Table 2-1
Dialog's Group of Databases Searched for Inventory Area Data and Information

Database	Additional Description
AGRICOLA	National Agricultural Library
AGRIS International	International database for agricultural sciences & technology
AGROProjects	Research and development for new agrochemical products
Analytical Abstracts	Chemistry
Beilstein Online	Organic chemistry
Biological and Agricultural Index	
BIOSIS Previews®	Biological & biomedical sciences
CA SEARCH®	Chemical Abstracts® (1967- present)
CAB ABSTRACTS	Agriculture and related sciences
CANCERLIT®	Cancer research publications
Chapman and Hall Chemical Database	
Chemical Engineering and Biotechnology Abstracts	
Current Biotechnology Abstracts	
Dictionary of Substances and Their Effects (DOSE)	
Dissertation Abstracts Online	
Ei Compendex®	Engineering and technological literature
Electric Power Database	Research and development
Elsevier Biobase	Life sciences biological database
EMBASE®	Human medicine and related disciplines
Energy Science and Technology	Produced by USDOE
Enviroline®	Environmental related
Federal Register	
Federal Research in Progress (FEDRIP)	
FLUIDEX	Fluid Engineering Abstracts
FOODLINE®	Food Science & Technology
Gale Group Legal Resource Index™	Legal literature
General Science Abstracts/Fulltext	
GeoArchive	Geoscience, hydroscience, and environmental science
GEOBASE™	Physical and human geography, environmental sciences
GeoRef	Geology and geophysics
Global Health	
GPO Monthly Catalog	Federal government agencies
ICONDA	International construction
Inside Conferences	Symposiums, expositions, etc.
INSPEC	1969-present - physics, electronics, energy, chemical substances, etc.
International Pharmacology Abstracts	
Material Safety Data Sheets	
McGraw-Hill Publications	
MEDLINE®/Pubmed	
Meteorological and Geoastrophysical Abstracts	
New England Journal of Medicine	
New Scientist	
NTIS	National Technical Information Service
Occupational Safety and Health (NIOSHTIC®)	
PAIS International	Public Affairs Information Services
PAPERCHEM	Pulp and paper technology
PASCAL	French producer (INIST) on scientific and technical literature
PIRA	Packaging, paper, printing and publishing, imaging and nonwovens abstracts
RAPRA	Rubber and plastics
RTECS®	Registry of Toxic Effects of Chemical Substances
Science	
SciSearch®	A cited reference science database
SEDBASE	
SPIN®	Physics research
TOXFILE	Toxicological, biochemical, and pharmacological
TSCA Chemical Substances Inventory	
TULSA™	Petroleum abstracts
WasteInfo	
WATERNET™ - AWWA	
Wilson Applied Science & Technology Abstracts	
Wilson Biological & Agricultural Index	

Table 2-2
Internet Sites Accessed for Inventory Area Data and Information

Organization	Internet Site Address(es)[a]
Audubon	http://www.audubon.org
	http://ny.audubon.org/iba/harborherons.html
Clean Ocean and Shores Trust (COAST)	http://www.nynjcoast.org
	http://www.nynjcoast.org/ARGO/Issues/issues.html
	http://www.nynjcoast.org/VirtualEstuary/TheVirtualEstuary_Gateway.html
Hudson River Foundation for Science and Environmental Research	http://www.hudsonriver.org/
Interstate Environmental Commission	http://www.iec-nynjct.org
Manomet Center for Conservation Science	http://www.manomet.org
	http://shorebirdplan.fws.gov/RegionalShorebird.htm
	http://www.manomet.org/programs/wildlife/
Meadowlands Environmental Research Institute	http://cimic.rutgers.edu/digitalmeadowlands/
	http://cimic.rutgers.edu/hmdc_public/statons/stationsbody.html
	http://cimic.rutgers.edu/hmdc_public/wq/
	http://cimic.rutgers.edu/meri/
	http://cimic.rutgers.edu/meri/lib/Gateway.html
	http://cimic.rutgers.edu/meri/library.html
Montclair State University Library	http://frontpage.montclair.edu/library/
National Oceanic and Atmospheric Administration (NOAA)	http://co-ops.nos.noaa.gov/NYOFS/nyofs.shtml
	http://response.restoration.noaa.gov/cpr/watershed/watershedtools.html
	http://sh.nefsc.noaa.gov/NEWRKbay.htm
	http://response.restoration.noaa.gov/cpr/watershed/watershedtools.html
	http://www.csc.noaa.gov/lcr/nyharbor/
	http://co-ops.nos.noaa.gov/NYOFS/bayo_wl.shtml
	http://www.co-ops.nos.noaa.gov/nyports/3CURTS_bp.html
	http://www.ncdc.noaa.gov/oa/climate/research/cag3/cag3.html
	http://co-ops.nos.noaa.gov/nyports/nyports.html
National Technical Information Service (NTIS)	http://www.ntis.gov/search/index.asp?loc=3-0-0
New Jersey Atmospheric Deposition Network	http://www.cep.rutgers.edu/research/datasets/realtime/index.shtml
NJ Department of Environmental Protection	http://www.state.nj.us/dep/wmm/sgwqt/wat/index.html
	http://www.state.nj.us/dep/gis/lists.html
	http://www.state.nj.us/dep/dwq/database.htm
	http://www.state.nj.us/dep/airmon/reports.htm
	http://www.state.nj.us/dep/airmon/
New Jersey Environmental Digital Library	http://njenv.rutgers.edu/njdlib/
New Jersey Institute of Technology Library	http://www.library.njit.edu/
New Jersey Marine Sciences Consortium	http://www.njmsc.org/
New Jersey Meadowlands Commission	http://www.meadowlands.state.nj.us/
New Jersey Sea Grant College Program	http://www.njmsc.org/Sea_Grant/Main_Page.htm
New Jersey Water Resources Research Institute	http://njwrri.rutgers.edu/
New York/New Jersey Harbor Estuary Program (NY/NJ HEP)	http://www.carpweb.org/main.html
	http://www.harborestuary.org/
	http://www.harborestuary.org/_pdf/ccmpintro.pdf
	http://www.harborestuary.org/_pdf/ccmptox.pdf
	http://www.harborestuary.org/_pdf/nutrients_mod.pdf
	http://www.harborestuary.org/datadepo.htm
	http://www.harborestuary.org/depot/depot_1.htm
	http://www.harborestuary.org/minutes/Hwg-01-01-24.pdf
	http://www.harborestuary.org/minutes/HWG-01dec12.pdf
	http://www.harborestuary.org/minutes/Hwg-01nov13.pdf
	http://www.harborestuary.org/minutes/hwg-03july15.pdf
	http://www.harborestuary.org/minutes/nwg-02dec17.pdf
	http://www.harborestuary.org/minutes/twg-02jan7.pdf
	http://www.harborestuary.org/news/TEsummer02.pdf
	http://www.harborestuary.org/news/TEwinter03.pdf
	http://www.harborestuary.org/pdf/hep_beaches_03.pdf
	http://www.harborestuary.org/pdf/hep_cso.pdf
	http://www.harborestuary.org/pdf/hep_toxics.pdf
	http://www.harborestuary.org/pdf/hepshellfish.pdf
	http://www.harborestuary.org/restmaps/HabitatSiteList.pdf
	http://www.harborestuary.org/surveys/wk01nyb03.pdf
	http://www.harborestuary.org/surveys/wk05nyb03.pdf
	http://www.harborestuary.org/surveys/wk07nyb03.pdf
	http://www.harborestuary.org/surveys/wk09nyb02.pdf
	http://www.harborestuary.org/surveys/wk1-helicopter.pdf
	http://www.hudsonriver.org/hep/depot/depot_5.htm
North Jersey District Water Supply Commission of the State of NJ	http://www.njdwsc.com/prbwmp/wma4/ doc/wma4wca_11_02.htm

Table 2-2
Internet Sites Accessed for Inventory Area Data and Information

Organization	Internet Site Address(es)[a]
New York City Department of Environmental Protection (NYCDEP)	http://www.ci.nyc.ny.us/html/dep/html/news/depnewshwqs.html
New York State Department of Environmental Conservation (NYSDEC)	http://www.dec.state.ny.us/apps/bba/results/index.cfm
	http://www.dec.state.ny.us/website/dar/reports/index.html
	http://www.dec.state.ny.us/website/dar/baqs/acidrain/index.html
	http://www.dec.state.ny.us/website/dar/bts/airmon/index.htm
Port Authority of NY/NJ	http://www.panynj.com
Regional Planning Association	http://www.rpa.org/maps/maps.html
Rutgers University	http://marine.rutgers.edu/mrs/newark/pubs.html
Rutgers University Institute of Marine and Coastal Sciences	http://marine.rutgers.edu/
Rutgers University Libraries	http://www.libraries.rutgers.edu/
Stevens Institute of Technology Library	http://www.lib.stevens-tech.edu/uhtbin/cgisirsi/Mon+Mar++1+12:22:18+EST+2004/0/4
The Trust for Public Lands	http://tpl.org/content_documents/main_map.pdf
U.S. Coast Guard (USCG)	http://www.uscg.mil/hq/g-m/nmc/response/stats/aa.htm
U.S. Environmental Protection Agency (USEPA)	http://www.epa.gov/emap/remap/html/two/data/nynj.html
	http://www.epa.gov/storet/
	http://www.epa.gov/wtc/summary.html
U.S. Fish and Wildlife Service (USFWS)	http://training.fws.gov/library/pubs5/web_link/images/fig20a.jpg
	http://www.nwi.fws.gov/
	http://training.fws.gov/library/pubs5/begin.htm
U.S. Geological Survey (USGS)	http://waterdata.usgs.gov/nj/nwis/sw
	http://waterdata.usgs.gov/nj/nwis/nwisman/?site_no=01392590&agency_cd=USGS
	http://waterdata.usgs.gov/nj/nwis/nwisman/?site_no= 01378570& agency_cd=USGS
	http://waterdata.usgs.gov/nj/nwis
Waterkeeper Alliance	http://www.waterkeeper.org/

Note:
a. Internet site addresses as of April 30, 2004

Table 2-3
Summary of Contents of Newark Bay Study Area Analytical Database Version 1.0 (April 2004)

Inventory Report Reference	Investigation Title in Database	Sample Matrix	Waterways Sampled
NOAA (1995b)	1991 NOAA Phase I NS&T Sediment Investigation	Sediment	Arthur Kill Newark Bay
NOAA (1995b)	1993 NOAA Phase II NS&T Sediment Investigation	Sediment	Hackensack River Kill Van Kull Newark Bay Passaic River
Tierra (1990)	1990 Surface Sediment Investigation	Sediment	Arthur Kill Hackensack River Passaic River
Tierra (1991)	1991 Core Sediment Investigation	Sediment	Arthur Kill Hackensack River Kill Van Kull Newark Bay Passaic River
Tierra (1992)	1992 Core Sediment Investigation	Sediment	Hackensack River Newark Bay Passaic River
Tierra (1993)	1993 Core Sediment Investigation - 01 (March)	Sediment	Arthur Kill Hackensack River Kill Van Kull Newark Bay Passaic River
Tierra (1993)	1993 Core Sediment Investigation - 02 (July)	Sediment	Passaic River
Tierra (1994a)	1994 Finfish and Benthic Invertebrate Survey	Sediment	Passaic River
Tierra (1994b)	1994 Surface Sediment Investigation	Sediment	Passaic River
NR	1994 USACE Minish Park Investigation	Ground Water Soil	Passaic River
Tierra (1995a)	1995 Biological Sampling Program	Surface Water Tissue	Passaic River
Tierra (1995b)	1995 Geotechnical Testing Program	Sediment	Passaic River
Tierra (1995c)	1995 RI Sampling Program	Sediment	Passaic River
Tierra (1995d)	1995 Surface Sediment Sampling Program	Sediment	Passaic River

Table 2-3
Summary of Contents of Newark Bay Study Area Analytical Database Version 1.0 (April 2004)

Inventory Report Reference	Investigation Title in Database	Sample Matrix	Waterways Sampled
Tierra (1996a)	1996 Newark Bay Reach A Sediment Sampling Program	Sediment	Newark Bay
Tierra (1996b)	1995-1996 Passaic River Study Area RI/FS Sediment Mobility Testing Program	Surface Water	Passaic River
Tierra (1997a)	1997 Newark Bay Reach B,C,D Sampling Program	Sediment	Newark Bay
Tierra (1997b)	1997 CSO Sampling Program	Sediment Surface Water	Passaic River
Tierra (1998)	1998 Newark Bay Elizabeth Channel Sampling Program	Sediment	Newark Bay
Tierra (1999a)	1999 Newark Bay Reach A, B, C, D Baseline Sampling Program	Sediment Surface Water	Newark Bay
Tierra (1999b)	1999 Sediment Sampling Program	Sediment	Arthur Kill Newark Bay Passaic River
Tierra (1999c)	1999 Newark Bay Reach A Monitoring Program	Surface Water Particulates	Newark Bay
Tierra (1999d)	1999 Late Summer/Early Fall RI-ESP Sampling Program	Sediment Tissue	Passaic River
Tierra (1999e)	1999 USACE Drift Removal Monitoring Program	Surface Water	Passaic River
Tierra (1999f)	1999 Preliminary TIE Study	Sediment Surface Water	Newark Bay Passaic River
Tierra (2000a)	1999/2000 Minish Park Monitoring Program	Sediment	Passaic River
Tierra (2000b)	2000 BioGenesis Sediment Collection Program	Sediment	Passaic River
Tierra (2000c)	2000 Spring RI-ESP Sampling Program	Sediment Tissue	Passaic River
Tierra (2000d)	2000 TIE Study	Sediment Pore Water	Passaic River

Table 2-3
Summary of Contents of Newark Bay Study Area Analytical Database Version 1.0 (April 2004)

Inventory Report Reference	Investigation Title in Database	Sample Matrix	Waterways Sampled
Tierra (2001a)	2001 RI Supplemental ESP Biota Sampling Program	Tissue	Passaic River
USACE (unknown)	1995 USACE Minish Park Investigation	Sediment	Passaic River
USEPA (unknown)	1993 USEPA Surface Sediment Program	Sediment	Passaic River
USEPA (1998)	1993/1994 USEPA R-EMAP Sediment Investigation	Sediment	Arthur Kill
			Hackensack River
			Kill Van Kull
			Newark Bay
			Passaic River
USEPA (2003)	1998 USEPA R-EMAP Sediment Investigation	Sediment	Hackensack River
			Newark Bay

Notes:
CSO = combined sewer overflow
ESP = Ecological Sampling Plan
NR = data not reported in Inventory Report
NS&T = National Status and Trends Program
R-EMAP = Regional Environmental Monitoring and Assessment Program
RI/FS = Remedial Investigation/Feasibility Study
TIE = Toxicity Identification Evaluation

Table 3-1
Important Government Investigations for which Existing Data were not Obtainable for the Inventory Area[a]

Program	Responsible/Participating Government Agencies	Program Objective	Types of Studies Performed (Based on Existing Documentation)	Data Not Available to Date or Partially Obtained	Reported Year(s) of Data Collection
NY/NJ Harbor Estuary Program (HEP) Contaminant Assessment and Reduction Program (CARP)	NYSDEC NJDEP USEPA USACE PA NY/NJ NJ Maritime Resources DMMIWG	The CARP is a component of the NY/NJ HEP with an objective to understand the fate and transport of contaminants discharged into the entire estuary, and use this information to take necessary action. Sampling efforts include: Water chemistry and hydrodynamic modeling, CSOs, POTW effluents, SWOs, surface water, sediment, and bioaccumulation studies.	CSOs POTW effluents Storm water outfalls Surface water sampling Sediment sampling Biota tissue sampling Hydrodynamics modeling	CSOs POTW effluents SWOs Surface water sampling (only limited amount of data have been released to date) Sediment sampling (only limited amount of data have been released to date) Biota tissue sampling (completed, but only provided in preliminary draft form) Hydrodynamics modeling (only limited portions of data have been released to date)	1999 - 2003
NY/NJ Harbor Deepening Project (HDP)	USACE New York District	The objective of the NY/NJ HDP is to determine, design, manage and coordinate ongoing and future navigational projects of the NY/NJ Jersey Harbor.	Biological community surveys Water quality Sediment chemistry Sediment toxicity Geotechnical characteristics Stratigraphy Hydrodynamic modeling Tidal data	Water quality Sediment chemistry Sediment toxicity Geotechnical characteristics Stratigraphy Hydrodynamic modeling Tidal data	1995 - present
Dredging Permits	USACE New York District	The USACE regulates the issuance of dredging permits for commercial ports, i.e., PA NY/NJ navigation projects and private organizations. The dredge permit applications contain environmental data required by the USACE for the proposed dredging site(s).	Dredging permit applications containing water, sediment, bioaccumulation, and toxicity data.	Only select permits obtained to date.	Ongoing
Bathymetric Surveys	USACE New York District	The USACE periodically conducts bathymetric surveys of NY/NJ Harbor Estuary navigable waterways.	Bathymetric surveys	Only most recent bathymetry data were obtained.	1940 - present

Notes:

a. The investigations described in this table include large-scale government-sponsored studies or initiatives that have collected substantial data and/or information from the Inventory Area that have not been made publicly available to date.

CARP = Contamination Assessment and Reduction Program
CSOs = combined sewer outfalls
DMMIWG = Dredged Materials Management Integration Work Group
HDP = Harbor Deepening Project
HEP = Harbor Estuary Program
NJDEP = New Jersey Department of Environmental Protection
NY/NJ = New York/New Jersey
PA NY/NJ = Port Authority of New York/New Jersey
POTW = publicly-owned treatment works
USACE = U.S. Army Corps of Engineers
USEPA = U.S. Environmental Protection Agency

Table 3-2
Water Studies Identified for the Inventory Area

Reference	Data Collection Date(s)	Data Collection Season(s)	Waterway	Number of Sampling Locations	Number of Samples	Parameters Measured							
						Chemical	Water Clarity	Temperature	Conductivity	Salinity	DO	pH	TSS
2B Inc. (1997)	1990s	not provided	groundwater (Ironbound section of Newark, NJ)	57	not provided	As, Cd, Cr, Hg, Ni, Pb, Sb, Zn						X	
Battelle (1992a)	1991	summer	NB	1	11	Ag, As, Cd, Cu, Hg, Ni, Pb, Zn				X	X		X
Bragin (1988)	1987 - 1988	year-round	NB, NY/NJ Harbor Estuary	3 main zones (lower, middle, upper)	not provided		X	X		X	X	X	
Cerrato (1986)	1985	spring, summer	NB, NY/NJ Harbor Estuary	not provided	not provided			X		X	X		
ChemRisk (1995)	1994	summer	PR	6	6				X	X	X	X	
Cheng and Konsevick (1988)	1978 - 1987	summer	HK	4	not provided			X		X	X		
Coastal & Environmental Studies, Inc. (2004)	1957 - 1992; KVK:1986 - 1992	year-round	KVK	5	276		X	X		X			
Creed et al. (2001)	2000 - 2001	not provided	AK, KVK, NB	3	5								X
Dredging Permit Applications (13): NB: USACE (1991b; 1997f) AK: USACE (1992b; 1992c; 1992d; 1993b; 1997e; 1997h; 1997i) KVK: USACE (1997g; 1999k) PR: USACE (1987; 1991a)	1987 - 1999	not applicable	AK, NB, KVK, PR site water and elutriate	AK, KVK, NB, PR	NB (2); AK (6); KVK (2); PR (2)	Ag, Cd, Cr, Cu, Hg, Ni, Pb, Zn							
EBASCO (1988)	prior to 1988	not provided	HK	3	not provided								
Eckenfelder (1993)	1991	summer, fall	HK	not provided	not provided			X		X	X	X	X
Edwards and Kelcey Inc. (1981)	1981	summer	HK	not provided	1	Ag, Ba, Cd, Cr, Cu, Fe, Hg, Ni, Zn	X	X		X	X	X	X
Environmental Connection, Inc. (1997)	1996	fall	HK	6	18	inorganic chemicals, PCBs, pesticides							
ERM (1985b)	1970s - 1980s	summer	HK	3	not provided			X		X	X	X	
ERM (1985g)	1970s - 1980s	not provided	HK	not provided	not provided	Cr, Cu, Fe, Mn, VOCs	X	X		X	X	X	X
Foote (1983)	1980 - 1981	year-round	HK	6	16			X		X	X	X	
Foote (1987)	1980 - 1981	summer, fall	HK	not provided	16			X		X			
Foote and Loveland (1982)	1980 - 1981	year-round	HK	not provided	not provided			X		X	X	X	
Galluzzi and Sabounjian (1980)	prior to 1980	year-round	HK	8	not provided	Hg							X
Grasso (1979)	prior to 1979	not provided	HK	15	not provided	Cd, Cu, Pb, Zn							
HMDC (1971)	1971	summer	HK	11	not provided	Cu, Fe	X	X		X	X	X	X
HMDC (1974)	prior to 1974	not provided	HK	not provided	not provided								
HMDC (1976)	1971 - 1975	year-round	HK	not provided	not provided					X	X		
HMDC (1977)	prior to 1977	not provided	HK	not provided	not provided	Hg							
HMDC (1980a)	1980	spring	HK	11	not provided			X		X	X		
HMDC (1982a)	prior to 1982	not provided	HK	not provided	not provided								
HMDC (1982b)	1980	fall	HK	1	continuous measurement	Hg							X
HMDC (1982c)	1980	fall	HK	1	continuous measurement	Hg							X
HMDC (1990c)	1990	summer	HK	5	5	Cr, Cu	X	X		X	X	X	
HMDC (1990d)	1988	year-round	HK	not provided	not provided		X	X		X	X	X	X
HMDC (1994)	1993 - 1994	year-round	HK	not provided	not provided	Cd, Cr, Cu, Ni, Pb		X		X	X	X	X
HMDC (1997)	1993 - 1996	year-round	HK	not provided	not provided	Cd, Cr, Cu, Ni, Pb					X		
Hromoko et al. (1982)	1980	winter, spring, summer	HK	3	180								
IEC (2000 - 2002)	2000 - 2002	year-round	HK, NB, NY/NJ Harbor Estuary, PR	not provided	not provided								
IEC (2003)	2003	summer	HK, NB, PR	HK: 6; NB: 3; PR: 6	6			X		X			
IEC (2004)	2003	year-round	HK, NB, NY/NJ Harbor Estuary, PR	not provided	not provided								
ISC (1937 - 1999)	1937 - 1999	year-round	HK, NB, NY/NJ Harbor Estuary, PR	not provided	not provided								
ISC (1988)	1988	not provided	AK, HK, KVK, NB, NY/NJ Harbor Estuary, PR	AK: 40; KVK: 26; NB: 14	not provided								
Keller et al. (1991)	1979 - 1989	year-round	NY/NJ Harbor Estuary	not provided	not provided						X		
Kimball (2000)	2000	spring	HK	7	7	inorganic chemicals, VOCs			X	X	X	X	X
Konsevick et al. (1994)	1993 - 1994	year-round	HK	14	not provided	Cd, Cr, Cu, Ni, Pb		X		X	X	X	X
Langan (1999)	1999	spring	HK	22	22	Au, Cd, Pb, PCBs, VOCs, Zn	X	X		X	X	X	X
Litten and Fowler (1999)	1998 - 1999	varies by location	NB, NY/NJ Harbor Estuary	1	1	PCBs, PCDD/Fs							
Litten et al. (1999)	1998 - 1999	varies by location	NB	1	1	Cd, Hg, pesticides, PCBs							
LoPinto (1979)	1978	year-round	HK	6	not provided								
Luther et al. (1987)	1979	summer	NB	7	7	Cd, Pb, Zn							X
March and Gittleson (1980)	1978	winter	HK	23	not provided	Fe		X					
McCormick et al. (1983)	1980	winter, spring, summer	NB	2	2					X	X		
McIntyre (2000)	1999	summer	HK	1	1	Cr, Cu, Ni, Pb, Zn				X		X	
MERI (2004a)	1993 - 2004	year-round	HK	14	not provided	Cd, Cr, Cu, Fe, Ni, Pb, Zn		X		X	X	X	X
MERI (2004b)	2002 - 2004	year-round	HK	3	not provided		X	X		X	X	X	X
Metcalf & Eddy (1995)	1992	summer, fall	HK	not provided	not provided			X		X	X		

Table 3-2
Water Studies Identified for the Inventory Area

Reference	Data Collection Date(s)	Data Collection Season(s)	Waterway	Number of Sampling Locations	Number of Samples	Parameters Measured							
						Chemical	Water Clarity	Temperature	Conductivity	Salinity	DO	pH	TSS
Mohan et al. (1999)	1990s	not provided	RW	7	7	As, Cu, DDD, DDE, DDT, Pb, Zn							
NJDEP (1987)	1983 - 1984	year-round	PR	not provided	not provided								
NJDEP (1996)	prior to 1996	not provided	NJ	not provided	not provided								
NJDEP (1998)	prior to 1998	not provided	NJ	not provided	not provided								
NJDEP (2000)	prior to 2000	not provided	NJ	not provided	not provided								
NJDEP (2001)	not provided	not provided	AK, ER, HK, KVK, PR, RW, RR	not provided	not provided	PCBs, PAHs, pesticides, PCDD/Fs, inorganic chemicals, POC, DOC	X						
NJDEP/SIT (2004)	2000 - 2002	year-round	AK, HK, KVK, NJ, PR	AK: 3; HK: 1; KVK: 3; NB: 5; PR: 1	not provided			X		X			X
NJDFGW (1981)	1981	spring, summer	NB, NY/NJ Harbor Estuary	1	1			X		X	X		
NJMSC (1987)	prior to 1987	not provided	NY/NJ Harbor Estuary	not provided	not provided						X		
NJTA (1986a)	prior to 1986	not provided	HK	not provided	not provided	Ag, Cu, Fe, Hg, Ni, Pb, PCBs, pesticides Zn							
NOAA (1981)	prior to 1981	not provided	HK, NB, NY/NJ Harbor Estuary	not provided	not provided	Cd, Cu, Hg, Ni, Pb, Zn		X		X	X		
NOAA (1982)	prior to 1982	year-round	ER, HK, NB, PR, RR, RW, NY/NJ Harbor Estuary	not provided	not provided	As, Be, Cd, Cr, Cu, Hg, Ni, Pb, Sb, Se, Ag, Zn					X		
NOAA (1984b)	prior to 1979	not provided	NB	not provided	not provided	total inorganic chemicals							
NOAA (1994)	1993 - 1994	year-round	NB, NY/NJ Harbor Estuary	17	496			X		X	X		
NY/NJ HEP (2004a)	1999 - 2004	varies by dataset	NB, NY/NJ Harbor Estuary	varies by dataset	varies by dataset	PCDD/Fs, pesticides, PCBs, PAHs, other chemicals		X			X	X	X
NYCDEP (1993)	1991 - 1992	winter, summer	AK, KVK	AK: 3; KVK: 2	not provided	Ag, As, Cd, Cu, Hg, Ni, Pb, Zn	X	X		X	X		X
NYCDEP (1998)	1909 - 1998	year-round	AK, KVK	AK: 3; KVK: 2	not provided	Ag, As, Cd, Cu, Hg, Ni, Pb, Zn	X	X		X	X		X
NYCDEP (1999)	1998	year-round	AK, KVK	AK: 3; KVK: 2	not provided	Ag, As, Cd, Cu, Hg, Ni, Pb, Zn	X	X	X		X	X	
NYCDEP (2000)	1999	year-round	AK, KVK	AK: 3; KVK: 2	not provided	Ag, As, Cd, Cu, Hg, Ni, Pb, Zn	X	X	X		X	X	
NYCDEP (2001)	2000	year-round	AK, KVK	AK: 3; KVK: 2	not provided	Ag, As, Cd, Cu, Hg, Ni, Pb, Zn	X	X	X		X	X	
NYCDEP (2003)	2002	winter, summer	AK, KVK	AK: 3; KVK: 2	not provided	Ag, As, Cd, Cu, Hg, Ni, Pb, Zn	X	X		X	X		X
NYSDEC (2003)	1998 - 2000	year-round	AK, HK, NB, PR	varies by dataset	not provided	PCDD/Fs, PCBs, PAHs, pesticides, inorganic chemicals (Cd, Hg, Pb)							X
O'Donoghue (1982)	1982	not provided	HK	1	18			X		X	X	X	X
Rankin (2001)	1998 - 2000	year-round	NY/NJ Harbor Estuary	13	not provided	PCDD/Fs, PCBs, pesticides, PAHs, inorganic chemicals,	X	X	X				
Rankin et al. (2001)	1998 - 2000	year-round	NY/NJ Harbor Estuary	13	not provided	PCDD/Fs, PCBs, pesticides, PAHs, inorganic chemicals,							
Rutgers (1976)	1974 - 1975	summer	NJ	not provided	not provided	Cr, Pb, Zn							X
Rutgers (1977)	1976	summer	PR	9	not provided								
SAIC (1993)	1991 - 1992	1991: summer; 1992: winter	NY/NJ Harbor Estuary	4	not provided	Ag, As, Be, Cd, Cr, Cu, Hg, Ni, Pb, Sb, Se, Tl, Zn, TOC, NH_3							
Squibb et al. (1991)	1980 - 1990	varies by dataset	NB, NY/NJ Harbor Estuary	varies by dataset	varies by dataset	varies by dataset							
Stahl (1985)	1983	summer, fall	PR	varies by river mile	76		X	X			X		
Su et al. (2002)	1999	spring	PR	6	not provided	PCDD/Fs, PCBs, Al, As, Cu, Mn, Pb, Zn				X	X	X	
Suszkowski (1978)	1976 - 1977	year-round	NB	not provided	not provided					X			X
Tierra (1994a)	1994	summer	PR	6	28			X	X	X	X		
Tierra (1995a)	1995	fall	PR	2	2	PCDD/Fs							
Tierra (1996b)	1995 - 1996	spring, summer	PR	6	not provided			X		X		X	X
Tierra (1997b)	1997	fall	PR	10	10	PCDD/Fs, pesticides/herbicides, PCBs, total cyanide, TEPH							X
Tierra (1999a)	1999	spring	NB	6	6	physical parameters					X	X	
Tierra (1999c)	1999	summer	NB	3	3	PCDD/Fs, pesticides, PCBs, PAHs, other chemicals					X	X	
Tierra (1999e)	1999	spring	PR	2	9 water column, 3 filterable solids	inorganic chemicals, PCDD/Fs, PCBs, pesticides, herbicides, PAHs, VOCs, TEPH							X
Tierra (2004a)	1995 - 1999	spring, summer	PR	8	varies by endpoint								
Tierra (2004b)	1995 - 1996	spring, summer	PR	8	varies by endpoint								
Tierra (2004c)	1995 - 1996	spring, summer	PR	8	varies by endpoint			X	X	X		X	X
Tierra (2004d)	1995 - 2001	spring, summer	PR	8	varies by endpoint								

Table 3-2
Water Studies Identified for the Inventory Area

Reference	Data Collection Date(s)	Data Collection Season(s)	Waterway	Number of Sampling Locations	Number of Samples	Parameters Measured							
						Chemical	Water Clarity	Temperature	Conductivity	Salinity	DO	pH	TSS
USACE (1985b)	prior to 1985	not provided	HK	not provided	not provided	Hg							
USACE (1997a)	1996	spring	NB, NY/NJ Harbor Estuary	3	3	inorganic chemicals, pesticides, PCBs							
USACE (1999a)	1991; 1994 - 1995	not provided	NB	not provided	not provided								
USACE (2003a)	2001/2002, 2002/2003	numerous sampling events	AK, NB	9	not provided			X	X	X	X		
USACE (2003b)	2001/2002, 2002/2003	numerous sampling events	AK, NB	9	not provided			X	X	X	X		
USACE (2003c)	1998/1999, 2001/2002, 2002/2003	numerous sampling events	NB	varies by sampling event	not provided			X		X	X	X	
USDOE (1982)	1975 - 1979	not provided	AK	not provided	not provided					X	X	X	
USEPA (1998)	1990 - 1994	summer 1993 and 1994	HK	20	20		X	X		X	X	X	
USEPA/USACE (1995)	1978 - 1988	not provided	HK	not provided	not provided			X		X	X	X	
USGS (1976)	prior to 1976	not provided	HK	not provided	not provided								
USGS (2001)	1993 - 1996	year-round	HK, PR	34	not provided								
Weston (1998)	1990s	not provided	groundwater	groundwater (Newark International Airport and the Port Newark / Elizabeth Port Authority Marine Terminal)	not provided	As, Ba, Cd, Cu, Hg, Ni, Pb, Se, Tl, Zn					X		

Notes:

AK = Arthur Kill
BOD = biological oxygen demand
BTEX = benzene, toluene, ethylbenzene, and xylene
COD = chemical oxygen demand
CSO = combined sewer outfall
ER = Elizabeth River
HK = Hackensack River
KVK = Kill Van Kull
NB = Newark Bay
NH_3 = ammonia
NH_4 = ammonium
NO_3 = nitrate
NY/NJ = New York/New Jersey
TKN = total Kjeldahl nitrogen
TOC = total organic carbon
VOCs = volatile organic compounds
PAHs = polycyclic aromatic hydrocarbons
PCBs = polychlorinated biphenyls
PCDD/Fs = polychlorinated dibenzo-*p*-dioxins and dibenzofurans
POC = particulate organic carbon
PR = Passaic River
RR = Raritan River
RW = Rahway River
TEPH = total extractable petroleum hydrocarbons

Other
BTEX, VOCs, SVOCs
BOD, precipitation
chlorophyll-*a* , BOD, NO_2, NO_3, NH_3, NH_4, phosphates, TOC
turbidity
pesticides, PCBs, TEPH
coliform, BOC, TOC, hardness, alkalinity, nutrients, coliform
pesticides, PCBs, VOCs.
nitrogen, BOD, TOC, phosphates
hardness, alkalinity, nutrients, coliform
water hardness, alkalinity, silica, sulfate, nitrate-nitrogen, orthophosphate, chloride
hardness, alkalinity, sulfate, Ca, chloride
hardness, alkalinity, nutrients
hardness, alkalinity, nutrients
NO_x in water
nitrogen levels
coliform, COD, phosphates, nitrogen
coliform, BOD, phosphates, ammonia, nutrients
coliform
coliform
pathogens
total coliform, fecal coliform, enterococcus, fecal streptococcus
pathogens
pathogens
CSO pipe diameter
TOC, nitrates, phosphates, chlorophyll-*a*
COD, BOD, chlorides, nitrate, nitrogen, total solids
BOD, COD, sulfate, ammonia, phosphorus, chlorophyll-*a*
water depth
hardness, alkalinity, nutrients
nitrates, effluent volume
BOD, COD, fecal coliform, oil/grease
chlorophyll-*a*
nitrogen, plankton, chlorophyll-*a*

Other
hardness, alkalinity, nutrients, coliform
water use designations, surface and groundwater exceedances of water quality criteria
water use designations, surface and groundwater exceedances of water quality criteria
water use designations, surface and groundwater exceedances of water quality criteria
velocity, organics
BOD
fecal coliform
BOD, nutrients
fecal coliform, BOD
fecal coliform, BOD
fecal coliform, BOD
fecal coliform, BOD
fecal coliform, BOD
organic carbon
phosphates, sulfates
POC, DOC, suspended sediments
POC, DOC, suspended sediments
coliform, BOD, phosphates, ammonia
nitrite-nitrate
chlorophyll-*a* , depth, velocity
turbidity
water current
TOC, COD, BOD, TKN, NO_3-N, NH_3-N, hardness, P
various geotechnical measurements
tide gage data
various current measurements
various bathymetric measurements

Other
streamflow
BTEX, VOCs, SVOCs

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Table 3-3
Surface Water Inorganic Chemicals, POC, DOC, and TSS for Low and High Flow Sampling in NY/NJ Harbor Estuary Waters in 1991 from Battelle (1992a)

Author's Sampling Location	Date	Tide	As (µg/L)		Cd (µg/L)		Cu (µg/L)		Pb (µg/L)		Hg (µg/L)			Ni (µg/L)		Ag (µg/L)		Zn (µg/L)		POC/DOC (mg C/L)		TSS (mg/L)	Salinity (%)
			TR	D	TR	D	TR	D	TR	D	TR	D	P	TR	D	TR	D	TR	D	PC	DOC		
Surface																							
A7	5/19/1991	Ebb	1.2	NR	0.104	0.092	3.8	2.22	2.54	0.165	0.0321	0.0037	NR	2.2	2.06	0.048	0.0048	10.5	7.92	1.420	2.67	9.50	17.83
A7	5/19/1991	Low	1.5	NR	0.076	0.079	3.9	2.04	2.72	0.190	0.0513	0.0028	NR	1.5	2.26	0.056	0.0020	7.4	7.86	1.090	2.65	13.8	17.32
A7	5/19/1991	Flood	1.2	NR	0.100	0.082	3.5	1.86	2.43	0.172	0.0282	0.0041	NR	2.1	1.88	0.048	0.0034	9.3	7.60	1.140	2.45	10.8	17.98
A7	5/19/1991	High	1.1	0.73	0.093	0.066	3.5	2.01	2.10	0.192	0.0190	0.0028	NR	2.1	1.65	0.036	0.0046	8.9	7.78	1.160	2.26	8.99	18.96
A3	5/18/1991	Ebb	1.9	1.1	0.134	0.086	6.4	2.36	3.33	0.225	0.0433	0.0036	NR	2.7	1.90	0.067	0.0053	11.0	7.22	0.980	3.23	9.15	21.61
A3	5/18/1991	Low	2.0	NR	0.148	0.129	6.4	2.39	3.61	0.280	0.0527	0.0024	NR	2.7	2.74	0.084	0.0059	12.8	10.40	0.990	2.37	12.2	20.08
A3	5/18/1991	Flood	1.7	NR	0.107	0.114	5.3	2.50	2.92	0.286	0.0409	0.0034	NR	1.7	2.75	0.064	0.0063	6.6	9.38	0.945	2.56	10.7	20.46
Bottom																							
A7	5/19/1991	Ebb	1.2	NR	0.092	0.080	3.5	1.88	2.14	0.181	0.0266	0.0028	NR	2.0	1.79	0.052	0.0052	9.0	7.86	0.666	2.18	7.58	19.44
A7	5/19/1991	Low	1.4	NR	0.073	0.090	4.3	1.96	3.00	0.192	0.0598	0.0040	NR	1.2	1.89	0.070	0.0087	6.2	7.81	1.310	2.24	14.1	18.85
A7	5/19/1991	Flood	1.5	0.78	0.115	0.063	6.2	1.96	4.54	0.206	0.0609	0.0028	NR	3.2	1.54	0.083	0.0045	12.2	7.68	0.975	2.08	22.4	19.58
A7	5/19/1991	High	1.3	NR	0.100	0.077	4.1	1.72	2.64	0.192	0.0351	0.0028	NR	1.5	1.61	0.081	0.0069	6.5	6.84	0.639	2.16	12.5	20.49
A3	5/18/1991	Ebb	1.4	0.91	0.100	0.060	5.0	2.05	2.52	0.159	0.0315	0.0028	NR	2.1	1.53	0.041	0.0090	7.1	5.08	0.695	2.06	8.11	22.86
A3	5/18/1991	Low	2.0	NR	0.126	0.099	6.5	2.13	3.55	0.217	0.0562	0.0028	NR	2.4	2.14	0.083	0.0057	10.2	7.23	1.010	2.04	13.5	21.61
A3	5/18/1991	Flood	2.5	NR	0.157	0.114	12.4	2.41	1.54	0.117	0.0416	0.0028	NR	3.7	1.13	0.163	0.0106	19.6	7.95	1.350	2.19	25.5	21.18

Notes:
D = dissolved
DOC = dissolved organic carbon
P = particulate phase
PC = particulate carbon
NR = not reported
TR = total recoverable
TSS = total suspended solids

Table 3-4
Surface Water Quality Data Collected during 1994 Passaic River Finfish and Benthic Invertebrate Survey from ChemRisk (1995) and Tierra (1994a)

Author's Sampling Location	Date	Approx. Tide Height (ft)	Depth (ft)	Temperature (^{o}C)	Dissolved Oxygen (mg/L)	Salinity (ppth)	Conductivity (μmho/cm^2 x 100)
1	8/11/1994	4.4	Surface	24	5.8	18	290
			10	24	5.4	20	259
			20	23	5.0	20	253
2	8/11/1994	5.7	Surface	24	5.2	17	223
			8	24	5.1	18	233
3	8/11/1994	4.8	Surface	25	4.9	16	215
			10	24	4.2	18	233
			20	24	4.2	19	248
4	8/11/1994	4.8	Surface	25	4.6	14	183
			10	24	4.2	15	195
			20	24	3.8	16	215
5	8/10/1994	5.7	Surface	24	--	21	290
			Bottom	25	--	23	305
6	8/11/1994	5.2	Surface	25	5.1	6.0	80
			10	24	3.0	8.5	120
			22	24	2.2	9.0	110

Notes:
-- Not measured
^{o}C = degrees Celsius
ft = feet
mg/L = milligram per liter
ppth = parts per thousand
μmho/cm^2 = micromho per square centimeter

Table 3-5

Surface Water Quality Data for Hackensack Meadowlands and Hackensack River from Eckenfelder (1993)

Parameter	Hackensack Meadowlands	Hackensack River
In Situ **Field Data**		
Conductivity (µmhos/cm^2)	11,500 - 18,000	8,500 - 10,800
DO (mg/L)	1.4 - 13	3.4 - 5.1
pH	6.3 - 8.9	7.6 - 7.8
Salinity (ppth)	11 - 26	11 - 18
Temperature (^{o}C)	5.2 - 27	16 - 18
Laboratory Data		
BOD (mg/L)	1.0 - 22	1.0 - 1.7
Fecal Coliforms (colonies/100 mL)	0 - 1,500	0 - 2,500
Hardness (mg/L)	2,652 - 3,010	2,200 - 3,450
Sulfides (mg/L)	1.0 - 3.6	1.0 - 8.2
TKN (mg/L)	0.60 - 3.6	0.20 - 6.4
TOC (mg/L)	1.8 - 21	2.5 - 6.5
TSS (mg/L)	2.0 - 39	2.0 - 38

Notes:
Results are presented as the range of results for the parameter.
BOD = biochemical oxygen demand
^{o}C = degrees Celsius
mg/L = milligrams per Liter
ppth = parts per thousand
TKN = total Kjeldahl nitrogen
TSS = total suspended solids
µmho/cm^2 = micromho per square centimeter

Table 3-6
Surface Water Data for Bucks Creek and Van Winkle Ditch from Kimball (2000)

Parameters	Range
Inorganic Chemicals (µg/L)	
Ag	ND - 4.8 B
As	ND
Be	7.2
Cd	1.6 B
Cr	1.2 B - 54
Cu	ND - 69
Hg	0.60 - 1.0
Pb	ND - 117
Ni	4.8 - 54
Sb	ND
Se	ND
Tl	ND - 6.4 B
Zn	40 - 510
Base Neutral Organic Compounds (µg/L)	
Bis(2-Ethylhexyl)phthalate	ND - 1.4
Di-n-butylphthalate	ND - 33
Fluorene	ND - 2
Total TICs	29.7 J - 366
Supplemental Parameters	
BOD (mg/L)	27 - 86
Chlorides (mg/L)	37 - 5,400
COD (mg/L)	59 - 140
DO (mg/L)	6.8 - 617
DO %	58 - 1,000
Nitrate nitrogen (mg/L)	<0.50 - 2.5
ORP (mV)	31 - 189
pH (lab)	7.0 - 7.8
pH (field)	6.0 - 10
Salinity (ppth)	0.58 - 2.2
Specific Conductivity (µmho/cm^2)	1,169 - 13,367
Temperature (˚C)	6.7 - 9.4
TS (mg/L)	800 - 8,300
TSS (mg/L)	15 - 1,100

Table 3-6
Surface Water Data for Bucks Creek and Van Winkle Ditch from Kimball (2000)

Parameters	Range
VOCs (µg/L)	
Base neutrals	ND - 1,756 J
Benzene	ND - 2.6
Chlorobenzene	ND - 7.3
Ethylbenzene	ND - 7.6
m/p-Xylene	ND - 22
Toluene	ND - 3.9
Total TICs	ND - 81

Notes:
Results are presented as the range of data per parameter.
B = detected in blank
BOD = biochemical oxygen demand
^{o}C = degree Celsius
COD = chemical oxygen demand
DO = dissolved oxygen
J = detected below method detection limit - estimated value
mg/L = milligrams per Liter
mV = millivolts
ND = not detected
ORP = oxidation reduction potential
ppth = parts per thousand
TICs = tentatively identified compounds
TS = total solids
TSS = total suspended solids
µg/L = micrograms per Liter
µmho/cm^2 = micromho per square centimeter
VOCs = volatile organic compounds

Table 3-7
Surface Water Data from Kearny Marsh from Langan (1999)

Parameters	Minimum	Maximum
***In Situ* Field Data**		
DO (ppm)	6.9	18
ORP (mV)	112	119
pH	7	8.3
Salinity (ppth)	0.20	2.4
Specific conductivity (µS)	164	4,550
Temperature (^{o}C)	11	19
Inorganic Chemicals (µg/L)		
Ag	ND	38
Cd	ND	3.6
Pb	7.3	16
Zn	ND	60
Pesticides (µg/L)		
4.4'-DDD	ND	0.035
SVOCs (µg/L)		
bis(2-Ethylhexyl)phthalate	ND	ND
Di-n-butyl phthalate	ND	40
Diethylphthalate	ND	1.2
SVOC TICs	ND	15
Total PCBs	ND	ND
VOCs (µg/L)		
Chloroform	ND	ND
Toluene	ND	0.72
Wet Chemistry		
BOD (mg/L)	0.92	20
Chloride (µg/L)	400,000	740,000
COD (mg/L)	35	87
Color (pt. Co)	45	65
Corrosivity as pH	7.4	8.0
Cyanide (µg/L)	ND	ND
Fecal Coliform (MPN/100mL)	4.0	3,000
Phenol (µg/L)	ND	ND
Sulfate (mg/L)	39	63
Surfactants (mg/L)	ND	ND
TKN (mg/L)	0.070	2.4
TOC (mg/L)	13	16
Total Phosphate (mg/L)	0.10	0.19
TPH (mg/L)	ND	ND

Table 3-7
Surface Water Data from Kearny Marsh from Langan (1999)

Parameters	Minimum	Maximum
TSS (mg/L)	11	58
Turbidity (NTU)	6.0	26

Notes:
BOD = biochemical oxygen demand
^{o}C = degrees Celsius
COD = chemical oxygen demand
DO = dissolved oxygen
mg/L = milligram per Liter
MPN/100mL = most probable number per 100 milliliter
mV = millivolts
ND = not detected
NTU = nephelometric turbidity units
ORP = oxidation reduction potential
PCBs = polychlorinate biphenyls
ppm = parts per million
ppth = parts per thousand
SVOCs = semivolatile organic compounds
TICs = tentatively identified compounds
TKN = total Kjeldahl nitrogen
TPH = total petroleum hydrocarbons
TOC = total organic carbon
TSS = total suspended solids
µg/L = microgram per Liter
µS = microSiemens
VOCs = volatile organic compounds

Table 3-8a

Surface Water Inorganic Chemicals Data from Hackensack River and Vicinity for May 1993 through July 1999 from Konsevick et al. (1994), HMDC (1994), HMDC (1997), and MERI (2004a)

Author's Sampling Location	Dates of Available Data	Cd	Cr	Cu	Fe	Ni	Pb	Zn
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Hackensack River A	May 25, 1993 to July 7, 1999	0.8 - 86	2.5 - 94	3 - 122	160 - 856	5.3 - 202	9.5 - 1,322	14 - 267
Hackensack River B	May 25, 1993 to July 7, 1999	1.2 - 95	2.5 - 30	5.9 - 51	170 - 648	11 - 408	11 - 1,020	15 - 206
Hackensack River C	May 25, 1993 to July 7, 1999	1.6 - 92	2.5 - 66	4.6 - 66	60 - 717	15 - 300	9.1 - 718	19 - 180
Hackensack River D	May 25, 1993 to July 7, 1999	3 - 113	2.5 - 108	4.4 - 99	70 - 606	31 - 894	17 - 617	23 - 199
Hackensack River E	May 25, 1993 to July 7, 1999	7.9 - 148	6.9 - 45	13 - 108	120 - 854	79 - 1,379	29 - 672	4.4 - 352
Penhorn Creek	May 25, 1993 to July 7, 1999	0.73 - 55	0.50 - 56	2 - 157	54 - 8,047	6.3 - 69	3.9 - 322	12 - 639
Sawmill Creek	May 25, 1993 to July 7, 1999	0.21 - 120	7.1 - 60	8.9 - 87	200 - 1,003	42 - 1,325	34 - 681	7.1 - 241
Berry's Creek	May 25, 1993 to July 7, 1999	1.1 - 74	2.5 - 230	3.2 - 100	107 - 1,180	19 - 462	13 - 581	27 - 253
Mill Creek	May 25, 1993 to July 7, 1999	0.18 - 81	2.5 - 60	4.5 - 69	120 - 469	4.2 - 246	11 - 361	21 - 263
Cromakill Creek (Lower)	May 25, 1993 to July 7, 1999	3 - 81	2.5 - 75	4.4 - 51	70 - 790	15 - 516	12 - 314	11 - 693
Cromakill Creek (Upper)	May 25, 1993 to July 7, 1999	0.12 - 39	2.5 - 60	3.2 - 104	60 - 2,332	6.7 - 100	3.9 - 242	21 - 181
Overpeck Creek	May 25, 1993 to July 7, 1999	1.1 - 53	1.1 - 75	1.1 - 34	30 - 540	4.3 - 300	4.8 - 247	7.9 - 182
Kearny Marsh	May 25, 1993 to July 7, 1999	2.5 - 70	3.5 - 90	2 - 43	90 - 1,330	8 - 65	3.5 - 329	9.9 - 280
Belleville Pike Drainage Lagoon	May 25, 1993 to July 7, 1999	0.80 - 78	0.50 - 167	1.2 - 113	360 - 4,308	2.5 - 99	3.9 - 389	7.1 - 248

Notes:
Results are presented as the range of data per the specified dates.
µg/L = microgram per Liter

Table 3-8b
Surface Water Quality Data from Hackensack River and Vicinity for May 1993 through July 1999 from Konsevick et al. (1994), HMDC (1994), HMDC (1997), and MERI (2004a)

Author's Sampling Location	Dates of Available Data	Fecal Coliforms (MPN/100ml)	BOD (mg/L)	COD (mg/L)	NH_4 (mg/L)	TSS (mg/L)	TDS (mg/L)	Chloride (mg/L)	Sulfate (mg/L)	pH	DO (mg/L)	Nitrate (mg/L)	Oil/Grease (mg/L)	Hardness (mg/L)	Alkalinity (mg $CaCO_3$/L)
Hackensack River A	May 25, 1993 to July 7, 1999	20 - 16,000	2 - 24	16 - 358	0.20 - 8.9	9.6 - 128	287 - 9,770	119 - 4,339	25 - 508	5.3- 8.4	1.0 - 18	0.10 - 0.75	2.9 - 528	484	124 - 124
Hackensack River B	May 25, 1993 to July 7, 1999	20 - 9,000	2.3 - 31	31 - 153	2.4 - 9.3	5.4 - 128	502 - 8,980	178 - 4,899	41 - 627	6.4 - 7.7	1.2 - 11	0.13 - 0.72	1.6 - 396	633	131 - 131
Hackensack River C	May 25, 1993 to July 7, 1999	20 - 9,000	2.3 - 14	30 - 176	2.0 - 8.2	0.60 - 143	991 - 11,850	458 - 8,048	79 - 856	6.4 - 7.8	1.6 - 11	0.22 - 0.89	4.2 - 73	822	136 - 136
Hackensack River D	May 25, 1993 to July 7, 1999	20 - 3,000	1.6 - 6.0	44 - 433	0.80 - 6.4	0.60 - 206	2,299 - 13,212	1,245 - 8,098	184 - 1,566	6.4 - 7.8	0.90 - 10	0.24 - 0.77	1.6 - 237	1,394	118
Hackensack River E	May 25, 1993 to July 7, 1999	20 - 5,000	1.6 - 5.2	34 - 466	0.34 - 4.6	0.70 - 234	1,080 - 20,738	2,839 - 12,596	190 - 1,326	6.2 - 8.0	2.6 - 12	0.060 - 0.64	0.34 - 3.0	1,768	105
Penhorn Creek	May 25, 1993 to July 7, 1999	80 - 16,000	2.0 - 9.1	17 - 243	0.30 - 8.9	6.5 - 166	353 - 10,350	50 - 770	26 - 636	5.8 - 7.8	0.80 - 10	0.090 - 0.97	1.2 - 63	278	168
Sawmill Creek	May 25, 1993 to July 7, 1999	40 - 5,000	2.6 - 5.2	56 - 648	0.90 - 7.2	3.2 - 232	4,032 - 15,910	2,119 - 12,496	277 - 2,111	6.2 - 8.0	2.9 - 14	0.26 - 0.80	2.0 - 9.5	1,564	127
Berry's Creek	May 25, 1993 to July 7, 1999	20 - 9,000	1.6 - 10	34 - 157	0.80 - 4.9	5.2 - 174	1,088 - 12,150	570 - 5,758	85 - 2,268	6.2 - 8.0	2.6 - 15	0.29 - 1.2	2.1 - 30	546	106
Mill Creek	May 25, 1993 to July 7, 1999	20 - 16,000	2.0 - 15	23 - 124	0.70 - 6.7	6.0 - 159	877 - 9,165	395 - 5,023	66 - 944	6.3 - 8.2	0.90 - 18	0.21 - 2.9	0.36 - 212	565	129
Cromakill Creek (Lower)	May 25, 1993 to July 7, 1999	20 - 16,000	2.1 - 18	31 - 204	2.4 - 8.4	1.1 - 164	559 - 27,464	245 - 5,198	47 - 584	5.9 - 7.7	0.50 - 13	0.12 - 0.74	2.2 - 65	594	140
Cromakill Creek (Upper)	May 25, 1993 to July 7, 1999	20 - 16,000	4.9 - 16	31 - 324	0.84 - 18	2.1 - 96	358 - 5,055	120 - 2,379	37 - 254	5.7 - 7.7	1.2 - 12	0.17 - 0.90	0.90 - 17	335	188
Overpeck Creek	May 25, 1993 to July 7, 1999	20 - 16,000	2.5 - 23	8.4 - 248	0.20 - 23.4	2.9 - 139	271 - 4,142	98 - 1,809	22 - 279	5.8 - 9.8	5.4 - 19	0.040 - 1.2	1.7 - 463	337	103
Kearny Marsh	May 25, 1993 to July 7, 1999	20 - 16,000	2.3 - 13	24 - 300	0.20 - 6.4	5.5 - 128	924 - 4,420	425 - 8,497	32 - 274	6.0 - 8.0	1.5 - 15	0.070 - 0.57	0.23 - 465	283	118
Belleville Pike Drainage Lagoon	May 25, 1993 to July 7, 1999	230 - 16,000	2.6 - 20	32 - 474	1.0 - 150	3.7 - 836	200 - 9,070	128 - 3,949	28 - 828	6.1 - 7.9	3.2 - 14	0.12 - 0.51	1.3 - 25	425	195

Notes:
Results are presented as the range of data per the specified dates.
BOD = biochemical oxygen demand
COD = chemical oxygen demand
DO = dissolved oxygen
mg CaCO3/L = milligrams of Ca carbonate per Liter
mg/L = milligram per Liter
MPN/100ml = most probable number per 100 milliliters
NH_4 = ammonium
TDS = total dissolved solids
TSS = total suspended solids

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Table 3-8c

In Situ Surface Water Field Data from Hackensack River and Vicinity for May 1993 through July 1999 from Konsevick et al. (1994), HMDC (1994), HMDC (1997), and MERI (2004)

Author's Sampling Location	Dates of Available Data	Turbidity (NTU)	Temperature (˚C)	Conductivity (mS/cm)	Salinity (ppth)
Hackensack River A	May 25, 1993 to July 7, 1999	4.6 - 20	3.0 - 31	0.54 - 14	0.20 - 9.5
Hackensack River B	May 25, 1993 to July 7, 1999	2.0 - 22	3.6 - 30	0.81 - 13	0.40 - 8.5
Hackensack River C	May 25, 1993 to July 7, 1999	4.0 - 21	3.3 - 30	1.8 - 16	1.0 - 11
Hackensack River D	May 25, 1993 to July 7, 1999	2.8 - 17	2.9 - 30	4.0 - 21	2.3 - 14
Hackensack River E	May 25, 1993 to July 7, 1999	2.5 - 20	2.7 - 31	8.9 - 26	5.5 - 18
Penhorn Creek	May 25, 1993 to July 7, 1999	4.6 - 64	2.6 - 28	0.63 - 19	0.30 - 2.6
Sawmill Creek	May 25, 1993 to July 7, 1999	5.0 - 31	1.5 - 30	6.8 - 24	4.1 - 16
Berry's Creek	May 25, 1993 to July 7, 1999	4.1 - 24	1.8 - 31	1.9 - 17	1.0 - 11
Mill Creek	May 25, 1993 to July 7, 1999	1.5 - 39	3.8 - 32	1.6 - 13	0.80 - 8.6
Cromakill Creek (Lower)	May 25, 1993 to July 7, 1999	2.2 - 34	3.8 - 31	1.0 - 15	0.50 - 9.4
Cromakill Creek (Upper)	May 25, 1993 to July 7, 1999	4.8 - 33	3.9 - 28	0.61 - 6.7	0.30 - 4.1
Overpeck Creek	May 25, 1993 to July 7, 1999	6.3 - 17	2.7 - 30	0.46 - 6.3	0.20 - 3.9
Kearny Marsh	May 25, 1993 to July 7, 1999	3.9 - 21	2.3 - 30	1.6 - 6.6	0.80 - 4.0
Belleville Pike Drainage Lagoon	May 25, 1993 to July 7, 1999	7.0 - 53	1.2 - 30	0.73 - 19	0.30 - 8.5

Notes:
Results are presented as the range of data per the specified dates.
^{o}C = degree Celsius
mS/cm = milliSiemen per centimeter
NTU = nephelometric turbidity unit
ppth = parts per thousand

Table 3-9
Summary of Continuous Surface Water Quality Data from Hackensack River and Vicinity for 2001, 2002, and 2003 from MERI (2004b)

Author's Sampling Location	Water Temperature (^{o}C)	Conductivity (mS/cm)	pH	Turbidity (NTU)	DO (mg/L)	Salinity (ppth)
2001 Summary						
EMS 1 - Kingsland Impoundment	20	91	7.7	42	3.4	8.9
EMS 2 - Hackensack River (Meadowlands Marina)	NR	NR	8.4	72	5.5	NR
EMS 4 - Hackensack River at Fairleigh Dickinson University	NR	NR	NR	NR	NR	NR
2002 Summary						
EMS 1 - Kingsland Impoundment	12	16	7.0	247	2.1	9.2
EMS 2 - Hackensack River (Meadowlands Marina)	12	100	5.5	93	2.4	7.5
EMS 4 - Hackensack River at Fairleigh Dickinson University	NR	NR	NR	NR	NR	NR
2003 Summary						
EMS 1 - Kingsland Impoundment	13	9.8	9.9	193	7.6	5.6
EMS 2 - Hackensack River (Meadowlands Marina)	11	6.8	13	19	NR	NR
EMS 4 - Hackensack River at Fairleigh Dickinson University	NR	NR	NR	NR	NR	NR

Notes:
Average annual data provided. Data acquired from Meadowlands Environmental Research Instite website:
(http://cimic.rutgers.edu/meri/ems_data/index.html)
^{o}C = degree Celsius
cm = centimeters
DO = dissolved oxygen
EMS = Environmental Monitoring Station
NR = not reported; data not available on website
NTU = nephelometric turbidity unit
mg/L = milligrams per Liter
mS/cm = milliSiemen per centimeter
ppth = parts per thousand

Table 3-10
In Situ Surface Water Data for Cromakill Creek and Hackensack River from Metcalf and Eddy (1995)

Parameter	Cromakill Creek		Hackensack River	
	Minimum	Maximum	Minimum	Maximum
***In Situ* Field Data**				
Conductivity (mS)	0.10	23	8.5	21
DO (ppm)	0.00	7.9	0.85	9.2
pH	5.7	8.0	5.7	8.0
Salinity (%)	0.40	1.4	0.43	1.3
Temperature (^{o}C)	8.4	28	8.5	29
Laboratory Data				
Alkalinity (mg/L)	111	226	111	125
Ammonia Nitrogen (mg/L)	2.9	17	2.1	5.2
CBOD-5 day (mg/L)	2.4	57	1.2	4.7
CBOD-30 day (mg/L)	ND (1.0)	72	ND (1.0)	ND (1.0)
Chlorophyll (mg/m^3)	5.2	71	31	59
Nitrite plus Nitrate (mg/L)	ND (0.040)	1.8	1.0	1.8
Organic Phosphorous (mg/L)	0.35	2.4	0.27	0.78
TDS (mg/L)	258	8,780	5,370	11,700
TKN (mg/L)	4.3	21	3.4	6.7
Total Phosphorous (mg/L)	0.68	3.1	0.52	1.2
TSS (mg/L)	14	162	11	31

Notes:

^{o}C = Degrees Celsius
CBOD-5 day = 5-day carbonaceous biochemical oxygen demand
CBOD-30 day = 30-day carbonaceous biochemical oxygen demand
DO = dissolved oxygen
mg/L = milligrams per Liter
mg/m^3 = milligram per cubic meter
mS = milliSiemen
ND (value) = non-detect (detection limit)
ppm = parts per million
TDS = total dissolved solids
TKN - total Kjeldahl nitrogen
TSS = total suspended solids

Table 3-11a
NY/NJ HEP CARP Surface Water 2,3,7,8-TCDD TEQ Data from NYSDEC (2003)

Author's Sampling Location	Average TEQ (pg/L)
Hackensack River, Mid-tidal	2.3
Hackensack River, Mouth	2.1
Newark Bay	1.3
Northern Arthur Kill	1.6
Passaic River, Mouth, Bottom	3.5
Passaic River, Mouth, Surface	11
Passaic River, Mid-tidal	11

Notes:

No sampling dates were provided for these samples in NYSDEC (2003).

CARP = Contamination Assessment and Reduction Program
NY/NJ HEP = New York/New Jersey Harbor Estuary Program
pg/L = picogram per Liter
TEQ = toxic equivalency quotient

Table 3-11b
NY/NJ HEP CARP Surface Water PCB Data from NYSDEC (2003)

Author's Sampling Location	Total PCBs (ng/L)	Date
Passaic River, Mouth, Surface	87	6/17/1999
Passaic River, Mouth, Surface	21	6/27/2000
Passaic River, Mouth, Surface	14	2/3/1999
Passaic River, Mouth, Surface	11	11/13/1998
Passaic River, Mouth Bottom	31	5/2/2000
Passaic River, Mouth Bottom	24	7/21/1999
Passaic River, Mouth Bottom	20	6/26/2000
Passaic River, Mouth Bottom	14	2/5/1999
Passaic River, Mid-Tidal	71	10/18/2000
Passaic River, Mid-Tidal	64	8/25/1999
Passaic River, Mid-Tidal	12	5/9/2000
Passaic River, Mid-Tidal	7.1	3/16/1999
Hackensack River, Mouth	11	11/12/1998
Hackensack River, Mouth	8.1	2/8/1999
Hackensack River, Mouth	25	7/7/1999
Hackensack River, Mouth	6.8	4/11/2000
Hackensack River, Mid-Tidal	14	3/17/1999
Hackensack River, Mid-Tidal	27	9/2/1999
Hackensack River, Mid-Tidal	29	10/12/1999
Hackensack River, Mid-Tidal	41	5/10/2000
Newark Bay	14	8/11/1999
Newark Bay	10	11/25/1998
Newark Bay	9.2	1/27/1999
Newark Bay	8.2	12/15/1999
Newark Bay	6.8	12/15/1999
Newark Bay	4.9	4/12/2000
Arthur Kill	25	11/17/1998
Arthur Kill	18	2/17/1999
Arthur Kill	13	7/8/1999
Arthur Kill	7	4/18/2000

Notes:
CARP = Contamination Assessment and Reduction Program
ng/L = nanogram per Liter
NY/NJ HEP = New York/New Jersey Harbor Estuary Program
PCBs = polychlorinated biphenyls

Table 3-11c
NY/NJ HEP CARP Surface Water Pesticides Data from NYSDEC (2003)

Author's Sampling Location	Aldrin/Dieldrin (ng/L)	HCB (ng/L)	Heptachlor (ng/L)	Total Chlordane (ng/L)	Total DDT (ng/L)	Total HCH (ng/L)
Passaic River, Mid-Tidal	1.4	0.28	0.68	2.0	2.5	NR
Passaic River, Mouth, Bottom	0.60	0.21	0.49	0.83	2.3	NR
Passaic River, Mouth, Surface	0.49	0.26	0.19	1.0	2.5	NR
Hackensack River, Mid-Tidal	0.51	0.73	0.36	0.65	1.0	NR
Hackensack River, Mouth	0.43	0.14	0.088	0.27	0.53	NR
Northern Arthur Kill	0.50	0.099	0.27	0.49	9.8	NR
Newark Bay	0.45	0.12	0.18	0.50	1.2	NR

Notes:
Data shown are the average pesticide concentrations.
No sampling dates were provided for these samples in NYSDEC (2003).
CARP = Contamination Assessment and Reduction Program
HCB = hexachlorobenzene
HCH = hexachlorocyclohexane
ng/L = nanogram per Liter
NR = not reported
NY/NJ HEP = New York/New Jersey Harbor Estuary Program
Total chlordane = sum of chlordane, alpha (cis); chlordane, gamma (trans); chlordane, oxy-; nonachlor, cis-; and nonachlor, trans-
Total DDT = sum of 2,4'-DDD, 2,4'-DDE, 2,4'-DDT,4,4'-DDD, 4,4'-DDE, 4,4'-DDT
Total HCH = sum of HCH, alpha; HCH, beta; HCH, delta; HCH, gamma

Table 3-11d
NY/NJ HEP CARP Surface Water PAH Data from NYSDEC (2003)

Author's Sampling Location	Total PAHs (ng/L)	Date
Passaic River, Mid-Tidal	3,800	10/18/2000
Hackensack River, Mouth	2,500	2/8/1999
Passaic River, Mid-Tidal	1,100	8/25/1999
Passaic River, Mid-Tidal	1,000	8/25/1999
Northern Arthur Kill	840	7/8/1999
Passaic River, Mid-Tidal	410	3/16/1999
Hackensack River, Mid-Tidal	420	10/12/1999
Newark Bay	260	1/27/1999
Passaic River, Surface	130	6/17/1999
Passaic River, Surface	50	11/13/1999

Notes:
All samples were filtered.
CARP = Contamination Assessment and Reduction Program
ng/L = nanogram per Liter
NY/NJ HEP = New York/New Jersey Harbor Estuary Program
PAHs = polycyclic aromatic hydrocarbons

Table 3-11e
NY/NJ HEP CARP Surface Water Inorganic Chemicals Data from NYSDEC (2003)

Author's Sampling Location	Inorganic Chemicals (ng/L)								
	Ag, D	Ag, T	Cd, D	Cd, T	Hg, D	Hg, DM	Hg, T	Pb, D	Pb, T
Hackensack River, Mid-Tidal	NR	NR	36	100	2.7	0.089	160	690	NR
Hackensack River, Mouth	NR	NR	56	70	1.0	0.043	22	160	NR
Newark Bay	NR	NR	67	88	1.6	0.02	33	130	NR
Northern Arthur Kill	NR	NR	77	83	0.85	0.025	33	130	NR
Passaic River, Mouth, Bottom	NR	NR	61	150	1.7	0.027	87	380	NR
Passaic River, Mouth, Surface	NR	NR	94	110	1.7	0.029	31	130	NR
Passaic River, Mid-Tidal	0	130	35	160	1.5	0.050	82	410	11,000

Notes:
Data shown are the average inorganic chemical concentration for the station.
No sampling dates were provided for these samples in NYSDEC (2003).
CARP = Contamination Assessment and Reduction Program
D = dissolved
DM = dissolved methyl
ng/L = nanogram per Liter
NR = not reported
NY/NJ HEP = New York/New Jersey Harbor Estuary Program
T = total

Table 3-11f
NY/NJ HEP CARP Surface Water Data for DOC, POC, and Suspended Solids from NYSDEC (2003)

Author's Sampling Location	Date	DOC (ng/L)	POC (ng/L)	SS (ng/L)
Hackensack River, Mouth	11/12/1998	7.0	0.62	5.9
Hackensack River, Mouth	2/8/1999	5.8	0.39	3.2
Hackensack River, Mouth	7/7/1999	5.5	0.46	24
Hackensack River, Mouth	4/11/2000	9.3	2.1	13
Hackensack River, Mid-Tidal	3/17/1999	14	2.8	44
Hackensack River, Mid-Tidal	9/2/1999	8.4	0.30	35
Hackensack River, Mid-Tidal	10/12/1999	7.5	1.3	37
Hackensack River, Mid-Tidal	11/2/1999	NR	NR	NR
Hackensack River, Mid-Tidal	5/10/2000	9.2	1.6	46
Northern Arthur Kill	11/17/1998	3.8	0.61	NR
Northern Arthur Kill	2/17/1999	18	0.67	4.9
Northern Arthur Kill	7/8/1999	NR	0.71	22
Northern Arthur Kill	4/18/2000	8.4	0.99	10
Newark Bay	11/25/1998	3.5	0.28	NR
Newark Bay	1/27/1999	4.9	0.50	3.8
Newark Bay	8/11/1999	3.4	0.46	44
Newark Bay	12/15/1999	3.8	0.38	6.1
Newark Bay	4/12/2000	6.0	0.75	11
Passaic River, Mouth, Bottom	2/5/1999	7.1	0.26	NR
Passaic River, Mouth, Bottom	7/21/1999	4.4	1.6	30
Passaic River, Mouth, Bottom	5/2/2000	8.9	0.89	61
Passaic River, Mouth, Bottom	6/26/2000	7.2	1.2	16
Passaic River, Mouth, Surface	11/13/1998	6.1	NR	4.8
Passaic River, Mouth, Surface	2/3/1999	7.6	0.15	5.9
Passaic River, Mouth, Surface	6/17/1999	4.5	0.080	24
Passaic River, Mouth, Surface	6/27/2000	6.8	1.5	16
Passaic River, Mid-Tidal	3/16/1999	4.6	0.21	11
Passaic River, Mid-Tidal	8/25/1999	6.3	2.9	57
Passaic River, Mid-Tidal	5/9/2000	NR	1.5	10
Passaic River, Mid-Tidal	10/18/2000	6.8	1.5	45

Notes:
Data shown are the average inorganic chemical concentration for the station.
CARP = Contamination Assessment and Reduction Program
DOC = dissolved organic carbon
ng/L = nanogram per Liter
NR = not reported
NY/NJ HEP = New York/New Jersey Harbor Estuary Program
POC = particulate organic carbon
SS = suspended solids

Table 3-12a
Surface Water Data Collected during Passaic River Barge Removal Activities from Tierra (1999e)

Parameters	Minimum	Maximum
Inorganic Chemicals (mg/L)		
Ag	ND (0.020)	ND (0.020)
Al	0.23	4.4
As	ND (0.010)	0.012
Ba	ND (0.10)	0.11
Be	ND (0.010)	ND (0.010)
Ca	1.2	34
Cd	ND (0.010)	ND (0.010)
Co	ND (0.050)	ND (0.050)
Cr	ND (0.030)	0.12
Cu	ND (0.025)	0.12
Fe	ND (0.10)	8.3
Hg	ND (0.0002)a	0.00023
K	ND (0.50)	7.3
Mg	ND (0.10)	21
Mn	ND (0.010)	0.21
Na	ND (0.60)	64
Ni	ND (0.050)	ND (0.050)
Pb	ND (0.0030)	0.18
Sb	ND (0.20)	ND (0.20)
Se	ND (0.0050)	ND (0.0050)
Tl	ND (0.010)	ND (0.010)
V	ND (0.020)	0.023
Zn	ND (0.025)	0.37
Herbicides (µg/L)		
2,4-D	ND (0.47)	ND (0.47)
2,4-DB	ND (0.47)	ND (0.47)
2,4,5-T	ND (0.047)	ND (0.047)
2,4,5-TP	ND (0.047)	ND (0.047)
PCB Congeners (ng/L)		
PCB-3	ND (0.50)	1.7
PCB-8	ND (0.50)	20
PCB-15	ND (0.50)	50
PCB-18	0.76	250
PCB-28	ND (0.55)	160
PCB-44	ND (0.55)	170
PCB-52	0.58	210
PCB-66	ND (0.55)	170
PCB-77	ND (0.50)	23
PCB-81	ND (0.50)	2.1
PCB-87	ND (0.50)	85
PCB-90/101	ND (0.55)	180

Table 3-12a
Surface Water Data Collected during Passaic River Barge Removal Activities from Tierra (1999e)

Parameters	Minimum	Maximum
PCB-105	ND (0.50)	55
PCB-114	ND (0.50)	3
PCB-118	ND (0.55)	130
PCB-123	ND (0.50)	3.2
PCB-126	ND (0.50)	0.7
PCB-128	ND (0.50)	24
PCB-138	ND (0.55)	150
PCB-153	ND (0.55)	150
PCB-156	ND (0.50)	13
PCB-157	ND (0.50)	3
PCB-167	ND (0.50)	5.1
PCB-169	ND (0.50)	ND (1.0)
PCB-170	ND (0.50)	33
PCB-180	ND (0.55)	84
PCB-183	ND (0.50)	18
PCB-184	ND (0.50)	ND (0.50)
PCB-187	ND (0.50)	36
PCB-189	ND (0.50)	1.2
PCB-195	ND (0.50)	7.5
PCB-202	ND (0.50)	4.8
PCB-206	ND (0.50)	12
PCB-207	ND (0.50)	0.85
PCB-209	ND (0.50)	12
Total monoCB	ND (0.50)	2.6
Total diCB	ND (0.50)	110
Total triCB	0.76	1,000
Total tetraCB	0.58	1,600
Total pentaCB	ND (0.55)	960
Total hexaCB	ND (0.55)	560
Total heptaCB	ND (0.55)	280
Total octaCB	ND (0.50)	78
Total nonaCB	ND (0.50)	16
Total PCBs	1.3	4,600
PCDD/Fs (pg/L)		
2,3,7,8-TCDD	ND (1.4)b	1,300
Total TCDD	ND (1.4)	1,500
1,2,3,7,8-PeCDD	ND (1.1)	6.1
Total PeCDD	ND (1.1)	110
1,2,3,4,7,8-HxCDD	ND (1.6)	4.6

Table 3-12a
Surface Water Data Collected during Passaic River Barge Removal Activities from Tierra (1999e)

Parameters	Minimum	Maximum
1,2,3,6,7,8-HxCDD	ND (1.5)	26
1,2,3,7,8,9-HxCDD	ND (1.4)	11
Total HxCDD	ND (1.6)	160
1,2,3,4,6,7,8-HpCDD	ND (1.9)	320
Total HpCDD	ND (1.9)	640
OCDD	8.8	3,700
2,3,7,8-TCDF	ND (1.2)	18
Total TCDF	ND (1.2)	1,200
1,2,3,7,8-PeCDF	ND (1.9)	8.5
2,3,4,7,8-PeCDF	ND (1.6)	30
Total PeCDF	ND (1.9)	780
1,2,3,4,7,8-HxCDF	ND (0.79)	120
1,2,3,6,7,8-HxCDF	ND (0.77)	28
1,2,3,7,8,9-HxCDF	ND (0.93)	6.8
2,3,4,6,7,8-HxCDF	ND (0.79)	17
Total HxCDF	ND (0.93)	430
1,2,3,4,6,7,8-HpCDF	ND (0.84)	570
1,2,3,4,7,8,9-HpCDF	ND (1.0)	17
Total HpCDF	ND (1.0)	760
OCDF	ND (5.1)	1,200
TEQ (USEPA)	0.0088	1,400
Pesticides (µg/L)		
Aldrin	ND (0.0097)	ND (0.0095)
Alpha BHC	ND (0.0097)	ND (0.0095)
Alpha Chlordane	ND (0.0097)	ND (0.0095)
Aroclor-1016	ND (0.48)	ND (0.48)
Aroclor-1221	ND (0.48)	ND (0.48)
Aroclor-1232	ND (0.48)	ND (0.48)
Aroclor-1242	ND (0.48)	ND (0.48)
Aroclor-1248	ND (0.48)	ND (0.48)
Aroclor-1254	ND (0.48)	ND (0.48)
Aroclor-1260	ND (0.48)	ND (0.48)
Beta BHC	ND (0.0097)	ND (0.0095)
DDD	ND (0.019)	ND (0.019)
DDE	ND (0.019)	0.031
DDT	ND (0.019)	ND (0.019)
Delta BHC	ND (0.0097)	ND (0.0095)
Dieldrin	ND (0.019)	ND (0.019)

Table 3-12a
Surface Water Data Collected during Passaic River Barge Removal Activities from Tierra (1999e)

Parameters	Minimum	Maximum
Endosulfan I	ND (0.0097)	ND (0.0095)
Endosulfan II	ND (0.019)	ND (0.019)
Endosulfan Sulfate	ND (0.019)	ND (0.019)
Endrin	ND (0.019)	ND (0.019)
Endrin Aldehyde	ND (0.019)	ND (0.019)
Endrin Ketone	ND (0.019)	ND (0.019)
Gamma BHC	ND (0.0097)	ND (0.0095)
Gamma Chlordane	ND (0.0097)	ND (0.0095)
Heptachlor	ND (0.0097)	ND (0.0095)
Heptachlor Epoxide	ND (0.0097)	ND (0.0095)
Methoxychlor	ND (0.097)	ND (0.095)
Total PCBs	ND (0.48)	ND (0.48)
Toxaphene	ND (1.0)	ND (1.0)
Supplemental Parameters (mg/L)		
Ammonia-nitrogen	ND (0.20)	0.48
DOC	ND (1.0)	4.1
TKN	ND (1.0)	1.1
TOC	ND (1.0)	5.6
Total Cyanide	ND (0.0050)	ND (0.0050)
TPH-DRO	ND (0.10)	1.0
TSS	ND (9.0)	241
SVOCs (µg/L)		
1,2,4-Trichlorobenzene	ND (10)	ND (9.0)
1,2-Dichlorobenzene	ND (10)	ND (9.0)
1,3-Dichlorobenzene	ND (10)	ND (9.0)
1,4-Dichlorobenzene	ND (10)	ND (9.0)
2,2'-oxybis(1-chloropropane)	ND (10)	ND (9.0)
2,4,5-Trichlorophenol	ND (10)	ND (9.0)
2,4,6-Trichlorophenol	ND (10)	ND (9.0)
2,4-Dichlorophenol	ND (10)	ND (9.0)
2,4-Dimethylphenol	ND (10)	ND (9.0)
2,4-Dinitrophenol	ND (48)	ND (47)
2,4-Dinitrotoluene	ND (10)	ND (9.0)
2,6-Dinitrotoluene	ND (10)	ND (9.0)
2-Chloronaphthalene	ND (10)	ND (9.0)
2-Chlorophenol	ND (10)	ND (9.0)
2-Methylnaphthalene	ND (10)	ND (9.0)
2-Methylphenol	ND (10)	ND (9.0)

Table 3-12a
Surface Water Data Collected during Passaic River Barge Removal Activities from Tierra (1999e)

Parameters	Minimum	Maximum
2-Nitroaniline	ND (10)	ND (9.0)
2-Nitrophenol	ND (10)	ND (9.0)
3,3'-Dichlorobenzidine	ND (10)	ND (9.0)
3-Nitroaniline	ND (10)	ND (9.0)
4,6-Dinitro-2-methylphenol	ND (24)	ND (24)
4-Bromophenyl-phenylether	ND (10)	ND (9.0)
4-Chloro-3-methylphenol	ND (10)	ND (9.0)
4-Chloroaniline	ND (10)	ND (9.0)
4-Chlorophenyl-phenylether	ND (10)	ND (9.0)
4-Methylphenol	ND (10)	ND (9.0)
4-Nitroaniline	ND (10)	ND (9.0)
4-Nitrophenol	ND (48)	ND (47)
Acenaphthene	ND (10)	ND (9.0)
Acenaphthylene	ND (10)	ND (9.0)
Anthracene	ND (10)	ND (9.0)
Benzo(a)anthracene	ND (10)	ND (9.0)
Benzo(a)pyrene	ND (10)	ND (9.0)
Benzo(b)fluoranthene	ND (10)	ND (9.0)
Benzo(g,h,i)perylene	ND (10)	ND (9.0)
Benzo(k)fluoranthene	ND (10)	ND (9.0)
bis(2-Chloroethoxy)methane	ND (10)	ND (9.0)
bis(2-Chloroethyl)ether	ND (10)	ND (9.0)
bis(2-Ethylhexyl)phthalate	ND (10)	ND (9.0)
Butylbenzylphthalate	ND (10)	ND (9.0)
Carbazole	ND (10)	ND (9.0)
Chrysene	ND (10)	ND (9.0)
Dibenz(a,h)anthracene	ND (10)	ND (9.0)
Dibenzofuran	ND (10)	ND (9.0)
Diethylphthalate	ND (10)	ND (9.0)
Dimethylphthalate	ND (10)	ND (9.0)
Di-n-butylphthalate	ND (10)	ND (9.0)
Di-n-octylphthalate	ND (10)	ND (9.0)
Fluoranthene	ND (10)	ND (9.0)
Fluorene	ND (10)	ND (9.0)
Hexachlorobenzene	ND (10)	ND (9.0)
Hexachlorobutadiene	ND (10)	ND (9.0)
Hexachlorocyclopentadiene	ND (24)	ND (24)
Hexachloroethane	ND (10)	ND (9.0)
Indeno(1,2,3-cd)pyrene	ND (10)	ND (9.0)
Isophorone	ND (10)	ND (9.0)
Naphthalene	ND (10)	ND (9.0)
Nitrobenzene	ND (10)	ND (9.0)

Table 3-12a
Surface Water Data Collected during Passaic River Barge Removal Activities from Tierra (1999e)

Parameters	Minimum	Maximum
N-Nitroso-di-n-propylamine	ND (10)	ND (9.0)
N-Nitrosodiphenylamine	ND (10)	ND (9.0)
Pentachlorophenol	ND (24)	ND (24)
Phenanthrene	ND (10)	ND (9.0)
Phenol	ND (10)	ND (9.0)
Pyrene	ND (10)	ND (9.0)

Notes:
DOC = dissolved organic carbon
mg/L = milligram per Liter
ND (value) = non-detect(detection limit)
ng/L = nanogram per Liter
PCBs = polychlorinated biphenyls
PCDD/Fs = polychlorinated dibenzo-p-dioxins and dibenzofurans
pg/L = picogram per Liter
SVOCs = semivolatile organic compounds
TEQ = toxic equivalency quotient
TKN = total Kjeldahl nitrogen
TPH-DRO = total petroleum hydrocarbons-diesel range oil
TOC = total organic carbon
TSS = total suspended solids
µg/L = microgram per Liter

Table 3-12b
Filtered Solids Data Collected during Passaic River Barge Removal Activities from Tierra (1999e)

Parameters	Minimum	Maximum
Inorganic Chemicals (mg/kg)		
Ag	9.9	
Al	32,800	
As	23	
Ba	45,300	
Be	1.1	
Ca	17,800	
Cd	16	
Co	20	
Cr	514	
Cu	485	
Fe	35,100	
Hg	11	
K	28,300	
Mg	5,460	
Mn	335	
Na	76,800	
Ni	66	
Pb	588	
Sb	ND (41)	
Se	ND (2.0)	
Tl	ND (4.1)	
V	60	
Zn	37,600	
PCB Congeners (µg/kg)		
PCB-3	ND (1.4)	3.4
PCB-8	7.3	33
PCB-15	15	54
PCB-18	37	230
PCB-28	54	600
PCB-44	38	280
PCB-52	55	340
PCB-66	45	310
PCB-77	7	40
PCB-81	ND (1.4)	3.3
PCB-87	26	130
PCB-90/101	80	290
PCB-105	22	100
PCB-114	ND (1.4)	8.8
PCB-118	52	240
PCB-123	ND (0.57)	1.5
PCB-126	2.0	1.6
PCB-128	11	41

Table 3-12b
Filtered Solids Data Collected during Passaic River Barge Removal Activities from Tierra (1999e)

Parameters	Minimum	Maximum
PCB-138	11	280
PCB-153	ND (1.4)	280
PCB-156	6.5	23
PCB-157	ND (1.4)	4.7
PCB-167	ND (0.92)	9.7
PCB-169	ND (0.57)	ND (0.92)
PCB-170	32	62
PCB-180	89	160
PCB-183	20	36
PCB-184	ND (0.57)	ND (1.4)
PCB-187	26	71
PCB-189	ND (0.92)	2.4
PCB-195	ND (1.4)	14
PCB-202	3.3	8
PCB-206	9.3	26
PCB-207	ND (0.92)	1.8
PCB-209	4.3	20
Total monoCB	ND (1.4)	5.8
Total diCB	35	150
Total triCB	250	1,600
Total tetraCB	540	2,700
Total pentaCB	430	1,600
Total hexaCB	350	1,100
Total heptaCB	290	540
Total octaCB	47	140
Total nonaCB	12	34
Total PCBs	1,974	7,870
PCDD/Fs (ng/kg)		
2,3,7,8-TCDD	340	8,100
Total TCDD	460	8,800
1,2,3,7,8-PeCDD	10	43
Total PeCDD	85	450
1,2,3,4,7,8-HxCDD	9.4	27
1,2,3,6,7,8-HxCDD	33	130
1,2,3,7,8,9-HxCDD	24	55
Total HxCDD	290	920
1,2,3,4,6,7,8-HpCDD	580	1,600
Total HpCDD	1,200	3,300

Table 3-12b
Filtered Solids Data Collected during Passaic River Barge Removal Activities from Tierra (1999e)

Parameters	Minimum	Maximum
OCDD	7,300	19,000
2,3,7,8-TCDF	23	100
Total TCDF	680	5,400
1,2,3,7,8-PeCDF	14	40
2,3,4,7,8-PeCDF	33	160
Total PeCDF	640	4,400
1,2,3,4,7,8-HxCDF	110	530
1,2,3,6,7,8-HxCDF	40	160
1,2,3,7,8,9-HxCDF	7.7	27
2,3,4,6,7,8-HxCDF	19	78
Total HxCDF	470	2,300
1,2,3,4,6,7,8-HpCDF	520	2,200
1,2,3,4,7,8,9-HpCDF	24	76
Total HpCDF	780	3,300
OCDF	900	5,500
TEQ (USEPA)	410	8,400
SVOCs (µg/kg)		
1,2,4,5-Tetrachlorobenzene	ND (2,400)	
1,2,4-Trichlorobenzene	ND (2,400)	
1,2-Dichlorobenzene	ND (2,400)	
1,3,5-Trinitrobenzene	ND (4,800)	
1,3-Dichlorobenzene	ND (2,400)	
1,3-Dinitrobenzene	ND (2,400)	
1,4-Dichlorobenzene	ND (2,400)	
1,4-Naphthoquinone	ND (4,800)	
1,4-Phenylenediamine	ND (48,000)	
1-Naphthylamine	ND (2,400)	
2,3,4,6-Tetrachlorophenol	ND (2,400)	
2,4,5-Trichlorophenol	ND (2,400)	
2,4,6-Trichlorophenol	ND (2,400)	
2,4-Dichlorophenol	ND (2,400)	
2,4-Dimethylphenol	ND (2,400)	
2,4-Dinitrophenol	ND (6,000)	
2,4-Dinitrotoluene	ND (2,400)	
2,6-Dichlorophenol	ND (2,400)	
2,6-Dinitrotoluene	ND (2,400)	
2-Acetylaminofluorene	ND (2,400)	
2-Chloronaphthalene	ND (2,400)	
2-Chlorophenol	ND (2,400)	

Table 3-12b
Filtered Solids Data Collected during Passaic River Barge Removal Activities from Tierra (1999e)

Parameters	Minimum	Maximum
2-Methylnaphthalene	ND (2,400)	
2-Methylphenol	ND (2,400)	
2-Naphthylamine	ND (6,000)	
2-Nitroaniline	ND (2,400)	
2-Nitrophenol	ND (2,400)	
2-Picoline	ND (2,400)	
3,3'-Dichlorobenzidine	ND (4,800)	
3,3'-Dimethylbenzidine	ND (6,000)	
3-Methylcholanthrene	ND (2,400)	
3-Nitroaniline	ND (2,400)	
4,6-Dinitro-2-methylphenol	ND (6,000)	
4-Aminobiphenyl	ND (6,000)	
4-Bromophenyl-phenylether	ND (2,400)	
4-Chloro-3-methylphenol	ND (2,400)	
4-Chloroaniline	ND (2,400)	
4-Chlorophenyl-phenylether	ND (2,400)	
4-Methylphenol	ND (2,400)	
4-Nitroaniline	ND (2,400)	
4-Nitrophenol	ND (6,000)	
4-Nitroquinoline-1-oxide	ND (6,000)	
5-Nitro-o-toluidine	ND (6,000)	
7,12-Dimethylbenz(a)anthracene	ND (2,400)	
Acenaphthene	ND (2,400)	
Acenaphthylene	ND (2,400)	
Acetophenone	ND (2,400)	
Alinine	ND (2,400)	
Anthracene	ND (2,400)	
Benzo(a)anthracene	2,400	
Benzo(a)pyrene	2,900	
Benzo(b)fluoranthene	4,500	
Benzo(g,h,i)perylene	3,000	
Benzo(k)fluoranthene	ND (2,400)	
Benzyl Alcohol	ND (6,000)	
bis(2-Chloroethoxy)methane	ND (2,400)	
bis(2-Chloroethyl)ether	ND (2,400)	
bis(2-Chloroisopropyl)ether	ND (2,400)	
bis(2-Ethylhexyl)phthalate	64,000	
Butylbenzylphthalate	ND (2,400)	
Chlorobenzilate	ND (2,400)	
Chrysene	4,300	
Diallate	ND (2,400)	
Dibenz(a,h)anthracene	ND (2,400)	

Table 3-12b
Filtered Solids Data Collected during Passaic River Barge Removal Activities from Tierra (1999e)

Parameters	Minimum	Maximum
Dibenzofuran	ND (2,400)	
Diethylphthalate	4,900	
Dimethoate	ND (2,400)	
Dimethylphthalate	ND (2,400)	
Di-n-butylphthalate	ND (2,400)	
Di-n-octylphthalate	6,500	
Ethylmethanesulfonate	ND (2,400)	
Fluoranthene	4,900	
Fluorene	ND (2,400)	
Hexachlorobenzene	ND (2,400)	
hexachlorobutadiene	ND (2,400)	
Hexachlorocyclopentadiene	ND (4,800)	
Hexachloroethane	ND (2,400)	
Hexachloropropene	ND (2,400)	
Indeno(1,2,3-cd)pyrene	2,800	
Isodrin	ND (4,800)	
Isophorone	ND (2,400)	
Isosafrole	ND (2,400)	
Methapyrilene	ND (2,400)	
Methylmethanesulfonate	ND (2,400)	
Naphthalene	ND (2,400)	
Nitrobenzene	ND (2,400)	
N-Nitrosodiethylamine	ND (2,400)	
N-Nitrosodimethylamine	ND (2,400)	
N-Nitroso-di-n-butylamine	ND (2,400)	
N-Nitroso-di-n-propylamine	ND (2,400)	
N-Nitrosodiphenylamine	ND (2,400)	
N-Nitrosomethylethylamine	ND (2,400)	
N-Nitrosomorpholine	ND (2,400)	
N-Nitrosopiperidine	ND (2,400)	
N-Nitrosopyrrolidine	ND (2,400)	
o,o,o-Triethylphosphorothioate	ND (2,400)	
o-Toluidine	ND (2,400)	
p-(Dimethylamino)azobenzene	ND (2,400)	
Pentachlorobenzene	ND (2,400)	
Pentachloronitrobenzene	ND (2,400)	
Pentachlorophenol	ND (6,000)	
Phenacetin	ND (2,400)	
Phenanthrene	ND (2,400)	

Table 3-12b
Filtered Solids Data Collected during Passaic River Barge Removal Activities from Tierra (1999e)

Parameters	Minimum	Maximum
Phenol	ND (2,400)	
Pronamide	ND (6,000)	
Pyrene	7,100	
Pyridine	ND (2,400)	
Safrole	ND (2,400)	
Tetraethyldithiopyrophosphate	ND (2,400)	
Thionazin	ND (4,800)	

Notes:
Only one sample was analyzed for semivolatiles and inorganic chemicals.
The values for this sample are presented in the "minimum" column.
mg/L = milligram per Liter
ND (value) = non-detect(detection limit)
ng/kg = nanogram per kilogram
PCBs = polychlorinated biphenyls
PCDD/Fs = polychlorinated dibenzo-p-dioxins and dibenzofurans
SVOCs = semivolatile organic compounds
TEQ = toxic equivalency quotient
µg/kg= microgram per kilogram

Table 3-12c
In Situ Surface Water Monitoring Data Collected during Passaic River Barge Removal Activities from Tierra (1999e)

Sample Date	Depth (ft)	Temperature (°C)	pH	DO (mg/L)	Turbidity (NTU)	Activity
4/8/1999	2.0	14	8.0	11	15	Baseline
4/8/1999	4.0	14	8.0	11	18	Baseline
4/8/1999	6.0	14	8.0	11	19	Baseline
4/8/1999	8.0	13	8.0	11	23	Baseline
4/8/1999	10	13	7.9	11	22	Baseline
4/8/1999	2.0	14	8.1	11	17	Baseline
4/8/1999	4.0	14	8.0	11	16	Baseline
4/8/1999	6.0	13	7.9	11	16	Baseline
4/8/1999	8.0	13	7.8	10	18	Baseline
4/8/1999	10	13	7.8	10	16	Baseline
4/8/1999	12	13	7.8	10	16	Baseline
4/8/1999	2.0	14	8.1	11	18	Baseline
4/8/1999	4.0	14	8.0	11	17	Baseline
4/8/1999	6.0	13	7.9	11	18	Baseline
4/8/1999	8.0	13	7.8	10	19	Baseline
4/8/1999	10	13	7.8	10	20 - 25	Baseline
4/9/1999	2.0	14	8.0	11	18	Removal
4/9/1999	4.0	14	8.0	11	37	Removal
4/9/1999	2.0	14	8.1	11	19	Removal
4/9/1999	4.0	14	8.1	11	22	Removal
4/9/1999	6.0	14	8.1	11	40	Removal
4/9/1999	8.0	14	8.0	11	32	Removal
4/9/1999	10	14	8.0	11	20 - 50	Removal
4/9/1999	12	14	8.0	11	15 - 30	Removal
4/9/1999	15	14	8.0	11	27	Removal
4/9/1999	13	14	7.9	10	6.8[b]	Removal
4/9/1999	2.0	14	8.1	11	19	Removal
4/9/1999	4.0	14	8.0	11	17	Removal
4/9/1999	6.0	14	8.0	11	19	Removal
4/9/1999	8.0	14	8.0	11	20	Removal
4/9/1999	10	14	7.9	11	19	Removal
4/9/1999	12	14	7.9	11	16	Removal
4/9/1999	14	14	7.8	11	12	Removal
4/9/1999	16	14	7.8	11	11	Removal
4/10/1999	2.0	14	8.0	9.5	14[a]	Post-Removal
4/10/1999	4.0	14	8.0	9.3	16[a]	Post-Removal
4/10/1999	2.0	14	8.0	9.3	14[a]	Post-Removal
4/10/1999	4.0	14	7.9	8.8	18[a]	Post-Removal
4/10/1999	6.0	14	7.9	9.1	17[a]	Post-Removal
4/10/1999	8.0	14	7.9	9.5	17[a]	Post-Removal

Table 3-12c
In Situ Surface Water Monitoring Data Collected during Passaic River Barge Removal Activities from Tierra (1999e)

Sample Date	Depth (ft)	Temperature (°C)	pH	DO (mg/L)	Turbidity (NTU)	Activity
4/10/1999	10	14	7.9	9.0	17[a]	Post-Removal
4/10/1999	12	14	7.9	8.8	17[a]	Post-Removal
4/10/1999	2.0	14	7.9	10	12[a]	Post-Removal
4/10/1999	4.0	14	7.9	9.8	15[a]	Post-Removal
4/10/1999	6.0	14	7.9	9.6	16[a]	Post-Removal
4/10/1999	8.0	14	7.9	9.7	15[a]	Post-Removal
4/11/1999	2.0	12	7.8	7.6	15[a]	Post-Removal
4/11/1999	4.0	12	7.9	5.0	20[a]	Post-Removal
4/11/1999	2.0	12	7.9	10	17[a]	Post-Removal
4/11/1999	4.0	12	7.9	9.9	21[a]	Post-Removal
4/11/1999	6.0	12	7.9	9.9	11[a]	Post-Removal
4/11/1999	2.0	12	7.9	9.9	11[a]	Post-Removal
4/11/1999	4.0	12	7.8	9.9	9.8[a]	Post-Removal
4/11/1999	6.0	12	7.8	9.9	9.7[a]	Post-Removal
4/11/1999	8.0	12	7.8	9.9	12[a]	Post-Removal
4/13/1999	2.0	11	8.0	11	9.4[a]	Post-Removal
4/13/1999	4.0	11	8.0	11	14[a]	Post-Removal
4/13/1999	6.0	11	7.9	11	19[a]	Post-Removal
4/13/1999	8.0	11	7.9	9.9	19[a]	Post-Removal
4/13/1999	10	11	7.9	9.0	18[a]	Post-Removal
4/13/1999	2.0	11	8.0	11	9.6[a]	Post-Removal
4/13/1999	4.0	11	7.9	11	15[a]	Post-Removal
4/13/1999	6.0	11	7.9	10	17[a]	Post-Removal
4/13/1999	8.0	11	7.9	9.1	21[a]	Post-Removal
4/13/1999	10	11	7.9	9.0	16[a]	Post-Removal
4/13/1999	2.0	11	7.9	10	23[a]	Post-Removal
4/13/1999	4.0	11	7.9	9.4	12[a]	Post-Removal
4/13/1999	6.0	11	7.9	8.4	13[a]	Post-Removal
4/9/1999	--	--	--	--	11[b]	Barge 4 Removal
4/9/1999	2.0	14	8.2	11	9.7[b]	Barge 4 Removal
4/10/1999	2.0	13	7.9	9.2	22[b]	Barge Repositioning
4/10/1999	2.3	13	8.1	10	44 (59)[b]	Barge 4 Removal
4/10/1999	2.0	15	8.0	6.1	11 (47)[b]	Barge 3 Removal
4/11/1999	--	--	--	--	83[b]	Barge 3 Removal
4/11/1999	2.0	13	7.8	10	17[b]	Barge 3 Removal
4/12/1999	2.0	12	8.1	9.8	7.6[b]	Barge 2 Pre-Removal
4/13/1999	2.0	11	8.1	12	13[a]	Post-Removal
4/13/1999	4.0	11	8.0	11	15[a]	Post-Removal

Table 3-12c
In Situ Surface Water Monitoring Data Collected during Passaic River Barge Removal Activities from Tierra (1999e)

Sample Date	Depth (ft)	Temperature (^{o}C)	pH	DO (mg/L)	Turbidity (NTU)	Activity
4/13/1999	2.0	11	8.0	12	14[a]	Post-Removal
4/13/1999	4.0	11	8.0	11	16[a]	Post-Removal
4/13/1999	2.0	11	8.0	12	16[a]	Post-Removal

Notes:

a. Turbidity readings measured for every 2 feet in water depth using turbidimeter (due to instability of YSI).

b. Surface grab (measured using turbidimeter)

^{o}C = degrees Celsius
DO = dissolved oxygen
ft = feet
mg/L = milligrams per Liter
NTU = nephelometric turbidity units

Table 3-13
Passaic River Surface Water CSO Data from Tierra (1997b)

Parameters	Minimum	Maximum
Inorganic Chemicals (µg/L)		
Al	ND (100)	1,400
Ag	ND (10)	ND (10)
As	BMDL (4.0)	8.7
Ba	BMDL (13)	270
Be	BMDL (0.80)	ND (1.0)
Ca	3,200	161,000
Cd	BMDL (1.2)	ND (4.0)
Co	ND (20)	ND (20)
Cr	BMDL (6.7)	35
Cu	BMDL (4.6)	57
Fe	690	13,400
Hg	ND (0.20)	0.7
K	610	87,900
Mg	380	300,000
Mn	BMDL (3.8)	1,090
Na	745,000	3,590,000
Ni	BMDL (5.2)	ND (20)
Pb	ND (5.0)	39
Sb	ND (60)	ND (60)
Se	BMDL (4.4)	ND (10)
Tl	ND (10)	ND (50)
V	BMDL (6.5)	ND (20)
Zn	BMDL (8.8)	140
Herbicide, Pesticides, and PCB Aroclors (µg/L)		
2,4,5-T	ND (0.71)	ND (0.80)
2,4,5-TP	ND (0.71)	ND (0.80)
2,4-D	ND (3.5)	ND (0.40)
4,4'-DDD	ND (0.10)	ND (0.11)
4,4'-DDE	ND (0.10)	ND (0.11)
4,4'-DDT	ND (0.10)	ND (0.11)
Aldrin	ND (0.050)	ND (0.050)
Alpha-BHC	ND (0.050)	ND (0.050)
alpha-Chlorodane	ND (0.050)	ND (0.050)
Aroclor 1016	ND (0.51)	ND (0.53)
Aroclor 1221	ND (0.51)	ND (0.53)
Aroclor 1232	ND (0.51)	ND (0.53)
Aroclor 1242	ND (0.51)	ND (0.53)
Aroclor 1248	ND (0.51)	ND (0.53)

Table 3-13
Passaic River Surface Water CSO Data from Tierra (1997b)

Parameters	Minimum	Maximum
Aroclor 1254	ND (1.0)	ND (1.1)
Aroclor 1260	ND (1.0)	ND (1.1)
Beta-BHC	ND (0.050)	ND (0.050)
Delta-BHC	ND (0.050)	ND (0.050)
Dieldrin	ND (0.10)	ND (0.11)
Endosulfan I	ND (0.050)	ND (0.050)
Endosulfan II	ND (0.10)	ND (0.11)
Endosulfan sulfate	ND (0.10)	ND (0.11)
Endrin	ND (0.10)	ND (0.11)
Endrin Aldehyde	ND (0.10)	0.14
Endrin Ketone	ND (0.10)	ND (0.11)
Gamma-BHC	ND (0.050)	ND (0.050)
Gamma-Chlordane	ND (0.050)	ND (0.050)
Heptachlor	ND (0.050)	ND (0.050)
Heptachlor Epoxide	ND (0.050)	ND (0.050)
Methoxychlor	ND (0.51)	ND (0.53)
Toxaphene	ND (2.0)	ND (2.1)
PCBs (pg/L)		
PCB-1	14 J	151
PCB-15	38 J	1,363
PCB-28	75	7,257
PCB-52	61 J	4,990
PCB-77	8.0 J	835
PCB-105	ND (11)	2,498
PCB-118	50 J	6,056
PCB-126	ND (3.0)	ND (58)
PCB-156	ND (7.5)	726
PCB-169	ND (2.8)	ND (43)
PCB-180	32 J	6,340
PCB-194	14 J	1,906
PCB-206	ND (5.8)	938
PCB-209	ND (14)	908
Total monoCB	25	321
Total diCB	150	3,333
Total triCB	339	25,656
Total tetraCB	516	46,769
Total pentaCB	395	37,708
Total hexaCB	254	33,055
Total heptaCB	98	21,512

Table 3-13
Passaic River Surface Water CSO Data from Tierra (1997b)

Parameters	Minimum	Maximum
Total octaCB	14	6,698
Total nonaCB	1.0	1,561
Total decaCB	24	908
PCDD/Fs (pg/L)		
2,3,7,8-TCDD	ND (2.6)	77
1,2,3,7,8-PeCDD	ND (1.2)	ND (39)
1,2,3,4,7,8-HxCDD	ND (0.80)	ND (20)
1,2,3,6,7,8-HxCDD	1.3 J	20 J
1,2,3,7,8,9-HxCDD	1.6 J	12 J
1,2,3,4,6,7,8-HpCDD	ND (1.8)	142
OCDD	ND (4.3)	1,331
2,3,7,8-TCDF	ND (0.80)	ND (11)
1,2,3,7,8-PeCDF	ND (0.80)	142
2,3,4,7,8-PeCDF	ND (1.5)	261
1,2,3,4,7,8-HxCDF	ND (1.4)	3,954
1,2,3,6,7,8-HxCDF	ND (1.5)	507
1,2,3,7,8,9-HxCDF	ND (2.0)	ND (124)
2,3,4,6,7,8-HxCDF	ND (1.5)	204
1,2,3,4,6,7,8-HpCDF	ND (2.3)	10,941
1,2,3,4,7,8,9-HpCDF	ND (0.90)	209
OCDF	6.4 J	12,488
Total TCDD	ND	96
Total PeCDD	ND	81
Total HxCDD	ND	196
Total HpCDD	3.4	325
Total TCDF	ND	3,623
Total PeCDF	ND	6,386
Total HxCDF	6.7	13,800
Total HpCDF	6.7	24,220
Water Quality Data (µg/L)		
Ammonia as N	BMDL (0.20)	1.9
BOD	BMDL (2.0)	60
COD	10	53
Cyanide, Total (ug/L)	10	95
Hardness as CaCO3	20	2,000
Nitrate as N	0.10	1.3
Nitrogen, Total Kjeldahl	0.30	4.5
Phosphorous	0.20	5

Table 3-13
Passaic River Surface Water CSO Data from Tierra (1997b)

Parameters	Minimum	Maximum
TEPH (Diesel Range)	ND (0.20)	ND (0.20)
TOC	1.9	22
TSS	7.0	189

Notes:
BOD = biochemical oxygen demand
BMDL = estimated value below method detection limit
COD = chemical oxygen demand
J = estimated value
ND (value) = non-detect (detection limit)
pg/L = picogram per Liter
TEPH = total extractable petroleum hydrocarbons
TSS = total suspended solids
TOC = total organic carbon
µg/L = microgram per Liter

Table 3-14a
Water Column Physicochemical Data for Newark Bay Reach A from Tierra (1999a,c)

Author's Sampling Location	Sample Date	Depth (ft)	Temperature (°C)	Turbidity (NTU)	Conductivity (µS/cm)	pH	Salinity (ppth)	DO (mg/L)
Background Field Parameters at Reach C	6/22/1999	10	21	9.8	34	7.3	21	5.4
	6/22/1999	20	21	9.9	34	7.3	22	4.9
	6/22/1999	30	21	11	35	7.4	22	4.6
	6/22/1999	40	21	9.6	35	7.4	22	4.7
NB99RASW-01	6/22/1999	10	---	9.4	---	---	---	---
	6/22/1999	20	---	13	---	---	---	---
	6/22/1999	30	21	25	35	7.4	22	4.2
	6/22/1999	40	---	65	---	---	---	---
NB99RASW-02	6/22/1999	10	---	11	---	---	---	---
	6/22/1999	20	---	11	---	---	---	---
	6/22/1999	30	21	12	35	7.2	22	4.6
	6/22/1999	40	---	11	---	---	---	---
Mouth of Reach A	6/22/1999	10	21	12	34	7.5	21	5.5
	6/22/1999	20	21	17	35	7.4	22	5.0
	6/22/1999	30	21	29	35	7.4	22	4.9
	6/22/1999	40	21	17	35	7.4	22	4.9
Mouth of Reach A	6/23/1999	10	21	17	34	7.3	21	5.2
	6/23/1999	20	21	16	34	7.2	22	4.9
	6/23/1999	30	21	16	34	7.3	22	4.8
	6/23/1999	40	21	19	35	7.4	22	4.8
NB99RASW-03	6/23/1999	10	21	15	34	7.5	21	4.7
	6/23/1999	20	21	17	34	7.4	22	4.5
	6/23/1999	30	21	18	34	7.4	22	4.5
NB99RASW-04	6/23/1999	10	---	12	---	---	---	---
	6/23/1999	20	22	17	34	7.4	21	4.9
	6/23/1999	30	---	17	---	---	---	---
	6/23/1999	40	---	16	---	---	---	---
NB99RASW-03	6/23/1999	10	---	13	---	---	---	---
	6/23/1999	20	---	14	---	---	---	---
	6/23/1999	30	---	15	---	---	---	---
	6/23/1999	40	21	16	34	7.4	22	4.8
Mouth of Reach A	6/23/1999	10	21	19	34	7.6	22	5.2
	6/23/1999	20	21	20	34	7.6	22	4.8
	6/23/1999	30	21	24	35	7.7	22	4.8
	6/23/1999	40	21	16	35	7.7	22	4.9
Mouth of Reach A	6/24/1999	10	21	14	34	6.7	21	5.1
	6/24/1999	20	21	13	34	6.7	22	4.8
	6/24/1999	30	21	16	34	6.8	22	4.7
	6/24/1999	40	21	17	35	6.8	22	4.9

Notes:

--- = no measurement
°C = degrees Celsius
DO = dissolved oxygen
ft = feet
mg/L = milligrams per Liter
NTU = nephelometric turbidity units
ppth = parts per thousand
µS/cm = microsiemen per centimeter

Table 3-14b
Surface Water Data from Newark Bay Reach A from Tierra (1999a,c)

Parameters	Minimum	Maximum
Inorganic Chemicals (mg/L)		
Ag	ND (0.0057)	ND (0.020)
Al	ND (0.052)	0.45
As	0.0069 J	ND (0.010)
Ba	ND (0.0015)	ND (0.10)
Be	ND (0.0017)	ND (0.010)
Ca	0.055 J	255
Cd	ND (0.0017)	ND (0.010)
Co	ND (0.0055)	ND (0.050)
Cr	ND (0.0054)	ND (0.030)
Cu	ND (0.0058)	ND (0.025)
Fe	ND (0.0019)	0.95
Hg	ND (0.000042)	ND (0.00020)
K	ND (0.36)	328
Mg	ND (0.040)	834
Mn	ND (0.0016)	0.11
Na	0.42 J	6,970
Ni	ND90.0054)	ND (0.050)
Pb	ND (0.0019)	ND (0.015)
Sb	ND (0.025)	ND (0.20)
Se	ND90.0016)	ND (0.025)
Tl	ND (0.0012)	ND (0.25)
V	ND90.0012)	ND (0.020)
Zn	ND (0.0030)	ND (0.036)
Herbicides (µg/L)		
2,4-D	ND (0.097)	0.72
2,4,5-TP	ND (0.0097)	ND (0.048)
2,4,5-T	ND (0.0097)	ND (0.048)
2,4-DB	ND (0.097)	ND (0.48)
PCBs (ng/L)		
PCB-1	ND (0.098)	0.19
PCB-3	ND (0.098)	0.36
PCB-8	ND (0.098)	0.18
PCB-15	0.72	1.0
PCB-18	1.7	2.2
PCB-28	1.4	1.7
PCB-37	0.39	0.44
PCB-44	1.2	1.4
PCB-49	1.1	1.2
PCB-52	1.5	1.8
PCB-66	0.83	1.0
PCB-70	0.65	0.77
PCB-74	0.37	0.44

Table 3-14b
Surface Water Data from Newark Bay Reach A from Tierra (1999a,c)

Parameters	Minimum	Maximum
PCB-77	ND (0.098)	0.10
PCB-81	ND (0.098)	0.099
PCB-87	0.32	0.39
PCB-90/101	0.80	0.98
PCB-99	0.35	0.50
PCB-105	0.20	0.28
PCB-110	0.50	0.63
PCB-114	ND (0.098)	ND (0.099)
PCB-115	ND (0.098)	0.15
PCB-118	0.49	0.62
PCB-119	ND (0.098)	ND (0.099)
PCB-123	ND (0.098)	ND (0.099)
PCB-126	ND (0.098)	ND (0.099)
PCB-128	ND (0.098)	0.12
PCB-138	1.0	1.6
PCB-149	0.53	0.76
PCB-151	ND (0.098)	0.23
PCB-153	0.71	1.1
PCB-156	ND (0.098)	ND (0.099)
PCB-157	ND (0.098)	ND (0.099)
PCB-158	ND (0.098)	ND (0.099)
PCB-167	ND (0.098)	ND (0.099)
PCB-168	ND (0.098)	ND (0.099)
PCB-169	ND (0.098)	ND (0.099)
PCB-170	0.14	0.22
PCB-177	0.12	0.17
PCB-180	0.37	0.59
PCB-183	0.11	0.13
PCB-184	ND (0.098)	ND (0.099)
PCB-187	0.25	0.35
PCB-189	ND (0.098)	ND (0.099)
PCB-194	0.24	0.26
PCB-195	ND (0.098)	ND (0.099)
PCB-201	0.10	0.17
PCB-202	ND (0.098)	ND (0.099)
PCB-206	ND (0.098)	ND (0.099)
PCB-207	ND (0.098)	ND (0.099)
PCB-209	0.11	0.15
Total monoCB	ND (0.098)	1.0
Total diCB	1.5	2.2
Total triCB	7.5	8.4
Total tetraCB	9.1	10
Total pentaCB	3.6	5.0

Table 3-14b
Surface Water Data from Newark Bay Reach A from Tierra (1999a,c)

Parameters	Minimum	Maximum
Total hexaCB	2.3	4.1
Total heptaCB	1.0	1.8
Total octaCB	0.35	0.57
Total nonaCB	ND (0.098)	ND (0.099)
Total PCBs	27	32
W.H.O. CONGENER TEQ	ND (0.000069)	0.00011
PCDD/Fs (pg/L)		
2,3,7,8-TCDD	3.9	4.4
Total TCDD	3.9	7.4
1,2,3,7,8-PeCDD	ND (2.9)	ND (5.9)
Total PeCDD	ND (2.9)	ND (5.9)
1,2,3,4,7,8-HxCDD	ND (3.7)	ND (6.3)
1,2,3,6,7,8-HxCDD	ND (3.5)	ND (6.2)
1,2,3,7,8,9-HxCDD	ND (3.2)	ND (5.5)
Total HxCDD	ND (3.7)	ND (6.3)
1,2,3,4,6,7,8-HpCDD	12	18
Total HpCDD	25	36
OCDD	120	150
Total Dioxins	150	190
2,3,7,8-TCDF	ND (3.0)	ND (3.0)
Total TCDF	ND (3.0)	ND (3.0)
1,2,3,7,8-PeCDF	ND (2.8)	ND (3.4)
2,3,4,7,8-PeCDF	ND (2.4)	ND (2.9)
Total PeCDF	ND (2.8)	ND (3.4)
1,2,3,4,7,8-HxCDF	ND (1.7)	ND (2.5)
1,2,3,6,7,8-HxCDF	ND (1.9)	ND (2.6)
1,2,3,7,8,9-HxCDF	ND (1.8)	ND (2.5)
2,3,4,6,7,8-HxCDF	ND (1.8)	ND (2.7)
Total HxCDF	ND (1.9)	ND (2.7)
1,2,3,4,6,7,8-HpCDF	9.1	11
1,2,3,4,7,8,9-HpCDF	ND (0.88)	ND (1.9)
Total HpCDF	9.1	11
OCDF	14	19
Total PCDFs	23	30
W.H.O. TEQ	4.1	4.7
USEPA TEQ	4.2	4.8
SVOCs (µg/L)		
1,2,4-Trichlorobenzene	ND (1.0)	ND (10)
1,2-Dichlorobenzene	ND (1.0)	ND (10)
1,3-Dichlorobenzene	ND (1.0)	ND (10)
1,4-Dichlorobenzene	ND (1.0)	ND (10)
2,2'-Oxybis(1-Chloropropane)	ND (1.0)	ND (10)
2,4,5-Trichlorophenol	ND (2.0)	ND (10)

Table 3-14b
Surface Water Data from Newark Bay Reach A from Tierra (1999a,c)

Parameters	Minimum	Maximum
2,4,6-Trichlorophenol	ND (2.0)	ND (10)
2,4-Dichlorophenol	ND (1.0)	ND (10)
2,4-Dimethylphenol	ND (1.0)	ND (10)
2,4-Dinitrophenol	ND (14)	ND (49)
2,4-Dinitrotoluene	ND (1.0)	ND (10)
2,6-Dinitrotoluene	ND (2.0)	ND (10)
2-Chloronaphthalene	ND (1.0)	ND (10)
2-Chlorophenol	ND (1.0)	ND (10)
2-Methylnaphthalene	ND (1.0)	ND (10)
2-Methylphenol	ND (1.0)	ND (10)
2-Nitroaniline	ND (2.0)	ND (10)
2-Nitrophenol	ND (1.0)	ND (10)
3,3'-Dichlorobenzidine	ND (2.0)	ND (10)
3-Nitroaniline	ND (2.0)	ND (10)
4,6-Dinitro-2-methylphenol	ND (5.0)	ND (24)
4-Bromophenyl-phenylether	ND (2.0)	ND (10)
4-Chloro-3-methylphenol	ND (1.0)	ND (10)
4-Chloroaniline	ND (1.0)	ND (10)
4-Chlorophenyl-phenylether	ND (1.0)	ND (10)
4-Methylphenol	ND (3.0)	ND (10)
4-Nitroaniline	ND (2.0)	ND (10)
4-Nitrophenol	ND (10)	ND (49)
Acenaphthene	ND (1.0)	ND (10)
Acenaphthylene	ND (1.0)	ND (10)
Anthracene	ND (1.0)	ND (10)
Benzo(a)anthracene	ND (1.0)	ND (10)
Benzo(a)pyrene	ND (1.0)	ND (10)
Benzo(b)fluoranthene	ND (1.0)	ND (10)
Benzo(g,h,i)perylene	ND (1.0)	ND (10)
Benzo(k)fluoranthene	ND (1.0)	ND (10)
Bis(2-Chloroethoxy)methane	ND (1.0)	ND (10)
Bis(2-Chloroethyl)ether	ND (1.0)	ND (10)
Bis(2-Ethylhexyl)phthalate	ND (2.0)	ND (10)
Butylbenzylphthalate	ND (2.0)	ND (10)
Carbazole	ND (2.0)	ND (10)
Chrysene	ND (1.0)	ND (10)
Dibenz(a,h)anthracene	ND (1.0)	ND (10)
Dibenzofuran	ND (1.0)	ND (10)
Diethylphthalate	ND (2.0)	ND (10)
Dimethylphthalate	ND (2.0)	ND (10)
Di-n-butylphthalate	ND (2.0)	ND (10)
Di-n-octylphthalate	ND (2.0)	ND (10)
Fluoranthene	ND (1.0)	ND (10)

Table 3-14b
Surface Water Data from Newark Bay Reach A from Tierra (1999a,c)

Parameters	Minimum	Maximum
Fluorene	ND (1.0)	ND (10)
Hexachlorobenzene	ND (2.0)	ND (10)
Hexachlorobutadiene	ND (2.0)	ND (10)
Hexachlorocyclopentadiene	ND (5.0)	ND (24)
Hexachloroethane	ND (1.0)	ND (10)
Indeno(1,2,3-cd)pyrene	ND (1.0)	ND (10)
Isophorone	ND (1.0)	ND (10)
Naphthalene	ND (1.0)	ND (10)
Nitrobenzene	ND (1.0)	ND (10)
N-Nitroso-di-n-propylamine	ND (1.0)	ND (10)
N-Nitrosodiphenylamine	ND (1.0)	ND (10)
Pentachlorophenol	ND (3.0)	ND (24)
Phenanthrene	ND (1.0)	ND (10)
Phenol	ND (1.0)	ND (10)
Pyrene	ND (1.0)	ND (10)
Pesticides, PCB Aroclors (µg/L)		
4,4'-DDD	ND (0.0038)	ND (0.22)
4,4'-DDE	ND (0.0038)	ND (0.22)
4,4'-DDT	ND (0.0038)	ND (0.22)
Aldrin	ND (0.0019)	ND (0.11)
Alpha-BHC	ND (0.0019)	ND (0.11)
Alpha-Chlordane	ND (0.0019)	ND (0.11)
Aroclor 1016	ND (0.095)	ND (5.5)
Aroclor 1221	ND (0.095)	ND (5.5)
Aroclor 1232	ND (0.095)	ND (5.5)
Aroclor 1242	ND (0.095)	ND (5.5)
Aroclor 1248	ND (0.095)	ND (5.5)
Aroclor 1254	ND (0.095)	ND (5.5)
Aroclor 1260	ND (0.095)	ND (5.5)
Beta-BHC	ND (0.0019)	ND (0.11)
Delta-BHC	0.0058 J	ND (0.11)
Dieldrin	ND (0.22)	ND (0.19)
Endosulfan I	ND (0.0019)	ND (0.11)
Endosulfan II	ND (0.0038)	ND (0.22)
Endosulfan Sulfate	ND (0.0038)	ND (0.22)
Endrin	ND (0.0038)	ND (0.22)
Endrin Aldehyde	ND (0.0038)	ND (0.22)
Endrin Ketone	ND (0.0038)	ND (0.22)
Gamma-BHC	ND (0.11)	ND (0.096)
Gamma-Chlordane	ND (0.0019)	ND (0.11)
Heptachlor	ND (0.0019)	ND (0.11)
Heptachlor Epoxide	ND (0.0019)	ND (0.11)
Methoxychlor	ND (0.019)	ND (1.1)

Table 3-14b
Surface Water Data from Newark Bay Reach A from Tierra (1999a,c)

Parameters	Minimum	Maximum
Total PCBs	ND (0.095)	ND (5.5)
Toxaphene	ND (0.19)	ND (11)
Supplemental Parameters (mg/L)		
TPH-DRO	ND (0.90)	0.15
Ammonia-nitrogen	0.048 J	0.54
DOC	1.3	1.4
Kjeldahl nitrogen	ND (0.40)	2.1 J
TOC	0.51 J	1.7
Total Cyanide	ND (0.0050)	ND (0.010)
TSS	ND (3.7)	14

Notes:
DOC = dissolved organic carbon
J = estimated value
mg/L = milligram per Liter
ND (value) = non-detect(detection limit)
ng/L = nanogram per Liter
PCBs = polychlorinated biphenyls
PCDD/Fs = polychlorinated dibenzo-*p*-dioxins and dibenzofurans
pg/L = picogram per Liter
SVOCs = semivolatile organic compounds
TEQ = toxic equivalency quotient
TPH-DRO = total petroleum hydrocarbons-diesel range oil
TOC = total organic carbon
TSS = total suspended solids
µg/L = microgram per Liter
W.H.O. = World Health Organization

Table 3-15
Surface Water Quality Data for 2001/2002 and 2002/2003 Aquatic Biological Sampling Programs in Newark Bay and Arthur Kill from USACE (2003a,b,c)

Author's Sampling Location	Temperature (^{o}C)	Salinity (ppth)	Conductivity (µS/cm)	DO (mg/L)
Arthur Kill	1.3 - 23	12 - 25	19,930 - 39,520	5.1 - 13
Arthur Kill	1.3 -23	13 - 25	22,040 - 39,501	4.9 - 13
Arthur Kill	1.2 - 23	12 - 24	19,780 - 38,520	5.1 - 13
Arthur Kill	1.7 - 24	12 - 24	19,960 - 39,030	4.9 - 14
Newark Bay	1.5 - 24	11 - 23	18,240 - 37,400	4.7 - 13
Newark Bay	1.1 - 24	11 - 23	18,300 - 37,420	4.7 - 13
Newark Bay	1.7 - 22	15 - 24	24,140 - 38,900	5.0 - 13
Newark Bay	1.5 - 22	16 - 25	26,190 - 40,150	5.1 - 13
Newark Bay	1.1 - 24	10. - 24	16,980 - 38,810	5.2 - 13

Notes:
^{o}C = Degrees Celsius
DO = dissolved oxygen
mg/L = milligrams per Liter
ppth = part per thousand
µS/cm = microSiemens per centimeter

Table 3-16a
Dredging Permit Application Summary Table - Site Water Data [a]

Waterway	Chemical	Number of Studies	Range of Concentrations			Units
Arthur Kill	**Inorganic Chemicals**					
	Ag	1	1.143	-	1.143	µg/L
	Cd	6	ND	-	ND	µg/L
	Cr	1	ND	-	ND	µg/L
	Cu	1	ND	-	ND	µg/L
	Hg	6	ND	-	0.103	µg/L
	Ni	1	ND	-	ND	µg/L
	Pb	1	14.433	-	14.433	µg/L
	Zn	1	13.633	-	13.633	µg/L
	Pesticides					
	a-Chlordane	2	0.001	-	176	µg/L
	Aldrin	2	ND	-	0.001	µg/L
	Dieldrin	2	ND	-	970	µg/L
	Endosulfan I	2	ND	-	ND	µg/L
	Endosulfan II	2	0.002	-	593	µg/L
	Endosulfan sulfate	2	ND	-	550	µg/L
	Heptachlor	2	0.001	-	19,442	µg/L
	Heptachlor epoxide	2	0.002	-	774	µg/L
	Total DDT	5	ND	-	8,309	µg/L
	trans Nonachlor	2	ND	-	61	µg/L
	Industrial Chemicals					
	TEPH	4	ND	-	ND	µg/L
	Total PCBs	6	ND	-	110,327	µg/L
Kill Van Kull	**Inorganic Chemicals**					
	Ag	2	0.01	-	0.053	µg/L
	As	1	0.59	-	0.59	µg/L
	Cd	2	0.05	-	0.308	µg/L
	Cr	2	0.97	-	1.27	µg/L
	Cu	2	2.25	-	2.957	µg/L
	Hg	2	0.010	-	0.014	µg/L
	Ni	2	1.19	-	1.397	µg/L
	Pb	2	1.22	-	2.15	µg/L
	Zn	2	6.85	-	14.033	µg/L
	Pesticides					
	a-Chlordane	2	ND	-	0.155	ng/L
	Aldrin	2	ND	-	ND	ng/L
	Dieldrin	2	ND	-	0.791	ng/L
	Endosulfan I	2	ND	-	ND	ng/L
	Endosulfan II	2	ND	-	0.347	ng/L
	Endosulfan sulfate	2	ND	-	0.335	ng/L
	Heptachlor	2	ND	-	7.294	ng/L
	Heptachlor epoxide	2	0.051	-	1.06	ng/L
	Total DDT	2	6.793	-	10.98	ng/L
	trans Nonachlor	2	ND	-	1.94	ng/L
	Industrial Chemicals					
	Total PCBs	2	70.612	-	110.29	ng/L

Table 3-16a
Dredging Permit Application Summary Table - Site Water Data [a]

Waterway	Chemical	Number of Studies	Range of Concentrations			Units
Newark Bay	**Inorganic Chemicals**					
	Ag	1	0.02	-	0.02	µg/L
	Cd	2	ND	-	0.1	µg/L
	Cr	1	0.78	-	1.62	µg/L
	Cu	1	3.12	-	3.87	µg/L
	Hg	2	ND	-	0.02	µg/L
	Ni	1	2.32	-	15.8	µg/L
	Pb	1	1.17	-	1.35	µg/L
	Zn	1	11.6	-	11.7	µg/L
	Pesticides					
	a-Chlordane	1	ND	-	ND	ng/L
	Aldrin	1	ND	-	ND	ng/L
	Dieldrin	1	1.10	-	1.16	ng/L
	Endosulfan I	1	ND	-	ND	ng/L
	Endosulfan II	1	ND	-	ND	ng/L
	Endosulfan sulfate	1	ND	-	ND	ng/L
	Heptachlor	1	ND	-	ND	ng/L
	Heptachlor epoxide	1	ND	-	ND	ng/L
	Total DDT	2	ND	-	3,780	µg/L
	trans Nonachlor	1	ND	-	ND	ng/L
	Industrial Chemicals					
	TEPH	1	ND	-	ND	µg/L
	Total PCBs	2	ND	-	91,800	µg/L
Passaic River	**Inorganic Chemicals**					
	Cd	1	ND	-	ND	µg/L
	Hg	1	ND	-	ND	µg/L
	Industrial Chemicals					
	TEPH	1	ND	-	ND	ng/L
	Total PCBs	1	ND	-	ND	ng/L

Notes:
a. Data ranges for obtained dredge permit applications in which data were provided.
ND = not detected
PCBs = polychlorinated biphenyls
TEPH = total extractable petroleum hydrocarbons

Sources:
Arthur Kill: Northville Linden Terminal Corporation (USACE, 1992c); CITGO Petroleum Corporation (USACE, 1997e); Consolidated Edison of New York (USACE, 1992d); Port Authority of NY/NJ (USACE, 1992b); Bayway Refining Company (USACE, 1993b); Federal Navigation Project (USACE, 1997h); Mobil Oil Corporation (USACE, 1997i).
Kill Van Kull: Federal Navigation Project (USACE, 1999k); EXXON Company, USA (USACE, 1997g).
Newark Bay: Port Authority of NY/NJ (USACE, 1991b); USACE (USACE, 1997f).
Passaic River: Celanese Chemical Company, Inc. (USACE, 1991a).

Table 3-16b
Dredging Permit Application Summary Table - Elutriate Data[a]

Waterway	Chemical	Number of Studies	Range of Concentrations			Units
Arthur Kill	**Inorganic Chemicals**					
	Ag	2	1.133	-	2.75	µg/L
	Cd	6	ND	-	0.107	µg/L
	Cr	2	ND	-	34.1	µg/L
	Cu	2	ND	-	41.733	µg/L
	Hg	6	ND	-	1.004	µg/L
	Ni	2	ND	-	4.627	µg/L
	Pb	2	ND	-	41.067	µg/L
	Zn	2	45.533	-	246.667	µg/L
	Pesticides					
	a-Chlordane	2	0.002	-	2,416	µg/L
	Aldrin	2	ND	-	ND	µg/L
	Dieldrin	2	ND	-	2,094	µg/L
	Endosulfan I	2	ND	-	ND	µg/L
	Endosulfan II	2	ND	-	1,201	µg/L
	Endosulfan sulfate	2	ND	-	640	µg/L
	Heptachlor	2	0.013	-	2,363	µg/L
	Heptachlor epoxide	2	0.002	-	652	µg/L
	Total DDT	5	ND	-	62,806	µg/L
	trans Nonachlor	2	ND	-	551	µg/L
	Industrial Chemicals					
	TEPH	4	ND	-	ND	µg/L
	Total PCBs	6	ND	-	205,098	µg/L
Kill Van Kull	**Inorganic Chemicals**					
	Ag	2	0.01	-	0.346	µg/L
	As	1	7.46	-	7.46	µg/L
	Cd	2	ND	-	0.042	µg/L
	Cr	2	1.31	-	5.11	µg/L
	Cu	2	2.14	-	8.293	µg/L
	Hg	2	0.040	-	0.169	µg/L
	Ni	2	0.88	-	3.48	µg/L
	Pb	2	2.767	-	10.4	µg/L
	Zn	2	6.28	-	13.4	µg/L
	Pesticides					
	a-Chlordane	2	ND	-	1.266	ng/L
	Aldrin	2	ND	-	ND	ng/L
	Dieldrin	2	ND	-	1.679	ng/L
	Endosulfan II	2	ND	-	0.413	ng/L
	Endosulfan sulfate	2	ND	-	0.359	ng/L
	Heptachlor	2	ND	-	0.765	ng/L
	Heptachlor epoxide	2	ND	-	0.463	ng/L
	Total DDT	2	10.579	-	17.243	ng/L
	trans Nonachlor	2	ND	-	0.164	ng/L
	Endosulfan I	2	ND	-	ND	ng/L
	Industrial Chemicals					
	Total PCBs	2	103.87	-	132.032	ng/L

Table 3-16b
Dredging Permit Application Summary Table - Elutriate Data[a]

Waterway	Chemical	Number of Studies	Range of Concentrations			Units
Newark Bay	**Inorganic Chemicals**					
	Ag	1	0.01	-	0.02	µg/L
	Cd	2	0.01	-	0.63	µg/L
	Cr	1	1.33	-	2.90	µg/L
	Cu	1	2.48	-	4.28	µg/L
	Hg	2	ND	-	0.06	µg/L
	Ni	1	1.59	-	3.77	µg/L
	Pb	1	0.85	-	2.32	µg/L
	Zn	1	8.23	-	20.9	µg/L
	Pesticides					
	a-Chlordane	1	0.29	-	1.37	ng/L
	Aldrin	1	ND	-	0.87	ng/L
	Dieldrin	1	0.43	-	0.47	ng/L
	Endosulfan I	1	ND	-	ND	ng/L
	Endosulfan II	1	ND	-	ND	ng/L
	Endosulfan sulfate	1	ND	-	ND	ng/L
	Heptachlor	1	ND	-	ND	ng/L
	Heptachlor epoxide	1	ND	-	ND	ng/L
	Total DDT	1	ND	-	35,400	µg/L
	trans Nonachlor	1	0.27	-	0.51	ng/L
	Industrial Chemicals					
	TEPH	1	ND	-	ND	µg/L
	Total PCBs	1	ND	-	217,000	µg/L
Passaic	**Inorganic Chemicals**					
	Cd	1	ND	-	ND	µg/L
	Hg	1	ND	-	ND	µg/L
	Industrial Chemicals					
	TEPH	1	ND	-	ND	ng/L
	Total PCBs	1	ND	-	ND	ng/L

Notes:
a. Data ranges for obtained dredge permit applications in which data were provided.
ND = not detected
PCBs = polychlorinated biphenyls
TEPH = total extractable petroleum hydrocarbons

Sources:
Arthur Kill: Northville Linden Terminal Corporation (USACE, 1992c); CITGO Petroleum Corporation (USACE, 1997e); Consolidated Edison of New York (USACE, 1992d); Port Authority of NY/NJ (USACE, 1992b); Bayway Refining Company (USACE, 1993b); Federal Navigation Project (USACE, 1997h); Mobil Oil Corporation (USACE, 1997i).
Kill Van Kull: Federal Navigation Project (USACE, 1999k); EXXON Company, USA (USACE, 1997g).
Newark Bay: Port Authority of NY/NJ (USACE, 1991b); USACE (USACE, 1997f).
Passaic River: Celanese Chemical Company, Inc. (USACE, 1991a).

Table 3-17
Quality Assurance/Quality Control Information for Water Studies

Reference	USEPA Region 2 Data Validation	Quantitative QA/QC[a]	Peer-reviewed Journal Publication	Not Specified	Notes
2B Inc. (1997)				X	
Battelle Ocean Sciences (1992a)		X			
ChemRisk (1995)				X	
Coastal & Environmental Studies, Inc. (2004)				X	
Creed et al. (2001)				X	
Dredging Permit Applications (12): NB: USACE (1991b; 1997f) AK: USACE (1992b; 1992c; 1992d; 1993b; 1997e; 1997h; 1997i) KVK: USACE (1997g; 1999k) PR: USACE (1991a)				X	
Eckenfelder (1993)		X			
Environmental Connection, Inc. (1997)				X	
HMDC (1990c)				X	
HMDC (1994)				X	
HMDC (1997)				X	
IEC (2000 - 2002)				X	
IEC (2003)				X	
IEC (2004)				X	
ISC (1937 - 1999)				X	
Kimball (2000)		X			
Konsevick et al. (1994)				X	
Langan (1999)		X			
Litten and Fowler (1999)				X	
Litten et al. (1999)				X	
McIntyre (2000)				X	
MERI (2004a)				X	
MERI (2004b)				X	
Metcalf & Eddy (1995)				X	
Mohan et al. (1999)			X		
NJDEP (1996)				X	
NJDEP (1998)				X	
NJDEP (2000)				X	
NJDEP (2001)				X	
NJDEP/SIT (2004)				X	
NOAA (1994)				X	
NY/NJ HEP (2004a)				X	
NYCDEP (1993)				X	
NYCDEP (1998)				X	
NYCDEP (1999)				X	

Table 3-17
Quality Assurance/Quality Control Information for Water Studies

Reference	USEPA Region 2 Data Validation	Quantitative QA/QC[a]	Peer-reviewed Journal Publication	Not Specified	Notes
NYCDEP (2000)				X	
NYCDEP (2001)				X	
NYCDEP (2003)				X	
NYSDEC (2003)				X	
Rankin (2001)				X	
Rankin et al. (2001)				X	
SAIC (1993)				X	
Su et al. (2002)			X		
Tierra (1994a)				X	
Tierra (1995a)		X			
Tierra (1996b)		X			
Tierra (1997b)		X			
Tierra (1999a)		X			
Tierra (1999c)		X			
Tierra (1999e)		X			
Tierra (2004a)				X	
Tierra (2004b)				X	
Tierra (2004c)				X	
Tierra (2004d)				X	
USACE (1997a)				X	
USACE (1999a)	X				
USACE (2003a)				X	
USACE (2003b)				X	
USACE (2003c)				X	
USEPA (1998)		X			
USGS (2001)				X	
Weston (1998)				X	

Note:

a. Quantitative QA/QC includes the analysis of field and laboratory duplicates, rinse blanks, matrix spike/matrix spike duplicates and other quantitative measures of precision and accuracy but without specification of implementing USEPA Region 2 data validation procedures.

Table 3-18
Sediment Studies Identified for the Inventory Area

Reference	Data Collection Date(s)	Data Collection Season(s)	Waterway	Number of Sampling Locations/Cores	Sampling Method	Number of Samples	Sample Depth	Parameters Measured									
								Inorganic Chemicals	AVS-SEM	Pesticides	PCDD/Fs	PCBs	PAHs	TEPH	TOC	Grain Size	Other
AWARE (unknown)	not provided	not provided	HK	16	grab-composite	16	not provided	X									
Barabas et al. (2001)	1995	spring, summer	PR	94	core	not provided	surface and subsurface				X						
Battelle (1992b)	1992	not provided	NB	2	core	2	surface	X	X						X	X	
Bonnevie et al. (1992)	1990	winter	NB	1	grab	1	surface	X									
Bonnevie et al. (1993)	1991	winter	NB	3	core	3	surface and subsurface	X									
Bonnevie et al. (1994)	1990	winter	NB	1	grab	1	surface	X									
Bopp (1988)	1985 - 1986	not provided	NB	not provided	core	not provided	surface and core depths with estimated deposition in mid-1960s				X						
Bopp (2001)	2000	fall	HK	5	core	not provided	surface and subsurface										radiochemical
Bopp and Simpson (1991)	1985-1986	not provided	NB	4	core	17	surface and subsurface			X	X						
Bopp et al. (1991)	1985 -1986	not provided	NB	4	core	17	surface and subsurface			X	X						
Burke et al. (2000)	1988	spring	HK	1	grab	not provided	not provided	X									
Cerrato (1986)	1985	spring, summer	NB	not provided	grab	not provided	surface										% silt; % clay
Chaky (2003)	2001	fall	AK, KVK, NB	5	core	not provided	surface and subsurface				X	X					radiochemical
ChemRisk (1995)	1994 - 1995	not provided	PR	not provided	core	not provided	surface	X		X	X	X	X			X	sediment characteristics
Dredging Permit Applications (2): AK: Chevron (1997); USACE (1997d)	1997	not applicable	AK	2	grab	2	surface	X		X	X	X	X				VOCs
Darby (1975)	not provided	not provided	AK	not provided	not provided	not provided	surface							X			bacteria
Demuth et al. (1993)	1989	winter	KVK, NB	2	grab	2	surface			X		X	X				
Ducks Unlimited (1998)	1997	spring	HK	4	grab	not provided	surface and subsurface	X		X		X					
Eckenfelder (1993)	1991	summer, fall	HK	8	grab	8	surface	X		X	X	X		X	X	X	sediment characteristics
Ehrlich et al. (1994)	1991 - 1993	winter	NB	14	core	11	surface				X						
ERM (1985c)	1970s - 1980s	year-round	HK	not provided	core and grab	not provided	surface and subsurface	X									
ERM (1985e)	1970s - 1980s	year-round	HK	not provided	core and grab	not provided	surface and subsurface	X									
ERM (1985g)	1970s - 1980s	not provided	HK	not provided	grab and core	not provided	surface and subsurface	X									
Finley et al. (1990)	1990	winter	NB	not provided	grab	19 (unknown number within NB)	surface				X						
Fu et al. (2001)	prior to 2001	not provided	PR	not provided	not provided	not provided	not provided										2,3,78-TCDD turnover via microbial
Galluzzi and Sabounjian (1980)	prior to 1980	not provided	HK	42	core	not provided	0-18"	X									
Gillis et al. (1993)	1990	not provided	NB	not provided	grab	18 (unknown number within NB)	surface	X									
Gillis et al. (1995)	1990 - 1993	winter	NB	15	core	45	surface and subsurface			X							
Grasso (1979)	not provided	not provided	HK	15	core	45	not provided	X									
Hart Crowser (1999)	1999	summer	NB	1	core	1 core (3 depths)	surface and subsurface	X	X	X	X	X	X	X	X	X	X
HMDC (1980b)	1976 - 1978	not provided	HK	not provided	core	not provided	surface and subsurface	X									
HMDC (1987a)	1987	summer	HK	1	grab	1	surface	X						X	X		
HMDC (1990c)	1990	summer	HK	5	grab	5	surface	X									
Huntley et al. (1993)	1991	winter	NB	3	core	3	surface to >1m						X	X			
Huntley et al. (1995a)	1990 - 1993	winter	NB	15	core	45	surface and subsurface						X	X			
Huntley et al. (1995b)	1991	fall, winter	PR	10	core	not provided	surface and subsurface						X			X	sediment classification, Pb and Cs geochronology
Huntley et al. (1997)	not provided	not provided	PR	4	grab	41	surface				X	X					
Huntley et al. (1998)	1991 - 1993	not provided	AK, HK, KVK, NB, PR	50	core	not provided	surface and subsurface				X	X					radiochemical
Iannuzzi and Wenning (1995)	1990 - 1993	winter	NB	15	core	45	surface and subsurface	X									
Iannuzzi et al. (1995)	1990 - 1993	winter	NB	15	core	45	surface and subsurface					X					
Iannuzzi et al. (1997)	1994	fall	PR	4	grab	10	surface	X		X		X	X				
Kimball (2000)	1985, 1987, 1988, 2000	year-round	HK	not provided	grab	not provided	surface and subsurface	X							X		VOCs
Konsevick (1991)	prior to 1991	year-round	HK, NB	not provided	core	not provided	not provided	X			X						
Kraus and Bragin (1989)	1987 - 1988	year-round	HK	23	grab	23	surface	X								X	
Kraut (1986)	1986	not provided	KVK, NB	not provided	core	not provided	surface and subsurface				X						
Langan (1999)	1999	spring	HK	22	core	51	surface and subsurface	X		X		X	X	X	X		pH
March and Gittleson (1980)	1978	winter	HK	23	grab	not provided	surface	X									

Table 3-18
Sediment Studies Identified for the Inventory Area

Reference	Data Collection Date(s)	Data Collection Season(s)	Waterway	Number of Sampling Locations/Cores	Sampling Method	Number of Samples	Sample Depth	Parameters Measured									
								Inorganic Chemicals	AVS-SEM	Pesticides	PCDD/Fs	PCBs	PAHs	TEPH	TOC	Grain Size	Other
McIntyre (2000)	1999	summer	HK	1	core	1	surface and subsurface	X									
Meyerson et al. (1981)	prior to 1981	not provided	NB	20	core	20	surface and subsurface	X								X	
Mitra (1997)	1996	summer	NB	1	core	not provided	surface and subsurface						X			X	% silt; % clay
Mohan et al. (1999)	1990s	not provided	RW	35	not provided	35	not provided	X		X							
NJDEP (1985a)	1984	spring	NB	not provided	grab	12	surface				X						
NJDEP (1991)	1990	not provided	AK, HK, KVK, NB	AK: 31; HK: 1, KVK: 1; NB: 4	core	37	surface and subsuface							X			
NOAA (1984a)	1976 - 1979	summer	NB	not provided	grab	not provided	surface (inorganic chemicals) and subsurface (modeling)	X						X		X	
NOAA (1984b)	prior to 1979	not provided	NB	not provided	not provided	not provided	surface	X									
NOAA (1995b)	1991; 1993	not provided	NB	1991: 2; 1993: 5	grab	7	surface	X	X	X	X	X	X		X	X	
NY/NJ HEP (2004a)	2000 - 2003	summer	NB	4	grab and core	91 surficial sediment grabs and 43 sediment cores	surface and subsurface	X		X	X	X	X		X		X
NYSDEC (2003)	1998 - 2000	year-round	AK, NB	AK: 9; NB: 1	grab and core	not provided	surface and subsuface			X							
Pruell et al. (1993)	not provided	not provided	PR	4 (homogenate)	grab	6 (replicates of homogenate)	surface				X	X					
Rice et al. (1995)	1991	spring	KVK, NB, NY/NJ Harbor Estuary	KVK: 1; NB: 1; NY/NJ Harbor Estuary:15	grab	17	surface	X		X		X	X		X	X	
Robinson (2002)	1985 - 1998	not provided	AK, KVK, NB	AK: 2; KVK: 3; NB: 3	core	not provided	surface and subsurface			X							
Rod et al. (1989)	1880 - 1980	not provided	NY/NJ Harbor Estuary	not provided	not provided	not provided	not provided	X		X							
Rosman et al. (2003)	1990 - 2000	not provided	NY/NJ Harbor Estuary	not provided	core	not provided	surface and subsurface				X	X					
Rubinstein et al. (1990)	not provided	not provided	PR	4 (homogenate)	grab	6 (replicates of homogenate)	surface				X	X					
Scott et al. (2000)	1991 - 1993; 1994	not provided	PR	1991-1993: 38; 1994: 12	grab	50	surface				X						
Squibb et al. (1991)	1970s - 1980s	varies by dataset	NB	varies by dataset	varies by dataset	not provided	varies by dataset	X		X	X	X	X				
Stackelberg (1997)	late 1970s - 1993	not provided	PR, RW	100 sites across NJ, including PR and RW	grab	PR: 93; RW: 21	surface			X		X			X		
Suszkowski (1978)	1976 - 1977	year-round	NB	not provided	grab	not provided	surface	X							X	X	
Tierra (1990)	1990	winter	AK, ER, HK, PR	AK: 5; ER: 5; HK: 2; PR: 11; RW: 5	core	not provided	various depths (surface to approximately 1m)	X		X	X	X	X		X		X
Tierra (1991)	1991	winter	AK, KVK, NB	AK: 5; KVK: 2; NB: 1	core	28	various depths (surface to approximately 1m)	X		X	X	X	X		X		X
Tierra (1992)	1992	winter	NB	9	core	27	surface and subsurface	X		X	X	X	X		X		X
Tierra (1993)	1993	winter	AK, KVK, NB	AK: 1; KVK: 22; NB: 4	core	4	surface and subsurface	X		X	X	X	X		X		X
Tierra (1994a)	1994	summer	PR	6	grab	6	surface									X	
Tierra (1994b)	1994	fall	PR	40	grab	40	surface	X		X	X	X	X	X	X		VOCs
Tierra (1995b)	1995	spring	PR	45	core	117	surface and subsurface									X	various geotechnical
Tierra (1995c)	1995	spring, summer	PR	93	core	552	surface and subsurface	X		X	X	X	X	X	X	X	VOCs
Tierra (1995d)	1995	fall	PR	7	grab	7	surface	X			X						
Tierra (1996a)	1996	spring	NB	4	core	4	surface and subsurface	X		X	X	X	X		X		X
Tierra (1997a)	1997	spring	NB	6	core	6	surface and subsurface	X		X	X	X	X		X		X
Tierra (1997b)	1997	fall	PR	4	grab	4	surface			X	X	X		X			COD, BOD, TKN, NO_3-N, NH_3-N, hardness, pH
Tierra (1998)	1998	spring	NB	3	core	5	surface and subsurface	X		X	X	X	X	X			
Tierra (1999a)	1999	spring	NB	4	core	4 (various depths)	surface and subsurface	X		X	X	X	X		X		X
Tierra (1999b)	1999	spring	AK, HK, NB	AK: 1; HK: 2; NB: 1	core	4 (various depths)	surface and subsurface	X		X	X	X	X		X		X
Tierra (1999d)	1999	summer	PR	15	grab	45	surface	X	X	X	X	X	X	X	X	X	SVOCs
Tierra (1999f)	1999	summer	NB, PR	5	grab	5	surface	X	X	X	X	X	X		X	X	NH_3-N, pH
Tierra (2000a)	1999	winter	PR	8	grab	8	surface	X	X	X	X	X	X	X	X	X	VOCs
Tierra (2000b)	2000	fall	PR	3	grab	3	surface	X	X	X	X	X	X	X	X	X	treatability study

Table 3-18
Sediment Studies Identified for the Inventory Area

Reference	Data Collection Date(s)	Data Collection Season(s)	Waterway	Number of Sampling Locations/Cores	Sampling Method	Number of Samples	Sample Depth	Parameters Measured									
								Inorganic Chemicals	AVS-SEM	Pesticides	PCDD/Fs	PCBs	PAHs	TEPH	TOC	Grain Size	Other
Tierra (2000c)	2000	spring	PR	15	grab	20	surface	X	X	X	X	X	X	X	X	X	SVOCs
Tierra (2000d)	2000	summer	PR	5	grab	5	surface	X	X	X	X	X	X	X	X	X	NH_3-N, pH, organotins, sulfide
Tierra (2004a)	1995 - 1999	spring, summer	PR	8	core	varies by endpoint	surface and subsurface	X		X	X	X	X	X	X	X	various geotechnical
Tong et al. (1990)	1985 - 1986	not provided	NB	not provided	core	not provided	surface and core depths with estimated deposition in mid-1960s				X						
USACE (unknown)	1995	winter	PR	10	not provided	39	not provided	X		X	X	X	X	X	X		SVOCs, VOCs
USACE (1993a)	1993	spring	AK, HK, NB	AK: 12; HK: 8; NB: 21	core	40	0 to 8.0 feet	X		X	X	X	X				
USACE (1995a)	1995	spring	NB	26	core	40	0 to 8.6 feet	X			X				X	X	% fines
USACE (1997a)	1996	spring	NB	22	core	22	surface (homogenized sample)	X		X	X	X	X				VOCs
USACE (2004a)	2001	fall	NB	not provided	sidescan surveys	spatial area coverage	surface and subsurface										silt thickness
USEPA (unknown)	1993	spring	PR	4	grab	4	surface	X		X	X	X	X		X		SVOCs, VOCs, TRPH
USEPA (1998)	1990 - 1994	not provided	NB	20	grab	not provided	surface	X	X	X	X	X	X		X	X	pathogen
USEPA (2003)	1998	not provided	NB	28	grab	28	surface	X	X	X	X		X				
USGS (1996)	late 1970s - 1993	not provided	PR, RW	not provided	grab	PR: 93; RW: 21	surface			X		X			X		
Wallin et al. (2002)	1990 - 1995	not provided	PR	not provided	core	100+	geochronology: 1910s to 1990s	X		X		X					
Wenning et al. (1994)	1991 - 1992	winter	PR	16	core	16	surface and subsurface	X			X		X	X			
Wolfe et al. (1996)	1991	not provided	NB	2	grab	6	surface	X	X	X			X		X	X	

Notes:
AK = Arthur Kill
AVS/SEM = acid volatile sulfide/simultaneously extracted inorganic chemicals
BOD = biological oxygen demand
COD = chemical oxygen demand
ER = Elizabeth River
HK = Hackensack River
KVK = Kill Van Kull
NH_3-N = ammonia nitrogen
NO_3-N = nitrate nitrogen
PAHs = polycyclic aromatic hydrocarbons
PCBs = polychlorinated biphenyls
PCDD/Fs = polychlorinated dibenzo-p-dioxins and dibenzofurans
PR = Passaic River
RW = Rahway River
SVOCs = semivolatile organic carbons
TEPH = total extractable petroleum hydrocarbons
TKN = total Kjeldahl nitrogen
TOC = total organic carbon
TRPH = total recoverable petroleum hydrocarbons
VOCs = volatile organic compounds

Table 3-19
Grain Size Data Collected during 1994 Passaic River Finfish and Benthic Invertebrate Survey from ChemRisk (1995) and Tierra (1994a)

Analyte	Units	Minimum Detect	Maximum Detect
Physical Property			
Clay	%	5	25
Gravel	%	0	20
Sand	%	2	55
Silt	%	22	73

Table 3-20

1999 Passaic River, Newark Bay, and Arthur Kill Sediment Sampling Program from Hart Crowser (1999) and Tierra (1999b)

Analyte	Units	Minimum Detect	Maximum Detect
AVS/SEM			
AVS	mg/kg	27.6	370
Cd - SEM	mg/kg	0.0178	11.4
Cu - SEM	mg/kg	1.34	330
Hg - SEM	mg/kg	0.000129	0.27
Ni - SEM	mg/kg	0.209	55.1
Pb - SEM	mg/kg	0.58	737
Zn - SEM	mg/kg	3.73	1,180
Cyanide			
Total Cyanide	ppm	0.55	0.85
Inorganic Chemicals			
Ag	ppm	4.3	6.9
Al	ppm	8,520	22,100
As	ppm	5.3	108
Ba	ppm	168	600
Be	ppm	0.56	1.2
Ca	ppm	835	31,500
Cd	ppm	1.09	11.9
Co	ppm	6.6	18.1
Cr	ppm	24.3	450
Cu	ppm	32.2	807
Fe	ppm	19,200	47,500
Hg	ppm	0.016	23.9
K	ppm	1,030	5,560
Mg	ppm	2,510	9,550
Mn	ppm	215	529
Na	ppm	200	9,500
Ni	ppm	17.4	134
Pb	ppm	14.6	1,550
Sb	ppm	1.2	38
Se	ppm	0.7	3.2
Tl	ppm	0.85	2.15
V	ppm	26.5	77.2
Zn	ppm	68.2	1,100
Miscellaneous			
Ammonia Nitrogen	ppm	240	2,880
pH		7.22	8.19
PCB Congeners			
PCB-1	ppb	0.18	8.4

Table 3-20

1999 Passaic River, Newark Bay, and Arthur Kill Sediment Sampling Program from Hart Crowser (1999) and Tierra (1999b)

Analyte	Units	Minimum Detect	Maximum Detect
PCB-105	ppb	0.93	130
PCB-110	ppb	1.4	260
PCB-114	ppb	0.3	8.5
PCB-115	ppb	0.1	65
PCB-118	ppb	1.4	270
PCB-119	ppb	0.099	8
PCB-123	ppb	0.18	4.9
PCB-126	ppb	0.45	0.99
PCB-128	ppb	0.11	40
PCB-138	ppb	0.67	240
PCB-149	ppb	0.48	150
PCB-15	ppb	0.53	77
PCB-151	ppb	1.6	38
PCB-153	ppb	0.5	180
PCB-156	ppb	0.76	20
PCB-157	ppb	0.21	4.2
PCB-158	ppb	0.72	17
PCB-167	ppb	0.41	9
PCB-168	ppb	0.16	0.49
PCB-169	ppb	0.62	0.62
PCB-170	ppb	0.14	54
PCB-177	ppb	1.3	31
PCB-18	ppb	3.7	420
PCB-180	ppb	0.4	120
PCB-183	ppb	1.2	31
PCB-184	ppb	0.75	0.75
PCB-187	ppb	0.2	82
PCB-189	ppb	0.21	1.8
PCB-194	ppb	0.11	25
PCB-195	ppb	0.42	10
PCB-201	ppb	1.9	44
PCB-202	ppb	0.34	6.1
PCB-206	ppb	0.89	22
PCB-207	ppb	0.38	1.5
PCB-209	ppb	0.027	18
PCB-28	ppb	3	460
PCB-3	ppb	0.16	8
PCB-37	ppb	0.22	110
PCB-44	ppb	3.6	360

Table 3-20

1999 Passaic River, Newark Bay, and Arthur Kill Sediment Sampling Program from Hart Crowser (1999) and Tierra (1999b)

Analyte	Units	Minimum Detect	Maximum Detect
PCB-49	ppb	4.3	370
PCB-52	ppb	4.5	500
PCB-66	ppb	5.1	470
PCB-70	ppb	5	450
PCB-74	ppb	2.6	220
PCB-77	ppb	0.47	36
PCB-8	ppb	0.88	140
PCB-81	ppb	0.14	3.8
PCB-87	ppb	1.1	170
PCB-90/101	ppb	1.7	330
PCB-99	ppb	0.96	180
Total Congeners	ppb	47.41	5,759
Total PCBs - Congeners (NOAA 1989)	ppb	58.3	7,210
Total PCBs - Sum of Coplanar Congeners	ppb	3.34	609
PCB Homologue Groups			
Total Dichlorobiphenyl	ppb	1.9	390
Total Heptachlorobiphenyl	ppb	0.87	450
Total Hexachlorobiphenyl	ppb	1.9	870
Total Monochlorobiphenyl	ppb	0.34	17
Total Nonachlorobiphenyl	ppb	1.1	28
Total Octachlorobiphenyl	ppb	0.11	120
Total PCBs - Homologue Groups	ppb	81.8	9,190
Total Pentachlorobiphenyl	ppb	12	2,000
Total Tetrachlorobiphenyl	ppb	42	3,800
Total Trichlorobiphenyl	ppb	23	2,200
PCDD/Fs			
1,2,3,4,6,7,8-HpCDD	ppt	6.7	1,200
1,2,3,4,6,7,8-HpCDF	ppt	2.3	1,900
1,2,3,4,7,8,9-HpCDF	ppt	5	69
1,2,3,4,7,8-HxCDD	ppt	1.7	27
1,2,3,4,7,8-HxCDF	ppt	16	330
1,2,3,6,7,8-HxCDD	ppt	5.3	110
1,2,3,6,7,8-HxCDF	ppt	7.7	110
1,2,3,7,8,9-HxCDD	ppt	2.6	40
1,2,3,7,8,9-HxCDF	ppt	2	16
1,2,3,7,8-PeCDD	ppt	2.6	22
1,2,3,7,8-PeCDF	ppt	6	39
2,3,4,6,7,8-HxCDF	ppt	4.2	39
2,3,4,7,8-PeCDF	ppt	10	99

Table 3-20

1999 Passaic River, Newark Bay, and Arthur Kill Sediment Sampling Program from Hart Crowser (1999) and Tierra (1999b)

Analyte	Units	Minimum Detect	Maximum Detect
2,3,7,8-TCDD	ppt	52	4,700
2,3,7,8-TCDF	ppt	5.4	69
OCDD	ppt	77	16,000
OCDF	ppt	3.7	3,400
Total 2,3,7,8-Congeners	ppt	89.7	28,100
Total HpCDD	ppt	18	2,700
Total HpCDF	ppt	2.3	2,600
Total HxCDD	ppt	5	750
Total HxCDF	ppt	1.1	1,200
Total PCDDs	ppt	100	25,800
Total PCDFs	ppt	8.9	15,100
Total PeCDD	ppt	17	1,500
Total PeCDF	ppt	0.8	2,800
Total TCDD	ppt	150	5,200
Total TCDF	ppt	1	5,100
Pesticides/PCBs			
4,4'-DDD	ppb	0.61	148
4,4'-DDE	ppb	0.33	504
4,4'-DDT	ppb	91	91
Aldrin	ppb	3.3	90
Alpha-BHC	ppb	0.131	3.7
Alpha-Chlordane	ppb	3.2	58
Aroclor-1016	ppb	ND	ND
Aroclor-1221	ppb	ND	ND
Aroclor-1232	ppb	ND	ND
Aroclor-1242	ppb	ND	ND
Aroclor-1248	ppb	2,520	5,360
Aroclor-1254	ppb	5,800	5,800
Aroclor-1260	ppb	ND	ND
Beta-BHC	ppb	ND	ND
Delta-BHC	ppb	0.271	80
Dieldrin	ppb	ND	ND
Endosulfan I	ppb	3.5	6.5
Endosulfan II	ppb	6.2	26
Endosulfan Sulfate	ppb	ND	ND
Endrin	ppb	11.6	64
Endrin Aldehyde	ppb	28	39
Endrin Ketone	ppb	ND	ND
Gamma-BHC (Lindane)	ppb	0.123	11.2

Table 3-20

1999 Passaic River, Newark Bay, and Arthur Kill Sediment Sampling Program from Hart Crowser (1999) and Tierra (1999b)

Analyte	Units	Minimum Detect	Maximum Detect
Gamma-Chlordane	ppb	9.7	59
Heptachlor	ppb	ND	ND
Heptachlor Epoxide	ppb	ND	ND
Methoxychlor	ppb	ND	ND
Total Alpha + Gamma Chlordane	ppb	3.7	117
Total DDT	ppb	0.94	584
Total PCBs - Aroclors	ppb	2,520	5,800
Toxaphene	ppb	ND	ND
Physical Property			
Percent Moisture	%	19.7	78.6
SVOCs			
1,2,4-Trichlorobenzene	ppb	ND	ND
1,2-Dichlorobenzene	ppb	ND	ND
1,3-Dichlorobenzene	ppb	ND	ND
1,4-Dichlorobenzene	ppb	150	150
2,4,5-Trichlorophenol	ppb	ND	ND
2,4,6-Trichlorophenol	ppb	ND	ND
2,4-Dichlorophenol	ppb	ND	ND
2,4-Dimethylphenol	ppb	ND	ND
2,4-Dinitrophenol	ppb	ND	ND
2,4-Dinitrotoluene	ppb	ND	ND
2,6-Dinitrotoluene	ppb	ND	ND
2-Chloronaphthalene	ppb	ND	ND
2-Chlorophenol	ppb	ND	ND
2-Methylnaphthalene	ppb	300	1,600
2-Methylphenol	ppb	ND	ND
2-Nitroaniline	ppb	ND	ND
2-Nitrophenol	ppb	ND	ND
3,3'-Dichlorobenzidine	ppb	ND	ND
3-Nitroaniline	ppb	ND	ND
4,6-Dinitro-2-methylphenol	ppb	ND	ND
4-Bromophenyl phenyl ether	ppb	ND	ND
4-Chloro-3-methylphenol	ppb	ND	ND
4-Chloroaniline	ppb	ND	ND
4-Chlorophenyl phenyl ether	ppb	ND	ND
4-Methylphenol	ppb	ND	ND
4-Nitroaniline	ppb	ND	ND
4-Nitrophenol	ppb	ND	ND
Acenaphthene	ppb	170	5,000

Table 3-20

1999 Passaic River, Newark Bay, and Arthur Kill Sediment Sampling Program from Hart Crowser (1999) and Tierra (1999b)

Analyte	Units	Minimum Detect	Maximum Detect
Acenaphthylene	ppb	200	2,900
Anthracene	ppb	430	11,000
Benzo(a)anthracene	ppb	220	15,000
Benzo(a)pyrene	ppb	48	12,000
Benzo(b)fluoranthene	ppb	83	9,800
Benzo(g,h,i)perylene	ppb	420	4,700
Benzo(k)fluoranthene	ppb	240	2,800
bis(2-Chloroethoxy)methane	ppb	ND	ND
bis(2-Chloroethyl)ether	ppb	ND	ND
bis(2-Chloroisopropyl)ether	ppb	ND	ND
bis(2-Ethylhexyl)phthalate	ppb	2,900	120,000
Butyl benzyl phthalate	ppb	14,000	22,000
Carbazole	ppb	ND	ND
Chrysene	ppb	210	15,000
Dibenzo(a,h)anthracene	ppb	290	1,200
Dibenzofuran	ppb	450	690
Diethyl phthalate	ppb	ND	ND
Dimethylphthalate	ppb	ND	ND
Di-n-Butylphthalate	ppb	870	870
Di-n-Octylphthalate	ppb	440	5,600
Fluoranthene	ppb	880	23,000
Fluorene	ppb	54	5,200
Hexachlorobenzene	ppb	ND	ND
Hexachlorobutadiene	ppb	ND	ND
Hexachlorocyclopentadiene	ppb	ND	ND
Hexachloroethane	ppb	ND	ND
HMW PAHs	ppb	1,970	119,000
Indeno(1,2,3-cd)pyrene	ppb	410	5,300
Isophorone	ppb	ND	ND
LMW PAHs	ppb	894	56,300
Naphthalene	ppb	380	1,600
Nitrobenzene	ppb	ND	ND
N-Nitroso-di-n-propylamine	ppb	ND	ND
N-Nitrosodiphenylamine	ppb	360	1,700
Pentachlorophenol	ppb	ND	ND
Phenanthrene	ppb	260	29,000
Phenol	ppb	ND	ND
Pyrene	ppb	530	30,000
Total PAHs	ppb	2,870	175,000

Table 3-20

1999 Passaic River, Newark Bay, and Arthur Kill Sediment Sampling Program from Hart Crowser (1999) and Tierra (1999b)

Analyte	Units	Minimum Detect	Maximum Detect
TOC			
TOC	ppm	600	38,000

Notes:
AVS/SEM = acid volatile sulfide/simultaneously extracted metals
BHC = beta hexachlorocyclohexane
HMW = high molecular weight
LMW = low molecular weight
NOAA = National Oceanic and Atmospheric Administration
ND = not detected
PAHs = polycyclic aromatic hydrocarbons
PCBs = polychlorinated biphenyls
PCDD/Fs = polychlorinated dibenzo-*p*-dioxins and dibenzofurans
ppb = parts per billion
ppm = parts per million
ppt = parts per trillion
SVOCs = semivolatile organic carbons
TOC = total organic carbon

Table 3-21a
1991 Phase I NY/NJ Harbor Estuary Sediment Toxicity Data from NOAA (1995b)

Analyte	Units	Minimum Detect	Maximum Detect
AVS/SEM			
AVS	mM	10.2	63.5
Inorganic Chemicals			
Ag	mg/kg	0.45	2.7
Al	mg/kg	39,000	68,000
As	mg/kg	1	38
Cd	mg/kg	0.8	6.4
Cr	mg/kg	83	190
Cu	mg/kg	31	520
Fe	mg/kg	15,000	40,000
Hg	mg/kg	1.1	15
Mn	mg/kg	224	590
Ni	mg/kg	15	54
Pb	mg/kg	41	300
Sb	mg/kg	0.46	7.8
Se	mg/kg	1.2	4.3
Sn	mg/kg	7.5	55
Zn	mg/kg	77	460
Miscellaneous			
Total Carbonate	% dry	0.07	0.39
PAH-SIM			
1,6,7-Trimethylnaphthalene	ppb	21.5	114
1-Methylnaphthalene	ppb	35.4	216
1-Methylphenanthrene	ppb	86.1	837
2,6-Dimethylnaphthalene	ppb	30.1	134
2-Methylnaphthalene	ppb	76.1	383
Acenaphthene	ppb	31.5	221
Acenaphthylene	ppb	49.6	792
Anthracene	ppb	152	1,370
Benzo(a)anthracene	ppb	343	3,750
Benzo(a)pyrene	ppb	356	4,770
Benzo(b)fluoranthene	ppb	530	3,590
Benzo(e)pyrene	ppb	312	2,280
Benzo(g,h,i)perylene	ppb	257	3,320
Benzo(k)fluoranthene	ppb	215	1,360
Biphenyl	ppb	24.8	90.3
Chrysene	ppb	312	3,420
Dibenzo(a,h)anthracene	ppb	61.5	469
Fluoranthene	ppb	999	4,360

Table 3-21a
1991 Phase I NY/NJ Harbor Estuary Sediment Toxicity Data from NOAA (1995b)

Analyte	Units	Minimum Detect	Maximum Detect
Fluorene	ppb	65.5	297
HMW PAHs	ppb	4,230	33,300
Indeno(1,2,3-cd)pyrene	ppb	241	22,800
LMW PAHs	ppb	893	5,480
Naphthalene	ppb	110	491
Perylene	ppb	137	798
Phenanthrene	ppb	350	1,930
Pyrene	ppb	913	6,420
Total PAHs	ppb	5,120	38,800
PCB Congeners			
PCB-101	ppb	13.2	92.1
PCB-105	ppb	3.71	37.9
PCB-118	ppb	7.52	40.1
PCB-126	ppb	ND	ND
PCB-128	ppb	3.23	6.74
PCB-138	ppb	8.55	48
PCB-153	ppb	11.5	71.7
PCB-170	ppb	3.21	27.7
PCB-18	ppb	4.65	61.4
PCB-180	ppb	5.26	32.2
PCB-187	ppb	3.02	38.7
PCB-195	ppb	0.303	4.16
PCB-206	ppb	0.48	7.76
PCB-209	ppb	0.314	9.44
PCB-28	ppb	11.6	137
PCB-44	ppb	6.88	84.7
PCB-52	ppb	13	132
PCB-66	ppb	7.81	96.4
PCB-77	ppb	ND	ND
PCB-8	ppb	1.85	26.6
Total PCBs - Congeners (NOAA, 1989)	ppb	253	1,670
Total PCBs - Sum of Coplanar Congeners	ppb	19.7	136
Pesticides/PCBs			
2,4'-DDD	ppb	6.96	146
2,4'-DDE	ppb	2.12	61.7
2,4'-DDT	ppb	0.906	131
4,4'-DDD	ppb	10.1	462
4,4'-DDE	ppb	8.65	182
4,4'-DDT	ppb	14.6	1,610

Table 3-21a
1991 Phase I NY/NJ Harbor Estuary Sediment Toxicity Data from NOAA (1995b)

Analyte	Units	Minimum Detect	Maximum Detect
Aldrin	ppb	13.2	13.2
Alpha-Chlordane	ppb	3.07	19
Dieldrin	ppb	1.63	6.88
Endrin	ppb	ND	ND
Gamma-BHC (Lindane)	ppb	ND	ND
Heptachlor	ppb	ND	ND
Heptachlor Epoxide	ppb	ND	ND
Hexachlorobenzene	ppb	3.3	10.8
Mirex	ppb	0.247	0.247
Total Chlordanes	ppb	5.05	33.8
Total DDT	ppb	33.4	2,170
trans-Nonachlor	ppb	1.98	14.8
Physical Property			
Clay	%	4.6	23.2
Fines (Clay and Silt)	%	15.2	76.7
Gravel	%	0.2	12.8
Sand	%	23.2	81.6
Silt	%	10.6	53.5
TOC			
TOC	ppm	7,700	31,900

Notes:
AVS/SEM = acid volatile sulfide/simultaneously extracted metals
BHC = beta hexachlorocyclohexane
HMW = high molecular weight
LMW = low molecular weight
mM = millimolar
ND = not detected
NOAA = National Oceanic and Atmospheric Administration
PAHs = polycyclic aromatic hydrocarbons
PCBs = polychlorinated biphenyls
ppb = parts per billion
ppm = parts per million
SIM = selected ion monitoring
TOC = total organic carbon

Table 3-21b
1993 Phase II Passaic River Sediment Data from NOAA (1995b)

Analyte	Units	Minimum Detect	Maximum Detect
AVS/SEM			
AVS	mM	0.98	62.9
Inorganic Chemicals			
Ag	mg/kg	0.843	5.74
Al	mg/kg	32,100	65,200
As	mg/kg	1.94	16.7
Cd	mg/kg	0.186	5.69
Cr	mg/kg	29.8	277
Cu	mg/kg	14.7	232
Fe	mg/kg	13,800	44,400
Hg	mg/kg	0.14	4.29
Ni	mg/kg	17.5	74.4
Pb	mg/kg	31.7	353
Sb	mg/kg	8.17	8.17
Se	mg/kg	0.104	1.34
Sn	mg/kg	4.9	82.9
Zn	mg/kg	55.9	720
PAH-SIM			
1-Methylnaphthalene	ppb	6	2,200
2,6-Dimethylnaphthalene	ppb	5	850
2-Methylnaphthalene	ppb	14	1,400
Acenaphthene	ppb	10	1,800
Acenaphthylene	ppb	7	280
Anthracene	ppb	31	2,300
Benzo(a)anthracene	ppb	58	11,300
Benzo(a)pyrene	ppb	77	9,800
Benzo(b)fluoranthene	ppb	88	8,000
Benzo(b)thiophene	ppb	1	65.4
Benzo(e)pyrene	ppb	88	8,000
Benzo(g,h,i)perylene	ppb	13	6,000
Benzo(k)fluoranthene	ppb	92	7,700
Biphenyl	ppb	9	130
Chrysene	ppb	79	14,200
Dibenzo(a,h)anthracene	ppb	64.7	1,300
Dibenzothiophene	ppb	10	1,900
Fluoranthene	ppb	100	22,800
Fluorene	ppb	11	4,000

Table 3-21b
1993 Phase II Passaic River Sediment Data from NOAA (1995b)

Analyte	Units	Minimum Detect	Maximum Detect
HMW PAHs	ppb	704	117,000
Indeno(1,2,3-cd)pyrene	ppb	47	7,000
LMW PAHs	ppb	138	35,300
Naphthalene	ppb	39	630
Perylene	ppb	13	2,200
Phenanthrene	ppb	26	25,100
Pyrene	ppb	150	29,300
Total PAHs	ppb	842	152,000
PCB Congeners			
PCB-105	ppb	0	9.17
PCB-107	ppb	0.483	13.3
PCB-110	ppb	0.718	32.9
PCB-118	ppb	0.81	22.5
PCB-119	ppb	0.44	6.27
PCB-123/149	ppb	0.598	129
PCB-126	ppb	0.009	0.21
PCB-128	ppb	0.563	13.5
PCB-129/178	ppb	0.793	20.8
PCB-130	ppb	0.529	2.87
PCB-132	ppb	0.502	83.3
PCB-134	ppb	0.459	35.1
PCB-135/144/124	ppb	1.03	30.1
PCB-136	ppb	0.81	71.4
PCB-137	ppb	0.401	3.35
PCB-138	ppb	0.763	119
PCB-141	ppb	0.866	38.3
PCB-146	ppb	1.04	26.9
PCB-153	ppb	0.489	80.7
PCB-157/201	ppb	0.535	10.4
PCB-158	ppb	0.463	11.3
PCB-16/32	ppb	0.699	33.1
PCB-167	ppb	0.0813	0.479
PCB-169	ppb	0.005	0.04
PCB-17/15	ppb	0.482	26.3
PCB-170/190	ppb	0.43	71
PCB-172	ppb	0.905	9.2
PCB-174	ppb	0.401	71.9

Table 3-21b
1993 Phase II Passaic River Sediment Data from NOAA (1995b)

Analyte	Units	Minimum Detect	Maximum Detect
PCB-176	ppb	0.432	24.4
PCB-177	ppb	0.96	45
PCB-179	ppb	1.01	45.8
PCB-18	ppb	0.523	51.5
PCB-180	ppb	0.671	147
PCB-182/187	ppb	0.529	98.4
PCB-183	ppb	1.05	52.9
PCB-185	ppb	0.651	9.34
PCB-19	ppb	0.494	4.37
PCB-191	ppb	0.4	7.85
PCB-193	ppb	0.413	11.2
PCB-194	ppb	0.651	34
PCB-196/203	ppb	0.797	40.7
PCB-199	ppb	0.777	34.5
PCB-20/33/53	ppb	1.34	35.6
PCB-200	ppb	0.504	6.81
PCB-202/171/156	ppb	1.2	41.1
PCB-208/195	ppb	0.416	15
PCB-22	ppb	0.725	17.5
PCB-24/27	ppb	0.422	3.97
PCB-25	ppb	0.684	11.9
PCB-26	ppb	0.585	11.6
PCB-28	ppb	0.764	49.7
PCB-29	ppb	0.451	3.98
PCB-31	ppb	0.479	32.8
PCB-4/10	ppb	0.472	7.08
PCB-40	ppb	0.536	30.7
PCB-41	ppb	1.32	23
PCB-42	ppb	0.598	37.4
PCB-44	ppb	0.471	52.1
PCB-45	ppb	0.687	10.8
PCB-46	ppb	0.565	5.29
PCB-47/48	ppb	0.638	81.1
PCB-49/43	ppb	0.717	60.6
PCB-5/8	ppb	0.586	9.76
PCB-51	ppb	0.402	31.1
PCB-52	ppb	0.748	67.3

Table 3-21b
1993 Phase II Passaic River Sediment Data from NOAA (1995b)

Analyte	Units	Minimum Detect	Maximum Detect
PCB-56/60	ppb	0.45	19
PCB-6	ppb	0.424	2.3
PCB-63	ppb	0.525	3.51
PCB-64	ppb	0.74	22.9
PCB-66/95/88	ppb	0.724	96.8
PCB-67	ppb	0.405	17.5
PCB-7/9	ppb	0.41	1.28
PCB-70/76	ppb	0.629	57.4
PCB-74	ppb	0.494	26.9
PCB-77	ppb	0.37	12
PCB-81	ppb	0.013	0.32
PCB-82/151	ppb	0.712	57.5
PCB-83	ppb	0.402	16.2
PCB-84	ppb	0.879	27.1
PCB-87	ppb	0.941	18.5
PCB-90/101	ppb	0.775	63.5
PCB-91	ppb	0.513	12.8
PCB-92	ppb	0.479	12.7
PCB-97	ppb	0.804	17.4
PCB-99	ppb	0.665	94.2
Total cPCBs-Sum of 81 Congeners	ppb	15.8	2,050
Total mPCB	ppb	2.53	85.3
Total PCBs - Congeners (NOAA, 1989)	ppb	10.3	1,440
Total PCBs - Sum of Coplanar Congeners	ppb	0.982	405
Total PCBs Congeners	ppb	106	2,850
Total PCBs Sum of cPCBs and mPCBs	ppb	18.8	2,120
PCDD/Fs			
1,2,3,4,6,7,8-HpCDD	ppt	42	870
1,2,3,4,6,7,8-HpCDF	ppt	23	1,630
1,2,3,4,7,8,9-HpCDF	ppt	1	41
1,2,3,4,7,8-HxCDD	ppt	0.7	9.7
1,2,3,4,7,8-HxCDF	ppt	4.3	387
1,2,3,6,7,8-HxCDD	ppt	2.4	44
1,2,3,6,7,8-HxCDF	ppt	1.2	75
1,2,3,7,8,9-HxCDD	ppt	1.4	29.7
1,2,3,7,8,9-HxCDF	ppt	0.7	1.5
1,2,3,7,8-PeCDD	ppt	0.5	12

Table 3-21b
1993 Phase II Passaic River Sediment Data from NOAA (1995b)

Analyte	Units	Minimum Detect	Maximum Detect
1,2,3,7,8-PeCDF	ppt	1.1	22.3
1,2,4,7,8-PeCDD	ppt	0.8	23
2,3,4,6,7,8-HxCDF	ppt	1.2	34
2,3,4,7,8-PeCDF	ppt	1.4	47.3
2,3,7,8-TCDD	ppt	3.6	620
2,3,7,8-TCDF	ppt	9.5	370
OCDD	ppt	510	8,700
OCDF	ppt	44	2,100
Total 2,3,7,8-Congeners	ppt	648	14,200
Pesticides/PCBs			
2,4'-DDD	ppb	0.8	40.4
2,4'-DDE	ppb	0.3	16.7
2,4'-DDT	ppb	0.3	14.1
4,4'-DDD	ppb	2.8	74.4
4,4'-DDE	ppb	3.3	72.1
4,4'-DDT	ppb	0.9	125
Alpha-BHC	ppb	0.4	2.4
Alpha-Chlordane	ppb	1	59.7
Beta-BHC	ppb	0.3	0.9
Beta-Chlordane	ppb	0.6	42.7
cis-Nonachlor	ppb	0.4	12
Dacthal	ppb	1.2	4.4
Delta-BHC	ppb	0.6	3.8
Dieldrin	ppb	0.9	21.2
Endrin	ppb	0.1	3.3
Gamma-BHC (Lindane)	ppb	0.6	0.9
Heptachlor	ppb	0.5	1.3
Heptachlor Epoxide	ppb	0.4	13
Hexachlorobenzene	ppb	0.9	10.1
Mirex	ppb	0.7	25.2
Oxychlordane	ppb	0.3	1.3
Pentachloroanisole	ppb	0.3	0.8
Total BHCs	ppb	0.4	6
Total Chlordanes	ppb	3.2	143
Total DDT	ppb	7.6	240
trans-Nonachlor	ppb	0.6	30.5

Table 3-21b
1993 Phase II Passaic River Sediment Data from NOAA (1995b)

Analyte	Units	Minimum Detect	Maximum Detect
TOC			
TOC	ppm	4,700	61,000

Notes:
AVS/SEM = acid volatile sulfide/simultaneously extracted metals
BHC = beta hexachlorocyclohexane
HMW = high molecular weight
LMW = low molecular weight
mM = millimolar
NOAA = National Oceanic and Atmospheric Administration
PAHs = polycyclic aromatic hydrocarbons
PCBs = polychlorinated biphenyls
PCDD/Fs = polychlorinated dibenzo-*p*-dioxins and dibenzofurans
ppb = parts per billion
ppm = parts per million
ppt = parts per trillion
SIM = selected ion monitoring
TOC = total organic carbon

Table 3-22
1990 Passaic River and Newark Bay Surface Sediment Data from Tierra (1990)

Analyte	Units	Minimum Detect	Maximum Detect
Cyanide			
Total Cyanide	ppm	0.27	2.9
Inorganic Chemicals			
Al	ppm	990	18,000
Ag	ppm	1.4	11
As	ppm	1.4	58
Ba	ppm	23	250
Be	ppm	0.52	1.1
Ca	ppm	1,700	9,000
Cd	ppm	1.6	29
Co	ppm	3.6	38
Cr	ppm	11	860
Cu	ppm	22	760
Fe	ppm	6,500	27,000
Hg	ppm	0.15	9.8
K	ppm	140	4,100
Mg	ppm	1,600	8,500
Mn	ppm	99	690
Na	ppm	96	16,000
Ni	ppm	0.15	230
Pb	ppm	64	2,500
Sb	ppm	ND	ND
Se	ppm	0.59	3.4
Tl	ppm	0.2	17
V	ppm	4.1	110
Zn	ppm	83	1,900
PCDD/Fs			
1,2,3,4,6,7,8-HpCDD	ppt	28	2,100
1,2,3,4,6,7,8-HpCDF	ppt	12	1,800
1,2,3,4,7,8,9-HpCDF	ppt	10	48
1,2,3,4,7,8-HxCDD	ppt	5.5	9.6
1,2,3,4,7,8-HxCDF	ppt	4.2	410
1,2,3,6,7,8-HxCDD	ppt	11	46
1,2,3,6,7,8-HxCDF	ppt	9.8	73
1,2,3,7,8,9-HxCDD	ppt	20	25
1,2,3,7,8,9-HxCDF	ppt	3.7	29
1,2,3,7,8-PeCDD	ppt	6.5	22

Table 3-22
1990 Passaic River and Newark Bay Surface Sediment Data from Tierra (1990)

Analyte	Units	Minimum Detect	Maximum Detect
1,2,3,7,8-PeCDF	ppt	5.3	36
2,3,4,6,7,8-HxCDF	ppt	ND	ND
2,3,4,7,8-PeCDF	ppt	1.1	420
2,3,7,8-TCDD	ppt	6.4	510
2,3,7,8-TCDF	ppt	2.8	480
OCDD	ppt	310	17,000
OCDF	ppt	12	2,400
Total 2,3,7,8-Congeners	ppt	372	24,000
Total HpCDD	ppt	54	4,100
Total HpCDF	ppt	27	2,200
Total HxCDD	ppt	5.5	1,700
Total HxCDF	ppt	7.6	990
Total PCDDs	ppt	410	23,300
Total PCDFs	ppt	32.9	8,440
Total PeCDD	ppt	6.5	630
Total PeCDF	ppt	3.4	2,300
Total TCDD	ppt	1.3	590
Total TCDF	ppt	3.2	1,500
Pesticides/PCBs			
4,4'-DDD	ppb	7	2,800
4,4'-DDE	ppb	5	290
4,4'-DDT	ppb	99	340
Aldrin	ppb	ND	ND
Alpha-BHC	ppb	ND	ND
Aroclor-1016	ppb	ND	ND
Aroclor-1221	ppb	ND	ND
Aroclor-1232	ppb	ND	ND
Aroclor-1242	ppb	ND	ND
Aroclor-1248	ppb	240	1,900
Aroclor-1254	ppb	300	300
Aroclor-1260	ppb	180	1,300
Beta-BHC	ppb	ND	ND
Chlordane	ppb	12	210
Delta-BHC	ppb	ND	ND
Dieldrin	ppb	ND	ND
Endosulfan I	ppb	ND	ND
Endosulfan II	ppb	ND	ND

Table 3-22
1990 Passaic River and Newark Bay Surface Sediment Data from Tierra (1990)

Analyte	Units	Minimum Detect	Maximum Detect
Endosulfan Sulfate	ppb	ND	ND
Endrin	ppb	ND	ND
Endrin Aldehyde	ppb	ND	ND
Gamma-BHC (Lindane)	ppb	ND	ND
Heptachlor	ppb	ND	ND
Heptachlor Epoxide	ppb	ND	ND
Methoxychlor	ppb	31	31
Total DDT	ppb	10	3,090
Total PCBs - Aroclors	ppb	180	1,900
Toxaphene	ppb	ND	ND
Physical Property			
Percent Moisture	%	8.3	85
SVOCs			
1,2,4-Trichlorobenzene	ppb	ND	ND
1,2-Dichlorobenzene	ppb	160	160
1,3-Dichlorobenzene	ppb	ND	ND
1,4-Dichlorobenzene	ppb	130	140
2,4,5-Trichlorophenol	ppb	ND	ND
2,4,6-Trichlorophenol	ppb	ND	ND
2,4-Dichlorophenol	ppb	ND	ND
2,4-Dimethylphenol	ppb	ND	ND
2,4-Dinitrophenol	ppb	ND	ND
2,4-Dinitrotoluene	ppb	ND	ND
2,6-Dinitrotoluene	ppb	ND	ND
2-Chloronaphthalene	ppb	ND	ND
2-Chlorophenol	ppb	ND	ND
2-Methylnaphthalene	ppb	ND	ND
2-Methylphenol	ppb	290	290
2-Nitroaniline	ppb	ND	ND
2-Nitrophenol	ppb	ND	ND
3,3'-Dichlorobenzidine	ppb	ND	ND
3-Nitroaniline	ppb	ND	ND
4,6-Dinitro-2-methylphenol	ppb	3,100	11,000
4-Bromophenyl phenyl ether	ppb	ND	ND
4-Chloro-3-methylphenol	ppb	ND	ND
4-Chloroaniline	ppb	ND	ND
4-Chlorophenyl phenyl ether	ppb	ND	ND

Table 3-22
1990 Passaic River and Newark Bay Surface Sediment Data from Tierra (1990)

Analyte	Units	Minimum Detect	Maximum Detect
4-Methylphenol	ppb	120	7,500
4-Nitroaniline	ppb	ND	ND
4-Nitrophenol	ppb	530	530
Acenaphthene	ppb	2,200	2,200
Acenaphthylene	ppb	ND	ND
Anthracene	ppb	200	1,600
Benzo(a)anthracene	ppb	920	4,600
Benzo(a)pyrene	ppb	760	5,900
Benzo(b)fluoranthene	ppb	760	4,200
Benzo(g,h,i)perylene	ppb	690	4,500
Benzo(k)fluoranthene	ppb	540	3,700
Benzoic Acid	ppb	ND	ND
Benzyl Alcohol	ppb	ND	ND
bis(2-Chloroethoxy)methane	ppb	ND	ND
bis(2-Chloroethyl)ether	ppb	ND	ND
bis(2-Chloroisopropyl)ether	ppb	ND	ND
bis(2-Ethylhexyl)phthalate	ppb	940	360,000
Butyl benzyl phthalate	ppb	300	530
Chrysene	ppb	610	5,700
Dibenzo(a,h)anthracene	ppb	170	170
Dibenzofuran	ppb	1,200	1,200
Diethyl phthalate	ppb	ND	ND
Dimethylphthalate	ppb	ND	ND
Di-n-Butylphthalate	ppb	ND	ND
Di-n-Octylphthalate	ppb	320	2,200
Fluoranthene	ppb	810	12,000
Fluorene	ppb	140	1,500
Hexachlorobenzene	ppb	ND	ND
Hexachlorobutadiene	ppb	ND	ND
Hexachlorocyclopentadiene	ppb	ND	ND
Hexachloroethane	ppb	ND	ND
HMW PAHs	ppb	1,500	48,700
Indeno(1,2,3-cd)pyrene	ppb	630	3,900
Isophorone	ppb	ND	ND
LMW PAHs	ppb	930	20,200
Naphthalene	ppb	460	870
Nitrobenzene	ppb	ND	ND

Table 3-22
1990 Passaic River and Newark Bay Surface Sediment Data from Tierra (1990)

Analyte	Units	Minimum Detect	Maximum Detect
N-Nitroso-di-n-propylamine	ppb	ND	ND
N-Nitrosodiphenylamine	ppb	ND	ND
Pentachlorophenol	ppb	ND	ND
Phenanthrene	ppb	480	14,000
Phenol	ppb	120	350
Pyrene	ppb	900	11,000
Total PAHs	ppb	1,500	68,900

Notes:
BHC = beta hexachlorocyclohexane
HMW = high molecular weight
LMW = low molecular weight
ND = not detected
PAHs = polycyclic aromatic hydrocarbons
PCBs = polychlorinated biphenyls
PCDD/Fs = polychlorinated dibenzo-*p*-dioxins and dibenzofurans
ppb = parts per billion
ppm = parts per million
ppt = parts per trillion
SVOCs = semivolatile organic compounds

Table 3-23
1991 Passaic River Core Sediment Data from Tierra (1991)

Analyte	Units	Minimum Detect	Maximum Detect
Cyanide			
Total Cyanide	ppm	0.55	162
Geochronology			
CS-137	pCi/gm	0.049	4.58
PB-210	pCi/gm	0.1	4.5
Inorganic Chemicals			
Ag	ppm	1.4	26.7
Al	ppm	1,970	57,800
As	ppm	0.72	294
Ba	ppm	12.3	8,010
Be	ppm	0.26	11.9
Ca	ppm	149	82,800
Cd	ppm	0.38	45.4
Co	ppm	1.6	40.1
Cr	ppm	6.1	1,230
Cu	ppm	3	3,850
Fe	ppm	4,190	127,000
Hg	ppm	0.37	29.6
K	ppm	211	11,800
Mg	ppm	863	24,700
Mn	ppm	12.3	1,120
Na	ppm	144	45,300
Ni	ppm	6.4	269
Pb	ppm	4.4	3,000
Sb	ppm	10	43.9
Se	ppm	0.64	45.6
Ti	ppm	55.3	510
Tl	ppm	0.78	3.3
V	ppm	7.8	164
Zn	ppm	10.2	10,200
Organotin			
Dibutyltin	ppb	218	937
Monobutyltin	ppb	ND	ND
Tributyltin	ppb	437	437
PCB Congeners			
PCB-105	ppb	0.0078	190
PCB-118	ppb	0.018	480
PCB-126	ppb	0.0024	0.86
PCB-169	ppb	0.002	0.046
PCB-77	ppb	0.0054	63

Table 3-23
1991 Passaic River Core Sediment Data from Tierra (1991)

Analyte	Units	Minimum Detect	Maximum Detect
Total PCBs - Sum of Coplanar Congeners	ppb	0.0091	734
PCDD/Fs			
1,2,3,4,6,7,8-HpCDD	ppt	1.8	4,541
1,2,3,4,6,7,8-HpCDF	ppt	1.4	15,900
1,2,3,4,7,8,9-HpCDF	ppt	0.53	665
1,2,3,4,7,8-HxCDD	ppt	1.5	183
1,2,3,4,7,8-HxCDF	ppt	0.84	6,400
1,2,3,6,7,8-HxCDD	ppt	4.8	483
1,2,3,6,7,8-HxCDF	ppt	0.42	912
1,2,3,7,8,9-HxCDD	ppt	1.2	331
1,2,3,7,8,9-HxCDF	ppt	0.45	152
1,2,3,7,8-PeCDD	ppt	2.5	178
1,2,3,7,8-PeCDF	ppt	1.3	1,910
2,3,4,6,7,8-HxCDF	ppt	0.91	437
2,3,4,7,8-PeCDF	ppt	0.77	1,050
2,3,7,8-TCDD	ppt	0.77	80,600
2,3,7,8-TCDF	ppt	1.2	22,100
OCDD	ppt	7.6	51,100
OCDF	ppt	2.4	35,200
Total 2,3,7,8-Congeners	ppt	1.3	179,000
Total HpCDD	ppt	2.7	12,800
Total HpCDF	ppt	2.6	16,400
Total HxCDD	ppt	3.1	12,600
Total HxCDF	ppt	2.1	14,700
Total PCDDs	ppt	2.5	164,000
Total PCDFs	ppt	1.8	123,000
Total PeCDD	ppt	3.8	2,800
Total PeCDF	ppt	2.5	24,700
Total TCDD	ppt	0.77	95,100
Total TCDF	ppt	1.8	54,800
Pesticides/PCBs			
4,4'-DDD	ppb	4.67	7,940
4,4'-DDE	ppb	4.59	2,720
4,4'-DDT	ppb	6.25	7,690
Aldrin	ppb	3.71	24.5
Alpha-BHC	ppb	ND	ND
Alpha-Chlordane	ppb	3.33	110
Aroclor-1016	ppb	ND	ND
Aroclor-1221	ppb	ND	ND
Aroclor-1232	ppb	ND	ND

Table 3-23
1991 Passaic River Core Sediment Data from Tierra (1991)

Analyte	Units	Minimum Detect	Maximum Detect
Aroclor-1242	ppb	704	3,840
Aroclor-1248	ppb	178	3,820
Aroclor-1254	ppb	121	3,790
Aroclor-1260	ppb	ND	ND
Beta-BHC	ppb	3.14	19.6
Delta-BHC	ppb	2.47	45.4
Dieldrin	ppb	7.77	230
Endosulfan I	ppb	5.01	24.9
Endosulfan II	ppb	11.5	57
Endosulfan Sulfate	ppb	5.22	31
Endrin	ppb	5.68	156
Endrin Aldehyde	ppb	5.17	62.4
Endrin Ketone	ppb	6.31	405
Gamma-BHC (Lindane)	ppb	4.13	36.8
Gamma-Chlordane	ppb	2.71	99.5
Heptachlor	ppb	ND	ND
Heptachlor Epoxide	ppb	ND	ND
Heptachlor epoxide (endo)	ppb	3.62	8.31
Heptachlor epoxide (exo)	ppb	4.22	108
Methoxychlor	ppb	29.5	82.8
Total Alpha + Gamma Chlordane	ppb	2.71	210
Total DDT	ppb	4.67	16,800
Total PCBs - Aroclors	ppb	121	7,630
Toxaphene	ppb	ND	ND
SVOCs			
1,2,4-Trichlorobenzene	ppb	ND	ND
1,2-Dichlorobenzene	ppb	10,000	10,000
1,3-Dichlorobenzene	ppb	630	630
1,4-Dichlorobenzene	ppb	350	25,000
2,4,5-Trichlorophenol	ppb	ND	ND
2,4,6-Trichlorophenol	ppb	1,200	1200
2,4-Dichlorophenol	ppb	4,200	350,000
2,4-Dimethylphenol	ppb	ND	ND
2,4-Dinitrophenol	ppb	ND	ND
2,4-Dinitrotoluene	ppb	ND	ND
2,6-Dinitrotoluene	ppb	ND	ND
2-Chloronaphthalene	ppb	ND	ND
2-Chlorophenol	ppb	40,000	40,000
2-Methylnaphthalene	ppb	200	850,000
2-Methylphenol	ppb	ND	ND

Table 3-23
1991 Passaic River Core Sediment Data from Tierra (1991)

Analyte	Units	Minimum Detect	Maximum Detect
2-Nitroaniline	ppb	ND	ND
2-Nitrophenol	ppb	ND	ND
3,3'-Dichlorobenzidine	ppb	ND	ND
3-Nitroaniline	ppb	ND	ND
4,6-Dinitro-2-methylphenol	ppb	ND	ND
4-Bromophenyl phenyl ether	ppb	ND	ND
4-Chloro-3-methylphenol	ppb	ND	ND
4-Chloroaniline	ppb	ND	ND
4-Chlorophenyl phenyl ether	ppb	ND	ND
4-Methylphenol	ppb	ND	ND
4-Nitroaniline	ppb	ND	ND
4-Nitrophenol	ppb	ND	ND
Acenaphthene	ppb	190	1,000,000
Acenaphthylene	ppb	180	80,000
Anthracene	ppb	180	500,000
Benzo(a)anthracene	ppb	300	320,000
Benzo(a)pyrene	ppb	220	210,000
Benzo(b)fluoranthene	ppb	240	110,000
Benzo(g,h,i)perylene	ppb	210	46,000
Benzo(k)fluoranthene	ppb	200	110,000
bis(2-Chloroethoxy)methane	ppb	ND	ND
bis(2-Chloroethyl)ether	ppb	ND	ND
bis(2-Chloroisopropyl)ether	ppb	ND	ND
bis(2-Ethylhexyl)phthalate	ppb	190	500,000
Butyl benzyl phthalate	ppb	480	1,800
Carbazole	ppb	260	2,500
Chrysene	ppb	180	340,000
Dibenzo(a,h)anthracene	ppb	180	29,000
Dibenzofuran	ppb	230	74,000
Diethyl phthalate	ppb	ND	ND
Dimethylphthalate	ppb	ND	ND
Di-n-Butylphthalate	ppb	ND	ND
Di-n-Octylphthalate	ppb	320	6,900
Fluoranthene	ppb	180	420,000
Fluorene	ppb	160	530,000
Hexachlorobenzene	ppb	ND	ND
Hexachlorobutadiene	ppb	ND	ND
Hexachlorocyclopentadiene	ppb	ND	ND
Hexachloroethane	ppb	ND	ND
HMW PAHs	ppb	170	2,290,000

Table 3-23
1991 Passaic River Core Sediment Data from Tierra (1991)

Analyte	Units	Minimum Detect	Maximum Detect
Indeno(1,2,3-cd)pyrene	ppb	200	55,000
Isophorone	ppb	ND	ND
LMW PAHs	ppb	210	5,460,000
Naphthalene	ppb	280	1,300,000
Nitrobenzene	ppb	ND	ND
N-Nitroso-di-n-propylamine	ppb	ND	ND
N-Nitrosodiphenylamine	ppb	ND	ND
Pentachlorophenol	ppb	ND	ND
Phenanthrene	ppb	260	1,200,000
Phenol	ppb	ND	ND
Pyrene	ppb	170	650,000
Total PAHs	ppb	220	7,750,000
TOC			
TOC	ppm	124.9	49,190
TPH			
Petroleum Hydrocarbons (extractable)	ppm	30	61,380

Notes:
BHC = beta hexachlorocyclohexane
HMW = high molecular weight
LMW = low molecular weight
ND = not detected
PAHs = polycyclic aromatic hydrocarbons
PCBs = polychlorinated biphenyls
PCDD/Fs = polychlorinated dibenzo-*p*-dioxins and dibenzofurans
pCi/gm = picoCuries per gram
ppb = parts per billion
ppm = parts per million
ppt = parts per trillion
SVOCs = semivolatile organic compounds
TOC = total organic carbon
TPH = total petroleum hydrocarbons

Table 3-24
1992 Passaic River Core Sediment Data from Tierra (1992)

Analyte	Units	Minimum Detect	Maximum Detect
Cyanide			
Total Cyanide	ppm	1.11	1.11
Geochronology			
CS-137	pCi/gm	1.11	8.84
PB-210	pCi/gm	1.1	9.2
Inorganic Chemicals			
Ag	ppm	2.3	24.6
Al	ppm	1,090	23,700
As	ppm	1.3	47.2
Ba	ppm	34.2	390
Be	ppm	0.3	1.4
Ca	ppm	2,270	39,400
Cd	ppm	2.1	22.9
Co	ppm	8	19.4
Cr	ppm	18.5	511
Cu	ppm	12.8	846
Fe	ppm	5,750	44,100
Hg	ppm	0.24	8.5
K	ppm	2,010	4,710
Mg	ppm	1,720	13,300
Mn	ppm	53.8	1,040
Na	ppm	1,140	16,200
Ni	ppm	20.4	117
Pb	ppm	8.1	1,020
Sb	ppm	21.4	21.4
Se	ppm	0.95	3.2
Ti	ppm	47	616
Tl	ppm	1.4	1.4
V	ppm	16.9	92.6
Zn	ppm	57.7	1,730
Organotin			
Dibutyltin	ppb	213	1,410
Monobutyltin	ppb	242	703
Tributyltin	ppb	262	2,190
PCB Congeners			
PCB-105	ppb	0.011	72
PCB-118	ppb	0.0064	250
PCB-126	ppb	0.0067	0.035
PCB-169	ppb	0.0032	0.014
PCB-77	ppb	0.013	54

Table 3-24
1992 Passaic River Core Sediment Data from Tierra (1992)

Analyte	Units	Minimum Detect	Maximum Detect
Total PCBs - Sum of Coplanar Congeners	ppb	0.0064	373
PCDD/Fs			
1,2,3,4,6,7,8-HpCDD	ppt	2.7	200,000
1,2,3,4,6,7,8-HpCDF	ppt	3.6	77,000
1,2,3,4,7,8,9-HpCDF	ppt	2.7	920
1,2,3,4,7,8-HxCDD	ppt	1.9	190
1,2,3,4,7,8-HxCDF	ppt	2.3	3,100
1,2,3,6,7,8-HxCDD	ppt	4.5	6,800
1,2,3,6,7,8-HxCDF	ppt	1.8	1,000
1,2,3,7,8,9-HxCDD	ppt	2.9	620
1,2,3,7,8,9-HxCDF	ppt	1.4	830
1,2,3,7,8-PeCDD	ppt	4.2	190
1,2,3,7,8-PeCDF	ppt	1.4	190
2,3,4,6,7,8-HxCDF	ppt	1.8	940
2,3,4,7,8-PeCDF	ppt	1.2	510
2,3,7,8-TCDD	ppt	1.3	62,000
2,3,7,8-TCDF	ppt	1.3	4,200
OCDD	ppt	6.2	290,000
OCDF	ppt	5.4	43,000
Total 2,3,7,8-Congeners	ppt	6.2	687,000
Total HpCDD	ppt	0.81	210,000
Total HpCDF	ppt	0.41	160,000
Total HxCDD	ppt	6.3	17,000
Total HxCDF	ppt	0.37	65,000
Total PCDDs	ppt	6.2	585,000
Total PCDFs	ppt	1.27	292,000
Total PeCDD	ppt	0.43	2,700
Total PeCDF	ppt	6.6	9,600
Total TCDD	ppt	0.49	70,000
Total TCDF	ppt	0.49	14,000
Pesticides/PCBs			
4,4'-DDD	ppb	5.46	2,270
4,4'-DDE	ppb	8.94	541
4,4'-DDT	ppb	8.19	3,150
Aldrin	ppb	8.78	8.78
Alpha-BHC	ppb	ND	ND
Alpha-Chlordane	ppb	4.24	129
Aroclor-1016	ppb	ND	ND
Aroclor-1221	ppb	ND	ND
Aroclor-1232	ppb	ND	ND

Table 3-24
1992 Passaic River Core Sediment Data from Tierra (1992)

Analyte	Units	Minimum Detect	Maximum Detect
Aroclor-1242	ppb	ND	ND
Aroclor-1248	ppb	126	12,500
Aroclor-1254	ppb	281	362
Aroclor-1260	ppb	ND	ND
Beta-BHC	ppb	56.2	56.2
Delta-BHC	ppb	6.03	8.24
Dieldrin	ppb	5.16	123
Endosulfan I	ppb	47.4	151
Endosulfan II	ppb	ND	ND
Endosulfan Sulfate	ppb	ND	ND
Endrin	ppb	162	322
Endrin Aldehyde	ppb	ND	ND
Endrin Ketone	ppb	19.1	145
Gamma-BHC (Lindane)	ppb	ND	ND
Gamma-Chlordane	ppb	3.19	128
Heptachlor	ppb	ND	ND
Heptachlor Epoxide	ppb	ND	ND
Methoxychlor	ppb	31.1	76.1
Total Alpha + Gamma Chlordane	ppb	4.24	257
Total DDT	ppb	14.4	4,630
Total PCBs - Aroclors	ppb	126	12,500
Toxaphene	ppb	ND	ND
SVOCs			
1,2,4-Trichlorobenzene	ppb	ND	ND
1,2-Dichlorobenzene	ppb	ND	ND
1,3-Dichlorobenzene	ppb	ND	ND
1,4-Dichlorobenzene	ppb	ND	ND
2,4,5-Trichlorophenol	ppb	ND	ND
2,4,6-Trichlorophenol	ppb	ND	ND
2,4-Dichlorophenol	ppb	ND	ND
2,4-Dimethylphenol	ppb	ND	ND
2,4-Dinitrophenol	ppb	ND	ND
2,4-Dinitrotoluene	ppb	ND	ND
2,6-Dinitrotoluene	ppb	ND	ND
2-Chloronaphthalene	ppb	ND	ND
2-Chlorophenol	ppb	ND	ND
2-Methylnaphthalene	ppb	380	380
2-Methylphenol	ppb	ND	ND
2-Nitroaniline	ppb	ND	ND
2-Nitrophenol	ppb	ND	ND

Table 3-24
1992 Passaic River Core Sediment Data from Tierra (1992)

Analyte	Units	Minimum Detect	Maximum Detect
3,3'-Dichlorobenzidine	ppb	450	570
3-Nitroaniline	ppb	ND	ND
4,6-Dinitro-2-methylphenol	ppb	ND	ND
4-Bromophenyl phenyl ether	ppb	ND	ND
4-Chloro-3-methylphenol	ppb	ND	ND
4-Chloroaniline	ppb	ND	ND
4-Chlorophenyl phenyl ether	ppb	ND	ND
4-Methylphenol	ppb	ND	ND
4-Nitroaniline	ppb	ND	ND
4-Nitrophenol	ppb	ND	ND
Acenaphthene	ppb	260	800
Acenaphthylene	ppb	430	430
Anthracene	ppb	270	940
Benzo(a)anthracene	ppb	390	12,000
Benzo(a)pyrene	ppb	280	8,400
Benzo(b)fluoranthene	ppb	270	9,500
Benzo(g,h,i)perylene	ppb	310	1,400
Benzo(k)fluoranthene	ppb	370	8,100
bis(2-Chloroethoxy)methane	ppb	ND	ND
bis(2-Chloroethyl)ether	ppb	ND	ND
bis(2-Chloroisopropyl)ether	ppb	ND	ND
bis(2-Ethylhexyl)phthalate	ppb	1,100	98,000
Butyl benzyl phthalate	ppb	400	690
Carbazole	ppb	ND	ND
Chrysene	ppb	290	13,000
Di-n-Butylphthalate	ppb	ND	ND
Di-n-Octylphthalate	ppb	400	620
Dibenzo(a,h)anthracene	ppb	520	560
Dibenzofuran	ppb	500	500
Diethyl phthalate	ppb	ND	ND
Dimethylphthalate	ppb	ND	ND
Fluoranthene	ppb	360	24,000
Fluorene	ppb	950	950
Hexachlorobenzene	ppb	ND	ND
Hexachlorobutadiene	ppb	ND	ND
Hexachlorocyclopentadiene	ppb	ND	ND
Hexachloroethane	ppb	ND	ND
HMW PAHs	ppb	670	94,000
Indeno(1,2,3-cd)pyrene	ppb	400	7,000
Isophorone	ppb	ND	ND

Table 3-24
1992 Passaic River Core Sediment Data from Tierra (1992)

Analyte	Units	Minimum Detect	Maximum Detect
LMW PAHs	ppb	450	6,700
N-Nitroso-di-n-propylamine	ppb	ND	ND
N-Nitrosodiphenylamine	ppb	ND	ND
Naphthalene	ppb	ND	ND
Nitrobenzene	ppb	ND	ND
Pentachlorophenol	ppb	ND	ND
Phenanthrene	ppb	380	6,700
Phenol	ppb	ND	ND
Pyrene	ppb	310	19,000
Total PAHs	ppb	670	101,000
TOC			
TOC	ppm	176	29,560
TPH			
Petroleum Hydrocarbons (extractable)	ppm	42.1	8,910
VOCs			
1,1,1-Trichloroethane	ppb	ND	ND
1,1,2,2-Tetrachloroethane	ppb	ND	ND
1,1,2-Trichloroethane	ppb	ND	ND
1,1-Dichloroethane	ppb	ND	ND
1,1-Dichloroethene	ppb	ND	ND
1,2-Dichloroethane	ppb	ND	ND
1,2-Dichloroethene (total)	ppb	ND	ND
1,2-Dichloropropane	ppb	ND	ND
2-Butanone	ppb	19	7,200
2-Hexanone	ppb	ND	ND
4-Methyl-2-pentanone	ppb	ND	ND
Acetone	ppb	86	17,000
Benzene	ppb	5	7
Bromodichloromethane	ppb	ND	ND
Bromoform	ppb	ND	ND
Bromomethane	ppb	ND	ND
Carbon Disulfide	ppb	4	10
Carbon Tetrachloride	ppb	ND	ND
Chlorobenzene	ppb	56	67
Chloroethane	ppb	ND	ND
Chloroform	ppb	ND	ND
Chloromethane	ppb	ND	ND
cis-1,3-Dichloropropene	ppb	ND	ND
Dibromochloromethane	ppb	ND	ND
Ethylbenzene	ppb	13	2,000

Table 3-24
1992 Passaic River Core Sediment Data from Tierra (1992)

Analyte	Units	Minimum Detect	Maximum Detect
Methylene Chloride	ppb	3	680
Styrene	ppb	ND	ND
Tetrachloroethene	ppb	ND	ND
Toluene	ppb	6	560
Total BTEX	ppb	5	14,600
Total Xylenes	ppb	51	12,000
trans-1,3-Dichloropropene	ppb	ND	ND
Trichloroethene	ppb	ND	ND
Vinyl Chloride	ppb	ND	ND

Notes:
BTEX = benzene, toluene, ethylbenzene, and xylene
BHC = beta hexachlorocyclohexane
HMW = high molecular weight
LMW = low molecular weight
ND = not detected
PAHs = polycyclic aromatic hydrocarbons
PCBs = polychlorinated biphenyls
PCDD/Fs = polychlorinated dibenzo-*p*-dioxins and dibenzofurans
pCi/gm = picoCuries per gram
ppb = parts per billion
ppm = parts per million
ppt = parts per trillion
SVOCs = semivolatile organic compounds
TOC = total organic carbon
TPH = total petroleum hydrocarbons
VOCs = volatile organic compounds

Table 3-25
1993 Passaic River Core Sediment Data - 01 (March) - from Tierra (1993)

Analyte	Units	Minimum Detect	Maximum Detect
Geochronology			
CS-137	pCi/gm	0.0739	3.66
PB-210	pCi/gm	0.088	3.6
Inorganic Chemicals			
Ag	ppm	1.4	74.9
Al	ppm	2,880	39,500
As	ppm	1.6	75.3
Ba	ppm	11.5	1,040
Be	ppm	0.25	3.1
Ca	ppm	649	60,200
Cd	ppm	0.74	27.5
Co	ppm	2.6	29.2
Cr	ppm	6.6	1,220
Cu	ppm	6.4	11,400
Fe	ppm	4,280	68,500
Hg	ppm	0.12	10.8
K	ppm	221	4,540
Mg	ppm	822	9,790
Mn	ppm	42.6	1,090
Na	ppm	381	21,000
Ni	ppm	7.3	157
Pb	ppm	5.6	7,860
Sb	ppm	198	198
Se	ppm	0.51	82.6
Ti	ppm	88.4	612
Tl	ppm	0.76	1.3
V	ppm	8.6	85.1
Zn	ppm	25.2	8,630
Organotin			
Dibutyltin	ppb	3,700	3,700
Monobutyltin	ppb	276	1,540
Tributyltin	ppb	574	3,260
PCB Congeners			
PCB-105	ppb	0.0048	420
PCB-118	ppb	0.012	970
PCB-126	ppb	0.0055	1.5
PCB-169	ppb	0.0081	0.35
PCB-77	ppb	0.0036	48
Total PCBs - Sum of Coplanar Congeners	ppb	0.0204	1,410

Table 3-25
1993 Passaic River Core Sediment Data - 01 (March) - from Tierra (1993)

Analyte	Units	Minimum Detect	Maximum Detect
PCDD/Fs			
1,2,3,4,6,7,8-HpCDD	ppt	3	2,700
1,2,3,4,6,7,8-HpCDF	ppt	1.5	64,000
1,2,3,4,7,8,9-HpCDF	ppt	0.69	1,400
1,2,3,4,7,8-HxCDD	ppt	0.99	93
1,2,3,4,7,8-HxCDF	ppt	1.1	20,000
1,2,3,6,7,8-HxCDD	ppt	1.3	240
1,2,3,6,7,8-HxCDF	ppt	0.65	2,900
1,2,3,7,8,9-HxCDD	ppt	1.1	140
1,2,3,7,8,9-HxCDF	ppt	1	300
1,2,3,7,8-PeCDD	ppt	4	95
1,2,3,7,8-PeCDF	ppt	0.57	580
2,3,4,6,7,8-HxCDF	ppt	0.74	780
2,3,4,7,8-PeCDF	ppt	0.71	1,400
2,3,7,8-TCDD	ppt	0.44	4,500
2,3,7,8-TCDF	ppt	0.57	420
OCDD	ppt	77	81,000
OCDF	ppt	2	130,000
Total 2,3,7,8-Congeners	ppt	80	304,000
Total HpCDD	ppt	6.8	47,000
Total HpCDF	ppt	2.2	76,000
Total HxCDD	ppt	1.6	1,400
Total HxCDF	ppt	0.74	36,000
Total PCDDs	ppt	91.3	85,800
Total PCDFs	ppt	8.34	260,000
Total PeCDD	ppt	0.84	800
Total PeCDF	ppt	6	11,000
Total TCDD	ppt	0.9	5,600
Total TCDF	ppt	2.4	13,000
Pesticides/PCBs			
4,4'-DDD	ppb	6.28	193
4,4'-DDE	ppb	4.74	246
4,4'-DDT	ppb	6.61	148
Aldrin	ppb	8.99	9.45
Alpha-BHC	ppb	ND	ND
Alpha-Chlordane	ppb	3.37	140
Aroclor-1016	ppb	ND	ND
Aroclor-1221	ppb	ND	ND
Aroclor-1232	ppb	ND	ND

Table 3-25
1993 Passaic River Core Sediment Data - 01 (March) - from Tierra (1993)

Analyte	Units	Minimum Detect	Maximum Detect
Aroclor-1242	ppb	ND	ND
Aroclor-1248	ppb	134	5,310
Aroclor-1254	ppb	438	5,850
Aroclor-1260	ppb	468	2,980
Beta-BHC	ppb	2.75	2.75
Delta-BHC	ppb	7.45	29.2
Dieldrin	ppb	7.93	294
Endosulfan I	ppb	9.05	62.5
Endosulfan II	ppb	7.89	28.1
Endosulfan Sulfate	ppb	19.9	19.9
Endrin	ppb	36.7	36.7
Endrin Aldehyde	ppb	4.1	29.8
Endrin Ketone	ppb	4.49	238
Gamma-BHC (Lindane)	ppb	2.47	10.3
Gamma-Chlordane	ppb	3.63	145
Heptachlor	ppb	ND	ND
Heptachlor Epoxide	ppb	2.73	2.73
Methoxychlor	ppb	27.6	113
Total Alpha + Gamma Chlordane	ppb	3.63	285
Total DDT	ppb	4.74	507
Total PCBs - Aroclors	ppb	134	14,100
Toxaphene	ppb	ND	ND
SVOCs			
1,2,4-Trichlorobenzene	ppb	ND	ND
1,2-Dichlorobenzene	ppb	680	680
1,3-Dichlorobenzene	ppb	ND	ND
1,4-Dichlorobenzene	ppb	640	1,800
2,4,5-Trichlorophenol	ppb	ND	ND
2,4,6-Trichlorophenol	ppb	ND	ND
2,4-Dichlorophenol	ppb	ND	ND
2,4-Dimethylphenol	ppb	ND	ND
2,4-Dinitrophenol	ppb	ND	ND
2,4-Dinitrotoluene	ppb	ND	ND
2,6-Dinitrotoluene	ppb	ND	ND
2-Chloronaphthalene	ppb	ND	ND
2-Chlorophenol	ppb	ND	ND
2-Methylnaphthalene	ppb	180	6,300
2-Methylphenol	ppb	ND	ND
2-Nitroaniline	ppb	ND	ND

Table 3-25
1993 Passaic River Core Sediment Data - 01 (March) - from Tierra (1993)

Analyte	Units	Minimum Detect	Maximum Detect
2-Nitrophenol	ppb	ND	ND
3,3'-Dichlorobenzidine	ppb	ND	ND
3-Nitroaniline	ppb	ND	ND
4,6-Dinitro-2-methylphenol	ppb	ND	ND
4-Bromophenyl phenyl ether	ppb	ND	ND
4-Chloro-3-methylphenol	ppb	ND	ND
4-Chloroaniline	ppb	ND	ND
4-Chlorophenyl phenyl ether	ppb	ND	ND
4-Methylphenol	ppb	ND	ND
4-Nitroaniline	ppb	ND	ND
4-Nitrophenol	ppb	ND	ND
Acenaphthene	ppb	270	20,000
Acenaphthylene	ppb	290	990
Anthracene	ppb	200	23,000
Benzo(a)anthracene	ppb	200	15,000
Benzo(a)pyrene	ppb	250	10,000
Benzo(b)fluoranthene	ppb	260	6,900
Benzo(g,h,i)perylene	ppb	180	1,900
Benzo(k)fluoranthene	ppb	190	5,600
bis(2-Chloroethoxy)methane	ppb	ND	ND
bis(2-Chloroethyl)ether	ppb	ND	ND
bis(2-Chloroisopropyl)ether	ppb	ND	ND
bis(2-Ethylhexyl)phthalate	ppb	440	300,000
Butyl benzyl phthalate	ppb	340	860
Carbazole	ppb	400	6,800
Chrysene	ppb	210	16,000
Di-n-Butylphthalate	ppb	400	400
Di-n-Octylphthalate	ppb	390	9,400
Dibenzo(a,h)anthracene	ppb	240	1,100
Dibenzofuran	ppb	200	13,000
Diethyl phthalate	ppb	ND	ND
Dimethylphthalate	ppb	ND	ND
Fluoranthene	ppb	300	90,000
Fluorene	ppb	160	19,000
Hexachlorobenzene	ppb	ND	ND
Hexachlorobutadiene	ppb	ND	ND
Hexachlorocyclopentadiene	ppb	ND	ND
Hexachloroethane	ppb	ND	ND
HMW PAHs	ppb	220	200,000

Table 3-25
1993 Passaic River Core Sediment Data - 01 (March) - from Tierra (1993)

Analyte	Units	Minimum Detect	Maximum Detect
Indeno(1,2,3-cd)pyrene	ppb	190	2,000
Isophorone	ppb	ND	ND
LMW PAHs	ppb	260	176,000
N-Nitroso-di-n-propylamine	ppb	ND	ND
N-Nitrosodiphenylamine	ppb	3,600	3,600
Naphthalene	ppb	550	12,000
Nitrobenzene	ppb	ND	ND
Pentachlorophenol	ppb	ND	ND
Phenanthrene	ppb	240	98,000
Phenol	ppb	ND	ND
Pyrene	ppb	220	57,000
Total PAHs	ppb	220	375,000
TOC			
TOC	ppm	112.6	99,890
TPH			
Petroleum Hydrocarbons (extractable)	ppm	24	2,780

Notes:
BHC = beta hexachlorocyclohexane
HMW = high molecular weight
LMW = low molecular weight
ND = not detected
PAHs = polycyclic aromatic hydrocarbons
PCBs = polychlorinated biphenyls
PCDD/Fs = polychlorinated dibenzo-*p*-dioxins and dibenzofurans
pCi/gm = picoCuries per gram
ppb = parts per billion
ppm = parts per million
ppt = parts per trillion
SVOCs = semivolatile organic compounds
TOC = total organic carbon
TPH = total petroleum hydrocarbons

Table 3-26

1993 Passaic River Core Sediment Data - 02 (July) - from Tierra (1993)

Analyte	Units	Minimum Detect	Maximum Detect
Geochronology			
CS-137	pCi/gm	0.1	12.8
PB-210	pCi/gm	0.14	3.9
Inorganic Chemicals			
Ag	ppm	1.4	15.4
Al	ppm	2,470	23,300
As	ppm	1.9	108
Ba	ppm	15.2	526
Be	ppm	0.28	1.6
Ca	ppm	1,240	13,200
Cd	ppm	1.8	38.3
Co	ppm	3.4	42.9
Cr	ppm	12.3	1,530
Cu	ppm	10.6	4,700
Fe	ppm	8,970	42,000
Hg	ppm	0.22	28.1
K	ppm	302	3,760
Mg	ppm	1,410	9,420
Mn	ppm	80.2	3,190
Na	ppm	1,150	12,500
Ni	ppm	9.5	178
Pb	ppm	8.5	2,490
Sb	ppm	8.4	35.6
Se	ppm	1	7.4
Ti	ppm	162	671
Tl	ppm	0.5	0.5
V	ppm	11.1	199
Zn	ppm	39.3	2,360
Organotin			
Dibutyltin	ppb	742	3,180
Monobutyltin	ppb	468	5,070
Tributyltin	ppb	298	354
PCB Congeners			
PCB-105	ppb	0.07	1,400
PCB-118	ppb	0.16	1,500
PCB-126	ppb	0.0068	38
PCB-169	ppb	0.025	0.33
PCB-77	ppb	0.062	1,600
Total PCBs - Sum of Coplanar Congeners	ppb	0.34	4,540

Table 3-26

1993 Passaic River Core Sediment Data - 02 (July) - from Tierra (1993)

Analyte	Units	Minimum Detect	Maximum Detect
PCDD/Fs			
1,2,3,4,6,7,8-HpCDD	ppt	11	4,400
1,2,3,4,6,7,8-HpCDF	ppt	1.9	23,000
1,2,3,4,7,8,9-HpCDF	ppt	2.2	620
1,2,3,4,7,8-HxCDD	ppt	0.67	160
1,2,3,4,7,8-HxCDF	ppt	2.1	4,400
1,2,3,6,7,8-HxCDD	ppt	1.3	520
1,2,3,6,7,8-HxCDF	ppt	0.61	2,100
1,2,3,7,8,9-HxCDD	ppt	1.1	310
1,2,3,7,8,9-HxCDF	ppt	0.87	130
1,2,3,7,8-PeCDD	ppt	1.1	400
1,2,3,7,8-PeCDF	ppt	1.8	270
2,3,4,6,7,8-HxCDF	ppt	1	520
2,3,4,7,8-PeCDF	ppt	0.75	1,700
2,3,7,8-TCDD	ppt	5.9	240,000
2,3,7,8-TCDF	ppt	2.2	980
OCDD	ppt	260	38,000
OCDF	ppt	2.8	33,000
Total 2,3,7,8-Congeners	ppt	271	322,000
Total HpCDD	ppt	41	13,000
Total HpCDF	ppt	1.9	33,000
Total HxCDD	ppt	15	6,800
Total HxCDF	ppt	6	21,000
Total PCDDs	ppt	317	313,000
Total PCDFs	ppt	4.7	181,000
Total PeCDD	ppt	4.6	6,400
Total PeCDF	ppt	2.3	41,000
Total TCDD	ppt	2.3	270,000
Total TCDF	ppt	7.7	76,000
Pesticides/PCBs			
4,4'-DDD	ppb	14.3	221,000
4,4'-DDE	ppb	6.44	1,690
4,4'-DDT	ppb	7.28	1,880
Aldrin	ppb	10.9	59.8
Alpha-BHC	ppb	15.7	34.6
Alpha-Chlordane	ppb	5.75	66
Aroclor-1016	ppb	ND	ND
Aroclor-1221	ppb	ND	ND
Aroclor-1232	ppb	ND	ND

Table 3-26

1993 Passaic River Core Sediment Data - 02 (July) - from Tierra (1993)

Analyte	Units	Minimum Detect	Maximum Detect
Aroclor-1242	ppb	ND	ND
Aroclor-1248	ppb	96.9	47,700
Aroclor-1254	ppb	ND	ND
Aroclor-1260	ppb	765	8,730
Beta-BHC	ppb	6.06	8,440
Delta-BHC	ppb	4.67	37.6
Dieldrin	ppb	14.6	270
Endosulfan I	ppb	3.12	3.12
Endosulfan II	ppb	6.51	123
Endosulfan Sulfate	ppb	6.8	107
Endrin	ppb	6.44	1,250
Endrin Aldehyde	ppb	7.15	452
Endrin Ketone	ppb	5.96	27.8
Gamma-BHC (Lindane)	ppb	ND	ND
Gamma-Chlordane	ppb	6.07	117
Heptachlor	ppb	ND	ND
Heptachlor Epoxide	ppb	ND	ND
Methoxychlor	ppb	43.5	43.5
Total Alpha + Gamma Chlordane	ppb	5.75	132
Total DDT	ppb	16.7	223,000
Total PCBs - Aroclors	ppb	96.9	47,700
Toxaphene	ppb	ND	ND
SVOCs			
1,2,4-Trichlorobenzene	ppb	2,100	120,000
1,2-Dichlorobenzene	ppb	430	17,000
1,3-Dichlorobenzene	ppb	1,900	21,000
1,4-Dichlorobenzene	ppb	660	35,000
2,4,5-Trichlorophenol	ppb	ND	ND
2,4,6-Trichlorophenol	ppb	ND	ND
2,4-Dichlorophenol	ppb	ND	ND
2,4-Dimethylphenol	ppb	34,000	83,000
2,4-Dinitrophenol	ppb	ND	ND
2,4-Dinitrotoluene	ppb	ND	ND
2,6-Dinitrotoluene	ppb	ND	ND
2-Chloronaphthalene	ppb	ND	ND
2-Chlorophenol	ppb	ND	ND
2-Methylnaphthalene	ppb	610	150,000
2-Methylphenol	ppb	ND	ND
2-Nitroaniline	ppb	ND	ND

Table 3-26

1993 Passaic River Core Sediment Data - 02 (July) - from Tierra (1993)

Analyte	Units	Minimum Detect	Maximum Detect
2-Nitrophenol	ppb	ND	ND
3,3'-Dichlorobenzidine	ppb	270	270
3-Nitroaniline	ppb	ND	ND
4,6-Dinitro-2-methylphenol	ppb	ND	ND
4-Bromophenyl phenyl ether	ppb	ND	ND
4-Chloro-3-methylphenol	ppb	ND	ND
4-Chloroaniline	ppb	580	1,800
4-Chlorophenyl phenyl ether	ppb	ND	ND
4-Methylphenol	ppb	890	6,300
4-Nitroaniline	ppb	ND	ND
4-Nitrophenol	ppb	ND	ND
Acenaphthene	ppb	510	86,000
Acenaphthylene	ppb	250	8,700
Anthracene	ppb	360	96,000
Benzo(a)anthracene	ppb	670	72,000
Benzo(a)pyrene	ppb	250	54,000
Benzo(b)fluoranthene	ppb	600	56,000
Benzo(g,h,i)perylene	ppb	270	23,000
Benzo(k)fluoranthene	ppb	250	41,000
bis(2-Chloroethoxy)methane	ppb	ND	ND
bis(2-Chloroethyl)ether	ppb	ND	ND
bis(2-Chloroisopropyl)ether	ppb	ND	ND
bis(2-Ethylhexyl)phthalate	ppb	300	1,700,000
Butyl benzyl phthalate	ppb	620	920
Carbazole	ppb	280	26,000
Chrysene	ppb	700	37,000
Di-n-Butylphthalate	ppb	560	38,000
Di-n-Octylphthalate	ppb	230	170,000
Dibenzo(a,h)anthracene	ppb	290	19,000
Dibenzofuran	ppb	330	74,000
Diethyl phthalate	ppb	ND	ND
Dimethylphthalate	ppb	ND	ND
Fluoranthene	ppb	1,300	180,000
Fluorene	ppb	330	100,000
Hexachlorobenzene	ppb	3,200	4,700
Hexachlorobutadiene	ppb	ND	ND
Hexachlorocyclopentadiene	ppb	ND	ND
Hexachloroethane	ppb	ND	ND
HMW PAHs	ppb	290	617,000

Table 3-26

1993 Passaic River Core Sediment Data - 02 (July) - from Tierra (1993)

Analyte	Units	Minimum Detect	Maximum Detect
Indeno(1,2,3-cd)pyrene	ppb	280	32,000
Isophorone	ppb	ND	ND
LMW PAHs	ppb	520	649,000
N-Nitroso-di-n-propylamine	ppb	ND	ND
N-Nitrosodiphenylamine	ppb	460	460
Naphthalene	ppb	430	120,000
Nitrobenzene	ppb	ND	ND
Pentachlorophenol	ppb	1,200	1,200
Phenanthrene	ppb	520	280,000
Phenol	ppb	1,200	2,000
Pyrene	ppb	280	140,000
Total PAHs	ppb	290	1,270,000
TOC			
TOC	ppm	12,810	563,370
TPH			
Petroleum Hydrocarbons (extractable)	ppm	21.2	52,000
VOCs			
1,1,1-Trichloroethane	ppb	ND	ND
1,1,2,2-Tetrachloroethane	ppb	ND	ND
1,1,2-Trichloroethane	ppb	ND	ND
1,1-Dichloroethane	ppb	ND	ND
1,1-Dichloroethene	ppb	ND	ND
1,2-Dichloroethane	ppb	ND	ND
1,2-Dichloroethene (total)	ppb	ND	ND
1,2-Dichloropropane	ppb	ND	ND
2-Butanone	ppb	19	410
2-Hexanone	ppb	38	38
4-Methyl-2-pentanone	ppb	ND	ND
Acetone	ppb	35	50,000
Benzene	ppb	7	1,300
Bromodichloromethane	ppb	ND	ND
Bromoform	ppb	ND	ND
Bromomethane	ppb	ND	ND
Carbon Disulfide	ppb	3	22
Carbon Tetrachloride	ppb	ND	ND
Chlorobenzene	ppb	18	29,000
Chloroethane	ppb	ND	ND
Chloroform	ppb	ND	ND
Chloromethane	ppb	7	7

Table 3-26

1993 Passaic River Core Sediment Data - 02 (July) - from Tierra (1993)

Analyte	Units	Minimum Detect	Maximum Detect
cis-1,3-Dichloropropene	ppb	ND	ND
Dibromochloromethane	ppb	ND	ND
Ethylbenzene	ppb	4	2,300
Methylene Chloride	ppb	2	29
Styrene	ppb	ND	ND
Tetrachloroethene	ppb	ND	ND
Toluene	ppb	5	870
Total BTEX	ppb	4	152,000
Total Xylenes	ppb	14	150,000
trans-1,3-Dichloropropene	ppb	ND	ND
Trichloroethene	ppb	ND	ND
Vinyl Chloride	ppb	ND	ND

Notes:
BTEX = benzene, toluene, ethylbenzene, and xylene
BHC = beta hexachlorocyclohexane
HMW = high molecular weight
LMW = low molecular weight
ND = not detected
PAHs = polycyclic aromatic hydrocarbons
PCBs = polychlorinated biphenyls
PCDD/Fs = polychlorinated dibenzo-*p*-dioxins and dibenzofurans
pCi/gm = picoCuries per gram
ppb = parts per billion
ppm = parts per million
ppt = parts per trillion
SVOCs = semivolatile organic compounds
TOC = total organic carbon
TPH = total petroleum hydrocarbons
VOCs = volatile organic compounds

Table 3-27
1994 Passaic River Surface Sediment Data from Tierra (1994b)

Analyte	Units	Minimum Detect	Maximum Detect
Cyanide			
Total Cyanide	ppm	1.55	269
Inorganic Chemicals			
Ag	ppm	1.2	39.5
Al	ppm	3,980	21,400
As	ppm	2.6	19.8
Ba	ppm	58.6	1,280
Be	ppm	0.27	3.1
Ca	ppm	2,300	14,400
Cd	ppm	1.9	11.8
Co	ppm	3.1	41.1
Cr	ppm	25.3	256
Cu	ppm	82.7	421
Fe	ppm	13,200	35,600
Hg	ppm	0.34	6.5
K	ppm	8.7	3,240
Mg	ppm	2,320	8,620
Mn	ppm	109	656
Na	ppm	208	8,130
Ni	ppm	22.6	206
Pb	ppm	150	806
Sb	ppm	13.2	13.2
Se	ppm	0.62	2
Ti	ppm	237	486
Tl	ppm	0.88	0.88
V	ppm	19.9	56.6
Zn	ppm	286	1060
PCB Congeners			
PCB-105	ppb	1.4	27
PCB-114	ppb	0.11	2.4
PCB-118	ppb	2.7	57
PCB-123	ppb	0.41	7.1
PCB-126	ppb	0.026	0.48
PCB-156	ppb	0.43	9.6
PCB-157	ppb	0.096	3.5
PCB-167	ppb	0.71	14
PCB-169	ppb	0.0017	0.036
PCB-189	ppb	0.076	4.3
PCB-77	ppb	0.29	14
Total PCBs - Sum of Coplanar Congeners	ppb	6.26	124

Table 3-27
1994 Passaic River Surface Sediment Data from Tierra (1994b)

Analyte	Units	Minimum Detect	Maximum Detect
PCDD/Fs			
1,2,3,4,6,7,8-HpCDD	ppt	40	1,000
1,2,3,4,6,7,8-HpCDF	ppt	12	1,700
1,2,3,4,7,8,9-HpCDF	ppt	1.6	39
1,2,3,4,7,8-HxCDD	ppt	0.92	16
1,2,3,4,7,8-HxCDF	ppt	9.9	290
1,2,3,6,7,8-HxCDD	ppt	2.3	380
1,2,3,6,7,8-HxCDF	ppt	3.3	71
1,2,3,7,8,9-HxCDD	ppt	1.7	29
1,2,3,7,8,9-HxCDF	ppt	0.54	11
1,2,3,7,8-PeCDD	ppt	1.3	17
1,2,3,7,8-PeCDF	ppt	1.2	23
2,3,4,6,7,8-HxCDF	ppt	3.1	46
2,3,4,7,8-PeCDF	ppt	4	95
2,3,7,8-TCDD	ppt	1.1	1,600
2,3,7,8-TCDF	ppt	1.6	45
OCDD	ppt	400	11,000
OCDF	ppt	71	3,000
Total 2,3,7,8-Congeners	ppt	617	17,500
Total HpCDD	ppt	83	2,200
Total HpCDF	ppt	90	2,500
Total HxCDD	ppt	5	470
Total HxCDF	ppt	56	1,200
Total PCDDs	ppt	530	14,500
Total PCDFs	ppt	310	8,290
Total PeCDD	ppt	1.2	150
Total PeCDF	ppt	9.4	990
Total TCDD	ppt	1.4	1,700
Total TCDF	ppt	5.3	1,100
Pesticides/PCBs			
4,4'-DDD	ppb	5.59	208
4,4'-DDE	ppb	10.5	173
4,4'-DDT	ppb	6.19	745
Aldrin	ppb	7.9	29.1
Alpha-BHC	ppb	ND	ND
Alpha-Chlordane	ppb	3.5	74.2
Aroclor-1016	ppb	ND	ND
Aroclor-1221	ppb	ND	ND
Aroclor-1232	ppb	ND	ND
Aroclor-1242	ppb	ND	ND

Table 3-27
1994 Passaic River Surface Sediment Data from Tierra (1994b)

Analyte	Units	Minimum Detect	Maximum Detect
Aroclor-1248	ppb	53.5	855
Aroclor-1254	ppb	ND	ND
Aroclor-1260	ppb	ND	ND
Beta-BHC	ppb	ND	ND
Delta-BHC	ppb	ND	ND
Dieldrin	ppb	4.84	23.3
Endosulfan I	ppb	ND	ND
Endosulfan II	ppb	5.45	76.4
Endosulfan Sulfate	ppb	ND	ND
Endrin	ppb	ND	ND
Endrin Aldehyde	ppb	ND	ND
Endrin Ketone	ppb	7.4	243
Gamma-BHC (Lindane)	ppb	2.3	4.43
Gamma-Chlordane	ppb	3.39	90.3
Heptachlor	ppb	ND	ND
Heptachlor Epoxide	ppb	2.87	8.6
Methoxychlor	ppb	445	445
Total Alpha + Gamma Chlordane	ppb	3.39	165
Total DDT	ppb	5.59	921
Total PCBs - Aroclors	ppb	53.5	855
Toxaphene	ppb	ND	ND
SVOCs			
1,2,4-Trichlorobenzene	ppb	ND	ND
1,2-Dichlorobenzene	ppb	ND	ND
1,3-Dichlorobenzene	ppb	ND	ND
1,4-Dichlorobenzene	ppb	97	680
2,4,5-Trichlorophenol	ppb	ND	ND
2,4,6-Trichlorophenol	ppb	ND	ND
2,4-Dichlorophenol	ppb	ND	ND
2,4-Dimethylphenol	ppb	ND	ND
2,4-Dinitrophenol	ppb	ND	ND
2,4-Dinitrotoluene	ppb	ND	ND
2,6-Dinitrotoluene	ppb	ND	ND
2-Chloronaphthalene	ppb	ND	ND
2-Chlorophenol	ppb	ND	ND
2-Methylnaphthalene	ppb	140	510
2-Methylphenol	ppb	ND	ND
2-Nitroaniline	ppb	ND	ND
2-Nitrophenol	ppb	ND	ND
3,3'-Dichlorobenzidine	ppb	93	93

Table 3-27
1994 Passaic River Surface Sediment Data from Tierra (1994b)

Analyte	Units	Minimum Detect	Maximum Detect
3-Nitroaniline	ppb	ND	ND
4,6-Dinitro-2-methylphenol	ppb	ND	ND
4-Bromophenyl phenyl ether	ppb	ND	ND
4-Chloro-3-methylphenol	ppb	ND	ND
4-Chloroaniline	ppb	ND	ND
4-Chlorophenyl phenyl ether	ppb	ND	ND
4-Methylphenol	ppb	230	230
4-Nitroaniline	ppb	ND	ND
4-Nitrophenol	ppb	ND	ND
Acenaphthene	ppb	100	890
Acenaphthylene	ppb	140	590
Anthracene	ppb	87	1,700
Benzo(a)anthracene	ppb	300	3,100
Benzo(a)pyrene	ppb	380	3,600
Benzo(b)fluoranthene	ppb	390	4,400
Benzo(g,h,i)perylene	ppb	170	2,100
Benzo(k)fluoranthene	ppb	270	3,300
bis(2-Chloroethoxy)methane	ppb	ND	ND
bis(2-Chloroethyl)ether	ppb	ND	ND
bis(2-Chloroisopropyl)ether	ppb	ND	ND
bis(2-Ethylhexyl)phthalate	ppb	960	30,000
Butyl benzyl phthalate	ppb	140	3,800
Carbazole	ppb	120	2,000
Chrysene	ppb	340	3,100
Di-n-Butylphthalate	ppb	130	960
Di-n-Octylphthalate	ppb	110	1,700
Dibenzo(a,h)anthracene	ppb	120	1,300
Dibenzofuran	ppb	140	540
Diethyl phthalate	ppb	1,000	45,000
Dimethylphthalate	ppb	270	2,000
Fluoranthene	ppb	850	10,000
Fluorene	ppb	140	1,100
Hexachlorobenzene	ppb	ND	ND
Hexachlorobutadiene	ppb	ND	ND
Hexachlorocyclopentadiene	ppb	ND	ND
Hexachloroethane	ppb	ND	ND
HMW PAHs	ppb	3,820	38,600
Indeno(1,2,3-cd)pyrene	ppb	220	2,600
Isophorone	ppb	ND	ND
LMW PAHs	ppb	210	12,200

Table 3-27
1994 Passaic River Surface Sediment Data from Tierra (1994b)

Analyte	Units	Minimum Detect	Maximum Detect
N-Nitroso-di-n-propylamine	ppb	ND	ND
N-Nitrosodiphenylamine	ppb	360	360
Naphthalene	ppb	110	550
Nitrobenzene	ppb	ND	ND
Pentachlorophenol	ppb	ND	ND
Phenanthrene	ppb	210	8,500
Phenol	ppb	ND	ND
Pyrene	ppb	640	7,600
Total PAHs	ppb	4,740	50,400
TOC			
TOC	ppm	7,230	233,000
TPH			
Petroleum Hydrocarbons (extractable)	ppm	183	5,340
VOCs			
1,1,1-Trichloroethane	ppb	ND	ND
1,1,2,2-Tetrachloroethane	ppb	ND	ND
1,1,2-Trichloroethane	ppb	ND	ND
1,1-Dichloroethane	ppb	ND	ND
1,1-Dichloroethene	ppb	ND	ND
1,2-Dichloroethane	ppb	ND	ND
1,2-Dichloroethene (total)	ppb	7	20
1,2-Dichloropropane	ppb	ND	ND
2-Butanone	ppb	9	38
2-Hexanone	ppb	ND	ND
4-Methyl-2-pentanone	ppb	ND	ND
Acetone	ppb	8	160
Benzene	ppb	7	17
Bromodichloromethane	ppb	ND	ND
Bromoform	ppb	ND	ND
Bromomethane	ppb	ND	ND
Carbon Disulfide	ppb	ND	ND
Carbon Tetrachloride	ppb	ND	ND
Chlorobenzene	ppb	7	1,400
Chloroethane	ppb	ND	ND
Chloroform	ppb	ND	ND
Chloromethane	ppb	3	48
cis-1,3-Dichloropropene	ppb	ND	ND
Dibromochloromethane	ppb	ND	ND
Ethylbenzene	ppb	4	4
Methylene Chloride	ppb	ND	ND

Table 3-27
1994 Passaic River Surface Sediment Data from Tierra (1994b)

Analyte	Units	Minimum Detect	Maximum Detect
Styrene	ppb	ND	ND
Tetrachloroethene	ppb	ND	ND
Toluene	ppb	3	250
Total BTEX	ppb	5	250
Total Xylenes	ppb	5	15
trans-1,3-Dichloropropene	ppb	ND	ND
Trichloroethene	ppb	ND	ND
Vinyl Chloride	ppb	ND	ND

Notes:
BTEX = benzene, toluene, ethylbenzene, and xylene
BHC = beta hexachlorocyclohexane
HMW = high molecular weight
LMW = low molecular weight
ND = not detected
PAHs = polycyclic aromatic hydrocarbons
PCBs = polychlorinated biphenyls
PCDD/Fs = polychlorinated dibenzo-*p*-dioxins and dibenzofurans
ppb = parts per billion
ppm = parts per million
ppt = parts per trillion
SVOCs = semivolatile organic compounds
TOC = total organic carbon
TPH = total petroleum hydrocarbons
VOCs = volatile organic compounds

Table 3-28a
1995 Passaic River RI Sediment Data from Tierra (1995b,c; 2004a)

Analyte	Units	Minimum Detect	Maximum Detect
Cyanide			
Total Cyanide	ppm	0.46	2.7
Geochronology			
BE-7	pCi/gm	0.752	3.83
CS-137	pCi/gm	0.0104	3.74
PB-210	pCi/gm	0.018	5
Herbicides			
2,4,5-T	ppb	1,660	212,000
2,4,5-TP (Silvex)	ppb	616	616
2,4-D	ppb	17,800	646,000
2,4-DB	ppb	1,990	1,990
Inorganic Chemicals			
Ag	ppm	1	21.4
Al	ppm	1,110	26,300
As	ppm	0.94	125
Ba	ppm	17.7	1,330
Be	ppm	0.47	1.3
Ca	ppm	433	95,900
Cd	ppm	0.55	39.6
Co	ppm	3.9	27.4
Cr	ppm	3.6	2,160
Cu	ppm	2.2	3,020
Fe	ppm	3,740	37,900
Hg	ppm	0.01	28.3
K	ppm	481	4,540
Mg	ppm	792	60,000
Mn	ppm	39.7	2,400
Na	ppm	439	13,900
Ni	ppm	3.1	369
Pb	ppm	1	17,900
Sb	ppm	8.2	7,560
Se	ppm	0.43	4.7
Ti	ppm	62	735
Tl	ppm	1.5	3.2
V	ppm	4.8	125
Zn	ppm	10.8	3,110

Table 3-28a
1995 Passaic River RI Sediment Data from Tierra (1995b,c; 2004a)

Analyte	Units	Minimum Detect	Maximum Detect
PCB Congeners			
PCB-105	ppb	0.011	780
PCB-114	ppb	0.0085	69
PCB-118	ppb	0.028	2,200
PCB-123	ppb	0.0052	92
PCB-126	ppb	0.0063	5.5
PCB-156	ppb	0.012	180
PCB-157	ppb	0.0072	64
PCB-167	ppb	0.015	190
PCB-169	ppb	0.0053	0.49
PCB-189	ppb	0.006	13
PCB-77	ppb	0.0061	360
Total PCBs - Sum of Coplanar Congeners	ppb	0.0451	3,540
PCDD/Fs			
1,2,3,4,6,7,8-HpCDD	ppt	0.613	37,200
1,2,3,4,6,7,8-HpCDF	ppt	0.872	124,000
1,2,3,4,7,8,9-HpCDF	ppt	0.371	83,100
1,2,3,4,7,8-HxCDD	ppt	0.69	4,470
1,2,3,4,7,8-HxCDF	ppt	0.661	727,000
1,2,3,6,7,8-HxCDD	ppt	0.827	15,800
1,2,3,6,7,8-HxCDF	ppt	0.367	125,000
1,2,3,7,8,9-HxCDD	ppt	0.75	4,700
1,2,3,7,8,9-HxCDF	ppt	0.269	16,400
1,2,3,7,8-PeCDD	ppt	0.489	17,700
1,2,3,7,8-PeCDF	ppt	0.421	15,600
2,3,4,6,7,8-HxCDF	ppt	0.64	50,200
2,3,4,7,8-PeCDF	ppt	0.421	111,000
2,3,7,8-TCDD	ppt	0.072	5,300,000
2,3,7,8-TCDF	ppt	0.276	17,800
OCDD	ppt	1.3	802,000
OCDF	ppt	0.866	183,000
Total 2,3,7,8-Congeners	ppt	1.16	5,510,000
Total HpCDD	ppt	0.613	154,000
Total HpCDF	ppt	0.872	263,000
Total HxCDD	ppt	0.853	132,000
Total HxCDF	ppt	1.06	1,710,000
Total PCDDs	ppt	1.3	3,510,000

Table 3-28a
1995 Passaic River RI Sediment Data from Tierra (1995b,c; 2004a)

Analyte	Units	Minimum Detect	Maximum Detect
Total PCDFs	ppt	1.16	5,710,000
Total PeCDD	ppt	1.73	552,000
Total PeCDF	ppt	0.81	1,680,000
Total TCDD	ppt	0.4	2,760,000
Total TCDF	ppt	0.489	2,320,000
Pesticides/PCBs			
4,4'-DDD	ppb	4.61	156,000
4,4'-DDE	ppb	4.64	3,840
4,4'-DDT	ppb	5.04	9,520,000
Aldrin	ppb	ND	ND
Alpha-BHC	ppb	6.01	107
Alpha-Chlordane	ppb	2.72	496
Aroclor-1016	ppb	ND	ND
Aroclor-1221	ppb	165	165
Aroclor-1232	ppb	ND	ND
Aroclor-1242	ppb	66.8	17,200
Aroclor-1248	ppb	59.8	21,900
Aroclor-1254	ppb	44.5	18,100
Aroclor-1260	ppb	109	4,290
Beta-BHC	ppb	4.27	52.7
Delta-BHC	ppb	3.46	50.6
Dieldrin	ppb	6.36	580
Endosulfan I	ppb	101	101
Endosulfan II	ppb	4.28	3,540
Endosulfan Sulfate	ppb	6.93	5,350
Endrin	ppb	6.77	1,660
Endrin Aldehyde	ppb	5.21	343
Endrin Ketone	ppb	7.18	2,360
Gamma-BHC (Lindane)	ppb	4.08	9.76
Gamma-Chlordane	ppb	2.26	295
Heptachlor	ppb	ND	ND
Heptachlor Epoxide	ppb	4.3	130
Methoxychlor	ppb	37.7	546
PCB-1	ppb	138	718
PCB-110	ppb	6.79	1,940
PCB-118	ppb	6.84	2,480
PCB-12	ppb	542	882

Table 3-28a
1995 Passaic River RI Sediment Data from Tierra (1995b,c; 2004a)

Analyte	Units	Minimum Detect	Maximum Detect
PCB-138	ppb	5.82	3,210
PCB-153	ppb	5.49	930
PCB-170	ppb	6.48	494
PCB-180	ppb	6.97	618
PCB-28	ppb	7.41	2,150
PCB-44	ppb	5.67	1,180
PCB-5	ppb	19.9	103
PCB-66	ppb	7.56	1,490
Total Alpha + Gamma Chlordane	ppb	2.26	791
Total DDT	ppb	4.68	9,520,000
Total PCBs - Aroclors	ppb	44.5	34,200
Toxaphene	ppb	ND	ND
SVOCs			
1,2,4-Trichlorobenzene	ppb	1,800	1,100,000
1,2-Dichlorobenzene	ppb	6,400	55,000
1,3-Dichlorobenzene	ppb	1,100	9,800
1,4-Dichlorobenzene	ppb	950	200,000
2,4,5-Trichlorophenol	ppb	1,300	830,000
2,4,6-Trichlorophenol	ppb	860	340,000
2,4-Dichlorophenol	ppb	830	2,500,000
2,4-Dimethylphenol	ppb	2,100	2,100
2,4-Dinitrophenol	ppb	ND	ND
2,4-Dinitrotoluene	ppb	710	750
2,6-Dinitrotoluene	ppb	ND	ND
2-Chloronaphthalene	ppb	ND	ND
2-Chlorophenol	ppb	8,000	8,000
2-Methylnaphthalene	ppb	520	220,000
2-Methylphenol	ppb	ND	ND
2-Nitroaniline	ppb	ND	ND
2-Nitrophenol	ppb	ND	ND
3,3'-Dichlorobenzidine	ppb	ND	ND
3-Nitroaniline	ppb	ND	ND
4,6-Dinitro-2-methylphenol	ppb	2,000	2,200
4-Bromophenyl phenyl ether	ppb	ND	ND
4-Chloro-3-methylphenol	ppb	ND	ND
4-Chloroaniline	ppb	770	1,100
4-Chlorophenyl phenyl ether	ppb	ND	ND

Table 3-28a
1995 Passaic River RI Sediment Data from Tierra (1995b,c; 2004a)

Analyte	Units	Minimum Detect	Maximum Detect
4-Methylphenol	ppb	1,200	1,200
4-Nitroaniline	ppb	ND	ND
4-Nitrophenol	ppb	ND	ND
Acenaphthene	ppb	440	420,000
Acenaphthylene	ppb	460	17,000
Anthracene	ppb	410	230,000
Benzo(a)anthracene	ppb	490	150,000
Benzo(a)pyrene	ppb	390	130,000
Benzo(b)fluoranthene	ppb	400	100,000
Benzo(g,h,i)perylene	ppb	500	63,000
Benzo(k)fluoranthene	ppb	430	63,000
bis(2-Chloroethoxy)methane	ppb	ND	ND
bis(2-Chloroethyl)ether	ppb	ND	ND
bis(2-Chloroisopropyl)ether	ppb	ND	ND
bis(2-Ethylhexyl)phthalate	ppb	630	280,000
Butyl benzyl phthalate	ppb	470	25,000
Carbazole	ppb	440	11,000
Chrysene	ppb	390	150,000
Di-n-Butylphthalate	ppb	690	4,900
Di-n-Octylphthalate	ppb	540	25,000
Dibenzo(a,h)anthracene	ppb	450	25,000
Dibenzofuran	ppb	400	70,000
Diethyl phthalate	ppb	ND	ND
Dimethylphthalate	ppb	ND	ND
Fluoranthene	ppb	490	320,000
Fluorene	ppb	500	140,000
Hexachlorobenzene	ppb	1,300	430,000
Hexachlorobutadiene	ppb	670	670
Hexachlorocyclopentadiene	ppb	ND	ND
Hexachloroethane	ppb	690	690
HMW PAHs	ppb	490	1,400,000
Indeno(1,2,3-cd)pyrene	ppb	470	57,000
Isophorone	ppb	ND	ND
LMW PAHs	ppb	500	1,410,000
N-Nitroso-di-n-propylamine	ppb	ND	ND
N-Nitrosodiphenylamine	ppb	780	2,800
Naphthalene	ppb	450	270,000

Table 3-28a
1995 Passaic River RI Sediment Data from Tierra (1995b,c; 2004a)

Analyte	Units	Minimum Detect	Maximum Detect
Nitrobenzene	ppb	ND	ND
Pentachlorophenol	ppb	13,000	13,000
Phenanthrene	ppb	500	570,000
Phenol	ppb	2,300	2,300
Pyrene	ppb	470	340,000
Total PAHs	ppb	490	2,810,000
TOC			
TOC	ppm	132	409,000
TPH			
Petroleum Hydrocarbons (extractable)	ppm	17.5	39,300
VOCs			
1,1,1-Trichloroethane	ppb	ND	ND
1,1,2,2-Tetrachloroethane	ppb	29	29
1,1,2-Trichloroethane	ppb	ND	ND
1,1-Dichloroethane	ppb	37	390
1,1-Dichloroethene	ppb	28	28
1,2-Dichloroethane	ppb	ND	ND
1,2-Dichloroethene (total)	ppb	ND	ND
1,2-Dichloropropane	ppb	83	83
2-Butanone	ppb	15	3,000
2-Hexanone	ppb	ND	ND
4-Methyl-2-pentanone	ppb	ND	ND
Acetone	ppb	12	3,000
Benzene	ppb	14	3,000
Bromodichloromethane	ppb	ND	ND
Bromoform	ppb	ND	ND
Bromomethane	ppb	12	12
Carbon Disulfide	ppb	23	46
Carbon Tetrachloride	ppb	ND	ND
Chlorobenzene	ppb	23	290,000
Chloroethane	ppb	ND	ND
Chloroform	ppb	ND	ND
Chloromethane	ppb	ND	ND
cis-1,3-Dichloropropene	ppb	ND	ND
Dibromochloromethane	ppb	ND	ND
Ethylbenzene	ppb	19	1,700
Methylene Chloride	ppb	160	58,000
Styrene	ppb	110	110
Tetrachloroethene	ppb	95	240
Toluene	ppb	19	2,800

Table 3-28a
1995 Passaic River RI Sediment Data from Tierra (1995b,c; 2004a)

Analyte	Units	Minimum Detect	Maximum Detect
Total BTEX	ppb	14	6,720
Total Xylenes	ppb	14	6,200
trans-1,3-Dichloropropene	ppb	ND	ND
Trichloroethene	ppb	51	51
Vinyl Chloride	ppb	13	49

Notes:
BTEX = benzene, toluene, ethylbenzene, and xylene
BHC = beta hexachlorocyclohexane
HMW = high molecular weight
LMW = low molecular weight
ND = not detected
PAHs = polycyclic aromatic hydrocarbons
PCBs = polychlorinated biphenyls
PCDD/Fs = polychlorinated dibenzo-*p*-dioxins and dibenzofurans
pCi/gm = picoCuries per gram
ppb = parts per billion
ppm = parts per million
ppt = parts per trillion
SVOCs = semivolatile organic compounds
TOC = total organic carbon
TPH = total petroleum hydrocarbons
VOCs = volatile organic compounds

Table 3-28b
1995 Passaic River RI Sediment Geotechnical Testing Data from Tierra (1995b,c; 2004a)

Analyte	Units	No. of Samples	Minimum Detect	Maximum Detect
Physical Property				
Bulk Density	lb/ft^3	103	64.92	129.21
Compression Index	%	11	0.5102	1.5044
Consolidation Coefficient (0.6psi)	cm^2/min	9	0.0186	0.2603
Consolidation Coefficient (1.7psi)	cm^2/min	11	0.0286	0.8145
Consolidation Coefficient (13.9psi)	cm^2/min	9	0.0208	0.1326
Consolidation Coefficient (27.8psi)	cm^2/min	5	0.0111	0.1203
Consolidation Coefficient (3.5psi)	cm^2/min	11	0.0072	0.6242
Consolidation Coefficient (55.5psi)	cm^2/min	3	0.0351	0.183
Consolidation Coefficient (6.9psi)	cm^2/min	10	0.0303	0.1728
Final Water Content	%	9	38.86	61.19
Hydrometer - Percent Clay	%	61	0	35
Initial Water Content	%	11	89.2	158.23
Natural Liquid Limit	%	96	0	185
Ovendried Liquid Limit	%	109	0	69
Passing # 200	%	114	0	100
Plastic Limit Percent	%	96	0	70
Water Content	%	115	0	287.2

Notes:
cm^2/min = square centimeter per minute
lb/ft^3 = pound per cubic foot
psi = pounds per square inch

Table 3-29
1995 Passaic River Surface Sediment Data from Tierra (1995d)

Analyte	Units	Minimum Detect	Maximum Detect
Cyanide			
Total Cyanide	ppm	1	1.34
PCDD/Fs			
1,2,3,4,6,7,8-HpCDD	ppt	730	740
1,2,3,4,6,7,8-HpCDF	ppt	1,100	1,100
1,2,3,4,7,8,9-HpCDF	ppt	29	33
1,2,3,4,7,8-HxCDD	ppt	8.9	9.3
1,2,3,4,7,8-HxCDF	ppt	220	270
1,2,3,6,7,8-HxCDD	ppt	34	44
1,2,3,6,7,8-HxCDF	ppt	56	65
1,2,3,7,8,9-HxCDD	ppt	19	20
1,2,3,7,8,9-HxCDF	ppt	11	12
1,2,3,7,8-PeCDD	ppt	9.8	9.8
1,2,3,7,8-PeCDF	ppt	15	28
2,3,4,6,7,8-HxCDF	ppt	52	53
2,3,4,7,8-PeCDF	ppt	49	63
2,3,7,8-TCDD	ppt	210	1,200
2,3,7,8-TCDF	ppt	30	48
OCDD	ppt	8,300	9,400
OCDF	ppt	1,200	1,600
Total 2,3,7,8-Congeners	ppt	13,200	13,600
Total HpCDD	ppt	1,600	1,600
Total HpCDF	ppt	1,400	1,500
Total HxCDD	ppt	190	220
Total HxCDF	ppt	730	850
Total PCDDs	ppt	11,400	11,500
Total PCDFs	ppt	4,550	6,450
Total PeCDD	ppt	9.8	21
Total PeCDF	ppt	520	1,000
Total TCDD	ppt	300	1,300
Total TCDF	ppt	700	1,500

Notes:
PCDD/Fs = polychlorinated dibenzo-*p*-dioxins and dibenzofurans
ppm = parts per million
ppt = parts per trillion

Table 3-30
1996 Newark Bay Reach A Sediment Data from Tierra (1996a)

Analyte	Units	Minimum Detect	Maximum Detect
Cyanide			
Total Cyanide	ppm	1.6	24
Herbicides			
2,4,5-T	ppb	ND	ND
2,4,5-TP (Silvex)	ppb	ND	ND
2,4-D	ppb	ND	ND
2,4-DB	ppb	ND	ND
Inorganic Chemicals			
Ag	ppm	3	8.8
Al	ppm	9,480	20,400
As	ppm	5.6	19.3
Ba	ppm	90.2	497
Be	ppm	0.52	1.1
Ca	ppm	4,970	10,300
Cd	ppm	3.3	16.4
Co	ppm	6.5	12.7
Cr	ppm	25.6	958
Cu	ppm	114	531
Fe	ppm	18,300	35,000
Hg	ppm	3.4	15.7
K	ppm	2,060	5020
Mg	ppm	5,790	10,000
Mn	ppm	284	515
Na	ppm	6,000	7750
Ni	ppm	23.3	50.1
Pb	ppm	5.3	17.3
Sb	ppm	ND	ND
Se	ppm	1.5	1.7
Ti	ppm	199	505
Tl	ppm	ND	ND
V	ppm	23.1	442
Zn	ppm	192	853
PCB Congeners			
PCB-105	ppb	7.7	26
PCB-114	ppb	0.59	2
PCB-118	ppb	25	85
PCB-123	ppb	2.2	7.6

Table 3-30
1996 Newark Bay Reach A Sediment Data from Tierra (1996a)

Analyte	Units	Minimum Detect	Maximum Detect
PCB-126	ppb	0.04	0.22
PCB-156	ppb	2.2	8
PCB-157	ppb	0.082	1.6
PCB-167	ppb	3.8	13
PCB-169	ppb	ND	ND
PCB-189	ppb	0.14	0.98
PCB-77	ppb	5.9	16
Total PCBs - Sum of Coplanar Congeners	ppb	48.6	158
PCDD/Fs			
1,2,3,4,6,7,8-HpCDD	ppt	500	2,300
1,2,3,4,6,7,8-HpCDF	ppt	410	4,000
1,2,3,4,7,8,9-HpCDF	ppt	18	82
1,2,3,4,7,8-HxCDD	ppt	7.4	35
1,2,3,4,7,8-HxCDF	ppt	94	820
1,2,3,6,7,8-HxCDD	ppt	33	110
1,2,3,6,7,8-HxCDF	ppt	35	220
1,2,3,7,8,9-HxCDD	ppt	17	42
1,2,3,7,8,9-HxCDF	ppt	6.5	29
1,2,3,7,8-PeCDD	ppt	24	24
1,2,3,7,8-PeCDF	ppt	15	63
2,3,4,6,7,8-HxCDF	ppt	23	94
2,3,4,7,8-PeCDF	ppt	32	150
2,3,7,8-TCDD	ppt	82	6,200
2,3,7,8-TCDF	ppt	31	99
OCDD	ppt	3,900	22,000
OCDF	ppt	600	5,300
Total 2,3,7,8-Congeners	ppt	5,950	40,600
Total HpCDD	ppt	1,100	4,100
Total HpCDF	ppt	620	5,400
Total HxCDD	ppt	300	1,200
Total HxCDF	ppt	420	3,000
Total PCDDs	ppt	5,540	34,500
Total PCDFs	ppt	2,880	21,700
Total PeCDD	ppt	36	160
Total PeCDF	ppt	460	3,100
Total TCDD	ppt	130	7,000
Total TCDF	ppt	680	4,900

Table 3-30
1996 Newark Bay Reach A Sediment Data from Tierra (1996a)

Analyte	Units	Minimum Detect	Maximum Detect
Pesticides/PCBs			
4,4'-DDD	ppb	8.98	34.7
4,4'-DDE	ppb	13	231
4,4'-DDT	ppb	9.99	45.9
Aldrin	ppb	8	16.4
Alpha-BHC	ppb	ND	ND
Alpha-Chlordane	ppb	7.67	8.91
Aroclor-1016	ppb	ND	ND
Aroclor-1221	ppb	ND	ND
Aroclor-1232	ppb	ND	ND
Aroclor-1242	ppb	146	341
Aroclor-1248	ppb	ND	ND
Aroclor-1254	ppb	ND	ND
Aroclor-1260	ppb	120	318
Beta-BHC	ppb	ND	ND
Delta-BHC	ppb	ND	ND
Dieldrin	ppb	10.2	14.7
Endosulfan I	ppb	11.8	13.6
Endosulfan II	ppb	17.7	17.7
Endosulfan Sulfate	ppb	ND	ND
Endrin	ppb	10.5	85.3
Endrin Aldehyde	ppb	ND	ND
Endrin Ketone	ppb	ND	ND
Gamma-BHC (Lindane)	ppb	ND	ND
Gamma-Chlordane	ppb	ND	ND
Heptachlor	ppb	ND	ND
Heptachlor Epoxide	ppb	5.32	17.3
Methoxychlor	ppb	ND	ND
PCB-1	ppb	ND	ND
PCB-110	ppb	16.8	48.6
PCB-118	ppb	17	28.1
PCB-12	ppb	ND	ND
PCB-138	ppb	13	50.4
PCB-153	ppb	11.1	21.2
PCB-170	ppb	13.7	20.7
PCB-180	ppb	12.2	29.8
PCB-28	ppb	18	38.7

Table 3-30
1996 Newark Bay Reach A Sediment Data from Tierra (1996a)

Analyte	Units	Minimum Detect	Maximum Detect
PCB-44	ppb	14.1	39.2
PCB-5	ppb	ND	ND
PCB-66	ppb	14	40
Total Alpha + Gamma Chlordane	ppb	7.67	8.91
Total DDT	ppb	13	312
Total PCBs - Aroclors	ppb	146	659
Toxaphene	ppb	ND	ND
Physical Property			
Percent Moisture	%	41.8	64.35
SVOCs			
1,2,4-Trichlorobenzene	ppb	ND	ND
1,2-Dichlorobenzene	ppb	ND	ND
1,3-Dichlorobenzene	ppb	ND	ND
1,4-Dichlorobenzene	ppb	ND	ND
2,4,5-Trichlorophenol	ppb	ND	ND
2,4,6-Trichlorophenol	ppb	ND	ND
2,4-Dichlorophenol	ppb	ND	ND
2,4-Dimethylphenol	ppb	ND	ND
2,4-Dinitrophenol	ppb	ND	ND
2,4-Dinitrotoluene	ppb	ND	ND
2,6-Dinitrotoluene	ppb	ND	ND
2-Chloronaphthalene	ppb	ND	ND
2-Chlorophenol	ppb	ND	ND
2-Methylnaphthalene	ppb	150	510
2-Methylphenol	ppb	ND	ND
2-Nitroaniline	ppb	ND	ND
2-Nitrophenol	ppb	ND	ND
3,3'-Dichlorobenzidine	ppb	740	740
3-Nitroaniline	ppb	ND	ND
4,6-Dinitro-2-methylphenol	ppb	ND	ND
4-Bromophenyl phenyl ether	ppb	ND	ND
4-Chloro-3-methylphenol	ppb	ND	ND
4-Chloroaniline	ppb	ND	ND
4-Chlorophenyl phenyl ether	ppb	ND	ND
4-Methylphenol	ppb	ND	ND
4-Nitroaniline	ppb	ND	ND
4-Nitrophenol	ppb	ND	ND

Table 3-30
1996 Newark Bay Reach A Sediment Data from Tierra (1996a)

Analyte	Units	Minimum Detect	Maximum Detect
Acenaphthene	ppb	340	920
Acenaphthylene	ppb	150	150
Anthracene	ppb	180	1,000
Benzo(a)anthracene	ppb	150	710
Benzo(a)pyrene	ppb	380	740
Benzo(b)fluoranthene	ppb	160	670
Benzo(g,h,i)perylene	ppb	220	340
Benzo(k)fluoranthene	ppb	240	680
Benzoic Acid	ppb	ND	ND
Benzyl Alcohol	ppb	ND	ND
bis(2-Chloroethoxy)methane	ppb	ND	ND
bis(2-Chloroethyl)ether	ppb	ND	ND
bis(2-Chloroisopropyl)ether	ppb	ND	ND
bis(2-Ethylhexyl)phthalate	ppb	860	12,000
Butyl benzyl phthalate	ppb	ND	ND
Carbazole	ppb	180	180
Chrysene	ppb	200	960
Di-n-Butylphthalate	ppb	ND	ND
Di-n-Octylphthalate	ppb	160	250
Dibenzo(a,h)anthracene	ppb	140	140
Dibenzofuran	ppb	400	420
Diethyl phthalate	ppb	ND	ND
Dimethylphthalate	ppb	ND	ND
Fluoranthene	ppb	330	2,800
Fluorene	ppb	330	800
Hexachlorobenzene	ppb	ND	ND
Hexachlorobutadiene	ppb	ND	ND
Hexachlorocyclopentadiene	ppb	ND	ND
Hexachloroethane	ppb	ND	ND
HMW PAHs	ppb	580	7,820
Indeno(1,2,3-cd)pyrene	ppb	210	320
Isophorone	ppb	ND	ND
LMW PAHs	ppb	180	6,290
N-Nitroso-di-n-propylamine	ppb	ND	ND
N-Nitrosodiphenylamine	ppb	ND	ND
Naphthalene	ppb	250	1,800
Nitrobenzene	ppb	ND	ND

Table 3-30
1996 Newark Bay Reach A Sediment Data from Tierra (1996a)

Analyte	Units	Minimum Detect	Maximum Detect
Pentachlorophenol	ppb	ND	ND
Phenanthrene	ppb	180	2,800
Phenol	ppb	ND	ND
Pyrene	ppb	250	2,200
Total PAHs	ppb	580	13,600
TOC			
TOC	ppm	40,800	78,200
TPH			
Petroleum Hydrocarbons (extractable)	ppm	115	2,600
VOCs			
1,1,1-Trichloroethane	ppb	ND	ND
1,1,2,2-Tetrachloroethane	ppb	ND	ND
1,1,2-Trichloroethane	ppb	ND	ND
1,1-Dichloroethane	ppb	61	61
1,1-Dichloroethene	ppb	ND	ND
1,2-Dichloroethane	ppb	ND	ND
1,2-Dichloroethene (total)	ppb	ND	ND
1,2-Dichloropropane	ppb	ND	ND
2-Butanone	ppb	8	50
2-Hexanone	ppb	ND	ND
4-Methyl-2-pentanone	ppb	ND	ND
Acetone	ppb	40	210
Benzene	ppb	8	20
Bromodichloromethane	ppb	ND	ND
Bromoform	ppb	ND	ND
Bromomethane	ppb	ND	ND
Carbon Disulfide	ppb	6	10
Carbon Tetrachloride	ppb	ND	ND
Chlorobenzene	ppb	ND	ND
Chloroethane	ppb	25	25
Chloroform	ppb	ND	ND
Chloromethane	ppb	ND	ND
cis-1,3-Dichloropropene	ppb	ND	ND
Dibromochloromethane	ppb	ND	ND
Ethylbenzene	ppb	ND	ND
Methylene Chloride	ppb	ND	ND
Styrene	ppb	ND	ND

Table 3-30
1996 Newark Bay Reach A Sediment Data from Tierra (1996a)

Analyte	Units	Minimum Detect	Maximum Detect
Tetrachloroethene	ppb	ND	ND
Toluene	ppb	ND	ND
Total BTEX	ppb	11	50
Total Xylenes	ppb	11	42
trans-1,3-Dichloropropene	ppb	ND	ND
Trichloroethene	ppb	ND	ND
Vinyl Chloride	ppb	ND	ND

Notes:
BTEX = benzene, toluene, ethylbenzene, and xylene
BHC = beta hexachlorocyclohexane
HMW = high molecular weight
LMW = low molecular weight
ND = not detected
PAHs = polycyclic aromatic hydrocarbons
PCBs = polychlorinated biphenyls
PCDD/Fs = polychlorinated dibenzo-*p*-dioxins and dibenzofurans
ppb = parts per billion
ppm = parts per million
ppt = parts per trillion
SVOCs = semivolatile organic compounds
TOC = total organic carbon
TPH = total petroleum hydrocarbons
VOCs = volatile organic compounds

Table 3-31
1997 Newark Bay Reach B,C,D Sediment Data from Tierra (1997a)

Analyte	Units	Minimum Detect	Maximum Detect
Cyanide			
Total Cyanide	ppm	ND	ND
Herbicides			
2,4,5-T	ppb	10	57
2,4,5-TP (Silvex)	ppb	18	69
2,4-D	ppb	45	450
2,4-DB	ppb	430	430
Dalapon	ppb	ND	ND
Dicamba	ppb	32	180
Dichloroprop	ppb	240	1,100
Dinoseb	ppb	ND	ND
MCPA	ppb	8,300	45,000
MCPP	ppb	23,000	75,000
Inorganic Chemicals			
Ag	ppm	2.4	5.2
Al	ppm	10,900	28,000
As	ppm	10.5	19.7
Ba	ppm	129	425
Be	ppm	0.52	0.8
Ca	ppm	6,900	13,300
Cd	ppm	1.7	7.1
Co	ppm	9.6	13.5
Cr	ppm	95.4	233
Cu	ppm	128	284
Fe	ppm	26,100	37,800
Hg	ppm	1.8	4.6
K	ppm	2,730	6,040
Mg	ppm	7,390	10,300
Mn	ppm	328	666
Na	ppm	7,420	16,200
Ni	ppm	32.6	46.3
Pb	ppm	121	539
Sb	ppm	0.63	1.9
Se	ppm	0.86	2.2
Ti	ppm	289	568
Tl	ppm	0.71	0.76
V	ppm	31.9	54.9
Zn	ppm	229	733

Table 3-31
1997 Newark Bay Reach B,C,D Sediment Data from Tierra (1997a)

Analyte	Units	Minimum Detect	Maximum Detect
PCB Congeners			
PCB-1	ppb	4.7	4.7
PCB-10	ppb	ND	ND
PCB-101	ppb	21	84
PCB-105	ppb	9.8	33
PCB-107	ppb	1.1	5.3
PCB-115	ppb	0.86	2.6
PCB-118	ppb	20	69
PCB-119	ppb	0.57	1.3
PCB-12	ppb	1.2	1.4
PCB-122	ppb	1.1	1.8
PCB-123	ppb	0.3	2.1
PCB-126	ppb	1.5	1.5
PCB-128	ppb	2.4	13
PCB-129	ppb	0.96	9.3
PCB-135	ppb	3.8	21
PCB-136	ppb	3.6	16
PCB-137	ppb	0.87	3
PCB-138	ppb	23	110
PCB-141	ppb	2.9	19
PCB-143	ppb	ND	ND
PCB-15	ppb	15	26
PCB-151	ppb	4.7	28
PCB-153	ppb	18	99
PCB-156	ppb	1.9	8.4
PCB-157	ppb	0.84	4.6
PCB-158	ppb	1.9	11
PCB-16	ppb	5.2	28
PCB-165	ppb	1	1.4
PCB-167	ppb	0.53	2.6
PCB-168	ppb	ND	ND
PCB-17	ppb	6.9	20
PCB-170	ppb	5	35
PCB-171	ppb	0.7	7.6
PCB-174	ppb	3.6	35
PCB-176	ppb	0.47	1.3
PCB-177	ppb	3.5	20

Table 3-31
1997 Newark Bay Reach B,C,D Sediment Data from Tierra (1997a)

Analyte	Units	Minimum Detect	Maximum Detect
PCB-179	ppb	2.3	19
PCB-18	ppb	12	46
PCB-180	ppb	12	80
PCB-183	ppb	3	20
PCB-185	ppb	0.79	3.5
PCB-187	ppb	7.6	44
PCB-189	ppb	0.46	2.2
PCB-19	ppb	1.4	4.3
PCB-190	ppb	2	4.8
PCB-191	ppb	0.82	0.82
PCB-193	ppb	0.67	1.5
PCB-194	ppb	2.6	19
PCB-195	ppb	1.7	9.5
PCB-196	ppb	2.4	12
PCB-198	ppb	0.86	1.6
PCB-199	ppb	0.84	1.1
PCB-20	ppb	0.3	54
PCB-201	ppb	2.9	37
PCB-202	ppb	2	6.4
PCB-205	ppb	ND	ND
PCB-206	ppb	1.7	11
PCB-207	ppb	0.67	1
PCB-208	ppb	1.8	5
PCB-209	ppb	3.6	47
PCB-22	ppb	6.8	18
PCB-25	ppb	3.6	7.5
PCB-26	ppb	6.4	13
PCB-27	ppb	1.7	3.2
PCB-28	ppb	32	64
PCB-29	ppb	1.2	35
PCB-3	ppb	2.8	7.1
PCB-31	ppb	23	52
PCB-33	ppb	6.5	52
PCB-37	ppb	13	52
PCB-4	ppb	1.6	34
PCB-40	ppb	4	14
PCB-41	ppb	10	31

Table 3-31
1997 Newark Bay Reach B,C,D Sediment Data from Tierra (1997a)

Analyte	Units	Minimum Detect	Maximum Detect
PCB-42	ppb	7.1	22
PCB-44	ppb	17	54
PCB-45	ppb	2.5	9.4
PCB-47	ppb	10	23
PCB-49	ppb	20	61
PCB-5	ppb	0.2	2.7
PCB-52	ppb	21	79
PCB-53	ppb	3.5	13
PCB-56	ppb	9.6	31
PCB-6	ppb	0.78	3.8
PCB-66	ppb	25	59
PCB-7	ppb	1.1	1.1
PCB-70	ppb	24	74
PCB-72	ppb	1.1	6.4
PCB-74	ppb	12	32
PCB-75	ppb	0.44	1.8
PCB-77	ppb	4.1	9.8
PCB-8	ppb	5.6	21
PCB-82	ppb	2.4	9.8
PCB-83	ppb	1.4	5.4
PCB-84	ppb	9.6	28
PCB-85	ppb	3	11
PCB-87	ppb	7.01	30.4
PCB-9	ppb	0.66	3.7
PCB-91	ppb	3.3	15
PCB-92	ppb	2.9	14
PCB-97	ppb	6.4	26
PCB-99	ppb	10	32
Total PCBs - Congeners (NOAA, 1989)	ppb	512	1,920
Total PCBs - Sum of Coplanar Congeners	ppb	59.4	247
PCDD/Fs			
1,2,3,4,6,7,8-HpCDD	ppt	410	1,100
1,2,3,4,6,7,8-HpCDF	ppt	220	450
1,2,3,4,7,8,9-HpCDF	ppt	8.4	20
1,2,3,4,7,8-HxCDD	ppt	4.8	9.9
1,2,3,4,7,8-HxCDF	ppt	33	64
1,2,3,6,7,8-HxCDD	ppt	20	51

Table 3-31
1997 Newark Bay Reach B,C,D Sediment Data from Tierra (1997a)

Analyte	Units	Minimum Detect	Maximum Detect
1,2,3,6,7,8-HxCDF	ppt	12	26
1,2,3,7,8,9-HxCDD	ppt	11	26
1,2,3,7,8,9-HxCDF	ppt	3	6.9
1,2,3,7,8-PeCDD	ppt	4.1	9.7
1,2,3,7,8-PeCDF	ppt	7.2	14
2,3,4,6,7,8-HxCDF	ppt	12	24
2,3,4,7,8-PeCDF	ppt	14	30
2,3,7,8-TCDD	ppt	41	110
2,3,7,8-TCDF	ppt	19	39
OCDD	ppt	4,000	13,000
OCDF	ppt	350	720
Total 2,3,7,8-Congeners	ppt	5,230	15,500
Pesticides/PCBs			
4,4'-DDD	ppb	13	24
4,4'-DDE	ppb	8.3	30
4,4'-DDT	ppb	5.9	30
Aldrin	ppb	15	21
Alpha-BHC	ppb	ND	ND
Aroclor-1016	ppb	ND	ND
Aroclor-1221	ppb	ND	ND
Aroclor-1232	ppb	ND	ND
Aroclor-1242	ppb	51	490
Aroclor-1248	ppb	ND	ND
Aroclor-1254	ppb	53	810
Aroclor-1260	ppb	45	610
Beta-BHC	ppb	ND	ND
Chlordane	ppb	ND	ND
Delta-BHC	ppb	2.7	3
Dieldrin	ppb	ND	ND
Endosulfan I	ppb	ND	ND
Endosulfan II	ppb	ND	ND
Endosulfan Sulfate	ppb	29	29
Endrin	ppb	ND	ND
Endrin Aldehyde	ppb	20	20
Endrin Ketone	ppb	ND	ND
Gamma-BHC (Lindane)	ppb	ND	ND
Heptachlor	ppb	ND	ND

Table 3-31
1997 Newark Bay Reach B,C,D Sediment Data from Tierra (1997a)

Analyte	Units	Minimum Detect	Maximum Detect
Heptachlor Epoxide	ppb	ND	ND
Methoxychlor	ppb	ND	ND
Total DDT	ppb	10	54
Total PCBs - Aroclors	ppb	96	1,910
Toxaphene	ppb	ND	ND
SVOCs			
1,2,4-Trichlorobenzene	ppb	ND	ND
1,2-Dichlorobenzene	ppb	ND	ND
1,3-Dichlorobenzene	ppb	ND	ND
1,4-Dichlorobenzene	ppb	ND	ND
2,4,5-Trichlorophenol	ppb	ND	ND
2,4,6-Trichlorophenol	ppb	ND	ND
2,4-Dichlorophenol	ppb	ND	ND
2,4-Dimethylphenol	ppb	210	210
2,4-Dinitrophenol	ppb	ND	ND
2,4-Dinitrotoluene	ppb	ND	ND
2,6-Dinitrotoluene	ppb	ND	ND
2-Chloronaphthalene	ppb	ND	ND
2-Chlorophenol	ppb	ND	ND
2-Methylnaphthalene	ppb	76	1,500
2-Methylphenol	ppb	ND	ND
2-Nitroaniline	ppb	ND	ND
2-Nitrophenol	ppb	ND	ND
3,3'-Dichlorobenzidine	ppb	730	730
3-Nitroaniline	ppb	ND	ND
4,6-Dinitro-2-methylphenol	ppb	ND	ND
4-Bromophenyl phenyl ether	ppb	ND	ND
4-Chloro-3-methylphenol	ppb	ND	ND
4-Chloroaniline	ppb	ND	ND
4-Chlorophenyl phenyl ether	ppb	ND	ND
4-Methylphenol	ppb	ND	ND
4-Nitroaniline	ppb	ND	ND
4-Nitrophenol	ppb	ND	ND
Acenaphthene	ppb	110	1,500
Acenaphthylene	ppb	77	77
Aniline	ppb	ND	ND
Anthracene	ppb	100	770

Table 3-31
1997 Newark Bay Reach B,C,D Sediment Data from Tierra (1997a)

Analyte	Units	Minimum Detect	Maximum Detect
Azobenzene	ppb	ND	ND
Benzidine	ppb	ND	ND
Benzo(a)anthracene	ppb	250	1,500
Benzo(a)pyrene	ppb	290	1,100
Benzo(b)fluoranthene	ppb	460	2,200
Benzo(g,h,i)perylene	ppb	180	1,200
Benzo(k)fluoranthene	ppb	ND	ND
Benzoic Acid	ppb	ND	ND
Benzyl Alcohol	ppb	ND	ND
bis(2-Chloroethoxy)methane	ppb	ND	ND
bis(2-Chloroethyl)ether	ppb	ND	ND
bis(2-Chloroisopropyl)ether	ppb	ND	ND
bis(2-Ethylhexyl)phthalate	ppb	2,300	22,000
Butyl benzyl phthalate	ppb	200	200
Carbazole	ppb	100	1,100
Chrysene	ppb	340	1,700
Dibenzo(a,h)anthracene	ppb	96	200
Dibenzofuran	ppb	92	650
Diethyl phthalate	ppb	ND	ND
Dimethylphthalate	ppb	ND	ND
Di-n-Butylphthalate	ppb	ND	ND
Di-n-Octylphthalate	ppb	210	3,000
Fluoranthene	ppb	560	4,900
Fluorene	ppb	100	800
Hexachlorobenzene	ppb	ND	ND
Hexachlorobutadiene	ppb	ND	ND
Hexachlorocyclopentadiene	ppb	ND	ND
Hexachloroethane	ppb	ND	ND
HMW PAHs	ppb	2,660	17,400
Indeno(1,2,3-cd)pyrene	ppb	140	880
Isophorone	ppb	ND	ND
LMW PAHs	ppb	260	12,000
Naphthalene	ppb	100	6,800
Nitrobenzene	ppb	ND	ND
N-Nitrosodimethylamine	ppb	ND	ND
N-Nitroso-di-n-propylamine	ppb	ND	ND
N-Nitrosodiphenylamine	ppb	ND	ND

Table 3-31
1997 Newark Bay Reach B,C,D Sediment Data from Tierra (1997a)

Analyte	Units	Minimum Detect	Maximum Detect
Pentachlorophenol	ppb	ND	ND
Phenanthrene	ppb	260	2,400
Phenol	ppb	ND	ND
Pyrene	ppb	440	3,900
Pyridine	ppb	ND	ND
Total PAHs	ppb	3,320	22,700
TOC			
TOC	ppm	18,100	63,200
TPH			
Petroleum Hydrocarbons (diesel fuel range)	ppm	880	2,300
Petroleum Hydrocarbons (motor oil range)	ppm	590	4,000
VOCs			
1,1,1,2-Tetrachloroethane	ppb	ND	ND
1,1,1-Trichloroethane	ppb	ND	ND
1,1,2,2-Tetrachloroethane	ppb	ND	ND
1,1,2-Trichloroethane	ppb	ND	ND
1,1-Dichloroethane	ppb	ND	ND
1,1-Dichloroethene	ppb	ND	ND
1,2,3-Trichloropropane	ppb	ND	ND
1,2,4-Trichlorobenzene	ppb	ND	ND
1,2-Dibromo-3-chloropropane	ppb	ND	ND
1,2-Dibromoethane	ppb	ND	ND
1,2-Dichlorobenzene	ppb	ND	ND
1,2-Dichloroethane	ppb	6.2	6.2
1,2-Dichloroethene (total)	ppb	ND	ND
1,2-Dichloropropane	ppb	ND	ND
1,3-Dichlorobenzene	ppb	ND	ND
1,4-Dichlorobenzene	ppb	ND	ND
1,4-Dioxane	ppb	620	620
2-Butanone	ppb	16	140
2-Chloroethylvinylether	ppb	ND	ND
2-Hexanone	ppb	ND	ND
4-Methyl-2-pentanone	ppb	ND	ND
Acetone	ppb	100	700
Acrolein	ppb	22	25
Acrylonitrile	ppb	ND	ND
Allyl Chloride	ppb	ND	ND

Table 3-31
1997 Newark Bay Reach B,C,D Sediment Data from Tierra (1997a)

Analyte	Units	Minimum Detect	Maximum Detect
Benzene	ppb	3.1	7.8
Bromochloromethane	ppb	ND	ND
Bromodichloromethane	ppb	ND	ND
Bromoform	ppb	ND	ND
Bromomethane	ppb	ND	ND
Carbon Disulfide	ppb	2	36
Carbon Tetrachloride	ppb	ND	ND
Chlorobenzene	ppb	ND	ND
Chloroethane	ppb	ND	ND
Chloroform	ppb	ND	ND
Chloromethane	ppb	ND	ND
Chloroprene	ppb	ND	ND
cis-1,2-Dichloroethene	ppb	ND	ND
cis-1,3-Dichloropropene	ppb	ND	ND
cis-1,4-Dichloro-2-butene	ppb	ND	ND
Dibromochloromethane	ppb	ND	ND
Dibromomethane	ppb	ND	ND
Dichlorodifluoromethane	ppb	ND	ND
Ethyl Methacrylate	ppb	ND	ND
Ethylbenzene	ppb	2	24
Freon TF	ppb	ND	ND
Hexachlorobutadiene	ppb	ND	ND
Isobutyl Alcohol	ppb	ND	ND
Isopropylbenzene	ppb	2.3	20
Methacrylonitrile	ppb	15	15
Methyl Iodide	ppb	ND	ND
Methyl Methacrylate	ppb	ND	ND
Methylene Chloride	ppb	ND	ND
Methyl-t-Butyl Ether	ppb	ND	ND
Naphthalene	ppb	5.7	950
Propionitrile	ppb	ND	ND
Styrene	ppb	ND	ND
Tetrachloroethene	ppb	ND	ND
Tetrahydrofuran	ppb	ND	ND
Toluene	ppb	1.5	74
Total BTEX	ppb	8.7	134
Total Xylenes	ppb	6.5	110

Table 3-31
1997 Newark Bay Reach B,C,D Sediment Data from Tierra (1997a)

Analyte	Units	Minimum Detect	Maximum Detect
trans-1,2-Dichloroethene	ppb	ND	ND
trans-1,3-Dichloropropene	ppb	ND	ND
trans-1,4-Dichloro-2-butene	ppb	ND	ND
Trichloroethene	ppb	ND	ND
Trichlorofluoromethane	ppb	ND	ND
Vinyl Acetate	ppb	ND	ND
Vinyl Chloride	ppb	ND	ND

Notes:
BTEX = benzene, toluene, ethylbenzene, and xylene
BHC = beta hexachlorocyclohexane
HMW = high molecular weight
LMW = low molecular weight
ND = not detected
NOAA = National Oceanic and Atmospheric Administration
PAHs = polycyclic aromatic hydrocarbons
PCBs = polychlorinated biphenyls
PCDD/Fs = polychlorinated dibenzo-*p*-dioxins and dibenzofurans
ppb = parts per billion
ppm = parts per million
ppt = parts per trillion
SVOCs = semivolatile organic compounds
TOC = total organic carbon
TPH = total petroleum hydrocarbons
VOCs = volatile organic compounds

Table 3-32
1997 Passaic River CSO Sediment Data from Tierra (1997b)

Analyte	Units	Minimum Detect	Maximum Detect
Cyanide			
Total Cyanide	ppm	63.7	63.7
Herbicides			
2,4,5-T	ppb	ND	ND
2,4,5-TP (Silvex)	ppb	ND	ND
2,4-D	ppb	ND	ND
Inorganic Chemicals			
Ag	ppm	1.9	1.9
Al	ppm	4,350	4,350
As	ppm	0.7	0.7
Ba	ppm	93	93
Be	ppm	0.33	0.33
Ca	ppm	3,450	3,450
Cd	ppm	ND	ND
Co	ppm	3.3	3.3
Cr	ppm	18	18
Cu	ppm	155	155
Fe	ppm	7,900	7,900
Hg	ppm	ND	ND
K	ppm	360	360
Mg	ppm	1,870	1,870
Mn	ppm	105	105
Na	ppm	220	220
Ni	ppm	18	18
Pb	ppm	500	500
Sb	ppm	ND	ND
Se	ppm	ND	ND
Tl	ppm	ND	ND
V	ppm	9	9
Zn	ppm	311	311
Miscellaneous			
Ammonia Nitrogen	ppm	22	22
Nitrate Nitrogen	ppm	0.2	0.2
Phosphorus	ppm	410	410
TKN	ppm	320	320
PCB Congeners			
PCB-1	ppb	0.041	0.041
PCB-105	ppb	ND	ND
PCB-118	ppb	3.2	3.2
PCB-126	ppb	ND	ND

Table 3-32
1997 Passaic River CSO Sediment Data from Tierra (1997b)

Analyte	Units	Minimum Detect	Maximum Detect
PCB-15	ppb	0.36	0.36
PCB-156	ppb	0.94	0.94
PCB-169	ppb	ND	ND
PCB-180	ppb	18	18
PCB-194	ppb	5.7	5.7
PCB-206	ppb	1.1	1.1
PCB-209	ppb	ND	ND
PCB-28	ppb	1.7	1.7
PCB-52	ppb	2.5	2.5
PCB-77	ppb	0.14	0.14
Total PCBs - Sum of Coplanar Congeners	ppb	23	23
PCB Homologue Groups			
Total Decachlorobiphenyl	ppb	ND	ND
Total Dichlorobiphenyl	ppb	1.4	1.4
Total Heptachlorobiphenyl	ppb	66	66
Total Hexachlorobiphenyl	ppb	77	77
Total Monochlorobiphenyl	ppb	0.084	0.084
Total Nonachlorobiphenyl	ppb	1.7	1.7
Total Octachlorobiphenyl	ppb	18	18
Total PCBs - Homologue Groups	ppb	245	245
Total Pentachlorobiphenyl	ppb	32	32
Total Tetrachlorobiphenyl	ppb	39	39
Total Trichlorobiphenyl	ppb	8.9	8.9
PCDD/Fs			
1,2,3,4,6,7,8-HpCDD	ppt	43.91	43.91
1,2,3,4,6,7,8-HpCDF	ppt	17.34	17.34
1,2,3,4,7,8,9-HpCDF	ppt	ND	ND
1,2,3,4,7,8-HxCDD	ppt	0.57	0.57
1,2,3,4,7,8-HxCDF	ppt	4	4
1,2,3,6,7,8-HxCDD	ppt	2.27	2.27
1,2,3,6,7,8-HxCDF	ppt	2.11	2.11
1,2,3,7,8,9-HxCDD	ppt	1.5	1.5
1,2,3,7,8,9-HxCDF	ppt	1.66	1.66
1,2,3,7,8-PeCDD	ppt	ND	ND
1,2,3,7,8-PeCDF	ppt	ND	ND
2,3,4,6,7,8-HxCDF	ppt	3.45	3.45
2,3,4,7,8-PeCDF	ppt	4.63	4.63
2,3,7,8-TCDD	ppt	ND	ND
2,3,7,8-TCDF	ppt	0.4	0.4
OCDD	ppt	364.03	364.03

Table 3-32
1997 Passaic River CSO Sediment Data from Tierra (1997b)

Analyte	Units	Minimum Detect	Maximum Detect
OCDF	ppt	31.65	31.65
Total 2,3,7,8-Congeners	ppt	478	478
Total HpCDD	ppt	80.7	80.7
Total HpCDF	ppt	39.04	39.04
Total HxCDD	ppt	4.75	4.75
Total HxCDF	ppt	36.23	36.23
Total PCDDs	ppt	451	451
Total PCDFs	ppt	149	149
Total PeCDD	ppt	ND	ND
Total PeCDF	ppt	28.56	28.56
Total TCDD	ppt	1.36	1.36
Total TCDF	ppt	13.11	13.11
Pesticides/PCBs			
4,4'-DDD	ppb	ND	ND
4,4'-DDE	ppb	ND	ND
4,4'-DDT	ppb	ND	ND
Aldrin	ppb	ND	ND
Alpha-BHC	ppb	ND	ND
Alpha-Chlordane	ppb	ND	ND
Aroclor-1016	ppb	ND	ND
Aroclor-1221	ppb	ND	ND
Aroclor-1232	ppb	ND	ND
Aroclor-1242	ppb	100	500
Aroclor-1248	ppb	ND	ND
Aroclor-1254	ppb	ND	ND
Aroclor-1260	ppb	300	300
Beta-BHC	ppb	ND	ND
Delta-BHC	ppb	ND	ND
Dieldrin	ppb	ND	ND
Endosulfan I	ppb	ND	ND
Endosulfan II	ppb	10.7	10.7
Endosulfan Sulfate	ppb	ND	ND
Endrin	ppb	ND	ND
Endrin Aldehyde	ppb	ND	ND
Endrin Ketone	ppb	ND	ND
Gamma-BHC (Lindane)	ppb	ND	ND
Gamma-Chlordane	ppb	6.7	6.7
Heptachlor	ppb	ND	ND
Heptachlor Epoxide	ppb	ND	ND
Methoxychlor	ppb	ND	ND

Table 3-32
1997 Passaic River CSO Sediment Data from Tierra (1997b)

Analyte	Units	Minimum Detect	Maximum Detect
Total Alpha + Gamma Chlordane	ppb	6.7	6.7
Total DDT	ppb	ND	ND
Total PCBs - Aroclors	ppb	100	800
Toxaphene	ppb	ND	ND
Physical Property			
Total Solids (Percent)	%	33.3	75.4
TOC			
TOC	ppm	ND	ND
TPH			
TPH-DRO	ppm	ND	ND

Notes:
BHC = beta hexachlorocyclohexane
CSO = combined sewer outfall
ND = not detected
PCBs = polychlorinated biphenyls
PCDD/Fs = polychlorinated dibenzo-*p*-dioxins and dibenzofurans
ppb = parts per billion
ppm = parts per million
ppt = parts per trillion
TKN = total Kjeldahl nitrogen
TOC = total organic carbon
TPH = total petroleum hydrocarbons
TPH-DRO = total petroleum hydrocarbons-diesel range oil

Table 3-33
1998 Newark Bay Elizabeth Channel Sediment Data from Tierra (1998)

Analyte	Units	Minimum Detect	Maximum Detect
Cyanide			
Total Cyanide	ppm	0.28	0.38
Herbicides			
2,4,5-T	ppb	ND	ND
2,4,5-TP (Silvex)	ppb	ND	ND
2,4-D	ppb	ND	ND
2,4-DB	ppb	ND	ND
Inorganic Chemicals			
Ag	ppm	1.7	4.3
Al	ppm	12,400	17,400
As	ppm	12	30
Ba	ppm	114	751
Be	ppm	0.87	1.17
Ca	ppm	7,820	19,400
Cd	ppm	1.65	14.2
Co	ppm	9.4	12.6
Cr	ppm	71.1	608
Cu	ppm	105	299
Fe	ppm	23,000	34,300
Hg	ppm	1.19	4.7
K	ppm	2,520	4,360
Mg	ppm	5,560	9,980
Mn	ppm	252	604
Na	ppm	5,510	12,100
Ni	ppm	33	63
Pb	ppm	69	1,060
Sb	ppm	6.1	6.1
Se	ppm	0.38	1.13
Ti	ppm	341	466
Tl	ppm	ND	ND
V	ppm	34.5	49.3
Zn	ppm	212	315
PCB Congeners			
PCB-1	ppb	1.2	14
PCB-105	ppb	7.1	100
PCB-110	ppb	24	440
PCB-114	ppb	0.62	8.7

Table 3-33
1998 Newark Bay Elizabeth Channel Sediment Data from Tierra (1998)

Analyte	Units	Minimum Detect	Maximum Detect
PCB-118	ppb	18	290
PCB-119	ppb	0.75	25
PCB-123	ppb	2.5	54
PCB-126	ppb	0.09	0.69
PCB-128/167	ppb	3.4	76
PCB-138/158	ppb	22	740
PCB-149	ppb	15	730
PCB-15	ppb	15	54
PCB-151	ppb	4.6	240
PCB-153/168	ppb	17	740
PCB-156	ppb	1.7	49
PCB-157	ppb	0.35	6.1
PCB-169	ppb	ND	ND
PCB-170	ppb	6.8	330
PCB-177	ppb	3.1	150
PCB-18	ppb	22	310
PCB-180	ppb	13	670
PCB-183	ppb	2.8	140
PCB-184	ppb	ND	ND
PCB-187	ppb	6.5	300
PCB-189	ppb	0.22	9.8
PCB-194	ppb	2.5	98
PCB-195	ppb	1.3	57
PCB-201	ppb	4.5	150
PCB-202	ppb	0.96	18
PCB-206	ppb	2.5	48
PCB-207	ppb	0.22	2.7
PCB-209	ppb	3.1	96
PCB-28	ppb	52	620
PCB-3	ppb	0.82	12
PCB-37	ppb	11	78
PCB-44	ppb	20	380
PCB-49	ppb	19	290
PCB-52	ppb	29	440
PCB-66	ppb	22	290
PCB-70	ppb	19	360
PCB-74	ppb	10	160

Table 3-33
1998 Newark Bay Elizabeth Channel Sediment Data from Tierra (1998)

Analyte	Units	Minimum Detect	Maximum Detect
PCB-77	ppb	3.1	28
PCB-8	ppb	6.5	120
PCB-81	ppb	0.12	3.2
PCB-87/115	ppb	7	160
PCB-90/101	ppb	23	690
PCB-99	ppb	11	300
Total PCBs - Congeners (NOAA, 1989)	ppb	513	12,700
Total PCBs - Sum of Coplanar Congeners	ppb	56.9	1,620
PCB Homologue Groups			
Total Dichlorobiphenyl	ppb	33	310
Total Heptachlorobiphenyl	ppb	43	2,100
Total Hexachlorobiphenyl	ppb	80	3,300
Total Monochlorobiphenyl	ppb	2.3	28
Total Nonachlorobiphenyl	ppb	3.6	61
Total Octachlorobiphenyl	ppb	14	460
Total PCBs - Homologue Groups	ppb	616	14,200
Total Pentachlorobiphenyl	ppb	130	3,100
Total Tetrachlorobiphenyl	ppb	190	3,000
Total Trichlorobiphenyl	ppb	120	1,800
PCDD/Fs			
1,2,3,4,6,7,8-HpCDD	ppt	430	1,700
1,2,3,4,6,7,8-HpCDF	ppt	190	970
1,2,3,4,7,8,9-HpCDF	ppt	6.7	41
1,2,3,4,7,8-HxCDD	ppt	3.7	14
1,2,3,4,7,8-HxCDF	ppt	28	140
1,2,3,6,7,8-HxCDD	ppt	18	110
1,2,3,6,7,8-HxCDF	ppt	9.8	36
1,2,3,7,8,9-HxCDD	ppt	7.6	35
1,2,3,7,8,9-HxCDF	ppt	2.2	10
1,2,3,7,8-PeCDD	ppt	2.2	11
1,2,3,7,8-PeCDF	ppt	4.7	15
2,3,4,6,7,8-HxCDF	ppt	6.7	29
2,3,4,7,8-PeCDF	ppt	9	39
2,3,7,8-TCDD	ppt	39	840
2,3,7,8-TCDF	ppt	14	30
OCDD	ppt	5,000	22,000
OCDF	ppt	330	1,900

Table 3-33
1998 Newark Bay Elizabeth Channel Sediment Data from Tierra (1998)

Analyte	Units	Minimum Detect	Maximum Detect
Total 2,3,7,8-Congeners	ppt	6,390	27,900
Total HpCDD	ppt	1,400	4,100
Total HpCDF	ppt	360	2,200
Total HxCDD	ppt	290	960
Total HxCDF	ppt	160	900
Total PCDDs	ppt	6,830	28,100
Total PCDFs	ppt	1,210	8,100
Total PeCDD	ppt	30	160
Total PeCDF	ppt	120	1,100
Total TCDD	ppt	81	920
Total TCDF	ppt	240	2,000
Pesticides/PCBs			
4,4'-DDD	ppb	18.4	23.1
4,4'-DDE	ppb	14.8	123
4,4'-DDT	ppb	33.5	33.5
Aldrin	ppb	ND	ND
Alpha-BHC	ppb	3.6	10.1
Alpha-Chlordane	ppb	ND	ND
Aroclor-1016	ppb	ND	ND
Aroclor-1221	ppb	ND	ND
Aroclor-1232	ppb	ND	ND
Aroclor-1242	ppb	ND	ND
Aroclor-1248	ppb	219	3,580
Aroclor-1254	ppb	ND	ND
Aroclor-1260	ppb	95	4,990
Beta-BHC	ppb	ND	ND
Delta-BHC	ppb	ND	ND
Dieldrin	ppb	9.7	106
Endosulfan I	ppb	ND	ND
Endosulfan II	ppb	8.2	8.2
Endosulfan Sulfate	ppb	7.3	10.8
Endrin	ppb	83	83
Endrin Aldehyde	ppb	ND	ND
Endrin Ketone	ppb	ND	ND
Gamma-BHC (Lindane)	ppb	7.4	7.4
Gamma-Chlordane	ppb	3.1	3.1
Heptachlor	ppb	ND	ND

Table 3-33
1998 Newark Bay Elizabeth Channel Sediment Data from Tierra (1998)

Analyte	Units	Minimum Detect	Maximum Detect
Heptachlor Epoxide	ppb	7.1	7.1
Methoxychlor	ppb	ND	ND
Total Alpha + Gamma Chlordane	ppb	3.1	3.1
Total DDT	ppb	14.8	123
Total PCBs - Aroclors	ppb	219	8,570
Toxaphene	ppb	310	310
Physical Property			
Percent Moisture	%	40.7	61.6
SVOCs			
1,2,4-Trichlorobenzene	ppb	2,200	3,300
1,2-Dichlorobenzene	ppb	2,300	3,100
1,3-Dichlorobenzene	ppb	ND	ND
1,4-Dichlorobenzene	ppb	440	440
2,4,5-Trichlorophenol	ppb	ND	ND
2,4,6-Trichlorophenol	ppb	ND	ND
2,4-Dichlorophenol	ppb	ND	ND
2,4-Dimethylphenol	ppb	440	440
2,4-Dinitrophenol	ppb	ND	ND
2,4-Dinitrotoluene	ppb	ND	ND
2,6-Dinitrotoluene	ppb	ND	ND
2-Chloronaphthalene	ppb	ND	ND
2-Chlorophenol	ppb	ND	ND
2-Methylnaphthalene	ppb	2,800	4,000
2-Methylphenol	ppb	ND	ND
2-Nitroaniline	ppb	ND	ND
2-Nitrophenol	ppb	ND	ND
3&4-Methylphenol	ppb	ND	ND
3,3'-Dichlorobenzidine	ppb	ND	ND
3-Nitroaniline	ppb	ND	ND
4,6-Dinitro-2-methylphenol	ppb	ND	ND
4-Bromophenyl phenyl ether	ppb	ND	ND
4-Chloro-3-methylphenol	ppb	ND	ND
4-Chloroaniline	ppb	ND	ND
4-Chlorophenyl phenyl ether	ppb	ND	ND
4-Methylphenol	ppb	ND	ND
4-Nitroaniline	ppb	ND	ND
4-Nitrophenol	ppb	ND	ND

Table 3-33
1998 Newark Bay Elizabeth Channel Sediment Data from Tierra (1998)

Analyte	Units	Minimum Detect	Maximum Detect
Acenaphthene	ppb	2,700	3,800
Acenaphthylene	ppb	2,500	3,600
Anthracene	ppb	2,600	3,700
Benzo(a)anthracene	ppb	550	1700
Benzo(a)pyrene	ppb	520	1000
Benzo(b)fluoranthene	ppb	2,800	4,100
Benzo(g,h,i)perylene	ppb	340	550
Benzo(k)fluoranthene	ppb	420	420
bis(2-Chloroethoxy)methane	ppb	ND	ND
bis(2-Chloroethyl)ether	ppb	ND	ND
bis(2-Chloroisopropyl)ether	ppb	ND	ND
bis(2-Ethylhexyl)phthalate	ppb	40,000	40,000
Butyl benzyl phthalate	ppb	ND	ND
Carbazole	ppb	2,500	3,600
Chrysene	ppb	430	1,600
Di-n-Butylphthalate	ppb	ND	ND
Di-n-Octylphthalate	ppb	2,500	3,400
Dibenzo(a,h)anthracene	ppb	ND	ND
Dibenzofuran	ppb	2,600	3,700
Diethyl phthalate	ppb	ND	ND
Dimethylphthalate	ppb	ND	ND
Fluoranthene	ppb	3,100	6,200
Fluorene	ppb	3,000	4,200
Hexachlorobenzene	ppb	ND	ND
Hexachlorobutadiene	ppb	ND	ND
Hexachlorocyclopentadiene	ppb	ND	ND
Hexachloroethane	ppb	ND	ND
HMW PAHs	ppb	8,900	18,500
Indeno(1,2,3-cd)pyrene	ppb	330	660
Isophorone	ppb	ND	ND
LMW PAHs	ppb	18,800	57,500
N-Nitroso-di-n-propylamine	ppb	ND	ND
N-Nitrosodiphenylamine	ppb	2,900	2,900
Naphthalene	ppb	2,400	3,500
Nitrobenzene	ppb	ND	ND
Pentachlorophenol	ppb	ND	ND
Phenanthrene	ppb	2,800	37,000

Table 3-33
1998 Newark Bay Elizabeth Channel Sediment Data from Tierra (1998)

Analyte	Units	Minimum Detect	Maximum Detect
Phenol	ppb	ND	ND
Pyrene	ppb	830	3,400
Total PAHs	ppb	27,700	71,500
TOC			
TOC	ppm	8,300	9,400
TPH			
Petroleum Hydrocarbons (extractable)	ppm	120	850

Notes:
BHC = beta hexachlorocyclohexane
HMW = high molecular weight
LMW = low molecular weight
ND = not detected
NOAA = National Oceanic and Atmospheric Administration
PAHs = polycyclic aromatic hydrocarbons
PCBs = polychlorinated biphenyls
PCDD/Fs = polychlorinated dibenzo-*p*-dioxins and dibenzofurans
ppb = parts per billion
ppm = parts per million
ppt = parts per trillion
SVOCs = semivolatile organic compounds
TOC = total organic carbon
TPH = total petroleum hydrocarbons

Table 3-34
1999 Newark Bay Reach A, B, C, D Baseline Sediment Data from Tierra (1999a)

Analyte	Units	Minimum Detect	Maximum Detect
Cyanide			
Total Cyanide	ppm	ND	ND
Herbicides			
2,4,5-T	ppb	62	62
2,4,5-TP (Silvex)	ppb	1.44	1.49
2,4-D	ppb	820	1,910
2,4-DB	ppb	81	2,700
Dalapon	ppb	ND	ND
Dicamba	ppb	4	263
Dichloroprop	ppb	ND	ND
Dinoseb	ppb	7.3	11.2
MCPA	ppb	39,000	129,000
MCPP	ppb	8,400	39,000
Pentachlorophenol	ppb	2.81	3.88
Inorganic Chemicals			
Ag	ppm	3.1	5.1
Al	ppm	10,300	22,500
As	ppm	11.5	22.8
Ba	ppm	108	350
Be	ppm	0.68	1.2
Ca	ppm	6,880	27,100
Cd	ppm	2.3	6.6
Co	ppm	7.8	14
Cr	ppm	93	186
Cu	ppm	121	343
Fe	ppm	24,700	38,300
Hg	ppm	1.03	9
K	ppm	2,850	6,800
Mg	ppm	5,380	11,200
Mn	ppm	233	602
Na	ppm	7,800	12,500
Ni	ppm	27	51
Pb	ppm	139	268
Sb	ppm	ND	ND
Se	ppm	0.34	1.22
Tl	ppm	0.28	0.47
V	ppm	34.8	59.2
Zn	ppm	266	821

Table 3-34
1999 Newark Bay Reach A, B, C, D Baseline Sediment Data from Tierra (1999a)

Analyte	Units	Minimum Detect	Maximum Detect
Miscellaneous			
Ammonia Nitrogen	ppm	172	640
TKN	ppm	1,800	3,000
PCB Congeners			
PCB-1	ppb	1.2	3.6
PCB-105	ppb	10	28
PCB-110	ppb	22	67
PCB-114	ppb	0.93	2.5
PCB-115	ppb	4.8	14
PCB-118	ppb	26	69
PCB-119	ppb	0.96	2.6
PCB-123	ppb	2.7	5.8
PCB-126	ppb	0.15	0.56
PCB-128	ppb	5	13
PCB-138	ppb	55	130
PCB-149	ppb	22	51
PCB-15	ppb	16	50
PCB-151	ppb	4	15
PCB-153	ppb	8.8	30
PCB-156	ppb	2.3	6
PCB-157	ppb	0.52	1.4
PCB-158	ppb	2.1	5.7
PCB-167	ppb	1.3	3.2
PCB-168	ppb	21	40
PCB-169	ppb	ND	ND
PCB-170	ppb	7.3	20
PCB-177	ppb	3.7	9.8
PCB-18	ppb	16	88
PCB-180	ppb	16	46
PCB-183	ppb	3.5	9.1
PCB-184	ppb	ND	ND
PCB-187	ppb	7.6	22
PCB-189	ppb	0.29	0.7
PCB-194	ppb	3.5	9.3
PCB-195	ppb	1.3	3.9
PCB-201	ppb	6.2	13
PCB-202	ppb	1.6	2.6
PCB-206	ppb	5	6.8
PCB-207	ppb	0.36	0.54

Table 3-34
1999 Newark Bay Reach A, B, C, D Baseline Sediment Data from Tierra (1999a)

Analyte	Units	Minimum Detect	Maximum Detect
PCB-209	ppb	3.7	18
PCB-28	ppb	50	170
PCB-3	ppb	1.1	2
PCB-37	ppb	14	36
PCB-44	ppb	21	70
PCB-49	ppb	26	72
PCB-52	ppb	29	91
PCB-66	ppb	27	64
PCB-70	ppb	28	59
PCB-74	ppb	13	51
PCB-77	ppb	4.2	9.3
PCB-8	ppb	11	46
PCB-81	ppb	0.38	1
PCB-87	ppb	12	44
PCB-90/101	ppb	30	88
PCB-99	ppb	16	38
Total PCBs - Congeners (NOAA, 1989)	ppb	690	1,790
Total PCBs - Sum of Coplanar Congeners	ppb	73	164
W.H.O. CONGENER TEQ	ppb	0.021	0.069
PCB Homologue Groups			
Total Dichlorobiphenyl	ppb	45	140
Total Heptachlorobiphenyl	ppb	54	150
Total Hexachlorobiphenyl	ppb	140	320
Total Monochlorobiphenyl	ppb	2.8	6
Total Nonachlorobiphenyl	ppb	7	9.8
Total Octachlorobiphenyl	ppb	19	41
Total PCBs - Homologue Groups	ppb	863	2,040
Total Pentachlorobiphenyl	ppb	160	470
Total Tetrachlorobiphenyl	ppb	240	620
Total Trichlorobiphenyl	ppb	160	470
PCDD/Fs			
1,2,3,4,6,7,8-HpCDD	ppt	310	1,100
1,2,3,4,6,7,8-HpCDF	ppt	170	370
1,2,3,4,7,8,9-HpCDF	ppt	7.6	22
1,2,3,4,7,8-HxCDD	ppt	8.5	18
1,2,3,4,7,8-HxCDF	ppt	32	88
1,2,3,6,7,8-HxCDD	ppt	26	47
1,2,3,6,7,8-HxCDF	ppt	14	42
1,2,3,7,8,9-HxCDD	ppt	11	25

Table 3-34
1999 Newark Bay Reach A, B, C, D Baseline Sediment Data from Tierra (1999a)

Analyte	Units	Minimum Detect	Maximum Detect
1,2,3,7,8,9-HxCDF	ppt	3.4	12
1,2,3,7,8-PeCDD	ppt	3.2	15
1,2,3,7,8-PeCDF	ppt	8.7	21
2,3,4,6,7,8-HxCDF	ppt	9.3	16
2,3,4,7,8-PeCDF	ppt	17	34
2,3,7,8-TCDD	ppt	28	190
2,3,7,8-TCDF	ppt	13	38
OCDD	ppt	2,800	7,100
OCDF	ppt	340	680
TEQ (USEPA TEFs)	ppt	67	235
TEQ (W.H.O. TEFs)	ppt	62	234
Total 2,3,7,8-Congeners	ppt	3,950	8,710
Total HpCDD	ppt	710	3,400
Total HpCDF	ppt	290	650
Total HxCDD	ppt	280	510
Total HxCDF	ppt	280	530
Total PCDDs	ppt	4,030	10,700
Total PCDFs	ppt	1,610	3,170
Total PeCDD	ppt	18	76
Total PeCDF	ppt	230	660
Total TCDD	ppt	78	260
Total TCDF	ppt	280	770
4,4'-DDE	ppb	38	225
4,4'-DDT	ppb	54	1,320
Aldrin	ppb	ND	ND
Alpha-BHC	ppb	ND	ND
Alpha-Chlordane	ppb	ND	ND
Aroclor-1016	ppb	ND	ND
Aroclor-1221	ppb	ND	ND
Aroclor-1232	ppb	ND	ND
Aroclor-1242	ppb	ND	ND
Aroclor-1248	ppb	ND	ND
Aroclor-1254	ppb	ND	ND
Aroclor-1260	ppb	ND	ND
Beta-BHC	ppb	ND	ND
Delta-BHC	ppb	ND	ND
Dieldrin	ppb	ND	ND
Endosulfan I	ppb	ND	ND
Endosulfan II	ppb	ND	ND

Table 3-34
1999 Newark Bay Reach A, B, C, D Baseline Sediment Data from Tierra (1999a)

Analyte	Units	Minimum Detect	Maximum Detect
Endosulfan Sulfate	ppb	ND	ND
Endrin	ppb	ND	ND
Endrin Aldehyde	ppb	7	18
Endrin Ketone	ppb	ND	ND
Gamma-BHC (Lindane)	ppb	ND	ND
Gamma-Chlordane	ppb	ND	ND
Heptachlor	ppb	ND	ND
Heptachlor Epoxide	ppb	ND	ND
Methoxychlor	ppb	ND	ND
Total Alpha + Gamma Chlordane	ppb	ND	ND
Total DDT	ppb	39	1,900
Total PCBs - Aroclors	ppb	ND	ND
Toxaphene	ppb	ND	ND
Physical Property			
Percent Moisture	%	49.9	61.8
SVOCs			
1,2,4-Trichlorobenzene	ppb	ND	ND
1,2-Dichlorobenzene	ppb	ND	ND
1,3-Dichlorobenzene	ppb	ND	ND
1,4-Dichlorobenzene	ppb	90	120
2,4,5-Trichlorophenol	ppb	ND	ND
2,4,6-Trichlorophenol	ppb	ND	ND
2,4-Dichlorophenol	ppb	ND	ND
2,4-Dimethylphenol	ppb	ND	ND
2,4-Dinitrophenol	ppb	ND	ND
2,4-Dinitrotoluene	ppb	ND	ND
2,6-Dinitrotoluene	ppb	ND	ND
2-Chloronaphthalene	ppb	ND	ND
2-Chlorophenol	ppb	ND	ND
2-Methylnaphthalene	ppb	87	370
2-Methylphenol	ppb	ND	ND
2-Nitroaniline	ppb	ND	ND
2-Nitrophenol	ppb	ND	ND
3,3'-Dichlorobenzidine	ppb	ND	ND
3-Nitroaniline	ppb	ND	ND
4,6-Dinitro-2-methylphenol	ppb	ND	ND
4-Bromophenyl phenyl ether	ppb	ND	ND
4-Chloro-3-methylphenol	ppb	ND	ND
4-Chloroaniline	ppb	93	93

Table 3-34
1999 Newark Bay Reach A, B, C, D Baseline Sediment Data from Tierra (1999a)

Analyte	Units	Minimum Detect	Maximum Detect
4-Chlorophenyl phenyl ether	ppb	ND	ND
4-Methylphenol	ppb	ND	ND
4-Nitroaniline	ppb	ND	ND
4-Nitrophenol	ppb	ND	ND
Acenaphthene	ppb	77	4,400
Acenaphthylene	ppb	100	1,200
Anthracene	ppb	260	4,700
Benzo(a)anthracene	ppb	550	5,800
Benzo(a)pyrene	ppb	580	4,200
Benzo(b)fluoranthene	ppb	790	4,000
Benzo(g,h,i)perylene	ppb	310	1,800
Benzo(k)fluoranthene	ppb	240	1,500
bis(2-Chloroethoxy)methane	ppb	ND	ND
bis(2-Chloroethyl)ether	ppb	ND	ND
bis(2-Chloroisopropyl)ether	ppb	ND	ND
bis(2-Ethylhexyl)phthalate	ppb	4,700	48,000
Butyl benzyl phthalate	ppb	770	770
Carbazole	ppb	310	520
Chrysene	ppb	510	4,700
Di-n-Butylphthalate	ppb	160	160
Di-n-Octylphthalate	ppb	180	2,900
Dibenzo(a,h)anthracene	ppb	110	540
Dibenzofuran	ppb	140	1,700
Diethyl phthalate	ppb	ND	ND
Dimethylphthalate	ppb	940	940
Fluoranthene	ppb	880	11,000
Fluorene	ppb	120	3,300
Hexachlorobenzene	ppb	ND	ND
Hexachlorobutadiene	ppb	ND	ND
Hexachlorocyclopentadiene	ppb	ND	ND
Hexachloroethane	ppb	ND	ND
HMW PAHs	ppb	5,290	44,600
Indeno(1,2,3-cd)pyrene	ppb	300	1,800
Isophorone	ppb	ND	ND
LMW PAHs	ppb	867	18,500
N-Nitroso-di-n-propylamine	ppb	ND	ND
N-Nitrosodiphenylamine	ppb	110	890
Naphthalene	ppb	100	980
Nitrobenzene	ppb	ND	ND

Table 3-34
1999 Newark Bay Reach A, B, C, D Baseline Sediment Data from Tierra (1999a)

Analyte	Units	Minimum Detect	Maximum Detect
Pentachlorophenol	ppb	ND	ND
Phenanthrene	ppb	310	8,000
Phenol	ppb	380	380
Pyrene	ppb	810	9,300
Total PAHs	ppb	6,160	62,700
TOC			
TOC	ppm	5,700	13,600
TPH			
TPH-DRO	ppm	110	1,100

Notes:
BHC = beta hexachlorocyclohexane
HMW = high molecular weight
LMW = low molecular weight
ND = not detected
NOAA = National Oceanic and Atmospheric Administration
PAHs = polycyclic aromatic hydrocarbons
PCBs = polychlorinated biphenyls
PCDD/Fs = polychlorinated dibenzo-*p*-dioxins and dibenzofurans
ppb = parts per billion
ppm = parts per million
ppt = parts per trillion
SVOCs = semivolatile organic compounds
TEF = toxicity equivalency factor
TEQ = toxic equivalency quotient
TKN = total Kjeldahl nitrogen
TOC = total organic carbon
TPH = total petroleum hydrocarbons
TPH-DRO = total petroleum hydrocarbons-diesel range oil
USEPA = U.S. Environmental Protection Agency
W.H.O. = World Health Organization

Table 3-35a
1999 Late Summer/Early Fall Passaic River RI-ESP Surface Sediment Data from Tierra (1999d)

Analyte	Units	Minimum Detect	Maximum Detect
AVS/SEM			
AVS	µmoles/g	1.8	128
Ag - SEM	µmoles/g	ND	ND
Al - SEM	µmoles/g	36.7	270
As - SEM	µmoles/g	0.0102	0.169
Ba - SEM	µmoles/g	0.063	2.07
Be - SEM	µmoles/g	0.0134	0.193
Ca - SEM	µmoles/g	52.3	1590
Cd - SEM	µmoles/g	0.0015	0.044
Co - SEM	µmoles/g	0.0192	3.02
Cr - SEM	µmoles/g	0.105	2.16
Cu - SEM	µmoles/g	0.0242	3.54
Fe - SEM	µmoles/g	47.1	677
Hg - SEM	µmoles/g	0.00014	0.00047
K - SEM	µmoles/g	6.11	70.1
Mg - SEM	µmoles/g	51.2	371
Mn - SEM	µmoles/g	0.613	13.4
Na - SEM	µmoles/g	28.6	903
Ni - SEM	µmoles/g	0.068	2.27
Pb - SEM	µmoles/g	0.0263	1.76
Sb - SEM	µmoles/g	0.0017	0.0063
Se - SEM	µmoles/g	0.0038	0.0097
Tl - SEM	µmoles/g	0.0017	0.013
V - SEM	µmoles/g	0.079	0.748
Zn - SEM	µmoles/g	0.41	12.4
Cyanide			
Total Cyanide	ppm	ND	ND
Herbicides			
2,4,5-T	ppb	ND	ND
2,4,5-TP (Silvex)	ppb	ND	ND
2,4-D	ppb	ND	ND
2,4-DB	ppb	49	112
Inorganic Chemicals			
Ag	ppm	0.27	4.9
Al	ppm	7,150	28,000
As	ppm	5	32.8
Ba	ppm	46.8	341
Be	ppm	0.5	1.5
Ca	ppm	2,930	36,500

Table 3-35a
1999 Late Summer/Early Fall Passaic River RI-ESP Surface Sediment Data from Tierra (1999d)

Analyte	Units	Minimum Detect	Maximum Detect
Cd	ppm	0.77	6.7
Co	ppm	5.4	18.7
Cr	ppm	56.5	202
Cu	ppm	24.1	273
Fe	ppm	16,100	61,600
Hg	ppm	0.26	5.8
K	ppm	1,130	6,680
Mg	ppm	3,300	12,400
Mn	ppm	197	861
Na	ppm	880	20,600
Ni	ppm	25.5	57.2
Pb	ppm	40.4	334
Sb	ppm	0.45	2.3
Se	ppm	0.93	2.9
Tl	ppm	0.48	4.8
V	ppm	20.6	83.2
Zn	ppm	135	641
Miscellaneous			
Ammonia Nitrogen	ppm	81	610
pH		6.46	10.6
Organotin			
Dibutyltin	ppb	1.25	212
Monobutyltin	ppb	0.233	16.7
Tetrabutyltin	ppb	0.787	1.57
Tributyltin	ppb	5.98	690
PAH-SIM			
1,6,7-Trimethylnaphthalene	ppb	2.7	143
1-Methylnaphthalene	ppb	109	911
1-Methylphenanthrene	ppb	90.7	1,240
2,6-Dimethylnaphthalene	ppb	108	468
2-Methylnaphthalene	ppb	207	1,450
Acenaphthene	ppb	6.2	2,510
Acenaphthylene	ppb	15.9	737
Anthracene	ppb	29.4	4,880
Benzo(a)anthracene	ppb	91.8	21,000
Benzo(a)pyrene	ppb	75.6	10,900
Benzo(b)fluoranthene	ppb	124	19,200
Benzo(e)pyrene	ppb	72.8	8,300
Benzo(g,h,i)perylene	ppb	123	6,390

Table 3-35a
1999 Late Summer/Early Fall Passaic River RI-ESP Surface Sediment Data from Tierra (1999d)

Analyte	Units	Minimum Detect	Maximum Detect
Benzo(k)fluoranthene	ppb	21.2	4,440
Biphenyl	ppb	20.6	340
C1-Chrysenes	ppb	1,480	9,910
C1-Dibenzothiophenes	ppb	231	460
C1-Fluoranthenes/Pyrenes	ppb	1,470	10,600
C1-Fluorenes	ppb	125	614
C1-Naphthalenes	ppb	316	2,360
C1-Phenanthrenes/Anthracenes	ppb	629	6,140
C2-Chrysenes	ppb	937	4,590
C2-Dibenzothiophenes	ppb	512	928
C2-Fluoranthenes/Pyrenes	ppb	890	4,208
C2-Fluorenes	ppb	247	1,050
C2-Naphthalenes	ppb	380	1,600
C2-Phenanthrenes/Anthracenes	ppb	731	2,520
C3-Chrysenes	ppb	303	1,120
C3-Dibenzothiophenes	ppb	622	1,070
C3-Fluoranthenes/Pyrenes	ppb	692	1,780
C3-Fluorenes	ppb	456	1,150
C3-Naphthalenes	ppb	424	1,690
C3-Phenanthrenes/Anthracenes	ppb	1,080	1,910
C4-Chrysenes	ppb	135	893
C4-Naphthalenes	ppb	341	1,270
C4-Phenanthrenes/Anthracenes	ppb	783	1,190
Chrysene	ppb	73.2	12,600
Dibenzo(a,h)anthracene	ppb	23.5	1,940
Dibenzothiophene	ppb	64.8	1,220
Fluoranthene	ppb	115	28,200
Fluorene	ppb	14.7	2,770
HMW PAHs	ppb	354	131,000
Indeno(1,2,3-cd)pyrene	ppb	89.7	6,130
LMW PAHs	ppb	6.2	36,700
Naphthalene	ppb	359	4,540
Perylene	ppb	176	2,430
Phenanthrene	ppb	61.1	20,000
Pyrene	ppb	2280	20,000
Total PAHs	ppb	361	167,000
PCB Congeners			
PCB-1	ppb	0.477	5.67
PCB-105	ppb	0.49	108

Table 3-35a
1999 Late Summer/Early Fall Passaic River RI-ESP Surface Sediment Data from Tierra (1999d)

Analyte	Units	Minimum Detect	Maximum Detect
PCB-114	ppb	0.677	7.05
PCB-118	ppb	1.56	198
PCB-123	ppb	0.488	4.4
PCB-126	ppb	0.48	1.21
PCB-128	ppb	4.52	30.9
PCB-138	ppb	1.85	162
PCB-15	ppb	0.916	19.1
PCB-153	ppb	1.86	137
PCB-156	ppb	2.43	16.6
PCB-157	ppb	0.504	3.96
PCB-167	ppb	0.977	6.88
PCB-169	ppb	ND	ND
PCB-170	ppb	0.446	63.3
PCB-18	ppb	0.517	81.6
PCB-180	ppb	1.11	148
PCB-183	ppb	0.496	37.9
PCB-184	ppb	ND	ND
PCB-187	ppb	1.07	85.6
PCB-189	ppb	0.511	1.89
PCB-194	ppb	0.487	31.3
PCB-195	ppb	2.53	13.1
PCB-202	ppb	1.65	9.53
PCB-206	ppb	0.448	37.2
PCB-207	ppb	0.458	2.97
PCB-209	ppb	0.51	8.01
PCB-28	ppb	1.22	140
PCB-3	ppb	0.518	2.04
PCB-44	ppb	0.556	187
PCB-52	ppb	0.646	229
PCB-66	ppb	1.29	256
PCB-77	ppb	0.567	27.5
PCB-8	ppb	0.499	16.6
PCB-81	ppb	0.524	4.23
PCB-87	ppb	0.561	118
PCB-90/101	ppb	1.12	198
Total PCBs - Congeners (NOAA, 1989)	ppb	30.1	3,920
Total PCBs - Sum of Coplanar Congeners	ppb	3.16	500
PCB Homologue Groups			
Total Dichlorobiphenyl	ppb	1.85	55.1

Table 3-35a
1999 Late Summer/Early Fall Passaic River RI-ESP Surface Sediment Data from Tierra (1999d)

Analyte	Units	Minimum Detect	Maximum Detect
Total Heptachlorobiphenyl	ppb	2.18	556
Total Hexachlorobiphenyl	ppb	4.75	579
Total Monochlorobiphenyl	ppb	0.49	7.69
Total Nonachlorobiphenyl	ppb	0.448	49.2
Total Octachlorobiphenyl	ppb	0.487	132
Total PCBs - Homologue Groups	ppb	28	5,130
Total Pentachlorobiphenyl	ppb	4.87	1,380
Total Tetrachlorobiphenyl	ppb	6.1	2,060
Total Trichlorobiphenyl	ppb	2.62	602
PCDD/Fs			
1,2,3,4,6,7,8-HpCDD	ppt	59.4	798
1,2,3,4,6,7,8-HpCDF	ppt	13.4	1,970
1,2,3,4,7,8,9-HpCDF	ppt	12.4	74.2
1,2,3,4,7,8-HxCDD	ppt	4.3	15.8
1,2,3,4,7,8-HxCDF	ppt	60	396
1,2,3,6,7,8-HxCDD	ppt	8.69	46.8
1,2,3,6,7,8-HxCDF	ppt	18.6	123
1,2,3,7,8,9-HxCDD	ppt	6.96	24.9
1,2,3,7,8,9-HxCDF	ppt	2.68	16.3
1,2,3,7,8-PeCDD	ppt	4.12	76.7
1,2,3,7,8-PeCDF	ppt	4.8	27.6
2,3,4,6,7,8-HxCDF	ppt	9.74	53.6
2,3,4,7,8-PeCDF	ppt	4.63	116
2,3,7,8-TCDD	ppt	142	4,330
2,3,7,8-TCDF	ppt	6.11	50.7
OCDD	ppt	627	12,200
OCDF	ppt	19.5	3,110
Total 2,3,7,8-Congeners	ppt	734	19,400
Total HpCDD	ppt	170	2,030
Total HpCDF	ppt	13.7	2,640
Total HxCDD	ppt	63	399
Total HxCDF	ppt	6.64	1,350
Total PCDDs	ppt	883	22,600
Total PCDFs	ppt	59.6	8,600
Total PeCDD	ppt	23	11,500
Total PeCDF	ppt	4.49	1,210
Total TCDD	ppt	11	5,350
Total TCDF	ppt	12.7	1,320

Table 3-35a
1999 Late Summer/Early Fall Passaic River RI-ESP Surface Sediment Data from Tierra (1999d)

Analyte	Units	Minimum Detect	Maximum Detect
Pesticides/PCBs			
4,4'-DDD	ppb	12.5	224
4,4'-DDE	ppb	1.54	80
4,4'-DDT	ppb	1.15	1,080
Aldrin	ppb	ND	ND
Alpha-BHC	ppb	ND	ND
Alpha-Chlordane	ppb	ND	ND
Aroclor-1016	ppb	ND	ND
Aroclor-1221	ppb	ND	ND
Aroclor-1232	ppb	ND	ND
Aroclor-1242	ppb	ND	ND
Aroclor-1248	ppb	187	2,021
Aroclor-1254	ppb	183	1,067
Aroclor-1260	ppb	24	515
Beta-BHC	ppb	ND	ND
Delta-BHC	ppb	1.82	3.4
Dieldrin	ppb	ND	ND
Endosulfan I	ppb	ND	ND
Endosulfan II	ppb	4.6	22
Endosulfan Sulfate	ppb	ND	ND
Endrin	ppb	ND	ND
Endrin Aldehyde	ppb	ND	ND
Endrin Ketone	ppb	ND	ND
Gamma-BHC (Lindane)	ppb	0.48	0.63
Gamma-Chlordane	ppb	ND	ND
Heptachlor	ppb	0.37	0.73
Heptachlor Epoxide	ppb	ND	ND
Methoxychlor	ppb	ND	ND
Total Alpha + Gamma Chlordane	ppb	ND	ND
Total DDT	ppb	1.57	1,210
Total PCBs - Aroclors	ppb	24	3,520
Toxaphene	ppb	ND	ND
Physical Property			
0.001 mm	% passing	1	11
0.002 mm	% passing	3	17
0.005 mm	% passing	7	27
0.02 mm	% passing	16	69
0.05 mm	% passing	25	88
0.064 mm	% passing	29.5	90

Table 3-35a
1999 Late Summer/Early Fall Passaic River RI-ESP Surface Sediment Data from Tierra (1999d)

Analyte	Units	Minimum Detect	Maximum Detect
0.075 mm	% passing	31.9	93.3
0.15 mm	% passing	40.7	96.7
0.3 mm	% passing	57.8	98.7
0.6 mm	% passing	78.5	99.3
1.18 mm	% passing	84.6	99.6
19 mm	% passing	99.8	100
2.36 mm	% passing	86.4	99.7
3.35 mm	% passing	90.3	100
37.5 mm	% passing	100	100
4.75 mm	% passing	92.5	100
75 mm	% passing	100	100
Percent Moisture	%	34.2	84.5
Water Content ASTM D2216	% by wt.	52.1	547
SVOCs			
1,2,4-Trichlorobenzene	ppb	64	220
1,2-Dichlorobenzene	ppb	410	410
1,3-Dichlorobenzene	ppb	70	70
1,4-Dichlorobenzene	ppb	52	1,200
2,4,5-Trichlorophenol	ppb	300	3,100
2,4,6-Trichlorophenol	ppb	ND	ND
2,4-Dichlorophenol	ppb	560	3,200
2,4-Dimethylphenol	ppb	ND	ND
2,4-Dinitrophenol	ppb	ND	ND
2,4-Dinitrotoluene	ppb	ND	ND
2,6-Dinitrotoluene	ppb	ND	ND
2-Chloronaphthalene	ppb	ND	ND
2-Chlorophenol	ppb	200	200
2-Methylnaphthalene	ppb	63	630
2-Methylphenol	ppb	190	190
2-Nitroaniline	ppb	ND	ND
2-Nitrophenol	ppb	ND	ND
3,3'-Dichlorobenzidine	ppb	ND	ND
3-Nitroaniline	ppb	ND	ND
4,6-Dinitro-2-methylphenol	ppb	ND	ND
4-Bromophenyl phenyl ether	ppb	ND	ND
4-Chloro-3-methylphenol	ppb	ND	ND
4-Chloroaniline	ppb	ND	ND
4-Chlorophenyl phenyl ether	ppb	ND	ND
4-Methylphenol	ppb	410	600

Table 3-35a
1999 Late Summer/Early Fall Passaic River RI-ESP Surface Sediment Data from Tierra (1999d)

Analyte	Units	Minimum Detect	Maximum Detect
4-Nitroaniline	ppb	ND	ND
4-Nitrophenol	ppb	ND	ND
Acenaphthene	ppb	97	960
Acenaphthylene	ppb	140	2,000
Anthracene	ppb	290	2,600
Benzo(a)anthracene	ppb	390	7,200
Benzo(a)pyrene	ppb	380	7,300
Benzo(b)fluoranthene	ppb	240	8,500
Benzo(g,h,i)perylene	ppb	660	5,100
Benzo(k)fluoranthene	ppb	570	4,200
bis(2-Chloroethoxy)methane	ppb	ND	ND
bis(2-Chloroethyl)ether	ppb	ND	ND
bis(2-Chloroisopropyl)ether	ppb	ND	ND
bis(2-Ethylhexyl)phthalate	ppb	1,800	45,000
Butyl benzyl phthalate	ppb	100	360,000
Carbazole	ppb	170	1,300
Chrysene	ppb	200	8,900
Di-n-Butylphthalate	ppb	160	1,100
Di-n-Octylphthalate	ppb	170	980
Dibenzo(a,h)anthracene	ppb	250	1,700
Dibenzofuran	ppb	85	640
Diethyl phthalate	ppb	ND	ND
Dimethylphthalate	ppb	ND	ND
Fluoranthene	ppb	390	12,000
Fluorene	ppb	110	870
Hexachlorobenzene	ppb	91	91
Hexachlorobutadiene	ppb	ND	ND
Hexachlorocyclopentadiene	ppb	ND	ND
Hexachloroethane	ppb	ND	ND
HMW PAHs	ppb	110	72,600
Indeno(1,2,3-cd)pyrene	ppb	660	5,100
Isophorone	ppb	ND	ND
LMW PAHs	ppb	320	15,000
N-Nitroso-di-n-propylamine	ppb	ND	ND
N-Nitrosodiphenylamine	ppb	76	180
Naphthalene	ppb	94	8,700
Nitrobenzene	ppb	ND	ND
Pentachlorophenol	ppb	ND	ND
Phenanthrene	ppb	320	8,900

Table 3-35a
1999 Late Summer/Early Fall Passaic River RI-ESP Surface Sediment Data from Tierra (1999d)

Analyte	Units	Minimum Detect	Maximum Detect
Phenol	ppb	1,400	3,100
Pyrene	ppb	110	14,000
Total PAHs	ppb	110	87,600
TOC			
TOC	ppm	9,300	66,200
TPH			
TPH-DRO CA LUFT	ppm	43	640

Notes:
ASTM = American Society for Testing and Materials
AVS/SEM = acid volatile sulfide/simultaneously extracted metals
BHC = beta hexachlorocyclohexane
HMW = high molecular weight
LMW = low molecular weight
mm = millimeters
µmoles/g = micromoles per gram
ND = not detected
NOAA = National Oceanic and Atmospheric Administration
PAHs = polycyclic aromatic hydrocarbons
PCBs = polychlorinated biphenyls
PCDD/Fs = polychlorinated dibenzo-*p*-dioxins and dibenzofurans
ppb = parts per billion
ppm = parts per million
ppt = parts per trillion
SIM = selected ion monitoring
SVOCs = semivolatile organic compounds
TOC = total organic carbon
TPH = total petroleum hydrocarbons
TPH-DRO CA LUFT = total petroleum hydrocarbons-diesel range oil, California leaking underground fuel tank

Table 3-35b
2000 Spring Passaic River RI-ESP Surface Sediment Data from Tierra (2000c)

Analyte	Units	Minimum Detect	Maximum Detect
AVS/SEM			
AVS	µmoles/g	10.5	86.5
Ag - SEM	µmoles/g	ND	ND
Al - SEM	µmoles/g	79.6	190
As - SEM	µmoles/g	0.0031	0.065
Ba - SEM	µmoles/g	0.085	1.06
Be - SEM	µmoles/g	0.029	0.063
Ca - SEM	µmoles/g	62.8	184
Cd - SEM	µmoles/g	0.0059	0.034
Co - SEM	µmoles/g	0.0115	0.082
Cr - SEM	µmoles/g	0.104	1.56
Cu - SEM	µmoles/g	0.092	2.33
Fe - SEM	µmoles/g	38.9	342
Hg - SEM	µmoles/g	ND	ND
K - SEM	µmoles/g	13.3	71
Mg - SEM	µmoles/g	90.3	234
Mn - SEM	µmoles/g	0.456	10
Na - SEM	µmoles/g	183	920
Ni - SEM	µmoles/g	0.054	1.57
Pb - SEM	µmoles/g	0.0306	1.27
Sb - SEM	µmoles/g	0.0034	0.011
Se - SEM	µmoles/g	ND	ND
Tl - SEM	µmoles/g	0.0028	0.0059
V - SEM	µmoles/g	0.202	0.557
Zn - SEM	µmoles/g	0.49	7.5
Cyanide			
Total Cyanide	ppm	0.27	2.01
Herbicides			
2,4,5-T	ppb	ND	ND
2,4,5-TP (Silvex)	ppb	1.9	7.2
2,4-D	ppb	ND	ND
2,4-DB	ppb	18	110
Inorganic Chemicals			
Ag	ppm	1.3	6.9
Al	ppm	9,320	23,700
As	ppm	5.7	17.6
Ba	ppm	43.6	431
Be	ppm	0.5	1.2
Ca	ppm	3,960	11,500

Table 3-35b
2000 Spring Passaic River RI-ESP Surface Sediment Data from Tierra (2000c)

Analyte	Units	Minimum Detect	Maximum Detect
Cd	ppm	0.17	8.5
Co	ppm	6.9	13.6
Cr	ppm	51.7	191
Cu	ppm	19.7	245
Fe	ppm	18,900	42,700
Hg	ppm	0.24	3.6
K	ppm	ND	ND
Mg	ppm	4,300	10,300
Mn	ppm	181	719
Na	ppm	1,040	18,600
Ni	ppm	22.5	49.3
Pb	ppm	34.2	385
Sb	ppm	0.99	2.2
Se	ppm	0.73	2.4
Tl	ppm	2.3	8.1
V	ppm	26.6	71
Zn	ppm	121	607
Miscellaneous			
Ammonia Nitrogen	ppm	220	700
pH		6.89	10
Organotin			
Dibutyltin	ppb	0.827	190
Monobutyltin	ppb	2.38	28.1
Tetrabutyltin	ppb	0.589	0.892
Tributyltin	ppb	1.39	56.8
PAH-SIM			
1,6,7-Trimethylnaphthalene	ppb	3.3	132
1-Methylnaphthalene	ppb	33.8	409
1-Methylphenanthrene	ppb	35	1,010
2,6-Dimethylnaphthalene	ppb	15.7	319
2-Methylnaphthalene	ppb	84.7	990
Acenaphthene	ppb	5.4	484
Acenaphthylene	ppb	25.5	915
Anthracene	ppb	23.4	2,280
Benzo(a)anthracene	ppb	58.9	6,970
Benzo(a)pyrene	ppb	48.8	6,920
Benzo(b)fluoranthene	ppb	79.5	10,900
Benzo(e)pyrene	ppb	42.5	5,230
Benzo(g,h,i)perylene	ppb	42.7	4,990

Table 3-35b
2000 Spring Passaic River RI-ESP Surface Sediment Data from Tierra (2000c)

Analyte	Units	Minimum Detect	Maximum Detect
Benzo(k)fluoranthene	ppb	34.6	3,670
Biphenyl	ppb	12.4	330
C1-Chrysenes	ppb	76.8	4,580
C1-Dibenzothiophenes	ppb	177	570
C1-Fluoranthenes/Pyrenes	ppb	215	10,600
C1-Fluorenes	ppb	14.2	466
C1-Naphthalenes	ppb	118	1,400
C1-Phenanthrenes/Anthracenes	ppb	125	4,160
C2-Chrysenes	ppb	68.4	3,050
C2-Dibenzothiophenes	ppb	458	1,330
C2-Fluoranthenes/Pyrenes	ppb	2,290	7,000
C2-Fluorenes	ppb	376	981
C2-Naphthalenes	ppb	49.2	990
C2-Phenanthrenes/Anthracenes	ppb	1,600	4,340
C3-Chrysenes	ppb	9	1,470
C3-Dibenzothiophenes	ppb	555	1,690
C3-Fluoranthenes/Pyrenes	ppb	826	2,950
C3-Fluorenes	ppb	517	1,710
C3-Naphthalenes	ppb	80.3	1,140
C3-Phenanthrenes/Anthracenes	ppb	1,160	3,660
C4-Chrysenes	ppb	11.5	1,040
C4-Naphthalenes	ppb	28.7	1,160
C4-Phenanthrenes/Anthracenes	ppb	713	1,670
Chrysene	ppb	81	7,360
Dibenzo(a,h)anthracene	ppb	18.3	1,530
Dibenzothiophene	ppb	5.3	362
Fluoranthene	ppb	145	16,500
Fluorene	ppb	12.8	584
HMW PAHs	ppb	600	79,400
Indeno(1,2,3-cd)pyrene	ppb	47.5	5,730
LMW PAHs	ppb	87.8	11,900
Naphthalene	ppb	121	2,200
Perylene	ppb	133	1,120
Phenanthrene	ppb	46.2	6,020
Pyrene	ppb	125	14,800
Total PAHs	ppb	688	91,200
PCB Congeners			
PCB-1	ppb	0.742	1.37
PCB-105	ppb	0.487	20.4

Table 3-35b
2000 Spring Passaic River RI-ESP Surface Sediment Data from Tierra (2000c)

Analyte	Units	Minimum Detect	Maximum Detect
PCB-114	ppb	0.649	1.23
PCB-118	ppb	1.31	43.9
PCB-123	ppb	0.549	0.907
PCB-126	ppb	ND	ND
PCB-128	ppb	4.65	11.3
PCB-138	ppb	1.51	65.7
PCB-15	ppb	1.31	21.6
PCB-153	ppb	1.47	54.5
PCB-156	ppb	3	5.45
PCB-157	ppb	0.518	0.914
PCB-167	ppb	1.21	2.32
PCB-169	ppb	ND	ND
PCB-170	ppb	0.538	18.7
PCB-18	ppb	0.5	36.9
PCB-180	ppb	0.924	55.2
PCB-183	ppb	5.76	13.3
PCB-184	ppb	ND	ND
PCB-187	ppb	0.679	28.7
PCB-189	ppb	0.554	1.05
PCB-194	ppb	5.87	14.3
PCB-195	ppb	2.2	8.74
PCB-202	ppb	1.51	3.14
PCB-206	ppb	3.85	10.6
PCB-207	ppb	0.492	0.589
PCB-209	ppb	2.18	6.09
PCB-28	ppb	2.89	131
PCB-3	ppb	0.685	1.61
PCB-44	ppb	24.9	51.4
PCB-52	ppb	0.516	61.3
PCB-66	ppb	1.06	57.3
PCB-77	ppb	5.32	17
PCB-8	ppb	0.611	13.9
PCB-81	ppb	0.517	0.866
PCB-87	ppb	17.3	30
PCB-90/101	ppb	0.976	57.5
Total PCBs - Congeners (NOAA, 1989)	ppb	25.4	1,270
Total PCBs - Sum of Coplanar Congeners	ppb	2.23	149
PCB Homologue Groups			
Total Dichlorobiphenyl	ppb	2.35	56.4

Table 3-35b
2000 Spring Passaic River RI-ESP Surface Sediment Data from Tierra (2000c)

Analyte	Units	Minimum Detect	Maximum Detect
Total Heptachlorobiphenyl	ppb	1.6	182
Total Hexachlorobiphenyl	ppb	3.83	274
Total Monochlorobiphenyl	ppb	0.685	3.26
Total Nonachlorobiphenyl	ppb	5.47	13.4
Total Octachlorobiphenyl	ppb	19.6	401
Total PCBs - Homologue Groups	ppb	24.4	1800
Total Pentachlorobiphenyl	ppb	3.49	286.1
Total Tetrachlorobiphenyl	ppb	3.03	437
Total Trichlorobiphenyl	ppb	5.91	514
PCDD/Fs			
1,2,3,4,6,7,8-HpCDD	ppt	65	651
1,2,3,4,6,7,8-HpCDF	ppt	14	1,140
1,2,3,4,7,8,9-HpCDF	ppt	1.79	38.1
1,2,3,4,7,8-HxCDD	ppt	1.83	9.86
1,2,3,4,7,8-HxCDF	ppt	3.15	340
1,2,3,6,7,8-HxCDD	ppt	4.79	39.8
1,2,3,6,7,8-HxCDF	ppt	1.75	76.5
1,2,3,7,8,9-HxCDD	ppt	3.78	23.8
1,2,3,7,8,9-HxCDF	ppt	5.12	12.4
1,2,3,7,8-PeCDD	ppt	1.57	13.1
1,2,3,7,8-PeCDF	ppt	2.07	25.5
2,3,4,6,7,8-HxCDF	ppt	1.63	26.5
2,3,4,7,8-PeCDF	ppt	2.66	66.6
2,3,7,8-TCDD	ppt	3.24	649
2,3,7,8-TCDF	ppt	10.1	38.4
OCDD	ppt	826	9,000
OCDF	ppt	27.8	2,020
Total 2,3,7,8-Congeners	ppt	995	12,500
Total HpCDD	ppt	196	1,390
Total HpCDF	ppt	34.9	1,790
Total HxCDD	ppt	82	343
Total HxCDF	ppt	22.9	845
Total PCDDs	ppt	1,150	13,700
Total PCDFs	ppt	175	6,280
Total PeCDD	ppt	9.12	2,570
Total PeCDF	ppt	27.5	813
Total TCDD	ppt	14.3	985
Total TCDF	ppt	55.1	1,890

Table 3-35b
2000 Spring Passaic River RI-ESP Surface Sediment Data from Tierra (2000c)

Analyte	Units	Minimum Detect	Maximum Detect
Pesticides/PCBs			
4,4'-DDD	ppb	6.6	200
4,4'-DDE	ppb	2.5	96
4,4'-DDT	ppb	5.1	500
Aldrin	ppb	ND	ND
Alpha-BHC	ppb	ND	ND
Alpha-Chlordane	ppb	ND	ND
Aroclor-1016	ppb	ND	ND
Aroclor-1221	ppb	ND	ND
Aroclor-1232	ppb	ND	ND
Aroclor-1242	ppb	ND	ND
Aroclor-1248	ppb	300	1,200
Aroclor-1254	ppb	320	1,200
Aroclor-1260	ppb	230	810
Beta-BHC	ppb	ND	ND
Delta-BHC	ppb	ND	ND
Dieldrin	ppb	ND	ND
Endosulfan I	ppb	ND	ND
Endosulfan II	ppb	ND	ND
Endosulfan Sulfate	ppb	ND	ND
Endrin	ppb	ND	ND
Endrin Aldehyde	ppb	ND	ND
Endrin Ketone	ppb	ND	ND
Gamma-BHC (Lindane)	ppb	ND	ND
Gamma-Chlordane	ppb	ND	ND
Heptachlor	ppb	ND	ND
Heptachlor Epoxide	ppb	ND	ND
Methoxychlor	ppb	ND	ND
Total Alpha + Gamma Chlordane	ppb	ND	ND
Total DDT	ppb	2.5	736
Total PCBs - Aroclors	ppb	830	3,160
Toxaphene	ppb	ND	ND
Physical Property			
0.001 mm	% passing	2	9
0.002 mm	% passing	6	15
0.005 mm	% passing	11.5	30
0.02 mm	% passing	28	70
0.05 mm	% passing	44.5	85.5
0.064 mm	% passing	49.5	89

Table 3-35b
2000 Spring Passaic River RI-ESP Surface Sediment Data from Tierra (2000c)

Analyte	Units	Minimum Detect	Maximum Detect
0.075 mm	% passing	53.2	91.2
0.15 mm	% passing	62.7	94.9
0.3 mm	% passing	69.9	96.9
0.6 mm	% passing	75.6	97.8
1.18 mm	% passing	78.5	98.5
19 mm	% passing	100	100
2.36 mm	% passing	80.9	99.1
3.35 mm	% passing	89.1	99.7
37.5 mm	% passing	100	100
4.75 mm	% passing	93.5	99.9
75 mm	% passing	100	100
Percent Moisture	%	45	72.7
Water Content ASTM D2216	% by wt.	81.8	266
SVOCs			
1,2,4-Trichlorobenzene	ppb	110	110
1,2-Dichlorobenzene	ppb	ND	ND
1,3-Dichlorobenzene	ppb	ND	ND
1,4-Dichlorobenzene	ppb	72	200
2,4,5-Trichlorophenol	ppb	430	430
2,4,6-Trichlorophenol	ppb	ND	ND
2,4-Dichlorophenol	ppb	350	350
2,4-Dimethylphenol	ppb	ND	ND
2,4-Dinitrophenol	ppb	ND	ND
2,4-Dinitrotoluene	ppb	ND	ND
2,6-Dinitrotoluene	ppb	ND	ND
2-Chloronaphthalene	ppb	ND	ND
2-Chlorophenol	ppb	ND	ND
2-Methylnaphthalene	ppb	62	190
2-Methylphenol	ppb	ND	ND
2-Nitroaniline	ppb	ND	ND
2-Nitrophenol	ppb	ND	ND
3,3'-Dichlorobenzidine	ppb	ND	ND
3-Nitroaniline	ppb	ND	ND
4,6-Dinitro-2-methylphenol	ppb	ND	ND
4-Bromophenyl phenyl ether	ppb	ND	ND
4-Chloro-3-methylphenol	ppb	ND	ND
4-Chloroaniline	ppb	ND	ND
4-Chlorophenyl phenyl ether	ppb	ND	ND
4-Methylphenol	ppb	680	680

Table 3-35b
2000 Spring Passaic River RI-ESP Surface Sediment Data from Tierra (2000c)

Analyte	Units	Minimum Detect	Maximum Detect
4-Nitroaniline	ppb	ND	ND
4-Nitrophenol	ppb	ND	ND
Acenaphthene	ppb	88	500
Acenaphthylene	ppb	160	680
Anthracene	ppb	360	1200
Benzo(a)anthracene	ppb	1,000	3,200
Benzo(a)pyrene	ppb	1,100	3,000
Benzo(b)fluoranthene	ppb	1,600	4,300
Benzo(g,h,i)perylene	ppb	480	1,400
Benzo(k)fluoranthene	ppb	720	2,000
bis(2-Chloroethoxy)methane	ppb	ND	ND
bis(2-Chloroethyl)ether	ppb	ND	ND
bis(2-Chloroisopropyl)ether	ppb	ND	ND
bis(2-Ethylhexyl)phthalate	ppb	5,200	23,000,000
Butyl benzyl phthalate	ppb	170	130,000
Carbazole	ppb	180	430
Chrysene	ppb	1,300	4,900
Di-n-Butylphthalate	ppb	230	310
Di-n-Octylphthalate	ppb	140	740
Dibenzo(a,h)anthracene	ppb	210	460
Dibenzofuran	ppb	99	260
Diethyl phthalate	ppb	ND	ND
Dimethylphthalate	ppb	ND	ND
Fluoranthene	ppb	1,800	6,100
Fluorene	ppb	98	430
Hexachlorobenzene	ppb	180	180
Hexachlorobutadiene	ppb	ND	ND
Hexachlorocyclopentadiene	ppb	ND	ND
Hexachloroethane	ppb	ND	ND
HMW PAHs	ppb	190	31,400
Indeno(1,2,3-cd)pyrene	ppb	600	1,500
Isophorone	ppb	ND	ND
LMW PAHs	ppb	1,700	5,320
N-Nitroso-di-n-propylamine	ppb	ND	ND
N-Nitrosodiphenylamine	ppb	ND	ND
Naphthalene	ppb	100	310
Nitrobenzene	ppb	ND	ND
Pentachlorophenol	ppb	ND	ND
Phenanthrene	ppb	730	2,800

Table 3-35b
2000 Spring Passaic River RI-ESP Surface Sediment Data from Tierra (2000c)

Analyte	Units	Minimum Detect	Maximum Detect
Phenol	ppb	1,700	1,700
Pyrene	ppb	190	5,400
Total PAHs	ppb	190	36,500
TOC			
TOC	ppm	23,000	63,000
TPH			
TPH - DRO CA LUFT	ppm	110	320

Notes:
ASTM = American Society for Testing and Materials
AVS/SEM = acid volatile sulfide/simultaneously extracted metals
BHC = beta hexachlorocyclohexane
HMW = high molecular weight
LMW = low molecular weight
µmoles/g = micromoles per gram
mm = millimeters
ND = not detected
NOAA = National Oceanic and Atmospheric Administration
PAHs = polycyclic aromatic hydrocarbons
PCBs = polychlorinated biphenyls
PCDD/Fs = polychlorinated dibenzo-*p*-dioxins and dibenzofurans
ppb = parts per billion
ppm = parts per million
ppt = parts per trillion
SIM = selected ion monitoring
SVOCs = semivolatile organic compounds
TOC = total organic carbon
TPH = total petroleum hydrocarbons
TPH-DRO CA LUFT = total petroleum hydrocarbons-diesel range oil, California leaking underground fuel tank

Table 3-36
1999 Preliminary Toxicity Evaluation (TIE) Study Sediment Data from Tierra (1999f)

Analyte	Units	Minimum Detect	Maximum Detect
AVS/SEM			
AVS	µmoles/g	5.6	24.2
Cd - SEM	µmoles/g	0.00398	0.0379
Cu - SEM	µmoles/g	0.649	1.44
Hg - SEM	µmoles/g	ND	ND
Ni - SEM	µmoles/g	0.086	0.62
Pb - SEM	µmoles/g	0.244	1.18
Zn - SEM	µmoles/g	1.54	5.88
Inorganic Chemicals			
Ag	ppm	1.02	2.2
Al	ppm	4,460	6,510
As	ppm	3.3	5.3
Ba	ppm	37	71
Be	ppm	0.25	0.34
Ca	ppm	1,840	3,350
Cd	ppm	0.69	3.6
Co	ppm	3.5	5.5
Cr	ppm	40.9	87.4
Cu	ppm	49.2	361
Fe	ppm	10,400	13,200
Hg	ppm	0.74	2.12
K	ppm	566	1,330
Mg	ppm	2,510	3,250
Mn	ppm	111	199
Na	ppm	1,490	5,300
Ni	ppm	11.4	133
Pb	ppm	49.2	215
Sb	ppm	0.45	0.56
Se	ppm	ND	ND
Tl	ppm	0.79	1.18
Total Cyanide	ppm	ND	ND
V	ppm	13.2	19
Zn	ppm	92.8	315
Miscellaneous			
Ammonia Nitrogen	ppm	72	130
pH		7.17	7.58
PAH-SIM			
1,6,7-Trimethylnaphthalene	ppb	35.6	114
1-Methylnaphthalene	ppb	136	325

Table 3-36
1999 Preliminary Toxicity Evaluation (TIE) Study Sediment Data from Tierra (1999f)

Analyte	Units	Minimum Detect	Maximum Detect
1-Methylphenanthrene	ppb	90.6	436
2,6-Dimethylnaphthalene	ppb	165	380
2-Methylnaphthalene	ppb	283	737
Acenaphthene	ppb	136	358
Acenaphthylene	ppb	244	613
Anthracene	ppb	763	1,820
Benzo(a)anthracene	ppb	1,160	5,030
Benzo(a)pyrene	ppb	1,270	3,470
Benzo(b)fluoranthene	ppb	2,280	4,640
Benzo(e)pyrene	ppb	1,030	2,870
Benzo(g,h,i)perylene	ppb	838	2,010
Benzo(k)fluoranthene	ppb	424	1,700
Biphenyl	ppb	91	317
C1-Chrysenes	ppb	2,200	5,000
C1-Dibenzothiophenes	ppb	187	545
C1-Fluoranthenes/Pyrenes	ppb	2,730	5,610
C1-Fluorenes	ppb	130	523
C1-Naphthalenes	ppb	418	1,060
C1-Phenanthrenes/Anthracenes	ppb	976	2,060
C2-Chrysenes	ppb	1,350	2,900
C2-Dibenzothiophenes	ppb	444	1,750
C2-Fluorenes	ppb	259	1,390
C2-Naphthalenes	ppb	338	708
C2-Phenanthrenes/Anthracenes	ppb	1,210	2,900
C3-Chrysenes	ppb	345	738
C3-Dibenzothiophenes	ppb	589	2,120
C3-Fluorenes	ppb	413	1,460
C3-Naphthalenes	ppb	344	825
C3-Phenanthrenes/Anthracenes	ppb	1,220	3,140
C4-Chrysenes	ppb	189	400
C4-Naphthalenes	ppb	281	1,160
C4-Phenanthrenes/Anthracenes	ppb	769	2,020
Chrysene	ppb	1,570	4,620
Dibenzo(a,h)anthracene	ppb	268	538
Dibenzothiophene	ppb	110	278
Fluoranthene	ppb	2,080	4,690
Fluorene	ppb	201	458
Indeno(1,2,3-cd)pyrene	ppb	960	2,030
Naphthalene	ppb	447	924

Table 3-36
1999 Preliminary Toxicity Evaluation (TIE) Study Sediment Data from Tierra (1999f)

Analyte	Units	Minimum Detect	Maximum Detect
Perylene	ppb	563	784
Phenanthrene	ppb	923	2,740
Pyrene	ppb	2,310	5,500
Total PAHs	ppb	33,500	81,100
PCB Congeners			
PCB-1	ppb	0.0012	0.0024
PCB-105	ppb	0.014	0.019
PCB-110	ppb	0.029	0.035
PCB-114	ppb	0.00092	0.0019
PCB-115	ppb	0.0065	0.0088
PCB-118	ppb	0.033	0.046
PCB-119	ppb	0.0017	0.0018
PCB-123	ppb	ND	ND
PCB-126	ppb	0.00023	0.00023
PCB-128	ppb	0.0073	0.0091
PCB-138	ppb	0.094	0.11
PCB-149	ppb	0.043	0.047
PCB-15	ppb	0.017	0.031
PCB-151	ppb	0.01	0.011
PCB-153	ppb	0.06	0.069
PCB-156	ppb	0.0039	0.0048
PCB-157	ppb	0.0008	0.0011
PCB-158	ppb	0.0037	0.0044
PCB-167	ppb	0.0018	0.0021
PCB-168	ppb	0.00014	0.00018
PCB-169	ppb	ND	ND
PCB-170	ppb	0.017	0.018
PCB-177	ppb	0.0094	0.011
PCB-18	ppb	0.013	0.014
PCB-180	ppb	0.044	0.045
PCB-183	ppb	0.0098	0.011
PCB-184	ppb	0.00013	0.00013
PCB-187	ppb	0.026	0.028
PCB-189	ppb	0.00055	0.00061
PCB-194	ppb	0.0088	0.009
PCB-195	ppb	0.0033	0.0036
PCB-201	ppb	0.011	0.013
PCB-202	ppb	0.0024	0.0029
PCB-206	ppb	0.0062	0.0077

Table 3-36
1999 Preliminary Toxicity Evaluation (TIE) Study Sediment Data from Tierra (1999f)

Analyte	Units	Minimum Detect	Maximum Detect
PCB-207	ppb	0.00045	0.00058
PCB-209	ppb	0.0031	0.0053
PCB-28	ppb	0.022	0.025
PCB-3	ppb	0.00087	0.0018
PCB-37	ppb	0.012	0.015
PCB-44	ppb	0.033	0.044
PCB-49	ppb	0.039	0.049
PCB-52	ppb	0.045	0.06
PCB-66	ppb	0.04	0.057
PCB-70	ppb	0.037	0.05
PCB-74	ppb	0.017	0.025
PCB-77	ppb	0.0058	0.0079
PCB-8	ppb	0.0088	0.016
PCB-81	ppb	0.00072	0.00095
PCB-87	ppb	0.018	0.022
PCB-90/101	ppb	0.045	0.057
PCB-99	ppb	0.02	0.028
PCB Homologue Groups			
Total Dichlorobiphenyl	ppb	0.042	0.079
Total Heptachlorobiphenyl	ppb	0.15	0.16
Total Hexachlorobiphenyl	ppb	0.26	0.3
Total Monochlorobiphenyl	ppb	0.0023	0.005
Total Nonachlorobiphenyl	ppb	0.0083	0.011
Total Octachlorobiphenyl	ppb	0.038	0.042
Total Pentachlorobiphenyl	ppb	0.23	0.3
Total Tetrachlorobiphenyl	ppb	0.36	0.47
Total Trichlorobiphenyl	ppb	0.12	0.12
PCDD/Fs			
1,2,3,4,6,7,8-HpCDD	ppt	480	630
1,2,3,4,6,7,8-HpCDF	ppt	510	1,200
1,2,3,4,7,8,9-HpCDF	ppt	18	36
1,2,3,4,7,8-HxCDD	ppt	9.1	18
1,2,3,4,7,8-HxCDF	ppt	85	160
1,2,3,6,7,8-HxCDD	ppt	25	42
1,2,3,6,7,8-HxCDF	ppt	28	54
1,2,3,7,8,9-HxCDD	ppt	14	20
1,2,3,7,8,9-HxCDF	ppt	4	7.2
1,2,3,7,8-PeCDD	ppt	5.1	14
1,2,3,7,8-PeCDF	ppt	12	22

Table 3-36
1999 Preliminary Toxicity Evaluation (TIE) Study Sediment Data from Tierra (1999f)

Analyte	Units	Minimum Detect	Maximum Detect
2,3,4,6,7,8-HxCDF	ppt	15	23
2,3,4,7,8-PeCDF	ppt	31	54
2,3,7,8-TCDD	ppt	200	550
2,3,7,8-TCDF	ppt	19	30
OCDD	ppt	6,600	7,900
OCDF	ppt	820	1,700
Total HpCDD	ppt	1,000	1,400
Total HpCDF	ppt	730	1,600
Total HxCDD	ppt	220	270
Total HxCDF	ppt	490	1,200
Total PeCDD	ppt	39	110
Total PeCDF	ppt	500	960
Total TCDD	ppt	290	690
Total TCDF	ppt	540	1,200
Pesticides/PCBs			
4,4'-DDD	ppb	4.6	14
4,4'-DDE	ppb	7.2	21
4,4'-DDT	ppb	18	200
Aldrin	ppb	ND	ND
Alpha-BHC	ppb	ND	ND
Alpha-Chlordane	ppb	4.1	18.2
Aroclor-1016	ppb	ND	ND
Aroclor-1221	ppb	ND	ND
Aroclor-1232	ppb	ND	ND
Aroclor-1242	ppb	ND	ND
Aroclor-1248	ppb	ND	ND
Aroclor-1254	ppb	ND	ND
Aroclor-1260	ppb	ND	ND
Beta-BHC	ppb	ND	ND
Delta-BHC	ppb	ND	ND
Dieldrin	ppb	5.4	15
Endosulfan I	ppb	1.6	1.6
Endosulfan II	ppb	ND	ND
Endosulfan Sulfate	ppb	ND	ND
Endrin	ppb	6	6
Endrin Aldehyde	ppb	ND	ND
Endrin Ketone	ppb	ND	ND
Gamma-BHC (Lindane)	ppb	ND	ND
Gamma-Chlordane	ppb	ND	ND

Table 3-36
1999 Preliminary Toxicity Evaluation (TIE) Study Sediment Data from Tierra (1999f)

Analyte	Units	Minimum Detect	Maximum Detect
Heptachlor	ppb	ND	ND
Heptachlor Epoxide	ppb	3.7	3.7
Methoxychlor	ppb	ND	ND
Toxaphene	ppb	ND	ND
Physical Property			
0.001 mm	% passing	2	8
0.002 mm	% passing	5	17
0.005 mm	% passing	8	30.5
0.02 mm	% passing	19	65.5
0.05 mm	% passing	32	81
0.064 mm	% passing	39	88
0.075 mm	% passing	42.4	92.3
0.15 mm	% passing	62	93.2
0.3 mm	% passing	71.7	94.6
0.6 mm	% passing	80.7	96.1
1.18 mm	% passing	86.5	96.9
19 mm	% passing	100	100
2.36 mm	% passing	90.1	97.3
3.35 mm	% passing	93.6	99.1
37.5 mm	% passing	100	100
4.75 mm	% passing	95.9	99.9
75 mm	% passing	100	100
SVOCs			
1,2,4-Trichlorobenzene	ppb	ND	ND
1,2-Dichlorobenzene	ppb	ND	ND
1,3-Dichlorobenzene	ppb	ND	ND
1,4-Dichlorobenzene	ppb	60	60
2,4,5-Trichlorophenol	ppb	ND	ND
2,4,6-Trichlorophenol	ppb	ND	ND
2,4-Dichlorophenol	ppb	ND	ND
2,4-Dimethylphenol	ppb	ND	ND
2,4-Dinitrophenol	ppb	ND	ND
2,4-Dinitrotoluene	ppb	ND	ND
2,6-Dinitrotoluene	ppb	ND	ND
2-Chloronaphthalene	ppb	ND	ND
2-Chlorophenol	ppb	ND	ND
2-Methylnaphthalene	ppb	62	62
2-Methylphenol	ppb	ND	ND
2-Nitroaniline	ppb	ND	ND

Table 3-36
1999 Preliminary Toxicity Evaluation (TIE) Study Sediment Data from Tierra (1999f)

Analyte	Units	Minimum Detect	Maximum Detect
2-Nitrophenol	ppb	ND	ND
3,3'-Dichlorobenzidine	ppb	ND	ND
3-Nitroaniline	ppb	ND	ND
4,6-Dinitro-2-methylphenol	ppb	ND	ND
4-Bromophenyl phenyl ether	ppb	ND	ND
4-Chloro-3-methylphenol	ppb	ND	ND
4-Chloroaniline	ppb	65	65
4-Chlorophenyl phenyl ether	ppb	ND	ND
4-Methylphenol	ppb	ND	ND
4-Nitroaniline	ppb	ND	ND
4-Nitrophenol	ppb	ND	ND
Acenaphthene	ppb	54	120
Acenaphthylene	ppb	82	180
Anthracene	ppb	200	380
Benzo(a)anthracene	ppb	490	1,500
Benzo(a)pyrene	ppb	440	1,400
Benzo(b)fluoranthene	ppb	590	1,900
Benzo(g,h,i)perylene	ppb	250	1,000
Benzo(k)fluoranthene	ppb	210	510
bis(2-Chloroethoxy)methane	ppb	ND	ND
bis(2-Chloroethyl)ether	ppb	ND	ND
bis(2-Chloroisopropyl)ether	ppb	ND	ND
bis(2-Ethylhexyl)phthalate	ppb	1,700	51,000
Butyl benzyl phthalate	ppb	160	160
Carbazole	ppb	73	73
Chrysene	ppb	610	1,600
Dibenzo(a,h)anthracene	ppb	84	230
Dibenzofuran	ppb	44	44
Diethyl phthalate	ppb	ND	ND
Dimethylphthalate	ppb	ND	ND
Di-n-Butylphthalate	ppb	ND	ND
Di-n-Octylphthalate	ppb	410	410
Fluoranthene	ppb	750	2,800
Fluorene	ppb	53	96
Hexachlorobenzene	ppb	ND	ND
Hexachlorobutadiene	ppb	ND	ND
Hexachlorocyclopentadiene	ppb	ND	ND
Hexachloroethane	ppb	ND	ND
Indeno(1,2,3-cd)pyrene	ppb	310	1,100

Table 3-36
1999 Preliminary Toxicity Evaluation (TIE) Study Sediment Data from Tierra (1999f)

Analyte	Units	Minimum Detect	Maximum Detect
Isophorone	ppb	ND	ND
Naphthalene	ppb	53	96
Nitrobenzene	ppb	ND	ND
N-Nitroso-di-n-propylamine	ppb	ND	ND
N-Nitrosodiphenylamine	ppb	ND	ND
Pentachlorophenol	ppb	ND	ND
Phenanthrene	ppb	280	1,300
Phenol	ppb	ND	ND
Pyrene	ppb	690	2,700
TOC			
TOC	ppm	3,800	5,000

Notes:
AVS/SEM = acid volatile sulfide/simultaneously extracted metals
BHC = beta hexachlorocyclohexane
µmoles/g = micromoles per gram
mm = millimeters
ND = not detected
PAHs = polycyclic aromatic hydrocarbons
PCBs = polychlorinated biphenyls
PCDD/Fs = polychlorinated dibenzo-*p*-dioxins and dibenzofurans
ppb = parts per billion
ppm = parts per million
ppt = parts per trillion
SIM = selected ion monitoring
SVOCs = semivolatile organic compounds
TOC = total organic carbon

Table 3-37
1999/2000 Minish Park Sediment Monitoring Data from Tierra (2000a)

Analyte	Units	Minimum Detect	Maximum Detect
AVS/SEM			
AVS	µmoles/g	16.3	62.1
Ag - SEM	µmoles/g	0.0019	0.0036
Al - SEM	µmoles/g	105	185
As - SEM	µmoles/g	0.0085	0.02
Ba - SEM	µmoles/g	0.894	1.42
Be - SEM	µmoles/g	0.039	0.07
Ca - SEM	µmoles/g	98.2	159
Cd - SEM	µmoles/g	0.026	0.045
Co - SEM	µmoles/g	0.0458	2.26
Cr - SEM	µmoles/g	0.916	1.71
Cu - SEM	µmoles/g	0.0123	1.63
Fe - SEM	µmoles/g	179	311
Hg - SEM	µmoles/g	0.000054	0.000213
K - SEM	µmoles/g	16.9	35.3
Mg - SEM	µmoles/g	108	194
Mn - SEM	µmoles/g	5.59	8.35
Na - SEM	µmoles/g	90	336
Ni - SEM	µmoles/g	0.197	1.54
Pb - SEM	µmoles/g	0.877	1.37
Sb - SEM	µmoles/g	0.0033	0.0033
Se - SEM	µmoles/g	0.0039	0.0068
Tl - SEM	µmoles/g	0.0075	0.013
V - SEM	µmoles/g	0.257	0.473
Zn - SEM	µmoles/g	5.93	9.56
Cyanide			
Total Cyanide	ppm	ND	ND
Herbicides			
2,4,5-T	ppb	ND	ND
2,4,5-TP (Silvex)	ppb	ND	ND
2,4-D	ppb	ND	ND
2,4-DB	ppb	75	75
Inorganic Chemicals			
Ag	ppm	2.8	5.4
Al	ppm	11,500	19,200
As	ppm	7.8	12.9
Ba	ppm	126	188
Be	ppm	0.65	1.1
Ca	ppm	5,140	7,750

Table 3-37
1999/2000 Minish Park Sediment Monitoring Data from Tierra (2000a)

Analyte	Units	Minimum Detect	Maximum Detect
Cd	ppm	3.7	5.9
Co	ppm	9.9	15.4
Cr	ppm	122	206
Cu	ppm	178	288
Fe	ppm	28,100	43,500
Hg	ppm	2.1	7.1
K	ppm	1,490	2,830
Mg	ppm	5,990	9,420
Mn	ppm	366	638
Na	ppm	2,710	7,040
Ni	ppm	34.8	53.7
Pb	ppm	225	339
Sb	ppm	1.6	1.6
Se	ppm	0.83	0.83
Tl	ppm	3.2	3.9
V	ppm	42	64
Zn	ppm	495	753
Miscellaneous			
Ammonia Nitrogen	ppm	240	420
pH		7.13	7.34
Organotin			
Dibutyltin	ppb	3.99	9.48
Monobutyltin	ppb	0.526	1.16
Tetrabutyltin	ppb	0.64	0.74
Tributyltin	ppb	24	132
PAH-SIM			
1,6,7-Trimethylnaphthalene	ppb	44.7	61.8
1-Methylnaphthalene	ppb	161	225
1-Methylphenanthrene	ppb	345	632
2,6-Dimethylnaphthalene	ppb	175	256
2-Methylnaphthalene	ppb	314	463
Acenaphthene	ppb	204	357
Acenaphthylene	ppb	370	563
Anthracene	ppb	1,100	1,670
Benzo(a)anthracene	ppb	3,950	7,250
Benzo(a)pyrene	ppb	2,680	5,440
Benzo(b)fluoranthene	ppb	4,870	7,630
Benzo(e)pyrene	ppb	2,200	4,000
Benzo(g,h,i)perylene	ppb	1,920	3,590

Table 3-37
1999/2000 Minish Park Sediment Monitoring Data from Tierra (2000a)

Analyte	Units	Minimum Detect	Maximum Detect
Benzo(k)fluoranthene	ppb	933	2,760
Biphenyl	ppb	112	173
C1-Chrysenes	ppb	2,870	4,380
C1-Dibenzothiophenes	ppb	280	468
C1-Fluoranthenes/Pyrenes	ppb	4,030	5,810
C1-Fluorenes	ppb	221	362
C1-Naphthalenes	ppb	475	688
C1-Phenanthrenes/Anthracenes	ppb	1,450	2,730
C2-Chrysenes	ppb	1,240	2,400
C2-Dibenzothiophenes	ppb	652	857
C2-Fluoranthenes/Pyrenes	ppb	1,980	3,150
C2-Fluorenes	ppb	373	601
C2-Naphthalenes	ppb	476	711
C2-Phenanthrenes/Anthracenes	ppb	1,360	1,980
C3-Chrysenes	ppb	550	953
C3-Dibenzothiophenes	ppb	621	826
C3-Fluoranthenes/Pyrenes	ppb	776	1,530
C3-Fluorenes	ppb	413	667
C3-Naphthalenes	ppb	589	822
C3-Phenanthrenes/Anthracenes	ppb	1,220	1,760
C4-Chrysenes	ppb	294	521
C4-Naphthalenes	ppb	520	611
C4-Phenanthrenes/Anthracenes	ppb	465	789
Chrysene	ppb	4,090	5,910
Dibenzo(a,h)anthracene	ppb	457	1,060
Dibenzothiophene	ppb	200	335
Fluoranthene	ppb	5,240	8,340
Fluorene	ppb	292	435
HMW PAHs	ppb	33,800	50,300
Indeno(1,2,3-cd)pyrene	ppb	2,480	4,830
LMW PAHs	ppb	5,180	7,940
Naphthalene	ppb	513	704
Perylene	ppb	864	1,270
Phenanthrene	ppb	2,060	4,040
Pyrene	ppb	5,060	7,810
Total PAHs	ppb	40,400	57,500
PCB Congeners			
PCB-1	ppb	0.673	1.15
PCB-105	ppb	0.861	19.1

Table 3-37
1999/2000 Minish Park Sediment Monitoring Data from Tierra (2000a)

Analyte	Units	Minimum Detect	Maximum Detect
PCB-114	ppb	0.76	1.15
PCB-118	ppb	32.5	49.7
PCB-123	ppb	0.501	0.788
PCB-126	ppb	ND	ND
PCB-128	ppb	7.69	11.5
PCB-138	ppb	43.9	67.8
PCB-15	ppb	13.1	22.7
PCB-153	ppb	36.2	56.1
PCB-156	ppb	3.6	5.5
PCB-157	ppb	0.722	1.17
PCB-167	ppb	1.45	2.35
PCB-169	ppb	ND	ND
PCB-170	ppb	10.2	16
PCB-18	ppb	21.6	33.6
PCB-180	ppb	26.1	40.1
PCB-183	ppb	5.95	9.41
PCB-184	ppb	ND	ND
PCB-187	ppb	15.2	26
PCB-189	ppb	0.534	0.743
PCB-194	ppb	6.29	10.5
PCB-195	ppb	2.45	3.85
PCB-202	ppb	1.65	3.24
PCB-206	ppb	4.85	25.3
PCB-207	ppb	0.558	1.46
PCB-209	ppb	3.2	13.7
PCB-28	ppb	43.5	69
PCB-3	ppb	0.92	1.91
PCB-44	ppb	26.8	38
PCB-52	ppb	35.5	52.9
PCB-66	ppb	31.2	49.1
PCB-77	ppb	4.86	10.7
PCB-8	ppb	7.52	11.4
PCB-81	ppb	0.543	0.848
PCB-87	ppb	19.1	28.9
PCB-90/101	ppb	42.3	62.4
Total PCBs - Congeners (NOAA, 1989)	ppb	817	1250
Total PCBs - Sum of Coplanar Congeners	ppb	93.4	143
PCB Homologue Groups			
Total Dichlorobiphenyl	ppb	35.5	58.1

Table 3-37
1999/2000 Minish Park Sediment Monitoring Data from Tierra (2000a)

Analyte	Units	Minimum Detect	Maximum Detect
Total Heptachlorobiphenyl	ppb	89	142
Total Hexachlorobiphenyl	ppb	154	242
Total Monochlorobiphenyl	ppb	1.59	2.95
Total Nonachlorobiphenyl	ppb	6.35	33.4
Total Octachlorobiphenyl	ppb	25	45.1
Total PCBs - Homologue Groups	ppb	1,000	1,550
Total Pentachlorobiphenyl	ppb	229	353
Total Tetrachlorobiphenyl	ppb	284	420
Total Trichlorobiphenyl	ppb	177	281
PCDD/Fs			
1,2,3,4,6,7,8-HpCDD	ppt	326	612
1,2,3,4,6,7,8-HpCDF	ppt	462	860
1,2,3,4,7,8,9-HpCDF	ppt	18.7	34.4
1,2,3,4,7,8-HxCDD	ppt	4.96	10.2
1,2,3,4,7,8-HxCDF	ppt	120	268
1,2,3,6,7,8-HxCDD	ppt	20.1	36.1
1,2,3,6,7,8-HxCDF	ppt	36.8	69
1,2,3,7,8,9-HxCDD	ppt	12.3	20.9
1,2,3,7,8,9-HxCDF	ppt	7.36	12.5
1,2,3,7,8-PeCDD	ppt	5.62	9.19
1,2,3,7,8-PeCDF	ppt	13.6	18.7
2,3,4,6,7,8-HxCDF	ppt	16.6	26.4
2,3,4,7,8-PeCDF	ppt	27.6	45.6
2,3,7,8-TCDD	ppt	258	571
2,3,7,8-TCDF	ppt	21.9	32.6
OCDD	ppt	3,540	7,940
OCDF	ppt	625	1,450
Total 2,3,7,8-Congeners	ppt	5,550	11,400
Total HpCDD	ppt	691	1,340
Total HpCDF	ppt	672	1,200
Total HxCDD	ppt	181	308
Total HxCDF	ppt	452	812
Total PCDDs	ppt	4,870	10,400
Total PCDFs	ppt	2,780	4,840
Total PeCDD	ppt	51	261
Total PeCDF	ppt	444	654
Total TCDD	ppt	353	712
Total TCDF	ppt	583	864

Table 3-37
1999/2000 Minish Park Sediment Monitoring Data from Tierra (2000a)

Analyte	Units	Minimum Detect	Maximum Detect
Pesticides/PCBs			
4,4'-DDD	ppb	13.3	53
4,4'-DDE	ppb	15.6	84
4,4'-DDT	ppb	36.8	183
Aldrin	ppb	ND	ND
Alpha-BHC	ppb	ND	ND
Alpha-Chlordane	ppb	ND	ND
Aroclor-1016	ppb	ND	ND
Aroclor-1221	ppb	ND	ND
Aroclor-1232	ppb	ND	ND
Aroclor-1242	ppb	ND	ND
Aroclor-1248	ppb	103	370
Aroclor-1254	ppb	287	940
Aroclor-1260	ppb	157	640
Beta-BHC	ppb	ND	ND
Delta-BHC	ppb	ND	ND
Dieldrin	ppb	ND	ND
Endosulfan I	ppb	ND	ND
Endosulfan II	ppb	ND	ND
Endosulfan Sulfate	ppb	ND	ND
Endrin	ppb	ND	ND
Endrin Aldehyde	ppb	ND	ND
Endrin Ketone	ppb	ND	ND
Gamma-BHC (Lindane)	ppb	ND	ND
Gamma-Chlordane	ppb	ND	ND
Heptachlor	ppb	ND	ND
Heptachlor Epoxide	ppb	ND	ND
Methoxychlor	ppb	ND	ND
Total Alpha + Gamma Chlordane	ppb	ND	ND
Total DDT	ppb	66.8	251
Total PCBs - Aroclors	ppb	583	1,890
Toxaphene	ppb	ND	ND
Physical Property			
0.001 mm	% passing	1	7.5
0.002 mm	% passing	5.5	12
0.005 mm	% passing	11.5	22.5
0.02 mm	% passing	32	60.5
0.05 mm	% passing	61.5	80
0.064 mm	% passing	74	84.5

Table 3-37
1999/2000 Minish Park Sediment Monitoring Data from Tierra (2000a)

Analyte	Units	Minimum Detect	Maximum Detect
0.075 mm	% passing	77.7	88
0.15 mm	% passing	80.4	95
0.3 mm	% passing	84.8	97.9
0.6 mm	% passing	86.4	98.9
1.18 mm	% passing	88.8	99.2
19 mm	% passing	100	100
2.36 mm	% passing	90.6	99.5
3.35 mm	% passing	97.5	100
37.5 mm	% passing	100	100
4.75 mm	% passing	98.7	100
75 mm	% passing	100	100
Percent Moisture	%	59.8	75.9
Water Content ASTM D2216	% by wt.	149	314
SVOCs			
1,2,4-Trichlorobenzene	ppb	ND	ND
1,2-Dichlorobenzene	ppb	ND	ND
1,3-Dichlorobenzene	ppb	ND	ND
1,4-Dichlorobenzene	ppb	ND	ND
2,4,5-Trichlorophenol	ppb	ND	ND
2,4,6-Trichlorophenol	ppb	ND	ND
2,4-Dichlorophenol	ppb	ND	ND
2,4-Dimethylphenol	ppb	ND	ND
2,4-Dinitrophenol	ppb	ND	ND
2,4-Dinitrotoluene	ppb	ND	ND
2,6-Dinitrotoluene	ppb	ND	ND
2-Chloronaphthalene	ppb	ND	ND
2-Chlorophenol	ppb	ND	ND
2-Methylnaphthalene	ppb	ND	ND
2-Methylphenol	ppb	ND	ND
2-Nitroaniline	ppb	ND	ND
2-Nitrophenol	ppb	ND	ND
3,3'-Dichlorobenzidine	ppb	ND	ND
3-Nitroaniline	ppb	ND	ND
4,6-Dinitro-2-methylphenol	ppb	ND	ND
4-Bromophenyl phenyl ether	ppb	ND	ND
4-Chloro-3-methylphenol	ppb	ND	ND
4-Chloroaniline	ppb	ND	ND
4-Chlorophenyl phenyl ether	ppb	ND	ND
4-Methylphenol	ppb	ND	ND

Table 3-37
1999/2000 Minish Park Sediment Monitoring Data from Tierra (2000a)

Analyte	Units	Minimum Detect	Maximum Detect
4-Nitroaniline	ppb	ND	ND
4-Nitrophenol	ppb	ND	ND
Acenaphthene	ppb	63	220
Acenaphthylene	ppb	89	290
Anthracene	ppb	180	530
Benzo(a)anthracene	ppb	660	1,900
Benzo(a)pyrene	ppb	730	2,100
Benzo(b)fluoranthene	ppb	920	2,600
Benzo(g,h,i)perylene	ppb	350	810
Benzo(k)fluoranthene	ppb	360	1,000
bis(2-Chloroethoxy)methane	ppb	ND	ND
bis(2-Chloroethyl)ether	ppb	ND	ND
bis(2-Chloroisopropyl)ether	ppb	ND	ND
bis(2-Ethylhexyl)phthalate	ppb	3,500	12,000
Butyl benzyl phthalate	ppb	89	350
Carbazole	ppb	180	180
Chrysene	ppb	860	2,100
Di-n-Butylphthalate	ppb	640	640
Di-n-Octylphthalate	ppb	99	380
Dibenzo(a,h)anthracene	ppb	140	510
Dibenzofuran	ppb	ND	ND
Diethyl phthalate	ppb	ND	ND
Dimethylphthalate	ppb	ND	ND
Fluoranthene	ppb	1,300	4,100
Fluorene	ppb	64	200
Hexachlorobenzene	ppb	ND	ND
Hexachlorobutadiene	ppb	ND	ND
Hexachlorocyclopentadiene	ppb	ND	ND
Hexachloroethane	ppb	ND	ND
HMW PAHs	ppb	7,200	20,200
Indeno(1,2,3-cd)pyrene	ppb	580	1,700
Isophorone	ppb	ND	ND
LMW PAHs	ppb	920	2,700
N-Nitroso-di-n-propylamine	ppb	ND	ND
N-Nitrosodiphenylamine	ppb	ND	ND
Naphthalene	ppb	34	34
Nitrobenzene	ppb	ND	ND
Pentachlorophenol	ppb	ND	ND
Phenanthrene	ppb	490	1,500

Table 3-37
1999/2000 Minish Park Sediment Monitoring Data from Tierra (2000a)

Analyte	Units	Minimum Detect	Maximum Detect
Phenol	ppb	ND	ND
Pyrene	ppb	1,300	3,500
Total PAHs	ppb	8,120	22,900
TOC			
TOC	ppm	32,200	76,500
TPH			
TPH - DRO CA LUFT	ppm	45	500

Notes:
ASTM = American Society for Testing and Materials
AVS/SEM = acid volatile sulfide/simultaneously extracted metals
BHC = beta hexachlorocyclohexane
HMW = high molecular weight
LMW = low molecular weight
µmoles/g = micromoles per gram
mm = millimeter
ND = not detected
NOAA = National Oceanic and Atmospheric Administration
PAHs = polycyclic aromatic hydrocarbons
PCBs = polychlorinated biphenyls
PCDD/Fs = polychlorinated dibenzo-*p*-dioxins and dibenzofurans
ppb = parts per billion
ppm = parts per million
ppt = parts per trillion
SIM = selected ion monitoring
SVOCs = semivolatile organic compounds
TOC = total organic carbon
TPH = total petroleum hydrocarbons
TPH-DRO CA LUFT = total petroleum hydrocarbons-diesel range oil, California leaking underground fuel tank

Table 3-38
2000 BioGenesis Sediment Collection Data from Tierra (2000b)

Analyte	Units	Minimum Detect	Maximum Detect
AVS/SEM			
AVS	µmoles/g	51.1	51.1
Ag - SEM	µmoles/g	0.0036	0.0036
Al - SEM	µmoles/g	180	180
As - SEM	µmoles/g	0.029	0.029
Ba - SEM	µmoles/g	1	1
Be - SEM	µmoles/g	0.053	0.053
Ca - SEM	µmoles/g	120	120
Cd - SEM	µmoles/g	0.05	0.05
Co - SEM	µmoles/g	0.072	0.072
Cr - SEM	µmoles/g	2.7	2.7
Cu - SEM	µmoles/g	1.6	1.6
Fe - SEM	µmoles/g	230	230
Hg - SEM	µmoles/g	ND	ND
K - SEM	µmoles/g	18	18
Mg - SEM	µmoles/g	120	120
Mn - SEM	µmoles/g	10	10
Na - SEM	µmoles/g	140	140
Ni - SEM	µmoles/g	0.4	0.4
Pb - SEM	µmoles/g	1.6	1.6
Sb - SEM	µmoles/g	ND	ND
Se - SEM	µmoles/g	0.01	0.01
Tl - SEM	µmoles/g	0.0061	0.0061
V - SEM	µmoles/g	0.63	0.63
Zn - SEM	µmoles/g	8	8
Cyanide			
Total Cyanide	ppm	ND	ND
Herbicides			
2,4,5-T	ppb	ND	ND
2,4,5-TP (Silvex)	ppb	ND	ND
2,4-D	ppb	ND	ND
2,4-DB	ppb	ND	ND
Inorganic Chemicals			
Ag	ppm	5.4	5.4
Al	ppm	18,500	18,500
As	ppm	14.8	14.8
Ba	ppm	220	220
Be	ppm	0.98	0.98
Ca	ppm	5,530	5,530
Cd	ppm	7.6	7.6

Table 3-38
2000 BioGenesis Sediment Collection Data from Tierra (2000b)

Analyte	Units	Minimum Detect	Maximum Detect
Co	ppm	12.6	12.6
Cr	ppm	242	242
Cu	ppm	242	242
Fe	ppm	29,900	29,900
Hg	ppm	4.5	4.5
K	ppm	2,960	2,960
Mg	ppm	6,480	6,480
Mn	ppm	792	792
Na	ppm	4,000	4,000
Ni	ppm	55.2	55.2
Pb	ppm	415	415
Sb	ppm	2.6	2.6
Se	ppm	2.2	2.2
Tl	ppm	2.6	2.6
V	ppm	60.6	60.6
Zn	ppm	675	675
Miscellaneous			
Ammonia Nitrogen	ppm	602	602
pH		7.42	7.42
Organotin			
Dibutyltin	ppb	25.5	25.5
Monobutyltin	ppb	2.72	2.72
Tetrabutyltin	ppb	2.98	2.98
Tributyltin	ppb	43.6	43.6
PAH-SIM			
1,6,7-Trimethylnaphthalene	ppb	133	133
1-Methylnaphthalene	ppb	215	215
1-Methylphenanthrene	ppb	571	571
2,6-Dimethylnaphthalene	ppb	357	357
2-Methylnaphthalene	ppb	432	432
Acenaphthene	ppb	254	254
Acenaphthylene	ppb	521	521
Anthracene	ppb	1,620	1,620
Benzo(a)anthracene	ppb	2,680	2,680
Benzo(a)pyrene	ppb	2,810	2,810
Benzo(b)fluoranthene	ppb	3,560	3,560
Benzo(e)pyrene	ppb	2,040	2,040
Benzo(g,h,i)perylene	ppb	1,800	1,800
Benzo(k)fluoranthene	ppb	1,350	1,350
Biphenyl	ppb	138	138

Table 3-38
2000 BioGenesis Sediment Collection Data from Tierra (2000b)

Analyte	Units	Minimum Detect	Maximum Detect
C1-Chrysenes	ppb	2,850	2,850
C1-Dibenzothiophenes	ppb	654	654
C1-Fluoranthenes/Pyrenes	ppb	4,400	4,400
C1-Fluorenes	ppb	378	378
C1-Naphthalenes	ppb	647	647
C1-Phenanthrenes/Anthracenes	ppb	2,700	2,700
C2-Chrysenes	ppb	1,360	1,360
C2-Dibenzothiophenes	ppb	1,370	1,370
C2-Fluoranthenes/Pyrenes	ppb	2,680	2,680
C2-Fluorenes	ppb	849	849
C2-Naphthalenes	ppb	989	989
C2-Phenanthrenes/Anthracenes	ppb	3,310	3,310
C3-Chrysenes	ppb	461	461
C3-Dibenzothiophenes	ppb	1,440	1,440
C3-Fluoranthenes/Pyrenes	ppb	1,050	1,050
C3-Fluorenes	ppb	937	937
C3-Naphthalenes	ppb	1,580	1,580
C3-Phenanthrenes/Anthracenes	ppb	2,830	2,830
C4-Chrysenes	ppb	284	284
C4-Naphthalenes	ppb	2,000	2,000
C4-Phenanthrenes/Anthracenes	ppb	1,390	1,390
Chrysene	ppb	2,910	2,910
Dibenzo(a,h)anthracene	ppb	543	543
Dibenzothiophene	ppb	268	268
Fluoranthene	ppb	5,810	5,810
Fluorene	ppb	407	407
HMW PAHs	ppb	29,200	29,200
Indeno(1,2,3-cd)pyrene	ppb	2,150	2,150
LMW PAHs	ppb	6,440	6,440
Naphthalene	ppb	519	519
Perylene	ppb	1,180	1,180
Phenanthrene	ppb	2,690	2,690
Pyrene	ppb	5,540	5,540
Total PAHs	ppb	35,600	35,600
PCB Congeners			
PCB-1	ppb	4.81	4.81
PCB-105	ppb	58.2	58.2
PCB-114	ppb	3.27	3.27
PCB-118	ppb	326	326
PCB-123	ppb	105	105

Table 3-38
2000 BioGenesis Sediment Collection Data from Tierra (2000b)

Analyte	Units	Minimum Detect	Maximum Detect
PCB-126	ppb	1.17	1.17
PCB-128	ppb	79.2	79.2
PCB-138	ppb	610	610
PCB-15	ppb	66	66
PCB-153	ppb	544	544
PCB-156	ppb	65.6	65.6
PCB-157	ppb	13.2	13.2
PCB-167	ppb	34.5	34.5
PCB-169	ppb	ND	ND
PCB-170	ppb	100	100
PCB-18	ppb	260	260
PCB-180	ppb	211	211
PCB-183	ppb	52.2	52.2
PCB-184	ppb	0.303	0.303
PCB-187	ppb	106	106
PCB-189	ppb	7.77	7.77
PCB-194	ppb	30.2	30.2
PCB-195	ppb	11.3	11.3
PCB-202	ppb	6.39	6.39
PCB-206	ppb	14.3	14.3
PCB-207	ppb	1.16	1.16
PCB-209	ppb	7.02	7.02
PCB-28	ppb	383	383
PCB-3	ppb	5.66	5.66
PCB-44	ppb	272	272
PCB-52	ppb	607	607
PCB-66	ppb	327	327
PCB-77	ppb	24.2	24.2
PCB-8	ppb	79.5	79.5
PCB-81	ppb	3.8	3.8
PCB-87	ppb	204	204
PCB-90/101	ppb	587	587
Total PCBs - Congeners (NOAA, 1989)	ppb	9,220	9,220
Total PCBs - Sum of Coplanar Congeners	ppb	950	950
PCB Homologue Groups			
Total Dichlorobiphenyl	ppb	249	249
Total Heptachlorobiphenyl	ppb	757	757
Total Hexachlorobiphenyl	ppb	2,290	2,290
Total Monochlorobiphenyl	ppb	12	12
Total Nonachlorobiphenyl	ppb	19	19

Table 3-38
2000 BioGenesis Sediment Collection Data from Tierra (2000b)

Analyte	Units	Minimum Detect	Maximum Detect
Total Octachlorobiphenyl	ppb	119	119
Total PCBs - Homologue Groups	ppb	15,400	15,400
Total Pentachlorobiphenyl	ppb	3,110	3,110
Total Tetrachlorobiphenyl	ppb	6,570	6,570
Total Trichlorobiphenyl	ppb	2,270	2,270
PCDD/Fs			
1,2,3,4,6,7,8-HpCDD	ppt	784	784
1,2,3,4,6,7,8-HpCDF	ppt	1,050	1,050
1,2,3,4,7,8,9-HpCDF	ppt	44	44
1,2,3,4,7,8-HxCDD	ppt	13.2	13.2
1,2,3,4,7,8-HxCDF	ppt	310	310
1,2,3,6,7,8-HxCDD	ppt	71.6	71.6
1,2,3,6,7,8-HxCDF	ppt	86.8	86.8
1,2,3,7,8,9-HxCDD	ppt	35.7	35.7
1,2,3,7,8,9-HxCDF	ppt	14.8	14.8
1,2,3,7,8-PeCDD	ppt	19.2	19.2
1,2,3,7,8-PeCDF	ppt	29	29
2,3,4,6,7,8-HxCDF	ppt	50.2	50.2
2,3,4,7,8-PeCDF	ppt	76.4	76.4
2,3,7,8-TCDD	ppt	1610	1610
2,3,7,8-TCDF	ppt	60.7	60.7
OCDD	ppt	9,240	9,240
OCDF	ppt	2,440	2,440
Total 2,3,7,8-Congeners	ppt	15,900	15,900
Total HpCDD	ppt	1,620	1,620
Total HpCDF	ppt	1,540	1,540
Total HxCDD	ppt	345	345
Total HxCDF	ppt	1,130	1,130
Total PCDDs	ppt	13,100	13,100
Total PCDFs	ppt	9,510	9,510
Total PeCDD	ppt	93.8	93.8
Total PeCDF	ppt	1,620	1,620
Total TCDD	ppt	1,830	1,830
Total TCDF	ppt	2,780	2,780

Table 3-38
2000 BioGenesis Sediment Collection Data from Tierra (2000b)

Analyte	Units	Minimum Detect	Maximum Detect
Pesticides/PCBs			
4,4'-DDD	ppb	83	83
4,4'-DDE	ppb	210	210
4,4'-DDT	ppb	190	190
Aldrin	ppb	ND	ND
Alpha-BHC	ppb	6	6
Alpha-Chlordane	ppb	ND	ND
Aroclor-1016	ppb	ND	ND
Aroclor-1221	ppb	ND	ND
Aroclor-1232	ppb	ND	ND
Aroclor-1242	ppb	ND	ND
Aroclor-1248	ppb	3,100	3,100
Aroclor-1254	ppb	2,200	2,200
Aroclor-1260	ppb	ND	ND
Beta-BHC	ppb	ND	ND
Delta-BHC	ppb	ND	ND
Dieldrin	ppb	ND	ND
Endosulfan I	ppb	ND	ND
Endosulfan II	ppb	ND	ND
Endosulfan Sulfate	ppb	ND	ND
Endrin	ppb	ND	ND
Endrin Aldehyde	ppb	ND	ND
Endrin Ketone	ppb	ND	ND
Gamma-BHC (Lindane)	ppb	ND	ND
Gamma-Chlordane	ppb	ND	ND
Heptachlor	ppb	ND	ND
Heptachlor Epoxide	ppb	ND	ND
Methoxychlor	ppb	ND	ND
Total Alpha + Gamma Chlordane	ppb	ND	ND
Total DDT	ppb	483	483
Total PCBs - Aroclors	ppb	5,300	5,300
Toxaphene	ppb	ND	ND
Physical Property			
0.001 mm	% passing	5	5
0.002 mm	% passing	8	8
0.005 mm	% passing	14	14
0.02 mm	% passing	50	50
0.05 mm	% passing	67	67
0.064 mm	% passing	74	74
0.075 mm	% passing	77.2	77.2

Table 3-38
2000 BioGenesis Sediment Collection Data from Tierra (2000b)

Analyte	Units	Minimum Detect	Maximum Detect
0.15 mm	% passing	85.2	85.2
0.3 mm	% passing	88.3	88.3
0.6 mm	% passing	90.7	90.7
1.18 mm	% passing	93.6	93.6
19 mm	% passing	100	100
2.36 mm	% passing	94.7	94.7
3.35 mm	% passing	98.9	98.9
37.5 mm	% passing	100	100
4.75 mm	% passing	99.6	99.6
75 mm	% passing	100	100
Percent Moisture	%	53.8	53.8
Water Content ASTM D2216	% by wt.	116	116
SVOCs			
1,2,4-Trichlorobenzene	ppb	100	100
1,2-Dichlorobenzene	ppb	78	78
1,3-Dichlorobenzene	ppb	ND	ND
1,4-Dichlorobenzene	ppb	200	200
2,4,5-Trichlorophenol	ppb	ND	ND
2,4,6-Trichlorophenol	ppb	ND	ND
2,4-Dichlorophenol	ppb	ND	ND
2,4-Dimethylphenol	ppb	ND	ND
2,4-Dinitrophenol	ppb	ND	ND
2,4-Dinitrotoluene	ppb	ND	ND
2,6-Dinitrotoluene	ppb	ND	ND
2-Chloronaphthalene	ppb	ND	ND
2-Chlorophenol	ppb	ND	ND
2-Methylnaphthalene	ppb	210	210
2-Methylphenol	ppb	ND	ND
2-Nitroaniline	ppb	ND	ND
2-Nitrophenol	ppb	ND	ND
3,3'-Dichlorobenzidine	ppb	ND	ND
3-Nitroaniline	ppb	ND	ND
4,6-Dinitro-2-methylphenol	ppb	ND	ND
4-Bromophenyl phenyl ether	ppb	ND	ND
4-Chloro-3-methylphenol	ppb	ND	ND
4-Chloroaniline	ppb	170	170
4-Chlorophenyl phenyl ether	ppb	ND	ND
4-Methylphenol	ppb	160	160
4-Nitroaniline	ppb	ND	ND
4-Nitrophenol	ppb	ND	ND

Table 3-38
2000 BioGenesis Sediment Collection Data from Tierra (2000b)

Analyte	Units	Minimum Detect	Maximum Detect
Acenaphthene	ppb	320	320
Acenaphthylene	ppb	610	610
Anthracene	ppb	1,300	1,300
Benzo(a)anthracene	ppb	2,800	2,800
Benzo(a)pyrene	ppb	2,800	2,800
Benzo(b)fluoranthene	ppb	3,400	3,400
Benzo(g,h,i)perylene	ppb	1,800	1,800
Benzo(k)fluoranthene	ppb	1,100	1,100
bis(2-Chloroethoxy)methane	ppb	ND	ND
bis(2-Chloroethyl)ether	ppb	ND	ND
bis(2-Chloroisopropyl)ether	ppb	ND	ND
bis(2-Ethylhexyl)phthalate	ppb	110,000	110,000
Butyl benzyl phthalate	ppb	9,400	9,400
Carbazole	ppb	240	240
Chrysene	ppb	3,400	3,400
Di-n-Butylphthalate	ppb	ND	ND
Di-n-Octylphthalate	ppb	3,300	3,300
Dibenzo(a,h)anthracene	ppb	460	460
Dibenzofuran	ppb	130	130
Diethyl phthalate	ppb	ND	ND
Dimethylphthalate	ppb	ND	ND
Fluoranthene	ppb	6,100	6,100
Fluorene	ppb	430	430
Hexachlorobenzene	ppb	ND	ND
Hexachlorobutadiene	ppb	ND	ND
Hexachlorocyclopentadiene	ppb	ND	ND
Hexachloroethane	ppb	ND	ND
HMW PAHs	ppb	29,700	29,700
Indeno(1,2,3-cd)pyrene	ppb	1,900	1,900
Isophorone	ppb	ND	ND
LMW PAHs	ppb	5,690	5,690
N-Nitroso-di-n-propylamine	ppb	ND	ND
N-Nitrosodiphenylamine	ppb	330	330
Naphthalene	ppb	220	220
Nitrobenzene	ppb	ND	ND
Pentachlorophenol	ppb	ND	ND
Phenanthrene	ppb	2,600	2,600
Phenol	ppb	ND	ND
Pyrene	ppb	5,900	5,900
Total PAHs	ppb	35,400	35,400

Table 3-38
2000 BioGenesis Sediment Collection Data from Tierra (2000b)

Analyte	Units	Minimum Detect	Maximum Detect
TOC			
TOC	ppm	59,200	59,200
TPH			
TPH - DRO CA LUFT	ppm	200	200

Notes:
ASTM = American Society for Testing and Materials
AVS/SEM = acid volatile sulfide/simultaneously extracted metals
BHC = beta hexachlorocyclohexane
HMW = high molecular weight
LMW = low molecular weight
µmoles/g = micromoles per gram
mm = millimeters
ND = not detected
NOAA = National Oceanic and Atmospheric Administration
PAHs = polycyclic aromatic hydrocarbons
PCBs = polychlorinated biphenyls
PCDD/Fs = polychlorinated dibenzo-*p*-dioxins and dibenzofurans
ppb = parts per billion
ppm = parts per million
ppt = parts per trillion
SIM = selected ion monitoring
SVOCs = semivolatile organic compounds
TOC = total organic carbon
TPH = total petroleum hydrocarbons
TPH-DRO CA LUFT = total petroleum hydrocarbons-diesel range oil, California leaking underground fuel tank

Table 3-39a
2000 Toxicity Identification Evaluation (TIE) Study Sediment Data from Tierra (2000d)

Analyte	Units	Minimum Detect	Maximum Detect
AVS/SEM			
AVS	umoles/g	9.2	67.6
Ag - SEM	µmoles/g	0.0015	0.0015
Al - SEM	µmoles/g	115	166
As - SEM	µmoles/g	0.0275	0.0367
Ba - SEM	µmoles/g	0.626	0.934
Be - SEM	µmoles/g	0.04	0.06
Ca - SEM	µmoles/g	87.5	129
Cd - SEM	µmoles/g	0.0234	0.036
Co - SEM	µmoles/g	0.058	0.082
Cr - SEM	µmoles/g	0.963	1.43
Cu - SEM	µmoles/g	1.88	2.49
Fe - SEM	µmoles/g	165	295
Hg - SEM	µmoles/g	0.00011	0.00018
K - SEM	µmoles/g	10.9	25.7
Mg - SEM	µmoles/g	105	170
Mn - SEM	µmoles/g	3.46	8.71
Na - SEM	µmoles/g	50.1	253
Ni - SEM	µmoles/g	0.264	0.389
Pb - SEM	µmoles/g	0.908	1.14
Sb - SEM	µmoles/g	ND	ND
Se - SEM	µmoles/g	0.0042	0.0042
Sulfide - SEM	µmoles/g	9.2	67.6
Tl - SEM	µmoles/g	ND	ND
V - SEM	µmoles/g	0.257	0.353
Zn - SEM	µmoles/g	4.82	7.39
Herbicides			
2,4,5-T	ppb	52	140
2,4,5-TP (Silvex)	ppb	ND	ND
2,4-D	ppb	ND	ND
2,4-DB	ppb	240	240
Inorganic Chemicals			
Ag	ppm	2.5	4.9
Al	ppm	12,400	19,800
As	ppm	6.9	12.8
Ba	ppm	126	283
Be	ppm	0.62	0.97

Table 3-39a
2000 Toxicity Identification Evaluation (TIE) Study Sediment Data from Tierra (2000d)

Analyte	Units	Minimum Detect	Maximum Detect
Ca	ppm	5,230	6,010
Cd	ppm	4	5.8
Co	ppm	7.7	11.1
Cr	ppm	100	148
Cu	ppm	140	201
Fe	ppm	25,800	35,200
Hg	ppm	1.5	2.5
K	ppm	1,870	3,570
Mg	ppm	5,040	8,170
Mn	ppm	331	576
Na	ppm	1,400	6,330
Ni	ppm	33.8	42.8
Pb	ppm	197	300
Sb	ppm	1.3	2.3
Se	ppm	ND	ND
Tl	ppm	1.1	2
V	ppm	34.8	45.5
Zn	ppm	460	586
Miscellaneous			
Ammonia Nitrogen	ppm	260	520
pH		7.08	8.02
Sulfide	ppm	455	1270
Total Cyanide	ppm	ND	ND
Organotin			
Dibutyltin	ppb	10.661	71.398
Monobutyltin	ppb	1.208	22.294
Tetrabutyltin	ppb	0.615	1.348
Tributyltin	ppb	15.237	62.953
PAH-SIM			
1,6,7-Trimethylnaphthalene	ppb	41	50.3
1-Methylnaphthalene	ppb	141	212
1-Methylphenanthrene	ppb	310	433
2,6-Dimethylnaphthalene	ppb	160	218
2-Methylnaphthalene	ppb	293	392
Acenaphthene	ppb	188	329
Acenaphthylene	ppb	464	697
Anthracene	ppb	1,010	1,290

Table 3-39a
2000 Toxicity Identification Evaluation (TIE) Study Sediment Data from Tierra (2000d)

Analyte	Units	Minimum Detect	Maximum Detect
Benzo(a)anthracene	ppb	2,100	3,680
Benzo(a)pyrene	ppb	2,480	3,480
Benzo(b)fluoranthene	ppb	3,650	5,860
Benzo(e)pyrene	ppb	1,840	2,790
Benzo(g,h,i)perylene	ppb	1,480	2,140
Benzo(k)fluoranthene	ppb	916	2,000
Biphenyl	ppb	89.8	262
C1-Chrysenes	ppb	2,410	3,110
C1-Dibenzothiophenes	ppb	254	330
C1-Fluoranthenes/Pyrenes	ppb	3,170	3,690
C1-Fluorenes	ppb	213	316
C1-Naphthalenes	ppb	434	603
C1-Phenanthrenes/Anthracenes	ppb	1,490	2,050
C2-Chrysenes	ppb	1,280	1,450
C2-Dibenzothiophenes	ppb	506	738
C2-Fluoranthenes/Pyrenes	ppb	1,630	2,000
C2-Fluorenes	ppb	387	626
C2-Naphthalenes	ppb	447	555
C2-Phenanthrenes/Anthracenes	ppb	1,740	2,000
C3-Chrysenes	ppb	331	448
C3-Dibenzothiophenes	ppb	467	767
C3-Fluoranthenes/Pyrenes	ppb	585	965
C3-Fluorenes	ppb	386	667
C3-Naphthalenes	ppb	520	574
C3-Phenanthrenes/Anthracenes	ppb	1,020	1,490
C4-Chrysenes	ppb	308	399
C4-Naphthalenes	ppb	573	774
C4-Phenanthrenes/Anthracenes	ppb	447	669
Chrysene	ppb	2,410	4,540
Dibenzo(a,h)anthracene	ppb	479	702
Dibenzothiophene	ppb	165	222
Fluoranthene	ppb	3,850	6,240
Fluorene	ppb	202	381
Indeno(1,2,3-cd)pyrene	ppb	1,530	2,330
Naphthalene	ppb	507	669
Perylene	ppb	680	1,090
Phenanthrene	ppb	1,350	2,510

Table 3-39a
2000 Toxicity Identification Evaluation (TIE) Study Sediment Data from Tierra (2000d)

Analyte	Units	Minimum Detect	Maximum Detect
Pyrene	ppb	3,980	5,620
Total PAHs	ppb	53,612	68,492
PCB Congeners			
PCB-1	ppb	0.584	1
PCB-105	ppb	16.6	22.9
PCB-114	ppb	0.835	1.15
PCB-118	ppb	35	43.4
PCB-123	ppb	0.513	0.85
PCB-126	ppb	0.52	0.52
PCB-128	ppb	9.7	13.3
PCB-138	ppb	53.6	77.8
PCB-15	ppb	15.6	21.2
PCB-153	ppb	40.8	67.7
PCB-156	ppb	4.48	6.16
PCB-157	ppb	0.813	1.1
PCB-167	ppb	1.81	2.48
PCB-169	ppb	ND	ND
PCB-170	ppb	9.86	18.5
PCB-18	ppb	28.8	52.5
PCB-180	ppb	30.9	61.2
PCB-183	ppb	8.01	16.1
PCB-184	ppb	ND	ND
PCB-187	ppb	15.3	29.8
PCB-189	ppb	0.717	1.11
PCB-194	ppb	7.3	14.2
PCB-195	ppb	2.61	5.74
PCB-202	ppb	1.8	2.98
PCB-206	ppb	4.54	7.17
PCB-207	ppb	0.587	0.587
PCB-209	ppb	2.51	7.32
PCB-28	ppb	45	63.5
PCB-3	ppb	1	1.52
PCB-44	ppb	35.7	63.7
PCB-52	ppb	45.7	72.4
PCB-66	ppb	39.7	60.5
PCB-77	ppb	6.72	10.9
PCB-8	ppb	7.07	14.2

Table 3-39a
2000 Toxicity Identification Evaluation (TIE) Study Sediment Data from Tierra (2000d)

Analyte	Units	Minimum Detect	Maximum Detect
PCB-81	ppb	0.56	0.91
PCB-87	ppb	26.3	31.6
PCB-90/101	ppb	48.4	59.9
PCB Homologue Groups			
Total Dichlorobiphenyl	ppb	38	55.4
Total Heptachlorobiphenyl	ppb	99.4	200
Total Hexachlorobiphenyl	ppb	196	316
Total Monochlorobiphenyl	ppb	1.59	2.86
Total Nonachlorobiphenyl	ppb	5.99	10
Total Octachlorobiphenyl	ppb	27.6	53.2
Total Pentachlorobiphenyl	ppb	257	310
Total Tetrachlorobiphenyl	ppb	399	617
Total Trichlorobiphenyl	ppb	187	291
PCDD/Fs			
1,2,3,4,6,7,8-HpCDD	ppt	362	473
1,2,3,4,6,7,8-HpCDF	ppt	480	749
1,2,3,4,7,8,9-HpCDF	ppt	17.6	26.4
1,2,3,4,7,8-HxCDD	ppt	5.11	8.58
1,2,3,4,7,8-HxCDF	ppt	115	176
1,2,3,6,7,8-HxCDD	ppt	24.9	33.5
1,2,3,6,7,8-HxCDF	ppt	33	48.2
1,2,3,7,8,9-HxCDD	ppt	14.3	19.8
1,2,3,7,8,9-HxCDF	ppt	5.58	7.76
1,2,3,7,8-PeCDD	ppt	5.4	10.2
1,2,3,7,8-PeCDF	ppt	11.6	13.8
2,3,4,6,7,8-HxCDF	ppt	18.4	23.7
2,3,4,7,8-PeCDF	ppt	29.7	38
2,3,7,8-TCDD	ppt	210	634
2,3,7,8-TCDF	ppt	24.7	29.1
OCDD	ppt	5130	7,450
OCDF	ppt	706	1,450
Total HpCDD	ppt	790	1,190
Total HpCDF	ppt	743	1,070
Total HxCDD	ppt	220	282
Total HxCDF	ppt	454	647
Total PeCDD	ppt	52.1	91
Total PeCDF	ppt	380	756

Table 3-39a
2000 Toxicity Identification Evaluation (TIE) Study Sediment Data from Tierra (2000d)

Analyte	Units	Minimum Detect	Maximum Detect
Total TCDD	ppt	299	1,260
Total TCDF	ppt	658	1,540
Pesticides/PCBs			
4,4'-DDD	ppb	17	250
4,4'-DDE	ppb	36	91
4,4'-DDT	ppb	47	430
Aldrin	ppb	ND	ND
Alpha-BHC	ppb	2.2	2.2
Alpha-Chlordane	ppb	ND	ND
Aroclor-1016	ppb	ND	ND
Aroclor-1221	ppb	ND	ND
Aroclor-1232	ppb	ND	ND
Aroclor-1242	ppb	ND	ND
Aroclor-1248	ppb	300	460
Aroclor-1254	ppb	230	460
Aroclor-1260	ppb	160	430
Beta-BHC	ppb	ND	ND
Delta-BHC	ppb	ND	ND
Dieldrin	ppb	ND	ND
Endosulfan I	ppb	ND	ND
Endosulfan II	ppb	ND	ND
Endosulfan Sulfate	ppb	ND	ND
Endrin	ppb	ND	ND
Endrin Aldehyde	ppb	ND	ND
Endrin Ketone	ppb	ND	ND
Gamma-BHC (Lindane)	ppb	ND	ND
Gamma-Chlordane	ppb	ND	ND
Heptachlor	ppb	ND	ND
Heptachlor Epoxide	ppb	ND	ND
Methoxychlor	ppb	ND	ND
Toxaphene	ppb	ND	ND
Physical Property			
0.001 mm	% passing	3	11
0.002 mm	% passing	6	15.5
0.005 mm	% passing	12	24.5
0.02 mm	% passing	29	56.5
0.05 mm	% passing	49	79

Table 3-39a
2000 Toxicity Identification Evaluation (TIE) Study Sediment Data from Tierra (2000d)

Analyte	Units	Minimum Detect	Maximum Detect
0.064 mm	% passing	54	88
0.075 mm	% passing	57.2	91.4
0.15 mm	% passing	69.8	94.5
0.3 mm	% passing	84.4	95.5
0.6 mm	% passing	92.7	96.3
1.18 mm	% passing	94.6	96.8
19 mm	% passing	99.2	100
2.36 mm	% passing	95.1	97.3
3.35 mm	% passing	97.6	99.6
37.5 mm	% passing	100	100
4.75 mm	% passing	98.6	99.9
75 mm	% passing	100	100
Clay	%	6	16
Gravel	%	3	5
Percent Moisture	%	51.7	66.3
Sand	%	6	40
Silt	%	51	75
Water Content ASTM D2216	% by wt.	107	197
SVOCs			
1,2,4-Trichlorobenzene	ppb	ND	ND
1,2-Dichlorobenzene	ppb	ND	ND
1,3-Dichlorobenzene	ppb	ND	ND
1,4-Dichlorobenzene	ppb	ND	ND
2,4,5-Trichlorophenol	ppb	ND	ND
2,4,6-Trichlorophenol	ppb	ND	ND
2,4-Dichlorophenol	ppb	ND	ND
2,4-Dimethylphenol	ppb	ND	ND
2,4-Dinitrophenol	ppb	ND	ND
2,4-Dinitrotoluene	ppb	ND	ND
2,6-Dinitrotoluene	ppb	ND	ND
2-Chloronaphthalene	ppb	ND	ND
2-Chlorophenol	ppb	ND	ND
2-Methylnaphthalene	ppb	790	790
2-Methylphenol	ppb	ND	ND
2-Nitroaniline	ppb	ND	ND
2-Nitrophenol	ppb	ND	ND
3,3'-Dichlorobenzidine	ppb	ND	ND

Table 3-39a
2000 Toxicity Identification Evaluation (TIE) Study Sediment Data from Tierra (2000d)

Analyte	Units	Minimum Detect	Maximum Detect
3-Nitroaniline	ppb	ND	ND
4,6-Dinitro-2-methylphenol	ppb	ND	ND
4-Bromophenyl phenyl ether	ppb	ND	ND
4-Chloro-3-methylphenol	ppb	ND	ND
4-Chloroaniline	ppb	ND	ND
4-Chlorophenyl phenyl ether	ppb	ND	ND
4-Methylphenol	ppb	ND	ND
4-Nitroaniline	ppb	ND	ND
4-Nitrophenol	ppb	ND	ND
Acenaphthene	ppb	730	730
Acenaphthylene	ppb	440	3,000
Anthracene	ppb	780	3,100
Benzo(a)anthracene	ppb	2,100	12,000
Benzo(a)pyrene	ppb	2,500	15,000
Benzo(b)fluoranthene	ppb	3,200	16,000
Benzo(g,h,i)perylene	ppb	1,400	7,700
Benzo(k)fluoranthene	ppb	1,400	6,000
bis(2-Chloroethoxy)methane	ppb	ND	ND
bis(2-Chloroethyl)ether	ppb	ND	ND
bis(2-Chloroisopropyl)ether	ppb	ND	ND
bis(2-Ethylhexyl)phthalate	ppb	12,000	26,000
Butyl benzyl phthalate	ppb	96,000	96,000
Carbazole	ppb	ND	ND
Chrysene	ppb	2,300	11,000
Dibenzo(a,h)anthracene	ppb	470	2,600
Dibenzofuran	ppb	ND	ND
Diethyl phthalate	ppb	ND	ND
Dimethylphthalate	ppb	ND	ND
Di-n-Butylphthalate	ppb	ND	ND
Di-n-Octylphthalate	ppb	ND	ND
Fluoranthene	ppb	4,500	19,000
Fluorene	ppb	920	920
Hexachlorobenzene	ppb	ND	ND
Hexachlorobutadiene	ppb	ND	ND
Hexachlorocyclopentadiene	ppb	ND	ND
Hexachloroethane	ppb	ND	ND
Indeno(1,2,3-cd)pyrene	ppb	1,800	9,700

Table 3-39a
2000 Toxicity Identification Evaluation (TIE) Study Sediment Data from Tierra (2000d)

Analyte	Units	Minimum Detect	Maximum Detect
Isophorone	ppb	ND	ND
Naphthalene	ppb	1,400	1,400
Nitrobenzene	ppb	ND	ND
N-Nitroso-di-n-propylamine	ppb	ND	ND
N-Nitrosodiphenylamine	ppb	1,300	1,300
Pentachlorophenol	ppb	ND	ND
Phenanthrene	ppb	1,900	4,400
Phenol	ppb	ND	ND
Pyrene	ppb	4,300	20,000
TOC			
TOC	ppm	19,800	37,500
TPH			
TPH - DRO CA LUFT	ppm	100	340

Notes:
ASTM = American Society for Testing and Materials
AVS/SEM = acid volatile sulfide/simultaneously extracted metals
BHC = beta hexachlorocyclohexane
mm = millimeters
ND = not detected
PAHs = polycyclic aromatic hydrocarbons
PCBs = polychlorinated biphenyls
PCDD/Fs = polychlorinated dibenzo-*p*-dioxins and dibenzofurans
ppb = parts per billion
ppm = parts per million
ppt = parts per trillion
SIM = selected ion monitoring
SVOCs = semivolatile organic compounds
TOC = total organic carbon
TPH = total petroleum hydrocarbons
TPH-DRO CA LUFT = total petroleum hydrocarbons-diesel range oil, California leaking underground fuel tank
µmoles/g = micromoles per gram

Table 3-39b
2000 Toxicity Identification Evaluation (TIE) Study Pore Water Data from Tierra (2000d)

Analyte	Units	Min Detect	Max Detect
Herbicides			
2,4,5-T	ppb	5.9	5.9
2,4,5-TP (Silvex)	ppb	0.15	0.15
2,4-D	ppb	25	25
2,4-DB	ppb	ND	ND
Inorganic Chemicals			
Ag	ppm	0.001	0.001
Al	ppm	0.113	0.293
As	ppm	ND	ND
Ba	ppm	0.026	0.0916
Be	ppm	ND	ND
Ca	ppm	75.8	144
Cd	ppm	ND	ND
Co	ppm	ND	ND
Cr	ppm	0.0066	0.0169
Cu	ppm	0.0026	0.0173
Fe	ppm	0.879	7.63
Hg	ppm	0.000027	0.00014
K	ppm	26.2	123
Mg	ppm	90.3	405
Mn	ppm	0.563	1.49
Na	ppm	493	3340
Ni	ppm	0.0014	0.0035
Pb	ppm	0.003	0.011
Sb	ppm	ND	ND
Se	ppm	ND	ND
Tl	ppm	0.005	0.005
V	ppm	0.0015	0.0032
Zn	ppm	0.0051	0.0143
Miscellaneous			
Ammonia Nitrogen	ppm	4.6	18.6
DOC	ppm	11	24.6
Sulfide	ppm	13.8	13.8
Total Cyanide	ppb	14.8	14.8
Organotin			
Dibutyltin	ppb	0.036	0.056
Monobutyltin	ppb	0.012	0.017

Table 3-39b
2000 Toxicity Identification Evaluation (TIE) Study Pore Water Data from Tierra (2000d)

Analyte	Units	Min Detect	Max Detect
Tetrabutyltin	ppb	ND	ND
Tributyltin	ppb	0.015	0.023
PAH-SIM			
1,6,7-Trimethylnaphthalene	ppb	0.0052	0.0504
1-Methylnaphthalene	ppb	0.035	0.11
1-Methylphenanthrene	ppb	0.0126	0.0802
2,6-Dimethylnaphthalene	ppb	0.0177	0.0919
2-Methylnaphthalene	ppb	0.0247	0.0818
Acenaphthene	ppb	0.0813	0.507
Acenaphthylene	ppb	0.0183	0.16
Anthracene	ppb	0.0451	0.557
Benzo(a)anthracene	ppb	0.058	0.461
Benzo(a)pyrene	ppb	0.0462	0.357
Benzo(b)fluoranthene	ppb	0.0761	0.59
Benzo(e)pyrene	ppb	0.0622	0.362
Benzo(g,h,i)perylene	ppb	0.0461	0.258
Benzo(k)fluoranthene	ppb	0.0278	0.153
Biphenyl	ppb	0.0181	0.425
C1-Chrysenes	ppb	0.0808	0.617
C1-Dibenzothiophenes	ppb	0.016	0.132
C1-Fluoranthenes/Pyrenes	ppb	0.104	0.943
C1-Fluorenes	ppb	0.0268	0.176
C1-Naphthalenes	ppb	0.0597	0.192
C1-Phenanthrenes/Anthracenes	ppb	0.0603	0.528
C2-Chrysenes	ppb	0.0494	0.358
C2-Dibenzothiophenes	ppb	0.0294	0.269
C2-Fluoranthenes/Pyrenes	ppb	0.0713	0.463
C2-Fluorenes	ppb	0.0384	0.294
C2-Naphthalenes	ppb	0.064	0.427
C2-Phenanthrenes/Anthracenes	ppb	0.078	0.776
C3-Chrysenes	ppb	0.0185	0.115
C3-Dibenzothiophenes	ppb	0.0436	0.405
C3-Fluoranthenes/Pyrenes	ppb	0.0434	0.25
C3-Fluorenes	ppb	0.044	0.317
C3-Naphthalenes	ppb	0.0506	0.622
C3-Phenanthrenes/Anthracenes	ppb	0.092	0.649
C4-Chrysenes	ppb	0.0255	0.0597

Table 3-39b
2000 Toxicity Identification Evaluation (TIE) Study Pore Water Data from Tierra (2000d)

Analyte	Units	Min Detect	Max Detect
C4-Naphthalenes	ppb	0.0736	0.807
C4-Phenanthrenes/Anthracenes	ppb	0.0369	0.301
Chrysene	ppb	0.0831	0.54
Dibenzo(a,h)anthracene	ppb	0.0099	0.0745
Dibenzothiophene	ppb	0.0102	0.134
Fluoranthene	ppb	0.156	1.3
Fluorene	ppb	0.0414	0.204
Indeno(1,2,3-cd)pyrene	ppb	0.0298	0.197
Naphthalene	ppb	0.0663	0.264
Perylene	ppb	0.0061	0.052
Phenanthrene	ppb	0.0646	0.505
Pyrene	ppb	0.16	1.23
Total PAHs	ppb	2365	16880
PCB Congeners			
PCB-1	ppb	ND	ND
PCB-105	ppb	0.00218	0.0299
PCB-114	ppb	0.00204	0.00204
PCB-118	ppb	0.00558	0.0683
PCB-123	ppb	0.00132	0.00132
PCB-126	ppb	ND	ND
PCB-128	ppb	0.00143	0.0107
PCB-138	ppb	0.0086	0.0819
PCB-15	ppb	0.00134	0.00569
PCB-153	ppb	0.00827	0.075
PCB-156	ppb	0.00265	0.00583
PCB-157	ppb	0.00136	0.00136
PCB-167	ppb	0.0013	0.00238
PCB-169	ppb	ND	ND
PCB-170	ppb	0.00168	0.0138
PCB-18	ppb	0.00246	0.0604
PCB-180	ppb	0.00589	0.0543
PCB-183	ppb	0.00154	0.0145
PCB-184	ppb	ND	ND
PCB-187	ppb	0.00337	0.0318
PCB-189	ppb	ND	ND
PCB-194	ppb	0.00151	0.015
PCB-195	ppb	0.00287	0.00542

Table 3-39b
2000 Toxicity Identification Evaluation (TIE) Study Pore Water Data from Tierra (2000d)

Analyte	Units	Min Detect	Max Detect
PCB-202	ppb	0.00184	0.00409
PCB-206	ppb	0.00114	0.012
PCB-207	ppb	ND	ND
PCB-209	ppb	0.00102	0.00939
PCB-28	ppb	0.0049	0.0947
PCB-3	ppb	ND	ND
PCB-44	ppb	0.00298	0.0822
PCB-52	ppb	0.00793	0.118
PCB-66	ppb	0.0061	0.0322
PCB-77	ppb	0.00195	0.00573
PCB-8	ppb	0.00243	0.0109
PCB-81	ppb	ND	ND
PCB-87	ppb	0.00338	0.0455
PCB-90/101	ppb	0.00897	0.102
PCB Homologue Groups			
Total Dichlorobiphenyl	ppb	0.00372	0.0282
Total Heptachlorobiphenyl	ppb	0.0168	0.171
Total Hexachlorobiphenyl	ppb	0.0308	0.317
Total Monochlorobiphenyl	ppb	ND	ND
Total Nonachlorobiphenyl	ppb	0.00114	0.0161
Total Octachlorobiphenyl	ppb	0.00445	0.0534
Total Pentachlorobiphenyl	ppb	0.0447	0.504
Total Tetrachlorobiphenyl	ppb	0.0579	0.89
Total Trichlorobiphenyl	ppb	0.0158	0.396
PCDD/Fs			
1,2,3,4,6,7,8-HpCDD	ppt	0.118	0.462
1,2,3,4,6,7,8-HpCDF	ppt	0.224	1.28
1,2,3,4,7,8,9-HpCDF	ppt	0.0208	0.0366
1,2,3,4,7,8-HxCDD	ppt	ND	ND
1,2,3,4,7,8-HxCDF	ppt	0.0388	0.258
1,2,3,6,7,8-HxCDD	ppt	0.0229	0.0316
1,2,3,6,7,8-HxCDF	ppt	0.0103	0.0641
1,2,3,7,8,9-HxCDD	ppt	0.0164	0.0177
1,2,3,7,8,9-HxCDF	ppt	ND	ND
1,2,3,7,8-PeCDD	ppt	ND	ND
1,2,3,7,8-PeCDF	ppt	0.00899	0.0145
2,3,4,6,7,8-HxCDF	ppt	0.01	0.0276

Table 3-39b
2000 Toxicity Identification Evaluation (TIE) Study Pore Water Data from Tierra (2000d)

Analyte	Units	Min Detect	Max Detect
2,3,4,7,8-PeCDF	ppt	0.00834	0.028
2,3,7,8-TCDD	ppt	0.037	0.15
2,3,7,8-TCDF	ppt	0.0139	0.02
OCDD	ppt	1.84	6.07
OCDF	ppt	0.388	2.21
Total HpCDD	ppt	0.254	1.08
Total HpCDF	ppt	0.284	1.63
Total HxCDD	ppt	0.0353	0.271
Total HxCDF	ppt	0.114	0.772
Total PeCDD	ppt	0.0369	0.0369
Total PeCDF	ppt	0.0181	0.39
Total TCDD	ppt	0.0545	0.249
Total TCDF	ppt	0.0729	0.562
Pesticides/PCBs			
4,4'-DDD	ppb	0.027	0.055
4,4'-DDE	ppb	0.037	0.12
4,4'-DDT	ppb	0.011	0.035
Aldrin	ppb	ND	ND
Alpha-BHC	ppb	ND	ND
Alpha-Chlordane	ppb	0.0032	0.032
Aroclor-1016	ppb	ND	ND
Aroclor-1221	ppb	ND	ND
Aroclor-1232	ppb	ND	ND
Aroclor-1242	ppb	ND	ND
Aroclor-1248	ppb	ND	ND
Aroclor-1254	ppb	ND	ND
Aroclor-1260	ppb	ND	ND
Beta-BHC	ppb	0.0048	0.016
Delta-BHC	ppb	0.013	0.037
Dieldrin	ppb	0.0097	0.0097
Endosulfan I	ppb	ND	ND
Endosulfan II	ppb	ND	ND
Endosulfan Sulfate	ppb	0.14	0.31
Endrin	ppb	0.024	0.094
Endrin Aldehyde	ppb	ND	ND
Endrin Ketone	ppb	ND	ND
Gamma-BHC (Lindane)	ppb	0.0054	0.0054

Table 3-39b
2000 Toxicity Identification Evaluation (TIE) Study Pore Water Data from Tierra (2000d)

Analyte	Units	Min Detect	Max Detect
Gamma-Chlordane	ppb	0.0037	0.0037
Heptachlor	ppb	0.0034	0.0034
Heptachlor Epoxide	ppb	0.024	0.024
Methoxychlor	ppb	ND	ND
Toxaphene	ppb	ND	ND
Physical Property			
TDS	ppm	1980	10700
TSS	ppm	13	59
SVOCs			
1,2,4-Trichlorobenzene	ppb	ND	ND
1,2-Dichlorobenzene	ppb	ND	ND
1,3-Dichlorobenzene	ppb	ND	ND
1,4-Dichlorobenzene	ppb	ND	ND
2,4,5-Trichlorophenol	ppb	ND	ND
2,4,6-Trichlorophenol	ppb	ND	ND
2,4-Dichlorophenol	ppb	4	4
2,4-Dimethylphenol	ppb	ND	ND
2,4-Dinitrophenol	ppb	ND	ND
2,4-Dinitrotoluene	ppb	ND	ND
2,6-Dinitrotoluene	ppb	ND	ND
2-Chloronaphthalene	ppb	ND	ND
2-Chlorophenol	ppb	2	2
2-Methylnaphthalene	ppb	ND	ND
2-Methylphenol	ppb	ND	ND
2-Nitroaniline	ppb	ND	ND
2-Nitrophenol	ppb	ND	ND
3,3'-Dichlorobenzidine	ppb	ND	ND
3-Nitroaniline	ppb	ND	ND
4,6-Dinitro-2-methylphenol	ppb	ND	ND
4-Bromophenyl phenyl ether	ppb	ND	ND
4-Chloro-3-methylphenol	ppb	1	1
4-Chloroaniline	ppb	ND	ND
4-Chlorophenyl phenyl ether	ppb	ND	ND
4-Methylphenol	ppb	ND	ND
4-Nitroaniline	ppb	ND	ND
4-Nitrophenol	ppb	ND	ND
Acenaphthene	ppb	ND	ND

Table 3-39b
2000 Toxicity Identification Evaluation (TIE) Study Pore Water Data from Tierra (2000d)

Analyte	Units	Min Detect	Max Detect
Acenaphthylene	ppb	ND	ND
Anthracene	ppb	ND	ND
Benzo(a)anthracene	ppb	ND	ND
Benzo(a)pyrene	ppb	ND	ND
Benzo(b)fluoranthene	ppb	ND	ND
Benzo(g,h,i)perylene	ppb	ND	ND
Benzo(k)fluoranthene	ppb	ND	ND
bis(2-Chloroethoxy)methane	ppb	ND	ND
bis(2-Chloroethyl)ether	ppb	ND	ND
bis(2-Chloroisopropyl)ether	ppb	ND	ND
bis(2-Ethylhexyl)phthalate	ppb	4	12
Butyl benzyl phthalate	ppb	ND	ND
Carbazole	ppb	ND	ND
Chrysene	ppb	ND	ND
Di-n-Butylphthalate	ppb	ND	ND
Di-n-Octylphthalate	ppb	ND	ND
Dibenzo(a,h)anthracene	ppb	ND	ND
Dibenzofuran	ppb	ND	ND
Diethyl phthalate	ppb	ND	ND
Dimethylphthalate	ppb	ND	ND
Fluoranthene	ppb	ND	ND
Fluorene	ppb	ND	ND
Hexachlorobenzene	ppb	ND	ND
Hexachlorobutadiene	ppb	ND	ND
Hexachlorocyclopentadiene	ppb	ND	ND
Hexachloroethane	ppb	ND	ND
Indeno(1,2,3-cd)pyrene	ppb	ND	ND
Isophorone	ppb	1	2
N-Nitroso-di-n-propylamine	ppb	ND	ND
N-Nitrosodiphenylamine	ppb	ND	ND
Naphthalene	ppb	ND	ND
Nitrobenzene	ppb	ND	ND
Pentachlorophenol	ppb	ND	ND
Phenanthrene	ppb	ND	ND
Phenol	ppb	2	18
Pyrene	ppb	ND	ND
TOC			
TOC	ppm	28.5	43

Table 3-39b
2000 Toxicity Identification Evaluation (TIE) Study Pore Water Data from Tierra (2000d)

Analyte	Units	Min Detect	Max Detect
TPH			
TPH - DRO CA LUFT	ppb	970	4100

Notes:
BHC = beta hexachlorocyclohexane
DOC = dissolved organic carbon
ND = not detected
PAHs = polycyclic aromatic hydrocarbons
PCBs = polychlorinated biphenyls
PCDD/Fs = polychlorinated dibenzo-*p*-dioxins and dibenzofurans
ppb = parts per billion
ppm = parts per million
ppt = parts per trillion
SIM = selected ion monitoring
SVOCs = semivolatile organic compounds
TDS = total dissolved solids
TOC = total organic carbon
TPH = total petroleum hydrocarbons
TPH-DRO CA LUFT = total petroleum hydrocarbons-diesel range oil, California leaking underground fuel tank
TSS = total suspended solids

Table 3-40

1995 USACE Minish Park Sediment Data from USACE (unknown)

Analyte	Units	Minimum Detect	Maximum Detect
Inorganic Chemicals			
Ag	ppm	0.63	17
Al	ppm	3,900	17,000
As	ppm	4.8	4,700
Ba	ppm	43	330
Be	ppm	0.22	0.93
Ca	ppm	2,000	25,000
Cd	ppm	1	18
Co	ppm	3.2	20
Cr	ppm	7.3	650
Cu	ppm	35	540
Fe	ppm	8,800	29,000
Hg	ppm	0.3	8.3
K	ppm	410	2,400
Mg	ppm	2,400	6,200
Mn	ppm	100	1,100
Na	ppm	240	3,900
Ni	ppm	15	100
Pb	ppm	52	22,000
Sb	ppm	6.9	290
Se	ppm	0.68	4.5
Tl	ppm	0.36	1
V	ppm	12	85
Zn	ppm	170	1,400
Pesticides/PCBs			
4,4'-DDD	ppb	9.3	920
4,4'-DDE	ppb	2.8	1,700
4,4'-DDT	ppb	5.9	880
Aldrin	ppb	12	140
Alpha-BHC	ppb	ND	ND
Alpha-Chlordane	ppb	2.5	77
Beta-BHC	ppb	ND	ND
Delta-BHC	ppb	1.1	21
Dieldrin	ppb	1.3	160
Endosulfan I	ppb	7.4	21
Endosulfan II	ppb	2.1	47
Endosulfan Sulfate	ppb	1.6	30
Endrin	ppb	1	64
Endrin Aldehyde	ppb	11	28

Table 3-40

1995 USACE Minish Park Sediment Data from USACE (unknown)

Analyte	Units	Minimum Detect	Maximum Detect
Endrin Ketone	ppb	ND	ND
Gamma-BHC (Lindane)	ppb	3.3	3.3
Gamma-Chlordane	ppb	2.5	130
Heptachlor	ppb	2.7	4.4
Heptachlor Epoxide	ppb	0.79	81
Methoxychlor	ppb	11	160
Total Alpha + Gamma Chlordane	ppb	5	130
Total DDT	ppb	16.1	2,300
Toxaphene	ppb	1,100	1,100
PCDD/Fs			
OCDD	ppt	1,000	19,000
OCDF	ppt	150	7,600
Total HpCDD	ppt	250	3,500
Total HpCDF	ppt	230	5,900
Total HxCDD	ppt	81	2,100
Total HxCDF	ppt	130	3,700
Total PCDDs	ppt	1,810	44,000
Total PCDFs	ppt	672	35,500
Total PeCDD	ppt	11	270
Total PeCDF	ppt	32	6,300
Total TCDD	ppt	77	20,000
Total TCDF	ppt	130	12,000
SVOCs			
1,2,4-Trichlorobenzene	ppb	ND	ND
1,2-Dichlorobenzene	ppb	ND	ND
1,3-Dichlorobenzene	ppb	ND	ND
1,4-Dichlorobenzene	ppb	480	480
2,4,5-Trichlorophenol	ppb	ND	ND
2,4,6-Trichlorophenol	ppb	ND	ND
2,4-Dichlorophenol	ppb	ND	ND
2,4-Dimethylphenol	ppb	ND	ND
2,4-Dinitrophenol	ppb	63,000	63,000
2,4-Dinitrotoluene	ppb	10,000	10,000
2,6-Dinitrotoluene	ppb	ND	ND
2-Chloronaphthalene	ppb	ND	ND
2-Chlorophenol	ppb	ND	ND
2-Methylnaphthalene	ppb	150	140,000
2-Methylphenol	ppb	ND	ND
2-Nitroaniline	ppb	ND	ND

Table 3-40

1995 USACE Minish Park Sediment Data from USACE (unknown)

Analyte	Units	Minimum Detect	Maximum Detect
2-Nitrophenol	ppb	ND	ND
3,3'-Dichlorobenzidine	ppb	ND	ND
3-Nitroaniline	ppb	ND	ND
4,6-Dinitro-2-methylphenol	ppb	ND	ND
4-Bromophenyl phenyl ether	ppb	ND	ND
4-Chloro-3-methylphenol	ppb	ND	ND
4-Chloroaniline	ppb	ND	ND
4-Chlorophenyl phenyl ether	ppb	ND	ND
4-Methylphenol	ppb	ND	ND
4-Nitroaniline	ppb	ND	ND
4-Nitrophenol	ppb	ND	ND
Acenaphthene	ppb	330	180,000
Acenaphthylene	ppb	260	27,000
Anthracene	ppb	130	140,000
Benzo(a)anthracene	ppb	340	120,000
Benzo(a)pyrene	ppb	390	100,000
Benzo(b)fluoranthene	ppb	460	85,000
Benzo(g,h,i)perylene	ppb	250	32,000
Benzo(k)fluoranthene	ppb	320	77,000
bis(2-Chloroethoxy)methane	ppb	ND	ND
bis(2-Chloroethyl)ether	ppb	ND	ND
bis(2-Chloroisopropyl)ether	ppb	ND	ND
bis(2-Ethylhexyl)phthalate	ppb	860	89,000
Butyl benzyl phthalate	ppb	290	780
Carbazole	ppb	300	12,000
Chrysene	ppb	500	140,000
Di-n-Butylphthalate	ppb	380	1,900
Di-n-Octylphthalate	ppb	220	17,000
Dibenzo(a,h)anthracene	ppb	120	18,000
Dibenzofuran	ppb	180	13,000
Diethyl phthalate	ppb	ND	ND
Dimethylphthalate	ppb	ND	ND
Fluoranthene	ppb	820	200,000
Fluorene	ppb	310	160,000
Hexachlorobenzene	ppb	ND	ND
Hexachlorobutadiene	ppb	ND	ND
Hexachlorocyclopentadiene	ppb	ND	ND
Hexachloroethane	ppb	ND	ND
HMW PAHs	ppb	4,350	1,080,000

Table 3-40

1995 USACE Minish Park Sediment Data from USACE (unknown)

Analyte	Units	Minimum Detect	Maximum Detect
Indeno(1,2,3-cd)pyrene	ppb	270	34,000
Isophorone	ppb	ND	ND
LMW PAHs	ppb	530	1,230,000
N-Nitroso-di-n-propylamine	ppb	ND	ND
N-Nitrosodiphenylamine	ppb	2,200	2,200
Naphthalene	ppb	330	130,000
Nitrobenzene	ppb	ND	ND
Pentachlorophenol	ppb	ND	ND
Phenanthrene	ppb	400	460,000
Phenol	ppb	ND	ND
Pyrene	ppb	880	270,000
Total PAHs	ppb	4,880	2,300,000
TOC			
TOC	ppm	11,000	170,000
TPH			
Petroleum Hydrocarbons (extractable)	ppm	880	19,000
VOCs			
1,1,1,2-Tetrachloroethane	ppb	ND	ND
1,1,1-Trichloroethane	ppb	ND	ND
1,1,2,2-Tetrachloroethane	ppb	ND	ND
1,1,2-Trichloroethane	ppb	ND	ND
1,1-Dichloroethane	ppb	ND	ND
1,1-Dichloroethene	ppb	ND	ND
1,1-Dichloropropene	ppb	ND	ND
1,2,3-Trichlorobenzene	ppb	ND	ND
1,2,3-Trichloropropane	ppb	ND	ND
1,2,4-Trichlorobenzene	ppb	ND	ND
1,2,4-Trimethylbenzene	ppb	5.2	26000
1,2-Dibromo-3-chloropropane	ppb	ND	ND
1,2-Dibromoethane	ppb	ND	ND
1,2-Dichlorobenzene	ppb	2.5	11
1,2-Dichloroethane	ppb	ND	ND
1,2-Dichloroethene (total)	ppb	ND	ND
1,2-Dichloropropane	ppb	ND	ND
1,3,5-Trimethylbenzene	ppb	4.9	12000
1,3-Dichlorobenzene	ppb	3.1	150
1,3-Dichloropropane	ppb	ND	ND
1,4-Dichlorobenzene	ppb	4	78
2,2-Dichloropropane	ppb	ND	ND

Table 3-40

1995 USACE Minish Park Sediment Data from USACE (unknown)

Analyte	Units	Minimum Detect	Maximum Detect
2-Butanone	ppb	10	170
2-Chlorotoluene	ppb	ND	ND
2-Hexanone	ppb	ND	ND
4-Chlorotoluene	ppb	ND	ND
4-Methyl-2-pentanone	ppb	ND	ND
Acetone	ppb	27	290
Benzene	ppb	2	3300
Bromobenzene	ppb	5.2	5.2
Bromochloromethane	ppb	ND	ND
Bromodichloromethane	ppb	ND	ND
Bromoform	ppb	ND	ND
Bromomethane	ppb	ND	ND
Carbon Disulfide	ppb	2	5
Carbon Tetrachloride	ppb	ND	ND
Chlorobenzene	ppb	3	15
Chloroethane	ppb	ND	ND
Chloroform	ppb	ND	ND
Chloromethane	ppb	ND	ND
cis-1,2-Dichloroethene	ppb	ND	ND
cis-1,3-Dichloropropene	ppb	ND	ND
Dibromochloromethane	ppb	ND	ND
Dibromomethane	ppb	ND	ND
Dichlorodifluoromethane	ppb	ND	ND
Ethylbenzene	ppb	2	31000
Hexachlorobutadiene	ppb	7.2	7.2
Isopropylbenzene	ppb	5.4	6700
m&p-Xylene	ppb	3	1400
Methylene Chloride	ppb	2	53
n-Butylbenzene	ppb	4.6	8.7
n-Propylbenzene	ppb	7.7	2300
Naphthalene	ppb	4.4	42000
o-Xylene	ppb	8.2	10000
p-Isopropyltoluene	ppb	3.7	8200
sec-Butylbenzene	ppb	5.4	200
Styrene	ppb	ND	ND
tert-Butylbenzene	ppb	ND	ND
Tetrachloroethene	ppb	ND	ND
Toluene	ppb	2	380
Total BTEX	ppb	2	46100

Table 3-40

1995 USACE Minish Park Sediment Data from USACE (unknown)

Analyte	Units	Minimum Detect	Maximum Detect
Total Xylenes	ppb	2	370
trans-1,2-Dichloroethene	ppb	ND	ND
trans-1,3-Dichloropropene	ppb	ND	ND
Trichloroethene	ppb	ND	ND
Trichlorofluoromethane	ppb	ND	ND
Vinyl Acetate	ppb	ND	ND
Vinyl Chloride	ppb	ND	ND

Notes:
BTEX = benzene, toluene, ethylbenzene, and xylene
BHC = beta hexachlorocyclohexane
HMW = high molecular weight
LMW = low molecular weight
ND = not detected
PAHs = polycyclic aromatic hydrocarbons
PCBs = polychlorinated biphenyls
PCDD/Fs = polychlorinated dibenzo-*p*-dioxins and dibenzofurans
ppb = parts per billion
ppm = parts per million
ppt = parts per trillion
SVOCs = semivolatile organic compounds
TOC = total organic carbon
TPH = total petroleum hydrocarbons
VOCs = volatile organic compounds

Table 3-41a
1993/1994 R-EMAP NY/NJ Harbor Estuary Sediment Quality Investigation from USEPA (1998)

Analyte	Units	Minimum Detect	Maximum Detect
AVS/SEM			
Acid Volatile Sulfide	mM	0.218	110
Cd - SEM	ppm	0.1	6.07
Cu - SEM	ppm	0.2	141
Hg - SEM	ppm	ND	ND
Ni - SEM	ppm	0.9	19.6
Pb - SEM	ppm	10	520
Zn - SEM	ppm	17	635
Inorganic Chemicals			
Ag	ppm	0.108	5.61
Al	ppm	35,600	79,800
As	ppm	3.98	114
Cd	ppm	0.133	12.9
Cr	ppm	26.5	244
Cu	ppm	12.2	652
Fe	ppm	8,370	47,100
Hg	ppm	0.166	6.7
Mn	ppm	145	598
Ni	ppm	10.5	85.1
Pb	ppm	12	550
Sb	ppm	0.54	36.1
Se	ppm	0.32	38.1
Silicon	ppm	210,000	450,000
Tin	ppm	0.28	71.8
Zn	ppm	46.2	786
Organotin			
Dibutyltin	ppb	2	130
Monobutyltin	ppb	1	56.4
Tetrabutyltin	ppb	0.1	62
Tributyltin	ppb	3	290
PAH-SIM			
1,6,7-Trimethylnaphthalene	ppb	10	280
1-Methylnaphthalene	ppb	3.6	490
1-Methylphenanthrene	ppb	42	4,000
2,6-Dimethylnaphthalene	ppb	6.8	620
2-Methylnaphthalene	ppb	12	690
Acenaphthene	ppb	10	1,100
Acenaphthylene	ppb	17	1,600
Anthracene	ppb	33	2,000

Table 3-41a
1993/1994 R-EMAP NY/NJ Harbor Estuary Sediment Quality Investigation from USEPA (1998)

Analyte	Units	Minimum Detect	Maximum Detect
Benzo(a)anthracene	ppb	82	3,900
Benzo(a)pyrene	ppb	67	4,200
Benzo(b,k)fluoranthene	ppb	165	6,030
Benzo(e)pyrene	ppb	76	3,000
Benzo(g,h,i)perylene	ppb	51	2,900
Biphenyl	ppb	5.2	280
Chrysene	ppb	90	6,500
Dibenzo(a,h)anthracene	ppb	16	1,400
Fluoranthene	ppb	120	3,400
Fluorene	ppb	14	610
HMW PAHs	ppb	754	30,800
Indeno(1,2,3-cd)pyrene	ppb	63	3,200
LMW PAHs	ppb	176	10,500
Naphthalene	ppb	36	1,100
Perylene	ppb	83	6,400
Phenanthrene	ppb	45	3,400
Pyrene	ppb	100	2,900
Total PAHs	ppb	930	41,300
PCB Congeners			
PCB-101	ppb	1.16	157
PCB-105	ppb	0.41	55.3
PCB-110/77	ppb	0	417
PCB-118	ppb	1.05	140
PCB-126	ppb	1.22	26.2
PCB-128	ppb	0.69	22.1
PCB-138	ppb	1.05	248
PCB-153	ppb	1.29	389
PCB-170	ppb	0	242
PCB-18	ppb	0.28	61.8
PCB-180	ppb	0.36	287
PCB-187	ppb	0.28	141
PCB-195	ppb	0.12	31.4
PCB-206	ppb	0.19	9.97
PCB-209	ppb	0.1	31
PCB-28	ppb	1.53	84.3
PCB-44	ppb	0.97	99.8
PCB-52	ppb	1.67	152
PCB-66	ppb	1.02	161
PCB-8	ppb	0.15	19.6

Table 3-41a
1993/1994 R-EMAP NY/NJ Harbor Estuary Sediment Quality Investigation from USEPA (1998)

Analyte	Units	Minimum Detect	Maximum Detect
Total PCBs - Congeners (NOAA, 1989)	ppb	43.9	4,960
Total PCBs - Sum of Coplanar Congeners	ppb	10.8	1,080
Pesticides/PCBs			
2,4'-DDD	ppb	0	90.8
2,4'-DDE	ppb	0.14	88.3
2,4'-DDT	ppb	0.03	14.2
4,4'-DDD	ppb	1.46	568
4,4'-DDE	ppb	1.52	214
4,4'-DDT	ppb	0.08	770
Aldrin	ppb	0.12	0.48
Alpha-Chlordane	ppb	0.27	29.9
Chlordane	ppb	1.04	98.3
Dieldrin	ppb	0.34	6.67
Endrin	ppb	0.82	14.3
Gamma-BHC (Lindane)	ppb	0.06	0.8
Heptachlor	ppb	0.09	3.35
Heptachlor Epoxide	ppb	0.01	2.05
Hexachlorobenzene	ppb	0.19	25.3
Mirex	ppb	0.01	135
Total DDT	ppb	3.06	1,220
trans-Nonachlor	ppb	0.05	13.8
Physical Property			
Fines (Clay and Silt)	%	5.3	96
Recoverable Inorganic Chemicals			
Al	ppm	3,540	26,800
Sb	ppm	0.36	6.64
As	ppm	2	118
Cd	ppm	0.15	7.75
Cr	ppm	15	178
Cu	ppm	11	561
Fe	ppm	7,260	39,500
Pb	ppm	14.2	423
Mn	ppm	74	556
Hg	ppm	0.11	5.91
Ni	ppm	7	51
Se	ppm	0.5	16
Ag	ppm	1.3	8
Zn	ppm	27	592

Table 3-41a
1993/1994 R-EMAP NY/NJ Harbor Estuary Sediment Quality Investigation from USEPA (1998)

Analyte	Units	Minimum Detect	Maximum Detect
TOC			
TOC	ppm	6,030	152,000

Notes:
AVS/SEM = acid volatile sulfide/simultaneously extracted metals
BHC = beta hexachlorocyclohexane
HMW = high molecular weight
LMW = low molecular weight
mM = millimolar
ND = not detected
NOAA = National Oceanic and Atmospheric Administration
PAHs = polycyclic aromatic hydrocarbons
PCBs = polychlorinated biphenyls
ppm = parts per million
ppb = parts per billion
SIM = selected ion monitoring
TOC = total organic carbon

Table 3-41b

1998 R-EMAP NY/NJ Harbor Estuary Sediment Quality Investigation from USEPA (2003)

Analyte	Units	Minimum Detect	Maximum Detect
AVS/SEM			
AVS	mM	25.2	5,970
Inorganic Chemicals			
Ag	ppm	0.953	4.46
Al	ppm	27,400	70,300
As	ppm	4.52	33
Cd	ppm	0.517	5.04
Cr	ppm	57.8	188
Hg	ppm	0.66	6.97
Mn	ppm	259	707
Ni	ppm	19	70.4
Pb	ppm	5.66	315
Sb	ppm	0.698	8.52
Se	ppm	0.207	1.8
Silicon	ppm	267,000	376,000
Tin	ppm	5.94	63.3
Tl	ppm	0.132	0.775
Zn	ppm	123	581
PCDD/Fs			
2,3,7,8-TCDD	ppt	0.656	384
2,3,7,8-TCDF	ppt	1.756	53
HPCDD_18	ppt	14.675	768
HPCDF_18	ppt	8.091	1,150
HPCDF_19	ppt	0.847	53
HXCDD_14	ppt	0.309	13
HXCDD_16	ppt	0.231	46
HXCDD_17	ppt	0.504	34
HXCDF_14	ppt	1.304	248
HXCDF_16	ppt	0.76	57
HXCDF_17	ppt	0.327	14
HXCDF_28	ppt	0.777	36
OCDD	ppt	133	8,355
OCDF	ppt	15.579	1,990
PECDD_18	ppt	0.158	10
PECDF_18	ppt	0.665	24
PECDF_28	ppt	1.061	51
Pesticides/PCBs			
2,4'-DDD	ppb	8	91.2
2,4'-DDE	ppb	8.7	70.9

Table 3-41b

1998 R-EMAP NY/NJ Harbor Estuary Sediment Quality Investigation from USEPA (2003)

Analyte	Units	Minimum Detect	Maximum Detect
2,4'-DDT	ppb	190	190
4,4'-DDD	ppb	4.3	418
4,4'-DDE	ppb	2.3	181
4,4'-DDT	ppb	3.7	2,209
Aldrin	ppb	ND	ND
Alpha-BHC	ppb	0.7	1.9
Alpha-Chlordane	ppb	1.8	16.3
Beta-BHC	ppb	ND	ND
Chlordane	ppb	1.8	32.1
Delta-BHC	ppb	ND	ND
Dieldrin	ppb	1.3	2.1
Endosulfan	ppb	ND	ND
Endrin	ppb	ND	ND
Gamma-BHC (Lindane)	ppb	ND	ND
Gamma-Chlordane	ppb	3.9	15.8
Heptachlor	ppb	ND	ND
Heptachlor Epoxide	ppb	ND	ND
Mirex	ppb	0.8	5.3
p,p'-DDD	ppb	4.3	327
p,p'-DDE	ppb	2.3	130
p,p'-DDT	ppb	3.7	2,019
Total DDT	ppb	7.3	2,807
trans-Nonachlor	ppb	ND	ND
SVOCs			
1-Methylnaphthalene	ppb	28	84
1-Methylphenanthrene	ppb	190	1,500
2,6-Dimethylnaphthalene	ppb	36	290
2-Methylnaphthalene	ppb	29	180
Acenaphthene	ppb	25	400
Acenaphthylene	ppb	47	900
Anthracene	ppb	56	4,700
Benzo(a)anthracene	ppb	46	3,600
Benzo(a)pyrene	ppb	56	4,300
Benzo(b)fluoranthene	ppb	68	4,200
Benzo(e)pyrene	ppb	13	1,000
Benzo(g,h,i)perylene	ppb	34	2,400
Benzo(k)fluoranthene	ppb	25	1,400
Chrysene	ppb	43	3,200
Dibenzo(a,h)anthracene	ppb	410	580

Table 3-41b

1998 R-EMAP NY/NJ Harbor Estuary Sediment Quality Investigation from USEPA (2003)

Analyte	Units	Minimum Detect	Maximum Detect
Fluoranthene	ppb	37	6,800
Fluorene	ppb	47	620
HMW PAHs	ppb	164	43,700
Indeno(1,2,3-cd)pyrene	ppb	36	2,800
LMW PAHs	ppb	40	2,543
Naphthalene	ppb	48	560
Perylene	ppb	36	1,900
Phenanthrene	ppb	64	3,500
Pyrene	ppb	57	5,500
Total PAHs	ppb	212	46,105

Notes:
AVS/SEM = acid volatile sulfide/simultaneously extracted metals
BHC = beta hexachlorocyclohexane
HMW = high molecular weight
LMW = low molecular weight
mM = millimolar
ND = not detected
PAHs = polycyclic aromatic hydrocarbons
PCBs = polychlorinated biphenyls
PCDD/Fs = polychlorinated dibenzo-p-dioxins and dibenzofurans
ppb = parts per billion
ppm = parts per million
ppt = parts per trillion
SVOCs = semivolatile organic carbons

Table 3-42
Sediment Inorganic Chemicals Data from Battelle (1992b)

Parameter	Minimum	Maximum
AVS/SEM (µmoles/g)		
Ag - SEM	0.00091	0.0041
As - SEM	0.0073	0.037
Cd - SEM	0.0056	0.045
Cu - SEM	0.13	0.57
Hg - SEM	0.0000050	0.000092
Ni - SEM	0.059	0.53
Pb - SEM	0.17	1.4
Zn - SEM	1.1	7.0
Grain Size (%)		
Gravel	0.00	26
Sand	33	74
Silt	0.49	49
Clay	0.10	32
Fines	0.59	81
TOC (%)	1.4	4.4
ORP (mV)	-163	193
Inorganic Chemicals (µg/g)		
Ag	0.19	15
As	6.0	25
Cd	0.68	17
Cu	25	362
Hg	0.49	7.0
Ni	6.8	67
Pb	109	844
Zn	135	818

Notes:
AVS/SEM = acid volatile sulfide/simultaneously extracted metals
mV = millivolts
ORP = oxidation reduction potential
TOC = total organic carbon
µg/g = micrograms per gram
µmole/g = micromoles per gram

Table 3-43
Sediment Data for Hackensack Meadowlands from Eckenfelder (1993)

Parameter	Minimum	Maximum
Inorganic Chemicals (mg/kg)		
Hg	<1.90	2.9
Other Parameters		
AVS (mg/kg)	498	11,200
Ca (mg/kg)	2,830	11,200
Gravel (%)	0.00	35
Hydrodgen sulfide (ppm gas phase)	ND	40,000
K (mg/kg)	1,720	4,820
Magnesium (mg/kg)	4,820	12,500
Mercaptans (ppm gas phase)	ND	>120
Na (mg/kg)	4,490	93,500
NH_3-N (mg/kg)	29	620
Non-target TCL SVOCs (mg/kg)	8.4	544
Non-target TCL VOCs (mg/kg)	ND	0.37
pH	7.1	7.8
PO_4-P (mg/kg)	239	1,290
Sand (%)	21	57
Silt/Clay (%)	15	79
Solids (%)	4.6	60
Specific gravity	1.71	2.6
Target TCL SVOCs (mg/kg)	1.8	14
Target TCL VOCs (mg/kg)	0.022	0.37
TKN (mg/kg)	1,850	47,800
TOC (%)	3.0	84
Total Sulfide (mg/kg)	3,020	40,400
Water (%)	44	95
PCDD/Fs (ng/kg)		
Total TCDD	ND	457
2,3,7,8-TCDD	ND	141
Total PeCDD	ND	433
1,2,3,7,8-PeCDD	ND	ND
Total HxCDD	7.4	708
1,2,3,4,7,8-HxCDD	ND	ND
1,2,3,6,7,8-HxCDD	ND	45
1,2,3,7,8,9-HxCDD	ND	ND
Total HpCDD	129	2,120
1,2,3,4,6,7,8-HpCDD	ND	988
OCDD	324	7,130
Total TCDF	4.3	6,060
2,3,7,8-TCDF	ND	187
Total PeCDF	8.6	6,880
1,2,3,7,8-PeCDF	ND	219

Table 3-43
Sediment Data for Hackensack Meadowlands from Eckenfelder (1993)

Parameter	Minimum	Maximum
2,3,4,7,8-PeCDF	ND	1,050
Total HxCDF	53	8,980
1,2,3,4,7,8-HxCDF	25	2,530
1,2,3,6,7,8-HxCDF	ND	487
1,2,3,7,8,9-HxCDF	ND	173
2,3,4,6,7,8-HxCDF	ND	102
Total HpCDF	7.7	7,930
1,2,3,4,6,7,8-HpCDF	ND	5,910
1,2,3,4,7,8,9-HpCDF	ND	159
OCDF	104	4,540
Pesticides/PCB Aroclors (mg/kg)		
4,4'-DDD	ND	0.036
4,4'-DDE	ND	0.021
Aroclor 1254	ND	0.052
Aroclor 1260	ND	0.37
Lindane	ND	0.040
TPH (mg/kg)	<645	6,060

Notes:
AVS = acid volatile sulfide
mg/kg = milligram per kilogram
ND = non detect
ng/kg = nanogram per kilogram
NH_3-N = ammonia nitrogen
PO_4-P = phosphate phosphorus
ppm = parts per million
SVOCs = semivolatile organic carbons
TCL = target compound list
TKN - total Kjeldahl nitrogen
TOC = total organic carbon
TPH = total petroleum hydrocarbons
VOCs = volatile organic compounds

Table 3-44
Bucks Creek and Van Winkle Ditch
Sediment Data from Kimball (2000)

Analyte	Minimum	Maximum
Base Neutral Organics (mg/kg)		
Acenaphthylene	0.11	--
Benzo(a)anthracene	0.11	0.29
Benzo(a)pyrene	0.12	0.32
Benzo(b)fluoranthene	0.090	0.24
Benzo(g,h,i)perylene	0.13	0.16
Benzo(k)fluoranthene	0.090	0.39
Chrysene	0.12	0.34
Fluoranthene	0.11	0.56
Indeno(1,2,3-cd)pyrene	0.15	0.16
Phenanthrene	0.23	--
Pyrene	0.090	0.41
Inorganic Chemicals (mg/kg)		
Ag	1.6	4.8
As	6.3	14
Be	0.35	0.97
Cd	1.1	3.2
Cr	128	288
Cu	61	157
Hg	2.6	3.7
Ni	21	44
Pb	74	193
Sb	1.0	3.0
Se	1.3	3.3
Tl	1.5	3.5
Zn	176	395
Other (mg/kg)		
pH	7.6	8.1
TOC	75,000	200,000
VOCs		
VOCs	ND	ND

Notes:
-- = Only one result was provided by author.
mg/kg = milligram per kilogram
ND = not detected
TOC = total organic carbon
VOCs = volatile organic compounds

Table 3-45
Kearny Marsh Sediment Data from Langan (1999)

Analyte	Minimum	Maximum
Inorganic Chemicals (mg/kg)		
Ag	ND	2.7
As	ND	106
Be	ND	0.87
Cd	ND	28
Cr	ND	5,950
Cu	ND	596
Hg	ND	158
Ni	ND	120
Pb	ND	2,030
Sb	ND	5.6
Se	ND	5.3
Tl	ND	2.1
Zn	ND	2,090
Pesticides (mg/kg)		
4,4'-DDD	ND	0.038
4,4'-DDE	ND	0.011
4,4'-DDT	ND	0.0097
Aldrin	ND	1.3
alpha-Chlordane	ND	0.042
Endrin ketone	ND	0.018
gamma-Chlordane	ND	0.050
SVOCs (mg/kg)		
Benzo(a)anthracene	ND	1.4
Benzo(a)pyrene	ND	2.2
Benzo(b)flouranthene	ND	2.3
Benzo(g,h,i)peryene	ND	1.5
Benzo(k)flouranthene	ND	0.99
bis(2-ethylhexyl)phthalate	ND	36
Butylbenzylphthalate	ND	0.90

Table 3-45
Kearny Marsh Sediment Data from Langan (1999)

Analyte	Minimum	Maximum
Chrysene	ND	1.9
Dibenz[a,h]anthracene	ND	0.48
Di-n-butyl phthalate	ND	18
Di-n-octylphthalate	ND	4.5
Flouranthene	ND	2.0
Ideno(1,2,3-cd)pyrene	ND	1.2
Phenanthrene	ND	1.1
Pyrene	ND	2.4
SVOC TICS (mg/kg)		
Substituted phthalate	ND	20
Total PCBs	ND	ND
Unknown	ND	228
Unknown alkanet	ND	373
Unknown aromatic	ND	276
Vitamin E	ND	6.6
VOCs (mg/kg)		
Methylene Choride	ND	205
Total Xylenes	ND	0.020
VOC TICs (mg/kg)		
Substituted benzene	ND	0.040
Unknown alkanet	ND	1.6
Unknown	ND	0.20
Unknown aliphatic	ND	0.41
Unknown cyclic hydrocarbon	ND	0.19
Unknown hydrocarbon	ND	0.11
Unknown aromatic	ND	0.38
Wet Chemistry		
Corrosivity as pH	6.5	8.1
Cyanide (mg/kg)	ND	21
Phenol (mg/kg)	ND	3.5

Table 3-45
Kearny Marsh Sediment Data from Langan (1999)

Analyte	Minimum	Maximum
TOC (mg/kg)	15,000	280,000
TPH (mg/kg)	53	7,070

Notes:
mg/kg = milligram per kilogram
ND = not detected
SVOCs = semivolatile organic compounds
TICs = tentatively identified compounds
TOC = total organic carbon
TPH = total petroleum hydrocarbons
VOCs = volatile organic compounds

Table 3-46a
Port Elizabeth Sediment Data from USACE (1993a)

Parameter	Minimum	Maximum
Grain Size (%)		
Sand	3	87
Silt	8	57
Clay	5	52
Herbicides (µg/kg)		
2,4,5-Y	20 U	20 U
2,4-D	100 U	100 U
Silvex	NR	NR
Inorganic Chemicals (µg/g)		
As	13.4	83.8
Cd	2.76	10.7
Cu	119	688
Pb	132	352
Hg	2.96	13.6
Ni	33.4	61.8
Ag	2.38	6.55
Zn	248	626
Other		
TOC (%)	0.35	13.4
wet bulk density (lbs/ft^3)	82	112
dry bulk density (lbs/ft^3)	31	57
specific gravity	2.39	2.68
PAHs (µg/kg)		
Total LMW PAHs	1925	88260
Total HMW PAHs	6431	217910
Total PAHs	8356	306170
PCBs (µg/kg)		
8	9.15	20.8
18	16.1	85.3
28	36.6	118
52	26.7	128
49	19.1	109
44	22.3	112
66	36.4	179
101	26.1	87.7
87	9.1	41.3
118	9.73	88.5
184	1.61 U	11
153	13.2	82.1
105	3.2	29.9
138	17.7	105
187	5.5	25.2
183	3.05	8.69
128	2.87	74.4
180	10.70	48.60
170	1.93 U	457.00
195	4.46	17.00
206	2.66	18.30
209	1.39	23.00
PCDD/Fs (pg/g)		
2,3,7,8-TCDD	ND	475
2,3,7,8-TCDF	ND	676 U
Pesticides (µg/kg)		
Aldrin	0.91 U	1.21 U
alpha-Chlordane	4.81	10.5
Dieldrin	3.16	18.9
2,4'-DDD	1.08 U	209
2,4'-DDY	0.8 U	240
4,4'-DDD	32.1	2070
4,4'-DDE	20.2	250

Table 3-46a
Port Elizabeth Sediment Data from USACE (1993a)

Parameter	Minimum	Maximum
4,4'-DDT	1.59 U	1480
Endosulfan I	4.47	134
Endosulfan II	1.34 U	1.78 U
Endosulfan sulfate	1.34 U	1.78 U
Heptachlor	1.17 U	1.55 U
Heptachlor epoxide	0.99 U	1.32 U
Lindane	0.44 U	0.58 U
Trans-nonachlor	0.92 U	14.4
VOCs (µg/kg)		
1,4-dichlorobenzene	39.4	82.6

Notes:
HMW = high molecular weight
J = below analyte practical quantitation limit
lbs/ft^3 = pounds per cubic foot
LMW = low molecular weight
mg/kg = milligram per kilogram
NR = not reported
PAHs = polycyclic aromatic hydrocarbons
PCBs = polychlorinated biphenyls
PCDD/Fs = polychlorinated dibenzo-p-dioxins and dibenzofurans
pg/kg = picogram per kilogram
TOC = total organic carbon
U = analyte not detected
µg/g = microgram per gram
µg/kg = microgram per kilogram
VOCs = volatile organic compounds

Table 3-46b
Port Elizabeth Sediment Data from USACE (1995)

Parameter	Minimum	Maximum
Grain Size (%)		
Sand	1.88	17.63
Silt	33.58	47.24
Clay	44.77	54.9
Inorganic Chemicals (µg/g)		
As	<0.08 J	14.6
Cd	<0.002 J	3.78
Cu	<0.11 J	140
Pb	<0.05 J	255
Hg	<0.036 J	0.914
Ni	<0.24 J	41
Ag	<0.004 J	5.78
Zn	<0.08 J	299
Other		
TOC (%)	1.66	3.85
PCDD/Fs (pg/g)		
2,3,7,8-TCDD	43.7	430.55
1,2,3,7,8-PeCDD	2.45	19.03
1,2,3,4,7,8-HxCDD	3.18	10.4
1,2,3,6,7,8-HxCDD	12.74	37.68
1,2,3,7,8,9-HxCDD	9.7	30.17
1,2,3,4,6,7,8-HpCDD	234.82	584.18
OCDD	2363.33	9601.42
2,3,7,8-TCDF	58.08	172.81
1,2,3,7,8-PeCDF	2.40 U	24.10 U
2,3,4,7,8-PeCDF	8.26 U	30.97
1,2,3,4,7,8-HxCDF	34.6	163.63
1,2,3,6,7,8-HxCDF	1.47 U	16.10 U
2,3,4,6,7,8-HxCDF	5.32	18.02
1,2,3,4,6,7,8-HpCDF	151.38	587.04
1,2,3,4,7,8,9-HpCDF	6.49 U	77.68
OCDF	228.43	1167.35

Notes:
J = below analyte practical quantitation limit
mg/kg = milligram per kilogram
PCDD/Fs = polychlorinated dibenzo-p-dioxins and dibenzofurans
pg/g = picogram per gram
U = analyte not detected
µg/g = microgram per gram
TOC = total organic carbon

Table 3-47
Summary of Sediment Results for Newark Bay Confined Disposal Facility Analysis from USACE (1997a)

Parameter	Author's Sampling Locations		
	Area 1	Area 2S	Area 2N
Inorganic Chemicals (mg/kg)			
Ag	0.41	0.34	1.0
As	8.6	10.4	17.4
Cd	0.54	0.09u	0.43
Cr	49.3	50.8	96.6
Cu	80.3	43.4	117
Hg	0.90	1.3	2.8
Ni	15.7	16.7	21.9
Pb	115	58.8	112
Zn	252	107	192
PAHs (µg/kg)			
Acenaphthene	230	790	290
Acenaphthylene	41U	41U	41U
Anthracene	64	150	74
Benzo(a)anthracene	110	370	130
Benzo(a)pyrene	190	120	220
Benzo(b)fluoranthene	280	270	170
Benzo(g,h,i)perylene	140	220	150
Benzo(k)fluoranthene	73	69	63
Chrysene	110	330	130
Dibenzo(a,h)anthracene	16	32	21
Fluoranthene	170	530	190
Fluorene	48	260	120
Indeno(1,2,3-cd)pyrene	80	160	82
Naphthalene	17U	41	46
Phaneanthrene	100	510	130
Pyrene	190	600	240
PCBs (µg/kg)			
BZ008	0.97U	0.97U	0.97U
BZ018	0.72U	0.72U	2.2P
BZ028	0.84U	0.84U	3.7
BZ052	1.3U	1.3U	2.7
BZ049	0.97U	0.97U	1.7
BZ044	0.72U	0.72U	2.1
BZ065	0.89U	0.89U	2.3
BZ101	0.83U	0.83U	2.0P
BZ087	0.82U	0.82U	1.0P
BZ118	1.0U	1.0U	1.9
BZ105	0.86U	0.86U	0.86U
BZ184	0.79U	0.79U	0.79U

Table 3-47
Summary of Sediment Results for Newark Bay Confined Disposal Facility Analysis from USACE (1997a)

Parameter	Author's Sampling Locations		
	Area 1	Area 2S	Area 2N
BZ153	0.99U	0.99U	0.99U
BZ138	1.0U	1.0U	1.7
BZ187	0.78U	0.78U	0.78U
BZ183	0.634	0.634	0.83
BZ128	1.0U	1.0U	1.0U
BZ180	1.1U	1.1U	1.1U
BZ170	0.98U	0.98U	0.98U
BZ195	1.2U	1.2U	1.2U
BZ206	1.2U	1.2U	1.2U
BZ209	1.0U	1.0U	1.0U
PCDD/Fs (pg/g)			
2,3,7,8-TCDD	8.6	11.4	99.6
1,2,3,7,8-PeCDD	0.71	1.2	1.8
1,2,3,4,7,8-HxCDD	1.1	0.79	2
1,2,3,6,7,8-HxCDD	3.3	2.3	8.4
1,2,3,7,8,9-HxCDD	3.0PR	2.0PR	5.9
1,2,3,4,6,7,8-HpCDD	59.5	43	122
OCDD	1,350	991	1630
2,3,7,8-TCDF	15.1	14.6	98.2
1,2,3,7,8-PeCDF	1.3	1.1	5
2,3,4,7,8-PeCDF	2	1.5	7.4
1,2,3,4,7,8-HxCDF	13.3E	9.9E	80.2E
1,2,3,6,7,8-HxCDF	2.4	1.2	11.2
2,3,4,6,7,8-HxCDF	1.9B,PR	1.1B,PR	5.7B,PR
1,2,3,7,8,9-HxCDF	0.7	1.0	3.4
1,2,3,4,6,7,8-HpCDF	27.6	19.6	209
1,2,3,4,7,8,9-HpCDF	1.8	1.8	6.5
OCDF	72.7	41.7	469
Pesticides (µg/kg)			
2,4'-DDD	0.55U	0.55U	0.55U
2,4'-DDE	0.44	0.44	0.44
2,4'-DDT	0.53U	0.53U	0.53U
4,4'-DDD	0.68U	0.68U	0.82U
4,4'-DDE	0.98U	0.60U	4.1P
4,4'-DDT	0.43U	0.37U	1.9P
Aldrin	0.43U	0.43U	0.43U
alpha-Chlordane	0.45	0.45	0.45
Dieldrin	0.44U	0.44U	0.44U
Endosulfan I	0.53	0.53	0.53
Endosulfan II	0.48U	0.48U	0.48U

Table 3-47
Summary of Sediment Results for Newark Bay Confined Disposal Facility Analysis from USACE (1997a)

Parameter	Author's Sampling Locations		
	Area 1	Area 2S	Area 2N
Endosulfan sulfate	0.79U	0.78U	0.79U
Heptachlor	0.43U	0.43U	0.43U
Heptachlor expoxide	0.44U	0.44U	0.44U
trans-Nonachlor	0.53U	0.53U	0.53U
VOCs (µg/kg)			
1,4-dichlorobenzene	0.40U	0.40U	1.8

Notes:
E = PCDF peak has eluted as the associated DPE.
mg/kg = milligram per kilogram
P = lower value between GC column results when >25% difference between column values recorded.
PAHs = polycyclic aromatic hydrocarbons
PCBs = polychlorinated biphenyls
PCDD/Fs = polychlorinated dibenzo-p-dioxins and dibenzofurans
pg/g = picogram per gram
PR = poorly resolved GC peak
U = analyte not detected
µg/kg = microgram per kilogram
VOCs = volatile organic compounds

Table 3-48
Dredging Permit Application Summary Table - Sediment Data[a]

Waterway	Chemical	Number of Studies	Range of Concentrations			Units[b]
Arthur Kill	**Inorganic Chemicals**					
	Ag	2	ND	-	16.8	mg/kg
	Al	1	4,210	-	19,318	mg/kg
	As	2	ND	-	92.9	mg/kg
	Ba	1	ND	-	383	mg/kg
	Be	1	ND	-	ND	mg/kg
	Cd	2	0.9	-	11.1	mg/kg
	Ca	1	209	-	20,400	mg/kg
	Cr	2	53.5	-	294	mg/kg
	Co	1	ND	-	24.3	mg/kg
	Cu	2	129	-	649	mg/kg
	Fe	1	11,300	-	40,744	mg/kg
	Hg	2	0.96	-	12.9	mg/kg
	K	1	1,140	-	4,392	mg/kg
	Mg	1	1,140	-	9,480	mg/kg
	Mn	1	112	-	557	mg/kg
	Na	1	3,650	-	17,202	mg/kg
	Ni	2	15.7	-	69.9	mg/kg
	Pb	2	96.3	-	384	mg/kg
	Se	1	2.1	-	ND	mg/kg
	Sb	1	ND	-	14.3	mg/kg
	Tl	1	ND	-	ND	mg/kg
	V	1	28.8	-	97.3	mg/kg
	Zn	2	168	-	723	mg/kg
	PAHs					
	Acenaphthene	1	ND	-	ND	mg/kg
	Acenaphthene	1	ND	-	14.9[c]	µg/kg
	Acenaphthylene	1	ND	-	ND	mg/kg
	Acenaphthylene	1	ND	-	ND	µg/kg
	Anthracene	1	ND	-	0.61[c]	mg/kg
	Anthracene	1	ND	-	11	µg/kg
	Fluorene	1	ND	-	ND	mg/kg
	Fluorene	1	ND	-	14.1[c]	µg/kg
	Naphthalene	1	ND	-	ND	mg/kg
	Naphthalene	1	16.4[c]	-	19.5[c]	µg/kg
	Phenanthrene	1	ND	-	1.40	mg/kg
	Phenanthrene	1	ND	-	43	µg/kg
	Benz[a]anthracene	1	ND	-	1.50	mg/kg
	Benz[a]anthracene	1	ND	-	31	µg/kg

Table 3-48
Dredging Permit Application Summary Table - Sediment Data[a]

Waterway	Chemical	Number of Studies	Range of Concentrations			Units[b]
Arthur Kill cont'd	Benzo[a]pyrene	1	ND	-	1.60	mg/kg
	Benzo[a]pyrene	1	ND	-	212.6	µg/kg
	Benzo[g,h,i]perylene	1	ND	-	0.140[c]	mg/kg
	Benzo[g,h,i]perylene	1	ND	-	12.1[c]	µg/kg
	Benzo[b]fluoranthene	1	ND	-	2.00[c]	mg/kg
	Benzo[b]fluoranthene	1	ND	-	24.2	µg/kg
	Benzo[k]fluoranthene	1	ND	-	1.20[c]	mg/kg
	Benzo[k]fluoranthene	1	ND	-	ND	µg/kg
	Benzoic Acid	1	ND	-	ND	mg/kg
	Benzyl Alcohol	1	ND	-	ND	mg/kg
	bis (2-Chloroethoxy) Methane	1	ND	-	ND	mg/kg
	bis (2-Chloroethyl) Ether	1	ND	-	ND	mg/kg
	bis (2-Ethylhexyl) Phthalate	1	3.20[c,d]	-	48.0	mg/kg
	4-Bromophenyl-phenyl ether	1	ND	-	ND	mg/kg
	Butylbenzylphthalate	1	ND	-	ND	mg/kg
	4-Chloro-3-methylphenol	1	ND	-	ND	mg/kg
	4-Chloroaniline	1	ND	-	ND	mg/kg
	2-Chloronaphthalene	1	ND	-	ND	mg/kg
	2-Chlorophenol	1	ND	-	ND	mg/kg
	4-Chlorophenyl-phenyl ether	1	ND	-	ND	mg/kg
	1-Chloropropane	1	ND	-	ND	mg/kg
	Carbazole	1	ND	-	ND	mg/kg
	Chrysene	1	ND	-	1.70	mg/kg
	Chrysene	1	ND	-	35.6	µg/kg
	Di-n-butylphthalate	1	ND	-	1.00[c]	mg/kg
	Di-n-octyl phthalate	1	ND	-	0.940[c]	mg/kg
	Dibenz[a,h]anthracene	1	ND	-	ND	mg/kg
	Dibenz[a,h]anthracene	1	ND	-	ND	µg/kg
	3,3'-Dichlorobenzidene	1	ND	-	ND	mg/kg
	2,4-Dichlorophenol	1	ND	-	ND	mg/kg
	Diethylphthalate	1	ND	-	ND	mg/kg
	2,4-Dimethylphenol	1	ND	-	ND	mg/kg
	Dimethylphthalate	1	ND	-	ND	mg/kg
	4,6-Dinitro-2-methylphenol	1	ND	-	ND	mg/kg
	2,4-Dinitrophenol	1	ND	-	ND	mg/kg
	2,4-Dinitrotoluene	1	ND	-	ND	mg/kg
	2,6-Dinitrotoluene	1	ND	-	ND	mg/kg
	Hexachlorobenzene	1	ND	-	ND	mg/kg
	Hexachlorobutadiene	1	ND	-	ND	mg/kg

Table 3-48
Dredging Permit Application Summary Table - Sediment Data[a]

Waterway	Chemical	Number of Studies	Range of Concentrations			Units[b]
	Hexachlorocyclopentadiene	1	ND	-	ND	mg/kg
	Hexachloroethane	1	ND	-	ND	mg/kg
	Fluoranthene	1	ND	-	2.40	mg/kg
	Fluoranthene	1	ND	-	58.1	µg/kg
	Indeno[1,2,3-cd]pyrene	1	ND	-	0.350[c]	mg/kg
	Indeno[1,2,3-cd]pyrene	1	ND	-	ND	µg/kg
	Isophorone	1	ND	-	ND	mg/kg
	2-Methylnaphthalene	1	ND	-	ND	mg/kg
	2-Methylphenol	1	ND	-	ND	mg/kg
	4-Methylphenol	1	ND	-	ND	mg/kg
	2-Nitroaniline	1	ND	-	ND	mg/kg
	3-Nitroaniline	1	ND	-	ND	mg/kg
	4-Nitroaniline	1	ND	-	ND	mg/kg
	Nitrobenzene	1	ND	-	ND	mg/kg
	2-Nitrophenol	1	ND	-	ND	mg/kg
	4-Nitrophenol	1	ND	-	ND	mg/kg
	n-Nitroso-di-n-propylamine	1	ND	-	ND	mg/kg
	n-Nitroso-diphenylamine	1	ND	-	ND	mg/kg
	Pentachlorophenol	1	ND	-	ND	mg/kg
Arthur Kill cont'd	Phenol	1	ND	-	ND	mg/kg
	Pyrene	1	ND	-	3.50	mg/kg
	Pyrene	1	ND	-	66.1	µg/kg
	1,2-Dichlorobenzene	1	ND	-	ND	mg/kg
	1,3-Dichlorobenzene	1	ND	-	ND	mg/kg
	1,4-Dichlorobenzene	1	ND	-	ND	mg/kg
	1,4-Dichlorobenzene	1	1.2[c]	-	1.8[c]	µg/kg
	1,2,4-Trichlorobenzene	1	ND	-	ND	mg/kg
	2,4,5-Trichlorophenol	1	ND	-	ND	mg/kg
	2,4,6-Trichlorophenol	1	ND	-	ND	mg/kg
	PCB Congeners			-		
	2,4-Dichlorobiphenyl	1	ND	-	ND	µg/kg
	2,2',5-Trichlorobiphenyl	1	ND	-	ND	µg/kg
	2,4',4-Trichlorobiphenyl	1	ND	-	ND	µg/kg
	2,2',3,5'-Tetrachlorobiphenyl	1	ND	-	ND	µg/kg
	2,2',4,5'-Tetrachlorobiphenyl	1	ND	-	ND	µg/kg
	2,2',5,5'-Tetrachlorobiphenyl	1	ND	-	ND	µg/kg
	2,3',4,4'-Tetrachlorobiphenyl	1	ND	-	4	µg/kg
	2,2',3,4,5'-Pentachlorobiphenyl	1	ND	-	ND	µg/kg
	2,2',4,4,5'-Pentachlorobiphenyl	1	ND	-	1.96[c]	µg/kg

Table 3-48
Dredging Permit Application Summary Table - Sediment Data[a]

Waterway	Chemical	Number of Studies	Range of Concentrations			Units[b]
Arthur Kill cont'd	2,3',3,4,4'-Pentachlorobiphenyl	1	ND	-	ND	µg/kg
	2,3',4,4,5'-Pentachlorobiphenyl	1	ND	-	3.43[c]	µg/kg
	2,2',3,3',4,4'-Hexachlorobiphenyl	1	ND	-	ND	µg/kg
	2,2',4,4',5,5'-Hexachlorobiphenyl	1	ND	-	5.93	µg/kg
	2,2',3,3',4,4',5-Heptachlorobiphenyl	1	ND	-	ND	µg/kg
	2,2',3,3,4',5,5'-Heptachlorobiphenyl	1	ND	-	1.15[c]	µg/kg
	2,2',3,4,4',5',6-Heptachlorobiphenyl	1	ND	-	ND	µg/kg
	2,2',3,4,4',6,6'-Heptachlorobiphenyl	1	ND	-	ND	µg/kg
	2,2',3,4',5,5',6-Heptachlorobiphenyl	1	ND	-	ND	µg/kg
	2,2',3,3',4,4',5,6-Octachlorobiphenyl	1	ND	-	ND	µg/kg
	2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl	1	ND	-	1.01[c]	µg/kg
	2,2',3,3',4,4',5,5',6,6'-Decachlorobiphenyl	1	ND	-	ND	µg/kg
	Total PCBs	1	ND	-	ND	mg/kg
	PCDD/Fs					
	2,3,7,8-TCDD	1	11	-	399.9	µg/kg
	2,3,7,8-TCDF	1	ND	-	ND	mg/kg
	Pesticides					
	alpha-BHC	1	ND	-	ND	mg/kg
	beta-BHC	1	ND	-	ND	mg/kg
	delta-BHC	1	ND	-	ND	mg/kg
	gamma-BHC (Lindane)	1	ND	-	ND	mg/kg
	Aldrin	1	ND	-	ND	mg/kg
	Aldrin	1	ND	-	ND	µg/kg
	a-Chlordane	1	ND	-	ND	mg/kg
	a-Chlordane	1	ND	-	ND	µg/kg
	trans Nonachlor	1	ND	-	11.4	µg/kg
	Dieldrin	1	ND	-	ND	mg/kg
	Dieldrin	1	ND	-	ND	µg/kg
	p,p'-DDT	1	ND	-	3.00	mg/kg
	p,p'-DDT	1	ND	-	ND	µg/kg
	o,p'-DDT	1	ND	-	ND	µg/kg
	p,p'-DDD	1	ND	-	2.3923	mg/kg
	p,p'-DDD	1	ND	-	2.02[c]	µg/kg
	o,p'-DDD	1	ND	-	1.07[c]	µg/kg
	p,p'-DDE	1	ND	-	1.08	mg/kg
	p,p'-DDE	1	ND	-	4.93	µg/kg
	o,p'-DDE	1	ND	-	ND	µg/kg
	Endosulfan I	1	ND	-	ND	mg/kg
	Endosulfan I	1	ND	-	ND	µg/kg

Table 3-48
Dredging Permit Application Summary Table - Sediment Data[a]

Waterway	Chemical	Number of Studies	Range of Concentrations	Units[b]
	Endosulfan II	1	ND - ND	mg/kg
	Endosulfan II	1	ND - ND	µg/kg
	Endosulfan sulfate	1	ND - ND	mg/kg
	Endosulfan sulfate	1	ND - ND	µg/kg
	Endrin	1	ND - ND	mg/kg
	Endrin aldehyde	1	ND - ND	mg/kg
	Endrin ketone	1	ND - ND	mg/kg
	Heptachlor	1	ND - ND	mg/kg
	Heptachlor	1	ND - ND	µg/kg
	Heptachlor epoxide	1	ND - ND	mg/kg
	Heptachlor epoxide	1	ND - ND	µg/kg
	Methoxychlor	1	ND - ND	mg/kg
	Toxaphene	1	ND - ND	mg/kg
	VOCs			
	Chloromethane	1	ND - ND	mg/kg
	Bromomethane	1	ND - ND	mg/kg
	Vinyl Chloride	1	ND - ND	mg/kg
	Chloroethane	1	ND - ND	mg/kg
	Methylene Chloride	1	ND - 0.180[b]	mg/kg
Arthur Kill cont'd	Acetone	1	ND - 0.970	mg/kg
	Carbone Disulfide	1	ND - 0.480	mg/kg
	1,1-Dichloroethene	1	ND - ND	mg/kg
	1,1-Dichloroethane	1	ND - ND	mg/kg
	1,2-Dichloroethene	1	ND - ND	mg/kg
	trans-1,2-Dichloroethene	1	ND - ND	mg/kg
	cis-1,2-Dichloroethene	1	ND - ND	mg/kg
	Chloroform	1	ND - ND	mg/kg
	1,2-Dichloroethane	1	ND - ND	mg/kg
	2-Butanone	1	ND - ND	mg/kg
	1,1,1-Trichloroethane	1	ND - ND	mg/kg
	Carbon Tetrachloride	1	ND - ND	mg/kg
	Bromodichloromethane	1	ND - ND	mg/kg
	1,2-Dichloropropane	1	ND - ND	mg/kg
	cis-1,3-Dichloropropene	1	ND - ND	mg/kg
	Trichloroethene	1	ND - ND	mg/kg
	Dibromochloromethane	1	ND - ND	mg/kg
	1,1,2-Trichloroethane	1	ND - ND	mg/kg
	Benzene	1	ND - 0.016[c]	mg/kg
	trans-1,3-Dichloropropene	1	ND - ND	mg/kg

Table 3-48
Dredging Permit Application Summary Table - Sediment Data[a]

Waterway	Chemical	Number of Studies	Range of Concentrations			Units[b]
Arthur Kill cont'd	Bromoform	1	ND	-	ND	mg/kg
	4-Methyl-2-pentanone	1	ND	-	ND	mg/kg
	2-Hexanone	1	ND	-	ND	mg/kg
	Tetrachloroethene	1	ND	-	ND	mg/kg
	1,1,2,2-Tetrachloroethane	1	ND	-	0.005[c]	mg/kg
	Toluene	1	ND	-	0.063	mg/kg
	Chlorobenzene	1	ND	-	ND	mg/kg
	Ethylbenzene	1	ND	-	ND	mg/kg
	Styrene	1	ND	-	ND	mg/kg
	Xylene (total)	1	ND	-	0.071[c]	mg/kg
	Vinyl Acetate	1	ND	-	ND	mg/kg

Note:
a. Data ranges for obtained dredge permit applications in which data were provided.
b. Units are as reported in the dredge permit applications.
c. Estimated value
d. Analyte was found in blanks as well as the sample. Use caution when applying the results of this analyte.

BHC = betahexachlorocyclohexane
mg/kg = milligrams per kilogram
ND = not detected
PAHs = polycyclic aromatic hydrocarbons
PCBs = polychlorinated biphenyls
PCDD/Fs = polychlorinated dibenzo-p-dioxins and dibenzofurans
µg/kg= microgram per kilogram

Sources:
Arthur Kill: Chevron (1997); TOSCO Refining Company (1997d).

Table 3-49
Quality Assurance/Quality Control Information for Sediment Studies

Reference	USEPA Region 2 Data Validation	Quantitative QA/QC[a]	Peer-reviewed Journal Publication	Not Specified	Notes
AWARE (unknown)				X	
Barabas et al. (2001)			X		
Battelle (1992b)					
Bonnevie et al. (1992)			X		
Bonnevie et al. (1993)			X		
Bonnevie et al. (1994)			X		
Bopp (2001)				X	
Chaky (2003)				X	
ChemRisk (1995)				X	
Dredging Permit Applications (2): AK: Chevron (1997); USACE (1997d)				X	
Ducks Unlimited (1998)				X	
Eckenfelder (1993)		X			
Ehrlich et al. (1994)			X		
Finley et al. (1990)			X		
Fu et al. (1991)			X		
Gillis et al. (1993)			X		
Gillis et al. (1995)			X		
Hart Crowser (1999)		X			
HMDC (1990c)				X	
Huntley et al. (1993)			X		
Huntley et al. (1995a)			X		
Huntley et al. (1995b)			X		
Huntley et al. (1997)			X		
Huntley et al. (1998)			X		
Iannuzzi and Wenning (1995)			X		
Iannuzzi et al. (1995)			X		
Iannuzzi et al. (1997)			X		
Kimball (2000)		X			
Langan (1999)		X			
McIntyre (2000)				X	
Mitra (1997)				X	
Mohan et al. (1999)			X		
NJDEP (1991)		X			
NOAA (1995b)				X	
NY/NJ HEP (2004a)				X	

Table 3-49
Quality Assurance/Quality Control Information for Sediment Studies

Reference	USEPA Region 2 Data Validation	Quantitative QA/QC[a]	Peer-reviewed Journal Publication	Not Specified	Notes
NYSDEC (2003)		X			
Pruell et al. (1993)			X		
Rice et al. (1995)			X		
Robinson (2002)				X	
Rosman et al. (2003)				X	
Rubinstein et al. (1990)				X	
Scott et al. (2000)			X		
Stackelberg (1997)			X		
Tierra (1990)		X			
Tierra (1991)	X				Partial Validation
Tierra (1992)	X				Partial Validation
Tierra (1993)		X			
Tierra (1994a)				X	
Tierra (1994b)		X			
Tierra (1995b)		X			
Tierra (1995c)	X				Full Validation
Tierra (1995d)	X				Full Validation
Tierra (1996a)		X			
Tierra (1997a)		X			
Tierra (1997b)		X			
Tierra (1998)		X			
Tierra (1999a)		X			
Tierra (1999b)		X			
Tierra (1999d)	X				
Tierra (1999f)		X			
Tierra (2000a)		X			
Tierra (2000b)		X			
Tierra (2000c)	X				
Tierra (2000d)		X			
Tierra (2004a)				X	
USACE (unknown)				X	
USACE (1993a)				X	
USACE (1995a)				X	
USACE (1997a)				X	
USACE (2004a)				X	
USEPA (unknown)				X	
USEPA (1998)				X	
USEPA (2003)				X	
USGS (1996)				X	

Table 3-49
Quality Assurance/Quality Control Information for Sediment Studies

Reference	USEPA Region 2 Data Validation	Quantitative QA/QC[a]	Peer-reviewed Journal Publication	Not Specified	Notes
Wallin et al. (2002)				X	
Wenning et al. (1994)			X		
Wolfe et al. (1996)			X		

Note:

a. Quantitative QA/QC includes the analysis of field and laboratory duplicates, rinse blanks, matrix spike/matrix spike duplicates and other quantitative measures of precision and accuracy but without specification of implementing USEPA Region 2 data validation procedures.

Table 3-50
Surface Water, Porewater, Sediment, and Other Toxicology Studies Identified for the Inventory Area

Reference	Data Collection Date(s)	Data Collection Season(s)	Species	Study Type	Exposure Matrix/Route	Endpoint	Waterway	Number of Sampling Locations	Sampling Method	Number of Samples
Battelle (1992b)	1992	not provided	amphipod (*Ampelisca abdita*)	laboratory	sediment	survival	NB	2	core	2
Battelle (1997a)	1995	summer	amphipod (*Ampelisca abdita*), mysid (*Mysidopsis bahia*)	laboratory	sediment	survival	AK	33	core	15
Battelle (1997b)	1995	summer	amphipod (*Ampelisca abdita*), mysid (*Mysidopsis bahia*)	laboratory	sediment	survival	HK	8	core	5
BenKinney et al. (2001)	2000	summer	amphipod (*Ampelisca abdita*)	laboratory	porewater	survival	PR	5	surface grab	5
Brown et al. (1992)	1988, 1989, 1990	year-round	clam (*Mya arenaria*)	field	surface water	histology	AK	1	not provided	not provided
Burger et al. (1992b)	1990	winter	fiddler crab (*Uca pugnax*)	field	surface water	survival, behavior	AK	24	observations	not provided
Carletta et al. (1999)	not provided	not provided	young-of-the-year mummichog (*Fundulus heteroclitus*)	field collected organisms	sediment	histology, enzyme induction	AK	not provided	dip nets	not provided
Cooper and Cristini (1990)	1987 - 1988	not provided	mollusk (*Corbicula fluminea, Mya arenaria*)	field collected organisms	sediment and surface water	growth, histology, physiological condition, tissue distribution	AK, NB, PR	not provided	transplant studies	not provided
Cooper et al. (1993)	not provided	not provided	Japanese medaka (*Oryzias latipes*)	laboratory	sediment	survival, histology, development	NB	not provided	core	not provided
Cristini and Cooper (1992)	not provided	not provided	blue crab (*Callinectes sapidus*)	laboratory	dietary	development, tissue distribution	NB	not provided	food organisms (*Mya arenaria*) collected from site	1
Demuth et al. (1993)	1989	winter	photobacterium	laboratory	sediment extract	survival	NB	2	grab	2
Dredging Permit Applications (15): NB: USACE (1991b; 1997f) AK: USACE (1992b; 1992c; 1992d; 1993b; 1997e; 1997i) KVK: USACE (1997g; 1999c) PR: USACE (1979; 1986b; 1987; 1988, 1991a)	1979 - 1999	not provided	*Acartia tonsa, Ampelisca abdita, Eohausorius estuarius, Menidia beryllina, Menidia menidia, Mercenaria mercenaria, Mysidopsis bahia, Mysidopsis edulis, Nereis virens, Palaemonetes pugio*	laboratory	sediment and surface water	survival	AK, KVK, NB, PR	AK: 6; KVK: 2; NB: 2; PR: 5	not provided	not provided
Elskus et al. (1999)	1990s	fall	adult and embryo mummichog (*Fundulus heteroclitus*)	field collected organisms, laboratory study	intraperitoneal (ip) injection of 2,3,7,8-TCDD	enzyme induction in parents and larvae, hatching success, larval survival and growth	NB	1	post spawning adults collected in baited traps	1
Jorgensen (1975)	prior to 1975	not provided	diatoms	field	sediment and surface water	community diversity	HK	not provided	grab	not provided
Khan et al. (1993)	1991	winter	mysid (*Mysidopsis bahia*)	laboratory	surface water	survival, growth, reproduction	AK	3	subsurface grabs	9
McArdle (1998)	1998	not provided	mummichog (*Fundulus heteroclitus*), striped bass (*Morone saxatilis*)	laboratory and field	injection of organic sediment extract	protein expression	NB	not provided	not provided	not provided
McArdle et al. (2004)	1998	summer	mummichog (*Fundulus heteroclitus*), striped bass (*Morone saxatilis*)	laboratory and field	injection of organic sediment extract	protein expression	KVK, NB	not provided	not provided	not provided
NOAA (1995b)	1991, 1993	not provided	photobacterium; amphipod (*Ampelisca abdita*), mollusk (*Mulinia lateralis*), rat hepatoma bioassay	laboratory	sediment	survival, development	AK, KVK, NB	1991: 2 (NB); 1993: 4 (AK), 7 (KVK), 25 (NB)	grab	6
Parsons (2003)	1999	not provided	double-crested cormorant (*Phalacrocorax auritus*)	field	dietary	reproduction	KVK	1	hatching success observations	1
Prince and Cooper (1989)	not provided	not provided	mummichog (*Fundulus heteroclitus*), Japanese medaka (*Oryzias latipes*)	field collected organisms, laboratory study	water	survival, histology	NB	not provided	not provided	not provided
Prince and Cooper (1995a)	not provided	not provided	mummichog (*Fundulus heteroclitus*)	field collected organisms, laboratory study	water or dermal application of 2,3,7,8-TCDD	survival, histology	NB	not provided	collected in baited minnow traps	not provided
Prince and Cooper (1995b)	not provided	not provided	mummichog (*Fundulus heteroclitus*)	field collected organisms, laboratory study	water or dermal application of 2,3,7,8-TCDD	metabolism, enzyme induction	NB	not provided	not provided	not provided
Prince et al. (1990)	not provided	not provided	mummichog (*Fundulus heteroclitus*)	laboratory	embryo survival and lesions: feral mummichog populations	survival, histology	NB	not provided	not provided	not provided
Ravit and Ehrenfeld (2002)	2002	not provided	sediment microbes	field	sediment and surface water	enzyme function	HK	2	peat corer	not provided
Rice et al. (1995)	1991	spring	amphipod (*Rhepoxynius abronius*), polychaete (*Armandia brevis*), sand dollar (*Dendraster excentricus*)	laboratory	sediment	survival, growth, behavior	KVK, NB	KVK: 1; NB: 1	grab	not provided

Table 3-50
Surface Water, Porewater, Sediment, and Other Toxicology Studies Identified for the Inventory Area

Reference	Data Collection Date(s)	Data Collection Season(s)	Species	Study Type	Exposure Matrix/Route	Endpoint	Waterway	Number of Sampling Locations	Sampling Method	Number of Samples
SAIC (1993)	1991 - 1992	summer, winter	sea urchin (*Arbacia punctulata*), macroalgae (*Callisia parvula*)	laboratory	surface water	reproduction	AK, KVK, NB	AK: 6; KVK: 4; NB: 4	not provided	several per location
Smith et al. (1995)	not provided	not provided	mummichog (*Fundulus heteroclitus*)	field collected organisms, laboratory study	sediment	behavior, neurotransmitter levels	AK	not provided	minnow traps	not provided
Thursby et al. (2000)	1991 - 1994	summer, winter	sea urchin (*Arbacia punctulata*), macroalgae (*Callisia parvula*)	laboratory	sediment	reproduction	AK, KVK, NB	AK: 6; KVK: 4; NB: 4	ambient water from various depths and tidal cycles	several per location
Tierra (2002e)	1999 - 2000	late summer/early fall, spring	multiple fish species	field	surface water, sediment	pathology	PR	variable by gear type	minnow traps, eel traps, experimental gill nets	284
Tierra (2002f)	1999	fall	amphipod (*Ampelisca abdita*), polychaete (*Neanthes arenaceodentata*)	laboratory	sediment	survival, growth	PR	15	surface grab	15 composites
Tierra (2004e)	1999	summer	amphipod (*Ampelisca abdita*), polychaete (*Neanthes arenaceodentata*)	laboratory	sediment	survival, growth	PR	4	surface grab	4
Tierra (2004f)	2000	summer	amphipod (*Ampelisca abdita*)	laboratory	porewater, sediment	survival	PR	5	surface grab	5
USACE (1997a)	1996	spring	amphipod (*Ampelisca abdita*), polychaete (*Neanthes arenaceodentata*), mysid (*Mysidopsis bahia*)	laboratory	surface water, sediment	survival	NB	3	composite cores	3
USEPA (1990)	not provided	not provided	amphipod (*Ampelisca abdita, Rhepoxynius hudsoni*)	laboratory	sediment	survival	NB	1	grab	3
USEPA (1996)	1994	fall, winter	amphipod (*Ampelisca abdita*), mysid (*Mysidopsis bahia*), bivalve (*Mulinia lateralis*)	laboratory	porewater	survival	AK	sediment porewater	grab	not provided
USEPA (1998)	1990 - 1994	summer	photobacterium, amphipod (*Ampelisca abdita*)	laboratory	sediment	survival	NB	20	not provided	20
USEPA (2003)	1998	summer	amphipod (*Ampelisca abdita*)	laboratory	sediment	survival	NB	20	not provided	20
Weis et al. (1999)	not provided	not provided	larvae and juvenile mummichog (*Fundulus heteroclitus*)	field collected organisms, laboratory study	sediment	behavior, neurotransmitter levels	AK	not provided	not provided	not provided
Wolfe et al. (1996)	1991	not provided	photobacterium, amphipod (*Ampelisca abdita*), mollusk (*Mulinia lateralis*)	laboratory	sediment	survival	NB	2	grab	6
Yuan et al. (2001)	1994 - 1998	not provided	Atlantic tomcod (*Microgadus tomcod*)	field	sediment, dietary	enzyme induction	NB	not provided	not provided	not provided
Zhou et al. (1999)	not provided	not provided	mummichog (*Fundulus heteroclitus*)	field	sediment	histology, enzyme induction	AK	not provided	dip nets	not provided

Notes:
AK = Arthur Kill
HK = Hackensack River
KVK = Kill Van Kull
NB = Newark Bay
PR = Passaic River

Control Location
no
yes
yes
yes
no
yes
no
yes
yes
yes
no
no
yes
no
yes
no
yes
yes
yes
yes
yes
yes
yes

Control Location
no
no
no
no
yes
yes
yes
yes
yes
yes
no
yes
no
no
no
no

Table 3-51
Other Toxicology Studies Conducted in the Inventory Area

Location	Sampling Date and Frequency	Organism	Endpoint(s)	Methods Comments	Results	Citation
Arthur Kill	January 8, 1990 and monthly (initial sampling 1 week after #2 fuel oil spill)	Clams (*Mya arenia*)	Histopathological alterations	Histopathological alterations examined after a large #2 fuel oil spill. Compared to baseline conditions established in 1988/1989 at same location.	Increased incidence of moderate and severe lesions of the digestive gland, gills and mantle 1 week after the spill, returning to pre-spill levels by 1 month. During the first 3 months post-spill an increase in lesion incidence of the intestines was observed which returned to previous levels by 6 months post-spill. The heart and kidney showed a latent increase in lesion incidence 2 and 3 months following the spill, which returned to previous levels by 4 months. Ova and sperm development were not adversely affected. Spawning occurred both in late spring and late summer. The siphon, gill, stomach, foot muscle, and body epithelium were not adversely affected by the oil spill.	Brown et al., 1992
Arthur Kill	January 1990 - April 1990 (sampled every 3-8 days after #2 fuel oil spill)	Fiddler crab (*Uca pugnax*)	Emergence and mortality	This study compared crab emergence and mortality in 7 salt marsh creeks immediately adjacent to the oil spill with 23 creeks at varying distances from the spill (including Cheesequake creeks 26-29 km from the spill as a control site), examined the temporal pattern of crab emergence in one creek, and compared the mortality rate of crabs that emerged with those the researchers dug up and transported to the laboratory. A 10 – 60 m length of each creek was sampled, beginning at the creek mouth, and the number of crabs per 10 m of creek length recorded. Every crab visible on the surface was collected. To examine emergence, J's Creek was sampled every 3 – 8 days after the spill and all crabs visible on the surface were collected. To separate the effects of early emergence and cold from the presence of oil, the researchers also dug up some crabs from their burrows in a creek in the area immediately adjacent to the spill and maintained them in the laboratory to assess mortality.	Twice as many crabs emerged in the creeks adjacent to the oil spill compared to those that were only 4.5 km away, with a significant difference in the number of crabs that emerged as a function of distance from the spill. For all the emerged crabs, the percentage of females ranged from 28 to 80%, whereas the percentage of females in intact burrows was 64 to 65%. For all emerged samples, females died earlier than males. In the laboratory, all emerged crabs died within 4 weeks whereas over 90% of the controls were still alive 8 weeks after the initiation of the experiment.	Burger et al., 1992
Piles Creek	one-time event, 1990s	Mummichog (*Fundulus heteroclitus*)	Thyroid differences between Piles Creek fish and reference site fish (Tuckerton, NJ)	Carletta et al. (2000) captured young-of-year fish from Piles Creek and Tuckerton, NJ, sorted them by length, preserved, prepared the fish as sagittal sections on histological slides, and measure the area of the thyroid follicles.	For fish longer than 15 mm (total length), the average follicle area of the Piles Creek population was significantly larger than that of the Tuckerton population. However, for the next smaller size class (12 – 14.5 mm), the average follicle area of the Piles Creek population was significantly smaller. At the smallest size (9 – 11.5 mm), the two populations were not significantly different in average follicle area. Although not statistically significant, radioimmunoassay measurements of thyroxine (T4) levels in fish were consistent with the follicle differences. In the 20 – 30 mm size class, the Piles Creek fish had a significantly lower triiodothyronine (T3)/T4 ratio that the Tuckerton fish. T4 levels in unfertilized eggs were much higher in Piles Creek eggs. The thyroid follicle abnormalities seen in adults began by the time the fish were approximately 15 – 20 mm long. However, the follicle size reversal for the next smaller size (12 – 14.5 mm) may also indicate abnormality at that developmental stage for the Piles Creek population.	Carletta et al., 2000

Table 3-51
Other Toxicology Studies Conducted in the Inventory Area

Location	Sampling Date and Frequency	Organism	Endpoint(s)	Methods Comments	Results	Citation
Newark Bay	one-time event, 1990s	Mummichog (*Fundulus heteroclitus*)	CYP1A induction, hatching success, larval survival, larval growth	Study treated adult fish from Newark Bay and a reference site (Flax Pond, New York) with a single intraperitoneal (ip) injection of PCBs (1:1.5 of Aroclors 1248 and 1262 in heptane and corn oil) during gametogenesis and measuring CYP1A expression in parents and larvae. Vehicle control injections were also performed. Hatching success, larval survival, and larval growth were also measured.	Fish from the reference population exhibited a strong CYP1A dose response to the PCB treatments in hepatic ethyoxyresorufin O-deethylase (EROD) activities and CYP1A protein levels. CYP1A expression in 24-hr and 8-day post-hatch larvae from PCB-treated reference area parents was measured immunohistochemically and revealed a strong and persistent induction that was dose-related. Larval organs responded sequentially to increasing parental PCB dose in the following order: hepatocytes, gill, gut, and heart. The kidney appeared to express CYP1A constitutively. In contrast to the reference area fish, Newark Bay adults and larvae failed to show induction of CYP1A in response to any PCB treatment, indicating that the Newark Bay population has acquired and altered response to CYP1A inducers that is both persistent and possibly heritable according to the study authors. No effect of PCB treatment was observed on hatching success, larval survival, and larval growth.	Elskus et al., 1999
Kill Van Kull	one-time event, 1990s	Mummichog (*Fundulus heteroclitus*)	Production of vitellogenin (VtG) in the livers of male and juvenile fish	Surface sediment (top 5 cm) from the Kill Van Kull and a reference site, Central Long Island Sound, underwent organic extraction. Fish from Flax Pond, New York were injected with equal amounts of sediment extract or E2 as a positive control or a vehicle control of 33% dimethylsulfoxide (DMSO) in corn oil. VtG synthesis was measured by Western blot analysis.	Injection with organic extracts of sediment from Kill Van Kull did not induce VtG production in adult male mummichog. In field studies of mummichog collected in Newark Bay, only gravid female mummichog had detectable levels of VtG.	McArdle et al., 1998; McArdle et al., 2004
Shooter's, Swinburne, and Gardiner's Islands	1999, approximately weekly	Double-crested cormorants (*Phalacrocorax auritus*)	Reproductive success	Productivity was monitored by following the success of marked nests. Nest contents were recorded at each visit and nestlings were banded at approximately week weeks of age. Frequency data such as the proportions of successful and unsuccessful nests, the distribution of egg and nestling production, and the distribution of egg and nestling mortality were investigated statistically using Chi-square tests of independence. Nests defined as successful at hatching eggs had at least one young observed through the study. Nests defined as successful at fledging young had at least one nestling that survived a minimum of 21 days. Two production endpoints, the number of eggs laid, and the maximum number of young observed, along with two nestling survival endpoints, total chick days, and maximum chick days per nest were evaluated.	Gardiner's Island produced more failing nests than the other two sites. The number of eggs laid did not differ among the colonies. The maximum number of young was higher at Swinburne Island that at the other two colonies. There were statistically detectable differences in the number of total chick days and the maximum chick days among the three colonies. No differences were detected among the colonies in egg mortality. The author concludes that double-crested cormorants nesting on Swinburne Island were generally more successful than cormorants on Shooter's or Gardiner's Islands. Although the number of eggs laid per nest was not different between sites, the maximum number of young observed per nest and total chick days and maximum chick days were highest on Swinburne and lowest on Shooter's Island.	Parsons, 2003

Table 3-51
Other Toxicology Studies Conducted in the Inventory Area

Location	Sampling Date and Frequency	Organism	Endpoint(s)	Methods Comments	Results	Citation
Newark Bay	one-time event, 1990s	Mummichog (*Fundulus heteroclitus*)	Survival, histology, metabolism	Adult mummichog were collected at Newark Bay and a reference site (Tuckerton, NJ), eggs and sperm were stripped from the adults and taken to the laboratory where embryos were exposed to 12 to 100 pptr [3H]TCDD/acetone (nominal water concentrations). Adult mummichog were also collected in Newark Bay and Tuckerton, transported to the laboratory and dermally treated with 0.3 to 60 ng/g [3H]TCDD/DMSO.	Newark Bay embryos did not exhibit TCDD-dependent lesions or death, whereas the Tuckerton embryos exhibited both TCDD concentration-related lesions and death that was associated with the lesions. The differences in the two populations were not due to differential absorption between the two populations. Newark Bay fish did not exhibit TCDD treatment related increases in death, lesions, or liver-to-body-weight ratios, whereas the Tuckerton adult fish did. The Newark fish did exhibit greater parasitic infestations of the liver, great hepatic neoplasias, and greater liver-to-body-weight ratios, all of which were independent of laboratory TCDD treatment, as compared to the Tuckerton fish. The rates of [3H]TCDD elimination following a single dermal treatment of [3H]TCDD were similar between the Newark and Tuckerton populations, as were the capabilities to metabolize TCDD. The Newark population consistently exhibited elevated hepatic P4501A catalytic activity, as measured by EROD, compared to the Tuckerton population. EROD activity could not be induced in the Newark fish by dermal administration of [3H]TCDD ranging from 0.020 to 8.0 ng/g [3H]TCDD. The Tuckerton fish exhibited a linear increase in EROD activity at 96 hrs following dermal administration of [3H]TCDD from 0.8 to 8 ng/g [3H]TCDD.	Prince and Cooper, 1995a, 1995b
Kearny Marsh, Saw Mill Creek	one-time event, 2001	Sediment microbes associated with saltmarsh cordgrass (*Spartina alterniflora*) and common reed (*Phragmites australis*) systems	microbial functional ability	Compared microbial functional ability via the rate of biodegradation of tetrabromol-bisphenol-A and extracellular enzyme activity using beta-glucosidase, chitobiase, peroxidase, phenol oxidase, and acid phosphatase as indicators between study areas and a reference area (Mullica River, NJ). Phospholipid fatty acids were quantitated as a measure of microbial community diversity.	Acid phosphatase and beta-glucosidase were highest at Kearny Marsh. Chitobiase, peroxidase, and phenol oxidase activity was lowest in Kearny Marsh. The microbial community was less diverse at Saw Mill Creek than Kearny Marsh or Mullica River. Microbial populations at these three sites were able to biodegradetetrabromol-bisphenol-A.	Ravit and Ehrenfeld, 2002
Piles Creek	one-time event, 1990s	Mummichog (*Fundulus heteroclitus*)	Behavior	Analysis of the neurotransmitters dopamine (DA) and serotonin (5-HT) and their metabolites, DOPAC, homovanillic acid (HVA), and 5-hydroxyindolacetic acid (5-HIAA) in cerebellums and medullas was performed by HPLC.	Fish from Tuckerton took significantly more prey (grass shrimp, Palaemonetes pugio) during the first 5-10 min of each behavioral trial than did fish from Piles Creek. Mummichogs from Piles Creek had significantly lower concentrations of 5-HT and its metabolite 5-HIAA in their medullas, but not cerebellums, than fish from the reference site. Concentrations of DA, DOPAC, and HVA were not different between populations in either part of the brain. When Tuckerton fish are maintained in an aquarium with Piles Creek sediments and water and fed grass shrimp from Piles Creek, their prey capture ability declined to that of Piles Creek fish after one month of exposure. Tuckerton juveniles are less vulnerable than Piles Creek fish to predation by blue crabs during a 14 day test period	Smith et al., 1995; Weiss et al., 1999

Table 3-51
Other Toxicology Studies Conducted in the Inventory Area

Location	Sampling Date and Frequency	Organism	Endpoint(s)	Methods Comments	Results	Citation
Two locations in the lower Hackensack River, one location at the north apex of Newark Bay just below where the Passaic River enters the Bay	one-time event, 1990s	Atlantic tomcod (*Microgadus tomcod*)	Hepatic cytochrome P450A1 expression	CYP1A1 mRNA levels were quantified using slot blot analyses.	CYP1A1 mRNA levels were highest in the two Hackensack River samples relative to the remaining sampled sites (OD = 1.9 – 2.0 for Hackensack samples, OD = 1.9 for Newark Bay sample).	Yuan et al., 2001
Piles Creek	one-time event, 1990s	Mummichog (*Fundulus heteroclitus*)	thyroid histology and thyroid hormone levels		In comparison to Tuckerton fish, Piles Creek fish had larger thyroid follicles and greater follicle epithelial cell heights and contained significantly higher plasma T4 levels. No significant differences were found between the populations in either plasma or tissue T3 levels. Tuckerton fish raised in a simulated Piles Creek environment contained higher plasma T4 and lower plasma T3 levels than those sampled from the field. Piles Creek fish raised in clean water showed a reduction in both plasma T4 and T3 levels in comparison to field-sampled fish. In either case, no significant difference was found in tissue T3 content.	Zhou et al., 1999

Table 3-52

Dredging Permit Application Summary Table - Toxicity Data[a]

Waterway	Suspended Particulate Phase	Test Duration	Number of Studies	LC 50 (critical)	LPC (after 4 hours)	Dilution (after 4 hours)	
Arthur Kill	*Acartia tonsa*	96 hours	4	12.0% - 48.5%	0.12% - 0.48%	0.0031 - 0.0043	
	Menidia beryllina	96 hours	3	19.9% - 25.0%	0.199% - 0.25%	0.0038 - 0.0038	
	Menidia menidia	96 hours	3	74.4% - 76.2%	0.74% - 0.76%	0.0031 - 0.0043	
	Mysidopsis bahia	96 hours	6	17.8% - >100.0%	0.178% - >1.00%	0.0031 - 0.0043	
	Mytilus edulis (larval survival)	48 hours	2	17.9% - 19.9%	0.179% - 0.199%		
	Mytilus edulis (larval normal development)	48 hours	2	13.4% - 18.7%	0.134% - 0.187%		
	Solid Phase	**Test Duration**	**Number of Studies**	**% Survival in Reference**	**% Survival in Test**	**Difference (Reference-Test)**	**Is Difference Statistically Significant? (p=0.05)**
	Ampelisca abdita	10 days	1	99.0 - 99.0	92.0 - 92.0	7.0 - 7.0	No - No
	Eohaustorius estuarius	10 days	2	92.0 - 94.0	10.0 - 89.0	5.0 - 82.0	No - No
	Mercenaria mercenaria	10 days	4	99.0 - 100.0	99.0 - 100.0	0.0 - 1.0	No - No
	Mysidposis bahia	10 days	3	73.0 - 91.0	32.0 - 93.0	<0.0 - 52.0	No - No
	Nereis virens	10 days	4	85.0 - 100.0	77.8 - 97.0	3.0 - 7.2	No - Yes
	Palaemonetes pugio	10 days	4	96.4 - 99.0	90.1 - 94.2	2.2 - 8.9	No - Yes
	Total Community	10 days	4	93.36 - 99.7	89.57 - 96.7	2.1 - 4.3	No - Yes

Table 3-52

Dredging Permit Application Summary Table - Toxicity Data[a]

Kill Van Kull	**Suspended Particulate Phase**	**Test Duration**	**Number of Studies**	**LC 50 (critical)**	**LPC (after 4 hours)**		
	Menidia beryllina	96 hours	2	17.1% - >100.0%	0.171% - >1.0%		
	Mysidopsis bahia	96 hours	2	27.4% - >100.0%	0.274% - >1.0%		
	Mytilus edulis (larval survival)	48 hours	2	19.6% - 66.0%	0.196% - 0.660%		
	Mytilus edulis (larval normal development)	48 hours	2	18.8% - 57.5%	0.188% - 0.575%		
	Solid Phase	**Test Duration**	**Number of Studies**	**% Survival in Reference**	**% Survival in Test**	**Difference (Reference-Test)**	**Is Difference Statistically**
	Ampelisca abdita	10 days	1	98.0 - 98.0	89.0 - 89.0	9.0 - 9.0	Yes - Yes
	Eohaustorius estuarius	10 days	1	58.0 - 58.0	67.0 - 67.0	0.0 - 0.0	No - No
	Mysidposis bahia	10 days	2	94.0 - 98.0	89.0 - 96.0	2.0 - 5.0	No - No

Table 3-52

Dredging Permit Application Summary Table - Toxicity Data[a]

	Suspended Particulate Phase	Test Duration	Number of Studies	LC 50 (critical)	LPC (after 4 hours)	Dilution (after 4 hours)	
Newark Bay	*Acartia tonsa*	96 hours	1	76.0% - 76.0%	0.76% - 0.76%	0.0043 - 0.0043	
	Menidia beryllina	96 hours	2	25.9% - >100.0%	0.259% - >1.00%	0.0043 - 0.0043	
	Mysidopsis bahia	96 hours	2	51.9% - >100.0%	0.519% - >1.00%	0.0043 - 0.0043	
	Mytilus edulis (larval survival)	48 hours	1	>100.0 - >100.0%	>1.00% - >1.00%		
	Mytilus edulis (larval normal development)	48 hours	1	22.5% - 22.5%	0.255% - 0.255%		
	Solid Phase	**Test Duration**	**Number of Studies**	**% Survival in Reference**	**% Survival in Test**	**Difference (Reference-Test)**	**Is Difference Statistically Significant? (p=0.05)**
	Ampelisca abdita	10 days	1	84.0 - 84.0	83.0 - 83.0	1.0 - 1.0	No - No
	Mercenaria mercenaria	10 days	1	100.0 - 100.0	100.0 - 100.0	0.0 - 0.0	No - No
	Mysidposis bahia	10 days	1	97.0 - 97.0	96.0 - 96.0	1.0 - 1.0	No - No
	Nereis virens	10 days	1	92.0 - 92.0	78.0 - 78.0	14.0 - 14.0	No - No
	Palaemonetes pugio	10 days	1	93.8 - 93.8	87.0 - 87	6.8 - 6.8	No - No
	Total Community	10 days	1	95.3 - 95.3	88.7 - 88.7	6.5 - 6.5	Yes - Yes

Table 3-52

Dredging Permit Application Summary Table - Toxicity Data[a]

	Suspended Particulate Phase	Test Duration	Number of Studies	LC 50 (critical)	LPC (after 4 hours)	Dilution (after 4 hours)	
Passaic River	*Acartia tonsa*	96 hours	1	10.8% - 10.8%	0.11% - 0.11%	0.0043 - 0.0043	
	Menidia beryllina	96 hours	1	>100.0% - >100.0%	1.00% - 1.00%	0.0043 - 0.0043	
	Mysidopsis bahia	96 hours	1	>100.0% - >100.0%	1.00% - 1.00%	0.0043 - 0.0043	
	Solid Phase	**Test Duration**	**Number of Studies**	**% Survival in Reference**	**% Survival in Test**	**Difference (Reference-Test)**	**Is Difference Statistically Significant? (p=0.05)**
	Mercenaria mercenaria	10 days	1	100.0 - 100.0	100.0 - 100.0	0.0 - 0.0	No - No
	Nereis virens	10 days	1	98.0 - 98.0	91.0 - 91.0	7.0 - 7.0	No - No
	Palaemonetes pugio	10 days	1	96.8 - 96.8	89.2 - 89.2	7.6 - 7.6	Yes - Yes
	Total Community	10 days	1	98.3 - 98.3	93.4 - 93.4	4.9 - 4.9	No - No

Notes:
a. Data ranges for obtained dredge permit applications in which data were provided.
LC 50 = the concentration of the test substance resulting in mortality of 50% of the test organisms
LPC = limiting permissible concentration

Sources:
Arthur Kill: Northville Linden Terminal Corporation (USACE, 1992c); CITGO Petroleum Corporation (USACE, 1997e); Consolidated Edison of New York (USACE, 1992d) ; Port Authority of NY/NJ (USACE, 1992b); Chevron (1997); Bayway Refining Company (USACE, 1993b); Federal Navigation Project (USACE, 1997h); Mobil Oil Corporation (USACE, 1997i).
Kill Van Kull: Federal Navigation Project (USACE, 1999k); EXXON Company, USA (USACE, 1997g).
Newark Bay: Port Authority of NY/NJ (USACE, 1991b); USACE (1997f).
Passaic River: Celanese Chemical Company, Inc. (USACE, 1991a).

Table 3-53
Quality Assurance/Quality Control Information for Toxicity Studies

Reference	USEPA Region 2 Data Validation	Qualitative QA/QC[a]	Peer-reviewed Journal Publication	Not Specified	Notes
Battelle (1992b)		X			
Battelle (1997a)		X			
Battelle (1997b)		X			
BenKinney et al. (2001)				X	
Brown et al. (1992)			X		
Burger et al. (1992b)			X		
Carletta et al. (1999)				X	
Cooper et al. (1993)			X		
Cristini and Cooper (1992)				X	
Dredging Permit Applications (11): NB: USACE (1991b; 1997f) AK: USACE (1992b; 1992c; 1992d; 1993b; 1997e; 1997i) KVK: USACE (1997g; 1999c) PR: USACE (1991a)				X	
Elskus et al. (1999)			X		
Khan et al. (1993)			X		
McArdle (1998)				X	
McArdle et al. (2004)			X		
NOAA (1995b)		X			
Parsons (2003)				X	
Prince and Cooper (1995a)			X		
Prince and Cooper (1995b)			X		
Ravit and Ehrenfeld (2002)				X	
Rice et al. (1995)			X		
SAIC (1993)		X			
Smith et al. (1995)			X		
Thursby et al. (2000)			X		
Tierra (2002e)				X	
Tierra (2002f)				X	
Tierra (2004e)				X	
Tierra (2004f)				X	
USACE (1997a)		X			
USEPA (1990)		X			
USEPA (1996)		X			
USEPA (1998)		X			
USEPA (2003)		X			
Weis et al. (1999)			X		
Wolfe et al. (1996)			X		

Table 3-53
Quality Assurance/Quality Control Information for Toxicity Studies

Reference	USEPA Region 2 Data Validation	Qualitative QA/QC[a]	Peer-reviewed Journal Publication	Not Specified	Notes
Yuan et al. (2001)			X		
Zhou et al. (1999)			X		

Notes:
a. Qualitative QA/QC includes analysis of positive and negative toxicity controls and appropriate exposure matrix controls.

Table 3-54
Bioaccumulation Studies Identified for the Inventory Area

Reference - Author/Year	Year(s) of Data Collection	Season(s) of Data Collection	Waterway	Number of Sampling Locations	Control Sampling Location	Organisms Included			Contaminants Included				
						Fish	Crustaceans	Invertebrates/ Other	Inorganic Chemicals	Pesticides	PCDD/Fs	PCBs	PAHs
Albers et al. (1986)	1981, 1982	summer	HK	8	Maryland			snapping turtle	X	X		X	
Ashley and Horwitz (2000)	1998 - 1999	not provided	PR	1	no	American eel, brown bullhead, carp, largemouth bass, redbreast sunfish			X	X		X	
Brown et al. (1994)	1986 - 1987	fall, winter, spring	AK, NB	AK: 5, NB: 4	Tuckerton, NJ			soft-shell clam			X		
Burke et al. (2000)	1998	spring, summer	HK	1	no			wetland plants	X				
Buser and Rappe (1991)	not provided	not provided	NB	not provided	no		blue crab, lobsters	benthic worm			X		
Cai et al. (1994a)	1991, 1992	summer	NB	1	no		blue crab				X		
Cai et al. (1994b)	1991, 1992	summer	NB	1	no		blue crab				X		
Cooper and Cristini (1990)	1987 - 1988	not provided	NB	not provided	Tuckerton, NJ			bivalve mollusk			X		
Cooper et al. (1992)	not provided	not provided	AK	Elizabeth, NJ	Tuckerton, NJ	mummichog and Atlantic menhaden	grass shrimp	bloodworm, snail, soft-shell clam, green algae, cordgrass			X		
Cristini (1992)	1991, 1992	fall, summer	NB	1 (3 elsewhere)	no		blue crab (muscle and hepatopancreas tissues)				X		
Cristini and Gross (1993)	1991, 1992	summer	NB	1 (3 elsewhere)	no		blue crab (edible tissues and/or hepatopancreas); 1991: 5 composite samples; 1992: 7 composite samples				X		
Dredging Permit Applications (16): NB: USACE (1991b; 1997f) AK: USACE (1992b; 1992c; 1992d; 1993b; 1997e; 1997h; 1997i) KVK: USACE (1997g; 1999k) PR: USACE (1979; 1986b; 1987; 1988, 1991a)	1979 - 1999	not provided	AK, KVK, NB, PR	AK: 6; KVK: 2; NB: 2; PR: 5	not provided		grass shrimp	hard clam, sand worm	X	X	X	X	X
Eckenfelder (1993)	1991	summer, fall	HK	8	no	killifish	blue crab		X	X	X	X	X
Elskus et al. (1999)	1995	fall	NB	1	Flax Pond, NY	mummichog (eggs)						X	
ERM (1985c)	1970s - 1980s	year-round	HK	not provided	no	multiple species		mammals, birds	X				
ERM (1985e)	1970s - 1980s	year-round	HK	not provided	no	multiple species		mammals, birds	X				
ERM (1985g)	1970s - 1980s	not provided	HK	not provided	no	killifish; goldfish		plants	X				
Fernandez et al. (2004)	1996, 1998	summer, winter	NB	HK: 1, NB: 1	Miramichi River, New Brunswick	Atlantic tomcod young-of-the-year and adults (composite of 10 livers)					X	X	
Finley et al. (1997)	1995	fall	PR	6	no	mummichog, striped bass	blue crab (muscle and hepatopancreas composite samples)					X	
Galluzzi (1976)	1975 - 1976	year-round	HK	5	no			muskrat	X				
Gillis et al. (1993)	1990	not provided	NB	not provided	no	multiple species	blue crab	ribbed mussel, soft shell clam	X				
HMDC (1978b)	1978	not provided	HK	16	no			mammals (house mouse, Norway rat, vole, opossum, muskrat, rabbit, raccoon, skunk, beaver)	X				
HMDC (1978c)	1978	not provided	HK	fish: 23; benthic invertebrates: 5	no	multiple species	blue crab, fiddler crab, mud crab, grass shrimp	soft-shell clam	X				
HMDC (1978d)	1977	spring, fall	HK	40	no			18 wetland plant species	X				
HMDC (1978e)	1978	not provided	HK	16				17 bird species	X				

Table 3-54
Bioaccumulation Studies Identified for the Inventory Area

Reference - Author/Year	Year(s) of Data Collection	Season(s) of Data Collection	Waterway	Number of Sampling Locations	Control Sampling Location	Organisms Included			Contaminants Included				
						Fish	Crustaceans	Invertebrates/ Other	Inorganic Chemicals	Pesticides	PCDD/Fs	PCBs	PAHs
HMDC (1981)	1978	not provided	HK	16	no			mammals (muskrat, skunk, raccoon, Norway rat, beaver); reptiles and amphibians; birds	X				
HMDC (1986)	1986	summer	HK	not provided	no			plant species	X				
HMDC (1988)	1988	spring	HK	3	no	American eel, brown bullhead, carp, white perch			X				
HMDC (1990a)	1986 - 1988	not provided	HK	5	no		blue crab (muscle and hepatopancreas)		X				
Iannuzzi and Ludwig (2000)	1995	summer	PR	not provided	no	mummichog, striped bass	blue crab				X	X	
Iannuzzi et al. (1996)	1995	summer	PR	not provided	no	mummichog, striped bass	blue crab	polychaete				X	
Jack McCormick & Associates (1975)	prior to 1974	not provided	HK	not provided	no	multiple species	multiple species	multiple plant species	X				
Kraus (1986)	prior to 1986	not provided	HK	not provided	no			wetland plant	X				
Kraus (1988)	1986	summer	HK	not provided	no			wetland plant	X				
Kraus (1989)	prior to 1990	not provided	HK	3	no			tree swallow	X				
Leach (1979)	1977 - 1978	not provided	HK	not provided	no	multiple species	blue crab, grass shrimp, fiddler crab		X				
Lee et al. (1988)	1987	not provided	HK	not provided	no	mummichog		estuarine clam	X				
McIntyre (2000)	1999	summer	HK	1				diamondback terrapin	X				
Monosson et al. (2003)	1994	summer	NB	1	Flax Pond, NY and Succotash Salt Marsh, RI	mummichog (muscle, liver, and gonad)						X	
NJDEP (1983)	1981 - 1982	not provided	AK, PR	not provided	no	AK: American eel; PR: striped bass, American eel, white perch, white catfish			X			X	
NJDEP (1985a)	1982 - 1984	spring, summer	KVK, NB	KVK	no	American eel: 2 composite fillet samples; striped bass: 6 composite fillet samples	blue crab (muscle and hepatopancreas) 5 composite samples				X		
NJDEP (1985b)	1983	summer, fall	KVK, NB	KVK	no	alewife: 1 sample (5 pooled whole body fish); American eel: 6 samples (30 pooled fillets); bluefish: 1 sample (3 pooled fillets); striped bass: 10 samples (37 pooled fillets)	10 blue crab sampled (50 pooled edible tissue and/or hepatopancreas tissue)			X		X	
NJDEP (1990a)	1986 - 1987	not provided	KVK	NB	no	American eel: scaled fillet with skin removed (1996: 1, 1997: 1); bluefish: scaled fillet with skin intact (1996: 0, 1997: 1); striped bass: scaled fillet with skin intact (1996: 2, 1997: 1)	blue crab (edible tissues and/or hepatopancreas); 1996: 1; 1997: 4			X		X	
NJDEP (1993a)	1990 - 1991;	fall, spring, summer	HK, NB, PR	PR: 1, NB: 1, HK: 1	Big Sheepshead Creek		blue crab (muscle, claw, hepatopancreas)		X				
NJDEP (1993b)	1988 - 1991; 1988 only in Inventory Area	not provided	AK, HK, NB, PR	AK: 1; HK: 1; NB: 1; PR: 2	no	American eel: 4; carp: 1; striped bass: 4	blue crab (edible tissues and/or hepatopancreas: 11)			X		X	
NJMSC (1980)	1978 - 1979	not provided	NB	1	no	American eel, bluefish, striped bass, white perch. Some data pooled into regional and/or statewide inorganic chemicals concentrations (mean, range, count)	ribbed mussel, soft clam. Some data pooled into regional and/or statewide inorganic chemicals concentrations (mean, range, count)		X				
NUS (1983)	1983	summer	NB	1	no	striped bass: 1			X		X		

Table 3-54
Bioaccumulation Studies Identified for the Inventory Area

Reference - Author/Year	Year(s) of Data Collection	Season(s) of Data Collection	Waterway	Number of Sampling Locations	Control Sampling Location	Organisms Included			Contaminants Included				
						Fish	Crustaceans	Invertebrates/ Other	Inorganic Chemicals	Pesticides	PCDD/Fs	PCBs	PAHs
NY/NJ HEP (2004a)	1999 - 2000	year-round	NB, PR, KVK	2; 1(bird)	no	American eel (fillet), mummichog (whole body), stripe bass (fillet and liver tissue), white perch (fillet)	blue crab, bivalves, decapods, arthropods, polychaetes	plankton, cormorants	X	X	X	X	X
NYSDEC (1996)	1993 and 1994	fall, winter	AK, KVK, NB	varies by species	no	American eel, Atlantic tomcod, bluefish, butterfish, cunner, porgy, spot, spotted hake, striped bass, weakfish, white perch, windowpane flounder, winter flounder	blue crab (muscle and hepatopancreas)	bivalves, cephalopods	X	X		X	
NYSDEC (1997a)	1993	fall	NB	varies by species	no	American eel, white perch, winter flounder	blue crab (muscle and hepatopancreas)				X		
NYSDEC (1997b)	1993	fall	AK, KVK, NB	varies by species	no	winter flounder		soft-shell clam					X
NYSDEC (2004c)	1975 - 1996	year-round	LIS, NY/NJ Harbor Estuary						X	X	X	X	
Parsons (2003)	1999	not provided	KVK	1	Gardiner's Island			double-crested cormorant	X	X	X	X	X
Paulson et al. (2003)	1996 and 1997	fall, spring	AK	6	Sandy Hook, NJ			ribbed mussel	X				
Prince et al. (1990)	not provided	not provided	NB	AK: 1	Tuckerton, NJ	*Fundulus* sp.- various tissues					X		
Pruell et al. (1993)	not provided	not provided	NB	NA (laboratory study)	North Jamestown, NJ & Narragansett Bay		grass shrimp	sandworm, clam			X	X	
Rappe et al. (1991)	1991 or earlier	not provided	NB	3	no	striped bass	blue crab (muscle and hepatopancreas)				X		
Robinson (2002)	1970 - 2000	not provided	HK, KVK, NB	not provided		American eel, striped bass	blue crab			X			
Rubinstein et al. (1990)	not provided	not provided	PR	NA (laboratory study)	North Jamestown, NJ		grass shrimp	sandworm, clam			X	X	
Santoro and Koepp (1986)	1979 - 1980	summer, fall, spring	HK	11	no	15 species	blue crab, fiddler crab, mud crab, grass shrimp		X				
Squibb et al. (1991)	1980 - 1990	varies by dataset	NB	varies by dataset	varies by dataset	varies by dataset	crabs, lobsters (varies by dataset)	molluscs (varies by dataset)	X	X	X	X	X
Tavalaro and Stern (1990)	not provided	not provided	KVK, NB	approximately 20	no		grass shrimp	sandworm, clam			X (proposed sampling, but results not available)		
Tierra (1995a)	1995	fall	PR	6	no	mummichog (whole body), striped bass (fillet)	blue crab (edible muscle, hepatopancreas)		X	X	X	X	X
Tierra (1999d)	1999	spring	PR	15	Mullica River	Atlantic menhaden (whole body), Atlantic silverside (whole body), bluefish (whole body and fillet), mummichog (whole body), adult striped bass (whole body and fillet), juvenile striped bass (whole body), white perch (whole body)	blue crab (whole body soft tissue, edible muscle, hepatopancreas)		X	X	X	X	X
Tierra (2000c)	2000	spring	PR	4	Mullica River	American eel (whole body), mummichog (whole body), adult striped bass (whole body and fillet), white perch (whole body and fillet)	blue crab (whole body soft tissue, edible muscle)		X	X	X	X	X
Tierra (2001a)	2001	summer	PR	12	no	American eel (fillet with skin on) brown bullhead (fillet with skin off)			X	X	X	X	X
USACE (1985a)	prior to 1985	not provided	HK	not provided	no			wetland plants	X				
USACE (1985c)	prior to 1985	not provided	HK	not provided	no	aquatic species			X				
USEPA/USACE (1995)	prior to 1990	not provided	HK	not provided	no	aquatic species							

Table 3-54
Bioaccumulation Studies Identified for the Inventory Area

Reference - Author/Year	Year(s) of Data Collection	Season(s) of Data Collection	Waterway	Number of Sampling Locations	Control Sampling Location	Organisms Included			Contaminants Included				
						Fish	Crustaceans	Invertebrates/ Other	Inorganic Chemicals	Pesticides	PCDD/Fs	PCBs	PAHs
Weis et al. (1986)	prior to 1986	not provided	HK	not provided	no	killifish			X				
Windham et al. (2001)	1999	spring, summer	HK	1	no			wetland plants	X				
Yuan et al. (2001)	1994 - 1998	summer	HK, NB	HK: 1; NB: 1	no	young-of-the-year tomcod pooled liver tissue					X	X	

Notes:
AK = Arthur Kill
HK = Hackensack River
KVK = Kill Van Kull
LIS = Long Island Sound
NB = Newark Bay
PAHs = polycyclic aromatic hydrocarbons
PCBs = polychlorinated biphenyls
PCDD/Fs = polychlorinated dibenzo-p-dioxins/dibenzofurans
PCDT = polychlorinated dibenzothiophenes
PR = Passaic River
TEPH = total extractable petroleum hydrocarbons
SVOCs = semivolatile organic carbons
VOCs = volatile organic carbons

Other
blood plasma characteristics
PCDT
PCDT
TEPH
TEPH, VOCs, SVOCs

Other
length/weight
length/weight; % lipids
length/weight; % lipids

Other
X
% lipid
% lipid
% lipid

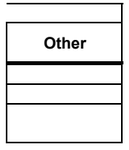

Other

Table 3-55
Fish Bioaccumulation Data from Ashley and Horwitz (2000)

Common Name	Scientific Name	Author's Sample Number	Lipid %	PCB Congener ng/g-ww					
				1	3	4+10	7	6	8+5
Elmwood Park		**DL**		**0.38**	**0.84**	**0.24**	**0.07**	**0.15**	**0.28**
brown bullhead	*Ameiurus nebulosus*	F-3234	2.54	ND	ND	ND	ND	ND	0.58
		F-3228	1.8	ND	ND	ND	BDL	ND	0.7
		F-3229	2.25	ND	ND	ND	BDL	ND	1.14
common carp	*Cyprinus carpio*	F-2845	4.86	0.56	BDL	0.35	BDL	0.16	2.47
		F-3225	4.36	2.49	8.54	0.95	0.31	0.82	11
		F-2847	1.13	0.86	BDL	ND	BDL	BDL	1.28
		F-2844	1.89	BDL	2.17	0.35	BDL	0.18	1.72
		F-3226	3.83	ND	ND	1.01	0.35	0.27	2.2
		F-3227	7.91	ND	ND	1.97	0.24	0.45	8.62
redbreast sunfish	*Lepomis auritus*	F-3222	0.28	ND	ND	ND	ND	ND	ND
		F-3223	16.52	ND	ND	ND	ND	ND	0.69
		F-3224	0.52	ND	ND	ND	ND	BDL	0.42
largemouth bass	*Micropterus salmoides*	F-3036	0.66	ND	ND	ND	ND	0.27	0.56
		F-3038	1.1	ND	ND	BDL	BDL	0.18	0.69
		F-3039	0.73	ND	ND	1.07	0.86	0.86	2.85
Pompton									
common carp	*Cyprinus carpio*	F-2846	5.6	BDL	2.22	0.31	0.26	0.59	6.15
		F-3040	7.43	ND	ND	1.07	0.86	0.86	2.85
		F-3231	5.61	ND	ND	1.24	0.36	0.85	5.34
		F-3230	8.74	9.76	4.45	0.53	0.53	2.25	3.36
redbreast sunfish	*Lepomis auritus*	F-3118	0.43	ND	ND	BDL	ND	BDL	0.37
		F-3119	0.92	ND	ND	BDL	BDL	BDL	0.42
		F-3120	0.24	ND	ND	ND	ND	0.49	BDL
largemouth bass	*Micropterus salmoides*	F-3233	0.36	ND	ND	BDL	BDL	BDL	0.56
		F-3232	0.56	ND	ND	ND	ND	0.22	0.36
		F-3037	0.68	ND	ND	ND	ND	ND	0.34

Table 3-55
Fish Bioaccumulation Data from Ashley and Horwitz (2000)

Common Name	Scientific Name	Sample ID	Lipid %	PCB Congener ng/g-ww					
				19	12+13	18	17	24+27	16+32
Elmwood Park		**DL**		**0.25**	**0.45**	**0.34**	**0.26**	**0.12**	**0.37**
brown bullhead	*Ameiurus nebulosus*	F-3234	2.54	ND	ND	0.47	0.37	ND	0.41
		F-3228	1.8	ND	ND	0.36	BDL	0.58	ND
		F-3229	2.25	ND	ND	1.36	0.78	0.15	1.73
common carp	*Cyprinus carpio*	F-2845	4.86	0.55	BDL	4.5	2.48	0.65	4.7
		F-3225	4.36	BDL	0.54	12.19	5.78	1.37	12.15
		F-2847	1.13	BDL	BDL	0.81	0.34	0.15	0.67
		F-2844	1.89	BDL	BDL	1.58	0.79	0.25	1.85
		F-3226	3.83	0.51	BDL	3.92	1.93	0.51	5.04
		F-3227	7.91	0.93	ND	6.28	3.82	1.22	8.35
redbreast sunfish	*Lepomis auritus*	F-3222	0.28	ND	ND	BDL	BDL	ND	BDL
		F-3223	16.52	ND	ND	0.52	0.32	BDL	0.49
		F-3224	0.52	BDL	ND	BDL	BDL	0.16	BDL
largemouth bass	*Micropterus salmoides*	F-3036	0.66	BDL	ND	0.64	0.43	ND	0.78
		F-3038	1.1	BDL	BDL	1.17	0.87	0.22	1.32
		F-3039	0.73	BDL	1.27	2.68	0.4	3.3	1.08
Pompton									
common carp	*Cyprinus carpio*	F-2846	5.6	0.67	BDL	3.15	1.65	0.64	4.58
		F-3040	7.43	0.42	BDL	4.35	2.58	0.67	7.58
		F-3231	5.61	0.96	0.62	5.99	3.99	0.95	9.24
		F-3230	8.74	1.65	0.49	4.96	3.9	1.46	10.02
redbreast sunfish	*Lepomis auritus*	F-3118	0.43	ND	BDL	BDL	0.27	0.14	0.38
		F-3119	0.92	BDL	BDL	0.43	0.47	BDL	0.61
		F-3120	0.24	ND	BDL	BDL	BDL	ND	BDL
largemouth bass	*Micropterus salmoides*	F-3233	0.36	BDL	BDL	BDL	BDL	0.18	BDL
		F-3232	0.56	BDL	ND	0.37	0.54	BDL	0.46
		F-3037	0.68	ND	ND	0.35	BDL	ND	0.44

Table 3-55
Fish Bioaccumulation Data from Ashley and Horwitz (2000)

Common Name	Scientific Name	Sample ID	Lipid %	PCB Congener ng/g-ww					
				29	26	25	31+28	33+53+21	22
Elmwood Park		**DL**		**0.18**	**0.25**	**0.86**	**1.1**	**0.56**	**0.77**
brown bullhead	*Ameiurus nebulosus*	F-3234	2.54	BDL	BDL	BDL	BDL	BDL	BDL
		F-3228	1.8	BDL	0.67	ND	1.63	BDL	0.87
		F-3229	2.25	ND	0.59	BDL	11.55	0.95	3.96
common carp	*Cyprinus carpio*	F-2845	4.86	BDL	1.81	0.98	30.06	3.16	5.11
		F-3225	4.36	BDL	5.61	2.78	41.21	16.67	18.79
		F-2847	1.13	BDL	BDL	BDL	4.36	1.01	1.66
		F-2844	1.89	BDL	1.39	1.18	14.87	2.42	3.92
		F-3226	3.83	BDL	2.14	1.15	12.71	5.56	6.35
		F-3227	7.91	BDL	2.82	1.22	34.92	4.59	10.48
redbreast sunfish	*Lepomis auritus*	F-3222	0.28	ND	ND	ND	BDL	ND	BDL
		F-3223	16.52	BDL	BDL	ND	2.01	BDL	0.82
		F-3224	0.52	BDL	BDL	BDL	BDL	BDL	BDL
largemouth bass	*Micropterus salmoides*	F-3036	0.66	BDL	BDL	BDL	2.85	1.01	1.06
		F-3038	1.1	BDL	0.86	BDL	2.31	1.68	1.7
		F-3039	0.73	BDL	0.5	0.96	1.38	0.74	1.76
Pompton									
common carp	*Cyprinus carpio*	F-2846	5.6	BDL	1.61	1.3	6.26	5.89	5.67
		F-3040	7.43	0.56	0.54	2.53	28.46	7.68	10.29
		F-3231	5.61	BDL	3.78	2.7	32.57	4.18	11.18
		F-3230	8.74	0.53	3.19	2.99	27.42	8.29	11.26
redbreast sunfish	*Lepomis auritus*	F-3118	0.43	BDL	BDL	BDL	2.07	BDL	BDL
		F-3119	0.92	BDL	BDL	BDL	BDL	BDL	0.98
		F-3120	0.24	BDL	BDL	BDL	1.51	BDL	BDL
largemouth bass	*Micropterus salmoides*	F-3233	0.36	BDL	ND	BDL	1.67	0.58	BDL
		F-3232	0.56	BDL	BDL	ND	1.59	BDL	BDL
		F-3037	0.68	BDL	BDL	BDL	BDL	ND	BDL

Table 3-55
Fish Bioaccumulation Data from Ashley and Horwitz (2000)

Common Name	Scientific Name	Sample ID	Lipid %	PCB Congener ng/g-ww					
				45	46	52	49	47+48	44
Elmwood Park		**DL**		**0.17**	**0.23**	**0.33**	**0.24**	**1.06**	**0.25**
brown bullhead	*Ameiurus nebulosus*	F-3234	2.54	ND	BDL	0.57	0.67	BDL	0.63
		F-3228	1.8	ND	BDL	0.86	1.1	BDL	0.85
		F-3229	2.25	ND	0.92	3.81	6.17	7.07	5.59
common carp	*Cyprinus carpio*	F-2845	4.86	5.08	0.56	18.26	15.17	ND	6.6
		F-3225	4.36	0.54	0.52	57.16	33.79	14.38	48.04
		F-2847	1.13	ND	0.4	5.89	4.65	1.92	4.62
		F-2844	1.89	2.64	0.95	8.82	6.76	5	8.63
		F-3226	3.83	5.91	0.82	12.97	10.82	10.68	11.84
		F-3227	7.91	10.37	1.87	21.87	18.58	18.21	21.43
redbreast sunfish	*Lepomis auritus*	F-3222	0.28	0.31	BDL	1.38	1.1	ND	0.5
		F-3223	16.52	ND	BDL	1.5	1.28	1.09	0.65
		F-3224	0.52	0.53	BDL	1.71	1.42	1.76	0.57
largemouth bass	*Micropterus salmoides*	F-3036	0.66	ND	0.26	2.11	2.23	2.43	2.32
		F-3038	1.1	1.22	0.3	5.27	4.47	5.06	3.56
		F-3039	0.73	1.29	BDL	3.1	2.63	10.89	2.46
Pompton									
common carp	*Cyprinus carpio*	F-2846	5.6	2.12	1.72	20.44	14.85	12.72	18.1
		F-3040	7.43	0.54	1.49	24.06	22.41	21.14	22.38
		F-3231	5.61	11.18	2.3	25.32	22.29	18.91	24.35
		F-3230	8.74	0.53	2.38	21.19	18.91	17.75	19.66
redbreast sunfish	*Lepomis auritus*	F-3118	0.43	0.44	BDL	1.65	1.54	BDL	0.71
		F-3119	0.92	0.75	BDL	2.16	2.02	1.7	1.12
		F-3120	0.24	0.27	BDL	1.48	1.31	1.26	0.5
largemouth bass	*Micropterus salmoides*	F-3233	0.36	0.25	BDL	3.92	1.91	BDL	1.85
		F-3232	0.56	ND	BDL	1.37	1.06	1.07	1
		F-3037	0.68	ND	ND	2.03	1.67	ND	1.31

Table 3-55
Fish Bioaccumulation Data from Ashley and Horwitz (2000)

Common Name	Scientific Name	Sample ID	Lipid %	PCB Congener ng/g-ww					
				37+42	41+71	64	40	100	63
Elmwood Park		**DL**		**0.08**	**0.11**	**0.16**	**0.09**	**0.13**	**0.12**
brown bullhead	*Ameiurus nebulosus*	F-3234	2.54	0.39	0.28	0.34	0.1	ND	BDL
		F-3228	1.8	0.65	0.47	0.53	0.17	ND	BDL
		F-3229	2.25	3.35	2.71	3.88	0.93	ND	1.01
common carp	*Cyprinus carpio*	F-2845	4.86	17.32	14.53	11.55	9.54	1.93	0.67
		F-3225	4.36	12.54	74.67	0.54	8.61	0.54	3.12
		F-2847	1.13	0.97	8.24	ND	0.43	BDL	0.6
		F-2844	1.89	4.86	1.72	2.51	1.79	0.6	1.08
		F-3226	3.83	7.53	7.15	6.05	2.58	3.23	1.48
		F-3227	7.91	13.09	5.04	12.12	4.5	7.99	3.36
redbreast sunfish	*Lepomis auritus*	F-3222	0.28	0.44	ND	0.44	ND	ND	0.16
		F-3223	16.52	0.76	0.52	0.61	BDL	BDL	BDL
		F-3224	0.52	0.64	0.53	0.68	BDL	ND	0.17
largemouth bass	*Micropterus salmoides*	F-3036	0.66	1.47	1.44	1.27	0.35	0.19	0.29
		F-3038	1.1	2.5	2.9	BDL	0.4	0.49	0.55
		F-3039	0.73	1.31	1.83	BDL	0.45	0.34	0.29
Pompton									
common carp	*Cyprinus carpio*	F-2846	5.6	9.69	9.07	8.07	2.54	0.63	1.65
		F-3040	7.43	16.63	14	12.93	5.88	0.54	3.61
		F-3231	5.61	15.08	22.95	ND	5.55	8.8	2.83
		F-3230	8.74	14.96	38.38	0.53	5.84	0.59	2.95
redbreast sunfish	*Lepomis auritus*	F-3118	0.43	0.64	0.55	0.6	BDL	0.21	0.14
		F-3119	0.92	0.99	0.81	0.77	0.11	0.15	0.21
		F-3120	0.24	0.5	ND	0.47	BDL	0.22	0.14
largemouth bass	*Micropterus salmoides*	F-3233	0.36	0.58	0.96	0.78	0.14	0.17	0.16
		F-3232	0.56	0.68	0.59	0.55	0.16	ND	0.13
		F-3037	0.68	0.87	0.74	0.71	ND	BDL	0.17

Table 3-55
Fish Bioaccumulation Data from Ashley and Horwitz (2000)

Common Name	Scientific Name	Sample ID	Lipid %	PCB Congener ng/g-ww					
				74	70+76	66+95	91	56+60	101
Elmwood Park		**DL**		**0.27**	**0.27**	**0.62**	**0.13**	**0.27**	**0.22**
brown bullhead	*Ameiurus nebulosus*	F-3234	2.54	0.56	0.4	1.95	0.14	0.89	0.67
		F-3228	1.8	0.98	0.69	2.85	BDL	1.29	1.02
		F-3229	2.25	7.81	1.91	22.6	1.45	10.37	5.16
common carp	*Cyprinus carpio*	F-2845	4.86	1.52	13.16	17.79	61.93	4.31	10.07
		F-3225	4.36	36.92	67.17	162.01	19.54	38.13	86.25
		F-2847	1.13	3.99	4.79	16.02	1.17	4.26	7.86
		F-2844	1.89	4.06	7.57	18.62	10.56	4.85	8.6
		F-3226	3.83	12.11	9.58	39.87	4.86	11.97	16.13
		F-3227	7.91	26.78	20.8	63.14	6.81	28.66	25.6
redbreast sunfish	*Lepomis auritus*	F-3222	0.28	1.17	1.98	3.63	0.33	1.32	2.51
		F-3223	16.52	1.08	1.99	3.67	0.3	1.65	1.71
		F-3224	0.52	1.47	2.03	4.65	0.41	1.98	2.39
largemouth bass	*Micropterus salmoides*	F-3036	0.66	1.99	2.98	4.01	0.87	3.7	3.67
		F-3038	1.1	4.24	5.35	15.16	1.56	6.02	7.21
		F-3039	0.73	3.8	3.09	10.18	0.71	3.22	3.75
Pompton									
common carp	*Cyprinus carpio*	F-2846	5.6	11.87	21.8	67.43	6.21	17.02	31.06
		F-3040	7.43	25.1	24.01	75.05	8.94	25.08	31.7
		F-3231	5.61	22.44	30.5	74.3	7.83	30.56	29.8
		F-3230	8.74	24.57	27.43	68.33	2.26	24.37	29.53
redbreast sunfish	*Lepomis auritus*	F-3118	0.43	1.07	1.54	3.93	0.28	1.55	1.82
		F-3119	0.92	1.43	2.09	5.41	0.39	2.31	2.34
		F-3120	0.24	1.31	1.61	4.18	0.25	1.97	2.2
largemouth bass	*Micropterus salmoides*	F-3233	0.36	2.04	3.56	11.54	0.86	2.26	6.09
		F-3232	0.56	1.02	1.17	3.72	0.34	2.19	1.73
		F-3037	0.68	1.4	1.68	5.08	0.4	1.89	2.15

Table 3-55
Fish Bioaccumulation Data from Ashley and Horwitz (2000)

Common Name	Scientific Name	Sample ID	Lipid %	PCB Congener ng/g-ww					
				99	83	97	81+87	85	136
Elmwood Park		**DL**		**0.24**	**0.12**	**0.08**	**0.29**	**0.1**	**0.06**
brown bullhead	*Ameiurus nebulosus*	F-3234	2.54	0.66	BDL	0.29	0.62	0.36	BDL
		F-3228	1.8	0.76	BDL	0.4	0.8	0.48	0.07
		F-3229	2.25	5.33	0.73	2.71	4.59	3.66	0.48
common carp	*Cyprinus carpio*	F-2845	4.86	20.02	70.1	1.52	6.52	178.23	7.94
		F-3225	4.36	23.88	7.87	35.45	59.49	25.34	7.25
		F-2847	1.13	4.24	0.46	2.2	3.31	ND	0.63
		F-2844	1.89	7.73	9.64	2.18	3.98	17.5	1.24
		F-3226	3.83	8.48	2.3	5.61	9.17	5.86	1.97
		F-3227	7.91	BDL	2.83	7.66	13.59	9.36	2.86
redbreast sunfish	*Lepomis auritus*	F-3222	0.28	2.17	BDL	0.51	0.84	0.96	BDL
		F-3223	16.52	1.53	BDL	0.45	0.81	0.65	BDL
		F-3224	0.52	2.56	BDL	0.65	1.1	0.95	0.08
largemouth bass	*Micropterus salmoides*	F-3036	0.66	2.85	0.22	1.27	1.98	1.26	0.2
		F-3038	1.1	4.99	0.3	2.14	3.26	2.54	0.35
		F-3039	0.73	2.64	0.38	1.3	1.96	1.38	0.21
Pompton									
common carp	*Cyprinus carpio*	F-2846	5.6	22.67	2.27	10.9	17.04	10.52	2.24
		F-3040	7.43	1.09	5.02	12.38	20.35	13.13	3.22
		F-3231	5.61	17.68	4.1	10.11	17.56	11.84	2.21
		F-3230	8.74	60.14	5.25	10.81	18.14	1.06	3.38
redbreast sunfish	*Lepomis auritus*	F-3118	0.43	1.32	BDL	0.47	0.88	0.71	BDL
		F-3119	0.92	1.9	BDL	0.61	1.01	0.96	0.08
		F-3120	0.24	1.69	BDL	0.55	0.88	0.93	BDL
largemouth bass	*Micropterus salmoides*	F-3233	0.36	3.29	0.3	1.99	3.27	2.12	0.24
		F-3232	0.56	1.27	0.14	0.52	0.87	0.62	0.07
		F-3037	0.68	1.51	BDL	0.58	0.99	0.82	0.06

Table 3-55
Fish Bioaccumulation Data from Ashley and Horwitz (2000)

Common Name	Scientific Name	Sample ID	Lipid %	PCB Congener ng/g-ww					
				77+110	82	151	135+144	107	149
Elmwood Park		**DL**		**0.31**	**0.07**	**0.09**	**0.08**	**0.07**	**0.26**
brown bullhead	*Ameiurus nebulosus*	F-3234	2.54	1.48	0.2	0.18	0.14	0.13	0.56
		F-3228	1.8	2.02	0.34	0.34	0.21	0.16	1
		F-3229	2.25	13.12	2.3	1.89	1.33	1.37	6.21
common carp	*Cyprinus carpio*	F-2845	4.86	2.35	33.55	2.65	7.5	5.32	4.69
		F-3225	4.36	145.08	18.5	18.67	20.46	10.15	68.67
		F-2847	1.13	8.49	0.43	3.14	1.73	0.7	8.62
		F-2844	1.89	9.53	6.68	3.16	3.19	1.61	8.79
		F-3226	3.83	27.1	2.66	6.07	4.21	2.38	20.4
		F-3227	7.91	39.35	6.21	13.12	7.05	3.79	32.23
redbreast sunfish	*Lepomis auritus*	F-3222	0.28	2.33	0.25	0.63	0.31	0.24	1.72
		F-3223	16.52	2.16	0.27	0.41	0.21	0.18	1.32
		F-3224	0.52	2.72	0.48	0.54	0.31	0.3	1.8
largemouth bass	*Micropterus salmoides*	F-3036	0.66	5.67	0.73	1.01	0.71	0.44	3.74
		F-3038	1.1	9.15	0.88	2.78	1.23	0.99	6.79
		F-3039	0.73	5.84	0.87	1.36	0.67	0.57	3.55
Pompton									
common carp	*Cyprinus carpio*	F-2846	5.6	53.57	4.92	5.91	5.35	2.66	23.14
		F-3040	7.43	49.6	5.58	7.39	7.26	5.2	25.73
		F-3231	5.61	49.27	7.71	8.42	6.19	3.42	23.07
		F-3230	8.74	50.43	5.09	7.7	7.04	3.81	25.55
redbreast sunfish	*Lepomis auritus*	F-3118	0.43	1.85	0.18	0.49	0.24	0.17	1.47
		F-3119	0.92	2.21	0.39	0.46	0.31	0.22	1.64
		F-3120	0.24	1.77	BDL	0.31	0.26	0.2	1.38
largemouth bass	*Micropterus salmoides*	F-3233	0.36	9.47	0.73	0.87	1	0.45	4.43
		F-3232	0.56	2.34	0.28	0.43	0.27	0.17	1.5
		F-3037	0.68	2.6	BDL	0.47	ND	0.19	1.91

Table 3-55
Fish Bioaccumulation Data from Ashley and Horwitz (2000)

Common Name	Scientific Name	Sample ID	Lipid %	PCB Congener ng/g-ww					
				118	134	131	146	53+132+?[a]	141
Elmwood Park		**DL**		**0.23**	**0.12**	**0.07**	**0.28**	**1.15**	**0.12**
brown bullhead	*Ameiurus nebulosus*	F-3234	2.54	1.27	BDL	BDL	0.36	1.98	BDL
		F-3228	1.8	1.66	0.16	BDL	0.56	3.37	BDL
		F-3229	2.25	11.46	0.89	0.21	3.36	16.4	0.5
common carp	*Cyprinus carpio*	F-2845	4.86	24.79	24.16	12.26	BDL	7.99	76.08
		F-3225	4.36	93.74	20.84	2.23	25.3	182.01	6.09
		F-2847	1.13	7.98	0.63	ND	3.37	36.23	1.47
		F-2844	1.89	12.01	5.04	3.38	3.15	28.23	18.09
		F-3226	3.83	16.85	11.55	0.74	8.04	60.79	2.34
		F-3227	7.91	28.93	8.19	1.1	12.63	103.87	4.82
redbreast sunfish	*Lepomis auritus*	F-3222	0.28	3.1	BDL	BDL	1.08	9.51	BDL
		F-3223	16.52	1.93	BDL	BDL	0.57	4.82	BDL
		F-3224	0.52	2.91	0.13	BDL	0.83	7.77	BDL
largemouth bass	*Micropterus salmoides*	F-3036	0.66	4.33	0.29	0.09	1.52	12.74	0.26
		F-3038	1.1	8.42	0.3	0.11	3.29	26.57	0.36
		F-3039	0.73	4.69	0.88	0.1	1.62	13.15	0.2
Pompton									
common carp	*Cyprinus carpio*	F-2846	5.6	36.97	2.6	ND	7.93	70.4	1.62
		F-3040	7.43	36.76	19.25	1.47	11.73	79.66	2
		F-3231	5.61	31.43	9.28	1.26	9.58	63.52	2.24
		F-3230	8.74	31.77	1.06	1.33	11.41	76.33	2.05
redbreast sunfish	*Lepomis auritus*	F-3118	0.43	1.86	BDL	BDL	0.6	4.39	BDL
		F-3119	0.92	2.69	0.13	BDL	0.79	6.37	BDL
		F-3120	0.24	2.73	ND	BDL	0.75	6.4	BDL
largemouth bass	*Micropterus salmoides*	F-3233	0.36	6.01	0.44	ND	1.18	9.67	BDL
		F-3232	0.56	1.97	0.14	BDL	0.68	5.39	BDL
		F-3037	0.68	2.3	BDL	BDL	0.75	5.79	BDL

Table 3-55
Fish Bioaccumulation Data from Ashley and Horwitz (2000)

Common Name	Scientific Name	Sample ID	Lipid %	PCB Congener ng/g-ww					
				137+176	163+138	158	129+178	187+182	183
Elmwood Park		**DL**		**0.36**	**0.68**	**0.23**	**0.19**	**0.36**	**0.16**
brown bullhead	*Ameiurus nebulosus*	F-3234	2.54	BDL	2.46	0.41	BDL	0.62	0.31
		F-3228	1.8	BDL	3.65	0.58	0.22	1.19	0.46
		F-3229	2.25	1.23	21.92	3.76	0.98	6.02	2.35
common carp	*Cyprinus carpio*	F-2845	4.86	3.77	1.57	63.09	10.08	8.1	20.58
		F-3225	4.36	12.3	178.65	39.06	7.3	33.72	23.56
		F-2847	1.13	1.32	27.29	3.49	1.81	11.21	6.7
		F-2844	1.89	1.72	21.57	16.36	3.41	13.97	10.81
		F-3226	3.83	3.2	49.24	8.97	3.41	18.65	10.34
		F-3227	7.91	5.34	85.49	12.62	69.07	36.03	20.96
redbreast sunfish	*Lepomis auritus*	F-3222	0.28	BDL	7.88	0.96	0.62	2.34	1.08
		F-3223	16.52	BDL	4.09	0.66	0.22	1.27	0.51
		F-3224	0.52	0.42	6.28	1.01	0.41	1.76	0.82
largemouth bass	*Micropterus salmoides*	F-3036	0.66	0.62	10	1.64	0.56	2.83	1.71
		F-3038	1.1	1	21.13	3.35	1.14	7.45	3.85
		F-3039	0.73	0.57	10.43	1.71	0.46	3.1	1.63
Pompton									
common carp	*Cyprinus carpio*	F-2846	5.6	3.12	74.64	9.54	1.55	12.04	5.27
		F-3040	7.43	5.13	71.54	14.44	2.76	13.23	7.55
		F-3231	5.61	4.1	59.16	9.83	5.33	12.26	5.78
		F-3230	8.74	5.2	65.44	12.14	2.9	15.32	7.12
redbreast sunfish	*Lepomis auritus*	F-3118	0.43	BDL	3.89	0.6	0.23	1.21	0.34
		F-3119	0.92	BDL	5.29	0.82	0.38	1.32	0.55
		F-3120	0.24	BDL	5.33	0.85	0.41	1.17	0.52
largemouth bass	*Micropterus salmoides*	F-3233	0.36	0.59	10.44	1.53	0.74	0.76	0.46
		F-3232	0.56	0.38	4.26	0.66	0.34	1.08	0.5
		F-3037	0.68	BDL	4.72	0.57	0.33	1.5	0.52

Table 3-55
Fish Bioaccumulation Data from Ashley and Horwitz (2000)

Common Name	Scientific Name	Sample ID	Lipid %	PCB Congener ng/g-ww					
				128	185	174	177	202+171	157+200
Elmwood Park		**DL**		**0.17**	**0.08**	**0.09**	**0.12**	**0.12**	**0.09**
brown bullhead	*Ameiurus nebulosus*	F-3234	2.54	0.38	BDL	0.22	0.25	0.12	BDL
		F-3228	1.8	0.62	0.09	0.35	0.38	0.3	0.13
		F-3229	2.25	4.22	0.44	2.22	2.17	1.34	ND
common carp	*Cyprinus carpio*	F-2845	4.86	13.84	3.44	2.34	12.05	9.53	6.12
		F-3225	4.36	34.3	4.02	21.04	16.77	31.3	1.09
		F-2847	1.13	2.88	1.13	4.13	4.2	3.8	1.38
		F-2844	1.89	5.53	1.47	3.86	5.5	4.32	2.25
		F-3226	3.83	8.78	1.8	8.62	6.89	4.65	3.07
		F-3227	7.91	12.65	3.41	15.96	13.5	15.28	5.75
redbreast sunfish	*Lepomis auritus*	F-3222	0.28	1.46	ND	0.45	0.41	0.55	0.32
		F-3223	16.52	0.56	BDL	0.31	0.28	0.3	0.13
		F-3224	0.52	1.06	0.1	0.44	0.51	0.52	0.2
largemouth bass	*Micropterus salmoides*	F-3036	0.66	1.74	0.25	1.1	1	0.78	0.47
		F-3038	1.1	2.55	0.47	1.96	1.84	1.57	1
		F-3039	0.73	1.55	0.24	0.96	0.84	0.82	0.43
Pompton									
common carp	*Cyprinus carpio*	F-2846	5.6	11.57	0.82	4.01	4.34	6.77	ND
		F-3040	7.43	15.78	1.31	5.97	6.04	1.09	4.01
		F-3231	5.61	12.4	0.97	4.44	5.03	3.41	3.36
		F-3230	8.74	11.07	1.32	5.57	5.92	4.28	1.06
redbreast sunfish	*Lepomis auritus*	F-3118	0.43	0.5	BDL	0.29	0.24	0.22	0.1
		F-3119	0.92	0.91	BDL	0.4	0.37	0.38	0.18
		F-3120	0.24	0.5	BDL	0.3	0.29	ND	0.15
largemouth bass	*Micropterus salmoides*	F-3233	0.36	2.17	BDL	0.62	0.32	ND	0.31
		F-3232	0.56	0.75	BDL	0.3	0.3	0.29	0.15
		F-3037	0.68	0.47	0.09	0.35	0.3	ND	0.16

Table 3-55
Fish Bioaccumulation Data from Ashley and Horwitz (2000)

Common Name	Scientific Name	Sample ID	Lipid %	PCB Congener ng/g-ww					
				172+197	180	193	191	199	170+190
Elmwood Park		**DL**		**0.07**	**0.38**	**0.28**	**0.09**	**0.07**	**0.23**
brown bullhead	*Ameiurus nebulosus*	F-3234	2.54	0.19	1.01	BDL	BDL	BDL	0.76
		F-3228	1.8	0.26	1.79	BDL	BDL	BDL	1.31
		F-3229	2.25	1.02	8.91	0.72	0.34	0.08	5.54
common carp	*Cyprinus carpio*	F-2845	4.86	9.74	3.97	45.12	36.23	2.06	0.73
		F-3225	4.36	7.08	74.18	2.61	2.72	1.19	63.77
		F-2847	1.13	2.23	24.01	1.6	0.54	0.31	15.58
		F-2844	1.89	6.71	17.48	22.18	9.98	0.58	11.41
		F-3226	3.83	3.11	34.35	1.8	1.42	0.58	25.18
		F-3227	7.91	6.81	69.69	87.38	2.63	1.07	49.75
redbreast sunfish	*Lepomis auritus*	F-3222	0.28	ND	3.5	ND	0.1	BDL	2.09
		F-3223	16.52	0.31	1.55	ND	BDL	BDL	1.21
		F-3224	0.52	0.31	2.54	ND	BDL	BDL	1.75
largemouth bass	*Micropterus salmoides*	F-3036	0.66	0.62	5.14	0.42	0.15	BDL	3.13
		F-3038	1.1	1.29	12.05	8.94	0.28	BDL	8.78
		F-3039	0.73	0.61	5.34	0.4	0.1	BDL	3.94
Pompton									
common carp	*Cyprinus carpio*	F-2846	5.6	1.69	17.39	ND	0.49	0.27	13.66
		F-3040	7.43	2.33	22.18	2.7	1.13	0.36	18.29
		F-3231	5.61	1.81	14.59	70.95	0.39	0.28	12.04
		F-3230	8.74	2.04	20.94	2.34	0.93	0.38	16.51
redbreast sunfish	*Lepomis auritus*	F-3118	0.43	0.21	1.15	BDL	BDL	BDL	0.85
		F-3119	0.92	0.24	1.75	ND	BDL	BDL	1.15
		F-3120	0.24	0.2	1.8	ND	BDL	BDL	1.3
largemouth bass	*Micropterus salmoides*	F-3233	0.36	0.13	1.48	1.2	BDL	ND	1.4
		F-3232	0.56	0.28	1.63	BDL	BDL	BDL	1.09
		F-3037	0.68	0.24	1.7	0.3	BDL	ND	1.17

Table 3-55
Fish Bioaccumulation Data from Ashley and Horwitz (2000)

Common Name	Scientific Name	Sample ID	Lipid %	PCB Congener ng/g-ww					
				198	201	203+196	189	208+195	207
Elmwood Park		**DL**		**0.08**	**0.17**	**0.23**	**0.11**	**0.14**	**0.09**
brown bullhead	*Ameiurus nebulosus*	F-3234	2.54	BDL	0.42	0.51	BDL	0.39	BDL
		F-3228	1.8	BDL	0.74	0.88	BDL	0.56	BDL
		F-3229	2.25	0.17	3.25	3.78	0.26	2.33	0.14
common carp	*Cyprinus carpio*	F-2845	4.86	32.12	0.81	15.13	18.64	0.35	10.88
		F-3225	4.36	1.34	25.4	32.3	2.94	17.68	0.77
		F-2847	1.13	0.42	7.96	10.6	0.39	6.12	0.3
		F-2844	1.89	7.19	5.88	10.79	4.57	3.9	2.7
		F-3226	3.83	0.71	12.83	16.28	0.92	9.26	0.52
		F-3227	7.91	1.52	28.08	35.31	1.79	22.45	1.08
redbreast sunfish	*Lepomis auritus*	F-3222	0.28	ND	1.11	1.32	0.14	0.8	BDL
		F-3223	16.52	BDL	0.53	0.63	BDL	0.39	BDL
		F-3224	0.52	BDL	0.83	1.02	BDL	0.63	BDL
largemouth bass	*Micropterus salmoides*	F-3036	0.66	0.09	1.91	2.43	0.14	1.51	0.14
		F-3038	1.1	0.16	4.22	5.38	0.2	3.17	0.23
		F-3039	0.73	BDL	1.93	2.41	BDL	1.43	BDL
Pompton									
common carp	*Cyprinus carpio*	F-2846	5.6	0.28	6.65	8.02	0.53	4.82	0.31
		F-3040	7.43	0.52	8.75	10.3	1.48	5.8	0.37
		F-3231	5.61	0.31	6.01	7.21	0.57	4.13	0.27
		F-3230	8.74	0.48	8.92	10.89	1.06	5.87	0.38
redbreast sunfish	*Lepomis auritus*	F-3118	0.43	BDL	0.51	0.47	BDL	0.22	BDL
		F-3119	0.92	BDL	0.63	0.75	BDL	0.38	BDL
		F-3120	0.24	BDL	0.62	0.74	BDL	0.4	BDL
largemouth bass	*Micropterus salmoides*	F-3233	0.36	ND	0.29	0.42	BDL	0.24	ND
		F-3232	0.56	BDL	0.62	0.76	BDL	0.4	BDL
		F-3037	0.68	BDL	0.55	0.67	ND	ND	BDL

Table 3-55
Fish Bioaccumulation Data from Ashley and Horwitz (2000)

Common Name	Scientific Name	Sample ID	Lipid %	PCB Congener ng/g-ww				
				194	205	206	209	Total
Elmwood Park		**DL**		**0.27**	**0.12**	**0.18**	**0.08**	
brown bullhead	*Ameiurus nebulosus*	F-3234	2.54	BDL	ND	0.3	BDL	26.01
		F-3228	1.8	0.35	BDL	0.44	BDL	42.88
		F-3229	2.25	1.69	BDL	1.61	0.2	260.18
common carp	*Cyprinus carpio*	F-2845	4.86	0.28	8.44	0.31	5.99	1098.56
		F-3225	4.36	14.57	0.9	9.95	0.57	2237.64
		F-2847	1.13	4.86	0.29	3.75	0.54	309.44
		F-2844	1.89	3.42	2.19	2.54	1.82	481.51
		F-3226	3.83	7.62	0.61	7.03	0.92	666.52
		F-3227	7.91	16.14	1.48	14.25	2.02	1331.28
redbreast sunfish	*Lepomis auritus*	F-3222	0.28	0.5	BDL	0.54	0.13	65.25
		F-3223	16.52	BDL	ND	0.22	BDL	50.15
		F-3224	0.52	0.41	BDL	0.39	0.18	66.28
largemouth bass	*Micropterus salmoides*	F-3036	0.66	1	BDL	1.18	0.16	119.2
		F-3038	1.1	2.31	0.15	2.27	0.28	248.74
		F-3039	0.73	1	BDL	1.12	0.16	149.11
Pompton								
common carp	*Cyprinus carpio*	F-2846	5.6	3.17	0.25	4.08	0.63	774.54
		F-3040	7.43	3.86	0.32	4.71	0.57	946.12
		F-3231	5.61	2.59	0.23	3.35	0.61	969.25
		F-3230	8.74	4	0.31	4.98	0.34	957.26
redbreast sunfish	*Lepomis auritus*	F-3118	0.43	BDL	BDL	0.22	BDL	45.79
		F-3119	0.92	BDL	ND	0.28	0.11	63.32
		F-3120	0.24	0.31	ND	0.35	0.14	52.86
largemouth bass	*Micropterus salmoides*	F-3233	0.36	BDL	ND	BDL	BDL	108.6
		F-3232	0.56	BDL	BDL	0.33	BDL	51.11
		F-3037	0.68	BDL	ND	0.29	BDL	53.16

Table 3-55
Fish Bioaccumulation Data from Ashley and Horwitz (2000)

Common Name	Scientific Name	Sample ID	Lipid %	Organochlorine Pesticides ng/g-ww					
				alpha BHC	beta BHC	Lindane	delta BHC	Aldrin	Dieldrin
Elmwood Park		**DL**		**0.26**	**2.16**	**0.23**	**0.6**	**1.58**	**0.14**
brown bullhead	*Ameiurus nebulosus*	F-3234	2.54	BDL	BDL	BDL	BDL	BDL	0.97
		F-3228	1.8	0.34	2.89	0.58	BDL	BDL	2.29
		F-3229	2.25	BDL	BDL	0.49	BDL	BDL	9.73
common carp	*Cyprinus carpio*	F-2845	4.86	0.65	7.23	0.98	BDL	1.59	20.78
		F-3225	4.36	2.56	20.52	1.25	BDL	BDL	15.04
		F-2847	1.13	2.17	16.15	0.64	2.34	5.51	5.3
		F-2844	1.89	BDL	2.33	0.46	0.74	BDL	4.4
		F-3226	3.83	1.89	24.37	1.38	BDL	BDL	13.65
		F-3227	7.91	4.5	66.21	2.01	BDL	BDL	22.74
redbreast sunfish	*Lepomis auritus*	F-3222	0.28	BDL	3.12	0.44	BDL	BDL	1.95
		F-3223	16.52	BDL	ND	BDL	BDL	BDL	1.41
		F-3224	0.52	0.32	6.26	BDL	BDL	BDL	1.8
largemouth bass	*Micropterus salmoides*	F-3036	0.66	0.45	3.48	0.37	BDL	BDL	3.27
		F-3038	1.1	0.95	7.71	0.59	BDL	BDL	6.35
		F-3039	0.73	0.36	5.47	0.71	BDL	BDL	3.24
Pompton									
common carp	*Cyprinus carpio*	F-2846	5.6	5.46	38.86	1.55	1.65	5.11	17.12
		F-3040	7.43	BDL	2.77	1.7	BDL	BDL	19.27
		F-3231	5.61	4.41	51.44	2.72	BDL	BDL	32.55
		F-3230	8.74	2.02	41.98	1.52	BDL	BDL	23.07
redbreast sunfish	*Lepomis auritus*	F-3118	0.43	BDL	BDL	0.3	BDL	BDL	1.16
		F-3119	0.92	0.42	2.22	0.34	BDL	BDL	2.78
		F-3120	0.24	0.34	BDL	BDL	BDL	BDL	0.84
largemouth bass	*Micropterus salmoides*	F-3233	0.36	0.29	BDL	0.4	BDL	BDL	1.22
		F-3232	0.56	0.45	7.22	0.47	BDL	BDL	2.85
		F-3037	0.68	BDL	BDL	0.55	BDL	BDL	1.73

Table 3-55
Fish Bioaccumulation Data from Ashley and Horwitz (2000)

Common Name	Scientific Name	Sample ID	Lipid %	Organochlorine Pesticides ng/g-ww					
				gamma - Chlordane	alpha - Chlordane	Total Chlordanes	Endo-sulfan	Endo-sulfan I	o,p'-DDD
Elmwood Park		**DL**		**0.25**	**0.28**		**0.19**	**0.23**	**0.16**
brown bullhead	*Ameiurus nebulosus*	F-3234	2.54	1.43	2.39	3.83	0.57	0.25	0.21
		F-3228	1.8	1.44	1.47	2.91	1.1	0.83	BDL
		F-3229	2.25	14.5	24.42	38.93	3.68	3.28	1.07
common carp	*Cyprinus carpio*	F-2845	4.86	42.93	84.49	127.42	4.32	3.08	10.53
		F-3225	4.36	18.18	23.33	41.52	9.33	1.81	9.52
		F-2847	1.13	8.8	19.27	28.07	1.27	0.69	3.02
		F-2844	1.89	7.14	11.86	19	0.91	0.52	1.58
		F-3226	3.83	14.01	21.95	35.96	4.32	2.29	5.71
		F-3227	7.91	23.38	41.48	64.86	12.01	2.46	8.19
redbreast sunfish	*Lepomis auritus*	F-3222	0.28	0.47	1.6	2.08	0.62	0.66	0.5
		F-3223	16.52	0.27	1.6	1.87	0.58	0.6	0.25
		F-3224	0.52	0.56	1.76	2.32	0.81	0.92	ND
largemouth bass	*Micropterus salmoides*	F-3036	0.66	2.39	5.4	7.8	1.48	0.84	1.42
		F-3038	1.1	3.7	11.41	15.11	2.63	1.31	3.44
		F-3039	0.73	1.16	2.06	3.22	1.24	0.72	0.69
Pompton									
common carp	*Cyprinus carpio*	F-2846	5.6	30.72	54.7	85.42	15.17	1.59	19.31
		F-3040	7.43	20.33	25.94	46.27	9.99	2.12	7.28
		F-3231	5.61	33.6	41.72	75.32	25.6	3.35	13.55
		F-3230	8.74	13.69	17.37	31.06	17.93	2	6.4
redbreast sunfish	*Lepomis auritus*	F-3118	0.43	0.35	1.41	1.76	2.35	0.47	0.48
		F-3119	0.92	0.86	5.03	5.89	7.74	1.19	0.96
		F-3120	0.24	0.29	1.42	1.71	2.37	0.41	1.24
largemouth bass	*Micropterus salmoides*	F-3233	0.36	0.74	1.61	2.35	2.48	BDL	0.88
		F-3232	0.56	1.59	3.61	5.2	3.31	0.67	1.52
		F-3037	0.68	1.23	3.62	4.85	3.24	0.3	1.41

Table 3-55
Fish Bioaccumulation Data from Ashley and Horwitz (2000)

Common Name	Scientific Name	Sample ID	Lipid %	Organochlorine Pesticides ng/g-ww					
				p,p'-DDD	o,p'-DDT	p,p'-DDT	o,p'-DDE	p,p'-DDE	Endrin
Elmwood Park		**DL**		**0.49**	**0.27**	**0.6**	**0.28**	**1.11**	**0.23**
brown bullhead	*Ameiurus nebulosus*	F-3234	2.54	1.14	1.73	BDL	0.41	1.9	BDL
		F-3228	1.8	3.78	2.67	1.27	1.22	4.28	BDL
		F-3229	2.25	14.02	20.01	1.57	5.8	28.02	ND
common carp	*Cyprinus carpio*	F-2845	4.86	57.33	100.5	3.18	18.8	9.14	1.29
		F-3225	4.36	36.15	23.66	1.63	42.41	107.43	0.29
		F-2847	1.13	16.23	14.37	BDL	6.64	52.08	BDL
		F-2844	1.89	15.14	18.02	0.84	4.71	33.97	0.33
		F-3226	3.83	26.88	20.6	1.96	14.97	92.56	0.32
		F-3227	7.91	38.28	53.38	ND	30.49	229.34	0.25
redbreast sunfish	*Lepomis auritus*	F-3222	0.28	2.28	7.61	1.94	ND	7.26	BDL
		F-3223	16.52	2.09	3.98	BDL	0.42	5.19	0.27
		F-3224	0.52	2.54	8.65	0.82	0.6	8.08	ND
largemouth bass	*Micropterus salmoides*	F-3036	0.66	4.85	6.04	1.14	1.59	9.73	BDL
		F-3038	1.1	10.19	14.86	1.48	1.43	21.6	BDL
		F-3039	0.73	4.09	3.86	BDL	2.65	11.2	0.63
Pompton									
common carp	*Cyprinus carpio*	F-2846	5.6	68.13	36.55	BDL	52.59	500.71	0.28
		F-3040	7.43	40.42	27.82	0.64	24.13	175.22	BDL
		F-3231	5.61	54.47	41.38	3.47	30.37	176.21	0.43
		F-3230	8.74	24.8	20.8	2.48	31.41	16.03	BDL
redbreast sunfish	*Lepomis auritus*	F-3118	0.43	2.33	3.81	0.71	BDL	4.54	0.61
		F-3119	0.92	3.95	8.03	1.93	0.33	10.03	BDL
		F-3120	0.24	1.37	3.79	BDL	BDL	9.29	ND
largemouth bass	*Micropterus salmoides*	F-3233	0.36	1.81	3.29	1.17	4.01	3.94	BDL
		F-3232	0.56	4.43	5.42	2.18	0.87	9.27	BDL
		F-3037	0.68	3.29	4.72	0.87	BDL	7.84	ND

Table 3-55
Fish Bioaccumulation Data from Ashley and Horwitz (2000)

Common Name	Scientific Name	Sample ID	Lipid %	Organochlorine Pesticides ng/g-ww				
				Heptachlor-epoxide	Hepta-chlor	trans-Nonachlor	cis-Nonachlor	oxy-Chlordane
Elmwood Park		**DL**		**0.11**	**0.08**	**0.54**	**1**	**0.3**
brown bullhead	*Ameiurus nebulosus*	F-3234	2.54	0.48	BDL	2.25	BDL	3.4
		F-3228	1.8	0.71	BDL	4.19	2.41	3.34
		F-3229	2.25	3.38	0.47	34.1	8.82	32.29
common carp	*Cyprinus carpio*	F-2845	4.86	6.45	2.71	16.87	2.04	107.67
		F-3225	4.36	6.15	1.53	63.35	97.64	14.92
		F-2847	1.13	2.18	0.39	12.26	2.85	6.07
		F-2844	1.89	2.07	0.88	14.51	3.25	18.13
		F-3226	3.83	5.05	2.14	57.27	47.7	12.73
		F-3227	7.91	8.33	2.91	140.73	87.82	46.52
redbreast sunfish	*Lepomis auritus*	F-3222	0.28	1.05	ND	9.14	1.64	11.65
		F-3223	16.52	0.53	0.08	6.49	1.22	14.17
		F-3224	0.52	0.68	0.12	16.03	2.24	13.37
largemouth bass	*Micropterus salmoides*	F-3036	0.66	1.31	0.24	8.09	2.8	6.56
		F-3038	1.1	2.13	0.46	16.7	4.23	17.09
		F-3039	0.73	1.22	0.79	13.5	11.79	5.29
Pompton								
common carp	*Cyprinus carpio*	F-2846	5.6	7.46	4.01	48.28	17.94	20.97
		F-3040	7.43	6.65	3.23	79.26	83.27	25.45
		F-3231	5.61	10.83	3.37	86.84	65.79	29.63
		F-3230	8.74	7.29	3.71	89.85	107.61	11.39
redbreast sunfish	*Lepomis auritus*	F-3118	0.43	0.7	0.09	3.72	1.15	7.74
		F-3119	0.92	1.76	0.14	8.19	1.38	11.79
		F-3120	0.24	0.34	ND	1.39	1.41	4.65
largemouth bass	*Micropterus salmoides*	F-3233	0.36	0.48	ND	2.46	3.17	2.93
		F-3232	0.56	0.96	0.09	4.81	2.68	4.26
		F-3037	0.68	0.74	0.12	1.4	1.55	6.2

Notes:
a. Final congener in the column is not visible/readable on source document.
BDL = below detection limit
DL = detection limit
ND = not detected
PCBs = polychlorinated biphenyls
ww = wet weight

Table 3-56

Biota Tissue Sampling by NYSDEC as part of the Contamination Assessment and Reduction Project (CARP) of the NY/NJ Harbor Estuary Program (NY/NJ HEP, 2004a)

Sampling Season/Year	Organisms Sampled	Sampling Collections	
		Newark Bay	Passaic River
Spring 1999	Zooplankton	5	5
	Shrimp/Amphipods	5	4
	Striped bass	1	0
Summer 1999	Bivalves	6	6
	American eel	2	12
	Blue crab	15	15
	Mummichog	3	1
	Striped bass	5	10
	White perch	2	10
Fall 1999	Bivalves	6	6
	Mummichog	1	1
	Striped bass	10	0
	White perch	10	10
Winter 1999-2000	Bivalves	6	6
	Mummichog	1	1
	White perch	10	10
Spring 2000	Zooplankton	5	5
	Bivalves	6	6
	Shrimp/Amphipods	6	1
	Mummichog	1	1
	Striped bass	1	0
	White perch	10	10

Table 3-57
Fish PCDD/F Bioaccumulation Data from NYSDEC (1997a)

	American Eel		White Perch	Winter Flounder	
	NYSDEC Sample Number				
Analytes (pg/g-ww)	**1216**	**1219**	**1685**	**0363**	**0378**
2,3,7,8-TCDD	12.7	9.9	1.8	2.2	1.1
1,2,3,7,8-PeCDD	3.3	1.9	0.43[a]	0.15 (0.3)	0.1 (0.2)
1,2,3,4,7,8-HxCDD	0.3 (0.6)[b]	0.25 (0.5)	0.15 (0.3)	0.15 (0.3)	0.1 (0.2)
1,2,3,6,7,8-HxCDD	2.4	1[a]	0.52[c]	0.15 (0.3)	0.1 (0.2)
1,2,3,7,8,9-HxCDD	0.25 (0.5)	0.25 (0.5)	0.15 (0.3)	0.15 (0.3)	0.1 (0.2)
1,2,3,4,6,7,8-HpCDD	1.1	0.59	0.42[c]	0.61	0.24
1,2,3,4,6,7,8,9-OCDD	0[a,c]	0[a]	0[a]	0[a]	0[a]
Other PCDD	0[d]	0[d]	0[d]	0.05	0[d]
Total PCDD[e]	20.05	13.89	3.47	3.41	1.74
2,3,7,8-TCDF	0.2 (0.4)	0.68[a]	7.4[a]	6.7	3.1[a]
1,2,3,7,8-PeCDF	0.15 (0.3)	0.1 (0.2)	0.41	0.1 (0.2)	0.05 (0.1)
2,3,4,7,8-PeCDF	3.6	2.1	1.4	0.1 (0.2)	0.20[c]
1,2,3,4,7,8-HxCDF	1.1	0.41[c]	0.05 (0.1)	0.1 (0.2)	0.05 (0.1)
1,2,3,6,7,8-HxCDF	0.56	0.1(0.2)	0.05 (0.1)	0.05 (0.1)	0.045 (0.09)
2,3,4,6,7,8-HxCDF	0.65[a]	0.29[a]	0.07[a,c]	0.07[a,c]	0.05[a]
1,2,3,7,8,9-HxCDF	0.15 (0.3)	0.15 (0.3)	0.1 (0.2)	0.1 (0.2)	0.05 (0.1)
1,2,3,4,6,7,8-HpCDF	0.49	0.23[c]	0.1 (0.2)	0.32	0.08
1,2,3,4,7,8,9-HpCDF	0.2 (0.4)	0.15 (0.3)	0.15 (0.3)	0.15 (0.3)	0.1 (0.2)
1,2,3,4,6,7,8,9-OCDF	0.3 (0.6)	0.25 (0.5)	0.2 (0.4)	0.5	0.1 (0.2)
Other PCDF	0[d]	0.4	2.67	0[d]	0.36
Total PCDF[f]	7.4	4.46	9.93	8.19	3.74
2,3,7,8-TCDD TEQ[g]	16.74	12.23	3.59	3.09	1.62
% 2,3,7,8-TCDD	75.9	80.9	50.1	71.2	67.9
% 2,3,7,8-TCDF	1.2	0.6	20.6	21.7	19.1
% 1,2,3,7,8-PeCDD	9.9	7.8	6	2.4	3.1
% 2,3,4,7,8-PeCDF	10.8	8.6	19.5	1.6	6.2
Lipid (%)	22.2	15.3	3.4	1.2	0.6

Notes:
a. Blank contamination subtraction included in this value. Blank value is the reported blank concentration.
b. One-half the detection limit followed by the (detection limit).
c. Estimated maximum possible concentration values (EMPC). EMPCs did not meet identification criteria for positive identification of the compound due to interference by another compound. However, the analyst is confident that the compound is present.
d. Other non-2,3,7,8-chloro substituted dioxins or furans were not found above detection limits.
e. Total PCDD with 2,3,7,8-chlorine substitution.
f. Total PCDF with 2,3,7,8-chlorine substitution.
g. 2,3,7,8-TCDD equivalents using toxic equivalency factors of Barnes and Bellin (1989), calculated with one-half the detection limit and full EMPC values.

HpCDD = heptachlorodibenzo-*p*-dioxin
HpCDF = heptachlorodibenzofuran
HxCDD = hexachlorodibenzo-*p*-dioxin
HxCDF = hexachlorodibenzofuran
NYSDEC = New York State Department of Environmental Conservation
OCDD = octachlorodibenzo-*p*-dioxin
OCDF = octachlorodibenzofuran
PCDD = polychlorinated dibenzo-*p*-dioxin
PCDF = polychlorinated dibenzofurans
PeCDD = pentachlorodibenzo-*p*-dioxin
PeCDF = pentachlorodibenzofuran
TCDD = 2,3,7,8 tetrachlorodibenzo-*p*-dioxin
TCDF = 2,3,7,8 tetrachlorodibenzofuran
TEQ = toxic equivalency factor
ww = wet weight

Table 3-58
Sample Count Summary for 1995-2001 Passaic River RI-ESP Sampling Programs (Tierra 1995a, 1999d, 2000c, 2001a)

Sampling Event	Tissue Type	PAHs (SVOCs)	NOAA NS&T Program Expanded PAH List (PAH-SIM)	Comprehensive Alkylated PAH List (PAH-SIM)	Other SVOCs	PCBs-Aroclors	PCBs-Congeners	PCBs-Homologue Groups	Pesticides	Herbicides	PCDD/Fs	PCDD/F Homologue Groups	Inorganic Chemicals	Mercury	Organotins	Cyanide	TPH	Percent Lipids
1995 Biological Sampling Program	Blue crab	6	6		6	6	6		6		6	6	6	6	5	5	3	6
	Mummichog	5	5		5	5	5		5		5	5	5	5	5	5	4	5
	Other fish	2	2		2	2	2		2		2	2	2	2	2	2	2	2
1999 Late Summer/Early Fall RI-ESP Sampling Program	Blue crab	48	48	48	48	48	48	48	48	48	48	48	48	48	48			48
	Caged bivalve	18	17	17	18	18	18	18	18	18	18	18	18	18	17			18
	Mummichog	52	52	52	52	52	53	53	52	52	54	54	52	52	52			54
	Other fish	44	44	44	44	44	44	44	44	44	44	44	44	44	44			44
2000 Spring RI-ESP Sampling Program	Blue crab	7	7	7	7	7	7	7	7	7	7	7	7	7	7			7
	Mummichog	7	6	6	7	7	7	7	7	7	7	7	7	7	6			7
	Other fish	26	26	26	26	27	27	27	27	27	27	27	27	27	26			27
2001 RI-ESP Supplemental Biota Sampling Program	Other fish	12	9	9	12	12	12	12	12	12	12	12	12	12	9			12

Notes:
NOAA = National Oceanic and Atmospheric Administration
NS&T = National Status and Trends Program
PAHs = polynuclear aromatic hydrocarbons
PCDD/Fs = polychlorinated dibenzo-*p*-dioxins and dibenzofurans
ESP = Ecological Sampling Plan
RI = Remedial Investigation
SVOCs = semivolatile organic compounds

Table 3-59
Bioaccumulation Data from 1995-2001 Passaic RI Sampling Programs Including Tierra (1995a, 1999d, 2000c, 2001a)

Species	Tissue Type	Analyte Class[a]	Compound	Count	Range of Values	Units
Fish						
American Eel	Fillet - skin on	PCDD/Fs	2,3,7,8-TCDD	7	0.0146 - 0.0322	µg/kg
American Eel	Fillet - skin on	PCDD/Fs	2,3,7,8-TCDF	7	0.0000561 - 0.000171	µg/kg
American Eel	Fillet - skin on	Herbicides	2,4,5-T	7	1000 - 1000	µg/kg
American Eel	Fillet - skin on	Herbicides	2,4,5-TP (Silvex)	7	6.8 - 1000	µg/kg
American Eel	Fillet - skin on	Herbicides	2,4-D	7	2400 - 2400	µg/kg
American Eel	Fillet - skin on	Herbicides	2,4-DB	7	87 - 1800	µg/kg
American Eel	Fillet - skin on	Homologue Groups	Total PCBs - Homologue Groups	7	1660 - 5560	µg/kg
American Eel	Fillet - skin on	Inorganic Chemicals	Ag	7	140 - 140	µg/kg
American Eel	Fillet - skin on	Inorganic Chemicals	Al	7	5900 - 20500	µg/kg
American Eel	Fillet - skin on	Inorganic Chemicals	As	7	370 - 380	µg/kg
American Eel	Fillet - skin on	Inorganic Chemicals	Ba	7	34 - 150	µg/kg
American Eel	Fillet - skin on	Inorganic Chemicals	Be	7	19 - 39	µg/kg
American Eel	Fillet - skin on	Inorganic Chemicals	Ca	7	686000 - 1080000	µg/kg
American Eel	Fillet - skin on	Inorganic Chemicals	Cd	7	54 - 55	µg/kg
American Eel	Fillet - skin on	Inorganic Chemicals	Co	7	180 - 180	µg/kg
American Eel	Fillet - skin on	Inorganic Chemicals	Cr	7	150 - 480	µg/kg
American Eel	Fillet - skin on	Inorganic Chemicals	Cu	7	790 - 2000	µg/kg
American Eel	Fillet - skin on	Inorganic Chemicals	Fe	7	7600 - 10500	µg/kg
American Eel	Fillet - skin on	Inorganic Chemicals	Hg	7	240 - 560	µg/kg
American Eel	Fillet - skin on	Inorganic Chemicals	K	7	2920000 - 4080000	µg/kg
American Eel	Fillet - skin on	Inorganic Chemicals	Mg	7	177000 - 311000	µg/kg
American Eel	Fillet - skin on	Inorganic Chemicals	Mn	7	290 - 740	µg/kg
American Eel	Fillet - skin on	Inorganic Chemicals	Na	7	701000 - 976000	µg/kg
American Eel	Fillet - skin on	Inorganic Chemicals	Ni	7	200 - 780	µg/kg
American Eel	Fillet - skin on	Inorganic Chemicals	Pb	7	800 - 820	µg/kg
American Eel	Fillet - skin on	Inorganic Chemicals	Sb	7	640 - 960	µg/kg
American Eel	Fillet - skin on	Inorganic Chemicals	Se	7	710 - 1400	µg/kg
American Eel	Fillet - skin on	Inorganic Chemicals	Tl	7	830 - 850	µg/kg
American Eel	Fillet - skin on	Inorganic Chemicals	V	7	190 - 190	µg/kg
American Eel	Fillet - skin on	Inorganic Chemicals	Zn	7	20800 - 33900	µg/kg
American Eel	Fillet - skin on	Organotin	Dibutyltin	7	0.791 - 2	µg/kg
American Eel	Fillet - skin on	Organotin	Monobutyltir	7	0.269 - 2	µg/kg
American Eel	Fillet - skin on	Organotin	Tetrabutyltin	7	4 - 4	µg/kg
American Eel	Fillet - skin on	Organotin	Tributyltin	7	1.91 - 3.96	µg/kg
American Eel	Fillet - skin on	PAH-SIM	Total PAHs	7	29.8 - 109	µg/kg
American Eel	Fillet - skin on	PCB Congeners	Total PCBs - Congeners (NOAA 1989)	7	1950 - 8360	µg/kg
American Eel	Fillet - skin on	PCB/PEST	4,4'-DDD	7	44 - 700	µg/kg
American Eel	Fillet - skin on	PCB/PEST	4,4'-DDE	7	120 - 530	µg/kg
American Eel	Fillet - skin on	PCB/PEST	4,4'-DDT	7	50 - 100	µg/kg
American Eel	Fillet - skin on	PCB/PEST	Aldrin	7	25 - 50	µg/kg
American Eel	Fillet - skin on	PCB/PEST	alpha-BHC	7	8.5 - 17	µg/kg
American Eel	Fillet - skin on	PCB/PEST	alpha-Chlordane	7	15 - 110	µg/kg
American Eel	Fillet - skin on	PCB/PEST	beta-BHC	7	35 - 70	µg/kg
American Eel	Fillet - skin on	PCB/PEST	delta-BHC	7	25 - 50	µg/kg
American Eel	Fillet - skin on	PCB/PEST	Dieldrin	7	17 - 84	µg/kg
American Eel	Fillet - skin on	PCB/PEST	Endosulfan I	7	25 - 50	µg/kg
American Eel	Fillet - skin on	PCB/PEST	Endosulfan II	7	35 - 70	µg/kg
American Eel	Fillet - skin on	PCB/PEST	Endosulfan sulfate	7	17 - 33	µg/kg
American Eel	Fillet - skin on	PCB/PEST	Endrin	7	25 - 61	µg/kg
American Eel	Fillet - skin on	PCB/PEST	Endrin aldehyde	7	25 - 50	µg/kg
American Eel	Fillet - skin on	PCB/PEST	Endrin ketone	7	25 - 50	µg/kg
American Eel	Fillet - skin on	PCB/PEST	gamma-BHC (Lindane)	7	25 - 50	µg/kg
American Eel	Fillet - skin on	PCB/PEST	gamma-Chlordane	7	25 - 50	µg/kg
American Eel	Fillet - skin on	PCB/PEST	Heptachlor	7	35 - 70	µg/kg
American Eel	Fillet - skin on	PCB/PEST	Heptachlor epoxide	7	25 - 73	µg/kg
American Eel	Fillet - skin on	PCB/PEST	Methoxychlor	7	85 - 170	µg/kg
American Eel	Fillet - skin on	PCB/PEST	Total DDT	7	120 - 1030	µg/kg
American Eel	Fillet - skin on	PCB/PEST	Total PCBs - Aroclors	7	670 - 2780	µg/kg
American Eel	Fillet - skin on	PCB/PEST	Toxaphene	6	850 - 1700	µg/kg
American Eel	Fillet - skin on	Physical Property	Percent Lipid	7	4.959 - 13.74	%
American Eel	Fillet - skin on	Physical Property	Percent Moisture	7	62.9 - 76.7	% by wt.
American Eel	Fillet - skin on	Semivolatiles	1,2,4-Trichlorobenzene	7	32 - 140	µg/kg
American Eel	Fillet - skin on	Semivolatiles	1,2-Dichlorobenzene	7	110 - 210	µg/kg
American Eel	Fillet - skin on	Semivolatiles	1,3-Dichlorobenzene	7	110 - 210	µg/kg
American Eel	Fillet - skin on	Semivolatiles	1,4-Dichlorobenzene	7	45 - 490	µg/kg
American Eel	Fillet - skin on	Semivolatiles	2,4,5-Trichlorophenol	7	280 - 560	µg/kg
American Eel	Fillet - skin on	Semivolatiles	2,4,6-Trichlorophenol	7	250 - 490	µg/kg
American Eel	Fillet - skin on	Semivolatiles	2,4-Dichloropheno	7	110 - 210	µg/kg
American Eel	Fillet - skin on	Semivolatiles	2,4-Dimethylpheno	7	110 - 5200	µg/kg
American Eel	Fillet - skin on	Semivolatiles	2,4-Dinitropheno	7	1500 - 3000	µg/kg
American Eel	Fillet - skin on	Semivolatiles	2,4-Dinitrotoluene	7	250 - 490	µg/kg
American Eel	Fillet - skin on	Semivolatiles	2,6-Dinitrotoluene	7	110 - 210	µg/kg
American Eel	Fillet - skin on	Semivolatiles	2-Chloronaphthalene	7	110 - 210	µg/kg
American Eel	Fillet - skin on	Semivolatiles	2-Chloropheno	7	110 - 210	µg/kg

Table 3-59
Bioaccumulation Data from 1995-2001 Passaic RI Sampling Programs Including Tierra (1995a, 1999d, 2000c, 2001a)

Species	Tissue Type	Analyte Class[a]	Compound	Count	Range of Values	Units
American Eel	Fillet - skin on	Semivolatiles	2-Methylnaphthalene	7	110 - 250	µg/kg
American Eel	Fillet - skin on	Semivolatiles	2-Methylpheno	7	250 - 490	µg/kg
American Eel	Fillet - skin on	Semivolatiles	2-Nitroaniline	7	280 - 560	µg/kg
American Eel	Fillet - skin on	Semivolatiles	2-Nitrophenol	7	110 - 210	µg/kg
American Eel	Fillet - skin on	Semivolatiles	3,3'-Dichlorobenzidine	7	250 - 490	µg/kg
American Eel	Fillet - skin on	Semivolatiles	3-Nitroaniline	7	500 - 1000	µg/kg
American Eel	Fillet - skin on	Semivolatiles	4,6-Dinitro-2-methylpheno	7	1500 - 3000	µg/kg
American Eel	Fillet - skin on	Semivolatiles	4-Bromophenyl phenyl ether	7	110 - 210	µg/kg
American Eel	Fillet - skin on	Semivolatiles	4-Chloro-3-methylpheno	7	110 - 210	µg/kg
American Eel	Fillet - skin on	Semivolatiles	4-Chloroaniline	7	110 - 210	µg/kg
American Eel	Fillet - skin on	Semivolatiles	4-Chlorophenyl phenyl ethe	7	110 - 210	µg/kg
American Eel	Fillet - skin on	Semivolatiles	4-Methylpheno	7	4800 - 97000	µg/kg
American Eel	Fillet - skin on	Semivolatiles	4-Nitroaniline	7	280 - 560	µg/kg
American Eel	Fillet - skin on	Semivolatiles	4-Nitrophenol	7	1500 - 3000	µg/kg
American Eel	Fillet - skin on	Semivolatiles	Acenaphthene	7	20 - 210	µg/kg
American Eel	Fillet - skin on	Semivolatiles	Acenaphthylene	7	34 - 210	µg/kg
American Eel	Fillet - skin on	Semivolatiles	Anthracene	7	110 - 210	µg/kg
American Eel	Fillet - skin on	Semivolatiles	Benzo(a)anthracene	7	110 - 210	µg/kg
American Eel	Fillet - skin on	Semivolatiles	Benzo(a)pyrene	7	250 - 490	µg/kg
American Eel	Fillet - skin on	Semivolatiles	Benzo(b)fluoranthene	7	110 - 210	µg/kg
American Eel	Fillet - skin on	Semivolatiles	Benzo(g,h,i)perylene	7	120 - 490	µg/kg
American Eel	Fillet - skin on	Semivolatiles	Benzo(k)fluoranthene	7	110 - 210	µg/kg
American Eel	Fillet - skin on	Semivolatiles	bis(2-Chloroethoxy)methane	7	110 - 210	µg/kg
American Eel	Fillet - skin on	Semivolatiles	bis(2-Chloroethyl)ether	7	110 - 210	µg/kg
American Eel	Fillet - skin on	Semivolatiles	bis(2-Chloroisopropyl)ether	7	2500 - 5000	µg/kg
American Eel	Fillet - skin on	Semivolatiles	bis(2-Ethylhexyl)phthalate	7	3000 - 6000	µg/kg
American Eel	Fillet - skin on	Semivolatiles	Butyl benzyl phthalate	7	110 - 210	µg/kg
American Eel	Fillet - skin on	Semivolatiles	Carbazole	7	1000 - 2000	µg/kg
American Eel	Fillet - skin on	Semivolatiles	Chrysene	7	110 - 210	µg/kg
American Eel	Fillet - skin on	Semivolatiles	Dibenzo(a,h)anthracene	7	250 - 490	µg/kg
American Eel	Fillet - skin on	Semivolatiles	Dibenzofuran	7	110 - 210	µg/kg
American Eel	Fillet - skin on	Semivolatiles	Diethyl phthalate	7	110 - 210	µg/kg
American Eel	Fillet - skin on	Semivolatiles	Dimethylphthalate	7	110 - 210	µg/kg
American Eel	Fillet - skin on	Semivolatiles	Di-n-butylphthalate	7	110 - 210	µg/kg
American Eel	Fillet - skin on	Semivolatiles	Di-n-octylphthalate	7	500 - 1000	µg/kg
American Eel	Fillet - skin on	Semivolatiles	Fluoranthene	7	110 - 210	µg/kg
American Eel	Fillet - skin on	Semivolatiles	Fluorene	7	110 - 210	µg/kg
American Eel	Fillet - skin on	Semivolatiles	Hexachlorobenzene	7	110 - 210	µg/kg
American Eel	Fillet - skin on	Semivolatiles	Hexachlorobutadiene	7	110 - 210	µg/kg
American Eel	Fillet - skin on	Semivolatiles	Hexachlorocyclopentadiene	7	110 - 210	µg/kg
American Eel	Fillet - skin on	Semivolatiles	Hexachloroethane	7	250 - 490	µg/kg
American Eel	Fillet - skin on	Semivolatiles	Indeno(1,2,3-cd)pyrene	7	250 - 490	µg/kg
American Eel	Fillet - skin on	Semivolatiles	Isophorone	7	120 - 16000	µg/kg
American Eel	Fillet - skin on	Semivolatiles	Naphthalene	7	110 - 670	µg/kg
American Eel	Fillet - skin on	Semivolatiles	Nitrobenzene	7	250 - 490	µg/kg
American Eel	Fillet - skin on	Semivolatiles	N-Nitroso-di-n-propylamine	7	250 - 490	µg/kg
American Eel	Fillet - skin on	Semivolatiles	N-Nitrosodiphenylamine	7	250 - 490	µg/kg
American Eel	Fillet - skin on	Semivolatiles	Pentachloropheno	7	1500 - 3000	µg/kg
American Eel	Fillet - skin on	Semivolatiles	Phenanthrene	7	110 - 210	µg/kg
American Eel	Fillet - skin on	Semivolatiles	Phenol	7	500 - 1900	µg/kg
American Eel	Fillet - skin on	Semivolatiles	Pyrene	7	110 - 210	µg/kg
American Eel	Whole body	PCDD/Fs	2,3,7,8-TCDD	6	0.00453 - 0.0206	µg/kg
American Eel	Whole body	PCDD/Fs	2,3,7,8-TCDF	6	0.000025 - 0.000431	µg/kg
American Eel	Whole body	Herbicides	2,4,5-T	5	2.6 - 100	µg/kg
American Eel	Whole body	Herbicides	2,4,5-TP (Silvex)	5	0.85 - 100	µg/kg
American Eel	Whole body	Herbicides	2,4-D	4	240 - 240	µg/kg
American Eel	Whole body	Herbicides	2,4-DB	5	42 - 150	µg/kg
American Eel	Whole body	Homologue Groups	Total PCBs - Homologue Groups	6	1120 - 2780	µg/kg
American Eel	Whole body	Inorganic Chemicals	Ag	6	75 - 76	µg/kg
American Eel	Whole body	Inorganic Chemicals	Al	6	3000 - 18500	µg/kg
American Eel	Whole body	Inorganic Chemicals	As	6	290 - 1000	µg/kg
American Eel	Whole body	Inorganic Chemicals	Ba	6	69 - 400	µg/kg
American Eel	Whole body	Inorganic Chemicals	Be	6	25 - 26	µg/kg
American Eel	Whole body	Inorganic Chemicals	Ca	6	1250000 - 12600000	µg/kg
American Eel	Whole body	Inorganic Chemicals	Cd	6	41 - 100	µg/kg
American Eel	Whole body	Inorganic Chemicals	Co	6	120 - 120	µg/kg
American Eel	Whole body	Inorganic Chemicals	Cr	6	470 - 1200	µg/kg
American Eel	Whole body	Inorganic Chemicals	Cu	6	1500 - 16000	µg/kg
American Eel	Whole body	Inorganic Chemicals	Fe	6	21500 - 62700	µg/kg
American Eel	Whole body	Inorganic Chemicals	Hg	6	110 - 710	µg/kg
American Eel	Whole body	Inorganic Chemicals	K	6	2690000 - 3130000	µg/kg
American Eel	Whole body	Inorganic Chemicals	Mg	6	197000 - 394000	µg/kg
American Eel	Whole body	Inorganic Chemicals	Mn	6	630 - 3200	µg/kg
American Eel	Whole body	Inorganic Chemicals	Na	6	932000 - 1120000	µg/kg
American Eel	Whole body	Inorganic Chemicals	Ni	6	140 - 840	µg/kg

Table 3-59
Bioaccumulation Data from 1995-2001 Passaic RI Sampling Programs Including Tierra (1995a, 1999d, 2000c, 2001a)

Species	Tissue Type	Analyte Class[a]	Compound	Count	Range of Values	Units
American Eel	Whole body	Inorganic Chemicals	Pb	6	250 - 1600	µg/kg
American Eel	Whole body	Inorganic Chemicals	Sb	6	400 - 480	µg/kg
American Eel	Whole body	Inorganic Chemicals	Se	6	570 - 1000	µg/kg
American Eel	Whole body	Inorganic Chemicals	Tl	6	330 - 340	µg/kg
American Eel	Whole body	Inorganic Chemicals	V	6	89 - 140	µg/kg
American Eel	Whole body	Inorganic Chemicals	Zn	6	22000 - 42100	µg/kg
American Eel	Whole body	Organotin	Dibutyltin	5	0.698 - 2	µg/kg
American Eel	Whole body	Organotin	Monobutyltir	5	0.238 - 2	µg/kg
American Eel	Whole body	Organotin	Tetrabutyltin	4	4 - 4	µg/kg
American Eel	Whole body	Organotin	Tributyltin	5	1.87 - 6.91	µg/kg
American Eel	Whole body	PAH-SIM	HMW PAHs	5	3.9 - 16.5	µg/kg
American Eel	Whole body	PAH-SIM	LMW PAHs	5	9.1 - 92.4	µg/kg
American Eel	Whole body	PAH-SIM	Total PAHs	5	13 - 109	µg/kg
American Eel	Whole body	PCB Congeners	Total PCBs - Congeners (NOAA 1989)	6	1340 - 3350	µg/kg
American Eel	Whole body	PCB/PEST	4,4'-DDD	6	10 - 140	µg/kg
American Eel	Whole body	PCB/PEST	4,4'-DDE	6	36 - 250	µg/kg
American Eel	Whole body	PCB/PEST	4,4'-DDT	6	37 - 180	µg/kg
American Eel	Whole body	PCB/PEST	Aldrin	6	5 - 5	µg/kg
American Eel	Whole body	PCB/PEST	Alpha-BHC	6	1.7 - 1.7	µg/kg
American Eel	Whole body	PCB/PEST	Alpha-Chlordane	6	3 - 3	µg/kg
American Eel	Whole body	PCB/PEST	Beta-BHC	6	7 - 7	µg/kg
American Eel	Whole body	PCB/PEST	Delta-BHC	6	5 - 5	µg/kg
American Eel	Whole body	PCB/PEST	Dieldrin	6	3.3 - 20	µg/kg
American Eel	Whole body	PCB/PEST	Endosulfan I	6	5 - 5	µg/kg
American Eel	Whole body	PCB/PEST	Endosulfan II	6	7 - 7	µg/kg
American Eel	Whole body	PCB/PEST	Endosulfan Sulfate	6	3.3 - 3.3	µg/kg
American Eel	Whole body	PCB/PEST	Endrin	6	10 - 100	µg/kg
American Eel	Whole body	PCB/PEST	Endrin Aldehyde	6	5 - 15	µg/kg
American Eel	Whole body	PCB/PEST	Endrin Ketone	6	5 - 5	µg/kg
American Eel	Whole body	PCB/PEST	Gamma-BHC (Lindane)	6	5 - 5	µg/kg
American Eel	Whole body	PCB/PEST	Gamma-Chlordane	6	5 - 5	µg/kg
American Eel	Whole body	PCB/PEST	Heptachlor	6	7 - 7	µg/kg
American Eel	Whole body	PCB/PEST	Heptachlor Epoxide	6	5 - 10	µg/kg
American Eel	Whole body	PCB/PEST	Methoxychlor	6	17 - 17	µg/kg
American Eel	Whole body	PCB/PEST	Total DDT	6	73 - 430	µg/kg
American Eel	Whole body	PCB/PEST	Total PCBs - Aroclors	6	320 - 1740	µg/kg
American Eel	Whole body	PCB/PEST	Toxaphene	6	170 - 170	µg/kg
American Eel	Whole body	Physical Property	Percent Lipid	6	2.29 - 10.91	%
American Eel	Whole body	Physical Property	Percent Moisture	5	67.7 - 75.7	% by wt.
American Eel	Whole body	Semivolatiles	1,2,4-Trichlorobenzene	5	14 - 110	µg/kg
American Eel	Whole body	Semivolatiles	1,2-Dichlorobenzene	5	18 - 110	µg/kg
American Eel	Whole body	Semivolatiles	1,3-Dichlorobenzene	5	13 - 110	µg/kg
American Eel	Whole body	Semivolatiles	1,4-Dichlorobenzene	5	55 - 250	µg/kg
American Eel	Whole body	Semivolatiles	2,4,5-Trichlorophenol	5	280 - 280	µg/kg
American Eel	Whole body	Semivolatiles	2,4,6-Trichlorophenol	5	250 - 250	µg/kg
American Eel	Whole body	Semivolatiles	2,4-Dichloropheno	5	110 - 110	µg/kg
American Eel	Whole body	Semivolatiles	2,4-Dimethylpheno	5	110 - 110	µg/kg
American Eel	Whole body	Semivolatiles	2,4-Dinitropheno	5	1500 - 1500	µg/kg
American Eel	Whole body	Semivolatiles	2,4-Dinitrotoluene	5	250 - 250	µg/kg
American Eel	Whole body	Semivolatiles	2,6-Dinitrotoluene	5	110 - 110	µg/kg
American Eel	Whole body	Semivolatiles	2-Chloronaphthalene	5	110 - 110	µg/kg
American Eel	Whole body	Semivolatiles	2-Chloropheno	5	110 - 110	µg/kg
American Eel	Whole body	Semivolatiles	2-Methylnaphthalene	5	110 - 110	µg/kg
American Eel	Whole body	Semivolatiles	2-Methylpheno	5	250 - 250	µg/kg
American Eel	Whole body	Semivolatiles	2-Nitroaniline	5	280 - 280	µg/kg
American Eel	Whole body	Semivolatiles	2-Nitrophenol	5	110 - 110	µg/kg
American Eel	Whole body	Semivolatiles	3,3'-Dichlorobenzidine	5	250 - 250	µg/kg
American Eel	Whole body	Semivolatiles	3-Nitroaniline	5	500 - 500	µg/kg
American Eel	Whole body	Semivolatiles	4,6-Dinitro-2-methylpheno	5	1500 - 1500	µg/kg
American Eel	Whole body	Semivolatiles	4-Bromophenyl phenyl ether	5	110 - 110	µg/kg
American Eel	Whole body	Semivolatiles	4-Chloro-3-methylpheno	5	110 - 110	µg/kg
American Eel	Whole body	Semivolatiles	4-Chloroaniline	5	110 - 110	µg/kg
American Eel	Whole body	Semivolatiles	4-Chlorophenyl phenyl ethe	5	110 - 110	µg/kg
American Eel	Whole body	Semivolatiles	4-Methylpheno	5	750 - 750	µg/kg
American Eel	Whole body	Semivolatiles	4-Nitroaniline	5	280 - 280	µg/kg
American Eel	Whole body	Semivolatiles	4-Nitrophenol	5	1500 - 1500	µg/kg
American Eel	Whole body	Semivolatiles	Acenaphthene	5	13 - 110	µg/kg
American Eel	Whole body	Semivolatiles	Acenaphthylene	5	110 - 110	µg/kg
American Eel	Whole body	Semivolatiles	Anthracene	5	110 - 110	µg/kg
American Eel	Whole body	Semivolatiles	Benzo(a)anthracene	5	110 - 110	µg/kg
American Eel	Whole body	Semivolatiles	Benzo(a)pyrene	5	250 - 250	µg/kg
American Eel	Whole body	Semivolatiles	Benzo(b)fluoranthene	5	110 - 110	µg/kg
American Eel	Whole body	Semivolatiles	Benzo(g,h,i)perylene	5	250 - 250	µg/kg
American Eel	Whole body	Semivolatiles	Benzo(k)fluoranthene	5	110 - 110	µg/kg
American Eel	Whole body	Semivolatiles	bis(2-Chloroethoxy)methane	5	110 - 110	µg/kg

Table 3-59
Bioaccumulation Data from 1995-2001 Passaic RI Sampling Programs Including Tierra (1995a, 1999d, 2000c, 2001a)

Species	Tissue Type	Analyte Class[a]	Compound	Count	Range of Values	Units
American Eel	Whole body	Semivolatiles	bis(2-Chloroethyl)ether	5	110 - 110	µg/kg
American Eel	Whole body	Semivolatiles	bis(2-Chloroisopropyl)ether	5	2500 - 2500	µg/kg
American Eel	Whole body	Semivolatiles	bis(2-Ethylhexyl)phthalate	5	3000 - 3000	µg/kg
American Eel	Whole body	Semivolatiles	Butyl benzyl phthalate	5	110 - 110	µg/kg
American Eel	Whole body	Semivolatiles	Carbazole	5	1000 - 1000	µg/kg
American Eel	Whole body	Semivolatiles	Chrysene	5	110 - 110	µg/kg
American Eel	Whole body	Semivolatiles	Dibenzo(a,h)anthracene	5	250 - 250	µg/kg
American Eel	Whole body	Semivolatiles	Dibenzofuran	5	110 - 110	µg/kg
American Eel	Whole body	Semivolatiles	Diethyl phthalate	5	110 - 110	µg/kg
American Eel	Whole body	Semivolatiles	Dimethylphthalate	5	110 - 110	µg/kg
American Eel	Whole body	Semivolatiles	Di-n-Butylphthalate	5	110 - 110	µg/kg
American Eel	Whole body	Semivolatiles	Di-n-Octylphthalate	5	500 - 500	µg/kg
American Eel	Whole body	Semivolatiles	Fluoranthene	5	110 - 110	µg/kg
American Eel	Whole body	Semivolatiles	Fluorene	5	110 - 110	µg/kg
American Eel	Whole body	Semivolatiles	Hexachlorobenzene	5	110 - 110	µg/kg
American Eel	Whole body	Semivolatiles	Hexachlorobutadiene	5	110 - 110	µg/kg
American Eel	Whole body	Semivolatiles	Hexachlorocyclopentadiene	5	110 - 110	µg/kg
American Eel	Whole body	Semivolatiles	Hexachloroethane	5	250 - 250	µg/kg
American Eel	Whole body	Semivolatiles	Indeno(1,2,3-cd)pyrene	5	250 - 250	µg/kg
American Eel	Whole body	Semivolatiles	Isophorone	5	250 - 250	µg/kg
American Eel	Whole body	Semivolatiles	Naphthalene	5	15 - 110	µg/kg
American Eel	Whole body	Semivolatiles	Nitrobenzene	5	250 - 250	µg/kg
American Eel	Whole body	Semivolatiles	N-Nitroso-di-n-propylamine	5	250 - 250	µg/kg
American Eel	Whole body	Semivolatiles	N-Nitrosodiphenylamine	5	250 - 250	µg/kg
American Eel	Whole body	Semivolatiles	Pentachloropheno	5	1500 - 1500	µg/kg
American Eel	Whole body	Semivolatiles	Phenanthrene	5	110 - 110	µg/kg
American Eel	Whole body	Semivolatiles	Phenol	5	83 - 500	µg/kg
American Eel	Whole body	Semivolatiles	Pyrene	5	110 - 110	µg/kg
Atlantic Menhaden	Whole body	PCDD/Fs	2,3,7,8-TCDD	6	0.025 - 0.0791	µg/kg
Atlantic Menhaden	Whole body	PCDD/Fs	2,3,7,8-TCDF	6	0.000354 - 0.0114	µg/kg
Atlantic Menhaden	Whole body	Herbicides	2,4,5-T	5	100 - 100	µg/kg
Atlantic Menhaden	Whole body	Herbicides	2,4,5-TP (Silvex)	5	6.9 - 100	µg/kg
Atlantic Menhaden	Whole body	Herbicides	2,4-D	4	209 - 240	µg/kg
Atlantic Menhaden	Whole body	Herbicides	2,4-DB	5	180 - 180	µg/kg
Atlantic Menhaden	Whole body	Homologue Groups	Total PCBs - Homologue Groups	6	912 - 3610	µg/kg
Atlantic Menhaden	Whole body	Inorganic Chemicals	Ag	6	90 - 2000	µg/kg
Atlantic Menhaden	Whole body	Inorganic Chemicals	Al	6	65500 - 155000	µg/kg
Atlantic Menhaden	Whole body	Inorganic Chemicals	As	6	350 - 2200	µg/kg
Atlantic Menhaden	Whole body	Inorganic Chemicals	Ba	6	880 - 1500	µg/kg
Atlantic Menhaden	Whole body	Inorganic Chemicals	Be	6	44 - 100	µg/kg
Atlantic Menhaden	Whole body	Inorganic Chemicals	Ca	6	7130000 - 25500000	µg/kg
Atlantic Menhaden	Whole body	Inorganic Chemicals	Cd	6	37 - 62	µg/kg
Atlantic Menhaden	Whole body	Inorganic Chemicals	Co	6	110 - 130	µg/kg
Atlantic Menhaden	Whole body	Inorganic Chemicals	Cr	6	670 - 1900	µg/kg
Atlantic Menhaden	Whole body	Inorganic Chemicals	Cu	6	790 - 2400	µg/kg
Atlantic Menhaden	Whole body	Inorganic Chemicals	Fe	6	112000 - 201000	µg/kg
Atlantic Menhaden	Whole body	Inorganic Chemicals	Hg	6	40 - 84	µg/kg
Atlantic Menhaden	Whole body	Inorganic Chemicals	K	6	2880000 - 3580000	µg/kg
Atlantic Menhaden	Whole body	Inorganic Chemicals	Mn	6	4500 - 9600	µg/kg
Atlantic Menhaden	Whole body	Inorganic Chemicals	Na	6	1560000 - 2090000	µg/kg
Atlantic Menhaden	Whole body	Inorganic Chemicals	Ni	6	74 - 1000	µg/kg
Atlantic Menhaden	Whole body	Inorganic Chemicals	Pb	6	540 - 1600	µg/kg
Atlantic Menhaden	Whole body	Inorganic Chemicals	Sb	6	320 - 550	µg/kg
Atlantic Menhaden	Whole body	Inorganic Chemicals	Se	6	250 - 1100	µg/kg
Atlantic Menhaden	Whole body	Inorganic Chemicals	Tl	6	280 - 620	µg/kg
Atlantic Menhaden	Whole body	Inorganic Chemicals	V	6	1100 - 1700	µg/kg
Atlantic Menhaden	Whole body	Inorganic Chemicals	Zn	6	19200 - 26400	µg/kg
Atlantic Menhaden	Whole body	Organotin	Dibutyltin	6	0.997 - 5.6	µg/kg
Atlantic Menhaden	Whole body	Organotin	Monobutyltin	6	0.239 - 1.28	µg/kg
Atlantic Menhaden	Whole body	Organotin	Tetrabutyltin	6	4 - 4	µg/kg
Atlantic Menhaden	Whole body	Organotin	Tributyltin	6	5.15 - 25.1	µg/kg
Atlantic Menhaden	Whole body	PAH-SIM	HMW PAHs	6	32.2 - 260	µg/kg
Atlantic Menhaden	Whole body	PAH-SIM	LMW PAHs	6	3.6 - 77	µg/kg
Atlantic Menhaden	Whole body	PAH-SIM	Total PAHs	6	35.8 - 337	µg/kg
Atlantic Menhaden	Whole body	PCB Congeners	Total PCBs - Congeners (NOAA 1989)	6	786 - 3150	µg/kg
Atlantic Menhaden	Whole body	PCB/PEST	4,4'-DDD	6	14 - 460	µg/kg
Atlantic Menhaden	Whole body	PCB/PEST	4,4'-DDE	6	45 - 370	µg/kg
Atlantic Menhaden	Whole body	PCB/PEST	4,4'-DDT	6	25 - 138	µg/kg
Atlantic Menhaden	Whole body	PCB/PEST	Aldrin	6	5 - 100	µg/kg
Atlantic Menhaden	Whole body	PCB/PEST	Alpha-BHC	6	1.7 - 34	µg/kg
Atlantic Menhaden	Whole body	PCB/PEST	Alpha-Chlordane	6	3 - 66	µg/kg
Atlantic Menhaden	Whole body	PCB/PEST	Beta-BHC	6	7 - 140	µg/kg
Atlantic Menhaden	Whole body	PCB/PEST	Delta-BHC	6	5 - 100	µg/kg
Atlantic Menhaden	Whole body	PCB/PEST	Dieldrin	6	3.3 - 66	µg/kg
Atlantic Menhaden	Whole body	PCB/PEST	Endosulfan I	6	5 - 100	µg/kg

Table 3-59
Bioaccumulation Data from 1995-2001 Passaic RI Sampling Programs Including Tierra (1995a, 1999d, 2000c, 2001a)

Species	Tissue Type	Analyte Class[a]	Compound	Count	Range of Values	Units
Atlantic Menhaden	Whole body	PCB/PEST	Endosulfan II	6	7 - 140	µg/kg
Atlantic Menhaden	Whole body	PCB/PEST	Endosulfan Sulfate	6	3.3 - 66	µg/kg
Atlantic Menhaden	Whole body	PCB/PEST	Endrin	6	5 - 100	µg/kg
Atlantic Menhaden	Whole body	PCB/PEST	Endrin Aldehyde	6	5 - 100	µg/kg
Atlantic Menhaden	Whole body	PCB/PEST	Endrin Ketone	6	5 - 100	µg/kg
Atlantic Menhaden	Whole body	PCB/PEST	Gamma-BHC (Lindane)	6	5 - 100	µg/kg
Atlantic Menhaden	Whole body	PCB/PEST	Gamma-Chlordane	6	5 - 100	µg/kg
Atlantic Menhaden	Whole body	PCB/PEST	Heptachlor	6	7 - 140	µg/kg
Atlantic Menhaden	Whole body	PCB/PEST	Heptachlor Epoxide	6	5 - 100	µg/kg
Atlantic Menhaden	Whole body	PCB/PEST	Methoxychlor	6	17 - 340	µg/kg
Atlantic Menhaden	Whole body	PCB/PEST	Total DDT	6	95 - 968	µg/kg
Atlantic Menhaden	Whole body	PCB/PEST	Total PCBs - Aroclors	6	723 - 3730	µg/kg
Atlantic Menhaden	Whole body	PCB/PEST	Toxaphene	6	170 - 3400	µg/kg
Atlantic Menhaden	Whole body	Physical Property	Percent Lipid	6	0.594 - 10.1	%
Atlantic Menhaden	Whole body	Physical Property	Percent Moisture	6	69.8 - 77.3	% by wt.
Atlantic Menhaden	Whole body	Semivolatiles	1,2,4-Trichlorobenzene	6	19 - 120	µg/kg
Atlantic Menhaden	Whole body	Semivolatiles	1,2-Dichlorobenzene	6	23 - 110	µg/kg
Atlantic Menhaden	Whole body	Semivolatiles	1,3-Dichlorobenzene	6	17 - 110	µg/kg
Atlantic Menhaden	Whole body	Semivolatiles	1,4-Dichlorobenzene	6	35 - 250	µg/kg
Atlantic Menhaden	Whole body	Semivolatiles	2,4,5-Trichlorophenol	6	280 - 280	µg/kg
Atlantic Menhaden	Whole body	Semivolatiles	2,4,6-Trichlorophenol	6	250 - 250	µg/kg
Atlantic Menhaden	Whole body	Semivolatiles	2,4-Dichloropheno	6	110 - 110	µg/kg
Atlantic Menhaden	Whole body	Semivolatiles	2,4-Dimethylpheno	6	110 - 110	µg/kg
Atlantic Menhaden	Whole body	Semivolatiles	2,4-Dinitropheno	6	1500 - 1500	µg/kg
Atlantic Menhaden	Whole body	Semivolatiles	2,4-Dinitrotoluene	6	110 - 250	µg/kg
Atlantic Menhaden	Whole body	Semivolatiles	2,6-Dinitrotoluene	6	110 - 110	µg/kg
Atlantic Menhaden	Whole body	Semivolatiles	2-Chloronaphthalene	6	110 - 110	µg/kg
Atlantic Menhaden	Whole body	Semivolatiles	2-Chloropheno	6	110 - 110	µg/kg
Atlantic Menhaden	Whole body	Semivolatiles	2-Methylnaphthalene	6	110 - 110	µg/kg
Atlantic Menhaden	Whole body	Semivolatiles	2-Methylpheno	6	250 - 250	µg/kg
Atlantic Menhaden	Whole body	Semivolatiles	2-Nitroaniline	6	280 - 280	µg/kg
Atlantic Menhaden	Whole body	Semivolatiles	2-Nitrophenol	6	110 - 110	µg/kg
Atlantic Menhaden	Whole body	Semivolatiles	3,3'-Dichlorobenzidine	6	250 - 250	µg/kg
Atlantic Menhaden	Whole body	Semivolatiles	3-Nitroaniline	6	500 - 500	µg/kg
Atlantic Menhaden	Whole body	Semivolatiles	4,6-Dinitro-2-methylpheno	6	1500 - 1500	µg/kg
Atlantic Menhaden	Whole body	Semivolatiles	4-Bromophenyl phenyl ether	6	110 - 110	µg/kg
Atlantic Menhaden	Whole body	Semivolatiles	4-Chloro-3-methylpheno	6	110 - 110	µg/kg
Atlantic Menhaden	Whole body	Semivolatiles	4-Chloroaniline	6	110 - 110	µg/kg
Atlantic Menhaden	Whole body	Semivolatiles	4-Chlorophenyl phenyl ethe	6	110 - 110	µg/kg
Atlantic Menhaden	Whole body	Semivolatiles	4-Methylpheno	6	750 - 750	µg/kg
Atlantic Menhaden	Whole body	Semivolatiles	4-Nitroaniline	6	280 - 280	µg/kg
Atlantic Menhaden	Whole body	Semivolatiles	4-Nitrophenol	6	1500 - 1500	µg/kg
Atlantic Menhaden	Whole body	Semivolatiles	Acenaphthene	6	13 - 110	µg/kg
Atlantic Menhaden	Whole body	Semivolatiles	Acenaphthylene	6	110 - 110	µg/kg
Atlantic Menhaden	Whole body	Semivolatiles	Anthracene	6	110 - 110	µg/kg
Atlantic Menhaden	Whole body	Semivolatiles	Benzo(a)anthracene	6	110 - 110	µg/kg
Atlantic Menhaden	Whole body	Semivolatiles	Benzo(a)pyrene	6	250 - 250	µg/kg
Atlantic Menhaden	Whole body	Semivolatiles	Benzo(b)fluoranthene	6	110 - 110	µg/kg
Atlantic Menhaden	Whole body	Semivolatiles	Benzo(g,h,i)perylene	6	250 - 250	µg/kg
Atlantic Menhaden	Whole body	Semivolatiles	Benzo(k)fluoranthene	6	110 - 110	µg/kg
Atlantic Menhaden	Whole body	Semivolatiles	bis(2-Chloroethoxy)methane	6	110 - 110	µg/kg
Atlantic Menhaden	Whole body	Semivolatiles	bis(2-Chloroethyl)ether	6	110 - 110	µg/kg
Atlantic Menhaden	Whole body	Semivolatiles	bis(2-Chloroisopropyl)ether	6	2500 - 2500	µg/kg
Atlantic Menhaden	Whole body	Semivolatiles	bis(2-Ethylhexyl)phthalate	6	3000 - 3000	µg/kg
Atlantic Menhaden	Whole body	Semivolatiles	Butyl benzyl phthalate	6	110 - 110	µg/kg
Atlantic Menhaden	Whole body	Semivolatiles	Carbazole	6	1000 - 1000	µg/kg
Atlantic Menhaden	Whole body	Semivolatiles	Chrysene	6	110 - 110	µg/kg
Atlantic Menhaden	Whole body	Semivolatiles	Dibenzo(a,h)anthracene	6	250 - 250	µg/kg
Atlantic Menhaden	Whole body	Semivolatiles	Dibenzofuran	6	110 - 110	µg/kg
Atlantic Menhaden	Whole body	Semivolatiles	Diethyl phthalate	6	110 - 110	µg/kg
Atlantic Menhaden	Whole body	Semivolatiles	Dimethylphthalate	6	110 - 110	µg/kg
Atlantic Menhaden	Whole body	Semivolatiles	Di-n-Butylphthalate	6	110 - 110	µg/kg
Atlantic Menhaden	Whole body	Semivolatiles	Di-n-Octylphthalate	6	500 - 500	µg/kg
Atlantic Menhaden	Whole body	Semivolatiles	Fluoranthene	6	110 - 110	µg/kg
Atlantic Menhaden	Whole body	Semivolatiles	Fluorene	6	110 - 110	µg/kg
Atlantic Menhaden	Whole body	Semivolatiles	Hexachlorobenzene	6	110 - 110	µg/kg
Atlantic Menhaden	Whole body	Semivolatiles	Hexachlorobutadiene	6	110 - 110	µg/kg
Atlantic Menhaden	Whole body	Semivolatiles	Hexachlorocyclopentadiene	6	110 - 110	µg/kg
Atlantic Menhaden	Whole body	Semivolatiles	Hexachloroethane	6	250 - 250	µg/kg
Atlantic Menhaden	Whole body	Semivolatiles	Indeno(1,2,3-cd)pyrene	6	250 - 250	µg/kg
Atlantic Menhaden	Whole body	Semivolatiles	Isophorone	6	250 - 250	µg/kg
Atlantic Menhaden	Whole body	Semivolatiles	Naphthalene	6	15 - 110	µg/kg
Atlantic Menhaden	Whole body	Semivolatiles	Nitrobenzene	6	250 - 250	µg/kg
Atlantic Menhaden	Whole body	Semivolatiles	N-Nitroso-di-n-propylamine	6	250 - 250	µg/kg
Atlantic Menhaden	Whole body	Semivolatiles	N-Nitrosodiphenylamine	6	250 - 250	µg/kg

Table 3-59
Bioaccumulation Data from 1995-2001 Passaic RI Sampling Programs Including Tierra (1995a, 1999d, 2000c, 2001a)

Species	Tissue Type	Analyte Class[a]	Compound	Count	Range of Values	Units
Atlantic Menhaden	Whole body	Semivolatiles	Pentachlorophenol	6	1500 - 1500	µg/kg
Atlantic Menhaden	Whole body	Semivolatiles	Phenanthrene	6	110 - 110	µg/kg
Atlantic Menhaden	Whole body	Semivolatiles	Phenol	6	79 - 500	µg/kg
Atlantic Menhaden	Whole body	Semivolatiles	Pyrene	6	110 - 110	µg/kg
Bluefish	Fillet - skin off	PCDD/Fs	2,3,7,8-TCDD	1	0.00754 - 0.00754	µg/kg
Bluefish	Fillet - skin off	PCDD/Fs	2,3,7,8-TCDF	1	0.000298 - 0.000298	µg/kg
Bluefish	Fillet - skin off	Herbicides	2,4,5-T	1	100 - 100	µg/kg
Bluefish	Fillet - skin off	Herbicides	2,4,5-TP (Silvex)	1	100 - 100	µg/kg
Bluefish	Fillet - skin off	Herbicides	2,4-D	1	240 - 240	µg/kg
Bluefish	Fillet - skin off	Herbicides	2,4-DB	1	180 - 180	µg/kg
Bluefish	Fillet - skin off	Homologue Groups	Total PCBs - Homologue Groups	1	756 - 756	µg/kg
Bluefish	Fillet - skin off	Inorganic Chemicals	Ag	1	79 - 79	µg/kg
Bluefish	Fillet - skin off	Inorganic Chemicals	Al	1	4700 - 4700	µg/kg
Bluefish	Fillet - skin off	Inorganic Chemicals	As	1	310 - 310	µg/kg
Bluefish	Fillet - skin off	Inorganic Chemicals	Ba	1	19 - 19	µg/kg
Bluefish	Fillet - skin off	Inorganic Chemicals	Be	1	74 - 74	µg/kg
Bluefish	Fillet - skin off	Inorganic Chemicals	Ca	1	87500 - 87500	µg/kg
Bluefish	Fillet - skin off	Inorganic Chemicals	Cd	1	51 - 51	µg/kg
Bluefish	Fillet - skin off	Inorganic Chemicals	Co	1	110 - 110	µg/kg
Bluefish	Fillet - skin off	Inorganic Chemicals	Cr	1	230 - 230	µg/kg
Bluefish	Fillet - skin off	Inorganic Chemicals	Cu	1	130 - 130	µg/kg
Bluefish	Fillet - skin off	Inorganic Chemicals	Fe	1	9700 - 9700	µg/kg
Bluefish	Fillet - skin off	Inorganic Chemicals	Hg	1	320 - 320	µg/kg
Bluefish	Fillet - skin off	Inorganic Chemicals	K	1	4620000 - 4620000	µg/kg
Bluefish	Fillet - skin off	Inorganic Chemicals	Mn	1	130 - 130	µg/kg
Bluefish	Fillet - skin off	Inorganic Chemicals	Na	1	1310000 - 1310000	µg/kg
Bluefish	Fillet - skin off	Inorganic Chemicals	Ni	1	140 - 140	µg/kg
Bluefish	Fillet - skin off	Inorganic Chemicals	Pb	1	180 - 180	µg/kg
Bluefish	Fillet - skin off	Inorganic Chemicals	Sb	1	330 - 330	µg/kg
Bluefish	Fillet - skin off	Inorganic Chemicals	Se	1	250 - 250	µg/kg
Bluefish	Fillet - skin off	Inorganic Chemicals	Tl	1	620 - 620	µg/kg
Bluefish	Fillet - skin off	Inorganic Chemicals	V	1	79 - 79	µg/kg
Bluefish	Fillet - skin off	Inorganic Chemicals	Zn	1	12900 - 12900	µg/kg
Bluefish	Fillet - skin off	Organotin	Dibutyltin	1	2 - 2	µg/kg
Bluefish	Fillet - skin off	Organotin	Monobutyltir	1	2 - 2	µg/kg
Bluefish	Fillet - skin off	Organotin	Tetrabutyltin	1	4 - 4	µg/kg
Bluefish	Fillet - skin off	Organotin	Tributyltin	1	2.75 - 2.75	µg/kg
Bluefish	Fillet - skin off	PAH-SIM	LMW PAHs	1	2.7 - 2.7	µg/kg
Bluefish	Fillet - skin off	PAH-SIM	Total PAHs	1	2.7 - 2.7	µg/kg
Bluefish	Fillet - skin off	PCB Congeners	Total PCBs - Congeners (NOAA 1989)	1	804 - 804	µg/kg
Bluefish	Fillet - skin off	PCB/PEST	4,4'-DDD	1	7 - 7	µg/kg
Bluefish	Fillet - skin off	PCB/PEST	4,4'-DDE	1	25 - 25	µg/kg
Bluefish	Fillet - skin off	PCB/PEST	4,4'-DDT	1	21 - 21	µg/kg
Bluefish	Fillet - skin off	PCB/PEST	Aldrin	1	5 - 5	µg/kg
Bluefish	Fillet - skin off	PCB/PEST	Alpha-BHC	1	1.7 - 1.7	µg/kg
Bluefish	Fillet - skin off	PCB/PEST	Alpha-Chlordane	1	3 - 3	µg/kg
Bluefish	Fillet - skin off	PCB/PEST	Beta-BHC	1	7 - 7	µg/kg
Bluefish	Fillet - skin off	PCB/PEST	Delta-BHC	1	5 - 5	µg/kg
Bluefish	Fillet - skin off	PCB/PEST	Dieldrin	1	3.3 - 3.3	µg/kg
Bluefish	Fillet - skin off	PCB/PEST	Endosulfan I	1	5 - 5	µg/kg
Bluefish	Fillet - skin off	PCB/PEST	Endosulfan II	1	7 - 7	µg/kg
Bluefish	Fillet - skin off	PCB/PEST	Endosulfan Sulfate	1	3.3 - 3.3	µg/kg
Bluefish	Fillet - skin off	PCB/PEST	Endrin	1	5 - 5	µg/kg
Bluefish	Fillet - skin off	PCB/PEST	Endrin Aldehyde	1	5 - 5	µg/kg
Bluefish	Fillet - skin off	PCB/PEST	Endrin Ketone	1	5 - 5	µg/kg
Bluefish	Fillet - skin off	PCB/PEST	Gamma-BHC (Lindane)	1	5 - 5	µg/kg
Bluefish	Fillet - skin off	PCB/PEST	Gamma-Chlordane	1	5 - 5	µg/kg
Bluefish	Fillet - skin off	PCB/PEST	Heptachlor	1	7 - 7	µg/kg
Bluefish	Fillet - skin off	PCB/PEST	Heptachlor Epoxide	1	5 - 5	µg/kg
Bluefish	Fillet - skin off	PCB/PEST	Methoxychlor	1	17 - 17	µg/kg
Bluefish	Fillet - skin off	PCB/PEST	Total DDT	1	46 - 46	µg/kg
Bluefish	Fillet - skin off	PCB/PEST	Total PCBs - Aroclors	1	410 - 410	µg/kg
Bluefish	Fillet - skin off	PCB/PEST	Toxaphene	1	170 - 170	µg/kg
Bluefish	Fillet - skin off	Physical Property	Percent Lipid	1	0.591 - 0.591	%
Bluefish	Fillet - skin off	Physical Property	Percent Moisture	1	83 - 83	% by wt.
Bluefish	Fillet - skin off	Semivolatiles	1,2,4-Trichlorobenzene	1	110 - 110	µg/kg
Bluefish	Fillet - skin off	Semivolatiles	1,2-Dichlorobenzene	1	110 - 110	µg/kg
Bluefish	Fillet - skin off	Semivolatiles	1,3-Dichlorobenzene	1	110 - 110	µg/kg
Bluefish	Fillet - skin off	Semivolatiles	1,4-Dichlorobenzene	1	250 - 250	µg/kg
Bluefish	Fillet - skin off	Semivolatiles	2,4,5-Trichlorophenol	1	280 - 280	µg/kg
Bluefish	Fillet - skin off	Semivolatiles	2,4,6-Trichlorophenol	1	250 - 250	µg/kg
Bluefish	Fillet - skin off	Semivolatiles	2,4-Dichloropheno	1	110 - 110	µg/kg
Bluefish	Fillet - skin off	Semivolatiles	2,4-Dimethylpheno	1	110 - 110	µg/kg
Bluefish	Fillet - skin off	Semivolatiles	2,4-Dinitropheno	1	1500 - 1500	µg/kg
Bluefish	Fillet - skin off	Semivolatiles	2,4-Dinitrotoluene	1	250 - 250	µg/kg

Table 3-59
Bioaccumulation Data from 1995-2001 Passaic RI Sampling Programs Including Tierra (1995a, 1999d, 2000c, 2001a)

Species	Tissue Type	Analyte Class[a]	Compound	Count	Range of Values	Units
Bluefish	Fillet - skin off	Semivolatiles	2,6-Dinitrotoluene	1	110 - 110	µg/kg
Bluefish	Fillet - skin off	Semivolatiles	2-Chloronaphthalene	1	110 - 110	µg/kg
Bluefish	Fillet - skin off	Semivolatiles	2-Chlorophenol	1	110 - 110	µg/kg
Bluefish	Fillet - skin off	Semivolatiles	2-Methylnaphthalene	1	110 - 110	µg/kg
Bluefish	Fillet - skin off	Semivolatiles	2-Methylphenol	1	250 - 250	µg/kg
Bluefish	Fillet - skin off	Semivolatiles	2-Nitroaniline	1	280 - 280	µg/kg
Bluefish	Fillet - skin off	Semivolatiles	2-Nitrophenol	1	110 - 110	µg/kg
Bluefish	Fillet - skin off	Semivolatiles	3,3'-Dichlorobenzidine	1	250 - 250	µg/kg
Bluefish	Fillet - skin off	Semivolatiles	3-Nitroaniline	1	500 - 500	µg/kg
Bluefish	Fillet - skin off	Semivolatiles	4,6-Dinitro-2-methylphenol	1	1500 - 1500	µg/kg
Bluefish	Fillet - skin off	Semivolatiles	4-Bromophenyl phenyl ether	1	110 - 110	µg/kg
Bluefish	Fillet - skin off	Semivolatiles	4-Chloro-3-methylphenol	1	110 - 110	µg/kg
Bluefish	Fillet - skin off	Semivolatiles	4-Chloroaniline	1	110 - 110	µg/kg
Bluefish	Fillet - skin off	Semivolatiles	4-Chlorophenyl phenyl ether	1	110 - 110	µg/kg
Bluefish	Fillet - skin off	Semivolatiles	4-Methylphenol	1	750 - 750	µg/kg
Bluefish	Fillet - skin off	Semivolatiles	4-Nitroaniline	1	280 - 280	µg/kg
Bluefish	Fillet - skin off	Semivolatiles	4-Nitrophenol	1	1500 - 1500	µg/kg
Bluefish	Fillet - skin off	Semivolatiles	Acenaphthene	1	110 - 110	µg/kg
Bluefish	Fillet - skin off	Semivolatiles	Acenaphthylene	1	110 - 110	µg/kg
Bluefish	Fillet - skin off	Semivolatiles	Anthracene	1	110 - 110	µg/kg
Bluefish	Fillet - skin off	Semivolatiles	Benzo(a)anthracene	1	110 - 110	µg/kg
Bluefish	Fillet - skin off	Semivolatiles	Benzo(a)pyrene	1	250 - 250	µg/kg
Bluefish	Fillet - skin off	Semivolatiles	Benzo(b)fluoranthene	1	110 - 110	µg/kg
Bluefish	Fillet - skin off	Semivolatiles	Benzo(g,h,i)perylene	1	250 - 250	µg/kg
Bluefish	Fillet - skin off	Semivolatiles	Benzo(k)fluoranthene	1	110 - 110	µg/kg
Bluefish	Fillet - skin off	Semivolatiles	bis(2-Chloroethoxy)methane	1	110 - 110	µg/kg
Bluefish	Fillet - skin off	Semivolatiles	bis(2-Chloroethyl)ether	1	110 - 110	µg/kg
Bluefish	Fillet - skin off	Semivolatiles	bis(2-Chloroisopropyl)ether	1	2500 - 2500	µg/kg
Bluefish	Fillet - skin off	Semivolatiles	bis(2-Ethylhexyl)phthalate	1	3000 - 3000	µg/kg
Bluefish	Fillet - skin off	Semivolatiles	Butyl benzyl phthalate	1	110 - 110	µg/kg
Bluefish	Fillet - skin off	Semivolatiles	Carbazole	1	1000 - 1000	µg/kg
Bluefish	Fillet - skin off	Semivolatiles	Chrysene	1	110 - 110	µg/kg
Bluefish	Fillet - skin off	Semivolatiles	Dibenzo(a,h)anthracene	1	250 - 250	µg/kg
Bluefish	Fillet - skin off	Semivolatiles	Dibenzofuran	1	110 - 110	µg/kg
Bluefish	Fillet - skin off	Semivolatiles	Diethyl phthalate	1	110 - 110	µg/kg
Bluefish	Fillet - skin off	Semivolatiles	Dimethylphthalate	1	110 - 110	µg/kg
Bluefish	Fillet - skin off	Semivolatiles	Di-n-Butylphthalate	1	110 - 110	µg/kg
Bluefish	Fillet - skin off	Semivolatiles	Di-n-Octylphthalate	1	500 - 500	µg/kg
Bluefish	Fillet - skin off	Semivolatiles	Fluoranthene	1	110 - 110	µg/kg
Bluefish	Fillet - skin off	Semivolatiles	Fluorene	1	110 - 110	µg/kg
Bluefish	Fillet - skin off	Semivolatiles	Hexachlorobenzene	1	110 - 110	µg/kg
Bluefish	Fillet - skin off	Semivolatiles	Hexachlorobutadiene	1	110 - 110	µg/kg
Bluefish	Fillet - skin off	Semivolatiles	Hexachlorocyclopentadiene	1	110 - 110	µg/kg
Bluefish	Fillet - skin off	Semivolatiles	Hexachloroethane	1	250 - 250	µg/kg
Bluefish	Fillet - skin off	Semivolatiles	Indeno(1,2,3-cd)pyrene	1	250 - 250	µg/kg
Bluefish	Fillet - skin off	Semivolatiles	Isophorone	1	250 - 250	µg/kg
Bluefish	Fillet - skin off	Semivolatiles	Naphthalene	1	110 - 110	µg/kg
Bluefish	Fillet - skin off	Semivolatiles	Nitrobenzene	1	250 - 250	µg/kg
Bluefish	Fillet - skin off	Semivolatiles	N-Nitroso-di-n-propylamine	1	250 - 250	µg/kg
Bluefish	Fillet - skin off	Semivolatiles	N-Nitrosodiphenylamine	1	250 - 250	µg/kg
Bluefish	Fillet - skin off	Semivolatiles	Pentachlorophenol	1	1500 - 1500	µg/kg
Bluefish	Fillet - skin off	Semivolatiles	Phenanthrene	1	110 - 110	µg/kg
Bluefish	Fillet - skin off	Semivolatiles	Phenol	1	500 - 500	µg/kg
Bluefish	Fillet - skin off	Semivolatiles	Pyrene	1	110 - 110	µg/kg
Bluefish	Whole body	PCDD/Fs	2,3,7,8-TCDD	2	0.0378 - 0.0667	µg/kg
Bluefish	Whole body	PCDD/Fs	2,3,7,8-TCDF	2	0.00192 - 0.00396	µg/kg
Bluefish	Whole body	Herbicides	2,4,5-T	2	100 - 100	µg/kg
Bluefish	Whole body	Herbicides	2,4,5-TP (Silvex)	2	100 - 100	µg/kg
Bluefish	Whole body	Herbicides	2,4-D	1	240 - 240	µg/kg
Bluefish	Whole body	Herbicides	2,4-DB	2	180 - 180	µg/kg
Bluefish	Whole body	Homologue Groups	Total PCBs - Homologue Groups	2	2230 - 2240	µg/kg
Bluefish	Whole body	Inorganic Chemicals	Ag	2	79 - 110	µg/kg
Bluefish	Whole body	Inorganic Chemicals	Al	2	16500 - 23200	µg/kg
Bluefish	Whole body	Inorganic Chemicals	As	2	300 - 490	µg/kg
Bluefish	Whole body	Inorganic Chemicals	Ba	2	210 - 410	µg/kg
Bluefish	Whole body	Inorganic Chemicals	Be	2	71 - 75	µg/kg
Bluefish	Whole body	Inorganic Chemicals	Ca	2	6380000 - 9420000	µg/kg
Bluefish	Whole body	Inorganic Chemicals	Cd	2	50 - 51	µg/kg
Bluefish	Whole body	Inorganic Chemicals	Co	2	110 - 110	µg/kg
Bluefish	Whole body	Inorganic Chemicals	Cr	2	400 - 460	µg/kg
Bluefish	Whole body	Inorganic Chemicals	Cu	2	640 - 720	µg/kg
Bluefish	Whole body	Inorganic Chemicals	Fe	2	22000 - 31500	µg/kg
Bluefish	Whole body	Inorganic Chemicals	Hg	2	73 - 97	µg/kg
Bluefish	Whole body	Inorganic Chemicals	K	2	3600000 - 3750000	µg/kg
Bluefish	Whole body	Inorganic Chemicals	Mn	2	910 - 1700	µg/kg

Table 3-59
Bioaccumulation Data from 1995-2001 Passaic RI Sampling Programs Including Tierra (1995a, 1999d, 2000c, 2001a)

Species	Tissue Type	Analyte Class[a]	Compound	Count	Range of Values	Units
Bluefish	Whole body	Inorganic Chemicals	Na	2	1420000 - 1450000	µg/kg
Bluefish	Whole body	Inorganic Chemicals	Ni	2	140 - 140	µg/kg
Bluefish	Whole body	Inorganic Chemicals	Pb	2	180 - 180	µg/kg
Bluefish	Whole body	Inorganic Chemicals	Sb	2	320 - 330	µg/kg
Bluefish	Whole body	Inorganic Chemicals	Se	2	250 - 330	µg/kg
Bluefish	Whole body	Inorganic Chemicals	Tl	2	620 - 620	µg/kg
Bluefish	Whole body	Inorganic Chemicals	V	2	79 - 79	µg/kg
Bluefish	Whole body	Inorganic Chemicals	Zn	2	13800 - 14800	µg/kg
Bluefish	Whole body	Organotin	Dibutyltin	2	1.32 - 1.62	µg/kg
Bluefish	Whole body	Organotin	Monobutyltir	2	2 - 2	µg/kg
Bluefish	Whole body	Organotin	Tetrabutyltin	2	4 - 4	µg/kg
Bluefish	Whole body	Organotin	Tributyltin	2	12.5 - 13.8	µg/kg
Bluefish	Whole body	PAH-SIM	HMW PAHs	2	3.3 - 17.2	µg/kg
Bluefish	Whole body	PAH-SIM	LMW PAHs	2	7.1 - 21.1	µg/kg
Bluefish	Whole body	PAH-SIM	Total PAHs	2	10.4 - 38.3	µg/kg
Bluefish	Whole body	PCB Congeners	Total PCBs - Congeners (NOAA 1989)	2	2020 - 2020	µg/kg
Bluefish	Whole body	PCB/PEST	4,4'-DDD	2	28 - 60	µg/kg
Bluefish	Whole body	PCB/PEST	4,4'-DDE	2	134 - 146	µg/kg
Bluefish	Whole body	PCB/PEST	4,4'-DDT	2	96 - 100	µg/kg
Bluefish	Whole body	PCB/PEST	Aldrin	2	5 - 5	µg/kg
Bluefish	Whole body	PCB/PEST	Alpha-BHC	2	1.7 - 1.7	µg/kg
Bluefish	Whole body	PCB/PEST	Alpha-Chlordane	2	30 - 50	µg/kg
Bluefish	Whole body	PCB/PEST	Beta-BHC	2	7 - 7	µg/kg
Bluefish	Whole body	PCB/PEST	Delta-BHC	2	5 - 5	µg/kg
Bluefish	Whole body	PCB/PEST	Dieldrin	2	3.3 - 3.3	µg/kg
Bluefish	Whole body	PCB/PEST	Endosulfan I	2	5 - 5	µg/kg
Bluefish	Whole body	PCB/PEST	Endosulfan II	2	7 - 7	µg/kg
Bluefish	Whole body	PCB/PEST	Endosulfan Sulfate	2	3.3 - 3.3	µg/kg
Bluefish	Whole body	PCB/PEST	Endrin	2	5 - 15	µg/kg
Bluefish	Whole body	PCB/PEST	Endrin Aldehyde	2	10 - 10	µg/kg
Bluefish	Whole body	PCB/PEST	Endrin Ketone	2	5 - 5	µg/kg
Bluefish	Whole body	PCB/PEST	Gamma-BHC (Lindane)	2	5 - 5	µg/kg
Bluefish	Whole body	PCB/PEST	Gamma-Chlordane	2	8 - 11	µg/kg
Bluefish	Whole body	PCB/PEST	Heptachlor	2	7 - 7	µg/kg
Bluefish	Whole body	PCB/PEST	Heptachlor Epoxide	2	5 - 5	µg/kg
Bluefish	Whole body	PCB/PEST	Methoxychlor	2	17 - 17	µg/kg
Bluefish	Whole body	PCB/PEST	Total DDT	2	274 - 290	µg/kg
Bluefish	Whole body	PCB/PEST	Total PCBs - Aroclors	2	1900 - 1930	µg/kg
Bluefish	Whole body	PCB/PEST	Toxaphene	2	170 - 170	µg/kg
Bluefish	Whole body	Physical Property	Percent Lipid	2	3.75 - 4.51	%
Bluefish	Whole body	Physical Property	Percent Moisture	2	74.5 - 75.1	% by wt.
Bluefish	Whole body	Semivolatiles	1,2,4-Trichlorobenzene	2	57 - 67	µg/kg
Bluefish	Whole body	Semivolatiles	1,2-Dichlorobenzene	2	9 - 11	µg/kg
Bluefish	Whole body	Semivolatiles	1,3-Dichlorobenzene	2	110 - 110	µg/kg
Bluefish	Whole body	Semivolatiles	1,4-Dichlorobenzene	2	250 - 250	µg/kg
Bluefish	Whole body	Semivolatiles	2,4,5-Trichlorophenol	2	280 - 280	µg/kg
Bluefish	Whole body	Semivolatiles	2,4,6-Trichlorophenol	2	250 - 250	µg/kg
Bluefish	Whole body	Semivolatiles	2,4-Dichloropheno	2	110 - 110	µg/kg
Bluefish	Whole body	Semivolatiles	2,4-Dimethylpheno	2	110 - 110	µg/kg
Bluefish	Whole body	Semivolatiles	2,4-Dinitropheno	2	1500 - 1500	µg/kg
Bluefish	Whole body	Semivolatiles	2,4-Dinitrotoluene	2	250 - 250	µg/kg
Bluefish	Whole body	Semivolatiles	2,6-Dinitrotoluene	2	110 - 110	µg/kg
Bluefish	Whole body	Semivolatiles	2-Chloronaphthalene	2	110 - 110	µg/kg
Bluefish	Whole body	Semivolatiles	2-Chloropheno	2	110 - 110	µg/kg
Bluefish	Whole body	Semivolatiles	2-Methylnaphthalene	2	110 - 110	µg/kg
Bluefish	Whole body	Semivolatiles	2-Methylpheno	2	250 - 250	µg/kg
Bluefish	Whole body	Semivolatiles	2-Nitroaniline	2	280 - 280	µg/kg
Bluefish	Whole body	Semivolatiles	2-Nitrophenol	2	110 - 110	µg/kg
Bluefish	Whole body	Semivolatiles	3,3'-Dichlorobenzidine	2	250 - 250	µg/kg
Bluefish	Whole body	Semivolatiles	3-Nitroaniline	2	500 - 500	µg/kg
Bluefish	Whole body	Semivolatiles	4,6-Dinitro-2-methylpheno	2	1500 - 1500	µg/kg
Bluefish	Whole body	Semivolatiles	4-Bromophenyl phenyl ether	2	110 - 110	µg/kg
Bluefish	Whole body	Semivolatiles	4-Chloro-3-methylpheno	2	110 - 110	µg/kg
Bluefish	Whole body	Semivolatiles	4-Chloroaniline	2	110 - 110	µg/kg
Bluefish	Whole body	Semivolatiles	4-Chlorophenyl phenyl ethe	2	110 - 110	µg/kg
Bluefish	Whole body	Semivolatiles	4-Methylpheno	2	750 - 750	µg/kg
Bluefish	Whole body	Semivolatiles	4-Nitroaniline	2	280 - 280	µg/kg
Bluefish	Whole body	Semivolatiles	4-Nitrophenol	2	1500 - 1500	µg/kg
Bluefish	Whole body	Semivolatiles	Acenaphthene	2	18 - 110	µg/kg
Bluefish	Whole body	Semivolatiles	Acenaphthylene	2	110 - 110	µg/kg
Bluefish	Whole body	Semivolatiles	Anthracene	2	110 - 110	µg/kg
Bluefish	Whole body	Semivolatiles	Benzo(a)anthracene	2	110 - 110	µg/kg
Bluefish	Whole body	Semivolatiles	Benzo(a)pyrene	2	250 - 250	µg/kg
Bluefish	Whole body	Semivolatiles	Benzo(b)fluoranthene	2	110 - 110	µg/kg
Bluefish	Whole body	Semivolatiles	Benzo(g,h,i)perylene	2	250 - 250	µg/kg

Table 3-59
Bioaccumulation Data from 1995-2001 Passaic RI Sampling Programs Including Tierra (1995a, 1999d, 2000c, 2001a)

Species	Tissue Type	Analyte Class[a]	Compound	Count	Range of Values	Units
Bluefish	Whole body	Semivolatiles	Benzo(k)fluoranthene	2	110 - 110	µg/kg
Bluefish	Whole body	Semivolatiles	bis(2-Chloroethoxy)methane	2	110 - 110	µg/kg
Bluefish	Whole body	Semivolatiles	bis(2-Chloroethyl)ether	2	110 - 110	µg/kg
Bluefish	Whole body	Semivolatiles	bis(2-Chloroisopropyl)ether	2	2500 - 2500	µg/kg
Bluefish	Whole body	Semivolatiles	bis(2-Ethylhexyl)phthalate	2	3000 - 3000	µg/kg
Bluefish	Whole body	Semivolatiles	Butyl benzyl phthalate	2	110 - 110	µg/kg
Bluefish	Whole body	Semivolatiles	Carbazole	2	1000 - 1000	µg/kg
Bluefish	Whole body	Semivolatiles	Chrysene	2	110 - 110	µg/kg
Bluefish	Whole body	Semivolatiles	Dibenzo(a,h)anthracene	2	250 - 250	µg/kg
Bluefish	Whole body	Semivolatiles	Dibenzofuran	2	110 - 110	µg/kg
Bluefish	Whole body	Semivolatiles	Diethyl phthalate	2	110 - 110	µg/kg
Bluefish	Whole body	Semivolatiles	Dimethylphthalate	2	110 - 110	µg/kg
Bluefish	Whole body	Semivolatiles	Di-n-Butylphthalate	2	110 - 110	µg/kg
Bluefish	Whole body	Semivolatiles	Di-n-Octylphthalate	2	500 - 500	µg/kg
Bluefish	Whole body	Semivolatiles	Fluoranthene	2	110 - 110	µg/kg
Bluefish	Whole body	Semivolatiles	Fluorene	2	110 - 110	µg/kg
Bluefish	Whole body	Semivolatiles	Hexachlorobenzene	2	110 - 110	µg/kg
Bluefish	Whole body	Semivolatiles	Hexachlorobutadiene	2	110 - 110	µg/kg
Bluefish	Whole body	Semivolatiles	Hexachlorocyclopentadiene	2	110 - 110	µg/kg
Bluefish	Whole body	Semivolatiles	Hexachloroethane	2	250 - 250	µg/kg
Bluefish	Whole body	Semivolatiles	Indeno(1,2,3-cd)pyrene	2	250 - 250	µg/kg
Bluefish	Whole body	Semivolatiles	Isophorone	2	250 - 250	µg/kg
Bluefish	Whole body	Semivolatiles	Naphthalene	2	110 - 110	µg/kg
Bluefish	Whole body	Semivolatiles	Nitrobenzene	2	250 - 250	µg/kg
Bluefish	Whole body	Semivolatiles	N-Nitroso-di-n-propylamine	2	250 - 250	µg/kg
Bluefish	Whole body	Semivolatiles	N-Nitrosodiphenylamine	2	250 - 250	µg/kg
Bluefish	Whole body	Semivolatiles	Pentachlorophenol	2	1500 - 1500	µg/kg
Bluefish	Whole body	Semivolatiles	Phenanthrene	2	110 - 110	µg/kg
Bluefish	Whole body	Semivolatiles	Phenol	2	90 - 500	µg/kg
Bluefish	Whole body	Semivolatiles	Pyrene	2	110 - 110	µg/kg
Brown Bullheac	Fillet - skin off	PCDD/Fs	2,3,7,8-TCDD	6	0.0742 - 0.226	µg/kg
Brown Bullheac	Fillet - skin off	PCDD/Fs	2,3,7,8-TCDF	6	0.00184 - 0.0051	µg/kg
Brown Bullheac	Fillet - skin off	Herbicides	2,4,5-T	6	0.91 - 1000	µg/kg
Brown Bullheac	Fillet - skin off	Herbicides	2,4,5-TP (Silvex)	6	1.4 - 100	µg/kg
Brown Bullheac	Fillet - skin off	Herbicides	2,4-D	6	17 - 2400	µg/kg
Brown Bullheac	Fillet - skin off	Herbicides	2,4-DB	6	13 - 1800	µg/kg
Brown Bullheac	Fillet - skin off	Homologue Groups	Total PCBs - Homologue Groups	6	1090 - 2490	µg/kg
Brown Bullheac	Fillet - skin off	Inorganic Chemicals	Ag	6	140 - 140	µg/kg
Brown Bullheac	Fillet - skin off	Inorganic Chemicals	Al	6	6500 - 13100	µg/kg
Brown Bullheac	Fillet - skin off	Inorganic Chemicals	As	6	380 - 380	µg/kg
Brown Bullheac	Fillet - skin off	Inorganic Chemicals	Ba	6	26 - 140	µg/kg
Brown Bullheac	Fillet - skin off	Inorganic Chemicals	Be	6	19 - 34	µg/kg
Brown Bullheac	Fillet - skin off	Inorganic Chemicals	Ca	6	90800 - 637000	µg/kg
Brown Bullheac	Fillet - skin off	Inorganic Chemicals	Cd	6	54 - 58	µg/kg
Brown Bullheac	Fillet - skin off	Inorganic Chemicals	Co	6	180 - 180	µg/kg
Brown Bullheac	Fillet - skin off	Inorganic Chemicals	Cr	6	140 - 210	µg/kg
Brown Bullheac	Fillet - skin off	Inorganic Chemicals	Cu	6	520 - 4000	µg/kg
Brown Bullheac	Fillet - skin off	Inorganic Chemicals	Fe	6	7400 - 12700	µg/kg
Brown Bullheac	Fillet - skin off	Inorganic Chemicals	Hg	6	92 - 190	µg/kg
Brown Bullheac	Fillet - skin off	Inorganic Chemicals	K	6	4120000 - 4640000	µg/kg
Brown Bullheac	Fillet - skin off	Inorganic Chemicals	Mg	6	244000 - 461000	µg/kg
Brown Bullheac	Fillet - skin off	Inorganic Chemicals	Mn	6	110 - 420	µg/kg
Brown Bullheac	Fillet - skin off	Inorganic Chemicals	Na	6	439000 - 545000	µg/kg
Brown Bullheac	Fillet - skin off	Inorganic Chemicals	Ni	6	200 - 910	µg/kg
Brown Bullheac	Fillet - skin off	Inorganic Chemicals	Pb	6	810 - 810	µg/kg
Brown Bullheac	Fillet - skin off	Inorganic Chemicals	Sb	6	740 - 1000	µg/kg
Brown Bullheac	Fillet - skin off	Inorganic Chemicals	Se	6	470 - 600	µg/kg
Brown Bullheac	Fillet - skin off	Inorganic Chemicals	Tl	6	840 - 840	µg/kg
Brown Bullheac	Fillet - skin off	Inorganic Chemicals	V	6	190 - 190	µg/kg
Brown Bullheac	Fillet - skin off	Inorganic Chemicals	Zn	6	5700 - 9700	µg/kg
Brown Bullheac	Fillet - skin off	Organotin	Dibutyltin	3	0.912 - 2	µg/kg
Brown Bullheac	Fillet - skin off	Organotin	Monobutyltir	3	0.243 - 0.368	µg/kg
Brown Bullheac	Fillet - skin off	Organotin	Tetrabutyltin	3	4 - 4	µg/kg
Brown Bullheac	Fillet - skin off	Organotin	Tributyltin	3	2.95 - 3.56	µg/kg
Brown Bullheac	Fillet - skin off	PAH-SIM	Total PAHs	3	76.9 - 195	µg/kg
Brown Bullheac	Fillet - skin off	PCB Congeners	Total PCBs - Congeners (NOAA 1989)	6	990 - 2210	µg/kg
Brown Bullheac	Fillet - skin off	PCB/PEST	4,4'-DDD	6	7 - 35	µg/kg
Brown Bullheac	Fillet - skin off	PCB/PEST	4,4'-DDE	6	11 - 60	µg/kg
Brown Bullheac	Fillet - skin off	PCB/PEST	4,4'-DDT	6	10 - 50	µg/kg
Brown Bullheac	Fillet - skin off	PCB/PEST	Aldrin	6	5 - 25	µg/kg
Brown Bullheac	Fillet - skin off	PCB/PEST	alpha-BHC	6	1.7 - 8.5	µg/kg
Brown Bullheac	Fillet - skin off	PCB/PEST	alpha-Chlordane	6	7.2 - 21	µg/kg
Brown Bullheac	Fillet - skin off	PCB/PEST	beta-BHC	6	7 - 35	µg/kg
Brown Bullheac	Fillet - skin off	PCB/PEST	delta-BHC	6	5 - 25	µg/kg
Brown Bullheac	Fillet - skin off	PCB/PEST	Dieldrin	6	3.3 - 17	µg/kg

Table 3-59
Bioaccumulation Data from 1995-2001 Passaic RI Sampling Programs Including Tierra (1995a, 1999d, 2000c, 2001a)

Species	Tissue Type	Analyte Class[a]	Compound	Count	Range of Values	Units
Brown Bullheac	Fillet - skin off	PCB/PEST	Endosulfan I	6	5 - 25	µg/kg
Brown Bullheac	Fillet - skin off	PCB/PEST	Endosulfan II	6	7 - 35	µg/kg
Brown Bullheac	Fillet - skin off	PCB/PEST	Endosulfan sulfate	6	3.3 - 17	µg/kg
Brown Bullheac	Fillet - skin off	PCB/PEST	Endrin	6	5 - 25	µg/kg
Brown Bullheac	Fillet - skin off	PCB/PEST	Endrin aldehyde	6	5 - 30	µg/kg
Brown Bullheac	Fillet - skin off	PCB/PEST	Endrin ketone	6	5 - 25	µg/kg
Brown Bullheac	Fillet - skin off	PCB/PEST	gamma-BHC (Lindane)	6	5 - 25	µg/kg
Brown Bullheac	Fillet - skin off	PCB/PEST	gamma-Chlordane	6	7.7 - 25	µg/kg
Brown Bullheac	Fillet - skin off	PCB/PEST	Heptachlor	6	7 - 35	µg/kg
Brown Bullheac	Fillet - skin off	PCB/PEST	Heptachlor epoxide	6	5 - 25	µg/kg
Brown Bullheac	Fillet - skin off	PCB/PEST	Methoxychlor	6	17 - 120	µg/kg
Brown Bullheac	Fillet - skin off	PCB/PEST	Total DDT	6	11 - 60	µg/kg
Brown Bullheac	Fillet - skin off	PCB/PEST	Total PCBs - Aroclors	6	342 - 1400	µg/kg
Brown Bullheac	Fillet - skin off	PCB/PEST	Toxaphene	6	170 - 850	µg/kg
Brown Bullheac	Fillet - skin off	Physical Property	Percent Lipid	6	2.265 - 3.401	%
Brown Bullheac	Fillet - skin off	Physical Property	Percent Moisture	5	76.7 - 79.3	% by wt.
Brown Bullheac	Fillet - skin off	Semivolatiles	1,2,4-Trichlorobenzene	6	18 - 110	µg/kg
Brown Bullheac	Fillet - skin off	Semivolatiles	1,2-Dichlorobenzene	6	110 - 180	µg/kg
Brown Bullheac	Fillet - skin off	Semivolatiles	1,3-Dichlorobenzene	6	110 - 180	µg/kg
Brown Bullheac	Fillet - skin off	Semivolatiles	1,4-Dichlorobenzene	6	250 - 410	µg/kg
Brown Bullheac	Fillet - skin off	Semivolatiles	2,4,5-Trichlorophenol	6	280 - 470	µg/kg
Brown Bullheac	Fillet - skin off	Semivolatiles	2,4,6-Trichlorophenol	6	250 - 410	µg/kg
Brown Bullheac	Fillet - skin off	Semivolatiles	2,4-Dichloropheno	6	15 - 180	µg/kg
Brown Bullheac	Fillet - skin off	Semivolatiles	2,4-Dimethylpheno	6	110 - 180	µg/kg
Brown Bullheac	Fillet - skin off	Semivolatiles	2,4-Dinitropheno	6	1500 - 2500	µg/kg
Brown Bullheac	Fillet - skin off	Semivolatiles	2,4-Dinitrotoluene	6	250 - 410	µg/kg
Brown Bullheac	Fillet - skin off	Semivolatiles	2,6-Dinitrotoluene	6	110 - 180	µg/kg
Brown Bullheac	Fillet - skin off	Semivolatiles	2-Chloronaphthalene	6	110 - 180	µg/kg
Brown Bullheac	Fillet - skin off	Semivolatiles	2-Chloropheno	6	24 - 110	µg/kg
Brown Bullheac	Fillet - skin off	Semivolatiles	2-Methylnaphthalene	6	110 - 180	µg/kg
Brown Bullheac	Fillet - skin off	Semivolatiles	2-Methylpheno	6	250 - 410	µg/kg
Brown Bullheac	Fillet - skin off	Semivolatiles	2-Nitroaniline	6	280 - 470	µg/kg
Brown Bullheac	Fillet - skin off	Semivolatiles	2-Nitrophenol	6	110 - 180	µg/kg
Brown Bullheac	Fillet - skin off	Semivolatiles	3,3'-Dichlorobenzidine	6	250 - 410	µg/kg
Brown Bullheac	Fillet - skin off	Semivolatiles	3-Nitroaniline	6	500 - 830	µg/kg
Brown Bullheac	Fillet - skin off	Semivolatiles	4,6-Dinitro-2-methylpheno	6	1500 - 2500	µg/kg
Brown Bullheac	Fillet - skin off	Semivolatiles	4-Bromophenyl phenyl ether	6	110 - 180	µg/kg
Brown Bullheac	Fillet - skin off	Semivolatiles	4-Chloro-3-methylpheno	6	110 - 180	µg/kg
Brown Bullheac	Fillet - skin off	Semivolatiles	4-Chloroaniline	6	110 - 180	µg/kg
Brown Bullheac	Fillet - skin off	Semivolatiles	4-Chlorophenyl phenyl ethe	6	110 - 180	µg/kg
Brown Bullheac	Fillet - skin off	Semivolatiles	4-Methylpheno	6	750 - 84000	µg/kg
Brown Bullheac	Fillet - skin off	Semivolatiles	4-Nitroaniline	6	280 - 470	µg/kg
Brown Bullheac	Fillet - skin off	Semivolatiles	4-Nitrophenol	6	1500 - 2500	µg/kg
Brown Bullheac	Fillet - skin off	Semivolatiles	Acenaphthene	6	17 - 110	µg/kg
Brown Bullheac	Fillet - skin off	Semivolatiles	Acenaphthylene	6	110 - 180	µg/kg
Brown Bullheac	Fillet - skin off	Semivolatiles	Anthracene	6	49 - 110	µg/kg
Brown Bullheac	Fillet - skin off	Semivolatiles	Benzo(a)anthracene	6	110 - 180	µg/kg
Brown Bullheac	Fillet - skin off	Semivolatiles	Benzo(a)pyrene	6	250 - 410	µg/kg
Brown Bullheac	Fillet - skin off	Semivolatiles	Benzo(b)fluoranthene	6	110 - 180	µg/kg
Brown Bullheac	Fillet - skin off	Semivolatiles	Benzo(g,h,i)perylene	6	250 - 410	µg/kg
Brown Bullheac	Fillet - skin off	Semivolatiles	Benzo(k)fluoranthene	6	110 - 180	µg/kg
Brown Bullheac	Fillet - skin off	Semivolatiles	bis(2-Chloroethoxy)methane	6	110 - 180	µg/kg
Brown Bullheac	Fillet - skin off	Semivolatiles	bis(2-Chloroethyl)ether	6	110 - 180	µg/kg
Brown Bullheac	Fillet - skin off	Semivolatiles	bis(2-Chloroisopropyl)ether	6	2500 - 4200	µg/kg
Brown Bullheac	Fillet - skin off	Semivolatiles	bis(2-Ethylhexyl)phthalate	6	3000 - 5000	µg/kg
Brown Bullheac	Fillet - skin off	Semivolatiles	Butyl benzyl phthalate	6	110 - 180	µg/kg
Brown Bullheac	Fillet - skin off	Semivolatiles	Carbazole	6	1000 - 1700	µg/kg
Brown Bullheac	Fillet - skin off	Semivolatiles	Chrysene	6	110 - 180	µg/kg
Brown Bullheac	Fillet - skin off	Semivolatiles	Dibenzo(a,h)anthracene	6	250 - 410	µg/kg
Brown Bullheac	Fillet - skin off	Semivolatiles	Dibenzofuran	6	110 - 180	µg/kg
Brown Bullheac	Fillet - skin off	Semivolatiles	Diethyl phthalate	6	28 - 260	µg/kg
Brown Bullheac	Fillet - skin off	Semivolatiles	Dimethylphthalate	6	110 - 180	µg/kg
Brown Bullheac	Fillet - skin off	Semivolatiles	Di-n-butylphthalate	6	110 - 320	µg/kg
Brown Bullheac	Fillet - skin off	Semivolatiles	Di-n-octylphthalate	6	500 - 830	µg/kg
Brown Bullheac	Fillet - skin off	Semivolatiles	Fluoranthene	6	110 - 180	µg/kg
Brown Bullheac	Fillet - skin off	Semivolatiles	Fluorene	6	110 - 180	µg/kg
Brown Bullheac	Fillet - skin off	Semivolatiles	Hexachlorobenzene	6	110 - 180	µg/kg
Brown Bullheac	Fillet - skin off	Semivolatiles	Hexachlorobutadiene	6	110 - 180	µg/kg
Brown Bullheac	Fillet - skin off	Semivolatiles	Hexachlorocyclopentadiene	6	110 - 180	µg/kg
Brown Bullheac	Fillet - skin off	Semivolatiles	Hexachloroethane	6	250 - 410	µg/kg
Brown Bullheac	Fillet - skin off	Semivolatiles	Indeno(1,2,3-cd)pyrene	6	250 - 410	µg/kg
Brown Bullheac	Fillet - skin off	Semivolatiles	Isophorone	6	98 - 250	µg/kg
Brown Bullheac	Fillet - skin off	Semivolatiles	Naphthalene	6	41 - 110	µg/kg
Brown Bullheac	Fillet - skin off	Semivolatiles	Nitrobenzene	6	250 - 410	µg/kg
Brown Bullheac	Fillet - skin off	Semivolatiles	N-Nitroso-di-n-propylamine	6	250 - 410	µg/kg

Table 3-59
Bioaccumulation Data from 1995-2001 Passaic RI Sampling Programs Including Tierra (1995a, 1999d, 2000c, 2001a)

Species	Tissue Type	Analyte Class[a]	Compound	Count	Range of Values	Units
Brown Bullheac	Fillet - skin off	Semivolatiles	N-Nitrosodiphenylamine	6	250 - 410	µg/kg
Brown Bullheac	Fillet - skin off	Semivolatiles	Pentachloropheno	6	1500 - 2500	µg/kg
Brown Bullheac	Fillet - skin off	Semivolatiles	Phenanthrene	6	33 - 110	µg/kg
Brown Bullheac	Fillet - skin off	Semivolatiles	Phenol	6	120 - 600	µg/kg
Brown Bullheac	Fillet - skin off	Semivolatiles	Pyrene	6	46 - 110	µg/kg
Mummichog	Whole body	Cyanide	Total Cyanide	5	500 - 500	µg/kg
Mummichog	Whole body	PCDD/Fs	2,3,7,8-TCDD	56	0.0185 - 0.828	µg/kg
Mummichog	Whole body	PCDD/Fs	2,3,7,8-TCDF	56	0.000848 - 0.00373	µg/kg
Mummichog	Whole body	Herbicides	2,4,5-T	47	1.8 - 100	µg/kg
Mummichog	Whole body	Herbicides	2,4,5-TP (Silvex)	47	6 - 100	µg/kg
Mummichog	Whole body	Herbicides	2,4-D	50	120 - 240	µg/kg
Mummichog	Whole body	Herbicides	2,4-DB	50	180 - 450	µg/kg
Mummichog	Whole body	Homologue Groups	Total PCBs - Homologue Groups	50	807 - 1940	µg/kg
Mummichog	Whole body	Inorganic Chemicals	Ag	56	75 - 4100	µg/kg
Mummichog	Whole body	Inorganic Chemicals	Al	56	2900 - 77900	µg/kg
Mummichog	Whole body	Inorganic Chemicals	As	56	290 - 1000	µg/kg
Mummichog	Whole body	Inorganic Chemicals	Ba	56	790 - 2600	µg/kg
Mummichog	Whole body	Inorganic Chemicals	Be	56	26 - 60	µg/kg
Mummichog	Whole body	Inorganic Chemicals	Ca	56	7200000 - 19900000	µg/kg
Mummichog	Whole body	Inorganic Chemicals	Cd	56	40 - 170	µg/kg
Mummichog	Whole body	Inorganic Chemicals	Co	56	110 - 600	µg/kg
Mummichog	Whole body	Inorganic Chemicals	Cr	56	410 - 2000	µg/kg
Mummichog	Whole body	Inorganic Chemicals	Cu	56	1900 - 7200	µg/kg
Mummichog	Whole body	Inorganic Chemicals	Fe	56	15300 - 243000	µg/kg
Mummichog	Whole body	Inorganic Chemicals	Hg	56	20 - 150	µg/kg
Mummichog	Whole body	Inorganic Chemicals	K	56	2190000 - 6070000	µg/kg
Mummichog	Whole body	Inorganic Chemicals	Mg	56	350000 - 831000	µg/kg
Mummichog	Whole body	Inorganic Chemicals	Mn	56	3700 - 15400	µg/kg
Mummichog	Whole body	Inorganic Chemicals	Na	56	1120000 - 2820000	µg/kg
Mummichog	Whole body	Inorganic Chemicals	Ni	56	130 - 5400	µg/kg
Mummichog	Whole body	Inorganic Chemicals	Pb	29	250 - 2800	µg/kg
Mummichog	Whole body	Inorganic Chemicals	Sb	56	320 - 8900	µg/kg
Mummichog	Whole body	Inorganic Chemicals	Se	56	520 - 1600	µg/kg
Mummichog	Whole body	Inorganic Chemicals	Ti	5	210 - 2800	µg/kg
Mummichog	Whole body	Inorganic Chemicals	Tl	49	330 - 1200	µg/kg
Mummichog	Whole body	Inorganic Chemicals	V	56	170 - 800	µg/kg
Mummichog	Whole body	Inorganic Chemicals	Zn	56	33000 - 76800	µg/kg
Mummichog	Whole body	Miscellaneous Chemica	Methyl Hg	5	39.6 - 76.8	µg/kg
Mummichog	Whole body	Organotin	Dibutyltin	55	0.637 - 100	µg/kg
Mummichog	Whole body	Organotin	Monobutyltir	55	0.176 - 150	µg/kg
Mummichog	Whole body	Organotin	Tetrabutyltin	55	4 - 100	µg/kg
Mummichog	Whole body	Organotin	Tributyltin	55	2.26 - 100	µg/kg
Mummichog	Whole body	PAH-SIM	HMW PAHs	55	4.2 - 79.8	µg/kg
Mummichog	Whole body	PAH-SIM	LMW PAHs	55	9.5 - 329	µg/kg
Mummichog	Whole body	PAH-SIM	Total PAHs	55	14.5 - 362	µg/kg
Mummichog	Whole body	PCB Congeners	Total PCBs - Congeners (NOAA 1989)	50	766 - 1730	µg/kg
Mummichog	Whole body	PCB/PEST	4,4'-DDD	56	7 - 70	µg/kg
Mummichog	Whole body	PCB/PEST	4,4'-DDE	56	15 - 150	µg/kg
Mummichog	Whole body	PCB/PEST	4,4'-DDT	56	1.82 - 120	µg/kg
Mummichog	Whole body	PCB/PEST	Aldrin	56	1.2 - 5	µg/kg
Mummichog	Whole body	PCB/PEST	Alpha-BHC	56	0.72 - 3.04	µg/kg
Mummichog	Whole body	PCB/PEST	Alpha-Chlordane	56	3 - 30	µg/kg
Mummichog	Whole body	PCB/PEST	Beta-BHC	56	0.9 - 7	µg/kg
Mummichog	Whole body	PCB/PEST	Delta-BHC	56	1.5 - 9	µg/kg
Mummichog	Whole body	PCB/PEST	Dieldrin	56	3.3 - 11.1	µg/kg
Mummichog	Whole body	PCB/PEST	Endosulfan I	56	0.86 - 5	µg/kg
Mummichog	Whole body	PCB/PEST	Endosulfan II	56	4.51 - 13.5	µg/kg
Mummichog	Whole body	PCB/PEST	Endosulfan Sulfate	56	3 - 3.3	µg/kg
Mummichog	Whole body	PCB/PEST	Endrin	56	1.68 - 10.7	µg/kg
Mummichog	Whole body	PCB/PEST	Endrin Aldehyde	56	1.2 - 10	µg/kg
Mummichog	Whole body	PCB/PEST	Endrin Ketone	56	2.84 - 25.1	µg/kg
Mummichog	Whole body	PCB/PEST	Gamma-BHC (Lindane)	56	0.8 - 5	µg/kg
Mummichog	Whole body	PCB/PEST	Gamma-Chlordane	56	5 - 16.8	µg/kg
Mummichog	Whole body	PCB/PEST	Heptachlor	56	0.84 - 7	µg/kg
Mummichog	Whole body	PCB/PEST	Heptachlor Epoxide	56	3.17 - 50	µg/kg
Mummichog	Whole body	PCB/PEST	Methoxychlor	56	6.72 - 17	µg/kg
Mummichog	Whole body	PCB/PEST	Total Alpha + Gamma Chlordane	8	3.9 - 29.3	µg/kg
Mummichog	Whole body	PCB/PEST	Total DDT	54	10 - 228	µg/kg
Mummichog	Whole body	PCB/PEST	Total PCBs - Aroclors	56	116 - 1020	µg/kg
Mummichog	Whole body	PCB/PEST	Toxaphene	56	136 - 170	µg/kg
Mummichog	Whole body	Physical Property	Percent Lipid	56	0.75 - 4.87	%
Mummichog	Whole body	Physical Property	Percent Moisture	50	73.6 - 78.7	% by wt.
Mummichog	Whole body	Semivolatiles	1,2,4-Trichlorobenzene	56	14 - 110	µg/kg
Mummichog	Whole body	Semivolatiles	1,2-Dichlorobenzene	56	8 - 110	µg/kg
Mummichog	Whole body	Semivolatiles	1,3-Dichlorobenzene	56	16 - 110	µg/kg

Table 3-59
Bioaccumulation Data from 1995-2001 Passaic RI Sampling Programs Including Tierra (1995a, 1999d, 2000c, 2001a)

Species	Tissue Type	Analyte Class[a]	Compound	Count	Range of Values	Units
Mummichog	Whole body	Semivolatiles	1,4-Dichlorobenzene	56	36 - 250	µg/kg
Mummichog	Whole body	Semivolatiles	2,4,5-Trichlorophenol	56	150 - 8500	µg/kg
Mummichog	Whole body	Semivolatiles	2,4,6-Trichlorophenol	56	39 - 2800	µg/kg
Mummichog	Whole body	Semivolatiles	2,4-Dichloropheno	56	14 - 14000	µg/kg
Mummichog	Whole body	Semivolatiles	2,4-Dimethylpheno	56	25 - 110	µg/kg
Mummichog	Whole body	Semivolatiles	2,4-Dinitropheno	56	260 - 1500	µg/kg
Mummichog	Whole body	Semivolatiles	2,4-Dinitrotoluene	56	39 - 250	µg/kg
Mummichog	Whole body	Semivolatiles	2,6-Dinitrotoluene	56	38 - 110	µg/kg
Mummichog	Whole body	Semivolatiles	2-Chloronaphthalene	56	39 - 110	µg/kg
Mummichog	Whole body	Semivolatiles	2-Chloropheno	56	22 - 110	µg/kg
Mummichog	Whole body	Semivolatiles	2-Methylnaphthalene	56	26 - 110	µg/kg
Mummichog	Whole body	Semivolatiles	2-Methylpheno	56	27 - 250	µg/kg
Mummichog	Whole body	Semivolatiles	2-Nitroaniline	56	130 - 280	µg/kg
Mummichog	Whole body	Semivolatiles	2-Nitrophenol	56	31 - 110	µg/kg
Mummichog	Whole body	Semivolatiles	3,3'-Dichlorobenzidine	56	96 - 1300	µg/kg
Mummichog	Whole body	Semivolatiles	3-Nitroaniline	56	240 - 500	µg/kg
Mummichog	Whole body	Semivolatiles	4,6-Dinitro-2-methylpheno	56	120 - 1500	µg/kg
Mummichog	Whole body	Semivolatiles	4-Bromophenyl phenyl ether	56	38 - 110	µg/kg
Mummichog	Whole body	Semivolatiles	4-Chloro-3-methylpheno	56	35 - 110	µg/kg
Mummichog	Whole body	Semivolatiles	4-Chloroaniline	56	63 - 110	µg/kg
Mummichog	Whole body	Semivolatiles	4-Chlorophenyl phenyl ethe	56	52 - 110	µg/kg
Mummichog	Whole body	Semivolatiles	4-Methylpheno	56	62 - 750	µg/kg
Mummichog	Whole body	Semivolatiles	4-Nitroaniline	56	130 - 280	µg/kg
Mummichog	Whole body	Semivolatiles	4-Nitrophenol	56	140 - 1500	µg/kg
Mummichog	Whole body	Semivolatiles	Acenaphthene	51	12 - 110	µg/kg
Mummichog	Whole body	Semivolatiles	Acenaphthylene	51	110 - 110	µg/kg
Mummichog	Whole body	Semivolatiles	Anthracene	51	110 - 110	µg/kg
Mummichog	Whole body	Semivolatiles	Benzo(a)anthracene	51	10 - 670	µg/kg
Mummichog	Whole body	Semivolatiles	Benzo(a)pyrene	51	250 - 250	µg/kg
Mummichog	Whole body	Semivolatiles	Benzo(b)fluoranthene	51	110 - 110	µg/kg
Mummichog	Whole body	Semivolatiles	Benzo(g,h,i)perylene	51	250 - 250	µg/kg
Mummichog	Whole body	Semivolatiles	Benzo(k)fluoranthene	51	110 - 110	µg/kg
Mummichog	Whole body	Semivolatiles	Benzoic Acid	5	800 - 800	µg/kg
Mummichog	Whole body	Semivolatiles	Benzyl Alcoho	5	27 - 27	µg/kg
Mummichog	Whole body	Semivolatiles	bis(2-Chloroethoxy)methane	56	46 - 110	µg/kg
Mummichog	Whole body	Semivolatiles	bis(2-Chloroethyl)ether	56	43 - 110	µg/kg
Mummichog	Whole body	Semivolatiles	bis(2-Chloroisopropyl)ether	56	46 - 2500	µg/kg
Mummichog	Whole body	Semivolatiles	bis(2-Ethylhexyl)phthalate	56	11 - 3000	µg/kg
Mummichog	Whole body	Semivolatiles	Butyl benzyl phthalate	56	21 - 110	µg/kg
Mummichog	Whole body	Semivolatiles	Carbazole	56	29 - 1000	µg/kg
Mummichog	Whole body	Semivolatiles	Chrysene	51	110 - 110	µg/kg
Mummichog	Whole body	Semivolatiles	Dibenzo(a,h)anthracene	51	250 - 250	µg/kg
Mummichog	Whole body	Semivolatiles	Dibenzofuran	56	49 - 110	µg/kg
Mummichog	Whole body	Semivolatiles	Diethyl phthalate	56	16 - 1300	µg/kg
Mummichog	Whole body	Semivolatiles	Dimethylphthalate	56	34 - 110	µg/kg
Mummichog	Whole body	Semivolatiles	Di-n-Butylphthalate	56	29 - 110	µg/kg
Mummichog	Whole body	Semivolatiles	Di-n-Octylphthalate	56	67 - 500	µg/kg
Mummichog	Whole body	Semivolatiles	Fluoranthene	51	21 - 110	µg/kg
Mummichog	Whole body	Semivolatiles	Fluorene	51	16 - 110	µg/kg
Mummichog	Whole body	Semivolatiles	Hexachlorobenzene	56	54 - 110	µg/kg
Mummichog	Whole body	Semivolatiles	Hexachlorobutadiene	56	47 - 110	µg/kg
Mummichog	Whole body	Semivolatiles	Hexachlorocyclopentadiene	56	60 - 110	µg/kg
Mummichog	Whole body	Semivolatiles	Hexachloroethane	56	53 - 250	µg/kg
Mummichog	Whole body	Semivolatiles	Indeno(1,2,3-cd)pyrene	51	250 - 250	µg/kg
Mummichog	Whole body	Semivolatiles	Isophorone	56	31 - 250	µg/kg
Mummichog	Whole body	Semivolatiles	Naphthalene	51	11 - 180	µg/kg
Mummichog	Whole body	Semivolatiles	Nitrobenzene	56	37 - 250	µg/kg
Mummichog	Whole body	Semivolatiles	N-Nitroso-di-n-propylamine	56	60 - 250	µg/kg
Mummichog	Whole body	Semivolatiles	N-Nitrosodiphenylamine	56	36 - 250	µg/kg
Mummichog	Whole body	Semivolatiles	Pentachloropheno	56	160 - 1500	µg/kg
Mummichog	Whole body	Semivolatiles	Phenanthrene	51	15 - 110	µg/kg
Mummichog	Whole body	Semivolatiles	Phenol	56	39 - 1300	µg/kg
Mummichog	Whole body	Semivolatiles	Pyrene	51	110 - 110	µg/kg
Mummichog	Whole body	TPH	Petroleum Hydrocarbons (extractable)	4	535000 - 1520000	µg/kg
Atlantic Agside	Whole body	PCDD/Fs	2,3,7,8-TCDD	9	0.0214 - 0.0595	µg/kg
Atlantic Agside	Whole body	PCDD/Fs	2,3,7,8-TCDF	9	0.00421 - 0.0082	µg/kg
Atlantic Agside	Whole body	Herbicides	2,4,5-T	8	5.6 - 100	µg/kg
Atlantic Agside	Whole body	Herbicides	2,4,5-TP (Silvex)	9	11.2 - 100	µg/kg
Atlantic Agside	Whole body	Herbicides	2,4-D	8	58 - 240	µg/kg
Atlantic Agside	Whole body	Herbicides	2,4-DB	7	142 - 180	µg/kg
Atlantic Agside	Whole body	Homologue Groups	Total PCBs - Homologue Groups	9	555 - 1150	µg/kg
Atlantic Agside	Whole body	Inorganic Chemicals	Ag	9	62 - 63	µg/kg
Atlantic Agside	Whole body	Inorganic Chemicals	Al	9	6200 - 91700	µg/kg
Atlantic Agside	Whole body	Inorganic Chemicals	As	9	320 - 330	µg/kg
Atlantic Agside	Whole body	Inorganic Chemicals	Ba	9	340 - 2000	µg/kg

Table 3-59
Bioaccumulation Data from 1995-2001 Passaic RI Sampling Programs Including Tierra (1995a, 1999d, 2000c, 2001a)

Species	Tissue Type	Analyte Class[a]	Compound	Count	Range of Values	Units
Atlantic Agside	Whole body	Inorganic Chemicals	Be	9	20 - 20	µg/kg
Atlantic Agside	Whole body	Inorganic Chemicals	Ca	9	3580000 - 13500000	µg/kg
Atlantic Agside	Whole body	Inorganic Chemicals	Cd	9	69 - 110	µg/kg
Atlantic Agside	Whole body	Inorganic Chemicals	Co	9	110 - 110	µg/kg
Atlantic Agside	Whole body	Inorganic Chemicals	Cr	9	210 - 1800	µg/kg
Atlantic Agside	Whole body	Inorganic Chemicals	Cu	9	240 - 1300	µg/kg
Atlantic Agside	Whole body	Inorganic Chemicals	Fe	9	14800 - 141000	µg/kg
Atlantic Agside	Whole body	Inorganic Chemicals	Hg	9	49 - 77	µg/kg
Atlantic Agside	Whole body	Inorganic Chemicals	K	9	312000 - 2750000	µg/kg
Atlantic Agside	Whole body	Inorganic Chemicals	Mg	9	357000 - 868000	µg/kg
Atlantic Agside	Whole body	Inorganic Chemicals	Mn	9	1100 - 11600	µg/kg
Atlantic Agside	Whole body	Inorganic Chemicals	Na	9	1490000 - 4110000	µg/kg
Atlantic Agside	Whole body	Inorganic Chemicals	Ni	9	120 - 8100	µg/kg
Atlantic Agside	Whole body	Inorganic Chemicals	Sb	9	190 - 300	µg/kg
Atlantic Agside	Whole body	Inorganic Chemicals	Se	9	270 - 650	µg/kg
Atlantic Agside	Whole body	Inorganic Chemicals	Tl	9	370 - 380	µg/kg
Atlantic Agside	Whole body	Inorganic Chemicals	V	9	37 - 400	µg/kg
Atlantic Agside	Whole body	Inorganic Chemicals	Zn	9	19600 - 50300	µg/kg
Atlantic Agside	Whole body	Organotin	Dibutyltin	9	1.18 - 4.06	µg/kg
Atlantic Agside	Whole body	Organotin	Monobutyltir	9	0.26 - 1.53	µg/kg
Atlantic Agside	Whole body	Organotin	Tetrabutyltin	9	4 - 4	µg/kg
Atlantic Agside	Whole body	Organotin	Tributyltin	9	4.08 - 9.15	µg/kg
Atlantic Agside	Whole body	PAH-SIM	HMW PAHs	8	2.7 - 226	µg/kg
Atlantic Agside	Whole body	PAH-SIM	LMW PAHs	9	3.8 - 36	µg/kg
Atlantic Agside	Whole body	PAH-SIM	Total PAHs	9	5 - 262	µg/kg
Atlantic Agside	Whole body	PCB Congeners	Total PCBs - Congeners (NOAA 1989)	9	502 - 1060	µg/kg
Atlantic Agside	Whole body	PCB/PEST	4,4'-DDD	9	7 - 14.9	µg/kg
Atlantic Agside	Whole body	PCB/PEST	4,4'-DDE	9	15 - 40	µg/kg
Atlantic Agside	Whole body	PCB/PEST	4,4'-DDT	9	11 - 35	µg/kg
Atlantic Agside	Whole body	PCB/PEST	Aldrin	9	5 - 5	µg/kg
Atlantic Agside	Whole body	PCB/PEST	Alpha-BHC	9	1.7 - 1.7	µg/kg
Atlantic Agside	Whole body	PCB/PEST	Alpha-Chlordane	9	3 - 4	µg/kg
Atlantic Agside	Whole body	PCB/PEST	Beta-BHC	9	7 - 7	µg/kg
Atlantic Agside	Whole body	PCB/PEST	Delta-BHC	9	5 - 5	µg/kg
Atlantic Agside	Whole body	PCB/PEST	Dieldrin	9	3.3 - 3.3	µg/kg
Atlantic Agside	Whole body	PCB/PEST	Endosulfan I	9	5 - 5	µg/kg
Atlantic Agside	Whole body	PCB/PEST	Endosulfan II	9	7 - 7	µg/kg
Atlantic Agside	Whole body	PCB/PEST	Endosulfan Sulfate	9	3.3 - 3.3	µg/kg
Atlantic Agside	Whole body	PCB/PEST	Endrin	9	5 - 7	µg/kg
Atlantic Agside	Whole body	PCB/PEST	Endrin Aldehyde	9	5 - 6	µg/kg
Atlantic Agside	Whole body	PCB/PEST	Endrin Ketone	9	5 - 5	µg/kg
Atlantic Agside	Whole body	PCB/PEST	Gamma-BHC (Lindane)	9	5 - 5	µg/kg
Atlantic Agside	Whole body	PCB/PEST	Gamma-Chlordane	9	5 - 5	µg/kg
Atlantic Agside	Whole body	PCB/PEST	Heptachlor	9	7 - 7	µg/kg
Atlantic Agside	Whole body	PCB/PEST	Heptachlor Epoxide	9	5 - 5	µg/kg
Atlantic Agside	Whole body	PCB/PEST	Methoxychlor	9	17 - 17	µg/kg
Atlantic Agside	Whole body	PCB/PEST	Total DDT	9	15 - 85.9	µg/kg
Atlantic Agside	Whole body	PCB/PEST	Total PCBs - Aroclors	9	252 - 708	µg/kg
Atlantic Agside	Whole body	PCB/PEST	Toxaphene	9	170 - 170	µg/kg
Atlantic Agside	Whole body	Physical Property	Percent Lipid	9	0.676 - 1.54	%
Atlantic Agside	Whole body	Physical Property	Percent Moisture	8	78.2 - 89.3	% by wt.
Atlantic Agside	Whole body	Semivolatiles	1,2,4-Trichlorobenzene	9	110 - 110	µg/kg
Atlantic Agside	Whole body	Semivolatiles	1,2-Dichlorobenzene	9	110 - 110	µg/kg
Atlantic Agside	Whole body	Semivolatiles	1,3-Dichlorobenzene	9	110 - 110	µg/kg
Atlantic Agside	Whole body	Semivolatiles	1,4-Dichlorobenzene	9	250 - 250	µg/kg
Atlantic Agside	Whole body	Semivolatiles	2,4,5-Trichlorophenol	9	280 - 1100	µg/kg
Atlantic Agside	Whole body	Semivolatiles	2,4,6-Trichlorophenol	9	95 - 250	µg/kg
Atlantic Agside	Whole body	Semivolatiles	2,4-Dichloropheno	9	110 - 1200	µg/kg
Atlantic Agside	Whole body	Semivolatiles	2,4-Dimethylpheno	9	110 - 110	µg/kg
Atlantic Agside	Whole body	Semivolatiles	2,4-Dinitropheno	9	1500 - 1500	µg/kg
Atlantic Agside	Whole body	Semivolatiles	2,4-Dinitrotoluene	9	250 - 250	µg/kg
Atlantic Agside	Whole body	Semivolatiles	2,6-Dinitrotoluene	9	110 - 110	µg/kg
Atlantic Agside	Whole body	Semivolatiles	2-Chloronaphthalene	9	110 - 110	µg/kg
Atlantic Agside	Whole body	Semivolatiles	2-Chloropheno	9	110 - 110	µg/kg
Atlantic Agside	Whole body	Semivolatiles	2-Methylnaphthalene	9	110 - 110	µg/kg
Atlantic Agside	Whole body	Semivolatiles	2-Methylpheno	9	250 - 250	µg/kg
Atlantic Agside	Whole body	Semivolatiles	2-Nitroaniline	9	280 - 280	µg/kg
Atlantic Agside	Whole body	Semivolatiles	2-Nitrophenol	9	110 - 110	µg/kg
Atlantic Agside	Whole body	Semivolatiles	3,3'-Dichlorobenzidine	9	250 - 250	µg/kg
Atlantic Agside	Whole body	Semivolatiles	3-Nitroaniline	9	500 - 500	µg/kg
Atlantic Agside	Whole body	Semivolatiles	4,6-Dinitro-2-methylpheno	9	1500 - 1500	µg/kg
Atlantic Agside	Whole body	Semivolatiles	4-Bromophenyl phenyl ethe	9	110 - 110	µg/kg
Atlantic Agside	Whole body	Semivolatiles	4-Chloro-3-methylpheno	9	110 - 110	µg/kg
Atlantic Agside	Whole body	Semivolatiles	4-Chloroaniline	9	110 - 110	µg/kg
Atlantic Agside	Whole body	Semivolatiles	4-Chlorophenyl phenyl ethe	9	110 - 110	µg/kg

Table 3-59
Bioaccumulation Data from 1995-2001 Passaic RI Sampling Programs Including Tierra (1995a, 1999d, 2000c, 2001a)

Species	Tissue Type	Analyte Class[a]	Compound	Count	Range of Values	Units
Atlantic Agside	Whole body	Semivolatiles	4-Methylpheno	9	750 - 8700	µg/kg
Atlantic Agside	Whole body	Semivolatiles	4-Nitroaniline	9	280 - 280	µg/kg
Atlantic Agside	Whole body	Semivolatiles	4-Nitrophenol	9	1500 - 1500	µg/kg
Atlantic Agside	Whole body	Semivolatiles	Acenaphthene	9	110 - 110	µg/kg
Atlantic Agside	Whole body	Semivolatiles	Acenaphthylene	9	110 - 110	µg/kg
Atlantic Agside	Whole body	Semivolatiles	Anthracene	9	110 - 110	µg/kg
Atlantic Agside	Whole body	Semivolatiles	Benzo(a)anthracene	9	110 - 110	µg/kg
Atlantic Agside	Whole body	Semivolatiles	Benzo(a)pyrene	9	250 - 250	µg/kg
Atlantic Agside	Whole body	Semivolatiles	Benzo(b)fluoranthene	9	110 - 110	µg/kg
Atlantic Agside	Whole body	Semivolatiles	Benzo(g,h,i)perylene	9	250 - 250	µg/kg
Atlantic Agside	Whole body	Semivolatiles	Benzo(k)fluoranthene	9	110 - 110	µg/kg
Atlantic Agside	Whole body	Semivolatiles	bis(2-Chloroethoxy)methane	9	110 - 110	µg/kg
Atlantic Agside	Whole body	Semivolatiles	bis(2-Chloroethyl)ether	9	110 - 110	µg/kg
Atlantic Agside	Whole body	Semivolatiles	bis(2-Chloroisopropyl)ether	9	2500 - 2500	µg/kg
Atlantic Agside	Whole body	Semivolatiles	bis(2-Ethylhexyl)phthalate	9	650 - 3000	µg/kg
Atlantic Agside	Whole body	Semivolatiles	Butyl benzyl phthalate	9	110 - 110	µg/kg
Atlantic Agside	Whole body	Semivolatiles	Carbazole	9	1000 - 1000	µg/kg
Atlantic Agside	Whole body	Semivolatiles	Chrysene	9	110 - 110	µg/kg
Atlantic Agside	Whole body	Semivolatiles	Dibenzo(a,h)anthracene	9	250 - 250	µg/kg
Atlantic Agside	Whole body	Semivolatiles	Dibenzofuran	9	110 - 110	µg/kg
Atlantic Agside	Whole body	Semivolatiles	Diethyl phthalate	9	77 - 110	µg/kg
Atlantic Agside	Whole body	Semivolatiles	Dimethylphthalate	9	110 - 110	µg/kg
Atlantic Agside	Whole body	Semivolatiles	Di-n-Butylphthalate	9	60 - 110	µg/kg
Atlantic Agside	Whole body	Semivolatiles	Di-n-Octylphthalate	9	500 - 500	µg/kg
Atlantic Agside	Whole body	Semivolatiles	Fluoranthene	9	110 - 110	µg/kg
Atlantic Agside	Whole body	Semivolatiles	Fluorene	9	110 - 110	µg/kg
Atlantic Agside	Whole body	Semivolatiles	Hexachlorobenzene	9	110 - 110	µg/kg
Atlantic Agside	Whole body	Semivolatiles	Hexachlorobutadiene	9	110 - 110	µg/kg
Atlantic Agside	Whole body	Semivolatiles	Hexachlorocyclopentadiene	9	110 - 110	µg/kg
Atlantic Agside	Whole body	Semivolatiles	Hexachloroethane	9	250 - 250	µg/kg
Atlantic Agside	Whole body	Semivolatiles	Indeno(1,2,3-cd)pyrene	9	250 - 250	µg/kg
Atlantic Agside	Whole body	Semivolatiles	Isophorone	9	87 - 250	µg/kg
Atlantic Agside	Whole body	Semivolatiles	Naphthalene	9	110 - 110	µg/kg
Atlantic Agside	Whole body	Semivolatiles	Nitrobenzene	9	250 - 250	µg/kg
Atlantic Agside	Whole body	Semivolatiles	N-Nitroso-di-n-propylamine	9	250 - 250	µg/kg
Atlantic Agside	Whole body	Semivolatiles	N-Nitrosodiphenylamine	9	250 - 250	µg/kg
Atlantic Agside	Whole body	Semivolatiles	Pentachloropheno	9	1500 - 1500	µg/kg
Atlantic Agside	Whole body	Semivolatiles	Phenanthrene	9	110 - 110	µg/kg
Atlantic Agside	Whole body	Semivolatiles	Phenol	9	150 - 1000	µg/kg
Atlantic Agside	Whole body	Semivolatiles	Pyrene	9	110 - 110	µg/kg
Striped Bass	Fillet	Cyanide	Total Cyanide	2	500 - 500	µg/kg
Striped Bass	Fillet	PCDD/Fs	2,3,7,8-TCDD	2	0.026 - 0.026	µg/kg
Striped Bass	Fillet	PCDD/Fs	2,3,7,8-TCDF	2	0.0032 - 0.0039	µg/kg
Striped Bass	Fillet	Inorganic Chemicals	Al	2	9300 - 9300	µg/kg
Striped Bass	Fillet	Inorganic Chemicals	Sb	2	8700 - 8700	µg/kg
Striped Bass	Fillet	Inorganic Chemicals	As	2	920 - 920	µg/kg
Striped Bass	Fillet	Inorganic Chemicals	Ba	2	590 - 590	µg/kg
Striped Bass	Fillet	Inorganic Chemicals	Be	2	60 - 60	µg/kg
Striped Bass	Fillet	Inorganic Chemicals	Cd	2	90 - 110	µg/kg
Striped Bass	Fillet	Inorganic Chemicals	Ca	2	139000 - 1740000	µg/kg
Striped Bass	Fillet	Inorganic Chemicals	Cr	2	1400 - 1400	µg/kg
Striped Bass	Fillet	Inorganic Chemicals	Co	2	590 - 590	µg/kg
Striped Bass	Fillet	Inorganic Chemicals	Cu	2	2400 - 2400	µg/kg
Striped Bass	Fillet	Inorganic Chemicals	Fe	2	4300 - 7500	µg/kg
Striped Bass	Fillet	Inorganic Chemicals	Pb	2	410 - 490	µg/kg
Striped Bass	Fillet	Inorganic Chemicals	Mg	2	314000 - 350000	µg/kg
Striped Bass	Fillet	Inorganic Chemicals	Mn	2	140 - 140	µg/kg
Striped Bass	Fillet	Inorganic Chemicals	Hg	2	670 - 700	µg/kg
Striped Bass	Fillet	Inorganic Chemicals	Ni	2	200 - 200	µg/kg
Striped Bass	Fillet	Inorganic Chemicals	K	2	3510000 - 4410000	µg/kg
Striped Bass	Fillet	Inorganic Chemicals	Se	2	780 - 1000	µg/kg
Striped Bass	Fillet	Inorganic Chemicals	Ag	2	1400 - 1400	µg/kg
Striped Bass	Fillet	Inorganic Chemicals	Na	2	598000 - 928000	µg/kg
Striped Bass	Fillet	Inorganic Chemicals	Tl	2	1200 - 1200	µg/kg
Striped Bass	Fillet	Inorganic Chemicals	Ti	2	80 - 80	µg/kg
Striped Bass	Fillet	Inorganic Chemicals	V	2	780 - 780	µg/kg
Striped Bass	Fillet	Inorganic Chemicals	Zn	2	4500 - 5100	µg/kg
Striped Bass	Fillet	Miscellaneous Chemica	Methyl Hg	2	429 - 464	µg/kg
Striped Bass	Fillet	Organotin	Dibutyltin	2	100 - 100	µg/kg
Striped Bass	Fillet	Organotin	Monobutyltir	2	150 - 150	µg/kg
Striped Bass	Fillet	Organotin	Tetrabutyltin	2	100 - 100	µg/kg
Striped Bass	Fillet	Organotin	Tributyltin	2	100 - 100	µg/kg
Striped Bass	Fillet	PAH-SIM	HMW PAHs	2	8.5 - 9	µg/kg
Striped Bass	Fillet	PAH-SIM	LMW PAHs	2	20.8 - 39.9	µg/kg
Striped Bass	Fillet	PAH-SIM	Total PAHs	2	29.3 - 48.9	µg/kg

Table 3-59
Bioaccumulation Data from 1995-2001 Passaic RI Sampling Programs Including Tierra (1995a, 1999d, 2000c, 2001a)

Species	Tissue Type	Analyte Class[a]	Compound	Count	Range of Values	Units
Striped Bass	Fillet	PCB/PEST	4,4'-DDD	2	2.1 - 2.1	µg/kg
Striped Bass	Fillet	PCB/PEST	4,4'-DDE	2	6.78 - 8.34	µg/kg
Striped Bass	Fillet	PCB/PEST	4,4'-DDT	2	1.82 - 1.82	µg/kg
Striped Bass	Fillet	PCB/PEST	Aldrin	2	1.76 - 2.04	µg/kg
Striped Bass	Fillet	PCB/PEST	Alpha-BHC	2	0.72 - 0.721	µg/kg
Striped Bass	Fillet	PCB/PEST	Alpha-Chlordane	2	1.2 - 2.25	µg/kg
Striped Bass	Fillet	PCB/PEST	Beta-BHC	2	0.901 - 902	µg/kg
Striped Bass	Fillet	PCB/PEST	Delta-BHC	2	1.5 - 1.5	µg/kg
Striped Bass	Fillet	PCB/PEST	Dieldrin	2	1.88 - 1.88	µg/kg
Striped Bass	Fillet	PCB/PEST	Endosulfan I	2	0.861 - 0.862	µg/kg
Striped Bass	Fillet	PCB/PEST	Endosulfan II	2	2.24 - 2.24	µg/kg
Striped Bass	Fillet	PCB/PEST	Endosulfan Sulfate	2	3 - 3.01	µg/kg
Striped Bass	Fillet	PCB/PEST	Endrin	2	1.68 - 1.68	µg/kg
Striped Bass	Fillet	PCB/PEST	Endrin Aldehyde	2	1.2 - 1.2	µg/kg
Striped Bass	Fillet	PCB/PEST	Endrin Ketone	2	2.84 - 2.85	µg/kg
Striped Bass	Fillet	PCB/PEST	Gamma-BHC (Lindane)	2	0.8 - 0.802	µg/kg
Striped Bass	Fillet	PCB/PEST	Gamma-Chlordane	2	1.26 - 1.26	µg/kg
Striped Bass	Fillet	PCB/PEST	Heptachlor	2	0.841 - 0.842	µg/kg
Striped Bass	Fillet	PCB/PEST	Heptachlor Epoxide	2	1.18 - 1.18	µg/kg
Striped Bass	Fillet	PCB/PEST	Methoxychlor	2	6.72 - 6.73	µg/kg
Striped Bass	Fillet	PCB/PEST	Total Alpha + Gamma Chlordane	1	2.25 - 2.25	µg/kg
Striped Bass	Fillet	PCB/PEST	Total DDT	2	6.78 - 8.34	µg/kg
Striped Bass	Fillet	PCB/PEST	Toxaphene	2	136 - 136	µg/kg
Striped Bass	Fillet	Physical Property	Percent Lipid	2	0.14 - 1	%
Striped Bass	Fillet	Semivolatiles	1,2,4-Trichlorobenzene	2	36 - 36	µg/kg
Striped Bass	Fillet	Semivolatiles	1,2-Dichlorobenzene	2	44 - 44	µg/kg
Striped Bass	Fillet	Semivolatiles	1,3-Dichlorobenzene	2	47 - 47	µg/kg
Striped Bass	Fillet	Semivolatiles	1,4-Dichlorobenzene	2	55 - 55	µg/kg
Striped Bass	Fillet	Semivolatiles	2,4,5-Trichlorophenol	2	150 - 150	µg/kg
Striped Bass	Fillet	Semivolatiles	2,4,6-Trichlorophenol	2	39 - 39	µg/kg
Striped Bass	Fillet	Semivolatiles	2,4-Dichloropheno	2	41 - 41	µg/kg
Striped Bass	Fillet	Semivolatiles	2,4-Dimethylpheno	2	39 - 39	µg/kg
Striped Bass	Fillet	Semivolatiles	2,4-Dinitropheno	2	260 - 260	µg/kg
Striped Bass	Fillet	Semivolatiles	2,4-Dinitrotoluene	2	39 - 39	µg/kg
Striped Bass	Fillet	Semivolatiles	2,6-Dinitrotoluene	2	38 - 38	µg/kg
Striped Bass	Fillet	Semivolatiles	2-Chloronaphthalene	2	39 - 39	µg/kg
Striped Bass	Fillet	Semivolatiles	2-Chloropheno	2	42 - 42	µg/kg
Striped Bass	Fillet	Semivolatiles	2-Methylnaphthalene	2	52 - 52	µg/kg
Striped Bass	Fillet	Semivolatiles	2-Methylpheno	2	27 - 27	µg/kg
Striped Bass	Fillet	Semivolatiles	2-Nitroaniline	2	130 - 130	µg/kg
Striped Bass	Fillet	Semivolatiles	2-Nitrophenol	2	31 - 31	µg/kg
Striped Bass	Fillet	Semivolatiles	3,3'-Dichlorobenzidine	2	96 - 96	µg/kg
Striped Bass	Fillet	Semivolatiles	3-Nitroaniline	2	240 - 240	µg/kg
Striped Bass	Fillet	Semivolatiles	4,6-Dinitro-2-methylpheno	2	120 - 120	µg/kg
Striped Bass	Fillet	Semivolatiles	4-Bromophenyl phenyl ether	2	38 - 38	µg/kg
Striped Bass	Fillet	Semivolatiles	4-Chloro-3-methylpheno	2	35 - 35	µg/kg
Striped Bass	Fillet	Semivolatiles	4-Chloroaniline	2	63 - 63	µg/kg
Striped Bass	Fillet	Semivolatiles	4-Chlorophenyl phenyl ethe	2	52 - 52	µg/kg
Striped Bass	Fillet	Semivolatiles	4-Methylpheno	2	62 - 62	µg/kg
Striped Bass	Fillet	Semivolatiles	4-Nitroaniline	2	130 - 130	µg/kg
Striped Bass	Fillet	Semivolatiles	4-Nitrophenol	2	140 - 140	µg/kg
Striped Bass	Fillet	Semivolatiles	Benzoic Acid	2	800 - 800	µg/kg
Striped Bass	Fillet	Semivolatiles	Benzyl Alcoho	2	27 - 27	µg/kg
Striped Bass	Fillet	Semivolatiles	bis(2-Chloroethoxy)methane	2	46 - 46	µg/kg
Striped Bass	Fillet	Semivolatiles	bis(2-Chloroethyl)ether	2	46 - 46	µg/kg
Striped Bass	Fillet	Semivolatiles	bis(2-Chloroisopropyl)ether	2	46 - 46	µg/kg
Striped Bass	Fillet	Semivolatiles	bis(2-Ethylhexyl)phthalate	2	11 - 11	µg/kg
Striped Bass	Fillet	Semivolatiles	Butyl benzyl phthalate	2	21 - 21	µg/kg
Striped Bass	Fillet	Semivolatiles	Carbazole	2	29 - 29	µg/kg
Striped Bass	Fillet	Semivolatiles	Dibenzofuran	2	49 - 49	µg/kg
Striped Bass	Fillet	Semivolatiles	Diethyl phthalate	2	52 - 52	µg/kg
Striped Bass	Fillet	Semivolatiles	Dimethylphthalate	2	34 - 34	µg/kg
Striped Bass	Fillet	Semivolatiles	Di-n-Butylphthalate	2	29 - 29	µg/kg
Striped Bass	Fillet	Semivolatiles	Di-n-Octylphthalate	2	67 - 67	µg/kg
Striped Bass	Fillet	Semivolatiles	Hexachlorobenzene	2	54 - 54	µg/kg
Striped Bass	Fillet	Semivolatiles	Hexachlorobutadiene	2	47 - 47	µg/kg
Striped Bass	Fillet	Semivolatiles	Hexachlorocyclopentadiene	2	60 - 60	µg/kg
Striped Bass	Fillet	Semivolatiles	Hexachloroethane	2	53 - 53	µg/kg
Striped Bass	Fillet	Semivolatiles	Isophorone	2	31 - 31	µg/kg
Striped Bass	Fillet	Semivolatiles	Nitrobenzene	2	37 - 37	µg/kg
Striped Bass	Fillet	Semivolatiles	N-Nitroso-di-n-propylamine	2	60 - 60	µg/kg
Striped Bass	Fillet	Semivolatiles	N-Nitrosodiphenylamine	2	36 - 36	µg/kg
Striped Bass	Fillet	Semivolatiles	Pentachloropheno	2	160 - 160	µg/kg
Striped Bass	Fillet	Semivolatiles	Phenol	2	39 - 39	µg/kg
Striped Bass	Fillet	TPH	Petroleum Hydrocarbons (extractable)	2	51800 - 110000	µg/kg

Table 3-59
Bioaccumulation Data from 1995-2001 Passaic RI Sampling Programs Including Tierra (1995a, 1999d, 2000c, 2001a)

Species	Tissue Type	Analyte Class[a]	Compound	Count	Range of Values	Units
Striped Bass	Fillet - skin off	PCDD/Fs	2,3,7,8-TCDD	11	0.00163 - 0.0492	µg/kg
Striped Bass	Fillet - skin off	PCDD/Fs	2,3,7,8-TCDF	11	0.0012 - 0.00874	µg/kg
Striped Bass	Fillet - skin off	Herbicides	2,4,5-T	10	100 - 100	µg/kg
Striped Bass	Fillet - skin off	Herbicides	2,4,5-TP (Silvex)	11	100 - 100	µg/kg
Striped Bass	Fillet - skin off	Herbicides	2,4-D	9	33 - 240	µg/kg
Striped Bass	Fillet - skin off	Herbicides	2,4-DB	10	25 - 180	µg/kg
Striped Bass	Fillet - skin off	Homologue Groups	Total PCBs - Homologue Groups	11	421 - 2070	µg/kg
Striped Bass	Fillet - skin off	Inorganic Chemicals	Al	10	2400 - 8000	µg/kg
Striped Bass	Fillet - skin off	Inorganic Chemicals	Sb	11	260 - 510	µg/kg
Striped Bass	Fillet - skin off	Inorganic Chemicals	As	11	230 - 890	µg/kg
Striped Bass	Fillet - skin off	Inorganic Chemicals	Ba	11	14 - 210	µg/kg
Striped Bass	Fillet - skin off	Inorganic Chemicals	Be	11	26 - 98	µg/kg
Striped Bass	Fillet - skin off	Inorganic Chemicals	Cd	11	30 - 61	µg/kg
Striped Bass	Fillet - skin off	Inorganic Chemicals	Ca	11	77800 - 130000	µg/kg
Striped Bass	Fillet - skin off	Inorganic Chemicals	Cr	11	130 - 410	µg/kg
Striped Bass	Fillet - skin off	Inorganic Chemicals	Co	11	59 - 120	µg/kg
Striped Bass	Fillet - skin off	Inorganic Chemicals	Cu	11	95 - 650	µg/kg
Striped Bass	Fillet - skin off	Inorganic Chemicals	Fe	11	2100 - 8900	µg/kg
Striped Bass	Fillet - skin off	Inorganic Chemicals	Pb	10	110 - 210	µg/kg
Striped Bass	Fillet - skin off	Inorganic Chemicals	Mg	4	232000 - 307000	µg/kg
Striped Bass	Fillet - skin off	Inorganic Chemicals	Mn	11	99 - 230	µg/kg
Striped Bass	Fillet - skin off	Inorganic Chemicals	Hg	10	170 - 690	µg/kg
Striped Bass	Fillet - skin off	Inorganic Chemicals	Ni	11	74 - 800	µg/kg
Striped Bass	Fillet - skin off	Inorganic Chemicals	K	11	3830000 - 4850000	µg/kg
Striped Bass	Fillet - skin off	Inorganic Chemicals	Se	11	180 - 1000	µg/kg
Striped Bass	Fillet - skin off	Inorganic Chemicals	Ag	11	50 - 230	µg/kg
Striped Bass	Fillet - skin off	Inorganic Chemicals	Na	11	513000 - 828000	µg/kg
Striped Bass	Fillet - skin off	Inorganic Chemicals	Tl	10	290 - 620	µg/kg
Striped Bass	Fillet - skin off	Inorganic Chemicals	V	11	40 - 96	µg/kg
Striped Bass	Fillet - skin off	Inorganic Chemicals	Zn	10	4400 - 7600	µg/kg
Striped Bass	Fillet - skin off	Organotin	Dibutyltin	11	0.561 - 5.25	µg/kg
Striped Bass	Fillet - skin off	Organotin	Monobutyltir	10	0.218 - 2	µg/kg
Striped Bass	Fillet - skin off	Organotin	Tetrabutyltin	10	4 - 4	µg/kg
Striped Bass	Fillet - skin off	Organotin	Tributyltin	11	2.25 - 47	µg/kg
Striped Bass	Fillet - skin off	PAH-SIM	HMW PAHs	10	3.8 - 23.6	µg/kg
Striped Bass	Fillet - skin off	PAH-SIM	LMW PAHs	11	5.9 - 68.3	µg/kg
Striped Bass	Fillet - skin off	PAH-SIM	Total PAHs	11	5.9 - 91.9	µg/kg
Striped Bass	Fillet - skin off	PCB Congeners	Total PCBs - Congeners (NOAA 1989)	11	343 - 1770	µg/kg
Striped Bass	Fillet - skin off	PCB/PEST	4,4'-DDD	11	4.6 - 32	µg/kg
Striped Bass	Fillet - skin off	PCB/PEST	4,4'-DDE	11	14 - 105	µg/kg
Striped Bass	Fillet - skin off	PCB/PEST	4,4'-DDT	11	10 - 81	µg/kg
Striped Bass	Fillet - skin off	PCB/PEST	Aldrin	11	5 - 5	µg/kg
Striped Bass	Fillet - skin off	PCB/PEST	Alpha-BHC	11	1.7 - 1.7	µg/kg
Striped Bass	Fillet - skin off	PCB/PEST	Alpha-Chlordane	11	3 - 30	µg/kg
Striped Bass	Fillet - skin off	PCB/PEST	Beta-BHC	11	7 - 7	µg/kg
Striped Bass	Fillet - skin off	PCB/PEST	Delta-BHC	11	5 - 5	µg/kg
Striped Bass	Fillet - skin off	PCB/PEST	Dieldrin	11	3.3 - 3.3	µg/kg
Striped Bass	Fillet - skin off	PCB/PEST	Endosulfan I	11	5 - 5	µg/kg
Striped Bass	Fillet - skin off	PCB/PEST	Endosulfan II	11	7 - 7	µg/kg
Striped Bass	Fillet - skin off	PCB/PEST	Endosulfan Sulfate	11	3.3 - 3.3	µg/kg
Striped Bass	Fillet - skin off	PCB/PEST	Endrin	11	5 - 15	µg/kg
Striped Bass	Fillet - skin off	PCB/PEST	Endrin Aldehyde	11	5 - 9	µg/kg
Striped Bass	Fillet - skin off	PCB/PEST	Endrin Ketone	11	5 - 5	µg/kg
Striped Bass	Fillet - skin off	PCB/PEST	Gamma-BHC (Lindane)	11	5 - 5	µg/kg
Striped Bass	Fillet - skin off	PCB/PEST	Gamma-Chlordane	11	5 - 5	µg/kg
Striped Bass	Fillet - skin off	PCB/PEST	Heptachlor	11	7 - 7	µg/kg
Striped Bass	Fillet - skin off	PCB/PEST	Heptachlor Epoxide	11	5 - 5	µg/kg
Striped Bass	Fillet - skin off	PCB/PEST	Methoxychlor	11	17 - 17	µg/kg
Striped Bass	Fillet - skin off	PCB/PEST	Total DDT	11	14 - 205	µg/kg
Striped Bass	Fillet - skin off	PCB/PEST	Total PCBs - Aroclors	11	122 - 1190	µg/kg
Striped Bass	Fillet - skin off	PCB/PEST	Toxaphene	11	170 - 170	µg/kg
Striped Bass	Fillet - skin off	Physical Property	Percent Lipid	10	0.985 - 3.12	%
Striped Bass	Fillet - skin off	Physical Property	Percent Moisture	10	74.9 - 79.5	% by wt.
Striped Bass	Fillet - skin off	Semivolatiles	1,2,4-Trichlorobenzene	11	13 - 110	µg/kg
Striped Bass	Fillet - skin off	Semivolatiles	1,2-Dichlorobenzene	11	25 - 110	µg/kg
Striped Bass	Fillet - skin off	Semivolatiles	1,3-Dichlorobenzene	11	110 - 110	µg/kg
Striped Bass	Fillet - skin off	Semivolatiles	1,4-Dichlorobenzene	11	44 - 250	µg/kg
Striped Bass	Fillet - skin off	Semivolatiles	2,4,5-Trichlorophenol	11	280 - 280	µg/kg
Striped Bass	Fillet - skin off	Semivolatiles	2,4,6-Trichlorophenol	11	250 - 250	µg/kg
Striped Bass	Fillet - skin off	Semivolatiles	2,4-Dichloropheno	11	110 - 110	µg/kg
Striped Bass	Fillet - skin off	Semivolatiles	2,4-Dimethylpheno	11	110 - 110	µg/kg
Striped Bass	Fillet - skin off	Semivolatiles	2,4-Dinitropheno	11	1500 - 1500	µg/kg
Striped Bass	Fillet - skin off	Semivolatiles	2,4-Dinitrotoluene	11	94 - 250	µg/kg
Striped Bass	Fillet - skin off	Semivolatiles	2,6-Dinitrotoluene	11	110 - 110	µg/kg
Striped Bass	Fillet - skin off	Semivolatiles	2-Chloronaphthalene	11	110 - 110	µg/kg

Table 3-59
Bioaccumulation Data from 1995-2001 Passaic RI Sampling Programs Including Tierra (1995a, 1999d, 2000c, 2001a)

Species	Tissue Type	Analyte Class[a]	Compound	Count	Range of Values	Units
Striped Bass	Fillet - skin off	Semivolatiles	2-Chlorophenol	11	50 - 110	µg/kg
Striped Bass	Fillet - skin off	Semivolatiles	2-Methylnaphthalene	11	110 - 110	µg/kg
Striped Bass	Fillet - skin off	Semivolatiles	2-Methylphenol	11	250 - 250	µg/kg
Striped Bass	Fillet - skin off	Semivolatiles	2-Nitroaniline	11	280 - 280	µg/kg
Striped Bass	Fillet - skin off	Semivolatiles	2-Nitrophenol	11	13 - 110	µg/kg
Striped Bass	Fillet - skin off	Semivolatiles	3,3'-Dichlorobenzidine	11	250 - 250	µg/kg
Striped Bass	Fillet - skin off	Semivolatiles	3-Nitroaniline	11	500 - 500	µg/kg
Striped Bass	Fillet - skin off	Semivolatiles	4,6-Dinitro-2-methylphenol	11	1500 - 1500	µg/kg
Striped Bass	Fillet - skin off	Semivolatiles	4-Bromophenyl phenyl ether	11	110 - 110	µg/kg
Striped Bass	Fillet - skin off	Semivolatiles	4-Chloro-3-methylphenol	11	110 - 110	µg/kg
Striped Bass	Fillet - skin off	Semivolatiles	4-Chloroaniline	11	110 - 110	µg/kg
Striped Bass	Fillet - skin off	Semivolatiles	4-Chlorophenyl phenyl ether	11	110 - 110	µg/kg
Striped Bass	Fillet - skin off	Semivolatiles	4-Methylphenol	11	750 - 750	µg/kg
Striped Bass	Fillet - skin off	Semivolatiles	4-Nitroaniline	11	280 - 280	µg/kg
Striped Bass	Fillet - skin off	Semivolatiles	4-Nitrophenol	11	1500 - 1500	µg/kg
Striped Bass	Fillet - skin off	Semivolatiles	Acenaphthene	11	110 - 110	µg/kg
Striped Bass	Fillet - skin off	Semivolatiles	Acenaphthylene	11	110 - 110	µg/kg
Striped Bass	Fillet - skin off	Semivolatiles	Anthracene	11	110 - 110	µg/kg
Striped Bass	Fillet - skin off	Semivolatiles	Benzo(a)anthracene	11	110 - 110	µg/kg
Striped Bass	Fillet - skin off	Semivolatiles	Benzo(a)pyrene	11	250 - 250	µg/kg
Striped Bass	Fillet - skin off	Semivolatiles	Benzo(b)fluoranthene	11	110 - 110	µg/kg
Striped Bass	Fillet - skin off	Semivolatiles	Benzo(g,h,i)perylene	11	250 - 250	µg/kg
Striped Bass	Fillet - skin off	Semivolatiles	Benzo(k)fluoranthene	11	110 - 110	µg/kg
Striped Bass	Fillet - skin off	Semivolatiles	bis(2-Chloroethoxy)methane	11	110 - 110	µg/kg
Striped Bass	Fillet - skin off	Semivolatiles	bis(2-Chloroethyl)ether	11	110 - 110	µg/kg
Striped Bass	Fillet - skin off	Semivolatiles	bis(2-Chloroisopropyl)ether	11	2500 - 2500	µg/kg
Striped Bass	Fillet - skin off	Semivolatiles	bis(2-Ethylhexyl)phthalate	11	3000 - 3000	µg/kg
Striped Bass	Fillet - skin off	Semivolatiles	Butyl benzyl phthalate	11	110 - 110	µg/kg
Striped Bass	Fillet - skin off	Semivolatiles	Carbazole	11	1000 - 1000	µg/kg
Striped Bass	Fillet - skin off	Semivolatiles	Chrysene	11	110 - 110	µg/kg
Striped Bass	Fillet - skin off	Semivolatiles	Dibenzo(a,h)anthracene	11	250 - 250	µg/kg
Striped Bass	Fillet - skin off	Semivolatiles	Dibenzofuran	11	110 - 110	µg/kg
Striped Bass	Fillet - skin off	Semivolatiles	Diethyl phthalate	11	21 - 940	µg/kg
Striped Bass	Fillet - skin off	Semivolatiles	Dimethylphthalate	11	110 - 110	µg/kg
Striped Bass	Fillet - skin off	Semivolatiles	Di-n-Butylphthalate	11	42 - 110	µg/kg
Striped Bass	Fillet - skin off	Semivolatiles	Di-n-Octylphthalate	11	500 - 500	µg/kg
Striped Bass	Fillet - skin off	Semivolatiles	Fluoranthene	11	110 - 110	µg/kg
Striped Bass	Fillet - skin off	Semivolatiles	Fluorene	11	110 - 110	µg/kg
Striped Bass	Fillet - skin off	Semivolatiles	Hexachlorobenzene	11	110 - 110	µg/kg
Striped Bass	Fillet - skin off	Semivolatiles	Hexachlorobutadiene	11	110 - 110	µg/kg
Striped Bass	Fillet - skin off	Semivolatiles	Hexachlorocyclopentadiene	11	110 - 110	µg/kg
Striped Bass	Fillet - skin off	Semivolatiles	Hexachloroethane	11	250 - 250	µg/kg
Striped Bass	Fillet - skin off	Semivolatiles	Indeno(1,2,3-cd)pyrene	11	250 - 250	µg/kg
Striped Bass	Fillet - skin off	Semivolatiles	Isophorone	11	250 - 250	µg/kg
Striped Bass	Fillet - skin off	Semivolatiles	Naphthalene	11	13 - 110	µg/kg
Striped Bass	Fillet - skin off	Semivolatiles	Nitrobenzene	11	250 - 250	µg/kg
Striped Bass	Fillet - skin off	Semivolatiles	N-Nitroso-di-n-propylamine	11	250 - 250	µg/kg
Striped Bass	Fillet - skin off	Semivolatiles	N-Nitrosodiphenylamine	11	250 - 250	µg/kg
Striped Bass	Fillet - skin off	Semivolatiles	Pentachlorophenol	11	1500 - 1500	µg/kg
Striped Bass	Fillet - skin off	Semivolatiles	Phenanthrene	11	110 - 110	µg/kg
Striped Bass	Fillet - skin off	Semivolatiles	Phenol	11	120 - 500	µg/kg
Striped Bass	Fillet - skin off	Semivolatiles	Pyrene	11	110 - 110	µg/kg
Striped Bass	Whole body	PCDD/Fs	2,3,7,8-TCDD	12	0.00414 - 0.101	µg/kg
Striped Bass	Whole body	PCDD/Fs	2,3,7,8-TCDF	12	0.00498 - 0.0214	µg/kg
Striped Bass	Whole body	Herbicides	2,4,5-T	10	1.4 - 100	µg/kg
Striped Bass	Whole body	Herbicides	2,4,5-TP (Silvex)	8	3.4 - 100	µg/kg
Striped Bass	Whole body	Herbicides	2,4-D	9	29 - 240	µg/kg
Striped Bass	Whole body	Herbicides	2,4-DB	11	71 - 300	µg/kg
Striped Bass	Whole body	Homologue Groups	Total PCBs - Homologue Groups	12	737 - 4510	µg/kg
Striped Bass	Whole body	Inorganic Chemicals	Al	9	3000 - 24600	µg/kg
Striped Bass	Whole body	Inorganic Chemicals	Sb	12	180 - 460	µg/kg
Striped Bass	Whole body	Inorganic Chemicals	As	12	300 - 1100	µg/kg
Striped Bass	Whole body	Inorganic Chemicals	Ba	12	220 - 580	µg/kg
Striped Bass	Whole body	Inorganic Chemicals	Be	12	26 - 94	µg/kg
Striped Bass	Whole body	Inorganic Chemicals	Cd	12	37 - 88	µg/kg
Striped Bass	Whole body	Inorganic Chemicals	Ca	12	2570000 - 8210000	µg/kg
Striped Bass	Whole body	Inorganic Chemicals	Cr	12	330 - 570	µg/kg
Striped Bass	Whole body	Inorganic Chemicals	Co	12	110 - 120	µg/kg
Striped Bass	Whole body	Inorganic Chemicals	Cu	12	350 - 2200	µg/kg
Striped Bass	Whole body	Inorganic Chemicals	Fe	12	15900 - 44900	µg/kg
Striped Bass	Whole body	Inorganic Chemicals	Pb	9	110 - 240	µg/kg
Striped Bass	Whole body	Inorganic Chemicals	Mg	6	260000 - 383000	µg/kg
Striped Bass	Whole body	Inorganic Chemicals	Mn	11	730 - 2700	µg/kg
Striped Bass	Whole body	Inorganic Chemicals	Hg	12	81 - 270	µg/kg
Striped Bass	Whole body	Inorganic Chemicals	Ni	12	74 - 6000	µg/kg

Table 3-59
Bioaccumulation Data from 1995-2001 Passaic RI Sampling Programs Including Tierra (1995a, 1999d, 2000c, 2001a)

Species	Tissue Type	Analyte Class[a]	Compound	Count	Range of Values	Units
Striped Bass	Whole body	Inorganic Chemicals	K	12	3180000 - 4190000	µg/kg
Striped Bass	Whole body	Inorganic Chemicals	Se	12	450 - 1500	µg/kg
Striped Bass	Whole body	Inorganic Chemicals	Ag	12	75 - 800	µg/kg
Striped Bass	Whole body	Inorganic Chemicals	Na	12	785000 - 1470000	µg/kg
Striped Bass	Whole body	Inorganic Chemicals	Tl	12	280 - 1900	µg/kg
Striped Bass	Whole body	Inorganic Chemicals	V	12	40 - 150	µg/kg
Striped Bass	Whole body	Inorganic Chemicals	Zn	9	9700 - 18200	µg/kg
Striped Bass	Whole body	Organotin	Dibutyltin	12	0.57 - 3.06	µg/kg
Striped Bass	Whole body	Organotin	Monobutyltir	12	0.199 - 2	µg/kg
Striped Bass	Whole body	Organotin	Tetrabutyltin	12	4 - 4	µg/kg
Striped Bass	Whole body	Organotin	Tributyltin	12	5.04 - 42.9	µg/kg
Striped Bass	Whole body	PAH-SIM	HMW PAHs	12	12.7 - 79.5	µg/kg
Striped Bass	Whole body	PAH-SIM	LMW PAHs	12	25.3 - 88	µg/kg
Striped Bass	Whole body	PAH-SIM	Total PAHs	12	38 - 153	µg/kg
Striped Bass	Whole body	PCB Congeners	Total PCBs - Congeners (NOAA 1989)	12	625 - 3850	µg/kg
Striped Bass	Whole body	PCB/PEST	4,4'-DDD	12	7 - 140	µg/kg
Striped Bass	Whole body	PCB/PEST	4,4'-DDE	12	39 - 300	µg/kg
Striped Bass	Whole body	PCB/PEST	4,4'-DDT	12	39 - 210	µg/kg
Striped Bass	Whole body	PCB/PEST	Aldrin	12	5 - 100	µg/kg
Striped Bass	Whole body	PCB/PEST	Alpha-BHC	12	1.7 - 34	µg/kg
Striped Bass	Whole body	PCB/PEST	Alpha-Chlordane	12	3 - 66	µg/kg
Striped Bass	Whole body	PCB/PEST	Beta-BHC	12	7 - 140	µg/kg
Striped Bass	Whole body	PCB/PEST	Delta-BHC	12	5 - 100	µg/kg
Striped Bass	Whole body	PCB/PEST	Dieldrin	12	3.3 - 66	µg/kg
Striped Bass	Whole body	PCB/PEST	Endosulfan I	12	5 - 100	µg/kg
Striped Bass	Whole body	PCB/PEST	Endosulfan II	12	7 - 140	µg/kg
Striped Bass	Whole body	PCB/PEST	Endosulfan Sulfate	12	3.3 - 66	µg/kg
Striped Bass	Whole body	PCB/PEST	Endrin	12	5 - 100	µg/kg
Striped Bass	Whole body	PCB/PEST	Endrin Aldehyde	12	5 - 100	µg/kg
Striped Bass	Whole body	PCB/PEST	Endrin Ketone	12	5 - 100	µg/kg
Striped Bass	Whole body	PCB/PEST	Gamma-BHC (Lindane)	12	5 - 100	µg/kg
Striped Bass	Whole body	PCB/PEST	Gamma-Chlordane	12	5 - 100	µg/kg
Striped Bass	Whole body	PCB/PEST	Heptachlor	12	7 - 140	µg/kg
Striped Bass	Whole body	PCB/PEST	Heptachlor Epoxide	12	5 - 100	µg/kg
Striped Bass	Whole body	PCB/PEST	Methoxychlor	12	17 - 340	µg/kg
Striped Bass	Whole body	PCB/PEST	Total DDT	12	78 - 578	µg/kg
Striped Bass	Whole body	PCB/PEST	Total PCBs - Aroclors	12	670 - 4680	µg/kg
Striped Bass	Whole body	PCB/PEST	Toxaphene	12	170 - 3400	µg/kg
Striped Bass	Whole body	Physical Property	Percent Lipid	10	2.23 - 8.62	%
Striped Bass	Whole body	Physical Property	Percent Moisture	10	71.2 - 76.5	% by wt.
Striped Bass	Whole body	Semivolatiles	1,2,4-Trichlorobenzene	12	14 - 200	µg/kg
Striped Bass	Whole body	Semivolatiles	1,2-Dichlorobenzene	12	9 - 110	µg/kg
Striped Bass	Whole body	Semivolatiles	1,3-Dichlorobenzene	12	15 - 110	µg/kg
Striped Bass	Whole body	Semivolatiles	1,4-Dichlorobenzene	12	38 - 250	µg/kg
Striped Bass	Whole body	Semivolatiles	2,4,5-Trichlorophenol	12	280 - 280	µg/kg
Striped Bass	Whole body	Semivolatiles	2,4,6-Trichlorophenol	12	250 - 250	µg/kg
Striped Bass	Whole body	Semivolatiles	2,4-Dichloropheno	12	20 - 110	µg/kg
Striped Bass	Whole body	Semivolatiles	2,4-Dimethylpheno	12	110 - 110	µg/kg
Striped Bass	Whole body	Semivolatiles	2,4-Dinitropheno	12	1500 - 1500	µg/kg
Striped Bass	Whole body	Semivolatiles	2,4-Dinitrotoluene	12	240 - 780	µg/kg
Striped Bass	Whole body	Semivolatiles	2,6-Dinitrotoluene	12	110 - 230	µg/kg
Striped Bass	Whole body	Semivolatiles	2-Chloronaphthalene	12	110 - 110	µg/kg
Striped Bass	Whole body	Semivolatiles	2-Chloropheno	12	110 - 110	µg/kg
Striped Bass	Whole body	Semivolatiles	2-Methylnaphthalene	12	110 - 110	µg/kg
Striped Bass	Whole body	Semivolatiles	2-Methylpheno	12	250 - 250	µg/kg
Striped Bass	Whole body	Semivolatiles	2-Nitroaniline	12	280 - 280	µg/kg
Striped Bass	Whole body	Semivolatiles	2-Nitrophenol	12	110 - 110	µg/kg
Striped Bass	Whole body	Semivolatiles	3,3'-Dichlorobenzidine	12	250 - 250	µg/kg
Striped Bass	Whole body	Semivolatiles	3-Nitroaniline	12	210 - 500	µg/kg
Striped Bass	Whole body	Semivolatiles	4,6-Dinitro-2-methylpheno	12	1500 - 1500	µg/kg
Striped Bass	Whole body	Semivolatiles	4-Bromophenyl phenyl ether	12	110 - 110	µg/kg
Striped Bass	Whole body	Semivolatiles	4-Chloro-3-methylpheno	12	110 - 110	µg/kg
Striped Bass	Whole body	Semivolatiles	4-Chloroaniline	12	110 - 110	µg/kg
Striped Bass	Whole body	Semivolatiles	4-Chlorophenyl phenyl ethe	12	110 - 110	µg/kg
Striped Bass	Whole body	Semivolatiles	4-Methylpheno	12	750 - 750	µg/kg
Striped Bass	Whole body	Semivolatiles	4-Nitroaniline	12	280 - 280	µg/kg
Striped Bass	Whole body	Semivolatiles	4-Nitrophenol	12	1500 - 1500	µg/kg
Striped Bass	Whole body	Semivolatiles	Acenaphthene	12	17 - 110	µg/kg
Striped Bass	Whole body	Semivolatiles	Acenaphthylene	12	110 - 110	µg/kg
Striped Bass	Whole body	Semivolatiles	Anthracene	12	110 - 110	µg/kg
Striped Bass	Whole body	Semivolatiles	Benzo(a)anthracene	12	110 - 110	µg/kg
Striped Bass	Whole body	Semivolatiles	Benzo(a)pyrene	12	250 - 250	µg/kg
Striped Bass	Whole body	Semivolatiles	Benzo(b)fluoranthene	12	110 - 110	µg/kg
Striped Bass	Whole body	Semivolatiles	Benzo(g,h,i)perylene	12	250 - 250	µg/kg
Striped Bass	Whole body	Semivolatiles	Benzo(k)fluoranthene	12	110 - 110	µg/kg

Table 3-59
Bioaccumulation Data from 1995-2001 Passaic RI Sampling Programs Including Tierra (1995a, 1999d, 2000c, 2001a)

Species	Tissue Type	Analyte Class[a]	Compound	Count	Range of Values	Units
Striped Bass	Whole body	Semivolatiles	bis(2-Chloroethoxy)methane	12	110 - 110	µg/kg
Striped Bass	Whole body	Semivolatiles	bis(2-Chloroethyl)ether	12	110 - 110	µg/kg
Striped Bass	Whole body	Semivolatiles	bis(2-Chloroisopropyl)ether	12	2500 - 2500	µg/kg
Striped Bass	Whole body	Semivolatiles	bis(2-Ethylhexyl)phthalate	12	3000 - 3000	µg/kg
Striped Bass	Whole body	Semivolatiles	Butyl benzyl phthalate	12	110 - 110	µg/kg
Striped Bass	Whole body	Semivolatiles	Carbazole	12	1000 - 1000	µg/kg
Striped Bass	Whole body	Semivolatiles	Chrysene	12	110 - 110	µg/kg
Striped Bass	Whole body	Semivolatiles	Dibenzo(a,h)anthracene	12	250 - 250	µg/kg
Striped Bass	Whole body	Semivolatiles	Dibenzofuran	12	110 - 110	µg/kg
Striped Bass	Whole body	Semivolatiles	Diethyl phthalate	12	24 - 110	µg/kg
Striped Bass	Whole body	Semivolatiles	Dimethylphthalate	12	110 - 110	µg/kg
Striped Bass	Whole body	Semivolatiles	Di-n-Butylphthalate	12	110 - 110	µg/kg
Striped Bass	Whole body	Semivolatiles	Di-n-Octylphthalate	12	500 - 500	µg/kg
Striped Bass	Whole body	Semivolatiles	Fluoranthene	12	12 - 110	µg/kg
Striped Bass	Whole body	Semivolatiles	Fluorene	12	16 - 110	µg/kg
Striped Bass	Whole body	Semivolatiles	Hexachlorobenzene	12	110 - 110	µg/kg
Striped Bass	Whole body	Semivolatiles	Hexachlorobutadiene	12	110 - 110	µg/kg
Striped Bass	Whole body	Semivolatiles	Hexachlorocyclopentadiene	12	110 - 110	µg/kg
Striped Bass	Whole body	Semivolatiles	Hexachloroethane	12	250 - 250	µg/kg
Striped Bass	Whole body	Semivolatiles	Indeno(1,2,3-cd)pyrene	12	250 - 250	µg/kg
Striped Bass	Whole body	Semivolatiles	Isophorone	12	45 - 250	µg/kg
Striped Bass	Whole body	Semivolatiles	Naphthalene	12	16 - 110	µg/kg
Striped Bass	Whole body	Semivolatiles	Nitrobenzene	12	250 - 250	µg/kg
Striped Bass	Whole body	Semivolatiles	N-Nitroso-di-n-propylamine	12	250 - 250	µg/kg
Striped Bass	Whole body	Semivolatiles	N-Nitrosodiphenylamine	12	250 - 250	µg/kg
Striped Bass	Whole body	Semivolatiles	Pentachlorophenol	12	1500 - 1500	µg/kg
Striped Bass	Whole body	Semivolatiles	Phenanthrene	12	110 - 110	µg/kg
Striped Bass	Whole body	Semivolatiles	Phenol	12	500 - 500	µg/kg
Striped Bass	Whole body	Semivolatiles	Pyrene	12	110 - 110	µg/kg
White Perch	Fillet - skin off	PCDD/Fs	2,3,7,8-TCDD	6	0.0344 - 0.0889	µg/kg
White Perch	Fillet - skin off	PCDD/Fs	2,3,7,8-TCDF	6	0.00831 - 0.0138	µg/kg
White Perch	Fillet - skin off	Herbicides	2,4,5-T	6	2.2 - 100	µg/kg
White Perch	Fillet - skin off	Herbicides	2,4,5-TP (Silvex)	6	100 - 100	µg/kg
White Perch	Fillet - skin off	Herbicides	2,4-D	5	32 - 240	µg/kg
White Perch	Fillet - skin off	Herbicides	2,4-DB	6	11 - 180	µg/kg
White Perch	Fillet - skin off	Homologue Groups	Total PCBs - Homologue Groups	6	1770 - 3220	µg/kg
White Perch	Fillet - skin off	Inorganic Chemicals	Al	6	2400 - 3600	µg/kg
White Perch	Fillet - skin off	Inorganic Chemicals	Sb	6	400 - 410	µg/kg
White Perch	Fillet - skin off	Inorganic Chemicals	As	6	220 - 270	µg/kg
White Perch	Fillet - skin off	Inorganic Chemicals	Ba	6	23 - 76	µg/kg
White Perch	Fillet - skin off	Inorganic Chemicals	Be	6	28 - 42	µg/kg
White Perch	Fillet - skin off	Inorganic Chemicals	Cd	6	30 - 31	µg/kg
White Perch	Fillet - skin off	Inorganic Chemicals	Ca	6	109000 - 578000	µg/kg
White Perch	Fillet - skin off	Inorganic Chemicals	Cr	6	140 - 960	µg/kg
White Perch	Fillet - skin off	Inorganic Chemicals	Co	6	59 - 61	µg/kg
White Perch	Fillet - skin off	Inorganic Chemicals	Cu	6	310 - 980	µg/kg
White Perch	Fillet - skin off	Inorganic Chemicals	Fe	6	4100 - 8400	µg/kg
White Perch	Fillet - skin off	Inorganic Chemicals	Pb	6	110 - 190	µg/kg
White Perch	Fillet - skin off	Inorganic Chemicals	Mg	6	271000 - 315000	µg/kg
White Perch	Fillet - skin off	Inorganic Chemicals	Mn	6	150 - 280	µg/kg
White Perch	Fillet - skin off	Inorganic Chemicals	Hg	6	330 - 430	µg/kg
White Perch	Fillet - skin off	Inorganic Chemicals	Ni	6	74 - 76	µg/kg
White Perch	Fillet - skin off	Inorganic Chemicals	K	6	3490000 - 4220000	µg/kg
White Perch	Fillet - skin off	Inorganic Chemicals	Se	6	310 - 730	µg/kg
White Perch	Fillet - skin off	Inorganic Chemicals	Ag	6	120 - 240	µg/kg
White Perch	Fillet - skin off	Inorganic Chemicals	Na	6	445000 - 659000	µg/kg
White Perch	Fillet - skin off	Inorganic Chemicals	Tl	3	300 - 310	µg/kg
White Perch	Fillet - skin off	Inorganic Chemicals	V	6	87 - 90	µg/kg
White Perch	Fillet - skin off	Inorganic Chemicals	Zn	6	5100 - 6400	µg/kg
White Perch	Fillet - skin off	Organotin	Dibutyltin	5	0.58 - 1.55	µg/kg
White Perch	Fillet - skin off	Organotin	Monobutyltin	4	0.194 - 2	µg/kg
White Perch	Fillet - skin off	Organotin	Tetrabutyltin	4	4 - 4	µg/kg
White Perch	Fillet - skin off	Organotin	Tributyltin	6	4.66 - 19.9	µg/kg
White Perch	Fillet - skin off	PAH-SIM	HMW PAHs	6	27 - 58.5	µg/kg
White Perch	Fillet - skin off	PAH-SIM	LMW PAHs	6	49.3 - 86.9	µg/kg
White Perch	Fillet - skin off	PAH-SIM	Total PAHs	6	76.3 - 143	µg/kg
White Perch	Fillet - skin off	PCB Congeners	Total PCBs - Congeners (NOAA 1989)	6	1410 - 2460	µg/kg
White Perch	Fillet - skin off	PCB/PEST	4,4'-DDD	6	14 - 27	µg/kg
White Perch	Fillet - skin off	PCB/PEST	4,4'-DDE	6	39 - 61	µg/kg
White Perch	Fillet - skin off	PCB/PEST	4,4'-DDT	6	10 - 43	µg/kg
White Perch	Fillet - skin off	PCB/PEST	Aldrin	6	5 - 5	µg/kg
White Perch	Fillet - skin off	PCB/PEST	Alpha-BHC	6	1.7 - 1.7	µg/kg
White Perch	Fillet - skin off	PCB/PEST	Alpha-Chlordane	6	6 - 30	µg/kg
White Perch	Fillet - skin off	PCB/PEST	Beta-BHC	6	7 - 7	µg/kg
White Perch	Fillet - skin off	PCB/PEST	Delta-BHC	6	5 - 5	µg/kg

Table 3-59
Bioaccumulation Data from 1995-2001 Passaic RI Sampling Programs Including Tierra (1995a, 1999d, 2000c, 2001a)

Species	Tissue Type	Analyte Class[a]	Compound	Count	Range of Values	Units
White Perch	Fillet - skin off	PCB/PEST	Dieldrin	6	3.3 - 3.3	µg/kg
White Perch	Fillet - skin off	PCB/PEST	Endosulfan I	6	5 - 5	µg/kg
White Perch	Fillet - skin off	PCB/PEST	Endosulfan II	6	7 - 7	µg/kg
White Perch	Fillet - skin off	PCB/PEST	Endosulfan Sulfate	6	3.3 - 3.3	µg/kg
White Perch	Fillet - skin off	PCB/PEST	Endrin	6	5 - 11	µg/kg
White Perch	Fillet - skin off	PCB/PEST	Endrin Aldehyde	6	5 - 8	µg/kg
White Perch	Fillet - skin off	PCB/PEST	Endrin Ketone	6	5 - 5	µg/kg
White Perch	Fillet - skin off	PCB/PEST	Gamma-BHC (Lindane)	6	5 - 5	µg/kg
White Perch	Fillet - skin off	PCB/PEST	Gamma-Chlordane	6	5 - 5	µg/kg
White Perch	Fillet - skin off	PCB/PEST	Heptachlor	6	7 - 7	µg/kg
White Perch	Fillet - skin off	PCB/PEST	Heptachlor Epoxide	6	5 - 5	µg/kg
White Perch	Fillet - skin off	PCB/PEST	Methoxychlor	6	17 - 17	µg/kg
White Perch	Fillet - skin off	PCB/PEST	Total DDT	6	53 - 124	µg/kg
White Perch	Fillet - skin off	PCB/PEST	Total PCBs - Aroclors	6	600 - 1120	µg/kg
White Perch	Fillet - skin off	PCB/PEST	Toxaphene	6	170 - 170	µg/kg
White Perch	Fillet - skin off	Physical Property	Percent Lipid	6	2.6 - 3.11	%
White Perch	Fillet - skin off	Physical Property	Percent Moisture	6	77.1 - 79.9	% by wt.
White Perch	Fillet - skin off	Semivolatiles	1,2,4-Trichlorobenzene	6	38 - 150	µg/kg
White Perch	Fillet - skin off	Semivolatiles	1,2-Dichlorobenzene	6	12 - 110	µg/kg
White Perch	Fillet - skin off	Semivolatiles	1,3-Dichlorobenzene	6	110 - 110	µg/kg
White Perch	Fillet - skin off	Semivolatiles	1,4-Dichlorobenzene	6	250 - 250	µg/kg
White Perch	Fillet - skin off	Semivolatiles	2,4,5-Trichlorophenol	6	280 - 280	µg/kg
White Perch	Fillet - skin off	Semivolatiles	2,4,6-Trichlorophenol	6	250 - 250	µg/kg
White Perch	Fillet - skin off	Semivolatiles	2,4-Dichloropheno	6	110 - 110	µg/kg
White Perch	Fillet - skin off	Semivolatiles	2,4-Dimethylpheno	6	110 - 110	µg/kg
White Perch	Fillet - skin off	Semivolatiles	2,4-Dinitropheno	6	1500 - 1500	µg/kg
White Perch	Fillet - skin off	Semivolatiles	2,4-Dinitrotoluene	6	250 - 250	µg/kg
White Perch	Fillet - skin off	Semivolatiles	2,6-Dinitrotoluene	6	110 - 110	µg/kg
White Perch	Fillet - skin off	Semivolatiles	2-Chloronaphthalene	6	110 - 110	µg/kg
White Perch	Fillet - skin off	Semivolatiles	2-Chloropheno	6	110 - 110	µg/kg
White Perch	Fillet - skin off	Semivolatiles	2-Methylnaphthalene	6	110 - 110	µg/kg
White Perch	Fillet - skin off	Semivolatiles	2-Methylpheno	6	250 - 250	µg/kg
White Perch	Fillet - skin off	Semivolatiles	2-Nitroaniline	6	280 - 280	µg/kg
White Perch	Fillet - skin off	Semivolatiles	2-Nitrophenol	6	110 - 110	µg/kg
White Perch	Fillet - skin off	Semivolatiles	3,3'-Dichlorobenzidine	6	250 - 250	µg/kg
White Perch	Fillet - skin off	Semivolatiles	3-Nitroaniline	6	500 - 500	µg/kg
White Perch	Fillet - skin off	Semivolatiles	4,6-Dinitro-2-methylpheno	6	1500 - 1500	µg/kg
White Perch	Fillet - skin off	Semivolatiles	4-Bromophenyl phenyl ether	6	110 - 110	µg/kg
White Perch	Fillet - skin off	Semivolatiles	4-Chloro-3-methylpheno	6	110 - 110	µg/kg
White Perch	Fillet - skin off	Semivolatiles	4-Chloroaniline	6	110 - 110	µg/kg
White Perch	Fillet - skin off	Semivolatiles	4-Chlorophenyl phenyl ethe	6	110 - 110	µg/kg
White Perch	Fillet - skin off	Semivolatiles	4-Methylpheno	6	750 - 750	µg/kg
White Perch	Fillet - skin off	Semivolatiles	4-Nitroaniline	6	280 - 280	µg/kg
White Perch	Fillet - skin off	Semivolatiles	4-Nitrophenol	6	1500 - 1500	µg/kg
White Perch	Fillet - skin off	Semivolatiles	Acenaphthene	6	14 - 110	µg/kg
White Perch	Fillet - skin off	Semivolatiles	Acenaphthylene	6	110 - 110	µg/kg
White Perch	Fillet - skin off	Semivolatiles	Anthracene	6	110 - 110	µg/kg
White Perch	Fillet - skin off	Semivolatiles	Benzo(a)anthracene	6	10 - 110	µg/kg
White Perch	Fillet - skin off	Semivolatiles	Benzo(a)pyrene	6	250 - 250	µg/kg
White Perch	Fillet - skin off	Semivolatiles	Benzo(b)fluoranthene	6	110 - 110	µg/kg
White Perch	Fillet - skin off	Semivolatiles	Benzo(g,h,i)perylene	6	250 - 250	µg/kg
White Perch	Fillet - skin off	Semivolatiles	Benzo(k)fluoranthene	6	110 - 110	µg/kg
White Perch	Fillet - skin off	Semivolatiles	bis(2-Chloroethoxy)methane	6	110 - 110	µg/kg
White Perch	Fillet - skin off	Semivolatiles	bis(2-Chloroethyl)ether	6	110 - 110	µg/kg
White Perch	Fillet - skin off	Semivolatiles	bis(2-Chloroisopropyl)ether	6	2500 - 2500	µg/kg
White Perch	Fillet - skin off	Semivolatiles	bis(2-Ethylhexyl)phthalate	6	3000 - 3000	µg/kg
White Perch	Fillet - skin off	Semivolatiles	Butyl benzyl phthalate	6	110 - 110	µg/kg
White Perch	Fillet - skin off	Semivolatiles	Carbazole	6	1000 - 1000	µg/kg
White Perch	Fillet - skin off	Semivolatiles	Chrysene	6	110 - 110	µg/kg
White Perch	Fillet - skin off	Semivolatiles	Dibenzo(a,h)anthracene	6	250 - 250	µg/kg
White Perch	Fillet - skin off	Semivolatiles	Dibenzofuran	6	110 - 110	µg/kg
White Perch	Fillet - skin off	Semivolatiles	Diethyl phthalate	6	16 - 110	µg/kg
White Perch	Fillet - skin off	Semivolatiles	Dimethylphthalate	6	110 - 110	µg/kg
White Perch	Fillet - skin off	Semivolatiles	Di-n-Butylphthalate	6	36 - 110	µg/kg
White Perch	Fillet - skin off	Semivolatiles	Di-n-Octylphthalate	6	500 - 500	µg/kg
White Perch	Fillet - skin off	Semivolatiles	Fluoranthene	6	110 - 110	µg/kg
White Perch	Fillet - skin off	Semivolatiles	Fluorene	6	110 - 110	µg/kg
White Perch	Fillet - skin off	Semivolatiles	Hexachlorobenzene	6	110 - 110	µg/kg
White Perch	Fillet - skin off	Semivolatiles	Hexachlorobutadiene	6	110 - 110	µg/kg
White Perch	Fillet - skin off	Semivolatiles	Hexachlorocyclopentadiene	6	110 - 110	µg/kg
White Perch	Fillet - skin off	Semivolatiles	Hexachloroethane	6	250 - 250	µg/kg
White Perch	Fillet - skin off	Semivolatiles	Indeno(1,2,3-cd)pyrene	6	250 - 250	µg/kg
White Perch	Fillet - skin off	Semivolatiles	Isophorone	6	250 - 250	µg/kg
White Perch	Fillet - skin off	Semivolatiles	Naphthalene	6	110 - 110	µg/kg
White Perch	Fillet - skin off	Semivolatiles	Nitrobenzene	6	250 - 250	µg/kg

Table 3-59
Bioaccumulation Data from 1995-2001 Passaic RI Sampling Programs Including Tierra (1995a, 1999d, 2000c, 2001a)

Species	Tissue Type	Analyte Class[a]	Compound	Count	Range of Values	Units
White Perch	Fillet - skin off	Semivolatiles	N-Nitroso-di-n-propylamine	6	250 - 250	µg/kg
White Perch	Fillet - skin off	Semivolatiles	N-Nitrosodiphenylamine	6	250 - 250	µg/kg
White Perch	Fillet - skin off	Semivolatiles	Pentachloropheno	6	1500 - 1500	µg/kg
White Perch	Fillet - skin off	Semivolatiles	Phenanthrene	6	15 - 110	µg/kg
White Perch	Fillet - skin off	Semivolatiles	Phenol	6	94 - 500	µg/kg
White Perch	Fillet - skin off	Semivolatiles	Pyrene	6	110 - 110	µg/kg
White Perch	Whole body	PCDD/Fs	2,3,7,8-TCDD	18	0.0736 - 0.352	µg/kg
White Perch	Whole body	PCDD/Fs	2,3,7,8-TCDF	18	0.0199 - 0.0443	µg/kg
White Perch	Whole body	Herbicides	2,4,5-T	16	0.95 - 100	µg/kg
White Perch	Whole body	Herbicides	2,4,5-TP (Silvex)	17	0.95 - 100	µg/kg
White Perch	Whole body	Herbicides	2,4-D	18	21 - 240	µg/kg
White Perch	Whole body	Herbicides	2,4-DB	17	79 - 190	µg/kg
White Perch	Whole body	Homologue Groups	Total PCBs - Homologue Groups	18	2920 - 7420	µg/kg
White Perch	Whole body	Inorganic Chemicals	Al	9	6900 - 31400	µg/kg
White Perch	Whole body	Inorganic Chemicals	Sb	18	180 - 360	µg/kg
White Perch	Whole body	Inorganic Chemicals	As	18	290 - 1000	µg/kg
White Perch	Whole body	Inorganic Chemicals	Ba	18	270 - 1700	µg/kg
White Perch	Whole body	Inorganic Chemicals	Be	18	27 - 45	µg/kg
White Perch	Whole body	Inorganic Chemicals	Cd	18	37 - 110	µg/kg
White Perch	Whole body	Inorganic Chemicals	Ca	18	2240000 - 35000000	µg/kg
White Perch	Whole body	Inorganic Chemicals	Cr	18	410 - 1700	µg/kg
White Perch	Whole body	Inorganic Chemicals	Co	18	120 - 180	µg/kg
White Perch	Whole body	Inorganic Chemicals	Cu	18	6700 - 36700	µg/kg
White Perch	Whole body	Inorganic Chemicals	Fe	18	22500 - 125000	µg/kg
White Perch	Whole body	Inorganic Chemicals	Pb	9	260 - 510	µg/kg
White Perch	Whole body	Inorganic Chemicals	Mg	9	241000 - 777000	µg/kg
White Perch	Whole body	Inorganic Chemicals	Mn	18	1100 - 5300	µg/kg
White Perch	Whole body	Inorganic Chemicals	Hg	18	130 - 570	µg/kg
White Perch	Whole body	Inorganic Chemicals	Ni	18	74 - 2400	µg/kg
White Perch	Whole body	Inorganic Chemicals	K	18	2740000 - 3380000	µg/kg
White Perch	Whole body	Inorganic Chemicals	Se	18	450 - 2200	µg/kg
White Perch	Whole body	Inorganic Chemicals	Ag	18	290 - 950	µg/kg
White Perch	Whole body	Inorganic Chemicals	Na	18	1040000 - 1830000	µg/kg
White Perch	Whole body	Inorganic Chemicals	Tl	18	280 - 730	µg/kg
White Perch	Whole body	Inorganic Chemicals	V	18	40 - 220	µg/kg
White Perch	Whole body	Inorganic Chemicals	Zn	9	20200 - 29800	µg/kg
White Perch	Whole body	Organotin	Dibutyltin	18	1.08 - 3.64	µg/kg
White Perch	Whole body	Organotin	Monobutyltir	18	0.24 - 2	µg/kg
White Perch	Whole body	Organotin	Tetrabutyltin	18	4 - 4	µg/kg
White Perch	Whole body	Organotin	Tributyltin	18	8.53 - 39.7	µg/kg
White Perch	Whole body	PAH-SIM	HMW PAHs	18	41.7 - 337	µg/kg
White Perch	Whole body	PAH-SIM	LMW PAHs	18	66 - 544	µg/kg
White Perch	Whole body	PAH-SIM	Total PAHs	18	112 - 724	µg/kg
White Perch	Whole body	PCB Congeners	Total PCBs - Congeners (NOAA 1989)	18	2380 - 6780	µg/kg
White Perch	Whole body	PCB/PEST	4,4'-DDD	18	45 - 150	µg/kg
White Perch	Whole body	PCB/PEST	4,4'-DDE	18	66 - 430	µg/kg
White Perch	Whole body	PCB/PEST	4,4'-DDT	18	51 - 380	µg/kg
White Perch	Whole body	PCB/PEST	Aldrin	18	5 - 100	µg/kg
White Perch	Whole body	PCB/PEST	Alpha-BHC	18	1.7 - 34	µg/kg
White Perch	Whole body	PCB/PEST	Alpha-Chlordane	18	15 - 250	µg/kg
White Perch	Whole body	PCB/PEST	Beta-BHC	18	7 - 140	µg/kg
White Perch	Whole body	PCB/PEST	Delta-BHC	18	5 - 100	µg/kg
White Perch	Whole body	PCB/PEST	Dieldrin	18	5 - 66	µg/kg
White Perch	Whole body	PCB/PEST	Endosulfan I	18	5 - 100	µg/kg
White Perch	Whole body	PCB/PEST	Endosulfan II	18	7 - 140	µg/kg
White Perch	Whole body	PCB/PEST	Endosulfan Sulfate	18	3.3 - 66	µg/kg
White Perch	Whole body	PCB/PEST	Endrin	18	5 - 100	µg/kg
White Perch	Whole body	PCB/PEST	Endrin Aldehyde	18	10 - 100	µg/kg
White Perch	Whole body	PCB/PEST	Endrin Ketone	18	5 - 100	µg/kg
White Perch	Whole body	PCB/PEST	Gamma-BHC (Lindane)	18	5 - 100	µg/kg
White Perch	Whole body	PCB/PEST	Gamma-Chlordane	18	5 - 100	µg/kg
White Perch	Whole body	PCB/PEST	Heptachlor	18	7 - 140	µg/kg
White Perch	Whole body	PCB/PEST	Heptachlor Epoxide	18	5 - 100	µg/kg
White Perch	Whole body	PCB/PEST	Methoxychlor	18	17 - 340	µg/kg
White Perch	Whole body	PCB/PEST	Total DDT	18	117 - 960	µg/kg
White Perch	Whole body	PCB/PEST	Total PCBs - Aroclors	18	1150 - 10500	µg/kg
White Perch	Whole body	PCB/PEST	Toxaphene	18	170 - 3400	µg/kg
White Perch	Whole body	Physical Property	Percent Lipid	18	5.38 - 10.4	%
White Perch	Whole body	Physical Property	Percent Moisture	18	62.7 - 73	% by wt.
White Perch	Whole body	Semivolatiles	1,2,4-Trichlorobenzene	18	14 - 390	µg/kg
White Perch	Whole body	Semivolatiles	1,2-Dichlorobenzene	18	12 - 110	µg/kg
White Perch	Whole body	Semivolatiles	1,3-Dichlorobenzene	18	16 - 110	µg/kg
White Perch	Whole body	Semivolatiles	1,4-Dichlorobenzene	18	39 - 250	µg/kg
White Perch	Whole body	Semivolatiles	2,4,5-Trichlorophenol	18	280 - 280	µg/kg
White Perch	Whole body	Semivolatiles	2,4,6-Trichlorophenol	18	250 - 250	µg/kg

Table 3-59
Bioaccumulation Data from 1995-2001 Passaic RI Sampling Programs Including Tierra (1995a, 1999d, 2000c, 2001a)

Species	Tissue Type	Analyte Class[a]	Compound	Count	Range of Values	Units
White Perch	Whole body	Semivolatiles	2,4-Dichlorophenol	18	14 - 110	µg/kg
White Perch	Whole body	Semivolatiles	2,4-Dimethylphenol	18	110 - 110	µg/kg
White Perch	Whole body	Semivolatiles	2,4-Dinitrophenol	18	1500 - 1500	µg/kg
White Perch	Whole body	Semivolatiles	2,4-Dinitrotoluene	18	150 - 420	µg/kg
White Perch	Whole body	Semivolatiles	2,6-Dinitrotoluene	18	97 - 200	µg/kg
White Perch	Whole body	Semivolatiles	2-Chloronaphthalene	18	110 - 110	µg/kg
White Perch	Whole body	Semivolatiles	2-Chlorophenol	18	110 - 110	µg/kg
White Perch	Whole body	Semivolatiles	2-Methylnaphthalene	18	110 - 110	µg/kg
White Perch	Whole body	Semivolatiles	2-Methylphenol	18	250 - 250	µg/kg
White Perch	Whole body	Semivolatiles	2-Nitroaniline	18	280 - 280	µg/kg
White Perch	Whole body	Semivolatiles	2-Nitrophenol	18	110 - 110	µg/kg
White Perch	Whole body	Semivolatiles	3,3'-Dichlorobenzidine	18	250 - 250	µg/kg
White Perch	Whole body	Semivolatiles	3-Nitroaniline	18	500 - 500	µg/kg
White Perch	Whole body	Semivolatiles	4,6-Dinitro-2-methylphenol	18	1500 - 1500	µg/kg
White Perch	Whole body	Semivolatiles	4-Bromophenyl phenyl ether	18	110 - 110	µg/kg
White Perch	Whole body	Semivolatiles	4-Chloro-3-methylphenol	18	33 - 110	µg/kg
White Perch	Whole body	Semivolatiles	4-Chloroaniline	18	110 - 110	µg/kg
White Perch	Whole body	Semivolatiles	4-Chlorophenyl phenyl ether	18	110 - 110	µg/kg
White Perch	Whole body	Semivolatiles	4-Methylphenol	18	750 - 750	µg/kg
White Perch	Whole body	Semivolatiles	4-Nitroaniline	18	280 - 280	µg/kg
White Perch	Whole body	Semivolatiles	4-Nitrophenol	18	300 - 1500	µg/kg
White Perch	Whole body	Semivolatiles	Acenaphthene	18	13 - 110	µg/kg
White Perch	Whole body	Semivolatiles	Acenaphthylene	18	19 - 110	µg/kg
White Perch	Whole body	Semivolatiles	Anthracene	18	18 - 110	µg/kg
White Perch	Whole body	Semivolatiles	Benzo(a)anthracene	18	110 - 110	µg/kg
White Perch	Whole body	Semivolatiles	Benzo(a)pyrene	18	250 - 250	µg/kg
White Perch	Whole body	Semivolatiles	Benzo(b)fluoranthene	18	110 - 110	µg/kg
White Perch	Whole body	Semivolatiles	Benzo(g,h,i)perylene	18	250 - 250	µg/kg
White Perch	Whole body	Semivolatiles	Benzo(k)fluoranthene	18	110 - 110	µg/kg
White Perch	Whole body	Semivolatiles	bis(2-Chloroethoxy)methane	18	110 - 110	µg/kg
White Perch	Whole body	Semivolatiles	bis(2-Chloroethyl)ether	18	110 - 110	µg/kg
White Perch	Whole body	Semivolatiles	bis(2-Chloroisopropyl)ether	18	2500 - 2500	µg/kg
White Perch	Whole body	Semivolatiles	bis(2-Ethylhexyl)phthalate	18	3000 - 3000	µg/kg
White Perch	Whole body	Semivolatiles	Butyl benzyl phthalate	18	110 - 110	µg/kg
White Perch	Whole body	Semivolatiles	Carbazole	18	1000 - 1000	µg/kg
White Perch	Whole body	Semivolatiles	Chrysene	18	110 - 110	µg/kg
White Perch	Whole body	Semivolatiles	Dibenzo(a,h)anthracene	18	250 - 250	µg/kg
White Perch	Whole body	Semivolatiles	Dibenzofuran	18	27 - 110	µg/kg
White Perch	Whole body	Semivolatiles	Diethyl phthalate	18	25 - 760	µg/kg
White Perch	Whole body	Semivolatiles	Dimethylphthalate	18	110 - 110	µg/kg
White Perch	Whole body	Semivolatiles	Di-n-Butylphthalate	18	110 - 110	µg/kg
White Perch	Whole body	Semivolatiles	Di-n-Octylphthalate	18	320 - 500	µg/kg
White Perch	Whole body	Semivolatiles	Fluoranthene	18	44 - 110	µg/kg
White Perch	Whole body	Semivolatiles	Fluorene	18	19 - 110	µg/kg
White Perch	Whole body	Semivolatiles	Hexachlorobenzene	18	110 - 110	µg/kg
White Perch	Whole body	Semivolatiles	Hexachlorobutadiene	18	110 - 110	µg/kg
White Perch	Whole body	Semivolatiles	Hexachlorocyclopentadiene	18	110 - 110	µg/kg
White Perch	Whole body	Semivolatiles	Hexachloroethane	18	250 - 250	µg/kg
White Perch	Whole body	Semivolatiles	Indeno(1,2,3-cd)pyrene	18	250 - 250	µg/kg
White Perch	Whole body	Semivolatiles	Isophorone	18	250 - 250	µg/kg
White Perch	Whole body	Semivolatiles	Naphthalene	18	25 - 110	µg/kg
White Perch	Whole body	Semivolatiles	Nitrobenzene	18	250 - 250	µg/kg
White Perch	Whole body	Semivolatiles	N-Nitroso-di-n-propylamine	18	250 - 250	µg/kg
White Perch	Whole body	Semivolatiles	N-Nitrosodiphenylamine	18	250 - 250	µg/kg
White Perch	Whole body	Semivolatiles	Pentachlorophenol	18	630 - 1500	µg/kg
White Perch	Whole body	Semivolatiles	Phenanthrene	18	16 - 110	µg/kg
White Perch	Whole body	Semivolatiles	Phenol	18	500 - 500	µg/kg
White Perch	Whole body	Semivolatiles	Pyrene	18	18 - 110	µg/kg
Crustaceans						
Blue Crab	Edible muscle	Cyanide	Total Cyanide	4	500 - 500	µg/kg
Blue Crab	Edible muscle	PCDD/Fs	2,3,7,8-TCDD	24	0.0066 - 0.0227	µg/kg
Blue Crab	Edible muscle	PCDD/Fs	2,3,7,8-TCDF	24	0.000993 - 0.0062	µg/kg
Blue Crab	Edible muscle	Herbicides	2,4,5-T	19	100 - 100	µg/kg
Blue Crab	Edible muscle	Herbicides	2,4,5-TP (Silvex)	18	7.9 - 100	µg/kg
Blue Crab	Edible muscle	Herbicides	2,4-D	17	240 - 240	µg/kg
Blue Crab	Edible muscle	Herbicides	2,4-DB	20	180 - 180	µg/kg
Blue Crab	Edible muscle	Homologue Groups	Total PCBs - Homologue Groups	20	53 - 199	µg/kg
Blue Crab	Edible muscle	Inorganic Chemicals	Al	24	2600 - 12800	µg/kg
Blue Crab	Edible muscle	Inorganic Chemicals	Sb	24	190 - 8900	µg/kg
Blue Crab	Edible muscle	Inorganic Chemicals	As	24	300 - 1800	µg/kg
Blue Crab	Edible muscle	Inorganic Chemicals	Ba	24	54 - 1500	µg/kg
Blue Crab	Edible muscle	Inorganic Chemicals	Be	24	20 - 60	µg/kg
Blue Crab	Edible muscle	Inorganic Chemicals	Cd	24	30 - 190	µg/kg
Blue Crab	Edible muscle	Inorganic Chemicals	Ca	24	524000 - 3700000	µg/kg
Blue Crab	Edible muscle	Inorganic Chemicals	Cr	24	140 - 1400	µg/kg

Table 3-59
Bioaccumulation Data from 1995-2001 Passaic RI Sampling Programs Including Tierra (1995a, 1999d, 2000c, 2001a)

Species	Tissue Type	Analyte Class[a]	Compound	Count	Range of Values	Units
Blue Crab	Edible muscle	Inorganic Chemicals	Co	24	60 - 600	µg/kg
Blue Crab	Edible muscle	Inorganic Chemicals	Cu	24	8400 - 19900	µg/kg
Blue Crab	Edible muscle	Inorganic Chemicals	Fe	24	2200 - 12900	µg/kg
Blue Crab	Edible muscle	Inorganic Chemicals	Pb	16	110 - 580	µg/kg
Blue Crab	Edible muscle	Inorganic Chemicals	Mg	24	215000 - 602000	µg/kg
Blue Crab	Edible muscle	Inorganic Chemicals	Mn	24	130 - 5600	µg/kg
Blue Crab	Edible muscle	Inorganic Chemicals	Hg	24	54 - 280	µg/kg
Blue Crab	Edible muscle	Inorganic Chemicals	Ni	24	75 - 4100	µg/kg
Blue Crab	Edible muscle	Inorganic Chemicals	K	19	2380000 - 4210000	µg/kg
Blue Crab	Edible muscle	Inorganic Chemicals	Se	24	290 - 1300	µg/kg
Blue Crab	Edible muscle	Inorganic Chemicals	Ag	24	100 - 1400	µg/kg
Blue Crab	Edible muscle	Inorganic Chemicals	Na	24	1630000 - 3400000	µg/kg
Blue Crab	Edible muscle	Inorganic Chemicals	Tl	18	300 - 1200	µg/kg
Blue Crab	Edible muscle	Inorganic Chemicals	Ti	4	80 - 80	µg/kg
Blue Crab	Edible muscle	Inorganic Chemicals	V	24	37 - 800	µg/kg
Blue Crab	Edible muscle	Inorganic Chemicals	Zn	24	17900 - 52600	µg/kg
Blue Crab	Edible muscle	Miscellaneous Chemica	Methyl Hg	4	152 - 235	µg/kg
Blue Crab	Edible muscle	Organotin	Dibutyltin	24	0.559 - 100	µg/kg
Blue Crab	Edible muscle	Organotin	Monobutyltir	24	0.18 - 150	µg/kg
Blue Crab	Edible muscle	Organotin	Tetrabutyltin	24	4 - 100	µg/kg
Blue Crab	Edible muscle	Organotin	Tributyltin	24	1.36 - 100	µg/kg
Blue Crab	Edible muscle	PAH-SIM	HMW PAHs	18	3 - 60	µg/kg
Blue Crab	Edible muscle	PAH-SIM	LMW PAHs	24	3.2 - 134	µg/kg
Blue Crab	Edible muscle	PAH-SIM	Total PAHs	24	3.2 - 194	µg/kg
Blue Crab	Edible muscle	PCB Congeners	Total PCBs - Congeners (NOAA 1989)	18	66.3 - 235	µg/kg
Blue Crab	Edible muscle	PCB/PEST	4,4'-DDD	24	2.1 - 7	µg/kg
Blue Crab	Edible muscle	PCB/PEST	4,4'-DDE	24	2.9 - 15	µg/kg
Blue Crab	Edible muscle	PCB/PEST	4,4'-DDT	24	1.82 - 10	µg/kg
Blue Crab	Edible muscle	PCB/PEST	Aldrin	24	1.2 - 5	µg/kg
Blue Crab	Edible muscle	PCB/PEST	Alpha-BHC	24	0.63 - 1.7	µg/kg
Blue Crab	Edible muscle	PCB/PEST	Alpha-Chlordane	24	1 - 3	µg/kg
Blue Crab	Edible muscle	PCB/PEST	Beta-BHC	24	0.9 - 7	µg/kg
Blue Crab	Edible muscle	PCB/PEST	Delta-BHC	24	1.5 - 5	µg/kg
Blue Crab	Edible muscle	PCB/PEST	Dieldrin	24	1.88 - 3.3	µg/kg
Blue Crab	Edible muscle	PCB/PEST	Endosulfan I	24	0.86 - 5	µg/kg
Blue Crab	Edible muscle	PCB/PEST	Endosulfan II	24	2.24 - 7	µg/kg
Blue Crab	Edible muscle	PCB/PEST	Endosulfan Sulfate	24	3 - 3.3	µg/kg
Blue Crab	Edible muscle	PCB/PEST	Endrin	24	1.68 - 5	µg/kg
Blue Crab	Edible muscle	PCB/PEST	Endrin Aldehyde	24	1.2 - 5	µg/kg
Blue Crab	Edible muscle	PCB/PEST	Endrin Ketone	24	2.84 - 5	µg/kg
Blue Crab	Edible muscle	PCB/PEST	Gamma-BHC (Lindane)	24	0.8 - 5	µg/kg
Blue Crab	Edible muscle	PCB/PEST	Gamma-Chlordane	24	1.26 - 5	µg/kg
Blue Crab	Edible muscle	PCB/PEST	Heptachlor	24	0.84 - 7	µg/kg
Blue Crab	Edible muscle	PCB/PEST	Heptachlor Epoxide	24	1.18 - 5	µg/kg
Blue Crab	Edible muscle	PCB/PEST	Methoxychlor	24	6.72 - 17	µg/kg
Blue Crab	Edible muscle	PCB/PEST	Total Alpha + Gamma Chlordane	2	1 - 1.29	µg/kg
Blue Crab	Edible muscle	PCB/PEST	Total DDT	10	3.7 - 8.1	µg/kg
Blue Crab	Edible muscle	PCB/PEST	Total PCBs - Aroclors	4	16 - 32	µg/kg
Blue Crab	Edible muscle	PCB/PEST	Toxaphene	24	136 - 170	µg/kg
Blue Crab	Edible muscle	Physical Property	Percent Lipid	24	0.168 - 0.85	%
Blue Crab	Edible muscle	Physical Property	Percent Moisture	19	78.9 - 85.9	% by wt.
Blue Crab	Edible muscle	Semivolatiles	1,2,4-Trichlorobenzene	24	13 - 110	µg/kg
Blue Crab	Edible muscle	Semivolatiles	1,2-Dichlorobenzene	24	9 - 110	µg/kg
Blue Crab	Edible muscle	Semivolatiles	1,3-Dichlorobenzene	24	47 - 110	µg/kg
Blue Crab	Edible muscle	Semivolatiles	1,4-Dichlorobenzene	24	55 - 250	µg/kg
Blue Crab	Edible muscle	Semivolatiles	2,4,5-Trichlorophenol	24	150 - 280	µg/kg
Blue Crab	Edible muscle	Semivolatiles	2,4,6-Trichlorophenol	24	39 - 250	µg/kg
Blue Crab	Edible muscle	Semivolatiles	2,4-Dichloropheno	24	26 - 110	µg/kg
Blue Crab	Edible muscle	Semivolatiles	2,4-Dimethylpheno	24	39 - 110	µg/kg
Blue Crab	Edible muscle	Semivolatiles	2,4-Dinitropheno	24	260 - 1500	µg/kg
Blue Crab	Edible muscle	Semivolatiles	2,4-Dinitrotoluene	24	39 - 250	µg/kg
Blue Crab	Edible muscle	Semivolatiles	2,6-Dinitrotoluene	24	38 - 110	µg/kg
Blue Crab	Edible muscle	Semivolatiles	2-Chloronaphthalene	24	21 - 110	µg/kg
Blue Crab	Edible muscle	Semivolatiles	2-Chloropheno	24	40 - 110	µg/kg
Blue Crab	Edible muscle	Semivolatiles	2-Methylnaphthalene	24	31 - 110	µg/kg
Blue Crab	Edible muscle	Semivolatiles	2-Methylpheno	24	27 - 250	µg/kg
Blue Crab	Edible muscle	Semivolatiles	2-Nitroaniline	24	130 - 280	µg/kg
Blue Crab	Edible muscle	Semivolatiles	2-Nitrophenol	24	31 - 110	µg/kg
Blue Crab	Edible muscle	Semivolatiles	3,3'-Dichlorobenzidine	24	96 - 250	µg/kg
Blue Crab	Edible muscle	Semivolatiles	3-Nitroaniline	24	240 - 500	µg/kg
Blue Crab	Edible muscle	Semivolatiles	4,6-Dinitro-2-methylpheno	24	120 - 1500	µg/kg
Blue Crab	Edible muscle	Semivolatiles	4-Bromophenyl phenyl ether	24	38 - 110	µg/kg
Blue Crab	Edible muscle	Semivolatiles	4-Chloro-3-methylpheno	24	35 - 110	µg/kg
Blue Crab	Edible muscle	Semivolatiles	4-Chloroaniline	24	63 - 110	µg/kg
Blue Crab	Edible muscle	Semivolatiles	4-Chlorophenyl phenyl ethe	24	52 - 110	µg/kg

Table 3-59
Bioaccumulation Data from 1995-2001 Passaic RI Sampling Programs Including Tierra (1995a, 1999d, 2000c, 2001a)

Species	Tissue Type	Analyte Class[a]	Compound	Count	Range of Values	Units
Blue Crab	Edible muscle	Semivolatiles	4-Methylpheno	24	62 - 750	µg/kg
Blue Crab	Edible muscle	Semivolatiles	4-Nitroaniline	24	130 - 280	µg/kg
Blue Crab	Edible muscle	Semivolatiles	4-Nitrophenol	24	140 - 1500	µg/kg
Blue Crab	Edible muscle	Semivolatiles	Acenaphthene	20	110 - 110	µg/kg
Blue Crab	Edible muscle	Semivolatiles	Acenaphthylene	20	110 - 110	µg/kg
Blue Crab	Edible muscle	Semivolatiles	Anthracene	20	110 - 110	µg/kg
Blue Crab	Edible muscle	Semivolatiles	Benzo(a)anthracene	20	110 - 110	µg/kg
Blue Crab	Edible muscle	Semivolatiles	Benzo(a)pyrene	20	250 - 250	µg/kg
Blue Crab	Edible muscle	Semivolatiles	Benzo(b)fluoranthene	20	110 - 110	µg/kg
Blue Crab	Edible muscle	Semivolatiles	Benzo(g,h,i)perylene	20	250 - 250	µg/kg
Blue Crab	Edible muscle	Semivolatiles	Benzo(k)fluoranthene	20	110 - 110	µg/kg
Blue Crab	Edible muscle	Semivolatiles	Benzoic Acid	4	800 - 800	µg/kg
Blue Crab	Edible muscle	Semivolatiles	Benzyl Alcoho	4	27 - 27	µg/kg
Blue Crab	Edible muscle	Semivolatiles	bis(2-Chloroethoxy)methane	24	46 - 110	µg/kg
Blue Crab	Edible muscle	Semivolatiles	bis(2-Chloroethyl)ether	24	46 - 110	µg/kg
Blue Crab	Edible muscle	Semivolatiles	bis(2-Chloroisopropyl)ether	24	46 - 2500	µg/kg
Blue Crab	Edible muscle	Semivolatiles	bis(2-Ethylhexyl)phthalate	24	11 - 3000	µg/kg
Blue Crab	Edible muscle	Semivolatiles	Butyl benzyl phthalate	24	21 - 110	µg/kg
Blue Crab	Edible muscle	Semivolatiles	Carbazole	24	29 - 1000	µg/kg
Blue Crab	Edible muscle	Semivolatiles	Chrysene	20	110 - 110	µg/kg
Blue Crab	Edible muscle	Semivolatiles	Dibenzo(a,h)anthracene	20	250 - 250	µg/kg
Blue Crab	Edible muscle	Semivolatiles	Dibenzofuran	24	49 - 110	µg/kg
Blue Crab	Edible muscle	Semivolatiles	Diethyl phthalate	24	16 - 110	µg/kg
Blue Crab	Edible muscle	Semivolatiles	Dimethylphthalate	24	34 - 110	µg/kg
Blue Crab	Edible muscle	Semivolatiles	Di-n-Butylphthalate	24	29 - 110	µg/kg
Blue Crab	Edible muscle	Semivolatiles	Di-n-Octylphthalate	24	67 - 500	µg/kg
Blue Crab	Edible muscle	Semivolatiles	Fluoranthene	20	110 - 110	µg/kg
Blue Crab	Edible muscle	Semivolatiles	Fluorene	20	110 - 110	µg/kg
Blue Crab	Edible muscle	Semivolatiles	Hexachlorobenzene	24	54 - 110	µg/kg
Blue Crab	Edible muscle	Semivolatiles	Hexachlorobutadiene	24	47 - 110	µg/kg
Blue Crab	Edible muscle	Semivolatiles	Hexachlorocyclopentadiene	24	60 - 110	µg/kg
Blue Crab	Edible muscle	Semivolatiles	Hexachloroethane	24	53 - 250	µg/kg
Blue Crab	Edible muscle	Semivolatiles	Indeno(1,2,3-cd)pyrene	20	250 - 250	µg/kg
Blue Crab	Edible muscle	Semivolatiles	Isophorone	24	31 - 250	µg/kg
Blue Crab	Edible muscle	Semivolatiles	Naphthalene	20	63 - 110	µg/kg
Blue Crab	Edible muscle	Semivolatiles	Nitrobenzene	24	37 - 250	µg/kg
Blue Crab	Edible muscle	Semivolatiles	N-Nitroso-di-n-propylamine	24	60 - 250	µg/kg
Blue Crab	Edible muscle	Semivolatiles	N-Nitrosodiphenylamine	24	36 - 250	µg/kg
Blue Crab	Edible muscle	Semivolatiles	Pentachloropheno	24	160 - 1500	µg/kg
Blue Crab	Edible muscle	Semivolatiles	Phenanthrene	20	110 - 110	µg/kg
Blue Crab	Edible muscle	Semivolatiles	Phenol	24	39 - 500	µg/kg
Blue Crab	Edible muscle	Semivolatiles	Pyrene	20	110 - 110	µg/kg
Blue Crab	Edible muscle	TPH	Petroleum Hydrocarbons (extractable)	3	18500 - 45700	µg/kg
Blue Crab	Hepatopancreas	Cyanide	Total Cyanide	1	500 - 500	µg/kg
Blue Crab	Hepatopancreas	PCDD/Fs	2,3,7,8-TCDD	17	0.195 - 0.67	µg/kg
Blue Crab	Hepatopancreas	PCDD/Fs	2,3,7,8-TCDF	17	0.0286 - 0.16	µg/kg
Blue Crab	Hepatopancreas	Herbicides	2,4,5-T	13	21.8 - 100	µg/kg
Blue Crab	Hepatopancreas	Herbicides	2,4,5-TP (Silvex)	12	33.8 - 100	µg/kg
Blue Crab	Hepatopancreas	Herbicides	2,4-D	15	240 - 240	µg/kg
Blue Crab	Hepatopancreas	Herbicides	2,4-DB	15	99 - 180	µg/kg
Blue Crab	Hepatopancreas	Homologue Groups	Total PCBs - Homologue Groups	15	1920 - 85000	µg/kg
Blue Crab	Hepatopancreas	Inorganic Chemicals	Al	17	5200 - 22100	µg/kg
Blue Crab	Hepatopancreas	Inorganic Chemicals	Sb	17	560 - 8800	µg/kg
Blue Crab	Hepatopancreas	Inorganic Chemicals	As	17	310 - 2600	µg/kg
Blue Crab	Hepatopancreas	Inorganic Chemicals	Ba	17	840 - 3100	µg/kg
Blue Crab	Hepatopancreas	Inorganic Chemicals	Be	17	29 - 60	µg/kg
Blue Crab	Hepatopancreas	Inorganic Chemicals	Cd	17	340 - 1300	µg/kg
Blue Crab	Hepatopancreas	Inorganic Chemicals	Ca	17	2140000 - 12600000	µg/kg
Blue Crab	Hepatopancreas	Inorganic Chemicals	Cr	17	140 - 1400	µg/kg
Blue Crab	Hepatopancreas	Inorganic Chemicals	Co	17	110 - 590	µg/kg
Blue Crab	Hepatopancreas	Inorganic Chemicals	Cu	17	30700 - 78500	µg/kg
Blue Crab	Hepatopancreas	Inorganic Chemicals	Fe	17	27800 - 64800	µg/kg
Blue Crab	Hepatopancreas	Inorganic Chemicals	Pb	17	260 - 2400	µg/kg
Blue Crab	Hepatopancreas	Inorganic Chemicals	Mg	17	288000 - 1130000	µg/kg
Blue Crab	Hepatopancreas	Inorganic Chemicals	Mn	17	1800 - 17900	µg/kg
Blue Crab	Hepatopancreas	Inorganic Chemicals	Hg	17	29 - 100	µg/kg
Blue Crab	Hepatopancreas	Inorganic Chemicals	Ni	17	160 - 3000	µg/kg
Blue Crab	Hepatopancreas	Inorganic Chemicals	K	2	2470000 - 2680000	µg/kg
Blue Crab	Hepatopancreas	Inorganic Chemicals	Se	17	790 - 1900	µg/kg
Blue Crab	Hepatopancreas	Inorganic Chemicals	Ag	17	1000 - 3000	µg/kg
Blue Crab	Hepatopancreas	Inorganic Chemicals	Na	17	2420000 - 3830000	µg/kg
Blue Crab	Hepatopancreas	Inorganic Chemicals	Tl	2	1200 - 1200	µg/kg
Blue Crab	Hepatopancreas	Inorganic Chemicals	Ti	2	80 - 540	µg/kg
Blue Crab	Hepatopancreas	Inorganic Chemicals	V	17	78 - 790	µg/kg
Blue Crab	Hepatopancreas	Inorganic Chemicals	Zn	17	16800 - 53200	µg/kg

Table 3-59
Bioaccumulation Data from 1995-2001 Passaic RI Sampling Programs Including Tierra (1995a, 1999d, 2000c, 2001a)

Species	Tissue Type	Analyte Class[a]	Compound	Count	Range of Values	Units
Blue Crab	Hepatopancreas	Miscellaneous Chemica	Methyl Hg	2	39.2 - 56.8	µg/kg
Blue Crab	Hepatopancreas	Organotin	Dibutyltin	16	4.4 - 100	µg/kg
Blue Crab	Hepatopancreas	Organotin	Monobutyltir	16	0.86 - 150	µg/kg
Blue Crab	Hepatopancreas	Organotin	Tetrabutyltin	16	4 - 100	µg/kg
Blue Crab	Hepatopancreas	Organotin	Tributyltin	16	2.02 - 100	µg/kg
Blue Crab	Hepatopancreas	PAH-SIM	HMW PAHs	17	63.6 - 704	µg/kg
Blue Crab	Hepatopancreas	PAH-SIM	LMW PAHs	17	44.7 - 835	µg/kg
Blue Crab	Hepatopancreas	PAH-SIM	Total PAHs	17	108 - 1540	µg/kg
Blue Crab	Hepatopancreas	PCB Congeners	Total PCBs - Congeners (NOAA 1989)	15	2490 - 103000	µg/kg
Blue Crab	Hepatopancreas	PCB/PEST	4,4'-DDD	17	67 - 823	µg/kg
Blue Crab	Hepatopancreas	PCB/PEST	4,4'-DDE	17	243 - 1740	µg/kg
Blue Crab	Hepatopancreas	PCB/PEST	4,4'-DDT	17	1.82 - 480	µg/kg
Blue Crab	Hepatopancreas	PCB/PEST	Aldrin	17	1.2 - 100	µg/kg
Blue Crab	Hepatopancreas	PCB/PEST	Alpha-BHC	17	0.721 - 34	µg/kg
Blue Crab	Hepatopancreas	PCB/PEST	Alpha-Chlordane	17	44.7 - 202	µg/kg
Blue Crab	Hepatopancreas	PCB/PEST	Beta-BHC	17	0.902 - 140	µg/kg
Blue Crab	Hepatopancreas	PCB/PEST	Delta-BHC	17	2.5 - 100	µg/kg
Blue Crab	Hepatopancreas	PCB/PEST	Dieldrin	17	1.88 - 66	µg/kg
Blue Crab	Hepatopancreas	PCB/PEST	Endosulfan I	17	1.43 - 100	µg/kg
Blue Crab	Hepatopancreas	PCB/PEST	Endosulfan II	17	2.24 - 140	µg/kg
Blue Crab	Hepatopancreas	PCB/PEST	Endosulfan Sulfate	17	3.01 - 100	µg/kg
Blue Crab	Hepatopancreas	PCB/PEST	Endrin	17	1.68 - 100	µg/kg
Blue Crab	Hepatopancreas	PCB/PEST	Endrin Aldehyde	17	1.2 - 100	µg/kg
Blue Crab	Hepatopancreas	PCB/PEST	Endrin Ketone	17	100 - 265	µg/kg
Blue Crab	Hepatopancreas	PCB/PEST	Gamma-BHC (Lindane)	17	1.33 - 100	µg/kg
Blue Crab	Hepatopancreas	PCB/PEST	Gamma-Chlordane	17	1.26 - 100	µg/kg
Blue Crab	Hepatopancreas	PCB/PEST	Heptachlor	17	0.842 - 140	µg/kg
Blue Crab	Hepatopancreas	PCB/PEST	Heptachlor Epoxide	17	1.97 - 100	µg/kg
Blue Crab	Hepatopancreas	PCB/PEST	Methoxychlor	17	6.73 - 340	µg/kg
Blue Crab	Hepatopancreas	PCB/PEST	Total Alpha + Gamma Chlordane	2	44.7 - 202	µg/kg
Blue Crab	Hepatopancreas	PCB/PEST	Total DDT	17	464 - 2560	µg/kg
Blue Crab	Hepatopancreas	PCB/PEST	Total PCBs - Aroclors	15	3200 - 10500	µg/kg
Blue Crab	Hepatopancreas	PCB/PEST	Toxaphene	17	136 - 3400	µg/kg
Blue Crab	Hepatopancreas	Physical Property	Percent Lipid	17	3.61 - 12.2	%
Blue Crab	Hepatopancreas	Physical Property	Percent Moisture	15	78.7 - 86.4	% by wt.
Blue Crab	Hepatopancreas	Semivolatiles	1,2,4-Trichlorobenzene	17	14 - 300	µg/kg
Blue Crab	Hepatopancreas	Semivolatiles	1,2-Dichlorobenzene	17	9 - 110	µg/kg
Blue Crab	Hepatopancreas	Semivolatiles	1,3-Dichlorobenzene	17	15 - 110	µg/kg
Blue Crab	Hepatopancreas	Semivolatiles	1,4-Dichlorobenzene	17	36 - 250	µg/kg
Blue Crab	Hepatopancreas	Semivolatiles	2,4,5-Trichlorophenol	17	240 - 290	µg/kg
Blue Crab	Hepatopancreas	Semivolatiles	2,4,6-Trichlorophenol	17	65 - 250	µg/kg
Blue Crab	Hepatopancreas	Semivolatiles	2,4-Dichloropheno	17	16 - 460	µg/kg
Blue Crab	Hepatopancreas	Semivolatiles	2,4-Dimethylpheno	17	65 - 110	µg/kg
Blue Crab	Hepatopancreas	Semivolatiles	2,4-Dinitropheno	17	430 - 1500	µg/kg
Blue Crab	Hepatopancreas	Semivolatiles	2,4-Dinitrotoluene	17	65 - 1600	µg/kg
Blue Crab	Hepatopancreas	Semivolatiles	2,6-Dinitrotoluene	17	63 - 600	µg/kg
Blue Crab	Hepatopancreas	Semivolatiles	2-Chloronaphthalene	17	65 - 110	µg/kg
Blue Crab	Hepatopancreas	Semivolatiles	2-Chloropheno	17	70 - 110	µg/kg
Blue Crab	Hepatopancreas	Semivolatiles	2-Methylnaphthalene	17	87 - 110	µg/kg
Blue Crab	Hepatopancreas	Semivolatiles	2-Methylpheno	17	45 - 250	µg/kg
Blue Crab	Hepatopancreas	Semivolatiles	2-Nitroaniline	17	220 - 280	µg/kg
Blue Crab	Hepatopancreas	Semivolatiles	2-Nitrophenol	17	52 - 110	µg/kg
Blue Crab	Hepatopancreas	Semivolatiles	3,3'-Dichlorobenzidine	17	160 - 250	µg/kg
Blue Crab	Hepatopancreas	Semivolatiles	3-Nitroaniline	17	400 - 500	µg/kg
Blue Crab	Hepatopancreas	Semivolatiles	4,6-Dinitro-2-methylpheno	17	210 - 1500	µg/kg
Blue Crab	Hepatopancreas	Semivolatiles	4-Bromophenyl phenyl ether	17	63 - 110	µg/kg
Blue Crab	Hepatopancreas	Semivolatiles	4-Chloro-3-methylpheno	17	58 - 110	µg/kg
Blue Crab	Hepatopancreas	Semivolatiles	4-Chloroaniline	17	100 - 130	µg/kg
Blue Crab	Hepatopancreas	Semivolatiles	4-Chlorophenyl phenyl ethe	17	87 - 110	µg/kg
Blue Crab	Hepatopancreas	Semivolatiles	4-Methylpheno	17	100 - 750	µg/kg
Blue Crab	Hepatopancreas	Semivolatiles	4-Nitroaniline	17	220 - 280	µg/kg
Blue Crab	Hepatopancreas	Semivolatiles	4-Nitrophenol	17	230 - 1500	µg/kg
Blue Crab	Hepatopancreas	Semivolatiles	Acenaphthene	15	38 - 170	µg/kg
Blue Crab	Hepatopancreas	Semivolatiles	Acenaphthylene	15	110 - 110	µg/kg
Blue Crab	Hepatopancreas	Semivolatiles	Anthracene	15	110 - 110	µg/kg
Blue Crab	Hepatopancreas	Semivolatiles	Benzo(a)anthracene	15	110 - 110	µg/kg
Blue Crab	Hepatopancreas	Semivolatiles	Benzo(a)pyrene	15	250 - 250	µg/kg
Blue Crab	Hepatopancreas	Semivolatiles	Benzo(b)fluoranthene	15	25 - 110	µg/kg
Blue Crab	Hepatopancreas	Semivolatiles	Benzo(g,h,i)perylene	15	250 - 250	µg/kg
Blue Crab	Hepatopancreas	Semivolatiles	Benzo(k)fluoranthene	15	110 - 110	µg/kg
Blue Crab	Hepatopancreas	Semivolatiles	Benzoic Acid	2	1300 - 1600	µg/kg
Blue Crab	Hepatopancreas	Semivolatiles	Benzyl Alcoho	2	45 - 54	µg/kg
Blue Crab	Hepatopancreas	Semivolatiles	bis(2-Chloroethoxy)methane	17	77 - 110	µg/kg
Blue Crab	Hepatopancreas	Semivolatiles	bis(2-Chloroethyl)ether	17	77 - 110	µg/kg
Blue Crab	Hepatopancreas	Semivolatiles	bis(2-Chloroisopropyl)ether	17	77 - 2500	µg/kg

Table 3-59
Bioaccumulation Data from 1995-2001 Passaic RI Sampling Programs Including Tierra (1995a, 1999d, 2000c, 2001a)

Species	Tissue Type	Analyte Class[a]	Compound	Count	Range of Values	Units
Blue Crab	Hepatopancreas	Semivolatiles	bis(2-Ethylhexyl)phthalate	17	18 - 3000	µg/kg
Blue Crab	Hepatopancreas	Semivolatiles	Butyl benzyl phthalate	17	35 - 110	µg/kg
Blue Crab	Hepatopancreas	Semivolatiles	Carbazole	17	48 - 1000	µg/kg
Blue Crab	Hepatopancreas	Semivolatiles	Chrysene	15	28 - 110	µg/kg
Blue Crab	Hepatopancreas	Semivolatiles	Dibenzo(a,h)anthracene	15	250 - 250	µg/kg
Blue Crab	Hepatopancreas	Semivolatiles	Dibenzofuran	17	82 - 110	µg/kg
Blue Crab	Hepatopancreas	Semivolatiles	Diethyl phthalate	17	17 - 110	µg/kg
Blue Crab	Hepatopancreas	Semivolatiles	Dimethylphthalate	17	57 - 110	µg/kg
Blue Crab	Hepatopancreas	Semivolatiles	Di-n-Butylphthalate	17	48 - 110	µg/kg
Blue Crab	Hepatopancreas	Semivolatiles	Di-n-Octylphthalate	17	110 - 500	µg/kg
Blue Crab	Hepatopancreas	Semivolatiles	Fluoranthene	15	110 - 110	µg/kg
Blue Crab	Hepatopancreas	Semivolatiles	Fluorene	15	110 - 110	µg/kg
Blue Crab	Hepatopancreas	Semivolatiles	Hexachlorobenzene	17	90 - 110	µg/kg
Blue Crab	Hepatopancreas	Semivolatiles	Hexachlorobutadiene	17	78 - 110	µg/kg
Blue Crab	Hepatopancreas	Semivolatiles	Hexachlorocyclopentadiene	17	100 - 120	µg/kg
Blue Crab	Hepatopancreas	Semivolatiles	Hexachloroethane	17	88 - 250	µg/kg
Blue Crab	Hepatopancreas	Semivolatiles	Indeno(1,2,3-cd)pyrene	15	250 - 250	µg/kg
Blue Crab	Hepatopancreas	Semivolatiles	Isophorone	17	52 - 250	µg/kg
Blue Crab	Hepatopancreas	Semivolatiles	Naphthalene	15	13 - 110	µg/kg
Blue Crab	Hepatopancreas	Semivolatiles	Nitrobenzene	17	62 - 250	µg/kg
Blue Crab	Hepatopancreas	Semivolatiles	N-Nitroso-di-n-propylamine	17	100 - 250	µg/kg
Blue Crab	Hepatopancreas	Semivolatiles	N-Nitrosodiphenylamine	17	60 - 250	µg/kg
Blue Crab	Hepatopancreas	Semivolatiles	Pentachloropheno	17	280 - 1500	µg/kg
Blue Crab	Hepatopancreas	Semivolatiles	Phenanthrene	15	110 - 110	µg/kg
Blue Crab	Hepatopancreas	Semivolatiles	Phenol	17	65 - 500	µg/kg
Blue Crab	Hepatopancreas	Semivolatiles	Pyrene	15	110 - 110	µg/kg
Blue Crab	Whole body - soft tissue	PCDD/Fs	2,3,7,8-TCDD	20	0.0281 - 0.141	µg/kg
Blue Crab	Whole body - soft tissue	PCDD/Fs	2,3,7,8-TCDF	20	0.00737 - 0.0217	µg/kg
Blue Crab	Whole body - soft tissue	Herbicides	2,4,5-T	15	4.9 - 1000	µg/kg
Blue Crab	Whole body - soft tissue	Herbicides	2,4,5-TP (Silvex)	15	3.5 - 1000	µg/kg
Blue Crab	Whole body - soft tissue	Herbicides	2,4-D	20	25 - 2400	µg/kg
Blue Crab	Whole body - soft tissue	Herbicides	2,4-DB	14	180 - 1800	µg/kg
Blue Crab	Whole body - soft tissue	Homologue Groups	Total PCBs - Homologue Groups	20	570 - 1230	µg/kg
Blue Crab	Whole body - soft tissue	Inorganic Chemicals	Al	20	3200 - 37900	µg/kg
Blue Crab	Whole body - soft tissue	Inorganic Chemicals	Sb	20	400 - 580	µg/kg
Blue Crab	Whole body - soft tissue	Inorganic Chemicals	As	20	450 - 1400	µg/kg
Blue Crab	Whole body - soft tissue	Inorganic Chemicals	Ba	20	310 - 9400	µg/kg
Blue Crab	Whole body - soft tissue	Inorganic Chemicals	Be	20	34 - 45	µg/kg
Blue Crab	Whole body - soft tissue	Inorganic Chemicals	Cd	20	92 - 260	µg/kg
Blue Crab	Whole body - soft tissue	Inorganic Chemicals	Ca	20	1900000 - 24100000	µg/kg
Blue Crab	Whole body - soft tissue	Inorganic Chemicals	Cr	20	250 - 1700	µg/kg
Blue Crab	Whole body - soft tissue	Inorganic Chemicals	Co	20	60 - 130	µg/kg
Blue Crab	Whole body - soft tissue	Inorganic Chemicals	Cu	20	19800 - 39700	µg/kg
Blue Crab	Whole body - soft tissue	Inorganic Chemicals	Fe	20	20400 - 92200	µg/kg
Blue Crab	Whole body - soft tissue	Inorganic Chemicals	Pb	20	190 - 950	µg/kg
Blue Crab	Whole body - soft tissue	Inorganic Chemicals	Mg	20	322000 - 919000	µg/kg
Blue Crab	Whole body - soft tissue	Inorganic Chemicals	Mn	20	2400 - 58900	µg/kg
Blue Crab	Whole body - soft tissue	Inorganic Chemicals	Hg	20	32 - 99	µg/kg
Blue Crab	Whole body - soft tissue	Inorganic Chemicals	Ni	20	98 - 5000	µg/kg
Blue Crab	Whole body - soft tissue	Inorganic Chemicals	K	20	2100000 - 3260000	µg/kg
Blue Crab	Whole body - soft tissue	Inorganic Chemicals	Se	20	310 - 1000	µg/kg
Blue Crab	Whole body - soft tissue	Inorganic Chemicals	Ag	20	580 - 9100	µg/kg
Blue Crab	Whole body - soft tissue	Inorganic Chemicals	Na	20	2500000 - 4150000	µg/kg
Blue Crab	Whole body - soft tissue	Inorganic Chemicals	Tl	18	310 - 750	µg/kg
Blue Crab	Whole body - soft tissue	Inorganic Chemicals	V	20	88 - 200	µg/kg
Blue Crab	Whole body - soft tissue	Inorganic Chemicals	Zn	20	18300 - 37900	µg/kg
Blue Crab	Whole body - soft tissue	Organotin	Dibutyltin	20	2 - 56.6	µg/kg
Blue Crab	Whole body - soft tissue	Organotin	Monobutyltir	20	0.649 - 11.6	µg/kg
Blue Crab	Whole body - soft tissue	Organotin	Tetrabutyltin	18	4 - 4	µg/kg
Blue Crab	Whole body - soft tissue	Organotin	Tributyltin	20	1.48 - 49.9	µg/kg
Blue Crab	Whole body - soft tissue	PAH-SIM	HMW PAHs	20	17.6 - 323	µg/kg
Blue Crab	Whole body - soft tissue	PAH-SIM	LMW PAHs	20	9.4 - 124	µg/kg
Blue Crab	Whole body - soft tissue	PAH-SIM	Total PAHs	20	27 - 390	µg/kg
Blue Crab	Whole body - soft tissue	PCB Congeners	Total PCBs - Congeners (NOAA 1989)	20	651 - 1670	µg/kg
Blue Crab	Whole body - soft tissue	PCB/PEST	4,4'-DDD	20	4.8 - 29	µg/kg
Blue Crab	Whole body - soft tissue	PCB/PEST	4,4'-DDE	20	16 - 122	µg/kg
Blue Crab	Whole body - soft tissue	PCB/PEST	4,4'-DDT	20	10 - 79	µg/kg
Blue Crab	Whole body - soft tissue	PCB/PEST	Aldrin	20	5 - 5	µg/kg
Blue Crab	Whole body - soft tissue	PCB/PEST	Alpha-BHC	19	1.7 - 1.7	µg/kg
Blue Crab	Whole body - soft tissue	PCB/PEST	Alpha-Chlordane	20	3 - 13	µg/kg
Blue Crab	Whole body - soft tissue	PCB/PEST	Beta-BHC	20	7 - 7	µg/kg
Blue Crab	Whole body - soft tissue	PCB/PEST	Delta-BHC	20	5 - 12	µg/kg
Blue Crab	Whole body - soft tissue	PCB/PEST	Dieldrin	20	3.3 - 12	µg/kg
Blue Crab	Whole body - soft tissue	PCB/PEST	Endosulfan I	19	5 - 5	µg/kg
Blue Crab	Whole body - soft tissue	PCB/PEST	Endosulfan II	20	7 - 7	µg/kg

Table 3-59
Bioaccumulation Data from 1995-2001 Passaic RI Sampling Programs Including Tierra (1995a, 1999d, 2000c, 2001a)

Species	Tissue Type	Analyte Class[a]	Compound	Count	Range of Values	Units
Blue Crab	Whole body - soft tissue	PCB/PEST	Endosulfan Sulfate	20	3.3 - 3.3	µg/kg
Blue Crab	Whole body - soft tissue	PCB/PEST	Endrin	20	5 - 14	µg/kg
Blue Crab	Whole body - soft tissue	PCB/PEST	Endrin Aldehyde	20	5 - 5	µg/kg
Blue Crab	Whole body - soft tissue	PCB/PEST	Endrin Ketone	20	5 - 5	µg/kg
Blue Crab	Whole body - soft tissue	PCB/PEST	Gamma-BHC (Lindane)	20	5 - 5	µg/kg
Blue Crab	Whole body - soft tissue	PCB/PEST	Gamma-Chlordane	20	5 - 5	µg/kg
Blue Crab	Whole body - soft tissue	PCB/PEST	Heptachlor	20	7 - 7	µg/kg
Blue Crab	Whole body - soft tissue	PCB/PEST	Heptachlor Epoxide	20	5 - 9	µg/kg
Blue Crab	Whole body - soft tissue	PCB/PEST	Methoxychlor	20	17 - 17	µg/kg
Blue Crab	Whole body - soft tissue	PCB/PEST	Total DDT	20	4.8 - 223	µg/kg
Blue Crab	Whole body - soft tissue	PCB/PEST	Total PCBs - Aroclors	19	140 - 1780	µg/kg
Blue Crab	Whole body - soft tissue	PCB/PEST	Toxaphene	20	170 - 170	µg/kg
Blue Crab	Whole body - soft tissue	Physical Property	Percent Lipid	20	1.04 - 4.05	%
Blue Crab	Whole body - soft tissue	Physical Property	Percent Moisture	20	76.1 - 88.6	% by wt.
Blue Crab	Whole body - soft tissue	Semivolatiles	1,2,4-Trichlorobenzene	20	18 - 530	µg/kg
Blue Crab	Whole body - soft tissue	Semivolatiles	1,2-Dichlorobenzene	20	8 - 530	µg/kg
Blue Crab	Whole body - soft tissue	Semivolatiles	1,3-Dichlorobenzene	20	110 - 530	µg/kg
Blue Crab	Whole body - soft tissue	Semivolatiles	1,4-Dichlorobenzene	20	250 - 1200	µg/kg
Blue Crab	Whole body - soft tissue	Semivolatiles	2,4,5-Trichlorophenol	20	280 - 1400	µg/kg
Blue Crab	Whole body - soft tissue	Semivolatiles	2,4,6-Trichlorophenol	20	250 - 1200	µg/kg
Blue Crab	Whole body - soft tissue	Semivolatiles	2,4-Dichloropheno	20	15 - 530	µg/kg
Blue Crab	Whole body - soft tissue	Semivolatiles	2,4-Dimethylpheno	20	110 - 530	µg/kg
Blue Crab	Whole body - soft tissue	Semivolatiles	2,4-Dinitropheno	20	1500 - 7500	µg/kg
Blue Crab	Whole body - soft tissue	Semivolatiles	2,4-Dinitrotoluene	20	130 - 1200	µg/kg
Blue Crab	Whole body - soft tissue	Semivolatiles	2,6-Dinitrotoluene	20	110 - 530	µg/kg
Blue Crab	Whole body - soft tissue	Semivolatiles	2-Chloronaphthalene	20	110 - 530	µg/kg
Blue Crab	Whole body - soft tissue	Semivolatiles	2-Chloropheno	20	110 - 530	µg/kg
Blue Crab	Whole body - soft tissue	Semivolatiles	2-Methylnaphthalene	20	110 - 530	µg/kg
Blue Crab	Whole body - soft tissue	Semivolatiles	2-Methylpheno	20	250 - 1200	µg/kg
Blue Crab	Whole body - soft tissue	Semivolatiles	2-Nitroaniline	20	280 - 1400	µg/kg
Blue Crab	Whole body - soft tissue	Semivolatiles	2-Nitrophenol	20	110 - 530	µg/kg
Blue Crab	Whole body - soft tissue	Semivolatiles	3,3'-Dichlorobenzidine	20	250 - 1200	µg/kg
Blue Crab	Whole body - soft tissue	Semivolatiles	3-Nitroaniline	20	500 - 2500	µg/kg
Blue Crab	Whole body - soft tissue	Semivolatiles	4,6-Dinitro-2-methylpheno	20	1500 - 7500	µg/kg
Blue Crab	Whole body - soft tissue	Semivolatiles	4-Bromophenyl phenyl ether	20	110 - 530	µg/kg
Blue Crab	Whole body - soft tissue	Semivolatiles	4-Chloro-3-methylpheno	20	110 - 530	µg/kg
Blue Crab	Whole body - soft tissue	Semivolatiles	4-Chloroaniline	20	110 - 530	µg/kg
Blue Crab	Whole body - soft tissue	Semivolatiles	4-Chlorophenyl phenyl ethe	20	110 - 530	µg/kg
Blue Crab	Whole body - soft tissue	Semivolatiles	4-Methylpheno	20	240 - 3700	µg/kg
Blue Crab	Whole body - soft tissue	Semivolatiles	4-Nitroaniline	20	280 - 1400	µg/kg
Blue Crab	Whole body - soft tissue	Semivolatiles	4-Nitrophenol	20	1500 - 7500	µg/kg
Blue Crab	Whole body - soft tissue	Semivolatiles	Acenaphthene	20	110 - 530	µg/kg
Blue Crab	Whole body - soft tissue	Semivolatiles	Acenaphthylene	20	110 - 530	µg/kg
Blue Crab	Whole body - soft tissue	Semivolatiles	Anthracene	20	110 - 530	µg/kg
Blue Crab	Whole body - soft tissue	Semivolatiles	Benzo(a)anthracene	20	9 - 530	µg/kg
Blue Crab	Whole body - soft tissue	Semivolatiles	Benzo(a)pyrene	20	250 - 1200	µg/kg
Blue Crab	Whole body - soft tissue	Semivolatiles	Benzo(b)fluoranthene	20	110 - 530	µg/kg
Blue Crab	Whole body - soft tissue	Semivolatiles	Benzo(g,h,i)perylene	20	250 - 1200	µg/kg
Blue Crab	Whole body - soft tissue	Semivolatiles	Benzo(k)fluoranthene	20	110 - 530	µg/kg
Blue Crab	Whole body - soft tissue	Semivolatiles	bis(2-Chloroethoxy)methane	20	110 - 530	µg/kg
Blue Crab	Whole body - soft tissue	Semivolatiles	bis(2-Chloroethyl)ether	20	110 - 530	µg/kg
Blue Crab	Whole body - soft tissue	Semivolatiles	bis(2-Chloroisopropyl)ether	20	2500 - 13000	µg/kg
Blue Crab	Whole body - soft tissue	Semivolatiles	bis(2-Ethylhexyl)phthalate	20	3000 - 15000	µg/kg
Blue Crab	Whole body - soft tissue	Semivolatiles	Butyl benzyl phthalate	20	110 - 530	µg/kg
Blue Crab	Whole body - soft tissue	Semivolatiles	Carbazole	20	1000 - 5000	µg/kg
Blue Crab	Whole body - soft tissue	Semivolatiles	Chrysene	20	110 - 530	µg/kg
Blue Crab	Whole body - soft tissue	Semivolatiles	Dibenzo(a,h)anthracene	20	250 - 1200	µg/kg
Blue Crab	Whole body - soft tissue	Semivolatiles	Dibenzofuran	20	110 - 530	µg/kg
Blue Crab	Whole body - soft tissue	Semivolatiles	Diethyl phthalate	20	17 - 530	µg/kg
Blue Crab	Whole body - soft tissue	Semivolatiles	Dimethylphthalate	20	110 - 530	µg/kg
Blue Crab	Whole body - soft tissue	Semivolatiles	Di-n-Butylphthalate	20	110 - 530	µg/kg
Blue Crab	Whole body - soft tissue	Semivolatiles	Di-n-Octylphthalate	20	500 - 2500	µg/kg
Blue Crab	Whole body - soft tissue	Semivolatiles	Fluoranthene	20	49 - 530	µg/kg
Blue Crab	Whole body - soft tissue	Semivolatiles	Fluorene	20	110 - 530	µg/kg
Blue Crab	Whole body - soft tissue	Semivolatiles	Hexachlorobenzene	20	110 - 530	µg/kg
Blue Crab	Whole body - soft tissue	Semivolatiles	Hexachlorobutadiene	20	110 - 530	µg/kg
Blue Crab	Whole body - soft tissue	Semivolatiles	Hexachlorocyclopentadiene	20	110 - 530	µg/kg
Blue Crab	Whole body - soft tissue	Semivolatiles	Hexachloroethane	20	250 - 1200	µg/kg
Blue Crab	Whole body - soft tissue	Semivolatiles	Indeno(1,2,3-cd)pyrene	20	250 - 1200	µg/kg
Blue Crab	Whole body - soft tissue	Semivolatiles	Isophorone	20	44 - 1200	µg/kg
Blue Crab	Whole body - soft tissue	Semivolatiles	Naphthalene	20	15 - 530	µg/kg
Blue Crab	Whole body - soft tissue	Semivolatiles	Nitrobenzene	20	250 - 1200	µg/kg
Blue Crab	Whole body - soft tissue	Semivolatiles	N-Nitroso-di-n-propylamine	20	250 - 1200	µg/kg
Blue Crab	Whole body - soft tissue	Semivolatiles	N-Nitrosodiphenylamine	20	250 - 1200	µg/kg
Blue Crab	Whole body - soft tissue	Semivolatiles	Pentachloropheno	20	1500 - 7500	µg/kg

Table 3-59
Bioaccumulation Data from 1995-2001 Passaic RI Sampling Programs Including Tierra (1995a, 1999d, 2000c, 2001a)

Species	Tissue Type	Analyte Class[a]	Compound	Count	Range of Values	Units
Blue Crab	Whole body - soft tissue	Semivolatiles	Phenanthrene	20	24 - 530	µg/kg
Blue Crab	Whole body - soft tissue	Semivolatiles	Phenol	20	87 - 2500	µg/kg
Blue Crab	Whole body - soft tissue	Semivolatiles	Pyrene	20	38 - 530	µg/kg
Molluscs						
Ribbed Mussel	Whole body - soft tissue	PCDD/Fs	2,3,7,8-TCDD	18	0.000069 - 0.017	µg/kg
Ribbed Mussel	Whole body - soft tissue	PCDD/Fs	2,3,7,8-TCDF	18	0.000249 - 0.00254	µg/kg
Ribbed Mussel	Whole body - soft tissue	Herbicides	2,4,5-T	15	100 - 100	µg/kg
Ribbed Mussel	Whole body - soft tissue	Herbicides	2,4,5-TP (Silvex)	11	100 - 100	µg/kg
Ribbed Mussel	Whole body - soft tissue	Herbicides	2,4-D	12	240 - 240	µg/kg
Ribbed Mussel	Whole body - soft tissue	Herbicides	2,4-DB	16	180 - 180	µg/kg
Ribbed Mussel	Whole body - soft tissue	Homologue Groups	Total PCBs - Homologue Groups	18	1.25 - 203	µg/kg
Ribbed Mussel	Whole body - soft tissue	Inorganic Chemicals	Al	3	3100 - 9500	µg/kg
Ribbed Mussel	Whole body - soft tissue	Inorganic Chemicals	Sb	18	220 - 2700	µg/kg
Ribbed Mussel	Whole body - soft tissue	Inorganic Chemicals	As	18	340 - 1800	µg/kg
Ribbed Mussel	Whole body - soft tissue	Inorganic Chemicals	Ba	18	63 - 880	µg/kg
Ribbed Mussel	Whole body - soft tissue	Inorganic Chemicals	Be	18	13 - 150	µg/kg
Ribbed Mussel	Whole body - soft tissue	Inorganic Chemicals	Cd	18	160 - 220	µg/kg
Ribbed Mussel	Whole body - soft tissue	Inorganic Chemicals	Ca	18	176000 - 3600000	µg/kg
Ribbed Mussel	Whole body - soft tissue	Inorganic Chemicals	Cr	3	510 - 750	µg/kg
Ribbed Mussel	Whole body - soft tissue	Inorganic Chemicals	Co	18	76 - 1000	µg/kg
Ribbed Mussel	Whole body - soft tissue	Inorganic Chemicals	Cu	18	1100 - 2700	µg/kg
Ribbed Mussel	Whole body - soft tissue	Inorganic Chemicals	Fe	2	18000 - 21300	µg/kg
Ribbed Mussel	Whole body - soft tissue	Inorganic Chemicals	Pb	18	130 - 520	µg/kg
Ribbed Mussel	Whole body - soft tissue	Inorganic Chemicals	Mg	18	226000 - 829000	µg/kg
Ribbed Mussel	Whole body - soft tissue	Inorganic Chemicals	Mn	3	1600 - 1900	µg/kg
Ribbed Mussel	Whole body - soft tissue	Inorganic Chemicals	Hg	18	3.9 - 25	µg/kg
Ribbed Mussel	Whole body - soft tissue	Inorganic Chemicals	Ni	3	340 - 970	µg/kg
Ribbed Mussel	Whole body - soft tissue	Inorganic Chemicals	K	18	816000 - 1960000	µg/kg
Ribbed Mussel	Whole body - soft tissue	Inorganic Chemicals	Se	18	400 - 770	µg/kg
Ribbed Mussel	Whole body - soft tissue	Inorganic Chemicals	Ag	18	44 - 780	µg/kg
Ribbed Mussel	Whole body - soft tissue	Inorganic Chemicals	Na	18	1010000 - 6690000	µg/kg
Ribbed Mussel	Whole body - soft tissue	Inorganic Chemicals	Tl	18	290 - 840	µg/kg
Ribbed Mussel	Whole body - soft tissue	Inorganic Chemicals	V	18	240 - 570	µg/kg
Ribbed Mussel	Whole body - soft tissue	Inorganic Chemicals	Zn	1	7800 - 7800	µg/kg
Ribbed Mussel	Whole body - soft tissue	Organotin	Dibutyltin	17	0.824 - 3.13	µg/kg
Ribbed Mussel	Whole body - soft tissue	Organotin	Monobutyltir	16	2 - 2	µg/kg
Ribbed Mussel	Whole body - soft tissue	Organotin	Tetrabutyltin	16	4 - 4	µg/kg
Ribbed Mussel	Whole body - soft tissue	Organotin	Tributyltin	17	4.08 - 14.8	µg/kg
Ribbed Mussel	Whole body - soft tissue	PAH-SIM	HMW PAHs	16	2.3 - 415	µg/kg
Ribbed Mussel	Whole body - soft tissue	PAH-SIM	LMW PAHs	16	2.8 - 43.4	µg/kg
Ribbed Mussel	Whole body - soft tissue	PAH-SIM	Total PAHs	16	45.7 - 451	µg/kg
Ribbed Mussel	Whole body - soft tissue	PCB Congeners	Total PCBs - Congeners (NOAA 1989)	18	1.52 - 158	µg/kg
Ribbed Mussel	Whole body - soft tissue	PCB/PEST	4,4'-DDD	18	7 - 10.5	µg/kg
Ribbed Mussel	Whole body - soft tissue	PCB/PEST	4,4'-DDE	18	3.09 - 15	µg/kg
Ribbed Mussel	Whole body - soft tissue	PCB/PEST	4,4'-DDT	18	10 - 10	µg/kg
Ribbed Mussel	Whole body - soft tissue	PCB/PEST	Aldrin	18	5 - 5	µg/kg
Ribbed Mussel	Whole body - soft tissue	PCB/PEST	Alpha-BHC	18	1.03 - 1.7	µg/kg
Ribbed Mussel	Whole body - soft tissue	PCB/PEST	Alpha-Chlordane	15	3 - 6.3	µg/kg
Ribbed Mussel	Whole body - soft tissue	PCB/PEST	Beta-BHC	18	7 - 7	µg/kg
Ribbed Mussel	Whole body - soft tissue	PCB/PEST	Delta-BHC	18	1.32 - 5	µg/kg
Ribbed Mussel	Whole body - soft tissue	PCB/PEST	Dieldrin	18	1 - 3.3	µg/kg
Ribbed Mussel	Whole body - soft tissue	PCB/PEST	Endosulfan I	18	0.3 - 5	µg/kg
Ribbed Mussel	Whole body - soft tissue	PCB/PEST	Endosulfan II	18	7 - 7	µg/kg
Ribbed Mussel	Whole body - soft tissue	PCB/PEST	Endosulfan Sulfate	18	3.3 - 3.3	µg/kg
Ribbed Mussel	Whole body - soft tissue	PCB/PEST	Endrin	18	5 - 5	µg/kg
Ribbed Mussel	Whole body - soft tissue	PCB/PEST	Endrin Aldehyde	18	5 - 5	µg/kg
Ribbed Mussel	Whole body - soft tissue	PCB/PEST	Endrin Ketone	18	5 - 5	µg/kg
Ribbed Mussel	Whole body - soft tissue	PCB/PEST	Gamma-BHC (Lindane)	18	5 - 5	µg/kg
Ribbed Mussel	Whole body - soft tissue	PCB/PEST	Gamma-Chlordane	18	1.54 - 5.6	µg/kg
Ribbed Mussel	Whole body - soft tissue	PCB/PEST	Heptachlor	18	7 - 7	µg/kg
Ribbed Mussel	Whole body - soft tissue	PCB/PEST	Heptachlor Epoxide	18	4.8 - 13.6	µg/kg
Ribbed Mussel	Whole body - soft tissue	PCB/PEST	Methoxychlor	18	2.3 - 17	µg/kg
Ribbed Mussel	Whole body - soft tissue	PCB/PEST	Total Alpha + Gamma Chlordane	9	1.54 - 6.3	µg/kg
Ribbed Mussel	Whole body - soft tissue	PCB/PEST	Total DDT	15	3.09 - 21.1	µg/kg
Ribbed Mussel	Whole body - soft tissue	PCB/PEST	Toxaphene	18	170 - 170	µg/kg
Ribbed Mussel	Whole body - soft tissue	Physical Property	Percent Lipid	17	0.026 - 0.804	%
Ribbed Mussel	Whole body - soft tissue	Physical Property	Percent Moisture	14	86.1 - 91.1	% by wt.
Ribbed Mussel	Whole body - soft tissue	Semivolatiles	1,2,4-Trichlorobenzene	18	15 - 110	µg/kg
Ribbed Mussel	Whole body - soft tissue	Semivolatiles	1,2-Dichlorobenzene	18	9 - 110	µg/kg
Ribbed Mussel	Whole body - soft tissue	Semivolatiles	1,3-Dichlorobenzene	18	110 - 110	µg/kg
Ribbed Mussel	Whole body - soft tissue	Semivolatiles	1,4-Dichlorobenzene	18	250 - 250	µg/kg
Ribbed Mussel	Whole body - soft tissue	Semivolatiles	2,4,5-Trichlorophenol	18	280 - 280	µg/kg
Ribbed Mussel	Whole body - soft tissue	Semivolatiles	2,4,6-Trichlorophenol	18	250 - 250	µg/kg
Ribbed Mussel	Whole body - soft tissue	Semivolatiles	2,4-Dichloropheno	18	110 - 110	µg/kg
Ribbed Mussel	Whole body - soft tissue	Semivolatiles	2,4-Dimethylpheno	18	110 - 110	µg/kg

Table 3-59
Bioaccumulation Data from 1995-2001 Passaic RI Sampling Programs Including Tierra (1995a, 1999d, 2000c, 2001a)

Species	Tissue Type	Analyte Class[a]	Compound	Count	Range of Values	Units
Ribbed Mussel	Whole body - soft tissue	Semivolatiles	2,4-Dinitropheno	18	1500 - 1500	µg/kg
Ribbed Mussel	Whole body - soft tissue	Semivolatiles	2,4-Dinitrotoluene	18	250 - 250	µg/kg
Ribbed Mussel	Whole body - soft tissue	Semivolatiles	2,6-Dinitrotoluene	18	110 - 110	µg/kg
Ribbed Mussel	Whole body - soft tissue	Semivolatiles	2-Chloronaphthalene	18	110 - 110	µg/kg
Ribbed Mussel	Whole body - soft tissue	Semivolatiles	2-Chloropheno	18	110 - 110	µg/kg
Ribbed Mussel	Whole body - soft tissue	Semivolatiles	2-Methylnaphthalene	18	110 - 110	µg/kg
Ribbed Mussel	Whole body - soft tissue	Semivolatiles	2-Methylpheno	18	250 - 250	µg/kg
Ribbed Mussel	Whole body - soft tissue	Semivolatiles	2-Nitroaniline	18	280 - 280	µg/kg
Ribbed Mussel	Whole body - soft tissue	Semivolatiles	2-Nitrophenol	18	110 - 110	µg/kg
Ribbed Mussel	Whole body - soft tissue	Semivolatiles	3,3'-Dichlorobenzidine	18	250 - 250	µg/kg
Ribbed Mussel	Whole body - soft tissue	Semivolatiles	3-Nitroaniline	18	500 - 500	µg/kg
Ribbed Mussel	Whole body - soft tissue	Semivolatiles	4,6-Dinitro-2-methylpheno	18	1500 - 1500	µg/kg
Ribbed Mussel	Whole body - soft tissue	Semivolatiles	4-Bromophenyl phenyl ether	18	110 - 110	µg/kg
Ribbed Mussel	Whole body - soft tissue	Semivolatiles	4-Chloro-3-methylpheno	18	110 - 110	µg/kg
Ribbed Mussel	Whole body - soft tissue	Semivolatiles	4-Chloroaniline	18	110 - 110	µg/kg
Ribbed Mussel	Whole body - soft tissue	Semivolatiles	4-Chlorophenyl phenyl ethe	18	110 - 110	µg/kg
Ribbed Mussel	Whole body - soft tissue	Semivolatiles	4-Methylpheno	18	750 - 750	µg/kg
Ribbed Mussel	Whole body - soft tissue	Semivolatiles	4-Nitroaniline	18	280 - 280	µg/kg
Ribbed Mussel	Whole body - soft tissue	Semivolatiles	4-Nitrophenol	18	1500 - 1500	µg/kg
Ribbed Mussel	Whole body - soft tissue	Semivolatiles	Acenaphthene	18	13 - 110	µg/kg
Ribbed Mussel	Whole body - soft tissue	Semivolatiles	Acenaphthylene	18	110 - 110	µg/kg
Ribbed Mussel	Whole body - soft tissue	Semivolatiles	Anthracene	18	12 - 110	µg/kg
Ribbed Mussel	Whole body - soft tissue	Semivolatiles	Benzo(a)anthracene	18	20 - 110	µg/kg
Ribbed Mussel	Whole body - soft tissue	Semivolatiles	Benzo(a)pyrene	18	37 - 250	µg/kg
Ribbed Mussel	Whole body - soft tissue	Semivolatiles	Benzo(b)fluoranthene	18	25 - 110	µg/kg
Ribbed Mussel	Whole body - soft tissue	Semivolatiles	Benzo(g,h,i)perylene	18	250 - 250	µg/kg
Ribbed Mussel	Whole body - soft tissue	Semivolatiles	Benzo(k)fluoranthene	18	23 - 110	µg/kg
Ribbed Mussel	Whole body - soft tissue	Semivolatiles	bis(2-Chloroethoxy)methane	18	110 - 110	µg/kg
Ribbed Mussel	Whole body - soft tissue	Semivolatiles	bis(2-Chloroethyl)ether	18	110 - 110	µg/kg
Ribbed Mussel	Whole body - soft tissue	Semivolatiles	bis(2-Chloroisopropyl)ether	18	2500 - 2500	µg/kg
Ribbed Mussel	Whole body - soft tissue	Semivolatiles	bis(2-Ethylhexyl)phthalate	18	240 - 3000	µg/kg
Ribbed Mussel	Whole body - soft tissue	Semivolatiles	Butyl benzyl phthalate	18	110 - 110	µg/kg
Ribbed Mussel	Whole body - soft tissue	Semivolatiles	Carbazole	18	1000 - 1000	µg/kg
Ribbed Mussel	Whole body - soft tissue	Semivolatiles	Chrysene	18	42 - 110	µg/kg
Ribbed Mussel	Whole body - soft tissue	Semivolatiles	Dibenzo(a,h)anthracene	18	250 - 250	µg/kg
Ribbed Mussel	Whole body - soft tissue	Semivolatiles	Dibenzofuran	18	110 - 110	µg/kg
Ribbed Mussel	Whole body - soft tissue	Semivolatiles	Diethyl phthalate	18	17 - 110	µg/kg
Ribbed Mussel	Whole body - soft tissue	Semivolatiles	Dimethylphthalate	18	110 - 110	µg/kg
Ribbed Mussel	Whole body - soft tissue	Semivolatiles	Di-n-Butylphthalate	18	69 - 110	µg/kg
Ribbed Mussel	Whole body - soft tissue	Semivolatiles	Di-n-Octylphthalate	18	500 - 500	µg/kg
Ribbed Mussel	Whole body - soft tissue	Semivolatiles	Fluoranthene	18	15 - 560	µg/kg
Ribbed Mussel	Whole body - soft tissue	Semivolatiles	Fluorene	18	110 - 110	µg/kg
Ribbed Mussel	Whole body - soft tissue	Semivolatiles	Hexachlorobenzene	18	110 - 110	µg/kg
Ribbed Mussel	Whole body - soft tissue	Semivolatiles	Hexachlorobutadiene	18	110 - 110	µg/kg
Ribbed Mussel	Whole body - soft tissue	Semivolatiles	Hexachlorocyclopentadiene	18	110 - 110	µg/kg
Ribbed Mussel	Whole body - soft tissue	Semivolatiles	Hexachloroethane	18	250 - 250	µg/kg
Ribbed Mussel	Whole body - soft tissue	Semivolatiles	Indeno(1,2,3-cd)pyrene	18	250 - 250	µg/kg
Ribbed Mussel	Whole body - soft tissue	Semivolatiles	Isophorone	18	250 - 250	µg/kg
Ribbed Mussel	Whole body - soft tissue	Semivolatiles	Naphthalene	18	13 - 110	µg/kg
Ribbed Mussel	Whole body - soft tissue	Semivolatiles	Nitrobenzene	18	250 - 250	µg/kg
Ribbed Mussel	Whole body - soft tissue	Semivolatiles	N-Nitroso-di-n-propylamine	18	250 - 250	µg/kg
Ribbed Mussel	Whole body - soft tissue	Semivolatiles	N-Nitrosodiphenylamine	18	250 - 250	µg/kg
Ribbed Mussel	Whole body - soft tissue	Semivolatiles	Pentachloropheno	18	1500 - 1500	µg/kg
Ribbed Mussel	Whole body - soft tissue	Semivolatiles	Phenanthrene	18	29 - 110	µg/kg
Ribbed Mussel	Whole body - soft tissue	Semivolatiles	Phenol	18	74 - 500	µg/kg
Ribbed Mussel	Whole body - soft tissue	Semivolatiles	Pyrene	18	31 - 110	µg/kg

Notes:
a. As defined in Newark Bay Study Area Analytical Database Version 1.0 (Appendix B).
µg/kg = microgram per killogram

Table 3-60
Atlantic Cod Liver Bioaccumulation Data from Yuan et al. (2001)

Contaminant	Units	Newark Bay	Hackensack River
PCDD/Fs			
2,3,7,8-TCDD	pg/g	655	897
	TEQ	655	897
Total PCDD[a]	pg/g	728	1,039
	TEQ	671	921
2,3,7,8-TCDF	pg/g	103	99
	TEQ	5	5
Total PCDF[b]	pg/g	380	697
	TEQ	50	103
Coplanar PCBs			
Total Coplanars[c]	pg/g	100,472	118,085
PCB 77[d]	pg/g	32,224	37,886
	TEQ	3	4
PCB 81[e]	pg/g	1,945	2,628
	TEQ	1	1
PCB 126[f]	pg/g	2,251	2,945
	TEQ	11	15
PCB 169[g]	pg/g	91	110
	TEQ	0	0
Mono-ortho PCBs			
Total Mono-orthos[h]	ng/g	4,233	4,663
Subset[i]	ng/g	1,246	1,581
	TEQ	6	8
Di-ortho PCBs			
Total Di-orthos[j]	ng/g	9,554	11,531

Notes:
a. Sum of polychlorinated dibenzo-dioxins (PCDD) including tetra-, penta-, hexa-, hepta-, and octa-chlorinated dibenzodioxins.
b. Sum of polychlorinated dibenzofurans (PCDF) including tetra-, penta-, hexa-, hepta-, and octa-chlorinated dibenzo-furans.
c. Sum of all 18 coplanar polychlorinated biphenyls including di-, tri-, tetra-, penta-, tri-, tetra-, penta-, and hexa-chlorinated biphenyls.
d. 3,3',4,4'-tetrachlorobiphenyl.
e. 3,4,4',5-tetrachlorobiphenyl.
f. 3,3',4,4',5-pentachlorobiphenyl.
g. 3,3',4,4',5,5'-hexachlorobiphenyl.
h. Sum of all 46 mono-ortho polychlorinated biphenyls including tetra-, penta-, hexa-, tetra-, penta-, hexa-, and hepta-chlorinated biphenyls.
i. Subset of 8 mono-ortho PCBs for which Toxic Equivalency Factors are available: PCB 123, PCB 118, PCB 114, PCB 105, PCB 167, PCB 156, PCB 157, PCB 189.
j. Sum of all 141 di-ortho polychlorinated biphenyls including di-, tri-, tetra-, penta-, hexa-, hepta-, octa-, nona-, and deca-chlorinated biphenyls.
ng/g = nanogram per gram
PCBs = polychlorinated biphenyls
PCDD/F = polychlorinated dibenzo-*p*-dioxins and dibenzofurans
pg/L = picogram per gram
TCDD = 2,3,7,8 tetrachlorodibenzo-*p*-dioxin
TCDF = 2,3,7,8 tetrachlorodibenzofuran
TEQ = toxic equivalency factor

Table 3-61
Blue Crab Bioaccumulation Data from NJDEP (1993a)

Chromium Concentration (mg/kg-dw)									
Site	**Berry's Creek**			**Sawmill Creek**			**Diamond Shamrock**		
Season	**Fall**	**Spring**	**Summer**	**Fall**	**Spring**	**Summer**	**Fall**	**Spring**	**Summer**
Body Muscle	2.50	0.94	0.41	1.00	0.89	0.67	0.10	0.70	0.69
	2.40	0.33	0.44	3.58	0.70	1.00	4.76	0.42	0.49
	10.50	0.68	1.05	0.70	0.19	0.71	0.50	0.31	1.17
	0.84	0.29	0.64	1.10	1.08	0.31	1.20	2.61	0.32
Claw Muscle	1.88	4.14	0.04	3.40	2.56	0.56	2.10	0.92	1.29
	1.00	0.04	0.28	1.60	0.61	0.43	0.70	0.14	0.26
	3.50	0.18	0.28	0.70	0.29	0.45	0.80	0.91	0.48
	1.30	1.51	0.44	7.70	0.53	0.31	8.10	0.20	0.24
Hepato-pancreas	15.37	1.54	1.85	5.50	1.61	0.86	1.60	3.29	1.84
	1.90	1.16	2.03	3.90	1.43	1.20	1.20	1.42	0.95
	3.62	1.82	5.07	2.10	1.38	0.67	0.80	1.74	3.45
	1.80	4.15	0.70	3.30	0.87	1.26	1.60	1.56	1.54

Note:
mg/kg-dw = milligrams per kilogram-dry weight

Table 3-62
Blue Crab Bioaccumulation Data from NYSDEC (1997a)

Analytes	Blue Crab - Muscle (pg/g-ww)							
	Author's Sample Number							
	0401	0405	0627-95-H	0628-95-H	0629-95-H	0630-95-H	0631-95-H	0633-95-H
2,3,7,8-TCDD	1.9	4	4	5.7	5.7	12.9	6.4[b]	2.3
1,2,3,7,8-PeCDD	0.05 (0.1)[a]	0.1 (0.2)	0.3 (0.6)	0.3 (0.6)	0.65 (1.3)	0.4 (0.8)	0.35 (0.7)	1.45 (2.9)
1,2,3,4,7,8-HxCDD	0.1 (0.2)	0.1 (0.2)	0.2 (0.4)	0.25 (0.5)	0.3 (0.6)	0.25 (0.5)	0.2 (0.4)	0.65 (1.3)
1,2,3,6,7,8-HxCDD	0.1 (0.2)	0.1 (0.2)	0.2 (0.4)	0.3	0.3 (0.6)	0.25 (0.5)	0.2 (0.4)	0.65 (1.3)
1,2,3,7,8,9-HxCDD	0.1 (0.2)	0.1 (0.2)	0.2 (0.4)	0.2 (0.4)	0.25 (0.5)	0.25 (0.5)	0.2 (0.4)	0.6 (1.2)
1,2,3,4,6,7,8-HpCDD	0.15 (0.3)	0.62[b]	0.43[b]	0.35 (0.7)	0.25 (0.5)	0.34[b]	0.37[b]	0.6 (1.2)
1,2,3,4,6,7,8,9-OCDD	0.64[b]	3.5	2.4	1.5	1.4	1.6[b]	1.6	0.95 (1.9)
Other PCDD	0.5	2.8	1.43	8.85	3.7	18.72	6.99	0
Total PCDD[c]	3.04	8.52	7.73	8.6	8.85	15.99	9.32	7.2
2,3,7,8-TCDF	1.3	2.4	3.7	6.9	5.8	11.3	4.7[b]	3.8
1,2,3,7,8-PeCDF	0.11[b]	0.25[b]	0.2 (0.4)	0.65	0.35 (0.7)	1.1	0.2 (0.4)	0.85 (1.7)
2,3,4,7,8-PeCDF	0.23	0.5	0.43[b]	0.91	0.35 (0.7)	3.3	1	0.75 (1.5)
1,2,3,4,7,8-HxCDF	0.66	1.2	0.68	0.91	0.89[b]	5.5	1.3	0.45 (0.9)
1,2,3,6,7,8-HxCDF	0.12	0.19	0.1 (0.2)	0.15 (0.3)	0.15 (0.3)	0.52	0.16	0.35 (0.7)
2,3,4,6,7,8-HxCDF	0[d]	0.07[d]	0.15 (0.3)	0.25	0.2 (0.4)	0.15 (0.3)	0.38	0.4 (0.8)
1,2,3,7,8,9-HxCDF	0.05 (0.1)	0.1 (0.2)	0.15 (0.3)	0.15 (0.3)	0.2 (0.4)	0.15 (0.3)	0.15 (0.3)	0.4 (0.8)
1,2,3,4,6,7,8-HpCDF	0.53	0.78	0.1 (0.2)	0.30[b]	0.15 (0.3)	1.1	0.49	0.35 (0.7)
1,2,3,4,7,8,9-HpCDF	0.1 (0.2)	0.15 (0.3)	0.15 (0.3)	0.25 (0.5)	0.2 (0.4)	0.25 (0.5)	0.15 (0.3)	0.5 (1.0)
1,2,3,4,6,7,8,9-OCDF	0.2 (0.4)	0.2 (0.4)	0.3	0.5 (1.0)	0.3 (0.6)	0.7 (1.4)	0.35 (0.7)	0.8 (1.6)
Other PCDF	8.56	20.2	17.62	48.78	21.67	117.08	44.36	0.56
Total PCDF[e]	3.3	5.84	5.96	10.97	8.59	24.07	8.88	8.65
2,3,7,8-TCDD TEQ[f]	2.3	4.76	4.92	7.26	7.03	16.67	7.83	4.19
% 2,3,7,8-TCDD	82.6	84	81.3	78.5	81.1	77.4	81.7	54.9
% 2,3,7,8-TCDF	5.7	5	7.5	9.5	8.3	6.8	6	9.1
% 1,2,3,7,8-PeCDD	1.1	1.1	NR	NR	NR	NR	NR	NR
% 2,3,4,7,8-PeCDF	5	5.3	4.4	6.3	2.5	9.9	6.4	8.9
Lipid (%)	0.3	0.5	0.4	0.4	0.5	0.3	0.4	0.2

Table 3-62
Blue Crab Bioaccumulation Data from NYSDEC (1997a)

Analytes	Blue Crab - Hepatopancreas (pg/g-ww)							
	Author's Sample ID Number							
	0401H	0405H	0627-95-H	0628-95-H	0629-95-H	0630-95-H	0631-95-H	0633-95-H
2,3,7,8-TCDD	189	121	113	154	72.6	139	227	107
1,2,3,7,8-PeCDD	11	5.8	6.4	8.1	3.9[b]	6.3[b]	8.3	7.9
1,2,3,4,7,8-HxCDD	3	1.8	1.4	2.1	0.6 (1.2)	1.45 (2.9)	2.2	1.25 (2.5)
1,2,3,6,7,8-HxCDD	13.7	6.4	6.4	8.9	3.4[b]	3.9	9	11
1,2,3,7,8,9-HxCDD	5	2	2.3[b]	3.3	1	1.25 (2.5)	3.4	4.4
1,2,3,4,6,7,8-HpCDD	18.5	12.3	8.7	12.8	3.9	4.8[b]	13	10.5
1,2,3,4,6,7,8,9-OCDD	43.0[g]	52.7[g]	21.7	44.9	12.9[b]	15.8[b]	31	25.6
Other PCDD	204	139	231	334	122	225	304	309
Total PCDD[c]	283.2	202	159.9	234.1	98.3	172.5	293.9	167.7
2,3,7,8-TCDF	177	98.1	176	247	102	135	196	238
1,2,3,7,8-PeCDF	19.4	11.2	13.4	17.7	7.9[b]	11.3[b]	18.7	19.3
2,3,4,7,8-PeCDF	48.9	27.4	23.7	35.2	15.8	45.6	37.1	32.3
1,2,3,4,7,8-HxCDF	87.7[g]	48.5[g]	20.9	29.9	13..2	63	45.7	36.2
1,2,3,6,7,8-HxCDF	14.9	7.9	3.4	4.7	1.7[b]	7.5	6.3	5.6
2,3,4,6,7,8-HxCDF	7.8[g]	4.1[g]	3.8	4.6	2	4.6	4.7	5.5[b]
1,2,3,7,8,9-HxCDF	0.7 (1.4)	0.65 (1.3)	0.45 (0.9)	0.75 (1.5)	0.4 (0.8)	0.9 (1.8)	0.65 (1.3)	0.8 (1.6)
1,2,3,4,6,7,8-HpCDF	79.6[g]	36.1[g]	10.6	12.9	6	16.7	16.2	12.8
1,2,3,4,7,8,9-HpCDF	1.15 (2.3)	1.05 (2.1)	0.65 (1.3)	1.0 (2.0)	0.5 (1.0)	1.15 (2.3)	1.85 (3.7)	1.2 (2.4)
1,2,3,4,6,7,8,9-OCDF	75.9[g]	40.8[g]	1.5 (3.0)	4.4	1.2 (2.4)	4.2	6.3	4.2 (8.4)
Other PCDF	1302	793	1187	1681	678	1333	1591	1468
Total PCDF[g]	513.1	275.8	254.4	358.2	150.7	290	333.5	355.9
2,3,7,8-TCDD TEQ[f]	253	155.7	150.41	206.98	95.39	187.62	277.78	158.61
% 2,3,7,8-TCDD	74.7	77.7	75.1	74.4	76.1	74.1	81.7	67.5
% 2,3,7,8-TCDF	7	6.3	11.7	11.9	10.7	7.2	7.1	15
% 1,2,3,7,8-PeCDD	2.2	1.9	NR	NR	NR	NR	NR	NR
% 2,3,4,7,8-PeCDF	9.7	8.8	7.9	8.5	8.3	12.2	6.7	10.2
Lipid (%)	22.1	16.3	8.6	8.9	4.6	3.1	10.4	10.8

Table 3-62
Blue Crab Bioaccumulation Data from NYSDEC (1997a)

Notes:
a. One-half the detection limit followed by the (detection limit).
b. Estimated maximum possible concentration values (EMPC). EMPCs did not meet identification criteria for positive identification of the compound due to interference by another compound. However, the analyst is confident that the compound is present.
c. Total PCDD with 2,3,7,8-chlorine substitution.
d. Blank contamination subtraction included in this value. Blank value is the reported blank concentration.
e. Total PCDF with 2,3,7,8-chlorine substitution.
f. 2,3,7,8-TCDD equivalents using toxic equivalency factors of Barnes and Bellin (1989), calculated with one-half the detection limit and full EMPC values.
g. 2,3,7,8-TCDD equivalents using toxic equivalency factors of Barnes and Bellin (1989), calculated with one-half the detection limit and full EMPC values.

HpCDD = heptachlorodibenzo-*p*-dioxin
HpCDF = heptachlorodibenzofuran
HxCDD = hexachlorodibenzo-*p*-dioxin
HxCDF = hexachlorodibenzofuran
NR = not reported
NYSDEC = New York State Department of Environmental Conservation
OCDD = octachlorodibenzo-*p*-dioxin
OCDF = octachlorodibenzofuran
PCDD = polychlorinated dibenzo-*p*-dioxin
PCDF = polychlorinated dibenzofurans
PeCDD = pentachlorodibenzo-*p*-dioxin
PeCDF = pentachlorodibenzofuran
pg/g-ww = picograms per gram-wet weight
TCDD = 2,3,7,8 tetrachlorodibenzo-*p*-dioxin
TCDF = 2,3,7,8 tetrachlorodibenzofuran
TEQ = toxic equivalency factor
ww = wet weight

Table 3-63
Diamondback Terrapin Bioaccumulation Data from McIntyre (2000)

Tissue Type	Author's Sample Location	Sex	Carapace Length (cm)	Cr (µg/g)	Ni (µg/g)	Cu (µg/g)	Zn (µg/g)	As (µg/g)	Cd (µg/g)
Liver	S2	Female	17.1	1.78	2.02	54.1	106.02	0.37	0.05
	S3	Female	17.7	0.73	0.83	48.18	87.21	0.37	0.047
	S4	Female	12.9	1.17	0.62	24.84	114.03	0.37	0.002
	S5	Female	12.4	1.37	0.98	25.68	87.4	0.73	0.002
	S12	Male	13.4	1.25	4.33	75.54	148.17	0.51	0.72
	S15	Male	11.8	0.71	1.19	29.37	105.56	0.47	0.53
	S17	Male	12.5	3.59	1.17	39.3	118.69	0.37	0.28
Stomach Contents	S22	Female	NA	7.66	4.81	21.33	141.83	2.14	0.21
	S23	Female	NA	5.28	3.11	29.69	88.92	1.32	0.04
	S29	Male	NA	3.96	NA	15.35	258.76	4.81	0.74

Notes:
NA = not analyzed (meaning of abbreviation not specified in source of data, assumed to mean "not analyzed")
µg/g = microgram per gram

Pb (ng/g)
<5.6
<5.6
<5.6
<5.6
52.3
<5.6
<5.6
17.1
9.87
4.9

Table 3-64a

Dredging Permit Application Summary Table - Clam Bioaccumulation Data[a]

Waterway	Analyte	Number of Studies	Range of Concentrations *Macoma nasuta*	Units[b]
Arthur Kill	**Inorganic Chemicals**			
	Ag	1	0.088[c] - 0.110[c]	mg/kg
	As	1	3.799 - 4.43	mg/kg
	Cd	1	0.044[c] - 0.059[c]	mg/kg
	Cr	1	0.648[c] - 0.989[c]	mg/kg
	Cu	1	17.067 - 18.360	mg/kg
	Hg	1	0.054[c] - 0.074	mg/kg
	Ni	1	1.219[c] - 1.414	mg/kg
	Pb	1	1.277[c] - 1.819[c]	mg/kg
	Zn	1	19.927 - 26.38	mg/kg
	Pesticides			
	Aldrin	1	ND[c] - ND[c]	µg/kg
	Aldrin	1	0.068 - 0.068	µg/L
	a-Chlordane	1	0.416[c] - 0.416[c]	µg/kg
	a-Chlordane	1	0.766[c] - 0.766[c]	µg/L
	trans Nonachlor	1	0.213[c] - 0.213[c]	µg/kg
	trans Nonachlor	1	0.369[c] - 0.369[c]	µg/L
	Dieldrin	1	0.955 - 0.955	µg/kg
	Dieldrin	1	1.013 - 1.013	µg/L
	Total DDT	1	13.788[c] - 13.788[c]	µg/kg
	Total DDT	1	40.848[c] - 40.848[c]	µg/L
	Endosulfan I	1	0.244 - 0.244	µg/kg
	Endosulfan I	1	1.308[c] - 1.308[c]	µg/L
	Endosulfan II	1	ND - ND	µg/kg
	Endosulfan II	1	0.116 - 0.116	µg/L
	Endosulfan sulfate	1	0.386[c] - 0.386[c]	µg/kg
	Endosulfan sulfate	1	0.339 - 0.339	µg/L
	Heptachlor	1	ND[c] - ND[c]	µg/kg
	Heptachlor	1	ND - ND	µg/L
	Heptachlor epoxide	1	ND[c] - ND[c]	µg/kg
	Heptachlor epoxide	1	ND - ND	µg/L
	Industrial Chemicals			
	Total PCBs	1	26.583[c] - 26.583[c]	µg/kg
	Total PCBs	1	44.710[c] - 44.710[c]	µg/L

Table 3-64a

Dredging Permit Application Summary Table - Clam Bioaccumulation Data[a]

Waterway	Analyte	Number of Studies	Range of Concentrations *Macoma nasuta*	Units[b]
Arthur Kill cont'd	1,4-Dichlorobenzene	1	1.92 - 1.92	µg/kg
	1,4-Dichlorobenzene	1	5.491 - 5.491	µg/L
	PAHs			
	Acenaphthalene	1	0.787[c] - 0.787[c]	µg/g
	Acenaphthalene	1	1.071[c] - 1.071[c]	µg/L
	Acenaphthene	1	1.540[c] - 1.540[c]	µg/g
	Acenaphthene	1	0.692[c] - 0.692[c]	µg/L
	Anthracene	1	2.905[c] - 2.905[c]	µg/g
	Anthracene	1	4.299[c] - 4.299[c]	µg/L
	Fluorene	1	1.244[c] - 1.244[c]	µg/g
	Fluorene	1	1.070[c] - 1.070[c]	µg/L
	Naphthalene	1	2.042[c] - 2.042[c]	µg/g
	Naphthalene	1	2.040[c] - 2.040[c]	µg/L
	Phenanthrene	1	6.595[c] - 6.595[c]	µg/g
	Phenanthrene	1	7.306[c] - 7.306[c]	µg/L
	Benz[a]anthracene	1	10.048[c] - 10.048[c]	µg/g
	Benz[a]anthracene	1	16.460[c] - 16.460[c]	µg/L
	Benzo[a]pyrene	1	8.538[c] - 8.538[c]	µg/g
	Benzo[a]pyrene	1	12.807[c] - 12.807[c]	µg/L
	Benzo[g,h,i]perylene	1	4.320[c] - 4.320[c]	µg/g
	Benzo[g,h,i]perylene	1	7.947[c] - 7.947[c]	µg/L
	Benzo[b]fluoranthene	1	11.983[c] - 11.983[c]	µg/g
	Benzo[b]fluoranthene	1	23.060[c] - 23.060[c]	µg/L
	Benzo[k]fluoranthene	1	3.579[c] - 3.579[c]	µg/g
	Benzo[k]fluoranthene	1	5.476[c] - 5.476[c]	µg/L
	Chrysene	1	15.440[c] - 15.440[c]	µg/g
	Chrysene	1	28.627[c] - 28.627[c]	µg/L
	Dibenz[a,h]anthracene	1	0.905 - 0.905	µg/g
	Dibenz[a,h]anthracene	1	1.703[c] - 1.703[c]	µg/L
	Fluoranthene	1	24.256[c] - 24.256[c]	µg/g
	Fluoranthene	1	28.835[c] - 28.835[c]	µg/L
	Indeno[1,2,3-cd]pyrene	1	2.812[c] - 2.812[c]	µg/g
	Indeno[1,2,3-cd]pyrene	1	4.996[c] - 4.996[c]	µg/L

Table 3-64a

Dredging Permit Application Summary Table - Clam Bioaccumulation Data[a]

Waterway	Analyte	Number of Studies	Range of Concentrations *Macoma nasuta*	Units[b]
Arthur Kill cont'd	Pyrene	1	29.356[c] - 29.356[c]	µg/g
	Pyrene	1	40.486[c] - 40.486[c]	µg/L
	PCDD			
	2,3,7,8-TCDD	2	0.553[c] - 0.792[c]	ng/kg
	1,2,3,7,8-PeCDD	1	ND - ND	ng/kg
	1,2,3,4,7,8-HxCDD	1	ND[c] - ND[c]	ng/kg
	1,2,3,6,7,8-HxCDD	1	ND - ND	ng/kg
	1,2,3,7,8,9-HxCDD	1	ND[c] - ND[c]	ng/kg
	1,2,3,4,6,7,8-HpCDD	1	4.260[c] - 4.260[c]	ng/kg
	OCDD	1	43.500[c] - 43.500[c]	ng/kg
	PDCF			
	2,3,7,8-TCDF	1	1.108[c] - 1.108[c]	ng/kg
	1,2,3,7,8-PeCDF	1	0.458[c] - 0.458[c]	ng/kg
	2,3,4,7,8-PeCDF	1	0.366 - 0.366	ng/kg
	1,2,3,4,7,8-HxCDF	1	0.840[c] - 0.840[c]	ng/kg
	1,2,3,6,7,8-HxCDF	1	0.338[c] - 0.338[c]	ng/kg
	1,2,3,7,8,9-HxCDF	1	0.656[c] - 0.656[c]	ng/kg
	2,3,4,6,7,8-HxCDF	1	ND[c] - ND[c]	ng/kg
	1,2,3,4,6,7,8-HpCDF	1	2.200[c] - 2.200[c]	ng/kg
	1,2,3,4,7,8,9-HpCDF	1	ND[c] - ND[c]	ng/kg
	OCDF	1	5.380[c] - 5.380[c]	ng/kg
Kill Van Kull	**Inorganic Chemicals**			
	Ag	2	0.075 - 40.5[c]	mg/g
	As	2	3.018 - 3,990	mg/g
	Cd	2	0.033 - 25.9	mg/g
	Cr	2	0.552[c] - 552[c]	mg/g
	Cu	2	13.866 - 2,360	mg/g
	Hg	2	0.039 - 18.4[c]	mg/g
	Ni	2	1.053 - 1,380[c]	mg/g
	Pb	2	0.895[c] - 516[c]	mg/g
	Zn	1	14.860 - 15,400	mg/g
	Pesticides			
	Aldrin	2	ND[c] - 482[c]	µg/g
	a-Chlordane	2	0.223[c] - 150	µg/g

Table 3-64a

Dredging Permit Application Summary Table - Clam Bioaccumulation Data[a]

Waterway	Analyte	Number of Studies	Range of Concentrations *Macoma nasuta*	Units[b]
Kill Van Kull cont'd	trans Nonachlor	2	0.093 - 92[c]	µg/g
	Dieldrin	2	0.7240 - 362	µg/g
	Total DDT	2	4.943 - 3,490[c]	µg/g
	Endosulfan I	2	ND[c] - 0.104	µg/g
	Endosulfan II	2	ND[c] - 389[c]	µg/g
	Endosulfan sulfate	2	0.155[c] - 545	µg/g
	Heptachlor	2	ND[c] - ND[c]	µg/g
	Heptachlor epoxide	2	ND[c] - 319[c]	µg/g
	Industrial Chemicals			
	Total PCBs	2	20.722[c] - 21,200[c]	µg/g
	1,4-Dichlorobenzene	2	3.644 - 237	µg/g
	PAHs			
	Acenaphthalene	1	0.386[c] - 0.460[c]	µg/g
	Acenaphthene	2	ND[c] - 57,500	µg/g
	Acenaphthylene	1	0.249 - 1.44	ng/g
	Anthracene	2	3.255[c] - 24,400[c]	µg/g
	Fluorene	2	1.584[c] - 1,290	µg/g
	Naphthalene	2	1.348[a] - 1,600	µg/g
	Phenanthrene	2	3.407[c] - 14,800[c]	µg/g
	Benz[a]anthracene	2	8.268[c] - 54,900[c]	µg/g
	Benzo[a]pyrene	2	7.219[c] - 28,300[c]	µg/g
	Benzo[g,h,i]perylene	2	2.762[c] - 4,230[c]	µg/g
	Benzo[b]fluoranthene	2	9.220[c] - 20,700[c]	µg/g
	Benzo[k]fluoranthene	2	3.216[c] - 18,700[c]	µg/g
	Chrysene	2	13.388[c] - 63,600[c]	µg/g
	Dibenz[a,h]anthracene	2	0.536 - 1,620	µg/g
	Fluoranthene	2	13.186[c] - 89,700[c]	µg/g
	Indeno[1,2,3-cd]pyrene	2	1.832 - 3,920[c]	µg/g
	Pyrene	2	19.711[c] - 151,000[c]	µg/g
	PCDD			
	2,3,7,8-TCDD	2	ND - 0.184	ng/kg
	1,2,3,7,8-PeCDD	1	ND - ND	ng/kg
	1,2,3,4,7,8-HxCDD	1	ND - ND	ng/kg
	1,2,3,6,7,8-HxCDD	1	ND - ND	ng/kg

Table 3-64a

Dredging Permit Application Summary Table - Clam Bioaccumulation Data[a]

Waterway	Analyte	Number of Studies	Range of Concentrations *Macoma nasuta*	Units[b]
Kill Van Kull cont'd	1,2,3,7,8,9-HxCDD	1	ND - 0.15	ng/kg
	1,2,3,4,6,7,8-HpCDD	1	0.508[c] - 1.12[c]	ng/kg
	OCDD	1	3.67[c] - 7.8[c]	ng/kg
	PCDF			
	2,3,7,8-TCDF	1	0.277 - 0.566[c]	ng/kg
	1,2,3,7,8-PeCDF	1	0.192 - 0.411	ng/kg
	2,3,4,7,8-PeCDF	1	0.224 - 0.317	ng/kg
	1,2,3,4,7,8-HxCDF	1	0.238 - 0.364	ng/kg
	1,2,3,6,7,8-HxCDF	1	0.141 - 0.184	ng/kg
	1,2,3,7,8,9-HxCDF	1	ND - ND	ng/kg
	2,3,4,6,7,8-HxCDF	1	0.198 - 0.297[c]	ng/kg
	1,2,3,4,6,7,8-HpCDF	1	0.263 - 0.62[c]	ng/kg
	1,2,3,4,7,8,9-HpCDF	1	ND - 0.143	ng/kg
	OCDF	1	0.268 - 0.411[c]	ng/kg
Newark Bay	**Inorganic Chemicals**			
	Ag	1	0.10[c] - 0.12[c]	mg/kg
	As	1	4.33 - 5.15	mg/kg
	Cd	1	0.08 - 0.121[c]	mg/kg
	Cr	1	1.51 - 1.74[c]	mg/kg
	Cu	1	6.98 - 8.15	mg/kg
	Hg	1	0.04 - 0.046[c]	mg/kg
	Ni	1	1.97 - 2.00	mg/kg
	Pb	1	3.32[c] - 3.50[c]	mg/kg
	Zn	1	21.90 - 25.50	mg/kg
	Pesticides			
	Aldrin	1	ND - ND	µg/kg
	a-Chlordane	1	- 0.56[c]	µg/kg
	trans Nonachlor	1	0.33[c] - 0.30[c]	µg/kg
	Dieldrin	1	0.65 - 0.75[c]	µg/kg
	Total DDT	1	11.6 - 16.84	µg/kg
	Endosulfan I	1	- 1.24[c]	µg/kg
	Endosulfan II	1	ND - ND	µg/kg
	Endosulfan sulfate	1	0.08[c] - 1.13[c]	µg/kg
	Heptachlor	1	ND - ND	µg/kg
	Heptachlor epoxide	1	ND - ND	µg/kg

Table 3-64a

Dredging Permit Application Summary Table - Clam Bioaccumulation Data[a]

Waterway	Analyte	Number of Studies	Range of Concentrations *Macoma nasuta*	Units[b]
Newark Bay cont'd	**Industrial Chemicals**			
	Total PCBs	1	47.69[c] - 53.6[c]	µg/kg
	1,4-Dichlorobenzene	1	1.81 - 2.2	µg/kg
	PAHs			
	Naphthalene	1	1.81 - 2.5	µg/kg
	Acenaphthylene	1	1.24[c] - 1.49[c]	µg/kg
	Acenaphthene	1	0.57[c] - 4.09[c]	µg/kg
	Fluorene	1	1.19[c] - 1.46[c]	µg/kg
	Phenanthrene	1	8.88[c] - 11.20[c]	µg/kg
	Anthracene	1	5.27[c] - 8.77[c]	µg/kg
	Fluoranthene	1	63.5[c] - 73.43[c]	µg/kg
	Pyrene	1	74.8[c] - 83.43[c]	µg/kg
	Benz[a]anthracene	1	28.5[c] - 29.40[c]	µg/kg
	Chrysene	1	31.1[c] - 31.52[c]	µg/kg
	Benzo[b]fluoranthene	1	33.6[c] - 37.47[c]	µg/kg
	Benzo[k]fluoranthene	1	10.7[c] - 11.00[c]	µg/kg
	Benzo[a]pyrene	1	21.8[c] - 22.23[c]	µg/kg
	Indeno[1,2,3-cd]pyrene	1	6.97[c] - 7.57[c]	µg/kg
	Dibenz[a,h]anthracene	1	2.01[c] - 2.07[c]	µg/kg
	Benzo[g,h,i]perylene	1	9.61[c] - 10.41[c]	µg/kg
	PCDD			
	2,3,7,8-TCDD	1	3.12[c] - 3.15[c]	ng/kg
	1,2,3,7,8-PeCDD	1	ND - ND	ng/kg
	1,2,3,4,7,8-HxCDD	1	ND - ND	ng/kg
	1,2,3,6,7,8-HxCDD	1	ND - ND	ng/kg
	1,2,3,7,8,9-HxCDD	1	ND - 0.23	ng/kg
	1,2,3,4,6,7,8-HpCDD	1	6.18[c] - 7.94[c]	ng/kg
	OCDD	1	55.5[c] - 63.0[c]	ng/kg
	PCDF		-	
	2,3,7,8-TCDF	1	0.99[c] - 1.08[c]	ng/kg
	1,2,3,7,8-PeCDF	1	ND - ND	ng/kg
	2,3,4,7,8-PeCDF	1	ND - ND	ng/kg
	1,2,3,4,7,8-HxCDF	1	ND - 0.30	ng/kg
	1,2,3,6,7,8-HxCDF	1	ND - ND	ng/kg

Table 3-64a

Dredging Permit Application Summary Table - Clam Bioaccumulation Data[a]

Waterway	Analyte	Number of Studies	Range of Concentrations *Macoma nasuta*	Units[b]
Newark Bay cont'd	1,2,3,7,8,9-HxCDF	1	ND - ND	ng/kg
	2,3,4,6,7,8-HxCDF	1	0.46[c] - 0.47	ng/kg
	1,2,3,4,6,7,8-HpCDF	1	4.11[c] - 4.43[c]	ng/kg
	1,2,3,4,7,8,9-HpCDF	1	ND - ND	ng/kg
	OCDF	1	6.13[c] - 6.27[c]	ng/kg

Notes:
a. Data ranges for obtained dredge permit applications in which data were provided.
b. Units are as reported in the dredge permit applications. Some units appear to be reported as water units but no explanation is provided in text.
c. Significantly higher than reference at 95% confidence interval.
d. Highlighting indicates illegible values in permit applications.

HpCDD = heptachlorodibenzo-*p*-dioxin
HpCDF = heptachlorodibenzofuran
HxCDD = hexachlorodibenzo-*p*-dioxin
HxCDF = hexachlorodibenzofuran
mg/g = milligrams per gram
mg/kg = milligrams per kilogram
ng/g = nanogram per gram
ng/kg = nanogram per kilogram
ND = not detected
OCDD = octachlorodibenzo-*p*-dioxin
OCDF = octachlorodibenzofuran
PAHs = polycyclic aromatic hydrocarbons
PCBs = polychlorinated biphenyls
PCDD = polychlorinated dibenzo-*p*-dioxin
PCDF = polychlorinated dibenzofuran
PeCDD = pentachlorodibenzo-*p*-dioxin
PeCDF = pentachlorodibenzofuran
TCDD = 2,3,7,8 tetrachlorodibenzo-*p*-dioxin
TCDF = 2,3,7,8 tetrachlorodibenzofuran
TEPH = total extractable petroleum hydrocarbons
µg/g= microgram per gram
µg/kg= microgram per kilogram
µg/L = microgram per Liter

Sources:

Arthur Kill: Northville Linden Terminal Corporation (USACE, 1992c); CITGO Petroleum Corporation (USACE, 1997g); Consolidated Edison of New York (USACE, 1992d); Port Authority of NY/NJ (USACE, 1992b); Bayway Refining Company (USACE, 1993b); Federal Navigation Project (USACE, 1997h); Mobil Oil Corporation (USACE, 1997i).

Kill Van Kull: Federal Navigation Project (USACE, 1999k); EXXON Company, USA (USACE, 1997g).
Newark Bay: Port Authority of NY/NJ (USACE, 1991b) dredging permit; USACE (1997f).
Passaic River: Celanese Chemical Company, Inc. (USACE, 1991a).

Table 3-64b
Dredging Permit Application Summary Table - Hard Clam Bioaccumulation Data[a]

Waterway	Analyte	Number of Studies	Range of Concentration *Mercenaria mercenaria*	Units
Arthur Kill	**Inorganic Chemicals**			
	Cd	4	ND - ND	mg/kg
	Hg	4	ND - ND	mg/kg
	Pesticides			
	Total DDT	3	ND - ND	mg/kg
	Industrial Chemicals			
	Total PCBs	4	ND - ND	mg/kg
	TEPH	4	ND - 4.45	mg/kg
Newark Bay	**Inorganic Chemicals**			
	Cd	1	ND - ND	mg/kg
	Hg	1	ND - ND	mg/kg
	Pesticides			
	Total DDT	1	ND - ND	mg/kg
	Industrial Chemicals			
	Total PCBs	1	ND - 0.06	mg/kg
	TEPH	1	11.35 - 20.9	mg/kg
Passaic	**Inorganic Chemicals**			
	Cd	1	ND - ND	mg/kg
	Hg	1	ND - ND	mg/kg
	Industrial Chemicals			
	Total PCBs	1	ND - ND	mg/kg
	TEPH	1	ND - ND	mg/kg
	PCDD			
	2,3,7,8-TCDD	1	ND - ND	ng/kg

Notes:
a. Data ranges for obtained dredge permit applications in which data were provided.
mg/kg = milligrams per kilogram
ND = not detected
ng/kg = nanogram per kilogram
PCBs = polychlorinated biphenyls
PCDD = polychlorinated dibenzo-*p*-dioxin
TCDD = 2,3,7,8 tetrachlorodibenzo-*p*-dioxin
TEPH = total petroleum hydrocarbons

Sources:
Arthur Kill: Northville Linden Terminal Corporation (USACE, 1992c); CITGO Petroleum Corporation (USACE, 1997g); Consolidated Edison of New York (USACE, 1992d); Port Authority of NY/NJ (USACE, 1992b); Bayway Refining Company (USACE, 1993b); Federal Navigation Project (USACE, 1997h); Mobil Oil Corporation (USACE, 1997i).
Kill Van Kull: Federal Navigation Project (USACE, 1999k); EXXON Company, USA (USACE, 1997g).
Newark Bay: Port Authority of NY/NJ (USACE, 1991b) dredging permit; USACE (1997f).
Passaic River: Celanese Chemical Company, Inc. (USACE, 1991a).

Table 3-64c
Dredging Permit Application Summary Table - Sand Worm Bioaccumulation Data[a]

Waterway	Analyte	Number of Studies	Range of Concentration *Nereis virens*	Units[b]
Arthur Kill	**Inorganic Chemicals**			
	Ag	2	0.024 - 0.026	mg/kg
	As	2	2.062 2.340	mg/kg
	Cd	6	ND - 0.100	mg/kg
	Cr	2	0.319 - 0.475	mg/kg
	Cu	2	1.882[c] - 3.557	mg/kg
	Hg	6	ND - 0.016	mg/kg
	Ni	2	0.259[c] - 0.342	mg/kg
	Pb	2	0.533[c] - 0.93	mg/kg
	Zn	1	11.149 - 17.360	mg/kg
	Pesticides			
	Aldrin	1	ND - ND	µg/kg
	Aldrin	1	ND - ND	µg/L
	a-Chlordane	1	1.290[c] - 1.290[c]	µg/kg
	a-Chlordane	1	1.383[c] - 1.383[c]	µg/L
	trans Nonachlor	1	1.231[c] - 1.231[c]	µg/kg
	trans Nonachlor	1	1.037[c] - 1.037[c]	µg/L
	Dieldrin	1	1.758[c] - 1.758[c]	µg/kg
	Dieldrin		1.119[c] - 1.119[c]	µg/L
	Total DDT	3	ND - ND	mg/kg
	Total DDT	1	30.867[c] - 30.867[c]	µg/kg
	Total DDT	1	39.673[c] - 39.673[c]	µg/L
	Endosulfan I	1	0.120 - 0.120	µg/kg
	Endosulfan I	1	0.258[c] - 0.258[c]	µg/L
	Endosulfan II	1	0.549 - 0.549	µg/kg
	Endosulfan II		ND - ND	µg/L
	Endosulfan sulfate	1	0.799[c] - 0.799[c]	µg/kg
	Endosulfan sulfate		0.291 - 0.291	µg/L
	Heptachlor	1	ND - ND	µg/kg
	Heptachlor		ND - ND	µg/L
	Heptachlor epoxide	1	0.053 - 0.053	µg/kg
	Heptachlor epoxide		0.077 - 0.077	µg/L
	Industrial Chemicals			
	Total PCBs	5	ND - 134,019[c]	mg/kg
	Total PCBs	1	62.795[c] - 62.795[c]	µg/L
	1,4-Dichlorobenzene	1	1.415 - 1.415	µg/kg
	1,4-Dichlorobenzene	1	2.183 - 2.183	µg/L
	TEPH	4	ND - 17.53	mg/kg

Table 3-64c
Dredging Permit Application Summary Table - Sand Worm Bioaccumulation Data[a]

Waterway	Analyte	Number of Studies	Range of Concentration *Nereis virens*	Units[b]
Arthur Kill cont'd	**PAHs**			
	Acenaphthalene	1	0.605[c] - 0.605[c]	µg/g
	Acenaphthalene	1	0.375[c] - 0.375[c]	µg/L
	Acenaphthene	1	7.890[c] - 7.890[c]	µg/g
	Acenaphthene	1	0.672 - 0.672	µg/L
	Anthracene	1	1.101 - 1.101	µg/g
	Anthracene	1	0.582 - 0.582	µg/L
	Fluorene	1	1.516[c] - 1.516[c]	µg/g
	Fluorene	1	0.405 - 0.405	µg/L
	Naphthalene	1	3.841[c] - 3.841[c]	µg/g
	Naphthalene	1	1.935 - 1.935	µg/L
	Phenanthrene	1	2.708[c] - 2.708[c]	µg/g
	Phenanthrene	1	1.248[c] - 1.248[c]	µg/L
	Benz[a]anthracene	1	2.086[c] - 2.086[c]	µg/g
	Benz[a]anthracene	1	1.523[c] - 1.523[c]	µg/L
	Benzo[a]pyrene	1	2.258[c] - 2.258[c]	µg/g
	Benzo[a]pyrene	1	1.416[c] - 1.416[c]	µg/L
	Benzo[g,h,i]perylene	1	1.688[c] - 1.688[c]	µg/g
	Benzo[g,h,i]perylene	1	1.330[c] - 1.330[c]	µg/L
	Benzo[b]fluoranthene	1	2.996[c] - 2.996[c]	µg/g
	Benzo[b]fluoranthene	1	2.880[c] - 2.880[c]	µg/L
	Benzo[k]fluoranthene	1	1.197[c] - 1.197[c]	µg/g
	Benzo[k]fluoranthene	1	0.925[c] - 0.925[c]	µg/L
	Chrysene	1	10.623[c] - 10.623[c]	µg/g
	Chrysene	1	8.335[c] - 8.335[c]	µg/L
	Dibenz[a,h]anthracene	1	0.293 - 0.293	µg/g
	Dibenz[a,h]anthracene	1	0.265 - 0.265	µg/L
	Fluoranthene	1	25.054[c] - 25.054[c]	µg/g
	Fluoranthene	1	8.290[c] - 8.290[c]	µg/L
	Indeno[1,2,3-cd]pyrene	1	0.782 - 0.782	µg/g
	Indeno[1,2,3-cd]pyrene	1	0.693 - 0.693	µg/L
	Pyrene	1	29.143[c] - 29.143[c]	µg/g
	Pyrene	1	12.598[c] - 12.598[c]	µg/L

Table 3-64c
Dredging Permit Application Summary Table - Sand Worm Bioaccumulation Data[a]

Waterway	Analyte	Number of Studies	Range of Concentration *Nereis virens*	Units[b]
Arthur Kill cont'd	**PCDD**			
	2,3,7,8-TCDD	3	1.018[c] - 1.200[c]	ng/kg
	1,2,3,7,8-PeCDD	1	0.200 - 0.200	ng/kg
	1,2,3,4,7,8-HxCDD	1	0.142 - 0.142	ng/kg
	1,2,3,6,7,8-HxCDD	1	0.440[c] - 0.440[c]	ng/kg
	1,2,3,7,8,9-HxCDD	1	0.256[c] - 0.256[c]	ng/kg
	1,2,3,4,6,7,8-HpCDD	1	2.620 - 2.620	ng/kg
	OCDD	1	22.000 - 22.000	ng/kg
	PCDF			
	2,3,7,8-TCDF	1	0.256[c] - 2.680[c]	ng/kg
	1,2,3,7,8-PeCDF	1	0.256[c] - 0.714[c]	ng/kg
	2,3,4,7,8-PeCDF	1	0.256[c] - 0.952[c]	ng/kg
	1,2,3,4,7,8-HxCDF	1	0.256[c] - 1.062[c]	ng/kg
	1,2,3,6,7,8-HxCDF	1	0.256[c] - 0.312[c]	ng/kg
	1,2,3,7,8,9-HxCDF	1	0.256[c] - 0.702[c]	ng/kg
	2,3,4,6,7,8-HxCDF	1	0.256[c] - ND	ng/kg
	1,2,3,4,6,7,8-HpCDF	1	0.256[c] - 1.490[c]	ng/kg
	1,2,3,4,7,8,9-HpCDF	1	0.256[c] - 0.134	ng/kg
	OCDF	1	0.256[c] - 1.822[c]	ng/kg
Kill Van Kull	**Inorganic Chemicals**			
	Ag	2	0.0.4 - 23.7	mg/kg
	As	2	2.182 - 3,110	mg/kg
	Cd	2	0.073 - 46.8	mg/kg
	Cr	2	0.193 - 320	mg/kg
	Cu	2	3.874 - 1,540	mg/kg
	Hg	2	0.011 - 26.2	mg/kg
	Ni	2	0.255 - 781[c]	mg/kg
	Pb	2	0.623 - 180[c]	mg/kg
	Zn	2	12.484 - 26,200	mg/kg
	Pesticides			
	Aldrin	2	ND - ND	µg/g
	a-Chlordane	1	0.852[c] - 601[c]	µg/g
	trans Nonachlor	2	0.905[c] - 788[c]	µg/g
	Dieldrin	2	1.291 - 662[c]	µg/g
	Total DDT	2	21.003 - 4,890[c]	µg/g
	Endosulfan I	2	ND - 477[c]	µg/g
	Endosulfan II	2	ND - 450[c]	µg/g
	Endosulfan sulfate	2	ND - 566	µg/g
	Heptachlor	2	ND - 0.03	µg/g
	Heptachlor epoxide	2	0.060 - 123[c]	µg/g

Table 3-64c
Dredging Permit Application Summary Table - Sand Worm Bioaccumulation Data[a]

Waterway	Analyte	Number of Studies	Range of Concentration *Nereis virens*	Units[b]
Kill Van Kull cont'd	**Industrial Chemicals**			
	Total PCBs	2	124.628[c] - 48,900[c]	µg/g
	1,4-Dichlorobenzene	2	2.528 - 725	µg/g
	PAHs			
	Acenaphthalene	1	0.516[c] - 0.841[c]	µg/g
	Acenaphthene	2	1.866[c] - 1,950[c]	µg/g
	Acenaphthylene	1	0.215[c] - 1.08[c]	ng/g
	Anthracene	2	1.022[c] - 2,110[c]	µg/g
	Fluorene	2	ND[c] - 10,000[c]	µg/g
	Naphthalene	2	3.237 - 1,850	µg/g
	Phenanthrene	2	1.451[c] - 1,950[c]	µg/g
	Benz[a]anthracene	2	1.984[c] - 4,950[c]	µg/g
	Benzo[a]pyrene	2	1.636[c] - 5,110[c]	µg/g
	Benzo[g,h,i]perylene	1	0.313[c] - 4.96[c]	ng/g
	Benzo[b]fluoranthene	2	1.925[c] - 3,160[c]	µg/g
	Benzo[k]fluoranthene	2	0.763[c] - 3,350[c]	µg/g
	Chrysene	2	9.992[c] - 21,800[c]	µg/g
	Dibenz[a,h]anthracene	2	0.297 - 6,730[c]	µg/g
	Fluoranthene	2	15.798[c] - 35,000[c]	µg/g
	Indeno[1,2,3-cd]pyrene	2	ND[c] - 9,370[c]	µg/g
	Pyrene	2	24.325[c] - 62,000[c]	µg/g
	PCDD			
	2,3,7,8-TCDD	2	0.162 - 1.540[c]	ng/kg
	1,2,3,7,8-PeCDD	1	ND - 0.18	ng/kg
	1,2,3,4,7,8-HxCDD	1	ND - ND	ng/kg
	1,2,3,6,7,8-HxCDD	1	ND - 0.267	ng/kg
	1,2,3,7,8,9-HxCDD	1	ND - 0.117	ng/kg
	1,2,3,4,6,7,8-HpCDD	1	1.0 - 1.53	ng/kg
	OCDD	1	6.21 - 11.9	ng/kg
	PCDF			
	2,3,7,8-TCDF	1	0.843 - 1.65[c]	ng/kg
	1,2,3,7,8-PeCDF	1	0.166 - 0.231	ng/kg
	2,3,4,7,8-PeCDF	1	0.198 - 0.367	ng/kg
	1,2,3,4,7,8-HxCDF	1	0.128 - 0.322[c]	ng/kg
	1,2,3,6,7,8-HxCDF	1	ND - 0.122	ng/kg
	1,2,3,7,8,9-HxCDF	1	ND - ND	ng/kg
	2,3,4,6,7,8-HxCDF	1	ND - 0.0957	ng/kg
	1,2,3,4,6,7,8-HpCDF	1	0.395 - 0.818	ng/kg
	1,2,3,4,7,8,9-HpCDF	1	ND - 0.672	ng/kg
	OCDF	1	0.355 - 1.25	ng/kg

Table 3-64c
Dredging Permit Application Summary Table - Sand Worm Bioaccumulation Data[a]

Waterway	Analyte	Number of Studies	Range of Concentration *Nereis virens*			Units[b]
Newark Bay	**Inorganic Chemicals**					
	Ag	1	0.040[c]	-	0.05[c]	mg/kg
	As	1	2.41	-	2.71	mg/kg
	Cd	2	ND	-	0.07	mg/kg
	Cr	1	0.09	-	0.18[c]	mg/kg
	Cu	1	1.90	-	2.26	mg/kg
	Hg	2	ND	-	0.01	mg/kg
	Ni	1	0.160[c]	-	0.21[c]	mg/kg
	Pb	1	0.197[c]	-	0.26[c]	mg/kg
	Zn	1	23.70	-	23.70	mg/kg
	Pesticides					
	Aldrin	1	ND	-	ND	µg/kg
	a-Chlordane	1		-	0.80[c]	µg/kg
	trans Nonachlor	1	0.75[c]	-	0.65[c]	µg/kg
	Dieldrin	1	0.75[c]	-	0.67[c]	µg/kg
	Total DDT	1	ND	-	7,400	mg/kg
	Endosulfan I	1	ND	-		µg/kg
	Endosulfan II	1	ND	-	ND	µg/kg
	Endosulfan sulfate	1	0.06	-	0.08	µg/kg
	Heptachlor	1	ND	-	ND	µg/kg
	Heptachlor epoxide	1	ND	-	ND	µg/kg
	Industrial Chemicals					
	Total PCBs	1	0.054	-	0.156	mg/kg
	Total PCBs	1	42.40[c]	-	57.4[c]	µg/kg
	1,4-Dichlorobenzene	1	1.45	-	1.5	µg/kg
	TEPH	1	14.57	-	20.66	mg/kg
	PAHs					
	Naphthalene	1	2.95	-	2.97	µg/kg
	Acenaphthylene	1	0.57[c]	-	0.61[c]	µg/kg
	Acenaphthene	1	1.91[c]	-	4.30[c]	µg/kg
	Fluorene	1	0.59	-	0.84[c]	µg/kg
	Phenanthrene	1	1.14[c]	-	1.51[c]	µg/kg
	Anthracene	1	0.96[c]	-	1.15[c]	µg/kg
	Fluoranthene	1	13.21[c]	-	15.93[c]	µg/kg
	Pyrene	1	14.9[c]	-	18.97[c]	µg/kg
	Benz[a]anthracene	1	1.05[c]	-	1.18[c]	µg/kg
	Chrysene	1	7.18[c]	-	9.13[c]	µg/kg
	Benzo[b]fluoranthene	1	1.82[c]	-	2.38[c]	µg/kg
	Benzo[k]fluoranthene	1	1.08[c]	-	1.45[c]	µg/kg
	Benzo[a]pyrene	1	[c]	-	1.63[c]	µg/kg

Table 3-64c
Dredging Permit Application Summary Table - Sand Worm Bioaccumulation Data[a]

Waterway	Analyte	Number of Studies	Range of Concentration *Nereis virens*	Units[b]
Newark Bay cont'd	Indeno[1,2,3-cd]pyrene	1	0.99[c] - 1.63[c]	µg/kg
	Dibenz[a,h]anthracene	1	ND[c] - 3.09[c]	µg/kg
	Benzo[g,h,i]perylene	1	2.09[c] - 3.35[c]	µg/kg
	PCDD			
	2,3,7,8-TCDD	1	2.94[c] - 2.94[c]	ng/kg
	1,2,3,7,8-PeCDD	1	ND - ND	ng/kg
	1,2,3,4,7,8-HxCDD	1	ND - ND	ng/kg
	1,2,3,6,7,8-HxCDD	1	ND - ND	ng/kg
	1,2,3,7,8,9-HxCDD	1	ND - ND	ng/kg
	1,2,3,4,6,7,8-HpCDD	1	1.71 - 1.83	ng/kg
	OCDD	1	11.32 - 11.4	ng/kg
	PCDF			
	2,3,7,8-TCDF	1	2.74[c] - 3.00[c]	ng/kg
	1,2,3,7,8-PeCDF	1	ND - ND	ng/kg
	2,3,4,7,8-PeCDF	1	ND[c] - ND[c]	ng/kg
	1,2,3,4,7,8-HxCDF	1	ND - ND	ng/kg
	1,2,3,6,7,8-HxCDF	1	ND - ND	ng/kg
	1,2,3,7,8,9-HxCDF	1	ND - ND	ng/kg
	2,3,4,6,7,8-HxCDF	1	ND - ND	ng/kg
	1,2,3,4,6,7,8-HpCDF	1	0.58 - 0.92[c]	ng/kg
	1,2,3,4,7,8,9-HpCDF	1	ND - ND	ng/kg
	OCDF	1	1.01 - 1.15	ng/kg

Table 3-64c
Dredging Permit Application Summary Table - Sand Worm Bioaccumulation Data[a]

Waterway	Analyte	Number of Studies	Range of Concentration *Nereis virens*			Units[b]
Passaic	**Inorganic Chemicals**					
	Cd	1	ND	-	ND	mg/kg
	Hg	1	ND	-	ND	mg/kg
	Industrial Chemicals					
	Total PCBs	1	ND	-	ND	mg/kg
	TEPH	1	ND	-	ND	mg/kg
	PCDD					
	2,3,7,8-TCDD	1	17.02		17.02	ng/kg

Notes:
a. Data ranges for obtained dredge permit applications in which data were provided.
b. Units are as reported in the dredge permit applications. Some units appear to be reported in water units but no explanation is provided in the text.
c. Significantly higher than reference at 95% confidence interval.
d. Highlighting indicates illegible values in permit applications.

HpCDD = heptachlorodibenzo-*p*-dioxin
HpCDF = heptachlorodibenzofuran
HxCDD = hexachlorodibenzo-*p*-dioxin
HxCDF = hexachlorodibenzofuran
mg/g = milligrams per gram
mg/kg = milligrams per kilogram
ng/g = nanogram per gram
ng/kg = nanogram per kilogram
ND = not detected
OCDD = octachlorodibenzo-*p*-dioxin
OCDF = octachlorodibenzofuran
PAHs = polycyclic aromatic hydrocarbons
PCBs = polychlorinated biphenyls
PCDD = polychlorinated dibenzo-*p*-dioxin
PCDF = polychlorinated dibenzofuran
PeCDD = pentachlorodibenzo-*p*-dioxin
PeCDF = pentachlorodibenzofuran
TCDD = 2,3,7,8 tetrachlorodibenzo-*p*-dioxin
TCDF = 2,3,7,8 tetrachlorodibenzofuran
TEPH = total petroleum hydrocarbons
µg/g= microgram per gram
µg/kg= microgram per kilogram
µg/L = microgram per Liter

Sources:
Arthur Kill: Northville Linden Terminal Corporation (USACE, 1992c); CITGO Petroleum Corporation (USACE, 1997g); Consolidated Edison of New York (USACE, 1992d); Port Authority of NY/NJ (USACE, 1992b); Bayway Refining Company (USACE, 1993b); Federal Navigation Project (USACE, 1997h); Mobil Oil Corporation (USACE, 1997i).
Kill Van Kull: Federal Navigation Project (USACE, 1999k); EXXON Company, USA (USACE, 1997g).
Newark Bay: Port Authority of NY/NJ (USACE, 1991b) dredging permit; USACE (1997f).
Passaic River: Celanese Chemical Company, Inc. (USACE, 1991a).

Table 3-64d
Dredging Permit Application Summary Table - Grass Shrimp
Bioaccumulation Data[a]

Waterway	Analyte	Number of Studies	Range of Concentration *Palaemonetes pugio*			Units
Arthur Kill	**Inorganic Chemicals**					
	Cd	4	ND	-	ND	mg/kg
	Hg	4	ND	-	ND	mg/kg
	Pesticides					
	Total DDT	3	ND	-	ND	mg/kg
	Industrial Chemicals					
	Total PCBs	4	ND	-	0.064	mg/kg
	TEPH	4	ND	-	66.9	mg/kg
Newark Bay	**Inorganic Chemicals**					
	Cd	1	ND	-	ND	mg/kg
	Hg	1	ND	-	DN	mg/kg
	Pesticides					
	Total DDT	1	ND	-	ND	mg/kg
	Industrial Chemicals					
	Total PCBs	1	ND	-	0.046	mg/kg
	TEPH	1	9.03		45.40	mg/kg
Passaic	**Inorganic Chemicals**					
	Cd	1	ND	-	ND	mg/kg
	Hg	1	ND	-	ND	mg/kg
	Industrial Chemicals					
	Total PCBs	1	ND	-	ND	mg/kg
	TEPH	1	ND	-	ND	mg/kg
	PCDD					
	2,3,7,8-TCDD	1	ND		ND	ng/kg

Notes:
a. Data ranges for obtained dredge permit applications in which data were provided.
mg/kg = milligrams per kilogram
ND = not detected
ng/kg = nanogram per kilogram
PCBs = polychlorinated biphenyls
PCDD = polychlorinated dibenzo-*p*-dioxin
TCDD = 2,3,7,8 tetrachlorodibenzo-*p*-dioxin
TEPH = total petroleum hydrocarbons

Sources:
Arthur Kill: Northville Linden Terminal Corporation (USACE, 1992c); CITGO Petroleum Corporation (USACE, 1997g); Consolidated Edison of New York (USACE, 1992d); Port Authority of NY/NJ (USACE, 1992b); Bayway Refining Company (USACE, 1993b); Federal Navigation Project (USACE, 1997h); Mobil Oil Corporation (USACE, 1997i).
Kill Van Kull: Federal Navigation Project (USACE, 1999k); EXXON Company, USA (USACE, 1997g).
Newark Bay: Port Authority of NY/NJ (USACE, 1991b) dredging permit; USACE (1997f).
Passaic River: Celanese Chemical Company, Inc. (USACE, 1991a).

Table 3-65
Quality Assurance/Quality Control Information for Bioaccumulation Studies

Reference	USEPA Region 2 Data Validation	Quantitative QA/QC[a]	Peer-reviewed Journal Publication	Not Specified	Notes
Ashley and Horwitz (2000)		X			
Burke et al. (2000)			X		
Buser and Rappe (1991)			X		
Cai et al. (1994a)			X		
Cai et al. (1994b)			X		
Cooper et al. (1992)			X		
Cristini (1992)		X			
Cristini and Gross (1993)		X			
Dredging Permit Applications (12): NB: USACE (1991b; 1997f) AK: USACE (1992b; 1992c; 1992d; 1993b; 1997e; 1997h; 1997i) KVK: USACE (1997g; 1999k) PR: USACE (1991a)				X	
Eckenfelder (1993)			X		
Elskus et al. (1999)			X		
Fernandez et al. (2004)			X		
Finley et al. (1997)			X		
Iannuzzi and Ludwig (2000)			X		
Iannuzzi et al. (1996)			X		
McIntyre (2000)				X	
Monosson et al. (2003)			X		
NJDEP (1993a)		X			
NY/NJ HEP (2004a)				X	
NYSDEC (1996)		X			
NYSDEC (1997a)		X			
NYSDEC (1997b)		X			
NYSDEC (2004c)				X	
Parsons (2003)				X	
Paulson et al. (2003)			X		
Pruell et al. (1993)			X		
Rappe et al. (1991)			X		
Robinson (2002)				X	

Table 3-65
Quality Assurance/Quality Control Information for Bioaccumulation Studies

Reference	USEPA Region 2 Data Validation	Quantitative QA/QC[a]	Peer-reviewed Journal Publication	Not Specified	Notes
Rubinstein et al. (1990)			X		
Tavalaro and Stern (1990)				X	
Tierra (1995a)	X				
Tierra (1999d)	X				
Tierra (2000c)	X				
Tierra (2001a)	X				
Windham et al. (2001)			X		
Yuan et al. (2001)			X		

Notes:

a. Quantitative QA/QC includes the analysis of field and laboratory duplicates, rinse blanks, matrix spike/matrix spike duplicates and other quantitative measures of precision and accuracy but without specification of implementing USEPA Region 2 data validation procedures.

Table 3-66
Habitat Studies Identified for the Inventory Area

Reference - Author/Year	Year(s) of Data Collection	Type of Report	Waterway	Number of Sampling Locations	Study Description
Agron (1980)	prior to 1980	geology	HK	not provided	Overview of the geology of Hackensack Meadowlands, including historical maps of habitat (1829).
Barclay and Squires (1991)	prior to 1990	habitat types	NY/NJ Harbor Estuary	not provided	Wildlife habitat and populations in the NY/NJ Harbor Estuary. Includes NB land use and wetlands/filled-in wetlands over time (1900 - 1989).
Barrett (1990a)	prior to 1990	habitat types	NY/NJ Harbor Estuary	not provided	Bibliography of the habitats and wildlife within the vicinity of the NY/NJ Harbor Estuary.
Barrett (1990b)	1990s	habitat types	AK, KVK, NB	none	Bird inventory and location of nests at NB.
Berger (1992)	prior to 1992	habitat changes	HK	not provided	Overview of the Hackensack Meadowlands, including formation of the HMDC, site history, and restoration activities.
Blanchard et al. (2001)	prior to 2001	habitat changes	AK	not provided	Conservation and natural area restoration in the vicinity of Staten Island, NJ.
Carmichael (1980)	400BC - 1980	habitat changes	HK	1	Long-term changes (flora, water salinities) to HK based on pollen records in sediment cores.
Cerrato (1986)	1985	habitat types	NB	area coverage	Benthic species, diversity, and abundance.
ChemRisk (1995)	prior to 1995	habitat types	PR	6-mile shoreline	Shoreline habitat study of PR.
City Plan Commission (1913)	prior to 1913	habitat types	NB, PR	not provided	Maps of wetland locations in relation to NB and PR.
Coastal Environmental Services, Inc. (1993)	prior to 1990	habitat assessment	NB	not provided	Topographic map with environmentally sensitive areas in the Newark vicinity.
Coastal Environmental Services, Inc. (1996)	prior to 1993	habitat types	NB	not provided	Natural resource mapping for the City of Bayonne. Includes: bedrock geology, land use/land cover, floodprone areas, environmentally sensitive areas, and topography.
Crawford et al. (1994)	1980s - 1990s	habitat changes	NB	not provided	Historical trends of habitats, species present, and water and sediment chemical contaminants.
Eckenfelder (1993)	1991	habitat types	HK	not provided	Inventories of plant and avian species at a site along the HK.
Edwards and Kelcey (1990)	prior to 1990	habitat types	HK	not provided	Wetlands delineation study in the Hackensack Meadowlands.
ERM (1986)	prior to 1986	habitat inventory	HK	not provided	Net production of marsh plant species in the Hackensack Meadowlands.
Foote (1981)	1980 - 1981	habitat inventory	HK	not provided	Field survey of HK plants (1980 - 1981; 362 identified taxa), including residential, commercial and industrial areas.
Greiling (1993)	prior to 1993	habitat types	AK	not provided	Overview of land use, natural resources, and impacts to the AK and its tributaries.
Grossmueller Enterprises (1996)	prior to 1996	habitat inventory	RW	not provided	Ecological survey of RW, including classification and physical characteristics of aquatic habitats and topography.
Hartman (2000)	2000	habitat inventory	HK	not provided	Vegetation cover mapping and plant species data for the Skeetkill Creek Marsh.
Hartman (2003a)	2002	habitat inventory	HK	not provided	Monitoring report of Harrier Meadows in the Hackensack Meadowlands, including vegetation coverage map.
Hartman (2003b)	2002	habitat inventory	HK	not provided	Vegetation cover mapping and plant species data for 72 plots across the site.
Heusser (1963)	prior to 1963	habitat changes	HK	3	Pollen diagrams from 3m sediment core samples detailing inputs of pollen from plant species over the course of approximately 2,000 years.
HMDC (1973)	prior to 1973	habitat changes	HK	not provided	Historical consideration of tidal flow in the Hackensack Meadowlands.
HMDC (1978a)	prior to 1978	habitat management	HK	not provided	Ecosystem management and environmental health in the Hackensack Meadowlands.
HMDC (1982f)	prior to 1982	habitat types	HK	not provided	Description of ecological conditions of waterfront parks in the Hackensack Meadowlands.
HMDC (1984a)	1980 - 1984	habitat types	HK	area coverage	Wetland habitats and associated species in the Hackensack Meadowlands
HMDC (1987b)	prior to 1987	habitat inventory	HK	33 areas	Review of previously documented Hackensack Meadowlands species, including vegetation, invertebrates, crustaceans, fish, reptiles, amphibians, birds, and mammals.

Table 3-66
Habitat Studies Identified for the Inventory Area

Reference - Author/Year	Year(s) of Data Collection	Type of Report	Waterway	Number of Sampling Locations	Study Description
HMDC (1990b)	1950 - 1985	habitat changes	HK	not provided	Vegetative changes in the Saw Mill Creek Marsh from 1950-1985, including coverages of mud flats, and wetland plant species *Spartina alternaflora* and *Phragmites australis*.
HMDC (1992a)	not provided	habitat inventory	HK	not provided	Landfill wildlife habitat field demonstration project grant proposal.
HMDC (1995a)	prior to 1995	habitat changes	HK	not provided	Overview of declining populations of the wetland plant *Spartina alterniflora* in the Hackensack Meadowlands District.
HMDC (1995b)	prior to 1995	habitat changes	HK	not provided	Overview of declining populations of the wetland plant *Spartina alterniflora* in northern portions of the Hackensack Meadowlands District.
Iannuzzi et al. (2002)	precolonial - 2002	habitat changes	NB, PR	not provided	Review of pollutant issues in the PR and its vicinity from pre-colonial to present time, including summaries of fisheries and wildlife, human uses, and pollutant sources.
Intrasearch (1999)	prior to 1999	habitat changes	HK, NB, PR	not provided	Estimated total wetland acres by watershed management area, including HK, NB, and PR from 1905 - 1997 (1905, 1932, 1940, 1954, 1966, 1976, 1989, 1997).
Intrasearch (2001)	prior to 2001	habitat changes	HK, NB, PR	not provided	Estimated total wetland acres by watershed management area, including HK, NB, and PR from 1870 - 1997 (1870, 1905, 1932, 1940, 1954, 1966, 1976, 1989, 1997).
Iocco et al. (2000)	1995	habitat types	NB	June: 19; October: 10	Sediment profile imagery and descriptions of benthic habitat in NB.
Kerlinger (1997b)	prior to 1997	habitat management	AK, HK, KVK, PR	not provided	Restoration of shorebird and songbird habitats in NY/NJ Harbor Estuary. Includes bird species and habitat types present along AK, HK, KVK, and PR.
Kraus and Smith (1986)	1950 - 1985	habitat changes	HK	not provided	Vegetative changes in the Saw Mill Creek Marsh from 1950 - 1985, including coverages of mud flats, and wetland plant species *Spartina alternaflora* and *Phragmites australis*.
Kummel (1908)	1905	habitat changes	HK, NB, PR	not applicable	Extent of marshes in HK, NB, and PR.
LBA (1993)	1992	habitat inventory	HK	area coverage	Wetland delineation report for a site along the lower HK.
Maguire Group Inc. (1989)	1986 - 1987	habitat types	HK	147 areas (8,259 acres)	Functional assessment of wetlands along the HK. Completion of wetland classifications for 147 areas representing 92% of all wetlands in the Hackensack Meadowlands.
Manspeizer (1980)	prior to 1980	habitat types	HK	not provided	Habitat map of the HK, circa. 1829.
NJDEP (1979)	prior to 1979	habitat assessment	NJ	not provided	Estuarine impacts and management activities, including a summary of environmental impacts and an overview of managing agencies.
NJDEP (1990c)	regulations	habitat types	AK, LB, RB	area coverage	Shellfish growing water classification chart (1990 - 1991), depicting AK, LB, and RB.
NJDEP (2004a)	1990s - 2004	habitat types	AK, KVK, NB, NY/NJ Harbor Estuary	area coverage	Various land use and water datasets available for NY/NJ Harbor Estuary, including NB vicinity.
NJDWSC (2002)	prior to 2002	habitat types	PR	not provided	Review of wetlands and land use in PR Basin Watershed Management Area 4 (WMA#4), including the lower PR and Saddle River.
NJGS (1870)	1870	habitat types	AK, KVK, NB	not provided	Wetlands of NB and adjacent waterways.
NJMC (2002)	2002	habitat types	HK	area coverage	Land use map for the Hackensack Meadowlands, with an emphasis on natural areas. Includes transportation services (roads, rail), recreation locations (parks, paths) and water access to the Hackensack and its tributaries.
NJMSC (1987)	1980s	habitat types	NB, NY/NJ Harbor Estuary	not provided	Habitat, water quality, and biological communities review for NY/NJ Harbor Estuary.

Table 3-66
Habitat Studies Identified for the Inventory Area

Reference - Author/Year	Year(s) of Data Collection	Type of Report	Waterway	Number of Sampling Locations	Study Description
NY/NJ HEP (2000)	prior to 2000	habitat management	AK, HK, JB, LIS, NY/NJ Harbor Estuary, RB, RR	area coverage	Priority acquisition and restoration of wetlands and other habitats in the NY/NJ Harbor Estuary.
PRC (1980)	prior to 1980	habitat inventory	PR	not provided	Overview of pre-1980 natural resources inventories for the PR Basin.
Quinn (1997)	prior to 1997	habitat inventory	HK	not provided	Overview of past and present wildlife presence and habitat conditions of the Hackensack Meadowlands.
RPA (2004)	prior to 2004	habitat changes	NY/NJ Harbor Estuary	area coverage	Regional Plan Association maps of historic tidelands of the NY/NJ Harbor Estuary, based on 19th century topographic maps from USGS, NJGS, and USCG.
Sipple (1971)	prior to 1971	habitat changes	HK	entire area	Listing of vegetation in the Hackensack Meadowlands, including a summary of historical documentation from the early 1800s to present.
Squires (1990)	prior to 1990	habitat changes	NY/NJ Harbor Estuary	not provided	Determination of land changes in the NY/NJ Harbor Estuary.
Squires (1992)	1897, 1966, 1989	habitat changes	NB	not provided	NB wetlands and filled-in wetlands over time.
Strims (1795)	1795	habitat types	PR	area coverage	Land use map of Belleville along the PR.
The Trust for Public Land and NYCAS (1990)	prior to 1990	habitat types	AK, KVK	not provided	Habitat types of the upper AK and western KVK, including strategies for land use planning.
Tierra (2002a)	1999 - 2000	habitat types	PR	area coverage	Habitat characterization of 6 mile stretch of PR.
Urquhart (1908)	prior to 1908	habitat changes	NB	not provided	Discussion of the filling of Newark Meadows for the construction of the Port Newark Terminal.
USACE (2000b)	prior to 2000	habitat assessment	AK, HK	not provided	Provides descriptive information on current habitat conditions, lists the federal- and state-listed species, identifies problems, opportunities, and potential ecosystem restoration sites, including the Passaic River in Passaic, Essex, and Bergen Counties, NJ.
USACE (2004d)	prior to 2004	habitat types	KVK, NB	not provided	Summary of fish habitat value of southern portion of NB in relation to other areas within the NY/NJ Harbor Estuary.
USACE (2004e)	prior to 2004	habitat types	AK, KVK, NB, NY/NJ Harbor Estuary	not provided	Summary of fish habitat value of NB in relation to other areas within the NY/NJ Harbor Estuary including essential fish habitat listed species in the NY/NJ Harbor Estuary.
USEPA (1989)	prior to 1990	habitat assessment	HK	area coverage	Functional assessment of wetlands in Hackensack Meadowlands.
USEPA/USACE (1995)	prior to 1990	habitat types	HK	not provided	Wetland types and biozones associated with the Hackensack Meadowlands.
USFWS (1983)	prior to 1983	habitat inventory	HK	not provided	Habitat mapping and wetland inventory for the HK, including summaries of prior investigations.
USFWS (1997)	prior to 1997	habitat types	NY/NJ Harbor Estuary	not provided	Summary of habitats, species presence, and ecological significance of NY/NJ Harbor Estuary by regions.
USFWS (2004)	1990s - 2004	wetland inventory	AK, HK, KVK, NB, NY/NJ Harbor Estuary, PR	area coverage	USFWS National Wetland Inventory data for NY/NJ Harbor Estuary, including NB vicinity, available for download using Geographic Information System.
USGS (1901)	prior to 1901	habitat inventory	AK, NB	not provided	USGS topography map with wetland locations surrounding NB and vicinity.
USGS (1925)	prior to 1925	habitat types	AK, NB	not provided	USGS topography map with wetland locations surrounding NB and vicinity.
Vaccari and Witt (1993)	prior to 1990	habitat types	HK, NB	not provided	Review of prior biological communities and habitat surveys in the vicinity of Jersey City, NJ, including HK and NB.
Van Winkle (1847)	1847	habitat types	NY/NJ Harbor Estuary	area coverage	Land use map of areas adjacent to the NY/NJ Harbor Estuary.

Table 3-66
Habitat Studies Identified for the Inventory Area

Reference - Author/Year	Year(s) of Data Collection	Type of Report	Waterway	Number of Sampling Locations	Study Description
Vermeule (1896)	prior to 1896	habitat types	NB	not provided	Changes to HK and NB marshes over time.
Wacker and Clemens (1995)	prior to 1990	habitat changes	NJ	not provided	Historic land use maps for NJ, with the majority of information provided on a state-wide basis.
Wolfskill and McNutt (1998)	1897 - 1989	habitat changes	NB	not provided	NB wetlands and filled-in wetlands over time, and locations of possible land-based sources of Pb, Hg, and PCDD/Fs in the vicinity of NB.

Notes:
AK = Arthur Kill
HK = Hackensack River
HMDC = Hackensack Meadowlands Development Commission
JB = Jamaica Bay
KVK = Kill Van Kull
LB = Lower Bay
LIS = Long Island Sound
NB = Newark Bay
NJGS = New Jersey Geologic Survey
NY/NJ = New York/New Jersey
PCDD/Fs = polychlorinated dibenzo-*p*-dioxins and dibenzofurans
PR = Passaic River
RB = Raritan Bay
RR = Raritan River
RW = Rahway River
USCG = U.S. Coast Guard
USFWS = U.S. Fish and Wildlife Service
USGS = U.S. Geologic Survey

Table 3
Priority Acquisition Sites and Restorati

Waterway/Location ID	Waterway
NY/NJ HEP Acquisition Priorities	
Arthur Kill Watershed	
AK1	Morses Creek
AK2	Piles Creek
AK3	RW Waterfront
AK4	Range Road Forest
AK5	Alfieri Site
AK6	Greenways to the AK
AK7	Graniteville Swamp Woods
Hackensack River Watershed	
HR1	Hudson County Mall
HR2A	Hackensack Meadowlands/Bellman's Creek
HR2B	Hackensack Meadowlands/Penhorn Creek
HR2C	Hackensack Meadowlands/Empire Tract/Moonachie Creek
HR2D	Hackensack Meadowlands/Berry's Creek
HR2E	Hackensack Meadowlands/Kearny Marsh
HR3	Overpeck Creek
HR4	Haworth
HR5	Old Tappan
HR6	Emerson
HR7	River Vale
Raritan River Watershed	
RR1	RR Site, Multiple Sites
RR1A	RR/Discharge Disposal Site
RR1B	RR/Raritan Arsenal
RR1C	RR/Kents Neck
RR1D	RR/Raritan River Waterfront
RR1E	RR/Mill Brook Center
RR1F	RR/Azco Chemical
RR1G	RR/Silver Lake
NY/NJ HEP Restoration Priorities	
Arthur Kill Watershed	
AK1	Salt Marsh Restoration
AK2	ER
AK3A	RW/Dri-Print Foil Printing Company
AK3B	RW/Central Avenue, Rahway
AK3C	RW/Central Avenue, Rahway
AK3D	RW/Madison Maple Avenues, Rahway
AK3E	RW/Milton Lake

Table 3
Priority Acquisition Sites and Restorati

Waterway/Location ID	Waterway
AK3F	RW/Potter's Island
AK3G	RW/Joseph Medwick Park
AK3H	RW/Essex Street, Rahway
AK3I	RW/West Grand Avenue, Rahway
AK3J	RW/Union/Allen Streets, Rahway
AK3K	RW/Rahway River Parkway Lake
AK3L	RW/Rahway River Parkway "The Lagoon"
AK3M	RW/Cranford
AK3N	RW/Vauxhall Creek
AK3O	RW/Orange Reservoir
AK4	Woodbridge River Restoration
AK5	AK/KVK, Staten Island: Saw Mill and Old Place Creeks
AK6	AK/KVK A
AK7	AK/ KVKV B
AK8	Prall's Island
Hackensack River Watershed	
HR1	Lincoln Park West
HR2A	Hackensack Meadowlands/NJ Turnpike, Western Spur
HR2B	Hackensack Meadowlands/Mill Creek
HR3	Van Buskirk Island
Raritan River Watershed	
RR1	RR

Notes:
AK =Arthur Kill
ER = Elizabeth River
RR = Raritan River
RW = Rahway River

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on Priorities from NY/NJ HEP (2000)

Description
Tidal wetland acquisition, preservation and enhancement
Tidal wetland acquisition, preservation and enhancement
Tidal wetland acquisition, preservation and enhancement
Forest acquisition and preservation
Freshwater wetland, forest floodplain preservation
Acquisition and preservation, multiple sites
Wet Woods/Headwaters of Old Place Creek
Marsh preservation and possible restoration
Waterfowl and northern harrier foraging areas; tidal marsh preservation/permanent protection and restoration
Wetland and tidal creek preservation and possible restoration
Wetland acquisition; northern harrier and yellow crowned night heron foraging area
Permanent protection of wetlands and stream corridor
Permanent open space designations
County park habitat management; possible restorations
Reservoir buffer, forest protection
Upland buffer protection
Reservoir buffer, forest protection
Reservoir buffer, upland protection
Tidal wetland acquisition, enhancement and restoration
Tidal wetland acquisition, enhancement and restoration
Tidal wetland acquisition, enhancement and restoration
Tidal wetland acquisition, enhancement and restoration
Tidal wetland acquisition, enhancement and restoration
Tidal wetland acquisition, enhancement and restoration
Tidal wetland acquisition, enhancement and restoration
Tidal wetland acquisition, enhancement and restoration
Multiple sites
Riparian corridor restoration/enhancement
Forested floodplain preservation
Stormwater impact reduction; riparian habitat restoration
Stormwater impact reduction; riparian habitat enhancement
Stormwater impact reduction; streambank stabilization; riparian habitat restoration
Shoreline restoration; possible freshwater habitat creation

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on Priorities from NY/NJ HEP (2000)

Description
Habitat enhancement for heron/egret rookery
Wetland enhancement
Shoreline restoration; riparian buffer/upland enhancement
Streambank restoration
Floodplain restoration; possible freshwater wetland creation
Shoreline stabilization; shallow water habitat enhancement
Shoreline restoration; stormwater impact reduction; possible wetland creation
Bank stabilization and riparian habitat restoration
Invasive plant management; streambank replanting; aquatic habitat enhancement
Lacustrine shoreline enhancement
Wetland enhancement and wildlife sanctuary
Salt marsh restoration/non-point source reduction
Clean fill restoration
Dredge material beneficial reuse/salt marsh restoration
Heron rookery enhancement
Marsh, tidal pond, tributary enhancement
Fencing to protect diamondback terrapins
Wetland and tidal enhancement
Freshwater wetland restoration; riparian buffer
Oyster bed restoration

Table 3-68
Biological Communities Studies Identified for the Inventory Area

Reference - Author/Year	Year(s) of Data Collection	Season(s) of Data Collection	Waterway	Plankton	Benthos	Fish	Bird	Terrestrial Organisms	Damage/Other	Number of Sampling Events	Number of Sampling Locations
Abbott (1907)	1906	summer	HK				X			HK: 6 events	HK: broad coverage
Audubon NY (2004)	1995	not provided	AK, KVK, NB				X				none
Barclay and Squires (1991)	prior to 1990	not provided	NY/NJ Harbor Estuary				X	X		not provided	not provided
Barrett (1990a)	prior to 1990	not provided	NY/NJ Harbor Estuary						X	not provided	not provided
Barrett (1990b)	prior to 1990	not provided	NB				X				none
Beans and Niles (2003)	prior to 2003	not provided	NB						X		1 quadrat
Berg and Levinton (1985)	1950s - 1980s	not provided	NY/NJ Harbor Estuary	X	X	X					not provided
Blanchard et al. (2001)	2001	not provided	KVK				X				not provided
Bragin (1988)	1987 - 1988	winter, spring, summer	HK			X				15	3 main zones (lower, middle, upper)
Bragin (2004)	2001 - 2003	year-round	HK		X	X				25	21
Brouwer (unknown)	1977	not provided	KVK				X				1
Brundage (1978)	1975 - 1976	spring	AK	X						26	3 (bottom and surface)
Burger et al. (1990)	1975 - 1989	not provided	NB, NY/NJ Harbor Estuary				X				1
Burger et al. (1992a)	1991	not provided	AK, NY/NJ Harbor Estuary						X	not provided	not provided
Burger et al. (1993)	1974 - 1989	not provided	NB, NY/NJ Harbor Estuary				X				none
Cerrato (1986)	1985	summer	NB		X						varies
ChemRisk (1995)	1994	summer	PR		X	X				1	6
Cristini (1991)	1987 - 1989	not provided	AK, HK, NB, NY/NJ Harbor Estuary		X					AK: 3 (PA NY/NJ 1988-89); HK: 1 (HMDC, 1987-88); NB: 1 (USACE,1988)	varies by dataset

Table 3-68
Biological Communities Studies Identified for the Inventory Area

Reference - Author/Year	Year(s) of Data Collection	Season(s) of Data Collection	Waterway	Plankton	Benthos	Fish	Bird	Terrestrial Organisms	Damage/Other	Number of Sampling Events	Number of Sampling Locations
Dentzau (1981)	1981	not provided	HK		X					1	12
DiNardo (unknown)	1980	not provided	HK			X				not provided	not provided
Duffy-Anderson et al. (2003)	1995 - 1996	summer, fall, winter	AK, KVK			X				AK: 8; KVK: 10	AK: 3; KVK: 3
Eaton (1936)	1800s - 1935	not provided	AK, HK, KVK, NB, PR				X			not provided	not provided
Eckenfelder (1993)	1991	summer, fall	HK				X			not provided	not provided
Empire (1998)	1995 - 1997	year-round	HK			X	X	X		Feb-June & Oct-Nov: weekly; July-Sept & Dec-Feb: biweekly	8
Festa and Toth (1976)	prior to 1976	not provided	AK, HK, KVK, NB		X	X				not provided	not provided
Fisher and Bezener (1998)	prior to 1998	not provided	NY/NJ Harbor Estuary				X			not provided	not provided
Foote and Loveland (1982)	1980 - 1981	summer, fall	HK	X						16 (monthly)	6
Greiner (1982)	prior to 1982	not provided	HK			X	X	X		not provided	not provided
Griscom (1929)	1920s	not provided	NB				X				none
Hartman (2003a)	1996 - 2003	not provided	HK		X	X	X	X		not provided	8
HMDC (1984a)	1980 - 1984	not provided	HK	X	X	X	X	X		not provided	lower HK coverage
HMDC (1987b)	prior to 1987	not provided	HK		X	X	X	X		not provided	33
HMDC (unknown)	1990s	not provided	HK				X			not provided	not provided
Hollick (1886)	prior to 1886	not provided	AK, KVK, NB, RB				X			not provided	not provided
Holmes (1885)	prior to 1885	not provided	PR			X				not provided	not provided
Holmes (1890)	prior to 1890	not provided	PR			X				not provided	not provided
Howells (1981)	1972 - 1978	not provided	AK			X				not provided	not provided

Table 3-68
Biological Communities Studies Identified for the Inventory Area

Reference - Author/Year	Year(s) of Data Collection	Season(s) of Data Collection	Waterway	Plankton	Benthos	Fish	Bird	Terrestrial Organisms	Damage/Other	Number of Sampling Events	Number of Sampling Locations
Howells and Brundage (1981)	1972 - 1976	not provided	AK			X				not provided	not provided
Iannuzzi et al. (2002)	precolonial - 2002	not provided	PR						X	not provided	not provided
Ichthyological Associates (1974a)	1971 - 1973	not provided	AK, HK, PR			X				varies by location	AK: 2; HK: 20; PR: 1
Ichthyological Associates (1974b)	1971 - 1973	not provided	HK			X				varies by location	HK: 2
Ichthyological Associates (1974c)	1971 - 1973	not provided	AK, HK, PR			X				varies by location	AK: 2; HK: 2; PR: 1
Ingersoll (1887)	late 1800s	not provided	AK, HK, KVK, NB		X					not provided	not provided
Iocco et al. (2000)	1995	summer, fall	NB		X						19 in June and 10 in October (sediment profile imagery and grab samples)
Jack McCormick & Associates (1977)	1977	fall	HK	X	X	X				1	9
Jones and Isquith (1981)	1974	spring, fall	HK	X	X						3
Kane (2001)	1970s - 1980s	not provided	HK				X			not provided	not provided
Kane et al. (1991)	1990	not provided	AK				X				none
Kerlinger (1996a)	1995 - 1996	not provided	AK, KVK				X			1	AK: 3; NB: 1
Kerlinger (1996b)	prior to 1996	not provided	AK, HK, KVK, NB, NY/NJ Harbor Estuary, PR						X	not provided	not provided
Kerlinger (1997a)	1997	spring	AK, East River, NB				X			1	AK: 3; NB: 1
Kraus and Bragin (1989)	1987 - 1988	year-round	HK		X	X				1987: 12; 1988: 4	23

Table 3-68
Biological Communities Studies Identified for the Inventory Area

Reference - Author/Year	Year(s) of Data Collection	Season(s) of Data Collection	Waterway	Plankton	Benthos	Fish	Bird	Terrestrial Organisms	Damage/Other	Number of Sampling Events	Number of Sampling Locations
Kraus and Bragin (1990)	1988 - 1989	not provided	HK			X				1988 - 1989: monthly	21 stations
Lawrence (1867)	prior to 1867	not provided	NY/NJ Harbor Estuary				X			not provided	not provided
LMS (1996)	1995 - 1996	year-round	AK, KVK, NB		X	X				not provided	4
MacCarone and Brzorad (1998)	1988 - 1997	not provided	AK, KVK, RW						X	not provided	9
MacCarone and Brzorad (2000)	1988 - 1999	not provided	AK, KVK, RW				X		X	not provided	40
MacKenzie (1992)	1800s	not provided	AK, NB		X					not provided	not provided
Mattson et al (1977)	1976	summer	HK			X	X		X	not provided	not provided
McCormick and Quinn (1975)	prior to 1975	not provided	NB	X	X	X				not provided	not provided
McCormick et al. (1983)	1980	winter, spring, summer	NB	X						not provided	2
Morris (1990)	prior to 1990	not provided	NY/NJ Harbor Estuary				X			not provided	not provided
NJAS (1976)	1975	fall	HK				X			not provided	not provided
NJAS (1997)	1995	spring	HK				X			6 - 8 per location	9
NJAS (1999)	1993 - 1997	not provided	NB				X			not provided	1 quadrat
NJDEP (1991)	1990	spring	AK, HK, KVK, NB						X	not provided	AK: 31; HK: 1; KVK: 1; NB:4
NJDFGW (1981)	1981	prior to 1981	NB, PR			X				3	not provided
NJMSC (1987)	1980s	not provided	NB, NY/NJ Harbor Estuary	X	X	X	X			not provided	not provided
NJTA (1986b)	prior to 1986	not provided	HK			X	X	X		not provided	not provided

Table 3-68
Biological Communities Studies Identified for the Inventory Area

Reference - Author/Year	Year(s) of Data Collection	Season(s) of Data Collection	Waterway	Plankton	Benthos	Fish	Bird	Terrestrial Organisms	Damage/Other	Number of Sampling Events	Number of Sampling Locations
NJTA (1987)	prior to 1987	not provided	HK		X	X	X	X		not provided	not provided
NOAA (1994)	1993 - 1994	year-round	NB			X				not provided	17 (10 channel trawls and 7 shallow water trawls and gillnet stations)
NYSDEC (2004a)	2000 - 2003	not provided	AK, KVK				X			not provided	none
Parsons (1993)	1986 - 1990	not provided	AK				X		X	not provided	none
Parsons and Wright (1994)	1994	spring, summer	AK, KVK				X			not provided	not provided
Planners Associates, Inc. (1977)	prior to 1977	not provided	HK				X	X		not provided	not provided
Princeton Aqua Science (1982)	1981 - 1982	fall, winter, spring	PR	X	X	X				not provided	15
PVSC (1897)	1800s	not provided	PR			X			X	not provided	not provided
Quinn (1997)	prior to 1997	not provided	HK						X	not provided	not provided
Quinn (1998)	prior to 1998	not provided	HK						X	not provided	not provided
Raichel (2001)	1999 - 2000	not provided	HK		X	X				13	6
Santoro et al. (1980)	1977 - 1979	not provided	NB			X				not provided	not provided
Scarlatelli (1992)	1992	summer	HK				X			not provided	9
Siebenheller (1981)	1881 - 1981	not provided	AK, KVK				X			not provided	not provided
Siebenheller and Siebenheller (1983)	1881 - 1981	not provided	AK, KVK				X			not provided	not provided
Smith (1886)	prior to 1886	not provided	AK, KVK		X					not provided	not provided
Smith (1887)	prior to 1886	not provided	AK, KVK		X					not provided	not provided

Table 3-68
Biological Communities Studies Identified for the Inventory Area

Reference - Author/Year	Year(s) of Data Collection	Season(s) of Data Collection	Waterway	Plankton	Benthos	Fish	Bird	Terrestrial Organisms	Damage/Other	Number of Sampling Events	Number of Sampling Locations
Squires and Barclay (1990)	1950s - 1980s	not provided	NY/NJ Harbor Estuary		X	X	X	X		not provided	not provided
T&M Associates (1993)	1985 - 1988	not provided	HK			X	X	X		not provided	not provided
Talge (1987)	prior to 1988	not provided	HK				X			not provided	not provided
The Trust for Public Land and NYCAS (1990)	prior to 1990	not provided	AK, KVK				X			not provided	not provided
Tierra (2001b)	2001	summer	PR			X				1	6
Tierra (2002b)	1999 - 2000	summer, spring	PR		X					2	15
Tierra (2002c)	1999 - 2000	summer, spring	PR		X	X				2	varies by gear type
Tierra (2002d)	2000 - 2001	summer, spring	PR				X			not provided	4
University of PA (1969)	prior to 1969	not provided	HK	X	X		X	X		not provided	not provided
Urner (1928)	1916 - 1927	not provided	AK, NB				X			not provided	not provided
Urner (1935)	prior to 1935	not provided	NJ				X			not provided	not provided
USACE (1986a)	1984 - 1985	not provided	KVK, NB		X	X				1	benthos: 30
USACE (1997a)	prior to 1997	not provided	NB		X	X				not provided	numerous sampling locations
USACE (1999a)	1998 - 1999	year-round	NB, NY/NJ Harbor Estuary		X	X				not provided	3
USACE (2003a)	2001 - 2002	winter, spring, summer	NB, NY/NJ Harbor Estuary	X		X				not provided	5
USACE (2003b)	2002 - 2003	winter, spring, summer	NB, NY/NJ Harbor Estuary	X		X				not provided	5
USACE (2003c)	2002 - 2003	not provided	NB, NY/NJ Harbor Estuary			X				not provided	numerous sampling locations
USEPA (1978)	1976 - 1978	not provided	HK		X				X	4	11

Table 3-68
Biological Communities Studies Identified for the Inventory Area

Reference - Author/Year	Year(s) of Data Collection	Season(s) of Data Collection	Waterway	Plankton	Benthos	Fish	Bird	Terrestrial Organisms	Damage/Other	Number of Sampling Events	Number of Sampling Locations
USEPA (1998)	1993 - 1994	summer	NB		X					not provided	20
USEPA (2003)	1998 - 1999	summer	NB		X					not provided	29
USEPA/USACE (1995)	prior to 1990	not provided	HK		X	X	X	X		not provided	not provided
USFWS (1983)	prior to 1983	not provided	HK			X		X		not provided	not provided
USFWS (1997)	prior to 1997	not provided	AK, HK			X	X	X		not provided	not provided
Vaccari and Witt (1993)	prior to 1990	not provided	HK, NB		X	X	X	X		not provided	not provided
Vitaliano et al. (2002)	1996 - 1997	spring, summer	AK		X					2	6
Wargo (1989)	prior to 1990	not provided	HK				X			not provided	2
Will and Houston (1989)	1987 - 1988	year-round	NB			X				not provided	12 locations
Woodhead (unknown)	1978 - 1989	year-round	NB, NY/NJ Harbor Estuary			X				15	not provided
Yuhas (2001)	1999	summer	HK		X					not provided	8
Zeisel (1989)	1800s - 1989	not provided	HK			X				not provided	not provided

Notes:
AK = Arthur Kill
B-IBI = benthic index of biotic integrity
EIS = environmental impact statement
HK = Hackensack River
HMDC = Hackensack Meadowlands Development Commission
KVK = Kill Van Kull
NB = Newark Bay
NY/NJ = New York/New Jersey
NY/NJ PA = Port Authority of NY/NJ
NYSDEC = New York State Department of Environmental Conservation
PR = Passaic River
RB = Raritan Bay
R-EMAP = Regional Environmental Monitoring and Assessment Program
RW = Rahway River
USACE = U.S. Army Corps of Engineers

Study Description
Review of 6 surveys conducted in Hackensack Meadowlands. Listing of bird species and nest observations, but no inventory of abundance provided.
Audubon New York listing of important bird habitats in the vicinity of Newark, including the Harbor Heron's Complex.
Present day land use, loss of wetlands and the increase in filled-in wetlands over time (1609 - 1989). Includes habitat maps and lists of wildlife species (birds, mammals, amphibians, reptiles) present in the NY/NJ Harbor Estuary.
Bibliography of the habitats and wildlife within the vicinity of the NY/NJ Harbor Estuary
Bird inventory and location of nests in NB.
Conserve Wildlife Foundation of New Jersey publication of endangered and threatened wildlife of NJ, including the NB area.
Abundance and prevalence of plankton, benthos, and fish species in the NY/NJ Harbor Estuary.
Land use and avian species present at Shooter's Island in southern NB.
List of 34 species of fish collected (no count data) from HK using bottom trawl, trap net, beach seine, and gillnet gear types.
Fish collection and benthic invertebrate data from the lower HK using bottom trawl, trapnet, beach seine, and gillnet gear types.
Listing of bird species found at Shooter's Island in the southern portion of NB.
Seasonal abundances of fish eggs and larvae collected in surface and bottom ichthyoplankton collection at 3 zones along northern AK during the course of an entire year period (biweekly May 1975 - 1976).
Summary of bird species found in the NY/NJ Harbor Estuary, and specifically in the vicinity of NB. Life histories of several species are provided.
Extensive monitoring of reproductive success of bird colonies in AK compared to other areas in NY/NJ Harbor Estuary and the East Coast.
Bird inventory and habitat suitability evaluation for NY/NJ Harbor Estuary, with cross-over into NB (Staten Island northwest data)
Compilation and review of data on benthic species diversity and abundance.
Finfish and benthic invertebrate surveys of the lower PR. Water quality data provided at time of sampling.
Distribution of benthic invertebrates in the NY/NJ Habor Estuary.

Study Description
Analysis of the benthic macroinvertebrate population of the Saw Mill Creek tidal mud flat within the Hackensack Meadowlands.
Investigation of the movement, population composition, growth and productivity of mummichog fish species in the Berry's Creek ecosystem.
Fish species present near man-made structures in AK, KVK, and Hudson River.
Bird observations in Essex and Hudson counties, NJ, with a detailed list of sighting locations and dates.
Inventories of plant and avian species at a site along the HK.
One-year bird and mammal surveys and 3-day fish survey to determine species composition and abundances at the Meadowlands Mills Project site.
Review of aquatic species found in the NY/NJ Harbor Estuary.
Bird species found in the vicinity of New York City, including seasonal presence, habitat use, behavioral notes.
Plankton and water quality characteristics in the HK during drought conditions.
Biological inventory of the Kearny Meadows in the Hackensack Meadowlands. Data tables include plants, mammals, birds, amphibians and reptiles, and fish species.
Bird inventory and location of sightings in NB and adjacent waterways.
Organism inventory surveys: avian, fish, benthic invertebrates, fiddler crabs, terrestrial arthropods, and insects.
Wetland habitats and associated species in the Hackensack Meadowlands.
Review of previously documented species lists of vegetation, invertebrates, crustaceans, fish, reptiles, amphibians, birds, and mammals found in 33 sampling areas within the Hackensack Meadowlands.
Bird sighting checklist for the Hackensack Meadowlands.
Inventory of 67 bird species known to breed on Staten Island.
Short description of fish species caught along the PR in the late 1800s.
Historical account of the Newark area in the 1800s, with select information on fish caught along the PR.
Multi-year fish community survey of AK with a listing of 72 species representing 36 families. The abundance of mummichog species, as well as blueback herring, alewife, and weakfish, was noted.

Study Description
Multi-year fish community survey of Arthur Kill with a listing of species list of 63 species representing 33 families. Mummichog were noted as the only abundance species, with noted lower abundances of this species in colder weather when they retreated to creeks.
Environmental history of the PR and its vicinity from pre-colonial to present time, including summaries of fisheries and wildlife.
Fisheries surveys using trawl and seine gear types, and those impinged on intake screens.
Fisheries surveys using trawl and seine gear types, and those impinged on intake screens.
Fisheries surveys using trawl and seine gear types, and those impinged on intake screens.
Historical account of the oyster industry in the late 1800s for NB, AK, HK, and KVK.
Sampling (sediment profile imagery and grab samples) in NB occurred outside of dredged channels. Sampling sites were predominantly silty sediment and a few sandy patches.
Aquatic surveys conducted in the Hackensack Meadowlands, including fish surveys, plankton collections, benthic invertebrate surveys, vegetation collections, and pitfall and snare traps.
112 species were identified in a 1974 (April-June; Sept-Nov) study determining the diversity and abundance of plankton and benthic organisms in the HR. Study was conducted at high and low tides over a 140-day timespan.
Bird use of habitats with *Phragmites,* including the NB vicinity.
Birds of the AK tributaries and other adjacent waterways to NB.
Bird observations in the AK and KVK waterways adjacent to NB.
Overview of recovery, restoration, management, and conservation plans for the birds of the NY/NJ Harbor Estuary. Listing of numerous bird inventory and habitat use studies.
Population survey of birds nesting on five islands in the NY/NJ Harbor Estuary. Part of a 12-year nesting population survey in an effort to establish ecological information for determining long-term status and trends of bird species.
Fisheries inventory and benthic invertebrate diversity and abundance. Report includes electronic data tables of fish and benthic data, including water quality and sediment characteristics.

Study Description
Utilization of the HR and its tributaries by the Atlantic tomcod (*Microgadus tomcod*) over the course of a 2-year period (1988 - 1989) with monthly fish surveys conducted using otter trawl, gillnet, and trapnet gear types.
Inventory of birds observed on New York, Long Island, Staten Island and adjacent parts of NJ.
Monthly biological survey (fish, blue crab) of NB shoal areas and adjacent KVK and AK channels using a bottom trawl.
Use of foraging locations and feeding success of avian species observed in the AK and KVK prior to and following several 1990 oil spills. Data includes maps and summary tables of the mean number of wading birds observed (1988, 1990, 1997).
Use of foraging locations and feeding success of avian species observed in the AK and KVK prior to and following several 1990 oil spills. Data includes maps and summary tables of the number of active nests (1989, 1998, 1999), and flight line information.
Discussion of historic use of oyster seed from NB and AK to seed Raritan Bay.
Damage assessment (affected vegetation and avian species) for a 3-week period following May 26, 1976 oil spill in HK.
Limited summary of plankton, benthos, and fish species in NB and adjacent tributaries.
Phytoplankton diversity and abundance.
Listing of bird species in the NYC region.
Overview of the 1975 Fall shorebird migration in the Hackensack Meadowlands.
HR migratory bird report. Includes summary information of migrant bird counts and habitat overview at several HR locations and recommendations for conservation.
NJ Audubon Society bird inventory, including the NB vicinity.
Biological surveys (benthic invertebrate and ribbed mussel surveys) and observations of dead birds following oil spills in the AK in early 1990.
Fish survey of NB and PR, including investigation of spawning locations and juvenile sampling.
Habitat, water quality, and biological communities review for NY/NJ Harbor Estuary.
Species inventories (fish, birds, mammals, plants) for the Hackensack Meadowlands area.

Study Description
EIS containing information on vegetation, wildlife and aquatic ecology and other environmental factors potentially impacted by the widening of the NJ Turnpike in the Hackensack Meadowlands. Summary of data provided.
Fish survey of Newark Bay with complete monthly coverage from May 1993 to April 1994. Biological characterization using trawl and gill net methods to catch fish and benthic invertebrates from middle and northern reach of Newark Bay. In total, 56 species were identified representing 37 familes of fish and invertebrates.
NYSDEC listing of breeding birds of NY state. Interim data (2000-2003) of birds observed in Staten Island to the south of NB.
List of impacted bird species after numerous oil spills incidents in AK in 1990.
Abundance of aquatic birds and number of active nests in AK and KVK island areas (Prall's Island, Isle of Meadows, Shooter's Island).
Biological inventory of a site within the Hackensack Meadowlands. Includes survey summaries for birds, mammals, and reptiles and amphibians.
Biological communities study of PR and its tributaries, including survey data on plankton, benthic invertebrates, and fish.
Description of fish losses attributed to industrial and city sewer effluents during late 19th century.
Overview of past and present wildlife presence and habitat conditions of the Hackensack Meadowlands.
Changes to the biological diversity of the HK due to anthropogenic alternations and pollution.
The influence of *Phragmites* dominance on marsh resident fish and benthic invertebrates in the Hackensack Meadowlands.
Fish community survey - 23 species.
Avian species inventory at a landfill in Sawmill Creek, a tributary of the HK. Includes water quality physochemical measurements at 9 sites within the vicinity of the landfill area.
Historical account of the presence of breeding birds of Staten Island, including Shooter's Island, Prall's Island, Hoffman and Swinburne Islands.
Historical account of the presence of breeding birds of Staten Island, including Shooter's Island, Prall's Island, Hoffman and Swinburne Islands.
List of mollusca species found in the water surrounding Staten Island, NY.
List of mollusca species found in the water surrounding Staten Island, NY.

Study Description
Summary of habitats, species (birds, amphibians, reptiles, mammals), and ecological significance of NY/NJ Harbor Estuary.
Environmental assessment describing construction activities along the HK, including a boat launch ramp, and riverfront park. Includes vegetative mapping and lists of plants and animals in the vicinity of the site.
Bird and plant species lists of the Losen Slofe Creek Park and adjacent lands in the Hackensack Meadowlands.
Breeding bird populations (1986 - 1989) and inventory of birds, plants, reptiles, amphibians, and mammals found in the upper AK and western KVK.
Supplemental fish collection for Passaic River RI.
Benthic invertebrate community characterization for Passaic River.
Fish and crustacean community characterization for Passaic River.
Bird community characterization for Passaic River.
A survey of existing physical conditions of the Hackensack Meadowlands. Overview of history, land use, geology, hydrology, soils, and species inventories for plankton, benthos, birds, terrestrial wildlife.
Monthly summary of bird inventory data (1916 - 1927) for Union County, including land adjacent to NB and AK.
Summary of bird species present in areas of mosquito control in the marshes in NJ.
Discussion of proposed navigation project for NB and KVK channels. Sediment quality data and summary of fisheries and benthic invertebrate data from prior reports.
Fish, benthic invertebrate, and wetlands surveys.
Summary of species diversity and abundance in NY/NJ Harbor Estuary, including sampling at 3 locations within NB for fish, crabs, benthic invertebrates and plankton.
Summary of finfish (including ichthyoplankton) collection, diversity and abundance in NY/NJ Harbor Estuary. Dates of NB sampling provided along with summary statistics for Newark/AK and other regions of NY/NJ Harbor Estuary.
Summary of finfish (including ichthyoplankton) collection, diversity and abundance in NY/NJ Harbor Estuary. Dates of NB sampling provided along with summary statistics for Newark/AK and other regions of NY/NJ Harbor Estuary.
Summary of finfish collection, diversity and abundance in NY/NJ Harbor Estuary. Dates of NB sampling provided along with summary statistics for entire NY/NJ Harbor Estuary.
Impacts of oil spill response and cleanup in a salt marsh on wetland plant and benthic species diversity and abundance.

Study Description
B-IBI benthos indices provided as part of an investigation of the R-EMAP for NB and the surrounding NY/NJ Harbor System.
Benthos taxon list, diversity and abundance summaries provided as part of a revisit to the investigation of the R-EMAP for NB and the surrounding NY/NJ Harbor System.
Summary of plant and animal observations in the Hackensack Meadowlands, including rare, threatened and endangered species.
Fish and wildlife resources inventory for the HK, including summaries of prior investigations.
Summary of habitats, species presence, and ecological significance of NY/NJ Harbor Estuary by regions.
Review of prior biological communities and habitat surveys in the vicinity of Jersey City, NJ, including HK and NB.
Measurement of benthic invertebrates diversity and abundances in the AK following the January 1990 oil spill. 41 taxa were measured in total.
Avian species richness comparisons between a natural marsh and an enhanced march in the Hackensack Meadowlands.
Fish survey of NB with complete monthly coverage from May 1987 to April 1988.
Fish community survey, commercial/ recreational fishery survey for NY/NJ Harbor Estuary (1979-1989) and NB (1984-1988).
Benthic communities in *Spartina alterniflora* and *Phragmites australis* dominated salt marshes of Sawmill Creek, Hackensack Meadowlands.
History of the tidal HR recreational and commercial fisheries.

Table 3-69
Ichthyoplankton Data - December 2000 - July 2003 from USACE (2003a,b)

Species Identified - Common Name
Alosa sp.
American sandlance
Atlantic croaker
Atlantic herring
Atlantic mackerel
Atlantic menhaden
Atlantic silverside
Atlantic tomcod
Bay anchovy
Blennidae
Butterfish
Conger eel
Cunner
Fourbeard rockling
Fourspot flounder
Goosefish
Grubby
Hogchocker
Labridae
Northern pipefish
Prionotus sp.
Rock gunnel
Spot
Striped bass
Striped cuskeel
Summer flounder
Tautog
Unidentified clupeid
Unidentified gobiid
Unidentified sp.
Weakfish
White perch
Windowpane
Winter flounder

Note:
Species listed in alphabetical order

Table 3-70

Ten Most Abundant Species (average number per m^2) in June and October 1995 as Part of the USACE 1995 NY/NJ Harbor Benthic Survey from Iocco et al. (2000)

Taxa - Scientific Name	June [a]	Taxa - Scientific Name	October [b]
Streblospio benedicti	2,900	*Mulinia lateralis*	1,243
Cirratulidae (LPIL)	1,400	*Mediomastus (LPIL)*	1,036
Leitoscoloplos (LPIL)	667	*Streblospio benedicti*	1,011
Mediomastus (LPIL)	388	*Bivalvia (LPIL)*	507
Marenzellaria viridis	271	*Pectinaria gouldii*	146
Heteromastus filiformis	125	*Sabellaria vulgaris*	132
Oligochaeta (LPIL)	117	*Leitoscoloplos robustus*	64
Leitoscoloplos fragilis	75	*Oligochaeta (LPIL)*	61
Tharyx acutus	63	*Glycera americana*	39
Phyllodocidae (LPIL)	50	*Polydora cornuta*	32
Total (95.2%)	**6,054**	**Total (96.1%)**	**4,271**

Notes:

a. June 1995 sampling was conducted at 6 locations within Newark Bay.

b. October 1995 sampling was conducted at 7 locations within Newark Bay.

LPIL = lowest practicable identification level

Table 3-71
Benthic Invertebrate Data - 1993 - 1994 from NOAA (1994)

Taxa - Scientific Name
Cnidaria
Anthozoa
Rhynchocoela
Rhynchocoela
Polychaeta
Lepidonotus squamatus
Lepidonotus sublevis
Hypereteone heteropoda
Hypereteone foliosa
Paranaitis speciosa
Eumida sanguinea
Podarkeopsis levifuscina
Microphthalmus sczelkowii
Proceraea cornuta
Streptosyllis pettiboneae
Nereididae
Neanthes succinea
Nephtys incisa
Glycera spp.
Glycera americana
Leitoscoloplos sp.
*Leitoscoloplos robustus**
Polydora spp.
*Polydora cornuta**
Spio setosa
Pygospio elegans
*Streblospio benedicti**
Marenzelleria viridis
Tharyx sp. A*
Heteromastus filiformis
*Mediomastus ambiseta**
*Sabellaria vulgaris**
Pectinaria gouldii
Ampharetidae
Asabellides oculata
Sabellidae
Unidentified Polychaeta fragments
Oligochaeta
*Oligochaeta**
Echinodermata
Asteroidea
Echinoidea

Table 3-71
Benthic Invertebrate Data - 1993 - 1994 from NOAA (1994)

Taxa - Scientific Name
Mollusca
Gastropoda
Epitonium sp.
Odostomia sp.*
Rictaxis punctostriatus
Cylichnella bidentata
Doradella obscura
Mytilus edulis
*Mulinia lateralis**
Ensis directus
Macoma balthica
Tellina agilis
*Mya arenaria**
Barnea truncata
Bivalve siphons
Crustacea
Balanus improvisus
Neomysis americana
*Leucon americanus**
Oxyurostylis smithi
Cyathura polita
Sphaeroma quadridentata
Edotea triloba
Ampelisca spp.
Ampelisca abdita
Microdeutopus spp.
Microdeutopus gryllotalpa
Corophium spp.
Corophium acutum
Unciola serrata
Elasmopus laevis
Melita nitida
Monoculodes sp. I
Parapleustes aestuarius
Paracaprella tenuis
Crangon septemspinosa
Cancer irroratus
Xanthidae
Rhithropanopeus harrisii
Insecta
Chironomidae

Table 3-71
Benthic Invertebrate Data - 1993 - 1994 from NOAA (1994)

Taxa - Scientific Name
Ascidiacea
Molgula manhattensis

Note:

* = reported as dominant taxon

Table 3-72
Benthic Invertebrates Data for Passaic River - September 1999 and May 2000 from Tierra (2002b)

Taxon - Scientific Name	Sampling Event		Functional Feeding Group
	September 1999	May 2000	
Amphipoda			
Gammarus mucronatus		X	surface deposit/ suspension
Gammarus sp.	X	X	surface deposit/ suspension
Leptocheirus plumulosus		X	surface deposit/ suspension
Bivalvia			
Macoma sp.	X	X	suspension
Mya arenaria		X	suspension
Decapoda			
Callinectes sapidus	X		carnivore / omnivore
Crangon septemspinosa	X		gatherer / collector
Diptera			
Ceratopogon sp.	X	X	carnivore / omnivore
Procladius sp.	X	X	carnivore / omnivore
Psychoda sp.		X	gatherer / collector
Thienemannimyia group		X	carnivore / omnivore
Isopoda			
Chiridotea coeca	X		carnivore / omnivore
Cyathura polita	X	X	carnivore / omnivore
Mysidacea			
Neomysis americana		X	filterer / collector
Nemertinia			
Cerebratulus lacteus	X	X	carnivore
Oligochaeta			
Naididae	X		deep deposit
poss. Enchytraeus sp.	X	X	deep deposit
Ilyodrilus templetoni		X	deep deposit
Limnodrilus sp.	X	X	deep deposit
Quistadrilus multisetosus	X		deep deposit
imm. Tub. w/ hair chaetae	X	X	deep deposit
Tubificoides heterochaetus		X	deep deposit
Polychaeta			
Eteone heteropoda		X	carnivore / omnivore
Glycinde solitaria		X	carnivore / omnivore
Heteromastus filiformis	X	X	deep deposit
Laeonereis culveri	X	X	carnivore / omnivore
Leitoscoloplos fragilis		X	deep deposit
Marenzelleria viridis	X	X	surface deposit/ suspension
Neanthes sp.		X	carnivore / omnivore
Streptoblospio benedicti		X	surface deposit/ suspension

Table 3-73a
R-EMAP Benthic Invertebrate Data for 1993 - 1994 from USEPA (1998)

Taxa - Scientific Name	Author's Sampling Location																										
	NB18	NB21	NB25	NB27	NB36	NB39	NB44	NB45	NB47	NB52	NB53	NB65	NB66	NB75	NB12	NB13	NB14	NB15	NB16	NB17	NB18	NB19	NB11	NB111	NB112	NB113	NB114	NB115
Ampelisca abdita										5								1		4								2
Ampelisca abdita-vadorum complex										7				1						9		1						
Ampharetidae	2					1		6		11	1			1										1				
Anthozoa	5																4											
Asabellides oculata	6							1		68																		2
Ascidiacea																	1											
Balanus improvisus	17											1					92											
Capitella spp.																												12
Capitellidae				1																								
Ceriantheopsis americanus																												
Crangon septemspinosa	1									1		3										1					3	
Cyathura polita		2		1													1					5	1	2				
Cylichnella bidentata																			1									
Doridella obscura																	1											
Edotea triloba	1							3		31	3	1		1											1			
Ensis directus												1								1						3		
Epitonium rupicola	2																											
Eumida sanguinea										1																		2
Gammarus daiberi																					2						512	
Gemma gemma																									1			
Glycera americana																				1		1				1		1
Glycera spp.																				2		3	4			16		8
Haminoea solitaria																						33				13		
Heteromastus filiformis	4	5		1	1		4			2							46		1	1		23	45	2	2	56		2
Hydrobia spp.																							3					
Hypereteone foliosa																						2						
Hypereteone heteropoda	3	3				1				8							15		1	3		2	3	1	9	4		3
Ilyanassa obsoleta																						16						
Laeonereis culveri		85																				2						
Leitoscoloplos robustus	13	6	22	85	67	5	54	31		15	4		2			64	6	3	36			5	23	15	19	8		4
Leitoscoloplos spp.		23			2	5	1			2		1				22		7	18	26		48	18		22	65		25
Leucon americanus			1	3	3	2	2		1				11		1	4		51	16	77		13	1	7	18			
Macoma balthica	8	6	1						2				1			1			3				3	2	1			
Marenzelleria viridis		16										1					5					1	4					
Mediomastus ambiseta	4	4	12	6	7	41	1	53		73	1			1				1		24	2	12	2	1		9		18
Melita nitida	2																6				4						1	
Microphthalmus sczelkowii				2			2										3								6			
Molgula manhattensis							2			3																		
Mulinia lateralis	1		1	7	4	2	3	2	2		4	1		1		1		17	3	82		1	1		3	6		1
Mya arenaria	8			3			1	11	1	2		8		8		1	1						9		1	6		
Mytilus edulis										2																		
Nassarius trivittatus																										1		
Neanthes succinea	2	1		1							1						1					3						
Nemertinea					1													1	1	6		1	15	1	1	2		
Neomysis americana				1	1			1					1		4			1									7	
Nephtyidae																				1								
Odostomia engonia	7	3			4	2	7											2										
Odostomia spp.								9		4									3			1						1
Oligochaeta	252	138	6	8			2	4	2	4	12	59	4		6	4	116	1	1	13		643	1	14	24		72	85
Oxyurostylis smithi										2										1						1		
Paracaprella tenuis										1																		1
Paranaitis speciosa										1																		
Pectinaria gouldii			1					2		2			1					3		8					1			3
Phyllodoce arenae										1																		2
Podarkeopsis levifuscina																				3								
Polydora cornuta	17	1						3		29		1		1			14		2	1		4	2	2	2	3		3
Polygordius spp.															13													
Pygospio elegans										5																		
Rhithropanopeus harrisii	4	4															3				16						22	
Rictaxis punctostriatus					48	2		1				1								2		1		1				
Sabellaria vulgaris	1											1								1								1
Scolelepis texana																										1		
Spio setosa								1		15		12											36					
Streblospio benedicti	119	1568	148	131	6	158	117	59	11	425	48	4	172	17	39	16	152	116	88	54	15	359	129	413	294	421	2	1,794
Streptosyllis pettiboneae																									1	1		
Tellina agilis								2		1													1					
Tharyx sp. A Morris	12		27	28	2	3	16			2	6	4				4	21	8	3	2			2		31	71		14
Turbellaria																	2									1		2
Unciola serrata	2									3																		1
Unciola spp.																												1
Xanthidae	3			1																								

Notes:
This table was generated from replicate 1 of raw data file USEPA (1998).
Taxa listed in alphabetical order
R-EMAP = Regional Environmental Monitoring and Assessment Program

Table 3-73b
R-EMAP Benthic Invertebrate Data - 1998 from USEPA (2003)

Taxa - Scientific Name	
Actiniaria	*Mediomastus*
Aeginellidae	*Mediomastus ambiseta*
Ampelisca	*Melita nitida*
Ampelisca abdita	*Melitidae*
Ampeliscidae	*Mercenaria mercenaria*
Ampharetidae	*Microdeutopus*
Amphipoda	*Microdeutopus gryllotalpa*
Aoridae	*Microphthalmus*
Aricidea	*Mulinia lateralis*
Asabellides oculata	*Mya arenaria*
Ascidiacea	*Mysidae*
Bivalvia	*Mysidopsis*
Bryozoa	*Mytilus edulis*
Calyptraeidae	*Neomysis americana*
Cancer irroratus	*Nephtys incisa*
Capitellidae	*Nereidae*
Cirratulidae	*Nereis*
Corophiidae	*Nereis succinea*
Corophium	*Nudibranchia*
Corophium acherusicum	*Oligochaeta*
Corophium acutum	*Onuphidae*
Corophium tuberculatum	*Oxyurostylis smithi*
Crangon septemspinosa	*Paguridae*
Crepidula	*Pagurus*
Crepidula fornicata	*Palaemonetes*
Crepidula plana	*Palaemonetes pugio*
Cyathura	*Paracaprella tenuis*
Cyathura polita	*Parametopella cypris*
Decapoda	*Pectinaria gouldii*
Demonax	*Petricola pholadiformis*
Demonax microphthalmus	*Macoma*
Deutella incerta	*Phyllodocidae*
Diastylidae	*Pleustidae*
Dinophilus	*Pleusymtes glaber*
Diopatra cuprea	*Podarkeopsis levifuscina*
Doridella obscura	*Polydora cornuta*
Edotia triloba	*Polynoidae*
Elasmopus	*Portunidae*
Elasmopus levis	*Rhithropanopeus harrisii*
Erichthonius brasiliensis	*Rhynchocoela*
Eumida sanguinea	*Rictaxis punctostriatus*
Eurypanopeus depressus	*Sabellaria vulgaris*
Eusarsiella zostericola	*Sabellariidae*
Gammarus annulatus	*Sabellidae*
Gastropoda	*Spio filicornis*
Glycera americana	*Spio setosa*
Glycera dibranchiata	*Spiochaetopterus oculatus*
Harmothoe	*Spionidae*
Harmothoe imbricata	*Streblospio benedicti*
Heteromastus filiformis	*Streptosyllis pettiboneae*
Hydrobia	*Synidotea* sp.
Hydrobiidae	*Tellina*
Hydrozoa	*Tellina agilis*
Hypereteone heteropoda	*Tellinidae*
Ilyanassa obsoleta	*Tharyx*
Ilyanassa trivittata	*Tharyx acutus*
Leitoscoloplos	*Tubulanus*
Leitoscoloplos acutus	*Turbellaria*
Leitoscoloplos robustus	*Unciola*
Lepidonotus sublevis	*Unciola serrata*
Leucon americanus	*Xanthidae*
Lineidae	
Lyonsia hyalina hyalina	
Macoma balthica	

Notes:
Taxa listed in alphabetical order
R-EMAP = Regional Environmental Monitoring & Assessment Program

Table 3-74
Seasonal Fish Data for Newark Bay - 1993 - 1994 and 2001 - 2003 from NOAA (1994) and USACE (2003a,b)

Species - Common Name	Seasonal Presence				1993 - 1994[a]	2001 - 2002[b]		2002 - 2003[c]	
	Winter	Spring	Summer	Fall	NB - total	NB - channel	NB - shallow/shoal	NB - channel	NB - shallow/shoal
Alewife	X	X	X	X	X	X	X	X	X
American Eel	X	X	X	X	X	X	X	X	X
American Sandlance	X								X
American Shad	X	X	X	X	X	X	X	X	X
Anchovy sp.			X	X	X				
Atherinid unidentified	X						X		
Atlantic Croaker	X		X	X	X			X	X
Atlantic Herring	X	X	X	X	X	X	X	X	X
Atlantic Menhaden	X	X	X	X	X	X	X	X	X
Atlantic Silverside	X	X	X	X	X	X	X		X
Atlantic Sturgeon			X		X				
Atlantic Tomcod	X	X	X	X	X			X	X
Bay Anchovy	X	X	X	X	X	X	X	X	X
Black Sea Bass		X	X				X	X	
Blueback Herring	X	X	X	X	X	X	X	X	X
Bluefish		X	X	X	X		X	X	
Butterfish			X	X	X	X			
Chub Mackerel			X		X				
Clearnose Skate	X						X		
Clupeid unidentified		X	X			X	X		
Conger Eel	X	X	X		X	X	X		
Crevalle Jack				X	X				
Cunner	X	X	X		X	X	X	X	X
Feather Blenny			X		X				
Fourspot Flounder	X		X		X	X			
Gizzard Shad	X	X	X	X	X	X	X	X	X
Gobby			X	X	X				
Grubby	X	X	X	X	X	X	X		
Hogchocker	X	X	X	X	X	X		X	
Little Skate				X	X				
Naked Goby	X	X	X			X	X		X
Northern Kingfish			X		X				
Northern Pipefish	X	X	X	X	X	X	X	X	X
Northern Puffer		X	X	X	X				X
Northern Searobin	X	X	X	X	X	X	X	X	
Northern Stargazer		X						X	
Oyster Toadfish		X	X			X		X	
Pipefish			X		X				
Planehead Filefish				X	X				
Rainbow Smelt	X	X			X				
Red Hake	X	X	X		X	X		X	X
Rock Gunnel	X	X			X	X	X		
Sand Lance		X			X				
Scup		X	X	X	X		X		
Seaboard Goby		X							X
Silver Hake	X								X
Silver Perch				X	X				

Table 3-74
Seasonal Fish Data for Newark Bay - 1993 - 1994 and 2001 - 2003 from NOAA (1994) and USACE (2003a,b)

Species - Common Name	Seasonal Presence				1993 - 1994[a]	2001 - 2002[b]		2002 - 2003[c]	
	Winter	Spring	Summer	Fall	NB - total	NB - channel	NB - shallow/shoal	NB - channel	NB - shallow/shoal
Smallmouth Flounder	X	X	X	X	X	X	X	X	X
Spot	X		X	X	X		X		
Spotted Hake	X	X	X	X	X	X	X	X	X
Striped Bass	X	X	X	X	X	X	X	X	X
Striped Cuskeel	X	X	X			X			X
Striped Killifish	X				X		X		X
Striped Mullet	X								X
Striped Searobin		X	X	X	X	X	X	X	
Summer Flounder		X	X	X	X	X	X	X	X
Tautog	X	X	X	X	X	X	X	X	X
Threespine Stickleback	X	X			X				
Weakfish	X	X	X	X	X	X	X		
White Perch	X	X	X	X	X	X	X	X	X
Windowpane	X	X	X	X	X	X	X	X	X
Winter Flounder	X	X	X	X	X	X	X	X	X

Notes:
a. NOAA (1994)
b. USACE (2003a)
c. USACE (2003b)
NB = Newark Bay
Species listed in alphabetical order

Table 3-75
Fish Data for Passaic River - August 2001 from Tierra (2001b)

Sampling Gear Type	Author's Sampling Location	American Eel	Atlantic Menhaden	Brown Bullhead	Striped Bass	White Catfish	White Perch	Blue Crab
Eel Traps	1							2
	2							
	3	1						
	4	1						2
	5	4						
	6							1
	7							2
	8	5						
	9							
	10							1
	11							
Gill Nets	1		2	7		1		16
	2						3	16
	3		12			1		16
	4		4		1		1	12
Trotlines	1	1						
	2	1				1		
	3							1
	4							
	5							
	6							2
Trapnets	1			1			8	6
	2			1			1	1
	3			1			12	2
	4			8				2
	5			1			2	2
TOTAL		13	18	19	1	3	27	84

Table 3-76
Fish Data for Passaic River - September/October 1999 and May 2000 from Tierra (2002c)

Common Name	Scientific Name	River Use Classification	Functional Feeding Group	Number of Fish Caught					
				1999 [a]		2000 [b]		1999 / 2000 Combined	
				N	% of Total	N	% of Total	N	% of Total
American eel	*Anguilla rostrata*	M	P/I	0	0	20	3.5	20	0.46
Atlantic menhaden	*Brevoortia tyrannus*	M	D/O	67	1.8	12	2.1	79	1.8
Blueback herring	*Alosa aestivalis*	M	I	1	0.03	11	1.9	12	0.28
Bluefish	*Pomatomus saltatrix*	M	I	14	0.37	0	0	14	0.32
Bluegill	*Lepomis macrochirus*	R / FW	O	3	0.08	0	0	3	0.069
Brown bullhead	*Ameiurus nebulosus*	R / FW	P/I	0	0	2	0.35	2	0.046
Channel catfish	*Ictalurus punctatus*	R	D	1	0.027	0	0	1	0.023
Common carp	*Cyprinus carpio*	R / FW	D	0	0	7	1.2	7	0.16
Gizzard shad	*Dorosoma cepedianum*	M	D/O	6	0.16	50	8.8	56	1.3
Green sunfish	*Lepomis cyanellus*	R / FW	I	4	0.11	0	0	4	0.092
Inland silverside	*Menidia beryllina*	M	O	477	13	0	0	477	11
Largemouth bass	*Micropterus salmoides*	R / FW	P	1	0.027	0	0	1	0.023
Mummichog	*Fundulus heteroclitus*	R	O	3,021	80	316	55	3,337	77
Redear sunfish	*Lepomis microlophus*	R / FW	O	4	0.11	0	0	4	0.092
Spotted hake	*Urophycis regio*	M	P/I	0	0	1	0.18	1	0.023
Striped bass	*Morone saxatilis*	M	P/I	51	1.4	14	2.5	65	1.5
Striped killifish	*Fundulus majalis*	R	O	3	0.080	0	0	3	0.069
Summer flounder	*Paralichthys dentatus*	M	P/I	4	0.11	0	0	4	0.092
Weakfish	*Cynoscion regalis*	M	P	2	0.05	0	0	2	0.046
White catfish	*Ameiurus catus*	M / R	D	0	0	4	0.70	4	0.092
White perch	*Morone americana*	R	O	94	2.5	132	23	232	5.4
White sucker	*Catastomus commersoni*	R / FW	O	0	0	1	0.18	1	0.023
			Total Species Number	16	100%	12	100%	22	100%
			Total Species Count	3,753	100%	570	100%	4,329	100%

Notes:
a. 1999 fish catch data from gill nets, minnow traps, and crab traps.
b. 2000 fish catch data from gill nets, eel traps, minnow traps, and crab traps.
D = Detritivore
FW = Freshwater species
H = Herbivore
O = Omnivore
P = Piscivore
R = Resident species
I = Insectivore
M = Migratory species

Table 3-77
Fish Data for Newark Bay - 1998 - 2003
from USACE (2003a,b,c)

Species - Common Name	Count
Alewife	122
American Eel	8
American Sandlance	1
American Shad	23
Atherinid unidentified	24
Atlantic Croaker	1
Atlantic Herring	72
Atlantic Menhaden	18
Atlantic Silverside	34
Atlantic Tomcod	34
Bay Anchovy	289
Black Sea Bass	5
Blueback Herring	155
Bluefish	4
Butterfish	23
Clearnose Skate	1
Clupeid unidentified	4
Cunner	8
Fourspot Flounder	1
Gizzard Shad	20
Grubby	14
Hogchocker	1
Little Skate	1
Lookdown	2
Naked Goby	3
Northern Kingfish	1
Northern Pipefish	9
Northern Puffer	1
Northern Searobin	21
Northern Stargazer	1
Oyster Toadfish	2
Red Hake	4
Rock Gunnel	2
Scup	28
Silver Hake	21
Smallmouth Flounder	41
Spotted Hake	692
Striped Bass	1,136
Striped Cuskeel	1
Striped Killifish	1
Striped Searobin	12
Summer Flounder	53
Tautog	4
Weakfish	484
White Perch	1,293
Windowpane	63
Winter Flounder	659
Total Count:	5,397

Notes:
Species listed in alphabetical order

Table 3-78a

Fish and Wildlife Species of Special Emphasis Occurring in the Arthur Kill Complex from USFWS (1997)

Organisms - Scientific Name	Common Name
Crustacea	
Callinectes sapidus	blue crab
Fish	
Alosa aestivalis	blueback herring
Alosa pseudoharengus	alewife
Alosa sapidissima	American shad
Anchoa mitchilli	bay anchovy
Anguilla rostrata	American eel
Brevoortia tyrannus	Atlantic menhaden
Centropristis striata	black sea bass
Cynoscion regalis	weakfish
Fundulus diaphanus	banded killifish
Fundulus heteroclitus	mummichog
Gobiosoma ginsburgi	seaboard goby
Leiostomas xanthurus	spot
Menidia beryllina	inland silverside
Menidia menidia	Atlantic silverside
Merluccius bilinearis	silver hake
Microgadus tomcod	Atlantic tomcod
Morone americana	white perch
Morone saxatilis	striped bass
Mugil cephalus	striped mullet
Mustelus canis	smooth dogfish
Myoxcephalus aenaeus	grubby sculpin
Opsanus tau	oyster toadfish
Paralichthys dentatus	summer flounder
Peprilus triacanthus	butterfish
Pleuronectes americanus	winter flounder
Pollachius virens	pollack
Pomatomus saltatrix	bluefish
Prionotus carolinus	northern searobin
Prionotus evolans	striped searobin
Scophthalmus aquosus	windowpane
Stenotomus chrysops	scup
Strongylura marina	Atlantic needlefish
Syngnathus fuscus	northern pipefish
Tautoga onitis	tautog
Tautogolabrus adspersus	cunner
Trinectes maculatus	hogchoker
Urophycis chuss	red hake

Table 3-78a

Fish and Wildlife Species of Special Emphasis Occurring in the Arthur Kill Complex from USFWS (1997)

Organisms - Scientific Name	Common Name
Amphibians	
Rana sphenocephala	southern leopard frog
Reptiles	
Kinosternon subrubrum	eastern mud turtle
Malaclemys t. terrapin	northern diamondback terrapin
Birds	
Accipiter cooperii	Cooper's hawk
Accipter striatus	sharp-shinned hawk
Aix sponsa	wood duck
Ammodramus caudacutus	sharp-tailed sparrow
Ammodramus maritimus	seaside sparrow
Anas acuta	northern pintail
Anas americana	American wigeon
Anas clypeata	northern shoveler
Anas crecca	green-winged teal
Anas discors	blue-winged teal
Anas platyrhynchos	mallard
Anas rubripes	American black duck
Anas strepera	gadwall
Archilochus colubris	ruby-throated hummingbird
Ardea herodias	great blue heron
Arenaria interpres	ruddy turnstone
Asio flammeus	short-eared owl
Aythya affinis	lesser scaup
Aythya marila	greater scaup
Aythya valisineria	canvasback
Botaurus lentiginosus	American bittern
Branta bernicla	brant
Branta canadensis	Canada goose
Bubulcus ibis	cattle egret
Bucephala clangula	common goldeneye
Buteo lagopus	rough-legged hawk
Buteo lineatus	red-shouldered hawk
Buteo platypterus	broad-winged hawk
Calidris alba	sanderling
Calidris canutus	red knot
Calidris minutilla	least sandpiper
Calidris pusilla	semipalmated sandpiper
Carduelis pinus	pine siskin
Carpodacus purpureus	purple finch
Casmerodius albus	great egret

Table 3-78a

Fish and Wildlife Species of Special Emphasis Occurring in the Arthur Kill Complex from USFWS (1997)

Organisms - Scientific Name	Common Name
Catharus fuscescens	veery
Catharus guttatus	hermit thrush
Catharus ustulatus	Swainson's thrush
Catoptrophorus semipalmatus	willet
Certhia americana	brown creeper
Chaetura pelagica	chimney swift
Charadrius semipalmatus	semipalmated plover
Chordeiles minor	common nighthawk
Circus cyaneus	northern harrier
Cistothorus palustris	marsh wren
Coccyzus americanus	yellow-billed cuckoo
Coccyzus erthropthalmus	black-billed cuckoo
Contopus virens	eastern wood-pewee
Dendroica caerulescens	black-throated blue warbler
Dendroica cerulea	cerulean warbler
Dendroica coronata	yellow-rumped warbler
Dendroica discolor	prairie warbler
Dendroica fusca	blackburnian warbler
Dendroica magnolia	magnolia warbler
Dendroica palmarum	palm warbler
Dendroica pensylvanica	chestnut-sided warbler
Dendroica striata	blackpoll warbler
Dendroica virens	black-throated green warbler
Dolichonyx oryzivorus	bobolink
Dryocopus pileatus	pileated woodpecker
Dumetella carolinensis	gray catbird
Egretta caerulea	little blue heron
Egretta thula	snowy egret
Egretta tricolor	tricolored heron
Empidonax flaviventris	yellow-bellied flycatcher
Empidonax minimus	least flycatcher
Empidonax traillii	willow flycatcher
Falco columbarius	merlin
Falco peregrinus	peregrine falcon
Fulica americana	American coot
Gallinula chloropus	common moorhen
Gavia immer	common loon
Helmitheros vermivorus	worm-eating warbler
Hylocichla mustelina	wood thrush
Icterus spurius	northern oriole
Ixobrychus exilis	least bittern

Table 3-78a

Fish and Wildlife Species of Special Emphasis Occurring in the Arthur Kill Complex from USFWS (1997)

Organisms - Scientific Name	Common Name
Junco hyemalis	dark-eyed junco
Lophodytes cucullatus	hooded merganser
Melanerpes erythrocephalus	red-headed woodpecker
Melospiza georgiana	swamp sparrow
Mergus merganser	common merganser
Mergus serrator	red-breasted merganser
Mniotilta varia	black-and-white warbler
Myiarchus crinitus	great crested flycatcher
Nuttallornis borealis	olive-sided flycatcher
Nycticorax nycticorax	black-crowned night-heron
Nycticorax violaceus	yellow-crowned night-heron
Oporomis philadelphia	mourning warbler
Oporornis formosus	Kentucky warbler
Oxyura jamaicensis	ruddy duck
Pandion haliaetus	osprey
Parula americana	northern parula
Phalacrocorax auritus	double-crested cormorant
Phalacrocorax carbo	great cormorant
Pheucticus ludovicianus	rose-breasted grosbeak
Pipilo erythrophthalmus	rufous-sided towhee
Piranga olivacea	scarlet tanager
Plegadis falcinellus	glossy ibis
Pluvialis squatarola	black-bellied plover
Podiceps auritus	horned grebe
Podilymbus podiceps	pied-billed grebe
Polioptila caerulea	blue-gray gnatcatcher
Porzana carolina	sora
Protonotaria citrea	prothonotary warbler
Rallus limicola	Virginia rail
Rallus longirostris	clapper rail
Riparia riparia	bank swallow
Seiurus aurocapillus	ovenbird
Seiurus motacilla	Louisiana waterthrush
Seiurus noveboracensis	northern waterthrush
Setophaga ruticilla	American redstart
Sphyrapicus varius	yellow-bellied sapsucker
Steldidopteryx serripennis	northern rough-winged swallow
Sterna antillarum	least tern
Sterna forsteri	Forster's tern
Sterna hirundo	common tern
Sterna nilotica	gull-billed tern

Table 3-78a

Fish and Wildlife Species of Special Emphasis Occurring in the Arthur Kill Complex from USFWS (1997)

Organisms - Scientific Name	Common Name
Strix varia	barred owl
Sturnella magna	eastern meadowlark
Tyrannus tyrannus	eastern kingbird
Tyto alba	common barn-owl
Vermivora pinus	blue-winged warbler
Vermivora ruficapilla	Nashville warbler
Vireo flavifrons	yellow-throated vireo
Vireo griseus	white-eyed vireo
Wilsonia canadensis	Canada warbler
Wilsonia citrina	hooded warbler
Zonotrichia albicollis	white-throated sparrow
Vascular Plants	
Amelanchier nantucketensis	Nantucket juneberry
Carex flaccosperma var. *glaucodea*	gray-green sedge
Diospyros virginiana	persimmon
Euonymus americanus	American strawberry-bush
Lespedeza stuevei	Stueve's or tall bush-clover
Pinus virginiana	Virginia pine
Populus heterophylla	swamp cottonwood
Quercus marilandica	blackjack oak
Sabatia angularis	rose-pink
Verbesina alternifolia	wingstem

Table 3-78b

Fish and Wildlife Species of Special Emphasis Occurring in the Hackensack Meadows Complex from USFWS (1997)

Organism - Scientific Name	Common Name
Crustacea	
Callinectes sapidus	blue crab
Merostomata	
Limulus polyphemus	horseshoe crab
Fish	
Mustelus canis	smooth dogfish
Anguilla rostrata	American eel
Menidia beryllina	inland silverside
Menidia menidia	Atlantic silverside
Paralichthys dentatus	summer flounder
Scophthalmus aquosus	windowpane
Alosa aestivalis	blueback herring
Alosa pseudoharengus	alewife
Alosa sapidissima	American shad
Brevoortia tyrannus	Atlantic menhaden
Dorosoma cepedianum	gizzard shad
Myoxcephalus aenaeus	grubby sculpin
Cyprinus carpio	common carp
Fundulus heteroclitus	mummichog
Anchoa mitchilli	bay anchovy
Microgadus tomcod	Atlantic tomcod
Urophycis chuss	red hake
Gobiosoma bosci	naked goby
Ameiurus catus	white catfish
Ameriurus nebulosus	brown bullhead
Osmerus mordax	rainbow smelt
Morone americana	white perch
Morone saxatilis	striped bass
Pleuronectes americanus	winter flounder
Pomatomus saltatrix	bluefish
Cynoscion regalis	weakfish
Leiostomas xanthurus	spot
Trinectes maculatus	hogchoker
Syngnathus fuscus	northern pipefish
Amphibians	
Rana sphenocephala	southern leopard frog
Reptiles	
Malaclemys t. terrapin	northern diamondback terrapin
Birds	
Accipiter cooperii	Cooper's hawk
Accipiter gentilis	northern goshawk

Table 3-78b

Fish and Wildlife Species of Special Emphasis Occurring in the Hackensack Meadows Complex from USFWS (1997)

Organism - Scientific Name	Common Name
Anas acuta	northern pintail
Anas americana	American wigeon
Anas clypeata	northern shoveler
Anas crecca	green-winged teal
Anas discors	blue-winged teal
Anas platyrhynchos	mallard
Anas rubripes	American black duck
Anas strepera	gadwall
Ardea herodias	great blue heron
Asio flammeus	short-eared owl
Asio otus	long-eared owl
Aythya marila	greater scaup
Aythya valisineria	canvasback
Botaurus lentiginosus	American bittern
Branta canadensis	Canada goose
Bucephala albeola	bufflehead
Buteo lagopus	rough-legged hawk
Calidris alba	sanderling
Calidris alpina	dunlin
Calidris himantopus	stilt sandpiper
Calidris maura	western sandpiper
Calidris melanotos	pectoral sandpiper
Calidris minutilla	least sandpiper
Calidris pusilla	semipalmated sandpiper
Casmerodius albus	great egret
Charadrius semipalmatus	semipalmated plover
Chordeiles minor	common nighthawk
Circus cyaneus	northern harrier
Cistothorus palustris	marsh wren
Cistothorus platensis	sedge wren
Dolichonyx oryzivorus	bobolink
Egretta thula	snowy egret
Empidonax traillii	willow flycatcher
Falco peregrinus	peregrine falcon
Fulica americana	American coot
Gallinula chloropus	common moorhen
Ixobrychus exilis	least bittern
Melospiza georgiana	swamp sparrow
Mergus serrator	red-breasted merganser
Nycticorax nycticorax	black-crowned night-heron
Nycticorax violaceus	yellow-crowned night-heron

Table 3-78b

Fish and Wildlife Species of Special Emphasis Occurring in the Hackensack Meadows Complex from USFWS (1997)

Organism - Scientific Name	Common Name
Oxyura jamaicensis	ruddy duck
Passerculus sandwichensis	savannah sparrow
Phalacrocorax auritus	double-crested cormorant
Plegadis falcinellus	glossy ibis
Pluvialis dominica	lesser golden-plover
Pluvialis squatarola	black-bellied plover
Podilymbus podiceps	pied-billed grebe
Rallus longirostris	clapper rail
Rynchops niger	black skimmer
Sterna antillarum	least tern
Tyto alba	common barn-owl
Zonotrichia albicollis	white-throated sparrow
Vascular Plants	
Scirpus maritimus	saltmarsh bulrush

Table 3-79
Inventory of Bird Observation Locations in the New York/New Jersey Harbor Estuary[a]

Bird Species - Common Name	Inventory Report Area Waterway					
	Passaic River	Hackensack River	Newark Bay	Arthur Kill	Kill Van Kull	Rahway River
Loons						
Loon, common		X	X	X		
Loon, red-throated		X		X		
Grebes						
Grebe, eared				X		
Grebe, horned		X		X		
Grebe, pied-billed		X		X		
Pelicaniformes						
Cormorant, double-crested	X	X		X	X	
Cormorant, great				X		
Pelican, brown				X		
Wading Birds						
Bittern, American		X		X		
Bittern, least		X		X		
Egret, cattle		X		X	X	X
Egret, great	X	X		X	X	X
Egret, snowy	X	X		X	X	X
Heron, black-crowned night	X	X		X	X	X
Heron, great blue	X	X		X		X
Heron, green	X	X	X	X	X	X
Heron, little blue	X	X		X	X	X
Heron, tricolored		X		X	X	X
Heron, yellow-crowned night		X		X	X	X
Ibis, glossy		X		X	X	X
Swans, Geese, and Ducks						
Brant		X		X		
Bufflehead		X		X		
Canvasback		X	X	X		
Duck, American black	X	X		X	X	X
Duck, fulvous whistling		X				
Duck, long-tailed		X		X		
Duck, ring-necked		X				
Duck, ruddy		X		X		
Duck, wood	X	X		X		X
Gadwall		X		X	X	X
Goldeneye, Barrow's						
Goldeneye, common		X		X		
Goose, Canada	X	X		X	X	X
Goose, snow		X				
Mallard	X	X		X	X	X
Merganser, common	X			X		
Merganser, hooded		X		X		X
Merganser, red-breasted		X		X		
Northern pintail		X		X		
Northern shoveler		X		X		X
Redhead		X				
Scaup, greater		X	X	X		
Scaup, lesser		X		X		
Scoter, black	X			X		
Scoter, surf		X		X		
Scoter, white-winged	X	X		X		
Swan, mute		X				X
Swan, tundra		X				
Teal, blue-winged		X		X		
Teal, green-winged		X		X		X
Wigeon, American				X		

Table 3-79
Inventory of Bird Observation Locations in the New York/New Jersey Harbor Estuary[a]

Bird Species - Common Name	Inventory Report Area Waterway					
	Passaic River	Hackensack River	Newark Bay	Arthur Kill	Kill Van Kull	Rahway River
Diurnal Raptors						
American kestrel	X	X		X		X
Bald eagle		X				
Falcon, peregrine	X	X		X		
Hawk, broad-winged		X		X		X
Hawk, Cooper's		X		X		X
Hawk, red-shouldered		X		X		X
Hawk, red-tailed	X	X		X		X
Hawk, rough-legged		X		X		X
Hawk, sharp-shinned		X		X		X
Merlin		X		X		X
Northern goshawk		X				
Northern harrier		X		X	X	X
Osprey	X	X		X		
Vulture, turkey		X				
Upland Game Birds						
Pheasant, ring-necked		X		X	X	X
Gruiformes						
American coot		X		X		
Common moorhen		X		X	X	
Rail, clapper		X		X		X
Rail, king		X				
Rail, Virginia		X		X	X	X
Rail, yellow		X				
Sora		X		X		X
Shorebirds						
American avocet		X				
American woodcock		X	X			
Common snipe		X		X		X
Dunlin		X		X		
Dowitcher, long-billed		X		X		
Dowitcher, short-billed		X				X
Godwit, Hudsonian		X				
Godwit, marbled		X				
Killdeer	X	X		X		X
Phalarope, red		X				
Phalarope, Wilson's		X				
Plover, American golden		X	X			
Plover, black-bellied		X		X		X
Plover, semipalmated		X		X		
Red knot		X		X		
Ruff		X				
Sanderling		X		X		
Sandpiper, Baird's		X				
Sandpiper, buff-breasted		X				
Sandpiper, curlew		X				
Sandpiper, least	X	X		X		X
Sandpiper, pectoral		X		X		X
Sandpiper, purple				X		
Sandpiper, semipalmated		X		X		
Sandpiper, solitary		X		X		X
Sandpiper, spotted	X	X		X	X	X
Sandpiper, stilt		X				X
Sandpiper, upland		X	X			
Sandpiper, western		X				
Sandpiper, white-rumped		X				
Stilt, black-necked		X				
Turnstone, ruddy		X		X		

Table 3-79
Inventory of Bird Observation Locations in the New York/New Jersey Harbor Estuary[a]

Bird Species - Common Name	Inventory Report Area Waterway					
	Passaic River	Hackensack River	Newark Bay	Arthur Kill	Kill Van Kull	Rahway River
Whimbrel		X		X		
Willet		X		X		
Yellowlegs, greater	X	X				
Yellowlegs, lesser	X	X				
Gulls, Terns and Skimmers						
Gull, great black-backed	X	X		X	X	X
Gull, Bonaparte's		X		X		
Gull, common black-headed	X	X		X		
Gull, glaucus		X		X		
Gull, herring	X	X		X	X	X
Gull, Iceland		X				
Gull, laughing	X	X		X		X
Gull, little				X		
Gull, ring-billed	X	X		X		X
Kittiwake, black-legged						
Skimmer, black		X				
Tern, black		X		X		
Tern, Caspian		X		X		
Tern, common		X		X		X
Tern, Forster's		X		X		
Tern, gull-billed		X		X		
Tern, least		X	X	X		X
Tern, roseate		X		X		
Tern, royal		X				
Pigeons and Doves						
Dove, mourning	X	X		X		X
Dove, rock	X	X	X	X	X	X
Cuckoos and their Allies						
Cuckoo, black-billed		X		X		X
Cuckoo, yellow-billed		X		X		X
Owls						
Owl, barn		X		X		
Owl, barred				X		X
Owl, eastern-screech		X				X
Owl, great horned		X				X
Owl, long-eared		X				
Owl, northern saw-whet						X
Owl, short-eared		X		X		
Owl, snowy		X				
Goatsuckers and Swifts						
Chimney swift		X		X		X
Nighthawk, common		X		X		
Hummingbirds						
Hummingbird, ruby-throated		X		X		X
Kingfishers						
Kingfisher, belted	X	X	X	X	X	X
Woodpeckers						
Flicker, northern		X		X	X	X
Sapsucker, yellow-bellied		X		X	X	X
Woodpecker, hairy		X				X
Woodpecker, pileated						X
Woodpecker, red-bellied				X		X
Woodpecker, downy		X		X	X	X
Woodpecker, red-headed		X				X

Table 3-79
Inventory of Bird Observation Locations in the New York/New Jersey Harbor Estuary[a]

Bird Species - Common Name	Inventory Report Area Waterway					
	Passaic River	Hackensack River	Newark Bay	Arthur Kill	Kill Van Kull	Rahway River
Tyrant Flycatchers						
Eastern wood-pewee		X		X		
Flycatcher, great-crested		X		X		X
Flycatcher, least		X		X		X
Flycatcher, olive-sided				X		X
Flycatcher, willow				X		X
Flycatcher, yellow-bellied		X		X		X
Kingbird, eastern	X	X		X		X
Kingbird, western		X	X			
Phoebe, eastern		X		X	X	X
Wood-pewee, eastern				X		X
Shrikes and Vireos						
Shrike, northern		X				
Vireo, red-eyed		X		X	X	X
Vireo, solitary		X		X		
Vireo, warbling		X	X	X		X
Vireo, white-eyed		X				
Vireo, yellow-throated		X				X
Jays, Crows and their Allies						
Crow, American	X	X		X		X
Crow, fish	X	X		X		X
Jay, blue	X	X		X		X
Larks						
Lark, horned		X				
Swallows						
Purple martin		X				
Swallow, bank		X		X		
Swallow, barn	X	X		X		X
Swallow, cliff		X				
Swallow, northern rough-winged	X	X		X		X
Swallow, tree		X		X		X
Chickadees and their Allies						
Chickadee, black-capped		X		X		X
Titmouse, tufted		X		X		X
Nuthatches and Creepers						
Brown creeper		X		X		X
Nuthatch, red-breasted		X		X		X
Nuthatch, white-breasted		X		X		X
Wrens						
Wren, Carolina		X		X		X
Wren, house		X		X	X	X
Wren, marsh		X		X		X
Wren, sedge		X				
Wren, winter		X		X		X
Old World Warblers, Thrushes and their Allies						
Robin, American		X		X	X	X
Gnatcatcher, blue-gray		X		X		X
Kinglet, golden-crowned		X		X	X	X
Kinglet, ruby-crowned		X		X	X	X
Thrush, gray-cheeked		X	X	X		X
Thrush, hermit		X		X	X	X
Thrush, Swainson's		X	X	X	X	X
Thrush, wood		X		X		X
Veery		X		X		X

Table 3-79
Inventory of Bird Observation Locations in the New York/New Jersey Harbor Estuary[a]

Bird Species - Common Name	Inventory Report Area Waterway					
	Passaic River	Hackensack River	Newark Bay	Arthur Kill	Kill Van Kull	Rahway River
Mimids						
Brown thrasher		X		X	X	X
Catbird, gray	X	X		X	X	X
Mockingbird, northern	X	X		X		X
Starlings and Minas						
Starling, European	X	X				
Wagtails and Pipits						
American pipit		X				
Waxwings						
Waxwing, cedar		X		X	X	X
Wood-Warblers						
American redstart		X		X	X	X
Chat, yellow-breasted			X			
Northern parula		X		X		X
Ovenbird		X		X	X	X
Warbler, bay-breasted		X		X		X
Warbler, black-and-white		X		X	X	X
Warbler, blackburnian		X		X		X
Warbler, blackpoll		X		X	X	X
Warbler, black-throated blue		X		X	X	X
Warbler, black-throated green		X		X		X
Warbler, blue-winged		X		X	X	X
Warbler, Canada		X		X		X
Warbler, Cape May		X		X		X
Warbler, cerulean			X	X		X
Warbler, chestnut-sided		X		X	X	X
Warbler, Connecticut		X	X	X	X	
Warbler, golden-winged			X			
Warbler, hooded			X	X		X
Warbler, Kentucky				X		X
Warbler, magnolia		X		X	X	X
Warbler, mourning			X	X		X
Warbler, Nashville		X		X	X	X
Warbler, orange-crowned		X				
Warbler, palm		X		X	X	X
Warbler, pine			X			
Warbler, prairie		X		X		X
Warbler, prothonotary				X		X
Warbler, Tennessee		X		X		X
Warbler, Wilson's		X			X	
Warbler, worm-eating			X	X		
Warbler, yellow		X	X	X		X
Warbler, yellow-rumped		X		X	X	
Warbler, yellow-throated			X			
Waterthrush, Louisiana		X		X		
Waterthrush, northern		X	X	X	X	X
Yellowthroat, common		X		X	X	X
Tanagers, Cardinals and their Allies						
Bunting, indigo		X				X
Dickcissel		X				X
Grosbeak, blue		X				
Grosbeak, rose-breasted		X		X		X
Northern cardinal	X	X		X		X
Tanager, scarlet		X		X		X

Table 3-79
Inventory of Bird Observation Locations in the New York/New Jersey Harbor Estuary[a]

Bird Species - Common Name	Inventory Report Area Waterway					
	Passaic River	Hackensack River	Newark Bay	Arthur Kill	Kill Van Kull	Rahway River
Emberizine Sparrows and their Allies						
Bunting, snow		X				
Junco, dark-eyed		X		X	X	X
Longspur, lapland		X				
Sparrow, American tree	X	X		X		
Sparrow, chipping		X		X		X
Sparrow, field		X		X	X	X
Sparrow, fox		X	X			
Sparrow, Lincoln's		X	X			X
Sparrow, Savannah		X		X		
Sparrow, seaside		X		X		X
Sparrow, sharp-tailed		X		X		X
Sparrow, song	X	X		X	X	X
Sparrow, swamp		X		X	X	X
Sparrow, vesper		X				
Sparrow, white-crowned		X		X		X
Sparrow, white-throated	X	X		X	X	X
Towhee, eastern		X		X	X	X
Icterids						
Blackbird, red-winged	X	X		X		X
Blackbird, rusty		X				X
Blackbird, yellow-headed		X				
Bobolink		X				X
Cowbird, brown-headed		X		X		X
Eastern meadowlark		X		X		
Grackle, common	X	X		X		X
Oriole, Baltimore		X		X		X
Oriole, orchard			X			X
Finches and Old World Sparrows						
Common redpoll		X				
Finch, house	X	X		X		X
Finch, purple		X		X		X
Goldfinch, American	X	X		X	X	X
Siskin, pine		X		X		X
Sparrow, house	X	X		X		X
Total Count:	49	248	28	204	59	158

Note:
a. Synthesis of data reported in Inventory Area studies.

Table 3-80

Breeding Bird Pairs Data Based on Nest and Adult Counts at Prall's Island, Isle of Meadows, and Shooter's Island - May - June of 1994, 1995, and 1997 from Kerlinger (1996a; 1997a) and Parsons and Wright (1994)

Bird Species - Common Name	Shooter's Island			Prall's Island			Isle of Meadows			Islands Total			
	1994[a]	1995[b]	1997[c]	1994[a]	1995[b]	1997[c]	1994[a]	1995[b]	1997[c]	1994[a]	1995[b]	1997[c]	1994 - 1997
Waders													
Black-crowned night heron	215	244	159	38	13	7	142	366	385	395	623	551	1,569
Glossy ibis	22	16	1	57	7	0	165	244	231	244	267	232	743
Snowy egret	3	36	27	52	0	0	36	148	106	91	184	133	408
Great egret	85	62	66	4	0	0	34	43	109	123	105	175	403
Cattle egret	3	1	9	51	0	0	87	24	15	141	25	24	190
Yellow-crowned night heron	11	4	0	7	6	9	2	4	0	20	14	9	43
Green-backed heron	6	8	1	3	1	0	0	1	4	9	10	5	24
Little blue heron	0	0	1	1	0	0	4	2	2	5	2	3	10
Unidentified wader nests	24	29	2	33	2	0	40	76	9	97	107	11	215
Seabirds													
Double-crested cormorant	88	121	95	0	0	0	0	0	0	88	121	95	304
Herring gull	348	410	226	200	12	0	149	197	137	697	619	363	1,679
Great black-baked gull	9	8	2	5	0	0	0	2	0	14	10	2	26
Waterfowl													
Canada goose	2	3	9	12	1	0	5	0	0	19	4	9	32
Mallard	6	5	3	1	2	1	0	0	2	7	7	6	20
American black duck	1	0	3	0	0	0	0	0	3	1	0	6	7
Gadwall	1	0	1	0	1	1	0	0	0	1	1	2	4
Total Count:	824	947	605	464	45	18	664	1,107	1,003	1,952	2,099	1,626	5,677

Notes:
a. Parsons and Wright (1994)
b. Kerlinger (1996a)
c. Kerlinger (1997a)

Table 3-81
Passaic River Bird Data - 1999 - 2000 from Tierra (2002d)

Pelicaniformes	**Old World Parrots**
Double-crested cormorant	Budgerigar
Wading Birds	**Pigeons and Doves**
Egret, great	Dove, mourning
Egret, snowy	Dove, rock (common pigeon)
Heron, black-crowned night-	**Kingfishers**
Heron, great blue	Belted kingfisher
Heron, green	**Tyrant Flycatchers**
Heron, little blue	Eastern kingbird
Swans, Geese and Ducks	**Jays and Crows**
Canada goose	Blue jay
Common merganser	Crow, American
Duck, American black	Crow, fish
Duck, wood	**Swallows**
Mallard	Swallow, barn
Mallard, domestic	Swallow, northern rough-winged
Scoter, black	**Mimids**
Scoter, white-winged	Gray catbird
Diurnal Raptors	Northern mockingbird
Osprey	**Starlings**
Peregrine falcon	European starling
Red-tailed hawk	**Cardinals**
Shorebirds	Northern cardinal
Killdeer	**Emberizine Sparrows and Allies**
Sandpiper, least	Sparrow, American tree
Sandpiper, spotted	Sparrow, song
Yellowlegs, greater	Sparrow, white-throated
Yellowlegs, lesser	**Icterids**
Gulls	Grackle, common
Gull, great black-backed	Red-winged blackbird
Gull, herring	**Finches and Old World Sparrows**
Gull, laughing	Goldfinch
Gull, ring-billed	House finch
	Sparrow, house

Table 3-82
Federally and State Listed Endangered Species and Species of Concern Possibly Occurring in the Arthur Kill and Hackensack Meadowlands Complexes from USFWS (1997)

Species Status	Common Name	Scientific Name
Federally listed endangered	peregrine falcon	*Falco peregrinus*
Federal species of concern	cerulean warbler	*Dendroica cerulea*
	northern diamondback terrapin	*Malaclemys t. terrapin*
	northern goshawk	Accipiter gentilis
State-listed endangered - New Jersey	black skimmer	*Rhynchops niger*
	Cooper's hawk	*Accipiter cooperii*
	least tern	*Sterna antillarum*
	northern harrier	*Circus cyaneus*
	pied-billed grebe	*Podilymbus podiceps*
	red-shouldered hawk	*Buteo lineatus*
	short-eared owl	*Asio flammeus*
State-listed threatened - New Jersey	American bittern	*Botaurus lentiginosus*
	barred owl	*Strix varia*
	bobolink	*Dolichonyx oryzivorous*
	great blue heron	*Ardea herodias*
	long-eared owl	*Asio otus*
	osprey	*Pandion haliaetus*
	red-headed woodpecker	*Melanerpes erythrocephalus*
	savannah sparrow	*Passerculcus sandwichensis*
	yellow-crowned night-heron	*Nycticorax violaceus*
State-listed endangered - New York	least tern	*Sterna antillarum*
	Nantucket juneberry	*Amelanchier nantucketensis*
	rose pink	*Sabatia angularis*
	Virginia pine	*Pinus virginiana*
State-listed threatened - New York	American bittern	*Botaurus lentiginosus*
	eastern mud turtle	*Kinosternon subrubrum*
	northern harrier	*Circus cyaneus*
	osprey	*Pandion haliaetus*
	wingstem	*Verbesina alternifolia*
State-listed special concern animals - New York	common barn owl	*Tyto alba*
	common nighthawk	*Chordeiles minor*
	short-eared owl	*Asio flammeus*
	southern leopard frog	*Rana sphenocephala*
State-listed rare plants - New York	blackjack oak	*Quercus marilandica*
	gray-green sedge	*Carex flaccosperma var. glaucodea*
	persimmon	*Diospyros virginiana*
	Stueve's or tall bush-clover	*Lespedeza stuevei*

Table 3-83
Hydrodynamic Studies Identified for the Inventory Area

Reference	Year(s) of Data Collection	Study Type	Parameters	Waterway
Balloffett et al. (1982)	not provided	joint probability analysis	storm surge water levels	NB
Blumberg (1999)	not provided	hydrodynamic model	water levels and currents	AK, HK, KVK, PR, NB, NY/NJ Harbor Estuary
BSC (1983)	not provided	field	water levels	HK
Burke et al. (2002)	2000 - 2002	field	water levels, currents, suspended sediment	NB
Caplow et al. (2003)	2002	field	solute circulation, mixing, fate, and transport	NB, KVK, AK
Chant et al. (2001)	2000 - 2001	field	water levels, currents, suspended sediment	AK, HK, KVK, PR, NB, NY/NJ Harbor Estuary
Creed et al. (2001)	2000 - 2001	field	water levels, currents, suspended sediment	AK, HK, KVK, PR, NB, NY/NJ Harbor Estuary
ERM (1985a)	not provided	model	water levels and flows	HK
ERM (1985d)	not provided	model	Water levels and flows	HK
Haldeman et al. (2002)	2000 - 2001	field	water levels, currents, suspended sediment	AK, HK, KVK, PR, NB, NY/NJ Harbor Estuary
Hunter et al. (2002)	2000 - 2001	field	water levels, currents, suspended sediment	AK, HK, KVK, PR, NB, NY/NJ Harbor Estuary
HydroQual Inc. (2002)	not provided	hydrodynamic model	water levels and currents	AK, HK, KVK, PR, NB, NY/NJ Harbor Estuary
HydroQual Inc. (unknown)	not provided	hydrodynamic model	water levels and currents	AK, HK, KVK, PR, NB, NY/NJ Harbor Estuary
Kaluarachchi et al. (2003)	not provided	hydrodynamic model	water levels, currents and salt fluxes	AK, KVK
Najarian (2002)	not provided	hydrodynamic model	stormwater discharge	HK
NOAA (2001)	not provided	hydrodynamic model	water levels and currents	AK, HK, KVK, PR, NB, NY/NJ Harbor Estuary
NOAA (2002)	not provided	hydrodynamic model	water levels and currents	AK, HK, KVK, PR, NB, NY/NJ Harbor Estuary
NOAA/NOS (2004)	not provided	real-time and hydrodynamic model	water levels and currents	AK, HK, KVK, PR, NB, NY/NJ Harbor Estuary
NY/NJ HEP (2004a)	2000 - 2003	field	water surface elevations and currents	NB
Rankin (2001)	2000 - 2001	field	water levels, currents, suspended sediment	AK, HK, KVK, PR, NB, NY/NJ Harbor Estuary
Rankin et al. (2001)	2000 - 2001	field	water levels, currents, suspended sediment	AK, HK, KVK, PR, NB, NY/NJ Harbor Estuary
Rankin et al. (2002)	2000 - 2001	field	water levels, currents, suspended sediment	AK, HK, KVK, PR, NB, NY/NJ Harbor Estuary
Sajan (1993)	1990	field	water levels and currents	KVK
Styles et al. (2001)	2000 - 2001	field	water levels, currents, suspended sediment	AK, HK, KVK, PR, NB, NY/NJ Harbor Estuary
Suszkowski (1978)	not provided	sediment budget study	suspended sediment	NB
Tierra (2004b)	1995 - 1996	field	water levels	PR
Tierra (2004c)	1995 - 1996	field	currents	PR
USACE (1992a)	1976	hydrodynamic model	storm surge water levels	AK, HK, KVK, NB, NY/NJ Harbor Estuary, PR
USACE (1995b)	not provided	hydrodynamic model	water levels and currents	HK, NB, PR
USACE (1997j)	not provided	hydrodynamic model	water levels and currents	AK, HK, KVK, PR, NB, NY/NJ Harbor Estuary
USACE (1999)	1991, 1994-95	field and model	water levels and currents	AK, HK, KVK, PR, NB, NY/NJ Harbor Estuary
USACE (2004c)	not provided	hydrodynamic model	water levels, currents, and sediment transport	AK, HK, KVK, PR, NB, NY/NJ Harbor Estuary
USGS (2004)	varies by location; 1923 - present	field	water levels and flow	ER, HK, PR, RW

Notes:

AK- Arthur Kill	KVK - Kill Van Kull
ER - Elizabeth River	PR - Passaic River
HK - Hackensack River	NB - Newark Bay

Table 3-84
Summary of Hydrodynamic, Water, and Suspended Sediment Studies Conducted as Part of the New Jersey Toxics Reduction Work Plan for Newark Bay 2000 - 2002 from NY/NJ HEP (2004a)

Month	Day	Vessel Location[a]	Vessel Data	Author's Mooring Locations[a] and Dates
June 2000			Preliminary Test	NB1, June 19-23
December 2000	13	KVK1	CTD	NB1, AK1, KVK1
	14	AK1	LISST, CTD, TOPS	December 11-21
		PA	LISST, CTD, ADCP	
		Transect: AK1-PA	LISST, CTD, ADCP	
	15	NB1	LISST, CTD, TOPS	
		NB3	LISST, CTD, ADCP	
		Transect, KVK1-Hackensack	LISST, CTD, ADCP	
March 2001	13	KVK1	LISST, CTD, TOPS	NB1, PA, KVK1
		Transect, KVK1 - Passaic	LISST, CTD, ADCP	March 2 – April 2
	14	AK1	LISST, CTD, ADCP	
		PA	LISST, CTD, TOPS	
		Transect, AK1 - PA	LISST, CTD, ADCP	
	15	NB1	LISST, CTD, TOPS	
		NB3	LISST, CTD, ADCP	
		Transect, KVK1 – Hackensack	LISST, CTD, ADCP	
April 2001	12	Raritan, bridge	LISST, CTD, ADCP	NB1, PA, KVK1
		Transect, Raritan bridge to R.U. Boathouse	LISST, CTD, ADCP	April 9 – May 9
	25	AK1	LISST, CTD, ADCP	
		PA	LISST, CTD, TOPS	
		Transect, AK1 - PA	LISST, CTD, ADCP	
May 2001	15	Raritan, bridge	LISST, CTD, ADCP	
		Transect, Raritan bridge to R.U. Boathouse	LISST, CTD, ADCP	
	22	AK1	LISST, CTD, ADCP	
		PA	LISST, CTD, TOPS	
		Transect, AK1 - PA	LISST, CTD, ADCP	

Table 3-84
Summary of Hydrodynamic, Water, and Suspended Sediment Studies Conducted as Part of the New Jersey Toxics Reduction Work Plan for Newark Bay 2000 - 2002 from NY/NJ HEP (2004a)

Month	Day	Vessel Location[a]	Vessel Data	Author's Mooring Locations[a] and Dates
October 2001	3	RR	LISST, CTD, ADCP	NB1, PA, KVK1
		PA	LISST, CTD, TOPS	September 28
		Transect, PA-RR	LISST, CTD, ADCP	October 5
	17	Hackensack	LISST, CTD, ADCP	
		KVK1	LISST, CTD, TOPS	
		Transect, KVK1 – Hackensack	LISST, CTD, ADCP	
	19	Passaic	LISST, CTD, ADCP	
		AK1	LISST, CTD, TOPS	
		Transect, AK1-P1	LISST, CTD, ADCP	
November 2001	6	PA	LISST, CTD, ADCP	NB1, PA, KVK1
		AK1	LISST, CTD, TOPS	November 2-19
		Transect, AK1-PA	LISST, CTD, ADCP	
March 2002	12	Transect, NB1-PA	LISST, CTD, ADCP	AK, KVK, NB1, NB3
	13	NB1, NB3	LISST, CTD, TOPS	March 7 – April 1
	14	Transect, NB1 – Hackensack	LISST, CTD, ADCP	
		KVK	LISST, CTD, TOPS	
	27	Transect, Raritan	LISST, CTD, ADCP	
		Raritan	LISST, CTD, TOPS	
April 2002	10	Transect, NB1 – Hackensack (special inorganic chemicals study)	LISST, CTD, ADCP	AK, KVK, NB1, NB3
				April 5 – May6
	26	Transect, NB1 – Passaic	LISST, CTD, ADCP	
May 2002	7	AK1	LISST, CTD, ADCP	

Notes:
Information obtained from http://www.ol.stevens-tech.edu/newark-bay/Data_Table.htm
a. See Figure 3-17 for Vessel and Mooring Locations
ADCP = Acoustic Doppler Current Profiles
AK = Arthur Kill
CTD = Conductivity-Temperature-Density Casts
KVK = Kill Van Kull
LISST = laser *in-situ* scattering and transmissmometer
NB = Newark Bay
TOPS = Trace Organics Platform Samplers

Table 3-85
Flow Measurement Locations from USGS (2004)

Location	USGS Station Name	Drainage Area (mi^2)	Mean Annual Flow (cfs)	1-day, Mean Maximum Flow			
				5-year	10-year	50-year	100-year
HK at Rivervale, NJ	1377000	58	84.6	1163.2	1522.5	2387.0	2778.8
HK at New Milford, NJ	1378500	113	98.5	NR	NR	NR	NR
PR at Pine Brook, NJ	1381900	349	632	5341.7	6417.8	8683.9	9605.5
PR at Little Falls, NJ	1389500	762	1155	9377.0	11574.9	16982.7	19525.9
ER at Ursino Lake at Elizabeth, NJ	1393450	16.9	28.8	919.2	1189.3	1950.8	2354.3
RW at Rahway, NJ	1395000	40.9	47.9	1448.4	1868.3	3007.3	3589.9

Notes:
cfs = cubic feet per second
ER = Elizabeth River
HK = Hackensack River
mi = miles
NR = not reported
PR = Passaic River
RW = Rahway River

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Table 3-86
Dredging Studies Identified for the Inventory Area

Reference - Author/Year	Year(s) of Data Collection	Waterway	Overview
Dredging Permit Applications (27): AK: Chevron (1997); USACE (1992b; 1992c; 1992d; 1993b; 1997d; 1997e; 1997h; 1997i; 1999h; 1999j) NB: USACE (1991b; 1997f; 1999c; 1999d; 1999e; 1999g; 2000a) KVK: USACE (1997g; 1999i; 1999k) PR: USACE (1979; 1986b; 1987; 1988, 1991a; 1999f) HK: USACE (1982; 1987)	not applicable	AK, NB, KVK, PR, HK	Dredging permit applications.
Joint Water-Ways Committee (1901)	prior to 1901	AK, KVK, PR	Discussion of channel dredging activities.
Knoesel et al. (1998)	no data	NB	Overview of the operation and management of the subaqueous CDF NB.
Mathew et al. (1999)	1997 - 1999	NB	Operating the NB CDF.
PA NY/NJ (2004)	1999 - 2004	KVK, NB	Dredging project status update for KVK and NB, including status of 9 completed areas and 2 planned contract awards.
Secretary of War (1922)	1920s	HK, NB, PR	Review of dredging and information relative to terminals in HR, NB, and PR in 1922, including channel depths and waterway mean low water depths.
Secretary of War (1929)	1928	PR	Review of dredging and bathymetry information relative to terminals in PR in 1928, including channel depths and waterway mean low water depths.
Su et al. (2001)	1989 - 1999	NB, NY/NJ Harbor Estuary	Discussion of dredge permit applicable process and bioaccumulation screening criteria for NY/NJ Harbor Estuary sediment disposal, including permitting information for AK, KVK, NB, and PR.
Tavolaro (1984)	1980	NY/NJ Harbor Estuary	Sediment budget for clamshell dredging of NY/NJ Harbor Estuary and ocean disposal at the Mud Dump Site.

Table 3-86
Dredging Studies Identified for the Inventory Area

Reference - Author/Year	Year(s) of Data Collection	Waterway	Overview
USACE (1965)	prior to 1965	AK, ER, HK, KVK, NB, PR, RW	General descriptions of the port and harbor conditions in the NY/NJ Harbor Estuary, including channel conditions of the AK, ER, HK, KVK, NB, PR, and RW.
USACE (1967)	prior to 1967	AK, KVK	Discussion of modeling efforts to determine the effects of channel deepening in the AK and KVK.
USACE (1971)	prior to 1971	AK, ER	Environmental statement discussing ER flood control project, including placement of new structure and abutments in lower river segment near AK.
USACE (1982)	prior to 1982	HK	Proposed dredging activities and placement of Hg contaminated dredged material in a CDF in HK.
USACE (1983)	prior to 1983	NY/NJ Harbor Estuary	Disposal of dredged material from the Port of New York and New Jersey.
USACE (1989)	prior to 1989	NB, NY/NJ Harbor Estuary	Evaluation of proposed dredged material disposal alternatives for NY/NJ Harbor Estuary, including geotechnical report for NB.
USACE (1996)	prior to 1996	AK, KVK, NB	Review of dredging needs of AK, KVK, NB, and NY/NJ Harbor estuary and proposed locations of dredged material placement.
USACE (1997a)	prior to 1997	NB	Final EIS on the NB CDF.
USACE (1997b)	1996	AK, KVK, NB	Waterborne seismic reflection survey of AK, KVK, and NB, including data tables of sediment description and bottom elevation with geocoordinates.
USACE (1999b)	1999 - 2040	AK, KVK, NB	Review of implementation needs for immediate (1999 - 2000), short-term (2000 - 2010) and long-term (2011 - 2040) dredging activities in AK, KVK, NB and NY/NJ Harbor estuary, and discussion of locations of dredged material placement.
USACE (2004a)	2004 - 2011	AK, KVK, NB	USACE status update of channel design and proposed actions for AK, KVK, and NB.
USACE (2004b)	2004 - 2011	AK, KVK, NB	Enviromental assessment of the implementation of the NY/NJ Harbor Deepening Project.

Table 3-86
Dredging Studies Identified for the Inventory Area

Reference - Author/Year	Year(s) of Data Collection	Waterway	Overview
USACE (2004c)	1947 - 2001; 2003	NB	Stratigraphy, hydrodynamic modeling and tidal data, including sidescan data and bottom profile for NB.

Notes:

AK = Arthur Kill	KVK = Kill Van Kull
CDF = Confined Disposal Facility	NB = Newark Bay
EIS = Environmental Impact Statement	NY/NJ = New York/New Jersey
ER = Elizabeth River	PR = Passaic River
HK = Hackensack River	USACE = U.S. Army Corps of Engineers

Table 3-87
Known Dredging Activities in the Inventory Area

Dredging Date	Dredging Party	Description of Dredging Event	Depth of Dredging (feet)	Estimated Volume of Dredged Material (cubic yards)	Dredged Material Disposal Site
Newark Bay					
2004 - 2011	USACE/PA NY/NJ	NY & NJ Harbor 50' Deepening Project	50	Undetermined	HARS
4/02 - present	USACE/PA NY/NJ	NB 45-foot Deepening Project Area 5: Bergen Point	50	ongoing	Fishing Reef/HARS
10/02 - present	USACE/PA NY/NJ	NB 45-foot Deepening Project Area 6: Upper Portion of Main Channel	45	ongoing	Landfill Closure/HARS
7/03 - present	USACE/PA NY/NJ	NB 45-foot Deepening Project Area 8: Lower Portion of Main Channel	45	ongoing	ND
1999	PA NY/NJ	Auto Marine Terminals	ND	36,000	Newark Bay CDF
3/90	USACE	Federal Navigation Channel	ND	10,200	ND
2/90	USACE	Federal Navigation Channel	ND	57,200	ND
1/90	USACE	Federal Navigation Channel	ND	230,900	ND
1/90	USACE	Federal Navigation Channel	ND	10,000	ND
12/89	USACE	Federal Navigation Channel	ND	138,500	ND
12/89	USACE	Federal Navigation Channel	ND	25,900	ND
11/89	USACE	Federal Navigation Channel	ND	102,800	ND
11/89	USACE	Federal Navigation Channel	ND	110,200	ND
10/89	USACE	Federal Navigation Channel	ND	302,600	ND
10/89	USACE	Federal Navigation Channel	ND	57,600	ND
9/89	USACE	Federal Navigation Channel	ND	155,900	ND
8/89	USACE	Federal Navigation Channel	ND	122,000	ND
8/89	USACE	Federal Navigation Channel	ND	118,400	ND
8/89	USACE	Federal Navigation Channel	ND	24,300	ND
8/89	USACE	Federal Navigation Channel	ND	31,500	ND
7/89	USACE	Federal Navigation Channel	ND	229,000	ND
7/89	USACE	Federal Navigation Channel	ND	63,900	ND
7/89	USACE	Federal Navigation Channel	ND	292,300	ND
7/89	USACE	Federal Navigation Channel	ND	76,800	ND
6/89	USACE	Federal Navigation Channel	ND	259,200	ND
6/89	USACE	Federal Navigation Channel	ND	45,200	ND
6/89	USACE	Federal Navigation Channel	ND	224,000	ND
6/89	USACE	Federal Navigation Channel	ND	337,600	ND
5/89	USACE	Federal Navigation Channel	ND	111,400	ND
5/89	USACE	Federal Navigation Channel	ND	147,200	ND
5/89	USACE	Federal Navigation Channel	ND	149,100	ND
5/89	USACE	Federal Navigation Channel	ND	23,900	ND
5/89	USACE	Federal Navigation Channel	ND	96,100	ND
5/89	USACE	Federal Navigation Channel	ND	116,800	ND
5/89	USACE	Federal Navigation Channel	ND	21,800	ND
5/89	USACE	Federal Navigation Channel	ND	137,600	ND
5/89	USACE	Federal Navigation Channel	ND	184,200	ND
4/89	USACE	Federal Navigation Channel	ND	50,600	ND
4/89	USACE	Federal Navigation Channel	ND	306,400	ND
4/89	USACE	Federal Navigation Channel	ND	323,600	ND
4/89	USACE	Federal Navigation Channel	ND	204,400	ND
3/89	USACE	Federal Navigation Channel	ND	40,300	ND
3/89	USACE	Federal Navigation Channel	ND	481,000	ND
3/89	USACE	Federal Navigation Channel	ND	246,700	ND

Table 3-87
Known Dredging Activities in the Inventory Area

Dredging Date	Dredging Party	Description of Dredging Event	Depth of Dredging (feet)	Estimated Volume of Dredged Material (cubic yards)	Dredged Material Disposal Site
3/89	USACE	Federal Navigation Channel	ND	25,300	ND
3/89	USACE	Upper NB	ND	150,500	ND
2/89	USACE	Upper NB	ND	214,100	ND
2/89	USACE	Upper NB	ND	382,200	ND
2/89	USACE	Federal Navigation Channel	ND	151,100	ND
2/89	USACE	Federal Navigation Channel	ND	26,500	ND
1/89	USACE	Federal Navigation Channel	ND	180,200	ND
1/89	USACE	Federal Navigation Channel	ND	12,000	ND
1/89	USACE	Upper NB	ND	160,000	ND
1/89	USACE	Upper NB	ND	410,000	ND
12/88	USACE	Upper NB	ND	123,400	ND
12/88	USACE	Upper NB	ND	174,700	ND
12/88	USACE	Upper NB	ND	349,800	ND
12/88	USACE	Upper NB	ND	55,600	ND
11/88	USACE	Upper NB	ND	226,100	ND
11/88	USACE	Upper NB	ND	311,400	ND
10/88	USACE	Federal Navigation Channel	ND	599,400	ND
9/88	USACE	Federal Navigation Channel	ND	406,400	ND
8/88	USACE	Federal Navigation Channel	ND	403,800	ND
7/88	USACE	Federal Navigation Channel	ND	410,600	ND
6/88	USACE	Federal Navigation Channel	ND	110,800	ND
10/87	USACE	Federal Navigation Channel	ND	149,700	ND
10/87	USACE	Federal Navigation Channel	ND	3,700	ND
12/84	USACE	Federal Navigation Channel	ND	3,600	ND
11/84	USACE	Federal Navigation Channel	ND	7,200	ND
10/84	USACE	Federal Navigation Channel	ND	180,800	ND
9/84	USACE	Federal Navigation Channel	ND	487,800	ND
8/84 - 11/84	PA NY/NJ	Main Channel and Port Elizabeth Branch Channel	35	ND	ND
8/84	USACE	Federal Navigation Channel	ND	198,000	ND
8/84	USACE	North Channel Reach	ND	198,000	ND
4/84	USACE	South Shooter's Island Channel	ND	32,400	ND
3/84	USACE	South Shooter's Island Channel	ND	255,000	ND
2/84	USACE	South Shooter's Island Channel	ND	194,400	ND
7/82 - 11/83	PA NY/NJ	Main Channel and Port Elizabeth Branch Channel	35	ND	ND
7/82 - 11/82	USACE	Federal Navigation Channel	ND	552,800	ND
7/82 - 8/82	PA NY/NJ	Main Channel and Port Elizabeth Channel	35	ND	ND
6/82 - 7/82	Atlantic Richfield Co.	Atlantic Richfield Co. (ARCO) facility	ND	41,800	ND
4/79 - 10/79	PA NY/NJ	Main Channel and Port Newark Branch Channel	35	732,300	ND
1/79 - 7/79	USACE	South Shooter's Island Channel	ND	18,000	ND
5/78 - 11/78	USACE	South Shooter's Island Channel	ND	78,600	ND
10/76 - 12/76	Texaco, Inc.	Texaco, Inc. facility	ND	44,000	ND
8/76 - 12/76	USACE	South Shooter's Island Channel	ND	197,000	ND
7/76	USACE	North Channel Reach	ND	72,400	ND
1/76 - 11/76	USACE	South Shooter's Island Channel	ND	116,500	ND
8/76 - 10/77	USACE	South of Shooter's Island Reach	35	ND	ND

Table 3-87
Known Dredging Activities in the Inventory Area

Dredging Date	Dredging Party	Description of Dredging Event	Depth of Dredging (feet)	Estimated Volume of Dredged Material (cubic yards)	Dredged Material Disposal Site
6/76 - 7/76	USACE	North of C.R.R. NJ Railroad Bridge	35	66,500	ND
4/74 - 5-74	USACE	North Reach Channel of NB	35	455,500	ND
12/72 - 9/73	USACE	Main Channel NB (Contract #7)	35	1,664,100	ND
11/71 - 9/72	USACE	North of C.R.R. NJ Railroad Bridge (Contract #4)	35	804,200	ND
6/72 - 3/73	USACE	Contract #5	35	13,000	ND
5/72 - 2/73	USACE	Contract #6	35	889,500	ND
11/71 - 4/72	USACE	South of C.R.R. NJ Railroad Bridge (Contract #2)	38	845,800	ND
7/70 - 4/71	USACE	North of C.R.R. NJ Railroad Bridge (Contract #3)	35	ND	ND
3/70 - 2/71	USACE	South of C.R.R. NJ Railroad Bridge (Contract #1)	35/38	812,800	ND
8/64 - 5/65	USACE	North Reach Channel NB	32	488,200	ND
4/64 - 6/64	USACE	North Reach Channel NB	32	ND	ND
1952	USACE	Bergen Pt. Rock	37	33,800 (sediment); 92,900 (rock)	ND
3/52 - 7/52	USACE	C.R.R. NJ to Railroad Bridge Port Newark	35	256,400	ND
4/51 - 4/52	USACE	Vicinity of Bergen Point	37	81,300 (rock)	ND
3/51 - 8/51	USACE	Main Channel NB	35	1,282,000	ND
7/50 - 2/51	USACE	Northerly 1,900' Main Channel and Branch Inshore Channel	35	2,034,900	ND
6/50	USACE	Northerly 1,900' Main Channel and Branch Inshore Channel	35	131,700	ND
Port Newark Channel					
12/02	PA NY/NJ	Port Newark Channels	ND	55,000	ND
5/99-6/99	PA NY/NJ	Port Newark Channel (Reach A)	ND	200,000	NB CDF
6/98	PA NY/NJ	Port Newark Channel - Reach A	ND	ND	ND
1996/1997	PA NY/NJ	Reach A in NB	ND	ND	ND
2/90	PA NY/NJ	Port Newark and Elizabeth Marine Terminal	ND	38,400	ND
1/90	PA NY/NJ	Port Newark and Elizabeth Marine Terminal	ND	68,000	ND
10/89	PA NY/NJ	Port Newark and Elizabeth Marine Terminal	ND	89,600	ND
9/89	USACE	Port Newark Channel	ND	21,000	ND
9/89	PA NY/NJ	Port Newark and Elizabeth Marine Terminal	ND	6,400	ND
6/89	PA NY/NJ	Port Newark and Elizabeth Marine Terminal	ND	158,600	ND
4/89	PA NY/NJ	Port Newark and Elizabeth Marine Terminal	ND	16,000	ND
3/89	PA NY/NJ	Port Newark and Elizabeth Marine Terminal	ND	3,200	ND
12/88	PA NY/NJ	Port Newark and Elizabeth Marine Terminal	ND	6,400	ND
12/88	PA NY/NJ	Port Newark and Elizabeth Marine Terminal	ND	12,000	ND
10/88	PA NY/NJ	Port Newark and Elizabeth Marine Terminal	ND	20,400	ND
7/88	PA NY/NJ	Port Newark and Elizabeth Marine Terminal	ND	45,400	ND
6/88	PA NY/NJ	Port Newark and Elizabeth Marine Terminal	ND	118,400	ND
4/88	PA NY/NJ	Port Newark and Elizabeth Marine Terminal	ND	21,000	ND
3/88	PA NY/NJ	Port Newark and Elizabeth Marine Terminal	ND	2,200	ND
2/88	PA NY/NJ	Port Newark and Elizabeth Marine Terminal	ND	42,000	ND
1/88	PA NY/NJ	Port Newark and Elizabeth Marine Terminal	ND	82,800	ND
1/88	USACE	Port Newark Channel	ND	21,000	ND
12/87	PA NY/NJ	Port Newark and Elizabeth Marine Terminal	ND	13,200	ND
11/87	USACE	Port Newark Channel	ND	16,500	ND
9/87	USACE	Port Newark Channel	ND	85,800	ND
5/87	PA NY/NJ	Port Newark and Elizabeth Marine Terminal	ND	74,300	ND
4/87	PA NY/NJ	Port Newark and Elizabeth Marine Terminal	ND	47,600	ND

Table 3-87
Known Dredging Activities in the Inventory Area

Dredging Date	Dredging Party	Description of Dredging Event	Depth of Dredging (feet)	Estimated Volume of Dredged Material (cubic yards)	Dredged Material Disposal Site
9/86	PA NY/NJ	Port Newark and Elizabeth Marine Terminal	ND	20,400	ND
8/86	PA NY/NJ	Port Newark and Elizabeth Marine Terminal	ND	50,400	ND
5/86	PA NY/NJ	Port Newark and Elizabeth Marine Terminal	ND	117,200	ND
9/85	PA NY/NJ	Port Newark and Elizabeth Marine Terminal	ND	43,200	ND
8/85	PA NY/NJ	Port Newark and Elizabeth Marine Terminal	ND	104,400	ND
9/84	PA NY/NJ	Port Newark and Elizabeth Marine Terminal	ND	3,000	ND
6/84	PA NY/NJ	Port Newark and Elizabeth Marine Terminal	ND	18,800	ND
5/84	PA NY/NJ	Port Newark and Elizabeth Marine Terminal	ND	82,800	ND
9/83	PA NY/NJ	Port Newark and Elizabeth Marine Terminal	ND	109,500	ND
8/83	PA NY/NJ	Port Newark and Elizabeth Marine Terminal	ND	36,000	ND
5/83 - 11/84	PA NY/NJ	Port Newark Inshore Channel & Port Newark Pierhead Channel	35	365,500	ND
5/83 - 7/83	USACE	Port Newark Channel	ND	468,400	ND
3/83	PA NY/NJ	Port Newark and Elizabeth Marine Terminal	ND	7,200	ND
2/83	PA NY/NJ	Port Newark and Elizabeth Marine Terminal	ND	3,600	ND
1/83	PA NY/NJ	Port Newark and Elizabeth Marine Terminal	ND	7,200	ND
8/82 - 11/82	PA NY/NJ	Port Newark and Elizabeth Marine Terminal	ND	180,000	ND
5/81 - 7/81	PA NY/NJ	Port Newark and Elizabeth Marine Terminal	ND	111,600	ND
4/80 - 5/80	PA NY/NJ	Port Newark and Elizabeth Marine Terminal	ND	97,200	ND
4/79 - 12/79	USACE	Port Newark Channel	ND	880,000	ND
11/78 - 12/78	PA NY/NJ	Port Newark and Elizabeth Marine Terminal	ND	155,000	ND
2/78	PA NY/NJ	Port Newark and Elizabeth Marine Terminal	ND	80,100	ND
2/78 - 3/78	USACE	Port Newark Channel	ND	287,000	ND
3/78	PA NY/NJ	Port Newark Pierhead Channel	35	247,200	ND
1/74 - 5/74	PA NY/NJ	Port Newark Branch Channel	35	314,300	ND
1974	PA NY/NJ	Port Newark Inshore and Branch Channels	35	714,000	ND
12/71 - 2/72	PA NY/NJ	Port Newark Branch and Inshore Channels	35	174,600	ND
12/71 - 2/72	PA NY/NJ	Port Newark Branch Channel	35	ND	ND
10/68 - 1/69	PA NY/NJ	Port Newark Branch and Inshore Channels	35	362,800	ND
11/64	PA NY/NJ	Port Newark Inshore Channel	35	92,200	ND
1964	PA NY/NJ	Port Newark Inshore Channel	35	12,900	ND
11/62 - 5/63	PA NY/NJ	Port Newark Inshore Channel	35	101,400	ND
1/62 - 3/62	PA NY/NJ	Port Newark Branch Channel	35	232,300	ND
3/56	PA NY/NJ	Port Newark Branch and Inshore Channels	35	198,700	ND
4/53 - 6/53	PA NY/NJ	Port Newark Inshore Channel	30/35	215,000	ND
1/51 - 4/51	PA NY/NJ	Port Newark Inshore Channel Rock Area	37	55,800	ND
Port Elizabeth Channel/Elizabeth Marine Terminal					
2004 - 2011	USACE/PA NY/NJ	NY & NJ Harbor 50' Deepening Project	50	Undetermined	HARS
2003?	USACE/PA NY/NJ	NB 45-foot Deepening Project Area 7: Port Elizabeth Channel	45	ND	ND
2003?	PA NY/NJ	Reaches B, C, D in NB	50	173,000	ND
10/02 - 2/03	PA NY/NJ	Reaches B, C, D in NB	45	49,000	ND
10/01 - 6/02	USACE	NB, Port Elizabeth pierhead channel	45 to 50	147,000 (clay); 33,000 (maint.	NB CDF/HARS
2002	PA NY/NJ	Reaches B, C, D in NB	45	50,000 (sediment); 100,000 (red clay)	Landfill Closure/HARS
7/01	PA NY/NJ	Reaches B, C, D in NB	45	250,000	Upland Disposal/NB CDF
1999	PA NY/NJ	Reaches B, C, D in NB	ND	ND	CDF
6/1998	PA NY/NJ	Port Elizabeth Channel	ND	ND	ND

Table 3-87
Known Dredging Activities in the Inventory Area

Dredging Date	Dredging Party	Description of Dredging Event	Depth of Dredging (feet)	Estimated Volume of Dredged Material (cubic yards)	Dredged Material Disposal Site
1997	PA NY/NJ	Reaches B, C, D in NB	ND	ND	ND
2/90	PA NY/NJ	Port Newark and Elizabeth Marine Terminal	ND	38,400	ND
1/90	PA NY/NJ	Port Newark and Elizabeth Marine Terminal	ND	68,000	ND
10/89	PA NY/NJ	Port Newark and Elizabeth Marine Terminal	ND	89,600	ND
9/89	USACE	Port Elizabeth Channel	ND	30,000	ND
9/89	PA NY/NJ	Port Newark and Elizabeth Marine Terminal	ND	6,400	ND
6/89	PA NY/NJ	Port Newark and Elizabeth Marine Terminal	ND	158,600	ND
4/89	PA NY/NJ	Port Newark and Elizabeth Marine Terminal	ND	16,000	ND
3/89	PA NY/NJ	Port Newark and Elizabeth Marine Terminal	ND	3,200	ND
12/88	PA NY/NJ	Port Newark and Elizabeth Marine Terminal	ND	6,400	ND
12/88	PA NY/NJ	Port Newark and Elizabeth Marine Terminal	ND	12,000	ND
10/88	PA NY/NJ	Port Newark and Elizabeth Marine Terminal	ND	20,400	ND
7/88	PA NY/NJ	Port Newark and Elizabeth Marine Terminal	ND	45,400	ND
6/88	PA NY/NJ	Port Newark and Elizabeth Marine Terminal	ND	118,400	ND
4/88	PA NY/NJ	Port Newark and Elizabeth Marine Terminal	ND	21,000	ND
3/88	PA NY/NJ	Port Newark and Elizabeth Marine Terminal	ND	2,200	ND
2/88	PA NY/NJ	Port Newark and Elizabeth Marine Terminal	ND	42,000	ND
1/88	PA NY/NJ	Port Newark and Elizabeth Marine Terminal	ND	82,800	ND
12/87	PA NY/NJ	Port Newark and Elizabeth Marine Terminal	ND	13,200	ND
11/87	USACE	Port Elizabeth Channel	ND	72,400	ND
10/87	USACE	Port Elizabeth Channel	ND	44,500	ND
10/87	USACE	Port Elizabeth Channel	ND	65,800	ND
5/87	PA NY/NJ	Port Newark and Elizabeth Marine Terminal	ND	74,300	ND
4/87	PA NY/NJ	Port Newark and Elizabeth Marine Terminal	ND	47,600	ND
9/86	PA NY/NJ	Port Newark and Elizabeth Marine Terminal	ND	20,400	ND
8/86	PA NY/NJ	Port Newark and Elizabeth Marine Terminal	ND	50,400	ND
5/86	PA NY/NJ	Port Newark and Elizabeth Marine Terminal	ND	117,200	ND
9/85	PA NY/NJ	Port Newark and Elizabeth Marine Terminal	ND	43,200	ND
8/85	PA NY/NJ	Port Newark and Elizabeth Marine Terminal	ND	104,400	ND
9/84	PA NY/NJ	Port Newark and Elizabeth Marine Terminal	ND	3,000	ND
8/84 - 11/84	USACE	Main Channel and Port Elizabeth Branch Channel	35	ND	ND
6/84	PA NY/NJ	Port Newark and Elizabeth Marine Terminal	ND	18,800	ND
5/84	PA NY/NJ	Port Newark and Elizabeth Marine Terminal	ND	82,800	ND
9/83	PA NY/NJ	Port Newark and Elizabeth Marine Terminal	ND	109,500	ND
8/83	PA NY/NJ	Port Newark and Elizabeth Marine Terminal	ND	36,000	ND
3/83	PA NY/NJ	Port Newark and Elizabeth Marine Terminal	ND	7,200	ND
2/83	PA NY/NJ	Port Newark and Elizabeth Marine Terminal	ND	3,600	ND
1/83	PA NY/NJ	Port Newark and Elizabeth Marine Terminal	ND	7,200	ND
8/82 - 11/82	PA NY/NJ	Port Newark and Elizabeth Marine Terminal	ND	180,000	ND
7/82 - 8/82	USACE	Main Channel and Port Elizabeth Channel	35	ND	ND
7/82 - 11/83	USACE	Main Channel and Port Elizabeth Branch Channel	35	ND	ND
5/81 - 7/81	PA NY/NJ	Port Newark and Elizabeth Marine Terminal	ND	111,600	ND
4/80 - 5/80	PA NY/NJ	Port Newark and Elizabeth Marine Terminal	ND	97,200	ND
4/79 - 10/79	USACE	Main Channel and Port Newark Branch Channel	35	732,300	ND
11/78 - 12/78	PA NY/NJ	Port Newark and Elizabeth Marine Terminal	ND	155,000	ND

Table 3-87
Known Dredging Activities in the Inventory Area

Dredging Date	Dredging Party	Description of Dredging Event	Depth of Dredging (feet)	Estimated Volume of Dredged Material (cubic yards)	Dredged Material Disposal Site
2/78	PA NY/NJ	Port Newark and Elizabeth Marine Terminal	ND	80,100	ND
12/77 - 1/78	USACE	Port Elizabeth Channel	ND	534,400	ND
12/77 - 1/78	USACE	Port Elizabeth Channel	35	313,400	ND
7/73 - 9/73	USACE	Port Elizabeth Branch Channel and Inshore Channel	35	216,100	ND
Kill Van Kull					
10/04-10/06	USACE/PA NY/NJ	NY & NJ Harbor 50' Deepening Project	50	Undetermined	HARS/Upland Disposal
2004-2011	USACE/PA NY/NJ	NB 45-foot Deepening Project Area 4b: Adjacent to Staten Island	50	ongoing	ND
2003	USACE/PA NY/NJ	NB 45-foot Deepening Project Area 3: Length of KVK	45	ND	HARS
2003	USACE/PA NY/NJ	NB 45-foot Deepening Project Area 4a: Adjacent to Staten Island	45	ND	Artificial Reef Site/HARS
6/76	USACE	Junction[e] of KVK (Triangle Turning Basin)	35	244,200 (sediment); 34,500 (rock)	ND
Arthur Kill					
2004 - 2011	USACE/PA NY/NJ	NY & NJ Harbor 50' Deepening Project	50	Undetermined	HARS
7/03-present	USACE	AK & Howland Hook Marine Terminal 41/40-ft Deepening Project	41/40	950,000	Landfill Closure/HARS
7/03 - 1/04	USACE	Howland Hook Terminal (Warf Expansion Project)	41/37	60,000	ND
12/02	USACE	Howland Hook Terminal	43	15,000	Fishing Reef/HARS
6/99	Tosco Refining Company	AK - maintenance dredging	ND	3,500 (dredging)	NB CDF
3/97 - 4/97	USACE	Lower New York Bay, RB and AK to 1000 ft North of Smith Creek	35	190,000	ND
Hackensack River					
1986	USACE	Junction[e] to Turning Basin (Various Sections)	22 to 25	257,130	ND
1963	USACE	Turning Basin	25	321,883	ND
1962	USACE	Junction[e] to Beacon #3	30	209,040	ND
1959	USACE	Little Ferry to Upstream Limit of HK	12	37,100 and 39,841	ND
1953	USACE	Junction to 1,500' above Gen. Pulaski Skyway	30	73,000	ND
1952	USACE	Shoals at Central RR of NJ Bridge	ND	613	ND
Passaic River					
2/89	Texaco, Inc.	Point-No-Point Reach - maintenance dredging	ND	30,400	ND
8/83	Celanese Chemical Co.	Point-No-Point Reach - maintenance dredging	ND	23,100	ND
7/83 - 10/83	USACE	Federal Navigation Channel	ND	702,400	ND
1983	USACE	Point-No-Point: Junction to Lincoln Highway Bridge	30	540,000	ND
10/81	Celanese Chemical Co.	Point-No-Point Reach - maintenance dredging	ND	36,000	ND
6/80	Monsanto Co.	Point-No-Point Reach - maintenance dredging	ND	8,000	ND
6/79	Tenneco Oil, Co.	Point-No-Point Reach - maintenance dredging	ND	18,000	ND
6/77	Celanese Chemical Co.	Point-No-Point Reach - maintenance dredging	ND	24,000	ND
5/77 - 8/77	USACE	Federal Navigation Channel	ND	525,000	ND
1977	USACE	Point-No-Point: Junction to Vicinity of Central RR of NJ Bridge	30	478,000	ND
8/76	Getty Oil Co.	Point-No-Point Reach - maintenance dredging	ND	119,500	ND
8/76	Monsanto Co.	Point-No-Point Reach - maintenance dredging	ND	6,800	ND
3/76 - 4/76	USACE	Federal Navigation Channel	ND	230,700	ND
1972	USACE	Point-No-Point: Junction to U.S. Rt. 1 and 9 Bridge, Newark	30	174,600	ND
1971	USACE	Point-No-Point: Junction to U.S. Rt. 1 and 9 Bridge, Newark	30	155,600	ND
1965	USACE	Point-No-Point: Junction to U.S. Rt. 1 and 9 Bridge, Newark	30	505,500	ND
1962	USACE	Point-No-Point: Junction to Vicinity of Central RR of NJ Bridge	30	245,000	ND

Table 3-87
Known Dredging Activities in the Inventory Area

Dredging Date	Dredging Party	Description of Dredging Event	Depth of Dredging (feet)	Estimated Volume of Dredged Material (cubic yards)	Dredged Material Disposal Site
1957	USACE	Point-No-Point: Junction to Vicinity of Glen. Pulaski Skyway	30	413,900	ND
1951	USACE	Point-No-Point: Junction to Vicinity of Central RR of NJ Bridge	30	329,200	ND
1950	USACE	Newark, Kearny, and Arlington: Center Street Bridge to Narin Linoleum Works	16	344,700	ND
1949/1950	USACE	Harrison and Newark: Interstate 95 Bridge to Center Street Bridge	16	369,800	ND
1946	USACE	Point-No-Point and Harrison: Junction to 3,000 ft above Lincoln Hwy. Bridge	30	934,500	ND
1941	USACE	Point-No-Point and Harrison: Junction to Rt. 95 Bridge	30	1,202,000	ND
1937	USACE	Harrison and Newark: 3,000 ft above Lincoln Hwy. Bridge to Jackson Street	20	800,900	ND
1933	USACE	Point-No-Point and Harrison: Junction to Rt. 95 Bridge, Newark	30	607,200	ND
1933	USACE	Kearny: Vicinity Congoleum Mfg. Co. to Erie RR Bridge	16	228,300	ND
1932	USACE	Point-No-Point and Harrison: Junction to 3,000 ft above Lincoln Hwy. Bridge	30	1,430,700	ND

Notes:
a. Junction is defined as the red channel Junction marker at the confluence of the Hackensack and Passaic Rivers.
AK = Arthur Kill
CDF = Combined Disposal Facility
HARS = Historic Area Remediation Site
HK = Hackensack River
KVK = Kill Van Kull
ND = Not documented
NB = Newark Bay
NJ = New Jersey
PA NY/NJ = Port Authority of New York/New Jersey
RB = Raritan Bay
USACE = U.S. Army Corps of Engineers

Sources: Iannuzzi et al., 2002; PA NY/NJ, 2004; USACE, 1997f; USACE, 2004a; and personal communications with the PA NY/NJ.

Table 3-88
Current Conditions and Dredging Status of Waterways in the Inventory Area

Channel	Length (miles)	Width (ft)	Depth (ft mlw)	Date last Dredged	Current and Future Work
AK - North of the Goethals Bridge	13.2	500-800	35/40/41	2003/2004	Dredging is currently ongoing in the AK as part of the AK Channel and Howland Hook Marine Terminal Deepening Project. Contract Areas 1, 2, and 3 are currently being dredged to 40/41 ft. This area will also be dredged to 50 ft as part of contract areas S-AK-1, S-AK-2, and S-AK-3 of the NY and NJ Harbor Deepening Project with anticipated construction start dates of September 2006, January 2008, and January 2009, respectively.
KVK	5.3	800-2,000	45/50	2003/2004	Dredging is currently ongoing in Contract Area 5 (Bergen Point) as part of the KVK and NB Channels 45' Project. Dredging began on April 13, 2002 and is expected to be completed in late spring 2004. Project is currently 85% complete with dredging to 50'. This area will also be dredged to 50 ft as part of contract area S-KVK-2 of the NY and NJ Harbor Deepening Project with an anticipated construction start date of October 2004.
NB South Channel	3.1	800-2,200	40/45	2003/2004	Dredging is currently ongoing as Contract Area 8 of the KVK and NB Channel 45' Deepening Project. Dredging began in July 2003 and is expected to be completed in April 2004. Project is currently over 25% complete with dredging to 45'. This area will also be dredged to 50 ft as part of contract areas S-NB-1 and S-NB-2 of the NY and NJ Harbor Deepening Project with anticipated construction start dates of October 2005 and June 2009, respectively.
Port Elizabeth Channel	1.7	290-800	40/45	2003/2004	Berths 8, 10, 12, 16, 26, 28, and 50 have been dredged to 45 ft, removing approx. 50,000 cy. Berths 90 and 92 are still being dredged to 45ft with a completion date of April 2004. This area will also be dredged to 50 ft as part of contract area S-E-1 of the NY and NJ Harbor Deepening Project with an anticipated construction start date of April 2011.
Port Newark Channel	1.3	290-800	40	2002	No dredging is currently ongoing in Port Newark Channel and no projects have been announced for the foreseeable future.
NB North Channel	1.5	500-	35	1986/1989	No dredging is currently ongoing in the NB North Channel and no projects have been announced for the foreseeable future.
PR - Kearny Point Reach	1.2	300	30	1983	No dredging is currently ongoing in the PR and no projects have been announced for the foreseeable future.
PR - Point-No-Point Reach	1.3	300	30	1983	No dredging is currently ongoing in the PR and no projects have been announced for the foreseeable future.
PR - Harrison Reach	2.2	300	30	1949	No dredging is currently ongoing in the PR and no projects have been announced for the foreseeable future.
PR - Newark Reach	1.5	300	16	1949/1950	No dredging is currently ongoing in the PR and no projects have been announced for the foreseeable future.
PR - Kearny Reach	1.0	300	16	1949/1950	No dredging is currently ongoing in the PR and no projects have been announced for the foreseeable future.
PR - Arlington Reach	1.0	200	16	1949/1950	No dredging is currently ongoing in the PR and no projects have been announced for the foreseeable future.
PR - Above Mile 6	7.3	150	10	1974/1976	No dredging is currently ongoing in the PR and no projects have been announced for the foreseeable future.
HK	4.2	300-800	22/25	1986	No dredging is currently ongoing in the HK and no projects have been announced for the foreseeable future.

Notes:
Length, width, and depth measurements are approximate.
AK = Arthur Kill
HK = Hackensack
KVK = Kill Van Kull
NB = Newark Bay
PR = Passaic River

Sources: Iannuzzi et al., 2002; PA NY/NJ, 2004; and USACE, 2004a.

Table 3-89
Known Dredging Permits Issued for the Inventory Area

Permit/Public Notice Date[a]	Permit Applicant	Description of Requested Dredging Event	Depth of Dredging (feet)	Estimated Volume of Dredged Material (cubic yards)	Dredged Material Disposal Site
Newark Bay					
1/00	PA NY/NJ	Reaches in B, C, D in NB - adding upland disposal site to existing dredging permit	NR	202,000	Upland Disposal
11/99	Darling International, Inc.	Ten year maintenance and subsequent upland disposal	NR	22,000	Upland Disposal
9/99	PA NY/NJ	Maintenance dredging	NR	4,000	Upland Disposal
9/99	Amerada Hess Corp.	Ten year maintenance and subsequent upland disposal	NR	20,500	Upland Disposal
4/99	Motiva Enterprises, L.L.C.	Ten year maintenance and subsequent upland disposal	NR	37,550	Upland Disposal
3/97	PA NY/NJ	Reaches B, C, D - maintenance dredging and deepening	45	137,000	Mud Dump Site
11/91	PA NY/NJ	Reaches B, C, D in NB - maintenance dredging	40	200,000	Mud Dump Site
12/88-12/91	Texaco Refining and Marketing, Inc.	Maintenance dredging	35	15,500	Mud Dump Site
12/87-12/90	Town of Kearny	Pipeline installation to Kearny Point	32 to 54	97,000	Upland Disposal
7/85-7/88	PA NY/NJ	Maintenance dredging	40	250,000	Mud Dump Site
2/84-2/87	Amerada Hess Corp.	Maintenance dredging	11	4,000	Mud Dump Site
2/83-2/86	PA NY/NJ	Maintenance dredging	35	NR	Mud Dump Site
3/82-3/92	City of Elizabeth	Maintenance dredge from the Great Ditch of NB	NR	2,500	Upland Disposal
3/82-3/85	Atlantic Richfield Co.	Maintenance dredging	30	35,000	Mud Dump Site
Port Elizabeth Channel					
3/97	USACE	Port Elizabeth Channel, Port Elizabeth Pierhead Channel, and South Elizabeth	40	390,000	Mud Dump Site
Kill Van Kull					
5/01	IMTT-Bayonne, Inc.	Perform new dredging in area surrounding pier	NR	120,000	NB CDF/HARS
6/99	Coastal Oil of New York, Inc.	Maintenance dredging of a barge and berthing area	NR	10,000	NB CDF
4/97	Exxon Company	Maintenance dredging of two berthing areas	15 to 40	106,000	Mud Dump Site
Arthur Kill					
6/99	Tosco Refining Company	Dredging and installation of floats, including wave attenuator	NR	4,000	Upland Disposal
6/99	Interstate Materials Corporation	Maintenance dredging	NR	217,000	Upland Disposal
6/88 - 6/98	Petro Port Terminal Corp.	Maintenance dredging	37	17,800	Upland Disposal
1997	Perth Amboy Refinery	Maintenance dredging	39	17,500	Upland Placement
8/97	Tosco Refining Company	Maintenance dredging of Barge Piers A and B (5 year maintenance schedule)	25	14,000 - 1st yr; 25,000 - 5	Mud Dump Site
4/97	Mobile Oil Corp.	Port Mobil Terminal - maintenance dredging	38	80,000	Mud Dump Site
3/97	Citgo Petroleum Corp.	Citgo Petroleum Berthing Facilities - maintenance dredging	36	34,500	Mud Dump Site
4/93	Bayway Refining Company	Bayway Refining Company - maintenance dredging	25	11,300	Mud Dump Site
10/92	PA NY/NJ	Howland Hook Marine Terminal maintenance dredging	35 to 40	50,000	Mud Dump Site
8/92	Consolidated Edison of New York	Maintenance Dredging in front of Generating Station	22	87,000	Mud Dump Site
6/92	Northville Linden Terminal Corp.	Northville Linden Terminal Corporation maintenance dredging	20, 26 & 37	18,000	Mud Dump Site
4/88 - 4/91	Citgo Petroleum Corp.	Maintenance dredging	33	5,900	Mud Dump Site
5/87 - 5/90	B.P. Oil, Inc.	Maintenance dredging	32	3,000	Mud Dump Site
7/85 - 7/88	GATX Terminals Corp.	Maintenance dredging	35	75,000	Mud Dump Site
1/85 - 1/88	Exxon Corp.	Maintenance dredging	40	3,000	Mud Dump Site
4/84 - 4/87	United States Lines, Inc.	Maintenance dredging	35/40	50,000 (rock); 22,000 (silt)	Mud Dump Site
12/83 - 12/86	Citgo Petroleum Corp.	Maintenance dredging	33	15,000	Mud Dump Site
10/83 - 10/86	Amoco Oil Co.	Maintenance dredging	27	17,000	Mud Dump Site
5/83 - 5/86	Exxon Corp.	Maintenance dredging	23	2,500	Mud Dump Site
10/82 - 10/85	B.P. Oil, Inc.	Maintenance dredging	30	22,000	Mud Dump Site
9/82 - 9/85	Gulf Refining and Marketing Co.	Maintenance dredging	33	40,000	Mud Dump Site

Table 3-89
Known Dredging Permits Issued for the Inventory Area

Permit/Public Notice Date[a]	Permit Applicant	Description of Requested Dredging Event	Depth of Dredging (feet)	Estimated Volume of Dredged Material (cubic yards)	Dredged Material Disposal Site
2/82 - 2/85	Proctor & Gamble Mfg. Co.	Maintenance dredging	15.5	7,500	Mud Dump Site
12/81 - 12/84	B.P. Oil, Inc.	Maintenance dredging	32	30,000	Mud Dump Site
7/81 - 7/84	Linden Roselle Sewerage Authority	Maintenance dredging	24.3	11,000	Mud Dump Site
Passaic River					
10/99	Stratus Petroleum Company	Maintenance Dredging	NR	2,500	NB CDF
12/91	Celanese Chemical Company, Inc	Point-No-Point Reach - maintenance dredging	28	25,000	Mud Dump Site
2/88	USACE	Federal Navigation Project No. 64 - Point-No-Point Reach	30	NR	Mud Dump Site
3/87-3/97	Essex Chemical Corporation	Point-No-Point Reach - maintenance dredging	16	3,500	Upland Disposal
1986	Celanese Chemical Company, Inc	Point-No-Point Reach - maintenance dredging	NR	NR	Ocean Waters
10/86-10/89	Delbay Corporation	Point-No-Point Reach - vicinity of the Center Street Bridge	19	19,000	Mud Dump Site
5/84-5/87	Tenneco Oil Co.	Point-No-Point Reach - maintenance dredging	NR	31,200	Mud Dump Site
9/83-9/86	Getty Refining and Marketing Co.	Point-No-Point Reach - maintenance dredging	24	25,000	Mud Dump Site
11/82-11/85	Tenneco Oil Co.	Point-No-Point Reach - maintenance dredging	32	30,000	Mud Dump Site
2/82-2/85	Essex Chemical Corporation	Point-No-Point Reach - maintenance dredging	16	3,500	Backfill/Upland Disposal
10/80-10/83	Amerada Hess Corp.	Maintenance dredging	NR	2,000	Mud Dump Site
2/80-2/83	Getty Refining and Marketing Co.	Point-No-Point Reach - maintenance dredging	26	20,000	Mud Dump Site
9/75	Getty Oil Company	Point-No-Point Reach - maintenance dredging	26	32,200	Mud Dump Site

Notes:
a. Due to incomplete information, the date assigned is the public notice or permit date as opposed to the date of project completion.
This table is incompleted due to incomplete information provided by the USACE; BBL is awaiting FOIA requested information (request dated March 17, 2004).
CDF = Combined Disposal Facility
HARS = Historic Area Remediation Site
NB = Newark Bay
NR = not reported; information not available at this time
PA NY/NJ = Port Authority of New York/New Jersey
USACE = U.S. Army Corps of Engineers

Sources: USACE 1991a; 1991b; 1992b; 1992c; 1992d; 1993b; 1997d; 1997e; 1997f; 1997g; 1997h; 1997i; 1999c; 1999d; 1999e; 1999f; 1999g; 1999h; 1999i

Table 3-90
Bathymetry Studies Identified for the Inventory Area

Reference	Year(s) of Data Collection	Waterway	Overview
NOAA (1997)	1996 - 2002	HK, NB, PR	NOAA Navigation Chart for Passaic and Hackensack Rivers (includes navigation channel depths reported by USACE through 2002).
NOAA (1999)	1991 - 2002	AK, NB	NOAA Navigation Chart for Raritan Bay and the Southern Part of Arthur Kill (includes navigation channel depths reported by USACE through 2002).
NOAA (2002b)	1989 - 2002	AK, KVK, NB	NOAA Navigation Chart for Kill Van Kull and Northern Part of Arthur Kill (includes navigation channel depths reported by USACE through 2002).
Secretary of War (1922)	1920s	NB, PR, HK	Review of dredging and information relative to terminals in Newark Bay, Passaic River and Hackensack River in 1922, including channel depths and waterway mean low water depths.
Secretary of War (1929)	1928	PR	Review of dredging and bathymetry information relative to terminals in Passaic River in 1928, including channel depths and waterway mean low water depths.
Stone (1839)	1839	NB	Historic bathymetry map of NB.
Tierra (2004d)	1995 - 1996	PR	Bathymetry surveys of the lower 6 miles of the Passaic River.
USACE (1997b)	1996	AK, KVK, NB	Waterborne seismic reflection survey of NB, AK, and KVK, including data tables of sediment description and bottom elevation with geocoordinates.

Notes:
AK = Arthur Kill
HK = Hackensack River
KVK = Kill Van Kull
NB = Newark Bay
PR = Passaic River

Table 3-91
Studies on Sources of Chemical Contaminants Identified for the Inventory Area

Reference - Author/Year	Year(s) of Data/Information Collection	Waterway	Overview
Ayres and Rod (1986)	1880 - 1980	NY/NJ Harbor Estuary	Patterns of chemical pollutants in Hudson-Raritan Estuary (1880s to present).
Battelle (1992c)	1992	NY/NJ Harbor Estuary; PR	Measurement of PCBs attributed to influent and effluent from POTW sources of PCBs in NY and NJ.
Battelle (1993)	1992	HK, NY/NJ Harbor Estuary, PR, RW	Measurement of PCBs attributed to influent and effluent from POTW sources of PCBs in NY and NJ.
Beale et al. (1972)	prior to 1972	NB, PR	Potential sources of degraded water quality in the PR and its tributaries.
Bonin et al. (2000)	1999	NB, NY/NJ Harbor Estuary	Investigation to determine the sources and concentrations of contaminants and sediment to the NB.
Bopp and Simpson (1991)	1985 - 1986	AK, HK, KVK, NB, PR	Measurement and source determination of contaminants in NB and adjacent waterways.
Bopp et al. (1991)	1985 - 1986	AK, HK, KVK, NB, PR	Measurement and source determination of contaminants in NB and adjacent waterways.
Burger (1994)	1990 - 1994	AK	Review of the effects of January 1990 oil spill in the AK. Discussion of observed effects to vegetation, fish, crabs, shrimp, and avian species.
CBA (1990)	1980 - 1990	HK	Impact analysis of POTWs on water quality in lower HK.
CFM (1986)	1984 - 1986	PR	Investigation of organic priority pollutants in the influent to the PVSC treatment plant. Sampling occurred at 4 locations along the PR and its tributaries.
Crawford et al. (1995)	1970s - 1980s	AK, KVK, NB	Historical review of contamination in NB area surficial sediment contamination, pollutant mass loadings, chemical discharges and CSO locations.
Galishoff (1970)	late 1800s - mid-1900s	PR	Overview of historical pollutant inputs into the PR.
Galishoff (1976)	late 1800s - mid-1900s	PR	A history of the sewer system of the City of Newark and their discharge to PR and its tributaries.
Gunster et al. (1993a)	1982 - 1991	AK, HK, KVK, NB, PR	Summary of chemical input into waters of NB and vicinity.
Gunster et al. (1993b)	1986 - 1991	AK, HK, KVK, NB, PR	Summary of chemical input into waters of NB and vicinity.
Havens and Emerson, Inc. (1979)	prior to 1979	HK, NB, PR	Wastewater facilities plan for Hudson County. Information including a listing of industries in the vicinity, quantity and characteristics of industrial wastes, and present collection and treatment of industrial wastes are provided. Analyses of industrial wastewater samples are presented.
Hedeman (1934)	prior to 1934	RW	Sewer system in the City of Rahway and its effect upon the RW.
HMDC (1982d)	prior to 1982	HK	Sewage and landfill leachate management issues in the Sawmill Creek Basin (HK).
HMDC (1990e)	1983 - 1988	HK	Determination of combined sewer overflow and sewage treatment plant influences on water quality of the Hackensack Meadowlands.
Huntley et al. (1994)	1990s	PR	Review of potential sources of PCDTs in the PR, NJ.
Hurley (1992)	1800s to 1992	AK	Review of oil and pollutant spills in AK and KVK in 1990, and a historical account of pollution from the 1800s to present.
Iannuzzi et al. (2002)	precolonial - 2002	PR	Review of pollutant issues in the PR and its vicinity from pre-colonial to present time, including summaries of fisheries and wildlife, human uses, and pollutant sources.
IEC (2000 - 2002)	2000 - 2002	NY/NJ Harbor Estuary	Annual review of water quality issues in the New York Harbor vicinity. Information on wastewater treatment plants discharging into IEC waters, and locations of ambient water quality monitoring for pathogens in the NB complex (HK, NB, PR). No data or summary of results provided.

Table 3-91
Studies on Sources of Chemical Contaminants Identified for the Inventory Area

Reference - Author/Year	Year(s) of Data/Information Collection	Waterway	Overview
IEC (2004)	2003	NY/NJ Harbor Estuary	Annual review of water quality issues in the New York Harbor vicinity. Information on wastewater treatment plants discharging into IEC waters, and locations of ambient water quality monitoring for pathogens in the NB complex (HK, NB, PR). No data or summary of results provided.
ISC (1937-1999)	1937 - 1999	NY/NJ Harbor Estuary	Annual review of water quality issues in the New York Harbor vicinity. Information on wastewater treatment plants discharging into IEC waters, and locations of ambient water quality monitoring for pathogens in the NB complex (HK, NB, PR). No data or summary of results provided.
ISC (1988)	1988	NY/NJ Harbor Estuary	Location and size of CSOs in the NY, NJ, and CT district of the ISC.
ISC (1995)	1995	NY/NJ Harbor Estuary	Annual review of wastewater treatment plant locations and discharge summaries, effluent and ambient water monitoring programs, CSO information, waters open to swimming and shellfishing, and air pollution issues in NJ, NY, and CT.
Killiam (1976)	1974 - 1976	PR	Identification and investigation of 73 CSOs within the jurisdiction of the PVSC. Location, physical characteristics, and the extent of service area is summarized for each CSO. Overflow measurements were made at active CSOs, where possible.
Killam (1995)	prior to 1995	NB	Identification and classification of the tributary discharges to Newark International Airport peripheral ditches. Includes an overview of industrial discharges, indirect discharges, location and characteristics of CSOs.
Malcom Pirnie (1998)	prior to 1998	PR	CSO solids and floatables control plan for the City of Newark, NJ.
MSA Inc. (1990)	1980s	RW	Litter and debris survey of the RW, including river discharge data (September 1981 - 1989) and photographic record of debris.
Najarian (1992)	1980s - 1992	HK	Impact analysis of POTWs on water quality in lower HK.
NJDEP (1975)	prior to 1973	AK, HK, KVK, NB, PR	Water quality problem areas in the NY/NJ Harbor Estuary.
NJDEP (1986)	1982	New Jersey	Review of effluent releases of NJ POTW, including sludge and water chemical analyses, and toxicity testing.
NJDEP (1990b)	prior to 1990	NB, NY/NJ Harbor Estuary	Location of CSOs and surface water and effluent pathogen sampling locations in NY/NJ Harbor Estuary.
NJDEP (1991)	1990	AK	Concentrations of petroleum hydrocarbons in sediments and biological surveys (benthic invertebrate and ribbed mussel surveys) following oil spills in the AK in early 1990.
NJDEP (1994a)	1980s - 1990s	NY/NJ Harbor Estuary	Mercury contamination of fish and advisories for consumption in NJ waters. Discussion of possible sources including atmospheric deposition included in report.
NJDEP (1994b)	1900 - 1994	HK	Discussion of possible sources of Hg to Berry's Creek.
NJDWSC (2002)	1990s - 2002	PR	Review of the PR Basin Watershed Management Area 4 (WMA#4), including the lower PR and Saddle River. Report includes a summary of climate, topography, soils, geology, non-tidal surface and groundwater resources, wetlands and land use, water supply and stormwater management, water quality monitoring programs and current status, and potential sources of contamination (runoff, discharges, CSOs). Maps available for download.

Table 3-91
Studies on Sources of Chemical Contaminants Identified for the Inventory Area

Reference - Author/Year	Year(s) of Data/Information Collection	Waterway	Overview
NJTA (1988)	prior to 1988	HK	Draft EIS for the NJ Turnpike widening project. Includes landfill information, species inventories, and sediment, water, and highway runoff water quality data.
NOAA (1982)	prior to 1982	NB, NY/NJ Harbor Estuary, PR	Review of contaminant inputs to the Hudson-Raritan Estuary, including landfills, spills, surface runoff and tributary inputs. Includes data on chemical concentrations of wastewater effluents from numerous sources.
NOAA (1984b)	prior to 1981	NY/NJ Harbor Estuary	Contaminant inputs to the Hudson-Raritan Estuary, and review of prior collection of water quality and sediment data.
NOAA (1996)	1990s	AK, HK, KVK, NB, PR, RW	Natural resource restoration plan for oil and chemical resources in the NY/NJ Harbor Estuary.
NY/NJ HEP (unknown)	not provided	NY/NJ Harbor Estuary	Summary of CSOs in the NY/NJ Harbor Estuary.
NYSDOH (unknown)	1959	AK, KVK	Overview of municipal and industrial discharges into the AK and KVK, and presentation of water quality analytical results.
Purcell (unknown)	not provided	NB, PR	Investigation and proposed improvements to the sewerage system of the City of Newark and the Newark International Airport in Elizabeth, NJ. Overview of existing sewerage system and combined sewage treatment.
Rod et al. (1989)	1880 - 1980	NY/NJ Harbor Estuary	Reconstruction of historical loadings of inorganic chemicals and pesticides in the Hudson-Raritan Basin (not Newark Bay-specific) from 1880s to 1980s.
Shear et al. (1996)	prior to 1996	PR	Evaluation of CSO contribution to sediment contamination in the PR, including CSO locations, operation, and discharge data, and listing of industries with inorganic and organic discharges into CSOs.
Tierra (1990)	1990	PR	Sediment chemistry data.
URS (1998)	prior to 1998	PR, NB	Work Plan for CSO discharge characterization study for the City of Newark, NJ.
USDOI (1969)	prior to 1967	NB, PR	Report on the quality of the interstate waters of the Lower PR and Upper and Lower Bays of New York Harbor. Includes information on the municipal and industrial direct waste discharges in the PR and NB.
Walker et al. (1999)	prior to 1999	NB, NY/NJ Harbor Estuary	Urban runoff concentrations and sediment loading calculations for inorganic chemicals, PCBs, PAHs, and DDT.
Wenning et al. (1992a)	1990	AK, KVK, NB, PR	Chemical fingerprinting of PCDD/Fs in surface sediments from tributaries of NB.
Wenning et al. (1992b)	prior to 1992	NB, NY/NJ Harbor Estuary	Review of detected concentrations and sources of PCDD/Fs in the aquatic environment, with emphasis on NB.
Wenning et al. (1993a)	1990	AK, KVK, NB, PR	Chemical fingerprinting of PCDD/Fs in surface sediments from tributaries of NB.
Wenning et al. (1993b)	1990	AK, KVK, NB, PR	Chemical fingerprinting and potential sources of PCDD/Fs in surface sediments from tributaries of NB.
Wenning et al. (1993c)	1991	PR	Distributions of PCDD/Fs in surface sediments from PR based on chemometric pattern recognition techniques.
Weston (1991)	1991	NB	Summary report of environment and assessment and treatability program for peripheral ditch sediments at Newark International Airport. Includes chemical analysis of peripheral ditch sediments from 3 locations surrounding Newark International Airport (raw data provided in Appendices).
Wolfskill and McNutt (1998)	prior to 1998	AK, KVK, NB, PR	Locations of possible land-based sources of Pb, Hg, and PCDD/Fs in the vicinity of Newark Bay.

Table 3-91
Studies on Sources of Chemical Contaminants Identified for the Inventory Area

Reference - Author/Year	Year(s) of Data/Information Collection	Waterway	Overview
Zdepski (1992)	prior to 1992	Newark, NJ groundwater	Discussion of industrial development and land-use practices and their impact on groundwater contamination in Newark, NJ.

Notes:
AK = Arthur Kill
CSO = combined sewer outfall
EIS = environmental impact statement
HK = Hackensack River
IEC = Interstate Environmental Commission
KVK = Kill Van Kull
NB = Newark Bay
NY/NJ = New York/New Jersey
NY/NJ HEP = NY/NJ Harbor Estuary Program
PAHs = polycyclic aromatic hydrocarbons
PCBs = polychlorinated biphenyls
PCDD/Fs = polychlorinated dibenzo-p-dioxins and dibenzofurans
PCDTS = polychlorinated dibenzothiophenes
POTW = publicly owned treatment work
PVSC = Passaic Valley Sewerage Commission
RI/FS = Remedial Investigation and Feasibility Study
USACE = U.S. Army Corps of Engineers

Table 3-92
Quality Assurance/Quality Control Information for Sources Studies

Reference	USEPA Region 2 Data Validation	Quantitative QA/QC[a]	Peer-reviewed Journal Publication	Not Specified	Notes
Battelle (1992c)				X	
Battelle (1993)				X	
Bonin et al. (2000)				X	
Burger (1994)				X	
CBA (1990)				X	
Gunster et al. (1993a)			X		
Gunster et al. (1993b)			X		
Huntley et al. (1994)			X		
Hurley (1992)				X	
Iannuzzi et al. (2002)			X		
IEC (2000 - 2002)				X	
IEC (2003)				X	
IEC (2004)				X	
ISC (1937-1999)				X	
ISC (1995)				X	
Killam (1995)				X	
Malcom Pirnie (1998)				X	
Najarian (1992)				X	
NJDEP (1991)				X	
NJDEP (1994a)				X	
NJDEP (1994b)				X	
NJDWSC (2002)				X	
NOAA (1996)				X	
NY/NJ HEP (unknown)				X	
Shear et al. (1996)			X		
Tierra, 1990		X			
URS (1998)				X	
Walker et al. (1999)				X	
Wenning et al. (1992a)			X		
Wenning et al. (1992b)			X		
Wenning et al. (1993a)			X		
Wenning et al. (1993b)			X		
Wenning et al. (1993c)			X		
Weston (1991)			X		
Wolfskill and McNutt (1998)			X		
Zdepski (1992)				X	

Note:
a. Quantitative QA/QC includes the analysis of field and laboratory duplicates, rinse blanks, matrix spike/matrix spike duplicates and other quantitative measures of precision and accuracy but without specification of implementing USEPA Region 2 data validation procedures.

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Table 3-93
Human Use Studies Identified for the Inventory Area

Reference - Author/Year	Year(s) of Data Collection	Study/Survey Location	General Description
Bard (1942)	precolonial - 1940s	NY/NJ Harbor Estuary	Historical account of the Port of New York Authority, including its formation and role in the NY/NJ Harbor Estuary.
Brydon (1974)	precolonial - 1974	PR	Historical account of the PR.
Burger (2003)	not provided	AK, HK, KVK, NB, PR, Manasquan Inlet, Shark River, Barnegat Inlet	Survey of environmental problems, habitat use, and perceptions about ecosystem management and restoration options.
Burger et al. (1999)	1995	AK, HK, KVK, NB, PR	Survey of risk perceptions of urban anglers, including demographics of anglers and fish consumption estimates.
Conniff and Farlow (2001)	1950 - 2001	HK	Recent uses and changes to the Hackensack Meadowlands in the late 20th century - present including conflicting views of development by local residents, scientists, and politicians.
Cunningham (1988)	precolonial - 1988	NB	Historical account of Newark.
Finley et al. (1997)	1990 - 1995	PR	Risks to human health from exposure to biota with elevated PCB concentrations in the lower PR.
Finley et al. (2003)	2000 - 2001	PR	Expert panel review findings on creel/angler survey of lower PR.
Galishoff (1988)	1800s	NB, PR	Review of human health issues in the Newark area in the 19th century.
Greiling (1993)	prior to 1993	AK	Overview of land use, natural resources, and impacts to the AK and its tributaries.
Headlee (1945)	early 1900s	NB	Documentation of mosquito control measures in the early 1900s in NJ, including the Newark area.
Iannuzzi et al. (2002)	precolonial - 2002	PR	Historical account of the lower PR, including land use, commercial and recreational fishing/crabbing, and recreational water use.
ICF (1994)	1951 - 1994	NB, PR	Overview of community relations plan, outlining the local community profile, involvement, and issues of importance for the lower PR.
Johnson et al. (2000)	1996 - 2001	PR	Model of non-use natural resource damages in the lower Passaic River based on telephone survey data for surrounding counties.
Leary (1891)	colonial - 1891	NB	Historical account of Newark and its citizens.
May and Burger (1996)	1994	AK, Raritan Bay, NJ shore	Survey of risk perceptions of urban anglers, including demographics of anglers and fish consumption estimates.
Mysak and Schiffer (1997)	late 1800s - late 1900s	AK, KVK, NB	Historical account of the Port Authority of NY/NJ.
New Jersey Board of Education (1914)	precolonial - 1914	PR	Historical uses of the PR from pre-colonial period to 20th century.
NJCSMD (1965)	early 1900s	HK	Report of the commission to study development of the Meadowlands, including present land use and ownership.
NJDEP (1985b)	1983	HK, AK, HK, KVK, NB, NJ, PR	Study of toxic hazards to urban recreational anglers and crabbers.
NJDEP (2002b)	posted: May 2002	NJ statewide to site-specific (NB, PR)	Fish, crab health advisories: consumption warnings for general population and high risk individuals.
NJDEP (2002c)	1994 - 2002	NB, PR, AK, HK, KVK	Human health risk assessment for blue crab consumption from the Newark Bay complex.
NJDEP (2003a)	posted: 2003	NJ statewide to site-specific (NB, PR)	Fish, crab health advisories: consumption warnings for general population and high risk individuals.
NJDEP (2003b)	posted: March 2004	NJ statewide to site-specific (NB, PR)	Fish, crab health advisories: consumption warnings for general population and high risk individuals.
NJDEP and NJDHSS (1997)	not provided	NJ statewide to site-specific (NB, PR)	Fish, crab health advisories: consumption warnings for general population and high risk individuals.

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Table 3-93
Human Use Studies Identified for the Inventory Area

Reference - Author/Year	Year(s) of Data Collection	Study/Survey Location	General Description
NJMC (2002)	not provided	HK	Map of green space in Hackensack Meadowlands describing land use, recreational opportunities, wildlife habitat.
NY/NJ HEP (2002)	1900 - 2002	NY/NJ Harbor Estuary	Synthesis of environmental data and information regarding the past and current health of the NY/NJ Harbor Estuary and the human populations that inhabit the surrounding areas.
Olsen (1999)	colonial - 1999	HK, NB, PR	Maritime history of the PR, HK, and NB from colonial times to present day.
Pflugh et al. (1999)	1995	AK, KVK, HK, NB, PR	Survey of risk perceptions of urban anglers, including demographics of anglers and fish consumption estimates.
Pierson (1917)	colonial - 1917	NB	Historical account of Newark and its citizens.
PRC (1982)	not provided	PR	Restoration plans and human uses along the lower portion of the PR.
PRC (1984)	not provided	PR	Restoration plans and human uses along the PR.
PRC (1987)	not provided	PR	Restoration plans and human uses along the lower portion of the PR.
Proctor et al. (2002)	2000 - 2001	PR	Human use survey of lower Passaic River and development of conceptual model for exposure to contaminants.
Rankin (1930)	precolonial- 1930	NB, PR	Historical map of the City of Newark, and summary of historical waterways.
Schnitzer (1962)	late 1800s	NB	Historical information describing the City of Bayonne and recreational uses of NB.
Shaw (1884)	late 1800s	PR	Historical information and maps of the City of Newark.
Strims (1795)	prior to 1800	PR	Land use map of Belleville.
Sullivan (1998)	precolonial - late 1990s	HK	Select information regarding the Hackensack Meadowlands, including history, industrial presence and natural resources.
TER (2001)	2000 - 2001	PR	Creel/angler survey results.
Tierra (1995a)	1995	PR	Surface water and tissue chemical concentration data.
Tierra (1999d)	1999	PR	Sediment and tissue data.
Tierra (2000c)	2000	PR	Sediment and tissue data.
Tierra (2001a)	2001	PR	Tissue and chemical concentration data.
Urquhart (1913)	1666 - 1913	NB, PR	Waterway usage adjacent to the City of Newark, 1666-1913.
USACE (1997c)	prior to 1997	PR	Environmental assessment for Joseph G. Minish Passaic River waterfront park project.
Van Winkle (1847)	early 1800s	NB	Topographical/land use map of Newark.
Von Stackelberg et al. (2002)	not provided	NY/NJ Harbor Estuary	Generic probabilistic model to evaluate human health risks associated with dredge disposal activities.
Wildes (1943)	colonial - industrial revolution	PR	Historical account of the PR and Raritan River.
Williams (1938)	early 1900s	PR	Historic fictional account of life along the PR.
Wright (1988)	precolonial - 1988	HK	Historical uses of the Hackensack Meadowlands from pre-colonial period to 20th century.

Notes:
AK = Arthur Kill
HK - Hackensack River
KVK = Kill Van Kull
NB = Newark Bay
PR = Passaic River

Table 3-94
Quality Assurance/Quality Control Information for Human Use Studies

Reference	USEPA Region 2 Data Validation	Peer-reviewed Journal Publication	Not Specified	Notes
Burger (2003)		X		
Burger et al. (1999)		X		
Conniff and Farlow (2001)			X	
Finley et al. (1997)		X		
Finley et al. (2003)		X		Survey methods reviewed by expert panel
Greiling (1993)			X	
Iannuzzi et al. (2002)			X	
ICF (1994)			X	
Johnson et al. (2001)			X	
May and Burger (1996)		X		
Mysak and Schiffer (1997)			X	
NJDEP (2002b)			X	
NJDEP (2002c)			X	
NJDEP (2003a)			X	
NJDEP (2003b)			X	
NJDEP and NJDHSS (1997)			X	
NJMC (2002)			X	
NY/NJ HEP (2002)			X	
Olsen (1999)			X	
Pflugh et al. (1999)		X		
Proctor et al. (2002)			X	
Sullivan (1998)			X	
TER (2001)			X	Survey methods reviewed by expert panel
Tierra (1995a)			X	
Tierra (1999d)	X			
Tierra (2000c)	X			
Tierra (2001a)	X			
USACE (1997c)			X	
Von Stackelberg et al. (2002)		X		

Table 3-95
Air Quality, Meteorology, and Geology Studies Identified for the Inventory Area

Reference - Author/Year	Matrix	Year(s) of Data Collection	Sampling Locations	Overview
Abrams (1980)	air, water, sediment	prior to 1980	NY/NJ Harbor Estuary	Review of Hg pollution and sources in the Hackensack Meadowlands.
Averill et al. (1980)	geology	prior to 1980	NY/NJ Harbor Estuary	Geological history of the Lower Hudson Region, including the Inventory Area.
Ayres (1987)	air	1880 - 1980	NY/NJ Harbor Estuary	Overview of industrial emission in the NY/NJ Harbor Estuary, including summaries of industrial emissions and point source loadings over a 100-year period.
Chaky (2003)	sediment, air	2001	NY/NJ Harbor Estuary	Direct air measurements taken in the vicinity of the World Trade Center collected after September 11, 2001.
Converse (1983)	geology	prior to 1983	HK	Review of soils and geology of an 1,180-acre site along Sawmill Creek in the Hackensack Meadowlands.
Eisenreich (2000)	air	1997 - 2000	NB	Presents atmospheric total PCB concentrations in NB collected as part of the NJADN.
ERT (1972)	air	not provided	HK	Air quality modeling based a selection of alternative land use plans for the New Jersey Hackensack Meadowlands.
Hartz (1978)	geology, air, water	prior to 1978	HK	Environmental assessment for property in Secaucus, NJ within the Hackensack Meadowlands.
HMDC (1989)	air	1986 - 1987	HK	An evaluation of a study of emissions of VOCs from sanitary landfills in the Hackensack Meadowlands.
HMDC (1992b)	air	1990s	HK	Discusses waterfront development plans and provides a review of air quality conditions and pertinent correspondence with agencies.
Kummel (1898)	geology	prior to 1898	NJ	Geology and topography of NJ.
Lipsky and Galuzzi (1982)	sediment, air, biota	1978	HK	Investigation of Hg contamination in the vicinity of Berry's Creek, Hackensack Meadowlands, NJ. Review and summary of data from other sources.
MERI (2004b)	air, water, meteorology	2002 - 2004	AK, HK, KVK, NB, PR	Searchable database off information from an environmental monitoring network of 3 continuous, automated monitoring stations for weather, water quality, and air quality. Air quality station currently offline. Long-term plan for 15 stations.
NJADN (2004)	air	1997 - 2004	NJ	NJADN quantifies atmospheric deposition samples for target chemicals (PCBs, PAHs, a suite of chlorinated pesticides, selected inorganic chemicals, Hg and nitrogen) at 9 location across NJ.
NJDEP (2002a)	air	2001	NY/NJ Harbor Estuary	Summary air monitoring data including the Air Quality Index, and concentrations of individual pollutants (CO, Pb, NO_x, particulate matter, SO_x, ozone) for NJ, including the NY/NJ Harbor Estuary.
NJDEP (2004b)	air	1990s - 2004	NB, NJ, NY/NJ Harbor Estuary	NJDEP daily and annual summaries of air quality indices for Newark, NJ.
NOAA (2004)	meteorology	1930 - 2004	NB	Historical weather data (temperature and precipitation) at Newark International Airport from 1930 to present.
NOAA/NOS (2004)	air, current, tides	real-time	NY/NJ Harbor Estuary	Realtime measurements and forecasts for multiple points in the NY/NJ Harbor Estuary to assist in navigation.
NY/NJ HEP (1996)	water, biota, habitat, sediments	prior to 1996	NY/NJ Harbor Estuary	Summary of the Comprehensive Conservation and Management Plan of the NY/NJ HEP.
NY/NJ HEP (2004b)	sediment, water, tissue	1990s - 2004	NY/NJ Harbor Estuary	Status of the NY/NJ Harbor Estuary including conditions of habitats and key species, pollution and chemical contamination, pathogens, floatable debris, and nutrients and organic enrichment.
NYSDEC (2002a)	air	2001	AK, KVK, NB, NY/NJ Harbor Estuary	Ambient air monitoring system concentrations of various chemicals (CO, ozone, SO_2, NO_x, As, Cd, Hg, Ni, V).
NYSDEC (2002b)	air	1987 - 2001	NY/NJ Harbor Estuary	Ambient air monitoring system concentrations of various chemicals (CO, ozone, SO_2, NO_x, As, Cd, Hg, Ni, V), including quarterly data for each station.
NYSDEC (2004b)	air	2001	NY/NJ Harbor Estuary	Overview of 2001 monitoring efforts across NY state, including New York Botanical Gardens. Precipitation deposition of acid rain chemicals.

Table 3-95
Air Quality, Meteorology, and Geology Studies Identified for the Inventory Area

Reference - Author/Year	Matrix	Year(s) of Data Collection	Sampling Locations	Overview
Rutgers (2002)	air	1997 - 2001	NY/NJ Harbor Estuary	Objectives and methods of the NJADN, including a summary of concentrations and deposition of SVOCs, inorganic chemicals, PCBs, PAHs, and particulate matter at Jersey City and 8 other locations across NJ.
Saxena et al. (1978)	geology, sediment	1973	HK	Soil and sediment geotechnical description in HK for the purposes of a feasibility study for a railroad link in this region.
Tierra (2003)	surface water, sediment, biota	1995 - 2004	PR	Briefing-level executive summary of the findings to date of the RI/FS being conducted for the lower 6 miles of the Passaic River.
University of PA (1969)	water, biota, geology	prior to 1969	HK	A survey of existing physical conditions of the Hackensack Meadowlands. Overview of history, geology, hydrology, and species inventories. No data provided.
USDOE (1982)	air, water	prior to 1982	AK	Review of impacts of power plant conversion to AK and vicinity.
USEPA (2004)	air	2001 - 2004	NY/NJ Harbor Estuary	Air quality monitoring conducted in vicinity of World Trade Center after September 11, 2001.

Notes:
AK = Arthur Kill
CO = carbon monoxide
HK = Hackensack River
KVK = Kill Van Kull
NB = Newark Bay
NJADN = NJ Atmospheric Deposition Network
NJDEP = New Jersey Department of Environmental Protection
NO_x = nitrous oxide
NR = not reported
NY/NJ = New York/New Jersey
PAHs = polycyclic aromatic hydrocarbons
PCBs = polychlorinated biphenyls
PR = Passaic River
SO_2 = sulfur dioxide
SVOCs = semivolatile organic compounds
VOCs = volatile organic compounds

Table 3-96a
Major Government Initiatives within the Inventory Area[a]

Program	Government Agency	Program Objective	Types of Studies Performed	Description	Sampling Locations Within the Inventory Area	Reported Number of Sampling Locations	Reported Year(s) of Data Collection	Analytes
NY/NJ HEP	USEPA, with representatives from local, state, and federal environmental agencies: Federal - USEPA Region 2; USACE New York District; NOAA, including the OCRM and NMFS; USFWS; NPS; USGS State - NJDEP; NJMC; NJDHHS State - New York: NYSDEC; HRE; NYSDOH Interstate - IEC; PA NY/NJ City - New York City: NYCDEP; New York City Parks and Recreation; New York City Soil and Water Conservation District	HEP is a multi-year effort to develop and implement a plan to protect, conserve, and restore the NY/NJ Harbor Estuary, including the waters of New York Harbor and the tidally influenced portions of all rivers and streams that empty into the Harbor, including AK, HK, KVK, NB, and PR.	Pathogens Floatables Surface water quality Effluents Habitat conservation and remediation Sediment Dredge material management	HEP is a National Estuary Program authorized in 1987 by the USEPA. The program is a multi-year effort to develop and implement a plan to protect, conserve, and restore the estuary. The coverage of the NY/NJ Harbor Estuary includes the waters of New York Harbor and the tidally influenced portions of all rivers and streams that empty into the Harbor, including AK, HK, KVK, NB, and PR.	AK, HK, KVK, NB, PR		ongoing	
NY/NJ HEP CARP	NYSDEC NJDEP USEPA USACE PA NY/NJ NJ Maritime Resources DMMIWG	The CARP is a component of the NY/NJ HEP with an objective to understand the fate and transport of contaminants discharged into the entire estuary, and use this information to take necessary action. Sampling efforts include: Water chemistry and hydrodynamic modeling, CSOs, POTW effluents, SWOs, surface water, sediment, and bioaccumulation studies. CARP is under the management structure of the NY/NJ HEP with the following management committee: Hudson River Foundation, PA NY/NJ, NYSDEC, NJDEP, USACE, USEPA, NJ Maritime Resources, Empire State Development Corp., and DMMIWG. The technical program includes monitoring (NYSDEC - water, loadings, sediment, biota; NJDEP - water, loadings; and USEPA - R-EMAP, research [Rutgers University -atmospheric deposition], and modeling [Manhattan College]). Technical support programs include Quality Assurance and Data Management (Battelle).	CSOs POTW effluents SWOs Surface water sampling Sediment sampling Biota tissue sampling Hydrodynamics modeling	The CARP, a component of the NY/NJ HEP, assists in the identification and quantification of sources of problematic contaminants. Through mass balance predictive models, the consequences of the contaminant loadings are determined on an estuary-wide basis. This information will be used to assist in the application of appropriate regulatory tools to reduce or eliminate the inputs, where feasible.				
	NYSDEC		CSOs POTW effluents SWOs Surface water	Ambient water sampling locations include the HK (2, mid-tidal and mouth), PR (2, mid-tidal and mouth), NB (1), and AK (1, northern). POTW, SWO, and CSO sampling locations include 1 location in the KVK (Port Richmond). Industrial effluent sampling locations include the KVK (1, Clean Waters of NY) and the HK (2).	AK, KVK, NB, PR	water: 6; effluent: 4	1997 - 2001	PCBs (USEPA congener list); PAHs (20); PCDD/Fs (17 congeners); Hg (total, dissolved, methylated, non-methylated); Cd (total, dissolved); Chlordane; DDT; Dieldrin
		CARP is under the management structure of the NY/NJ HEP with the following management committee: Hudson River Foundation, PA NY/NJ, NYSDEC, NJDEP, USACE, USEPA, NJ Maritime Resources, Empire State Development Corp., and DMMIWG. The technical program includes monitoring (NYSDEC - water, loadings, sediment, biota; NJDEP - water, loadings; and USEPA - R-EMAP, research [Rutgers University -atmospheric deposition], and modeling [Manhattan College]). Technical support programs include Quality Assurance and Data Management (Battelle).	Sediment	Sediment data generated from this monitoring effort will be used to identify contaminants of concern, including their concentrations and depths at which they are found, track and identify sources, and identify suitable disposal options for dredged material. The number of surficial and core sampling locations to date include: NB (4), KVK (1), AK (10), Lower PR (2), and the HK (3).	AK, KVK, NB, PR	20	1997 - 2001	PCBs (USEPA congener list); PAHs (20); PCDD/Fs (17 congeners); Hg (total, dissolved, methylated, non-methylated); Cd (total, dissolved); Chlordane; DDT; Dieldrin
			Zooplankton	One of the objectives of this study is to identify and quantify chemical residue concentrations in NY/NJ Harbor Estuary zooplankton to provide an indication of the spatial variability of zooplankton chemical residues present in the harbor estuary ecosystem. This data will assist in an analysis of potential impacts of critical pollutants on harbor estuary ecosystems. Five samples per sampling area were collected in Spring 1999 and Spring 2000.	NB, PR	2	1999 - 2000	Aldrin; BHC isomers; Chlordane compounds; DDT & metabolites; Dieldrin; Endrin; Heptachlor; Heptachlor epoxide; Mirex; Photomirex; Hexachlorobenzene; PCDD/Fs; PAHs (25); Hg; PCB congeners

Table 3-96a
Major Government Initiatives within the Inventory Area[a]

Program	Government Agency	Program Objective	Types of Studies Performed	Description	Sampling Locations Within the Inventory Area	Reported Number of Sampling Locations	Reported Year(s) of Data Collection	Analytes
NY/NJ HEP CARP	NYSDEC		Benthic invertebrates	One of the objectives of this study is to identify and quantify chemical residue concentrations in representative NY/NJ Harbor Estuary benthic invertebrates to provide an indication of the spatial and temporal variability of chemical residues in benthic invertebrates present in the harbor estuary ecosystem. This data will assist in an analysis of potential impacts of critical pollutants on harbor estuary ecosystems. Six samples of representative species from each species group (bivalves, polychaetes, decapods, or arthropods) were collected at each of the sampling sites indicated above during early Summer 1999. For bivalves, additional samples were collected in winter 1998-1999, spring 1999, and fall 1999. A total of 255 samples were taken study-wide.	NB, PR	2	1998 - 1999	Aldrin; BHC isomers; Chlordane compounds; DDT & metabolites; Dieldrin; Endrin; Heptachlor; Heptachlor epoxide; Mirex; Photomirex; Hexachlorobenzene; PCDD/Fs; PAHs (25); Hg; PCB congeners
			Fish and crustaceans	One of the objectives of this study is to provide a baseline assessment of selected chemical residue concentrations in representative fish and crustaceans taken from the NY/NJ Harbor Estuary. The database of chemical residues generated through this data collection will be useful for developing predictions of chemical changes in aquatic biota and piscivorous avifauna as a consequence of proposed dredging of the NY/NJ Harbor Estuary, or other chemical control actions in the harbor estuary ecosystem. Total of 105 blue crab (*Callinectes sapidus*) muscle and hepatopancreas samples study-wide, and a total of 586 fish tissue samples study-wide from 5 key species: mummichog (*Fundulus heteroclitus*) whole body, white perch (*Morone americana*) fillet, American eels (*Anguilla rostrata*) fillet, striped bass (*Morone saxatilus*) fillet and liver; winter flounder (*Pseudopleuronectes americanus*) fillet and liver.	NB, PR	2	1998 - 1999	Aldrin; BHC isomers; Chlordane compounds; DDT & metabolites; Dieldrin; Endrin; Heptachlor; Heptachlor epoxide; Mirex; Photomirex; Hexachlorobenzene; PCDD/Fs; PAHs (25); Hg; PCB congeners
			Double-crested cormorant (*Phalacrocorax auritus*)	Objectives of this survey include: measure concentrations of bioaccumulative chemical compounds in double-crested cormorant eggs, blood, and breast feathers; provide baseline information on current levels of toxic substances present in cormorant populations; assess the feasibility and potential benefit of a long-term cormorant monitoring project to assist in the evaluation of harbor estuary ecosystem health; and assess and compare the potential impact of chemical contaminants on reproductive success and bill deformities in double-crested cormorant populations. Cormorant egg, blood, and feather collection during a 1 time sampling event May-June 1998. Total of 30 cormorant samples including. - 10 egg samples per colony, one egg per completed clutch of eggs. - 10 blood samples from each colony of cormorants. - 10 feather samples will be taken from each colony of cormorants.	KVK (Shooter's Island)	1	1998	Aldrin; BHC isomers; Chlordane compounds; DDT & metabolites; Dieldrin; Endrin; Heptachlor; Heptachlor epoxide; Mirex; Photomirex; Hexachlorobenzene; PCDD/Fs; PAHs (25); Hg; PCB congeners
	NJDEP	The New Jersey Toxics Reduction Workplan, a component of the NY/NJ HEP CARP, is to develop an understanding of the contaminant transport pathways within the estuary though water quality and hydrodynamic modeling studies in major NJ tributaries that discharge to NY/NJ Harbor Estuary.	Water chemistry and hydrodynamic modeling	Hydrodynamic and water and suspended sediment quality studies were completed in NB, AK, and KVK under this program. This work is coordinated with water and sediment quality sampling studies undertaken at the head-of-tide and within the tidal reaches of the major NJ tributaries that discharge to NY/NJ Harbor Estuary. One of the objectives of this study is to develop an understanding of the contaminant transport pathways within the estuary. The program uses a combination of 3 fixed mooring stations and 5 shipboard measurement locations.	AK, KVK, NB, NY/NJ Harbor Estuary	8 (3 fixed mooring, 5 shipboard)	1999 - 2001	PCBs (USEPA congener list); PAHs (20); PCDD/Fs (17 congeners); Hg (total, dissolved, methylated, non-methylated); Cd (total, dissolved); Chlordane; DDT; Dieldrin; Hydrodynamic measurements
NS&T Program	NOAA	The NS&T conducts long-term monitoring of temporal trends in chemical contaminations and its biological effects, and participates in local, regional, national, and international projects related to coastal monitoring and assessment.	Long-term monitoring of contaminants in sediment and biota	The NS&T conducts long-term monitoring of contaminants; studies biotic effects; and participates in local, regional, national, and international projects related to coastal monitoring and assessment. Spatial trends in chemical concentrations can be obtained from data among all NS&T sites. There are 3 major projects carried about under this program: Bioeffects Assessment Project: Regional studies based on the SQT. Benthic Surveillance Project: completed long-term database of sediment, fish liver, fish bile chemistry of over 80 organic and inorganic contaminants. Mussel Watch Project: ongoing long-term database of sediment and bivalve tissue chemistry of over 80 organic and inorganic contaminants.	NB, NY/NJ Harbor Estuary	1991: NB - 2; 1993: AK-4, HK-8, KVK-1, NB-32, PR-11	ongoing	Toxicity tests and chemical analyses of >80 organic and inorganic contaminants, including PAHs and PCBs.

Table 3-96a
Major Government Initiatives within the Inventory Area[a]

Program	Government Agency	Program Objective	Types of Studies Performed	Description	Sampling Locations Within the Inventory Area	Reported Number of Sampling Locations	Reported Year(s) of Data Collection	Analytes
R-EMAP	USEPA	R-EMAP goal is to generate assessments of current ecological condition and forecasts of future risks to natural resources based on environmental monitoring data from multiple spatial and temporal scales.	Sediment chemistry; Amphipod toxicity tests; Benthic invertebrate; Community characterization	R-EMAP is a research program designed to develop the tools necessary to monitor and assess the status and trends of regional and local ecological resources. R-EMAP's goal is to develop the scientific understanding for translating environmental monitoring data from multiple spatial and temporal scales into assessments of current ecological condition and forecasts of future risks to natural resources.	AK, KVK, NB	1993-1994: 28; 1998: 29	1993 - 1994; 1998	Sediment toxicity tests with amphipods, Microtox™, biological community analysis, and sediment chemistry analysis: PAHS (23), DDT and metabolites, chlorinated pesticides other than DDT (10), inorganics (16), butlytins, PCB congeners, PCDD/F congeners (16), AVS/SEM, grain size, TOC, Clostridium
NY/NJ HDP	USACE New York District	The objective of the NY/NJ HDP is to determine, design, manage and coordinate ongoing and future navigational projects of the New York/New Jersey Harbor.	Biological community surveys; Water quality; Sediment chemistry; Sediment toxicity; Geotechnical characteristics; Stratigraphy; Hydrodynamic modeling; Tidal data; Temperature	Activities within the NY/NJ Harbor Estuary include deepening projects, recurring or operations and maintenance efforts, and investigations and planning for future development of the channels. Important navigation projects for the Port of NY/NJ include the KVK and NB Federal Channels Deepening, the AK Channel Howland Hook Marine Terminal Deepening, the Port Jersey Channel Deepening, and the NY/NJ Harbor Navigation Study, and the DMMP.	AK, KVK, NB	ichthyoplankton: 7; fish: 8	plankton: 2001 - 2003; fish: 1998 - 2003; sediment: 1993, 1995	Geotechnical characteristics; Biological community surveys
DMMP for the Port of New York and the State of New Jersey	USACE New York District	The DMMP identifies and implements various options to manage dredged material generated from both the federal and non-federal maintenance and deepening of the Port through the year 2040.	Dredged material management	NY Harbor encompasses approximately 2 dozen separately authorized and maintained Federal navigation channels. The DMMP process seeks to identify and implement options to manage the material generated from both the federal and non-federal maintenance and deepening of the Port through the year 2040. As part of this plan, beneficial uses are explored, including the use of dredged material as fill for embankments and foundations, beach nourishment, habitat creation, and land site remediation.	AK, KVK, NB			Geotechnical characteristics; Sediment chemistry and toxicity
Hudson-Raritan Estuary Ecosystem Restoration Project (HRE Project)	USACE New York District	The HRE Project assists in the identification of actions needed for comprehensive restoration of the HRE in New York and New Jersey. Projects include tidal wetland and riparian habitat restoration, and the re-establishment of adequate drainage in support	Restoration of impacted habitat	The HRE Project will assist in the identification of actions needed for comprehensive restoration of the HRE in NY and NJ. The HRE Project study area includes all the waters of NY/NJ Harbor Estuary and the tidally influenced portions of all rivers and streams that empty into and ecologically influence the harbor. Thirteen representative sites have been identified for the project, inlcuding the following 3 areas in the Inventory Report area: Old Place Creek, Richmond, NY - Restoration opportunities in Old Place Creek include fill removal and regrading to support tidal wetland restoration, bridge abutment and culvert modifications to enhance tidal flow, reconnection between Old Place Creek and Bridge Creek, development of freshwater inputs, and riparian habitat restoration. Rahway River, Union, NJ - Restoration opportunities along the right descending bank include fill removal, enhancement of tidal influence, and wetland restoration. Kearny Marsh, NJ - Restoration opportunities at Kearny Marsh include re-establishment of adequate drainage in support of emergent wetland and riparian habitat restoration.	AK (Old Place Creek), RW, Hackensack Meadowlands (Kearny Marsh)	3	ongoing	
USACE New York District Urban Rivers Restoration Initiative	USACE New York District USEPA In collaboration with: NJDEP NOAA USFWS	The Urban Rivers Restoration Initiative assists in the identification and proposal of restoration initiatives, including riparian habitat restoration, enhancement of water quality, reduction of contaminants.	Restoration of impacted habitat	The Lower PR Ecosystem Restoration Study provides information on the remediation and restoration of this urban river segment. Restoration initiatives include riparian habitat restoration, enhancement of water quality, an increase in recreational functions, a removal of fish consumption bans, reduction of contaminant levels in dredged materials and an overall beneficial impact to this waterway.	PR	1	ongoing	

Table 3-96a
Major Government Initiatives within the Inventory Area[a]

Program	Government Agency	Program Objective	Types of Studies Performed	Description	Sampling Locations Within the Inventory Area	Reported Number of Sampling Locations	Reported Year(s) of Data Collection	Analytes
CERLCA	USEPA	CERCLA sites may pose risks to human health and the environment and require further investigation into their potential inputs (surface water, groundwater, sediment, air) temporally and spatially to the Inventory Area.	Various ongoing investigations: sediment chemistry surface water and groundwater chemistry bioaccumulation biological communities	Sites that are on the CERCLA Final NPL within the Inventory Area include the following: LCP Chemicals Inc. (EPA ID: NJD079303020) located in the vicinity of the mid-AK in Linden, NJ; Chemical Control (EPA ID: NJD000607481), located in the vicinity of the upper AK in Elizabeth, NJ; White Chemical Corp. (EPA ID: NJD980755623) located in Newark, NJ; PJP Landfill (EPA ID: NJD980505648), located in the vicinity of the lower HK in Jersey City, NJ; Syncon Resins (EPA ID: NJD064263817), located in the vicinity of the lower PR in South Kearny, NJ; Diamond Alkali Co. (EPA ID: NJD980528996), located in the vicinity of the lower PR in Newark, NJ; Diamond Head Oil Refinery Div. (EPA ID: NJD092226000), located in the vicinity of the lower PR in Kearny, NJ. A full list of CERCLA sites that exist in the Inventory Area and their regulatory classification status as of April 2004 are provided in Table 3-96b.				

Notes:
a. This table contains a brief summary and breakdown of major government initiatives that include the Inventory Area. The table is based on information summarized from available internet sites and recent reports contained in the bibliography for this Inventory Report.

AK = Arthur Kill
BHC = beta hexachlorocyclohexane
CERCLA = Comprehensive Environmental Response, Compensation, and Liability Act
CSOs = combined sewer outfalls
DMMIWG = Dredged Materials Management Integration Work Group
DMMP = Dredged Material Management Plan
HDP = Harbor Deepening Project
HEP = Harbor Estuary Program
HK = Hackensack River
HRE = Hudson-Raritan Estuary
IEC = Interstate Environmental Commission
KVK = Kill Van Kull
NB = Newark Bay
NJDEP = New Jersey Department of Environmental Protection
NJDHHS = New Jersey Department of Health and Human Services
NJMC = New Jersey Meadowlands Commission
NMFS = National Marine Fisheries Service
NOAA = National Oceanic and Atmospheric Administration
NPL = National Priorities List
NPS = National Park Service
NS&T = National Status and Trends
NY/NJ = New York/New Jersey
NYSDEC = New York State Department of Environmental Conservation
NYSDOH = New York State Department of Health
NYCDEP - New York City Department of Environmental Protection
OCRM = Office of Coastal and Resource Management
PA NY/NJ = Port Authority of New York/New Jersey
PAHs = polycyclic aromatic hydrocarbons
PCBs = polychlorinated biphenyls
PCDD/Fs = polychlorinated dibenzo-*p*-dioxins and dibenzofurans
POTW = publicly-owned treatment plant
PR = Passaic River
R-EMAP = Regional Environmental Monitoring and Assessment Program
RW = Rahway River
SQT = sediment quality triad
SWOs = stormwater outfalls
TOC = total organic carbon
USACE = U.S. Army Corps of Engineers
USEPA = U.S. Environmental Protection Agency
USFWS = U.S. Fish and Wildlife Survey
USGS = U.S. Geological Survey

Related Internet Sites
http://www.harborestuary.org/
http://www.carpweb.org http://www.hudsonriver.org/sources.htm

Related Internet Sites
http://carpweb.org http://www.dl.stevens-tech.edu/newark_bay/newark_bay_intro.htm
http://nsandt.noaa.gov/

Related Internet Sites
http://www.epa.gov/emap/remap/index.html
http://www.nan.usace.army.mil/harbor/
http://www.nan.usace.army.mil/business/prjlinks/dmmp/
http://www.hudsonraritanrestoration.org
http://www.epa.gov/oswer/landrevitalization/download/factsheet_Passaic.pdf

Related Internet Sites
http://www.epa.gov/superfund/action/law/cercla.htm

Table 3-96b

Known Contaminated Sites within or in Counties Immediately Surrounding the Inventory Area

County	City	Site Name	EPA ID	NPL Status
Essex	Cedar Grove	Essex County Hospital Center - Hill Top	NJD982797045	N
Essex	Fairfield Township	Fairfield Textiles	NJD080630049	N
Essex	Fairfield	Caldwell Trucking Co.	NJD048798953	F
Essex	Glen Ridge	Glen Ridge Radium Site	NJD980785646	F
Essex	Irvington	Scott Associates	NJ0000760934	N
Essex	Irvington	Silsonix Corp	NJD980788962	N
Essex	Maplewood	Boyden Avenue Site	NJD002162824	N
Essex	Montclair/West Orange	Montclair/West Orange Radium Site	NJD980785653	F
Essex	Newark	Brady Iron & Metal Co	NJD981877764	A
Essex	Newark	Diamond Alkali Co.	NJD980528996	F
Essex	Newark	White Chemical Corp.	NJD980755623	F
Essex	Newark	Arkansas Company	NJD002155703	N
Essex	Newark	Avenue P Site	NJD980504831	N
Essex	Newark	Bayonne Drum & Barrel Co	NJD009871401	N
Essex	Newark	Celanese Chemical Former Facility	NJD986610848	N
Essex	Newark	Cellofilm Corporation	NJD000813451	N
Essex	Newark	Central Steel Drum Co	NJD011482577	N
Essex	Newark	Dreco, Inc.	NJD982737793	N
Essex	Newark	Fairmont Chemical	NJD002151322	N
Essex	Newark	Federal Pacific Electric Company	NJD002146272	N
Essex	Newark	General Color Co.	NJD000542258	N
Essex	Newark	Jobar Packaging Inc.	NJD000729780	N
Essex	Newark	Maas And Waldstein Hwy	NJD002194454	N
Essex	Newark	Norpak Corp.	NJD056700487	N
Essex	Newark	Petro-Chem Resources Co Inc.	NJD130486327	N
Essex	Newark	Pierson's Creek	NJSFN0204211	N
Essex	Newark	Reichold Chemicals, Inc	NJD048797195	N
Essex	Newark	Royal Recovery Systems	NJ0001021708	N
Essex	Newark	T&J Lf	NJD000416420	N
Essex	Newark	Tidewater Baling	NJD011534708	N
Essex	Newark	Newark Lamp Plant/General Electric Co.	NJD002454213	N
Essex	North Caldwell	Orient Way Radiation	NJN000204419	N
Essex	Nutley	Atlantic Chemical Manufacturing Company	NJD002177186	N
Essex	Nutley	L. Sonneborns Sons, Inc.	NJ0001015940	N
Essex	Orange	U.S. Radium Corp.	NJD980654172	F
Essex	Roseland	Amphenol Products, Severna Operations	NJD150056166	N
Essex	Roseland	Intedge Industries Inc.	NJD002184380	N
Essex	West Orange	Selectro Flash Incorporated	NJD002148799	N
Hudson	Bayonne	Atlas Yacht Club	NJD982187403	N
Hudson	Bayonne	Bayonne City Dump	NJD980504849	N

Table 3-96b

Known Contaminated Sites within or in Counties Immediately Surrounding the Inventory Area

County	City	Site Name	EPA ID	NPL Status
Hudson	Bayonne	Standard Tank Cleaning Corp	NJD068292648	N
Hudson	Hoboken	Grand Street Mercury	NJ0001327733	F
Hudson	Jersey City	Pjp Landfill	NJD980505648	F
Hudson	Jersey City	City Chemical Corp	NJD001306414	N
Hudson	Jersey City	Dye Specialties Inc	NJD981563687	N
Hudson	Jersey City	Eighth Street Site	NJD986571115	N
Hudson	Jersey City	Jersey City Chromium Waste Site	NJD980766729	N
Hudson	Jersey City	Jersey City Chromium Waste Site	NJD980766752	N
Hudson	Jersey City	Jersey City Chromium Waste Site	NJD980766745	N
Hudson	Jersey City	Jersey City Chromium Waste Site	NJD980766737	N
Hudson	Jersey City	Pittsburgh Metals & Graphics	NJD981490295	N
Hudson	Jersey City	Woodward Metal Processing	NJD052438355	N
Hudson	Jersey City / Hoboken	Conrail-Yard	NJD980770036	N
Hudson	Kearny	Diamond Head Oil Refinery Div.	NJD092226000	F
Hudson	Kearny	A T & T Technologies Co	NJD002139053	N
Hudson	Kearny	Conrail-Meadows Yard	NJD980770028	N
Hudson	Kearny	Kearny Drum Dump #2	NJD980770069	N
Hudson	Kearny	Kearny Drum Dump #4	NJD980770085	N
Hudson	Kearny	Kearny Drum Dump #5	NJD980770093	N
Hudson	Kearny	Keegan Landfill	NJD981490428	N
Hudson	Kearny	Koppers Co Inc /Seaboard Plant	NJD002445112	N
Hudson	Kearny	St Johnsbury Trucking	NJD046945218	N
Hudson	Kearny	Standard Chlorine Chem Co Inc	NJD002175057	P
Hudson	North Arlington	P&M Sanitation	NJD081895153	N
Hudson	South Kearny	Syncon Resins	NJD064263817	F
Union	Elizabeth	Chemical Control	NJD000607481	F
Union	Elizabeth	Exact Anodizing Corp	NJR000004200	N
Union	Hillside	Ra Johnston Co	NJD000576918	N
Union	Linden	Lip Chemicals Inc.	NJD079303020	F
Union	Linden	Chevron Use Inc	NJD000632174	N
Union	Linden	Solar Compounds Corp	NJD002180255	N
Union	Linden	Texas Eastern Gas Pipeline	NJD982181182	N
Union	Plainfield City	Haller Testing Laboratories, Inc	NJD986578284	N
Union	Rahway	Rahway River Voc Contamination	NJN000204277	N
Union	Rahway	Warwick Laboratories Inc	NJD001613306	N
Union	Roselle Park	Roselle Park Baseball Fields	NJSFN0204259	N
Union	Springfield	Atlantic Metal Products, Inc.	NJD350010724	N
Union	Springfield	Republic Metal Products	NJD055082259	N
Union	Springfield Twp	General Electric Co.	NJD053524450	N
Union	Union	Best Foods Res And Eng Center	NJD065827925	N

Table 3-96b

Known Contaminated Sites within or in Counties Immediately Surrounding the Inventory Area

County	City	Site Name	EPA ID	NPL Status
Union	Union	Griffith Laboratories	NJD002185791	N
Union	Union	Schaeffer Salts	NJN000204293	N

Notes:
A = site is part of NPL site
D = deleted from the final NPL
F = currently on the final NPL
N = not on the NPL
NPL = National Priority List
P = proposed for NPL