61	mg/kg	4	09/15/98	JAH	
MAGNESIUM	4430	mg/kg	2	10/02/98	JAH	
MANGANESE	548	mg/kg	1	09/16/98	JAH	
MERCURY	U	mg/kg	0.1	09/11/98	ATB	EPA 245.5
METALS PREP-SOLIDS/WASTES	COMPLETED	COMPLETED		08/28/98	EAM	
NICKEL	277	mg/kg	2	09/11/98	JAH	
PERCENT SOLIDS	75.2	%		09/08/98	SDS	
POTASSIUM	556	mg/kg	2	10/02/98	JAH	
SELENIUM	1.8	mg/kg	0.4	10/08/98	JAH	

Project/Site No.: 47-559
Project Name: SMOKEY MOUNTAIN SMELTERS
Description: SMS-SS-04/DRUM STOR./DISP.
Station No.: SMS-SS-04
Collected: 08/25/98 15:30:00 By CA
County: 47

Lab Number: 9808248-03
Matrix: SOIL
Received: 08/26/98 10:00:00 By FMM
Sampling Agency: HWM_11_KFO
Priority:

TEST	RESULT	UNITS	LIMIT	ANALYZED	BY	METHOD
SILVER	U	mg/kg	1	09/15/98	JAH	
SODIUM	11200	mg/kg	10	10/02/98	JAH	
THALLIUM	U	mg/kg	5	09/15/98	JAH	
VANADIUM	44	mg/kg	20	10/01/98	JAH	
ZINC	776	mg/kg	0.5	09/15/98	JAH	

State of Tennessee - Environmental Laboratories
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Inorganic Analysis

Z

PROJECT/SITE NO. 47559	PROJECT NAME Smoky Mtn Smelters
STATION NUMBER SMS-55-04	COUNTY Knox
DESCRIPTION Alum storage area	
STREAM MILE	DEPTH MATRIX
COLLECTED: DATE August 25 1998	TIME 15:30
SAMPLER'S NAME(printed) Chris A. Ardel	
SAMPLING AGENCY DSF	BILLING CODE 3273811
IF PRIORITY, DATE NEEDED 9-25-98	
SEND REPORT TO: KEAC	
CONTACT HAZARD metals, radiochemical, unknown	

*	Metals
X	aluminum, Al
X	antimony, Sb
X	arsenic, As
X	barium, Ba
X	beryllium, Be
X	cadmium, Cd
X	calcium, Ca
X	chromium, Cr
X	cobalt, Co
X	copper, Cu
X	iron, Fe
X	lead, Pb
X	magnesium, Mg
X	manganese, Mn
X	mercury, Hg
X	nickel, Ni
X	potassium, K
X	selenium, Se
X	silver, Ag
X	sodium, Na
X	thallium, Tl
X	vanadium, V
X	zinc, Zn

*	Env. Microbiology	*	General Inorganics		Gen. Inorganics (con't)
	coliform, fecal*		acidity as $CaCO_3$*		oil and grease
	coliform, total*		alkalinity as $CaCO_3$*		orthophosphate, total*
	strep, fecal*		alkalinity, phen. as $CaCO_3$*		oxygen, dissolved*
			BOD, 5-day*		pH
			CBOD, 5-day*		phenols, total
			boron		phosphate, total
*	**Ambient Parameters**		chloride*		residue, dissolved*
	COD*		chlorine, residual*		residue, settleable*
	coliform, fecal		chromium, hexavalent		residue, suspended*
	conductivity*		COD*		residue, total*
	hardness, total as $CaCO_3$*		color, apparent*		silica*
	nitrogen, ammonia		color, true*		sulfate*
	nitrogen, NO_3 & NO_2		conductivity*		sulfide, total*
	nitrogen, total Kjeldahl	X	cyanide		TOC*
	phosphate, total		flash point*		turbidity*
	pH		fluoride*		percent solids
	residue, dissolved*		hardness, Ca as $CaCO_3$*	*	**Other**
	residue, suspended*		hardness, total as $CaCO_3$*		
	arsenic, As		hydrocarbons, total		
	cadmium, Cd		MBAS*		
	chromium, Cr	X	nitrogen, ammonia		
	copper, Cu		nitrogen, nitrate*		
	lead, Pb		nitrogen, nitrite*		
	mercury, Hg		nitrogen, NO_3 & NO_2		
	nickel, Ni		nitrogen, total Kjeldahl		
	zinc, Zn		nitrogen, total organic		

*	TCLP
	arsenic, As
	barium, Ba
	cadmium, Cd
	chromium, Cr
	lead, Pb
	mercury, Hg
	nickel, Ni
	selenium, Se
	silver, Ag

*denotes analyses performed only on water

FIELD DETERMINATIONS	Temperature
pH	Chlorine, residual
Conductivity	Other
Dissolved Oxygen	

Laboratory Number

Branch Lab Number

Chain of Custody and Supplemental Information

Only one chain of custody form is required per sample set or point (if all collected at the same time)

1. Collected by CAA
   Date 8-25-98 Time 15:30
   Delivered to KBJ
   Date 8-26-98 Time 10:00
2. Received by
   Date Time
   Delivered to
   Date Time
3. Received by
   Date Time
   Delivered to
   Date Time
4. Received in Lab by [illegible]
   Date 8-26-98 Time 10:00
   Logged in by
   Date Time

Additional Information

1. Approximate volume of sample 16oz
2. Nearest town or city Knoxville
3. Others present at collection Beth Walker
4. Number of other samples collected at same time at this point 3
5. Field collection procedure, handling and/or preservation of this sample EPA procedures and protocol
6. Mode of transportation to lab State vehicle, in cooler, w/ ice
7. Sample sealed by
8. Date sample sealed
9. Remarks

PH-3011 (rev 1/96)

RDA 1527

OCT 13 1998

Project/Site No.: 47-559
Project Name: SMOKEY MOUNTAIN SMELTERS
Description: SMS-SS-04/DRUM STOR./DISP.
Station No.: SMS-SS-04
Collected: 08/25/98 15:30:00 By CA
nty: 47

Lab Number: 9808248-03F
Matrix: SOIL
Received: 08/26/98 10:00:00 By FMM
Sampling Agency: HWM_11_KFO
Priority:

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
B/N/A EXTR+PESTS,PCBS-SOIL						MS+ECD
BUTYL BENZYL PHTHALATE	U	PPB	100	10/01/98	MAC	
BIS(2-ETHYLHEXYL)PHTHALATE	B 68.0	PPB	-	10/01/98	MAC	
DI-n-BUTYL PHTHALATE	U	PPB	100	10/01/98	MAC	
DI-n-OCTYL PHTHALATE	U	PPB	210	10/01/98	MAC	
DIETHYL PHTHALATE	B 215	PPB	-	10/01/98	MAC	
DIMETHYL PHTHALATE	U	PPB	52	10/01/98	MAC	
n-NITROSODIMETHYLAMINE	U	PPB	210	10/01/98	MAC	
n-NITROSODIPHENYLAMINE	U	PPB	100	10/01/98	MAC	
n-NITROSO-di-n-PROPYLAMINE	U	PPB	100	10/01/98	MAC	
ISOPHORONE	U	PPB	52	10/01/98	MAC	
NITROBENZENE	U	PPB	100	10/01/98	MAC	
2,4-DINITROTOLUENE	U	PPB	210	10/01/98	MAC	
2,6-DINITROTOLUENE	U	PPB	210	10/01/98	MAC	
ACENAPTHENE	U	PPB	52	10/01/98	MAC	
ACENAPHTHYLENE	U	PPB	52	10/01/98	MAC	
ANTHRACENE	U	PPB	52	10/01/98	MAC	
BENZO(a)ANTHRACENE	J 16.5	PPB	52	10/01/98	MAC	
BENZO(a)PYRENE	J 26.8	PPB	52	10/01/98	MAC	
BENZO(b)FLUORANTHENE	J 52.3	PPB	52	10/01/98	MAC	
BENZO(ghi)PERYLENE	U	PPB	210	10/01/98	MAC	
BENZO(k)FLUORANTHENE	J 15.5	PPB	52	10/01/98	MAC	
DIBENZO(a,h)ANTHRACENE	U	PPB	210	10/01/98	MAC	
FLUORANTHENE	J N 21.6	PPB	52	10/01/98	MAC	
FLUORENE	U	PPB	52	10/01/98	MAC	
INDENO(1,2,3-cd)PYRENE	U	PPB	210	10/01/98	MAC	
NAPHTHALENE	U	PPB	52	10/01/98	MAC	
PHENANTHRENE	U	PPB	52	10/01/98	MAC	
PYRENE	U	PPB	52	10/01/98	MAC	
CHRYSENE	U	PPB	52	10/01/98	MAC	
BIS(2-CHLOROETHYL)ETHER	U	PPB	100	10/01/98	MAC	
BIS(2-CHLOROETHOXY)METHANE	U	PPB	52	10/01/98	MAC	
BIS(2-CHLOROISOPROPYL)ETHER	U	PPB	210	10/01/98	MAC	
4-BROMOPHENYLPHENYL ETHER	U	PPB	210	10/01/98	MAC	
4-CHLOROPHENYLPHENYL ETHER	U	PPB	100	10/01/98	MAC	
HEXACHLOROCYCLOPENTADIENE	U	PPB	520	10/01/98	MAC	
HEXACHLOROBUTADIENE	U	PPB	100	10/01/98	MAC	
HEXACHLOROBENZENE	U	PPB	100	10/01/98	MAC	
HEXACHLOROETHANE	U	PPB	100	10/01/98	MAC	
1,2,4-TRICHLOROBENZENE	U	PPB	100	10/01/98	MAC	
2-CHLORONAPHTHALENE	U	PPB	52	10/01/98	MAC	
4-CHLORO-3-METHYLPHENOL	U	PPB	100	10/01/98	MAC	
2-CHLOROPHENOL	U	PPB	52	10/01/98	MAC	
2,4-DICHLOROPHENOL	U	PPB	100	10/01/98	MAC	
2,4-DIMETHYLPHENOL	U	PPB	100	10/01/98	MAC	
2,4-DINITROPHENOL	U	PPB	1000	10/01/98	MAC	
2-METHYL-4,6-DINITROPHENOL	U	PPB	520	10/01/98	MAC	
2-NITROPHENOL	U	PPB	210	10/01/98	MAC	
4-NITROPHENOL	U	PPB	520	10/01/98	MAC	
PENTACHLOROPHENOL	U	PPB	210	10/01/98	MAC	
PHENOL	U	PPB	52	10/01/98	MAC	
2,4,6-TRICHLOROPHENOL	U	PPB	100	10/01/98	MAC	
2,4,5-TRICHLOROPHENOL	U	PPB	100	10/01/98	MAC	
O-CRESOL	U	PPB	100	10/01/98	MAC	
M- & P-CRESOL	U	PPB	52	10/01/98	MAC	
2-METHYLNAPHTHALENE	U	PPB	52	10/01/98	MAC	
BENZOIC ACID	U	PPB	210	10/01/98	MAC	
BENZYL ALCOHOL	U	PPB	210	10/01/98	MAC	
4-CHLOROANILINE	U	PPB	100	10/01/98	MAC	
DIBENZOFURAN	U	PPB	52	10/01/98	MAC	
3,3-DICHLOROBENZIDINE	U	PPB	210	10/01/98	MAC	
2-NITROANILINE	U	PPB	210	10/01/98	MAC	
3-NITROANILINE	U	PPB	210	10/01/98	MAC	
4-NITROANILINE	U	PPB	520	10/01/98	MAC	
HEXACHLOROBENZENE	U	PPB	2.1	10/01/98	MAC	
ALDRIN	U	PPB	2.8	10/01/98	MAC	
alpha-BHC	U	PPB	4.9	10/01/98	MAC	
·a-BHC	U	PPB	7.2	10/01/98	MAC	
:a-BHC	U	PPB	7.1	10/01/98	MAC	
gamma-BHC (LINDANE)	U	PPB	2.8	10/01/98	MAC	
alpha-CHLORDANE	U	PPB	3.8	10/01/98	MAC	
gamma-CHLORDANE	U	PPB	2.8	10/01/98	MAC	
TECHNICAL CHLORDANE	U	PPB	42	10/01/98	MAC	
p,p-DDD	U	PPB	5.1	10/01/98	MAC	

OCT 13 1998

Project/Site No.: 47-559
Project Name: SMOKEY MOUNTAIN SMELTERS
Description: SMS-SS-04/DRUM STOR./DISP.
Station No.: SMS-SS-04
Collected: 08/25/98 15:30:00 By CA
unty: 47

Lab Number: 9808248-03F
Matrix: SOIL
Received: 08/26/98 10:00;00 By FMM
Sampling Agency: HWM_11_KFO
Priority:

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
B/N/A EXTR+PESTS,PCBS-SOIL						MS+ECD
p,p-DDE	U	PPB	4.5	10/01/98	MAC	
p,p-DDT	U	PPB	4.8	10/01/98	MAC	
DIELDRIN	U	PPB	2.9	10/01/98	MAC	
ENDOSULFAN I	U	PPB	4.5	10/01/98	MAC	
ENDOSULFAN II	U	PPB	5.2	10/01/98	MAC	
ENDOSULFAN SULFATE	U	PPB	5.2	10/01/98	MAC	
ENDRIN	U	PPB	5.2	10/01/98	MAC	
ENDRIN ALDEHYDE	U	PPB	4.3	10/01/98	MAC	
ENDRIN KETONE	U	PPB	5.3	10/01/98	MAC	
HEPTACHLOR	U	PPB	3.4	10/01/98	MAC	
HEPTACHLOR EPOXIDE	U	PPB	3.6	10/01/98	MAC	
TOXAPHENE	U	PPB	150	10/01/98	MAC	
METHOXYCHLOR	U	PPB	20	10/01/98	MAC	
PCB 1016/1242	U	PPB	110	10/01/98	MAC	
PCB 1221	U	PPB	180	10/01/98	MAC	
PCB 1232	U	PPB	130	10/01/98	MAC	
PCB 1248	U	PPB	140	10/01/98	MAC	
PCB 1254	U	PPB	130	10/01/98	MAC	
PCB 1260	U	PPB	120	10/01/98	MAC	
PCB 1262	U	PPB	130	10/01/98	MAC	

*-Water, uG/L; Sediment, uG/kG

Printed: October 5, 1998

State of Tennessee - Environmental Laboratories
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Organic Analysis
Base/Neutral/Acid Extractables

PROJECT/SITE NO.	47-559
PROJECT NAME	SMOKEY MTN SMELTERS
STATION NUMBER	EMS-SS-04
COUNTY	KNOX
DESCRIPTION	AT DRUM STORAGE/DISPOSAL AREA
STREAM MILE	
DEPTH	
MATRIX	SOIL
COLLECTED: DATE	08-25-98
TIME	15:30
SAMPLER'S NAME(printed)	CHRIS A ANDEL
SAMPLING AGENCY	TDSE
BILLING CODE	327.38.11
IF PRIORITY, DATE NEEDED	09-25-98
SEND REPORT TO:	BERT H MAHUPTN, KNOXVILLE
	ENVIR ASST ST CENTER
CONTACT HAZARD	UNKNOWN (possible metals & Radiochemical)

*	NPDES Extractables	*	NPDES Extractables(con't)	*	TAL Semivolatiles
	butylbenzylphthalate	X	2-chlorophenol	X	dimethylphthalate
	bis(2-ethylhexyl)phthalate		2,4-dichlorophenol	X	4,6-dinitro-2-methylphenol
	di-n-butylphthalate		2,4-dimethylphenol	X	2,4-dinitrophenol
	di-n-octylphthalate		2,4-dinitrophenol	X	2,4-dinitrotoluene
	diethylphthalate		4,6-dinitro-o-cresol	X	2,6-dinitrotoluene
	dimethylphthalate		2-nitrophenol	X	fluoranthene
X	n-nitrosodimethylamine		4-nitrophenol	X	fluorene
	n-nitrosodiphenylamine		pentachlorophenol	X	hexachlorobenzene
	n-nitrosodi-n-propylamine		phenol	X	hexachlorobutadiene
	isophorone		2,4,6-trichlorophenol	X	hexachlorocyclopentadiene
	nitrobenzene	*	TAL Semivolatiles	X	hexachloroethane
	2,4-dinitrotoluene	X	acenaphthene	X	indeno(1,2,3-cd)pyrene
	acenaphthene	X	acenaphthylene	X	isophorone
	acenaphthylene	X	anthracene	X	2-methylnaphthalene
	anthracene	X	benzo(a)anthracene	X	2-methylphenol
	benzo(a)anthracene	X	benzo(a)pyrene	X	4-methylphenol
	benzo(a)pyrene	X	benzo(b)fluoranthene	X	n-nitrosodiphenylamine
	benzo(b)fluoranthene	X	benzo(g,h,i)perylene	X	n-nitroso-n-dipropylamine
	benzo(g,h,i)perylene	X	benzo(k)fluoranthene	X	naphthalene
	benzo(k)fluoranthene	X	benzoic acid	X	2-nitroaniline
	chrysene	X	benzyl alcohol	X	3-nitroaniline
	dibenzo(a,h)anthracene	X	bis(2-chloroethoxy)methane	X	4-nitroaniline
	fluoranthene	X	bis(2-chloroethyl) ether	X	nitrobenzene
	fluorene	X	bis(2-chloroisopropyl)ether	X	2-nitrophenol
	indeno(1,2,3-c,d)pyrene	X	bis(2-ethylhexyl)phthalate	X	4-nitrophenol
	naphthalene	X	4-bromophenylphenylether	X	pentachlorophenol
	phenanthrene	X	butylbenzylphthalate	X	phenanthrene
	pyrene	X	4-chloroaniline	X	phenol
	bis(2-chloroethyl)ether	X	4-chloro-3-methyl phenol	X	pyrene
	bis(2-chloroethoxy)methane	X	2-chloronaphthalene	X	1,2,4-trichlorobenzene
	bis(2-chloroisopropyl)ether	X	4-chlorophenylphenylether	X	2,4,5-trichlorophenol
	4-bromophenylphenylether	X	chrysene	X	2,4,6-trichlorophenol
	4-chlorophenylphenylether	X	di-n-butylphthalate	*	Nitrobodies
	hexachlorocyclopentadiene	X	di-n-octylphthalate		RDX
	hexachlorobutadiene	X	dibenzo(a,h)anthracene		2,4,6-TNT
	hexachlorobenzene	X	dibenzofuran		2,4-dinitrotoluene
	hexachloroethane	X	3,3'-dichlorobenzidine		2,6-dinitrotoluene
	1,2,4-trichlorobenzene	X	2,4-dichlorophenol		nitrobenzene
	2-chloronaphthalene	X	diethylphthalate		1,3,5-TNB
	4-chloro-3-methyl phenol	X	2,4-dimethylphenol		

*	TCLP Semivolatiles
	chlordane
	o-cresol
	m-cresol
	p-cresol
	cresol
	2,4-D
	2,4-dinitrotoluene
	endrin
	heptachlor
	heptachlor epoxide
	hexachlorobenzene
	hexachlorobutadiene
	hexachloroethane
	lindane
	methoxychlor
	nitrobenzene
	pentachlorophenol
	pyridine
	toxaphene
	2,4,5-trichlorophenol
	2,4,6-trichlorophenol
	2,4,5-TP (Silvex)
*	Pesticides/PCBs
X	aldrin
X	alpha-BHC
X	beta-BHC
X	delta-BHC
X	gamma-BHC (lindane)
X	technical chlordane
X	alpha-chlordane
X	gamma-chlordane
X	4,4'-DDD
X	4,4'-DDE
X	4,4'-DDT
X	dieldrin
X	endosulfan I
X	endosulfan II
X	endosulfan sulfate
X	endrin
X	endrin aldehyde
X	endrin ketone
X	heptachlor
X	heptachlor epoxide
X	toxaphene
X	methoxychlor
X	PCB 1016/1242
X	PCB 1221
X	PCB 1232
X	PCB 1248
X	PCB 1254
X	PCB 1260
X	PCB 1262

Laboratory Number

Branch Lab Number

Chain of Custody and Supplemental Information

Only one chain of custody form is required per sample set or point (if all collected at the same time)

1. Collected by [signature]
   Date 08-25-98 Time 15:30
   Delivered to KNOXVILLE STATE LAB
   Date 08-26-98 Time 10:00
2. Received by
   Date Time
   Delivered to
   Date Time
3. Received by
   Date Time
   Delivered to
   Date Time
4. Received in Lab by [signature]
   Date 8-26-98 Time 10:00
   Logged in by
   Date Time

Additional Information

1. Approximate volume of sample 16 OZ
2. Nearest town or city KNOXVILLE
3. Others present at collection BETH WALKER
4. Number of other samples collected at same time at this point TWO
5. Field collection procedure, handling and/or preservation of this sample ACCORDING TO U.S. EPA PROCEDURES AND PROTOCOLS
6. Mode of transportation to lab ON ICE IN AN ICE CHEST, TN A STATE VEHICLE
7. Sample sealed by
8. Date sample sealed
9. Remarks

SEP 08 1998

Project/Site No.: 47-559
Project Name: SMOKEY MOUNTAIN SMELTERS
Site Description: SMS-SS-04/DRUM STOR./DISP.
Station No.: SMS-SS-04
lected: 08/25/98 15:30:00 By CA
ounty: 47

Lab Number: 9808248-03E
Matrix: SOIL
Received: 08/26/98 10:00:00 By FMM
Sampling Agency: HWM_11_KFO
Priority:

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
VOLATILES-TAL SEDIMENTS						8260A
ACETONE	U	PPB	25	09/03/98	HMG	
BENZENE	U	PPB	2.5	09/03/98	HMG	
BROMODICHLOROMETHANE	U	PPB	2.5	09/03/98	HMG	
BROMOFORM	U	PPB	2.5	09/03/98	HMG	
BROMOMETHANE	U	PPB	5.0	09/03/98	HMG	
2-BUTANONE (MEK)	U	PPB	25	09/03/98	HMG	
CARBON DISULFIDE	U	PPB	5.0	09/03/98	HMG	
CARBON TETRACHLORIDE	U	PPB	2.5	09/03/98	HMG	
VINYL ACETATE	U	PPB	5.0	09/03/98	HMG	
CHLOROBENZENE	U	PPB	2.5	09/03/98	HMG	
CHLOROETHANE	U	PPB	5.0	09/03/98	HMG	
CHLOROFORM	U	PPB	2.5	09/03/98	HMG	
CHLOROMETHANE	U	PPB	5.0	09/03/98	HMG	
DIBROMOCHLOROMETHANE	U	PPB	2.5	09/03/98	HMG	
1,2-DICHLOROBENZENE	U	PPB	2.5	09/03/98	HMG	
1,3-DICHLOROBENZENE	U	PPB	2.5	09/03/98	HMG	
1,4-DICHLOROBENZENE	U	PPB	2.5	09/03/98	HMG	
DICHLORODIFLUOROMETHANE	U	PPB	5.0	09/03/98	HMG	
1,1-DICHLOROETHANE	U	PPB	2.5	09/03/98	HMG	
1,2-DICHLOROETHANE	U	PPB	2.5	09/03/98	HMG	
1,1-DICHLOROETHENE	U	PPB	2.5	09/03/98	HMG	
CIS-1,2-DICHLOROETHENE	U	PPB	2.5	09/03/98	HMG	
TRANS-1,2-DICHLOROETHENE	U	PPB	2.5	09/03/98	HMG	
1,2-DICHLOROPROPANE	U	PPB	2.5	09/03/98	HMG	
CIS-1,3-DICHLOROPROPENE	U	PPB	2.5	09/03/98	HMG	
TRANS-1,3-DICHLOROPROPENE	U	PPB	2.5	09/03/98	HMG	
ETHYLBENZENE	U	PPB	2.5	09/03/98	HMG	
METHYLENE CHLORIDE	B 35	PPB	2.5	09/03/98	HMG	
4-METHYL-2-PENTANONE (MIBK)	U	PPB	25	09/03/98	HMG	
STYRENE	U	PPB	2.5	09/03/98	HMG	
2-HEXANONE	U	PPB	5.0	09/03/98	HMG	
1,1,2,2-TETRACHLOROETHANE	U	PPB	2.5	09/03/98	HMG	
TETRACHLOROETHENE	U	PPB	2.5	09/03/98	HMG	
TOLUENE	U	PPB	2.5	09/03/98	HMG	
1,1,1-TRICHLOROETHANE	U	PPB	2.5	09/03/98	HMG	
1,1,2-TRICHLOROETHANE	U	PPB	2.5	09/03/98	HMG	
TRICHLOROETHENE	U	PPB	2.5	09/03/98	HMG	
TRICHLOROFLUOROMETHANE	U	PPB	5.0	09/03/98	HMG	
VINYL CHLORIDE	U	PPB	5.0	09/03/98	HMG	
o-XYLENE	U	PPB	2.5	09/03/98	HMG	
m&p-XYLENE	U	PPB	2.5	09/03/98	HMG	

*-Water, uG/L; Sediment, uG/kG

Printed: September 4, 1998

State of Tennessee - Environmental Laboratories

PLEASE PRINT LEGIBLY

Organic Analysis

Volatiles and Petroleum Hydrocarbons

PROJECT/SITE NO.	47-559	PROJECT NAME	SMOKY MOUNTAIN SMELTERS
STATION NUMBER	SMS-SS-04	COUNTY	KNOX
DESCRIPTION	AT DRUM STORAGE/DISPOSAL AREA		
STREAM MILE		DEPTH	MATRIX Soil
COLLECTED: DATE	AUGUST 25, 1998	TIME	15:30
SAMPLER'S NAME(printed)	CHRIS A. ANDEL		
SAMPLING AGENCY	DIVISION OF SUPERFUND	BILLING CODE	327-38-11
IF PRIORITY, DATE NEEDED	SEPTEMBER 25		
SEND REPORT TO:	KNOXVILLE ENVIRONMENTAL ASSISSTANCE CENTER BURL H. MAUPIN		
CONTACT HAZARD	METALS, RADIOCHEMICAL, UNKNOWN		

*	NPDES Volatiles - 624	*	TAL Volatiles - 8260A	*	TCLP Volatiles
	Bromoform		Chloromethane		Benzene
	Bromodichloromethane		Bromomethane		Carbon tetrachloride
	Carbon Tetrachloride		Vinyl chloride		Chlorobenzene
	Chlorobenzene		Chloroethane		Chloroform
	Chloroethane		Methylene chloride		1,2-Dichloroethane
	2-Chloroethylvinyl ether		Acetone		1,1-Dichloroethane
	Chloroform		Carbon disulfide		Methyl ethyl ketone
	Chloromethane		1,1-Dichloroethene		Tetrachloroethene
	Dibromochloromethane		1,1-Dichloroethane		Trichloroethene
	1,2-Dichlorobenzene		Cis-1,2-dichloroethene		Vinyl chloride
	1,3-Dichlorobenzene		Trans-1,2-dichloroethene	*	BTEX - 8260A - UST
	1,4-Dichlorobenzene		1,2-Dichloroethane		Benzene
	Dichlorodifluoromethane		Chloroform		Toluene
	1,1-Dichloroethane		2-Butanone		Ethyl benzene
	1,2-Dichloroethane		1,1,1-Trichloroethane		o-Xylene
	1,1-Dichloroethene		Carbon tetrachloride		m-Xylene
	Cis-1,2-dichloroethene		Vinyl acetate		p-Xylene
	Trans-1,2-dichloroethene		Bromodichloromethane		Methyl t-butyl ether
	1,2-Dichloropropane		1,2-Dichloropropane		Diisopropyl ether
	Cis-1,3-dichloropropene		Cis-1,3-dichloropropane	*	TPH by GC
	Trans-1,2-dichloroethene		Trichloroethene		Gasoline Range Organics
	Methylene chloride		Dibromochloromethane		Diesel Range Organics
	1,1,2,2-Tetrachloroethane		1,1,2-Trichloroethane	*	TPH by IR (418.1)
	Tetrachloroethene		Benzene		418.1 - Waste Oil
	1,1,1-Trichloroethane		Trans-1,3-dichloropropene	*	Other
	1,1,2-Trichloroethane		Bromoform		
	Trichloroethene		4-Methyl-2-pentanone		
	Trichlorofluoromethane		2-Hexanone		
	Vinyl chloride		Tetrachloroethene		
	Benzene		Toluene		
	Ethylbenzene		1,1,2,2-Tetrachloroethane		
	Toluene		Chlorobenzene		
	o-Xylene		Ethyl benzene		
	m-Xylene		Styrene		
	p-Xylene		o-Xylene		
			m-Xylene		
			p-Xylene		

Laboratory Number

Branch Lab Number

Chain of Custody and Supplemental Information

Only one chain of custody form is required per sample set or point (if all collected at the same time)

1. Collected by CHRIS A. ANDEL
   Date AUGUST 25, 1998 Time 15:30
   Delivered to Knoxville Basin Laboratory
   Date 8-26-98 Time 10:00
2. Received by
   Date Time
   Delivered to
   Date Time
3. Received by
   Date Time
   Delivered to
   Date Time
4. Received in Lab by [signature]
   Date 8-26-98 Time 10:00 AM
   Logged in by
   Date Time

Additional Information

1. Approximate volume of sample 4 oz.
2. Nearest town or city KNOXVILLE
3. Others present at collection BETH WALKER
4. Number of other samples collected at same time at this point *One other sample each for INORGANICS, RADIOCHEMICAL, AND EXTRACTABLE ORGANICS were collected for a total of three other samples.*
5. Field collection procedure, handling and/or preservation of this sample *according to EPA procedures and protocol*
6. Mode of transportation to lab *in State vehicle, in cooler, and on ice*
7. Sample sealed by
8. Date sample sealed
9. Remarks

SEP 30 1998

Project/Site No.:	47-559	Lab Number:	9808248-03G
Project Name:	SMOKEY MOUNTAIN SMELTERS	Matrix:	SOIL
Description:	SMS-SS-04/DRUM STOR./DISP.	Received:	08/26/98 10:00;00 By FMM
Station No.:	SMS-SS-04	Sampling Agency:	HWM_11_KFO
Collected:	08/25/98 15:30:00 By CA	Priority:	
nty:	47		

TEST	RESULT	*ERROR	UNITS	ANALYZED	BY	METHOD
GAMMA RADIONUCLIDES						R.6
K-40	13.50	0.65	pCi/g dry wt	09/01/98	AK	
Pb-214	0.815	0.070	pCi/g dry wt	09/01/98	AK	
Bi-214	0.739	0.070	pCi/g dry wt	09/01/98	AK	
Pb-212	1.023	0.060	pCi/g dry wt	09/01/98	AK	
Ac-228	1.16	0.11	pCi/g dry wt	09/01/98	AK	
Tl-208	0.356	0.040	pCi/g dry wt	09/01/98	AK	
Bi-212	0.73	0.17	pCi/g dry wt	09/01/98	AK	
GROSS ALPHA & BETA						R.1.3
GROSS ALPHA	0.99	0.62	pCi/g DRY WT.	09/09/98	NLF	
GROSS BETA	12.0	1.4	pCi/g DRY WT.	09/09/98	NLF	

*--Represents +/- error value

Printed: September 10, 1998

State of Tennessee - Environmental Laboratories

Radiochemical Analysis

PLEASE PRINT LEGIBLY

PROJECT/SITE NO. 47-559	PROJECT NAME Smokey Mountain Smelters
STATION NUMBER SMS-SS-04	COUNTY Knox
DESCRIPTION Surface soil below drum pile	
STREAM MILE	DEPTH 0-6 inches
COLLECTED: DATE 08/25/98	TIME 15:30
PICK-UP DATE:	
CONTACT HAZARD UNKNOWN	mR/hr Reading 0.01
SAMPLER'S NAME (printed) Chris ANDEL	
SAMPLING AGENCY TDSF	BILLING CODE 327, 38, 10'
IF PRIORITY, DATE NEEDED 09/26/98	
SEND REPORT TO: Burl Maupin	
KEAC — Superfund	

Laboratory Number

Date Received

Time Received **By**

Sample Type

___Air ___Milk ___Swipe
___Water ___Tissue ___Liquid
___Sludge X Soil ___Solid
___Vegetation ___Sediment

Other_____

Field Comments:

Air Samples
Volume _____
Total Hours _____

___Sample Filtration
___Sample Acidification
___Send to RESL

Chain of Custody and Supplemental Information

Only one chain of custody form is required per sample set or point (if all collected at the same time)

1. Collected by CAA
   Date 08/25/98 Time 15:30
   Delivered to Knoxville LAB
   Date 8-26-98 Time 10:00
2. Collected by
   Date Time
   Delivered to
   Date Time
3. Collected by
   Date Time
   Delivered to
   Date Time
4. Received in Lab by Frances [illegible]
   Date 8-26-98 Time 10:00 AM
   Logged in by
   Date Time

REQUESTED ANALYSES:

X	GROSS ALPHA (TOTAL)		STRONTIUM 89
	GROSS ALPHA (SUSPENDED)		STRONTIUM 90
	GROSS ALPHA (DISSOLVED)		TRITIUM (H-3)
X	GROSS BETA (TOTAL)		THORIUM (TOTAL)
	GROSS BETA (SUSPENDED)		URANIUM (TOTAL)
	GROSS BETA (DISSOLVED)	X	GAMMA RADIONUCLIDES
			ADDITIONAL ANALYSES:

Additional Information

1. Approximate volume of sample 16 oz
2. Nearest town or city Knoxville
3. Others present at collection BHW
4. Number of other samples collected at same time at this point 3 — Vol, Extr, + inorganics
5. Field collection procedure, handling and/or preservation of this sample According to EPA procedures
6. Mode of transportation to lab in coolers on ice in State vehicle
7. Sample sealed by
8. Date sample sealed
9. Remarks

OCT 13 1998

Project/Site No.: 47-559
Project Name: SMOKEY MOUNTAIN SMELTERS
Description: SMS-SS-05/MONTG. VIL. YARD
Station No.: SMS-SS-05
Collected: 08/31/98 13:20:00 By WLB
County: 47

Lab Number: 9809002-04
Matrix: SOIL
Received: 09/01/98 09:05:00 By FMM
Sampling Agency: HWM_11_KFO
Priority:

TEST	RESULT	UNITS	LIMIT	ANALYZED	BY	METHOD
AMMONIA	46.5	mg/kg	10	09/15/98	SAL	A.18.2
CYANIDE	U	mg/kg	1.0	09/23/98	SAL	A.9
NITRATE & NITRITE NITROGEN	9.52	mg/kg	0.5	09/15/98	SAL	A.18.5
ALUMINUM	14600	mg/kg	10	10/01/98	JAH	
ANTIMONY	1.0	mg/kg	0.6	10/09/98	JAH	
ARSENIC	10.2	mg/kg	0.2	10/05/98	JAH	
BARIUM	66	mg/kg	10	10/01/98	JAH	
BERYLLIUM	U	mg/kg	1	09/30/98	JAH	
CADMIUM	U	mg/kg	0.5	09/11/98	JAH	
CALCIUM	5400	mg/kg	3	10/02/98	JAH	
CHROMIUM	22	mg/kg	1	09/23/98	JAH	
COBALT	17	mg/kg	1	09/15/98	JAH	
COPPER	34	mg/kg	1	09/16/98	JAH	
DIGESTION-METALS	COMPLETED	COMPLETED		09/10/98	EAM	
IRON	22100	mg/kg	5	09/16/98	JAH	
LEAD	28	mg/kg	4	09/15/98	JAH	
MAGNESIUM	1410	mg/kg	2	10/02/98	JAH	
MANGANESE	912	mg/kg	1	09/16/98	JAH	
MERCURY	U	mg/kg	0.1	09/11/98	ATB	EPA 245.5
METALS PREP-SOLIDS/WASTES	COMPLETED	COMPLETED		09/02/98	EAM	
NICKEL	8	mg/kg	2	09/11/98	JAH	
PERCENT SOLIDS	85.0	%		09/08/98	SDS	
POTASSIUM	716	mg/kg	2	10/02/98	JAH	

Project/Site No.: 47-559
Project Name: SMOKEY MOUNTAIN SMELTERS
Description: SMS-SS-05/MONTG. VIL. YARD
Station No.: SMS-SS-05
Collected: 08/31/98 13:20:00 By WLB
County: 47

Lab Number: 9809002-04
Matrix: SOIL
Received: 09/01/98 09:05:00 By FMM
Sampling Agency: HWM_11_KFO
Priority:

TEST	RESULT	UNITS	LIMIT	ANALYZED	BY	METHOD
SELENIUM	U	mg/kg	0.4	10/07/98	JAH	
SILVER	U	mg/kg	1	09/15/98	JAH	
SODIUM	75	mg/kg	10	10/02/98	JAH	
THALLIUM	U	mg/kg	5	09/15/98	JAH	
VANADIUM	25	mg/kg	20	10/01/98	JAH	
ZINC	472	mg/kg	0.5	09/15/98	JAH	

State of Tennessee - Environmental Laboratories

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Inorganic Analysis

PROJECT/SITE NO. 47-559	PROJECT NAME SMOKEY MTN. SMELTERS
STATION NUMBER SMS-SS-05	COUNTY KNOX
DESCRIPTION MONTGOMERY VILLAGE YARD	
STREAM MILE —	DEPTH 0"-6" MATRIX SOIL
COLLECTED: DATE 08-31-98	TIME 13:20
SAMPLER'S NAME(printed) WM. LEE BARROW + ADAM D. DEWEESE	
SAMPLING AGENCY TDSF	BILLING CODE 32238.11
IF PRIORITY, DATE NEEDED 09-30-98	
SEND REPORT TO: BURL H. MAURIN, TDSF, KNOXVILLE ENVIR. ASSEST CENTER	
CONTACT HAZARD UNKNOWN	

*	Env. Microbiology	*	General Inorganics		Gen. Inorganics (con't)
	coliform, fecal*		acidity as $CaCO_3$*		oil and grease
	coliform, total*		alkalinity as $CaCO_3$*		orthophosphate, total*
	strep, fecal*		alkalinity, phen. as $CaCO_3$*		oxygen, dissolved*
			BOD, 5-day*		pH
			CBOD, 5-day*		phenols, total
			boron		phosphate, total
*	Ambient Parameters		chloride*		residue, dissolved*
	COD*		chlorine, residual*		residue, settleable*
	coliform, fecal		chromium, hexavalent		residue, suspended*
	conductivity*		COD*		residue, total*
	hardness, total as $CaCO_3$*		color, apparent*		silica*
	nitrogen, ammonia		color, true*		sulfate*
	nitrogen, NO_3 & NO_2		conductivity*		sulfide, total*
	nitrogen, total Kjeldahl	X	cyanide		TOC*
	phosphate, total		flash point*		turbidity*
	pH		fluoride*		percent solids
	residue, dissolved*		hardness, Ca as $CaCO_3$*	*	Other
	residue, suspended*		hardness, total as $CaCO_3$*		
	arsenic, As		hydrocarbons, total		
	cadmium, Cd		MBAS*		
	chromium, Cr	X	nitrogen, ammonia		
	copper, Cu		nitrogen, nitrate*		
	lead, Pb		nitrogen, nitrite*		
	mercury, Hg	X	nitrogen, NO_3 & NO_2		
	nickel, Ni		nitrogen, total Kjeldahl		
	zinc, Zn		nitrogen, total organic		

*	Metals	*	TCLP
X	aluminum, Al		arsenic, As
X	antimony, Sb		barium, Ba
X	arsenic, As		cadmium, Cd
X	barium, Ba		chromium, Cr
X	beryllium, Be		lead, Pb
X	cadmium, Cd		mercury, Hg
X	calcium, Ca		nickel, Ni
X	chromium, Cr		selenium, Se
X	cobalt, Co		silver, Ag
X	copper, Cu		
X	iron, Fe		
X	lead, Pb		
X	magnesium, Mg		
X	manganese, Mn		
X	mercury, Hg		
X	nickel, Ni		
X	potassium, K		
X	selenium, Se		
X	silver, Ag		
X	sodium, Na		
X	thallium, Tl		
X	vanadium, V		
X	zinc, Zn		

*denotes analyses performed only on water

FIELD DETERMINATIONS	Temperature
pH	Chlorine, residual
Conductivity	Other
Dissolved Oxygen	

Laboratory Number

Branch Lab Number

Chain of Custody and Supplemental Information

Only one chain of custody form is required per sample set or point (if all collected at the same time)

1. Collected by W.L.B. & A.D.D.
   Date 08-31-98 Time 13:20
   Delivered to BURL H. MAURIN
   Date 08-31-98 Time 15:00
2. Received by Burl H. Maurin
   Date 8-31-98 Time 1500
   Delivered to KNOXVILLE STATE LAB
   Date 9-1-98 Time 9:00
3. Received by
   Date Time
   Delivered to
   Date Time
4. Received in Lab by [illegible]
   Date 9-1-98 Time 9:05
   Logged in by
   Date Time

Additional Information

1. Approximate volume of sample 16 OZ
2. Nearest town or city KNOXVILLE
3. Others present at collection NONE
4. Number of other samples collected at same time at this point THREE
5. Field collection procedure, handling and/or preservation of this sample ACCORDING TO U.S. EPA PROCEDURES AND PROTOCOLS.
6. Mode of transportation to lab ON ICE IN AN ICE CHEST IN A STATE VEHICLE.
7. Sample sealed by
8. Date sample sealed
9. Remarks

PH-3011 (rev 1/96)

RDA 1527

Project/Site No.:	47-559	Lab Number:	9809002-04F
Project Name:	SMOKEY MOUNTAIN SMELTERS	Matrix:	SOIL
Description:	SMS-SS-05/MONTG. VIL. YARD	Received:	09/01/98 09:05:00 By FMM
Station No.:	SMS-SS-05	Sampling Agency:	HWM_11_KFO
›llected:	08/31/98 13:20:00 By WLB	Priority:	
›unty:	47		

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
B/N/A EXTR+PESTS,PCBS-SOIL						MS+ECD
BUTYL BENZYL PHTHALATE	B,J 55.1	PPB	89	10/09/98	MAC	
BIS(2-ETHYLHEXYL)PHTHALATE	B 583	PPB	-	10/09/98	MAC	
DI-n-BUTYL PHTHALATE	U	PPB	89	10/09/98	MAC	
DI-n-OCTYL PHTHALATE	U	PPB	180	10/09/98	MAC	
DIETHYL PHTHALATE	B 176	PPB	-	10/09/98	MAC	
DIMETHYL PHTHALATE	U	PPB	44	10/09/98	MAC	
n-NITROSODIMETHYLAMINE	U	PPB	180	10/09/98	MAC	
n-NITROSODIPHENYLAMINE	U	PPB	89	10/09/98	MAC	
n-NITROSO-di-n-PROPYLAMINE	U	PPB	89	10/09/98	MAC	
ISOPHORONE	U	PPB	44	10/09/98	MAC	
NITROBENZENE	U	PPB	89	10/09/98	MAC	
2,4-DINITROTOLUENE	U	PPB	180	10/09/98	MAC	
2,6-DINITROTOLUENE	U	PPB	180	10/09/98	MAC	
ACENAPTHENE	U	PPB	44	10/09/98	MAC	
ACENAPHTHYLENE	U	PPB	44	10/09/98	MAC	
ANTHRACENE	U	PPB	44	10/09/98	MAC	
BENZO(a)ANTHRACENE	J 25.8	PPB	44	10/09/98	MAC	
BENZO(a)PYRENE	52.4	PPB	-	10/09/98	MAC	
BENZO(b)FLUORANTHENE	80.8	PPB	-	10/09/98	MAC	
BENZO(ghi)PERYLENE	J 107	PPB	180	10/09/98	MAC	
BENZO(k)FLUORANTHENE	J 25.9	PPB	44	10/09/98	MAC	
DIBENZO(a,h)ANTHRACENE	U	PPB	180	10/09/98	MAC	
FLUORANTHENE	J 42.6	PPB	44	10/09/98	MAC	
FLUORENE	U	PPB	44	10/09/98	MAC	
INDENO(1,2,3-cd)PYRENE	U	PPB	180	10/09/98	MAC	
NAPHTHALENE	U	PPB	44	10/09/98	MAC	
PHENANTHRENE	U	PPB	44	10/09/98	MAC	
PYRENE	J 24.0	PPB	44	10/09/98	MAC	
CHRYSENE	J 42.6	PPB	44	10/09/98	MAC	
BIS(2-CHLOROETHYL)ETHER	U	PPB	89	10/09/98	MAC	
BIS(2-CHLOROETHOXY)METHANE	U	PPB	44	10/09/98	MAC	
BIS(2-CHLOROISOPROPYL)ETHER	U	PPB	180	10/09/98	MAC	
4-BROMOPHENYLPHENYL ETHER	U	PPB	180	10/09/98	MAC	
4-CHLOROPHENYLPHENYL ETHER	U	PPB	89	10/09/98	MAC	
HEXACHLOROCYCLOPENTADIENE	U	PPB	440	10/09/98	MAC	
HEXACHLOROBUTADIENE	U	PPB	89	10/09/98	MAC	
HEXACHLOROBENZENE	U	PPB	89	10/09/98	MAC	
HEXACHLOROETHANE	U	PPB	89	10/09/98	MAC	
1,2,4-TRICHLOROBENZENE	U	PPB	89	10/09/98	MAC	
2-CHLORONAPHTHALENE	U	PPB	44	10/09/98	MAC	
4-CHLORO-3-METHYLPHENOL	U	PPB	89	10/09/98	MAC	
2-CHLOROPHENOL	U	PPB	44	10/09/98	MAC	
2,4-DICHLOROPHENOL	U	PPB	89	10/09/98	MAC	
2,4-DIMETHYLPHENOL	U	PPB	89	10/09/98	MAC	
2,4-DINITROPHENOL	U	PPB	890	10/09/98	MAC	
2-METHYL-4,6-DINITROPHENOL	U	PPB	440	10/09/98	MAC	
2-NITROPHENOL	U	PPB	180	10/09/98	MAC	
4-NITROPHENOL	U	PPB	440	10/09/98	MAC	
PENTACHLOROPHENOL	U	PPB	180	10/09/98	MAC	
PHENOL	U	PPB	44	10/09/98	MAC	
2,4,6-TRICHLOROPHENOL	U	PPB	89	10/09/98	MAC	
2,4,5-TRICHLOROPHENOL	U	PPB	89	10/09/98	MAC	
O-CRESOL	U	PPB	89	10/09/98	MAC	
M- & P-CRESOL	U	PPB	44	10/09/98	MAC	
2-METHYLNAPHTHALENE	U	PPB	44	10/09/98	MAC	
BENZOIC ACID	U	PPB	180	10/09/98	MAC	
BENZYL ALCOHOL	U	PPB	180	10/09/98	MAC	
4-CHLOROANILINE	U	PPB	89	10/09/98	MAC	
DIBENZOFURAN	U	PPB	44	10/09/98	MAC	
3,3-DICHLOROBENZIDINE	U	PPB	180	10/09/98	MAC	
2-NITROANILINE	U	PPB	180	10/09/98	MAC	
3-NITROANILINE	U	PPB	180	10/09/98	MAC	
4-NITROANILINE	U	PPB	440	10/09/98	MAC	
ALDRIN	U	PPB	2.4	10/09/98	MAC	
alpha-BHC	U	PPB	4.2	10/09/98	MAC	
·eta-BHC	U	PPB	6.1	10/09/98	MAC	
:lta-BHC	U	PPB	6.1	10/09/98	MAC	
gamma-BHC (LINDANE)	U	PPB	2.4	10/09/98	MAC	
alpha-CHLORDANE	U	PPB	3.3	10/09/98	MAC	
gamma-CHLORDANE	U	PPB	2.4	10/09/98	MAC	
TECHNICAL CHLORDANE	U	PPB	37	10/09/98	MAC	
p,p-DDD	U	PPB	4.4	10/09/98	MAC	
p,p-DDE	U	PPB	3.9	10/09/98	MAC	

Project/Site No.:	47-559	Lab Number:	9809002-04F
Project Name:	SMOKEY MOUNTAIN SMELTERS	Matrix:	SOIL
Description:	SMS-SS-05/MONTG. VIL. YARD	Received:	09/01/98 09:05:00 By FMM
Station No.:	SMS-SS-05	Sampling Agency:	HWM_11_KFO
Collected:	08/31/98 13:20:00 By WLB	Priority:	
County:	47		

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
B/N/A EXTR+PESTS,PCBS-SOIL						MS+ECD
p,p-DDT	U	PPB	4.1	10/09/98	MAC	
DIELDRIN	U	PPB	2.5	10/09/98	MAC	
ENDOSULFAN I	U	PPB	3.9	10/09/98	MAC	
ENDOSULFAN II	U	PPB	4.5	10/09/98	MAC	
ENDOSULFAN SULFATE	U	PPB	4.4	10/09/98	MAC	
ENDRIN	U	PPB	4.4	10/09/98	MAC	
ENDRIN ALDEHYDE	U	PPB	3.7	10/09/98	MAC	
ENDRIN KETONE	U	PPB	4.5	10/09/98	MAC	
HEPTACHLOR	U	PPB	2.9	10/09/98	MAC	
HEPTACHLOR EPOXIDE	U	PPB	3.1	10/09/98	MAC	
TOXAPHENE	U	PPB	260	10/09/98	MAC	
METHOXYCHLOR	U	PPB	17	10/09/98	MAC	
PCB 1016/1242	U	PPB	220	10/09/98	MAC	
PCB 1221	U	PPB	300	10/09/98	MAC	
PCB 1232	U	PPB	270	10/09/98	MAC	
PCB 1248	U	PPB	160	10/09/98	MAC	
PCB 1254	U	PPB	200	10/09/98	MAC	
PCB 1260	U	PPB	130	10/09/98	MAC	
PCB 1262	U	PPB	130	10/09/98	MAC	

*-Water, uG/L; Sediment, uG/kG

Printed: October 13, 1998

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Organic Analysis
Base/Neutral/Acid Extractables

PROJECT/SITE NO.	47-559
PROJECT NAME	SMOKEY MTN. SMELTERS
STATION NUMBER	SMS-SS-05
COUNTY	KNOX
DESCRIPTION	MONTGOMERY VILLAGE YARD
STREAM MILE	—
DEPTH	0 - 6"
MATRIX	SOIL
COLLECTED: DATE	08-31-98
TIME	13:20
SAMPLER'S NAME(printed)	WILLIE BARKER, LINDA DAVIS
SAMPLING AGENCY	TDSF
BILLING CODE	327 38-11
IF PRIORITY, DATE NEEDED	09-30-98
SEND REPORT TO:	BURL H. MAUPIN TDSF KNOXVILLE SOLID WASTE CENTER
CONTACT HAZARD	UNKNOWN

*	NPDES Extractables	*	NPDES Extractables(con't)	*	TAL Semivolatiles
	butylbenzylphthalate	X	2-chlorophenol	X	dimethylphthalate
	bis(2-ethylhexyl)phthalate		2,4-dichlorophenol	X	4,6-dinitro-2-methylphenol
	di-n-butylphthalate		2,4-dimethylphenol	X	2,4-dinitrophenol
	di-n-octylphthalate		2,4-dinitrophenol	X	2,4-dinitrotoluene
	diethylphthalate		4,6-dinitro-o-cresol	X	2,6-dinitrotoluene
	dimethylphthalate		2-nitrophenol	X	fluoranthene
X	n-nitrosodimethylamine		4-nitrophenol	X	fluorene
	n-nitrosodiphenylamine		pentachlorophenol	X	hexachlorobenzene
	n-nitrosodi-n-propylamine		phenol	X	hexachlorobutadiene
	isophorone		2,4,6-trichlorophenol	X	hexachlorocyclopentadiene
	nitrobenzene	*	TAL Semivolatiles	X	hexachloroethane
	2,4-dinitrotoluene	X	acenaphthene	X	indeno(1,2,3-cd)pyrene
	acenaphthene	X	acenaphthylene	X	isophorone
	acenaphthylene	X	anthracene	X	2-methylnaphthalene
	anthracene	X	benzo(a)anthracene	X	2-methylphenol
	benzo(a)anthracene	X	benzo(a)pyrene	X	4-methylphenol
	benzo(a)pyrene	X	benzo(b)fluoranthene	X	n-nitrosodiphenylamine
	benzo(b)fluoranthene	X	benzo(g,h,i)perylene	X	n-nitroso-n-dipropylamine
	benzo(g,h,i)perylene	X	benzo(k)fluoranthene	X	naphthalene
	benzo(k)fluoranthene	X	benzoic acid	X	2-nitroaniline
	chrysene	X	benzyl alcohol	X	3-nitroaniline
	dibenzo(a,h)anthracene	X	bis(2-chloroethoxy)methane	X	4-nitroaniline
	fluoranthene	X	bis(2-chloroethyl) ether	X	nitrobenzene
	fluorene	X	bis(2-chloroisopropyl)ether	X	2-nitrophenol
	indeno(1,2,3-c,d)pyrene	X	bis(2-ethylhexyl)phthalate	X	4-nitrophenol
	naphthalene	X	4-bromophenylphenylether	X	pentachlorophenol
	phenanthrene	X	butylbenzylphthalate	X	phenanthrene
	pyrene	X	4-chloroaniline	X	phenol
	bis(2-chloroethyl)ether	X	4-chloro-3-methyl phenol	X	pyrene
	bis(2-chloroethoxy)methane	X	2-chloronaphthalene	X	1,2,4-trichlorobenzene
	bis(2-chloroisopropyl)ether	X	4-chlorophenylphenylether	X	2,4,5-trichlorophenol
	4-bromophenylphenylether	X	chrysene	X	2,4,6-trichlorophenol
	4-chlorophenylphenylether	X	di-n-butylphthalate	*	Nitrobodies
	hexachlorocyclopentadiene	X	di-n-octylphthalate		RDX
	hexachlorobutadiene	X	dibenzo(a,h)anthracene		2,4,6-TNT
	hexachlorobenzene	X	dibenzofuran		2,4-dinitrotoluene
	hexachloroethane	X	3,3'-dichlorobenzidine		2,6-dinitrotoluene
	1,2,4-trichlorobenzene	X	2,4-dichlorophenol		nitrobenzene
	2-chloronaphthalene	X	diethylphthalate		1,3,5-TNB
	4-chloro-3-methyl phenol	X	2,4-dimethylphenol		

*	TCLP Semivolatiles
	chlordane
	o-cresol
	m-cresol
	p-cresol
	cresol
	2,4-D
	2,4-dinitrotoluene
	endrin
	heptachlor
	heptachlor epoxide
	hexachlorobenzene
	hexachlorobutadiene
	hexachloroethane
	lindane
	methoxychlor
	nitrobenzene
	pentachlorophenol
	pyridine
	toxaphene
	2,4,5-trichlorophenol
	2,4,6-trichlorophenol
	2,4,5-TP (Silvex)
*	Pesticides/PCBs
X	aldrin
X	alpha-BHC
X	beta-BHC
X	delta-BHC
X	gamma-BHC (lindane)
X	technical chlordane
X	alpha-chlordane
X	gamma-chlordane
X	4,4'-DDD
X	4,4'-DDE
X	4,4'-DDT
X	dieldrin
X	endosulfan I
X	endosulfan II
X	endosulfan sulfate
X	endrin
X	endrin aldehyde
X	endrin ketone
X	heptachlor
X	heptachlor epoxide
X	toxaphene
X	methoxychlor
X	PCB 1016/1242
X	PCB 1221
X	PCB 1232
X	PCB 1248
X	PCB 1254
X	PCB 1260
X	PCB 1262

Laboratory Number

Branch Lab Number

Chain of Custody and Supplemental Information

Only one chain of custody form is required per sample set or point (if all collected at the same time)

1. Collected by TJB & LDD
   Date 08-31-98 Time 13:20
   Delivered to BURL H. MAUPIN
   Date 08-31-98 Time 15:00
2. Received by [illegible]
   Date 8-31-98 Time 1500
   Delivered to KNOXVILLE STATE LAB
   Date 9-1-98 Time 9:05
3. Received by
   Date Time
   Delivered to
   Date Time
4. Received in Lab by [illegible]
   Date 9-1-98 Time 9:05
   Logged in by
   Date Time

Additional Information

1. Approximate volume of sample 16 oz
2. Nearest town or city KNOXVILLE
3. Others present at collection NONE
4. Number of other samples collected at same time at this point THREE
5. Field collection procedure, handling and/or preservation of this sample ACCORDING TO U.S. EPA PROCEDURES AND PROTOCOLS.
6. Mode of transportation to lab ON ICE IN AN ICE CHEST IN A STATE VEHICLE.
7. Sample sealed by
8. Date sample sealed
9. Remarks

SEP 1 1 199

Project/Site No.: 47-559
Project Name: SMOKEY MOUNTAIN SMELTERS
Site Description: SMS-SS-05/MONTG. VIL. YARD
Station No.: SMS-SS-05
Collected: 08/31/98 13:20:00 By WLB
ɔunty: 47

Lab Number: 9809002-04E
Matrix: SOIL
Received: 09/01/98 09:05:00 By FMM
Sampling Agency: HWM_11_KFO
Priority:

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
VOLATILES-TAL SEDIMENTS						8260A
ACETONE	U	PPB	25	09/04/98	HMG	
BENZENE	U	PPB	2.5	09/04/98	HMG	
BROMODICHLOROMETHANE	U	PPB	2.5	09/04/98	HMG	
BROMOFORM	U	PPB	2.5	09/04/98	HMG	
BROMOMETHANE	U	PPB	5.0	09/04/98	HMG	
2-BUTANONE (MEK)	U	PPB	25	09/04/98	HMG	
CARBON DISULFIDE	U	PPB	5.0	09/04/98	HMG	
CARBON TETRACHLORIDE	U	PPB	2.5	09/04/98	HMG	
VINYL ACETATE	U	PPB	5.0	09/04/98	HMG	
CHLOROBENZENE	U	PPB	2.5	09/04/98	HMG	
CHLOROETHANE	U	PPB	5.0	09/04/98	HMG	
CHLOROFORM	U	PPB	2.5	09/04/98	HMG	
CHLOROMETHANE	U	PPB	5.0	09/04/98	HMG	
DIBROMOCHLOROMETHANE	U	PPB	2.5	09/04/98	HMG	
1,2-DICHLOROBENZENE	U	PPB	2.5	09/04/98	HMG	
1,3-DICHLOROBENZENE	U	PPB	2.5	09/04/98	HMG	
1,4-DICHLOROBENZENE	U	PPB	2.5	09/04/98	HMG	
DICHLORODIFLUOROMETHANE	U	PPB	5.0	09/04/98	HMG	
1,1-DICHLOROETHANE	U	PPB	2.5	09/04/98	HMG	
1,2-DICHLOROETHANE	U	PPB	2.5	09/04/98	HMG	
1,1-DICHLOROETHENE	U	PPB	2.5	09/04/98	HMG	
CIS-1,2-DICHLOROETHENE	U	PPB	2.5	09/04/98	HMG	
TRANS-1,2-DICHLOROETHENE	U	PPB	2.5	09/04/98	HMG	
1,2-DICHLOROPROPANE	U	PPB	2.5	09/04/98	HMG	
CIS-1,3-DICHLOROPROPENE	U	PPB	2.5	09/04/98	HMG	
TRANS-1,3-DICHLOROPROPENE	U	PPB	2.5	09/04/98	HMG	
ETHYLBENZENE	U	PPB	2.5	09/04/98	HMG	
METHYLENE CHLORIDE	B 24	PPB	2.5	09/04/98	HMG	
4-METHYL-2-PENTANONE (MIBK)	U	PPB	25	09/04/98	HMG	
STYRENE	U	PPB	2.5	09/04/98	HMG	
2-HEXANONE	U	PPB	5.0	09/04/98	HMG	
1,1,2,2-TETRACHLOROETHANE	U	PPB	2.5	09/04/98	HMG	
TETRACHLOROETHENE	U	PPB	2.5	09/04/98	HMG	
TOLUENE	U	PPB	2.5	09/04/98	HMG	
1,1,1-TRICHLOROETHANE	U	PPB	2.5	09/04/98	HMG	
1,1,2-TRICHLOROETHANE	U	PPB	2.5	09/04/98	HMG	
TRICHLOROETHENE	U	PPB	2.5	09/04/98	HMG	
TRICHLOROFLUOROMETHANE	U	PPB	5.0	09/04/98	HMG	
VINYL CHLORIDE	U	PPB	5.0	09/04/98	HMG	
o-XYLENE	U	PPB	2.5	09/04/98	HMG	
m&p-XYLENE	U	PPB	2.5	09/04/98	HMG	

*-Water, uG/L; Sediment, uG/kG

Printed: September 8, 1998

ALSO CONFIRMED BY GCMS: PENTANE
HEXANE

State of Tennessee - Environmental Laboratories

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Organic Analysis

Volatiles and Petroleum Hydrocarbons

PROJECT/SITE NO. 47-559	PROJECT NAME SMOKEY MTN SMELTING
STATION NUMBER SMS-SS-05	COUNTY KNOX
DESCRIPTION MONTGOMERY VILLAGE YARD	
STREAM MILE —	DEPTH 0"-6" MATRIX SOIL
COLLECTED: DATE 08-31-98	TIME 13:20
SAMPLER'S NAME(printed) WM. LEE BARTON & ADAM D. DEWEESE	
SAMPLING AGENCY TDSF	BILLING CODE 327.38.11
IF PRIORITY, DATE NEEDED 09-30-98	
SEND REPORT TO: BURL H. MAUPIN, TDSF, KNOXVILLE ENVTR. ASSIST. CENTER	
CONTACT HAZARD UNKNOWN	

*	NPDES Volatiles - 624	*	TAL Volatiles - 8260A	*	TCLP Volatiles
	Bromoform	X	Chloromethane		Benzene
	Bromodichloromethane	X	Bromomethane		Carbon tetrachloride
	Carbon Tetrachloride	X	Vinyl chloride		Chlorobenzene
	Chlorobenzene	X	Chloroethane		Chloroform
	Chloroethane	X	Methylene chloride		1,2-Dichloroethane
X	2-Chloroethylvinyl ether	X	Acetone		1,1-Dichloroethane
	Chloroform	X	Carbon disulfide		Methyl ethyl ketone
	Chloromethane	X	1,1-Dichloroethene		Tetrachloroethene
	Dibromochloromethane	X	1,1-Dichloroethane		Trichloroethene
X	1,2-Dichlorobenzene	X	Cis-1,2-dichloroethene		Vinyl chloride
X	1,3-Dichlorobenzene	X	Trans-1,2-dichloroethene	*	BTEX - 8260A - UST
X	1,4-Dichlorobenzene	X	1,2-Dichloroethane		Benzene
X	Dichlorodifluoromethane	X	Chloroform		Toluene
	1,1-Dichloroethane	X	2-Butanone		Ethyl benzene
	1,2-Dichloroethane	X	1,1,1-Trichloroethane		o-Xylene
	1,1-Dichloroethene	X	Carbon tetrachloride		m-Xylene
	Cis-1,2-dichloroethene	X	Vinyl acetate		p-Xylene
	Trans-1,2-dichloroethene	X	Bromodichloromethane		Methyl t-butyl ether
	1,2-Dichloropropane	X	1,2-Dichloropropane		Diisopropyl ether
	Cis-1,3-dichloropropene	X	Cis-1,3-dichloropropane	*	TPH by GC
	Trans-1,2-dichloroethene	X	Trichloroethene		Gasoline Range Organics
	Methylene chloride	X	Dibromochloromethane		Diesel Range Organics
	1,1,2,2-Tetrachloroethane	X	1,1,2-Trichloroethane	*	TPH by IR (418.1)
	Tetrachloroethene	X	Benzene		418.1 - Waste Oil
	1,1,1-Trichloroethane	X	Trans-1,3-dichloropropene	*	Other
	1,1,2-Trichloroethane	X	Bromoform		
	Trichloroethene	X	4-Methyl-2-pentanone		
X	Trichlorofluoromethane	X	2-Hexanone		
	Vinyl chloride	X	Tetrachloroethene		
	Benzene	X	Toluene		
	Ethylbenzene	X	1,1,2,2-Tetrachloroethane		
	Toluene	X	Chlorobenzene		
	o-Xylene	X	Ethyl benzene		
	m-Xylene	X	Styrene		
	p-Xylene	X	o-Xylene		
		X	m-Xylene		
		X	p-Xylene		

Laboratory Number

Branch Lab Number

Chain of Custody and Supplemental Information

Only one chain of custody form is required per sample set or point (if all collected at the same time)

1. Collected by W. L. B. & A. D. D.
   Date 08-31-98 Time 13:20
   Delivered to BURL H. MAUPIN
   Date 08-31-98 Time 15:00
2. Received by [illegible]
   Date 8-31-98 Time 1500
   Delivered to KNOXVILLE STATE LAB
   Date 9-1-98 Time 9:00
3. Received by
   Date Time
   Delivered to
   Date Time
4. Received in Lab by [illegible]
   Date 9-1-98 Time [illegible]
   Logged in by
   Date Time

Additional Information

1. Approximate volume of sample 4 OZ
2. Nearest town or city KNOXVILLE
3. Others present at collection NONE
4. Number of other samples collected at same time at this point THREE
5. Field collection procedure, handling and/or preservation of this sample ACCORDING TO U.S. EPA PROCEDURES AND PROTOCOLS.
6. Mode of transportation to lab ON ICE IN AN ICE CHEST IN A STATE VEHICLE.
7. Sample sealed by
8. Date sample sealed
9. Remarks

SEP 30 1998

Project/Site No.: 47-559
Project Name: SMOKEY MOUNTAIN SMELTERS
Description: SMS-SS-05/MONTG. VIL. YARD
Station No.: SMS-SS-05
Collected: 08/31/98 13:20:00 By WLB
nty: 47

Lab Number: 9809002-04G
Matrix: SOIL
Received: 09/01/98 09:05;00 By FMM
Sampling Agency: HWM_11_KFO
Priority:

TEST	RESULT	*ERROR	UNITS	ANALYZED	BY	METHOD
GAMMA RADIONUCLIDES						R.6
K-40	15.31	0.65	pCi/g dry wt	09/03/98	AK	
Pb-214	1.168	0.070	pCi/g dry wt	09/03/98	AK	
Bi-214	1.078	0.070	pCi/g dry wt	09/03/98	AK	
Pb-212	1.641	0.070	pCi/g dry wt	09/03/98	AK	
Ac-228	1.79	0.14	pCi/g dry wt	09/03/98	AK	
Tl-208	0.591	0.050	pCi/g dry wt	09/03/98	AK	
Bi-212	1.25	0.23	pCi/g dry wt	09/03/98	AK	
Cs-137	0.178	0.030	pCi/g dry wt	09/03/98	AK	
GROSS ALPHA & BETA						R.1.3
GROSS ALPHA	3.8	1.0	pCi/g DRY WT.	09/10/98	NLF	
GROSS BETA	26.6	1.9	pCi/g DRY WT.	09/10/98	NLF	

*--Represents +/- error value

Printed: September 10, 1998

State of Tennessee - Environmental Laboratories

Radiochemical Analysis

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PROJECT/SITE NO. 47-559	PROJECT NAME SMOKEY MTN SMELTERS
STATION NUMBER SMS-SS-05	COUNTY KNOX
DESCRIPTION MONTGOMERY VILLAGE YARD	
STREAM MILE _____	DEPTH 0"-6"
COLLECTED: DATE 08-31-98	TIME 13:20
PICK-UP DATE:	
CONTACT HAZARD UNKNOWN	mR/hr Reading <1.0
SAMPLER'S NAME (printed) WM. LEE BARRON & ADAM D. DEWEESE	
SAMPLING AGENCY TDSF	BILLING CODE 327.38.11
IF PRIORITY, DATE NEEDED 09-30-98	
SEND REPORT TO: BURL H. MAUPIN, TDSF, KNOXVILLE ENVIR. ASSIST. CENTER	

Sample Type

___Air ___Milk ___Swipe
___Water ___Tissue ___Liquid
___Sludge X Soil ___Solid
___Vegetation ___Sediment

Other_____

Field Comments:

Air Samples
Volume _____
Total Hours _____

___Sample Filtration
___Sample Acidification
___Send to RESL

REQUESTED ANALYSES:

X	GROSS ALPHA (TOTAL)		STRONTIUM 89
	GROSS ALPHA (SUSPENDED)		STRONTIUM 90
	GROSS ALPHA (DISSOLVED)		TRITIUM (H-3)
X	GROSS BETA (TOTAL)		THORIUM (TOTAL)
	GROSS BETA (SUSPENDED)		URANIUM (TOTAL)
	GROSS BETA (DISSOLVED)	X	GAMMA RADIONUCLIDES
			ADDITIONAL ANALYSES:

Laboratory Number

Date Received

Time Received **By**

Chain of Custody and Supplemental Information

Only one chain of custody form is required per sample set or point (if all collected at the same time)

1. Collected by W.L.B. & A.D.D
   Date 08-31-98 Time 13:20
   Delivered to BURL H. MAUPIN
   Date 08-31-98 Time 15:00
2. Collected by [illegible]
   Date 8-31-98 Time 1500
   Delivered to KNOXVILLE STATE LAB
   Date 9-1-98 Time 9:00
3. Collected by
   Date Time
   Delivered to
   Date Time
4. Received in Lab by [illegible]
   Date 9-1-98 Time 9:05
   Logged in by
   Date Time

Additional Information

1. Approximate volume of sample 1608
2. Nearest town or city KNOXVILLE
3. Others present at collection NONE
4. Number of other samples collected at same time at this point THREE
5. Field collection procedure, handling and/or preservation of this sample ACCORDING TO U.S. EPA PROCEEDURES AND PROTOCOLS
6. Mode of transportation to lab ON ICE, IN AN ICE CHEST, IN A STATE VEHICLE.
7. Sample sealed by
8. Date sample sealed
9. Remarks

Project/Site No.: 47-559
Project Name: SMOKEY MTN SMELTERS
Description: SMS-SB-01/BACKGROUND SUBS.
Station No.: SMS-SB-01
Collected: 08/31/98 11:50:00 By BHM
County: 47

Lab Number: 9808275-04
Matrix: SOIL
Received: 08/31/98 14:15:00 By LAB
Sampling Agency: HWM_11_KFO
Priority: 9_30_98

TEST	RESULT	UNITS	LIMIT	ANALYZED	BY	METHOD
AMMONIA	U	mg/kg	10	09/15/98	SAL	A.18.2
CYANIDE	U	mg/kg	1.0	09/23/98	SAL	A.9
ALUMINUM	7680	mg/kg	10	10/01/98	JAH	
ANTIMONY	U	mg/kg	0.6	10/09/98	JAH	
ARSENIC	6.1	mg/kg	0.2	10/05/98	JAH	
BARIUM	64	mg/kg	10	10/01/98	JAH	
BERYLLIUM	U	mg/kg	1	09/30/98	JAH	
CADMIUM	U	mg/kg	0.5	09/11/98	JAH	
CALCIUM	364	mg/kg	3	10/02/98	JAH	
CHROMIUM	10	mg/kg	1	09/23/98	JAH	
COBALT	10	mg/kg	1	09/15/98	JAH	
COPPER	6	mg/kg	1	09/16/98	JAH	
DIGESTION-METALS	COMPLETED	COMPLETED		09/10/98	EAM	
IRON	5060	mg/kg	5	09/16/98	JAH	
LEAD	21	mg/kg	4	09/15/98	JAH	
MAGNESIUM	529	mg/kg	2	10/02/98	JAH	
MANGANESE	1060	mg/kg	1	09/16/98	JAH	
MERCURY	U	mg/kg	0.1	09/11/98	ATB	EPA 245.5
METALS PREP-SOLIDS/WASTES	COMPLETED	COMPLETED		09/02/98	EAM	
NICKEL	U	mg/kg	2	09/11/98	JAH	
PERCENT SOLIDS	83.0	%		09/08/98	SDS	
POTASSIUM	246	mg/kg	2	10/02/98	JAH	
SELENIUM	U	mg/kg	0.4	10/07/98	JAH	

Project/Site No.: 47-559
Project Name: SMOKEY MTN SMELTERS
Description: SMS-SB-01/BACKGROUND SUBS.
Station No.: SMS-SB-01
Collected: 08/31/98 11:50:00 By BHM
County: 47

Lab Number: 9808275-04
Matrix: SOIL
Received: 08/31/98 14:15:00 By LAB
Sampling Agency: HWM_11_KFO
Priority: 9_30_98

TEST	RESULT	UNITS	LIMIT	ANALYZED	BY	METHOD
SILVER	U	mg/kg	1	09/15/98	JAH	
SODIUM	68	mg/kg	10	10/02/98	JAH	
THALLIUM	U	mg/kg	5	09/15/98	JAH	
VANADIUM	U	mg/kg	20	10/01/98	JAH	
ZINC	22.1	mg/kg	0.5	09/15/98	JAH	

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Inorganic Analysis

PROJECT/SITE NO. 47559	PROJECT NAME Smky Mtn Smelters
STATION NUMBER SMS-SB-01	COUNTY Knox
DESCRIPTION background subsurface soil	
STREAM MILE	DEPTH / MATRIX soil
COLLECTED: DATE 8-31-98	TIME 11:50
SAMPLER'S NAME(printed) Burl Maupin	
SAMPLING AGENCY DSF	BILLING CODE 3273811
IF PRIORITY, DATE NEEDED 9-30-98	
SEND REPORT TO: KEAC	
CONTACT HAZARD unknown	

*	Metals
X	aluminum, Al
X	antimony, Sb
X	arsenic, As
X	barium, Ba
X	beryllium, Be
X	cadmium, Cd
X	calcium, Ca
X	chromium, Cr
X	cobalt, Co
X	copper, Cu
X	iron, Fe
X	lead, Pb
X	magnesium, Mg
X	manganese, Mn
X	mercury, Hg
X	nickel, Ni
X	potassium, K
X	selenium, Se
X	silver, Ag
X	sodium, Na
X	thallium, Tl
X	vanadium, V
X	zinc, Zn

*	Env. Microbiology	*	General Inorganics		Gen. Inorganics (con't)
	coliform, fecal*		acidity as $CaCO_3$*		oil and grease
	coliform, total*		alkalinity as $CaCO_3$*		orthophosphate, total*
	strep, fecal*		alkalinity, phen. as $CaCO_3$*		oxygen, dissolved*
			BOD, 5-day*		pH
			CBOD, 5-day*		phenols, total
			boron		phosphate, total
*	**Ambient Parameters**		chloride*		residue, dissolved*
	COD*		chlorine, residual*		residue, settleable*
	coliform, fecal		chromium, hexavalent		residue, suspended*
	conductivity*		COD*		residue, total*
	hardness, total as $CaCO_3$*		color, apparent*		silica*
	nitrogen, ammonia		color, true*		sulfate*
	nitrogen, NO_3 & NO_2		conductivity*		sulfide, total*
	nitrogen, total Kjeldahl	X	cyanide		TOC*
	phosphate, total		flash point*		turbidity*
	pH		fluoride*		percent solids
	residue, dissolved*		hardness, Ca as $CaCO_3$*	*	**Other**
	residue, suspended*		hardness, total as $CaCO_3$*		
	arsenic, As		hydrocarbons, total		
	cadmium, Cd		MBAS*		
	chromium, Cr	X	nitrogen, ammonia		
	copper, Cu		nitrogen, nitrate*		
	lead, Pb		nitrogen, nitrite*		
	mercury, Hg		nitrogen, NO_3 & NO_2		
	nickel, Ni		nitrogen, total Kjeldahl		
	zinc, Zn		nitrogen, total organic		

*	TCLP
	arsenic, As
	barium, Ba
	cadmium, Cd
	chromium, Cr
	lead, Pb
	mercury, Hg
	nickel, Ni
	selenium, Se
	silver, Ag

***denotes analyses performed only on water**

FIELD DETERMINATIONS	Temperature
pH	Chlorine, residual
Conductivity	Other
Dissolved Oxygen	

Laboratory Number

Branch Lab Number

Chain of Custody and Supplemental Information

Only one chain of custody form is required per sample set or point (if all collected at the same time)

1. Collected by BHM
   Date 8-31-98 Time 11:50
   Delivered to KBL
   Date 8-31-98 Time 2:15
2. Received by
   Date Time
   Delivered to
   Date Time
3. Received by
   Date Time
   Delivered to
   Date Time
4. Received in Lab by [illegible]
   Date 8-31-98 Time 14:15
   Logged in by
   Date Time

Additional Information

1. Approximate volume of sample 16 oz
2. Nearest town or city Knoxville
3. Others present at collection Beth Walker
4. Number of other samples collected at same time at this point 3
5. Field collection procedure, handling and/or preservation of this sample
   EPA procedures and protocol
6. Mode of transportation to lab
   State vehicle, in cooler, on ice
7. Sample sealed by
8. Date sample sealed
9. Remarks

PH-3011 (rev 1/96)

RDA 1527

OCT 13 1998

Project/Site No.: 47-559
Project Name: SMOKEY MTN SMELTERS
Description: SMS-SB-01/BACKGROUND SUBS.
Station No.: SMS-SB-01
Collected: 08/31/98 11:50:00 By BHM
unty: 47

Lab Number: 9808275-04F
Matrix: SOIL
Received: 08/31/98 14:15:00 By LAB
Sampling Agency: HWM_11_KFO
Priority: 9_30_98

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
B/N/A EXTR+PESTS,PCBS-SOIL						MS+ECD
BUTYL BENZYL PHTHALATE	U	PPB	95	09/28/98	MAC	
BIS(2-ETHYLHEXYL)PHTHALATE	B 75.8	PPB	-	09/28/98	MAC	
DI-n-BUTYL PHTHALATE	U	PPB	95	09/28/98	MAC	
DI-n-OCTYL PHTHALATE	U	PPB	190	09/28/98	MAC	
DIETHYL PHTHALATE	B 57.8	PPB	-	09/28/98	MAC	
DIMETHYL PHTHALATE	U	PPB	47	09/28/98	MAC	
n-NITROSODIMETHYLAMINE	U	PPB	190	09/28/98	MAC	
n-NITROSODIPHENYLAMINE	U	PPB	95	09/28/98	MAC	
n-NITROSO-di-n-PROPYLAMINE	U	PPB	95	09/28/98	MAC	
ISOPHORONE	U	PPB	47	09/28/98	MAC	
NITROBENZENE	U	PPB	95	09/28/98	MAC	
2,4-DINITROTOLUENE	U	PPB	190	09/28/98	MAC	
2,6-DINITROTOLUENE	U	PPB	190	09/28/98	MAC	
ACENAPTHENE	U	PPB	47	09/28/98	MAC	
ACENAPHTHYLENE	U	PPB	47	09/28/98	MAC	
ANTHRACENE	U	PPB	47	09/28/98	MAC	
BENZO(a)ANTHRACENE	U	PPB	47	09/28/98	MAC	
BENZO(a)PYRENE	U	PPB	47	09/28/98	MAC	
BENZO(b)FLUORANTHENE	U	PPB	47	09/28/98	MAC	
BENZO(ghi)PERYLENE	U	PPB	190	09/28/98	MAC	
BENZO(k)FLUORANTHENE	U	PPB	47	09/28/98	MAC	
DIBENZO(a,h)ANTHRACENE	U	PPB	190	09/28/98	MAC	
FLUORANTHENE	U	PPB	47	09/28/98	MAC	
FLUORENE	U	PPB	47	09/28/98	MAC	
INDENO(1,2,3-cd)PYRENE	U	PPB	190	09/28/98	MAC	
NAPHTHALENE	U	PPB	47	09/28/98	MAC	
PHENANTHRENE	U	PPB	47	09/28/98	MAC	
PYRENE	U	PPB	47	09/28/98	MAC	
CHRYSENE	U	PPB	47	09/28/98	MAC	
BIS(2-CHLOROETHYL)ETHER	U	PPB	95	09/28/98	MAC	
BIS(2-CHLOROETHOXY)METHANE	U	PPB	47	09/28/98	MAC	
BIS(2-CHLOROISOPROPYL)ETHER	U	PPB	190	09/28/98	MAC	
4-BROMOPHENYLPHENYL ETHER	U	PPB	190	09/28/98	MAC	
4-CHLOROPHENYLPHENYL ETHER	U	PPB	95	09/28/98	MAC	
HEXACHLOROCYCLOPENTADIENE	U	PPB	470	09/28/98	MAC	
HEXACHLOROBUTADIENE	U	PPB	95	09/28/98	MAC	
HEXACHLOROBENZENE	U	PPB	95	09/28/98	MAC	
HEXACHLOROETHANE	U	PPB	95	09/28/98	MAC	
1,2,4-TRICHLOROBENZENE	U	PPB	95	09/28/98	MAC	
2-CHLORONAPHTHALENE	U	PPB	47	09/28/98	MAC	
4-CHLORO-3-METHYLPHENOL	U	PPB	95	09/28/98	MAC	
2-CHLOROPHENOL	U	PPB	47	09/28/98	MAC	
2,4-DICHLOROPHENOL	U	PPB	95	09/28/98	MAC	
2,4-DIMETHYLPHENOL	U	PPB	95	09/28/98	MAC	
2,4-DINITROPHENOL	U	PPB	950	09/28/98	MAC	
2-METHYL-4,6-DINITROPHENOL	U	PPB	470	09/28/98	MAC	
2-NITROPHENOL	U	PPB	190	09/28/98	MAC	
4-NITROPHENOL	U	PPB	470	09/28/98	MAC	
PENTACHLOROPHENOL	U	PPB	190	09/28/98	MAC	
PHENOL	U	PPB	47	09/28/98	MAC	
2,4,6-TRICHLOROPHENOL	U	PPB	95	09/28/98	MAC	
2,4,5-TRICHLOROPHENOL	U	PPB	95	09/28/98	MAC	
O-CRESOL	U	PPB	95	09/28/98	MAC	
M- & P-CRESOL	U	PPB	47	09/28/98	MAC	
2-METHYLNAPHTHALENE	U	PPB	47	09/28/98	MAC	
BENZOIC ACID	U	PPB	190	09/28/98	MAC	
BENZYL ALCOHOL	U	PPB	190	09/28/98	MAC	
4-CHLOROANILINE	U	PPB	95	09/28/98	MAC	
DIBENZOFURAN	U	PPB	47	09/28/98	MAC	
3,3-DICHLOROBENZIDINE	U	PPB	190	09/28/98	MAC	
2-NITROANILINE	U	PPB	190	09/28/98	MAC	
3-NITROANILINE	U	PPB	190	09/28/98	MAC	
4-NITROANILINE	U	PPB	470	09/28/98	MAC	
HEXACHLOROBENZENE	U	PPB	1.9	09/28/98	MAC	
ALDRIN	U	PPB	2.5	09/28/98	MAC	
alpha-BHC	U	PPB	4.4	09/28/98	MAC	
beta-BHC	U	PPB	6.4	09/28/98	MAC	
a-BHC	U	PPB	6.4	09/28/98	MAC	
ama-BHC (LINDANE)	U	PPB	2.5	09/28/98	MAC	
alpha-CHLORDANE	U	PPB	3.4	09/28/98	MAC	
gamma-CHLORDANE	U	PPB	2.5	09/28/98	MAC	
TECHNICAL CHLORDANE	U	PPB	39	09/28/98	MAC	
p,p-DDD	U	PPB	4.6	09/28/98	MAC	

OCT 13 1998

Project/Site No.: 47-559
Project Name: SMOKEY MTN SMELTERS
Description: SMS-SB-01/BACKGROUND SUBS.
Station No.: SMS-SB-01
Collected: 08/31/98 11:50:00 By BHM
inty: 47

Lab Number: 9808275-04F
Matrix: SOIL
Received: 08/31/98 14:15;00 By LAB
Sampling Agency: HWM_11_KFO
Priority: 9_30_98

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
B/N/A EXTR+PESTS,PCBS-SOIL						MS+ECD
p,p-DDE	U	PPB	4.0	09/28/98	MAC	
p,p-DDT	U	PPB	4.3	09/28/98	MAC	
DIELDRIN	U	PPB	2.6	09/28/98	MAC	
ENDOSULFAN I	U	PPB	4.1	09/28/98	MAC	
ENDOSULFAN II	U	PPB	4.7	09/28/98	MAC	
ENDOSULFAN SULFATE	U	PPB	4.7	09/28/98	MAC	
ENDRIN	U	PPB	4.7	09/28/98	MAC	
ENDRIN ALDEHYDE	U	PPB	3.9	09/28/98	MAC	
ENDRIN KETONE	U	PPB	4.7	09/28/98	MAC	
HEPTACHLOR	U	PPB	3.1	09/28/98	MAC	
HEPTACHLOR EPOXIDE	U	PPB	3.2	09/28/98	MAC	
TOXAPHENE	U	PPB	270	09/28/98	MAC	
METHOXYCHLOR	U	PPB	18	09/28/98	MAC	
PCB 1016/1242	U	PPB	230	09/28/98	MAC	
PCB 1221	U	PPB	310	09/28/98	MAC	
PCB 1232	U	PPB	280	09/28/98	MAC	
PCB 1248	U	PPB	170	09/28/98	MAC	
PCB 1254	U	PPB	210	09/28/98	MAC	
PCB 1260	U	PPB	140	09/28/98	MAC	
PCB 1262	U	PPB	140	09/28/98	MAC	

*-Water, uG/L; Sediment, uG/kG

Printed: October 5, 1998

State of Tennessee - Environmental Laboratories
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Organic Analysis
Base/Neutral/Acid Extractables

PROJECT/SITE NO. 477-559 PROJECT NAME Smokey Mtn Smelters
STATION NUMBER SMS-SB-01 COUNTY KNOX
DESCRIPTION Background Subsurface
STREAM MILE DEPTH 6-12 MATRIX soil
COLLECTED: DATE 08/31/98 TIME 11:50
SAMPLER'S NAME(printed) Burl Maupin
SAMPLING AGENCY TDSF BILLING CODE 327,38,11
IF PRIORITY, DATE NEEDED 09/30/98
SEND REPORT TO: Burl Maupin
KFAC - Superfund
CONTACT HAZARD UNKNOWN

*	NPDES Extractables	*	NPDES Extractables(con't)	*	TAL Semivolatiles
	butylbenzylphthalate	X	2-chlorophenol	X	dimethylphthalate
	bis(2-ethylhexyl)phthalate		2,4-dichlorophenol	X	4,6-dinitro-2-methylphenol
	di-n-butylphthalate		2,4-dimethylphenol	X	2,4-dinitrophenol
	di-n-octylphthalate		2,4-dinitrophenol	X	2,4-dinitrotoluene
	diethylphthalate		4,6-dinitro-o-cresol	X	2,6-dinitrotoluene
	dimethylphthalate		2-nitrophenol	X	fluoranthene
X	n-nitrosodimethylamine		4-nitrophenol	X	fluorene
	n-nitrosodiphenylamine		pentachlorophenol	X	hexachlorobenzene
	n-nitrosodi-n-propylamine		phenol	X	hexachlorobutadiene
	isophorone		2,4,6-trichlorophenol	X	hexachlorocyclopentadiene
	nitrobenzene	*	TAL Semivolatiles	X	hexachloroethane
	2,4-dinitrotoluene	X	acenaphthene	X	indeno(1,2,3-cd)pyrene
	acenaphthene	X	acenaphthylene	X	isophorone
	acenaphthylene	X	anthracene	X	2-methylnaphthalene
	anthracene	X	benzo(a)anthracene	X	2-methylphenol
	benzo(a)anthracene	X	benzo(a)pyrene	X	4-methylphenol
	benzo(a)pyrene	X	benzo(b)fluoranthene	X	n-nitrosodiphenylamine
	benzo(b)fluoranthene	X	benzo(g,h,i)perylene	X	n-nitroso-n-dipropylamine
	benzo(g,h,i)perylene	X	benzo(k)fluoranthene	X	naphthalene
	benzo(k)fluoranthene	X	benzoic acid	X	2-nitroaniline
	chrysene	X	benzyl alcohol	X	3-nitroaniline
	dibenzo(a,h)anthracene	X	bis(2-chloroethoxy)methane	X	4-nitroaniline
	fluoranthene	X	bis(2-chloroethyl) ether	X	nitrobenzene
	fluorene	X	bis(2-chloroisopropyl)ether	X	2-nitrophenol
	indeno(1,2,3-c,d)pyrene	X	bis(2-ethylhexyl)phthalate	X	4-nitrophenol
	naphthalene	X	4-bromophenylphenylether	X	pentachlorophenol
	phenanthrene	X	butylbenzylphthalate	X	phenanthrene
	pyrene	X	4-chloroaniline	X	phenol
	bis(2-chloroethyl)ether	X	4-chloro-3-methyl phenol	X	pyrene
	bis(2-chloroethoxy)methane	X	2-chloronaphthalene	X	1,2,4-trichlorobenzene
	bis(2-chloroisopropyl)ether	X	4-chlorophenylphenylether	X	2,4,5-trichlorophenol
	4-bromophenylphenylether	X	chrysene	X	2,4,6-trichlorophenol
	4-chlorophenylphenylether	X	di-n-butylphthalate	*	Nitrobodies
	hexachlorocyclopentadiene	X	di-n-octylphthalate		RDX
	hexachlorobutadiene	X	dibenzo(a,h)anthracene		2,4,6-TNT
	hexachlorobenzene	X	dibenzofuran		2,4-dinitrotoluene
	hexachloroethane	X	3,3'-dichlorobenzidine		2,6-dinitrotoluene
	1,2,4-trichlorobenzene	X	2,4-dichlorophenol		nitrobenzene
	2-chloronaphthalene	X	diethylphthalate		1,3,5-TNB
	4-chloro-3-methyl phenol	X	2,4-dimethylphenol		

*	TCLP Semivolatiles
	chlordane
	o-cresol
	m-cresol
	p-cresol
	cresol
	2,4-D
	2,4-dinitrotoluene
	endrin
	heptachlor
	heptachlor epoxide
	hexachlorobenzene
	hexachlorobutadiene
	hexachloroethane
	lindane
	methoxychlor
	nitrobenzene
	pentachlorophenol
	pyridine
	toxaphene
	2,4,5-trichlorophenol
	2,4,6-trichlorophenol
	2,4,5-TP (Silvex)
*	Pesticides/PCBs
X	aldrin
X	alpha-BHC
X	beta-BHC
X	delta-BHC
X	gamma-BHC (lindane)
X	technical chlordane
X	alpha-chlordane
X	gamma-chlordane
X	4,4'-DDD
X	4,4'-DDE
X	4,4'-DDT
X	dieldrin
X	endosulfan I
X	endosulfan II
X	endosulfan sulfate
X	endrin
X	endrin aldehyde
X	endrin ketone
X	heptachlor
X	heptachlor epoxide
X	toxaphene
X	methoxychlor
X	PCB 1016/1242
X	PCB 1221
X	PCB 1232
X	PCB 1248
X	PCB 1254
X	PCB 1260
X	PCB 1262

Laboratory Number

Branch Lab Number

Chain of Custody and Supplemental Information

Only one chain of custody form is required per sample set or point (if all collected at the same time)

1. Collected by BHM & BHW
   Date 8/31/98 Time 11:50
   Delivered to Knoxville LAB
   Date 8/31/98 Time 2:15
2. Received by
   Date Time
   Delivered to
   Date Time
3. Received by
   Date Time
   Delivered to
   Date Time
4. Received in Lab by [illegible]
   Date 8-31-98 Time 14:15
   Logged in by
   Date Time

Additional Information

1. Approximate volume of sample 1 gallon
2. Nearest town or city Knoxville
3. Others present at collection no
4. Number of other samples collected at same time at this point 3
5. Field collection procedure, handling and/or preservation of this sample According to EPA procedures
6. Mode of transportation to lab in cooler on ice, in State vehicle
7. Sample sealed by
8. Date sample sealed
9. Remarks

Project/Site No.: 47-559
Project Name: SMOKEY MTN SMELTERS
Site Description: SMS-SB-01/BACKGROUND SUBS.
Station No.: SMS-SB-01
Collected: 08/31/98 11:50:00 By BHM
unty: 47

Lab Number: 9808275-04E
Matrix: SOIL
Received: 08/31/98 14:15:00 By LAB
Sampling Agency: HWM_11_KFO
Priority: 9_30_98

SEP 14 1998

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
VOLATILES-TAL SEDIMENTS						8260A
ACETONE	U	PPB	25	09/04/98	HMG	
BENZENE	U	PPB	2.5	09/04/98	HMG	
BROMODICHLOROMETHANE	U	PPB	2.5	09/04/98	HMG	
BROMOFORM	U	PPB	2.5	09/04/98	HMG	
BROMOMETHANE	U	PPB	5.0	09/04/98	HMG	
2-BUTANONE (MEK)	U	PPB	25	09/04/98	HMG	
CARBON DISULFIDE	U	PPB	5.0	09/04/98	HMG	
CARBON TETRACHLORIDE	U	PPB	2.5	09/04/98	HMG	
VINYL ACETATE	U	PPB	5.0	09/04/98	HMG	
CHLOROBENZENE	U	PPB	2.5	09/04/98	HMG	
CHLOROETHANE	U	PPB	5.0	09/04/98	HMG	
CHLOROFORM	U	PPB	2.5	09/04/98	HMG	
CHLOROMETHANE	U	PPB	5.0	09/04/98	HMG	
DIBROMOCHLOROMETHANE	U	PPB	2.5	09/04/98	HMG	
1,2-DICHLOROBENZENE	U	PPB	2.5	09/04/98	HMG	
1,3-DICHLOROBENZENE	U	PPB	2.5	09/04/98	HMG	
1,4-DICHLOROBENZENE	U	PPB	2.5	09/04/98	HMG	
DICHLORODIFLUOROMETHANE	U	PPB	5.0	09/04/98	HMG	
1,1-DICHLOROETHANE	U	PPB	2.5	09/04/98	HMG	
1,2-DICHLOROETHANE	U	PPB	2.5	09/04/98	HMG	
1,1-DICHLOROETHENE	U	PPB	2.5	09/04/98	HMG	
CIS-1,2-DICHLOROETHENE	U	PPB	2.5	09/04/98	HMG	
TRANS-1,2-DICHLOROETHENE	U	PPB	2.5	09/04/98	HMG	
1,2-DICHLOROPROPANE	U	PPB	2.5	09/04/98	HMG	
CIS-1,3-DICHLOROPROPENE	U	PPB	2.5	09/04/98	HMG	
TRANS-1,3-DICHLOROPROPENE	U	PPB	2.5	09/04/98	HMG	
ETHYLBENZENE	U	PPB	2.5	09/04/98	HMG	
METHYLENE CHLORIDE	B 9.0	PPB	2.5	09/04/98	HMG	
4-METHYL-2-PENTANONE (MIBK)	U	PPB	25	09/04/98	HMG	
STYRENE	U	PPB	2.5	09/04/98	HMG	
2-HEXANONE	U	PPB	5.0	09/04/98	HMG	
1,1,2,2-TETRACHLOROETHANE	U	PPB	2.5	09/04/98	HMG	
TETRACHLOROETHENE	U	PPB	2.5	09/04/98	HMG	
TOLUENE	U	PPB	2.5	09/04/98	HMG	
1,1,1-TRICHLOROETHANE	U	PPB	2.5	09/04/98	HMG	
1,1,2-TRICHLOROETHANE	U	PPB	2.5	09/04/98	HMG	
TRICHLOROETHENE	U	PPB	2.5	09/04/98	HMG	
TRICHLOROFLUOROMETHANE	U	PPB	5.0	09/04/98	HMG	
VINYL CHLORIDE	U	PPB	5.0	09/04/98	HMG	
o-XYLENE	U	PPB	2.5	09/04/98	HMG	
m&p-XYLENE	U	PPB	2.5	09/04/98	HMG	

*-Water, uG/L; Sediment, uG/kG

Printed: September 8, 1998

ALSO CONFIRMED: alpha-PINENE ; CAMPHENE.

State of Tennessee - Environmental Laboratories

PLEASE PRINT LEGIBLY

Organic Analysis

Volatiles and Petroleum Hydrocarbons

PROJECT/SITE NO. 47-559	PROJECT NAME Smokey Mtn SMP
STATION NUMBER SMS-SB-01	COUNTY KNOX
DESCRIPTION Background Subsurface Soil	
STREAM MILE	DEPTH 6-12 inches MATRIX
COLLECTED: DATE 8/31/98	TIME 11:50
SAMPLER'S NAME(printed) Burl Maupin	
SAMPLING AGENCY TDSF	BILLING CODE 327.38.11
IF PRIORITY, DATE NEEDED 09/30/98	
SEND REPORT TO: Burl Maupin KCAC - Superfund	
CONTACT HAZARD UNKNOWN	

*	NPDES Volatiles - 624	*	TAL Volatiles - 8260A	*	TCLP Volatiles
	Bromoform	X	Chloromethane		Benzene
	Bromodichloromethane	X	Bromomethane		Carbon tetrachloride
	Carbon Tetrachloride	X	Vinyl chloride		Chlorobenzene
	Chlorobenzene	X	Chloroethane		Chloroform
	Chloroethane	X	Methylene chloride		1,2-Dichloroethane
X	2-Chloroethylvinyl ether	X	Acetone		1,1-Dichloroethane
	Chloroform	X	Carbon disulfide		Methyl ethyl ketone
	Chloromethane	X	1,1-Dichloroethene		Tetrachloroethene
	Dibromochloromethane	X	1,1-Dichloroethane		Trichloroethene
X	1,2-Dichlorobenzene	X	Cis-1,2-dichloroethene		Vinyl chloride
X	1,3-Dichlorobenzene	X	Trans-1,2-dichloroethene	*	BTEX - 8260A - UST
X	1,4-Dichlorobenzene	X	1,2-Dichloroethane		Benzene
X	Dichlorodifluoromethane	X	Chloroform		Toluene
	1,1-Dichloroethane	X	2-Butanone		Ethyl benzene
	1,2-Dichloroethane	X	1,1,1-Trichloroethane		o-Xylene
	1,1-Dichloroethene	X	Carbon tetrachloride		m-Xylene
	Cis-1,2-dichloroethene	X	Vinyl acetate		p-Xylene
	Trans-1,2-dichloroethene	X	Bromodichloromethane		Methyl t-butyl ether
	1,2-Dichloropropane	X	1,2-Dichloropropane		Diisopropyl ether
	Cis-1,3-dichloropropene	X	Cis-1,3-dichloropropane	*	TPH by GC
	Trans-1,2-dichloroethene	X	Trichloroethene		Gasoline Range Organics
	Methylene chloride	X	Dibromochloromethane		Diesel Range Organics
	1,1,2,2-Tetrachloroethane	X	1,1,2-Trichloroethane	*	TPH by IR (418.1)
	Tetrachloroethene	X	Benzene		418.1 - Waste Oil
	1,1,1-Trichloroethane	X	Trans-1,3-dichloropropene	*	Other
	1,1,2-Trichloroethane	X	Bromoform		
	Trichloroethene	X	4-Methyl-2-pentanone		
X	Trichlorofluoromethane	X	2-Hexanone		
	Vinyl chloride	X	Tetrachloroethene		
	Benzene	X	Toluene		
	Ethylbenzene	X	1,1,2,2-Tetrachloroethane		
	Toluene	X	Chlorobenzene		
	o-Xylene	X	Ethyl benzene		
	m-Xylene	X	Styrene		
	p-Xylene	X	o-Xylene		
		X	m-Xylene		
		X	p-Xylene		

Liters

Laboratory Number

Branch Lab Number

Chain of Custody and Supplemental Information

Only one chain of custody form is required per sample set or point (if all collected at the same time)

1. Collected by BHM + BHW
   Date 8/31/98 Time 11:50
   Delivered to KNOX LAB
   Date 8/31/98 Time 2:15
2. Received by
   Date Time
   Delivered to
   Date Time
3. Received by
   Date Time
   Delivered to
   Date Time
4. Received in Lab by [signature]
   Date 8-31-98 Time 14:15
   Logged in by
   Date Time

Additional Information

1. Approximate volume of sample 4oz
2. Nearest town or city KNOXVILLE
3. Others present at collection NU
4. Number of other samples collected at same time at this point 3
5. Field collection procedure, handling and/or preservation of this sample According to EPA procedures
6. Mode of transportation to lab in cooler, on ice, in State vehicle
7. Sample sealed by
8. Date sample sealed
9. Remarks

Project/Site No.:	47-559	Lab Number:	9808275-04G
Project Name:	SMOKEY MTN SMELTERS	Matrix:	SOIL
Description:	SMS-SB-01/BACKGROUND SUBS.	Received:	08/31/98 14:15:00 By LAB
Station No.:	SMS-SB-01	Sampling Agency:	HWM_11_KFO
Collected:	08/31/98 11:50:00 By BHM	Priority:	9_30_98
County:	47		

TEST	RESULT	*ERROR	UNITS	ANALYZED	BY	METHOD
GAMMA RADIONUCLIDES						R.6
K-40	6.41	0.48	pCi/g dry wt	09/03/98	AK	
Pb-214	1.44	0.11	pCi/g dry wt	09/03/98	AK	
Bi-214	1.489	0.090	pCi/g dry wt	09/03/98	AK	
Pb-212	1.536	0.060	pCi/g dry wt	09/03/98	AK	
Ac-228	1.50	0.11	pCi/g dry wt	09/03/98	AK	
Tl-208	0.578	0.050	pCi/g dry wt	09/03/98	AK	
Bi-212	0.91	0.24	pCi/g dry wt	09/03/98	AK	
Cs-137	0.106	0.030	pCi/g dry wt	09/03/98	AK	
GROSS ALPHA & BETA						R.1.3
GROSS ALPHA	2.13	0.81	pCi/g DRY WT.	09/10/98	NLF	
GROSS BETA	13.3	1.5	pCi/g DRY WT.	09/10/98	NLF	

*--Represents +/- error value

Printed: September 10, 1998

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Radiochemical Analysis

PROJECT/SITE NO.	PROJECT NAME Smokey Mtn Smelters
STATION NUMBER SMS-SB-01	COUNTY KNOX
DESCRIPTION BACKGROUND Subsurface soil	
STREAM MILE	DEPTH 6 to 12 inches
COLLECTED: DATE 8/31/98	TIME 11:50
PICK-UP DATE:	
CONTACT HAZARD UNKNOWN	mR/hr Reading 0.01
SAMPLER'S NAME (printed) Burl Maupin	
SAMPLING AGENCY TDSF	BILLING CODE 327, 38, 11
IF PRIORITY, DATE NEEDED 09/30/98	
SEND REPORT TO: Burl Maupin	
KEAC — Superfund	

Laboratory Number

Branch Lab Number

Date Received

Time Received **By**

Sample Type

___Air ___Milk ___Swipe
___Water ___Tissue ___Liquid
___Sludge X Soil ___Solid
___Vegetation ___Sediment

Other _____

Field Comments:

Air Samples
Volume _____
Total Hours _____

___Sample Filtration
___Sample Acidification
___Send to RESL

REQUESTED ANALYSES:

X	GROSS ALPHA (TOTAL)		STRONTIUM 89
	GROSS ALPHA (SUSPENDED)		STRONTIUM 90
	GROSS ALPHA (DISSOLVED)		TRITIUM (H-3)
X	GROSS BETA (TOTAL)		THORIUM (TOTAL)
	GROSS BETA (SUSPENDED)		URANIUM (TOTAL)
	GROSS BETA (DISSOLVED)	X	GAMMA RADIONUCLIDES
			ADDITIONAL ANALYSES:

Chain of Custody and Supplemental Information

Only one chain of custody form is required per sample set or point (if all collected at the same time)

1. Collected by BHM + BHW
   Date 8/31/98 Time 11:50
   Delivered to KNOX LAB
   Date 8/31/98 Time 2:15
2. Collected by
   Date Time
   Delivered to
   Date Time
3. Collected by
   Date Time
   Delivered to
   Date Time
4. Received in Lab by [signature]
   Date 8-31-98 Time 14:11
   Logged in by
   Date Time

Additional Information

1. Approximate volume of sample 16 oz
2. Nearest town or city Knoxville
3. Others present at collection No
4. Number of other samples collected at same time at this point 3
5. Field collection procedure, handling and/or preservation of this sample
   According to EPA procedure
6. Mode of transportation to lab in coolers on ice, in State vehicle
7. Sample sealed by
8. Date sample sealed
9. Remarks

Project/Site No.: 47-559
Project Name: SMOKEY MOUNTAIN SMELTERS
Description: SMS-SB-02/TRANSFORMER STA.
Station No.: SMS-SB-02
Collected: 08/25/98 11:20:00 By BHM
County: 47

Lab Number: 9808247-01
Matrix: SOIL
Received: 08/26/98 10:00:00 By PMB
Sampling Agency: HWM_11_KFO
Priority:

TEST	RESULT	UNITS	LIMIT	ANALYZED	BY	METHOD
AMMONIA	13.7	mg/kg	10	09/15/98	SAL	A.18.2
CYANIDE	U	mg/kg	1.0	09/18/98	LKS	A.9
ALUMINUM	20100	mg/kg	10	10/01/98	JAH	
ANTIMONY	U	mg/kg	0.6	10/08/98	JAH	
ARSENIC	4.3	mg/kg	0.2	10/05/98	JAH	
BARIUM	53	mg/kg	10	10/01/98	JAH	
BERYLLIUM	2	mg/kg	1	09/30/98	JAH	
CADMIUM	U	mg/kg	0.5	09/11/98	JAH	
CALCIUM	14500	mg/kg	3	10/02/98	JAH	
CHROMIUM	36	mg/kg	1	09/23/98	JAH	
COBALT	10	mg/kg	1	09/15/98	JAH	
COPPER	40	mg/kg	1	09/16/98	JAH	
DIGESTION-METALS	COMPLETED	COMPLETED		09/10/98	EAM	
IRON	44000	mg/kg	5	09/16/98	JAH	
LEAD	26	mg/kg	4	09/15/98	JAH	
MAGNESIUM	2250	mg/kg	2	10/02/98	JAH	
MANGANESE	265	mg/kg	1	09/16/98	JAH	
MERCURY	U	mg/kg	0.1	09/11/98	ATB	EPA 245.5
METALS PREP-SOLIDS/WASTES	COMPLETED	COMPLETED		08/28/98	EAM	
NICKEL	19	mg/kg	2	09/11/98	JAH	
PERCENT SOLIDS	79.8	%		09/08/98	SDS	
POTASSIUM	1240	mg/kg	2	10/02/98	JAH	
SELENIUM	U	mg/kg	0.4	10/07/98	JAH	

Project/Site No.: 47-559
Project Name: SMOKEY MOUNTAIN SMELTERS
Description: SMS-SB-02/TRANSFORMER STA.
Station No.: SMS-SB-02
Collected: 08/25/98 11:20:00 By BHM
County: 47

Lab Number: 9808247-01
Matrix: SOIL
Received: 08/26/98 10:00:00 By PMB
Sampling Agency: HWM_11_KFO
Priority:

TEST	RESULT	UNITS	LIMIT	ANALYZED	BY	METHOD
SILVER	U	mg/kg	1	09/15/98	JAH	
SODIUM	118	mg/kg	10	10/02/98	JAH	
THALLIUM	U	mg/kg	5	09/15/98	JAH	
VANADIUM	35	mg/kg	20	10/01/98	JAH	
ZINC	118	mg/kg	0.5	09/15/98	JAH	

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Inorganic Analysis

PROJECT/SITE NO. 47-559		PROJECT NAME Smokey Mountain Smelters	
STATION NUMBER SMS-SB-02		COUNTY Knox	
DESCRIPTION at transformer station			
STREAM MILE	DEPTH	MATRIX soil	
COLLECTED: DATE August 25, 1998		TIME 11:20	
SAMPLER'S NAME(printed) Burl H. Maupin			
SAMPLING AGENCY Division of Superfund		BILLING CODE 327.38-11	
IF PRIORITY, DATE NEEDED September 25, 1998			
SEND REPORT TO: Knoxville Environmental Assisstance Center			
Burl H. Maupin			
CONTACT HAZARD metals, radiochemical, unknown			

*	Metals
x	aluminum, Al
x	antimony, Sb
x	arsenic, As
x	barium, Ba
x	beryllium, Be
x	cadmium, Cd
x	calcium, Ca
x	chromium, Cr
x	cobalt, Co
x	copper, Cu
x	iron, Fe
x	lead, Pb
x	magnesium, Mg
x	manganese, Mn
x	mercury, Hg
x	nickel, Ni
x	potassium, K
x	selenium, Se
x	silver, Ag
x	sodium, Na
x	thallium, Tl
x	vanadium, V
x	zinc, Zn

*	Env. Microbiology	*	General Inorganics		Gen. Inorganics (con't)
	coliform, fecal*		acidity as $CaCO_3$*		oil and grease
	coliform, total*		alkalinity as $CaCO_3$*		orthophosphate, total*
	strep, fecal*		alkalinity, phen. as $CaCO_3$*		oxygen, dissolved*
			BOD, 5-day*		pH
			CBOD, 5-day*		phenols, total
			boron		phosphate, total
*	**Ambient Parameters**		chloride*		residue, dissolved*
	COD*		chlorine, residual*		residue, settleable*
	coliform, fecal		chromium, hexavalent		residue, suspended*
	conductivity*		COD*		residue, total*
	hardness, total as $CaCO_3$*		color, apparent*		silica*
	nitrogen, ammonia		color, true*		sulfate*
	nitrogen, NO_3 & NO_2		conductivity*		sulfide, total*
	nitrogen, total Kjeldahl	x	cyanide		TOC*
	phosphate, total		flash point*		turbidity*
	pH		fluoride*		percent solids
	residue, dissolved*		hardness, Ca as $CaCO_3$*	*	**Other**
	residue, suspended*		hardness, total as $CaCO_3$*		
	arsenic, As		hydrocarbons, total		
	cadmium, Cd		MBAS*		
	chromium, Cr	x	nitrogen, ammonia		
	copper, Cu		nitrogen, nitrate*		
	lead, Pb		nitrogen, nitrite*		
	mercury, Hg		nitrogen, NO_3 & NO_2		
	nickel, Ni		nitrogen, total Kjeldahl		
	zinc, Zn		nitrogen, total organic		

*	TCLP
	arsenic, As
	barium, Ba
	cadmium, Cd
	chromium, Cr
	lead, Pb
	mercury, Hg
	nickel, Ni
	selenium, Se
	silver, Ag

** denotes analyses performed only on water*

FIELD DETERMINATIONS	Temperature
pH	Chlorine, residual
Conductivity	Other
Dissolved Oxygen	

Laboratory Number

Branch Lab Number

Chain of Custody and Supplemental Information

Only one chain of custody form is required per sample set or point (if all collected at the same time)

1. Collected by Chris A. Andel
   Date August 25, 1998 Time 11:20
   Delivered to Knoxville Basin Laboratory
   Date August 25, 1998 Time 1000
2. Received by
   Date Time
   Delivered to
   Date Time
3. Received by
   Date Time
   Delivered to
   Date Time
4. Received in Lab by P Barbere
   Date 8/26/98 Time 1000
   Logged in by
   Date Time

Additional Information

1. Approximate volume of sample
   16 oz.
2. Nearest town or city Knoxville
3. Others present at collection ~~Burl H. Maupin~~ Beth Walker
4. Number of other samples collected at same time at this point 3
5. Field collection procedure, handling and/or preservation of this sample
   According to standard operating procedure
6. Mode of transportation to lab
   State vehicle; on ice
7. Sample sealed by
8. Date sample sealed
9. Remarks

PH-3011 (rev 1/96)

RDA 1527

OCT 19 1998

Project/Site No.: 47-559
Project Name: SMOKEY MOUNTAIN SMELTERS
Description: SMS-SB-02/TRANSFORMER STA.
Station No.: SMS-SB-02
Collected: 08/25/98 11:20:00 By BHM
County: 47

Lab Number: 9808247-01F
Matrix: SOIL
Received: 08/26/98 10:00:00 By PMB
Sampling Agency: HWM_11_KFO
Priority:

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
B/N/A EXTR+PESTS,PCBS-SOIL						MS+ECD
BUTYL BENZYL PHTHALATE	U	PPB	97	09/30/98	MAC	
BIS(2-ETHYLHEXYL)PHTHALATE	B 58.2	PPB	-	09/30/98	MAC	
DI-n-BUTYL PHTHALATE	U	PPB	97	09/30/98	MAC	
DI-n-OCTYL PHTHALATE	U	PPB	190	09/30/98	MAC	
DIETHYL PHTHALATE	B 116	PPB	-	09/30/98	MAC	
DIMETHYL PHTHALATE	U	PPB	49	09/30/98	MAC	
n-NITROSODIMETHYLAMINE	U	PPB	190	09/30/98	MAC	
n-NITROSODIPHENYLAMINE	U	PPB	97	09/30/98	MAC	
n-NITROSO-di-n-PROPYLAMINE	U	PPB	97	09/30/98	MAC	
ISOPHORONE	U	PPB	49	09/30/98	MAC	
NITROBENZENE	U	PPB	97	09/30/98	MAC	
2,4-DINITROTOLUENE	U	PPB	190	09/30/98	MAC	
2,6-DINITROTOLUENE	U	PPB	190	09/30/98	MAC	
ACENAPTHENE	U	PPB	49	09/30/98	MAC	
ACENAPHTHYLENE	U	PPB	49	09/30/98	MAC	
ANTHRACENE	U	PPB	49	09/30/98	MAC	
BENZO(a)ANTHRACENE	U	PPB	49	09/30/98	MAC	
BENZO(a)PYRENE	U	PPB	49	09/30/98	MAC	
BENZO(b)FLUORANTHENE	U	PPB	49	09/30/98	MAC	
BENZO(ghi)PERYLENE	U	PPB	190	09/30/98	MAC	
BENZO(k)FLUORANTHENE	U	PPB	49	09/30/98	MAC	
DIBENZO(a,h)ANTHRACENE	U	PPB	190	09/30/98	MAC	
FLUORANTHENE	U	PPB	49	09/30/98	MAC	
FLUORENE	U	PPB	49	09/30/98	MAC	
INDENO(1,2,3-cd)PYRENE	U	PPB	190	09/30/98	MAC	
NAPHTHALENE	U	PPB	49	09/30/98	MAC	
PHENANTHRENE	U	PPB	49	09/30/98	MAC	
PYRENE	U	PPB	49	09/30/98	MAC	
CHRYSENE	U	PPB	49	09/30/98	MAC	
BIS(2-CHLOROETHYL)ETHER	U	PPB	97	09/30/98	MAC	
BIS(2-CHLOROETHOXY)METHANE	U	PPB	49	09/30/98	MAC	
BIS(2-CHLOROISOPROPYL)ETHER	U	PPB	190	09/30/98	MAC	
4-BROMOPHENYLPHENYL ETHER	U	PPB	190	09/30/98	MAC	
4-CHLOROPHENYLPHENYL ETHER	U	PPB	97	09/30/98	MAC	
HEXACHLOROCYCLOPENTADIENE	U	PPB	490	09/30/98	MAC	
HEXACHLOROBUTADIENE	U	PPB	97	09/30/98	MAC	
HEXACHLOROBENZENE	U	PPB	97	09/30/98	MAC	
HEXACHLOROETHANE	U	PPB	97	09/30/98	MAC	
1,2,4-TRICHLOROBENZENE	U	PPB	97	09/30/98	MAC	
2-CHLORONAPHTHALENE	U	PPB	49	09/30/98	MAC	
4-CHLORO-3-METHYLPHENOL	U	PPB	97	09/30/98	MAC	
2-CHLOROPHENOL	U	PPB	49	09/30/98	MAC	
2,4-DICHLOROPHENOL	U	PPB	97	09/30/98	MAC	
2,4-DIMETHYLPHENOL	U	PPB	97	09/30/98	MAC	
2,4-DINITROPHENOL	U	PPB	970	09/30/98	MAC	
2-METHYL-4,6-DINITROPHENOL	U	PPB	490	09/30/98	MAC	
2-NITROPHENOL	U	PPB	190	09/30/98	MAC	
4-NITROPHENOL	U	PPB	490	09/30/98	MAC	
PENTACHLOROPHENOL	U	PPB	190	09/30/98	MAC	
PHENOL	U	PPB	49	09/30/98	MAC	
2,4,6-TRICHLOROPHENOL	U	PPB	97	09/30/98	MAC	
2,4,5-TRICHLOROPHENOL	U	PPB	97	09/30/98	MAC	
O-CRESOL	U	PPB	97	09/30/98	MAC	
M- & P-CRESOL	U	PPB	49	09/30/98	MAC	
2-METHYLNAPHTHALENE	U	PPB	49	09/30/98	MAC	
BENZOIC ACID	U	PPB	190	09/30/98	MAC	
BENZYL ALCOHOL	U	PPB	190	09/30/98	MAC	
4-CHLOROANILINE	U	PPB	97	09/30/98	MAC	
DIBENZOFURAN	U	PPB	49	09/30/98	MAC	
3,3-DICHLOROBENZIDINE	U	PPB	190	09/30/98	MAC	
2-NITROANILINE	U	PPB	190	09/30/98	MAC	
3-NITROANILINE	U	PPB	190	09/30/98	MAC	
4-NITROANILINE	U	PPB	490	09/30/98	MAC	
HEXACHLOROBENZENE	U	PPB	1.9	09/30/98	MAC	
ALDRIN	U	PPB	2.5	09/30/98	MAC	
alpha-BHC	U	PPB	4.5	09/30/98	MAC	
beta-BHC	U	PPB	6.6	09/30/98	MAC	
delta-BHC	U	PPB	6.5	09/30/98	MAC	
gamma-BHC (LINDANE)	U	PPB	2.5	09/30/98	MAC	
alpha-CHLORDANE	11.2	PPB	-	09/30/98	MAC	
gamma-CHLORDANE	81.8	PPB	-	09/30/98	MAC	
TECHNICAL CHLORDANE	U	PPB	39	09/30/98	MAC	
p,p-DDD	U	PPB	4.7	09/30/98	MAC	

Project/Site No.: 47-559
Project Name: SMOKEY MOUNTAIN SMELTERS
Description: SMS-SB-02/TRANSFORMER STA.
Station No.: SMS-SB-02
Collected: 08/25/98 11:20:00 By BHM
nty: 47

Lab Number: 9808247-01F
Matrix: SOIL
Received: 08/26/98 10:00;00 By PMB
Sampling Agency: HWM_11_KFO
Priority:

OCT 13 1998

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
B/N/A EXTR+PESTS,PCBS-SOIL						MS+ECD
p,p-DDE	U	PPB	4.1	09/30/98	MAC	
p,p-DDT	U	PPB	4.4	09/30/98	MAC	
DIELDRIN	602	PPB	-	09/30/98	MAC	
ENDOSULFAN I	U	PPB	4.2	09/30/98	MAC	
ENDOSULFAN II	U	PPB	4.8	09/30/98	MAC	
ENDOSULFAN SULFATE	U	PPB	4.8	09/30/98	MAC	
ENDRIN	U	PPB	4.8	09/30/98	MAC	
ENDRIN ALDEHYDE	U	PPB	7.9	09/30/98	MAC	
ENDRIN KETONE	U	PPB	18	09/30/98	MAC	
HEPTACHLOR	27.8	PPB	-	09/30/98	MAC	
HEPTACHLOR EPOXIDE	54.3	PPB	-	09/30/98	MAC	
TOXAPHENE	U	PPB	280	09/30/98	MAC	
METHOXYCHLOR	U	PPB	18	09/30/98	MAC	
PCB 1016/1242	U	PPB	240	09/30/98	MAC	
PCB 1221	U	PPB	320	09/30/98	MAC	
PCB 1232	U	PPB	280	09/30/98	MAC	
PCB 1248	U	PPB	180	09/30/98	MAC	
PCB 1254	U	PPB	220	09/30/98	MAC	
PCB 1260	U	PPB	140	09/30/98	MAC	
PCB 1262	U	PPB	140	09/30/98	MAC	

*-Water, uG/L; Sediment, uG/kG

Printed: October 5, 1998

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Organic Analysis
Base/Neutral/Acid Extractables

PROJECT/SITE NO. 47559	PROJECT NAME Smokey Mtn. Smelters
STATION NUMBER SMS-SB-02	COUNTY Knox
DESCRIPTION at transformer station	
STREAM MILE	DEPTH / MATRIX soil
COLLECTED: DATE 8-25-98	TIME 11:20
SAMPLER'S NAME(printed) ~~Bernard Memphis~~ Chris Andol	
SAMPLING AGENCY DSF	BILLING CODE 327-3811
IF PRIORITY, DATE NEEDED 9-25-98	
SEND REPORT TO: KEAC	
CONTACT HAZARD metals, radiochemical, unknown	

*	NPDES Extractables	*	NPDES Extractables(con't)	*	TAL Semivolatiles
	butylbenzylphthalate	X	2-chlorophenol	X	dimethylphthalate
	bis(2-ethylhexyl)phthalate		2,4-dichlorophenol	X	4,6-dinitro-2-methylphenol
	di-n-butylphthalate		2,4-dimethylphenol	X	2,4-dinitrophenol
	di-n-octylphthalate		2,4-dinitrophenol	X	2,4-dinitrotoluene
	diethylphthalate		4,6-dinitro-o-cresol	X	2,6-dinitrotoluene
	dimethylphthalate		2-nitrophenol	X	fluoranthene
X	n-nitrosodimethylamine		4-nitrophenol	X	fluorene
	n-nitrosodiphenylamine		pentachlorophenol	X	hexachlorobenzene
	n-nitrosodi-n-propylamine		phenol	X	hexachlorobutadiene
	isophorone		2,4,6-trichlorophenol	X	hexachlorocyclopentadiene
	nitrobenzene	*	TAL Semivolatiles	X	hexachloroethane
	2,4-dinitrotoluene	X	acenaphthene	X	indeno(1,2,3-cd)pyrene
	acenaphthene	X	acenaphthylene	X	isophorone
	acenaphthylene	X	anthracene	X	2-methylnaphthalene
	anthracene	X	benzo(a)anthracene	X	2-methylphenol
	benzo(a)anthracene	X	benzo(a)pyrene	X	4-methylphenol
	benzo(a)pyrene	X	benzo(b)fluoranthene	X	n-nitrosodiphenylamine
	benzo(b)fluoranthene	X	benzo(g,h,i)perylene	X	n-nitroso-n-dipropylamine
	benzo(g,h,i)perylene	X	benzo(k)fluoranthene	X	naphthalene
	benzo(k)fluoranthene	X	benzoic acid	X	2-nitroaniline
	chrysene	X	benzyl alcohol	X	3-nitroaniline
	dibenzo(a,h)anthracene	X	bis(2-chloroethoxy)methane	X	4-nitroaniline
	fluoranthene	X	bis(2-chloroethyl) ether	X	nitrobenzene
	fluorene	X	bis(2-chloroisopropyl)ether	X	2-nitrophenol
	indeno(1,2,3-c,d)pyrene	X	bis(2-ethylhexyl)phthalate	X	4-nitrophenol
	naphthalene	X	4-bromophenylphenylether	X	pentachlorophenol
	phenanthrene	X	butylbenzylphthalate	X	phenanthrene
	pyrene	X	4-chloroaniline	X	phenol
	bis(2-chloroethyl)ether	X	4-chloro-3-methyl phenol	X	pyrene
	bis(2-chloroethoxy)methane	X	2-chloronaphthalene	X	1,2,4-trichlorobenzene
	bis(2-chloroisopropyl)ether	X	4-chlorophenylphenylether	X	2,4,5-trichlorophenol
	4-bromophenylphenylether	X	chrysene	X	2,4,6-trichlorophenol
	4-chlorophenylphenylether	X	di-n-butylphthalate	*	Nitrobodies
	hexachlorocyclopentadiene	X	di-n-octylphthalate		RDX
	hexachlorobutadiene	X	dibenzo(a,h)anthracene		2,4,6-TNT
	hexachlorobenzene	X	dibenzofuran		2,4-dinitrotoluene
	hexachloroethane	X	3,3'-dichlorobenzidine		2,6-dinitrotoluene
	1,2,4-trichlorobenzene	X	2,4-dichlorophenol		nitrobenzene
	2-chloronaphthalene	X	diethylphthalate		1,3,5-TNB
	4-chloro-3-methyl phenol	X	2,4-dimethylphenol		

*	TCLP Semivolatiles	*	Pesticides/PCBs
	chlordane	X	aldrin
	o-cresol	X	alpha-BHC
	m-cresol	X	beta-BHC
	p-cresol	X	delta-BHC
	cresol	X	gamma-BHC (lindane)
	2,4-D	X	technical chlordane
	2,4-dinitrotoluene	X	alpha-chlordane
	endrin	X	gamma-chlordane
	heptachlor	X	4,4'-DDD
	heptachlor epoxide	X	4,4'-DDE
	hexachlorobenzene	X	4,4'-DDT
	hexachlorobutadiene	X	dieldrin
	hexachloroethane	X	endosulfan I
	lindane	X	endosulfan II
	methoxychlor	X	endosulfan sulfate
	nitrobenzene	X	endrin
	pentachlorophenol	X	endrin aldehyde
	pyridine	X	endrin ketone
	toxaphene	X	heptachlor
	2,4,5-trichlorophenol	X	heptachlor epoxide
	2,4,6-trichlorophenol	X	toxaphene
	2,4,5-TP (Silvex)	X	methoxychlor
		X	PCB 1016/1242
		X	PCB 1221
		X	PCB 1232
		X	PCB 1248
		X	PCB 1254
		X	PCB 1260
		X	PCB 1262

Laboratory Number

Branch Lab Number

Chain of Custody and Supplemental Information

Only one chain of custody form is required per sample set or point (if all collected at the same time)

1. Collected by Chris Andol
   Date 8-25-98 Time 11:20
   Delivered to KBL
   Date 8-26-98 Time 10:00
2. Received by
   Date Time
   Delivered to
   Date Time
3. Received by
   Date Time
   Delivered to
   Date Time
4. Received in Lab by
   Date 8/26/98 Time
   Logged in by [illegible] 1100
   Date Time

Additional Information

1. Approximate volume of sample 16 oz
2. Nearest town or city Knoxville
3. Others present at collection Beth Walker
4. Number of other samples collected at same time at this point 3
5. Field collection procedure, handling and/or preservation of this sample EPA procedures and protocol
6. Mode of transportation to lab State vehicle, in cooler on ice
7. Sample sealed by
8. Date sample sealed
9. Remarks

Project/Site No.: 47-559
Project Name: SMOKEY MOUNTAIN SMELTERS
Site Description: SMS-SB-02/TRANSFORMER STA.
Station No.: SMS-SB-02
Collected: 08/25/98 11:20:00 By CAA
County: 47

Lab Number: 9808247-01E
Matrix: SOIL
Received: 08/26/98 10:00:00 By PMB
Sampling Agency: HWM_11_KFO
Priority:

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
VOLATILES-TAL SEDIMENTS						8260A
ACETONE	U	PPB	25	09/04/98	HMG	
BENZENE	U	PPB	2.5	09/04/98	HMG	
BROMODICHLOROMETHANE	U	PPB	2.5	09/04/98	HMG	
BROMOFORM	U	PPB	2.5	09/04/98	HMG	
BROMOMETHANE	U	PPB	5.0	09/04/98	HMG	
2-BUTANONE (MEK)	U	PPB	25	09/04/98	HMG	
CARBON DISULFIDE	U	PPB	5.0	09/04/98	HMG	
CARBON TETRACHLORIDE	U	PPB	2.5	09/04/98	HMG	
VINYL ACETATE	U	PPB	5.0	09/04/98	HMG	
CHLOROBENZENE	U	PPB	2.5	09/04/98	HMG	
CHLOROETHANE	U	PPB	5.0	09/04/98	HMG	
CHLOROFORM	U	PPB	2.5	09/04/98	HMG	
CHLOROMETHANE	U	PPB	5.0	09/04/98	HMG	
DIBROMOCHLOROMETHANE	U	PPB	2.5	09/04/98	HMG	
1,2-DICHLOROBENZENE	U	PPB	2.5	09/04/98	HMG	
1,3-DICHLOROBENZENE	U	PPB	2.5	09/04/98	HMG	
1,4-DICHLOROBENZENE	U	PPB	2.5	09/04/98	HMG	
DICHLORODIFLUOROMETHANE	U	PPB	5.0	09/04/98	HMG	
1,1-DICHLOROETHANE	U	PPB	2.5	09/04/98	HMG	
1,2-DICHLOROETHANE	U	PPB	2.5	09/04/98	HMG	
1,1-DICHLOROETHENE	U	PPB	2.5	09/04/98	HMG	
CIS-1,2-DICHLOROETHENE	U	PPB	2.5	09/04/98	HMG	
TRANS-1,2-DICHLOROETHENE	U	PPB	2.5	09/04/98	HMG	
1,2-DICHLOROPROPANE	U	PPB	2.5	09/04/98	HMG	
CIS-1,3-DICHLOROPROPENE	U	PPB	2.5	09/04/98	HMG	
TRANS-1,3-DICHLOROPROPENE	U	PPB	2.5	09/04/98	HMG	
ETHYLBENZENE	U	PPB	2.5	09/04/98	HMG	
METHYLENE CHLORIDE	B 21	PPB	2.5	09/04/98	HMG	
4-METHYL-2-PENTANONE (MIBK)	U	PPB	25	09/04/98	HMG	
STYRENE	U	PPB	2.5	09/04/98	HMG	
2-HEXANONE	U	PPB	5.0	09/04/98	HMG	
1,1,2,2-TETRACHLOROETHANE	U	PPB	2.5	09/04/98	HMG	
TETRACHLOROETHENE	U	PPB	2.5	09/04/98	HMG	
TOLUENE	7.5	PPB	2.5	09/04/98	HMG	
1,1,1-TRICHLOROETHANE	U	PPB	2.5	09/04/98	HMG	
1,1,2-TRICHLOROETHANE	U	PPB	2.5	09/04/98	HMG	
TRICHLOROETHENE	U	PPB	2.5	09/04/98	HMG	
TRICHLOROFLUOROMETHANE	U	PPB	5.0	09/04/98	HMG	
VINYL CHLORIDE	U	PPB	5.0	09/04/98	HMG	
o-XYLENE	U	PPB	2.5	09/04/98	HMG	
m&p-XYLENE	U	PPB	2.5	09/04/98	HMG	

*-Water, uG/L; Sediment, uG/kG

Printed: September 8, 1998

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Organic Analysis

Volatiles and Petroleum Hydrocarbons

PROJECT/SITE NO.	47-559	PROJECT NAME	SMOKY MOUNTAIN SMELTERS
STATION NUMBER	SMS-SB-02	COUNTY	KNOX
DESCRIPTION	AT TRANSFORMER STATION		
STREAM MILE		DEPTH	MATRIX SOIL
COLLECTED: DATE	AUGUST 25, 1998	TIME	11:20
SAMPLER'S NAME(printed)	CHRIS A. ANDEL		
SAMPLING AGENCY	DIVISION OF SUPERFUND	BILLING CODE	327.38-11
IF PRIORITY, DATE NEEDED	SEPTEMBER 25		
SEND REPORT TO:	KNOXVILLE ENVIRONMENTAL ASSISSTANCE CENTER		
	BURL H. MAUPIN		
CONTACT HAZARD	METALS, RADIOCHEMICAL, UNKNOWN		

*	NPDES Volatiles - 624	*	TAL Volatiles - 8260A	*	TCLP Volatiles
	Bromoform		Chloromethane		Benzene
	Bromodichloromethane		Bromomethane		Carbon tetrachloride
	Carbon Tetrachloride		Vinyl chloride		Chlorobenzene
	Chlorobenzene		Chloroethane		Chloroform
	Chloroethane		Methylene chloride		1,2-Dichloroethane
	2-Chloroethylvinyl ether		Acetone		1,1-Dichloroethane
	Chloroform		Carbon disulfide		Methyl ethyl ketone
	Chloromethane		1,1-Dichloroethene		Tetrachloroethene
	Dibromochloromethane		1,1-Dichloroethane		Trichloroethene
	1,2-Dichlorobenzene		Cis-1,2-dichloroethene		Vinyl chloride
	1,3-Dichlorobenzene		Trans-1,2-dichloroethene	*	BTEX - 8260A - UST
	1,4-Dichlorobenzene		1,2-Dichloroethane		Benzene
	Dichlorodifluoromethane		Chloroform		Toluene
	1,1-Dichloroethane		2-Butanone		Ethyl benzene
	1,2-Dichloroethane		1,1,1-Trichloroethane		o-Xylene
	1,1-Dichloroethene		Carbon tetrachloride		m-Xylene
	Cis-1,2-dichloroethene		Vinyl acetate		p-Xylene
	Trans-1,2-dichloroethene		Bromodichloromethane		Methyl t-butyl ether
	1,2-Dichloropropane		1,2-Dichloropropane		Diisopropyl ether
	Cis-1,3-dichloropropene		Cis-1,3-dichloropropane	*	TPH by GC
	Trans-1,2-dichloroethene		Trichloroethene		Gasoline Range Organics
	Methylene chloride		Dibromochloromethane		Diesel Range Organics
	1,1,2,2-Tetrachloroethane		1,1,2-Trichloroethane	*	TPH by IR (418.1)
	Tetrachloroethene		Benzene		418.1 - Waste Oil
	1,1,1-Trichloroethane		Trans-1,3-dichloropropene	*	Other
	1,1,2-Trichloroethane		Bromoform		
	Trichloroethene		4-Methyl-2-pentanone		
	Trichlorofluoromethane		2-Hexanone		
	Vinyl chloride		Tetrachloroethene		
	Benzene		Toluene		
	Ethylbenzene		1,1,2,2-Tetrachloroethane		
	Toluene		Chlorobenzene		
	o-Xylene		Ethyl benzene		
	m-Xylene		Styrene		
	p-Xylene		o-Xylene		
			m-Xylene		
			p-Xylene		

Laboratory Number

Branch Lab Number

Chain of Custody and Supplemental Information

Only one chain of custody form is required per sample set or point (if all collected at the same time)

1. Collected by CHRIS A. ANDEL
   Date AUGUST 25, 1998 Time 11:20
   Delivered to Knoxville Basin Laboratory
   Date 8-26-98 Time 10:00
2. Received by
   Date Time
   Delivered to
   Date Time
3. Received by
   Date Time
   Delivered to
   Date Time
4. Received in Lab by P. Walker
   Date 8/26/98 Time 1000
   Logged in by
   Date Time

Additional Information

1. Approximate volume of sample 4 oz.
2. Nearest town or city KNOXVILLE
3. Others present at collection BETH WALKER
4. Number of other samples collected at same time at this point *One other sample each for INORGANICS, RADIOCHEMICAL, AND EXTRACTABLE ORGANICS were collected for a total of three other samples.*
5. Field collection procedure, handling and/or preservation of this sample *according to EPA procedures and protocol*
6. Mode of transportation to lab *in State vehicle, in cooler, and on ice*
7. Sample sealed by
8. Date sample sealed
9. Remarks

SEP 30 1998

Project/Site No.: 47-559
Project Name: SMOKEY MOUNTAIN SMELTERS
Description: SMS-SB-02/TRANSFORMER STA.
Station No.: SMS-SB-02
Collected: 08/25/98 11:20:00 By BHM
County: 47

Lab Number: 9808247-01G
Matrix: SOIL
Received: 08/26/98 10:00:00 By PMB
Sampling Agency: HWM_11_KFO
Priority:

TEST	RESULT	*ERROR	UNITS	ANALYZED	BY	METHOD
GAMMA RADIONUCLIDES						R.6
K-40	24.69	0.87	pCi/g dry wet	08/31/98	AK	
Pb-214	2.97	0.16	pCi/g dry wet	08/31/98	AK	
Bi-214	2.45	0.10	pCi/g dry wet	08/31/98	AK	
Pb-212	1.880	0.070	pCi/g dry wet	08/31/98	AK	
Ac-228	1.85	0.17	pCi/g dry wet	08/31/98	AK	
Tl-208	0.639	0.060	pCi/g dry wet	08/31/98	AK	
Bi-212	1.21	0.20	pCi/g dry wet	08/31/98	AK	
GROSS ALPHA & BETA						R.1.3
GROSS ALPHA	14.4	1.9	pCi/g DRY WT.	09/09/98	NLF	
GROSS BETA	86.0	3.3	pCi/g DRY WT.	09/09/98	NLF	

*--Represents +/- error value

Printed: September 10, 1998

State of Tennessee - Environmental Laboratories

Radiochemical Analysis

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PROJECT/SITE NO. 47-559	PROJECT NAME Smokey Mountain Smelters
STATION NUMBER SMS-SB-02	COUNTY KNOX
DESCRIPTION Subsurface soil near transformer station	
STREAM MILE	DEPTH 6-12 inches
COLLECTED: DATE 8/25/98	TIME 11:20
PICK-UP DATE:	
CONTACT HAZARD UNKNOWN	mR/hr Reading 0.01
SAMPLER'S NAME (printed) Chris ANDEL	
SAMPLING AGENCY TDSF	BILLING CODE 327.38.10
IF PRIORITY, DATE NEEDED 09/26/98	
SEND REPORT TO: Burl Maupin	
KEAC - Superfund	

Sample Type

___Air ___Milk ___Swipe
___Water ___Tissue ___Liquid
___Sludge X Soil ___Solid
___Vegetation ___Sediment

Other_____

Field Comments:

Air Samples
Volume _____
Total Hours _____

___Sample Filtration
___Sample Acidification
___Send to RESL

REQUESTED ANALYSES:

X	GROSS ALPHA (TOTAL)		STRONTIUM 89
	GROSS ALPHA (SUSPENDED)		STRONTIUM 90
	GROSS ALPHA (DISSOLVED)		TRITIUM (H-3)
X	GROSS BETA (TOTAL)		THORIUM (TOTAL)
	GROSS BETA (SUSPENDED)		URANIUM (TOTAL)
	GROSS BETA (DISSOLVED)	X	GAMMA RADIONUCLIDES
			ADDITIONAL ANALYSES:

Laboratory Number

Date Received

Time Received **By**

Chain of Custody and Supplemental Information

Only one chain of custody form is required per sample set or point (if all collected at the same time)

1. Collected by CAA
   Date 8/25/98 Time 11:20
   Delivered to Knoxville LAB
   Date 8-26-98 Time 10:00
2. Collected by
   Date Time
   Delivered to
   Date Time
3. Collected by
   Date Time
   Delivered to
   Date Time
4. Received in Lab by [illegible]
   Date 8/26/98 Time 1000
   Logged in by
   Date Time

Additional Information

1. Approximate volume of sample 16 oz
2. Nearest town or city Knoxville
3. Others present at collection BHW
4. Number of other samples collected at same time at this point
5. Field collection procedure, handling and/or preservation of this sample 3, Volatiles, extractables and inorganics According to standard operating procedure
6. Mode of transportation to lab in cooler on ice in state vehicle
7. Sample sealed by
8. Date sample sealed
9. Remarks

OCT 13 1998

Project/Site No.: 47-559
Project Name: SMOKEY MOUNTAIN SMELTERS
Description: SMS-SB-03/AT TANK SUPPORT
Station No.: SMS-SB-03
Collected: 08/25/98 13:00:00 By BHM
County: 47

Lab Number: 9808247-02
Matrix: SOIL
Received: 08/26/98 10:00:00 By PMB
Sampling Agency: HWM_11_KFO
Priority:

TEST	RESULT	UNITS	LIMIT	ANALYZED	BY	METHOD
AMMONIA	30.0	mg/kg	10	09/15/98	SAL	A.18.2
CYANIDE	U	mg/kg	1.0	09/18/98	LKS	A.9
ALUMINUM	20400	mg/kg	10	10/01/98	JAH	
ANTIMONY	1.2	mg/kg	0.6	10/08/98	JAH	
ARSENIC	11.6	mg/kg	0.2	10/05/98	JAH	
BARIUM	73	mg/kg	10	10/01/98	JAH	
BERYLLIUM	2	mg/kg	1	09/30/98	JAH	
CADMIUM	1.3	mg/kg	0.5	09/11/98	JAH	
CALCIUM	16200	mg/kg	3	10/02/98	JAH	
CHROMIUM	33	mg/kg	1	09/23/98	JAH	
COBALT	10	mg/kg	1	09/15/98	JAH	
COPPER	76	mg/kg	1	09/16/98	JAH	
DIGESTION-METALS	COMPLETED	COMPLETED		09/10/98	EAM	
IRON	47100	mg/kg	5	09/16/98	JAH	
LEAD	158	mg/kg	4	09/15/98	JAH	
MAGNESIUM	1950	mg/kg	2	10/02/98	JAH	
MANGANESE	547	mg/kg	1	09/16/98	JAH	
MERCURY	0.18	mg/kg	0.1	09/11/98	ATB	EPA 245.5
METALS PREP-SOLIDS/WASTES	COMPLETED	COMPLETED		08/31/98	EAM	
NICKEL	21	mg/kg	2	09/11/98	JAH	
PERCENT SOLIDS	71.1	%		09/08/98	SDS	
POTASSIUM	3050	mg/kg	2	10/02/98	JAH	
SELENIUM	13.4	mg/kg	0.4	10/07/98	JAH	

OCT 13 1998

Project/Site No.: 47-559
Project Name: SMOKEY MOUNTAIN SMELTERS
Description: SMS-SB-03/AT TANK SUPPORT
Station No.: SMS-SB-03
Collected: 08/25/98 13:00:00 By BHM
County: 47

Lab Number: 9808247-02
Matrix: SOIL
Received: 08/26/98 10:00:00 By PMB
Sampling Agency: HWM_11_KFO
Priority:

TEST	RESULT	UNITS	LIMIT	ANALYZED	BY	METHOD
SILVER	U	mg/kg	1	09/15/98	JAH	
SODIUM	1070	mg/kg	10	10/02/98	JAH	
THALLIUM	U	mg/kg	5	09/15/98	JAH	
VANADIUM	49	mg/kg	20	10/01/98	JAH	
ZINC	299	mg/kg	0.5	09/15/98	JAH	

State of Tennessee - Environmental Laboratories

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Inorganic Analysis

PROJECT/SITE NO.	47-559	PROJECT NAME	Smokey Mountain Smelters
STATION NUMBER	SMS-SB-03	COUNTY	Knox
DESCRIPTION	at tank support		
STREAM MILE		DEPTH	MATRIX soil
COLLECTED: DATE	August 25, 1998	TIME	13:00
SAMPLER'S NAME(printed)	Chris A. Andel		
SAMPLING AGENCY	Division of Superfund	BILLING CODE	327.38-11
IF PRIORITY, DATE NEEDED	September 25, 1998		
SEND REPORT TO:	Knoxville Environmental Assisstance Center		
	Burl H. Maupin		
CONTACT HAZARD	metals, radiochemical, unknown		

*	Metals
x	aluminum, Al
x	antimony, Sb
x	arsenic, As
x	barium, Ba
x	beryllium, Be
x	cadmium, Cd
x	calcium, Ca
x	chromium, Cr
x	cobalt, Co
x	copper, Cu
x	iron, Fe
x	lead, Pb
x	magnesium, Mg
x	manganese, Mn
x	mercury, Hg
x	nickel, Ni
x	potassium, K
x	selenium, Se
x	silver, Ag
x	sodium, Na
x	thallium, Tl
x	vanadium, V
x	zinc, Zn

*	Env. Microbiology	*	General Inorganics		Gen. Inorganics (con't)
	coliform, fecal*		acidity as $CaCO_3$*		oil and grease
	coliform, total*		alkalinity as $CaCO_3$*		orthophosphate, total*
	strep, fecal*		alkalinity, phen. as $CaCO_3$*		oxygen, dissolved*
			BOD, 5-day*		pH
			CBOD, 5-day*		phenols, total
			boron		phosphate, total
*	Ambient Parameters		chloride*		residue, dissolved*
	COD*		chlorine, residual*		residue, settleable*
	coliform, fecal		chromium, hexavalent		residue, suspended*
	conductivity*		COD*		residue, total*
	hardness, total as $CaCO_3$*		color, apparent*		silica*
	nitrogen, ammonia		color, true*		sulfate*
	nitrogen, NO_3 & NO_2		conductivity*		sulfide, total*
	nitrogen, total Kjeldahl	x	cyanide		TOC*
	phosphate, total		flash point*		turbidity*
	pH		fluoride*		percent solids
	residue, dissolved*		hardness, Ca as $CaCO_3$*	*	Other
	residue, suspended*		hardness, total as $CaCO_3$*		
	arsenic, As		hydrocarbons, total		
	cadmium, Cd		MBAS*		
	chromium, Cr	x	nitrogen, ammonia		
	copper, Cu		nitrogen, nitrate*		
	lead, Pb		nitrogen, nitrite*		
	mercury, Hg		nitrogen, NO_3 & NO_2		
	nickel, Ni		nitrogen, total Kjeldahl		
	zinc, Zn		nitrogen, total organic		

*	TCLP
	arsenic, As
	barium, Ba
	cadmium, Cd
	chromium, Cr
	lead, Pb
	mercury, Hg
	nickel, Ni
	selenium, Se
	silver, Ag

** denotes analyses performed only on water*

FIELD DETERMINATIONS	Temperature
pH	Chlorine, residual
Conductivity	Other
Dissolved Oxygen	

Laboratory Number

Branch Lab Number

Chain of Custody and Supplemental Information

Only one chain of custody form is required per sample set or point (if all collected at the same time)

1. Collected by Chris A. Andel
   Date August 25, 1998 Time 13:00
   Delivered to Knoxville Basin Laboratory
   Date August 26, 1998 Time 10:00
2. Received by
   Date Time
   Delivered to
   Date Time
3. Received by
   Date Time
   Delivered to
   Date Time
4. Received in Lab by [illegible]
   Date 8/26/98 Time 1000
   Logged in by
   Date Time

Additional Information

1. Approximate volume of sample 16 oz.
2. Nearest town or city Knoxville
3. Others present at collection Beth H. Walker
4. Number of other samples collected at same time at this point 3
5. Field collection procedure, handling and/or preservation of this sample
   According to standard operating procedure
6. Mode of transportation to lab State vehicle; on ice
7. Sample sealed by
8. Date sample sealed
9. Remarks

PH-3011 (rev. 1/96)

RDA 1527

Project/Site No.: 47-559
Project Name: SMOKEY MOUNTAIN SMELTERS
Description: SMS-SB-03/AT TANK SUPPORT
Station No.: SMS-SB-03
Collected: 08/25/98 13:00:00 By BHM
County: 47

Lab Number: 9808247-02F
Matrix: SOIL
Received: 08/26/98 10:00:00 By PMB
Sampling Agency: HWM_11_KFO
Priority:

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
B/N/A EXTR+PESTS,PCBS-SOIL						MS+ECD
BUTYL BENZYL PHTHALATE	U	PPB	110	09/30/98	MAC	
BIS(2-ETHYLHEXYL)PHTHALATE	B 55.9	PPB	-	09/30/98	MAC	
DI-n-BUTYL PHTHALATE	U	PPB	110	09/30/98	MAC	
DI-n-OCTYL PHTHALATE	U	PPB	210	09/30/98	MAC	
DIETHYL PHTHALATE	B 146	PPB	-	09/30/98	MAC	
DIMETHYL PHTHALATE	U	PPB	53	09/30/98	MAC	
n-NITROSODIMETHYLAMINE	U	PPB	210	09/30/98	MAC	
n-NITROSODIPHENYLAMINE	U	PPB	110	09/30/98	MAC	
n-NITROSO-di-n-PROPYLAMINE	U	PPB	110	09/30/98	MAC	
ISOPHORONE	U	PPB	53	09/30/98	MAC	
NITROBENZENE	U	PPB	110	09/30/98	MAC	
2,4-DINITROTOLUENE	U	PPB	210	09/30/98	MAC	
2,6-DINITROTOLUENE	U	PPB	210	09/30/98	MAC	
ACENAPTHENE	U	PPB	53	09/30/98	MAC	
ACENAPHTHYLENE	U	PPB	53	09/30/98	MAC	
ANTHRACENE	U	PPB	53	09/30/98	MAC	
BENZO(a)ANTHRACENE	J 28.5	PPB	53	09/30/98	MAC	
BENZO(a)PYRENE	J 42.2	PPB	53	09/30/98	MAC	
BENZO(b)FLUORANTHENE	79.0	PPB	-	09/30/98	MAC	
BENZO(ghi)PERYLENE	U	PPB	210	09/30/98	MAC	
BENZO(k)FLUORANTHENE	J 28.5	PPB	53	09/30/98	MAC	
DIBENZO(a,h)ANTHRACENE	U	PPB	210	09/30/98	MAC	
FLUORANTHENE	J 47.4	PPB	53	09/30/98	MAC	
FLUORENE	U	PPB	53	09/30/98	MAC	
INDENO(1,2,3-cd)PYRENE	U	PPB	210	09/30/98	MAC	
NAPHTHALENE	U	PPB	53	09/30/98	MAC	
PHENANTHRENE	U	PPB	53	09/30/98	MAC	
PYRENE	J 23.2	PPB	53	09/30/98	MAC	
CHRYSENE	J 30.6	PPB	53	09/30/98	MAC	
BIS(2-CHLOROETHYL)ETHER	U	PPB	110	09/30/98	MAC	
BIS(2-CHLOROETHOXY)METHANE	U	PPB	53	09/30/98	MAC	
BIS(2-CHLOROISOPROPYL)ETHER	U	PPB	210	09/30/98	MAC	
4-BROMOPHENYLPHENYL ETHER	U	PPB	210	09/30/98	MAC	
4-CHLOROPHENYLPHENYL ETHER	U	PPB	110	09/30/98	MAC	
HEXACHLOROCYCLOPENTADIENE	U	PPB	530	09/30/98	MAC	
HEXACHLOROBUTADIENE	U	PPB	110	09/30/98	MAC	
HEXACHLOROBENZENE	U	PPB	110	09/30/98	MAC	
HEXACHLOROETHANE	U	PPB	110	09/30/98	MAC	
1,2,4-TRICHLOROBENZENE	U	PPB	110	09/30/98	MAC	
2-CHLORONAPHTHALENE	U	PPB	53	09/30/98	MAC	
4-CHLORO-3-METHYLPHENOL	U	PPB	110	09/30/98	MAC	
2-CHLOROPHENOL	U	PPB	53	09/30/98	MAC	
2,4-DICHLOROPHENOL	U	PPB	110	09/30/98	MAC	
2,4-DIMETHYLPHENOL	U	PPB	110	09/30/98	MAC	
2,4-DINITROPHENOL	U	PPB	1100	09/30/98	MAC	
2-METHYL-4,6-DINITROPHENOL	U	PPB	530	09/30/98	MAC	
2-NITROPHENOL	U	PPB	210	09/30/98	MAC	
4-NITROPHENOL	U	PPB	530	09/30/98	MAC	
PENTACHLOROPHENOL	U	PPB	210	09/30/98	MAC	
PHENOL	U	PPB	53	09/30/98	MAC	
2,4,6-TRICHLOROPHENOL	U	PPB	110	09/30/98	MAC	
2,4,5-TRICHLOROPHENOL	U	PPB	110	09/30/98	MAC	
O-CRESOL	U	PPB	110	09/30/98	MAC	
M- & P-CRESOL	U	PPB	53	09/30/98	MAC	
2-METHYLNAPHTHALENE	U	PPB	53	09/30/98	MAC	
BENZOIC ACID	U	PPB	210	09/30/98	MAC	
BENZYL ALCOHOL	U	PPB	210	09/30/98	MAC	
4-CHLOROANILINE	U	PPB	110	09/30/98	MAC	
DIBENZOFURAN	U	PPB	53	09/30/98	MAC	
3,3-DICHLOROBENZIDINE	U	PPB	210	09/30/98	MAC	
2-NITROANILINE	U	PPB	210	09/30/98	MAC	
3-NITROANILINE	U	PPB	210	09/30/98	MAC	
4-NITROANILINE	U	PPB	530	09/30/98	MAC	
HEXACHLOROBENZENE	U	PPB	2.2	09/30/98	MAC	
ALDRIN	U	PPB	2.9	09/30/98	MAC	
alpha-BHC	U	PPB	5.2	09/30/98	MAC	
beta-BHC	U	PPB	7.6	09/30/98	MAC	
delta-BHC	U	PPB	7.5	09/30/98	MAC	
gamma-BHC (LINDANE)	U	PPB	2.9	09/30/98	MAC	
alpha-CHLORDANE	J 2.19	PPB	4.0	09/30/98	MAC	
gamma-CHLORDANE	6.07	PPB	-	09/30/98	MAC	
TECHNICAL CHLORDANE	U	PPB	45	09/30/98	MAC	
p,p-DDD	U	PPB	5.4	09/30/98	MAC	

Project/Site No.: 47-559
Project Name: SMOKEY MOUNTAIN SMELTERS
Description: SMS-SB-03/AT TANK SUPPORT
Station No.: SMS-SB-03
Collected: 08/25/98 13:00:00 By BHM
ıty: 47

Lab Number: 9808247-02F
Matrix: SOIL
Received: 08/26/98 10:00:00 By PMB
Sampling Agency: HWM_11_KFO
Priority:

OCT 13 1998

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
B/N/A EXTR+PESTS,PCBS-SOIL						MS+ECD
p,p-DDE	U	PPB	4.7	09/30/98	MAC	
p,p-DDT	U	PPB	5.0	09/30/98	MAC	
DIELDRIN	5.71	PPB	-	09/30/98	MAC	
ENDOSULFAN I	U	PPB	4.8	09/30/98	MAC	
ENDOSULFAN II	U	PPB	5.5	09/30/98	MAC	
ENDOSULFAN SULFATE	U	PPB	5.5	09/30/98	MAC	
ENDRIN	U	PPB	5.5	09/30/98	MAC	
ENDRIN ALDEHYDE	U	PPB	4.6	09/30/98	MAC	
ENDRIN KETONE	U	PPB	5.6	09/30/98	MAC	
HEPTACHLOR	U	PPB	3.6	09/30/98	MAC	
HEPTACHLOR EPOXIDE	J 3.28	PPB	3.8	09/30/98	MAC	
TOXAPHENE	U	PPB	320	09/30/98	MAC	
METHOXYCHLOR	U	PPB	21	09/30/98	MAC	
PCB 1016/1242	U	PPB	280	09/30/98	MAC	
PCB 1221	U	PPB	370	09/30/98	MAC	
PCB 1232	U	PPB	330	09/30/98	MAC	
PCB 1248	U	PPB	200	09/30/98	MAC	
PCB 1254	U	PPB	250	09/30/98	MAC	
PCB 1260	U	PPB	160	09/30/98	MAC	
PCB 1262	U	PPB	160	09/30/98	MAC	

*-Water, uG/L; Sediment, uG/kG

Printed: October 5, 1998

State of Tennessee - Environmental Laboratories
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Organic Analysis
Base/Neutral/Acid Extractables

PROJECT/SITE NO. 47659	PROJECT NAME Smokey Mtn. Smelters
STATION NUMBER SMS-SB-03	COUNTY Knox
DESCRIPTION ad tank suspect	
STREAM MILE	DEPTH MATRIX soil
COLLECTED: DATE 8-25-98	TIME 13:00
SAMPLER'S NAME(printed) Chris Andel	
SAMPLING AGENCY DSF	BILLING CODE 3273811
IF PRIORITY, DATE NEEDED 9-25-98	
SEND REPORT TO: KEAC	
CONTACT HAZARD metals pad chemical, industrial	

*	NPDES Extractables	*	NPDES Extractables(con't)	*	TAL Semivolatiles
	butylbenzylphthalate	X	2-chlorophenol	X	dimethylphthalate
	bis(2-ethylhexyl)phthalate		2,4-dichlorophenol	X	4,6-dinitro-2-methylphenol
	di-n-butylphthalate		2,4-dimethylphenol	X	2,4-dinitrophenol
	di-n-octylphthalate		2,4-dinitrophenol	X	2,4-dinitrotoluene
	diethylphthalate		4,6-dinitro-o-cresol	X	2,6-dinitrotoluene
	dimethylphthalate		2-nitrophenol	X	fluoranthene
X	n-nitrosodimethylamine		4-nitrophenol	X	fluorene
	n-nitrosodiphenylamine		pentachlorophenol	X	hexachlorobenzene
	n-nitrosodi-n-propylamine		phenol	X	hexachlorobutadiene
	isophorone		2,4,6-trichlorophenol	X	hexachlorocyclopentadiene
	nitrobenzene	*	TAL Semivolatiles	X	hexachloroethane
	2,4-dinitrotoluene	X	acenaphthene	X	indeno(1,2,3-cd)pyrene
	acenaphthene	X	acenaphthylene	X	isophorone
	acenaphthylene	X	anthracene	X	2-methylnaphthalene
	anthracene	X	benzo(a)anthracene	X	2-methylphenol
	benzo(a)anthracene	X	benzo(a)pyrene	X	4-methylphenol
	benzo(a)pyrene	X	benzo(b)fluoranthene	X	n-nitrosodiphenylamine
	benzo(b)fluoranthene	X	benzo(g,h,i)perylene	X	n-nitroso-n-dipropylamine
	benzo(g,h,i)perylene	X	benzo(k)fluoranthene	X	naphthalene
	benzo(k)fluoranthene	X	benzoic acid	X	2-nitroaniline
	chrysene	X	benzyl alcohol	X	3-nitroaniline
	dibenzo(a,h)anthracene	X	bis(2-chloroethoxy)methane	X	4-nitroaniline
	fluoranthene	X	bis(2-chloroethyl) ether	X	nitrobenzene
	fluorene	X	bis(2-chloroisopropyl)ether	X	2-nitrophenol
	indeno(1,2,3-c,d)pyrene	X	bis(2-ethylhexyl)phthalate	X	4-nitrophenol
	naphthalene	X	4-bromophenylphenylether	X	pentachlorophenol
	phenanthrene	X	butylbenzylphthalate	X	phenanthrene
	pyrene	X	4-chloroaniline	X	phenol
	bis(2-chloroethyl)ether	X	4-chloro-3-methyl phenol	X	pyrene
	bis(2-chloroethoxy)methane	X	2-chloronaphthalene	X	1,2,4-trichlorobenzene
	bis(2-chloroisopropyl)ether	X	4-chlorophenylphenylether	X	2,4,5-trichlorophenol
	4-bromophenylphenylether	X	chrysene	X	2,4,6-trichlorophenol
	4-chlorophenylphenylether	X	di-n-butylphthalate	*	Nitrobodies
	hexachlorocyclopentadiene	X	di-n-octylphthalate		RDX
	hexachlorobutadiene	X	dibenzo(a,h)anthracene		2,4,6-TNT
	hexachlorobenzene	X	dibenzofuran		2,4-dinitrotoluene
	hexachloroethane	X	3,3'-dichlorobenzidine		2,6-dinitrotoluene
	1,2,4-trichlorobenzene	X	2,4-dichlorophenol		nitrobenzene
	2-chloronaphthalene	X	diethylphthalate		1,3,5-TNB
	4-chloro-3-methyl phenol	X	2,4-dimethylphenol		

*	TCLP Semivolatiles	*	Pesticides/PCBs
	chlordane	X	aldrin
	o-cresol	X	alpha-BHC
	m-cresol	X	beta-BHC
	p-cresol	X	delta-BHC
	cresol	X	gamma-BHC (lindane)
	2,4-D	X	technical chlordane
	2,4-dinitrotoluene	X	alpha-chlordane
	endrin	X	gamma-chlordane
	heptachlor	X	4,4'-DDD
	heptachlor epoxide	X	4,4'-DDE
	hexachlorobenzene	X	4,4'-DDT
	hexachlorobutadiene	X	dieldrin
	hexachloroethane	X	endosulfan I
	lindane	X	endosulfan II
	methoxychlor	X	endosulfan sulfate
	nitrobenzene	X	endrin
	pentachlorophenol	X	endrin aldehyde
	pyridine	X	endrin ketone
	toxaphene	X	heptachlor
	2,4,5-trichlorophenol	X	heptachlor epoxide
	2,4,6-trichlorophenol	X	toxaphene
	2,4,5-TP (Silvex)	X	methoxychlor
		X	PCB 1016/1242
		X	PCB 1221
		X	PCB 1232
		X	PCB 1248
		X	PCB 1254
		X	PCB 1260
		X	PCB 1262

Laboratory Number

Branch Lab Number

Chain of Custody and Supplemental Information

Only one chain of custody form is required per sample set or point (if all collected at the same time)

1. Collected by CAA
   Date 8-25-98 Time 13:00
   Delivered to KEAC
   Date 8-26-98 Time 10:00
2. Received by
   Date Time
   Delivered to
   Date Time
3. Received by
   Date Time
   Delivered to
   Date Time
4. Received in Lab by P Baker
   Date 8/26/98 Time 1000
   Logged in by
   Date Time

Additional Information

1. Approximate volume of sample 16 oz
2. Nearest town or city Knoxville
3. Others present at collection Beth Walker
4. Number of other samples collected at same time at this point 3
5. Field collection procedure, handling and/or preservation of this sample EPA procedures and protocol
6. Mode of transportation to lab in State vehicle, in coolers, on ice
7. Sample sealed by
8. Date sample sealed
9. Remarks

SEP 14 1998

Project/Site No.: 47-559
Project Name: SMOKEY MOUNTAIN SMELTERS
Site Description: SMS-SB-03/AT TANK SUPPORT
Station No.: SMS-SB-03
Collected: 08/25/98 13:00:00 By CAA
nty: 47

Lab Number: 9808247-02E
Matrix: SOIL
Received: 08/26/98 10:00:00 By PMB
Sampling Agency: HWM_11_KFO
Priority:

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
VOLATILES-TAL SEDIMENTS						8260A
ACETONE	U	PPB	25	09/04/98	HMG	
BENZENE	U	PPB	2.5	09/04/98	HMG	
BROMODICHLOROMETHANE	U	PPB	2.5	09/04/98	HMG	
BROMOFORM	U	PPB	2.5	09/04/98	HMG	
BROMOMETHANE	U	PPB	5.0	09/04/98	HMG	
2-BUTANONE (MEK)	U	PPB	25	09/04/98	HMG	
CARBON DISULFIDE	U	PPB	5.0	09/04/98	HMG	
CARBON TETRACHLORIDE	U	PPB	2.5	09/04/98	HMG	
VINYL ACETATE	U	PPB	5.0	09/04/98	HMG	
CHLOROBENZENE	U	PPB	2.5	09/04/98	HMG	
CHLOROETHANE	U	PPB	5.0	09/04/98	HMG	
CHLOROFORM	U	PPB	2.5	09/04/98	HMG	
CHLOROMETHANE	U	PPB	5.0	09/04/98	HMG	
DIBROMOCHLOROMETHANE	U	PPB	2.5	09/04/98	HMG	
1,2-DICHLOROBENZENE	U	PPB	2.5	09/04/98	HMG	
1,3-DICHLOROBENZENE	U	PPB	2.5	09/04/98	HMG	
1,4-DICHLOROBENZENE	U	PPB	2.5	09/04/98	HMG	
DICHLORODIFLUOROMETHANE	U	PPB	5.0	09/04/98	HMG	
1,1-DICHLOROETHANE	U	PPB	2.5	09/04/98	HMG	
1,2-DICHLOROETHANE	U	PPB	2.5	09/04/98	HMG	
1,1-DICHLOROETHENE	U	PPB	2.5	09/04/98	HMG	
CIS-1,2-DICHLOROETHENE	U	PPB	2.5	09/04/98	HMG	
TRANS-1,2-DICHLOROETHENE	U	PPB	2.5	09/04/98	HMG	
1,2-DICHLOROPROPANE	U	PPB	2.5	09/04/98	HMG	
CIS-1,3-DICHLOROPROPENE	U	PPB	2.5	09/04/98	HMG	
TRANS-1,3-DICHLOROPROPENE	U	PPB	2.5	09/04/98	HMG	
ETHYLBENZENE	U	PPB	2.5	09/04/98	HMG	
METHYLENE CHLORIDE	B 16	PPB	2.5	09/04/98	HMG	
4-METHYL-2-PENTANONE (MIBK)	U	PPB	25	09/04/98	HMG	
STYRENE	U	PPB	2.5	09/04/98	HMG	
2-HEXANONE	U	PPB	5.0	09/04/98	HMG	
1,1,2,2-TETRACHLOROETHANE	U	PPB	2.5	09/04/98	HMG	
TETRACHLOROETHENE	U	PPB	2.5	09/04/98	HMG	
TOLUENE	U	PPB	2.5	09/04/98	HMG	
1,1,1-TRICHLOROETHANE	U	PPB	2.5	09/04/98	HMG	
1,1,2-TRICHLOROETHANE	U	PPB	2.5	09/04/98	HMG	
TRICHLOROETHENE	U	PPB	2.5	09/04/98	HMG	
TRICHLOROFLUOROMETHANE	U	PPB	5.0	09/04/98	HMG	
VINYL CHLORIDE	U	PPB	5.0	09/04/98	HMG	
o-XYLENE	U	PPB	2.5	09/04/98	HMG	
m&p-XYLENE	U	PPB	2.5	09/04/98	HMG	

*-Water, uG/L; Sediment, uG/kG

Printed: September 8, 1998

State of Tennessee - Environmental Laboratories

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Organic Analysis

Volatiles and Petroleum Hydrocarbons

PROJECT/SITE NO.	47-559	PROJECT NAME	SMOKY MOUNTAIN SMELTERS
STATION NUMBER	SMS-SB-03	COUNTY	KNOX
DESCRIPTION	AT TANK SUPPORT		
STREAM MILE		DEPTH	MATRIX Soil
COLLECTED: DATE	AUGUST 25, 1998	TIME	13:00
SAMPLER'S NAME(printed)	CHRIS A. ANDEL		
SAMPLING AGENCY	DIVISION OF SUPERFUND	BILLING CODE	327.38-11
IF PRIORITY, DATE NEEDED	SEPTEMBER 25		
SEND REPORT TO:	KNOXVILLE ENVIRONMENTAL ASSISSTANCE CENTER BURL H. MAUPIN		
CONTACT HAZARD	METALS, RADIOCHEMICAL, UNKNOWN		

*	NPDES Volatiles - 624	*	TAL Volatiles - 8260A	*	TCLP Volatiles
	Bromoform		Chloromethane		Benzene
	Bromodichloromethane		Bromomethane		Carbon tetrachloride
	Carbon Tetrachloride		Vinyl chloride		Chlorobenzene
	Chlorobenzene		Chloroethane		Chloroform
	Chloroethane		Methylene chloride		1,2-Dichloroethane
X	2-Chloroethylvinyl ether		Acetone		1,1-Dichloroethane
	Chloroform		Carbon disulfide		Methyl ethyl ketone
	Chloromethane		1,1-Dichloroethene		Tetrachloroethene
	Dibromochloromethane		1,1-Dichloroethane		Trichloroethene
	1,2-Dichlorobenzene		Cis-1,2-dichloroethene		Vinyl chloride
	1,3-Dichlorobenzene		Trans-1,2-dichloroethene	*	BTEX - 8260A - UST
	1,4-Dichlorobenzene		1,2-Dichloroethane		Benzene
	Dichlorodifluoromethane		Chloroform		Toluene
	1,1-Dichloroethane		2-Butanone		Ethyl benzene
	1,2-Dichloroethane		1,1,1-Trichloroethane		o-Xylene
	1,1-Dichloroethene		Carbon tetrachloride		m-Xylene
	Cis-1,2-dichloroethene		Vinyl acetate		p-Xylene
	Trans-1,2-dichloroethene		Bromodichloromethane		Methyl t-butyl ether
	1,2-Dichloropropane		1,2-Dichloropropane		Diisopropyl ether
	Cis-1,3-dichloropropene		Cis-1,3-dichloropropane	*	TPH by GC
	Trans-1,2-dichloroethene		Trichloroethene		Gasoline Range Organics
	Methylene chloride		Dibromochloromethane		Diesel Range Organics
	1,1,2,2-Tetrachloroethane		1,1,2-Trichloroethane	*	TPH by IR (418.1)
	Tetrachloroethene		Benzene		418.1 - Waste Oil
	1,1,1-Trichloroethane		Trans-1,3-dichloropropene	*	Other
	1,1,2-Trichloroethane		Bromoform		
	Trichloroethene		4-Methyl-2-pentanone		
	Trichlorofluoromethane		2-Hexanone		
	Vinyl chloride		Tetrachloroethene		
	Benzene		Toluene		
	Ethylbenzene		1,1,2,2-Tetrachloroethane		
	Toluene		Chlorobenzene		
	o-Xylene		Ethyl benzene		
	m-Xylene		Styrene		
	p-Xylene		o-Xylene		
			m-Xylene		
			p-Xylene		

Laboratory Number

Branch Lab Number

Chain of Custody and Supplemental Information

Only one chain of custody form is required per sample set or point (if all collected at the same time)

1. Collected by CHRIS A. ANDEL
   Date AUGUST 25, 1998 Time 13:00
   Delivered to *Knoxville Basin Laboratory*
   Date 8-26-98 Time 10:00
2. Received by
   Date Time
   Delivered to
   Date Time
3. Received by
   Date Time
   Delivered to
   Date Time
4. Received in Lab by
   Date 8/26/98 Time 1000
   Logged in by
   Date Time

Additional Information

1. Approximate volume of sample *4 oz.*
2. Nearest town or city KNOXVILLE
3. Others present at collection BETH WALKER
4. Number of other samples collected at same time at this point *One other sample each for INORGANICS, RADIOCHEMICAL, AND EXTRACTABLE ORGANICS were collected for a total of three other samples.*
5. Field collection procedure, handling and/or preservation of this sample *according to EPA procedures and protocol*
6. Mode of transportation to lab *in State vehicle, in cooler, and on ice*
7. Sample sealed by
8. Date sample sealed
9. Remarks

SEP 30 1998

Project/Site No.: 47-559
Project Name: SMOKEY MOUNTAIN SMELTERS
Description: SMS-SB-03/AT TANK SUPPORT
Station No.: SMS-SB-03
Collected: 08/25/98 13:00:00 By BHM
inty: 47

Lab Number: 9808247-02G
Matrix: SOIL
Received: 08/26/98 10:00:00 By PMB
Sampling Agency: HWM_11_KFO
Priority:

TEST	RESULT	*ERROR	UNITS	ANALYZED	BY	METHOD
GAMMA RADIONUCLIDES						R.6
K-40	22.72	0.80	pCi/g dry wt	09/01/98	AK	
Pb-214	1.96	0.10	pCi/g dry wt	09/01/98	AK	
Bi-214	2.05	0.10	pCi/g dry wt	09/01/98	AK	
Pb-212	1.917	0.070	pCi/g dry wt	09/01/98	AK	
Ac-228	2.36	0.15	pCi/g dry wt	09/01/98	AK	
Tl-208	0.598	0.070	pCi/g dry wt	09/01/98	AK	
Bi-212	1.24	0.19	pCi/g dry wt	09/01/98	AK	
Cs-137	0.203	0.030	pCi/g dry wt	09/01/98	AK	
GROSS ALPHA & BETA						R.1.3
GROSS ALPHA	5.0	1.3	pCi/g DRY WT.	09/09/98	NLF	
GROSS BETA	48.3	2.4	pCi/g DRY WT.	09/09/98	NLF	

*--Represents +/- error value

Printed: September 10, 1998

State of Tennessee - Environmental Laboratories

Radiochemical Analysis

PLEASE PRINT LEGIBLY

PROJECT/SITE NO. 47-559	PROJECT NAME Smokey Mountain Smelters
STATION NUMBER SMS-SB-03	COUNTY KNOX
DESCRIPTION Subsurface soil near tank	
STREAM MILE	DEPTH 6-12 in
COLLECTED: DATE 08/25/98	TIME 13:00
PICK-UP DATE:	
CONTACT HAZARD UNKNOWN	mR/hr Reading 0.01
SAMPLER'S NAME (printed) Chris Andel	
SAMPLING AGENCY TDSF	BILLING CODE 327.38.10
IF PRIORITY, DATE NEEDED 09/26/98	
SEND REPORT TO: Burl Maupin	
KEAC - Superfund	

Laboratory Number

Date Received

Time Received By

Sample Type

___Air ___Milk ___Swipe
___Water ___Tissue ___Liquid
___Sludge X Soil ___Solid
___Vegetation ___Sediment

Other_____

Field Comments:

Air Samples
Volume _____
Total Hours _____

___Sample Filtration
___Sample Acidification
___Send to RESL

Chain of Custody and Supplemental Information

Only one chain of custody form is required per sample set or point (if all collected at the same time)

1. Collected by CAA
   Date 08/25/98 Time 13:00
   Delivered to Knoxville LAB
   Date 8-26-98 Time 10:00
2. Collected by
   Date Time
   Delivered to
   Date Time
3. Collected by
   Date Time
   Delivered to
   Date Time
4. Received in Lab by S Baker
   Date 8/26/98 Time 1000
   Logged in by
   Date Time

REQUESTED ANALYSES:

X	GROSS ALPHA (TOTAL)		STRONTIUM 89
	GROSS ALPHA (SUSPENDED)		STRONTIUM 90
	GROSS ALPHA (DISSOLVED)		TRITIUM (H-3)
X	GROSS BETA (TOTAL)		THORIUM (TOTAL)
	GROSS BETA (SUSPENDED)		URANIUM (TOTAL)
	GROSS BETA (DISSOLVED)	X	GAMMA RADIONUCLIDES
			ADDITIONAL ANALYSES:

Additional Information

1. Approximate volume of sample 16 oz
2. Nearest town or city Knoxville
3. Others present at collection BHW
4. Number of other samples collected at same time at this point 3 - volatiles, extr, + inorganics
5. Field collection procedure, handling and/or preservation of this sample According to EPA procedures
6. Mode of transportation to lab in cooler on ice in state vehicle
7. Sample sealed by
8. Date sample sealed
9. Remarks

OCT 1 1998

Project/Site No.: 47-559
Project Name: SMOKEY MOUNTAIN SMELTERS
Description: SMS-SB-04/DRUM STOR./DISP.
Station No.: SMS-SB-04
Collected: 08/25/98 15:40:00 By BHM
County: 47

Lab Number: 9808247-03
Matrix: SOIL
Received: 08/26/98 10:00:00 By PMB
Sampling Agency: HWM_11_KFO
Priority:

TEST	RESULT	UNITS	LIMIT	ANALYZED	BY	METHOD
AMMONIA	26.5	mg/kg	10	09/15/98	SAL	A.18.2
CYANIDE	U	mg/kg	1.0	09/18/98	LKS	A.9
ALUMINUM	73500	mg/kg	10	10/01/98	JAH	
ANTIMONY	3.0	mg/kg	0.6	10/08/98	JAH	
ARSENIC	2.0	mg/kg	0.2	10/05/98	JAH	
BARIUM	63	mg/kg	10	10/01/98	JAH	
BERYLLIUM	4	mg/kg	1	09/30/98	JAH	
CADMIUM	U	mg/kg	0.5	09/11/98	JAH	
CALCIUM	8360	mg/kg	3	10/02/98	JAH	
CHROMIUM	50	mg/kg	1	09/23/98	JAH	
COBALT	7	mg/kg	1	09/15/98	JAH	
COPPER	1770	mg/kg	1	09/16/98	JAH	
DIGESTION-METALS	COMPLETED	COMPLETED		09/10/98	EAM	
IRON	14800	mg/kg	5	09/16/98	JAH	
LEAD	70	mg/kg	4	09/15/98	JAH	
MAGNESIUM	4780	mg/kg	2	10/02/98	JAH	
MANGANESE	467	mg/kg	1	09/16/98	JAH	
MERCURY	U	mg/kg	0.1	09/11/98	ATB	EPA 245.5
METALS PREP-SOLIDS/WASTES	COMPLETED	COMPLETED		08/28/98	EAM	
NICKEL	238	mg/kg	2	09/11/98	JAH	
PERCENT SOLIDS	69.1	%		09/08/98	SDS	
POTASSIUM	704	mg/kg	2	10/02/98	JAH	
SELENIUM	U	mg/kg	0.4	10/07/98	JAH	

OCT 1 8 1998

Project/Site No.: 47-559
Project Name: SMOKEY MOUNTAIN SMELTERS
Description: SMS-SB-04/DRUM STOR./DISP.
Station No.: SMS-SB-04
Collected: 08/25/98 15:40:00 By BHM
County: 47

Lab Number: 9808247-03
Matrix: SOIL
Received: 08/26/98 10:00:00 By PMB
Sampling Agency: HWM_11_KFO
Priority:

TEST	RESULT	UNITS	LIMIT	ANALYZED	BY	METHOD
SILVER	1	mg/kg	1	09/15/98	JAH	
SODIUM	10300	mg/kg	10	10/02/98	JAH	
THALLIUM	U	mg/kg	5	09/15/98	JAH	
VANADIUM	37	mg/kg	20	10/01/98	JAH	
ZINC	761	mg/kg	0.5	09/15/98	JAH	

State of Tennessee - Environmental Laboratories

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Inorganic Analysis

PROJECT/SITE NO.	47-559	PROJECT NAME	Smokey Mountain Smelters
STATION NUMBER	SMS-SB-04	COUNTY	Knox
DESCRIPTION	at drum storage/disposal area		
STREAM MILE		DEPTH	MATRIX soil
COLLECTED: DATE	August 25, 1998	TIME	15:40
SAMPLER'S NAME(printed)	Chris A. Andel		
SAMPLING AGENCY	Division of Superfund	BILLING CODE	327.38-11
IF PRIORITY, DATE NEEDED	September 25, 1998		
SEND REPORT TO:	Knoxville Environmental Assisstance Center		
	Burl H. Maupin		
CONTACT HAZARD	metals, radiochemical, unknown		

*	Metals
x	aluminum, Al
x	antimony, Sb
x	arsenic, As
x	barium, Ba
x	beryllium, Be
x	cadmium, Cd
x	calcium, Ca
x	chromium, Cr
x	cobalt, Co
x	copper, Cu
x	iron, Fe
x	lead, Pb
x	magnesium, Mg
x	manganese, Mn
x	mercury, Hg
x	nickel, Ni
x	potassium, K
x	selenium, Se
x	silver, Ag
x	sodium, Na
x	thallium, Tl
x	vanadium, V
x	zinc, Zn

*	Env. Microbiology	*	General Inorganics		Gen. Inorganics (con't)
	coliform, fecal*		acidity as $CaCO_3$*		oil and grease
	coliform, total*		alkalinity as $CaCO_3$*		orthophosphate, total*
	strep, fecal*		alkalinity, phen. as $CaCO_3$*		oxygen, dissolved*
			BOD, 5-day*		pH
			CBOD, 5-day*		phenols, total
			boron		phosphate, total
*	**Ambient Parameters**		chloride*		residue, dissolved*
	COD*		chlorine, residual*		residue, settleable*
	coliform, fecal		chromium, hexavalent		residue, suspended*
	conductivity*		COD*		residue, total*
	hardness, total as $CaCO_3$*		color, apparent*		silica*
	nitrogen, ammonia		color, true*		sulfate*
	nitrogen, NO_3 & NO_2		conductivity*		sulfide, total*
	nitrogen, total Kjeldahl	x	cyanide		TOC*
	phosphate, total		flash point*		turbidity*
	pH		fluoride*		percent solids
	residue, dissolved*		hardness, Ca as $CaCO_3$*	*	**Other**
	residue, suspended*		hardness, total as $CaCO_3$*		
	arsenic, As		hydrocarbons, total		
	cadmium, Cd		MBAS*		
	chromium, Cr	x	nitrogen, ammonia		
	copper, Cu		nitrogen, nitrate*		
	lead, Pb		nitrogen, nitrite*		
	mercury, Hg		nitrogen, NO_3 & NO_2		
	nickel, Ni		nitrogen, total Kjeldahl		
	zinc, Zn		nitrogen, total organic		

*	TCLP
	arsenic, As
	barium, Ba
	cadmium, Cd
	chromium, Cr
	lead, Pb
	mercury, Hg
	nickel, Ni
	selenium, Se
	silver, Ag

** denotes analyses performed only on water*

FIELD DETERMINATIONS	Temperature
pH	Chlorine, residual
Conductivity	Other
Dissolved Oxygen	

Laboratory Number

Branch Lab Number

Chain of Custody and Supplemental Information

Only one chain of custody form is required per sample set or point (if all collected at the same time)

1. Collected by Chris A. Andel
   Date August 25, 1998 Time ~~15:40~~ 15:40
   Delivered to Knoxville Basin Laboratory
   Date August 25, 1998 Time 1011(x)
2. Received by
   Date Time
   Delivered to
   Date Time
3. Received by
   Date Time
   Delivered to
   Date Time
4. Received in Lab by [illegible]
   Date 8/26/98 Time 1600
   Logged in by
   Date Time

Additional Information

1. Approximate volume of sample
   16 oz.
2. Nearest town or city Knoxville
3. Others present at collection Beth H. Walker
4. Number of other samples collected at same time at this point 3
5. Field collection procedure, handling and/or preservation of this sample
   ~~According to standard operating procedure~~
6. Mode of transportation to lab
   State vehicle; on ice in cooler
7. Sample sealed by
8. Date sample sealed
9. Remarks

PH-3011 (rev 1/96)

RDA 1627

Project/Site No.: 47-559
Project Name: SMOKEY MOUNTAIN SMELTERS
Description: SMS-SB-04/DRUM STOR./DISP.
Station No.: SMS-SB-04
Collected: 08/25/98 15:40:00 By BHM
nty: 47

Lab Number: 9808247-03F
Matrix: SOIL
Received: 08/26/98 10:00:00 By PMB
Sampling Agency: HWM_11_KFO
Priority:

OCT 13 1998

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
B/N/A EXTR+PESTS,PCBS-SOIL						MS+ECD
BUTYL BENZYL PHTHALATE	U	PPB	110	09/30/98	MAC	
BIS(2-ETHYLHEXYL)PHTHALATE	B 63.1	PPB	-	09/30/98	MAC	
DI-n-BUTYL PHTHALATE	U	PPB	110	09/30/98	MAC	
DI-n-OCTYL PHTHALATE	U	PPB	220	09/30/98	MAC	
DIETHYL PHTHALATE	B,J 46.7	PPB	54	09/30/98	MAC	
DIMETHYL PHTHALATE	U	PPB	54	09/30/98	MAC	
n-NITROSODIMETHYLAMINE	U	PPB	220	09/30/98	MAC	
n-NITROSODIPHENYLAMINE	U	PPB	110	09/30/98	MAC	
n-NITROSO-di-n-PROPYLAMINE	U	PPB	110	09/30/98	MAC	
ISOPHORONE	U	PPB	54	09/30/98	MAC	
NITROBENZENE	U	PPB	110	09/30/98	MAC	
2,4-DINITROTOLUENE	U	PPB	220	09/30/98	MAC	
2,6-DINITROTOLUENE	U	PPB	220	09/30/98	MAC	
ACENAPTHENE	U	PPB	54	09/30/98	MAC	
ACENAPHTHYLENE	U	PPB	54	09/30/98	MAC	
ANTHRACENE	U	PPB	54	09/30/98	MAC	
BENZO(a)ANTHRACENE	U	PPB	54	09/30/98	MAC	
BENZO(a)PYRENE	U	PPB	54	09/30/98	MAC	
BENZO(b)FLUORANTHENE	U	PPB	54	09/30/98	MAC	
BENZO(ghi)PERYLENE	U	PPB	220	09/30/98	MAC	
BENZO(k)FLUORANTHENE	U	PPB	54	09/30/98	MAC	
DIBENZO(a,h)ANTHRACENE	U	PPB	220	09/30/98	MAC	
FLUORANTHENE	U	PPB	54	09/30/98	MAC	
FLUORENE	U	PPB	54	09/30/98	MAC	
INDENO(1,2,3-cd)PYRENE	U	PPB	220	09/30/98	MAC	
NAPHTHALENE	U	PPB	54	09/30/98	MAC	
PHENANTHRENE	U	PPB	54	09/30/98	MAC	
PYRENE	U	PPB	54	09/30/98	MAC	
CHRYSENE	U	PPB	54	09/30/98	MAC	
BIS(2-CHLOROETHYL)ETHER	U	PPB	110	09/30/98	MAC	
BIS(2-CHLOROETHOXY)METHANE	U	PPB	54	09/30/98	MAC	
BIS(2-CHLOROISOPROPYL)ETHER	U	PPB	220	09/30/98	MAC	
4-BROMOPHENYLPHENYL ETHER	U	PPB	220	09/30/98	MAC	
4-CHLOROPHENYLPHENYL ETHER	U	PPB	110	09/30/98	MAC	
HEXACHLOROCYCLOPENTADIENE	U	PPB	540	09/30/98	MAC	
HEXACHLOROBUTADIENE	U	PPB	110	09/30/98	MAC	
HEXACHLOROBENZENE	U	PPB	110	09/30/98	MAC	
HEXACHLOROETHANE	U	PPB	110	09/30/98	MAC	
1,2,4-TRICHLOROBENZENE	U	PPB	110	09/30/98	MAC	
2-CHLORONAPHTHALENE	U	PPB	54	09/30/98	MAC	
4-CHLORO-3-METHYLPHENOL	U	PPB	110	09/30/98	MAC	
2-CHLOROPHENOL	U	PPB	54	09/30/98	MAC	
2,4-DICHLOROPHENOL	U	PPB	110	09/30/98	MAC	
2,4-DIMETHYLPHENOL	U	PPB	110	09/30/98	MAC	
2,4-DINITROPHENOL	U	PPB	1100	09/30/98	MAC	
2-METHYL-4,6-DINITROPHENOL	U	PPB	540	09/30/98	MAC	
2-NITROPHENOL	U	PPB	220	09/30/98	MAC	
4-NITROPHENOL	U	PPB	540	09/30/98	MAC	
PENTACHLOROPHENOL	U	PPB	220	09/30/98	MAC	
PHENOL	U	PPB	54	09/30/98	MAC	
2,4,6-TRICHLOROPHENOL	U	PPB	110	09/30/98	MAC	
2,4,5-TRICHLOROPHENOL	U	PPB	110	09/30/98	MAC	
O-CRESOL	U	PPB	110	09/30/98	MAC	
M- & P-CRESOL	U	PPB	54	09/30/98	MAC	
2-METHYLNAPHTHALENE	U	PPB	54	09/30/98	MAC	
BENZOIC ACID	U	PPB	220	09/30/98	MAC	
BENZYL ALCOHOL	U	PPB	220	09/30/98	MAC	
4-CHLOROANILINE	U	PPB	110	09/30/98	MAC	
DIBENZOFURAN	U	PPB	54	09/30/98	MAC	
3,3-DICHLOROBENZIDINE	U	PPB	220	09/30/98	MAC	
2-NITROANILINE	U	PPB	220	09/30/98	MAC	
3-NITROANILINE	U	PPB	220	09/30/98	MAC	
4-NITROANILINE	U	PPB	540	09/30/98	MAC	
HEXACHLOROBENZENE	U	PPB	2.2	09/30/98	MAC	
ALDRIN	U	PPB	2.9	09/30/98	MAC	
alpha-BHC	U	PPB	5.2	09/30/98	MAC	
ta-BHC	U	PPB	7.5	09/30/98	MAC	
ta-BHC	U	PPB	7.5	09/30/98	MAC	
amma-BHC (LINDANE)	U	PPB	2.9	09/30/98	MAC	
alpha-CHLORDANE	U	PPB	4.0	09/30/98	MAC	
gamma-CHLORDANE	U	PPB	2.9	09/30/98	MAC	
TECHNICAL CHLORDANE	U	PPB	45	09/30/98	MAC	
p,p-DDD	U	PPB	5.4	09/30/98	MAC	

OCT 13 1998

Project/Site No.: 47-559
Project Name: SMOKEY MOUNTAIN SMELTERS
Description: SMS-SB-04/DRUM STOR./DISP.
Station No.: SMS-SB-04
Collected: 08/25/98 15:40:00 By BHM
unty: 47

Lab Number: 9808247-03F
Matrix: SOIL
Received: 08/26/98 10:00:00 By PMB
Sampling Agency: HWM_11_KFO
Priority:

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
B/N/A EXTR+PESTS,PCBS-SOIL						MS+ECD
p,p-DDE	U	PPB	4.7	09/30/98	MAC	
p,p-DDT	U	PPB	5.0	09/30/98	MAC	
DIELDRIN	U	PPB	3.0	09/30/98	MAC	
ENDOSULFAN I	U	PPB	4.8	09/30/98	MAC	
ENDOSULFAN II	U	PPB	5.5	09/30/98	MAC	
ENDOSULFAN SULFATE	U	PPB	5.4	09/30/98	MAC	
ENDRIN	U	PPB	5.4	09/30/98	MAC	
ENDRIN ALDEHYDE	U	PPB	4.5	09/30/98	MAC	
ENDRIN KETONE	U	PPB	5.5	09/30/98	MAC	
HEPTACHLOR	U	PPB	3.6	09/30/98	MAC	
HEPTACHLOR EPOXIDE	U	PPB	3.8	09/30/98	MAC	
TOXAPHENE	U	PPB	320	09/30/98	MAC	
METHOXYCHLOR	U	PPB	21	09/30/98	MAC	
PCB 1016/1242	U	PPB	270	09/30/98	MAC	
PCB 1221	U	PPB	360	09/30/98	MAC	
PCB 1232	U	PPB	330	09/30/98	MAC	
PCB 1248	U	PPB	200	09/30/98	MAC	
PCB 1254	U	PPB	250	09/30/98	MAC	
PCB 1260	U	PPB	160	09/30/98	MAC	
PCB 1262	U	PPB	160	09/30/98	MAC	

*-Water, uG/L; Sediment, uG/kG

Printed: October 5, 1998

State of Tennessee - Environmental Laboratories
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Organic Analysis
Base/Neutral/Acid Extractables

PROJECT/SITE NO. 47559	PROJECT NAME Smoky Mtn. Smelters
STATION NUMBER SMS-SB-04	COUNTY Knox
DESCRIPTION at drum storage/disposal area	
STREAM MILE	DEPTH / MATRIX soil
COLLECTED: DATE 8-25-98	TIME 15:40
SAMPLER'S NAME(printed) Chris Andrl	
SAMPLING AGENCY DSF	BILLING CODE 3273811
IF PRIORITY, DATE NEEDED 9-25-98	
SEND REPORT TO: KEAC	
CONTACT HAZARD metals, radiochemical, unknown	

*	NPDES Extractables	*	NPDES Extractables(con't)	*	TAL Semivolatiles
	butylbenzylphthalate	X	2-chlorophenol	X	dimethylphthalate
	bis(2-ethylhexyl)phthalate		2,4-dichlorophenol	X	4,6-dinitro-2-methylphenol
	di-n-butylphthalate		2,4-dimethylphenol	X	2,4-dinitrophenol
	di-n-octylphthalate		2,4-dinitrophenol	X	2,4-dinitrotoluene
	diethylphthalate		4,6-dinitro-o-cresol	X	2,6-dinitrotoluene
	dimethylphthalate		2-nitrophenol	X	fluoranthene
X	n-nitrosodimethylamine		4-nitrophenol	X	fluorene
	n-nitrosodiphenylamine		pentachlorophenol	X	hexachlorobenzene
	n-nitrosodi-n-propylamine		phenol	X	hexachlorobutadiene
	isophorone		2,4,6-trichlorophenol	X	hexachlorocyclopentadiene
	nitrobenzene	*	TAL Semivolatiles	X	hexachloroethane
	2,4-dinitrotoluene	X	acenaphthene	X	indeno(1,2,3-cd)pyrene
	acenaphthene	X	acenaphthylene	X	isophorone
	acenaphthylene	X	anthracene	X	2-methylnaphthalene
	anthracene	X	benzo(a)anthracene	X	2-methylphenol
	benzo(a)anthracene	X	benzo(a)pyrene	X	4-methylphenol
	benzo(a)pyrene	X	benzo(b)fluoranthene	X	n-nitrosodiphenylamine
	benzo(b)fluoranthene	X	benzo(g,h,i)perylene	X	n-nitroso-n-dipropylamine
	benzo(g,h,i)perylene	X	benzo(k)fluoranthene	X	naphthalene
	benzo(k)fluoranthene	X	benzoic acid	X	2-nitroaniline
	chrysene	X	benzyl alcohol	X	3-nitroaniline
	dibenzo(a,h)anthracene	X	bis(2-chloroethoxy)methane	X	4-nitroaniline
	fluoranthene	X	bis(2-chloroethyl) ether	X	nitrobenzene
	fluorene	X	bis(2-chloroisopropyl)ether	X	2-nitrophenol
	indeno(1,2,3-c,d)pyrene	X	bis(2-ethylhexyl)phthalate	X	4-nitrophenol
	naphthalene	X	4-bromophenylphenylether	X	pentachlorophenol
	phenanthrene	X	butylbenzylphthalate	X	phenanthrene
	pyrene	X	4-chloroaniline	X	phenol
	bis(2-chloroethyl)ether	X	4-chloro-3-methyl phenol	X	pyrene
	bis(2-chloroethoxy)methane	X	2-chloronaphthalene	X	1,2,4-trichlorobenzene
	bis(2-chloroisopropyl)ether	X	4-chlorophenylphenylether	X	2,4,5-trichlorophenol
	4-bromophenylphenylether	X	chrysene	X	2,4,6-trichlorophenol
	4-chlorophenylphenylether	X	di-n-butylphthalate	*	Nitrobodies
	hexachlorocyclopentadiene	X	di-n-octylphthalate		RDX
	hexachlorobutadiene	X	dibenzo(a,h)anthracene		2,4,6-TNT
	hexachlorobenzene	X	dibenzofuran		2,4-dinitrotoluene
	hexachloroethane	X	3,3'-dichlorobenzidine		2,6-dinitrotoluene
	1,2,4-trichlorobenzene	X	2,4-dichlorophenol		nitrobenzene
	2-chloronaphthalene	X	diethylphthalate		1,3,5-TNB
	4-chloro-3-methyl phenol	X	2,4-dimethylphenol		

*	TCLP Semivolatiles
	chlordane
	o-cresol
	m-cresol
	p-cresol
	cresol
	2,4-D
	2,4-dinitrotoluene
	endrin
	heptachlor
	heptachlor epoxide
	hexachlorobenzene
	hexachlorobutadiene
	hexachloroethane
	lindane
	methoxychlor
	nitrobenzene
	pentachlorophenol
	pyridine
	toxaphene
	2,4,5-trichlorophenol
	2,4,6-trichlorophenol
	2,4,5-TP (Silvex)

*	Pesticides/PCBs
X	aldrin
X	alpha-BHC
X	beta-BHC
X	delta-BHC
X	gamma-BHC (lindane)
X	technical chlordane
X	alpha-chlordane
X	gamma-chlordane
X	4,4'-DDD
X	4,4'-DDE
X	4,4'-DDT
X	dieldrin
X	endosulfan I
X	endosulfan II
X	endosulfan sulfate
X	endrin
X	endrin aldehyde
X	endrin ketone
X	heptachlor
X	heptachlor epoxide
X	toxaphene
X	methoxychlor
X	PCB 1016/1242
X	PCB 1221
X	PCB 1232
X	PCB 1248
X	PCB 1254
X	PCB 1260
X	PCB 1262

Laboratory Number

Branch Lab Number

Chain of Custody and Supplemental Information

Only one chain of custody form is required per sample set or point (if all collected at the same time)

1. Collected by CAA
   Date 8-25-98 Time 15:40
   Delivered to KBL
   Date 8-25-98 Time 10:00
2. Received by
   Date Time
   Delivered to
   Date Time
3. Received by
   Date Time
   Delivered to
   Date Time
4. Received in Lab by P Baker
   Date 8/26/98 Time 1000
   Logged in by
   Date Time

Additional Information

1. Approximate volume of sample 16 oz.
2. Nearest town or city Knoxville
3. Others present at collection Beth Walker
4. Number of other samples collected at same time at this point 3
5. Field collection procedure, handling and/or preservation of this sample EPA procedures and protocol
6. Mode of transportation to lab in State vehicle, in cooler, on ice
7. Sample sealed by
8. Date sample sealed
9. Remarks

SEP 14 1998

Project/Site No.: 47-559
Project Name: SMOKEY MOUNTAIN SMELTERS
Site Description: SMS-SB-04/DRUM STOR./DISP.
Station No.: SMS-SB-04
Collected: 08/25/98 15:40:00 By CAA
unty: 47

Lab Number: 9808247-03E
Matrix: SOIL
Received: 08/26/98 10:00:00 By PMB
Sampling Agency: HWM_11_KFO
Priority:

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
VOLATILES-TAL SEDIMENTS						8260A
ACETONE	U	PPB	25	09/04/98	HMG	
BENZENE	U	PPB	2.5	09/04/98	HMG	
BROMODICHLOROMETHANE	U	PPB	2.5	09/04/98	HMG	
BROMOFORM	U	PPB	2.5	09/04/98	HMG	
BROMOMETHANE	U	PPB	5.0	09/04/98	HMG	
2-BUTANONE (MEK)	U	PPB	25	09/04/98	HMG	
CARBON DISULFIDE	U	PPB	5.0	09/04/98	HMG	
CARBON TETRACHLORIDE	U	PPB	2.5	09/04/98	HMG	
VINYL ACETATE	U	PPB	5.0	09/04/98	HMG	
CHLOROBENZENE	U	PPB	2.5	09/04/98	HMG	
CHLOROETHANE	U	PPB	5.0	09/04/98	HMG	
CHLOROFORM	U	PPB	2.5	09/04/98	HMG	
CHLOROMETHANE	U	PPB	5.0	09/04/98	HMG	
DIBROMOCHLOROMETHANE	U	PPB	2.5	09/04/98	HMG	
1,2-DICHLOROBENZENE	U	PPB	2.5	09/04/98	HMG	
1,3-DICHLOROBENZENE	U	PPB	2.5	09/04/98	HMG	
1,4-DICHLOROBENZENE	U	PPB	2.5	09/04/98	HMG	
DICHLORODIFLUOROMETHANE	U	PPB	5.0	09/04/98	HMG	
1,1-DICHLOROETHANE	U	PPB	2.5	09/04/98	HMG	
1,2-DICHLOROETHANE	U	PPB	2.5	09/04/98	HMG	
1,1-DICHLOROETHENE	U	PPB	2.5	09/04/98	HMG	
CIS-1,2-DICHLOROETHENE	U	PPB	2.5	09/04/98	HMG	
TRANS-1,2-DICHLOROETHENE	U	PPB	2.5	09/04/98	HMG	
1,2-DICHLOROPROPANE	U	PPB	2.5	09/04/98	HMG	
CIS-1,3-DICHLOROPROPENE	U	PPB	2.5	09/04/98	HMG	
TRANS-1,3-DICHLOROPROPENE	U	PPB	2.5	09/04/98	HMG	
ETHYLBENZENE	U	PPB	2.5	09/04/98	HMG	
METHYLENE CHLORIDE	B 19	PPB	2.5	09/04/98	HMG	
4-METHYL-2-PENTANONE (MIBK)	U	PPB	25	09/04/98	HMG	
STYRENE	U	PPB	2.5	09/04/98	HMG	
2-HEXANONE	U	PPB	5.0	09/04/98	HMG	
1,1,2,2-TETRACHLOROETHANE	U	PPB	2.5	09/04/98	HMG	
TETRACHLOROETHENE	U	PPB	2.5	09/04/98	HMG	
TOLUENE	6.5	PPB	2.5	09/04/98	HMG	
1,1,1-TRICHLOROETHANE	U	PPB	2.5	09/04/98	HMG	
1,1,2-TRICHLOROETHANE	U	PPB	2.5	09/04/98	HMG	
TRICHLOROETHENE	U	PPB	2.5	09/04/98	HMG	
TRICHLOROFLUOROMETHANE	U	PPB	5.0	09/04/98	HMG	
VINYL CHLORIDE	U	PPB	5.0	09/04/98	HMG	
o-XYLENE	U	PPB	2.5	09/04/98	HMG	
m&p-XYLENE	U	PPB	2.5	09/04/98	HMG	

*-Water, uG/L; Sediment, uG/kG

Printed: September 8, 1998

State of Tennessee - Environmental Laboratories

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Organic Analysis

Volatiles and Petroleum Hydrocarbons

PROJECT/SITE NO.	47-559	PROJECT NAME	~~BUCKEYE MOUNTAIN SMELTERS~~
STATION NUMBER	SMS-SB-04	COUNTY	KNOX
DESCRIPTION	~~AT DRUM STORAGE/DISPOSAL AREA~~		
STREAM MILE		DEPTH	MATRIX Soil
COLLECTED: DATE	AUGUST 25, 1998	TIME	15:40
SAMPLER'S NAME(printed)	CHRIS A. ANDEL		
SAMPLING AGENCY	~~DIVISION OF SUPERFUND~~	BILLING CODE	~~327.38-11~~
IF PRIORITY, DATE NEEDED	~~SEPTEMBER 25~~		
SEND REPORT TO:	~~KNOXVILLE ENVIRONMENTAL ASSISSTANCE CENTER~~ BURL H. MAUPIN		
CONTACT HAZARD	~~METALS, RADIOCHEMICAL, UNKNOWN~~		

*	NPDES Volatiles - 624	*	TAL Volatiles - 8260A	*	TCLP Volatiles
	Bromoform		Chloromethane		Benzene
	Bromodichloromethane		Bromomethane		Carbon tetrachloride
	Carbon Tetrachloride		Vinyl chloride		Chlorobenzene
	Chlorobenzene		Chloroethane		Chloroform
	Chloroethane		Methylene chloride		1,2-Dichloroethane
	2-Chloroethylvinyl ether		Acetone		1,1-Dichloroethane
	Chloroform		Carbon disulfide		Methyl ethyl ketone
	Chloromethane		1,1-Dichloroethene		Tetrachloroethene
	Dibromochloromethane		1,1-Dichloroethane		Trichloroethene
	1,2-Dichlorobenzene		Cis-1,2-dichloroethene		Vinyl chloride
	1,3-Dichlorobenzene		Trans-1,2-dichloroethene	*	BTEX - 8260A - UST
	1,4-Dichlorobenzene		1,2-Dichloroethane		Benzene
	Dichlorodifluoromethane		Chloroform		Toluene
	1,1-Dichloroethane		2-Butanone		Ethyl benzene
	1,2-Dichloroethane		1,1,1-Trichloroethane		o-Xylene
	1,1-Dichloroethene		Carbon tetrachloride		m-Xylene
	Cis-1,2-dichloroethene		Vinyl acetate		p-Xylene
	Trans-1,2-dichloroethene		Bromodichloromethane		Methyl t-butyl ether
	1,2-Dichloropropane		1,2-Dichloropropane		Diisopropyl ether
	Cis-1,3-dichloropropene		Cis-1,3-dichloropropane	*	TPH by GC
	Trans-1,2-dichloroethene		Trichloroethene		Gasoline Range Organics
	Methylene chloride		Dibromochloromethane		Diesel Range Organics
	1,1,2,2-Tetrachloroethane		1,1,2-Trichloroethane	*	TPH by IR (418.1)
	Tetrachloroethene		Benzene		418.1 - Waste Oil
	1,1,1-Trichloroethane		Trans-1,3-dichloropropene	*	Other
	1,1,2-Trichloroethane		Bromoform		
	Trichloroethene		4-Methyl-2-pentanone		
	Trichlorofluoromethane		2-Hexanone		
	Vinyl chloride		Tetrachloroethene		
	Benzene		Toluene		
	Ethylbenzene		1,1,2,2-Tetrachloroethane		
	Toluene		Chlorobenzene		
	o-Xylene		Ethyl benzene		
	m-Xylene		Styrene		
	p-Xylene		o-Xylene		
			m-Xylene		
			p-Xylene		

Laboratory Number

Branch Lab Number

Chain of Custody and Supplemental Information

Only one chain of custody form is required per sample set or point (if all collected at the same time)

1. Collected by CHRIS A. ANDEL
   Date ~~AUGUST 25, 1998~~ Time ~~15:40~~
   Delivered to *Knoxville Basin Laboratory*
   Date 8-26-98 Time 10:00
2. Received by
   Date Time
   Delivered to
   Date Time
3. Received by
   Date Time
   Delivered to
   Date Time
4. Received in Lab by [illegible]
   Date 8/26/98 Time 1000
   Logged in by
   Date Time

Additional Information

1. Approximate volume of sample *4 oz.*
2. Nearest town or city KNOXVILLE
3. Others present at collection BETH WALKER
4. Number of other samples collected at same time at this point *One other sample each for INORGANICS, RADIOCHEMICAL, AND EXTRACTABLE ORGANICS were collected for a total of three other samples.*
5. Field collection procedure, handling and/or preservation of this sample *according to EPA procedures and protocol*
6. Mode of transportation to lab *in State vehicle, in cooler, and on ice*
7. Sample sealed by
8. Date sample sealed
9. Remarks

SEP 30 1998

Project/Site No.: 47-559
Project Name: SMOKEY MOUNTAIN SMELTERS
Description: SMS-SB-04/DRUM STOR./DISP.
Station No.: SMS-SB-04
Collected: 08/25/98 15:40:00 By BHM
nty: 47

Lab Number: 9808247-03G
Matrix: SOIL
Received: 08/26/98 10:00:00 By PMB
Sampling Agency: HWM_11_KFO
Priority:

TEST	RESULT	*ERROR	UNITS	ANALYZED	BY	METHOD
GAMMA RADIONUCLIDES						R.6
K-40	1.20	0.57	pCi/g dry wt	08/31/98	AK	
Pb-214	0.637	0.070	pCi/g dry wt	08/31/98	AK	
Bi-214	0.580	0.060	pCi/g dry wt	08/31/98	AK	
Pb-212	0.910	0.050	pCi/g dry wt	08/31/98	AK	
Ac-228	0.968	0.080	pCi/g dry wt	08/31/98	AK	
Bi-212	7.02	0.20	pCi/g dry wt	08/31/98	AK	
GROSS ALPHA & BETA						R.1.3
GROSS ALPHA	1.27	0.67	pCi/g DRY WT.	09/09/98	NLF	
GROSS BETA	13.1	1.5	pCi/g DRY WT.	09/09/98	NLF	

*--Represents +/- error value

Printed: September 10, 1998

SEP 30 1998

Project/Site No.:	47-559	Lab Number:	9808247-06A
Project Name:	SMOKEY MOUNTAIN SMELTERS	Matrix:	SOIL
Description:	SMS-SB-04/DRUM STOR. DUP.	Received:	08/26/98 10:00:00 By PMB
Station No.:	SMS-SB-04	Sampling Agency:	HWM_11_KFO
Collected:	08/25/98 15:40:00 By BHM	Priority:	
Qty:	47		

TEST	RESULT	*ERROR	UNITS	ANALYZED	BY	METHOD
GROSS ALPHA & BETA						R.1.3
GROSS ALPHA	1.31	0.67	pCi/g DRY WT.	09/09/98	NLF	
GROSS BETA	12.8	1.4	pCi/g DRY WT.	09/09/98	NLF	

*--Represents +/- error value

Printed: September 10, 1998

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Radiochemical Analysis

PROJECT/SITE NO. 47-559	PROJECT NAME Smokey Mountain Smelter
STATION NUMBER SMS-SB-04	COUNTY Knox
DESCRIPTION subsurface soil below drum pile	
STREAM MILE	DEPTH 6-12 inches
COLLECTED: DATE 08/25/98	TIME 15:40
PICK-UP DATE:	
CONTACT HAZARD unknown	mR/hr Reading 0.01
SAMPLER'S NAME (printed) Chris Ansel	
SAMPLING AGENCY TDSF	BILLING CODE 327.38.10
IF PRIORITY, DATE NEEDED 09/26/98	
SEND REPORT TO: Burl Maupin	
KEAC - Superfund	

Laboratory Number

Branch Lab Number

Date Received

Time Received **By**

Sample Type

___Air ___Milk ___Swipe
___Water ___Tissue ___Liquid
___Sludge X Soil ___Solid
___Vegetation ___Sediment

Other_____

Field Comments:

Air Samples
Volume _____
Total Hours _____

___Sample Filtration
___Sample Acidification
___Send to RESL

REQUESTED ANALYSES:

X	GROSS ALPHA (TOTAL)		STRONTIUM 89
	GROSS ALPHA (SUSPENDED)		STRONTIUM 90
	GROSS ALPHA (DISSOLVED)		TRITIUM (H-3)
X	GROSS BETA (TOTAL)		THORIUM (TOTAL)
	GROSS BETA (SUSPENDED)		URANIUM (TOTAL)
	GROSS BETA (DISSOLVED)	X	GAMMA RADIONUCLIDES
			ADDITIONAL ANALYSES:

Chain of Custody and Supplemental Information

Only one chain of custody form is required per sample set or point (if all collected at the same time)

1. Collected by CAA
   Date 08/25/98 Time 15:40
   Delivered to Knoxville LAB
   Date 8-26-98 Time 10:00
2. Collected by
   Date Time
   Delivered to
   Date Time
3. Collected by
   Date Time
   Delivered to
   Date Time
4. Received in Lab by P Baker
   Date 8/26/98 Time 1000
   Logged in by
   Date Time

Additional Information

1. Approximate volume of sample 1602
2. Nearest town or city Knoxville
3. Others present at collection BHW
4. Number of other samples collected at same time at this point 3 = Volatiles, extra, + morg.
5. Field collection procedure, handling and/or preservation of this sample according to EPA procedures
6. Mode of transportation to lab in cooler, on ice in state vehicle
7. Sample sealed by
8. Date sample sealed
9. Remarks

PH-3009 (rev 1/96)

RDA 1527

" Laboratory Forms - Sediment Samples "

TDH/Division of Laboratory Services (DLS). 1997-8. "Laboratory Reports, Requests, and Chain-of-Custody Forms - Sediment Samples". Tennessee Department of Health/Division of Laboratory Services.

SMOKEY MOUNTAIN SMELTERS
KNOXVILLE, TENNESSEE 37920
U.S. EPA # TN0002318277
TSDF #47-559

DEC 08 1997

Project/Site No.: 47-559
Project Name: SMOKEY MTN. SMELTERS
Description: SW DRAINAGE SEDIMENT
Station No.: SD-01
Collected: 10/21/97 09:40:00 By BHM
unty: 47

Lab Number: 9710216-01
Matrix: SEDIMENT
Received: 10/21/97 12:45:00 By LAB
Sampling Agency: HWM_05_KFO
Priority: 11_21_97

TEST	RESULT	UNITS	LIMIT	ANALYZED	BY	METHOD
AMMONIA	121	mg/kg	10	10/31/97	LKS	A.18.2
CYANIDE	1.08	mg/kg	1.0	10/31/97	SAL	A.9
ALUMINUM	7130	mg/kg	10	11/13/97	JAH	
ANTIMONY	3	mg/kg	1	11/19/97	JAH	
ARSENIC	6	mg/kg	1	11/21/97	JAH	
BARIUM	63	mg/kg	10	11/13/97	JAH	
BERYLLIUM	1	mg/kg	1	11/17/97	JAH	
CADMIUM	0.8	mg/kg	0.5	11/05/97	JAH	
CALCIUM	8000	mg/kg	10	11/07/97	JAH	
CHROMIUM	44	mg/kg	1	11/04/97	JAH	
COBALT	10	mg/kg	1	11/06/97	JAH	
COPPER	809	mg/kg	1	11/04/97	JAH	
DIGESTION-METALS	COMPLETED	COMPLETED		10/29/97	EAM	
IRON	12500	mg/kg	5	11/04/97	JAH	
LEAD	47	mg/kg	4	11/04/97	JAH	
MAGNESIUM	2860	mg/kg	10	11/07/97	JAH	
MANGANESE	511	mg/kg	1	11/04/97	JAH	
MERCURY	U	mg/kg	0.1	11/18/97	EBS	EPA 245.5
METALS PREP-SOLIDS/WASTES	COMPLETED	COMPLETED		10/23/97	EAM	
NICKEL	233	mg/kg	2	11/04/97	JAH	
PERCENT SOLIDS	75.8	%		11/14/97	JAH	
POTASSIUM	869	mg/kg	10	11/06/97	JAH	
LENIUM	U	mg/kg	1	11/20/97	JAH	

DEC 03 1997

Project/Site No.: 47-559
Project Name: SMOKEY MTN. SMELTERS
Description: SW DRAINAGE SEDIMENT
Station No.: SD-01
Collected: 10/21/97 09:40:00 By BHM
County: 47

Lab Number: 9710216-01
Matrix: SEDIMENT
Received: 10/21/97 12:45:00 By LAB
Sampling Agency: HWM_05_KFO
Priority: 11_21_97

TEST	RESULT	UNITS	LIMIT	ANALYZED	BY	METHOD
SILVER	U	mg/kg	1	11/06/97	JAH	
SODIUM	7200	mg/kg	10	11/06/97	JAH	
THALLIUM	U	mg/kg	5	11/06/97	JAH	
VANADIUM	32	mg/kg	20	11/17/97	JAH	
ZINC	523	mg/kg	0.5	11/05/97	JAH	

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Inorganic Analysis

PROJECT/SITE NO. 47-559	PROJECT NAME Smoky Mtn. Smelters
STATION NUMBER SD-01	COUNTY Knox
DESCRIPTION SW drainage sediment	
STREAM MILE	DEPTH / MATRIX sediment
COLLECTED: DATE 10-21-97	TIME 9:40a
SAMPLER'S NAME(printed) Burl Maupin	
SAMPLING AGENCY DSF	BILLING CODE 3873801
IF PRIORITY, DATE NEEDED 11-21-97	
SEND REPORT TO: KFO	
CONTACT HAZARD radioactivity ammonia, metals	

*	Metals
X	aluminum, Al
X	antimony, Sb
X	arsenic, As
X	barium, Ba
X	beryllium, Be
X	cadmium, Cd
X	calcium, Ca
X	chromium, Cr
X	cobalt, Co
X	copper, Cu
X	iron, Fe
X	lead, Pb
X	magnesium, Mg
X	manganese, Mn
X	mercury, Hg
X	nickel, Ni
X	potassium, K
X	selenium, Se
X	silver, Ag
X	sodium, Na
X	thallium, Tl
X	vanadium, V
X	zinc, Zn

*	Env. Microbiology	*	General Inorganics		Gen. Inorganics (con't)
	coliform, fecal*		acidity as $CaCO_3$*		oil and grease
	coliform, total*		alkalinity as $CaCO_3$*		orthophosphate, total*
	strep, fecal*		alkalinity, phen. as $CaCO_3$*		oxygen, dissolved*
			BOD, 5-day*		pH
			CBOD, 5-day*		phenols, total
			boron		phosphate, total
*	**Ambient Parameters**		chloride*		residue, dissolved*
	COD*		chlorine, residual*		residue, settleable*
	coliform, fecal		chromium, hexavalent		residue, suspended*
	conductivity*		COD*		residue, total*
	hardness, total as $CaCO_3$*		color, apparent*		silica*
	nitrogen, ammonia		color, true*		sulfate*
	nitrogen, NO_3 & NO_2		conductivity*		sulfide, total*
	nitrogen, total Kjeldahl	X	cyanide		TOC*
	phosphate, total		flash point*		turbidity*
	pH		fluoride*		percent solids
	residue, dissolved*		hardness, Ca as $CaCO_3$*	*	**Other**
	residue, suspended*		hardness, total as $CaCO_3$*		
	arsenic, As		hydrocarbons, total		
	cadmium, Cd		MBAS*		
	chromium, Cr	X	nitrogen, ammonia		
	copper, Cu		nitrogen, nitrate*		
	lead, Pb		nitrogen, nitrite*		
	mercury, Hg		nitrogen, NO_3 & NO_2		
	nickel, Ni		nitrogen, total Kjeldahl		
	zinc, Zn		nitrogen, total organic		

*	TCLP
	arsenic, As
	barium, Ba
	cadmium, Cd
	chromium, Cr
	lead, Pb
	mercury, Hg
	nickel, Ni
	selenium, Se
	silver, Ag

** denotes analyses performed only on water*

FIELD DETERMINATIONS	Temperature
pH	Chlorine, residual
Conductivity	Other
Dissolved Oxygen	rad = 50.1 mR/hr

Laboratory Number

Branch Lab Number

Chain of Custody and Supplemental Information

Only one chain of custody form is required per sample set or point (if all collected at the same time)

1. Collected by BHM
   Date 10-21-97 Time 9:40a
   Delivered to KBL
   Date 10-21-97 Time 12:45 a.m.
2. Received by
   Date Time
   Delivered to
   Date Time
3. Received by
   Date Time
   Delivered to
   Date Time
4. Received in Lab by [illegible]
   Date 10-21-97 Time 12:45
   Logged in by
   Date Time

Additional Information

1. Approximate volume of sample
   500 ml
2. Nearest town or city Knoxville
3. Others present at collection
   WLB, ADD, WW
4. Number of other samples collected at same time at this point 3
5. Field collection procedure, handling and/or preservation of this sample
   standard
6. Mode of transportation to lab state vehicle
7. Sample sealed by
8. Date sample sealed
9. Remarks

DEC 1997

Project/Site No.:	47-559	Lab Number:	9710238-01A
Project Name:	SMOKEY MOUNTAIN SMELTERS	Matrix:	SEDIMENT
Description:	SW DRAINAGE SEDIMENT	Received:	10/23/97 08:30:00 By LJB
S tion No.:	SD-01	Sampling Agency:	HWM_05_KFO
.ected:	10/21/97 09:40:00 By B M	Priority:	11_21_97
County:	47		

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
B/N/A EXTR+PESTS,PCBS-SOIL						MS+ECD
BUTYL BENZYL PHTHALATE	U	PPB	200	11/14/97	MAC	
BIS(2-ETHYLHEXYL)PHTHALATE	288	PPB	-	11/14/97	MAC	
DI-n-BUTYL PHTHALATE	U	PPB	200	11/14/97	MAC	
DI-n-OCTYL PHTHALATE	U	PPB	500	11/14/97	MAC	
DIETHYL PHTHALATE	U	PPB	100	11/14/97	MAC	
DIMETHYL PHTHALATE	U	PPB	100	11/14/97	MAC	
n-NITROSODIMETHYLAMINE	U	PPB	500	11/14/97	MAC	
n-NITROSODIPHENYLAMINE	U	PPB	200	11/14/97	MAC	
n-NITROSO-di-n-PROPYLAMINE	U	PPB	200	11/14/97	MAC	
ISOPHORONE	U	PPB	100	11/14/97	MAC	
NITROBENZENE	U	PPB	200	11/14/97	MAC	
2,4-DINITROTOLUENE	U	PPB	500	11/14/97	MAC	
2,6-DINITROTOLUENE	U	PPB	500	11/14/97	MAC	
ACENAPTHENE	U	PPB	100	11/14/97	MAC	
ACENAPHTHYLENE	U	PPB	100	11/14/97	MAC	
ANTHRACENE	U	PPB	100	11/14/97	MAC	
BENZO(a)ANTHRACENE	136	PPB	-	11/14/97	MAC	
BENZO(a)PYRENE	155	PPB	-	11/14/97	MAC	
BENZO(b)FLUORANTHENE	188	PPB	-	11/14/97	MAC	
BENZO(ghi)PERYLENE	U	PPB	200	11/14/97	MAC	
BENZO(k)FLUORANTHENE	U	PPB	100	11/14/97	MAC	
DIBENZO(a,h)ANTHRACENE	U	PPB	500	11/14/97	MAC	
FLUORANTHENE	252	PPB	-	11/14/97	MAC	
FLUORENE	U	PPB	50	11/14/97	MAC	
INDENO(1,2,3-cd)PYRENE	U	PPB	500	11/14/97	MAC	
NAPHTHALENE	U	PPB	50	11/14/97	MAC	
PHENANTHRENE	137	PPB	-	11/14/97	MAC	
PYRENE	239	PPB	-	11/14/97	MAC	
CHRYSENE	107	PPB	-	11/14/97	MAC	
BIS(2-CHLOROETHYL)ETHER	U	PPB	200	11/14/97	MAC	
BIS(2-CHLOROETHOXY)METHANE	U	PPB	200	11/14/97	MAC	
BIS(2-CHLOROISOPROPYL)ETHER	U	PPB	200	11/14/97	MAC	
4-BROMOPHENYLPHENYL ETHER	U	PPB	200	11/14/97	MAC	
4-CHLOROPHENYLPHENYL ETHER	U	PPB	200	11/14/97	MAC	
HEXACHLOROCYCLOPENTADIENE	U	PPB	500	11/14/97	MAC	
HEXACHLOROBUTADIENE	U	PPB	200	11/14/97	MAC	
HEXACHLOROBENZENE	U	PPB	200	11/14/97	MAC	
HEXACHLOROETHANE	U	PPB	200	11/14/97	MAC	
1,2,4-TRICHLOROBENZENE	U	PPB	200	11/14/97	MAC	
2-CHLORONAPHTHALENE	U	PPB	100	11/14/97	MAC	
4-CHLORO-3-METHYLPHENOL	U	PPB	200	11/14/97	MAC	
2-CHLOROPHENOL	U	PPB	200	11/14/97	MAC	
2,4-DICHLOROPHENOL	U	PPB	200	11/14/97	MAC	
2,4-DIMETHYLPHENOL	U	PPB	200	11/14/97	MAC	
2,4-DINITROPHENOL	U	PPB	1000	11/14/97	MAC	
2-METHYL-4,6-DINITROPHENOL	U	PPB	500	11/14/97	MAC	
2-NITROPHENOL	U	PPB	500	11/14/97	MAC	
4-NITROPHENOL	U	PPB	500	11/14/97	MAC	
PENTACHLOROPHENOL	U	PPB	500	11/14/97	MAC	
PHENOL	U	PPB	200	11/14/97	MAC	
2,4,6-TRICHLOROPHENOL	U	PPB	200	11/14/97	MAC	
2,4,5-TRICHLOROPHENOL	U	PPB	200	11/14/97	MAC	
O-CRESOL	U	PPB	200	11/14/97	MAC	
M- & P-CRESOL	U	PPB	200	11/14/97	MAC	
2-METHYLNAPHTHALENE	U	PPB	100	11/14/97	MAC	
BENZOIC ACID	U	PPB	1000	11/14/97	MAC	
BENZYL ALCOHOL	U	PPB	200	11/14/97	MAC	
4-CHLOROANILINE	U	PPB	200	11/14/97	MAC	
DIBENZOFURAN	U	PPB	50	11/14/97	MAC	
3,3-DICHLOROBENZIDINE	U	PPB	500	11/14/97	MAC	
2-NITROANILINE	U	PPB	500	11/14/97	MAC	
3-NITROANILINE	U	PPB	500	11/14/97	MAC	
4-NITROANILINE	U	PPB	500	11/14/97	MAC	
ALDRIN	U	PPB	2.7	11/14/97	MAC	
a-BHC	U	PPB	4.8	11/14/97	MAC	
BHC	U	PPB	7.0	11/14/97	MAC	
beta-BHC	U	PPB	6.9	11/14/97	MAC	
gamma-BHC (LINDANE)	U	PPB	2.7	11/14/97	MAC	
alpha-CHLORDANE	U	PPB	3.7	11/14/97	MAC	
gamma-CHLORDANE	U	PPB	2.7	11/14/97	MAC	
TECHNICAL CHLORDANE	U	PPB	40	11/14/97	MAC	
p,p-DDD	U	PPB	5.0	11/14/97	MAC	
p,p-DDE	U	PPB	4.4	11/14/97	MAC	

DEC 0 9 1997

Project/Site No.: 47-559
Project Name: SMOKEY MOUNTAIN SMELTERS
Description: SW DRAINAGE SEDIMENT
Station No.: SD-01
Collected: 10/21/97 09:40:00 By B M
County: 47

Lab Number: 9710238-01A
Matrix: SEDIMENT
Received: 10/23/97 08:30:00 By LJB
Sampling Agency: HWM_05_KFO
Priority: 11_21_97

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
B/N/A EXTR+PESTS,PCBS-SOIL						MS+ECD
p,p-DDT	U	PPB	4.7	11/14/97	MAC	
DIELDRIN	3.26	PPB	-	11/14/97	MAC	
ENDOSULFAN I	U	PPB	4.4	11/14/97	MAC	
ENDOSULFAN II	U	PPB	5.1	11/14/97	MAC	
ENDOSULFAN SULFATE	U	PPB	5.0	11/14/97	MAC	
ENDRIN	U	PPB	5.0	11/14/97	MAC	
ENDRIN ALDEHYDE	U	PPB	4.2	11/14/97	MAC	
ENDRIN KETONE	U	PPB	5.1	11/14/97	MAC	
HEPTACHLOR	U	PPB	3.3	11/14/97	MAC	
HEPTACHLOR EPOXIDE	U	PPB	3.5	11/14/97	MAC	
TOXAPHENE	U	PPB	290	11/14/97	MAC	
METHOXYCHLOR	U	PPB	19	11/14/97	MAC	
PCB 1016/1242	U	PPB	310	11/14/97	MAC	
PCB 1221	U	PPB	340	11/14/97	MAC	
PCB 1232	U	PPB	390	11/14/97	MAC	
PCB 1248	U	PPB	260	11/14/97	MAC	
PCB 1254	U	PPB	170	11/14/97	MAC	
PCB 1260	U	PPB	160	11/14/97	MAC	
PCB 1262	U	PPB	120	11/14/97	MAC	

*-Water, uG/L; Sediment, uG/kG

Printed: December 1, 1997

State of Tennessee - Environmental Laboratories
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Organic Analysis
Base/Neutral/Acid Extractables

PROJECT/SITE NO. 47-559	PROJECT NAME Smoky Mtn Smelters
STATION NUMBER SD-01	COUNTY Knox
DESCRIPTION SW drainage sediment	
STREAM MILE	DEPTH MATRIX sediment
COLLECTED: DATE 10-21-97	TIME 9:40a
SAMPLER'S NAME(printed) Burl Maupin	
SAMPLING AGENCY DSF	BILLING CODE 3273801
IF PRIORITY, DATE NEEDED 11-21-97	
SEND REPORT TO: KEO	
CONTACT HAZARD radioactivity ammonia, metals	

*	NPDES Extractables	*	NPDES Extractables(con't)	*	TAL Semivolatiles
	butylbenzylphthalate	X	2-chlorophenol	X	dimethylphthalate
	bis(2-ethylhexyl)phthalate		2,4-dichlorophenol	X	4,6-dinitro-2-methylphenol
	di-n-butylphthalate		2,4-dimethylphenol	X	2,4-dinitrophenol
	di-n-octylphthalate		2,4-dinitrophenol	X	2,4-dinitrotoluene
	diethylphthalate		4,6-dinitro-o-cresol	X	2,6-dinitrotoluene
	dimethylphthalate		2-nitrophenol	X	fluoranthene
X	n-nitrosodimethylamine		4-nitrophenol	X	fluorene
	n-nitrosodiphenylamine		pentachlorophenol	X	hexachlorobenzene
	n-nitrosodi-n-propylamine		phenol	X	hexachlorobutadiene
	isophorone		2,4,6-trichlorophenol	X	hexachlorocyclopentadiene
	nitrobenzene	*	TAL Semivolatiles	X	hexachloroethane
	2,4-dinitrotoluene	X	acenaphthene	X	indeno(1,2,3-cd)pyrene
	acenaphthene	X	acenaphthylene	X	isophorone
	acenaphthylene	X	anthracene	X	2-methylnaphthalene
	anthracene	X	benzo(a)anthracene	X	2-methylphenol
	benzo(a)anthracene	X	benzo(a)pyrene	X	4-methylphenol
	benzo(a)pyrene	X	benzo(b)fluoranthene	X	n-nitrosodiphenylamine
	benzo(b)fluoranthene	X	benzo(g,h,i)perylene	X	n-nitroso-n-dipropylamine
	benzo(g,h,i)perylene	X	benzo(k)fluoranthene	X	naphthalene
	benzo(k)fluoranthene	X	benzoic acid	X	2-nitroaniline
	chrysene	X	benzyl alcohol	X	3-nitroaniline
	dibenzo(a,h)anthracene	X	bis(2-chloroethoxy)methane	X	4-nitroaniline
	fluoranthene	X	bis(2-chloroethyl) ether	X	nitrobenzene
	fluorene	X	bis(2-chloroisopropyl)ether	X	2-nitrophenol
	indeno(1,2,3-c,d)pyrene	X	bis(2-ethylhexyl)phthalate	X	4-nitrophenol
	naphthalene	X	4-bromophenylphenylether	X	pentachlorophenol
	phenanthrene	X	butylbenzylphthalate	X	phenanthrene
	pyrene	X	4-chloroaniline	X	phenol
	bis(2-chloroethyl)ether	X	4-chloro-3-methyl phenol	X	pyrene
	bis(2-chloroethoxy)methane	X	2-chloronaphthalene	X	1,2,4-trichlorobenzene
	bis(2-chloroisopropyl)ether	X	4-chlorophenylphenylether	X	2,4,5-trichlorophenol
	4-bromophenylphenylether	X	chrysene	X	2,4,6-trichlorophenol
	4-chlorophenylphenylether	X	di-n-butylphthalate	*	Nitrobodies
	hexachlorocyclopentadiene	X	di-n-octylphthalate		RDX
	hexachlorobutadiene	X	dibenzo(a,h)anthracene		2,4,6-TNT
	hexachlorobenzene	X	dibenzofuran		2,4-dinitrotoluene
	hexachloroethane	X	3,3'-dichlorobenzidine		2,6-dinitrotoluene
	1,2,4-trichlorobenzene	X	2,4-dichlorophenol		nitrobenzene
	2-chloronaphthalene	X	diethylphthalate		1,3,5-TNB
	4-chloro-3-methyl phenol	X	2,4-dimethylphenol		

*	TCLP Semivolatiles
	chlordane
	o-cresol
	m-cresol
	p-cresol
	cresol
	2,4-D
	2,4-dinitrotoluene
	endrin
	heptachlor
	heptachlor epoxide
	hexachlorobenzene
	hexachlorobutadiene
	hexachloroethane
	lindane
	methoxychlor
	nitrobenzene
	pentachlorophenol
	pyridine
	toxaphene
	2,4,5-trichlorophenol
	2,4,6-trichlorophenol
	2,4,5-TP (Silvex)
*	Pesticides/PCBs
X	aldrin
X	alpha-BHC
X	beta-BHC
X	delta-BHC
X	gamma-BHC (lindane)
X	technical chlordane
X	alpha-chlordane
X	gamma-chlordane
X	4,4'-DDD
X	4,4'-DDE
X	4,4'-DDT
X	dieldrin
X	endosulfan I
X	endosulfan II
X	endosulfan sulfate
X	endrin
X	endrin aldehyde
X	endrin ketone
X	heptachlor
X	heptachlor epoxide
X	toxaphene
X	methoxychlor
X	PCB 1016/1242
X	PCB 1221
X	PCB 1232
X	PCB 1248
X	PCB 1254
X	PCB 1260
X	PCB 1262

Laboratory Number

Branch Lab Number

Chain of Custody and Supplemental Information

Only one chain of custody form is required per sample set or point (if all collected at the same time)

1. Collected by BHM
   Date 10-21-97 Time 9:40a
   Delivered to KBL
   Date 10-21-97 Time 12:45 p.m.
2. Received by
   Date Time
   Delivered to
   Date Time
3. Received by
   Date Time
   Delivered to
   Date Time
4. Received in Lab by [illegible]
   Date 10-21-97 Time 12:45
   Logged in by
   Date Time

Additional Information

1. Approximate volume of sample 500 ml
2. Nearest town or city Knoxville
3. Others present at collection
   WLB, JWW ADD
4. Number of other samples collected at same time at this point 3
5. Field collection procedure, handling and/or preservation of this sample
   standard
6. Mode of transportation to lab
   state vehicle
7. Sample sealed by
8. Date sample sealed
9. Remarks

PH-3014 (rev 1/96)

RDA 1527

Project/Site No.:	47-559	Lab Number:	9710216-01E
Project Name:	SMOKEY MTN. SMELTERS	Matrix:	SEDIMENT
Site Description:	SW DRAINAGE SEDIMENT	Received:	10/21/97 12:45:00 By LAB
Station No.:	SD-01	Sampling Agency:	HWM_05_KFO
llected:	10/21/97 09:40:00 By BHM	Priority:	11_21_97
ounty:	47		

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
VOLATILES-TAL SEDIMENTS						8260A
ACETONE	U	PPB	25	10/24/97	HMG	
BENZENE	U	PPB	2.5	10/24/97	HMG	
BROMODICHLOROMETHANE	U	PPB	2.5	10/24/97	HMG	
BROMOFORM	U	PPB	2.5	10/24/97	HMG	
BROMOMETHANE	U	PPB	5.0	10/24/97	HMG	
2-BUTANONE (MEK)	U	PPB	25	10/24/97	HMG	
CARBON DISULFIDE	U	PPB	5.0	10/24/97	HMG	
CARBON TETRACHLORIDE	U	PPB	2.5	10/24/97	HMG	
VINYL ACETATE	U	PPB	5.0	10/24/97	HMG	
CHLOROBENZENE	U	PPB	2.5	10/24/97	HMG	
CHLOROETHANE	U	PPB	5.0	10/24/97	HMG	
CHLOROFORM	U	PPB	2.5	10/24/97	HMG	
CHLOROMETHANE	U	PPB	5.0	10/24/97	HMG	
DIBROMOCHLOROMETHANE	U	PPB	2.5	10/24/97	HMG	
1,2-DICHLOROBENZENE	U	PPB	2.5	10/24/97	HMG	
1,3-DICHLOROBENZENE	U	PPB	2.5	10/24/97	HMG	
1,4-DICHLOROBENZENE	U	PPB	2.5	10/24/97	HMG	
DICHLORODIFLUOROMETHANE	U	PPB	5.0	10/24/97	HMG	
1,1-DICHLOROETHANE	U	PPB	2.5	10/24/97	HMG	
1,2-DICHLOROETHANE	U	PPB	2.5	10/24/97	HMG	
1,1-DICHLOROETHENE	U	PPB	2.5	10/24/97	HMG	
CIS-1,2-DICHLOROETHENE	U	PPB	2.5	10/24/97	HMG	
TRANS-1,2-DICHLOROETHENE	U	PPB	2.5	10/24/97	HMG	
1,2-DICHLOROPROPANE	U	PPB	2.5	10/24/97	HMG	
CIS-1,3-DICHLOROPROPENE	U	PPB	2.5	10/24/97	HMG	
TRANS-1,3-DICHLOROPROPENE	U	PPB	2.5	10/24/97	HMG	
ETHYLBENZENE	U	PPB	2.5	10/24/97	HMG	
METHYLENE CHLORIDE	U	PPB	2.5	10/24/97	HMG	
4-METHYL-2-PENTANONE (MIBK)	U	PPB	25	10/24/97	HMG	
STYRENE	U	PPB	2.5	10/24/97	HMG	
2-HEXANONE	U	PPB	5.0	10/24/97	HMG	
1,1,2,2-TETRACHLOROETHANE	U	PPB	2.5	10/24/97	HMG	
TETRACHLOROETHENE	U	PPB	2.5	10/24/97	HMG	
TOLUENE	J 0.6	PPB	2.5	10/24/97	HMG	
1,1,1-TRICHLOROETHANE	U	PPB	2.5	10/24/97	HMG	
1,1,2-TRICHLOROETHANE	U	PPB	2.5	10/24/97	HMG	
TRICHLOROETHENE	U	PPB	2.5	10/24/97	HMG	
TRICHLOROFLUOROMETHANE	U	PPB	5.0	10/24/97	HMG	
VINYL CHLORIDE	U	PPB	5.0	10/24/97	HMG	
o-XYLENE	U	PPB	2.5	10/24/97	HMG	
m&p-XYLENE	U	PPB	2.5	10/24/97	HMG	

*-Water, uG/L; Sediment, uG/kG

Printed: October 27, 1997

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Organic Analysis

Volatiles and Petroleum Hydrocarbons

PROJECT/SITE NO. 47-559	PROJECT NAME Smokey Mtn Smelters
STATION NUMBER SD-01	COUNTY Knox
DESCRIPTION SW drainage sediment	
STREAM MILE	DEPTH / MATRIX sediment
COLLECTED: DATE 10-21-97	TIME
SAMPLER'S NAME(printed) Burl Maupin	
SAMPLING AGENCY DSF	BILLING CODE ~~3273801~~
IF PRIORITY, DATE NEEDED 11-21-97	3273801
SEND REPORT TO: KFO	
CONTACT HAZARD radioactivity, ammonia, metals	

Laboratory Number

Branch Lab Number

Chain of Custody and Supplemental Information

Only one chain of custody form is required per sample set or point (if all collected at the same time)

1. Collected by BHM
   Date 10-21-97 Time 9:40
   Delivered to KBL
   Date 10-21-97 Time 12:45 p.m.
2. Received by
   Date Time
   Delivered to
   Date Time
3. Received by
   Date Time
   Delivered to
   Date Time
4. Received in Lab by [signature]
   Date 10-21-97 Time 12:45
   Logged in by
   Date Time

*	NPDES Volatiles - 624	*	TAL Volatiles - 8260A	*	TCLP Volatiles
	Bromoform	X	Chloromethane		Benzene
	Bromodichloromethane		Bromomethane		Carbon tetrachloride
	Carbon Tetrachloride		Vinyl chloride		Chlorobenzene
	Chlorobenzene		Chloroethane		Chloroform
	Chloroethane		Methylene chloride		1,2-Dichloroethane
X	2-Chloroethylvinyl ether		Acetone		1,1-Dichloroethane
	Chloroform		Carbon disulfide		Methyl ethyl ketone
	Chloromethane		1,1-Dichloroethene		Tetrachloroethene
	Dibromochloromethane		1,1-Dichloroethane		Trichloroethene
X	1,2-Dichlorobenzene		Cis-1,2-dichloroethene		Vinyl chloride
X	1,3-Dichlorobenzene		Trans-1,2-dichloroethene	*	**BTEX - 8260A - UST**
X	1,4-Dichlorobenzene		1,2-Dichloroethane		Benzene
X	Dichlorodifluoromethane		Chloroform		Toluene
	1,1-Dichloroethane		2-Butanone		Ethyl benzene
	1,2-Dichloroethane		1,1,1-Trichloroethane		o-Xylene
	1,1-Dichloroethene		Carbon tetrachloride		m-Xylene
	Cis-1,2-dichloroethene		Vinyl acetate		p-Xylene
	Trans-1,2-dichloroethene		Bromodichloromethane		Methyl t-butyl ether
	1,2-Dichloropropane		1,2-Dichloropropane		Diisopropyl ether
	Cis-1,3-dichloropropene		Cis-1,3-dichloropropane	*	**TPH by GC**
	Trans-1,2-dichloroethene		Trichloroethene		Gasoline Range Organics
	Methylene chloride		Dibromochloromethane		Diesel Range Organics
	1,1,2,2-Tetrachloroethane		1,1,2-Trichloroethane	*	**TPH by IR (418.1)**
	Tetrachloroethene		Benzene		418.1 - Waste Oil
	1,1,1-Trichloroethane		Trans-1,3-dichloropropene	*	**Other**
	1,1,2-Trichloroethane		Bromoform		
	Trichloroethene		4-Methyl-2-pentanone		
X	Trichlorofluoromethane		2-Hexanone		
	Vinyl chloride		Tetrachloroethene		
	Benzene		Toluene		
	Ethylbenzene		1,1,2,2-Tetrachloroethane		
	Toluene		Chlorobenzene		
	o-Xylene		Ethyl benzene		
	m-Xylene		Styrene		
	p-Xylene		o-Xylene		
			m-Xylene		
		X	p-Xylene		

Additional Information

1. Approximate volume of sample 4 oz
2. Nearest town or city Knoxville
3. Others present at collection WLB, JWW, ADD
4. Number of other samples collected at same time at this point 3
5. Field collection procedure, handling and/or preservation of this sample standard
6. Mode of transportation to lab state vehicle
7. Sample sealed by
8. Date sample sealed
9. Remarks

NOV 21 1997

Project/Site No.:	47-559	Lab Number:	9710216-01F
Project Name:	SMOKEY MTN. SMELTERS	Matrix:	SEDIMENT
Description:	SW DRAINAGE SEDIMENT	Received:	10/21/97 12:45:00 By LAB
Station No.:	SD-01	Sampling Agency:	HWM_05_KFO
Collected:	10/21/97 09:40:00 By BHM	Priority:	11_21_97
County:	47		

TEST	RESULT	*ERROR	UNITS	ANALYZED	BY	METHOD
GAMMA RADIONUCLIDES						R.6
K-40	8.05	0.56	pCi/g dry wt	10/28/97	RJR	
GROSS ALPHA & BETA						R.1.3
GROSS ALPHA	1.42	0.67	pCi/g DRY WT.	10/29/97	NLF	
GROSS BETA	12.4	1.4	pCi/g DRY WT.	10/29/97	NLF	

*--Represents +/- error value

Printed: October 30, 1997

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Radiochemical Analysis

PROJECT/SITE NO. 47559	PROJECT NAME Smokey Mtn. Smelters
STATION NUMBER SD-01	COUNTY Knox
DESCRIPTION SW drainage sediment	
STREAM MILE	DEPTH
COLLECTED: DATE 10-21-97	TIME 9:40a
PICK-UP DATE:	
CONTACT HAZARD ammonia, metals	mR/hr Reading < 0.1
SAMPLER'S NAME (printed) Burl Maupin	
SAMPLING AGENCY DSF	BILLING CODE 3273801
IF PRIORITY, DATE NEEDED 11-21-97	
SEND REPORT TO: KFO	

Laboratory Number

Branch Lab Number

Date Received

Time Received **By**

Sample Type

___Air ___Milk ___Swipe
___Water ___Tissue ___Liquid
___Sludge ___Soil ___Solid
___Vegetation X Sediment

Other ___

Field Comments:

Air Samples
Volume ___
Total Hours ___

___Sample Filtration
___Sample Acidification
___Send to RESL

REQUESTED ANALYSES:

X	GROSS ALPHA (TOTAL)		STRONTIUM 89
	GROSS ALPHA (SUSPENDED)		STRONTIUM 90
	GROSS ALPHA (DISSOLVED)		TRITIUM (H-3)
X	GROSS BETA (TOTAL)		THORIUM (TOTAL)
	GROSS BETA (SUSPENDED)		URANIUM (TOTAL)
	GROSS BETA (DISSOLVED)	X	GAMMA RADIONUCLIDES
			ADDITIONAL ANALYSES:

Chain of Custody and Supplemental Information

Only one chain of custody form is required per sample set or point (if all collected at the same time)

1. Collected by BHM
   Date 10-21-97 Time 9:40a
   Delivered to KBL
   Date 10-21-97 Time 12:45 p.m.
2. Collected by
   Date Time
   Delivered to
   Date Time
3. Collected by
   Date Time
   Delivered to
   Date Time
4. Received in Lab by [signature]
   Date 10-21-97 Time 12:45
   Logged in by
   Date Time

Additional Information

1. Approximate volume of sample 500ml
2. Nearest town or city Knoxville
3. Others present at collection WLB, JWW, ADD
4. Number of other samples collected at same time at this point 3
5. Field collection procedure, handling and/or preservation of this sample
   standard
6. Mode of transportation to lab
   state vehicle
7. Sample sealed by
8. Date sample sealed
9. Remarks

Project/Site No.: 47-559
Project Name: SMOKEY MTN SMELTERS
Description: SMS-SD-02/BACKGROUND SED.
Station No.: SMS-SD-02
Collected: 08/31/98 10:15:00 By BHM
County: 47

Lab Number: 9808275-02
Matrix: SOIL
Received: 08/31/98 14:15:00 By LAB
Sampling Agency: HWM_11_KFO
Priority: 9_30_98

TEST	RESULT	UNITS	LIMIT	ANALYZED	BY	METHOD
AMMONIA	U	mg/kg	10	09/15/98	SAL	A.18.2
CYANIDE	U	mg/kg	1.0	09/23/98	SAL	A.9
ALUMINUM	3710	mg/kg	10	10/01/98	JAH	
ANTIMONY	U	mg/kg	0.6	10/09/98	JAH	
ARSENIC	4.1	mg/kg	0.2	10/05/98	JAH	
BARIUM	15	mg/kg	10	10/01/98	JAH	
BERYLLIUM	U	mg/kg	1	09/30/98	JAH	
CADMIUM	U	mg/kg	0.5	09/11/98	JAH	
CALCIUM	175	mg/kg	3	10/02/98	JAH	
CHROMIUM	10	mg/kg	1	09/23/98	JAH	
COBALT	4	mg/kg	1	09/15/98	JAH	
COPPER	4	mg/kg	1	09/16/98	JAH	
DIGESTION-METALS	COMPLETED	COMPLETED		09/10/98	EAM	
IRON	9630	mg/kg	5	09/16/98	JAH	
LEAD	6	mg/kg	4	09/15/98	JAH	
MAGNESIUM	259	mg/kg	2	10/02/98	JAH	
MANGANESE	295	mg/kg	1	09/16/98	JAH	
MERCURY	U	mg/kg	0.1	09/11/98	ATB	EPA 245.5
METALS PREP-SOLIDS/WASTES	COMPLETED	COMPLETED		09/02/98	EAM	
NICKEL	U	mg/kg	2	09/11/98	JAH	
PERCENT SOLIDS	76.5	%		09/08/98	SDS	
POTASSIUM	201	mg/kg	2	10/02/98	JAH	
SELENIUM	U	mg/kg	0.4	10/07/98	JAH	

Project/Site No.: 47-559
Project Name: SMOKEY MTN SMELTERS
Description: SMS-SD-02/BACKGROUND SED.
Station No.: SMS-SD-02
Collected: 08/31/98 10:15:00 By BHM
County: 47

Lab Number: 9808275-02
Matrix: SOIL
Received: 08/31/98 14:15:00 By LAB
Sampling Agency: HWM_11_KFO
Priority: 9_30_98

TEST	RESULT	UNITS	LIMIT	ANALYZED	BY	METHOD
SILVER	U	mg/kg	1	09/15/98	JAH	
SODIUM	42	mg/kg	10	10/02/98	JAH	
THALLIUM	U	mg/kg	5	09/15/98	JAH	
VANADIUM	U	mg/kg	20	10/01/98	JAH	
ZINC	18.8	mg/kg	0.5	09/15/98	JAH	

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Inorganic Analysis

PROJECT/SITE NO. 47559	PROJECT NAME Smky Mtn. Smelters
STATION NUMBER SMS-SD-02	COUNTY Knox
DESCRIPTION background sediment near Mt Olive Road	
STREAM MILE	DEPTH / MATRIX SOIL
COLLECTED: DATE 8-31-98	TIME 10:15
SAMPLER'S NAME(printed) Burl Maupin	
SAMPLING AGENCY DSF	BILLING CODE 3273811
IF PRIORITY, DATE NEEDED 9-30-98	
SEND REPORT TO: KEAC	
CONTACT HAZARD unknown	

*	Metals
X	aluminum, Al
X	antimony, Sb
X	arsenic, As
X	barium, Ba
X	beryllium, Be
X	cadmium, Cd
X	calcium, Ca
X	chromium, Cr
X	cobalt, Co
X	copper, Cu
X	iron, Fe
X	lead, Pb
X	magnesium, Mg
X	manganese, Mn
X	mercury, Hg
X	nickel, Ni
X	potassium, K
X	selenium, Se
X	silver, Ag
X	sodium, Na
X	thallium, Tl
X	vanadium, V
X	zinc, Zn

*	Env. Microbiology	*	General Inorganics		Gen. Inorganics (con't)
	coliform, fecal*		acidity as $CaCO_3$*		oil and grease
	coliform, total*		alkalinity as $CaCO_3$*		orthophosphate, total*
	strep, fecal*		alkalinity, phen. as $CaCO_3$*		oxygen, dissolved*
			BOD, 5-day*		pH
			CBOD, 5-day*		phenols, total
			boron		phosphate, total
*	**Ambient Parameters**		chloride*		residue, dissolved*
	COD*		chlorine, residual*		residue, settleable*
	coliform, fecal		chromium, hexavalent		residue, suspended*
	conductivity*		COD*		residue, total*
	hardness, total as $CaCO_3$*		color, apparent*		silica*
	nitrogen, ammonia		color, true*		sulfate*
	nitrogen, NO_3 & NO_2		conductivity*		sulfide, total*
	nitrogen, total Kjeldahl	X	cyanide		TOC*
	phosphate, total		flash point*		turbidity*
	pH		fluoride*		percent solids
	residue, dissolved*		hardness, Ca as $CaCO_3$*	*	**Other**
	residue, suspended*		hardness, total as $CaCO_3$*		
	arsenic, As		hydrocarbons, total		
	cadmium, Cd		MBAS*		
	chromium, Cr	X	nitrogen, ammonia		
	copper, Cu		nitrogen, nitrate*		
	lead, Pb		nitrogen, nitrite*		
	mercury, Hg		nitrogen, NO_3 & NO_2		
	nickel, Ni		nitrogen, total Kjeldahl		
	zinc, Zn		nitrogen, total organic		

*	TCLP
	arsenic, As
	barium, Ba
	cadmium, Cd
	chromium, Cr
	lead, Pb
	mercury, Hg
	nickel, Ni
	selenium, Se
	silver, Ag

denotes analyses performed only on water

FIELD DETERMINATIONS	Temperature
pH	Chlorine, residual
Conductivity	Other
Dissolved Oxygen	

Laboratory Number

Branch Lab Number

Chain of Custody and Supplemental Information

Only one chain of custody form is required per sample set or point (if all collected at the same time)

1. Collected by BHM
   Date 8-31-98 Time 10:15
   Delivered to KBL
   Date 8-31-98 Time 2:15
2. Received by
   Date Time
   Delivered to
   Date Time
3. Received by
   Date Time
   Delivered to
   Date Time
4. Received in Lab by [illegible]
   Date 8-31-98 Time 14:15
   Logged in by
   Date Time

Additional Information

1. Approximate volume of sample 16 oz.
2. Nearest town or city Knoxville
3. Others present at collection
   Beth Walker
4. Number of other samples collected at same time at this point
   3
5. Field collection procedure, handling and/or preservation of this sample
   EPA procedures and protocol
6. Mode of transportation to lab
   State vehicle, in cooler, on ice
7. Sample sealed by
8. Date sample sealed
9. Remarks

PH-3011 (rev 1/96)

RDA 1527

Project/Site No.: 47-559
Project Name: SMOKEY MTN SMELTERS
Description: SMS-SD-02/BACKGROUND SED.
Station No.: SMS-SD-02
Collected: 08/31/98 10:15:00 By BHM
County: 47

Lab Number: 9808275-02F
Matrix: SOIL
Received: 08/31/98 14:15:00 By LAB
Sampling Agency: HWM_11_KFO
Priority: 9_30_98

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
B/N/A EXTR+PESTS,PCBS-SOIL						MS+ECD
BUTYL BENZYL PHTHALATE	U	PPB	100	09/28/98	MAC	
BIS(2-ETHYLHEXYL)PHTHALATE	B,J 51.0	PPB	53	09/28/98	MAC	
DI-n-BUTYL PHTHALATE	U	PPB	100	09/28/98	MAC	
DI-n-OCTYL PHTHALATE	U	PPB	210	09/28/98	MAC	
DIETHYL PHTHALATE	B 78.1	PPB	-	09/28/98	MAC	
DIMETHYL PHTHALATE	U	PPB	52	09/28/98	MAC	
n-NITROSODIMETHYLAMINE	U	PPB	210	09/28/98	MAC	
n-NITROSODIPHENYLAMINE	U	PPB	100	09/28/98	MAC	
n-NITROSO-di-n-PROPYLAMINE	U	PPB	100	09/28/98	MAC	
ISOPHORONE	U	PPB	52	09/28/98	MAC	
NITROBENZENE	U	PPB	100	09/28/98	MAC	
2,4-DINITROTOLUENE	U	PPB	210	09/28/98	MAC	
2,6-DINITROTOLUENE	U	PPB	210	09/28/98	MAC	
ACENAPTHENE	U	PPB	52	09/28/98	MAC	
ACENAPHTHYLENE	U	PPB	52	09/28/98	MAC	
ANTHRACENE	U	PPB	52	09/28/98	MAC	
BENZO(a)ANTHRACENE	U	PPB	52	09/28/98	MAC	
BENZO(a)PYRENE	U	PPB	52	09/28/98	MAC	
BENZO(b)FLUORANTHENE	U	PPB	52	09/28/98	MAC	
BENZO(ghi)PERYLENE	U	PPB	210	09/28/98	MAC	
BENZO(k)FLUORANTHENE	U	PPB	52	09/28/98	MAC	
DIBENZO(a,h)ANTHRACENE	U	PPB	210	09/28/98	MAC	
FLUORANTHENE	U	PPB	52	09/28/98	MAC	
FLUORENE	U	PPB	52	09/28/98	MAC	
INDENO(1,2,3-cd)PYRENE	U	PPB	210	09/28/98	MAC	
NAPHTHALENE	U	PPB	52	09/28/98	MAC	
PHENANTHRENE	U	PPB	52	09/28/98	MAC	
PYRENE	U	PPB	52	09/28/98	MAC	
CHRYSENE	U	PPB	52	09/28/98	MAC	
BIS(2-CHLOROETHYL)ETHER	U	PPB	100	09/28/98	MAC	
BIS(2-CHLOROETHOXY)METHANE	U	PPB	52	09/28/98	MAC	
BIS(2-CHLOROISOPROPYL)ETHER	U	PPB	210	09/28/98	MAC	
4-BROMOPHENYLPHENYL ETHER	U	PPB	210	09/28/98	MAC	
4-CHLOROPHENYLPHENYL ETHER	U	PPB	100	09/28/98	MAC	
HEXACHLOROCYCLOPENTADIENE	U	PPB	520	09/28/98	MAC	
HEXACHLOROBUTADIENE	U	PPB	100	09/28/98	MAC	
HEXACHLOROBENZENE	U	PPB	100	09/28/98	MAC	
HEXACHLOROETHANE	U	PPB	100	09/28/98	MAC	
1,2,4-TRICHLOROBENZENE	U	PPB	100	09/28/98	MAC	
2-CHLORONAPHTHALENE	U	PPB	52	09/28/98	MAC	
4-CHLORO-3-METHYLPHENOL	U	PPB	100	09/28/98	MAC	
2-CHLOROPHENOL	U	PPB	52	09/28/98	MAC	
2,4-DICHLOROPHENOL	U	PPB	100	09/28/98	MAC	
2,4-DIMETHYLPHENOL	U	PPB	100	09/28/98	MAC	
2,4-DINITROPHENOL	U	PPB	1000	09/28/98	MAC	
2-METHYL-4,6-DINITROPHENOL	U	PPB	520	09/28/98	MAC	
2-NITROPHENOL	U	PPB	210	09/28/98	MAC	
4-NITROPHENOL	U	PPB	520	09/28/98	MAC	
PENTACHLOROPHENOL	U	PPB	210	09/28/98	MAC	
PHENOL	U	PPB	52	09/28/98	MAC	
2,4,6-TRICHLOROPHENOL	U	PPB	100	09/28/98	MAC	
2,4,5-TRICHLOROPHENOL	U	PPB	100	09/28/98	MAC	
O-CRESOL	U	PPB	100	09/28/98	MAC	
M- & P-CRESOL	U	PPB	52	09/28/98	MAC	
2-METHYLNAPHTHALENE	U	PPB	52	09/28/98	MAC	
BENZOIC ACID	U	PPB	210	09/28/98	MAC	
BENZYL ALCOHOL	U	PPB	210	09/28/98	MAC	
4-CHLOROANILINE	U	PPB	100	09/28/98	MAC	
DIBENZOFURAN	U	PPB	52	09/28/98	MAC	
3,3-DICHLOROBENZIDINE	U	PPB	210	09/28/98	MAC	
2-NITROANILINE	U	PPB	210	09/28/98	MAC	
3-NITROANILINE	U	PPB	210	09/28/98	MAC	
4-NITROANILINE	U	PPB	520	09/28/98	MAC	
HEXACHLOROBENZENE	U	PPB	2.0	09/28/98	MAC	
ALDRIN	U	PPB	2.7	09/28/98	MAC	
alpha-BHC	U	PPB	4.9	09/28/98	MAC	
β-BHC	U	PPB	7.1	09/28/98	MAC	
δ-BHC	U	PPB	7.0	09/28/98	MAC	
gamma-BHC (LINDANE)	U	PPB	2.7	09/28/98	MAC	
alpha-CHLORDANE	U	PPB	3.8	09/28/98	MAC	
gamma-CHLORDANE	U	PPB	2.7	09/28/98	MAC	
TECHNICAL CHLORDANE	U	PPB	42	09/28/98	MAC	
p,p-DDD	U	PPB	5.0	09/28/98	MAC	

OCT 13 1998

Project/Site No.: 47-559
Project Name: SMOKEY MTN SMELTERS
Description: SMS-SD-02/BACKGROUND SED.
Station No.: SMS-SD-02
Collected: 08/31/98 10:15:00 By BHM
unty: 47

Lab Number: 9808275-02F
Matrix: SOIL
Received: 08/31/98 14:15:00 By LAB
Sampling Agency: HWM_11_KFO
Priority: 9_30_98

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
B/N/A EXTR+PESTS,PCBS-SOIL						MS+ECD
p,p-DDE	U	PPB	4.4	09/28/98	MAC	
p,p-DDT	U	PPB	4.7	09/28/98	MAC	
DIELDRIN	U	PPB	2.8	09/28/98	MAC	
ENDOSULFAN I	U	PPB	4.5	09/28/98	MAC	
ENDOSULFAN II	U	PPB	5.1	09/28/98	MAC	
ENDOSULFAN SULFATE	U	PPB	5.1	09/28/98	MAC	
ENDRIN	U	PPB	5.1	09/28/98	MAC	
ENDRIN ALDEHYDE	U	PPB	4.3	09/28/98	MAC	
ENDRIN KETONE	U	PPB	5.2	09/28/98	MAC	
HEPTACHLOR	U	PPB	3.4	09/28/98	MAC	
HEPTACHLOR EPOXIDE	U	PPB	3.6	09/28/98	MAC	
TOXAPHENE	U	PPB	300	09/28/98	MAC	
METHOXYCHLOR	U	PPB	20	09/28/98	MAC	
PCB 1016/1242	U	PPB	260	09/28/98	MAC	
PCB 1221	U	PPB	340	09/28/98	MAC	
PCB 1232	U	PPB	310	09/28/98	MAC	
PCB 1248	U	PPB	190	09/28/98	MAC	
PCB 1254	U	PPB	240	09/28/98	MAC	
PCB 1260	U	PPB	150	09/28/98	MAC	
PCB 1262	U	PPB	150	09/28/98	MAC	

*-Water, uG/L; Sediment, uG/kG

Printed: October 5, 1998

State o. .nessee - Environmental Laboratories
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Organic Analysis
Base/Neutral/Acid Extractables

PROJECT/SITE NO. 47-559	PROJECT NAME Smokey Mtn Smelters
STATION NUMBER SMS-SD-02	COUNTY Knox
DESCRIPTION Background sediment	
STREAM MILE	DEPTH	MATRIX sediment
COLLECTED: DATE 08/31/98	TIME 10:15
SAMPLER'S NAME(printed) Burl Maupin	
SAMPLING AGENCY TDSF	BILLING CODE 327,38,11
IF PRIORITY, DATE NEEDED 09/30/98	
SEND REPORT TO: Burl Maupin	
KEAC - Superfund	
CONTACT HAZARD UNKNOWN	

*	NPDES Extractables	*	NPDES Extractables(con't)	*	TAL Semivolatiles
	butylbenzylphthalate	X	2-chlorophenol	X	dimethylphthalate
	bis(2-ethylhexyl)phthalate		2,4-dichlorophenol	X	4,6-dinitro-2-methylphenol
	di-n-butylphthalate		2,4-dimethylphenol	X	2,4-dinitrophenol
	di-n-octylphthalate		2,4-dinitrophenol	X	2,4-dinitrotoluene
	diethylphthalate		4,6-dinitro-o-cresol	X	2,6-dinitrotoluene
	dimethylphthalate		2-nitrophenol	X	fluoranthene
X	n-nitrosodimethylamine		4-nitrophenol	X	fluorene
	n-nitrosodiphenylamine		pentachlorophenol	X	hexachlorobenzene
	n-nitrosodi-n-propylamine		phenol	X	hexachlorobutadiene
	isophorone		2,4,6-trichlorophenol	X	hexachlorocyclopentadiene
	nitrobenzene	*	TAL Semivolatiles	X	hexachloroethane
	2,4-dinitrotoluene	X	acenaphthene	X	indeno(1,2,3-cd)pyrene
	acenaphthene	X	acenaphthylene	X	isophorone
	acenaphthylene	X	anthracene	X	2-methylnaphthalene
	anthracene	X	benzo(a)anthracene	X	2-methylphenol
	benzo(a)anthracene	X	benzo(a)pyrene	X	4-methylphenol
	benzo(a)pyrene	X	benzo(b)fluoranthene	X	n-nitrosodiphenylamine
	benzo(b)fluoranthene	X	benzo(g,h,i)perylene	X	n-nitroso-n-dipropylamine
	benzo(g,h,i)perylene	X	benzo(k)fluoranthene	X	naphthalene
	benzo(k)fluoranthene	X	benzoic acid	X	2-nitroaniline
	chrysene	X	benzyl alcohol	X	3-nitroaniline
	dibenzo(a,h)anthracene	X	bis(2-chloroethoxy)methane	X	4-nitroaniline
	fluoranthene	X	bis(2-chloroethyl) ether	X	nitrobenzene
	fluorene	X	bis(2-chloroisopropyl)ether	X	2-nitrophenol
	indeno(1,2,3-c,d)pyrene	X	bis(2-ethylhexyl)phthalate	X	4-nitrophenol
	naphthalene	X	4-bromophenylphenylether	X	pentachlorophenol
	phenanthrene	X	butylbenzylphthalate	X	phenanthrene
	pyrene	X	4-chloroaniline	X	phenol
	bis(2-chloroethyl)ether	X	4-chloro-3-methyl phenol	X	pyrene
	bis(2-chloroethoxy)methane	X	2-chloronaphthalene	X	1,2,4-trichlorobenzene
	bis(2-chloroisopropyl)ether	X	4-chlorophenylphenylether	X	2,4,5-trichlorophenol
	4-bromophenylphenylether	X	chrysene	X	2,4,6-trichlorophenol
	4-chlorophenylphenylether	X	di-n-butylphthalate	*	Nitrobodies
	hexachlorocyclopentadiene	X	di-n-octylphthalate		RDX
	hexachlorobutadiene	X	dibenzo(a,h)anthracene		2,4,6-TNT
	hexachlorobenzene	X	dibenzofuran		2,4-dinitrotoluene
	hexachloroethane	X	3,3'-dichlorobenzidine		2,6-dinitrotoluene
	1,2,4-trichlorobenzene	X	2,4-dichlorophenol		nitrobenzene
	2-chloronaphthalene	X	diethylphthalate		1,3,5-TNB
	4-chloro-3-methyl phenol	X	2,4-dimethylphenol		

*	TCLP Semivolatiles	*	Pesticides/PCBs
	chlordane	X	aldrin
	o-cresol	X	alpha-BHC
	m-cresol	X	beta-BHC
	p-cresol	X	delta-BHC
	cresol	X	gamma-BHC (lindane)
	2,4-D	X	technical chlordane
	2,4-dinitrotoluene	X	alpha-chlordane
	endrin	X	gamma-chlordane
	heptachlor	X	4,4'-DDD
	heptachlor epoxide	X	4,4'-DDE
	hexachlorobenzene	X	4,4'-DDT
	hexachlorobutadiene	X	dieldrin
	hexachloroethane	X	endosulfan I
	lindane	X	endosulfan II
	methoxychlor	X	endosulfan sulfate
	nitrobenzene	X	endrin
	pentachlorophenol	X	endrin aldehyde
	pyridine	X	endrin ketone
	toxaphene	X	heptachlor
	2,4,5-trichlorophenol	X	heptachlor epoxide
	2,4,6-trichlorophenol	X	toxaphene
	2,4,5-TP (Silvex)	X	methoxychlor
	hexachloroethane	X	PCB 1016/1242
	indeno(1,2,3-cd)pyrene	X	PCB 1221
	isophorone	X	PCB 1232
	2-methylnaphthalene	X	PCB 1248
	2-methylphenol	X	PCB 1254
	4-methylphenol	X	PCB 1260
	n-nitrosodiphenylamine	X	PCB 1262

Laboratory Number

Branch Lab Number

Chain of Custody and Supplemental Information

Only one chain of custody form is required per sample set or point (if all collected at the same time)

1. Collected by BHM + BHW
   Date 8/31/98 Time 10:15
   Delivered to Knoxville LAB
   Date 8/31/98 Time 2:15
2. Received by
   Date Time
   Delivered to
   Date Time
3. Received by
   Date Time
   Delivered to
   Date Time
4. Received in Lab by [illegible]
   Date 8-31-98 Time 14:15
   Logged in by
   Date Time

Additional Information

1. Approximate volume of sample 1 gallon
2. Nearest town or city Knoxville
3. Others present at collection No
4. Number of other samples collected at same time at this point 3
5. Field collection procedure, handling and/or preservation of this sample According to EPA procedures
6. Mode of transportation to lab in cooler, on ice, in state vehicle
7. Sample sealed by
8. Date sample sealed
9. Remarks

SEP 1 1998

Project/Site No.: 47-559
Project Name: SMOKEY MTN SMELTERS
Site Description: SMS-SD-02/SED. MT OLIVE RD
Station No.: SMS-SD-02
Collected: 08/31/98 10:15:00 By BHM
County: 47

Lab Number: 9808275-02E
Matrix: SOIL
Received: 08/31/98 14:15:00 By LAB
Sampling Agency: HWM_11_KFO
Priority: 9_30_98

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
VOLATILES-TAL SEDIMENTS						8260A
ACETONE	U	PPB	25	09/04/98	HMG	
BENZENE	U	PPB	2.5	09/04/98	HMG	
BROMODICHLOROMETHANE	U	PPB	2.5	09/04/98	HMG	
BROMOFORM	U	PPB	2.5	09/04/98	HMG	
BROMOMETHANE	U	PPB	5.0	09/04/98	HMG	
2-BUTANONE (MEK)	U	PPB	25	09/04/98	HMG	
CARBON DISULFIDE	U	PPB	5.0	09/04/98	HMG	
CARBON TETRACHLORIDE	U	PPB	2.5	09/04/98	HMG	
VINYL ACETATE	U	PPB	5.0	09/04/98	HMG	
CHLOROBENZENE	U	PPB	2.5	09/04/98	HMG	
CHLOROETHANE	U	PPB	5.0	09/04/98	HMG	
CHLOROFORM	U	PPB	2.5	09/04/98	HMG	
CHLOROMETHANE	U	PPB	5.0	09/04/98	HMG	
DIBROMOCHLOROMETHANE	U	PPB	2.5	09/04/98	HMG	
1,2-DICHLOROBENZENE	U	PPB	2.5	09/04/98	HMG	
1,3-DICHLOROBENZENE	U	PPB	2.5	09/04/98	HMG	
1,4-DICHLOROBENZENE	U	PPB	2.5	09/04/98	HMG	
DICHLORODIFLUOROMETHANE	U	PPB	5.0	09/04/98	HMG	
1,1-DICHLOROETHANE	U	PPB	2.5	09/04/98	HMG	
1,2-DICHLOROETHANE	U	PPB	2.5	09/04/98	HMG	
1,1-DICHLOROETHENE	U	PPB	2.5	09/04/98	HMG	
CIS-1,2-DICHLOROETHENE	U	PPB	2.5	09/04/98	HMG	
TRANS-1,2-DICHLOROETHENE	U	PPB	2.5	09/04/98	HMG	
1,2-DICHLOROPROPANE	U	PPB	2.5	09/04/98	HMG	
CIS-1,3-DICHLOROPROPENE	U	PPB	2.5	09/04/98	HMG	
TRANS-1,3-DICHLOROPROPENE	U	PPB	2.5	09/04/98	HMG	
ETHYLBENZENE	U	PPB	2.5	09/04/98	HMG	
METHYLENE CHLORIDE	B 12	PPB	2.5	09/04/98	HMG	
4-METHYL-2-PENTANONE (MIBK)	U	PPB	25	09/04/98	HMG	
STYRENE	U	PPB	2.5	09/04/98	HMG	
2-HEXANONE	U	PPB	5.0	09/04/98	HMG	
1,1,2,2-TETRACHLOROETHANE	U	PPB	2.5	09/04/98	HMG	
TETRACHLOROETHENE	U	PPB	2.5	09/04/98	HMG	
TOLUENE	U	PPB	2.5	09/04/98	HMG	
1,1,1-TRICHLOROETHANE	U	PPB	2.5	09/04/98	HMG	
1,1,2-TRICHLOROETHANE	U	PPB	2.5	09/04/98	HMG	
TRICHLOROETHENE	U	PPB	2.5	09/04/98	HMG	
TRICHLOROFLUOROMETHANE	U	PPB	5.0	09/04/98	HMG	
VINYL CHLORIDE	U	PPB	5.0	09/04/98	HMG	
o-XYLENE	U	PPB	2.5	09/04/98	HMG	
m&p-XYLENE	U	PPB	2.5	09/04/98	HMG	

*-Water, uG/L; Sediment, uG/kG

Printed: September 8, 1998

State of Tennessee - Environmental Laboratories

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Organic Analysis

Volatiles and Petroleum Hydrocarbons

PROJECT/SITE NO.	47-559	PROJECT NAME	SMOKEY MOUNTAIN SMELTERS
STATION NUMBER	SMS-SD-02	COUNTY	KNOX
DESCRIPTION	Sediment near Mt. Olive Road		
STREAM MILE		DEPTH	MATRIX SEDIMENT
COLLECTED: DATE	AUGUST 31, 1998	TIME	10:15
SAMPLER'S NAME(printed)	B.H. Maupin		
SAMPLING AGENCY	DIVISION OF SUPERFUND	BILLING CODE	327.38-11
IF PRIORITY, DATE NEEDED	SEPTEMBER 30		
SEND REPORT TO:	KNOXVILLE ENVIRONMENTAL ASSISSTANCE CENTER BURL H. MAUPIN		
CONTACT HAZARD	METALS, RADIOCHEMICAL, UNKNOWN		

*	NPDES Volatiles - 624	*	TAL Volatiles - 8260A	*	TCLP Volatiles
	Bromoform		Chloromethane		Benzene
	Bromodichloromethane		Bromomethane		Carbon tetrachloride
	Carbon Tetrachloride		Vinyl chloride		Chlorobenzene
	Chlorobenzene		Chloroethane		Chloroform
	Chloroethane		Methylene chloride		1,2-Dichloroethane
	2-Chloroethylvinyl ether		Acetone		1,1-Dichloroethane
	Chloroform		Carbon disulfide		Methyl ethyl ketone
	Chloromethane		1,1-Dichloroethene		Tetrachloroethene
	Dibromochloromethane		1,1-Dichloroethane		Trichloroethene
	1,2-Dichlorobenzene		Cis-1,2-dichloroethene		Vinyl chloride
	1,3-Dichlorobenzene		Trans-1,2-dichloroethene	*	BTEX - 8260A - UST
	1,4-Dichlorobenzene		1,2-Dichloroethane		Benzene
	Dichlorodifluoromethane		Chloroform		Toluene
	1,1-Dichloroethane		2-Butanone		Ethyl benzene
	1,2-Dichloroethane		1,1,1-Trichloroethane		o-Xylene
	1,1-Dichloroethene		Carbon tetrachloride		m-Xylene
	Cis-1,2-dichloroethene		Vinyl acetate		p-Xylene
	Trans-1,2-dichloroethene		Bromodichloromethane		Methyl t-butyl ether
	1,2-Dichloropropane		1,2-Dichloropropane		Diisopropyl ether
	Cis-1,3-dichloropropene		Cis-1,3-dichloropropane	*	TPH by GC
	Trans-1,2-dichloroethene		Trichloroethene		Gasoline Range Organics
	Methylene chloride		Dibromochloromethane		Diesel Range Organics
	1,1,2,2-Tetrachloroethane		1,1,2-Trichloroethane	*	TPH by IR (418.1)
	Tetrachloroethene		Benzene		418.1 - Waste Oil
	1,1,1-Trichloroethane		Trans-1,3-dichloropropene	*	Other
	1,1,2-Trichloroethane		Bromoform		
	Trichloroethene		4-Methyl-2-pentanone		
	Trichlorofluoromethane		2-Hexanone		
	Vinyl chloride		Tetrachloroethene		
	Benzene		Toluene		
	Ethylbenzene		1,1,2,2-Tetrachloroethane		
	Toluene		Chlorobenzene		
	o-Xylene		Ethyl benzene		
	m-Xylene		Styrene		
	p-Xylene		o-Xylene		
			m-Xylene		
			p-Xylene		

Laboratory Number

Branch Lab Number

Chain of Custody and Supplemental Information

Only one chain of custody form is required per sample set or point (if all collected at the same time)

1. Collected by BHM
   Date AUGUST 31 1998 Time ~~12:40~~ 10:15
   Delivered to Knoxville Basin Laboratory
   Date AUGUST 31 1998 Time 12:15
2. Received by
   Date Time
   Delivered to
   Date Time
3. Received by
   Date Time
   Delivered to
   Date Time
4. Received in Lab by [signature]
   Date 8-31-98 Time 14:15
   Logged in by
   Date Time

Additional Information

1. Approximate volume of sample 16 OZ
2. Nearest town or city KNOXVILLE
3. Others present at collection Doth Walker
4. Number of other samples collected at same time at this point *One other sample each for INORGANICS, RADIOCHEMICAL, AND EXTRACTABLE ORGANICS were collected for a total of three other samples.*
5. Field collection procedure, handling and/or preservation of this sample *according to EPA procedures and protocol*
6. Mode of transportation to lab *in State vehicle, in cooler, and on ice*
7. Sample sealed by
8. Date sample sealed
9. Remarks

Project/Site No.: 47-559
Project Name: SMOKEY MTN SMELTERS
Description: SMS-SD-02/BACKGROUND SED.
Station No.: SMS-SD-02
Collected: 08/31/98 10:15:00 By BHM
nty: 47

Lab Number: 9808275-02G SEP 30 1998
Matrix: SOIL
Received: 08/31/98 14:15:00 By LAB
Sampling Agency: HWM_11_KFO
Priority: 9_30_98

TEST	RESULT	*ERROR	UNITS	ANALYZED	BY	METHOD
GAMMA RADIONUCLIDES						R.6
K-40	5.52	0.34	pCi/g dry wt	09/03/98	AK	
Pb-214	0.515	0.060	pCi/g dry wt	09/03/98	AK	
Bi-214	0.489	0.050	pCi/g dry wt	09/03/98	AK	
Pb-212	0.631	0.040	pCi/g dry wt	09/03/98	AK	
Ac-228	0.657	0.060	pCi/g dry wt	09/03/98	AK	
Bi-212	0.37	0.11	pCi/g dry wt	09/03/98	AK	
GROSS ALPHA & BETA						R.1.3
GROSS ALPHA	0.83	0.60	pCi/g DRY WT.	09/10/98	NLF	
GROSS BETA	4.9	1.1	pCi/g DRY WT.	09/10/98	NLF	

*--Represents +/- error value

Printed: September 10, 1998

State of Tennessee - Environmental Laboratories

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Radiochemical Analysis

PROJECT/SITE NO. 47-559	**PROJECT NAME** Smokey Mtn. Smelters
STATION NUMBER SMS-SD-02	**COUNTY** KNOX
DESCRIPTION Background sediment	
STREAM MILE	**DEPTH**
COLLECTED: DATE 8/31/98	**TIME** 10:15
PICK-UP DATE:	
CONTACT HAZARD unknown	**mR/hr Reading** 0.01
SAMPLER'S NAME (printed) Burl Maupin	
SAMPLING AGENCY TDSF	**BILLING CODE** 327, 38, 11
IF PRIORITY, DATE NEEDED 09/30/98	
SEND REPORT TO: Burl Maupin	
KEAC - Superfund	

Laboratory Number

Branch Lab Number

Date Received

Time Received **By**

Sample Type

___Air ___Milk ___Swipe
___Water ___Tissue ___Liquid
___Sludge ___Soil ___Solid
___Vegetation X Sediment

Other _____

Field Comments:

Air Samples
Volume _____
Total Hours _____

___Sample Filtration
___Sample Acidification
___Send to RESL

REQUESTED ANALYSES:

X	GROSS ALPHA (TOTAL)		STRONTIUM 89
	GROSS ALPHA (SUSPENDED)		STRONTIUM 90
	GROSS ALPHA (DISSOLVED)		TRITIUM (H-3)
X	GROSS BETA (TOTAL)		THORIUM (TOTAL)
	GROSS BETA (SUSPENDED)		URANIUM (TOTAL)
	GROSS BETA (DISSOLVED)	X	GAMMA RADIONUCLIDES
			ADDITIONAL ANALYSES:

Chain of Custody and Supplemental Information

Only one chain of custody form is required per sample set or point (if all collected at the same time)

1. Collected by BHM + BHW
   Date 8/31/98 Time 10:15
   Delivered to KNOX LAB
   Date 8/31/98 Time 2:15
2. Collected by
   Date Time
   Delivered to
   Date Time
3. Collected by
   Date Time
   Delivered to
   Date Time
4. Received in Lab by [signature]
   Date 8-31-98 Time 14:15
   Logged in by
   Date Time

Additional Information

1. Approximate volume of sample 16 oz
2. Nearest town or city Knoxville
3. Others present at collection NO
4. Number of other samples collected at same time at this point 3
5. Field collection procedure, handling and/or preservation of this sample
   according to EPA procedures
6. Mode of transportation to lab in cooler on ice in state vehicle
7. Sample sealed by
8. Date sample sealed
9. Remarks

Project/Site No.: 47-559
Project Name: SMOKEY MOUNTAIN SMELTERS
Description: SMS-SD-03/ON-SITE LAGOON
Station No.: SMS-SD-03
Collected: 08/25/98 13:10:00 By BHM
County: 47

Lab Number: 9808247-04
Matrix: SOIL
Received: 08/26/98 10:00:00 By PMB
Sampling Agency: HWM_11_KFO
Priority:

TEST	RESULT	UNITS	LIMIT	ANALYZED	BY	METHOD
AMMONIA	38.5	mg/kg	10	09/15/98	SAL	A.18.2
CYANIDE	U	mg/kg	1.0	09/18/98	LKS	A.9
ALUMINUM	64000	mg/kg	10	10/01/98	JAH	
ANTIMONY	13.2	mg/kg	0.6	10/08/98	JAH	
ARSENIC	6.8	mg/kg	0.2	10/05/98	JAH	
BARIUM	156	mg/kg	10	10/01/98	JAH	
BERYLLIUM	3	mg/kg	1	09/30/98	JAH	
CADMIUM	4.5	mg/kg	0.5	09/11/98	JAH	
CALCIUM	10700	mg/kg	3	10/02/98	JAH	
CHROMIUM	33	mg/kg	1	09/23/98	JAH	
COBALT	11	mg/kg	1	09/15/98	JAH	
COPPER	155	mg/kg	1	09/16/98	JAH	
DIGESTION-METALS	COMPLETED	COMPLETED		09/10/98	EAM	
IRON	16800	mg/kg	5	09/16/98	JAH	
LEAD	64	mg/kg	4	09/15/98	JAH	
MAGNESIUM	3280	mg/kg	2	10/02/98	JAH	
MANGANESE	584	mg/kg	1	09/16/98	JAH	
MERCURY	0.10	mg/kg	0.1	09/11/98	ATB	EPA 245.5
METALS PREP-SOLIDS/WASTES	COMPLETED	COMPLETED		08/31/98	EAM	
NICKEL	143	mg/kg	2	09/11/98	JAH	
PERCENT SOLIDS	60.6	%		09/08/98	SDS	
POTASSIUM	2610	mg/kg	2	10/02/98	JAH	
SELENIUM	U	mg/kg	0.4	10/08/98	JAH	

Project/Site No.: 47-559
Project Name: SMOKEY MOUNTAIN SMELTERS
Description: SMS-SD-03/ON-SITE LAGOON
Station No.: SMS-SD-03
Collected: 08/25/98 13:10:00 By BHM
County: 47

Lab Number: 9808247-04
Matrix: SOIL
Received: 08/26/98 10:00:00 By PMB
Sampling Agency: HWM_11_KFO
Priority:

TEST	RESULT	UNITS	LIMIT	ANALYZED	BY	METHOD
SILVER	U	mg/kg	1	09/15/98	JAH	
SODIUM	7050	mg/kg	10	10/02/98	JAH	
THALLIUM	U	mg/kg	5	09/15/98	JAH	
VANADIUM	46	mg/kg	20	10/01/98	JAH	
ZINC	486	mg/kg	0.5	09/15/98	JAH	

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Inorganic Analysis

PROJECT/SITE NO.	47-559
PROJECT NAME	Smokey Mountain Smelters
STATION NUMBER	SMS-SD-03
COUNTY	Knox
DESCRIPTION	on-site lagoon sediment
STREAM MILE	
DEPTH	
MATRIX	soil
COLLECTED: DATE	August 25, 1998
TIME	13:10
SAMPLER'S NAME(printed)	Burl H. Maupin
SAMPLING AGENCY	Division of Superfund
BILLING CODE	327.38-10
IF PRIORITY, DATE NEEDED	September 25, 1998
SEND REPORT TO:	Knoxville Environmental Assisstance Center Burl H. Maupin
CONTACT HAZARD	metals, radiochemical, unknown

*	Metals
x	aluminum, Al
x	antimony, Sb
x	arsenic, As
x	barium, Ba
x	beryllium, Be
x	cadmium, Cd
x	calcium, Ca
x	chromium, Cr
x	cobalt, Co
x	copper, Cu
x	iron, Fe
x	lead, Pb
x	magnesium, Mg
x	manganese, Mn
x	mercury, Hg
x	nickel, Ni
x	potassium, K
x	selenium, Se
x	silver, Ag
x	sodium, Na
x	thallium, Tl
x	vanadium, V
x	zinc, Zn

*	Env. Microbiology	*	General Inorganics		Gen. Inorganics (con't)
	coliform, fecal*		acidity as $CaCO_3$*		oil and grease
	coliform, total*		alkalinity as $CaCO_3$*		orthophosphate, total*
	strep, fecal*		alkalinity, phen. as $CaCO_3$*		oxygen, dissolved*
			BOD, 5-day*		pH
			CBOD, 5-day*		phenols, total
			boron		phosphate, total
*	**Ambient Parameters**		chloride*		residue, dissolved*
	COD*		chlorine, residual*		residue, settleable*
	coliform, fecal		chromium, hexavalent		residue, suspended*
	conductivity*		COD*		residue, total*
	hardness, total as $CaCO_3$*		color, apparent*		silica*
	nitrogen, ammonia		color, true*		sulfate*
	nitrogen, NO_3 & NO_2		conductivity*		sulfide, total*
	nitrogen, total Kjeldahl	x	cyanide		TOC*
	phosphate, total		flash point*		turbidity*
	pH		fluoride*		percent solids
	residue, dissolved*		hardness, Ca as $CaCO_3$*	*	**Other**
	residue, suspended*		hardness, total as $CaCO_3$*		
	arsenic, As		hydrocarbons, total		
	cadmium, Cd		MBAS*		
	chromium, Cr	x	nitrogen, ammonia		
	copper, Cu		nitrogen, nitrate*		
	lead, Pb		nitrogen, nitrite*		
	mercury, Hg		nitrogen, NO_3 & NO_2		
	nickel, Ni		nitrogen, total Kjeldahl		
	zinc, Zn		nitrogen, total organic		

*	TCLP
	arsenic, As
	barium, Ba
	cadmium, Cd
	chromium, Cr
	lead, Pb
	mercury, Hg
	nickel, Ni
	selenium, Se
	silver, Ag

denotes analyses performed only on water

FIELD DETERMINATIONS	Temperature
pH	Chlorine, residual
Conductivity	Other
Dissolved Oxygen	

Laboratory Number

Branch Lab Number

Chain of Custody and Supplemental Information

Only one chain of custody form is required per sample set or point (if all collected at the same time)

1. Collected by Burl H. Maupin
   Date August 25, 1998 Time 13:10
   Delivered to Knoxville Basin Laboratory
   Date August 26, 1998 Time 10:00
2. Received by
   Date Time
   Delivered to
   Date Time
3. Received by
   Date Time
   Delivered to
   Date Time
4. Received in Lab by [illegible]
   Date 8/26/98 Time 1000
   Logged in by
   Date Time

Additional Information

1. Approximate volume of sample 16 oz.
2. Nearest town or city Knoxville
3. Others present at collection Burl H. Maupin
4. Number of other samples collected at same time at this point 3
5. Field collection procedure, handling and/or preservation of this sample
   According to standard operating procedure
6. Mode of transportation to lab State vehicle; on ice
7. Sample sealed by
8. Date sample sealed
9. Remarks

PH-3011 (rev 1/96)

RDA 1527

Project/Site No.: 47-559
Project Name: SMOKEY MOUNTAIN SMELTERS
Description: SMS-SD-03/ON-SITE LAGOON
Station No.: SMS-SD-03
Collected: 08/25/98 13:10:00 By BHM
County: 47

Lab Number: 9808247-04F
Matrix: SOIL
Received: 08/26/98 10:00;00 By PMB
Sampling Agency: HWM_11_KFO
Priority:

OCT 13 1998

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
B/N/A EXTR+PESTS,PCBS-SOIL						MS+ECD
BUTYL BENZYL PHTHALATE	U	PPB	270	09/30/98	MAC	
BIS(2-ETHYLHEXYL)PHTHALATE	B 218	PPB	-	09/30/98	MAC	
DI-n-BUTYL PHTHALATE	U	PPB	270	09/30/98	MAC	
DI-n-OCTYL PHTHALATE	U	PPB	530	09/30/98	MAC	
DIETHYL PHTHALATE	B 557	PPB	-	09/30/98	MAC	
DIMETHYL PHTHALATE	U	PPB	130	09/30/98	MAC	
n-NITROSODIMETHYLAMINE	U	PPB	530	09/30/98	MAC	
n-NITROSODIPHENYLAMINE	U	PPB	270	09/30/98	MAC	
n-NITROSO-di-n-PROPYLAMINE	U	PPB	270	09/30/98	MAC	
ISOPHORONE	U	PPB	130	09/30/98	MAC	
NITROBENZENE	U	PPB	270	09/30/98	MAC	
2,4-DINITROTOLUENE	U	PPB	530	09/30/98	MAC	
2,6-DINITROTOLUENE	U	PPB	530	09/30/98	MAC	
ACENAPTHENE	U	PPB	130	09/30/98	MAC	
ACENAPHTHYLENE	U	PPB	130	09/30/98	MAC	
ANTHRACENE	U	PPB	130	09/30/98	MAC	
BENZO(a)ANTHRACENE	157	PPB	-	09/30/98	MAC	
BENZO(a)PYRENE	239	PPB	-	09/30/98	MAC	
BENZO(b)FLUORANTHENE	300	PPB	-	09/30/98	MAC	
BENZO(ghi)PERYLENE	J 295	PPB	530	09/30/98	MAC	
BENZO(k)FLUORANTHENE	J 109	PPB	130	09/30/98	MAC	
DIBENZO(a,h)ANTHRACENE	U	PPB	530	09/30/98	MAC	
FLUORANTHENE	218	PPB	-	09/30/98	MAC	
FLUORENE	U	PPB	130	09/30/98	MAC	
INDENO(1,2,3-cd)PYRENE	J 326	PPB	530	09/30/98	MAC	
NAPHTHALENE	U	PPB	130	09/30/98	MAC	
PHENANTHRENE	J 21.2	PPB	130	09/30/98	MAC	
PYRENE	167	PPB	-	09/30/98	MAC	
CHRYSENE	165	PPB	-	09/30/98	MAC	
BIS(2-CHLOROETHYL)ETHER	U	PPB	270	09/30/98	MAC	
BIS(2-CHLOROETHOXY)METHANE	U	PPB	130	09/30/98	MAC	
BIS(2-CHLOROISOPROPYL)ETHER	U	PPB	530	09/30/98	MAC	
4-BROMOPHENYLPHENYL ETHER	U	PPB	530	09/30/98	MAC	
4-CHLOROPHENYLPHENYL ETHER	U	PPB	270	09/30/98	MAC	
HEXACHLOROCYCLOPENTADIENE	U	PPB	1300	09/30/98	MAC	
HEXACHLOROBUTADIENE	U	PPB	270	09/30/98	MAC	
HEXACHLOROBENZENE	U	PPB	270	09/30/98	MAC	
HEXACHLOROETHANE	U	PPB	270	09/30/98	MAC	
1,2,4-TRICHLOROBENZENE	U	PPB	270	09/30/98	MAC	
2-CHLORONAPHTHALENE	U	PPB	130	09/30/98	MAC	
4-CHLORO-3-METHYLPHENOL	U	PPB	270	09/30/98	MAC	
2-CHLOROPHENOL	U	PPB	130	09/30/98	MAC	
2,4-DICHLOROPHENOL	U	PPB	270	09/30/98	MAC	
2,4-DIMETHYLPHENOL	U	PPB	270	09/30/98	MAC	
2,4-DINITROPHENOL	U	PPB	2700	09/30/98	MAC	
2-METHYL-4,6-DINITROPHENOL	U	PPB	1300	09/30/98	MAC	
2-NITROPHENOL	U	PPB	530	09/30/98	MAC	
4-NITROPHENOL	U	PPB	1300	09/30/98	MAC	
PENTACHLOROPHENOL	U	PPB	530	09/30/98	MAC	
PHENOL	U	PPB	130	09/30/98	MAC	
2,4,6-TRICHLOROPHENOL	U	PPB	270	09/30/98	MAC	
2,4,5-TRICHLOROPHENOL	U	PPB	270	09/30/98	MAC	
O-CRESOL	U	PPB	270	09/30/98	MAC	
M- & P-CRESOL	U	PPB	130	09/30/98	MAC	
2-METHYLNAPHTHALENE	U	PPB	130	09/30/98	MAC	
BENZOIC ACID	U	PPB	530	09/30/98	MAC	
BENZYL ALCOHOL	U	PPB	530	09/30/98	MAC	
4-CHLOROANILINE	U	PPB	270	09/30/98	MAC	
DIBENZOFURAN	U	PPB	130	09/30/98	MAC	
3,3-DICHLOROBENZIDINE	U	PPB	530	09/30/98	MAC	
2-NITROANILINE	U	PPB	530	09/30/98	MAC	
3-NITROANILINE	U	PPB	530	09/30/98	MAC	
4-NITROANILINE	U	PPB	1300	09/30/98	MAC	
HEXACHLOROBENZENE	U	PPB	2.7	09/30/98	MAC	
ALDRIN	U	PPB	3.6	09/30/98	MAC	
alpha-BHC	U	PPB	6.4	09/30/98	MAC	
beta-BHC	U	PPB	9.3	09/30/98	MAC	
delta-BHC	U	PPB	9.2	09/30/98	MAC	
gamma-BHC (LINDANE)	U	PPB	3.6	09/30/98	MAC	
alpha-CHLORDANE	U	PPB	4.9	09/30/98	MAC	
gamma-CHLORDANE	J 2.68	PPB	3.6	09/30/98	MAC	
TECHNICAL CHLORDANE	U	PPB	56	09/30/98	MAC	
p,p-DDD	U	PPB	6.6	09/30/98	MAC	

OCT 13 1998

Project/Site No.: 47-559
Project Name: SMOKEY MOUNTAIN SMELTERS
Description: SMS-SD-03/ON-SITE LAGOON
Station No.: SMS-SD-03
Collected: 08/25/98 13:10:00 By BHM
unty: 47

Lab Number: 9808247-04F
Matrix: SOIL
Received: 08/26/98 10:00:00 By PMB
Sampling Agency: HWM_11_KFO
Priority:

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
B/N/A EXTR+PESTS,PCBS-SOIL						MS+ECD
p,p-DDE	U	PPB	5.8	09/30/98	MAC	
p,p-DDT	U	PPB	6.2	09/30/98	MAC	
DIELDRIN	5.48	PPB	-	09/30/98	MAC	
ENDOSULFAN I	U	PPB	5.9	09/30/98	MAC	
ENDOSULFAN II	U	PPB	6.7	09/30/98	MAC	
ENDOSULFAN SULFATE	U	PPB	6.7	09/30/98	MAC	
ENDRIN	U	PPB	6.7	09/30/98	MAC	
ENDRIN ALDEHYDE	U	PPB	5.6	09/30/98	MAC	
ENDRIN KETONE	U	PPB	6.8	09/30/98	MAC	
HEPTACHLOR	U	PPB	4.4	09/30/98	MAC	
HEPTACHLOR EPOXIDE	U	PPB	4.7	09/30/98	MAC	
TOXAPHENE	U	PPB	390	09/30/98	MAC	
METHOXYCHLOR	U	PPB	26	09/30/98	MAC	
PCB 1016/1242	U	PPB	340	09/30/98	MAC	
PCB 1221	U	PPB	450	09/30/98	MAC	
PCB 1232	U	PPB	400	09/30/98	MAC	
PCB 1248	U	PPB	250	09/30/98	MAC	
PCB 1254	U	PPB	310	09/30/98	MAC	
PCB 1260	U	PPB	200	09/30/98	MAC	
PCB 1262	U	PPB	200	09/30/98	MAC	

*-Water, uG/L; Sediment, uG/kG

Printed: October 5, 1998

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Organic Analysis
Base/Neutral/Acid Extractables

PROJECT/SITE NO. 47559	PROJECT NAME Smokey Mtn. Smelters
STATION NUMBER SMS-SD-03	COUNTY Knox
DESCRIPTION	
STREAM MILE on-site 1000'	DEPTH sediment MATRIX soil
COLLECTED: DATE 8-25-98	TIME 13:10
SAMPLER'S NAME(printed) Burl Maupin	BILLING CODE 3257281
SAMPLING AGENCY DSE	
IF PRIORITY, DATE NEEDED 9-25-98	
SEND REPORT TO: KEAC	
CONTACT HAZARD	

*	NPDES Extractables	*	NPDES Extractables(con't)	*	TAL Semivolatiles
	butylbenzylphthalate	X	2-chlorophenol	X	dimethylphthalate
	bis(2-ethylhexyl)phthalate		2,4-dichlorophenol	X	4,6-dinitro-2-methylphenol
	di-n-butylphthalate		2,4-dimethylphenol	X	2,4-dinitrophenol
	di-n-octylphthalate		2,4-dinitrophenol	X	2,4-dinitrotoluene
	diethylphthalate		4,6-dinitro-o-cresol	X	2,6-dinitrotoluene
	dimethylphthalate		2-nitrophenol	X	fluoranthene
X	n-nitrosodimethylamine		4-nitrophenol	X	fluorene
	n-nitrosodiphenylamine		pentachlorophenol	X	hexachlorobenzene
	n-nitrosodi-n-propylamine		phenol	X	hexachlorobutadiene
	isophorone		2,4,6-trichlorophenol	X	hexachlorocyclopentadiene
	nitrobenzene	*	**TAL Semivolatiles**	X	hexachloroethane
	2,4-dinitrotoluene	X	acenaphthene	X	indeno(1,2,3-cd)pyrene
	acenaphthene	X	acenaphthylene	X	isophorone
	acenaphthylene	X	anthracene	X	2-methylnaphthalene
	anthracene	X	benzo(a)anthracene	X	2-methylphenol
	benzo(a)anthracene	X	benzo(a)pyrene	X	4-methylphenol
	benzo(a)pyrene	X	benzo(b)fluoranthene	X	n-nitrosodiphenylamine
	benzo(b)fluoranthene	X	benzo(g,h,i)perylene	X	n-nitroso-n-dipropylamine
	benzo(g,h,i)perylene	X	benzo(k)fluoranthene	X	naphthalene
	benzo(k)fluoranthene	X	benzoic acid	X	2-nitroaniline
	chrysene	X	benzyl alcohol	X	3-nitroaniline
	dibenzo(a,h)anthracene	X	bis(2-chloroethoxy)methane	X	4-nitroaniline
	fluoranthene	X	bis(2-chloroethyl) ether	X	nitrobenzene
	fluorene	X	bis(2-chloroisopropyl)ether	X	2-nitrophenol
	indeno(1,2,3-c,d)pyrene	X	bis(2-ethylhexyl)phthalate	X	4-nitrophenol
	naphthalene	X	4-bromophenylphenylether	X	pentachlorophenol
	phenanthrene	X	butylbenzylphthalate	X	phenanthrene
	pyrene	X	4-chloroaniline	X	phenol
	bis(2-chloroethyl)ether	X	4-chloro-3-methyl phenol	X	pyrene
	bis(2-chloroethoxy)methane	X	2-chloronaphthalene	X	1,2,4-trichlorobenzene
	bis(2-chloroisopropyl)ether	X	4-chlorophenylphenylether	X	2,4,5-trichlorophenol
	4-bromophenylphenylether	X	chrysene	X	2,4,6-trichlorophenol
	4-chlorophenylphenylether	X	di-n-butylphthalate	*	**Nitrobodies**
	hexachlorocyclopentadiene	X	di-n-octylphthalate		RDX
	hexachlorobutadiene	X	dibenzo(a,h)anthracene		2,4,6-TNT
	hexachlorobenzene	X	dibenzofuran		2,4-dinitrotoluene
	hexachloroethane	X	3,3'-dichlorobenzidine		2,6-dinitrotoluene
	1,2,4-trichlorobenzene	X	2,4-dichlorophenol		nitrobenzene
	2-chloronaphthalene	X	diethylphthalate		1,3,5-TNB
	4-chloro-3-methyl phenol	X	2,4-dimethylphenol		

*	TCLP Semivolatiles	*	Pesticides/PCBs
	chlordane	X	aldrin
	o-cresol	X	alpha-BHC
	m-cresol	X	beta-BHC
	p-cresol	X	delta-BHC
	cresol	X	gamma-BHC (lindane)
	2,4-D	X	technical chlordane
	2,4-dinitrotoluene	X	alpha-chlordane
	endrin	X	gamma-chlordane
	heptachlor	X	4,4'-DDD
	heptachlor epoxide	X	4,4'-DDE
	hexachlorobenzene	X	4,4'-DDT
	hexachlorobutadiene	X	dieldrin
	hexachloroethane	X	endosulfan I
	lindane	X	endosulfan II
	methoxychlor	X	endosulfan sulfate
	nitrobenzene	X	endrin
	pentachlorophenol	X	endrin aldehyde
	pyridine	X	endrin ketone
	toxaphene	X	heptachlor
	2,4,5-trichlorophenol	X	heptachlor epoxide
	2,4,6-trichlorophenol	X	toxaphene
	2,4,5-TP (Silvex)	X	methoxychlor
		X	PCB 1016/1242
		X	PCB 1221
		X	PCB 1232
		X	PCB 1248
		X	PCB 1254
		X	PCB 1260
		X	PCB 1262

Laboratory Number

Branch Lab Number

Chain of Custody and Supplemental Information

Only one chain of custody form is required per sample set or point (if all collected at the same time)

1. Collected by BHM
   Date 8-25-98 Time 13:10
   Delivered to KBL
   Date 8-26-98 Time 1080
2. Received by
   Date Time
   Delivered to
   Date Time
3. Received by
   Date Time
   Delivered to
   Date Time
4. Received in Lab by [illegible]
   Date 8/26/98 Time 1000
   Logged in by ?
   Date Time

Additional Information

1. Approximate volume of sample 16 oz
2. Nearest town or city Knoxville
3. Others present at collection Lee Burrow
4. Number of other samples collected at same time at this point 3
5. Field collection procedure, handling and/or preservation of this sample according to EPA procedures and protocol
6. Mode of transportation to lab in State vehicle, in coolers, on ice
7. Sample sealed by
8. Date sample sealed
9. Remarks

SEP 1 - 1998

Project/Site No.: 47-559
Project Name: SMOKEY MOUNTAIN SMELTERS
Site Description: SMS-SD-03/ON-SITE LAGOON
Station No.: SMS-SD-03
Collected: 08/25/98 13:10:00 By BHM
County: 47

Lab Number: 9808247-04E
Matrix: SOIL
Received: 08/26/98 10:00:00 By PMB
Sampling Agency: HWM_11_KFO
Priority:

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
VOLATILES-TAL SEDIMENTS						8260A
ACETONE	U	PPB	25	09/04/98	HMG	
BENZENE	U	PPB	2.5	09/04/98	HMG	
BROMODICHLOROMETHANE	U	PPB	2.5	09/04/98	HMG	
BROMOFORM	U	PPB	2.5	09/04/98	HMG	
BROMOMETHANE	U	PPB	5.0	09/04/98	HMG	
2-BUTANONE (MEK)	U	PPB	25	09/04/98	HMG	
CARBON DISULFIDE	U	PPB	5.0	09/04/98	HMG	
CARBON TETRACHLORIDE	U	PPB	2.5	09/04/98	HMG	
VINYL ACETATE	U	PPB	5.0	09/04/98	HMG	
CHLOROBENZENE	U	PPB	2.5	09/04/98	HMG	
CHLOROETHANE	U	PPB	5.0	09/04/98	HMG	
CHLOROFORM	U	PPB	2.5	09/04/98	HMG	
CHLOROMETHANE	U	PPB	5.0	09/04/98	HMG	
DIBROMOCHLOROMETHANE	U	PPB	2.5	09/04/98	HMG	
1,2-DICHLOROBENZENE	U	PPB	2.5	09/04/98	HMG	
1,3-DICHLOROBENZENE	U	PPB	2.5	09/04/98	HMG	
1,4-DICHLOROBENZENE	U	PPB	2.5	09/04/98	HMG	
DICHLORODIFLUOROMETHANE	U	PPB	5.0	09/04/98	HMG	
1,1-DICHLOROETHANE	U	PPB	2.5	09/04/98	HMG	
1,2-DICHLOROETHANE	U	PPB	2.5	09/04/98	HMG	
1,1-DICHLOROETHENE	U	PPB	2.5	09/04/98	HMG	
CIS-1,2-DICHLOROETHENE	U	PPB	2.5	09/04/98	HMG	
TRANS-1,2-DICHLOROETHENE	U	PPB	2.5	09/04/98	HMG	
1,2-DICHLOROPROPANE	U	PPB	2.5	09/04/98	HMG	
CIS-1,3-DICHLOROPROPENE	U	PPB	2.5	09/04/98	HMG	
TRANS-1,3-DICHLOROPROPENE	U	PPB	2.5	09/04/98	HMG	
ETHYLBENZENE	U	PPB	2.5	09/04/98	HMG	
METHYLENE CHLORIDE	B 10	PPB	2.5	09/04/98	HMG	
4-METHYL-2-PENTANONE (MIBK)	U	PPB	25	09/04/98	HMG	
STYRENE	U	PPB	2.5	09/04/98	HMG	
2-HEXANONE	U	PPB	5.0	09/04/98	HMG	
1,1,2,2-TETRACHLOROETHANE	U	PPB	2.5	09/04/98	HMG	
TETRACHLOROETHENE	U	PPB	2.5	09/04/98	HMG	
TOLUENE	U	PPB	2.5	09/04/98	HMG	
1,1,1-TRICHLOROETHANE	U	PPB	2.5	09/04/98	HMG	
1,1,2-TRICHLOROETHANE	U	PPB	2.5	09/04/98	HMG	
TRICHLOROETHENE	U	PPB	2.5	09/04/98	HMG	
TRICHLOROFLUOROMETHANE	U	PPB	5.0	09/04/98	HMG	
VINYL CHLORIDE	U	PPB	5.0	09/04/98	HMG	
o-XYLENE	U	PPB	2.5	09/04/98	HMG	
m&p-XYLENE	U	PPB	2.5	09/04/98	HMG	

*-Water, uG/L; Sediment, uG/kG

Printed: September 8, 1998

State of Tennessee - Environmental Laboratories

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Organic Analysis

Volatiles and Petroleum Hydrocarbons

PROJECT/SITE NO.	47-559	PROJECT NAME	SUPERFUND MOUNTAIN SMELTERS
STATION NUMBER	SMS-SD-03	COUNTY	KNOX
DESCRIPTION	~~WASTE AT MAINTENANCE SHED~~ lagoon sediment		
STREAM MILE		DEPTH	MATRIX SOIL
COLLECTED: DATE	AUGUST 25, 1998	TIME	13:10
SAMPLER'S NAME(printed)	BURL H. MAUPIN		
SAMPLING AGENCY	DIVISION OF SUPERFUND	BILLING CODE	327.38-11
IF PRIORITY, DATE NEEDED	SEPTEMBER 25		
SEND REPORT TO:	KNOXVILLE ENVIRONMENTAL ASSISSTANCE CENTER		
	BURL H. MAUPIN		
CONTACT HAZARD	METALS, RADIOCHEMICAL, UNKNOWN		

*	NPDES Volatiles - 624	*	TAL Volatiles - 8260A	*	TCLP Volatiles
	Bromoform		Chloromethane		Benzene
	Bromodichloromethane		Bromomethane		Carbon tetrachloride
	Carbon Tetrachloride		Vinyl chloride		Chlorobenzene
	Chlorobenzene		Chloroethane		Chloroform
	Chloroethane		Methylene chloride		1,2-Dichloroethane
	2-Chloroethylvinyl ether		Acetone		1,1-Dichloroethane
	Chloroform		Carbon disulfide		Methyl ethyl ketone
	Chloromethane		1,1-Dichloroethene		Tetrachloroethene
	Dibromochloromethane		1,1-Dichloroethane		Trichloroethene
	1,2-Dichlorobenzene		Cis-1,2-dichloroethene		Vinyl chloride
	1,3-Dichlorobenzene		Trans-1,2-dichloroethene	*	BTEX - 8260A - UST
	1,4-Dichlorobenzene		1,2-Dichloroethane		Benzene
	Dichlorodifluoromethane		Chloroform		Toluene
	1,1-Dichloroethane		2-Butanone		Ethyl benzene
	1,2-Dichloroethane		1,1,1-Trichloroethane		o-Xylene
	1,1-Dichloroethene		Carbon tetrachloride		m-Xylene
	Cis-1,2-dichloroethene		Vinyl acetate		p-Xylene
	Trans-1,2-dichloroethene		Bromodichloromethane		Methyl t-butyl ether
	1,2-Dichloropropane		1,2-Dichloropropane		Diisopropyl ether
	Cis-1,3-dichloropropene		Cis-1,3-dichloropropane	*	TPH by GC
	Trans-1,2-dichloroethene		Trichloroethene		Gasoline Range Organics
	Methylene chloride		Dibromochloromethane		Diesel Range Organics
	1,1,2,2-Tetrachloroethane		1,1,2-Trichloroethane	*	TPH by IR (418.1)
	Tetrachloroethene		Benzene		418.1 - Waste Oil
	1,1,1-Trichloroethane		Trans-1,3-dichloropropene	*	Other
	1,1,2-Trichloroethane		Bromoform		
	Trichloroethene		4-Methyl-2-pentanone		
	Trichlorofluoromethane		2-Hexanone		
	Vinyl chloride		Tetrachloroethene		
	Benzene		Toluene		
	Ethylbenzene		1,1,2,2-Tetrachloroethane		
	Toluene		Chlorobenzene		
	o-Xylene		Ethyl benzene		
	m-Xylene		Styrene		
	p-Xylene		o-Xylene		
			m-Xylene		
			o-Xylene		

Laboratory Number

Branch Lab Number

Chain of Custody and Supplemental Information

Only one chain of custody form is required per sample set or point (if all collected at the same time)

1. Collected by Burl H. Maupin
   Date AUGUST 25, 1998 Time 13:10
   Delivered to Knoxville Basin Laboratory
   Date 8-26-98 Time 10:00
2. Received by
   Date Time
   Delivered to
   Date Time
3. Received by
   Date Time
   Delivered to
   Date Time
4. Received in Lab by [illegible]
   Date 8/26/98 Time 1000
   Logged in by
   Date Time

Additional Information

1. Approximate volume of sample 4 oz.
2. Nearest town or city KNOXVILLE
3. Others present at collection LEE BARRON
4. Number of other samples collected at same time at this point *One other sample each for INORGANICS, RADIOCHEMICAL, AND EXTRACTABLE ORGANICS were collected for a total of three other samples.*
5. Field collection procedure, handling and/or preservation of this sample *according to EPA procedures and protocol*
6. Mode of transportation to lab *in State vehicle, in cooler, and on ice*
7. Sample sealed by
8. Date sample sealed
9. Remarks

SEP 30 1998

Project/Site No.: 47-559
Project Name: SMOKEY MOUNTAIN SMELTERS
Description: SMS-SD-03/ON-SITE LAGOON
Station No.: SMS-SD-03
Collected: 08/25/98 13:10:00 By BHM
inty: 47

Lab Number: 9808247-04G
Matrix: SOIL
Received: 08/26/98 10:00;00 By PMB
Sampling Agency: HWM_11_KFO
Priority:

TEST	RESULT	*ERROR	UNITS	ANALYZED	BY	METHOD
GAMMA RADIONUCLIDES						R.6
K-40	13.53	0.69	pCi/g dry wt	09/01/98	AK	
Pb-214	1.226	0.090	pCi/g dry wt	09/01/98	AK	
Bi-214	1.147	0.080	pCi/g dry wt	09/01/98	AK	
Pb-212	1.492	0.070	pCi/g dry wt	09/01/98	AK	
Ac-228	1.78	0.13	pCi/g dry wt	09/01/98	AK	
Tl-208	0.501	0.060	pCi/g dry wt	09/01/98	AK	
Cs-137	0.107	0.030	pCi/g dry wt	09/01/98	AK	
GROSS ALPHA & BETA						R.1.3
GROSS ALPHA	2.18	0.82	pCi/g DRY WT.	09/09/98	NLF	
GROSS BETA	22.3	1.8	pCi/g DRY WT.	09/09/98	NLF	

*--Represents +/- error value

Printed: September 10, 1998

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Radiochemical Analysis

PROJECT/SITE NO. 47559	PROJECT NAME SMKY MTN SMELTERS
STATION NUMBER SMS-SD-03	COUNTY KNOX
DESCRIPTION ON-SITE LAGOON SEDIMENT	
STREAM MILE	DEPTH
COLLECTED: DATE 8-25-98	TIME 13:10
PICK-UP DATE:	
CONTACT HAZARD metals, radiochemical	mR/hr Reading < 0.1
SAMPLER'S NAME (printed) Burl Maupin	
SAMPLING AGENCY DSF	BILLING CODE 3273811
IF PRIORITY, DATE NEEDED 9-25-98	
SEND REPORT TO: KEAC	

Sample Type

___Air ___Milk ___Swipe
___Water ___Tissue ___Liquid
___Sludge ___Soil ___Solid
___Vegetation ✓Sediment

Other_____

Field Comments:

Air Samples
Volume _____
Total Hours _____

___Sample Filtration
___Sample Acidification
___Send to RESL

REQUESTED ANALYSES:

✓	GROSS ALPHA (TOTAL)		STRONTIUM 89
	GROSS ALPHA (SUSPENDED)		STRONTIUM 90
	GROSS ALPHA (DISSOLVED)		TRITIUM (H-3)
✓	GROSS BETA (TOTAL)		THORIUM (TOTAL)
	GROSS BETA (SUSPENDED)		URANIUM (TOTAL)
	GROSS BETA (DISSOLVED)	✓	GAMMA RADIONUCLIDES
			ADDITIONAL ANALYSES:

Laboratory Number

Date Received

Time Received **By**

Chain of Custody and Supplemental Information

Only one chain of custody form is required per sample set or point (if all collected at the same time)

1. Collected by BHM
   Date 8-25-98 Time 13:10
   Delivered to KBL
   Date 8-26-98 Time 10:00
2. Collected by
   Date Time
   Delivered to
   Date Time
3. Collected by
   Date Time
   Delivered to
   Date Time
4. Received in Lab by [signature]
   Date 8/26/98 Time 1000
   Logged in by
   Date Time

Additional Information

1. Approximate volume of sample 16 oz.
2. Nearest town or city Knoxville
3. Others present at collection Lee Barron
4. Number of other samples collected at same time at this point 3
5. Field collection procedure, handling and/or preservation of this sample according to EPA procedures and protocol
6. Mode of transportation to lab in State vehicle, in cooler, on ice
7. Sample sealed by
8. Date sample sealed
9. Remarks

Project/Site No.: 47-559
Project Name: SMOKEY MOUNTAIN SMELTERS
Description: SMS-SD-04/S. DRAINAGE SWA.
Station No.: SMS-SD-04
Collected: 08/31/98 10:00:00 By WLB
County: 47

Lab Number: 9809002-01
Matrix: SOIL
Received: 09/01/98 09:05:00 By FMM
Sampling Agency: HWM_11_KFO
Priority:

TEST	RESULT	UNITS	LIMIT	ANALYZED	BY	METHOD
AMMONIA	35.4	mg/kg	10	09/15/98	SAL	A.18.2
CYANIDE	U	mg/kg	1.0	09/23/98	SAL	A.9
NITRATE & NITRITE NITROGEN	20.7	mg/kg	0.5	09/15/98	SAL	A.18.5
ALUMINUM	80900	mg/kg	10	10/01/98	JAH	
ANTIMONY	6.8	mg/kg	0.6	10/09/98	JAH	
ARSENIC	11.0	mg/kg	0.2	10/05/98	JAH	
BARIUM	96	mg/kg	10	10/01/98	JAH	
BERYLLIUM	2.7	mg/kg	1	09/30/98	JAH	
CADMIUM	5.0	mg/kg	0.5	09/11/98	JAH	
CALCIUM	12300	mg/kg	3	10/02/98	JAH	
CHROMIUM	64	mg/kg	1	09/23/98	JAH	
COBALT	11	mg/kg	1	09/15/98	JAH	
COPPER	1380	mg/kg	1	09/16/98	JAH	
DIGESTION-METALS	COMPLETED	COMPLETED		09/10/98	EAM	
IRON	10300	mg/kg	5	09/16/98	JAH	
LEAD	133	mg/kg	4	09/15/98	JAH	
MAGNESIUM	2510	mg/kg	2	10/02/98	JAH	
MANGANESE	837	mg/kg	1	09/16/98	JAH	
MERCURY	0.23	mg/kg	0.1	09/11/98	ATB	EPA 245.5
METALS PREP-SOLIDS/WASTES	COMPLETED	COMPLETED		09/02/98	EAM	
NICKEL	294	mg/kg	2	09/11/98	JAH	
PERCENT SOLIDS	72.6	%		09/08/98	SDS	
POTASSIUM	143	mg/kg	2	10/02/98	JAH	

Project/Site No.: 47-559
Project Name: SMOKEY MOUNTAIN SMELTERS
Description: SMS-SD-04/S. DRAINAGE SWA.
Station No.: SMS-SD-04
Collected: 08/31/98 10:00:00 By WLB
County: 47

Lab Number: 9809002-01
Matrix: SOIL
Received: 09/01/98 09:05:00 By FMM
Sampling Agency: HWM_11_KFO
Priority:

TEST	RESULT	UNITS	LIMIT	ANALYZED	BY	METHOD
SELENIUM	3.4	mg/kg	0.4	10/07/98	JAH	
SILVER	2	mg/kg	1	09/15/98	JAH	
SODIUM	3820	mg/kg	10	10/02/98	JAH	
THALLIUM	U	mg/kg	5	09/15/98	JAH	
VANADIUM	46	mg/kg	20	10/01/98	JAH	
ZINC	738	mg/kg	0.5	09/15/98	JAH	

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Inorganic Analysi.

PROJECT/SITE NO. 47-559	PROJECT NAME SMOKEY MTN. SMELTERS
STATION NUMBER SMS-SD-04	COUNTY KNOX
DESCRIPTION SOUTHERN DRAINAGE SWALE	
STREAM MILE —	DEPTH 0"-6" MATRIX SOIL
COLLECTED: DATE 08-31-98	TIME 10:00
SAMPLER'S NAME(printed) WM. LEE BARRON & ADAM D DEWEESE	
SAMPLING AGENCY TDSF	BILLING CODE 327.38.11
IF PRIORITY, DATE NEEDED 09-30-98	
SEND REPORT TO: BURL H. MAUPIN TDSF KNOXVILLE ENVIR. ASSIST. CENTER	
CONTACT HAZARD UNKNOWN	

*	Metals
X	aluminum, Al
X	antimony, Sb
X	arsenic, As
X	barium, Ba
X	beryllium, Be
X	cadmium, Cd
X	calcium, Ca
X	chromium, Cr
X	cobalt, Co
X	copper, Cu
X	iron, Fe
X	lead, Pb
X	magnesium, Mg
X	manganese, Mn
X	mercury, Hg
X	nickel, Ni
X	potassium, K
X	selenium, Se
X	silver, Ag
X	sodium, Na
X	thallium, Tl
X	vanadium, V
X	zinc, Zn

*	Env. Microbiology	*	General Inorganics		Gen. Inorganics (con't)
	coliform, fecal*		acidity as $CaCO_3$*		oil and grease
	coliform, total*		alkalinity as $CaCO_3$*		orthophosphate, total*
	strep, fecal*		alkalinity, phen. as $CaCO_3$*		oxygen, dissolved*
			BOD, 5-day*		pH
			CBOD, 5-day*		phenols, total
			boron		phosphate, total
*	**Ambient Parameters**		chloride*		residue, dissolved*
	COD*		chlorine, residual*		residue, settleable*
	coliform, fecal		chromium, hexavalent		residue, suspended*
	conductivity*		COD*		residue, total*
	hardness, total as $CaCO_3$*		color, apparent*		silica*
	nitrogen, ammonia		color, true*		sulfate*
	nitrogen, NO_3 & NO_2		conductivity*		sulfide, total*
	nitrogen, total Kjeldahl	X	cyanide		TOC*
	phosphate, total		flash point*		turbidity*
	pH		fluoride*		percent solids
	residue, dissolved*		hardness, Ca as $CaCO_3$*	*	**Other**
	residue, suspended*		hardness, total as $CaCO_3$*		
	arsenic, As		hydrocarbons, total		
	cadmium, Cd		MBAS*		
	chromium, Cr	X	nitrogen, ammonia		
	copper, Cu		nitrogen, nitrate*		
	lead, Pb		nitrogen, nitrite*		
	mercury, Hg	X	nitrogen, NO_3 & NO_2		
	nickel, Ni		nitrogen, total Kjeldahl		
	zinc, Zn		nitrogen, total organic		

*	TCLP
	arsenic, As
	barium, Ba
	cadmium, Cd
	chromium, Cr
	lead, Pb
	mercury, Hg
	nickel, Ni
	selenium, Se
	silver, Ag

** denotes analyses performed only on water*

FIELD DETERMINATIONS	Temperature
pH	Chlorine, residual
Conductivity	Other
Dissolved Oxygen	

Laboratory Number

Branch Lab Number

Chain of Custody and Supplemental Information

Only one chain of custody form is required per sample set or point (if all collected at the same time)

1. Collected by T.D. & R. & ADD
   Date 08-31-98 Time 10:00
   Delivered to BURL H. MAUPIN
   Date 08-31-98 Time 15:00
2. Received by [illegible]
   Date 8-31-98 Time 1500
   Delivered to KNOXVILLE STATE LAB
   Date 9-1-98 Time 9:00
3. Received by
   Date Time
   Delivered to
   Date Time
4. Received in Lab by [illegible]
   Date 9-1-98 Time [illegible]
   Logged in by
   Date Time

Additional Information

1. Approximate volume of sample 16 OZ
2. Nearest town or city KNOXVILLE
3. Others present at collection NONE
4. Number of other samples collected at same time at this point THREE
5. Field collection procedure, handling and/or preservation of this sample ACCORDING TO U.S. EPA PROCEDURES AND PROTOCOLS
6. Mode of transportation to lab ON ICE, IN AN ICE CHEST IN A STATE VEHICLE
7. Sample sealed by
8. Date sample sealed
9. Remarks

Project/Site No.: 47-559
Project Name: SMOKEY MOUNTAIN SMELTERS
Description: SMS-SD-04/S. DRAINAGE SWA.
Station No.: SMS-SD-04
'lected: 08/31/98 10:00:00 By WLB
.nty: 47

Lab Number: 9809002-01F
Matrix: SOIL
Received: 09/01/98 09:05:00 By FMM
Sampling Agency: HWM_11_KFO
Priority:

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
B/N/A EXTR+PESTS,PCBS-SOIL						MS+ECD
BUTYL BENZYL PHTHALATE	U	PPB	210	10/09/98	MAC	
BIS(2-ETHYLHEXYL)PHTHALATE	B 310	PPB	-	10/09/98	MAC	
DI-n-BUTYL PHTHALATE	U	PPB	210	10/09/98	MAC	
DI-n-OCTYL PHTHALATE	U	PPB	420	10/09/98	MAC	
DIETHYL PHTHALATE	5630	PPB	-	10/09/98	MAC	
DIMETHYL PHTHALATE	U	PPB	100	10/09/98	MAC	
n-NITROSODIMETHYLAMINE	U	PPB	420	10/09/98	MAC	
n-NITROSODIPHENYLAMINE	U	PPB	210	10/09/98	MAC	
n-NITROSO-di-n-PROPYLAMINE	U	PPB	210	10/09/98	MAC	
ISOPHORONE	U	PPB	100	10/09/98	MAC	
NITROBENZENE	U	PPB	210	10/09/98	MAC	
2,4-DINITROTOLUENE	U	PPB	420	10/09/98	MAC	
2,6-DINITROTOLUENE	U	PPB	420	10/09/98	MAC	
ACENAPTHENE	U	PPB	100	10/09/98	MAC	
ACENAPHTHYLENE	U	PPB	100	10/09/98	MAC	
ANTHRACENE	U	PPB	100	10/09/98	MAC	
BENZO(a)ANTHRACENE	116	PPB	-	10/09/98	MAC	
BENZO(a)PYRENE	173	PPB	-	10/09/98	MAC	
BENZO(b)FLUORANTHENE	352	PPB	-	10/09/98	MAC	
BENZO(ghi)PERYLENE	J 397	PPB	420	10/09/98	MAC	
BENZO(k)FLUORANTHENE	104	PPB	-	10/09/98	MAC	
DIBENZO(a,h)ANTHRACENE	U	PPB	420	10/09/98	MAC	
FLUORANTHENE	179	PPB	-	10/09/98	MAC	
FLUORENE	U	PPB	100	10/09/98	MAC	
INDENO(1,2,3-cd)PYRENE	J 372	PPB	420	10/09/98	MAC	
NAPHTHALENE	U	PPB	100	10/09/98	MAC	
PHENANTHRENE	J 27.0	PPB	100	10/09/98	MAC	
PYRENE	123	PPB	-	10/09/98	MAC	
CHRYSENE	152	PPB	-	10/09/98	MAC	
BIS(2-CHLOROETHYL)ETHER	U	PPB	210	10/09/98	MAC	
BIS(2-CHLOROETHOXY)METHANE	U	PPB	100	10/09/98	MAC	
BIS(2-CHLOROISOPROPYL)ETHER	U	PPB	420	10/09/98	MAC	
4-BROMOPHENYLPHENYL ETHER	U	PPB	420	10/09/98	MAC	
4-CHLOROPHENYLPHENYL ETHER	U	PPB	210	10/09/98	MAC	
HEXACHLOROCYCLOPENTADIENE	U	PPB	1000	10/09/98	MAC	
HEXACHLOROBUTADIENE	U	PPB	210	10/09/98	MAC	
HEXACHLOROBENZENE	U	PPB	210	10/09/98	MAC	
HEXACHLOROETHANE	U	PPB	210	10/09/98	MAC	
1,2,4-TRICHLOROBENZENE	U	PPB	210	10/09/98	MAC	
2-CHLORONAPHTHALENE	U	PPB	100	10/09/98	MAC	
4-CHLORO-3-METHYLPHENOL	U	PPB	210	10/09/98	MAC	
2-CHLOROPHENOL	U	PPB	100	10/09/98	MAC	
2,4-DICHLOROPHENOL	U	PPB	210	10/09/98	MAC	
2,4-DIMETHYLPHENOL	U	PPB	210	10/09/98	MAC	
2,4-DINITROPHENOL	U	PPB	2100	10/09/98	MAC	
2-METHYL-4,6-DINITROPHENOL	U	PPB	1000	10/09/98	MAC	
2-NITROPHENOL	U	PPB	420	10/09/98	MAC	
4-NITROPHENOL	U	PPB	1000	10/09/98	MAC	
PENTACHLOROPHENOL	U	PPB	420	10/09/98	MAC	
PHENOL	U	PPB	100	10/09/98	MAC	
2,4,6-TRICHLOROPHENOL	U	PPB	210	10/09/98	MAC	
2,4,5-TRICHLOROPHENOL	U	PPB	210	10/09/98	MAC	
O-CRESOL	U	PPB	210	10/09/98	MAC	
M- & P-CRESOL	U	PPB	100	10/09/98	MAC	
2-METHYLNAPHTHALENE	U	PPB	100	10/09/98	MAC	
BENZOIC ACID	U	PPB	420	10/09/98	MAC	
BENZYL ALCOHOL	U	PPB	420	10/09/98	MAC	
4-CHLOROANILINE	U	PPB	210	10/09/98	MAC	
DIBENZOFURAN	U	PPB	100	10/09/98	MAC	
3,3-DICHLOROBENZIDINE	U	PPB	420	10/09/98	MAC	
2-NITROANILINE	U	PPB	420	10/09/98	MAC	
3-NITROANILINE	U	PPB	420	10/09/98	MAC	
4-NITROANILINE	U	PPB	1000	10/09/98	MAC	
ALDRIN	U	PPB	2.9	10/09/98	MAC	
alpha-BHC	U	PPB	5.1	10/09/98	MAC	
beta-BHC	U	PPB	7.4	10/09/98	MAC	
a-BHC	U	PPB	7.4	10/09/98	MAC	
gamma-BHC (LINDANE)	U	PPB	2.9	10/09/98	MAC	
alpha-CHLORDANE	3.54	PPB	-	10/09/98	MAC	
gamma-CHLORDANE	12.4	PPB	-	10/09/98	MAC	
TECHNICAL CHLORDANE	U	PPB	44	10/09/98	MAC	
p,p-DDD	U	PPB	5.3	10/09/98	MAC	
p,p-DDE	U	PPB	4.7	10/09/98	MAC	

Project/Site No.:	47-559	Lab Number:	9809002-01F
Project Name:	SMOKEY MOUNTAIN SMELTERS	Matrix:	SOIL
Description:	SMS-SD-04/S. DRAINAGE SWA.	Received:	09/01/98 09:05:00 By FMM
Station No.:	SMS-SD-04	Sampling Agency:	HWM_11_KFO
Collected:	08/31/98 10:00:00 By WLB	Priority:	
nty:	47		

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
B/N/A EXTR+PESTS,PCBS-SOIL						MS+ECD
p,p-DDT	U	PPB	5.0	10/09/98	MAC	
DIELDRIN	U	PPB	12	10/09/98	MAC	
ENDOSULFAN I	U	PPB	4.7	10/09/98	MAC	
ENDOSULFAN II	U	PPB	5.4	10/09/98	MAC	
ENDOSULFAN SULFATE	U	PPB	5.4	10/09/98	MAC	
ENDRIN	U	PPB	5.4	10/09/98	MAC	
ENDRIN ALDEHYDE	U	PPB	4.5	10/09/98	MAC	
ENDRIN KETONE	U	PPB	22	10/09/98	MAC	
HEPTACHLOR	U	PPB	3.5	10/09/98	MAC	
HEPTACHLOR EPOXIDE	U	PPB	3.7	10/09/98	MAC	
TOXAPHENE	U	PPB	310	10/09/98	MAC	
METHOXYCHLOR	U	PPB	21	10/09/98	MAC	
PCB 1016/1242	U	PPB	270	10/09/98	MAC	
PCB 1221	U	PPB	360	10/09/98	MAC	
PCB 1232	U	PPB	320	10/09/98	MAC	
PCB 1248	U	PPB	200	10/09/98	MAC	
PCB 1254	J 179	PPB	180	10/09/98	MAC	
PCB 1260	J 137	PPB	160	10/09/98	MAC	
PCB 1262	X	PPB	-	10/09/98	MAC	

*-Water, uG/L; Sediment, uG/kG

Printed: October 13, 1998

X - PCB 1262 NOT ANALYZED. PEAKS MEASURED AS PCB 1260.

State c nessee - Environmental Laboratories
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Organic Analysis
Base/Neutral/Acid Extractables

PROJECT/SITE NO. 47-539	PROJECT NAME SMOKEY MTN. SMELTER
STATION NUMBER SMS-SD-04	COUNTY KNOX
DESCRIPTION SOUTHERN DRAINAGE SWALE	
STREAM MILE —	DEPTH 0"-6" MATRIX SOIL
COLLECTED: DATE 08-31-98	TIME 10:00
SAMPLER'S NAME(printed) WM. LEE BARRON & ADAM D. DEWESE	
SAMPLING AGENCY TDSF	BILLING CODE 327 38.11
IF PRIORITY, DATE NEEDED 09-30-98	
SEND REPORT TO: BURL H. MAUPIN, TDSF, KNOXVILLE ENVIR. ASSIST. CENTER	
CONTACT HAZARD UNKNOWN	

*	NPDES Extractables	*	NPDES Extractables(con't)	*	TAL Semivolatiles
	butylbenzylphthalate	X	2-chlorophenol	X	dimethylphthalate
	bis(2-ethylhexyl)phthalate		2,4-dichlorophenol	X	4,6-dinitro-2-methylphenol
	di-n-butylphthalate		2,4-dimethylphenol	X	2,4-dinitrophenol
	di-n-octylphthalate		2,4-dinitrophenol	X	2,4-dinitrotoluene
	diethylphthalate		4,6-dinitro-o-cresol	X	2,6-dinitrotoluene
	dimethylphthalate		2-nitrophenol	X	fluoranthene
X	n-nitrosodimethylamine		4-nitrophenol	X	fluorene
X	n-nitrosodiphenylamine		pentachlorophenol	X	hexachlorobenzene
	n-nitrosodi-n-propylamine		phenol	X	hexachlorobutadiene
	isophorone		2,4,6-trichlorophenol	X	hexachlorocyclopentadiene
	nitrobenzene	*	TAL Semivolatiles	X	hexachloroethane
	2,4-dinitrotoluene	X	acenaphthene	X	indeno(1,2,3-cd)pyrene
	acenaphthene	X	acenaphthylene	X	isophorone
	acenaphthylene	X	anthracene	X	2-methylnaphthalene
	anthracene	X	benzo(a)anthracene	X	2-methylphenol
	benzo(a)anthracene	X	benzo(a)pyrene	X	4-methylphenol
	benzo(a)pyrene	X	benzo(b)fluoranthene	X	n-nitrosodiphenylamine
	benzo(b)fluoranthene	X	benzo(g,h,i)perylene	X	n-nitroso-n-dipropylamine
	benzo(g,h,i)perylene	X	benzo(k)fluoranthene	X	naphthalene
	benzo(k)fluoranthene	X	benzoic acid	X	2-nitroaniline
	chrysene	X	benzyl alcohol	X	3-nitroaniline
	dibenzo(a,h)anthracene	X	bis(2-chloroethoxy)methane	X	4-nitroaniline
	fluoranthene	X	bis(2-chloroethyl) ether	X	nitrobenzene
	fluorene	X	bis(2-chloroisopropyl)ether	X	2-nitrophenol
	indeno(1,2,3-c,d)pyrene	X	bis(2-ethylhexyl)phthalate	X	4-nitrophenol
	naphthalene	X	4-bromophenylphenylether	X	pentachlorophenol
	phenanthrene	X	butylbenzylphthalate	X	phenanthrene
	pyrene	X	4-chloroaniline	X	phenol
	bis(2-chloroethyl)ether	X	4-chloro-3-methyl phenol	X	pyrene
	bis(2-chloroethoxy)methane	X	2-chloronaphthalene	X	1,2,4-trichlorobenzene
	bis(2-chloroisopropyl)ether	X	4-chlorophenylphenylether	X	2,4,5-trichlorophenol
	4-bromophenylphenylether	X	chrysene	X	2,4,6-trichlorophenol
	4-chlorophenylphenylether	X	di-n-butylphthalate	*	Nitrobodies
	hexachlorocyclopentadiene	X	di-n-octylphthalate		RDX
	hexachlorobutadiene	X	dibenzo(a,h)anthracene		2,4,6-TNT
	hexachlorobenzene	X	dibenzofuran		2,4-dinitrotoluene
X	hexachloroethane	X	3,3'-dichlorobenzidine		2,6-dinitrotoluene
	1,2,4-trichlorobenzene	X	2,4-dichlorophenol		nitrobenzene
	2-chloronaphthalene	X	diethylphthalate		1,3,5-TNB
	4-chloro-3-methyl phenol	X	2,4-dimethylphenol		

*	TCLP Semivolatiles
	chlordane
	o-cresol
	m-cresol
	p-cresol
	cresol
	2,4-D
	2,4-dinitrotoluene
	endrin
	heptachlor
	heptachlor epoxide
	hexachlorobenzene
	hexachlorobutadiene
	hexachloroethane
	lindane
	methoxychlor
	nitrobenzene
	pentachlorophenol
	pyridine
	toxaphene
	2,4,5-trichlorophenol
	2,4,6-trichlorophenol
	2,4,5-TP (Silvex)

*	Pesticides/PCBs
X	aldrin
X	alpha-BHC
X	beta-BHC
X	delta-BHC
X	gamma-BHC (lindane)
X	technical chlordane
X	alpha-chlordane
X	gamma-chlordane
X	4,4'-DDD
X	4,4'-DDE
X	4,4'-DDT
X	dieldrin
X	endosulfan I
X	endosulfan II
X	endosulfan sulfate
X	endrin
X	endrin aldehyde
X	endrin ketone
X	heptachlor
X	heptachlor epoxide
X	toxaphene
X	methoxychlor
X	PCB 1016/1242
X	PCB 1221
X	PCB 1232
X	PCB 1248
X	PCB 1254
X	PCB 1260
X	PCB 1262

Laboratory Number

Branch Lab Number

Chain of Custody and Supplemental Information

Only one chain of custody form is required per sample set or point (if all collected at the same time)

1. Collected by W.L.B. & A.D.D
   Date 08-31-98 Time 10:00
   Delivered to BURL H. MAUPIN
   Date 08-31-98 Time 15:00
2. Received by [illegible]
   Date 8-31-98 Time 1500
   Delivered to KNOXVILLE STATE LAB
   Date 9-1-98 Time 9:00
3. Received by
   Date Time
   Delivered to
   Date Time
4. Received in Lab by [illegible]
   Date 9-01-98 Time 9:05
   Logged in by
   Date Time

Additional Information

1. Approximate volume of sample 16 OZ
2. Nearest town or city KNOXVILLE
3. Others present at collection NONE
4. Number of other samples collected at same time at this point THREE
5. Field collection procedure, handling and/or preservation of this sample ACCORDING TO U.S.EPA PROCEDURES AND PROTOCOLS
6. Mode of transportation to lab ON ICE, IN AN ICE CHEST, IN A STATE VEHICLE.
7. Sample sealed by
8. Date sample sealed
9. Remarks

PH-3014 (rev 1/96)

RDA 1527

SEP 14 19

Project/Site No.: 47-559
Project Name: SMOKEY MOUNTAIN SMELTERS
Site Description: SMS-SD-04/S. DRAINAGE SWA.
Station No.: SMS-SD-04
Collected: 08/31/98 10:00:00 By WLB
County: 47

Lab Number: 9809002-01E
Matrix: SOIL
Received: 09/01/98 09:05:00 By FMM
Sampling Agency: HWM_11_KFO
Priority:

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
VOLATILES-TAL SEDIMENTS						8260A
ACETONE	U	PPB	25	09/04/98	HMG	
BENZENE	U	PPB	2.5	09/04/98	HMG	
BROMODICHLOROMETHANE	U	PPB	2.5	09/04/98	HMG	
BROMOFORM	U	PPB	2.5	09/04/98	HMG	
BROMOMETHANE	U	PPB	5.0	09/04/98	HMG	
2-BUTANONE (MEK)	U	PPB	25	09/04/98	HMG	
CARBON DISULFIDE	U	PPB	5.0	09/04/98	HMG	
CARBON TETRACHLORIDE	U	PPB	2.5	09/04/98	HMG	
VINYL ACETATE	U	PPB	5.0	09/04/98	HMG	
CHLOROBENZENE	U	PPB	2.5	09/04/98	HMG	
CHLOROETHANE	U	PPB	5.0	09/04/98	HMG	
CHLOROFORM	U	PPB	2.5	09/04/98	HMG	
CHLOROMETHANE	U	PPB	5.0	09/04/98	HMG	
DIBROMOCHLOROMETHANE	U	PPB	2.5	09/04/98	HMG	
1,2-DICHLOROBENZENE	U	PPB	2.5	09/04/98	HMG	
1,3-DICHLOROBENZENE	U	PPB	2.5	09/04/98	HMG	
1,4-DICHLOROBENZENE	U	PPB	2.5	09/04/98	HMG	
DICHLORODIFLUOROMETHANE	U	PPB	5.0	09/04/98	HMG	
1,1-DICHLOROETHANE	U	PPB	2.5	09/04/98	HMG	
1,2-DICHLOROETHANE	U	PPB	2.5	09/04/98	HMG	
1,1-DICHLOROETHENE	U	PPB	2.5	09/04/98	HMG	
CIS-1,2-DICHLOROETHENE	U	PPB	2.5	09/04/98	HMG	
TRANS-1,2-DICHLOROETHENE	U	PPB	2.5	09/04/98	HMG	
1,2-DICHLOROPROPANE	U	PPB	2.5	09/04/98	HMG	
CIS-1,3-DICHLOROPROPENE	U	PPB	2.5	09/04/98	HMG	
TRANS-1,3-DICHLOROPROPENE	U	PPB	2.5	09/04/98	HMG	
ETHYLBENZENE	U	PPB	2.5	09/04/98	HMG	
METHYLENE CHLORIDE	B 31	PPB	2.5	09/04/98	HMG	
4-METHYL-2-PENTANONE (MIBK)	U	PPB	25	09/04/98	HMG	
STYRENE	U	PPB	2.5	09/04/98	HMG	
2-HEXANONE	U	PPB	5.0	09/04/98	HMG	
1,1,2,2-TETRACHLOROETHANE	U	PPB	2.5	09/04/98	HMG	
TETRACHLOROETHENE	U	PPB	2.5	09/04/98	HMG	
TOLUENE	U	PPB	2.5	09/04/98	HMG	
1,1,1-TRICHLOROETHANE	U	PPB	2.5	09/04/98	HMG	
1,1,2-TRICHLOROETHANE	U	PPB	2.5	09/04/98	HMG	
TRICHLOROETHENE	U	PPB	2.5	09/04/98	HMG	
TRICHLOROFLUOROMETHANE	U	PPB	5.0	09/04/98	HMG	
VINYL CHLORIDE	U	PPB	5.0	09/04/98	HMG	
o-XYLENE	U	PPB	2.5	09/04/98	HMG	
m&p-XYLENE	U	PPB	2.5	09/04/98	HMG	

*-Water, uG/L; Sediment, uG/kG

Printed: September 8, 1998

State of Tennessee - Environmental Laboratories

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Organic Analysis

Volatiles and Petroleum Hydrocarbons

PROJECT/SITE NO. 47-559 PROJECT NAME SMOKEY MTN. SMELTER
STATION NUMBER SMS-SD-04 COUNTY KNOX
DESCRIPTION SOUTHERN DRAINAGE SWALE
STREAM MILE — DEPTH 0"-6" MATRIX SOIL
COLLECTED: DATE 08-31-98 TIME 10:00
SAMPLER'S NAME(printed) KIM LEE BARTON & ADAM D. DAWKINS
SAMPLING AGENCY TDSF BILLING CODE 327.38.11
IF PRIORITY, DATE NEEDED 09-30-98
SEND REPORT TO: BURL H. MAUPIN, TDSF, KNOXVILLE ENVIR. FIELD OFFICE
CONTACT HAZARD UNKNOWN

*	NPDES Volatiles - 624	*	TAL Volatiles - 8260A	*	TCLP Volatiles
	Bromoform	X	Chloromethane		Benzene
	Bromodichloromethane	X	Bromomethane		Carbon tetrachloride
	Carbon Tetrachloride	X	Vinyl chloride		Chlorobenzene
	Chlorobenzene	X	Chloroethane		Chloroform
	Chloroethane	X	Methylene chloride		1,2-Dichloroethane
X	2-Chloroethylvinyl ether	X	Acetone		1,1-Dichloroethane
	Chloroform	X	Carbon disulfide		Methyl ethyl ketone
	Chloromethane	X	1,1-Dichloroethene		Tetrachloroethene
	Dibromochloromethane	X	1,1-Dichloroethane		Trichloroethene
X	1,2-Dichlorobenzene	X	Cis-1,2-dichloroethene		Vinyl chloride
X	1,3-Dichlorobenzene	X	Trans-1,2-dichloroethene	*	**BTEX - 8260A - UST**
X	1,4-Dichlorobenzene	X	1,2-Dichloroethane		Benzene
X	Dichlorodifluoromethane	X	Chloroform		Toluene
	1,1-Dichloroethane	X	2-Butanone		Ethyl benzene
	1,2-Dichloroethane	X	1,1,1-Trichloroethane		o-Xylene
	1,1-Dichloroethene	X	Carbon tetrachloride		m-Xylene
	Cis-1,2-dichloroethene	X	Vinyl acetate		p-Xylene
	Trans-1,2-dichloroethene	X	Bromodichloromethane		Methyl t-butyl ether
	1,2-Dichloropropane	X	1,2-Dichloropropane		Diisopropyl ether
	Cis-1,3-dichloropropene	X	Cis-1,3-dichloropropane	*	**TPH by GC**
	Trans-1,2-dichloroethene	X	Trichloroethene		Gasoline Range Organics
	Methylene chloride	X	Dibromochloromethane		Diesel Range Organics
	1,1,2,2-Tetrachloroethane	X	1,1,2-Trichloroethane	*	**TPH by IR (418.1)**
	Tetrachloroethene	X	Benzene		418.1 - Waste Oil
	1,1,1-Trichloroethane	X	Trans-1,3-dichloropropene	*	**Other**
	1,1,2-Trichloroethane	X	Bromoform		
	Trichloroethene	X	4-Methyl-2-pentanone		
X	Trichlorofluoromethane	X	2-Hexanone		
	Vinyl chloride	X	Tetrachloroethene		
	Benzene	X	Toluene		
	Ethylbenzene	X	1,1,2,2-Tetrachloroethane		
	Toluene	X	Chlorobenzene		
	o-Xylene	X	Ethyl benzene		
	m-Xylene	X	Styrene		
	p-Xylene	X	o-Xylene		
		X	m-Xylene		
		X	p-Xylene		

Laboratory Number

Branch Lab Number

Chain of Custody and Supplemental Information

Only one chain of custody form is required per sample set or point (if all collected at the same time)

1. Collected by K.L.B. & A.D.D.
   Date 08-31-98 Time 10:00
   Delivered to BURL H. MAUPIN
   Date 08-31-98 Time 15:00
2. Received by [illegible]
   Date 8-31-98 Time 1500
   Delivered to KNOXVILLE STATE LAB
   Date 9-1-98 Time 9:00
3. Received by
   Date Time
   Delivered to
   Date Time
4. Received in Lab by [illegible]
   Date 9-1-98 Time 9:05
   Logged in by
   Date Time

Additional Information

1. Approximate volume of sample 4 OZ
2. Nearest town or city KNOXVILLE
3. Others present at collection NONE
4. Number of other samples collected at same time at this point THREE
5. Field collection procedure, handling and/or preservation of this sample ACCORDING TO CLEAN PROCEDURES AND PROTOCOLS
6. Mode of transportation to lab ON ICE, IN AN ICE CHEST, IN A STATE VEHICLE
7. Sample sealed by
8. Date sample sealed
9. Remarks

PH-3013 (rev 1/96)

RDA 1527

Project/Site No.: 47-559
Project Name: SMOKEY MOUNTAIN SMELTERS
Description: SMS-SD-04/S. DRAINAGE SWA.
Station No.: SMS-SD-04
Collected: 08/31/98 10:00:00 By WLB
County: 47

Lab Number: 9809002-01G
Matrix: SOIL
Received: 09/01/98 09:05:00 By FMM
Sampling Agency: HWM_11_KFO
Priority:

SEP 30 1998

TEST	RESULT	*ERROR	UNITS	ANALYZED	BY	METHOD
GAMMA RADIONUCLIDES						R.6
K-40	8.51	0.56	pCi/g dry wt	09/03/98	AK	
Pb-214	1.15	0.10	pCi/g dry wt	09/03/98	AK	
Bi-214	1.092	0.080	pCi/g dry wt	09/03/98	AK	
Pb-212	0.856	0.060	pCi/g dry wt	09/03/98	AK	
Ac-228	1.17	0.12	pCi/g dry wt	09/03/98	AK	
Tl-208	0.319	0.040	pCi/g dry wt	09/03/98	AK	
GROSS ALPHA & BETA						R.1.3
GROSS ALPHA	1.24	0.67	pCi/g DRY WT.	09/10/98	NLF	
GROSS BETA	12.8	1.4	pCi/g DRY WT.	09/10/98	NLF	

*--Represents +/- error value

Printed: September 10, 1998

State of Tennessee - Environmental Laboratories

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Radiochemical Analysis

PROJECT/SITE NO. 47-559	PROJECT NAME SMOKEY MTN. SMELTERS
STATION NUMBER SMS-SD-04	COUNTY KNOX
DESCRIPTION SOUTHERN DRAINAGE SWALE	
STREAM MILE —	DEPTH 0"-6"
COLLECTED: DATE 08-31-98	TIME 10:00
PICK-UP DATE:	
CONTACT HAZARD UNKNOWN	mR/hr Reading 1.2
SAMPLER'S NAME (printed) WM. LEE BARRON & ADAM D. DEWEESE	
SAMPLING AGENCY TDSF	BILLING CODE 327.38.11
IF PRIORITY, DATE NEEDED 09-30-98	
SEND REPORT TO: BURL H. MAUPIN, TDSF, KNOXVILLE ENVIRO. ASSIST. CENTER	

Sample Type

___Air ___Milk ___Swipe
___Water ___Tissue ___Liquid
___Sludge ___Soil ___Solid
___Vegetation X Sediment

Other_____

Field Comments:

Air Samples
Volume _____
Total Hours _____

___Sample Filtration
___Sample Acidification
___Send to RESL

REQUESTED ANALYSES:

X	GROSS ALPHA (TOTAL)		STRONTIUM 89
	GROSS ALPHA (SUSPENDED)		STRONTIUM 90
	GROSS ALPHA (DISSOLVED)		TRITIUM (H-3)
X	GROSS BETA (TOTAL)		THORIUM (TOTAL)
	GROSS BETA (SUSPENDED)		URANIUM (TOTAL)
	GROSS BETA (DISSOLVED)	X	GAMMA RADIONUCLIDES
			ADDITIONAL ANALYSES:

Laboratory Number

Date Received

Time Received **By**

Chain of Custody and Supplemental Information

Only one chain of custody form is required per sample set or point (if all collected at the same time)

1. Collected by W.L.B. & A.D.D.
   Date 08-31-98 Time 10:00
   Delivered to BURL H. MAUPIN
   Date 08-31-98 Time 15:00
2. Collected by Burl H. Maupin
   Date 8-31-98 Time 1500
   Delivered to KNOXVILLE STATE LAB
   Date 9-1-98 Time 9:00
3. Collected by
   Date Time
   Delivered to
   Date Time
4. Received in Lab by [illegible]
   Date 9-1-98 Time 9:05
   Logged in by
   Date Time

Additional Information

1. Approximate volume of sample 16 oz
2. Nearest town or city KNOXVILLE
3. Others present at collection NONE
4. Number of other samples collected at same time at this point THREE
5. Field collection procedure, handling and/or preservation of this sample ACCORDING TO U.S. EPA PROCEDURES AND PROTOCOLS.
6. Mode of transportation to lab ON ICE IN AN ICE CHEST, IN A STATE VEHICLE.
7. Sample sealed by
8. Date sample sealed
9. Remarks

OCT 18 1998

Project/Site No.: 47-559
Project Name: SMOKEY MOUNTAIN SMELTERS
Description: SMS-SD-05/DOWNSTREAM SITE
Station No.: SMS-SD-05
Collected: 08/25/98 11:05:00 By BHM
County: 47

Lab Number: 9808247-05
Matrix: SOIL
Received: 08/26/98 10:00:00 By PMB
Sampling Agency: HWM_11_KFO
Priority:

TEST	RESULT	UNITS	LIMIT	ANALYZED	BY	METHOD
AMMONIA	63.2	mg/kg	10	09/15/98	SAL	A.18.2
CYANIDE	U	mg/kg	1.0	09/18/98	LKS	A.9
ALUMINUM	15600	mg/kg	10	10/01/98	JAH	
ANTIMONY	0.7	mg/kg	0.6	10/08/98	JAH	
ARSENIC	5.0	mg/kg	0.2	10/05/98	JAH	
BARIUM	70	mg/kg	10	10/01/98	JAH	
BERYLLIUM	1	mg/kg	1	09/30/98	JAH	
CADMIUM	U	mg/kg	0.5	09/11/98	JAH	
CALCIUM	2500	mg/kg	3	10/02/98	JAH	
CHROMIUM	14	mg/kg	1	09/23/98	JAH	
COBALT	16	mg/kg	1	09/15/98	JAH	
COPPER	72	mg/kg	1	09/16/98	JAH	
DIGESTION-METALS	COMPLETED	COMPLETED		09/10/98	EAM	
IRON	192000	mg/kg	5	09/16/98	JAH	
LEAD	18	mg/kg	4	09/15/98	JAH	
MAGNESIUM	1070	mg/kg	2	10/02/98	JAH	
MANGANESE	1000	mg/kg	1	09/16/98	JAH	
MERCURY	U	mg/kg	0.1	09/11/98	ATB	EPA 245.5
METALS PREP-SOLIDS/WASTES	COMPLETED	COMPLETED		08/31/98	EAM	
NICKEL	27	mg/kg	2	09/11/98	JAH	
PERCENT SOLIDS	70.2	%		09/08/98	SDS	
POTASSIUM	1640	mg/kg	2	10/02/98	JAH	
SELENIUM	U	mg/kg	0.4	10/07/98	JAH	

OCT 19 1998

Project/Site No.: 47-559
oject Name: SMOKEY MOUNTAIN SMELTERS
scription: SMS-SD-05/DOWNSTREAM SITE
Station No.: SMS-SD-05
Collected: 08/25/98 11:05:00 By BHM
County: 47

Lab Number: 9808247-05
Matrix: SOIL
Received: 08/26/98 10:00:00 By PMB
Sampling Agency: HWM_11_KFO
Priority:

TEST	RESULT	UNITS	LIMIT	ANALYZED	BY	METHOD
SILVER	U	mg/kg	1	09/15/98	JAH	
SODIUM	5570	mg/kg	10	10/02/98	JAH	
THALLIUM	U	mg/kg	5	09/15/98	JAH	
VANADIUM	25	mg/kg	20	10/01/98	JAH	
ZINC	135	mg/kg	0.5	09/15/98	JAH	

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Inorganic Analys.

PROJECT/SITE NO. 47-559	PROJECT NAME Smokey Mountain Smelters
STATION NUMBER SMS-SD-05	COUNTY Knox
DESCRIPTION sediment d/s of Site-unnamed trib of Flenniken Branch at Rimmer	
STREAM MILE	DEPTH MATRIX soil
COLLECTED: DATE August 25, 1998	TIME 11:05
SAMPLER'S NAME(printed) Burl H. Maupin	
SAMPLING AGENCY Division of Superfund	BILLING CODE 327.38-11
IF PRIORITY, DATE NEEDED September 25, 1998	
SEND REPORT TO: Knoxville Environmental Assisstance Center	
Burl H. Maupin	
CONTACT HAZARD metals, radiochemical, unknown	

*	Metals
x	aluminum, Al
x	antimony, Sb
x	arsenic, As
x	barium, Ba
x	beryllium, Be
x	cadmium, Cd
x	calcium, Ca
x	chromium, Cr
x	cobalt, Co
x	copper, Cu
x	iron, Fe
x	lead, Pb
x	magnesium, Mg
x	manganese, Mn
x	mercury, Hg
x	nickel, Ni
x	potassium, K
x	selenium, Se
x	silver, Ag
x	sodium, Na
x	thallium, Tl
x	vanadium, V
x	zinc, Zn

*	Env. Microbiology	*	General Inorganics		Gen. Inorganics (con't)
	coliform, fecal*		acidity as $CaCO_3$*		oil and grease
	coliform, total*		alkalinity as $CaCO_3$*		orthophosphate, total*
	strep, fecal*		alkalinity, phen. as $CaCO_3$*		oxygen, dissolved*
			BOD, 5-day*		pH
			CBOD, 5-day*		phenols, total
			boron		phosphate, total
*	Ambient Parameters		chloride*		residue, dissolved*
	COD*		chlorine, residual*		residue, settleable*
	coliform, fecal		chromium, hexavalent		residue, suspended*
	conductivity*		COD*		residue, total*
	hardness, total as $CaCO_3$*		color, apparent*		silica*
	nitrogen, ammonia		color, true*		sulfate*
	nitrogen, NO_3 & NO_2		conductivity*		sulfide, total*
	nitrogen, total Kjeldahl	x	cyanide		TOC*
	phosphate, total		flash point*		turbidity*
	pH		fluoride*		percent solids
	residue, dissolved*		hardness, Ca as $CaCO_3$*	*	Other
	residue, suspended*		hardness, total as $CaCO_3$*		
	arsenic, As		hydrocarbons, total		
	cadmium, Cd		MBAS*		
	chromium, Cr	x	nitrogen, ammonia		
	copper, Cu		nitrogen, nitrate*		
	lead, Pb		nitrogen, nitrite*		
	mercury, Hg		nitrogen, NO_3 & NO_2		
	nickel, Ni		nitrogen, total Kjeldahl		
	zinc, Zn		nitrogen, total organic		

*	TCLP
	arsenic, As
	barium, Ba
	cadmium, Cd
	chromium, Cr
	lead, Pb
	mercury, Hg
	nickel, Ni
	selenium, Se
	silver, Ag

** denotes analyses performed only on water*

FIELD DETERMINATIONS	Temperature
pH	Chlorine, residual
Conductivity	Other
Dissolved Oxygen	

Laboratory Number

Branch Lab Number

Chain of Custody and Supplemental Information

Only one chain of custody form is required per sample set or point (if all collected at the same time)

1. Collected by Burl H. Maupin
   Date August 25, 1998 Time 11:05
   Delivered to Knoxville Basin Laboratory
   Date August 26, 1998 Time 10:05
2. Received by
   Date Time
   Delivered to
   Date Time
3. Received by
   Date Time
   Delivered to
   Date Time
4. Received in Lab by [signature]
   Date 8/26/98 Time 1000
   Logged in by
   Date Time

Additional Information

1. Approximate volume of sample
   16 oz.
2. Nearest town or city Knoxville
3. Others present at collection Burl H. Maupin
4. Number of other samples collected at same time at this point 3
5. Field collection procedure, handling and/or preservation of this sample
   According to standard operating procedure
6. Mode of transportation to lab
   State vehicle; on ice
7. Sample sealed by
8. Date sample sealed
9. Remarks

PH-3011 (rev 1/96)

RDA 1527

Project/Site No.: 47-559
Project Name: SMOKEY MOUNTAIN SMELTERS
Description: SMS-SD-05/DOWNSTREAM SITE
Station No.: SMS-SD-05
Collected: 08/25/98 11:05:00 By BHM
unty: 47

Lab Number: 9808247-05F
Matrix: SOIL
Received: 08/26/98 10:00:00 By PMB
Sampling Agency: HWM_11_KFO
Priority:

OCT 13 1998

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
B/N/A EXTR+PESTS,PCBS-SOIL						MS+ECD
BUTYL BENZYL PHTHALATE	U	PPB	110	09/30/98	MAC	
BIS(2-ETHYLHEXYL)PHTHALATE	3000	PPB	-	09/30/98	MAC	
DI-n-BUTYL PHTHALATE	U	PPB	110	09/30/98	MAC	
DI-n-OCTYL PHTHALATE	U	PPB	230	09/30/98	MAC	
DIETHYL PHTHALATE	B 167	PPB	-	09/30/98	MAC	
DIMETHYL PHTHALATE	U	PPB	57	09/30/98	MAC	
n-NITROSODIMETHYLAMINE	U	PPB	230	09/30/98	MAC	
n-NITROSODIPHENYLAMINE	U	PPB	110	09/30/98	MAC	
n-NITROSO-di-n-PROPYLAMINE	U	PPB	110	09/30/98	MAC	
ISOPHORONE	U	PPB	57	09/30/98	MAC	
NITROBENZENE	U	PPB	110	09/30/98	MAC	
2,4-DINITROTOLUENE	U	PPB	230	09/30/98	MAC	
2,6-DINITROTOLUENE	U	PPB	230	09/30/98	MAC	
ACENAPTHENE	U	PPB	57	09/30/98	MAC	
ACENAPHTHYLENE	U	PPB	57	09/30/98	MAC	
ANTHRACENE	U	PPB	57	09/30/98	MAC	
BENZO(a)ANTHRACENE	U	PPB	57	09/30/98	MAC	
BENZO(a)PYRENE	U	PPB	57	09/30/98	MAC	
BENZO(b)FLUORANTHENE	U	PPB	57	09/30/98	MAC	
BENZO(ghi)PERYLENE	U	PPB	230	09/30/98	MAC	
BENZO(k)FLUORANTHENE	U	PPB	57	09/30/98	MAC	
DIBENZO(a,h)ANTHRACENE	U	PPB	230	09/30/98	MAC	
FLUORANTHENE	U	PPB	57	09/30/98	MAC	
FLUORENE	U	PPB	57	09/30/98	MAC	
INDENO(1,2,3-cd)PYRENE	U	PPB	230	09/30/98	MAC	
NAPHTHALENE	U	PPB	57	09/30/98	MAC	
PHENANTHRENE	U	PPB	57	09/30/98	MAC	
PYRENE	U	PPB	57	09/30/98	MAC	
CHRYSENE	U	PPB	57	09/30/98	MAC	
BIS(2-CHLOROETHYL)ETHER	U	PPB	110	09/30/98	MAC	
BIS(2-CHLOROETHOXY)METHANE	U	PPB	57	09/30/98	MAC	
BIS(2-CHLOROISOPROPYL)ETHER	U	PPB	230	09/30/98	MAC	
4-BROMOPHENYLPHENYL ETHER	U	PPB	230	09/30/98	MAC	
4-CHLOROPHENYLPHENYL ETHER	U	PPB	110	09/30/98	MAC	
HEXACHLOROCYCLOPENTADIENE	U	PPB	570	09/30/98	MAC	
HEXACHLOROBUTADIENE	U	PPB	110	09/30/98	MAC	
HEXACHLOROBENZENE	U	PPB	110	09/30/98	MAC	
HEXACHLOROETHANE	U	PPB	110	09/30/98	MAC	
1,2,4-TRICHLOROBENZENE	U	PPB	110	09/30/98	MAC	
2-CHLORONAPHTHALENE	U	PPB	57	09/30/98	MAC	
4-CHLORO-3-METHYLPHENOL	U	PPB	110	09/30/98	MAC	
2-CHLOROPHENOL	U	PPB	57	09/30/98	MAC	
2,4-DICHLOROPHENOL	U	PPB	110	09/30/98	MAC	
2,4-DIMETHYLPHENOL	U	PPB	110	09/30/98	MAC	
2,4-DINITROPHENOL	U	PPB	1100	09/30/98	MAC	
2-METHYL-4,6-DINITROPHENOL	U	PPB	570	09/30/98	MAC	
2-NITROPHENOL	U	PPB	230	09/30/98	MAC	
4-NITROPHENOL	U	PPB	570	09/30/98	MAC	
PENTACHLOROPHENOL	U	PPB	230	09/30/98	MAC	
PHENOL	U	PPB	57	09/30/98	MAC	
2,4,6-TRICHLOROPHENOL	U	PPB	110	09/30/98	MAC	
2,4,5-TRICHLOROPHENOL	U	PPB	110	09/30/98	MAC	
O-CRESOL	U	PPB	110	09/30/98	MAC	
M- & P-CRESOL	U	PPB	57	09/30/98	MAC	
2-METHYLNAPHTHALENE	U	PPB	57	09/30/98	MAC	
BENZOIC ACID	U	PPB	230	09/30/98	MAC	
BENZYL ALCOHOL	U	PPB	230	09/30/98	MAC	
4-CHLOROANILINE	U	PPB	110	09/30/98	MAC	
DIBENZOFURAN	U	PPB	57	09/30/98	MAC	
3,3-DICHLOROBENZIDINE	U	PPB	230	09/30/98	MAC	
2-NITROANILINE	U	PPB	230	09/30/98	MAC	
3-NITROANILINE	U	PPB	230	09/30/98	MAC	
4-NITROANILINE	U	PPB	570	09/30/98	MAC	
HEXACHLOROBENZENE	U	PPB	2.3	09/30/98	MAC	
ALDRIN	U	PPB	3.1	09/30/98	MAC	
alpha-BHC	U	PPB	5.6	09/30/98	MAC	
eta-BHC	U	PPB	8.1	09/30/98	MAC	
lta-BHC	U	PPB	8.1	09/30/98	MAC	
gamma-BHC (LINDANE)	U	PPB	3.1	09/30/98	MAC	
alpha-CHLORDANE	J 1.05	PPB	4.3	09/30/98	MAC	
gamma-CHLORDANE	J 0.937	PPB	3.1	09/30/98	MAC	
TECHNICAL CHLORDANE	U	PPB	49	09/30/98	MAC	
p,p-DDD	U	PPB	5.8	09/30/98	MAC	

Project/Site No.: 47-559
Project Name: SMOKEY MOUNTAIN SMELTERS
Description: SMS-SD-05/DOWNSTREAM SITE
Station No.: SMS-SD-05
Collected: 08/25/98 11:05:00 By BHM
unty: 47

Lab Number: 9808247-05F
Matrix: SOIL
Received: 08/26/98 10:00:00 By PMB
Sampling Agency: HWM_11_KFO
Priority:

OCT 13 1998

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
B/N/A EXTR+PESTS,PCBS-SOIL						MS+ECD
p,p-DDE	U	PPB	5.1	09/30/98	MAC	
p,p-DDT	U	PPB	5.4	09/30/98	MAC	
DIELDRIN	6.01	PPB	-	09/30/98	MAC	
ENDOSULFAN I	U	PPB	5.1	09/30/98	MAC	
ENDOSULFAN II	U	PPB	5.9	09/30/98	MAC	
ENDOSULFAN SULFATE	U	PPB	5.9	09/30/98	MAC	
ENDRIN	U	PPB	5.9	09/30/98	MAC	
ENDRIN ALDEHYDE	U	PPB	4.9	09/30/98	MAC	
ENDRIN KETONE	U	PPB	6.0	09/30/98	MAC	
HEPTACHLOR	U	PPB	3.9	09/30/98	MAC	
HEPTACHLOR EPOXIDE	U	PPB	4.1	09/30/98	MAC	
TOXAPHENE	U	PPB	340	09/30/98	MAC	
METHOXYCHLOR	U	PPB	23	09/30/98	MAC	
PCB 1016/1242	U	PPB	290	09/30/98	MAC	
PCB 1221	U	PPB	390	09/30/98	MAC	
PCB 1232	U	PPB	350	09/30/98	MAC	
PCB 1248	U	PPB	220	09/30/98	MAC	
PCB 1254	U	PPB	270	09/30/98	MAC	
PCB 1260	U	PPB	170	09/30/98	MAC	
PCB 1262	U	PPB	170	09/30/98	MAC	

*-Water, uG/L; Sediment, uG/kG

Printed: October 5, 1998

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Organic Analysis
Base/Neutral/Acid Extractables

PROJECT/SITE NO. 47559	PROJECT NAME Smky Mtn. Smelters
STATION NUMBER SMS-SD-05	COUNTY Knox
DESCRIPTION sediment d/s of Site - unnamed trib of Flanikin Cr	
STREAM MILE	DEPTH MATRIX soil
COLLECTED: DATE 8-25-98	TIME 11:05
SAMPLER'S NAME(printed) Burl Maupin	
SAMPLING AGENCY DSF	BILLING CODE 327.3811
IF PRIORITY, DATE NEEDED 9-25-98	
SEND REPORT TO: KEAC	
CONTACT HAZARD metals, radiochemical, unknown	

*	NPDES Extractables	*	NPDES Extractables(con't)	*	TAL Semivolatiles
	butylbenzylphthalate	X	2-chlorophenol	X	dimethylphthalate
	bis(2-ethylhexyl)phthalate		2,4-dichlorophenol	X	4,6-dinitro-2-methylphenol
	di-n-butylphthalate		2,4-dimethylphenol	X	2,4-dinitrophenol
	di-n-octylphthalate		2,4-dinitrophenol	X	2,4-dinitrotoluene
	diethylphthalate		4,6-dinitro-o-cresol	X	2,6-dinitrotoluene
	dimethylphthalate		2-nitrophenol	X	fluoranthene
X	n-nitrosodimethylamine		4-nitrophenol	X	fluorene
	n-nitrosodiphenylamine		pentachlorophenol	X	hexachlorobenzene
	n-nitrosodi-n-propylamine		phenol	X	hexachlorobutadiene
	isophorone		2,4,6-trichlorophenol	X	hexachlorocyclopentadiene
	nitrobenzene	*	TAL Semivolatiles	X	hexachloroethane
	2,4-dinitrotoluene	X	acenaphthene	X	indeno(1,2,3-cd)pyrene
	acenaphthene	X	acenaphthylene	X	isophorone
	acenaphthylene	X	anthracene	X	2-methylnaphthalene
	anthracene	X	benzo(a)anthracene	X	2-methylphenol
	benzo(a)anthracene	X	benzo(a)pyrene	X	4-methylphenol
	benzo(a)pyrene	X	benzo(b)fluoranthene	X	n-nitrosodiphenylamine
	benzo(b)fluoranthene	X	benzo(g,h,i)perylene	X	n-nitroso-n-dipropylamine
	benzo(g,h,i)perylene	X	benzo(k)fluoranthene	X	naphthalene
	benzo(k)fluoranthene	X	benzoic acid	X	2-nitroaniline
	chrysene	X	benzyl alcohol	X	3-nitroaniline
	dibenzo(a,h)anthracene	X	bis(2-chloroethoxy)methane	X	4-nitroaniline
	fluoranthene	X	bis(2-chloroethyl) ether	X	nitrobenzene
	fluorene	X	bis(2-chloroisopropyl)ether	X	2-nitrophenol
	indeno(1,2,3-c,d)pyrene	X	bis(2-ethylhexyl)phthalate	X	4-nitrophenol
	naphthalene	X	4-bromophenylphenylether	X	pentachlorophenol
	phenanthrene	X	butylbenzylphthalate	X	phenanthrene
	pyrene	X	4-chloroaniline	X	phenol
	bis(2-chloroethyl)ether	X	4-chloro-3-methyl phenol	X	pyrene
	bis(2-chloroethoxy)methane	X	2-chloronaphthalene	X	1,2,4-trichlorobenzene
	bis(2-chloroisopropyl)ether	X	4-chlorophenylphenylether	X	2,4,5-trichlorophenol
	4-bromophenylphenylether	X	chrysene	X	2,4,6-trichlorophenol
	4-chlorophenylphenylether	X	di-n-butylphthalate	*	Nitrobodies
	hexachlorocyclopentadiene	X	di-n-octylphthalate		RDX
	hexachlorobutadiene	X	dibenzo(a,h)anthracene		2,4,6-TNT
	hexachlorobenzene	X	dibenzofuran		2,4-dinitrotoluene
	hexachloroethane	X	3,3'-dichlorobenzidine		2,6-dinitrotoluene
	1,2,4-trichlorobenzene	X	2,4-dichlorophenol		nitrobenzene
	2-chloronaphthalene	X	diethylphthalate		1,3,5-TNB
	4-chloro-3-methyl phenol	X	2,4-dimethylphenol		

*	TCLP Semivolatiles	*	Pesticides/PCBs
	chlordane	X	aldrin
	o-cresol	X	alpha-BHC
	m-cresol	X	beta-BHC
	p-cresol	X	delta-BHC
	cresol	X	gamma-BHC (lindane)
	2,4-D	X	technical chlordane
	2,4-dinitrotoluene	X	alpha-chlordane
	endrin	X	gamma-chlordane
	heptachlor	X	4,4'-DDD
	heptachlor epoxide	X	4,4'-DDE
	hexachlorobenzene	X	4,4'-DDT
	hexachlorobutadiene	X	dieldrin
	hexachloroethane	X	endosulfan I
	lindane	X	endosulfan II
	methoxychlor	X	endosulfan sulfate
	nitrobenzene	X	endrin
	pentachlorophenol	X	endrin aldehyde
	pyridine	X	endrin ketone
	toxaphene	X	heptachlor
	2,4,5-trichlorophenol	X	heptachlor epoxide
	2,4,6-trichlorophenol	X	toxaphene
	2,4,5-TP (Silvex)	X	methoxychlor
		X	PCB 1016/1242
		X	PCB 1221
		X	PCB 1232
		X	PCB 1248
		X	PCB 1254
		X	PCB 1260
		X	PCB 1262

Laboratory Number

Branch Lab Number

Chain of Custody and Supplemental Information

Only one chain of custody form is required per sample set or point (if all collected at the same time)

1. Collected by BHM
   Date 8-25-98 Time 11:05
   Delivered to KBL
   Date 8-26-98 Time 13:00
2. Received by
   Date Time
   Delivered to
   Date Time
3. Received by
   Date Time
   Delivered to
   Date Time
4. Received in Lab by [illegible]
   Date 8/26/98 Time 100
   Logged in by
   Date Time

Additional Information

1. Approximate volume of sample 16 oz
2. Nearest town or city Knoxville
3. Others present at collection Lee Burman
4. Number of other samples collected at same time at this point 3
5. Field collection procedure, handling and/or preservation of this sample according to EPA procedures and protocol
6. Mode of transportation to lab in State vehicle, in coolers, on ice
7. Sample sealed by
8. Date sample sealed
9. Remarks

SEP 14 1998

Project/Site No.: 47-559
Project Name: SMOKEY MOUNTAIN SMELTERS
Site Description: SMS-SD-05/DOWNSTREAM SITE
Station No.: SMS-SD-05
Collected: 08/25/98 11:05:00 By BHM
County: 47

Lab Number: 9808247-05E
Matrix: SOIL
Received: 08/26/98 10:00:00 By PMB
Sampling Agency: HWM_11_KFO
Priority:

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
VOLATILES-TAL SEDIMENTS						8260A
ACETONE	U	PPB	25	09/04/98	HMG	
BENZENE	U	PPB	2.5	09/04/98	HMG	
BROMODICHLOROMETHANE	U	PPB	2.5	09/04/98	HMG	
BROMOFORM	U	PPB	2.5	09/04/98	HMG	
BROMOMETHANE	U	PPB	5.0	09/04/98	HMG	
2-BUTANONE (MEK)	U	PPB	25	09/04/98	HMG	
CARBON DISULFIDE	U	PPB	5.0	09/04/98	HMG	
CARBON TETRACHLORIDE	U	PPB	2.5	09/04/98	HMG	
VINYL ACETATE	U	PPB	5.0	09/04/98	HMG	
CHLOROBENZENE	U	PPB	2.5	09/04/98	HMG	
CHLOROETHANE	U	PPB	5.0	09/04/98	HMG	
CHLOROFORM	U	PPB	2.5	09/04/98	HMG	
CHLOROMETHANE	U	PPB	5.0	09/04/98	HMG	
DIBROMOCHLOROMETHANE	U	PPB	2.5	09/04/98	HMG	
1,2-DICHLOROBENZENE	U	PPB	2.5	09/04/98	HMG	
1,3-DICHLOROBENZENE	U	PPB	2.5	09/04/98	HMG	
1,4-DICHLOROBENZENE	U	PPB	2.5	09/04/98	HMG	
DICHLORODIFLUOROMETHANE	U	PPB	5.0	09/04/98	HMG	
1,1-DICHLOROETHANE	U	PPB	2.5	09/04/98	HMG	
1,2-DICHLOROETHANE	U	PPB	2.5	09/04/98	HMG	
1,1-DICHLOROETHENE	U	PPB	2.5	09/04/98	HMG	
CIS-1,2-DICHLOROETHENE	U	PPB	2.5	09/04/98	HMG	
TRANS-1,2-DICHLOROETHENE	U	PPB	2.5	09/04/98	HMG	
1,2-DICHLOROPROPANE	U	PPB	2.5	09/04/98	HMG	
CIS-1,3-DICHLOROPROPENE	U	PPB	2.5	09/04/98	HMG	
TRANS-1,3-DICHLOROPROPENE	U	PPB	2.5	09/04/98	HMG	
ETHYLBENZENE	U	PPB	2.5	09/04/98	HMG	
METHYLENE CHLORIDE	B 10	PPB	2.5	09/04/98	HMG	
4-METHYL-2-PENTANONE (MIBK)	U	PPB	25	09/04/98	HMG	
STYRENE	U	PPB	2.5	09/04/98	HMG	
2-HEXANONE	U	PPB	5.0	09/04/98	HMG	
1,1,2,2-TETRACHLOROETHANE	U	PPB	2.5	09/04/98	HMG	
TETRACHLOROETHENE	U	PPB	2.5	09/04/98	HMG	
TOLUENE	U	PPB	2.5	09/04/98	HMG	
1,1,1-TRICHLOROETHANE	U	PPB	2.5	09/04/98	HMG	
1,1,2-TRICHLOROETHANE	U	PPB	2.5	09/04/98	HMG	
TRICHLOROETHENE	U	PPB	2.5	09/04/98	HMG	
TRICHLOROFLUOROMETHANE	U	PPB	5.0	09/04/98	HMG	
VINYL CHLORIDE	U	PPB	5.0	09/04/98	HMG	
o-XYLENE	U	PPB	2.5	09/04/98	HMG	
m&p-XYLENE	U	PPB	2.5	09/04/98	HMG	

*-Water, uG/L; Sediment, uG/kG

Printed: September 8, 1998

State of Tennessee - Environmental Laboratories

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Organic Analysis

Volatiles and Petroleum Hydrocarbons

PROJECT/SITE NO.	47-559	PROJECT NAME	~~BUNKER HILL MOUNTAIN SMELTERS~~
STATION NUMBER	SMS-SD-05	COUNTY	KNOX
DESCRIPTION	~~WASTE ARMAMENTS DISPOSED~~ Sediment, Gravel Bar, unnamed tributary Flanders		
STREAM MILE		DEPTH	MATRIX Soil
COLLECTED: DATE	AUGUST 25, 1998	TIME	11:05
SAMPLER'S NAME(printed)	BURL H. MAUPIN		
SAMPLING AGENCY	DIVISION OF SUPERFUND	BILLING CODE	327.38-11
IF PRIORITY, DATE NEEDED	SEPTEMBER 25		
SEND REPORT TO:	KNOXVILLE ENVIRONMENTAL ASSISSTANCE CENTER BURL H. MAUPIN		
CONTACT HAZARD	METALS, RADIOCHEMICAL, UNKNOWN		

*	NPDES Volatiles - 624	*	TAL Volatiles - 8260A	*	TCLP Volatiles
	Bromoform		Chloromethane		Benzene
	Bromodichloromethane		Bromomethane		Carbon tetrachloride
	Carbon Tetrachloride		Vinyl chloride		Chlorobenzene
	Chlorobenzene		Chloroethane		Chloroform
	Chloroethane		Methylene chloride		1,2-Dichloroethane
	2-Chloroethylvinyl ether		Acetone		1,1-Dichloroethane
	Chloroform		Carbon disulfide		Methyl ethyl ketone
	Chloromethane		1,1-Dichloroethene		Tetrachloroethene
	Dibromochloromethane		1,1-Dichloroethane		Trichloroethene
	1,2-Dichlorobenzene		Cis-1,2-dichloroethene		Vinyl chloride
	1,3-Dichlorobenzene		Trans-1,2-dichloroethene	*	BTEX - 8260A - UST
	1,4-Dichlorobenzene		1,2-Dichloroethane		Benzene
	Dichlorodifluoromethane		Chloroform		Toluene
	1,1-Dichloroethane		2-Butanone		Ethyl benzene
	1,2-Dichloroethane		1,1,1-Trichloroethane		o-Xylene
	1,1-Dichloroethene		Carbon tetrachloride		m-Xylene
	Cis-1,2-dichloroethene		Vinyl acetate		p-Xylene
	Trans-1,2-dichloroethene		Bromodichloromethane		Methyl t-butyl ether
	1,2-Dichloropropane		1,2-Dichloropropane		Diisopropyl ether
	Cis-1,3-dichloropropene		Cis-1,3-dichloropropane	*	TPH by GC
	Trans-1,2-dichloroethene		Trichloroethene		Gasoline Range Organics
	Methylene chloride		Dibromochloromethane		Diesel Range Organics
	1,1,2,2-Tetrachloroethane		1,1,2-Trichloroethane	*	TPH by IR (418.1)
	Tetrachloroethene		Benzene		418.1 - Waste Oil
	1,1,1-Trichloroethane		Trans-1,3-dichloropropene	*	Other
	1,1,2-Trichloroethane		Bromoform		
	Trichloroethene		4-Methyl-2-pentanone		
	Trichlorofluoromethane		2-Hexanone		
	Vinyl chloride		Tetrachloroethene		
	Benzene		Toluene		
	Ethylbenzene		1,1,2,2-Tetrachloroethane		
	Toluene		Chlorobenzene		
	o-Xylene		Ethyl benzene		
	m-Xylene		Styrene		
	p-Xylene		o-Xylene		
			m-Xylene		
			p-Xylene		

Laboratory Number

Branch Lab Number

Chain of Custody and Supplemental Information

Only one chain of custody form is required per sample set or point (if all collected at the same time)

1. Collected by BURL H. MAUPIN
   Date AUGUST 25, 1998 Time 11:05
   Delivered to Knoxville Basin Laboratory
   Date 8-26-98 Time 1000
2. Received by
   Date Time
   Delivered to
   Date Time
3. Received by
   Date Time
   Delivered to
   Date Time
4. Received in Lab by [signature]
   Date 8/26/98 Time 1000
   Logged in by
   Date Time

Additional Information

1. Approximate volume of sample 4 oz.
2. Nearest town or city KNOXVILLE
3. Others present at collection LEE BARRON
4. Number of other samples collected at same time at this point *One other sample each for INORGANICS, RADIOCHEMICAL, AND EXTRACTABLE ORGANICS were collected for a total of three other samples.*
5. Field collection procedure, handling and/or preservation of this sample *according to EPA procedures and protocol*
6. Mode of transportation to lab *in State vehicle, in cooler, and on ice*
7. Sample sealed by
8. Date sample sealed
9. Remarks

Project/Site No.: 47-559
Project Name: SMOKEY MOUNTAIN SMELTERS
Description: SMS-SD-05/DOWNSTREAM SITE
Station No.: SMS-SD-05
Collected: 08/25/98 11:05:00 By BHM
County: 47

Lab Number: 9808247-05G
Matrix: SOIL
Received: 08/26/98 10:00:00 By PMB
Sampling Agency: HWM_11_KFO
Priority:

SEP 30 1998

TEST	RESULT	*ERROR	UNITS	ANALYZED	BY	METHOD
GAMMA RADIONUCLIDES						R.6
K-40	9.89	0.58	pCi/g dry wt	09/01/98	AK	
Pb-214	0.887	0.080	pCi/g dry wt	09/01/98	AK	
Bi-214	0.831	0.060	pCi/g dry wt	09/01/98	AK	
Pb-212	1.266	0.050	pCi/g dry wt	09/01/98	AK	
Ac-228	1.48	0.10	pCi/g dry wt	09/01/98	AK	
Tl-208	0.459	0.050	pCi/g dry wt	09/01/98	AK	
Bi-212	1.01	0.27	pCi/g dry wt	09/01/98	AK	
Cs-137	0.129	0.020	pCi/g dry wt	09/01/98	AK	
GROSS ALPHA & BETA						R.1.3
GROSS ALPHA	1.79	0.97	pCi/g DRY WT.	09/09/98	NLF	
GROSS BETA	18.3	1.6	pCi/g DRY WT.	09/09/98	NLF	

*--Represents +/- error value

Printed: September 10, 1998

State of Tennessee - Environmental Laboratories

Radiochemical Analysis

PLEAS RINT LEGIBLY

PROJECT/SITE NO. 47559	PROJECT NAME SMKY MTN SMELTERS
STATION NUMBER SMS-SD-05	COUNTY KNOX
DESCRIPTION SEDIMENT D/S OF SITE-UNNAMED TRIB OF FLENNIKEN BR.	
STREAM MILE	DEPTH
COLLECTED: DATE 8-25-98	TIME 11:05
PICK-UP DATE:	
CONTACT HAZARD METALS, RADIOCHEMICAL	mR/hr Reading <0.1
SAMPLER'S NAME (printed) BURL MAUPIN	
SAMPLING AGENCY DSF	BILLING CODE 3273811
IF PRIORITY, DATE NEEDED 9-25-98	
SEND REPORT TO: KEAC	

Laboratory Number

Date Received

Time Received By

Sample Type

___Air ___Milk ___Swipe
___Water ___Tissue ___Liquid
___Sludge ___Soil ___Solid
___Vegetation ✓Sediment

Other_____

Field Comments:

Air Samples
Volume _____
Total Hours _____

___Sample Filtration
___Sample Acidification
___Send to RESL

Chain of Custody and Supplemental Information

Only one chain of custody form is required per sample set or point (if all collected at the same time)

1. Collected by BHM
   Date 8-25-98 Time 11:05
   Delivered to KBL
   Date 8-26-98 Time 10:00
2. Collected by
   Date Time
   Delivered to
   Date Time
3. Collected by
   Date Time
   Delivered to
   Date Time
4. Received in Lab by J Baker
   Date 8/26/98 Time 1000
   Logged in by
   Date Time

REQUESTED ANALYSES:

✓	GROSS ALPHA (TOTAL)		STRONTIUM 89
	GROSS ALPHA (SUSPENDED)		STRONTIUM 90
	GROSS ALPHA (DISSOLVED)		TRITIUM (H-3)
✓	GROSS BETA (TOTAL)		THORIUM (TOTAL)
	GROSS BETA (SUSPENDED)		URANIUM (TOTAL)
	GROSS BETA (DISSOLVED)	✓	GAMMA RADIONUCLIDES
			ADDITIONAL ANALYSES:

Additional Information

1. Approximate volume of sample 16 oz
2. Nearest town or city Knoxville
3. Others present at collection Lee Barron
4. Number of other samples collected at same time at this point 3
5. Field collection procedure, handling and/or preservation of this sample according to EPA procedures and protocol
6. Mode of transportation to lab in State vehicle in cooler, on ice
7. Sample sealed by
8. Date sample sealed
9. Remarks

PH-3009 (rev 2/98)

RDA 1527

Project/Site No.: 47-559
Project Name: SMOKEY MOUNTAIN SMELTERS
Description: SMS-SD-06/FLENNIKEN BRANCH
Station No.: SMS-SD-06
Collected: 08/26/98 12:40:00 By BHM
County: 47

Lab Number: 9808257-03
Matrix: SEDIMENT
Received: 08/27/89 10:00:00 By FMM
Sampling Agency: HWM_11_KFO
Priority:

TEST	RESULT	UNITS	LIMIT	ANALYZED	BY	METHOD
AMMONIA	46.8	mg/kg	10	09/15/98	SAL	A.18.2
CYANIDE	U	mg/kg	1.0	09/23/98	SAL	A.9
ALUMINUM	3840	mg/kg	10	10/01/98	JAH	
ANTIMONY	U	mg/kg	0.6	10/09/98	JAH	
ARSENIC	3.8	mg/kg	0.2	10/05/98	JAH	
BARIUM	32	mg/kg	10	10/01/98	JAH	
BERYLLIUM	U	mg/kg	1	09/30/98	JAH	
CADMIUM	U	mg/kg	0.5	09/11/98	JAH	
CALCIUM	3390	mg/kg	3	10/02/98	JAH	
CHROMIUM	6	mg/kg	1	09/23/98	JAH	
COBALT	7	mg/kg	1	09/15/98	JAH	
COPPER	13	mg/kg	1	09/16/98	JAH	
DIGESTION-METALS	COMPLETED	COMPLETED		09/10/98	EAM	
IRON	12600	mg/kg	5	09/16/98	JAH	
LEAD	16	mg/kg	4	09/15/98	JAH	
MAGNESIUM	581	mg/kg	2	10/02/98	JAH	
MANGANESE	503	mg/kg	1	09/16/98	JAH	
MERCURY	U	mg/kg	0.1	09/11/98	ATB	EPA 245.5
METALS PREP-SOLIDS/WASTES	COMPLETED	COMPLETED		08/28/98	EAM	
NICKEL	3	mg/kg	2	09/11/98	JAH	
PERCENT SOLIDS	71.4	%		09/08/98	SDS	
POTASSIUM	274	mg/kg	2	10/02/98	JAH	
SELENIUM	0.5	mg/kg	0.4	10/07/98	JAH	

Project/Site No.: 47-559
Project Name: SMOKEY MOUNTAIN SMELTERS
Description: SMS-SD-06/FLENNIKEN BRANCH
Station No.: SMS-SD-06
Collected: 08/26/98 12:40:00 By BHM
County: 47

Lab Number: 9808257-03
Matrix: SEDIMENT
Received: 08/27/89 10:00:00 By FMM
Sampling Agency: HWM_11_KFO
Priority:

TEST	RESULT	UNITS	LIMIT	ANALYZED	BY	METHOD
SILVER	U	mg/kg	1	09/15/98	JAH	
SODIUM	121	mg/kg	10	10/02/98	JAH	
THALLIUM	U	mg/kg	5	09/15/98	JAH	
VANADIUM	U	mg/kg	20	10/01/98	JAH	
ZINC	59.8	mg/kg	0.5	09/15/98	JAH	

State of Tennessee - Environmental Laboratories

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Inorganic Analysis

PROJECT/SITE NO. 47-559	PROJECT NAME Smokey Mountain Smelters
STATION NUMBER SMS-SD-06	COUNTY Knox
DESCRIPTION Flenniken Branch at Embayment of Fort Loudoun Lake	
STREAM MILE	DEPTH / MATRIX sediment
COLLECTED: DATE August 26, 1998	TIME 12:40
SAMPLER'S NAME(printed) Burl H. Maupin	
SAMPLING AGENCY Division of Superfund	BILLING CODE 327.38-11
IF PRIORITY, DATE NEEDED September 28, 1998	
SEND REPORT TO: Knoxville Environmental Assisstance Center	
Burl H. Maupin	
CONTACT HAZARD metals, radiochemical, unknown	

*	Metals
x	aluminum, Al
x	antimony, Sb
x	arsenic, As
x	barium, Ba
x	beryllium, Be
x	cadmium, Cd
x	calcium, Ca
x	chromium, Cr
x	cobalt, Co
x	copper, Cu
x	iron, Fe
x	lead, Pb
x	magnesium, Mg
x	manganese, Mn
x	mercury, Hg
x	nickel, Ni
x	potassium, K
x	selenium, Se
x	silver, Ag
x	sodium, Na
x	thallium, Tl
x	vanadium, V
x	zinc, Zn

*	Env. Microbiology	*	General Inorganics		Gen. Inorganics (con't)
	coliform, fecal*		acidity as $CaCO_3$*		oil and grease
	coliform, total*		alkalinity as $CaCO_3$*		orthophosphate, total*
	strep, fecal*		alkalinity, phen. as $CaCO_3$*		oxygen, dissolved*
			BOD, 5-day*		pH
			CBOD, 5-day*		phenols, total
			boron		phosphate, total
*	Ambient Parameters		chloride*		residue, dissolved*
	COD*		chlorine, residual*		residue, settleable*
	coliform, fecal		chromium, hexavalent		residue, suspended*
	conductivity*		COD*		residue, total*
	hardness, total as $CaCO_3$*		color, apparent*		silica*
	nitrogen, ammonia		color, true*		sulfate*
	nitrogen, NO_3 & NO_2		conductivity*		sulfide, total*
	nitrogen, total Kjeldahl	x	cyanide		TOC*
	phosphate, total		flash point*		turbidity*
	pH		fluoride*		percent solids
	residue, dissolved*		hardness, Ca as $CaCO_3$*	*	Other
	residue, suspended*		hardness, total as $CaCO_3$*		
	arsenic, As		hydrocarbons, total		
	cadmium, Cd		MBAS*		
	chromium, Cr	x	nitrogen, ammonia		
	copper, Cu		nitrogen, nitrate*		
	lead, Pb		nitrogen, nitrite*		
	mercury, Hg		nitrogen, NO_3 & NO_2		
	nickel, Ni		nitrogen, total Kjeldahl		
	zinc, Zn		nitrogen, total organic		

*	TCLP
	arsenic, As
	barium, Ba
	cadmium, Cd
	chromium, Cr
	lead, Pb
	mercury, Hg
	nickel, Ni
	selenium, Se
	silver, Ag

** denotes analyses performed only on water*

FIELD DETERMINATIONS	Temperature
pH	Chlorine, residual
Conductivity	Other
Dissolved Oxygen	

Laboratory Number

Branch Lab Number

Chain of Custody and Supplemental Information

Only one chain of custody form is required per sample set or point (if all collected at the same time)

1. Collected by Burl H. Maupin
   Date August 26, 1998 Time 12:40
   Delivered to Knoxville Basin Laboratory
   Date August 27, 1998 Time 10:00
2. Received by
   Date Time
   Delivered to
   Date Time
3. Received by
   Date Time
   Delivered to
   Date Time
4. Received in Lab by [illegible]
   Date 8-27-98 Time 10:00
   Logged in by
   Date Time

Additional Information

1. Approximate volume of sample 4000 ml.
2. Nearest town or city Knoxville
3. Others present at collection Beth H. Walker
4. Number of other samples collected at same time at this point 3
5. Field collection procedure, handling and/or preservation of this sample
   According to standard operating procedure
6. Mode of transportation to lab State vehicle; on ice
7. Sample sealed by
8. Date sample sealed
9. Remarks

PH-3011 (rev 1/96)

RDA 1527

Project/Site No.: 47-559
Project Name: SMOKEY MOUNTAIN SMELTERS
Description: SMS-SD-06/FLENNIKEN BRANCH
Station No.: SMS-SD-06
Collected: 08/26/98 12:40:00 By BHM
ınty: 47

Lab Number: 9808257-03F
Matrix: SEDIMENT
Received: 08/27/89 10:00:00 By FMM
Sampling Agency: HWM_11_KFO
Priority:

OCT 13 1998

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
B/N/A EXTR+PESTS,PCBS-SOIL						MS+ECD
BUTYL BENZYL PHTHALATE	U	PPB	110	09/29/98	MAC	
BIS(2-ETHYLHEXYL)PHTHALATE	B 67.7	PPB	-	09/29/98	MAC	
DI-n-BUTYL PHTHALATE	U	PPB	110	09/29/98	MAC	
DI-n-OCTYL PHTHALATE	U	PPB	230	09/29/98	MAC	
DIETHYL PHTHALATE	B 97.1	PPB	-	09/29/98	MAC	
DIMETHYL PHTHALATE	U	PPB	56	09/29/98	MAC	
n-NITROSODIMETHYLAMINE	U	PPB	230	09/29/98	MAC	
n-NITROSODIPHENYLAMINE	U	PPB	110	09/29/98	MAC	
n-NITROSO-di-n-PROPYLAMINE	U	PPB	110	09/29/98	MAC	
ISOPHORONE	U	PPB	56	09/29/98	MAC	
NITROBENZENE	U	PPB	110	09/29/98	MAC	
2,4-DINITROTOLUENE	U	PPB	230	09/29/98	MAC	
2,6-DINITROTOLUENE	U	PPB	230	09/29/98	MAC	
ACENAPTHENE	U	PPB	56	09/29/98	MAC	
ACENAPHTHYLENE	U	PPB	56	09/29/98	MAC	
ANTHRACENE	U	PPB	56	09/29/98	MAC	
BENZO(a)ANTHRACENE	J 45.1	PPB	56	09/29/98	MAC	
BENZO(a)PYRENE	58.7	PPB	-	09/29/98	MAC	
BENZO(b)FLUORANTHENE	98.2	PPB	-	09/29/98	MAC	
BENZO(ghi)PERYLENE	U	PPB	230	09/29/98	MAC	
BENZO(k)FLUORANTHENE	J 38.4	PPB	56	09/29/98	MAC	
DIBENZO(a,h)ANTHRACENE	U	PPB	230	09/29/98	MAC	
FLUORANTHENE	129	PPB	-	09/29/98	MAC	
FLUORENE	U	PPB	56	09/29/98	MAC	
INDENO(1,2,3-cd)PYRENE	U	PPB	230	09/29/98	MAC	
NAPHTHALENE	U	PPB	56	09/29/98	MAC	
PHENANTHRENE	J 29.3	PPB	56	09/29/98	MAC	
PYRENE	80.1	PPB	-	09/29/98	MAC	
CHRYSENE	58.7	PPB	-	09/29/98	MAC	
BIS(2-CHLOROETHYL)ETHER	U	PPB	110	09/29/98	MAC	
BIS(2-CHLOROETHOXY)METHANE	U	PPB	56	09/29/98	MAC	
BIS(2-CHLOROISOPROPYL)ETHER	U	PPB	230	09/29/98	MAC	
4-BROMOPHENYLPHENYL ETHER	U	PPB	230	09/29/98	MAC	
4-CHLOROPHENYLPHENYL ETHER	U	PPB	110	09/29/98	MAC	
HEXACHLOROCYCLOPENTADIENE	U	PPB	560	09/29/98	MAC	
HEXACHLOROBUTADIENE	U	PPB	110	09/29/98	MAC	
HEXACHLOROBENZENE	U	PPB	110	09/29/98	MAC	
HEXACHLOROETHANE	U	PPB	110	09/29/98	MAC	
1,2,4-TRICHLOROBENZENE	U	PPB	110	09/29/98	MAC	
2-CHLORONAPHTHALENE	U	PPB	56	09/29/98	MAC	
4-CHLORO-3-METHYLPHENOL	U	PPB	110	09/29/98	MAC	
2-CHLOROPHENOL	U	PPB	56	09/29/98	MAC	
2,4-DICHLOROPHENOL	U	PPB	110	09/29/98	MAC	
2,4-DIMETHYLPHENOL	U	PPB	110	09/29/98	MAC	
2,4-DINITROPHENOL	U	PPB	1100	09/29/98	MAC	
2-METHYL-4,6-DINITROPHENOL	U	PPB	560	09/29/98	MAC	
2-NITROPHENOL	U	PPB	230	09/29/98	MAC	
4-NITROPHENOL	U	PPB	560	09/29/98	MAC	
PENTACHLOROPHENOL	U	PPB	230	09/29/98	MAC	
PHENOL	U	PPB	56	09/29/98	MAC	
2,4,6-TRICHLOROPHENOL	U	PPB	110	09/29/98	MAC	
2,4,5-TRICHLOROPHENOL	U	PPB	110	09/29/98	MAC	
O-CRESOL	U	PPB	110	09/29/98	MAC	
M- & P-CRESOL	U	PPB	56	09/29/98	MAC	
2-METHYLNAPHTHALENE	U	PPB	56	09/29/98	MAC	
BENZOIC ACID	U	PPB	230	09/29/98	MAC	
BENZYL ALCOHOL	U	PPB	230	09/29/98	MAC	
4-CHLOROANILINE	U	PPB	110	09/29/98	MAC	
DIBENZOFURAN	U	PPB	56	09/29/98	MAC	
3,3-DICHLOROBENZIDINE	U	PPB	230	09/29/98	MAC	
2-NITROANILINE	U	PPB	230	09/29/98	MAC	
3-NITROANILINE	U	PPB	230	09/29/98	MAC	
4-NITROANILINE	U	PPB	560	09/29/98	MAC	
HEXACHLOROBENZENE	U	PPB	2.3	09/29/98	MAC	
ALDRIN	U	PPB	3.1	09/29/98	MAC	
alpha-BHC	U	PPB	5.6	09/29/98	MAC	
·ta-BHC	U	PPB	8.1	09/29/98	MAC	
ta-BHC	U	PPB	8.0	09/29/98	MAC	
amma-BHC (LINDANE)	U	PPB	3.1	09/29/98	MAC	
alpha-CHLORDANE	U	PPB	4.3	09/29/98	MAC	
gamma-CHLORDANE	U	PPB	3.1	09/29/98	MAC	
TECHNICAL CHLORDANE	U	PPB	48	09/29/98	MAC	
p,p-DDD	U	PPB	5.8	09/29/98	MAC	

Project/Site No.: 47-559
Project Name: SMOKEY MOUNTAIN SMELTERS
Description: SMS-SD-06/FLENNIKEN BRANCH
Station No.: SMS-SD-06
Collected: 08/26/98 12:40:00 By BHM
unty: 47

Lab Number: 9808257-03F
Matrix: SEDIMENT
Received: 08/27/89 10:00;00 By FMM
Sampling Agency: HWM_11_KFO
Priority:

OCT 1 1 1998

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
B/N/A EXTR+PESTS,PCBS-SOIL						MS+ECD
p,p-DDE	U	PPB	5.1	09/29/98	MAC	
p,p-DDT	U	PPB	5.4	09/29/98	MAC	
DIELDRIN	U	PPB	3.2	09/29/98	MAC	
ENDOSULFAN I	U	PPB	5.1	09/29/98	MAC	
ENDOSULFAN II	U	PPB	5.9	09/29/98	MAC	
ENDOSULFAN SULFATE	U	PPB	5.8	09/29/98	MAC	
ENDRIN	U	PPB	5.8	09/29/98	MAC	
ENDRIN ALDEHYDE	U	PPB	4.9	09/29/98	MAC	
ENDRIN KETONE	U	PPB	12	09/29/98	MAC	
HEPTACHLOR	U	PPB	3.8	09/29/98	MAC	
HEPTACHLOR EPOXIDE	U	PPB	4.1	09/29/98	MAC	
TOXAPHENE	U	PPB	340	09/29/98	MAC	
METHOXYCHLOR	U	PPB	23	09/29/98	MAC	
PCB 1016/1242	U	PPB	290	09/29/98	MAC	
PCB 1221	U	PPB	390	09/29/98	MAC	
PCB 1232	U	PPB	350	09/29/98	MAC	
PCB 1248	U	PPB	220	09/29/98	MAC	
PCB 1254	U	PPB	270	09/29/98	MAC	
PCB 1260	U	PPB	170	09/29/98	MAC	

*-Water, uG/L; Sediment, uG/kG

Printed: October 2, 1998

State of Tennessee - Environmental Laboratories

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Organic Analysis
Base/Neutral/Acid Extractables

PROJECT/SITE NO. 47559 PROJECT NAME Smoky Mtn Smelters

STATION NUMBER SMS-SD-06 COUNTY KNOX

DESCRIPTION Flennikin Branch at Fort Loudoun Embayment

STREAM MILE DEPTH MATRIX sediment

COLLECTED: DATE 8-26-98 TIME 12:40

SAMPLER'S NAME(printed) Burl Maupin

SAMPLING AGENCY DSF BILLING CODE 3273911

IF PRIORITY, DATE NEEDED 9-28-98

SEND REPORT TO: KEAC

CONTACT HAZARD metals, radiochemical, unknown

*	NPDES Extractables	*	NPDES Extractables(con't)	*	TAL Semivolatiles
	butylbenzylphthalate		2-chlorophenol		dimethylphthalate
	bis(2-ethylhexyl)phthalate		2,4-dichlorophenol		4,6-dinitro-2-methylphenol
	di-n-butylphthalate		2,4-dimethylphenol		2,4-dinitrophenol
	di-n-octylphthalate		2,4-dinitrophenol		2,4-dinitrotoluene
	diethylphthalate		4,6-dinitro-o-cresol		2,6-dinitrotoluene
	dimethylphthalate		2-nitrophenol		fluoranthene
X	n-nitrosodimethylamine		4-nitrophenol		fluorene
	n-nitrosodiphenylamine		pentachlorophenol		hexachlorobenzene
	n-nitrosodi-n-propylamine		phenol		hexachlorobutadiene
	isophorone		2,4,6-trichlorophenol		hexachlorocyclopentadiene
	nitrobenzene	*	TAL Semivolatiles		hexachloroethane
	2,4-dinitrotoluene	X	acenaphthene		indeno(1,2,3-cd)pyrene
	acenaphthene	X	acenaphthylene		isophorone
	acenaphthylene	X	anthracene		2-methylnaphthalene
	anthracene	X	benzo(a)anthracene		2-methylphenol
	benzo(a)anthracene	X	benzo(a)pyrene		4-methylphenol
	benzo(a)pyrene	X	benzo(b)fluoranthene		n-nitrosodiphenylamine
	benzo(b)fluoranthene	X	benzo(g,h,i)perylene		n-nitroso-n-dipropylamine
	benzo(g,h,i)perylene	X	benzo(k)fluoranthene		naphthalene
	benzo(k)fluoranthene	X	benzoic acid		2-nitroaniline
	chrysene	X	benzyl alcohol		3-nitroaniline
	dibenzo(a,h)anthracene	X	bis(2-chloroethoxy)methane		4-nitroaniline
	fluoranthene	X	bis(2-chloroethyl) ether		nitrobenzene
	fluorene	X	bis(2-chloroisopropyl)ether		2-nitrophenol
	indeno(1,2,3-c,d)pyrene	X	bis(2-ethylhexyl)phthalate		4-nitrophenol
	naphthalene	X	4-bromophenylphenylether		pentachlorophenol
	phenanthrene	X	butylbenzylphthalate		phenanthrene
	pyrene	X	4-chloroaniline		phenol
	bis(2-chloroethyl)ether	X	4-chloro-3-methyl phenol		pyrene
	bis(2-chloroethoxy)methane	X	2-chloronaphthalene		1,2,4-trichlorobenzene
	bis(2-chloroisopropyl)ether	X	4-chlorophenylphenylether		2,4,5-trichlorophenol
	4-bromophenylphenylether	X	chrysene		2,4,6-trichlorophenol
	4-chlorophenylphenylether	X	di-n-butylphthalate	*	Nitrobodies
	hexachlorocyclopentadiene	X	di-n-octylphthalate		RDX
	hexachlorobutadiene	X	dibenzo(a,h)anthracene		2,4,6-TNT
	hexachlorobenzene	X	dibenzofuran		2,4-dinitrotoluene
	hexachloroethane	X	3,3'-dichlorobenzidine		2,6-dinitrotoluene
	1,2,4-trichlorobenzene	X	2,4-dichlorophenol		nitrobenzene
	2-chloronaphthalene	X	diethylphthalate		1,3,5-TNB
	4-chloro-3-methyl phenol	X	2,4-dimethylphenol		

*	TCLP Semivolatiles
	chlordane
	o-cresol
	m-cresol
	p-cresol
	cresol
	2,4-D
	2,4-dinitrotoluene
	endrin
	heptachlor
	heptachlor epoxide
	hexachlorobenzene
	hexachlorobutadiene
	hexachloroethane
	lindane
	methoxychlor
	nitrobenzene
	pentachlorophenol
	pyridine
	toxaphene
	2,4,5-trichlorophenol
	2,4,6-trichlorophenol
	2,4,5-TP (Silvex)
*	Pesticides/PCBs
X	aldrin
X	alpha-BHC
X	beta-BHC
X	delta-BHC
X	gamma-BHC (lindane)
X	technical chlordane
X	alpha-chlordane
X	gamma-chlordane
X	4,4'-DDD
X	4,4'-DDE
X	4,4'-DDT
X	dieldrin
X	endosulfan I
X	endosulfan II
X	endosulfan sulfate
X	endrin
X	endrin aldehyde
X	endrin ketone
X	heptachlor
X	heptachlor epoxide
X	toxaphene
X	methoxychlor
X	PCB 1016/1242
X	PCB 1221
X	PCB 1232
X	PCB 1248
X	PCB 1254
X	PCB 1260
X	PCB 1262

Laboratory Number

Branch Lab Number

Chain of Custody and Supplemental Information

Only one chain of custody form is required per sample set or point (if all collected at the same time)

1. Collected by BMM
   Date 8-26-98 Time 12:40
   Delivered to KBL
   Date 8-27-98 Time 10:55
2. Received by
   Date Time
   Delivered to
   Date Time
3. Received by
   Date Time
   Delivered to
   Date Time
4. Received in Lab by [illegible]
   Date 8-27-98 Time 10:20
   Logged in by
   Date Time

Additional Information

1. Approximate volume of sample 16 oz
2. Nearest town or city Knoxville
3. Others present at collection Beth Walker
4. Number of other samples collected at same time at this point 3
5. Field collection procedure, handling and/or preservation of this sample EPA procedures and protocol
6. Mode of transportation to lab State vehicle, in cooler on ice
7. Sample sealed by
8. Date sample sealed
9. Remarks

PH-3014 (rev 1/96)

RDA 1527

Project/Site No.: 47-559
Project Name: SMOKEY MOUNTAIN SMELTERS
Site Description: SMS-SD-06/FLENNIKEN BRANCH
Station No.: SMS-SD-06
Collected: 08/26/98 12:40:00 By BHM
nty: 47

Lab Number: 9808257-03E
Matrix: SEDIMENT
Received: 08/27/89 10:00:00 By FMM
Sampling Agency: HWM_11_KFO
Priority:

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
VOLATILES-TAL SEDIMENTS						8260A
ACETONE	U	PPB	25	09/03/98	HMG	
BENZENE	U	PPB	2.5	09/03/98	HMG	
BROMODICHLOROMETHANE	U	PPB	2.5	09/03/98	HMG	
BROMOFORM	U	PPB	2.5	09/03/98	HMG	
BROMOMETHANE	U	PPB	5.0	09/03/98	HMG	
2-BUTANONE (MEK)	U	PPB	25	09/03/98	HMG	
CARBON DISULFIDE	U	PPB	5.0	09/03/98	HMG	
CARBON TETRACHLORIDE	U	PPB	2.5	09/03/98	HMG	
VINYL ACETATE	U	PPB	5.0	09/03/98	HMG	
CHLOROBENZENE	U	PPB	2.5	09/03/98	HMG	
CHLOROETHANE	U	PPB	5.0	09/03/98	HMG	
CHLOROFORM	U	PPB	2.5	09/03/98	HMG	
CHLOROMETHANE	U	PPB	5.0	09/03/98	HMG	
DIBROMOCHLOROMETHANE	U	PPB	2.5	09/03/98	HMG	
1,2-DICHLOROBENZENE	U	PPB	2.5	09/03/98	HMG	
1,3-DICHLOROBENZENE	U	PPB	2.5	09/03/98	HMG	
1,4-DICHLOROBENZENE	U	PPB	2.5	09/03/98	HMG	
DICHLORODIFLUOROMETHANE	U	PPB	5.0	09/03/98	HMG	
1,1-DICHLOROETHANE	U	PPB	2.5	09/03/98	HMG	
1,2-DICHLOROETHANE	U	PPB	2.5	09/03/98	HMG	
1,1-DICHLOROETHENE	U	PPB	2.5	09/03/98	HMG	
CIS-1,2-DICHLOROETHENE	U	PPB	2.5	09/03/98	HMG	
TRANS-1,2-DICHLOROETHENE	U	PPB	2.5	09/03/98	HMG	
1,2-DICHLOROPROPANE	U	PPB	2.5	09/03/98	HMG	
CIS-1,3-DICHLOROPROPENE	U	PPB	2.5	09/03/98	HMG	
TRANS-1,3-DICHLOROPROPENE	U	PPB	2.5	09/03/98	HMG	
ETHYLBENZENE	U	PPB	2.5	09/03/98	HMG	
METHYLENE CHLORIDE	B 37	PPB	2.5	09/03/98	HMG	
4-METHYL-2-PENTANONE (MIBK)	U	PPB	25	09/03/98	HMG	
STYRENE	U	PPB	2.5	09/03/98	HMG	
2-HEXANONE	U	PPB	5.0	09/03/98	HMG	
1,1,2,2-TETRACHLOROETHANE	U	PPB	2.5	09/03/98	HMG	
TETRACHLOROETHENE	U	PPB	2.5	09/03/98	HMG	
TOLUENE	U	PPB	2.5	09/03/98	HMG	
1,1,1-TRICHLOROETHANE	U	PPB	2.5	09/03/98	HMG	
1,1,2-TRICHLOROETHANE	U	PPB	2.5	09/03/98	HMG	
TRICHLOROETHENE	J 0.5	PPB	2.5	09/03/98	HMG	
TRICHLOROFLUOROMETHANE	U	PPB	5.0	09/03/98	HMG	
VINYL CHLORIDE	U	PPB	5.0	09/03/98	HMG	
o-XYLENE	U	PPB	2.5	09/03/98	HMG	
m&p-XYLENE	U	PPB	2.5	09/03/98	HMG	

*-Water, uG/L; Sediment, uG/kG

Printed: September 4, 1998

State of Tennessee - Environmental Laboratories

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Organic Analysis

Volatiles and Petroleum Hydrocarbons

PROJECT/SITE NO.	47-559	PROJECT NAME	SMOKY MOUNTAIN SMELTERS
STATION NUMBER	SMS-SD-06	COUNTY	KNOX
DESCRIPTION	ON-SITE LAGOON		
STREAM MILE		DEPTH	MATRIX SEDIMENT
COLLECTED: DATE	AUGUST 26, 1998	TIME	12:40
SAMPLER'S NAME(printed)	BURL H. MAUPIN		
SAMPLING AGENCY	DIVISION OF SUPERFUND	BILLING CODE	327.38-11
IF PRIORITY, DATE NEEDED	SEPTEMBER 28		
SEND REPORT TO:	KNOXVILLE ENVIRONMENTAL ASSISSTANCE CENTER		
	BURL H. MAUPIN		
CONTACT HAZARD	METALS, RADIOCHEMICAL, UNKNOWN		

*	NPDES Volatiles - 624	*	TAL Volatiles - 8260A	*	TCLP Volatiles
	Bromoform		Chloromethane		Benzene
	Bromodichloromethane		Bromomethane		Carbon tetrachloride
	Carbon Tetrachloride		Vinyl chloride		Chlorobenzene
	Chlorobenzene		Chloroethane		Chloroform
	Chloroethane		Methylene chloride		1,2-Dichloroethane
	2-Chloroethylvinyl ether		Acetone		1,1-Dichloroethane
	Chloroform		Carbon disulfide		Methyl ethyl ketone
	Chloromethane		1,1-Dichloroethene		Tetrachloroethene
	Dibromochloromethane		1,1-Dichloroethane		Trichloroethene
	1,2-Dichlorobenzene		Cis-1,2-dichloroethene		Vinyl chloride
	1,3-Dichlorobenzene		Trans-1,2-dichloroethene	*	BTEX - 8260A - UST
	1,4-Dichlorobenzene		1,2-Dichloroethane		Benzene
	Dichlorodifluoromethane		Chloroform		Toluene
	1,1-Dichloroethane		2-Butanone		Ethyl benzene
	1,2-Dichloroethane		1,1,1-Trichloroethane		o-Xylene
	1,1-Dichloroethene		Carbon tetrachloride		m-Xylene
	Cis-1,2-dichloroethene		Vinyl acetate		p-Xylene
	Trans-1,2-dichloroethene		Bromodichloromethane		Methyl t-butyl ether
	1,2-Dichloropropane		1,2-Dichloropropane		Diisopropyl ether
	Cis-1,3-dichloropropene		Cis-1,3-dichloropropane	*	TPH by GC
	Trans-1,2-dichloroethene		Trichloroethene		Gasoline Range Organics
	Methylene chloride		Dibromochloromethane		Diesel Range Organics
	1,1,2,2-Tetrachloroethane		1,1,2-Trichloroethane	*	TPH by IR (418.1)
	Tetrachloroethene		Benzene		418.1 - Waste Oil
	1,1,1-Trichloroethane		Trans-1,3-dichloropropene	*	Other
	1,1,2-Trichloroethane		Bromoform		
	Trichloroethene		4-Methyl-2-pentanone		
	Trichlorofluoromethane		2-Hexanone		
	Vinyl chloride		Tetrachloroethene		
	Benzene		Toluene		
	Ethylbenzene		1,1,2,2-Tetrachloroethane		
	Toluene		Chlorobenzene		
	o-Xylene		Ethyl benzene		
	m-Xylene		Styrene		
	p-Xylene		o-Xylene		
			m-Xylene		
			p-Xylene		

Laboratory Number

Branch Lab Number

Chain of Custody and Supplemental Information

Only one chain of custody form is required per sample set or point (if all collected at the same time)

1. Collected by BURL H. MAUPIN
   Date AUGUST 26, 1998 Time 12:40
   Delivered to Knoxville Basin Laboratory
   Date AUGUST 27, 1998 Time 10:00
2. Received by
   Date Time
   Delivered to
   Date Time
3. Received by
   Date Time
   Delivered to
   Date Time
4. Received in Lab by [illegible]
   Date 8-27-98 Time 10:00
   Logged in by
   Date Time

Additional Information

1. Approximate volume of sample 200ML
2. Nearest town or city KNOXVILLE
3. Others present at collection BETH WALKER
4. Number of other samples collected at same time at this point *One other sample each for INORGANICS, RADIOCHEMICAL, AND EXTRACTABLE ORGANICS were collected for a total of three other samples.*
5. Field collection procedure, handling and/or preservation of this sample *according to EPA procedures and protocol*
6. Mode of transportation to lab *in State vehicle, in cooler, and on ice*
7. Sample sealed by
8. Date sample sealed
9. Remarks

SEP 30 1998

Project/Site No.: 47-559
Project Name: SMOKEY MOUNTAIN SMELTERS
Description: SMS-SD-06/FLENNIKEN BRANCH
Station No.: SMS-SD-06
Collected: 08/26/98 12:40:00 By BHM
County: 47

Lab Number: 9808257-03G
Matrix: SEDIMENT
Received: 08/27/89 10:00:00 By FMM
Sampling Agency: HWM_11_KFO
Priority:

TEST	RESULT	*ERROR	UNITS	ANALYZED	BY	METHOD
GAMMA RADIONUCLIDES						R.6
K-40	3.95	0.39	pCi/g dry wt	09/01/98	AK	
Pb-214	0.529	0.060	pCi/g dry wt	09/01/98	AK	
Bi-214	0.523	0.060	pCi/g dry wt	09/01/98	AK	
Pb-212	0.609	0.040	pCi/g dry wt	09/01/98	AK	
Ac-228	0.731	0.070	pCi/g dry wt	09/01/98	AK	
Tl-208	0.188	0.040	pCi/g dry wt	09/01/98	AK	
Cs-137	0.057	0.020	pCi/g dry wt	09/01/98	AK	
GROSS ALPHA & BETA						R.1.3
GROSS ALPHA	0.74	0.56	pCi/g DRY WT.	09/09/98	NLF	
GROSS BETA	5.9	1.1	pCi/g DRY WT.	09/09/98	NLF	

*--Represents +/- error value

Printed: September 10, 1998

State of Tennessee - Environmental Laboratories

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Radiochemical Analysis

PROJECT/SITE NO. 47559	PROJECT NAME Smoky Mtn Smelters
STATION NUMBER SMS-SD-06	COUNTY Knox
DESCRIPTION Flenniken Branch at Fort Loudoun Embayment	
STREAM MILE	DEPTH
COLLECTED: DATE 8-26-98	TIME 12:40
PICK-UP DATE:	
CONTACT HAZARD metals, radiochemical	mR/hr Reading < 0.1
SAMPLER'S NAME (printed) Burl Maupin	
SAMPLING AGENCY DSF	BILLING CODE 3273811
IF PRIORITY, DATE NEEDED 9-28-98	
SEND REPORT TO: KEAC	

Laboratory Number

Date Received

Time Received **By**

Sample Type

___Air ___Milk ___Swipe
___Water ___Tissue ___Liquid
___Sludge ___Soil ___Solid
___Vegetation ✓ Sediment

Other_____

Field Comments:

Air Samples
Volume _____
Total Hours _____

___Sample Filtration
___Sample Acidification
___Send to RESL

Chain of Custody and Supplemental Information

Only one chain of custody form is required per sample set or point (if all collected at the same time)

1. Collected by BHM
   Date 8-26-98 Time 12:40
   Delivered to KBL
   Date 8-27-98 Time 10:00
2. Collected by
   Date Time
   Delivered to
   Date Time
3. Collected by
   Date Time
   Delivered to
   Date Time
4. Received in Lab by Frances Myer
   Date 8-27-98 Time 10:00
   Logged in by
   Date Time

REQUESTED ANALYSES:

✓	GROSS ALPHA (TOTAL)		STRONTIUM 89
	GROSS ALPHA (SUSPENDED)		STRONTIUM 90
	GROSS ALPHA (DISSOLVED)		TRITIUM (H-3)
✓	GROSS BETA (TOTAL)		THORIUM (TOTAL)
	GROSS BETA (SUSPENDED)		URANIUM (TOTAL)
	GROSS BETA (DISSOLVED)	✓	GAMMA RADIONUCLIDES
			ADDITIONAL ANALYSES:

Additional Information

1. Approximate volume of sample 16 oz
2. Nearest town or city Knoxville
3. Others present at collection Beth Walker
4. Number of other samples collected at same time at this point 3
5. Field collection procedure, handling and/or preservation of this sample EPA procedures and protocol
6. Mode of transportation to lab State vehicle, in cooler, on ice
7. Sample sealed by
8. Date sample sealed
9. Remarks

" Laboratory Forms - Groundwater Samples "

TDH/Division of Laboratory Services (DLS). 1998. "Laboratory Reports, Requests, and Chain-of-Custody Forms - Groundwater Samples". Tennessee Department of Health/Division of Laboratory Services.

SMOKEY MOUNTAIN SMELTERS
KNOXVILLE, TENNESSEE 37920
U.S. EPA # TN0002318277
TSDF #47-559

Project/Site No.: 47-559
oject Name: SMOKEY MOUNTAIN SMELTERS
scription: BACKGROUND/SMOKEY MTN. SM.
Station No.: SMS-GW-01
Collected: 09/28/98 12:30:00 By BHM
County: 47

Lab Number: 9809251-01
Matrix: WATER
Received: 09/28/98 13:30:00 By FMM
Sampling Agency: HWM_11_KFO
Priority:

TEST	RESULT	UNITS	LIMIT	ANALYZED	BY	METHOD
AMMONIA	U	mg/l	0.02	09/30/98	SAL	A.18.1
CYANIDE	U	mg/l	0.02	10/09/98	SAL	A.9
FLUORIDE	0.1	mg/l	0.1	09/30/98	SDS	A.11.1
NITRATE NITROGEN	1.60	mg/l	0.01	09/30/98	SAL	
NITRITE NITROGEN	0.02	mg/l	0.01	09/29/98	SDS	A.18.7
NO3 & NO2 NITROGEN	1.62	mg/l	0.01	09/30/98	SAL	A.18.4
pH	6.06	pH UNITS		09/28/98	BHM	FIELD
SPECIFIC CONDUCTIVITY	379	uMHO		09/28/98	BHM	FIELD
SULFATE	8	mg/l	2	09/29/98	FMM	A.26
TEMPERATURE	19.2	CELSIUS		09/28/98	BHM	FIELD
ALUMINUM	U	ug/l	100	09/30/98	JAH	
ANTIMONY	U	ug/l	3	10/14/98	JAH	
ARSENIC	U	ug/l	1	10/05/98	EAM	
BARIUM	U	ug/l	100	09/30/98	JAH	
BERYLLIUM	U	ug/l	1	10/21/98	EAM	EPA 200.9
CADMIUM	U	ug/l	1	09/29/98	EAM	EPA 200.9
CALCIUM	70.8	mg/l	0.03	10/16/98	JAH	
CHROMIUM	U	ug/l	1	09/30/98	EAM	EPA 200.9
COBALT	U	ug/l	5	10/13/98	JAH	
COPPER	1	ug/l	1	10/02/98	EAM	EPA 200.9
DIGESTION-METALS	COMPLETED	COMPLETED		10/10/98	DEL	
IRON	204	ug/l	25	10/13/98	JAH	
LEAD	U	ug/l	1	09/30/98	EAM	EPA 200.9

Project/Site No.: 47-559
Project Name: SMOKEY MOUNTAIN SMELTERS
Description: BACKGROUND/SMOKEY MTN. SM.
Station No.: SMS-GW-01
Collected: 09/28/98 12:30:00 By BHM
County: 47

Lab Number: 9809251-01
Matrix: WATER
Received: 09/28/98 13:30:00 By FMM
Sampling Agency: HWM_11_KFO
Priority:

TEST	RESULT	UNITS	LIMIT	ANALYZED	BY	METHOD
MAGNESIUM	5.66	mg/l	0.02	10/16/98	JAH	
MANGANESE	45	ug/l	5	10/02/98	JAH	
MERCURY	U	ug/l	0.2	10/01/98	ATB	EPA 245.1
NICKEL	U	ug/l	10	10/12/98	JAH	
POTASSIUM	0.56	mg/l	0.02	10/16/98	JAH	
SELENIUM	U	ug/l	2	10/02/98	EAM	
SILVER	U	ug/l	1	10/01/98	EAM	EPA 200.9
SODIUM	5.18	mg/l	0.10	10/16/98	JAH	
THALLIUM	U	ug/l	2	09/30/98	EAM	
VANADIUM	U	ug/l	1	10/22/98	EAM	
ZINC	8	ug/l	1	10/12/98	JAH	

State of Tennessee - Environmental Laboratories

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Inorganic Analysis

PROJECT/SITE NO.	47-559	PROJECT NAME	Smokey Mountain Smelters
STATION NUMBER	SMS-GW-01	COUNTY	Knox
DESCRIPTION	background		
STREAM MILE		DEPTH	MATRIX water
COLLECTED: DATE	September 28, 1998	TIME	12:30p
SAMPLER'S NAME(printed)	Burl H. Maupin		
SAMPLING AGENCY	Division of Superfund	BILLING CODE	327.38-11
IF PRIORITY, DATE NEEDED	October 28, 1998		
SEND REPORT TO:	Knoxville Environmental Assisstance Center		
	Burl H. Maupin		
CONTACT HAZARD	unknown		

*	Env. Microbiology	*	General Inorganics		Gen. Inorganics (con't)
	coliform, fecal*		acidity as $CaCO_3$*		oil and grease
	coliform, total*		alkalinity as $CaCO_3$*		orthophosphate, total*
	strep, fecal*		alkalinity, phen. as $CaCO_3$*		oxygen, dissolved*
			BOD, 5-day*		pH
			CBOD, 5-day*		phenols, total
			boron		phosphate, total
*	**Ambient Parameters**		chloride*		residue, dissolved*
	COD*		chlorine, residual*		residue, settleable*
	coliform, fecal		chromium, hexavalent		residue, suspended*
	conductivity*		COD*		residue, total*
	hardness, total as $CaCO_3$*		color, apparent*		silica*
	nitrogen, ammonia		color, true*	X	sulfate*
	nitrogen, NO_3 & NO_2		conductivity*		sulfide, total*
	nitrogen, total Kjeldahl	X	cyanide		TOC*
	phosphate, total		flash point*		turbidity*
	pH	X	fluoride*		percent solids
	residue, dissolved*		hardness, Ca as $CaCO_3$*	*	**Other**
	residue, suspended*		hardness, total as $CaCO_3$*		
	arsenic, As		hydrocarbons, total		
	cadmium, Cd		MBAS*		
	chromium, Cr	X	nitrogen, ammonia		
	copper, Cu	X	nitrogen, nitrate*		
	lead, Pb	X	nitrogen, nitrite*		
	mercury, Hg		nitrogen, NO_3 & NO_2		
	nickel, Ni		nitrogen, total Kjeldahl		
	zinc, Zn		nitrogen, total organic		

*	Metals	*	TCLP
x	aluminum, Al		
x	antimony, Sb		
x	arsenic, As		
x	barium, Ba		
x	beryllium, Be		
x	cadmium, Cd		
x	calcium, Ca		
x	chromium, Cr		
x	cobalt, Co		
x	copper, Cu		
x	iron, Fe		
x	lead, Pb		
x	magnesium, Mg		
x	manganese, Mn		
x	mercury, Hg		
x	nickel, Ni		
x	potassium, K		
x	selenium, Se		
x	silver, Ag		
x	sodium, Na		
x	thallium, Tl		
x	vanadium, V		
x	zinc, Zn		
			arsenic, As
			barium, Ba
			cadmium, Cd
			chromium, Cr
			lead, Pb
			mercury, Hg
			nickel, Ni
			selenium, Se
			silver, Ag

Laboratory Number

Branch Lab Number

Chain of Custody and Supplemental Information

Only one chain of custody form is required per sample set or point (if all collected at the same time)

1. Collected by Burl H. Maupin
   Date September 28 1998 Time
   Delivered to Knoxville Basin Laboratory
   Date September 28, 1998 Time 1:15p
2. Received by
   Date Time
   Delivered to
   Date Time
3. Received by
   Date Time
   Delivered to
   Date Time
4. Received in Lab by [signature]
   Date 9-28-98 Time 1:30pm
   Logged in by
   Date Time

Additional Information

1. Approximate volume of sample
   1000 ml.
2. Nearest town or city
   Knoxville
3. Others present at collection
   Adam DeWeese
4. Number of other samples collected at same time at this point
   3
5. Field collection procedure, handling and/or preservation of this sample
   According to standard operating procedure
6. Mode of transportation to lab
   State vehicle; on ice
7. Sample sealed by
8. Date sample sealed
9. Remarks

** denotes analyses performed only on water*

FIELD DETERMINATIONS		Temperature 19.2°C
pH	6.06	Chlorine, residual
Conductivity	379	Other 2.3 NTU
Dissolved Oxygen		

PH-3011 (rev 1/96)

RDA 1527

Project/Site No.: 47-559
Project Name: SMOKEY MOUNTAIN SMELTERS
Description: BACKGROUND/SMOKEY MTN. SM.
Station No.: SMS-GW-01
Collected: 09/28/98 12:30:00 By BHM
nty: 47

Lab Number: 9809251-01G
Matrix: WATER
Received: 09/28/98 13:30:00 By FMM
Sampling Agency: HWM_11_KFO
Priority:

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
B/N/A EXTR+PESTS,PCBS-H2O						MS+ECD
BUTYL BENZYL PHTHALATE	U	PPB	1.0	10/14/98	CQL	
BIS(2-ETHYLHEXYL)PHTHALATE	B,J 0.48	PPB	0.50	10/14/98	CQL	
DI-n-BUTYL PHTHALATE	U	PPB	1.0	10/14/98	CQL	
DI-n-OCTYL PHTHALATE	U	PPB	2.0	10/14/98	CQL	
DIETHYL PHTHALATE	U	PPB	0.50	10/14/98	CQL	
DIMETHYL PHTHALATE	U	PPB	0.50	10/14/98	CQL	
n-NITROSODIMETHYLAMINE	U	PPB	2.0	10/14/98	CQL	
n-NITROSODIPHENYLAMINE	U	PPB	1.0	10/14/98	CQL	
n-NITROSO-di-n-PROPYLAMINE	U	PPB	1.0	10/14/98	CQL	
ISOPHORONE	U	PPB	0.50	10/14/98	CQL	
NITROBENZENE	U	PPB	1.0	10/14/98	CQL	
2,4-DINITROTOLUENE	U	PPB	2.0	10/14/98	CQL	
2,6-DINITROTOLUENE	U	PPB	2.0	10/14/98	CQL	
ACENAPTHENE	U	PPB	0.50	10/14/98	CQL	
ACENAPHTHYLENE	U	PPB	0.50	10/14/98	CQL	
ANTHRACENE	U	PPB	0.50	10/14/98	CQL	
BENZO(a)ANTHRACENE	U	PPB	0.50	10/14/98	CQL	
BENZO(a)PYRENE	U	PPB	0.50	10/14/98	CQL	
BENZO(b)FLUORANTHENE	U	PPB	0.50	10/14/98	CQL	
BENZO(ghi)PERYLENE	U	PPB	2.0	10/14/98	CQL	
BENZO(k)FLUORANTHENE	U	PPB	0.50	10/14/98	CQL	
DIBENZO(a,h)ANTHRACENE	U	PPB	2.0	10/14/98	CQL	
FLUORANTHENE	U	PPB	0.50	10/14/98	CQL	
FLUORENE	U	PPB	0.50	10/14/98	CQL	
INDENO(1,2,3-cd)PYRENE	U	PPB	2.0	10/14/98	CQL	
NAPHTHALENE	U	PPB	0.50	10/14/98	CQL	
PHENANTHRENE	U	PPB	0.50	10/14/98	CQL	
PYRENE	U	PPB	0.50	10/14/98	CQL	
CHRYSENE	U	PPB	0.50	10/14/98	CQL	
BIS(2-CHLOROETHYL)ETHER	U	PPB	1.0	10/14/98	CQL	
BIS(2-CHLOROETHOXY)METHANE	U	PPB	0.50	10/14/98	CQL	
BIS(2-CHLOROISOPROPYL)ETHER	U	PPB	2.0	10/14/98	CQL	
4-BROMOPHENYLPHENYL ETHER	U	PPB	2.0	10/14/98	CQL	
4-CHLOROPHENYLPHENYL ETHER	U	PPB	1.0	10/14/98	CQL	
HEXACHLOROCYCLOPENTADIENE	U	PPB	5.0	10/14/98	CQL	
HEXACHLOROBUTADIENE	U	PPB	1.0	10/14/98	CQL	
HEXACHLOROBENZENE	U	PPB	1.0	10/14/98	CQL	
HEXACHLOROETHANE	U	PPB	1.0	10/14/98	CQL	
1,2,4-TRICHLOROBENZENE	U	PPB	1.0	10/14/98	CQL	
2-CHLORONAPHTHALENE	U	PPB	0.50	10/14/98	CQL	
4-CHLORO-3-METHYLPHENOL	U	PPB	1.0	10/14/98	CQL	
2-CHLOROPHENOL	U	PPB	0.50	10/14/98	CQL	
2,4-DICHLOROPHENOL	U	PPB	1.0	10/14/98	CQL	
2,4-DIMETHYLPHENOL	U	PPB	1.0	10/14/98	CQL	
2,4-DINITROPHENOL	U	PPB	10	10/14/98	CQL	
2-METHYL-4,6-DINITROPHENOL	U	PPB	5.0	10/14/98	CQL	
2-NITROPHENOL	U	PPB	2.0	10/14/98	CQL	
4-NITROPHENOL	U	PPB	5.0	10/14/98	CQL	
PENTACHLOROPHENOL	U	PPB	2.0	10/14/98	CQL	
PHENOL	U	PPB	0.50	10/14/98	CQL	
2,4,6-TRICHLOROPHENOL	U	PPB	1.0	10/14/98	CQL	
2,4,5-TRICHLOROPHENOL	U	PPB	1.0	10/14/98	CQL	
O-CRESOL	U	PPB	1.0	10/14/98	CQL	
M- & P-CRESOL	U	PPB	0.50	10/14/98	CQL	
2-METHYLNAPHTHALENE	U	PPB	0.50	10/14/98	CQL	
BENZOIC ACID	U	PPB	2.0	10/14/98	CQL	
BENZYL ALCOHOL	U	PPB	2.0	10/14/98	CQL	
4-CHLOROANILINE	U	PPB	1.0	10/14/98	CQL	
DIBENZOFURAN	U	PPB	0.50	10/14/98	CQL	
3,3-DICHLOROBENZIDINE	U	PPB	2.0	10/14/98	CQL	
2-NITROANILINE	U	PPB	2.0	10/14/98	CQL	
3-NITROANILINE	U	PPB	2.0	10/14/98	CQL	
4-NITROANILINE	U	PPB	5.0	10/14/98	CQL	
HEXACHLOROBENZENE	U	PPB	0.010	10/14/98	CQL	
ALDRIN	U	PPB	0.013	10/14/98	CQL	
alpha-BHC	U	PPB	0.024	10/14/98	CQL	
ı-BHC	U	PPB	0.035	10/14/98	CQL	
.a-BHC	U	PPB	0.034	10/14/98	CQL	
gamma-BHC (LINDANE)	U	PPB	0.013	10/14/98	CQL	
alpha-CHLORDANE	U	PPB	0.018	10/14/98	CQL	
gamma-CHLORDANE	U	PPB	0.013	10/14/98	CQL	
TECHNICAL CHLORDANE	U	PPB	0.50	10/14/98	CQL	
p,p-DDD	U	PPB	0.025	10/14/98	CQL	

Project/Site No.:	47-559	Lab Number:	9809251-01G
Project Name:	SMOKEY MOUNTAIN SMELTERS	Matrix:	WATER
Description:	BACKGROUND/SMOKEY MTN. SM.	Received:	09/28/98 13:30:00 By FMM
Station No.:	SMS-GW-01	Sampling Agency:	HWM_11_KFO
Collected:	09/28/98 12:30:00 By BHM	Priority:	
County:	47		

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
B/N/A EXTR+PESTS,PCBS-H2O						MS+ECD
p,p-DDE	U	PPB	0.022	10/14/98	CQL	
p,p-DDT	U	PPB	0.023	10/14/98	CQL	
DIELDRIN	U	PPB	0.014	10/14/98	CQL	
ENDOSULFAN I	U	PPB	0.022	10/14/98	CQL	
ENDOSULFAN II	U	PPB	0.025	10/14/98	CQL	
ENDOSULFAN SULFATE	U	PPB	0.025	10/14/98	CQL	
ENDRIN	U	PPB	0.025	10/14/98	CQL	
ENDRIN ALDEHYDE	U	PPB	0.021	10/14/98	CQL	
ENDRIN KETONE	U	PPB	0.025	10/14/98	CQL	
HEPTACHLOR	U	PPB	0.016	10/14/98	CQL	
HEPTACHLOR EPOXIDE	U	PPB	0.017	10/14/98	CQL	
TOXAPHENE	U	PPB	2.9	10/14/98	CQL	
METHOXYCHLOR	U	PPB	0.097	10/14/98	CQL	
PCB 1016/1242	U	PPB	2.5	10/14/98	CQL	
PCB 1221	U	PPB	3.3	10/14/98	CQL	
PCB 1232	U	PPB	3.0	10/14/98	CQL	
PCB 1248	U	PPB	1.8	10/14/98	CQL	
PCB 1254	U	PPB	2.3	10/14/98	CQL	
PCB 1260	U	PPB	1.5	10/14/98	CQL	
PCB 1262	U	PPB	1.5	10/14/98	CQL	

*-Water, uG/L; Sediment, uG/kG

Printed: October 19, 1998

State of Tennessee - Environmental Laboratories
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Organic Analysis
Base/Neutral/Acid Extractables

PROJECT/SITE NO. 47559	PROJECT NAME Smoky Mtn Streams
STATION NUMBER SMS-GW-01	COUNTY Knox
DESCRIPTION Maloney Rd Spring	
STREAM MILE	DEPTH / MATRIX WATER
COLLECTED: DATE 9-28-98	TIME 12:30p
SAMPLER'S NAME(printed) Burl H. Mangin	
SAMPLING AGENCY DSF	BILLING CODE 3213311
IF PRIORITY, DATE NEEDED 10-28-98	
SEND REPORT TO: KEAC	
CONTACT HAZARD unknown	

*	NPDES Extractables	*	NPDES Extractables(con't)	*	TAL Semivolatiles
	butylbenzylphthalate	X	2-chlorophenol		dimethylphthalate
	bis(2-ethylhexyl)phthalate		2,4-dichlorophenol	X	4,6-dinitro-2-methylphenol
	di-n-butylphthalate		2,4-dimethylphenol	X	2,4-dinitrophenol
	di-n-octylphthalate		2,4-dinitrophenol	X	2,4-dinitrotoluene
	diethylphthalate		4,6-dinitro-o-cresol	X	2,6-dinitrotoluene
	dimethylphthalate		2-nitrophenol	X	fluoranthene
X	n-nitrosodimethylamine		4-nitrophenol	X	fluorene
	n-nitrosodiphenylamine		pentachlorophenol	X	hexachlorobenzene
	n-nitrosodi-n-propylamine		phenol	X	hexachlorobutadiene
	isophorone		2,4,6-trichlorophenol	X	hexachlorocyclopentadiene
	nitrobenzene	*	TAL Semivolatiles	X	hexachloroethane
	2,4-dinitrotoluene	X	acenaphthene	X	indeno(1,2,3-cd)pyrene
	acenaphthene	X	acenaphthylene	X	isophorone
	acenaphthylene	X	anthracene	X	2-methylnaphthalene
	anthracene	X	benzo(a)anthracene	X	2-methylphenol
	benzo(a)anthracene	X	benzo(a)pyrene	X	4-methylphenol
	benzo(a)pyrene	X	benzo(b)fluoranthene	X	n-nitrosodiphenylamine
	benzo(b)fluoranthene	X	benzo(g,h,i)perylene	X	n-nitroso-n-dipropylamine
	benzo(g,h,i)perylene	X	benzo(k)fluoranthene	X	naphthalene
	benzo(k)fluoranthene	X	benzoic acid	X	2-nitroaniline
	chrysene	X	benzyl alcohol	X	3-nitroaniline
	dibenzo(a,h)anthracene	X	bis(2-chloroethoxy)methane	X	4-nitroaniline
	fluoranthene	X	bis(2-chloroethyl) ether	X	nitrobenzene
	fluorene	X	bis(2-chloroisopropyl)ether	X	2-nitrophenol
	indeno(1,2,3-c,d)pyrene	X	bis(2-ethylhexyl)phthalate	X	4-nitrophenol
	naphthalene	X	4-bromophenylphenylether	X	pentachlorophenol
	phenanthrene	X	butylbenzylphthalate	X	phenanthrene
	pyrene	X	4-chloroaniline	X	phenol
	bis(2-chloroethyl)ether	X	4-chloro-3-methyl phenol	X	pyrene
	bis(2-chloroethoxy)methane	X	2-chloronaphthalene	X	1,2,4-trichlorobenzene
	bis(2-chloroisopropyl)ether	X	4-chlorophenylphenylether	X	2,4,5-trichlorophenol
	4-bromophenylphenylether	X	chrysene	X	2,4,6-trichlorophenol
	4-chlorophenylphenylether	X	di-n-butylphthalate	*	Nitrobodies
	hexachlorocyclopentadiene	X	di-n-octylphthalate		RDX
	hexachlorobutadiene	X	dibenzo(a,h)anthracene		2,4,6-TNT
	hexachlorobenzene	X	dibenzofuran		2,4-dinitrotoluene
	hexachloroethane	X	3,3'-dichlorobenzidine		2,6-dinitrotoluene
	1,2,4-trichlorobenzene	X	2,4-dichlorophenol		nitrobenzene
	2-chloronaphthalene	X	diethylphthalate		1,3,5-TNB
	4-chloro-3-methyl phenol	X	2,4-dimethylphenol		

*	TCLP Semivolatiles
	chlordane
	o-cresol
	m-cresol
	p-cresol
	cresol
	2,4-D
	2,4-dinitrotoluene
	endrin
	heptachlor
	heptachlor epoxide
	hexachlorobenzene
	hexachlorobutadiene
	hexachloroethane
	lindane
	methoxychlor
	nitrobenzene
	pentachlorophenol
	pyridine
	toxaphene
	2,4,5-trichlorophenol
	2,4,6-trichlorophenol
	2,4,5-TP (Silvex)
*	Pesticides/PCBs
	aldrin
	alpha-BHC
	beta-BHC
	delta-BHC
	gamma-BHC (lindane)
	technical chlordane
	alpha-chlordane
	gamma-chlordane
	4,4'-DDD
	4,4'-DDE
	4,4'-DDT
	dieldrin
	endosulfan I
	endosulfan II
	endosulfan sulfate
	endrin
	endrin aldehyde
	endrin ketone
	heptachlor
	heptachlor epoxide
	toxaphene
	methoxychlor
	PCB 1016/1242
	PCB 1221
	PCB 1232
	PCB 1248
	PCB 1254
	PCB 1260
	PCB 1262

Laboratory Number

Branch Lab Number

Chain of Custody and Supplemental Information

Only one chain of custody form is required per sample set or point (if all collected at the same time)

1. Collected by BHM
   Date 9-28-98 Time 12:30p
   Delivered to KBL
   Date 9-28-98 Time 1:15p
2. Received by
   Date Time
   Delivered to
   Date Time
3. Received by
   Date Time
   Delivered to
   Date Time
4. Received in Lab by [illegible]
   Date 9-28-98 Time 1:8 [illegible]
   Logged in by
   Date Time

Additional Information

1. Approximate volume of sample 1 gal
2. Nearest town or city Knoxville
3. Others present at collection Adam DeWeese
4. Number of other samples collected at same time at this point 3
5. Field collection procedure, handling and/or preservation of this sample
   EPA procedures and protocol
6. Mode of transportation to lab
   State vehicle, on ice, in cooler
7. Sample sealed by
8. Date sample sealed
9. Remarks

OCT 13 1998

Project/Site No.: 47-559
Project Name: SMOKEY MOUNTAIN SMELTERS
Site Description: BACKGROUND/SMOKEY MTN. SM.
Station No.: SMS-GW-01
Collected: 09/28/98 12:30:00 By BHM
County: 47

Lab Number: 9809251-01F
Matrix: WATER
Received: 09/28/98 13:30:00 By FMM
Sampling Agency: HWM_11_KFO
Priority:

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
VOLATILES-TAL WATERS						8260A
ACETONE	U	PPB	5.0	10/01/98	JWB	
BENZENE	U	PPB	0.50	10/01/98	JWB	
BROMODICHLOROMETHANE	U	PPB	0.50	10/01/98	JWB	
BROMOFORM	U	PPB	0.50	10/01/98	JWB	
BROMOMETHANE	U	PPB	1.0	10/01/98	JWB	
2-BUTANONE (MEK)	U	PPB	5.0	10/01/98	JWB	
CARBON DISULFIDE	U	PPB	1.0	10/01/98	JWB	
CARBON TETRACHLORIDE	U	PPB	0.50	10/01/98	JWB	
VINYL ACETATE	U	PPB	1.0	10/01/98	JWB	
CHLOROBENZENE	U	PPB	0.50	10/01/98	JWB	
CHLOROETHANE	U	PPB	1.0	10/01/98	JWB	
CHLOROFORM	0.5	PPB	0.50	10/01/98	JWB	
CHLOROMETHANE	U	PPB	1.0	10/01/98	JWB	
DIBROMOCHLOROMETHANE	U	PPB	0.50	10/01/98	JWB	
1,2-DICHLOROBENZENE	U	PPB	0.50	10/01/98	JWB	
1,3-DICHLOROBENZENE	U	PPB	0.50	10/01/98	JWB	
1,4-DICHLOROBENZENE	U	PPB	0.50	10/01/98	JWB	
DICHLORODIFLUOROMETHANE	U	PPB	1.0	10/01/98	JWB	
1,1-DICHLOROETHANE	U	PPB	0.50	10/01/98	JWB	
1,2-DICHLOROETHANE	U	PPB	0.50	10/01/98	JWB	
1,1-DICHLOROETHENE	U	PPB	0.50	10/01/98	JWB	
CIS-1,2-DICHLOROETHENE	U	PPB	0.50	10/01/98	JWB	
TRANS-1,2-DICHLOROETHENE	U	PPB	0.50	10/01/98	JWB	
1,2-DICHLOROPROPANE	U	PPB	0.50	10/01/98	JWB	
CIS-1,3-DICHLOROPROPENE	U	PPB	0.50	10/01/98	JWB	
TRANS-1,3-DICHLOROPROPENE	U	PPB	0.50	10/01/98	JWB	
ETHYLBENZENE	J 0.1	PPB	0.50	10/01/98	JWB	
METHYLENE CHLORIDE	U	PPB	0.50	10/01/98	JWB	
4-METHYL-2-PENTANONE (MIBK)	U	PPB	5.0	10/01/98	JWB	
STYRENE	U	PPB	0.50	10/01/98	JWB	
2-HEXANONE	U	PPB	1.0	10/01/98	JWB	
1,1,2,2-TETRACHLOROETHANE	U	PPB	0.50	10/01/98	JWB	
TETRACHLOROETHENE	U	PPB	0.50	10/01/98	JWB	
TOLUENE	U	PPB	0.50	10/01/98	JWB	
1,1,1-TRICHLOROETHANE	U	PPB	0.50	10/01/98	JWB	
1,1,2-TRICHLOROETHANE	U	PPB	0.50	10/01/98	JWB	
TRICHLOROETHENE	U	PPB	0.50	10/01/98	JWB	
TRICHLOROFLUOROMETHANE	U	PPB	1.0	10/01/98	JWB	
VINYL CHLORIDE	U	PPB	1.0	10/01/98	JWB	
o-XYLENE	U	PPB	0.50	10/01/98	JWB	
m & p XYLENE	J 0.2	PPB	0.50	10/01/98	JWB	

*-Water, uG/L; Sediment, uG/kG

Printed: October 7, 1998

State of Tennessee - Environmental Laboratories

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Organic Analysis

Volatiles and Petroleum Hydrocarbons

PROJECT/SITE NO.	47-559	PROJECT NAME	SMOKY MOUNTAIN SMELTERS
STATION NUMBER	SMS-GW-01	COUNTY	KNOX
DESCRIPTION	BACKGROUND		
STREAM MILE		DEPTH	MATRIX WATER
COLLECTED: DATE	9/28/98	TIME	12:30p
SAMPLER'S NAME(printed)	Burl H. Maupin		
SAMPLING AGENCY	DIVISION OF SUPERFUND	BILLING CODE	327.38-11
IF PRIORITY, DATE NEEDED	OCTOBER 28		
SEND REPORT TO:	KNOXVILLE ENVIRONMENTAL ASSISSTANCE CENTER		
	BURL H. MAUPIN		
CONTACT HAZARD	UNKNOWN		

*	NPDES Volatiles - 624	*	TAL Volatiles - 8260A	*	TCLP Volatiles
	Bromoform	C	Chloromethane		Benzene
	Bromodichloromethane	C	Bromomethane		Carbon tetrachloride
	Carbon Tetrachloride	C	Vinyl chloride		Chlorobenzene
	Chlorobenzene	C	Chloroethane		Chloroform
	Chloroethane	C	Methylene chloride		1,2-Dichloroethane
C	2-Chloroethylvinyl ether	C	Acetone		1,1-Dichloroethane
	Chloroform	C	Carbon disulfide		Methyl ethyl ketone
	Chloromethane	C	1,1-Dichloroethene		Tetrachloroethene
	Dibromochloromethane	C	1,1-Dichloroethane		Trichloroethene
C	1,2-Dichlorobenzene	C	Cis-1,2-dichloroethene		Vinyl chloride
C	1,3-Dichlorobenzene	C	Trans-1,2-dichloroethene	*	BTEX - 8260A - UST
C	1,4-Dichlorobenzene	C	1,2-Dichloroethane		Benzene
C	Dichlorodifluoromethane	C	Chloroform		Toluene
	1,1-Dichloroethane	C	2-Butanone		Ethyl benzene
	1,2-Dichloroethane	C	1,1,1-Trichloroethane		o-Xylene
	1,1-Dichloroethene	C	Carbon tetrachloride		m-Xylene
	Cis-1,2-dichloroethene	C	Vinyl acetate		p-Xylene
	Trans-1,2-dichloroethene	C	Bromodichloromethane		Methyl t-butyl ether
	1,2-Dichloropropane	C	1,2-Dichloropropane		Diisopropyl ether
	Cis-1,3-dichloropropene	C	Cis-1,3-dichloropropane	*	TPH by GC
	Trans-1,2-dichloroethene	C	Trichloroethene		Gasoline Range Organics
	Methylene chloride	C	Dibromochloromethane		Diesel Range Organics
	1,1,2,2-Tetrachloroethane	C	1,1,2-Trichloroethane	*	TPH by IR (418.1)
	Tetrachloroethene	C	Benzene		418.1 - Waste Oil
	1,1,1-Trichloroethane	C	Trans-1,3-dichloropropene	*	Other
	1,1,2-Trichloroethane	C	Bromoform		
	Trichloroethene	C	4-Methyl-2-pentanone		
C	Trichlorofluoromethane	C	2-Hexanone		
	Vinyl chloride	C	Tetrachloroethene		
	Benzene	C	Toluene		
	Ethylbenzene	C	1,1,2,2-Tetrachloroethane		
	Toluene	C	Chlorobenzene		
	o-Xylene	C	Ethyl benzene		
	m-Xylene	C	Styrene		
	p-Xylene	C	o-Xylene		
		C	m-Xylene		
		C	p-Xylene		

Laboratory Number

Branch Lab Number

Chain of Custody and Supplemental Information

Only one chain of custody form is required per sample set or point (if all collected at the same time)

1. Collected by BHM
   Date 9/28/98 Time 12:30p
   Delivered to Knoxville Basin Laboratory
   Date 9/28/98 Time 1:15p
2. Received by
   Date Time
   Delivered to
   Date Time
3. Received by
   Date Time
   Delivered to
   Date Time
4. Received in Lab by [illegible]
   Date 9-28-98 Time 1:5[illegible]p
   Logged in by
   Date Time

Additional Information

1. Approximate volume of sample
   160 ML (4X40ML/VIAL)
2. Nearest town or city KNOXVILLE
3. Others present at collection Alan DeWeese
4. Number of other samples collected at same time at this point *One other sample each for INORGANICS, RADIOCHEMICAL, AND EXTRACTABLE ORGANICS were collected for a total of three other samples.*
5. Field collection procedure, handling and/or preservation of this sample
   according to EPA procedures and protocol
6. Mode of transportation to lab
   in State vehicle, in cooler, and on ice
7. Sample sealed by
8. Date sample sealed
9. Remarks

OCT 30 1998

Project/Site No.: 47-559
Project Name: SMOKEY MOUNTAIN SMELTERS
Description: BACKGROUND/SMOKEY MTN. SM.
Station No.: SMS-GW-01
Collected: 09/28/98 12:30:00 By BHM
nty: 47

Lab Number: 9809251-01H
Matrix: WATER
Received: 09/28/98 13:30;00 By FMM
Sampling Agency: HWM_11_KFO
Priority:

TEST	RESULT	*ERROR	UNITS	ANALYZED	BY	METHOD
GAMMA RADIONUCLIDES						R.6
Bi-214	27.3	4.0	pCi/L	10/06/98	AK	
GROSS ALPHA & BETA						R.1.1
GROSS ALPHA	2.6	2.2	pCi/L	10/06/98	AK	
GROSS BETA	6.1	2.4	pCi/L	10/06/98	AK	

*--Represents +/- error value

Printed: October 22, 1998

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Radiochemical Analysis

PROJECT/SITE NO. 47-559	PROJECT NAME Smokey Mountain Smelters
STATION NUMBER SM-GW-01	COUNTY Knox
DESCRIPTION Malones Road Spring	
STREAM MILE NA	DEPTH Surface
COLLECTED: DATE 9/28/98	TIME 12:30P
PICK-UP DATE:	
CONTACT HAZARD	mR/hr Reading <0.2
SAMPLER'S NAME (printed) Burl Maupin	
SAMPLING AGENCY TDEC/DSE	BILLING CODE 327.38.11
IF PRIORITY, DATE NEEDED	
SEND REPORT TO: Burl Maupin KEAC	

Laboratory Number

Date Received

Time Received **By**

Sample Type

- ___Air
- X Water
- ___Sludge
- ___Vegetation
- ___Milk
- ___Tissue
- ___Soil
- ___Sediment
- ___Swipe
- ___Liquid
- ___Solid

Other_____

Field Comments:

Air Samples

Volume _____

Total Hours _____

___Sample Filtration

___Sample Acidification

___Send to RESL

Chain of Custody and Supplemental Information

Only one chain of custody form is required per sample set or point (if all collected at the same time)

1. Collected by ADD/BHM
   Date 9/28/98 Time 12:30P
   Delivered to KRL
   Date 9/28/98 Time 1:15
2. Collected by
   Date Time
   Delivered to
   Date Time
3. Collected by
   Date Time
   Delivered to
   Date Time
4. Received in Lab by [signature]
   Date 9-28-98 Time 1:30PM
   Logged in by
   Date Time

REQUESTED ANALYSES:

X	GROSS ALPHA (TOTAL)		STRONTIUM 89
	GROSS ALPHA (SUSPENDED)		STRONTIUM 90
	GROSS ALPHA (DISSOLVED)		TRITIUM (H-3)
X	GROSS BETA (TOTAL)		THORIUM (TOTAL)
	GROSS BETA (SUSPENDED)		URANIUM (TOTAL)
	GROSS BETA (DISSOLVED)	X	GAMMA RADIONUCLIDES
			ADDITIONAL ANALYSES:

Additional Information

1. Approximate volume of sample 1 gallon
2. Nearest town or city Knoxville
3. Others present at collection Adam Dewees
4. Number of other samples collected at same time at this point ?
5. Field collection procedure, handling and/or preservation of this sample
   According to S.O.P.
6. Mode of transportation to lab State vehicle on ice
7. Sample sealed by ~~[illegible]~~
8. Date sample sealed ~~9/28/98~~
9. Remarks

PH-3009 (rev 2/98)

RDA 1527

Project/Site No.: 47-559
Project Name: SMOKEY MOUNTAIN SMELTERS
Description: SMS-GW-02/MARY KNOX WELL
Station No.: SMS-GW-02
Collected: 08/26/98 14:30:00 By WLB
County: 47

Lab Number: 9808257-02
Matrix: WATER
Received: 08/27/89 10:00:00 By FMM
Sampling Agency: HWM_11_KFO
Priority:

TEST	RESULT	UNITS	LIMIT	ANALYZED	BY	METHOD
CYANIDE	U	mg/l	0.02	09/02/98	LKS	A.9
FLUORIDE	0.2	mg/l	0.1	09/03/98	SDS	A.11.1
NITRATE NITROGEN	1.97	mg/l	0.01	09/02/98	SAL	
NITRITE NITROGEN	U	mg/l	0.01	08/27/98	SDS	A.18.7
NO3 & NO2 NITROGEN	1.97	mg/l	0.01	09/02/98	SAL	A.18.4
SULFATE	20	mg/l	2	08/27/98	FMM	A.26
ALUMINUM	920	ug/l	100	09/30/98	JAH	
ANTIMONY	U	ug/l	3	10/14/98	JAH	
ARSENIC	U	ug/l	1	09/11/98	EAM	
BARIUM	U	ug/l	100	09/30/98	JAH	
BERYLLIUM	U	ug/l	1	09/21/98	EAM	EPA 200.9
CADMIUM	U	ug/l	1	09/09/98	EAM	EPA 200.9
CALCIUM	133	mg/l	0.03	09/10/98	JAH	
CHROMIUM	U	ug/l	1	09/10/98	EAM	EPA 200.9
COBALT	U	ug/l	5	09/04/98	JAH	
COPPER	2	ug/l	1	09/10/98	EAM	EPA 200.9
DIGESTION-METALS	COMPLETED	COMPLETED		09/03/98	DEL	
IRON	620	ug/l	25	09/04/98	JAH	
LEAD	7	ug/l	1	09/09/98	EAM	EPA 200.9
MAGNESIUM	14.2	mg/l	0.02	09/10/98	JAH	
MANGANESE	492	ug/l	5	09/04/98	JAH	
MERCURY	U	ug/l	0.2	08/31/98	ATB	EPA 245.1
NICKEL	U	ug/l	10	09/04/98	JAH	

Project/Site No.: 47-559
Project Name: SMOKEY MOUNTAIN SMELTERS
Description: SMS-GW-02/MARY KNOX WELL
Station No.: SMS-GW-02
Collected: 08/26/98 14:30:00 By WLB
County: 47

Lab Number: 9808257-02
Matrix: WATER
Received: 08/27/89 10:00:00 By FMM
Sampling Agency: HWM_11_KFO
Priority:

TEST	RESULT	UNITS	LIMIT	ANALYZED	BY	METHOD
POTASSIUM	0.64	mg/l	0.02	09/10/98	JAH	
SELENIUM	U	ug/l	2	09/04/98	EAM	
SILVER	U	ug/l	1	09/08/98	EAM	EPA 200.9
SODIUM	17.2	mg/l	0.10	09/09/98	JAH	
THALLIUM	U	ug/l	2	09/09/98	EAM	
VANADIUM	U	ug/l	1	09/14/98	EAM	
ZINC	46	ug/l	1	09/04/98	JAH	

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Inorganic Analysis

PROJECT/SITE NO. 47-559	PROJECT NAME CHUNKY MTN SAMPLES
STATION NUMBER SMS-GW-02	COUNTY KNOX
DESCRIPTION MARY KNOX WELL	
STREAM MILE	DEPTH 100 ft MATRIX GROUND WATER
COLLECTED: DATE 08-26-98	TIME 14:30
SAMPLER'S NAME(printed) WM. LEE BARRON	
SAMPLING AGENCY TDSF	BILLING CODE 327.38.11
IF PRIORITY, DATE NEEDED 09-30-98	
SEND REPORT TO: BURL MAUPIN, TDSF, KNOXVILLE	
CONTACT HAZARD UNKNOWN	

*	Metals
X	aluminum, Al
X	antimony, Sb
X	arsenic, As
X	barium, Ba
X	beryllium, Be
X	cadmium, Cd
X	calcium, Ca
X	chromium, Cr
X	cobalt, Co
X	copper, Cu
X	iron, Fe
X	lead, Pb
X	magnesium, Mg
X	manganese, Mn
X	mercury, Hg
X	nickel, Ni
X	potassium, K
X	selenium, Se
X	silver, Ag
X	sodium, Na
X	thallium, Tl
X	vanadium, V
X	zinc, Zn

*	Env. Microbiology	*	General Inorganics		Gen. Inorganics (con't)
	coliform, fecal*		acidity as $CaCO_3$*		oil and grease
	coliform, total*		alkalinity as $CaCO_3$*		orthophosphate, total*
	strep, fecal*		alkalinity, phen. as $CaCO_3$*		oxygen, dissolved*
			BOD, 5-day*		pH
			CBOD, 5-day*		phenols, total
			boron		phosphate, total
*	**Ambient Parameters**		chloride*		residue, dissolved*
	COD*		chlorine, residual*		residue, settleable*
	coliform, fecal		chromium, hexavalent		residue, suspended*
	conductivity*		COD*		residue, total*
	hardness, total as $CaCO_3$*		color, apparent*		silica*
	nitrogen, ammonia		color, true*	X	sulfate*
	nitrogen, NO_3 & NO_2		conductivity*		sulfide, total*
	nitrogen, total Kjeldahl	X	cyanide		TOC*
	phosphate, total		flash point*		turbidity*
	pH	X	fluoride*		percent solids
	residue, dissolved*		hardness, Ca as $CaCO_3$*	*	**Other**
	residue, suspended*		hardness, total as $CaCO_3$*		
	arsenic, As		hydrocarbons, total		
	cadmium, Cd		MBAS*		
	chromium, Cr	X	nitrogen, ammonia		
	copper, Cu	X	nitrogen, nitrate*		
	lead, Pb	X	nitrogen, nitrite*		
	mercury, Hg		nitrogen, NO_3 & NO_2		
	nickel, Ni		nitrogen, total Kjeldahl		
	zinc, Zn		nitrogen, total organic		

*	TCLP
	arsenic, As
	barium, Ba
	cadmium, Cd
	chromium, Cr
	lead, Pb
	mercury, Hg
	nickel, Ni
	selenium, Se
	silver, Ag

** denotes analyses performed only on water*

FIELD DETERMINATIONS	Temperature 18.3°C
pH 6.78	Chlorine, residual
Conductivity 993.5	Other 175 NTU
Dissolved Oxygen	

Laboratory Number

Branch Lab Number

Chain of Custody and Supplemental Information

Only one chain of custody form is required per sample set or point (if all collected at the same time)

1. Collected by W. L. B.
   Date 08-26-98 Time 14:30
   Delivered to KNOXVILLE STATE LAB
   Date 8-27-98 Time 10:00
2. Received by
   Date Time
   Delivered to
   Date Time
3. Received by
   Date Time
   Delivered to
   Date Time
4. Received in Lab by [illegible]
   Date 8-27-98 Time 10:00
   Logged in by
   Date Time

Additional Information

1. Approximate volume of sample 4 L
2. Nearest town or city KNOXVILLE
3. Others present at collection
4. Number of other samples collected at same time at this point THREE
5. Field collection procedure, handling and/or preservation of this sample ACCORDING TO U.S. EPA PROCEDURES AND PROTOCOLS.
6. Mode of transportation to lab ON ICE IN AN ICE CHEST, IN A STATE VEHICLE.
7. Sample sealed by
8. Date sample sealed
9. Remarks

Project/Site No.: 47-559
Project Name: SMOKEY MOUNTAIN SMELTERS
Description: SMS-GW-02/MARY KNOX WELL
Station No.: SMS-GW-02
Collected: 08/26/98 14:30:00 By WLB
unty: 47

Lab Number: 9808257-02G
Matrix: WATER
Received: 08/27/89 10:00:00 By FMM
Sampling Agency: HWM_11_KFO
Priority:

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
B/N/A EXTR+PESTS,PCBS-H2O						MS+ECD
BUTYL BENZYL PHTHALATE	U	PPB	1.0	09/01/98	MAC	
BIS(2-ETHYLHEXYL)PHTHALATE	U	PPB	2.0	09/01/98	MAC	
DI-n-BUTYL PHTHALATE	U	PPB	1.0	09/01/98	MAC	
DI-n-OCTYL PHTHALATE	U	PPB	2.0	09/01/98	MAC	
DIETHYL PHTHALATE	U	PPB	0.50	09/01/98	MAC	
DIMETHYL PHTHALATE	U	PPB	0.50	09/01/98	MAC	
n-NITROSODIMETHYLAMINE	U	PPB	2.0	09/01/98	MAC	
n-NITROSODIPHENYLAMINE	U	PPB	1.0	09/01/98	MAC	
n-NITROSO-di-n-PROPYLAMINE	U	PPB	1.0	09/01/98	MAC	
ISOPHORONE	U	PPB	0.50	09/01/98	MAC	
NITROBENZENE	U	PPB	1.0	09/01/98	MAC	
2,4-DINITROTOLUENE	U	PPB	2.0	09/01/98	MAC	
2,6-DINITROTOLUENE	U	PPB	2.0	09/01/98	MAC	
ACENAPTHENE	U	PPB	0.50	09/01/98	MAC	
ACENAPHTHYLENE	U	PPB	0.50	09/01/98	MAC	
ANTHRACENE	U	PPB	0.50	09/01/98	MAC	
BENZO(a)ANTHRACENE	U	PPB	0.50	09/01/98	MAC	
BENZO(a)PYRENE	U	PPB	0.50	09/01/98	MAC	
BENZO(b)FLUORANTHENE	U	PPB	0.50	09/01/98	MAC	
BENZO(ghi)PERYLENE	U	PPB	2.0	09/01/98	MAC	
BENZO(k)FLUORANTHENE	U	PPB	0.50	09/01/98	MAC	
DIBENZO(a,h)ANTHRACENE	U	PPB	2.0	09/01/98	MAC	
FLUORANTHENE	U	PPB	0.50	09/01/98	MAC	
FLUORENE	U	PPB	0.50	09/01/98	MAC	
INDENO(1,2,3-cd)PYRENE	U	PPB	2.0	09/01/98	MAC	
NAPHTHALENE	U	PPB	0.50	09/01/98	MAC	
PHENANTHRENE	U	PPB	0.50	09/01/98	MAC	
PYRENE	U	PPB	0.50	09/01/98	MAC	
CHRYSENE	U	PPB	0.50	09/01/98	MAC	
BIS(2-CHLOROETHYL)ETHER	U	PPB	1.0	09/01/98	MAC	
BIS(2-CHLOROETHOXY)METHANE	U	PPB	1.0	09/01/98	MAC	
BIS(2-CHLOROISOPROPYL)ETHER	U	PPB	2.0	09/01/98	MAC	
4-BROMOPHENYLPHENYL ETHER	U	PPB	2.0	09/01/98	MAC	
4-CHLOROPHENYLPHENYL ETHER	U	PPB	1.0	09/01/98	MAC	
HEXACHLOROCYCLOPENTADIENE	U	PPB	5.0	09/01/98	MAC	
HEXACHLOROBUTADIENE	U	PPB	1.0	09/01/98	MAC	
HEXACHLOROBENZENE	U	PPB	1.0	09/01/98	MAC	
HEXACHLOROETHANE	U	PPB	1.0	09/01/98	MAC	
1,2,4-TRICHLOROBENZENE	U	PPB	1.0	09/01/98	MAC	
2-CHLORONAPHTHALENE	U	PPB	0.50	09/01/98	MAC	
4-CHLORO-3-METHYLPHENOL	U	PPB	1.0	09/01/98	MAC	
2-CHLOROPHENOL	U	PPB	1.0	09/01/98	MAC	
2,4-DICHLOROPHENOL	U	PPB	1.0	09/01/98	MAC	
2,4-DIMETHYLPHENOL	U	PPB	1.0	09/01/98	MAC	
2,4-DINITROPHENOL	U	PPB	10	09/01/98	MAC	
2-METHYL-4,6-DINITROPHENOL	U	PPB	5.0	09/01/98	MAC	
2-NITROPHENOL	U	PPB	2.0	09/01/98	MAC	
4-NITROPHENOL	U	PPB	5.0	09/01/98	MAC	
PENTACHLOROPHENOL	U	PPB	2.0	09/01/98	MAC	
PHENOL	U	PPB	1.0	09/01/98	MAC	
2,4,6-TRICHLOROPHENOL	U	PPB	1.0	09/01/98	MAC	
2,4,5-TRICHLOROPHENOL	U	PPB	1.0	09/01/98	MAC	
O-CRESOL	U	PPB	1.0	09/01/98	MAC	
M- & P-CRESOL	U	PPB	1.0	09/01/98	MAC	
2-METHYLNAPHTHALENE	U	PPB	0.50	09/01/98	MAC	
BENZOIC ACID	U	PPB	5.0	09/01/98	MAC	
BENZYL ALCOHOL	U	PPB	2.0	09/01/98	MAC	
4-CHLOROANILINE	U	PPB	1.0	09/01/98	MAC	
DIBENZOFURAN	U	PPB	0.50	09/01/98	MAC	
3,3-DICHLOROBENZIDINE	U	PPB	2.0	09/01/98	MAC	
2-NITROANILINE	U	PPB	2.0	09/01/98	MAC	
3-NITROANILINE	U	PPB	2.0	09/01/98	MAC	
4-NITROANILINE	U	PPB	5.0	09/01/98	MAC	
HEXACHLOROBENZENE	U	PPB	0.020	09/01/98	MAC	
ALDRIN	U	PPB	0.027	09/01/98	MAC	
alpha-BHC	U	PPB	0.048	09/01/98	MAC	
ta-BHC	U	PPB	0.069	09/01/98	MAC	
a-BHC	U	PPB	0.069	09/01/98	MAC	
gamma-BHC (LINDANE)	U	PPB	0.027	09/01/98	MAC	
alpha-CHLORDANE	U	PPB	0.037	09/01/98	MAC	
gamma-CHLORDANE	U	PPB	0.027	09/01/98	MAC	
TECHNICAL CHLORDANE	U	PPB	0.40	09/01/98	MAC	
p,p-DDD	U	PPB	0.049	09/01/98	MAC	

Project/Site No.: 47-559
Project Name: SMOKEY MOUNTAIN SMELTERS
Description: SMS-GW-02/MARY KNOX WELL
Station No.: SMS-GW-02
Collected: 08/26/98 14:30:00 By WLB
inty: 47

Lab Number: 9808257-02G
Matrix: WATER
Received: 08/27/89 10:00:00 By FMM
Sampling Agency: HWM_11_KFO
Priority:

OCT 13 1998

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
B/N/A EXTR+PESTS,PCBS-H2O						MS+ECD
p,p-DDE	U	PPB	0.043	09/01/98	MAC	
p,p-DDT	U	PPB	0.046	09/01/98	MAC	
DIELDRIN	U	PPB	0.028	09/01/98	MAC	
ENDOSULFAN I	U	PPB	0.044	09/01/98	MAC	
ENDOSULFAN II	U	PPB	0.050	09/01/98	MAC	
ENDOSULFAN SULFATE	U	PPB	0.050	09/01/98	MAC	
ENDRIN	U	PPB	0.050	09/01/98	MAC	
ENDRIN ALDEHYDE	U	PPB	0.042	09/01/98	MAC	
ENDRIN KETONE	U	PPB	0.051	09/01/98	MAC	
HEPTACHLOR	U	PPB	0.033	09/01/98	MAC	
HEPTACHLOR EPOXIDE	U	PPB	0.035	09/01/98	MAC	
TOXAPHENE	U	PPB	1.4	09/01/98	MAC	
METHOXYCHLOR	U	PPB	0.19	09/01/98	MAC	
PCB 1016/1242	U	PPB	1.0	09/01/98	MAC	
PCB 1221	U	PPB	1.7	09/01/98	MAC	
PCB 1232	U	PPB	1.3	09/01/98	MAC	
PCB 1248	U	PPB	1.3	09/01/98	MAC	
PCB 1254	U	PPB	1.3	09/01/98	MAC	
PCB 1260	U	PPB	1.2	09/01/98	MAC	
PCB 1262	U	PPB	1.2	09/01/98	MAC	

*-Water, uG/L; Sediment, uG/kG

Printed: October 2, 1998

State of Tennessee - Environmental Laboratories
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Organic Analysis
Base/Neutral/Acid Extractables

PROJECT/SITE NO. 47-559	PROJECT NAME SMOKEY MTN. SMELTERS
STATION NUMBER SMS-GW-02	COUNTY KNOX
DESCRIPTION MARY KNOX WELL	
STREAM MILE	DEPTH	MATRIX GROUND-WATER
COLLECTED: DATE 08-26-98	TIME 14:30
SAMPLER'S NAME(printed) ~~[illegible]~~ WM. LEE BARRON	
SAMPLING AGENCY TDSF	BILLING CODE 327 38.11
IF PRIORITY, DATE NEEDED 09-30-98	
SEND REPORT TO: SUSI H. MARTIN TDSF KNOXVILLE ENVIR ASSIST. CENTER	
CONTACT HAZARD UNKNOWN (POSSIBLE METALS (RAD.)	

*	NPDES Extractables	*	NPDES Extractables(con't)	*	TAL Semivolatiles
	butylbenzylphthalate	X	2-chlorophenol	X	dimethylphthalate
	bis(2-ethylhexyl)phthalate		2,4-dichlorophenol	X	4,6-dinitro-2-methylphenol
	di-n-butylphthalate		2,4-dimethylphenol	X	2,4-dinitrophenol
	di-n-octylphthalate		2,4-dinitrophenol	X	2,4-dinitrotoluene
	diethylphthalate	X	4,6-dinitro-o-cresol	X	2,6-dinitrotoluene
	dimethylphthalate		2-nitrophenol	X	fluoranthene
X	n-nitrosodimethylamine		4-nitrophenol	X	fluorene
	n-nitrosodiphenylamine		pentachlorophenol	X	hexachlorobenzene
	n-nitrosodi-n-propylamine		phenol	X	hexachlorobutadiene
	isophorone		2,4,6-trichlorophenol	X	hexachlorocyclopentadiene
	nitrobenzene	*	TAL Semivolatiles	X	hexachloroethane
	2,4-dinitrotoluene	X	acenaphthene	X	indeno(1,2,3-cd)pyrene
	acenaphthene	X	acenaphthylene	X	isophorone
	acenaphthylene	X	anthracene	X	2-methylnaphthalene
	anthracene	X	benzo(a)anthracene	X	2-methylphenol
	benzo(a)anthracene	X	benzo(a)pyrene	X	4-methylphenol
	benzo(a)pyrene	X	benzo(b)fluoranthene	X	n-nitrosodiphenylamine
	benzo(b)fluoranthene	X	benzo(g,h,i)perylene	X	n-nitroso-n-dipropylamine
	benzo(g,h,i)perylene	X	benzo(k)fluoranthene	X	naphthalene
	benzo(k)fluoranthene	X	benzoic acid	X	2-nitroaniline
	chrysene	X	benzyl alcohol	X	3-nitroaniline
	dibenzo(a,h)anthracene	X	bis(2-chloroethoxy)methane	X	4-nitroaniline
	fluoranthene	X	bis(2-chloroethyl) ether	X	nitrobenzene
	fluorene	X	bis(2-chloroisopropyl)ether	X	2-nitrophenol
	indeno(1,2,3-c,d)pyrene	X	bis(2-ethylhexyl)phthalate	X	4-nitrophenol
	naphthalene	X	4-bromophenylphenylether	X	pentachlorophenol
	phenanthrene	X	butylbenzylphthalate	X	phenanthrene
	pyrene	X	4-chloroaniline	X	phenol
	bis(2-chloroethyl)ether	X	4-chloro-3-methyl phenol	X	pyrene
	bis(2-chloroethoxy)methane	X	2-chloronaphthalene	X	1,2,4-trichlorobenzene
	bis(2-chloroisopropyl)ether	X	4-chlorophenylphenylether	X	2,4,5-trichlorophenol
	4-bromophenylphenylether	X	chrysene	X	2,4,6-trichlorophenol
X	4-chlorophenylphenylether	X	di-n-butylphthalate	*	Nitrobodies
	hexachlorocyclopentadiene	X	di-n-octylphthalate		RDX
	hexachlorobutadiene	X	dibenzo(a,h)anthracene		2,4,6-TNT
	hexachlorobenzene	X	dibenzofuran		2,4-dinitrotoluene
	hexachloroethane	X	3,3'-dichlorobenzidine		2,6-dinitrotoluene
	1,2,4-trichlorobenzene	X	2,4-dichlorophenol		nitrobenzene
	2-chloronaphthalene	X	diethylphthalate		1,3,5-TNB
	4-chloro-3-methyl phenol	X	2,4-dimethylphenol		

*	TCLP Semivolatiles	*	Pesticides/PCBs
	chlordane	X	aldrin
	o-cresol	X	alpha-BHC
	m-cresol	X	beta-BHC
	p-cresol	X	delta-BHC
	cresol	X	gamma-BHC (lindane)
	2,4-D	X	technical chlordane
	2,4-dinitrotoluene	X	alpha-chlordane
	endrin	X	gamma-chlordane
	heptachlor	X	4,4'-DDD
	heptachlor epoxide	X	4,4'-DDE
	hexachlorobenzene	X	4,4'-DDT
	hexachlorobutadiene	X	dieldrin
	hexachloroethane	X	endosulfan I
	lindane	X	endosulfan II
	methoxychlor	X	endosulfan sulfate
	nitrobenzene	X	endrin
	pentachlorophenol	X	endrin aldehyde
	pyridine	X	endrin ketone
	toxaphene	X	heptachlor
	2,4,5-trichlorophenol	X	heptachlor epoxide
	2,4,6-trichlorophenol	X	toxaphene
	2,4,5-TP (Silvex)	X	methoxychlor
		X	PCB 1016/1242
		X	PCB 1221
		X	PCB 1232
		X	PCB 1248
		X	PCB 1254
		X	PCB 1260
		X	PCB 1262

Laboratory Number

Branch Lab Number

Chain of Custody and Supplemental Information

Only one chain of custody form is required per sample set or point (if all collected at the same time)

1. Collected by W. L. B.
   Date 08-26-98 Time 14:30
   Delivered to KNOXVILLE STATE LAB
   Date 8-27-98 Time 10:00
2. Received by
   Date Time
   Delivered to
   Date Time
3. Received by
   Date Time
   Delivered to
   Date Time
4. Received in Lab by [illegible]
   Date 8-27-98 Time 10:00
   Logged in by
   Date Time

Additional Information

1. Approximate volume of sample 1 gal
2. Nearest town or city KNOXVILLE
3. Others present at collection
4. Number of other samples collected at same time at this point THREE
5. Field collection procedure, handling and/or preservation of this sample ACCORDING TO U.S. EPA PROCEDURES AND PROTOCOLS
6. Mode of transportation to lab ON ICE IN AN ICE CHEST IN A STATE VEHICLE.
7. Sample sealed by
8. Date sample sealed
9. Remarks

SEP 08 1998

Project/Site No.: 47-559
Project Name: SMOKEY MOUNTAIN SMELTERS
Site Description: SMS-GW-02/MARY KNOX WELL
Station No.: SMS-GW-02
Collected: 08/26/98 14:30:00 By WLB
inty: 47

Lab Number: 9808257-02F
Matrix: WATER
Received: 08/27/89 10:00:00 By FMM
Sampling Agency: HWM_11_KFO
Priority:

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
VOLATILES-TAL WATERS						8260A
ACETONE	U	PPB	5.0	08/31/98	HMG	
BENZENE	U	PPB	0.50	08/31/98	HMG	
BROMODICHLOROMETHANE	U	PPB	0.50	08/31/98	HMG	
BROMOFORM	U	PPB	0.50	08/31/98	HMG	
BROMOMETHANE	U	PPB	1.0	08/31/98	HMG	
2-BUTANONE (MEK)	U	PPB	5.0	08/31/98	HMG	
CARBON DISULFIDE	U	PPB	1.0	08/31/98	HMG	
CARBON TETRACHLORIDE	U	PPB	0.50	08/31/98	HMG	
VINYL ACETATE	U	PPB	1.0	08/31/98	HMG	
CHLOROBENZENE	U	PPB	0.50	08/31/98	HMG	
CHLOROETHANE	U	PPB	1.0	08/31/98	HMG	
CHLOROFORM	U	PPB	0.50	08/31/98	HMG	
CHLOROMETHANE	U	PPB	1.0	08/31/98	HMG	
DIBROMOCHLOROMETHANE	U	PPB	0.50	08/31/98	HMG	
1,2-DICHLOROBENZENE	U	PPB	0.50	08/31/98	HMG	
1,3-DICHLOROBENZENE	U	PPB	0.50	08/31/98	HMG	
1,4-DICHLOROBENZENE	U	PPB	0.50	08/31/98	HMG	
DICHLORODIFLUOROMETHANE	U	PPB	1.0	08/31/98	HMG	
1,1-DICHLOROETHANE	U	PPB	0.50	08/31/98	HMG	
1,2-DICHLOROETHANE	U	PPB	0.50	08/31/98	HMG	
1,1-DICHLOROETHENE	U	PPB	0.50	08/31/98	HMG	
CIS-1,2-DICHLOROETHENE	U	PPB	0.50	08/31/98	HMG	
TRANS-1,2-DICHLOROETHENE	U	PPB	0.50	08/31/98	HMG	
1,2-DICHLOROPROPANE	U	PPB	0.50	08/31/98	HMG	
CIS-1,3-DICHLOROPROPENE	U	PPB	0.50	08/31/98	HMG	
TRANS-1,3-DICHLOROPROPENE	U	PPB	0.50	08/31/98	HMG	
ETHYLBENZENE	U	PPB	0.50	08/31/98	HMG	
METHYLENE CHLORIDE	B 1.0	PPB	0.50	08/31/98	HMG	
4-METHYL-2-PENTANONE (MIBK)	U	PPB	5.0	08/31/98	HMG	
STYRENE	U	PPB	0.50	08/31/98	HMG	
2-HEXANONE	U	PPB	1.0	08/31/98	HMG	
1,1,2,2-TETRACHLOROETHANE	U	PPB	0.50	08/31/98	HMG	
TETRACHLOROETHENE	U	PPB	0.50	08/31/98	HMG	
TOLUENE	U	PPB	0.50	08/31/98	HMG	
1,1,1-TRICHLOROETHANE	U	PPB	0.50	08/31/98	HMG	
1,1,2-TRICHLOROETHANE	U	PPB	0.50	08/31/98	HMG	
TRICHLOROETHENE	U	PPB	0.50	08/31/98	HMG	
TRICHLOROFLUOROMETHANE	U	PPB	1.0	08/31/98	HMG	
VINYL CHLORIDE	U	PPB	1.0	08/31/98	HMG	
o-XYLENE	U	PPB	0.50	08/31/98	HMG	
m & p XYLENE	U	PPB	0.50	08/31/98	HMG	

*-Water, uG/L; Sediment, uG/kG

Printed: September 4, 1998

State of Tennessee - Environmental Laboratories

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Organic Analysis

Volatiles and Petroleum Hydrocarbons

PROJECT/SITE NO. 47-559	PROJECT NAME SMOKEY MTN SPRING
STATION NUMBER SMS-GW-02	COUNTY KNOX
DESCRIPTION MARY KNOX WELL	
STREAM MILE	DEPTH MATRIX WATER
COLLECTED: DATE 08-26-98	TIME 14:30
SAMPLER'S NAME(printed) Wm. LEE BARRON	
SAMPLING AGENCY TDSF	BILLING CODE 327.38.11
IF PRIORITY, DATE NEEDED 09-30-98	
SEND REPORT TO: BURL H. MAUPIN, TDSF KNOXVILLE ENVIR. ASSIST. CENTER	
CONTACT HAZARD UNKNOWN (possible Metals & Rad.)	

*	NPDES Volatiles - 624	*	TAL Volatiles - 8260A	*	TCLP Volatiles
	Bromoform	X	Chloromethane		Benzene
	Bromodichloromethane	X	Bromomethane		Carbon tetrachloride
	Carbon Tetrachloride	X	Vinyl chloride		Chlorobenzene
	Chlorobenzene	X	Chloroethane		Chloroform
	Chloroethane	X	Methylene chloride		1,2-Dichloroethane
X	2-Chloroethylvinyl ether	X	Acetone		1,1-Dichloroethane
	Chloroform	X	Carbon disulfide		Methyl ethyl ketone
	Chloromethane	X	1,1-Dichloroethene		Tetrachloroethene
	Dibromochloromethane	X	1,1-Dichloroethane		Trichloroethene
X	1,2-Dichlorobenzene	X	Cis-1,2-dichloroethene		Vinyl chloride
X	1,3-Dichlorobenzene	X	Trans-1,2-dichloroethene	*	BTEX - 8260A - UST
X	1,4-Dichlorobenzene	X	1,2-Dichloroethane		Benzene
X	Dichlorodifluoromethane	X	Chloroform		Toluene
	1,1-Dichloroethane	X	2-Butanone		Ethyl benzene
	1,2-Dichloroethane	X	1,1,1-Trichloroethane		o-Xylene
	1,1-Dichloroethene	X	Carbon tetrachloride		m-Xylene
	Cis-1,2-dichloroethene	X	Vinyl acetate		p-Xylene
	Trans-1,2-dichloroethene	X	Bromodichloromethane		Methyl t-butyl ether
	1,2-Dichloropropane	X	1,2-Dichloropropane		Diisopropyl ether
	Cis-1,3-dichloropropene	X	Cis-1,3-dichloropropane	*	TPH by GC
	Trans-1,2-dichloroethene	X	Trichloroethene		Gasoline Range Organics
	Methylene chloride	X	Dibromochloromethane		Diesel Range Organics
	1,1,2,2-Tetrachloroethane	X	1,1,2-Trichloroethane	*	TPH by IR (418.1)
	Tetrachloroethene	X	Benzene		418.1 - Waste Oil
	1,1,1-Trichloroethane	X	Trans-1,3-dichloropropene	*	Other
	1,1,2-Trichloroethane	X	Bromoform		
	Trichloroethene	X	4-Methyl-2-pentanone		
X	Trichlorofluoromethane	X	2-Hexanone		
	Vinyl chloride	X	Tetrachloroethene		
	Benzene	X	Toluene		
	Ethylbenzene	X	1,1,2,2-Tetrachloroethane		
	Toluene	X	Chlorobenzene		
	o-Xylene	X	Ethyl benzene		
	m-Xylene	X	Styrene		
	p-Xylene	X	o-Xylene		
		X	m-Xylene		
		X	p-Xylene		

Laboratory Number

Branch Lab Number

Chain of Custody and Supplemental Information

Only one chain of custody form is required per sample set or point (if all collected at the same time)

1. Collected by W. L. B.
   Date 08-26-98 Time 14:30
   Delivered to KNOXVILLE STATE LAB
   Date 8-27-98 Time 10:00
2. Received by
   Date Time
   Delivered to
   Date Time
3. Received by
   Date Time
   Delivered to
   Date Time
4. Received in Lab by [signature]
   Date 8-27-98 Time 10:00
   Logged in by
   Date Time

Additional Information

1. Approximate volume of sample 200 ml
2. Nearest town or city KNOXVILLE
3. Others present at collection
4. Number of other samples collected at same time at this point THREE
5. Field collection procedure, handling and/or preservation of this sample ACCORDING TO U.S. EPA PROCEEDURES AND PROTOCOLS.
6. Mode of transportation to lab ON ICE IN AN ICE CHEST, IN A STATE VEHICLE.
7. Sample sealed by
8. Date sample sealed
9. Remarks

PH-3013 (rev 1/96)

RDA 1527

SEP 30 1998

Project/Site No.:	47-559	Lab Number:	9808257-02H
Project Name:	SMOKEY MOUNTAIN SMELTERS	Matrix:	WATER
Description:	SMS-GW-02/MARY KNOX WELL	Received:	08/27/89 10:00:00 By FMM
Station No.:	SMS-GW-02	Sampling Agency:	HWM_11_KFO
Collected:	08/26/98 14:30:00 By WLB	Priority:	
Qty:	47		

TEST	RESULT	*ERROR	UNITS	ANALYZED	BY	METHOD
GAMMA RADIONUCLIDES						R.6
Pb-214	74.1	5.5	pCi/L	08/31/98	AK	
Bi-214	83.7	5.7	pCi/L	08/31/98	AK	
GROSS ALPHA & BETA						R.1.1
GROSS ALPHA	0.4	1.7	pCi/L	09/08/98	AK	
GROSS BETA	1.8	2.3	pCi/L	09/08/98	AK	

*--Represents +/- error value

Printed: September 10, 1998

State of T essee - Environmental Laboratories

Radiochemical Analysis

PLEASE PRINT LEGIBLY

PROJECT/SITE NO. 47-559	PROJECT NAME SMOKEY MTN. SMELTERS
STATION NUMBER SMS-GW-02	COUNTY KNOX
DESCRIPTION MARY KNOX WELL	
STREAM MILE	DEPTH
COLLECTED: DATE 08-26-98	TIME 14:30
PICK-UP DATE:	
CONTACT HAZARD UNKNOWN	mR/hr Reading
SAMPLER'S NAME (printed) WM. LEE BARRON	
SAMPLING AGENCY TDSF	BILLING CODE 327.38.11
IF PRIORITY, DATE NEEDED 09-30-98	
SEND REPORT TO: BURL H. MAUPIN, TDSF, KNOXVILLE ENVIRONMENTAL ASSISTANCE CENTER	

Laboratory Number

Date Received

Time Received By

Sample Type

___Air ___Milk ___Swipe
X Water ___Tissue ___Liquid
___Sludge ___Soil ___Solid
___Vegetation ___Sediment

Other_____

Field Comments:

Air Samples
Volume _____
Total Hours _____

___Sample Filtration
___Sample Acidification
___Send to RESL

Chain of Custody and Supplemental Information

Only one chain of custody form is required per sample set or point (if all collected at the same time)

1. Collected by W. L. B.
   Date 08-26-98 Time 14:30
   Delivered to KNOXVILLE STATE LAB
   Date 8-27-98 Time 10:00
2. Collected by
   Date Time
   Delivered to
   Date Time
3. Collected by
   Date Time
   Delivered to
   Date Time
4. Received in Lab by [illegible]
   Date 8-27-98 Time 10:00
   Logged in by
   Date Time

REQUESTED ANALYSES:

X	GROSS ALPHA (TOTAL)		STRONTIUM 89
	GROSS ALPHA (SUSPENDED)		STRONTIUM 90
	GROSS ALPHA (DISSOLVED)		TRITIUM (H-3)
X	GROSS BETA (TOTAL)		THORIUM (TOTAL)
	GROSS BETA (SUSPENDED)		URANIUM (TOTAL)
	GROSS BETA (DISSOLVED)	X	GAMMA RADIONUCLIDES
			ADDITIONAL ANALYSES:

Additional Information

1. Approximate volume of sample 1 gal
2. Nearest town or city KNOXVILLE
3. Others present at collection
4. Number of other samples collected at same time at this point THREE
5. Field collection procedure, handling and/or preservation of this sample ACCORDING TO U.S. EPA PROCEDURES AND PROTOCOLS.
6. Mode of transportation to lab ON ICE, IN AN ICE CHEST, IN A STATE VEHICLE.
7. Sample sealed by
8. Date sample sealed
9. Remarks

" Laboratory Forms - Surface Water Samples "

TDH/Division of Laboratory Services (DLS). 1998. "Laboratory Reports, Requests, and Chain-of-Custody Forms - Surface Water Samples". Tennessee Department of Health/Division of Laboratory Services.

SMOKEY MOUNTAIN SMELTERS
KNOXVILLE, TENNESSEE 37920
U.S. EPA # TN0002318277
TSDF #47-559

Project/Site No.:	47-559	Lab Number:	9808275-01
Project Name:	SMOKEY MTN SMELTERS	Matrix:	WATER
Description:	SMS-SW-01/BACKGROUND S. W.	Received:	08/31/98 14:15:00 By LAB
Station No.:	SMS-SW-01	Sampling Agency:	HWM_11_KFO
Collected:	08/31/98 10:25:00 By BHM	Priority:	9_30_98
County:	47		

TEST	RESULT	UNITS	LIMIT	ANALYZED	BY	METHOD
AMMONIA	U	mg/l	0.02	09/08/98	SAL	A.18.1
CYANIDE	U	mg/l	0.02	09/14/98	LKS	A.9
FLUORIDE	U	mg/l	0.1	09/03/98	SDS	A.11.1
NITRATE NITROGEN	1.14	mg/l	0.01	09/08/98	SAL	
NITRITE NITROGEN	U	mg/l	0.01	09/01/98	SDS	A.18.7
NO3 & NO2 NITROGEN	1.14	mg/l	0.01	09/08/98	SAL	A.18.4
SULFATE	4	mg/l	2	09/02/98	FMM	A.26
ALUMINUM	U	ug/l	100	09/30/98	JAH	
ANTIMONY	U	ug/l	3	10/14/98	JAH	
ARSENIC	U	ug/l	1	09/11/98	EAM	
BARIUM	U	ug/l	100	09/30/98	JAH	
BERYLLIUM	U	ug/l	1	09/21/98	EAM	EPA 200.9
CADMIUM	U	ug/l	1	09/09/98	EAM	EPA 200.9
CALCIUM	67.0	mg/l	0.03	09/10/98	JAH	
CHROMIUM	U	ug/l	1	09/10/98	EAM	EPA 200.9
COBALT	U	ug/l	5	09/04/98	JAH	
COPPER	U	ug/l	1	09/10/98	EAM	EPA 200.9
DIGESTION-METALS	COMPLETED	COMPLETED		09/03/98	DEL	
IRON	U	ug/l	25	09/04/98	JAH	
LEAD	U	ug/l	1	09/09/98	EAM	EPA 200.9
MAGNESIUM	4.40	mg/l	0.02	09/10/98	JAH	
MANGANESE	U	ug/l	5	09/04/98	JAH	
MERCURY	U	ug/l	0.2	09/08/98	ATB	EPA 245.1

Project/Site No.: 47-559
Project Name: SMOKEY MTN SMELTERS
Description: SMS-SW-01/BACKGROUND S. W.
Station No.: SMS-SW-01
Collected: 08/31/98 10:25:00 By BHM
County: 47

Lab Number: 9808275-01
Matrix: WATER
Received: 08/31/98 14:15:00 By LAB
Sampling Agency: HWM_11_KFO
Priority: 9_30_98

TEST	RESULT	UNITS	LIMIT	ANALYZED	BY	METHOD
NICKEL	U	ug/l	10	09/04/98	JAH	
POTASSIUM	0.43	mg/l	0.02	09/10/98	JAH	
SELENIUM	U	ug/l	2	09/04/98	EAM	
SILVER	U	ug/l	1	09/08/98	EAM	EPA 200.9
SODIUM	1.92	mg/l	0.10	09/09/98	JAH	
THALLIUM	U	ug/l	2	09/09/98	EAM	
VANADIUM	U	ug/l	1	09/14/98	EAM	
ZINC	U	ug/l	1	09/04/98	JAH	

State of Tennessee - Environmental Laboratories

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Inorganic Analysis

PROJECT/SITE NO. 47559	PROJECT NAME Smky Mtn Smelters
STATION NUMBER SM3-SW-01	COUNTY Knox
DESCRIPTION background surface water	
STREAM MILE	DEPTH / MATRIX Water
COLLECTED: DATE 8-31-98	TIME 10:25
SAMPLER'S NAME(printed) Burl H. Maupin	
SAMPLING AGENCY DSF	BILLING CODE 3273811
IF PRIORITY, DATE NEEDED 9-30-98	
SEND REPORT TO: KEAC	
CONTACT HAZARD unknown	

*	Metals
X	aluminum, Al
X	antimony, Sb
X	arsenic, As
X	barium, Ba
X	beryllium, Be
X	cadmium, Cd
X	calcium, Ca
X	chromium, Cr
X	cobalt, Co
X	copper, Cu
X	iron, Fe
X	lead, Pb
X	magnesium, Mg
X	manganese, Mn
X	mercury, Hg
X	nickel, Ni
X	potassium, K
X	selenium, Se
X	silver, Ag
X	sodium, Na
X	thallium, Tl
X	vanadium, V
X	zinc, Zn

*	Env. Microbiology	*	General Inorganics		Gen. Inorganics (con't)
	coliform, fecal*		acidity as $CaCO_3$*		oil and grease
	coliform, total*		alkalinity as $CaCO_3$*		orthophosphate, total*
	strep, fecal*		alkalinity, phen. as $CaCO_3$*		oxygen, dissolved*
			BOD, 5-day*		pH
			CBOD, 5-day*		phenols, total
			boron		phosphate, total
*	Ambient Parameters		chloride*		residue, dissolved*
	COD*		chlorine, residual*		residue, settleable*
	coliform, fecal		chromium, hexavalent		residue, suspended*
	conductivity*		COD*		residue, total*
	hardness, total as $CaCO_3$*		color, apparent*		silica*
	nitrogen, ammonia		color, true*	X	sulfate*
	nitrogen, NO_3 & NO_2		conductivity*		sulfide, total*
	nitrogen, total Kjeldahl	X	cyanide		TOC*
	phosphate, total		flash point*		turbidity*
	pH	X	fluoride*		percent solids
	residue, dissolved*		hardness, Ca as $CaCO_3$*	*	Other
	residue, suspended*		hardness, total as $CaCO_3$*		
	arsenic, As		hydrocarbons, total		
	cadmium, Cd		MBAS*		
	chromium, Cr	X	nitrogen, ammonia		
	copper, Cu	X	nitrogen, nitrate*		
	lead, Pb	X	nitrogen, nitrite*		
	mercury, Hg		nitrogen, NO_3 & NO_2		
	nickel, Ni		nitrogen, total Kjeldahl		
	zinc, Zn		nitrogen, total organic		

*	TCLP
	arsenic, As
	barium, Ba
	cadmium, Cd
	chromium, Cr
	lead, Pb
	mercury, Hg
	nickel, Ni
	selenium, Se
	silver, Ag

*** denotes analyses performed only on water**

FIELD DETERMINATIONS	Temperature
pH	Chlorine, residual
Conductivity	Other
Dissolved Oxygen	

Laboratory Number

Branch Lab Number

Chain of Custody and Supplemental Information

Only one chain of custody form is required per sample set or point (if all collected at the same time)

1. Collected by BHM
   Date 8-31-98 Time 10:25
   Delivered to KBL
   Date 8-31-98 Time 2:15
2. Received by
   Date Time
   Delivered to
   Date Time
3. Received by
   Date Time
   Delivered to
   Date Time
4. Received in Lab by [signature]
   Date 8-31-98 Time 1415
   Logged in by
   Date Time

Additional Information

1. Approximate volume of sample 4000 ml
2. Nearest town or city Knoxville
3. Others present at collection Beth Walker
4. Number of other samples collected at same time at this point 3
5. Field collection procedure, handling and/or preservation of this sample
   EPA procedures and protocol
6. Mode of transportation to lab
   State vehicle, in cooler, on ice
7. Sample sealed by
8. Date sample sealed
9. Remarks

Project/Site No.: 47-559
Project Name: SMOKEY MTN SMELTERS
Description: SMS-SW-01/BACKGROUND S. W.
Station No.: SMS-SW-01
Collected: 08/31/98 10:25:00 By BHM
nty: 47

Lab Number: 9808275-01G
Matrix: WATER
Received: 08/31/98 14:15:00 By LAB
Sampling Agency: HWM_11_KFO
Priority: 9_30_98

OCT 1 9 1998

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
B/N/A EXTR+PESTS,PCBS-H2O						MS+ECD
BUTYL BENZYL PHTHALATE	U	PPB	1.0	09/28/98	MAC	
BIS(2-ETHYLHEXYL)PHTHALATE	B,J 0.48	PPB	0.50	09/28/98	MAC	
DI-n-BUTYL PHTHALATE	U	PPB	1.0	09/28/98	MAC	
DI-n-OCTYL PHTHALATE	U	PPB	2.0	09/28/98	MAC	
DIETHYL PHTHALATE	B 0.56	PPB	-	09/28/98	MAC	
DIMETHYL PHTHALATE	U	PPB	0.50	09/28/98	MAC	
n-NITROSODIMETHYLAMINE	U	PPB	2.0	09/28/98	MAC	
n-NITROSODIPHENYLAMINE	U	PPB	1.0	09/28/98	MAC	
n-NITROSO-di-n-PROPYLAMINE	U	PPB	1.0	09/28/98	MAC	
ISOPHORONE	U	PPB	0.50	09/28/98	MAC	
NITROBENZENE	U	PPB	1.0	09/28/98	MAC	
2,4-DINITROTOLUENE	U	PPB	2.0	09/28/98	MAC	
2,6-DINITROTOLUENE	U	PPB	2.0	09/28/98	MAC	
ACENAPTHENE	U	PPB	0.50	09/28/98	MAC	
ACENAPHTHYLENE	U	PPB	0.50	09/28/98	MAC	
ANTHRACENE	U	PPB	0.50	09/28/98	MAC	
BENZO(a)ANTHRACENE	U	PPB	0.50	09/28/98	MAC	
BENZO(a)PYRENE	U	PPB	0.50	09/28/98	MAC	
BENZO(b)FLUORANTHENE	U	PPB	0.50	09/28/98	MAC	
BENZO(ghi)PERYLENE	U	PPB	2.0	09/28/98	MAC	
BENZO(k)FLUORANTHENE	U	PPB	0.50	09/28/98	MAC	
DIBENZO(a,h)ANTHRACENE	U	PPB	2.0	09/28/98	MAC	
FLUORANTHENE	U	PPB	0.50	09/28/98	MAC	
FLUORENE	U	PPB	0.50	09/28/98	MAC	
INDENO(1,2,3-cd)PYRENE	U	PPB	2.0	09/28/98	MAC	
NAPHTHALENE	2.25	PPB	-	09/28/98	MAC	
PHENANTHRENE	U	PPB	0.50	09/28/98	MAC	
PYRENE	U	PPB	0.50	09/28/98	MAC	
CHRYSENE	U	PPB	0.50	09/28/98	MAC	
BIS(2-CHLOROETHYL)ETHER	U	PPB	1.0	09/28/98	MAC	
BIS(2-CHLOROETHOXY)METHANE	U	PPB	0.50	09/28/98	MAC	
BIS(2-CHLOROISOPROPYL)ETHER	U	PPB	2.0	09/28/98	MAC	
4-BROMOPHENYLPHENYL ETHER	U	PPB	2.0	09/28/98	MAC	
4-CHLOROPHENYLPHENYL ETHER	U	PPB	1.0	09/28/98	MAC	
HEXACHLOROCYCLOPENTADIENE	U	PPB	5.0	09/28/98	MAC	
HEXACHLOROBUTADIENE	U	PPB	1.0	09/28/98	MAC	
HEXACHLOROBENZENE	U	PPB	1.0	09/28/98	MAC	
HEXACHLOROETHANE	U	PPB	1.0	09/28/98	MAC	
1,2,4-TRICHLOROBENZENE	U	PPB	1.0	09/28/98	MAC	
2-CHLORONAPHTHALENE	U	PPB	0.50	09/28/98	MAC	
4-CHLORO-3-METHYLPHENOL	U	PPB	1.0	09/28/98	MAC	
2-CHLOROPHENOL	U	PPB	0.50	09/28/98	MAC	
2,4-DICHLOROPHENOL	U	PPB	1.0	09/28/98	MAC	
2,4-DIMETHYLPHENOL	U	PPB	1.0	09/28/98	MAC	
2,4-DINITROPHENOL	U	PPB	10	09/28/98	MAC	
2-METHYL-4,6-DINITROPHENOL	U	PPB	5.0	09/28/98	MAC	
2-NITROPHENOL	U	PPB	2.0	09/28/98	MAC	
4-NITROPHENOL	U	PPB	5.0	09/28/98	MAC	
PENTACHLOROPHENOL	U	PPB	2.0	09/28/98	MAC	
PHENOL	U	PPB	0.50	09/28/98	MAC	
2,4,6-TRICHLOROPHENOL	U	PPB	1.0	09/28/98	MAC	
2,4,5-TRICHLOROPHENOL	U	PPB	1.0	09/28/98	MAC	
O-CRESOL	U	PPB	1.0	09/28/98	MAC	
M- & P-CRESOL	U	PPB	0.50	09/28/98	MAC	
2-METHYLNAPHTHALENE	U	PPB	0.50	09/28/98	MAC	
BENZOIC ACID	U	PPB	2.0	09/28/98	MAC	
BENZYL ALCOHOL	U	PPB	2.0	09/28/98	MAC	
4-CHLOROANILINE	U	PPB	1.0	09/28/98	MAC	
DIBENZOFURAN	U	PPB	0.50	09/28/98	MAC	
3,3-DICHLOROBENZIDINE	U	PPB	2.0	09/28/98	MAC	
2-NITROANILINE	U	PPB	2.0	09/28/98	MAC	
3-NITROANILINE	U	PPB	2.0	09/28/98	MAC	
4-NITROANILINE	U	PPB	5.0	09/28/98	MAC	
HEXACHLOROBENZENE	U	PPB	0.020	09/28/98	MAC	
ALDRIN	U	PPB	0.027	09/28/98	MAC	
alpha-BHC	U	PPB	0.048	09/28/98	MAC	
a-BHC	U	PPB	0.069	09/28/98	MAC	
a-BHC	U	PPB	0.069	09/28/98	MAC	
gamma-BHC (LINDANE)	U	PPB	0.027	09/28/98	MAC	
alpha-CHLORDANE	U	PPB	0.037	09/28/98	MAC	
gamma-CHLORDANE	U	PPB	0.027	09/28/98	MAC	
TECHNICAL CHLORDANE	U	PPB	0.40	09/28/98	MAC	
p,p-DDD	U	PPB	0.049	09/28/98	MAC	

Project/Site No.:	47-559	Lab Number:	9808275-01G
Project Name:	SMOKEY MTN SMELTERS	Matrix:	WATER
Description:	SMS-SW-01/BACKGROUND S. W.	Received:	08/31/98 14:15:00 By LAB
Station No.:	SMS-SW-01	Sampling Agency:	HWM_11_KFO
Collected:	08/31/98 10:25:00 By BHM	Priority:	9_30_98
County:	47		

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
B/N/A EXTR+PESTS,PCBS-H2O						MS+ECD
p,p-DDE	U	PPB	0.043	09/28/98	MAC	
p,p-DDT	U	PPB	0.046	09/28/98	MAC	
DIELDRIN	U	PPB	0.028	09/28/98	MAC	
ENDOSULFAN I	U	PPB	0.044	09/28/98	MAC	
ENDOSULFAN II	U	PPB	0.050	09/28/98	MAC	
ENDOSULFAN SULFATE	U	PPB	0.050	09/28/98	MAC	
ENDRIN	U	PPB	0.050	09/28/98	MAC	
ENDRIN ALDEHYDE	U	PPB	0.042	09/28/98	MAC	
ENDRIN KETONE	U	PPB	0.051	09/28/98	MAC	
HEPTACHLOR	U	PPB	0.033	09/28/98	MAC	
HEPTACHLOR EPOXIDE	U	PPB	0.035	09/28/98	MAC	
TOXAPHENE	U	PPB	1.4	09/28/98	MAC	
METHOXYCHLOR	U	PPB	0.19	09/28/98	MAC	
PCB 1016/1242	U	PPB	1.0	09/28/98	MAC	
PCB 1221	U	PPB	1.7	09/28/98	MAC	
PCB 1232	U	PPB	1.3	09/28/98	MAC	
PCB 1248	U	PPB	1.3	09/28/98	MAC	
PCB 1254	U	PPB	1.3	09/28/98	MAC	
PCB 1260	U	PPB	1.2	09/28/98	MAC	
PCB 1262	U	PPB	1.2	09/28/98	MAC	

*-Water, uG/L; Sediment, uG/kG

Printed: October 5, 1998

State of Tennessee - Environmental Laboratories
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Organic Analysis
Base/Neutral/Acid Extractables

PROJECT/SITE NO. 47-559 PROJECT NAME Smokey MTN Smelter
STATION NUMBER SMS-SW-01 COUNTY Knox
DESCRIPTION Background Surface Water
STREAM MILE DEPTH MATRIX Water
COLLECTED: DATE 8/31/98 TIME 10:25
SAMPLER'S NAME(printed) Burl Maupin
SAMPLING AGENCY TDSF BILLING CODE 327.38.11
IF PRIORITY, DATE NEEDED 09/30/98
SEND REPORT TO: Burl Maupin
CONTACT HAZARD unknown

*	NPDES Extractables	*	NPDES Extractables(con't)	*	TAL Semivolatiles
	butylbenzylphthalate	X	2-chlorophenol	X	dimethylphthalate
	bis(2-ethylhexyl)phthalate		2,4-dichlorophenol	X	4,6-dinitro-2-methylphenol
	di-n-butylphthalate		2,4-dimethylphenol	X	2,4-dinitrophenol
	di-n-octylphthalate		2,4-dinitrophenol	X	2,4-dinitrotoluene
	diethylphthalate		4,6-dinitro-o-cresol	X	2,6-dinitrotoluene
	dimethylphthalate		2-nitrophenol	X	fluoranthene
X	n-nitrosodimethylamine		4-nitrophenol	X	fluorene
	n-nitrosodiphenylamine		pentachlorophenol	X	hexachlorobenzene
	n-nitrosodi-n-propylamine		phenol	X	hexachlorobutadiene
	isophorone		2,4,6-trichlorophenol	X	hexachlorocyclopentadiene
	nitrobenzene	*	TAL Semivolatiles	X	hexachloroethane
	2,4-dinitrotoluene	X	acenaphthene	X	indeno(1,2,3-cd)pyrene
	acenaphthene	X	acenaphthylene	X	isophorone
	acenaphthylene	X	anthracene	X	2-methylnaphthalene
	anthracene	X	benzo(a)anthracene	X	2-methylphenol
	benzo(a)anthracene	X	benzo(a)pyrene	X	4-methylphenol
	benzo(a)pyrene	X	benzo(b)fluoranthene	X	n-nitrosodiphenylamine
	benzo(b)fluoranthene	X	benzo(g,h,i)perylene	X	n-nitroso-n-dipropylamine
	benzo(g,h,i)perylene	X	benzo(k)fluoranthene	X	naphthalene
	benzo(k)fluoranthene	X	benzoic acid	X	2-nitroaniline
	chrysene	X	benzyl alcohol	X	3-nitroaniline
	dibenzo(a,h)anthracene	X	bis(2-chloroethoxy)methane	X	4-nitroaniline
	fluoranthene	X	bis(2-chloroethyl) ether	X	nitrobenzene
	fluorene	X	bis(2-chloroisopropyl)ether	X	2-nitrophenol
	indeno(1,2,3-c,d)pyrene	X	bis(2-ethylhexyl)phthalate	X	4-nitrophenol
	naphthalene	X	4-bromophenylphenylether	X	pentachlorophenol
	phenanthrene	X	butylbenzylphthalate	X	phenanthrene
	pyrene	X	4-chloroaniline	X	phenol
	bis(2-chloroethyl)ether	X	4-chloro-3-methyl phenol	X	pyrene
	bis(2-chloroethoxy)methane	X	2-chloronaphthalene	X	1,2,4-trichlorobenzene
	bis(2-chloroisopropyl)ether	X	4-chlorophenylphenylether	X	2,4,5-trichlorophenol
	4-bromophenylphenylether	X	chrysene	X	2,4,6-trichlorophenol
	4-chlorophenylphenylether	X	di-n-butylphthalate	*	Nitrobodies
	hexachlorocyclopentadiene	X	di-n-octylphthalate		RDX
	hexachlorobutadiene	X	dibenzo(a,h)anthracene		2,4,6-TNT
	hexachlorobenzene	X	dibenzofuran		2,4-dinitrotoluene
	hexachloroethane	X	3,3'-dichlorobenzidine		2,6-dinitrotoluene
	1,2,4-trichlorobenzene	X	2,4-dichlorophenol		nitrobenzene
	2-chloronaphthalene	X	diethylphthalate		1,3,5-TNB
	4-chloro-3-methyl phenol	X	2,4-dimethylphenol		

*	TCLP Semivolatiles
	chlordane
	o-cresol
	m-cresol
	p-cresol
	cresol
	2,4-D
	2,4-dinitrotoluene
	endrin
	heptachlor
	heptachlor epoxide
	hexachlorobenzene
	hexachlorobutadiene
	hexachloroethane
	lindane
	methoxychlor
	nitrobenzene
	pentachlorophenol
	pyridine
	toxaphene
	2,4,5-trichlorophenol
	2,4,6-trichlorophenol
	2,4,5-TP (Silvex)
*	Pesticides/PCBs
X	aldrin
X	alpha-BHC
X	beta-BHC
X	delta-BHC
X	gamma-BHC (lindane)
X	technical chlordane
X	alpha-chlordane
X	gamma-chlordane
X	4,4'-DDD
X	4,4'-DDE
X	4,4'-DDT
X	dieldrin
X	endosulfan I
X	endosulfan II
X	endosulfan sulfate
X	endrin
X	endrin aldehyde
X	endrin ketone
X	heptachlor
X	heptachlor epoxide
X	toxaphene
X	methoxychlor
X	PCB 1016/1242
X	PCB 1221
X	PCB 1232
X	PCB 1248
X	PCB 1254
X	PCB 1260
X	PCB 1262

Laboratory Number

Branch Lab Number

Chain of Custody and Supplemental Information

Only one chain of custody form is required per sample set or point (if all collected at the same time)

1. Collected by BHM J-BHM
   Date 8/31/98 Time 10:25
   Delivered to Knox LAB
   Date 8/31/98 Time 2:15
2. Received by
   Date Time
   Delivered to
   Date Time
3. Received by
   Date Time
   Delivered to
   Date Time
4. Received in Lab by [illegible]
   Date 8-31-98 Time 14:15
   Logged in by
   Date Time

Additional Information

1. Approximate volume of sample 1 gal
2. Nearest town or city Knoxville
3. Others present at collection no
4. Number of other samples collected at same time at this point 3
5. Field collection procedure, handling and/or preservation of this sample According to EPA procedures
6. Mode of transportation to lab in cooler on ice in state vehicle
7. Sample sealed by
8. Date sample sealed
9. Remarks

SEP 1 : 199

Project/Site No.: 47-559
Project Name: SMOKEY MTN SMELTERS
Site Description: SMS-SW-01/BACKGROUND S. W.
Station No.: SMS-SW-01
Collected: 08/31/98 10:25:00 By BHM
County: 47

Lab Number: 9808275-01F
Matrix: WATER
Received: 08/31/98 14:15:00 By LAB
Sampling Agency: HWM_11_KFO.
Priority: 9_30_98

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
VOLATILES-TAL WATERS						8260A
ACETONE	U	PPB	5.0	09/03/98	HMG	
BENZENE	U	PPB	0.50	09/03/98	HMG	
BROMODICHLOROMETHANE	U	PPB	0.50	09/03/98	HMG	
BROMOFORM	U	PPB	0.50	09/03/98	HMG	
BROMOMETHANE	U	PPB	1.0	09/03/98	HMG	
2-BUTANONE (MEK)	U	PPB	5.0	09/03/98	HMG	
CARBON DISULFIDE	U	PPB	1.0	09/03/98	HMG	
CARBON TETRACHLORIDE	U	PPB	0.50	09/03/98	HMG	
VINYL ACETATE	U	PPB	1.0	09/03/98	HMG	
CHLOROBENZENE	U	PPB	0.50	09/03/98	HMG	
CHLOROETHANE	U	PPB	1.0	09/03/98	HMG	
CHLOROFORM	U	PPB	0.50	09/03/98	HMG	
CHLOROMETHANE	U	PPB	1.0	09/03/98	HMG	
DIBROMOCHLOROMETHANE	U	PPB	0.50	09/03/98	HMG	
1,2-DICHLOROBENZENE	U	PPB	0.50	09/03/98	HMG	
1,3-DICHLOROBENZENE	U	PPB	0.50	09/03/98	HMG	
1,4-DICHLOROBENZENE	U	PPB	0.50	09/03/98	HMG	
DICHLORODIFLUOROMETHANE	U	PPB	1.0	09/03/98	HMG	
1,1-DICHLOROETHANE	U	PPB	0.50	09/03/98	HMG	
1,2-DICHLOROETHANE	U	PPB	0.50	09/03/98	HMG	
1,1-DICHLOROETHENE	U	PPB	0.50	09/03/98	HMG	
CIS-1,2-DICHLOROETHENE	U	PPB	0.50	09/03/98	HMG	
TRANS-1,2-DICHLOROETHENE	U	PPB	0.50	09/03/98	HMG	
1,2-DICHLOROPROPANE	U	PPB	0.50	09/03/98	HMG	
CIS-1,3-DICHLOROPROPENE	U	PPB	0.50	09/03/98	HMG	
TRANS-1,3-DICHLOROPROPENE	U	PPB	0.50	09/03/98	HMG	
ETHYLBENZENE	U	PPB	0.50	09/03/98	HMG	
METHYLENE CHLORIDE	B 6.9	PPB	0.50	09/03/98	HMG	
4-METHYL-2-PENTANONE (MIBK)	U	PPB	5.0	09/03/98	HMG	
STYRENE	U	PPB	0.50	09/03/98	HMG	
2-HEXANONE	U	PPB	1.0	09/03/98	HMG	
1,1,2,2-TETRACHLOROETHANE	U	PPB	0.50	09/03/98	HMG	
TETRACHLOROETHENE	U	PPB	0.50	09/03/98	HMG	
TOLUENE	U	PPB	0.50	09/03/98	HMG	
1,1,1-TRICHLOROETHANE	U	PPB	0.50	09/03/98	HMG	
1,1,2-TRICHLOROETHANE	U	PPB	0.50	09/03/98	HMG	
TRICHLOROETHENE	J 0.4	PPB	0.50	09/03/98	HMG	
TRICHLOROFLUOROMETHANE	U	PPB	1.0	09/03/98	HMG	
VINYL CHLORIDE	U	PPB	1.0	09/03/98	HMG	
o-XYLENE	U	PPB	0.50	09/03/98	HMG	
m & p XYLENE	U	PPB	0.50	09/03/98	HMG	

*-Water, uG/L; Sediment, uG/kG

Printed: September 8, 1998

State of Tennessee - Environmental Laboratories

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Organic Analysis

Volatiles and Petroleum Hydrocarbons

PROJECT/SITE NO.	47-559	PROJECT NAME	SMOKEY MOUNTAIN SMELTERS
STATION NUMBER	SMS-SW-01	COUNTY	KNOX
DESCRIPTION	NEAR MT. OLIVE ROAD		
STREAM MILE		DEPTH	MATRIX WATER
COLLECTED: DATE	8/31 /98	TIME	
SAMPLER'S NAME(printed)	Burl H. Maupin		
SAMPLING AGENCY	DIVISION OF SUPERFUND	BILLING CODE	327.38-11
IF PRIORITY, DATE NEEDED	SEPTEMBER 30		
SEND REPORT TO:	KNOXVILLE ENVIRONMENTAL ASSISSTANCE CENTER		
	BURL H. MAUPIN		
CONTACT HAZARD	UNKNOWN		

*	NPDES Volatiles - 624	*	TAL Volatiles - 8260A	*	TCLP Volatiles
	Bromoform	O	Chloromethane		Benzene
	Bromodichloromethane	O	Bromomethane		Carbon tetrachloride
	Carbon Tetrachloride	O	Vinyl chloride		Chlorobenzene
	Chlorobenzene	O	Chloroethane		Chloroform
	Chloroethane	O	Methylene chloride		1,2-Dichloroethane
O	2-Chloroethylvinyl ether	O	Acetone		1,1-Dichloroethane
	Chloroform	O	Carbon disulfide		Methyl ethyl ketone
	Chloromethane	O	1,1-Dichloroethene		Tetrachloroethene
	Dibromochloromethane	O	1,1-Dichloroethane		Trichloroethene
O	1,2-Dichlorobenzene	O	Cis-1,2-dichloroethene		Vinyl chloride
O	1,3-Dichlorobenzene	O	Trans-1,2-dichloroethene	*	BTEX - 8260A - UST
O	1,4-Dichlorobenzene	O	1,2-Dichloroethane		Benzene
O	Dichlorodifluoromethane	O	Chloroform		Toluene
	1,1-Dichloroethane	O	2-Butanone		Ethyl benzene
	1,2-Dichloroethane	O	1,1,1-Trichloroethane		o-Xylene
	1,1-Dichloroethene	O	Carbon tetrachloride		m-Xylene
	Cis-1,2-dichloroethene	O	Vinyl acetate		p-Xylene
	Trans-1,2-dichloroethene	O	Bromodichloromethane		Methyl t-butyl ether
	1,2-Dichloropropane	O	1,2-Dichloropropane		Diisopropyl ether
	Cis-1,3-dichloropropene	O	Cis-1,3-dichloropropane	*	TPH by GC
	Trans-1,2-dichloroethene	O	Trichloroethene		Gasoline Range Organics
	Methylene chloride	O	Dibromochloromethane		Diesel Range Organics
	1,1,2,2-Tetrachloroethane	O	1,1,2-Trichloroethane	*	TPH by IR (418.1)
	Tetrachloroethene	O	Benzene		418.1 - Waste Oil
	1,1,1-Trichloroethane	O	Trans-1,3-dichloropropene	*	Other
	1,1,2-Trichloroethane	O	Bromoform		
	Trichloroethene	O	4-Methyl-2-pentanone		
	Trichlorofluoromethane	O	2-Hexanone		
O	Vinyl chloride	O	Tetrachloroethene		
	Benzene	O	Toluene		
	Ethylbenzene	O	1,1,2,2-Tetrachloroethane		
	Toluene	O	Chlorobenzene		
	o-Xylene	O	Ethyl benzene		
	m-Xylene	O	Styrene		
	p-Xylene	O	o-Xylene		
		O	m-Xylene		
		O	p-Xylene		

Laboratory Number

Branch Lab Number

Chain of Custody and Supplemental Information

Only one chain of custody form is required per sample set or point (if all collected at the same time)

1. Collected by BHM
   Date 8/31 /98 Time 10:25
   Delivered to ~~Knoxville Basin Laboratory~~
   Date 8/31 /98 Time
2. Received by
   Date Time
   Delivered to
   Date Time
3. Received by
   Date Time
   Delivered to
   Date Time
4. Received in Lab by [illegible]
   Date 8-31-98 Time 14:15
   Logged in by
   Date Time

Additional Information

1. Approximate volume of sample
   ~~160 ML~~
2. Nearest town or city
   ~~KNOXVILLE~~
3. Others present at collection
   Beth Walker
4. Number of other samples collected at same time at this point
   ~~One other sample each for INORGANICS, RADIOCHEMICAL, AND EXTRACTABLE ORGANICS were collected for a total of three other samples.~~
5. Field collection procedure, handling and/or preservation of this sample
   according to EPA procedures and protocol
6. Mode of transportation to lab
   In State vehicle, in cooler, and on ice
7. Sample sealed by
8. Date sample sealed
9. Remarks

Project/Site No.:	47-559	Lab Number:	9808275-01H
Project Name:	SMOKEY MTN SMELTERS	Matrix:	WATER
Description:	SMS-SW-01/BACKGROUND S. W.	Received:	08/31/98 14:15:00 By LAB
Station No.:	SMS-SW-01	Sampling Agency:	HWM_11_KFO
Collected:	08/31/98 10:25:00 By BHM	Priority:	9_30_98
nty:	47		

SEP 30 1998

TEST	RESULT	*ERROR	UNITS	ANALYZED	BY	METHOD
GAMMA RADIONUCLIDES						R.6
Pb-214	76.1	5.5	pCi/L	09/03/98	AK	
Bi-214	90.9	6.4	pCi/L	09/03/98	AK	
GROSS ALPHA & BETA						R.1.1
GROSS ALPHA	1.0	1.6	pCi/L	09/08/98	AK	
GROSS BETA	-0.4	2.1	pCi/L	09/08/98	AK	

*--Represents +/- error value

Printed: September 10, 1998

SEP 30 1998

Project/Site No.:	47-559	Lab Number:	9808275-07A
Project Name:	SMOKEY MTN SMELTERS	Matrix:	WATER
Description:	SMS-SW-01/BACKGROUND DUP	Received:	08/31/98 14:15:00 By JWB
Station No.:		Sampling Agency:	HWM_11_KFO
Collected:	08/31/98 10:25:00 By BHM	Priority:	9_30_98
Quantity:	47		

TEST	RESULT	*ERROR	UNITS	ANALYZED	BY	METHOD
GROSS ALPHA & BETA						R.1.1
GROSS ALPHA	0	1.4	pCi/L	09/08/98	AK	
GROSS BETA	-1.7	2.0	pCi/L	09/08/98	AK	

*--Represents +/- error value

Printed: September 10, 1998

State of Tennessee - Environmental Laboratories

Radiochemical Analysis

PLEASE PRINT LEGIBLY

PROJECT/SITE NO. 47-559	PROJECT NAME Smokey Mountain Smelters
STATION NUMBER SMS-SW-01	COUNTY
DESCRIPTION Background Surface Water	
STREAM MILE	DEPTH
COLLECTED: DATE 8/31/98	TIME 10:25
PICK-UP DATE:	
CONTACT HAZARD UNKNOWN	mR/hr Reading 0.01
SAMPLER'S NAME (printed) Burl Maupin	
SAMPLING AGENCY TDSF	BILLING CODE 327, 38, 11
IF PRIORITY, DATE NEEDED 09/30/98	
SEND REPORT TO: Burl Maupin	
KEAC - Superfund	

Laboratory Number

Date Received

Time Received By

Sample Type

___Air ___Milk ___Swipe
X Water ___Tissue ___Liquid
___Sludge ___Soil ___Solid
___Vegetation ___Sediment

Other_____

Field Comments:

Air Samples
Volume _____
Total Hours _____

___Sample Filtration
___Sample Acidification
___Send to RESL

Chain of Custody and Supplemental Information

Only one chain of custody form is required per sample set or point (if all collected at the same time)

1. Collected by BHM & BHW
   Date 8/31/98 Time 10:25
   Delivered to KNOX LAB
   Date 8/31/98 Time 2:15
2. Collected by
   Date Time
   Delivered to
   Date Time
3. Collected by
   Date Time
   Delivered to
   Date Time
4. Received in Lab by [signature]
   Date 8-31-98 Time 14:15
   Logged in by
   Date Time

REQUESTED ANALYSES:

X	GROSS ALPHA (TOTAL)		STRONTIUM 89
	GROSS ALPHA (SUSPENDED)		STRONTIUM 90
	GROSS ALPHA (DISSOLVED)		TRITIUM (H-3)
X	GROSS BETA (TOTAL)		THORIUM (TOTAL)
	GROSS BETA (SUSPENDED)		URANIUM (TOTAL)
	GROSS BETA (DISSOLVED)	X	GAMMA RADIONUCLIDES
			ADDITIONAL ANALYSES:

Additional Information

1. Approximate volume of sample 16 oz
2. Nearest town or city Knoxville
3. Others present at collection No
4. Number of other samples collected at same time at this point 3
5. Field collection procedure, handling and/or preservation of this sample
   According to EPA procedures
6. Mode of transportation to lab TN Cooler on ice, in State vehicle
7. Sample sealed by
8. Date sample sealed
9. Remarks

PH-3009 (rev 2/98)

RDA 1527

Project/Site No.: 47-559
oject Name: SMOKEY MOUNTAIN SMELTERS
escription: SMS-SW-02/ON-SITE LAGOON
Station No.: SMS-SW-02
Collected: 08/25/98 12:42:00 By BHM
County: 47

Lab Number: 9808248-04
Matrix: WATER
Received: 08/26/98 10:00:00 By PMB
Sampling Agency: HWM_11_KFO
Priority:

TEST	RESULT	UNITS	LIMIT	ANALYZED	BY	METHOD
AMMONIA	28.1	mg/l	0.02	09/08/98	SAL	A.18.1
CYANIDE	U	mg/l	0.02	09/02/98	LKS	A.9
FLUORIDE	105	mg/l	0.1	09/03/98	SDS	A.11.1
NITRATE NITROGEN	U	mg/l	0.01	09/08/98	SAL	
NITRITE NITROGEN	15.28	mg/l	0.01	08/27/98	SDS	A.18.7
NO3 & NO2 NITROGEN	13.6	mg/l	0.01	09/08/98	SAL	A.18.4
SULFATE	52	mg/l	2	08/27/98	FMM	A.26
ALUMINUM	2160	ug/l	100	09/30/98	JAH	
ANTIMONY	U	ug/l	3	10/14/98	JAH	
ARSENIC	5	ug/l	1	09/01/98	EAM	
BARIUM	U	ug/l	100	09/30/98	JAH	
BERYLLIUM	U	ug/l	1	09/21/98	EAM	EPA 200.9
CADMIUM	1	ug/l	1	09/03/98	EAM	EPA 200.9
CALCIUM	39.1	mg/l	0.03	09/10/98	JAH	
CHROMIUM	U	ug/l	1	10/08/98	EAM	EPA 200.9
COBALT	U	ug/l	5	09/01/98	JAH	
COPPER	82	ug/l	5	09/02/98	JAH	EPA 200.9
DIGESTION-METALS	COMPLETED	COMPLETED		08/31/98	DEL	
IRON	352	ug/l	25	09/01/98	JAH	
LEAD	4	ug/l	1	09/02/98	EAM	EPA 200.9
MAGNESIUM	4.21	mg/l	0.02	09/10/98	JAH	
MANGANESE	406	ug/l	5	09/01/98	JAH	
MERCURY	U	ug/l	0.2	08/31/98	ATB	EPA 245.1

Project/Site No.: 47-559
Project Name: SMOKEY MOUNTAIN SMELTERS
Description: SMS-SW-02/ON-SITE LAGOON
Station No.: SMS-SW-02
Collected: 08/25/98 12:42:00 By BHM
County: 47

Lab Number: 9808248-04
Matrix: WATER
Received: 08/26/98 10:00:00 By PMB
Sampling Agency: HWM_11_KFO
Priority:

TEST	RESULT	UNITS	LIMIT	ANALYZED	BY	METHOD
NICKEL	U	ug/l	10	09/01/98	JAH	
POTASSIUM	99.9	mg/l	0.02	09/10/98	JAH	
SELENIUM	U	ug/l	2	09/04/98	EAM	
SILVER	U	ug/l	1	09/02/98	EAM	EPA 200.9
SODIUM	416	mg/l	0.10	09/09/98	JAH	
THALLIUM	U	ug/l	2	09/01/98	EAM	
VANADIUM	3	ug/l	1	09/14/98	EAM	
ZINC	63	ug/l	1	09/01/98	JAH	

State of Tennessee - Environmental Laboratories
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Inorganic Analysis

PROJECT/SITE NO. 47-559	PROJECT NAME Smokey Mountain Smelters
STATION NUMBER SMS-SW-02	COUNTY Knox
DESCRIPTION on-site lagoon	
STREAM MILE	DEPTH / MATRIX water
COLLECTED: DATE August 25, 1998	TIME 12:42
SAMPLER'S NAME(printed) Burl H. Maupin	
SAMPLING AGENCY Division of Superfund	BILLING CODE 327.38-1
IF PRIORITY, DATE NEEDED September 25, 1998	
SEND REPORT TO: Knoxville Environmental Assisstance Center	
Burl H. Maupin	
CONTACT HAZARD metals, radiochemical, unknown	

*	Metals
x	aluminum, Al
x	antimony, Sb
x	arsenic, As
x	barium, Ba
x	beryllium, Be
x	cadmium, Cd
x	calcium, Ca
x	chromium, Cr
x	cobalt, Co
x	copper, Cu
x	iron, Fe
x	lead, Pb
x	magnesium, Mg
x	manganese, Mn
x	mercury, Hg
x	nickel, Ni
x	potassium, K
x	selenium, Se
x	silver, Ag
x	sodium, Na
x	thallium, Tl
x	vanadium, V
x	zinc, Zn

*	Env. Microbiology	*	General Inorganics		Gen. Inorganics (con't)
	coliform, fecal*		acidity as $CaCO_3$*		oil and grease
	coliform, total*		alkalinity as $CaCO_3$*		orthophosphate, total*
	strep, fecal*		alkalinity, phen. as $CaCO_3$*		oxygen, dissolved*
			BOD, 5-day*		pH
			CBOD, 5-day*		phenols, total
			boron		phosphate, total
*	**Ambient Parameters**		chloride*		residue, dissolved*
	COD*		chlorine, residual*		residue, settleable*
	coliform, fecal		chromium, hexavalent		residue, suspended*
	conductivity*		COD*		residue, total*
	hardness, total as $CaCO_3$*		color, apparent*		silica*
	nitrogen, ammonia		color, true*	x	sulfate*
	nitrogen, NO_3 & NO_2		conductivity*		sulfide, total*
	nitrogen, total Kjeldahl	x	cyanide		TOC*
	phosphate, total		flash point*		turbidity*
	pH	x	fluoride*		percent solids
	residue, dissolved*		hardness, Ca as $CaCO_3$*	*	**Other**
	residue, suspended*		hardness, total as $CaCO_3$*		
	arsenic, As		hydrocarbons, total		
	cadmium, Cd		MBAS*		
	chromium, Cr	x	nitrogen, ammonia		
	copper, Cu	x	nitrogen, nitrate*		
	lead, Pb	x	nitrogen, nitrite*		
	mercury, Hg		nitrogen, NO_3 & NO_2		
	nickel, Ni		nitrogen, total Kjeldahl		
	zinc, Zn		nitrogen, total organic		

*	TCLP
	arsenic, As
	barium, Ba
	cadmium, Cd
	chromium, Cr
	lead, Pb
	mercury, Hg
	nickel, Ni
	selenium, Se
	silver, Ag

** denotes analyses performed only on water*

FIELD DETERMINATIONS	Temperature
pH	Chlorine, residual
Conductivity	Other
Dissolved Oxygen	

Laboratory Number

Branch Lab Number

Chain of Custody and Supplemental Information

Only one chain of custody form is required per sample set or point (if all collected at the same time)

1. Collected by Burl H. Maupin
   Date August 25, 1998 Time 12:42
   Delivered to Knoxville Basin Laboratory
   Date August 26, 1998 Time 10:00
2. Received by
   Date Time
   Delivered to
   Date Time
3. Received by
   Date Time
   Delivered to
   Date Time
4. Received in Lab by F Baker
   Date 8/26/98 Time 1000
   Logged in by
   Date Time

Additional Information

1. Approximate volume of sample: 4000 ml
2. Nearest town or city: Knoxville
3. Others present at collection: Burl H. Maupin, Lee Barron TVA 8-27-98
4. Number of other samples collected at same time at this point: 3
5. Field collection procedure, handling and/or preservation of this sample: According to standard operating procedure
6. Mode of transportation to lab: State vehicle; on ice
7. Sample sealed by
8. Date sample sealed
9. Remarks

PH-3011 (rev 1/96)

RDA 1527

OCT 13 1998

Project/Site No.: 47-559
Project Name: SMOKEY MOUNTAIN SMELTERS
Description: SMS-SW-02/ON-SITE LAGOON
Station No.: SMS-SW-02
Collected: 08/25/98 12:42:00 By BHM
nty: 47

Lab Number: 9808248-04G
Matrix: WATER
Received: 08/26/98 10:00:00 By PMB
Sampling Agency: HWM_11_KFO
Priority:

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
B/N/A EXTR+PESTS,PCBS-H2O						MS+ECD
BUTYL BENZYL PHTHALATE	U	PPB	2.0	09/01/98	MAC	
BIS(2-ETHYLHEXYL)PHTHALATE	B 1.90	PPB	-	09/01/98	MAC	
DI-n-BUTYL PHTHALATE	U	PPB	2.0	09/01/98	MAC	
DI-n-OCTYL PHTHALATE	U	PPB	4.0	09/01/98	MAC	
DIETHYL PHTHALATE	U	PPB	1.0	09/01/98	MAC	
DIMETHYL PHTHALATE	U	PPB	1.0	09/01/98	MAC	
n-NITROSODIMETHYLAMINE	U	PPB	4.0	09/01/98	MAC	
n-NITROSODIPHENYLAMINE	U	PPB	2.0	09/01/98	MAC	
n-NITROSO-di-n-PROPYLAMINE	U	PPB	2.0	09/01/98	MAC	
ISOPHORONE	U	PPB	1.0	09/01/98	MAC	
NITROBENZENE	U	PPB	2.0	09/01/98	MAC	
2,4-DINITROTOLUENE	U	PPB	4.0	09/01/98	MAC	
2,6-DINITROTOLUENE	U	PPB	4.0	09/01/98	MAC	
ACENAPTHENE	U	PPB	1.0	09/01/98	MAC	
ACENAPHTHYLENE	U	PPB	1.0	09/01/98	MAC	
ANTHRACENE	U	PPB	1.0	09/01/98	MAC	
BENZO(a)ANTHRACENE	U	PPB	1.0	09/01/98	MAC	
BENZO(a)PYRENE	U	PPB	1.0	09/01/98	MAC	
BENZO(b)FLUORANTHENE	U	PPB	1.0	09/01/98	MAC	
BENZO(ghi)PERYLENE	U	PPB	4.0	09/01/98	MAC	
BENZO(k)FLUORANTHENE	U	PPB	1.0	09/01/98	MAC	
DIBENZO(a,h)ANTHRACENE	U	PPB	4.0	09/01/98	MAC	
FLUORANTHENE	U	PPB	1.0	09/01/98	MAC	
FLUORENE	U	PPB	1.0	09/01/98	MAC	
INDENO(1,2,3-cd)PYRENE	U	PPB	4.0	09/01/98	MAC	
NAPHTHALENE	U	PPB	1.0	09/01/98	MAC	
PHENANTHRENE	U	PPB	1.0	09/01/98	MAC	
PYRENE	U	PPB	1.0	09/01/98	MAC	
CHRYSENE	U	PPB	1.0	09/01/98	MAC	
BIS(2-CHLOROETHYL)ETHER	U	PPB	2.0	09/01/98	MAC	
BIS(2-CHLOROETHOXY)METHANE	U	PPB	2.0	09/01/98	MAC	
BIS(2-CHLOROISOPROPYL)ETHER	U	PPB	4.0	09/01/98	MAC	
4-BROMOPHENYLPHENYL ETHER	U	PPB	4.0	09/01/98	MAC	
4-CHLOROPHENYLPHENYL ETHER	U	PPB	2.0	09/01/98	MAC	
HEXACHLOROCYCLOPENTADIENE	U	PPB	10	09/01/98	MAC	
HEXACHLOROBUTADIENE	U	PPB	2.0	09/01/98	MAC	
HEXACHLOROBENZENE	U	PPB	2.0	09/01/98	MAC	
HEXACHLOROETHANE	U	PPB	2.0	09/01/98	MAC	
1,2,4-TRICHLOROBENZENE	U	PPB	2.0	09/01/98	MAC	
2-CHLORONAPHTHALENE	U	PPB	1.0	09/01/98	MAC	
4-CHLORO-3-METHYLPHENOL	U	PPB	2.0	09/01/98	MAC	
2-CHLOROPHENOL	U	PPB	2.0	09/01/98	MAC	
2,4-DICHLOROPHENOL	U	PPB	2.0	09/01/98	MAC	
2,4-DIMETHYLPHENOL	U	PPB	2.0	09/01/98	MAC	
2,4-DINITROPHENOL	U	PPB	20	09/01/98	MAC	
2-METHYL-4,6-DINITROPHENOL	U	PPB	10	09/01/98	MAC	
2-NITROPHENOL	U	PPB	4.0	09/01/98	MAC	
4-NITROPHENOL	U	PPB	10	09/01/98	MAC	
PENTACHLOROPHENOL	U	PPB	4.0	09/01/98	MAC	
PHENOL	U	PPB	2.0	09/01/98	MAC	
2,4,6-TRICHLOROPHENOL	U	PPB	2.0	09/01/98	MAC	
2,4,5-TRICHLOROPHENOL	U	PPB	2.0	09/01/98	MAC	
O-CRESOL	U	PPB	2.0	09/01/98	MAC	
M- & P-CRESOL	U	PPB	2.0	09/01/98	MAC	
2-METHYLNAPHTHALENE	U	PPB	1.0	09/01/98	MAC	
BENZOIC ACID	U	PPB	10	09/01/98	MAC	
BENZYL ALCOHOL	U	PPB	4.0	09/01/98	MAC	
4-CHLOROANILINE	U	PPB	2.0	09/01/98	MAC	
DIBENZOFURAN	U	PPB	1.0	09/01/98	MAC	
3,3-DICHLOROBENZIDINE	U	PPB	4.0	09/01/98	MAC	
2-NITROANILINE	U	PPB	4.0	09/01/98	MAC	
3-NITROANILINE	U	PPB	4.0	09/01/98	MAC	
4-NITROANILINE	U	PPB	10	09/01/98	MAC	
HEXACHLOROBENZENE	U	PPB	0.020	09/01/98	MAC	
ALDRIN	U	PPB	0.027	09/01/98	MAC	
alpha-BHC	U	PPB	0.048	09/01/98	MAC	
·a-BHC	U	PPB	0.069	09/01/98	MAC	
a-BHC	U	PPB	0.069	09/01/98	MAC	
..nma-BHC (LINDANE)	U	PPB	0.027	09/01/98	MAC	
alpha-CHLORDANE	U	PPB	0.037	09/01/98	MAC	
gamma-CHLORDANE	U	PPB	0.027	09/01/98	MAC	
TECHNICAL CHLORDANE	U	PPB	0.40	09/01/98	MAC	
p,p-DDD	U	PPB	0.049	09/01/98	MAC	

OCT 13 1998

Project/Site No.: 47-559
Project Name: SMOKEY MOUNTAIN SMELTERS
Description: SMS-SW-02/ON-SITE LAGOON
Station No.: SMS-SW-02
Collected: 08/25/98 12:42:00 By BHM
unty: 47

Lab Number: 9808248-04G
Matrix: WATER
Received: 08/26/98 10:00:00 By PMB
Sampling Agency: HWM_11_KFO
Priority:

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
B/N/A EXTR+PESTS,PCBS-H2O						MS+ECD
p,p-DDE	U	PPB	0.043	09/01/98	MAC	
p,p-DDT	U	PPB	0.046	09/01/98	MAC	
DIELDRIN	U	PPB	0.028	09/01/98	MAC	
ENDOSULFAN I	U	PPB	0.044	09/01/98	MAC	
ENDOSULFAN II	U	PPB	0.050	09/01/98	MAC	
ENDOSULFAN SULFATE	U	PPB	0.050	09/01/98	MAC	
ENDRIN	U	PPB	0.050	09/01/98	MAC	
ENDRIN ALDEHYDE	U	PPB	0.042	09/01/98	MAC	
ENDRIN KETONE	U	PPB	0.051	09/01/98	MAC	
HEPTACHLOR	U	PPB	0.033	09/01/98	MAC	
HEPTACHLOR EPOXIDE	U	PPB	0.035	09/01/98	MAC	
TOXAPHENE	U	PPB	1.4	09/01/98	MAC	
METHOXYCHLOR	U	PPB	0.19	09/01/98	MAC	
PCB 1016/1242	U	PPB	1.0	09/01/98	MAC	
PCB 1221	U	PPB	1.7	09/01/98	MAC	
PCB 1232	U	PPB	1.3	09/01/98	MAC	
PCB 1248	U	PPB	1.3	09/01/98	MAC	
PCB 1254	U	PPB	1.3	09/01/98	MAC	
PCB 1260	U	PPB	1.2	09/01/98	MAC	
PCB 1262	U	PPB	1.2	09/01/98	MAC	

*-Water, uG/L; Sediment, uG/kG

Printed: October 5, 1998

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Organic Analysis
Base/Neutral/Acid Extractables

PROJECT/SITE NO. 47-559	PROJECT NAME Smky Mtn Smelters
STATION NUMBER SMS-SW-02	COUNTY Knox
DESCRIPTION on-site lagoon	
STREAM MILE	DEPTH MATRIX water
COLLECTED: DATE 8-25-98	TIME 12:42p
SAMPLER'S NAME(printed) Burl Maupin	
SAMPLING AGENCY DSF	BILLING CODE 3273811
IF PRIORITY, DATE NEEDED 9-25-98	
SEND REPORT TO: KEAC	
CONTACT HAZARD metals, radionuclides, [illegible]	

*	NPDES Extractables	*	NPDES Extractables(con't)	*	TAL Semivolatiles
	butylbenzylphthalate	X	2-chlorophenol	X	dimethylphthalate
	bis(2-ethylhexyl)phthalate		2,4-dichlorophenol	X	4,6-dinitro-2-methylphenol
	di-n-butylphthalate		2,4-dimethylphenol	X	2,4-dinitrophenol
	di-n-octylphthalate		2,4-dinitrophenol	X	2,4-dinitrotoluene
	diethylphthalate		4,6-dinitro-o-cresol	X	2,6-dinitrotoluene
	dimethylphthalate		2-nitrophenol	X	fluoranthene
X	n-nitrosodimethylamine		4-nitrophenol	X	fluorene
	n-nitrosodiphenylamine		pentachlorophenol	X	hexachlorobenzene
	n-nitrosodi-n-propylamine		phenol	X	hexachlorobutadiene
	isophorone		2,4,6-trichlorophenol	X	hexachlorocyclopentadiene
	nitrobenzene	*	TAL Semivolatiles	X	hexachloroethane
	2,4-dinitrotoluene	X	acenaphthene	X	indeno(1,2,3-cd)pyrene
	acenaphthene	X	acenaphthylene	X	isophorone
	acenaphthylene	X	anthracene	X	2-methylnaphthalene
	anthracene	X	benzo(a)anthracene	X	2-methylphenol
	benzo(a)anthracene	X	benzo(a)pyrene	X	4-methylphenol
	benzo(a)pyrene	X	benzo(b)fluoranthene	X	n-nitrosodiphenylamine
	benzo(b)fluoranthene	X	benzo(g,h,i)perylene	X	n-nitroso-n-dipropylamine
	benzo(g,h,i)perylene	X	benzo(k)fluoranthene	X	naphthalene
	benzo(k)fluoranthene	X	benzoic acid	X	2-nitroaniline
	chrysene	X	benzyl alcohol	X	3-nitroaniline
	dibenzo(a,h)anthracene	X	bis(2-chloroethoxy)methane	X	4-nitroaniline
	fluoranthene	X	bis(2-chloroethyl) ether	X	nitrobenzene
	fluorene	X	bis(2-chloroisopropyl)ether	X	2-nitrophenol
	indeno(1,2,3-c,d)pyrene	X	bis(2-ethylhexyl)phthalate	X	4-nitrophenol
	naphthalene	X	4-bromophenylphenylether	X	pentachlorophenol
	phenanthrene	X	butylbenzylphthalate	X	phenanthrene
	pyrene	X	4-chloroaniline	X	phenol
	bis(2-chloroethyl)ether	X	4-chloro-3-methyl phenol	X	pyrene
	bis(2-chloroethoxy)methane	X	2-chloronaphthalene	X	1,2,4-trichlorobenzene
	bis(2-chloroisopropyl)ether	X	4-chlorophenylphenylether	X	2,4,5-trichlorophenol
	4-bromophenylphenylether	X	chrysene	X	2,4,6-trichlorophenol
	4-chlorophenylphenylether	X	di-n-butylphthalate	*	Nitrobodies
	hexachlorocyclopentadiene	X	di-n-octylphthalate		RDX
	hexachlorobutadiene	X	dibenzo(a,h)anthracene		2,4,6-TNT
	hexachlorobenzene	X	dibenzofuran		2,4-dinitrotoluene
	hexachloroethane	X	3,3'-dichlorobenzidine		2,6-dinitrotoluene
	1,2,4-trichlorobenzene	X	2,4-dichlorophenol		nitrobenzene
	2-chloronaphthalene	X	diethylphthalate		1,3,5-TNB
	4-chloro-3-methyl phenol	X	2,4-dimethylphenol		

*	TCLP Semivolatiles	*	Pesticides/PCBs
	chlordane	X	aldrin
	o-cresol	X	alpha-BHC
	m-cresol	X	beta-BHC
	p-cresol	X	delta-BHC
	cresol	X	gamma-BHC (lindane)
	2,4-D	X	technical chlordane
	2,4-dinitrotoluene	X	alpha-chlordane
	endrin	X	gamma-chlordane
	heptachlor	X	4,4'-DDD
	heptachlor epoxide	X	4,4'-DDE
	hexachlorobenzene	X	4,4'-DDT
	hexachlorobutadiene	X	dieldrin
	hexachloroethane	X	endosulfan I
	lindane	X	endosulfan II
	methoxychlor	X	endosulfan sulfate
	nitrobenzene	X	endrin
	pentachlorophenol	X	endrin aldehyde
	pyridine	X	endrin ketone
	toxaphene	X	heptachlor
	2,4,5-trichlorophenol	X	heptachlor epoxide
	2,4,6-trichlorophenol	X	toxaphene
	2,4,5-TP (Silvex)	X	methoxychlor
		X	PCB 1016/1242
		X	PCB 1221
		X	PCB 1232
		X	PCB 1248
		X	PCB 1254
		X	PCB 1260
		X	PCB 1262

Laboratory Number

Branch Lab Number

Chain of Custody and Supplemental Information

Only one chain of custody form is required per sample set or point (if all collected at the same time)

1. Collected by BHM
   Date 8-25-98 Time 12:42p
   Delivered to KBL
   Date 8-26-98 Time 10:00
2. Received by
   Date Time
   Delivered to
   Date Time
3. Received by
   Date Time
   Delivered to
   Date Time
4. Received in Lab by [illegible]
   Date 8/26/98 Time 1000
   Logged in by
   Date Time

Additional Information

1. Approximate volume of sample 1 gallon
2. Nearest town or city Knoxville
3. Others present at collection Lee Boerner
4. Number of other samples collected at same time at this point 3
5. Field collection procedure, handling and/or preservation of this sample according to EPA procedures and protocol
6. Mode of transportation to lab in State vehicle in coolers on ice
7. Sample sealed by
8. Date sample sealed
9. Remarks

SEP 08 1998

Project/Site No.: 47-559
Project Name: SMOKEY MOUNTAIN SMELTERS
Site Description: SMS-SW-02/ON-SITE LAGOON
Station No.: SMS-SW-02
lected: 08/25/98 12:42:00 By BHM
nty: 47

Lab Number: 9808248-04F
Matrix: WATER
Received: 08/26/98 10:00:00 By PMB
Sampling Agency: HWM_11_KFO
Priority:

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
VOLATILES-TAL WATERS						8260A
ACETONE	U	PPB	5.0	08/31/98	HMG	
BENZENE	U	PPB	0.50	08/31/98	HMG	
BROMODICHLOROMETHANE	U	PPB	0.50	08/31/98	HMG	
BROMOFORM	U	PPB	0.50	08/31/98	HMG	
BROMOMETHANE	U	PPB	1.0	08/31/98	HMG	
2-BUTANONE (MEK)	U	PPB	5.0	08/31/98	HMG	
CARBON DISULFIDE	U	PPB	1.0	08/31/98	HMG	
CARBON TETRACHLORIDE	U	PPB	0.50	08/31/98	HMG	
VINYL ACETATE	U	PPB	1.0	08/31/98	HMG	
CHLOROBENZENE	U	PPB	0.50	08/31/98	HMG	
CHLOROETHANE	U	PPB	1.0	08/31/98	HMG	
CHLOROFORM	U	PPB	0.50	08/31/98	HMG	
CHLOROMETHANE	J 0.5	PPB	1.0	08/31/98	HMG	
DIBROMOCHLOROMETHANE	U	PPB	0.50	08/31/98	HMG	
1,2-DICHLOROBENZENE	U	PPB	0.50	08/31/98	HMG	
1,3-DICHLOROBENZENE	U	PPB	0.50	08/31/98	HMG	
1,4-DICHLOROBENZENE	U	PPB	0.50	08/31/98	HMG	
DICHLORODIFLUOROMETHANE	U	PPB	1.0	08/31/98	HMG	
1,1-DICHLOROETHANE	U	PPB	0.50	08/31/98	HMG	
1,2-DICHLOROETHANE	U	PPB	0.50	08/31/98	HMG	
1,1-DICHLOROETHENE	U	PPB	0.50	08/31/98	HMG	
CIS-1,2-DICHLOROETHENE	U	PPB	0.50	08/31/98	HMG	
TRANS-1,2-DICHLOROETHENE	U	PPB	0.50	08/31/98	HMG	
1,2-DICHLOROPROPANE	U	PPB	0.50	08/31/98	HMG	
CIS-1,3-DICHLOROPROPENE	U	PPB	0.50	08/31/98	HMG	
TRANS-1,3-DICHLOROPROPENE	U	PPB	0.50	08/31/98	HMG	
ETHYLBENZENE	U	PPB	0.50	08/31/98	HMG	
METHYLENE CHLORIDE	B 3.4	PPB	0.50	08/31/98	HMG	
4-METHYL-2-PENTANONE (MIBK)	U	PPB	5.0	08/31/98	HMG	
STYRENE	U	PPB	0.50	08/31/98	HMG	
2-HEXANONE	U	PPB	1.0	08/31/98	HMG	
1,1,2,2-TETRACHLOROETHANE	U	PPB	0.50	08/31/98	HMG	
TETRACHLOROETHENE	U	PPB	0.50	08/31/98	HMG	
TOLUENE	U	PPB	0.50	08/31/98	HMG	
1,1,1-TRICHLOROETHANE	U	PPB	0.50	08/31/98	HMG	
1,1,2-TRICHLOROETHANE	U	PPB	0.50	08/31/98	HMG	
TRICHLOROETHENE	U	PPB	0.50	08/31/98	HMG	
TRICHLOROFLUOROMETHANE	U	PPB	1.0	08/31/98	HMG	
VINYL CHLORIDE	U	PPB	1.0	08/31/98	HMG	
o-XYLENE	U	PPB	0.50	08/31/98	HMG	
m & p XYLENE	U	PPB	0.50	08/31/98	HMG	

*-Water, uG/L; Sediment, uG/kG

Printed: September 4, 1998

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Organic Analysis

Volatiles and Petroleum Hydrocarbons

PROJECT/SITE NO.	47-559	PROJECT NAME	SMOKEY MOUNTAIN SMELTERS
STATION NUMBER	SMS-SW-02	COUNTY	KNOX
DESCRIPTION	ON-SITE LAGOON		
STREAM MILE		DEPTH	MATRIX WATER
COLLECTED: DATE	AUGUST 25, 1998	TIME	12:42
SAMPLER'S NAME(printed)	BURL H. MAUPIN		
SAMPLING AGENCY	DIVISION OF SUPERFUND	BILLING CODE	327.38-11
IF PRIORITY, DATE NEEDED	SEPTEMBER 25		
SEND REPORT TO:	KNOXVILLE ENVIRONMENTAL ASSISSTANCE CENTER BURL H. MAUPIN		
CONTACT HAZARD	METALS, RADIOCHEMICAL, UNKNOWN		

*	NPDES Volatiles - 624	*	TAL Volatiles - 8260A	*	TCLP Volatiles
	Bromoform		Chloromethane		Benzene
	Bromodichloromethane		Bromomethane		Carbon tetrachloride
	Carbon Tetrachloride		Vinyl chloride		Chlorobenzene
	Chlorobenzene		Chloroethane		Chloroform
	Chloroethane		Methylene chloride		1,2-Dichloroethane
	2-Chloroethylvinyl ether		Acetone		1,1-Dichloroethane
	Chloroform		Carbon disulfide		Methyl ethyl ketone
	Chloromethane		1,1-Dichloroethene		Tetrachloroethene
	Dibromochloromethane		1,1-Dichloroethane		Trichloroethene
	1,2-Dichlorobenzene		Cis-1,2-dichloroethene		Vinyl chloride
	1,3-Dichlorobenzene		Trans-1,2-dichloroethene	*	BTEX - 8260A - UST
	1,4-Dichlorobenzene		1,2-Dichloroethane		Benzene
	Dichlorodifluoromethane		Chloroform		Toluene
	1,1-Dichloroethane		2-Butanone		Ethyl benzene
	1,2-Dichloroethane		1,1,1-Trichloroethane		o-Xylene
	1,1-Dichloroethene		Carbon tetrachloride		m-Xylene
	Cis-1,2-dichloroethene		Vinyl acetate		p-Xylene
	Trans-1,2-dichloroethene		Bromodichloromethane		Methyl t-butyl ether
	1,2-Dichloropropane		1,2-Dichloropropane		Diisopropyl ether
	Cis-1,3-dichloropropene		Cis-1,3-dichloropropane	*	TPH by GC
	Trans-1,2-dichloroethene		Trichloroethene		Gasoline Range Organics
	Methylene chloride		Dibromochloromethane		Diesel Range Organics
	1,1,2,2-Tetrachloroethane		1,1,2-Trichloroethane	*	TPH by IR (418.1)
	Tetrachloroethene		Benzene		418.1 - Waste Oil
	1,1,1-Trichloroethane		Trans-1,3-dichloropropene	*	Other
	1,1,2-Trichloroethane		Bromoform		
	Trichloroethene		4-Methyl-2-pentanone		
	Trichlorofluoromethane		2-Hexanone		
	Vinyl chloride		Tetrachloroethene		
	Benzene		Toluene		
	Ethylbenzene		1,1,2,2-Tetrachloroethane		
	Toluene		Chlorobenzene		
	o-Xylene		Ethyl benzene		
	m-Xylene		Styrene		
	p-Xylene		o-Xylene		
			m-Xylene		
			p-Xylene		

Laboratory Number

Branch Lab Number

Chain of Custody and Supplemental Information

Only one chain of custody form is required per sample set or point (if all collected at the same time)

1. Collected by BURL H. MAUPIN
   Date AUGUST 25, 1998 Time 12:42
   Delivered to Knoxville Basin Laboratory
   Date 8-26-98 Time 10:00
2. Received by
   Date Time
   Delivered to
   Date Time
3. Received by
   Date Time
   Delivered to
   Date Time
4. Received in Lab by [illegible]
   Date 8/26/98 Time 1200
   Logged in by
   Date Time

Additional Information

1. Approximate volume of sample 200ML
2. Nearest town or city KNOXVILLE
3. Others present at collection LEE BARRON
4. Number of other samples collected at same time at this point One other sample each for INORGANICS, RADIOCHEMICAL, AND EXTRACTABLE ORGANICS were collected for a total of three other samples.
5. Field collection procedure, handling and/or preservation of this sample according to EPA procedures and protocol
6. Mode of transportation to lab in State vehicle, in cooler, and on ice
7. Sample sealed by
8. Date sample sealed
9. Remarks

SEP 30 1998

Project/Site No.:	47-559	Lab Number:	9808248-04H
Project Name:	SMOKEY MOUNTAIN SMELTERS	Matrix:	WATER
Description:	SMS-SW-02/ON-SITE LAGOON	Received:	08/26/98 10:00:00 By PMB
Station No.:	SMS-SW-02	Sampling Agency:	HWM_11_KFO
lected:	08/25/98 12:42:00 By BHM	Priority:	
nty:	47		

TEST	RESULT	*ERROR	UNITS	ANALYZED	BY	METHOD
GAMMA RADIONUCLIDES						R.6
K-40	741	45	pCi/L	08/31/98	AK	
Bi-214	19.2	3.7	pCi/L	08/31/98	AK	
GROSS ALPHA & BETA						R.1.1
GROSS ALPHA	-13	44	pCi/L	09/08/98	AK	
GROSS BETA	296	69	pCi/L	09/08/98	AK	

*--Represents +/- error value

Printed: September 10, 1998

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Radiochemical Analysis

PROJECT/SITE NO. 47559	PROJECT NAME Smokey Mtn. Smelters
STATION NUMBER SMS-SW-02	COUNTY Knox
DESCRIPTION On-Site Lagoon	
STREAM MILE	DEPTH
COLLECTED: DATE 8-25-98	TIME 12:42p
PICK-UP DATE:	
CONTACT HAZARD metals, radiochemical	mR/hr Reading < 0.1
SAMPLER'S NAME (printed) Burl Maupin	
SAMPLING AGENCY DSF	BILLING CODE 3273811
IF PRIORITY, DATE NEEDED 9-25-98	
SEND REPORT TO: KEAC	

Laboratory Number

Date Received

Time Received By

Sample Type

- ___Air
- ✓Water
- ___Sludge
- ___Vegetation
- ___Milk
- ___Tissue
- ___Soil
- ___Sediment
- ___Swipe
- ___Liquid
- ___Solid

Other ___

Field Comments:

Air Samples

Volume ___

Total Hours ___

___Sample Filtration

___Sample Acidification

___Send to RESL

Chain of Custody and Supplemental Information

Only one chain of custody form is required per sample set or point (if all collected at the same time)

1. Collected by BHM
   Date 8-25-98 Time 12:42
   Delivered to KBL
   Date 8-26-98 Time 10:00
2. Collected by
   Date Time
   Delivered to
   Date Time
3. Collected by
   Date Time
   Delivered to
   Date Time
4. Received in Lab by, [illegible]
   Date 8/26/98 Time 1000
   Logged in by
   Date Time

REQUESTED ANALYSES:

✓	GROSS ALPHA (TOTAL)		STRONTIUM 89
	GROSS ALPHA (SUSPENDED)		STRONTIUM 90
	GROSS ALPHA (DISSOLVED)		TRITIUM (H-3)
✓	GROSS BETA (TOTAL)		THORIUM (TOTAL)
	GROSS BETA (SUSPENDED)		URANIUM (TOTAL)
	GROSS BETA (DISSOLVED)	✓	GAMMA RADIONUCLIDES
			ADDITIONAL ANALYSES:

Additional Information

1. Approximate volume of sample 1 gallon
2. Nearest town or city Knoxville
3. Others present at collection Lee Barron
4. Number of other samples collected at same time at this point 3
5. Field collection procedure, handling and/or preservation of this sample according to EPA procedures and protocol
6. Mode of transportation to lab in State vehicle, in cooler, on ice
7. Sample sealed by
8. Date sample sealed
9. Remarks

Project/Site No.: 47-559
oject Name: SMOKEY MOUNTAIN SMELTERS
escription: SMS-SW-03/DOWNSTREAM-RIMM.
Station No.: SMS-SW-03
Collected: 08/25/98 10:40:00 By BHM
County: 47

Lab Number: 9808248-05
Matrix: WATER
Received: 08/26/98 10:00:00 By PMB
Sampling Agency: HWM_11_KFO
Priority:

TEST	RESULT	UNITS	LIMIT	ANALYZED	BY	METHOD
AMMONIA	192	mg/l	0.02	09/15/98	SAL	A.18.1
CYANIDE	U	mg/l	0.02	09/02/98	LKS	A.9
FLUORIDE	30.7	mg/l	0.1	09/03/98	SDS	A.11.1
NITRATE NITROGEN	U	mg/l	0.01	09/08/98	SAL	
NITRITE NITROGEN	2.22	mg/l	0.01	08/27/98	SDS	A.18.7
NO3 & NO2 NITROGEN	0.91	mg/l	0.01	09/02/98	SAL	A.18.4
SULFATE	120	mg/l	2	08/27/98	FMM	A.26
ALUMINUM	365	ug/l	100	09/30/98	JAH	
ANTIMONY	16	ug/l	3	10/14/98	JAH	
ARSENIC	U	ug/l	20	09/09/98	CS	200.7/6010
BARIUM	U	ug/l	100	09/30/98	JAH	
BERYLLIUM	U	ug/l	1	09/09/98	CS	200.7/6010
CADMIUM	U	ug/l	1	09/09/98	CS	200.7/6010
CALCIUM	18.9	mg/l	0.03	09/10/98	JAH	
CHROMIUM	1	ug/l	1	09/09/98	CS	200.7/6010
COBALT	U	ug/l	2	09/09/98	CS	200.7/6010
COPPER	120	ug/l	1	09/09/98	CS	200.7/6010
DIGESTION-METALS	COMPLETED	COMPLETED		08/31/98	DEL	
IRON	206	ug/l	25	09/09/98	CS	200.7/6010
LEAD	U	ug/l	3	09/09/98	CS	200.7/6010
MAGNESIUM	U	mg/l	0.02	09/10/98	JAH	
MANGANESE	364	ug/l	5	09/09/98	CS	200.7/6010
MERCURY	U	ug/l	0.2	08/31/98	ATB	EPA 245.1

Project/Site No.: 47-559
oject Name: SMOKEY MOUNTAIN SMELTERS
scription: SMS-SW-03/DOWNSTREAM-RIMM.
Station No.: SMS-SW-03
Collected: 08/25/98 10:40:00 By BHM
County: 47

Lab Number: 9808248-05
Matrix: WATER
Received: 08/26/98 10:00:00 By PMB
Sampling Agency: HWM_11_KFO
Priority:

TEST	RESULT	UNITS	LIMIT	ANALYZED	BY	METHOD
NICKEL	U	ug/l	10	09/09/98	CS	200.7/6010
POTASSIUM	505	mg/l	0.02	09/10/98	JAH	
SELENIUM	U	ug/l	20	09/09/98	CS	200.7/6010
SILVER	U	ug/l	1	09/02/98	EAM	EPA 200.9
SODIUM	10400	mg/l	0.10	09/09/98	JAH	
THALLIUM	U	ug/l	10	09/09/98	CS	200.7/6010
VANADIUM	U	ug/l	2	09/09/98	CS	200.7/6010
ZINC	17	ug/l	1	09/09/98	CS	200.7/6010

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Inorganic Analysis

PROJECT/SITE NO.	47-559	PROJECT NAME	Smokey Mountain Smelters
STATION NUMBER	SMS-SW-03	COUNTY	Knox
DESCRIPTION	downstream at Kimmer		
STREAM MILE		DEPTH	MATRIX water
COLLECTED: DATE	August 25, 1998	TIME	10:40
SAMPLER'S NAME(printed)	Burl H. Maupin		
SAMPLING AGENCY	Division of Superfund	BILLING CODE	327.38-11
IF PRIORITY, DATE NEEDED	September 25, 1998		
SEND REPORT TO:	Knoxville Environmental Assisstance Center		
	Burl H. Maupin		
CONTACT HAZARD	metals, radiochemical, unknown		

*	Metals
x	aluminum, Al
x	antimony, Sb
x	arsenic, As
x	barium, Ba
x	beryllium, Be
x	cadmium, Cd
x	calcium, Ca
x	chromium, Cr
x	cobalt, Co
x	copper, Cu
x	iron, Fe
x	lead, Pb
x	magnesium, Mg
x	manganese, Mn
x	mercury, Hg
x	nickel, Ni
x	potassium, K
x	selenium, Se
x	silver, Ag
x	sodium, Na
x	thallium, Tl
x	vanadium, V
x	zinc, Zn

*	Env. Microbiology	*	General Inorganics		Gen. Inorganics (con't)
	coliform, fecal*		acidity as $CaCO_3$*		oil and grease
	coliform, total*		alkalinity as $CaCO_3$*		orthophosphate, total*
	strep, fecal*		alkalinity, phen. as $CaCO_3$*		oxygen, dissolved*
			BOD, 5-day*		pH
			CBOD, 5-day*		phenols, total
			boron		phosphate, total
*	**Ambient Parameters**		chloride*		residue, dissolved*
	COD*		chlorine, residual*		residue, settleable*
	coliform, fecal		chromium, hexavalent		residue, suspended*
	conductivity*		COD*		residue, total*
	hardness, total as $CaCO_3$*		color, apparent*		silica*
	nitrogen, ammonia		color, true*	x	sulfate*
	nitrogen, NO_3 & NO_2		conductivity*		sulfide, total*
	nitrogen, total Kjeldahl	X	cyanide		TOC*
	phosphate, total		flash point*		turbidity*
	pH	X	fluoride*		percent solids
	residue, dissolved*		hardness, Ca as $CaCO_3$*	*	**Other**
	residue, suspended*		hardness, total as $CaCO_3$*		
	arsenic, As		hydrocarbons, total		
	cadmium, Cd		MBAS*		
	chromium, Cr	X	nitrogen, ammonia		
	copper, Cu	X	nitrogen, nitrate*		
	lead, Pb	X	nitrogen, nitrite*		
	mercury, Hg		nitrogen, NO_3 & NO_2		
	nickel, Ni		nitrogen, total Kjeldahl		
	zinc, Zn		nitrogen, total organic		

*	TCLP
	arsenic, As
	barium, Ba
	cadmium, Cd
	chromium, Cr
	lead, Pb
	mercury, Hg
	nickel, Ni
	selenium, Se
	silver, Ag

** denotes analyses performed only on water*

FIELD DETERMINATIONS	Temperature
pH	Chlorine, residual
Conductivity	Other
Dissolved Oxygen	

Laboratory Number

Branch Lab Number

Chain of Custody and Supplemental Information

Only one chain of custody form is required per sample set or point (if all collected at the same time)

1. Collected by Burl H. Maupin
   Date August 25, 1998 Time 10:40
   Delivered to Knoxville Basin Laboratory 15:00
   Date August 25, 1998 Time
2. Received by
   Date Time
   Delivered to
   Date Time
3. Received by
   Date Time
   Delivered to
   Date Time
4. Received in Lab by
   Date 8/26/98 Time 10:00
   Logged in by
   Date Time

Additional Information

1. Approximate volume of sample
   4000 ml
2. Nearest town or city Knoxville
3. Others present at collection Burl H. Maupin
4. Number of other samples collected at same time at this point 3
5. Field collection procedure, handling and/or preservation of this sample
   According to standard operating procedure
6. Mode of transportation to lab
   State vehicle; on ice
7. Sample sealed by
8. Date sample sealed
9. Remarks

PH-3011 (rev 1/96)

RDA 1527

OCT 13 1998

Project/Site No.: 47-559
Project Name: SMOKEY MOUNTAIN SMELTERS
Description: SMS-SW-03/DOWNSTREAM-RIMM.
Station No.: SMS-SW-03
Collected: 08/25/98 10:40:00 By BHM
nty: 47

Lab Number: 9808248-05G
Matrix: WATER
Received: 08/26/98 10:00:00 By PMB
Sampling Agency: HWM_11_KFO
Priority:

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
B/N/A EXTR+PESTS,PCBS-H2O						MS+ECD
BUTYL BENZYL PHTHALATE	U	PPB	10	09/01/98	MAC	
BIS(2-ETHYLHEXYL)PHTHALATE	B 9.50	PPB	-	09/01/98	MAC	
DI-n-BUTYL PHTHALATE	U	PPB	10	09/01/98	MAC	
DI-n-OCTYL PHTHALATE	U	PPB	20	09/01/98	MAC	
DIETHYL PHTHALATE	U	PPB	5.0	09/01/98	MAC	
DIMETHYL PHTHALATE	U	PPB	5.0	09/01/98	MAC	
n-NITROSODIMETHYLAMINE	U	PPB	20	09/01/98	MAC	
n-NITROSODIPHENYLAMINE	U	PPB	10	09/01/98	MAC	
n-NITROSO-di-n-PROPYLAMINE	U	PPB	10	09/01/98	MAC	
ISOPHORONE	U	PPB	5.0	09/01/98	MAC	
NITROBENZENE	U	PPB	10	09/01/98	MAC	
2,4-DINITROTOLUENE	U	PPB	20	09/01/98	MAC	
2,6-DINITROTOLUENE	U	PPB	20	09/01/98	MAC	
ACENAPTHENE	U	PPB	5.0	09/01/98	MAC	
ACENAPHTHYLENE	U	PPB	5.0	09/01/98	MAC	
ANTHRACENE	U	PPB	5.0	09/01/98	MAC	
BENZO(a)ANTHRACENE	U	PPB	5.0	09/01/98	MAC	
BENZO(a)PYRENE	U	PPB	5.0	09/01/98	MAC	
BENZO(b)FLUORANTHENE	U	PPB	5.0	09/01/98	MAC	
BENZO(ghi)PERYLENE	U	PPB	20	09/01/98	MAC	
BENZO(k)FLUORANTHENE	U	PPB	5.0	09/01/98	MAC	
DIBENZO(a,h)ANTHRACENE	U	PPB	20	09/01/98	MAC	
FLUORANTHENE	U	PPB	5.0	09/01/98	MAC	
FLUORENE	U	PPB	5.0	09/01/98	MAC	
INDENO(1,2,3-cd)PYRENE	U	PPB	20	09/01/98	MAC	
NAPHTHALENE	U	PPB	5.0	09/01/98	MAC	
PHENANTHRENE	U	PPB	5.0	09/01/98	MAC	
PYRENE	U	PPB	5.0	09/01/98	MAC	
CHRYSENE	U	PPB	5.0	09/01/98	MAC	
BIS(2-CHLOROETHYL)ETHER	U	PPB	10	09/01/98	MAC	
BIS(2-CHLOROETHOXY)METHANE	U	PPB	10	09/01/98	MAC	
BIS(2-CHLOROISOPROPYL)ETHER	U	PPB	20	09/01/98	MAC	
4-BROMOPHENYLPHENYL ETHER	U	PPB	20	09/01/98	MAC	
4-CHLOROPHENYLPHENYL ETHER	U	PPB	10	09/01/98	MAC	
HEXACHLOROCYCLOPENTADIENE	U	PPB	50	09/01/98	MAC	
HEXACHLOROBUTADIENE	U	PPB	10	09/01/98	MAC	
HEXACHLOROBENZENE	U	PPB	10	09/01/98	MAC	
HEXACHLOROETHANE	U	PPB	10	09/01/98	MAC	
1,2,4-TRICHLOROBENZENE	U	PPB	10	09/01/98	MAC	
2-CHLORONAPHTHALENE	U	PPB	5.0	09/01/98	MAC	
4-CHLORO-3-METHYLPHENOL	U	PPB	10	09/01/98	MAC	
2-CHLOROPHENOL	U	PPB	10	09/01/98	MAC	
2,4-DICHLOROPHENOL	U	PPB	10	09/01/98	MAC	
2,4-DIMETHYLPHENOL	U	PPB	10	09/01/98	MAC	
2,4-DINITROPHENOL	U	PPB	100	09/01/98	MAC	
2-METHYL-4,6-DINITROPHENOL	U	PPB	50	09/01/98	MAC	
2-NITROPHENOL	U	PPB	20	09/01/98	MAC	
4-NITROPHENOL	U	PPB	50	09/01/98	MAC	
PENTACHLOROPHENOL	U	PPB	20	09/01/98	MAC	
PHENOL	U	PPB	10	09/01/98	MAC	
2,4,6-TRICHLOROPHENOL	U	PPB	10	09/01/98	MAC	
2,4,5-TRICHLOROPHENOL	U	PPB	10	09/01/98	MAC	
O-CRESOL	U	PPB	10	09/01/98	MAC	
M- & P-CRESOL	U	PPB	10	09/01/98	MAC	
2-METHYLNAPHTHALENE	U	PPB	5.0	09/01/98	MAC	
BENZOIC ACID	U	PPB	50	09/01/98	MAC	
BENZYL ALCOHOL	U	PPB	20	09/01/98	MAC	
4-CHLOROANILINE	U	PPB	10	09/01/98	MAC	
DIBENZOFURAN	U	PPB	5.0	09/01/98	MAC	
3,3-DICHLOROBENZIDINE	U	PPB	20	09/01/98	MAC	
2-NITROANILINE	U	PPB	20	09/01/98	MAC	
3-NITROANILINE	U	PPB	20	09/01/98	MAC	
4-NITROANILINE	U	PPB	50	09/01/98	MAC	
HEXACHLOROBENZENE	U	PPB	0.020	09/01/98	MAC	
ALDRIN	U	PPB	0.027	09/01/98	MAC	
alpha-BHC	U	PPB	0.048	09/01/98	MAC	
a-BHC	U	PPB	0.069	09/01/98	MAC	
a-BHC	U	PPB	0.069	09/01/98	MAC	
gamma-BHC (LINDANE)	U	PPB	0.053	09/01/98	MAC	
alpha-CHLORDANE	U	PPB	0.037	09/01/98	MAC	
gamma-CHLORDANE	U	PPB	0.027	09/01/98	MAC	
TECHNICAL CHLORDANE	U	PPB	0.40	09/01/98	MAC	
p,p-DDD	U	PPB	0.049	09/01/98	MAC	

OCT 13 1998

Project/Site No.: 47-559
Project Name: SMOKEY MOUNTAIN SMELTERS
Description: SMS-SW-03/DOWNSTREAM-RIMM.
Station No.: SMS-SW-03
Collected: 08/25/98 10:40:00 By BHM
unty: 47

Lab Number: 9808248-05G
Matrix: WATER
Received: 08/26/98 10:00:00 By PMB
Sampling Agency: HWM_11_KFO
Priority:

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
B/N/A EXTR+PESTS,PCBS-H2O						MS+ECD
p,p-DDE	U	PPB	0.043	09/01/98	MAC	
p,p-DDT	U	PPB	0.046	09/01/98	MAC	
DIELDRIN	U	PPB	0.028	09/01/98	MAC	
ENDOSULFAN I	U	PPB	0.044	09/01/98	MAC	
ENDOSULFAN II	U	PPB	0.050	09/01/98	MAC	
ENDOSULFAN SULFATE	U	PPB	0.050	09/01/98	MAC	
ENDRIN	U	PPB	0.050	09/01/98	MAC	
ENDRIN ALDEHYDE	U	PPB	0.042	09/01/98	MAC	
ENDRIN KETONE	U	PPB	0.051	09/01/98	MAC	
HEPTACHLOR	U	PPB	0.033	09/01/98	MAC	
HEPTACHLOR EPOXIDE	U	PPB	0.035	09/01/98	MAC	
TOXAPHENE	U	PPB	1.4	09/01/98	MAC	
METHOXYCHLOR	U	PPB	0.19	09/01/98	MAC	
PCB 1016/1242	U	PPB	1.0	09/01/98	MAC	
PCB 1221	U	PPB	1.7	09/01/98	MAC	
PCB 1232	U	PPB	1.3	09/01/98	MAC	
PCB 1248	U	PPB	1.3	09/01/98	MAC	
PCB 1254	U	PPB	1.3	09/01/98	MAC	
PCB 1260	U	PPB	1.2	09/01/98	MAC	
PCB 1262	U	PPB	1.2	09/01/98	MAC	

*-Water, uG/L; Sediment, uG/kG

Printed: October 5, 1998

State of Tennessee - Environmental Laboratories
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Organic Analysis
Base/Neutral/Acid Extractables

PROJECT/SITE NO. 47-559	PROJECT NAME Smky Mtn. Sealtors
STATION NUMBER SMS-SW-03	COUNTY Knox
DESCRIPTION D/S of Site at Bumper on Unnamed Trib of Flowing Br	
STREAM MILE	DEPTH MATRIX water
COLLECTED: DATE August 25, 1998	TIME 18:40 a
SAMPLER'S NAME(printed) BILL MADFIN	
SAMPLING AGENCY DSF	BILLING CODE 3273811
IF PRIORITY, DATE NEEDED 9-25-98	
SEND REPORT TO: KEAC	
CONTACT HAZARD metals radiochemical, unknown	

*	NPDES Extractables	*	NPDES Extractables(con't)	*	TAL Semivolatiles
	butylbenzylphthalate	X	2-chlorophenol	X	dimethylphthalate
	bis(2-ethylhexyl)phthalate		2,4-dichlorophenol	X	4,6-dinitro-2-methylphenol
	di-n-butylphthalate		2,4-dimethylphenol	X	2,4-dinitrophenol
	di-n-octylphthalate		2,4-dinitrophenol	X	2,4-dinitrotoluene
	diethylphthalate		4,6-dinitro-o-cresol	X	2,6-dinitrotoluene
	dimethylphthalate		2-nitrophenol	X	fluoranthene
X	n-nitrosodimethylamine		4-nitrophenol	X	fluorene
	n-nitrosodiphenylamine		pentachlorophenol	X	hexachlorobenzene
	n-nitrosodi-n-propylamine		phenol	X	hexachlorobutadiene
	isophorone		2,4,6-trichlorophenol	X	hexachlorocyclopentadiene
	nitrobenzene	*	TAL Semivolatiles	X	hexachloroethane
	2,4-dinitrotoluene	X	acenaphthene	X	indeno(1,2,3-cd)pyrene
	acenaphthene	X	acenaphthylene	X	isophorone
	acenaphthylene	X	anthracene	X	2-methylnaphthalene
	anthracene	X	benzo(a)anthracene	X	2-methylphenol
	benzo(a)anthracene	X	benzo(a)pyrene	X	4-methylphenol
	benzo(a)pyrene	X	benzo(b)fluoranthene	X	n-nitrosodiphenylamine
	benzo(b)fluoranthene	X	benzo(g,h,i)perylene	X	n-nitroso-n-dipropylamine
	benzo(g,h,i)perylene	X	benzo(k)fluoranthene	X	naphthalene
	benzo(k)fluoranthene	X	benzoic acid	X	2-nitroaniline
	chrysene	X	benzyl alcohol	X	3-nitroaniline
	dibenzo(a,h)anthracene	X	bis(2-chloroethoxy)methane	X	4-nitroaniline
	fluoranthene	X	bis(2-chloroethyl) ether	X	nitrobenzene
	fluorene	X	bis(2-chloroisopropyl)ether	X	2-nitrophenol
	indeno(1,2,3-c,d)pyrene	X	bis(2-ethylhexyl)phthalate	X	4-nitrophenol
	naphthalene	X	4-bromophenylphenylether	X	pentachlorophenol
	phenanthrene	X	butylbenzylphthalate	X	phenanthrene
	pyrene	X	4-chloroaniline	X	phenol
	bis(2-chloroethyl)ether	X	4-chloro-3-methyl phenol	X	pyrene
	bis(2-chloroethoxy)methane	X	2-chloronaphthalene	X	1,2,4-trichlorobenzene
	bis(2-chloroisopropyl)ether	X	4-chlorophenylphenylether	X	2,4,5-trichlorophenol
	4-bromophenylphenylether	X	chrysene	X	2,4,6-trichlorophenol
	4-chlorophenylphenylether	X	di-n-butylphthalate	*	Nitrobodies
	hexachlorocyclopentadiene	X	di-n-octylphthalate		RDX
	hexachlorobutadiene	X	dibenzo(a,h)anthracene		2,4,6-TNT
	hexachlorobenzene	X	dibenzofuran		2,4-dinitrotoluene
	hexachloroethane	X	3,3'-dichlorobenzidine		2,6-dinitrotoluene
	1,2,4-trichlorobenzene	X	2,4-dichlorophenol		nitrobenzene
	2-chloronaphthalene	X	diethylphthalate		1,3,5-TNB
	4-chloro-3-methyl phenol	X	2,4-dimethylphenol		

*	TCLP Semivolatiles	*	Pesticides/PCBs
	chlordane	X	aldrin
	o-cresol	X	alpha-BHC
	m-cresol	X	beta-BHC
	p-cresol	X	delta-BHC
	cresol	X	gamma-BHC (lindane)
	2,4-D	X	technical chlordane
	2,4-dinitrotoluene	X	alpha-chlordane
	endrin	X	gamma-chlordane
	heptachlor	X	4,4'-DDD
	heptachlor epoxide	X	4,4'-DDE
	hexachlorobenzene	X	4,4'-DDT
	hexachlorobutadiene	X	dieldrin
	hexachloroethane	X	endosulfan I
	lindane	X	endosulfan II
	methoxychlor	X	endosulfan sulfate
	nitrobenzene	X	endrin
	pentachlorophenol	X	endrin aldehyde
	pyridine	X	endrin ketone
	toxaphene	X	heptachlor
	2,4,5-trichlorophenol	X	heptachlor epoxide
	2,4,6-trichlorophenol	X	toxaphene
	2,4,5-TP (Silvex)	X	methoxychlor
		X	PCB 1016/1242
		X	PCB 1221
		X	PCB 1232
		X	PCB 1248
		X	PCB 1254
		X	PCB 1260
		X	PCB 1262

Laboratory Number

Branch Lab Number

Chain of Custody and Supplemental Information

Only one chain of custody form is required per sample set or point (if all collected at the same time)

1. Collected by BHM
   Date 8-25-98 Time 18:40 a
   Delivered to KBL
   Date 8-26-98 Time 10:00
2. Received by
   Date Time
   Delivered to
   Date Time
3. Received by
   Date Time
   Delivered to
   Date Time
4. Received in Lab by [illegible]
   Date 8/26/98 Time 1000
   Logged in by
   Date Time

Additional Information

1. Approximate volume of sample
   1 gallon
2. Nearest town or city Knoxville
3. Others present at collection Lee Barrow
4. Number of other samples collected at same time at this point 2
5. Field collection procedure, handling and/or preservation of this sample
   according to EPA procedures and protocol
6. Mode of transportation to lab in State vehicle, in cooler, on ice
7. Sample sealed by
8. Date sample sealed
9. Remarks

SEP 08 1998

Project/Site No.: 47-559
Project Name: SMOKEY MOUNTAIN SMELTERS
Site Description: SMS-SW-03/DOWNSTREAM-RIMM.
Station No.: SMS-SW-03
llected: 08/25/98 10:40:00 By BHM
unty: 47

Lab Number: 9808248-05F
Matrix: WATER
Received: 08/26/98 10:00:00 By PMB
Sampling Agency: HWM_11_KFO
Priority:

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
VOLATILES-TAL WATERS						8260A
ACETONE	U		5.0			
BENZENE	U		0.50			
BROMODICHLOROMETHANE	U		0.50			
BROMOFORM	U		0.50			
BROMOMETHANE	U		1.0			
2-BUTANONE (MEK)	U		5.0			
CARBON DISULFIDE	U		1.0			
CARBON TETRACHLORIDE	U		0.50			
VINYL ACETATE	U		1.0			
CHLOROBENZENE	U		0.50			
CHLOROETHANE	U		1.0			
CHLOROFORM	U		0.50			
CHLOROMETHANE	U		1.0			
DIBROMOCHLOROMETHANE	U		0.50			
1,2-DICHLOROBENZENE	U		0.50			
1,3-DICHLOROBENZENE	U		0.50			
1,4-DICHLOROBENZENE	U		0.50			
DICHLORODIFLUOROMETHANE	U		1.0			
1,1-DICHLOROETHANE	U		0.50			
1,2-DICHLOROETHANE	U		0.50			
1,1-DICHLOROETHENE	U		0.50			
CIS-1,2-DICHLOROETHENE	U		0.50			
TRANS-1,2-DICHLOROETHENE	U		0.50			
1,2-DICHLOROPROPANE	U		0.50			
CIS-1,3-DICHLOROPROPENE	U		0.50			
TRANS-1,3-DICHLOROPROPENE	U		0.50			
ETHYLBENZENE	U		0.50			
METHYLENE CHLORIDE	B 0.8		0.50			
4-METHYL-2-PENTANONE (MIBK)	U		5.0			
STYRENE	U		0.50			
2-HEXANONE	U		1.0			
1,1,2,2-TETRACHLOROETHANE	U		0.50			
TETRACHLOROETHENE	U		0.50			
TOLUENE	U		0.50			
1,1,1-TRICHLOROETHANE	U		0.50			
1,1,2-TRICHLOROETHANE	U		0.50			
TRICHLOROETHENE	1.8		0.50			
TRICHLOROFLUOROMETHANE	U		1.0			
VINYL CHLORIDE	U		1.0			
o-XYLENE	U		0.50			
m & p XYLENE	U		0.50			

*-Water, uG/L; Sediment, uG/kG

Printed: September 4, 1998

State of Tennessee - Environmental Laboratories

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Organic Analysis

Volatiles and Petroleum Hydrocarbons

PROJECT/SITE NO.	47-559	PROJECT NAME	SMOKEY MOUNTAIN SMELTERS
STATION NUMBER	SMS-SW-03	COUNTY	KNOX
DESCRIPTION	D/S OF SITE AT RIMMER ON UNNAMED TRIB OF FLENNIKEN		
STREAM MILE		DEPTH	
MATRIX	WATER		
COLLECTED: DATE	AUGUST 25, 1998	TIME	10:40
SAMPLER'S NAME(printed)	BURL H. MAUPIN		
SAMPLING AGENCY	DIVISION OF SUPERFUND	BILLING CODE	327.38-11
IF PRIORITY, DATE NEEDED	SEPTEMBER 25		
SEND REPORT TO:	KNOXVILLE ENVIRONMENTAL ASSISSTANCE CENTER BURL H. MAUPIN		
CONTACT HAZARD	METALS, RADIOCHEMICAL, UNKNOWN		

*	NPDES Volatiles - 624	*	TAL Volatiles - 8260A	*	TCLP Volatiles
	Bromoform		Chloromethane		Benzene
	Bromodichloromethane		Bromomethane		Carbon tetrachloride
	Carbon Tetrachloride		Vinyl chloride		Chlorobenzene
	Chlorobenzene		Chloroethane		Chloroform
	Chloroethane		Methylene chloride		1,2-Dichloroethane
	2-Chloroethylvinyl ether		Acetone		1,1-Dichloroethane
	Chloroform		Carbon disulfide		Methyl ethyl ketone
	Chloromethane		1,1-Dichloroethene		Tetrachloroethene
	Dibromochloromethane		1,1-Dichloroethane		Trichloroethene
	1,2-Dichlorobenzene		Cis-1,2-dichloroethene		Vinyl chloride
	1,3-Dichlorobenzene		Trans-1,2-dichloroethene	*	BTEX - 8260A - UST
	1,4-Dichlorobenzene		1,2-Dichloroethane		Benzene
	Dichlorodifluoromethane		Chloroform		Toluene
	1,1-Dichloroethane		2-Butanone		Ethyl benzene
	1,2-Dichloroethane		1,1,1-Trichloroethane		o-Xylene
	1,1-Dichloroethene		Carbon tetrachloride		m-Xylene
	Cis-1,2-dichloroethene		Vinyl acetate		p-Xylene
	Trans-1,2-dichloroethene		Bromodichloromethane		Methyl t-butyl ether
	1,2-Dichloropropane		1,2-Dichloropropane		Diisopropyl ether
	Cis-1,3-dichloropropene		Cis-1,3-dichloropropane	*	TPH by GC
	Trans-1,2-dichloroethene		Trichloroethene		Gasoline Range Organics
	Methylene chloride		Dibromochloromethane		Diesel Range Organics
	1,1,2,2-Tetrachloroethane		1,1,2-Trichloroethane	*	TPH by IR (418.1)
	Tetrachloroethene		Benzene		418.1 - Waste Oil
	1,1,1-Trichloroethane		Trans-1,3-dichloropropene	*	Other
	1,1,2-Trichloroethane		Bromoform		
	Trichloroethene		4-Methyl-2-pentanone		
	Trichlorofluoromethane		2-Hexanone		
	Vinyl chloride		Tetrachloroethene		
	Benzene		Toluene		
	Ethylbenzene		1,1,2,2-Tetrachloroethane		
	Toluene		Chlorobenzene		
	o-Xylene		Ethyl benzene		
	m-Xylene		Styrene		
	p-Xylene		o-Xylene		
			m-Xylene		
			p-Xylene		

Laboratory Number

Branch Lab Number

Chain of Custody and Supplemental Information

Only one chain of custody form is required per sample set or point (if all collected at the same time)

1. Collected by BURL H. MAUPIN
   Date AUGUST 25, 1998 Time 10:40
   Delivered to Knoxville Basin Laboratory
   Date 8-26-98 Time 10:00
2. Received by
   Date Time
   Delivered to
   Date Time
3. Received by
   Date Time
   Delivered to
   Date Time
4. Received in Lab by Fisher
   Date 8/26/98 Time 1000
   Logged in by
   Date Time

Additional Information

1. Approximate volume of sample 160ML
2. Nearest town or city KNOXVILLE
3. Others present at collection LEE BARRON
4. Number of other samples collected at same time at this point *One other sample each for INORGANICS, RADIOCHEMICAL, AND EXTRACTABLE ORGANICS were collected for a total of three other samples.*
5. Field collection procedure, handling and/or preservation of this sample *according to EPA procedures and protocol*
6. Mode of transportation to lab *in State vehicle, in cooler, and on ice*
7. Sample sealed by
8. Date sample sealed
9. Remarks

PH-3013 (rev 1/96)

RDA 1527

SEP 30 1998

Project/Site No.:	47-559	Lab Number:	9808248-05H
Project Name:	SMOKEY MOUNTAIN SMELTERS	Matrix:	WATER
Description:	SMS-SW-03/DOWNSTREAM-RIMM.	Received:	08/26/98 10:00:00 By PMB
Station No.:	SMS-SW-03	Sampling Agency:	HWM_11_KFO
Collected:	08/25/98 10:40:00 By BHM	Priority:	
County:	47		

TEST	RESULT	*ERROR	UNITS	ANALYZED	BY	METHOD
GAMMA RADIONUCLIDES						R.6
K-40	574	40	pCi/L	08/31/98	AK	
Bi-214	19.2	3.8	pCi/L	08/31/98	AK	
GROSS ALPHA & BETA						R.1.1
GROSS ALPHA	-129	94	pCi/L	09/09/98	AK	
GROSS BETA	323	153	pCi/L	09/09/98	AK	

*--Represents +/- error value

Printed: September 10, 1998

State of Tennessee - Environmental Laboratories

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Radiochemical Analysis

PROJECT/SITE NO. 47-559	PROJECT NAME Smokey Mtn. Smelters
STATION NUMBER SMS-SW-03	COUNTY Knox
DESCRIPTION D/S of Site at Rimmer on unnamed trib of Flennikin Br	
STREAM MILE	DEPTH
COLLECTED: DATE 8-25-98	TIME 10:40a
PICK-UP DATE:	
CONTACT HAZARD metals, radiochemical	mR/hr Reading <0.1
SAMPLER'S NAME (printed) Burl Maupin	
SAMPLING AGENCY DSF	BILLING CODE 3273811
IF PRIORITY, DATE NEEDED 9-25-98	
SEND REPORT TO: KEAC	

Laboratory Number

Date Received

Time Received By

Sample Type

___Air ___Milk ___Swipe
✓Water ___Tissue ___Liquid
___Sludge ___Soil ___Solid
___Vegetation ___Sediment

Other_____

Field Comments:

Air Samples
Volume _____
Total Hours _____

___Sample Filtration
___Sample Acidification
___Send to RESL

Chain of Custody and Supplemental Information

Only one chain of custody form is required per sample set or point (if all collected at the same time)

1. Collected by BHM
   Date 8-25-98 Time 10:40a
   Delivered to KBL
   Date 8-26-98 Time 10:00
2. Collected by
   Date Time
   Delivered to
   Date Time
3. Collected by
   Date Time
   Delivered to
   Date Time
4. Received in Lab by P Baker
   Date 8/26/98 Time 1000
   Logged in by
   Date Time

REQUESTED ANALYSES:

✓	GROSS ALPHA (TOTAL)		STRONTIUM 89
	GROSS ALPHA (SUSPENDED)		STRONTIUM 90
	GROSS ALPHA (DISSOLVED)		TRITIUM (H-3)
✓	GROSS BETA (TOTAL)		THORIUM (TOTAL)
	GROSS BETA (SUSPENDED)		URANIUM (TOTAL)
	GROSS BETA (DISSOLVED)	✓	GAMMA RADIONUCLIDES
			ADDITIONAL ANALYSES:

Additional Information

1. Approximate volume of sample 1 gallon
2. Nearest town or city Knoxville
3. Others present at collection Lee Barnes
4. Number of other samples collected at same time at this point 3
5. Field collection procedure, handling and/or preservation of this sample according to EPA procedures and protocol
6. Mode of transportation to lab in State vehicle in cooler on ice
7. Sample sealed by
8. Date sample sealed
9. Remarks

Project/Site No.: 47-559
Project Name: SMOKEY MOUNTAIN SMELTERS
Description: SMS-SW-04/FLENNIKEN BRANCH
Station No.: SMS-SW-04
Collected: 08/26/98 12:25:00 By BHM
County: 47

Lab Number: 9808257-01
Matrix: WATER
Received: 08/27/89 10:00:00 By FMM
Sampling Agency: HWM_11_KFO
Priority:

TEST	RESULT	UNITS	LIMIT	ANALYZED	BY	METHOD
CYANIDE	U	mg/l	0.02	09/02/98	LKS	A.9
FLUORIDE	0.4	mg/l	0.1	09/03/98	SDS	A.11.1
NITRATE NITROGEN	1.90	mg/l	0.01	09/02/98	SAL	
NITRITE NITROGEN	U	mg/l	0.01	08/27/98	SDS	A.18.7
NO3 & NO2 NITROGEN	1.90	mg/l	0.01	09/02/98	SAL	A.18.4
SULFATE	17	mg/l	2	08/27/98	FMM	A.26
ALUMINUM	U	ug/l	100	09/30/98	JAH	
ANTIMONY	U	ug/l	3	10/15/98	JAH	
ARSENIC	U	ug/l	1	09/11/98	EAM	
BARIUM	U	ug/l	100	09/30/98	JAH	
BERYLLIUM	U	ug/l	1	09/21/98	EAM	EPA 200.9
CADMIUM	U	ug/l	1	09/09/98	EAM	EPA 200.9
CALCIUM	125	mg/l	0.03	09/10/98	JAH	
CHROMIUM	U	ug/l	1	09/10/98	EAM	EPA 200.9
COBALT	U	ug/l	5	09/04/98	JAH	
COPPER	1	ug/l	1	09/10/98	EAM	EPA 200.9
DIGESTION-METALS	COMPLETED	COMPLETED		09/03/98	DEL	
IRON	194	ug/l	25	09/04/98	JAH	
LEAD	1	ug/l	1	09/09/98	EAM	EPA 200.9
MAGNESIUM	10.1	mg/l	0.02	09/10/98	JAH	
MANGANESE	138	ug/l	5	09/04/98	JAH	
MERCURY	U	ug/l	0.2	08/31/98	ATB	EPA 245.1
NICKEL	U	ug/l	10	09/04/98	JAH	

Project/Site No.: 47-559
Project Name: SMOKEY MOUNTAIN SMELTERS
Description: SMS-SW-04/FLENNIKEN BRANCH
Station No.: SMS-SW-04
Collected: 08/26/98 12:25:00 By BHM
County: 47

Lab Number: 9808257-01
Matrix: WATER
Received: 08/27/89 10:00:00 By FMM
Sampling Agency: HWM_11_KFO
Priority:

TEST	RESULT	UNITS	LIMIT	ANALYZED	BY	METHOD
POTASSIUM	1.78	mg/l	0.02	09/10/98	JAH	
SELENIUM	U	ug/l	2	09/04/98	EAM	
SILVER	U	ug/l	1	09/08/98	EAM	EPA 200.9
SODIUM	81.4	mg/l	0.10	09/09/98	JAH	
THALLIUM	U	ug/l	2	09/09/98	EAM	
VANADIUM	U	ug/l	1	09/14/98	EAM	
ZINC	8	ug/l	1	09/04/98	JAH	

State of ,nessee - Environmental Laboratories

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Inorganic Analysi.

PROJECT/SITE NO.	47-559	PROJECT NAME	Smokey Mountain Smelters
STATION NUMBER	SMS-SW-04	COUNTY	Knox
DESCRIPTION	Flenniken Branch at Embayment of Fort Loudoun Lake		
STREAM MILE		DEPTH	MATRIX water
COLLECTED: DATE	August 26, 1998	TIME	12:25
SAMPLER'S NAME(printed)	Burl H. Maupin		
SAMPLING AGENCY	Division of Superfund	BILLING CODE	327.38-11
IF PRIORITY, DATE NEEDED	September 28, 1998		
SEND REPORT TO:	Knoxville Environmental Assisstance Center		
	Burl H. Maupin		
CONTACT HAZARD	metals, radiochemical, unknown		

*	Env. Microbiology	*	General Inorganics		Gen. Inorganics (con't)
	coliform, fecal*		acidity as $CaCO_3$*		oil and grease
	coliform, total*		alkalinity as $CaCO_3$*		orthophosphate, total*
	strep, fecal*		alkalinity, phen. as $CaCO_3$*		oxygen, dissolved*
			BOD, 5-day*		pH
			CBOD, 5-day*		phenols, total
			boron		phosphate, total
*	Ambient Parameters		chloride*		residue, dissolved*
	COD*		chlorine, residual*		residue, settleable*
	coliform, fecal		chromium, hexavalent		residue, suspended*
	conductivity*		COD*		residue, total*
	hardness, total as $CaCO_3$*		color, apparent*		silica*
	nitrogen, ammonia		color, true*	x	sulfate*
	nitrogen, NO_3 & NO_2		conductivity*		sulfide, total*
	nitrogen, total Kjeldahl	x	cyanide		TOC*
	phosphate, total		flash point*		turbidity*
	pH	x	fluoride*		percent solids
	residue, dissolved*		hardness, Ca as $CaCO_3$*	*	Other
	residue, suspended*		hardness, total as $CaCO_3$*		
	arsenic, As		hydrocarbons, total		
	cadmium, Cd		MBAS*		
	chromium, Cr	x	nitrogen, ammonia		
	copper, Cu	x	nitrogen, nitrate*		
	lead, Pb	x	nitrogen, nitrite*		
	mercury, Hg		nitrogen, NO_3 & NO_2		
	nickel, Ni		nitrogen, total Kjeldahl		
	zinc, Zn		nitrogen, total organic		

*	Metals	*	TCLP
x	aluminum, Al		
x	antimony, Sb		
x	arsenic, As		
x	barium, Ba		
x	beryllium, Be		
x	cadmium, Cd		
x	calcium, Ca		
x	chromium, Cr		
x	cobalt, Co		
x	copper, Cu		
x	iron, Fe		
x	lead, Pb		
x	magnesium, Mg		
x	manganese, Mn		
x	mercury, Hg		
x	nickel, Ni		
x	potassium, K		
x	selenium, Se		
x	silver, Ag		
x	sodium, Na		
x	thallium, Tl		
x	vanadium, V		
x	zinc, Zn		
			arsenic, As
			barium, Ba
			cadmium, Cd
			chromium, Cr
			lead, Pb
			mercury, Hg
			nickel, Ni
			selenium, Se
			silver, Ag

*denotes analyses performed only on water

FIELD DETERMINATIONS	Temperature
pH	Chlorine, residual
Conductivity	Other
Dissolved Oxygen	

Laboratory Number

Branch Lab Number

Chain of Custody and Supplemental Information

Only one chain of custody form is required per sample set or point (if all collected at the same time)

1. Collected by Burl H. Maupin
   Date August 26, 1998 Time 12:25
   Delivered to Knoxville Basin Laboratory
   Date August 27, 1998 Time 10:50
2. Received by
   Date Time
   Delivered to
   Date Time
3. Received by
   Date Time
   Delivered to
   Date Time
4. Received in Lab by [illegible]
   Date 8-27-89 Time 10:50
   Logged in by
   Date Time

Additional Information

1. Approximate volume of sample
   4000 ml.
2. Nearest town or city Knoxville
3. Others present at collection Beth H. Walker
4. Number of other samples collected at same time at this point 3
5. Field collection procedure, handling and/or preservation of this sample
   According to standard operating procedure
6. Mode of transportation to lab
   State vehicle; on ice
7. Sample sealed by
8. Date sample sealed
9. Remarks

PH-3011 (rev 1/96)

RDA 1527

Project/Site No.: 47-559
Project Name: SMOKEY MOUNTAIN SMELTERS
Description: SMS-SW-04/FLENNIKEN BRANCH
Station No.: SMS-SW-04
Collected: 08/26/98 12:25:00 By BHM
unty: 47

Lab Number: 9808257-01G
Matrix: WATER
Received: 08/27/89 10:00:00 By FMM
Sampling Agency: HWM_11_KFO
Priority:

OCT 13 1998

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
B/N/A EXTR+PESTS,PCBS-H2O						MS+ECD
BUTYL BENZYL PHTHALATE	U	PPB	1.0	09/01/98	MAC	
BIS(2-ETHYLHEXYL)PHTHALATE	U	PPB	0.50	09/01/98	MAC	
DI-n-BUTYL PHTHALATE	U	PPB	1.0	09/01/98	MAC	
DI-n-OCTYL PHTHALATE	U	PPB	2.0	09/01/98	MAC	
DIETHYL PHTHALATE	U	PPB	0.50	09/01/98	MAC	
DIMETHYL PHTHALATE	U	PPB	0.50	09/01/98	MAC	
n-NITROSODIMETHYLAMINE	U	PPB	2.0	09/01/98	MAC	
n-NITROSODIPHENYLAMINE	U	PPB	1.0	09/01/98	MAC	
n-NITROSO-di-n-PROPYLAMINE	U	PPB	1.0	09/01/98	MAC	
ISOPHORONE	U	PPB	0.50	09/01/98	MAC	
NITROBENZENE	U	PPB	1.0	09/01/98	MAC	
2,4-DINITROTOLUENE	U	PPB	2.0	09/01/98	MAC	
2,6-DINITROTOLUENE	U	PPB	2.0	09/01/98	MAC	
ACENAPTHENE	U	PPB	0.50	09/01/98	MAC	
ACENAPHTHYLENE	U	PPB	0.50	09/01/98	MAC	
ANTHRACENE	U	PPB	0.50	09/01/98	MAC	
BENZO(a)ANTHRACENE	U	PPB	0.50	09/01/98	MAC	
BENZO(a)PYRENE	U	PPB	0.50	09/01/98	MAC	
BENZO(b)FLUORANTHENE	U	PPB	0.50	09/01/98	MAC	
BENZO(ghi)PERYLENE	U	PPB	2.0	09/01/98	MAC	
BENZO(k)FLUORANTHENE	U	PPB	0.50	09/01/98	MAC	
DIBENZO(a,h)ANTHRACENE	U	PPB	2.0	09/01/98	MAC	
FLUORANTHENE	U	PPB	0.50	09/01/98	MAC	
FLUORENE	U	PPB	0.50	09/01/98	MAC	
INDENO(1,2,3-cd)PYRENE	U	PPB	2.0	09/01/98	MAC	
NAPHTHALENE	U	PPB	0.50	09/01/98	MAC	
PHENANTHRENE	U	PPB	0.50	09/01/98	MAC	
PYRENE	U	PPB	0.50	09/01/98	MAC	
CHRYSENE	U	PPB	0.50	09/01/98	MAC	
BIS(2-CHLOROETHYL)ETHER	U	PPB	1.0	09/01/98	MAC	
BIS(2-CHLOROETHOXY)METHANE	U	PPB	1.0	09/01/98	MAC	
BIS(2-CHLOROISOPROPYL)ETHER	U	PPB	2.0	09/01/98	MAC	
4-BROMOPHENYLPHENYL ETHER	U	PPB	2.0	09/01/98	MAC	
4-CHLOROPHENYLPHENYL ETHER	U	PPB	1.0	09/01/98	MAC	
HEXACHLOROCYCLOPENTADIENE	U	PPB	5.0	09/01/98	MAC	
HEXACHLOROBUTADIENE	U	PPB	1.0	09/01/98	MAC	
HEXACHLOROBENZENE	U	PPB	1.0	09/01/98	MAC	
HEXACHLOROETHANE	U	PPB	1.0	09/01/98	MAC	
1,2,4-TRICHLOROBENZENE	U	PPB	1.0	09/01/98	MAC	
2-CHLORONAPHTHALENE	U	PPB	0.50	09/01/98	MAC	
4-CHLORO-3-METHYLPHENOL	U	PPB	1.0	09/01/98	MAC	
2-CHLOROPHENOL	U	PPB	1.0	09/01/98	MAC	
2,4-DICHLOROPHENOL	U	PPB	1.0	09/01/98	MAC	
2,4-DIMETHYLPHENOL	U	PPB	1.0	09/01/98	MAC	
2,4-DINITROPHENOL	U	PPB	10	09/01/98	MAC	
2-METHYL-4,6-DINITROPHENOL	U	PPB	5.0	09/01/98	MAC	
2-NITROPHENOL	U	PPB	2.0	09/01/98	MAC	
4-NITROPHENOL	U	PPB	5.0	09/01/98	MAC	
PENTACHLOROPHENOL	U	PPB	2.0	09/01/98	MAC	
PHENOL	U	PPB	1.0	09/01/98	MAC	
2,4,6-TRICHLOROPHENOL	U	PPB	1.0	09/01/98	MAC	
2,4,5-TRICHLOROPHENOL	U	PPB	1.0	09/01/98	MAC	
O-CRESOL	U	PPB	1.0	09/01/98	MAC	
M- & P-CRESOL	U	PPB	1.0	09/01/98	MAC	
2-METHYLNAPHTHALENE	U	PPB	0.50	09/01/98	MAC	
BENZOIC ACID	U	PPB	5.0	09/01/98	MAC	
BENZYL ALCOHOL	U	PPB	2.0	09/01/98	MAC	
4-CHLOROANILINE	U	PPB	1.0	09/01/98	MAC	
DIBENZOFURAN	U	PPB	0.50	09/01/98	MAC	
3,3-DICHLOROBENZIDINE	U	PPB	2.0	09/01/98	MAC	
2-NITROANILINE	U	PPB	2.0	09/01/98	MAC	
3-NITROANILINE	U	PPB	2.0	09/01/98	MAC	
4-NITROANILINE	U	PPB	5.0	09/01/98	MAC	
HEXACHLOROBENZENE	U	PPB	0.020	09/01/98	MAC	
ALDRIN	U	PPB	0.027	09/01/98	MAC	
alpha-BHC	U	PPB	0.048	09/01/98	MAC	
ta-BHC	U	PPB	0.069	09/01/98	MAC	
ta-BHC	U	PPB	0.069	09/01/98	MAC	
gamma-BHC (LINDANE)	U	PPB	0.027	09/01/98	MAC	
alpha-CHLORDANE	U	PPB	0.037	09/01/98	MAC	
gamma-CHLORDANE	U	PPB	0.027	09/01/98	MAC	
TECHNICAL CHLORDANE	U	PPB	0.40	09/01/98	MAC	
p,p-DDD	U	PPB	0.049	09/01/98	MAC	

OCT 13 1998

Project/Site No.: 47-559
Project Name: SMOKEY MOUNTAIN SMELTERS
Description: SMS-SW-04/FLENNIKEN BRANCH
Station No.: SMS-SW-04
Collected: 08/26/98 12:25:00 By BHM
nty: 47

Lab Number: 9808257-01G
Matrix: WATER
Received: 08/27/89 10:00:00 By FMM
Sampling Agency: HWM_11_KFO
Priority:

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
B/N/A EXTR+PESTS,PCBS-H2O						MS+ECD
p,p-DDE	U	PPB	0.043	09/01/98	MAC	
p,p-DDT	U	PPB	0.046	09/01/98	MAC	
DIELDRIN	U	PPB	0.028	09/01/98	MAC	
ENDOSULFAN I	U	PPB	0.044	09/01/98	MAC	
ENDOSULFAN II	U	PPB	0.050	09/01/98	MAC	
ENDOSULFAN SULFATE	U	PPB	0.050	09/01/98	MAC	
ENDRIN	U	PPB	0.050	09/01/98	MAC	
ENDRIN ALDEHYDE	U	PPB	0.042	09/01/98	MAC	
ENDRIN KETONE	U	PPB	0.051	09/01/98	MAC	
HEPTACHLOR	U	PPB	0.033	09/01/98	MAC	
HEPTACHLOR EPOXIDE	U	PPB	0.035	09/01/98	MAC	
TOXAPHENE	U	PPB	1.4	09/01/98	MAC	
METHOXYCHLOR	U	PPB	0.19	09/01/98	MAC	
PCB 1016/1242	U	PPB	1.0	09/01/98	MAC	
PCB 1221	U	PPB	1.7	09/01/98	MAC	
PCB 1232	U	PPB	1.3	09/01/98	MAC	
PCB 1248	U	PPB	1.3	09/01/98	MAC	
PCB 1254	U	PPB	1.3	09/01/98	MAC	
PCB 1260	U	PPB	1.2	09/01/98	MAC	
PCB 1262	U	PPB	1.2	09/01/98	MAC	

*-Water, uG/L; Sediment, uG/kG

Printed: October 2, 1998

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Organic Analysis
Base/Neutral/Acid Extractables

PROJECT/SITE NO. 47559	PROJECT NAME Smokey Mtn. Smelters
STATION NUMBER SMS-SW-04	COUNTY Knox
DESCRIPTION Flenniken Branch at Ft Loudoun Lake	
STREAM MILE	DEPTH / MATRIX water
COLLECTED: DATE 8-26-98	TIME 12:25
SAMPLER'S NAME(printed) Burl Maupin	
SAMPLING AGENCY DSF	BILLING CODE 3273811
IF PRIORITY, DATE NEEDED 9-28-98	
SEND REPORT TO: KEAC	
CONTACT HAZARD metals, radiochemical, unknown	

*	NPDES Extractables	*	NPDES Extractables(con't)	*	TAL Semivolatiles
	butylbenzylphthalate	X	2-chlorophenol	X	dimethylphthalate
	bis(2-ethylhexyl)phthalate		2,4-dichlorophenol	X	4,6-dinitro-2-methylphenol
	di-n-butylphthalate		2,4-dimethylphenol	X	2,4-dinitrophenol
	di-n-octylphthalate		2,4-dinitrophenol	X	2,4-dinitrotoluene
	diethylphthalate		4,6-dinitro-o-cresol	X	2,6-dinitrotoluene
	dimethylphthalate		2-nitrophenol	X	fluoranthene
X	n-nitrosodimethylamine		4-nitrophenol	X	fluorene
	n-nitrosodiphenylamine		pentachlorophenol	X	hexachlorobenzene
	n-nitrosodi-n-propylamine		phenol	X	hexachlorobutadiene
	isophorone		2,4,6-trichlorophenol	X	hexachlorocyclopentadiene
	nitrobenzene	*	TAL Semivolatiles	X	hexachloroethane
	2,4-dinitrotoluene	X	acenaphthene	X	indeno(1,2,3-cd)pyrene
	acenaphthene	X	acenaphthylene	X	isophorone
	acenaphthylene	X	anthracene	X	2-methylnaphthalene
	anthracene	X	benzo(a)anthracene	X	2-methylphenol
	benzo(a)anthracene	X	benzo(a)pyrene	X	4-methylphenol
	benzo(a)pyrene	X	benzo(b)fluoranthene	X	n-nitrosodiphenylamine
	benzo(b)fluoranthene	X	benzo(g,h,i)perylene	X	n-nitroso-n-dipropylamine
	benzo(g,h,i)perylene	X	benzo(k)fluoranthene	X	naphthalene
	benzo(k)fluoranthene	X	benzoic acid	X	2-nitroaniline
	chrysene	X	benzyl alcohol	X	3-nitroaniline
	dibenzo(a,h)anthracene	X	bis(2-chloroethoxy)methane	X	4-nitroaniline
	fluoranthene	X	bis(2-chloroethyl) ether	X	nitrobenzene
	fluorene	X	bis(2-chloroisopropyl)ether	X	2-nitrophenol
	indeno(1,2,3-c,d)pyrene	X	bis(2-ethylhexyl)phthalate	X	4-nitrophenol
	naphthalene	X	4-bromophenylphenylether	X	pentachlorophenol
	phenanthrene	X	butylbenzylphthalate	X	phenanthrene
	pyrene	X	4-chloroaniline	X	phenol
	bis(2-chloroethyl)ether	X	4-chloro-3-methyl phenol	X	pyrene
	bis(2-chloroethoxy)methane	X	2-chloronaphthalene	X	1,2,4-trichlorobenzene
	bis(2-chloroisopropyl)ether	X	4-chlorophenylphenylether	X	2,4,5-trichlorophenol
	4-bromophenylphenylether	X	chrysene	X	2,4,6-trichlorophenol
	4-chlorophenylphenylether	X	di-n-butylphthalate	*	Nitrobodies
	hexachlorocyclopentadiene	X	di-n-octylphthalate		RDX
	hexachlorobutadiene	X	dibenzo(a,h)anthracene		2,4,6-TNT
	hexachlorobenzene	X	dibenzofuran		2,4-dinitrotoluene
	hexachloroethane	X	3,3'-dichlorobenzidine		2,6-dinitrotoluene
	1,2,4-trichlorobenzene	X	2,4-dichlorophenol		nitrobenzene
	2-chloronaphthalene	X	diethylphthalate		1,3,5-TNB
	4-chloro-3-methyl phenol	X	2,4-dimethylphenol		

*	TCLP Semivolatiles	*	Pesticides/PCBs
	chlordane	X	aldrin
	o-cresol	X	alpha-BHC
	m-cresol	X	beta-BHC
	p-cresol	X	delta-BHC
	cresol	X	gamma-BHC (lindane)
	2,4-D	X	technical chlordane
	2,4-dinitrotoluene	X	alpha-chlordane
	endrin	X	gamma-chlordane
	heptachlor	X	4,4'-DDD
	heptachlor epoxide	X	4,4'-DDE
	hexachlorobenzene	X	4,4'-DDT
	hexachlorobutadiene	X	dieldrin
	hexachloroethane	X	endosulfan I
	lindane	X	endosulfan II
	methoxychlor	X	endosulfan sulfate
	nitrobenzene	X	endrin
	pentachlorophenol	X	endrin aldehyde
	pyridine	X	endrin ketone
	toxaphene	X	heptachlor
	2,4,5-trichlorophenol	X	heptachlor epoxide
	2,4,6-trichlorophenol	X	toxaphene
	2,4,5-TP (Silvex)	X	methoxychlor
		X	PCB 1016/1242
		X	PCB 1221
		X	PCB 1232
		X	PCB 1248
		X	PCB 1254
		X	PCB 1260
		X	PCB 1262

Laboratory Number

Branch Lab Number

Chain of Custody and Supplemental Information

Only one chain of custody form is required per sample set or point (if all collected at the same time)

1. Collected by BHM
   Date 8-26-98 Time 12:25
   Delivered to KBL
   Date 8-27-98 Time 10:00
2. Received by
   Date Time
   Delivered to
   Date Time
3. Received by
   Date Time
   Delivered to
   Date Time
4. Received in Lab by [illegible]
   Date 8-27-98 Time 10:00
   Logged in by
   Date Time

Additional Information

1. Approximate volume of sample 1 gallon
2. Nearest town or city Knoxville
3. Others present at collection Beth Walker
4. Number of other samples collected at same time at this point 3
5. Field collection procedure, handling and/or preservation of this sample EPA procedures and protocol
6. Mode of transportation to lab State vehicle, in cooler, on ice
7. Sample sealed by
8. Date sample sealed
9. Remarks

SEP 08 1998

Project/Site No.: 47-559
Project Name: SMOKEY MOUNTAIN SMELTERS
Site Description: SMS-SW-04/FLENNIKEN BRANCH
Station No.: SMS-SW-04
Collected: 08/26/98 12:25:00 By BHM
Quantity: 47

Lab Number: 9808257-01F
Matrix: WATER
Received: 08/27/89 10:00:00 By FMM
Sampling Agency: HWM_11_KFO
Priority:

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
VOLATILES-TAL WATERS						8260A
ACETONE	U	PPB	5.0	08/31/98	HMG	
BENZENE	U	PPB	0.50	08/31/98	HMG	
BROMODICHLOROMETHANE	U	PPB	0.50	08/31/98	HMG	
BROMOFORM	U	PPB	0.50	08/31/98	HMG	
BROMOMETHANE	U	PPB	1.0	08/31/98	HMG	
2-BUTANONE (MEK)	U	PPB	5.0	08/31/98	HMG	
CARBON DISULFIDE	U	PPB	1.0	08/31/98	HMG	
CARBON TETRACHLORIDE	U	PPB	0.50	08/31/98	HMG	
VINYL ACETATE	U	PPB	1.0	08/31/98	HMG	
CHLOROBENZENE	U	PPB	0.50	08/31/98	HMG	
CHLOROETHANE	U	PPB	1.0	08/31/98	HMG	
CHLOROFORM	U	PPB	0.50	08/31/98	HMG	
CHLOROMETHANE	U	PPB	1.0	08/31/98	HMG	
DIBROMOCHLOROMETHANE	U	PPB	0.50	08/31/98	HMG	
1,2-DICHLOROBENZENE	U	PPB	0.50	08/31/98	HMG	
1,3-DICHLOROBENZENE	U	PPB	0.50	08/31/98	HMG	
1,4-DICHLOROBENZENE	U	PPB	0.50	08/31/98	HMG	
DICHLORODIFLUOROMETHANE	U	PPB	1.0	08/31/98	HMG	
1,1-DICHLOROETHANE	U	PPB	0.50	08/31/98	HMG	
1,2-DICHLOROETHANE	U	PPB	0.50	08/31/98	HMG	
1,1-DICHLOROETHENE	U	PPB	0.50	08/31/98	HMG	
CIS-1,2-DICHLOROETHENE	U	PPB	0.50	08/31/98	HMG	
TRANS-1,2-DICHLOROETHENE	U	PPB	0.50	08/31/98	HMG	
1,2-DICHLOROPROPANE	U	PPB	0.50	08/31/98	HMG	
CIS-1,3-DICHLOROPROPENE	U	PPB	0.50	08/31/98	HMG	
TRANS-1,3-DICHLOROPROPENE	U	PPB	0.50	08/31/98	HMG	
ETHYLBENZENE	U	PPB	0.50	08/31/98	HMG	
METHYLENE CHLORIDE	B 0.7	PPB	0.50	08/31/98	HMG	
4-METHYL-2-PENTANONE (MIBK)	U	PPB	5.0	08/31/98	HMG	
STYRENE	U	PPB	0.50	08/31/98	HMG	
2-HEXANONE	U	PPB	1.0	08/31/98	HMG	
1,1,2,2-TETRACHLOROETHANE	U	PPB	0.50	08/31/98	HMG	
TETRACHLOROETHENE	1.2	PPB	0.50	08/31/98	HMG	
TOLUENE	U	PPB	0.50	08/31/98	HMG	
1,1,1-TRICHLOROETHANE	U	PPB	0.50	08/31/98	HMG	
1,1,2-TRICHLOROETHANE	U	PPB	0.50	08/31/98	HMG	
TRICHLOROETHENE	0.5	PPB	0.50	08/31/98	HMG	
TRICHLOROFLUOROMETHANE	U	PPB	1.0	08/31/98	HMG	
VINYL CHLORIDE	U	PPB	1.0	08/31/98	HMG	
o-XYLENE	U	PPB	0.50	08/31/98	HMG	
m & p XYLENE	U	PPB	0.50	08/31/98	HMG	

*-Water, uG/L; Sediment, uG/kG

Printed: September 4, 1998

State of Tennessee - Environmental Laboratories

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Organic Analysis

Volatiles and Petroleum Hydrocarbons

PROJECT/SITE NO.	47-559	PROJECT NAME	SMOKY MOUNTAIN SMELTERS
STATION NUMBER	SMS-SW-04	COUNTY	KNOX
DESCRIPTION	ON SITE LAGOON		
STREAM MILE		DEPTH	MATRIX WATER
COLLECTED: DATE	AUGUST 26, 1998	TIME	12:25
SAMPLER'S NAME(printed)	BURL H. MAUPIN		
SAMPLING AGENCY	DIVISION OF SUPERFUND	BILLING CODE	327.38-11
IF PRIORITY, DATE NEEDED	SEPTEMBER 25		
SEND REPORT TO:	KNOXVILLE ENVIRONMENTAL ASSISSTANCE CENTER BURL H. MAUPIN		
CONTACT HAZARD	METALS, RADIOCHEMICAL, UNKNOWN		

*	NPDES Volatiles - 624	*	TAL Volatiles - 8260A	*	TCLP Volatiles
	Bromoform		Chloromethane		Benzene
	Bromodichloromethane		Bromomethane		Carbon tetrachloride
	Carbon Tetrachloride		Vinyl chloride		Chlorobenzene
	Chlorobenzene		Chloroethane		Chloroform
	Chloroethane		Methylene chloride		1,2-Dichloroethane
	2-Chloroethylvinyl ether		Acetone		1,1-Dichloroethane
	Chloroform		Carbon disulfide		Methyl ethyl ketone
	Chloromethane		1,1-Dichloroethene		Tetrachloroethene
	Dibromochloromethane		1,1-Dichloroethane		Trichloroethene
	1,2-Dichlorobenzene		Cis-1,2-dichloroethene		Vinyl chloride
	1,3-Dichlorobenzene		Trans-1,2-dichloroethene	*	BTEX - 8260A - UST
	1,4-Dichlorobenzene		1,2-Dichloroethane		Benzene
	Dichlorodifluoromethane		Chloroform		Toluene
	1,1-Dichloroethane		2-Butanone		Ethyl benzene
	1,2-Dichloroethane		1,1,1-Trichloroethane		o-Xylene
	1,1-Dichloroethene		Carbon tetrachloride		m-Xylene
	Cis-1,2-dichloroethene		Vinyl acetate		p-Xylene
	Trans-1,2-dichloroethene		Bromodichloromethane		Methyl t-butyl ether
	1,2-Dichloropropane		1,2-Dichloropropane		Diisopropyl ether
	Cis-1,3-dichloropropene		Cis-1,3-dichloropropane	*	TPH by GC
	Trans-1,2-dichloroethene		Trichloroethene		Gasoline Range Organics
	Methylene chloride		Dibromochloromethane		Diesel Range Organics
	1,1,2,2-Tetrachloroethane		1,1,2-Trichloroethane	*	TPH by IR (418.1)
	Tetrachloroethene		Benzene		418.1 - Waste Oil
	1,1,1-Trichloroethane		Trans-1,3-dichloropropene	*	Other
	1,1,2-Trichloroethane		Bromoform		
	Trichloroethene		4-Methyl-2-pentanone		
	Trichlorofluoromethane		2-Hexanone		
	Vinyl chloride		Tetrachloroethene		
	Benzene		Toluene		
	Ethylbenzene		1,1,2,2-Tetrachloroethane		
	Toluene		Chlorobenzene		
	o-Xylene		Ethyl benzene		
	m-Xylene		Styrene		
	p-Xylene		o-Xylene		
			m-Xylene		
			p-Xylene		

Laboratory Number

Branch Lab Number

Chain of Custody and Supplemental Information

Only one chain of custody form is required per sample set or point (if all collected at the same time)

1. Collected by BURL H. MAUPIN
   Date AUGUST 26, 1998 Time 12:25
   Delivered to Knoxville Basin Laboratory
   Date 8-27-98 Time 10:00
2. Received by
   Date Time
   Delivered to
   Date Time
3. Received by
   Date Time
   Delivered to
   Date Time
4. Received in Lab by [illegible]
   Date 8-27-98 Time 10:00
   Logged in by
   Date Time

Additional Information

1. Approximate volume of sample 200ML
2. Nearest town or city KNOXVILLE
3. Others present at collection BETH WALKER
4. Number of other samples collected at same time at this point One other sample each for INORGANICS, RADIOCHEMICAL, AND EXTRACTABLE ORGANICS were collected for a total of three other samples.
5. Field collection procedure, handling and/or preservation of this sample according to EPA procedures and protocol
6. Mode of transportation to lab in State vehicle, in cooler, and on ice
7. Sample sealed by
8. Date sample sealed
9. Remarks

SEP 30 1998

Project/Site No.:	47-559	Lab Number:	9808257-01H
Project Name:	SMOKEY MOUNTAIN SMELTERS	Matrix:	WATER
Description:	SMS-SW-04/FLENNIKEN BRANCH	Received:	08/27/89 10:00:00 By FMM
Station No.:	SMS-SW-04	Sampling Agency:	HWM_11_KFO
Collected:	08/26/98 12:25:00 By BHM	Priority:	
Qty:	47		

TEST	RESULT	*ERROR	UNITS	ANALYZED	BY	METHOD
GAMMA RADIONUCLIDES						R.6
Pb-214	17.1	4.2	pCi/L	08/31/98	AK	
Bi-214	20.3	4.2	pCi/L	08/31/98	AK	
GROSS ALPHA & BETA						R.1.1
GROSS ALPHA	1.5	2.5	pCi/L	09/08/98	AK	
GROSS BETA	-0.3	2.3	pCi/L	09/08/98	AK	

*--Represents +/- error value

Printed: September 10, 1998

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Radiochemical Analysis

PROJECT/SITE NO. 47558	PROJECT NAME Smokey Mtn. Smelters
STATION NUMBER SMS-SW-04	COUNTY Knox
DESCRIPTION Flanniken Branch at Ft. Loudoun Embayment	
STREAM MILE	DEPTH
COLLECTED: DATE 8-26-98	TIME 12:25
PICK-UP DATE:	
CONTACT HAZARD metals, radiochemical	mR/hr Reading < 0.1
SAMPLER'S NAME (printed) Bruce H. Maple	
SAMPLING AGENCY DSF	BILLING CODE 3273911
IF PRIORITY, DATE NEEDED 9-28-98	
SEND REPORT TO: KEAC	

Laboratory Number

Date Received

Time Received By

Sample Type

___Air ___Milk ___Swipe
✓Water ___Tissue ___Liquid
___Sludge ___Soil ___Solid
___Vegetation ___Sediment

Other_____

Field Comments:

Air Samples
Volume _____
Total Hours _____

___Sample Filtration
___Sample Acidification
___Send to RESL

Chain of Custody and Supplemental Information

Only one chain of custody form is required per sample set or point (if all collected at the same time)

1. Collected by BHM
   Date 8-26-98 Time 12:25
   Delivered to KBL
   Date 8-27-98 Time 10:00
2. Collected by
   Date Time
   Delivered to
   Date Time
3. Collected by
   Date Time
   Delivered to
   Date Time
4. Received in Lab by [illegible]
   Date 8-27-98 Time 10:00
   Logged in by
   Date Time

REQUESTED ANALYSES:

✓	GROSS ALPHA (TOTAL)		STRONTIUM 89
	GROSS ALPHA (SUSPENDED)		STRONTIUM 90
	GROSS ALPHA (DISSOLVED)		TRITIUM (H-3)
✓	GROSS BETA (TOTAL)		THORIUM (TOTAL)
	GROSS BETA (SUSPENDED)		URANIUM (TOTAL)
	GROSS BETA (DISSOLVED)	✓	GAMMA RADIONUCLIDES
			ADDITIONAL ANALYSES:

Additional Information

1. Approximate volume of sample 1 gallon
2. Nearest town or city Knoxville
3. Others present at collection Beth Walker
4. Number of other samples collected at same time at this point 3
5. Field collection procedure, handling and/or preservation of this sample EPA procedures and protocol
6. Mode of transportation to lab State vehicle, in cooler, on ice
7. Sample sealed by
8. Date sample sealed
9. Remarks

PH-3009 (rev 2/98)

RDA 1527