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TABLE 3-1
SUMMARY OF CHEMICALS OF POTENTIAL CONCERN IN GROUNDWATER BASED ON THE BHHRA AND NJDEP VISL[1]
FEASIBILITY STUDY REPORT
RIVERSIDE INDUSTRIAL PARK SUPERFUND SITE
NEWARK, NEW JERSEY

Chemical	CASRN	Groundwater		
		Deep	Shallow	
		Tapwater	Tapwater	Vapor Intrusion
Acetone	67-64-1		Yes	
Benzene	71-43-2	Yes	Yes	Yes
Bromodichloromethane	75-27-4		Yes	
Carbon Tetrachloride	56-23-5		Yes	
Chloroform	67-66-3	Yes	Yes	
1,2-Dibromo-3-chloropropane	96-12-8		Yes	Yes
1,4-Dichlorobenzene	106-46-7		Yes	
1,3-Dichloropropene (total)	542-75-6		Yes	Yes
1,4-Dioxane	123-91-1	Yes	Yes	
Ethyl Benzene	100-41-4		Yes	
2-Hexanone	591-78-6		Yes	
1,1,2,2-Tetrachloroethane	79-34-5	Yes	Yes	
Toluene	108-88-3		Yes	
1,2,4-Trichlorobenzene	120-82-1		Yes	
1,1,2-Trichloroethane	79-00-5	Yes	Yes	
Trichloroethene	79-01-6		Yes	
Vinyl Chloride	75-01-4		Yes	
Xylenes (total)	1330-20-7		Yes	Yes
Benzo(a)anthracene	56-55-3	Yes	Yes	
Benzo(a)pyrene	50-32-8	Yes	Yes	
Benzo(b)fluoranthene	205-99-2		Yes	
1,1-Biphenyl	92-52-4		Yes	
bis(2-Ethylhexyl)phthalate	117-81-7		Yes	
4-Chloroaniline	106-47-8		Yes	
Dibenz(a,h)anthracene	53-70-3		Yes	
Indeno(1,2,3-cd)pyrene	193-39-5		Yes	
Naphthalene	91-20-3	Yes	Yes	Yes
Pentachlorophenol	87-86-5		Yes	
PCBs (total)	1336-36-3		Yes	
Antimony	7440-36-0		Yes	
Arsenic	7440-38-2	Yes	Yes	
Barium	7440-39-3		Yes	
Cyanide (total)	57-12-5	Yes	Yes	
Iron	7439-89-6	Yes	Yes	
Lead	7439-92-1		Yes [2]	
Manganese	7439-96-5	Yes	Yes	

Notes:
1. Based on BHRRA (Ramboll April 2020) for hypothetical potable use of groundwater at the Site. Groundwater use is unlikely since the Site and surrounding area are served by the City of Newark's potable water system, and the site-specific conductivity readings of the shallow groundwater indicate possible brackish conditions.
2. Based on comparison of detected concentrations to the USEPA Action Level for lead in drinking water.

TABLE 3-2
CHEMICAL-SPECIFIC ARARs AND TBCs
FEASIBILITY STUDY REPORT
RIVERSIDE INDUSTRIAL PARK SUPERFUND SITE
NEWARK, NEW JERSEY

ARAR/TBC	Regulatory Level	Citation	Brief Description	Applicability
Federal Safe Drinking Water Act - National Primary Drinking Water Standards - Maximum Contaminant Level Goals (MCLGs) and Maximum Contaminant Levels (MCLs)	Federal	40 CFR 141	Establishes drinking water standards.	The New Jersey Class IIA Ground Water Quality Standards are applicable to the active remedial alternatives, as all such alternatives include remediation of groundwater. Groundwater at the Site is not used as a drinking water source.
EPA Memorandum "Updated Scientific Consideration for Lead in Soil Cleanups"	Federal	OLEM Direction 9200.2-167 (December 22, 2016)	Guidance on development of residential lead cleanup criterion for Superfund sites using Integrated Exposure Uptake and Biokinetic models and current scientific conclusions to determine soil screening levels (such as 10 µg/dL blood lead levels for children).	The memorandum will be considered in development of the cleanup level.
New Jersey Ground Water - Ground Water Quality Standards	State	N.J.A.C. 7:9C	Defines groundwater classifications and establishes groundwater quality standards for various compounds. The site groundwater is classified as Class IIA suitable for drinking water.	New Jersey classifies groundwater as Class IIA groundwater, considered suitable for drinking water.
NJ Water Statues and Rules - Primary Drinking Water Standards - MCLs	State	N.J.A.C. 7-10	Establishes state discretionary MCLs that are generally equal to or more stringent than federal Safe Drinking Water Act MCLs.	The standards will be considered in developing PRGs.
NJ Water Statues and Rules - State Secondary Drinking Water Standards - Secondary MCLs	State	N.J.A.C. 7:10	Establishes standards for public drinking water systems for those contaminants which impact the aesthetic qualities of drinking water.	The standards will be considered in developing the PRGs.
EPA Regional Screening Levels (NRSLs) for non-residential soil	Federal		Establishes risk-based screening levels for soil cleanups for the protection of human health and the environment.	The screening levels will be considered in the development of the PRGs if there are no applicable standards.
TSCA	Federal	40 C.F.R. Part 761.61	Provides PCB soil cleanup levels for low/high occupancy areas.	The cleanup levels will be considered to develop the PRGs for the Site.
New Jersey Non-Residential Direct Contact Soil Remediation Standards	State	N.J.A.C. 7:26D-4	Establishes standards for NJ soil cleanups.	The standards will be considered in developing the PRGs.
NJDEP Guidance Document for Development of Impact to Groundwater Soil Remediation Standards, November 2013	State		Guidance on determining site-specific impact to groundwater soil remediation standards.	The criteria will be considered in developing the PRGs.
NJDEP Groundwater Vapor Intrusion Screening Levels (VISLs)	State		Provides groundwater screening level related to vapor intrusion investigation.	Screening levels considered in FS.

Legend

ARAR - Applicable, Relevant, or Appropriate Requirement
TBC - Advisories, Criteria, and Guidance To Be Considered
C.F.R. – Code of Federal Regulations
EPA – United States Environmental Protection Agency
MCL – Maximum Contaminant Level
OLEM – Office of Land and Emergency Management
N.J.A.C. – New Jersey Administrative Code
PRG – Preliminary Remediation Goal
RSL – Regional Screening Level
TSCA – Toxic Substances Control Act
µg/dL – micrograms per deciliter

TABLE 3-3
LOCATION-SPECIFIC ARARs AND TBCs
FEASIBILITY STUDY REPORT
RIVERSIDE INDUSTRIAL PARK SUPERFUND SITE
NEWARK, NEW JERSEY

ARAR/TBC	Regulatory Level	Citation	Brief Description	Applicability
Clean Air Act, Standards of Performance for New Stationary Sources	Federal	40 CFR Part 60	Air emissions standards apply to owners and operators of stationary sources.	During excavation, treatment, and/or stabilization, air emissions will be properly controlled and monitored to comply with these standards.
Clean Air Act, National Emission Standards for Hazardous Air Pollutants	Federal	40 CFR Part 61	Provide air quality standards for hazardous air pollutants.	During excavation, treatment, and/or stabilization, air emissions will be properly controlled and monitored to comply with these standards.
Clean Air Act, National Primary and Secondary Ambient Air Quality Standards (NAAOS)	Federal	40 CFR Part 50	Establishes national ambient air quality standards with respect to health-based criteria.	Potential ARAR for remedial activities which emit contaminants into the atmosphere.
New Jersey Air Pollution Control Act	State	N.J.A.C. 7:27-22 N.J.S.A. 26:2C	Describes requirements and procedures for obtaining air permits and certificates; rules that govern the emission of contaminants into the ambient atmosphere.	This standard would apply to air emissions from remediation activities performed at the site.
Subsurface and Percolating Waters Act and Well Construction, Maintenance, and Sealing Rules	State	NJSA 58:4A-5 et seq. and N.J.A.C. 7:9D	Requirements for drilling and installing wells, licensing of well driller and pump installer, constructions, and well casing specifications.	Applicable to active remedial alternatives that include the installation of monitoring wells, extraction wells, or reinjection wells.
New Jersey Pollutant Discharge Elimination System	NJDEP	N.J.A.C. 7:14A	This permit governs the discharge of any wastes into or adjacent to State waters that may alter the physical, chemical, or biological properties of State waters, except as authorized pursuant to a NPDES or State permit.	Alternative water surface discharge will meet NPDES permit equivalency requirements.
Administrative Requirement for the Remediation of Contaminated Sites (ARRCS)	State	N.J.A.C. 7:26C	Establishes a new paradigm for the remediation of contaminated sites in New Jersey, including the requirement that a person responsible for conducting the remediation employ a licensed site remediation professional (LSRP) to supervise the remediation.	Applicable to active remedial alternatives for supervising the actions taken in accordance with the State of New Jersey technical regulations. Not applicable for a Superfund site.
New Jersey Technical Requirements for Site Remediation	State	N.J.A.C. 7:26E	This regulation provides the minimal technical requirements to investigate and remediate contamination at the site.	The regulation will be applied to any hazardous waste operation during remediation of the site.
New Jersey Freshwater Wetland Protection Act	State	N.J.A.C. 7:7A	Establishes requirements for the protection of freshwater wetlands. Requires permit equivalency for construction within wetland areas.	Potentially applicable for investigation and construction activities performed in the vicinity of a wetland or waterway.
Flood Hazard Area Control Act Rules	State	N.J.A.C. 7:13	Requires placement of fill, grading and other disturbances within floodplain.	Potential ARAR for remedial activities are located in or near a 100-or 500-year floodplain
Flood Hazard Area Control Act	State	N.J.A.C. 58: 16A-50	Delineates flood hazard areas and regulates use.	Potential ARAR for remedial activities are located in or near a 100- or 500-year floodplain.
Section 10 of the Rivers and Harbors Act of 1899	Federal	33 U.S.C. § 403, 33 C.F.R. Part 322	Governs coordination with the U.S. Army Corps of Engineers with regard to work at or below mean high water, including management of fill materials and vertical barrier.	On-site activities would be properly conducted to minimize adverse effects.
Coastal Zone Management Act (CZMA)	Federal	16 U.S.C.§ 1451, et seq. Federal Consistency Regulations, 15 C.F.R. Part 930	This act encourages states to develop coastal management plans to manage competing uses of and impacts to coastal resources, and to manage sources of nonpoint source pollution in coastal waters. The CZMA Federal Consistency Determination provisions require that any federal agency undertaking a project in the coastal zone of a state shall insure that the project is, to the maximum extent practicable, consistent with the enforceable policies of approved state management programs. Implemented through compliance with substantive requirements of New Jersey Waterfront Development Law and Coastal Zone Management Rules, N.J.A.C. 7:7.	Remedy will be consistent, to the extent practicable, with enforceable policies of approved state management programs.
Coastal Zone Management Rules	State	N.J.A.C. 7:7E	This program establishes standards for use and development of coastal resources.	Remedy will be consistent with substantive provisions of these regulations.
Statement of Procedures on Floodplain Management and Wetlands Protection	Federal	40 C.F.R. Part 6, Appendix A	This Statement of Procedures sets forth Agency policy and guidance for carrying out the provisions of Executive Order (EO) 11988 and EO 11990.	Remedy will be consistent, to the extent practicable, with these regulations.

TABLE 3-3
LOCATION-SPECIFIC ARARs AND TBCs
FEASIBILITY STUDY REPORT
RIVERSIDE INDUSTRIAL PARK SUPERFUND SITE
NEWARK, NEW JERSEY

ARAR/TBC	Regulatory Level	Citation	Brief Description	Applicability
Protection of Wetlands	Federal	Executive Order 11990	This Executive Order prohibits any federally-funded construction projects in wetlands unless there are no practicable alternatives to such construction, and the proposed action includes all practicable measures to minimize harm to wetlands which may result from such use.	Remedy will be consistent, to the extent practicable, with this policy.
Policy on Floodplains and Wetlands Assessments for CERCLA Actions	Federal	OSWER Directive 9280.0-02, 1985	Superfund actions must meet the substantive requirements of EO 11988, EO 11990, and 40 C.F.R. Part 6, Appendix A. This memorandum discusses situations that require preparation of a floodplains assessment, and the factors that should be considered in preparing an assessment, for response actions taken pursuant to Section 104 or 106 of CERCLA.	Remedy will be consistent, to the extent practicable, with this policy.
Floodplain Management	Federal	Executive Order 11988, as amended by Executive Order 13690	Federal agencies are required to reduce the risk of flood loss, to minimize the impact of floods, and to restore and preserve the natural and beneficial values of floodplains.	The potential effects of any action will be evaluated to ensure that the planning and decision making reflect consideration of flood hazards and floodplains management, including restoration and preservation of natural undeveloped floodplains.
New Jersey Freshwater Wetlands Protection Act Rules	State	N.J.S.A.13:981, N.J.A.C. 7:7A	Regulates construction or other activities (including remedial action) that will have an impact on a river.	Best management practices will be used to avoid or minimize adverse impact to aquatic habitat, consistent with substantive requirements of N.J.A.C. 7:7A.
New Jersey Flood Area Control Act Rules	State	N.J.A.C. 7:13	Regulates activities (including remedial action) within flood hazard areas that will impact stream carrying capacity or flow velocity to avoid increasing impacts of flood waters, to minimize degradation of water quality, protect wildlife and fisheries, and protect and enhance public health and welfare.	This requirement will be evaluated during the development of alternatives along with the planned remedy for actions in flood hazard areas.
Fish and Wildlife Coordination Act	Federal	16 U.S.C. § 661-666c	Requires consideration of the effects of a proposed action on wetlands and areas affecting streams (including floodplains), as well as other protected habitats. Calls for federal agencies to consult with the United States Fish and Wildlife Service (USFWS) and the appropriate state agency with jurisdiction over wildlife resources prior to issuing permits or undertaking actions involving the modification of any body of water (including impoundment, diversion, deepening, or otherwise controlled or modified for any purpose).	EPA will consult with USFS and the state.
Migratory Bird Treaty Act	Federal	16 U.S.C. 703 et seq.	Prohibits the taking of protected migratory bird species, including individual birds or their nests or eggs, unless otherwise permitted.	To be considered during the development of alternatives.
National Historic Preservation Act	Federal	54 U.S.C. § 300101, et seq., 36 C.F.R. Part 800	Establishes procedures to provide for preservation of historical and archeological data that might be destroyed through alteration of terrain as a result of a federal construction project or a federally licensed activity or program.	The RI included a CRS survey with findings of no archeological resource present at the site (RIR, Appendix N).

Legend

ARAR - Applicable, Relevant, or Appropriate Requirement
TBC - Advisories, Criteria, and Guidance To Be Considered
C.F.R. – Code of Federal Regulations
EPA – United States Environmental Protection Agency
N.J.A.C. – New Jersey Administrative Code
U.S.C - United States Code
OSWER - Office of Solid Waste and Emergency Response
CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act

TABLE 3-4
ACTION-SPECIFIC ARARs AND TBCs
FEASIBILITY STUDY REPORT
RIVERSIDE INDUSTRIAL PARK SUPERFUND SITE
NEWARK, NEW JERSEY

ARAR/TBC	Regulatory Level	Citation	Brief Description	Applicability
RCRA Identification and Listing of Hazardous Waste	Federal	40 C.F.R. Part 261.3 and 261.10	Describes methods for identifying hazardous wastes and lists known hazardous wastes.	Applicable to the identification of hazardous wastes that are generated, treated, stored, or disposed of during remedial activities.
RCRA Standards Applicable to Generators of Hazardous Waste	Federal	40 C.F.R. Part 262	Standards applicable to generators of hazardous wastes.	These standards will be followed if any hazardous wastes are generated on-site.
RCRA Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities – General Facility Standards	Federal	40 C.F.R. Part 264, Subpart B	General hazardous waste facility requirements, including waste analysis, security measures, inspections, and training requirements.	Facilities involved in the remedial activities will be designed, constructed, and operated in accordance with Part 264. All workers will be properly trained.
RCRA Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities – Preparedness and Prevention	Federal	40 C.F.R. Part 264, Subpart C (Preparedness and Prevention)	This regulation outlines the requirements for safety equipment, spill control, and arrangements with local authorities at hazardous waste facilities.	Safety and communication equipment will be installed at the Site. Local authorities will be familiarized with the Site.
RCRA Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities – Contingency Plan and Emergency Procedures	Federal	40 C.F.R. Part 264, Subpart D	Requirements for emergency procedures to be used following explosions, fires, etc. at hazardous waste facilities.	Emergency Procedure Plans will be developed and implemented during remedial action. Copies of the plans will be kept on-site.
New Jersey Technical Requirements for Site Remediation	State	N.J.A.C. 7:26E	Provides technical requirements to investigate and remediate contamination at the Site.	The regulation will be applied to any hazardous waste operation during remediation of the Site.
New Jersey Uniform Construction Code	State	N.J.A.C. 5:23	Requirements for construction performed during remediation of the Site.	This code will be applied to any construction performed during remediation of the Site.
New Jersey Hazardous Waste Regulations - Identification and Listing of Hazardous Waste	State	N.J.A.C. 7:26G-5	Methods for identifying hazardous wastes and lists known hazardous wastes.	This regulation will be applicable to the identification of hazardous wastes that are generated, treated, stored, or disposed of during remedial activities.
New Jersey Stormwater Management Rule	State	N.J.A.C. 7:8	This regulation sets the requirements for stormwater management during construction including nonstructural stormwater management strategies, erosion control, and stormwater runoff quality standards.	Substantive requirements will be met during construction.
New Jersey Soil Erosion and Sediment Control Act	State	N.J.A.C. 2:90, N.J.S.A. 4:24-39, et seq.	Regulates construction that will potentially result in erosion of soil and sediment. Lists requirements including the submittal and approval of a plan for soil erosion and sediment control.	This act will be considered the development of alternatives.
New Jersey Noise Control	State	N.J.A.C. 7:29	Regulates noise levels for certain types of activities such as commercial, industrial, community service and public service facilities. Relevant and appropriate for establishing allowable noise levels.	This standard will be applied to remediation activities performed at the Site.
Hazardous Material Transportation Act, 49 U.S.C. § 1801-1819, Department of Transportation Rules for Transportation of Hazardous Materials	Federal	49 C.F.R. Part 107, 171, 172, 177-179	Applicable to the transportation of excavated material that is being managed as hazardous waste. Includes requirements for the packaging, labeling, manifesting, and transporting hazardous materials.	Any company contracted to transport hazardous material from the Site will be required to comply with this regulation.
RCRA Standards Applicable to Transporters of Hazardous Waste	Federal	40 C.F.R. Part 263	This regulation establishes standards for hazardous waste transporters.	Any company contracted to transport hazardous material from the Site will be required to comply with this regulation.
TSCA-PCB Waste Disposal Records and Reports	Federal	40 C.F.R. Part 761, Subpart K	This regulation establishes the responsibility of generators, transporters, and disposers of PCB waste in the handling, transportation, and management of the waste. Requires a manifest and record-keeping.	Applicable to the transportation of hazardous material from the Site.

TABLE 3-4
ACTION-SPECIFIC ARARs AND TBCs
FEASIBILITY STUDY REPORT
RIVERSIDE INDUSTRIAL PARK SUPERFUND SITE
NEWARK, NEW JERSEY

ARAR/TBC	Regulatory Level	Citation	Brief Description	Applicability
New Jersey Transportation of Hazardous Materials	State	N.J.A.C. 16:49	Regulates the shipping, packaging, marking, labeling, placarding, handling, and transportation of hazardous materials.	Applicable to the transport of hazardous material from the Site.
Clean Air Act - National Ambient Air Quality Standards	Federal	40 C.F.R. Part 50	This regulation specifies maximum primary and secondary 24-hour concentrations for particulate matter. Fugitive dust emissions from site excavation activities must be maintained below 260 $\mu g/m^3$ (primary standard).	Proper dust suppression methods such as water spray would be specified when implementing excavation and/or solidification/stabilization actions.
Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities; Subpart L. Waste Pile	Federal	40 C.F.R. Part 264, Subpart L	Provides requirements to design and operate waste piles including controlling wind dispersal of particulate matter and controlling surface water from running through the piles.	Performance standards would be specified for compliance in the remedy.
Section 10 of the Rivers and Harbors Act of 1899	Federal	33 U.S.C. § 403, C.F.R. Part 322	Governs coordination with the U.S. Army Corps of Engineers with regard to work at or below mean high water, including dredging, discharging dredged fill materials.	U.S. Army Corps of Engineers approval is generally required to excavate or fill, or in any manner to alter or modify the course, location, condition, or capacity of any navigable water of the United States. On-site work for CERCLA remedies is exempt from permit requirements under CERCLA Section 121(e), although the work will comply with substantive requirements of these regulations and will be coordinated with the U.S. Army Corps of Engineers.
Clean Water Act, Section 404, 33 U.S.C. § 1344, C.F.R. Part 230 (Guidelines for Specification of Disposal Sites for Dredged or Fill Material)	Federal	Section 404(b)(1)	Regulated the discharge of dredged and fill material into waters of the United States including wetlands.	On-site activities would be properly conducted to minimize adverse effects.
RCRA Land Disposal Restrictions (LDRs)	Federal	40 C.F.R. Part 268	Identifies hazardous wastes restricted for land disposal and provides treatment standards for land disposal.	Hazardous wastes will be treated to meet disposal requirements.
Area of Contamination Policy	Federal	55 FR 8758- 8760, March 8, 1990	This policy addresses consolidation of contiguous waste within an area of contamination (AOC). Movement of media contaminated with hazardous wastes within an AOC does not typically trigger RCRA requirements.	Hazardous wastes may be consolidated and contained within an AOC without triggering LDRs or other treatment, storage, or disposal requirements under RCRA.
Corrective Action Management Units	Federal	40 C.F.R. § 264.552	These regulations provide exceptions to LDR requirements and establish rules for consolidation and treatment of noncontiguous waste within the Site.	Hazardous wastes will be treated and backfilled on-site using the CAMU for one of the proposed alternatives.
TSCA Disposal Requirements	Federal	40 C.F.R. Part 268, Subpart D - Treatment Standards	Soils contaminated above 50 ppm may also be disposed of in a chemical waste landfill.	Alternative development incorporates disposal requirements.
New Jersey Land Disposal Restrictions (LDRs)	State	N.J.A.C. 7:26G-11	These regulations established standards for treatment and disposal of hazardous wastes.	Hazardous wastes must comply with the treatment and disposal standards.
National Pollutant Discharge Elimination System (NPDES)	Federal	40 C.F.R. 122 et seq.	NPDES permit requirements for point source discharges must be met, including the NPDES Best Management Practice Program. These regulations include, but are not limited to, requirements for compliance with water quality standards, a discharge monitoring system, and records maintenance.	The project will meet substantive NPDES permit requirements for point source discharges.
Effluent Guidelines and Standards for the Point Source Category	Federal	40 C.F.R. Part 414	These regulations establish effluent limitations organized by industry on any direct discharge and indirect discharge point sources.	Point source discharges will substantively comply with these standards.

TABLE 3-4
ACTION-SPECIFIC ARARs AND TBCs
FEASIBILITY STUDY REPORT
RIVERSIDE INDUSTRIAL PARK SUPERFUND SITE
NEWARK, NEW JERSEY

ARAR/TBC	Regulatory Level	Citation	Brief Description	Applicability
The New Jersey Pollutant Discharge Elimination System (NJPDES)	State	N.J.A.C. 7:14A	Governs the discharge of any wastes into or adjacent to State waters that may alter the physical, chemical, or biological properties of State waters.	The project will meet substantive NJPDES permit requirements for any surface water discharges or groundwater discharges, such as injection of reagent for in situ treatment.
Clean Air Act - National Ambient Air Quality Standards	Federal	40 C.F.R. Part 50	This regulation provides air quality standards for particulate matter, lead, NO_2, SO_2, CO, and volatile organic matter.	During excavation, treatment, and/or stabilization of waste, air emissions will be properly controlled and monitored to comply with these standards.
Standards of Performance for New Stationary Sources	Federal	40 C.F.R. Part 60	This regulation sets the general requirements for air quality for new stationary sources of air pollution.	During excavation, treatment, and/or stabilization of waste, air emissions will be properly controlled and monitored to comply with these standards.
National Emission Standards for Hazardous Air Pollutants	Federal	40 C.F.R. Part 61	This regulation provides air quality standards for hazardous air pollutants.	During excavation, treatment, and/or stabilization of waste, air emissions will be properly controlled and monitored to comply with these standards.
New Jersey Air Pollution Control Act	State	N.J.A.C. 7:27	This regulation includes rules that govern the emission of contaminants into the ambient atmosphere.	This standard will be applied to air emissions from remediation activities performed at the Site.
New Jersey Ambient Air Quality Standards	State	N.J.A.C. 7:27-13	This standard provides the requirements for ambient air quality control.	This standard would apply to air emissions from remediation activities performed at the Site.
Technical Guidance for the Attainment of Remediation Standards and Site-Specific Criteria Sept 2012	State		This guidance presents options for demonstrating compliance with New Jersey ARARs.	Guidance used in demonstrating compliance with ARARs.
USEPA Region 2 Clean & Green Policy	Federal		Promotes technologies and practices that are sustainable. If practicable from schedule and technical viewpoints, redevelopment and property improvements could be coordinated with remediation to obtain green and sustainable synergies.	Policy considered in developing alternatives. Policy will be considered in implementation of selected alternate.
Administrative Requirement for the Remediation of Contaminated Sites (ARRCS)	State	N.J.A.C. 7:26C	Establishes a paradigm for the remediation of contaminated sites in New Jersey, including the requirement that a person responsible for conducting the remediation employ a licensed site remediation professional (LSRP) to supervise the remediation.	Applicable to Lot 57 remedial alternatives for supervising the actions taken in accordance with the State of New Jersey Technical Regulations.

Legend

AOC - area of contamination
ARAR - Applicable or Relevant and Appropriate Requirement
C.F.R. - Code of Federal Regulations
CO - Carbon monoxide
FR - Federal Register
LDR - Land Disposal Restrictions
N.J.A.C. - New Jersey Administrative Code
NJPDES - New Jersey Pollutant Discharge Elimination System
NO_2 - Nitrogen dioxide
NPDES - National Pollutant Discharge Elimination System
PRG - Project Remediation Goals
RCRA - Resource Conservation and Recovery Act
SO_2 - Sulfur dioxide
TBC - Advisories, Criteria, and Guidance To Be Considered
TSCA - Toxic Substances Control Act
µg/m3 - microgram per cubic meter

TABLE 3-5A
SUMMARY OF RI SOIL SAMPLE ARAR/PRG EXCEEDANCES
RIVERSIDE INDUSTRIAL PARK SUPERFUND SITE
NEWARK, NEW JERSEY

							Metals					
							Arsenic		Copper		Lead	
							ARAR = 19 mg/kg		PRG = 526 mg/kg		PRG = 800 mg/kg	
Lot ID	Location	Sample ID	Sample Date	Sample Depth Interval (ft bgs)	Sample Type	Parent sample ID	Result (mg/kg)	Qual	Result (mg/kg)	Qual	Result (mg/kg)	Qual
1	B-3	B-3(1-2)_102517	10/25/2017	1 - 2	Primary		5.3		60.5		620	
1	B-3	B-3(2-3)_102517	10/25/2017	2 - 3	Primary		2.5		23		9.9	
1	B-4	B-4(0-1)_100617	10/6/2017	0 - 1	Primary		7.3		238		650	
1	B-4	B-4(1-3)_100617	10/6/2017	1 - 3	Primary		12.6		92.1		***1070***	
1	B-5	B-5(0.5-1.5)_101317	10/13/2017	0.5 - 1.5	Primary		4.8		55.6		254	
1	B-5	B-5(5-6.5)_101317	10/13/2017	5 - 6.5	Primary		2.2		30.3		77.7	
1	B-12	B-12(0-1)_101317	10/13/2017	0 - 1	Primary		15.3		188		***2000***	
1	B-12	B-12(1-3)_101317	10/13/2017	1 - 3	Primary		13.5		134		578	
1	B-79	B-79(1-2)_102617	10/26/2017	1 - 2	Primary		4.6		42		405	
1	B-79	B-79(5-6)_102617	10/26/2017	5 - 6	Primary		1.9		18.9		33.1	
1	B-96	B-96(1-2)_121518	12/15/2018	1 - 2	Primary		4.5	J	38.2	J	197	
1	B-96	B-96(2-3.5)_121518	12/15/2018	2 - 3.5	Primary		1.5	J	26.3		13.5	
1	B-97	B-97(11-13)_121518	12/15/2018	11 - 13	Primary		1.1	J	11		4.4	
1	B-97	B-97(1-2)_121518	12/15/2018	1 - 2	Primary		3.7	J	33		105	
1	B-97	DUP-4_121518	12/15/2018	1 - 2	Duplicate	B-97(1-2)_121518	3.6	J	23.3		105	
1	B-97	B-97(2-3.8)_121518	12/15/2018	2 - 3.8	Primary		5.4		58.2		732	
1	B-98	B-98(0-1)_121418	12/14/2018	0 - 1	Primary		4.1	J	45.1		314	
1	B-98	B-98(1-2.9)_121418	12/14/2018	1 - 2.9	Primary		5.3	J	33.4		182	
57	B-6	B-6(3.5-4.5)_101717	10/17/2017	3.5 - 4.5	Primary		2		72.2		298	
57	B-6	B-6(5-5.5)_101717	10/17/2017	5 - 5.5	Primary		2.7		39.7		255	
57	B-7	B-7(0.5-1.5)_101017	10/10/2017	0.5 - 1.5	Primary		3.7		34.1		273	
57	B-7	B-7(5-6)_101017	10/10/2017	5 - 6	Primary		4.6		30.7		24.1	
57	B-8	B-8(1.5-2.5)_101017	10/10/2017	1.5 - 2.5	Primary		2.6		62.8		71.6	
57	B-8	B-8(5-6.25)_101017	10/10/2017	5 - 6.25	Primary		1.6		26.6		40.8	
57	B-9	B-9(0-1)_101617	10/16/2017	0 - 1	Primary		3.8		55.9		571	
57	B-9	B-9(5-6)_101617	10/16/2017	5 - 6	Primary		6.4		41.5		***925***	
57	B-10	B_10(3_5)_101617	10/16/2017	3 - 5	Primary		7.4		85.4		211	
57	B-71	B-71(3-5)_101617	10/16/2017	3 - 5	Primary		3.8		19.1		48.7	
58	B-13	B-13(0-1)_101117	10/11/2017	0 - 1	Primary		3.9		34.1		171	
58	B-13	B-13(1-3)_101117	10/11/2017	1 - 3	Primary		10.1		127		***1390***	
58	B-14	B-14(0-1)_101717	10/17/2017	0 - 1	Primary		2		78.8		33.9	
58	B-14	B-14(7-7.5)_101717	10/17/2017	7 - 7.5	Primary		0.74		8.1		1.9	
58	B-15	B-15(0.25-1.25)_101717	10/17/2017	0.25 - 1.25	Primary		10	J-	47.3		545	
58	B-15	B-15(5-6)_101717	10/17/2017	5 - 6	Primary		6.3		35		310	
58	B-16	B-16(0-1)_101217	10/12/2017	0 - 1	Primary		6.1		422		435	
58	B-16	B-16(7-7.75)_101217	10/12/2017	7 - 7.75	Primary		0.4	U	4.2		1.4	J+
58	B-17	B-17(0.25-1.25)_101717	10/17/2017	0.25 - 1.25	Primary		2.7		85.6		222	
58	B-17	B-17(5-6.5)_101717	10/17/2017	5 - 6.5	Primary		3.8		40.2		72.6	
58	B-17	DUP-6_101717	10/17/2017	5 - 6.5	Duplicate	B-17(5-6.5)_101717	5.1		44		62	
59	B-18	B-18(0-1)_101217	10/12/2017	0 - 1	Primary		4		55.2		302	
59	B-18	B-18(5-6)_101217	10/12/2017	5 - 6	Primary		2.4		61.2		156	
59	B-99	B-99(0-1)_121518	12/15/2018	0 - 1	Primary		3.6		41.3		311	
59	B-99	B-99(11-13)_121518	12/15/2018	11 - 13	Primary		1.3	J-	7		18.4	
59	B-99	B-99(1-2.9)_121518	12/15/2018	1 - 2.9	Primary		5.8		25.3		60.9	
59	B-103	B-103(0-1)_121418	12/14/2018	0 - 1	Primary		4	J	69.8		372	
59	B-103	B-103(5-7)_121418	12/14/2018	5 - 7	Primary		0.65		3	J+	2.6	J+
59	B-104	B-104(0-1)_121418	12/14/2018	0 - 1	Primary		4.8		61.3		153	
59	B-104	B-104(7-8.7)_121418	12/14/2018	7 - 8.7	Primary		0.46	J	3.6	J+	2.4	
59	B-104	DUP-3_121418	12/14/2018	7 - 8.7	Duplicate	B-104(7-8.7)_12141	0.62		3.9	J+	2.3	
60	B-20	B-20(3.5-4)_101817	10/18/2017	3.5 - 4	Primary		6.8		71.5		294	
60	B-20	B-20(5-6)_101817	10/18/2017	5 - 6	Primary		3.5		42.3		88.7	
60	B-22	B-22(0-1)_100617	10/6/2017	0 - 1	Primary		7.1		53		482	
60	B-22	B-22(1-3)_100617	10/6/2017	1 - 3	Primary		3.2		29.2		122	
60	B-23	B-23(0-1)_100517	10/5/2017	0 - 1	Primary		5.7		60.5		243	
60	B-23	B-23(1-3)_100517	10/5/2017	1 - 3	Primary		7.7		63.3		350	
60	B-95	B-95(0-1)_121318	12/13/2018	0 - 1	Primary		1.4		118		38.3	
60	B-95	B-95(11-13)_121318	12/13/2018	11 - 13	Primary		3.8	J	31		20.4	
60	B-95	B-95(1-2.8)_121318	12/13/2018	1 - 2.8	Primary		2.5		48.6		117	
60	B-105	B-105(0.7-1.7)_121518	12/15/2018	0.7 - 1.7	Primary		10.7	J	18.8		97.9	
60	B-105	B-105(1.7-3.2)_121518	12/15/2018	1.7 - 3.2	Primary		3		28.2		31.2	
61	B-24	B-24(0.5-1.5)_100517	10/5/2017	0.5 - 1.5	Primary		10.8		68.8		205	
61	B-24	B-24(1.5-3.5)_100517	10/5/2017	1.5 - 3.5	Primary		***56.8***		32.5		420	
61	B-24	DUP-3_100517	10/5/2017	1.5 - 3.5	Duplicate	B-24(1.5-3.5)_10051	***49.3***		32.9		458	
61	B-25	B-25(0.5-1.5)_100517	10/5/2017	0.5 - 1.5	Primary		2.8		40.4		32.4	
61	B-25	B-25(5-5.5)_100517	10/5/2017	5 - 5.5	Primary		4.4		89.2		427	
61	B-26	B-26(0.5-1.5)_100517	10/5/2017	0.5 - 1.5	Primary		10.1		222		***1510***	
61	B-26	B-26(5-5.8)_100517	10/5/2017	5 - 5.8	Primary		9.3		115		***831***	
61	B-27	B-27(0.5-1.5)_100517	10/5/2017	0.5 - 1.5	Primary		6		59.5		421	
61	B-27	B-27(5-5.5)_100517	10/5/2017	5 - 5.5	Primary		5.5		130		213	
61	B-68	B-68(1-2)_102417	10/24/2017	1 - 2	Primary		4.3		60.5		422	
62	B-28	B-28(0.5-1.5)_100917	10/9/2017	0.5 - 1.5	Primary		3.5		101		375	
62	B-28	B-28(1.5-2.75)_100917	10/9/2017	1.5 - 2.75	Primary		10.5		137		643	
62	B-93	B-93(1-2)_121518	12/15/2018	1 - 2	Primary		7.1	J	111		683	
62	B-93	B-93(2-3)_121518	12/15/2018	2 - 3	Primary		9.3		109		272	
63	B-29	B-29(0-1)_092917	9/29/2017	0 - 1	Primary		4.5		137		***802***	
63	B-29	B-29(1-3)_092917	9/29/2017	1 - 3	Primary		5.2		150		***851***	
63	B-30	B-30(0-1)_100417	10/4/2017	0 - 1	Primary		***19.9***		316		***3700***	
63	B-30	B-30(3-3.8)_100417	10/4/2017	3 - 3.8	Primary		***26.1***		337		***6210***	
63	B-31	B-31(1-2)_101817	10/18/2017	1 - 2	Primary		***35.6***		151		***3880***	
63	B-31	B-31(5-5.5)_101817	10/18/2017	5 - 5.5	Primary		***31.4***		203		***3980***	

TABLE 3-5A
SUMMARY OF RI SOIL SAMPLE ARAR/PRG EXCEEDANCES
RIVERSIDE INDUSTRIAL PARK SUPERFUND SITE
NEWARK, NEW JERSEY

							Metals					
							Arsenic		Copper		Lead	
							ARAR = 19 mg/kg		PRG = 526 mg/kg		PRG = 800 mg/kg	
Lot ID	Location	Sample ID	Sample Date	Sample Depth Interval (ft bgs)	Sample Type	Parent sample ID	Result (mg/kg)	Qual	Result (mg/kg)	Qual	Result (mg/kg)	Qual
63	B-32	B-32(1-2)_100417	10/4/2017	1 - 2	Primary		***24.9***		109		***1690***	
63	B-32	B-32(2-4)_100417	10/4/2017	2 - 4	Primary		***36.5***		132		***4540***	
63	B-33	B-33(0.5-1.5)_100417	10/4/2017	0.5 - 1.5	Primary		4.5		***1040***		***911***	
63	B-33	B-33(3.5-4.5)_100417	10/4/2017	3.5 - 4.5	Primary		11.7		117		***1210***	
63	B-85	B-85(0-0.5)_121218	12/12/2018	0 - 0.5	Primary		2.7	J+	66.4		***905***	
63	B-85	B-85(2.5-3.5)_121218	12/12/2018	2.5 - 3.5	Primary		14.6		153		668	
63	B-87	B-87(0-1)_121318	12/13/2018	0 - 1	Primary		18.9		154		***2370***	
63	B-87	B-87(1-3)_121318	12/13/2018	1 - 3	Primary		***34.8***		245		***3910***	
63	B-87	DUP-2_121318	12/13/2018	1 - 3	Duplicate	B-87(1-3)_121318	***23.6***		176		***3400***	
64	B-34	B-34(0-1)_100617	10/6/2017	0 - 1	Primary		4.7		63		287	
64	B-34	B-34(5-5.5)_100617	10/6/2017	5 - 5.5	Primary		4.8		54.1		311	
64	B-35	B-35(1-2)_100417	10/4/2017	1 - 2	Primary		8.5		34.3		218	
64	B-35	B-35(2-3.8)_100417	10/4/2017	2 - 3.8	Primary		***20.9***		240		504	
64	B-36	B-36(0-1)_100417	10/4/2017	0 - 1	Primary		3		67.6		182	
64	B-36	B-36(3-3.7)_100417	10/4/2017	3 - 3.7	Primary		8		85.4		157	
64	B-37	B-37(0-1)_100417	10/4/2017	0 - 1	Primary		1.8		42		92.5	
64	B-37	B-37(1-3)_100417	10/4/2017	1 - 3	Primary		1.9		39.4		71.9	
64	B-38	B-38(0-1)_100917	10/9/2017	0 - 1	Primary		3.6		46.6		794	
64	B-38	DUP-4_101017	10/9/2017	0 - 1	Duplicate	B-38(0-1)_100917	3.2		42		514	
64	B-38	B-38(1-3)_100917	10/9/2017	1 - 3	Primary		2.4		19.2		18.1	
64	B-38	B-38(FILL)_100917	10/9/2017	-3 - 0	Primary		8.7		121		***828***	
64	B-41	B-41(0-1)_092617	9/26/2017	0 - 1	Primary		7.2		134		***829***	
64	B-41	B-41(5-7)_092717	9/27/2017	5 - 7	Primary		2.2		19.8		240	
64	B-42	B-42(0.3-1.3)_100217	10/2/2017	0.3 - 1.3	Primary		4.1		46.6		314	
64	B-42	B-42(7-9)_100217	10/2/2017	7 - 9	Primary		11.5		255		585	
64	B-69	B-69(0-1)_092717	9/27/2017	0 - 1	Primary		2.7		56.3		153	
64	B-69	B-69(1-3)_092717	9/27/2017	1 - 3	Primary		3		58		167	
64	B-70	B-70(0-1)_092717	9/27/2017	0 - 1	Primary		2.4		80.4		210	
64	B-70	B-70(5-7)_092717	9/27/2017	5 - 7	Primary		***23***		223		***3020***	
64	B-74	B-74(0-1)_100417	10/4/2017	0 - 1	Primary		1.3		82.1		123	
64	B-74	B-74(3-4)_100417	10/4/2017	3 - 4	Primary		10.2		102		***3080***	
64	B-75	B-75(0-1)_092917	9/29/2017	0 - 1	Primary		1.1		70.1		76.3	
64	B-75	B-75(1-3)_092917	9/29/2017	1 - 3	Primary		7.1		162		***8690***	
64	B-86	B-86(0.3-1.3)_121118	12/11/2018	0.3 - 1.3	Primary		4.5	J+	65.3		400	
64	B-86	B-86(1.3-3.3)_121118	12/11/2018	1.3 - 3.3	Primary		8.3	J+	158		***1190***	
64	B-88	B-88(0-1)_121318	12/13/2018	0 - 1	Primary		5.2		127		472	
64	B-88	B-88(11-13)_121318	12/13/2018	11 - 13	Primary		8.7		80.7		122	
64	B-88	B-88(1-3)_121318	12/13/2018	1 - 3	Primary		7.1		182		200	
64	B-89	B-89(0-1)_121318	12/13/2018	0 - 1	Primary		4.5		64.5		168	
64	B-89	B-89(1-3)_121318	12/13/2018	1 - 3	Primary		5.4		78.9		220	
64	B-90	B-90(0-1)_121218	12/12/2018	0 - 1	Primary		2.9	J+	35.9		373	
64	B-90	B-90(11-13)_121218	12/12/2018	11 - 13	Primary		7.9	J+	88.5		280	
64	B-90	B-90(1-2.2)_121218	12/12/2018	1.2 - 2	Primary		4.5	J+	41.2		***1170***	
64	B-91	B-91(0-1)_121518	12/15/2018	0 - 1	Primary		4	J	62.8		439	
64	B-91	B-91(11-13)_121518	12/15/2018	11 - 13	Primary		2.1	J	18.5		18.6	
64	B-91	B-91(1-3)_121518	12/15/2018	1 - 3	Primary		2.8	J	62.6		148	
64	B-92	B-92(0-1)_121218	12/12/2018	0 - 1	Primary		2.8		65		173	
64	B-92	B-92(1-2.5)_121218	12/12/2018	1 - 2.5	Primary		6.1		93.9		441	
64	B-94	B-94(0-1)_121318	12/13/2018	0 - 1	Primary		2.2		55.7		97.1	
64	B-94	B-94(1-3)_121318	12/13/2018	1 - 3	Primary		10.8		215		***850***	
65	B-39	B-39(0.5-1.5)_100317	10/3/2017	0.5 - 1.5	Primary		8.3	J	132		317	
65	B-39	B-39(5-7)_100317	10/3/2017	5 - 7	Primary		5.8	J	133		216	
65	B-40	B-40(0-1)_092617	9/26/2017	0 - 1	Primary		3.1		104		295	
65	B-40	B-40(5-7)_092717	9/27/2017	5 - 7	Primary		7.5		68.6		270	
65	B-43	B-43(0-1)_092617	9/26/2017	0 - 1	Primary		2.8		70.5		***895***	
65	B-43	B-43(5-7)_092617	9/26/2017	5 - 7	Primary		10		97.6		445	
65	B-76	B-76(0-1)_102317	10/23/2017	0 - 1	Primary		7.7		225		662	
65	B-76	B-76(1-3)_102317	10/23/2017	1 - 3	Primary		4.1		132		358	
65	B-76	DUP-7_102317	10/23/2017	1 - 3	Duplicate	B-76(1-3)_102317	5.2		172		374	
66	B-44	B-44(0-1)_100217	10/2/2017	0 - 1	Primary		3.8		48.4		174	
66	B-44	B-44(5-5.5)_100217	10/2/2017	5 - 5.5	Primary		5.3		88.8		323	
66	B-78	B-78(0.5-1.5)_102517	10/25/2017	0.5 - 1.5	Primary		3.7		65.4		166	
66	B-78	B-78(5-7)_102517	10/25/2017	5 - 7	Primary		10.1		102		470	
66	B-84	B-84(11-13)_121218	12/12/2018	11 - 13	Primary		10.5	J+	190		236	
66	B-84	B-84(1-2)_121218	12/12/2018	1 - 2	Primary		1.7	J+	29.8		46.2	
66	B-84	B-84(2-4)_121218	12/12/2018	2 - 4	Primary		2	J+	20.4		29.7	
67	B-51	B-51(1-2)_092817	9/28/2017	1 - 2	Primary		4.5		61.3		159	
67	B-51	B-51(5-7)_092817	9/28/2017	5 - 7	Primary		2.8		28		215	
67	B-52	B-52(0-1)_102317	10/23/2017	0 - 1	Primary		5		174		528	
67	B-52	B-52(1-3)_102317	10/23/2017	1 - 3	Primary		15.1		201		***813***	
67	B-53	B-53(0-1)_092817	9/28/2017	0 - 1	Primary		7.3		426		297	
67	B-53	B-53(1-3)_092817	9/28/2017	1 - 3	Primary		16.5		118		***803***	
67	B-54	B-54(1-2)_092817	9/28/2017	1 - 2	Primary		10.2		112		484	
67	B-54	B-54(7-8)_092817	9/28/2017	7 - 8	Primary		***19.8***		215		471	
67	B-55	B-55(0.5-1.5)_100317	10/3/2017	0.5 - 1.5	Primary		10.9		132		241	
67	B-55	B-55(3.5-5)_100317	10/3/2017	3.5 - 5	Primary		10.8		111		450	
67	B-81	B-81(0.3-1.3)_121218	12/12/2018	0.3 - 1.3	Primary		1.5	J	37.2		103	
67	B-81	B-81(5-7)_121218	12/12/2018	5 - 7	Primary		3.2	J+	60.4		180	
68	B-56	B-56(1-2)_092717	9/27/2017	1 - 2	Primary		6.8		116		384	
68	B-56	B-56(2-4)_092717	9/27/2017	2 - 4	Primary		13.4		254		***838***	

TABLE 3-5A
SUMMARY OF RI SOIL SAMPLE ARAR/PRG EXCEEDANCES
RIVERSIDE INDUSTRIAL PARK SUPERFUND SITE
NEWARK, NEW JERSEY

							Metals					
							Arsenic		Copper		Lead	
							ARAR = 19 mg/kg		PRG = 526 mg/kg		PRG = 800 mg/kg	
Lot ID	Location	Sample ID	Sample Date	Sample Depth Interval (ft bgs)	Sample Type	Parent sample ID	Result (mg/kg)	Qual	Result (mg/kg)	Qual	Result (mg/kg)	Qual
68	B-57	B-57(1-2)_100317	10/3/2017	1 - 2	Primary		15.9		168		***1060***	
68	B-57	B-57(2-4)_100317	10/3/2017	2 - 4	Primary		17.2		***590***		798	
68	B-58	B-58(1-2)_092717	9/27/2017	1 - 2	Primary		***26***		***543***		753	
68	B-58	B-58(6-8)_092717	9/27/2017	6 - 8	Primary		3.9		469		50.7	
68	B-59	B-59(12-13.5)_100317	10/3/2017	9 - 10.5	Primary		1.9	J	25.2		34.9	
68	B-59	B-59(5-7)_100317	10/3/2017	2 - 4	Primary		12.5	J	152		***1770***	
68	B-59	DUP-2_100317	10/3/2017	2 - 4	Duplicate	B-59(5-7)_100317	13.6		120		***2530***	
68	B-59	B-59(FILL)_100317	10/3/2017	-3 - 0	Primary		6	J	74.4		288	
68	B-60	B-60(0-1)_092617	9/26/2017	0 - 1	Primary		5.2		58.7		299	
68	B-60	B-60(5-7)_092617	9/26/2017	5 - 7	Primary		7.5		278		***1180***	
68	B-60	B-60(FILL)_092617	9/26/2017	-4 - 0	Primary		***19.8***		145		***2550***	
68	B-77	B-77(0-1)_092817	9/28/2017	0 - 1	Primary		4.2		57.2		152	
68	B-77	B-77(1-3)_092817	9/28/2017	1 - 3	Primary		7.6		105		424	
68	B-77	DUP-1_092817	9/28/2017	1 - 3	Duplicate	B-77(1-3)_092817	8.1		92.2		483	
68	B-80	B-80(0.3-1.3)_121218	12/12/2018	0.3 - 1.3	Primary		5.1	J+	72.6		353	
68	B-80	B-80(1.3-3.3)_121218	12/12/2018	1.3 - 3.3	Primary		12.1	J+	317		709	
68	B-82	B-82(11-13)_121118	12/11/2018	11 - 13	Primary		3.8	J+	13.8		17.5	
68	B-82	B-82(1-2)_121118	12/11/2018	1 - 2	Primary		16.1	J+	27.3		137	
68	B-82	B-82(5-7)_121118	12/11/2018	5 - 7	Primary		9.7	J+	259		450	
68	B-83	B-83(0.3-1.3)_121118	12/11/2018	0.3 - 1.3	Primary		5.6	J	70.3		798	J
68	B-83	B-83(1.3-3.3)_121118	12/11/2018	1.3 - 3.3	Primary		9.3		85.4		414	
68	B-83	DUP-1_121118	12/11/2018	1.3 - 3.3	Duplicate	B-83(1.3-3.3)_12111	7.4	J+	77.4		604	
69	B-61	B-61(0-1)_101117	10/11/2017	0 - 1	Primary		5.4		47.9		333	
69	B-61	B-61(5-6)_101117	10/11/2017	5 - 6	Primary		2.2		13.4		43.7	
69	B-62	B-62(0-1)_101117	10/11/2017	0 - 1	Primary		3.2		55.3		215	
69	B-62	B-62(5-5.5)_101117	10/11/2017	5 - 5.5	Primary		3.8		41.4		143	
69	B-63	B-63(0-1)_101117	10/11/2017	0 - 1	Primary		3.2		83.2		440	
69	B-63	B-63(1-3)_101117	10/11/2017	1 - 3	Primary		2.6		31.6		126	
69	B-101	B-101(0-1)_121418	12/14/2018	0 - 1	Primary		4.9	J	363		***849***	
69	B-101	B-101(11-13)_121418	12/14/2018	11 - 13	Primary		0.62	J	15		6.4	
69	B-101	B-101(5-6)_121418	12/14/2018	5 - 6	Primary		2.3	J	26.8		52.7	
69	B-102	B-102(0-1)_121418	12/14/2018	0 - 1	Primary		5.6	J	69.9		264	
69	B-102	B-102(1-2.9)_121418	12/14/2018	1 - 2.9	Primary		4.2		120		174	
70	B-19	B-19(0-1)_101117	10/11/2017	0 - 1	Primary		15.2		170		622	
70	B-19	B-19(2-4)_101117	10/11/2017	2 - 4	Primary		6.9		58.7		***1190***	
70	B-64	B-64(1.5-2.5)_101117	10/11/2017	1.5 - 2.5	Primary		8.2		84.5		***1080***	
70	B-64	DUP-5_101117	10/11/2017	1.5 - 2.5	Duplicate	B-64(1.5-2.5)_10111	5.4		69		646	
70	B-64	B-64(2.5-4.5)_101117	10/11/2017	2.5 - 4.5	Primary		5.7		88		***823***	
70	B-65	B-65(0.5-1.5)_101317	10/13/2017	0.5 - 1.5	Primary		4.4		76		141	
70	B-65	B-65(1.5-2.7)_101317	10/13/2017	1.5 - 2.7	Primary		5.7		66.6		***3540***	
70	B-66	B-66(1.5-2.5)_101017	10/10/2017	1.5 - 2.5	Primary		3.2		74.4		391	
70	B-66	B-66(2.5-4.5)_101017	10/10/2017	2.5 - 4.5	Primary		8.4		70		***841***	
70	B-67	B-67(1.5-2.5)_101017	10/10/2017	1.5 - 2.5	Primary		1.4		47.8		48.8	
70	B-67	B-67(2.5-3.8)_101017	10/10/2017	2.5 - 3.8	Primary		5.3		101		***2880***	
70	B-100	B-100(11-13)_121418	12/14/2018	11 - 13	Primary		7.1	J	72.8		189	
70	B-100	B-100(2.2-3.2)_121418	12/14/2018	2.2 - 3.2	Primary		4.3	J	107		598	
70	B-100	B-100(3.2-4.2)_121418	12/14/2018	3.2 - 4.2	Primary		4.8	J	166		486	

Notes:
ARAR = Applicable or Relevant and Appropriate Requirements.
PRG = Preliminary Remediation Goal
Detected result exceeds ARAR or PRG
Reporting Detection Limit exceeds ARAR or PRG
NR = Not reportable
J - Estimated Value, result >MDL and <RL
J+ - Estimated High
J- - Estimated Low
U - Not detected above the laboratory reporting limit
Total PCBs are calculated as the sum of detected Aroclor concentration. If all the Aroclors are reported as nondetected, then the highest reporting limit of the Aroclors is reported.

Only parameters that have a result greater than the selected ARAR/PRG and used in the soil and soil gas alternatives are listed

TABLE 3-5A
SUMMARY OF RI SOIL SAMPLE ARAR/PRG EXCEEDANCES
RIVERSIDE INDUSTRIAL PARK SUPERFUND SITE
NEWARK, NEW JERSEY

							PAHs							
							Benzo(a) anthracene ARAR = 17 mg/kg		Benzo(a)pyrene ARAR = 2 mg/kg		Benzo(b) fluoranthene ARAR = 17 mg/kg		Dibenzo(a,h) anthracene ARAR = 2 mg/kg	
Lot ID	Location	Sample ID	Sample Date	Sample Depth Interval (ft bgs)	Sample Type	Parent sample ID	Result (mg/kg)	Qual	Result (mg/kg)	Qual	Result (mg/kg)	Qual	Result (mg/kg)	Qual
1	B-3	B-3(1-2)_102517	10/25/2017	1 - 2	Primary		1.1		0.53	J	1.8		0.2	
1	B-3	B-3(2-3)_102517	10/25/2017	2 - 3	Primary		0.0087		0.0051		0.0091		0.0036	U
1	B-4	B-4(0-1)_100617	10/6/2017	0 - 1	Primary		2.3		***2.1***		2.8		0.44	J
1	B-4	B-4(1-3)_100617	10/6/2017	1 - 3	Primary		3.2		***3.1***		4.2		0.72	
1	B-5	B-5(0.5-1.5)_101317	10/13/2017	0.5 - 1.5	Primary		0.076		0.062		0.089		0.0093	J
1	B-5	B-5(5-6.5)_101317	10/13/2017	5 - 6.5	Primary		0.012	J	0.0088	J	0.012	J	0.017	U
1	B-12	B-12(0-1)_101317	10/13/2017	0 - 1	Primary		0.31		0.33		0.49		0.046	
1	B-12	B-12(1-3)_101317	10/13/2017	1 - 3	Primary		0.24		0.27		0.42		0.04	
1	B-79	B-79(1-2)_102617	10/26/2017	1 - 2	Primary		0.04		0.019	U	0.034		0.019	U
1	B-79	B-79(5-6)_102617	10/26/2017	5 - 6	Primary		0.026		0.018	U	0.022		0.018	U
1	B-96	B-96(1-2)_121518	12/15/2018	1 - 2	Primary		0.2		0.16		0.2		0.037	
1	B-96	B-96(2-3.5)_121518	12/15/2018	2 - 3.5	Primary		0.0051		0.0088		0.0048		0.00093	J
1	B-97	B-97(11-13)_121518	12/15/2018	11 - 13	Primary		0.0039	U	0.0039	U	0.0039	U	0.0039	U
1	B-97	B-97(1-2)_121518	12/15/2018	1 - 2	Primary		0.076		0.083		0.085		0.021	
1	B-97	DUP-4_121518	12/15/2018	1 - 2	Duplicate	B-97(1-2)_121518	0.086		0.093		0.086		0.024	
1	B-97	B-97(2-3.8)_121518	12/15/2018	2 - 3.8	Primary		0.14		0.14		0.27		0.032	
1	B-98	B-98(0-1)_121418	12/14/2018	0 - 1	Primary		4.2		***2.9***		3.1		0.55	J
1	B-98	B-98(1-2.9)_121418	12/14/2018	1 - 2.9	Primary		3.9		***2.9***		3.2		0.58	J
57	B-6	B-6(3.5-4.5)_101717	10/17/2017	3.5 - 4.5	Primary		0.013	J	0.0094	J	0.015	J	0.019	U
57	B-6	B-6(5-5.5)_101717	10/17/2017	5 - 5.5	Primary		15		***12***		14		1.7	J
57	B-7	B-7(0.5-1.5)_101017	10/10/2017	0.5 - 1.5	Primary		0.084		0.084		0.12		0.019	
57	B-7	B-7(5-6)_101017	10/10/2017	5 - 6	Primary		0.022		0.022		0.022		0.018	U
57	B-8	B-8(1.5-2.5)_101017	10/10/2017	1.5 - 2.5	Primary		0.5		0.43		0.62		0.076	
57	B-8	B-8(5-6.25)_101017	10/10/2017	5 - 6.25	Primary		0.11		0.11		0.15		0.02	
57	B-9	B-9(0-1)_101617	10/16/2017	0 - 1	Primary		4.8		***4.4***		5.9		0.8	J
57	B-9	B-9(5-6)_101617	10/16/2017	5 - 6	Primary		1		0.96		1.1		0.11	
57	B-10	B_10(3_5)_101617	10/16/2017	3 - 5	Primary		0.049		0.03		0.045		0.0043	J
57	B-71	B-71(3-5)_101617	10/16/2017	3 - 5	Primary		0.4	J+	0.28		0.38		0.024	
58	B-13	B-13(0-1)_101117	10/11/2017	0 - 1	Primary		0.3		0.26		0.39		0.051	
58	B-13	B-13(1-3)_101117	10/11/2017	1 - 3	Primary		0.41		0.28		0.62		0.092	
58	B-14	B-14(0-1)_101717	10/17/2017	0 - 1	Primary		0.72		0.65		0.88		0.094	
58	B-14	B-14(7-7.5)_101717	10/17/2017	7 - 7.5	Primary		0.0036	U	0.0036	U	0.0036	U	0.0036	U
58	B-15	B-15(0.25-1.25)_101717	10/17/2017	0.25 - 1.25	Primary		0.028		0.028		0.1		0.021	
58	B-15	B-15(5-6)_101717	10/17/2017	5 - 6	Primary		0.013	J	0.0093	J	0.011	J	0.018	U
58	B-16	B-16(0-1)_101217	10/12/2017	0 - 1	Primary		0.068	J+	0.076	J+	0.13	J+	0.021	J+
58	B-16	B-16(7-7.75)_101217	10/12/2017	7 - 7.75	Primary		0.074	J+	0.047	J+	0.04	J+	0.01	J
58	B-17	B-17(0.25-1.25)_101717	10/17/2017	0.25 - 1.25	Primary		0.07		0.018	U	0.11		0.018	U
58	B-17	B-17(5-6.5)_101717	10/17/2017	5 - 6.5	Primary		0.37		0.4		0.52	J	0.076	J
58	B-17	DUP-6_101717	10/17/2017	5 - 6.5	Duplicate	B-17(5-6.5)_101717	0.081	J	0.085	J	0.084	J	0.0097	J
59	B-18	B-18(0-1)_101217	10/12/2017	0 - 1	Primary		0.53		0.52		1.1		0.11	
59	B-18	B-18(5-6)_101217	10/12/2017	5 - 6	Primary		1		0.91		1.1		0.14	
59	B-99	B-99(0-1)_121518	12/15/2018	0 - 1	Primary		0.11		0.12		0.14		0.075	J
59	B-99	B-99(11-13)_121518	12/15/2018	11 - 13	Primary		0.21	U	0.0041	U	0.21	U	0.0041	U
59	B-99	B-99(1-2.9)_121518	12/15/2018	1 - 2.9	Primary		0.011		0.018		0.014		0.0034	J
59	B-103	B-103(0-1)_121418	12/14/2018	0 - 1	Primary		1.1		0.84		1.2		0.2	
59	B-103	B-103(5-7)_121418	12/14/2018	5 - 7	Primary		0.0039	U	0.0039	U	0.0039	U	0.0039	U
59	B-104	B-104(0-1)_121418	12/14/2018	0 - 1	Primary		0.41		0.35		0.53		0.076	
59	B-104	B-104(7-8.7)_121418	12/14/2018	7 - 8.7	Primary		0.0036	U	0.0036	U	0.00039	J	0.0036	U
59	B-104	DUP-3_121418	12/14/2018	7 - 8.7	Duplicate	B-104(7-8.7)_12141	0.0037	U	0.0037	U	0.0037	U	0.0037	U
60	B-20	B-20(3.5-4)_101817	10/18/2017	3.5 - 4	Primary		0.075		0.052		0.065		0.0081	J
60	B-20	B-20(5-6)_101817	10/18/2017	5 - 6	Primary		0.012	J	0.0079	J	0.0099	J	0.02	U
60	B-22	B-22(0-1)_100617	10/6/2017	0 - 1	Primary		0.26		0.31		0.45		0.089	
60	B-22	B-22(1-3)_100617	10/6/2017	1 - 3	Primary		0.28		0.33		0.43		0.074	
60	B-23	B-23(0-1)_100517	10/5/2017	0 - 1	Primary		0.34		0.36		0.54		0.085	
60	B-23	B-23(1-3)_100517	10/5/2017	1 - 3	Primary		0.18		0.21		0.27		0.041	
60	B-95	B-95(0-1)_121318	12/13/2018	0 - 1	Primary		0.25		0.3		0.31		0.085	
60	B-95	B-95(11-13)_121318	12/13/2018	11 - 13	Primary		0.061		0.054		0.048		0.011	
60	B-95	B-95(1-2.8)_121318	12/13/2018	1 - 2.8	Primary		0.55		0.44		0.57		0.11	
60	B-105	B-105(0.7-1.7)_121518	12/15/2018	0.7 - 1.7	Primary		3.9		***4***		4.4		1	
60	B-105	B-105(1.7-3.2)_121518	12/15/2018	1.7 - 3.2	Primary		0.91		0.94		1.4		0.27	
61	B-24	B-24(0.5-1.5)_100517	10/5/2017	0.5 - 1.5	Primary		0.79		0.82		1.2		0.18	
61	B-24	B-24(1.5-3.5)_100517	10/5/2017	1.5 - 3.5	Primary		4.6		***3.8***		5.1		0.77	J
61	B-24	DUP-3_100517	10/5/2017	1.5 - 3.5	Duplicate	B-24(1.5-3.5)_10051	5.1		***4.1***		5.6		0.82	J
61	B-25	B-25(0.5-1.5)_100517	10/5/2017	0.5 - 1.5	Primary		3.6		***3.8***		4.8		0.71	
61	B-25	B-25(5-5.5)_100517	10/5/2017	5 - 5.5	Primary		0.094		0.089		0.13		0.018	
61	B-26	B-26(0.5-1.5)_100517	10/5/2017	0.5 - 1.5	Primary		0.031		0.027		0.06		0.012	J
61	B-26	B-26(5-5.8)_100517	10/5/2017	5 - 5.8	Primary		0.27		0.22		0.32	J	0.048	
61	B-27	B-27(0.5-1.5)_100517	10/5/2017	0.5 - 1.5	Primary		0.17		0.16		0.23		0.03	
61	B-27	B-27(5-5.5)_100517	10/5/2017	5 - 5.5	Primary		0.16		0.14		0.19		0.025	
61	B-68	B-68(1-2)_102417	10/24/2017	1 - 2	Primary		0.045		0.034		0.045		0.021	U
62	B-28	B-28(0.5-1.5)_100917	10/9/2017	0.5 - 1.5	Primary		4.3		***4.1***		5.9		0.91	J
62	B-28	B-28(1.5-2.75)_100917	10/9/2017	1.5 - 2.75	Primary		3.2		***2.3***		3.2		0.51	
62	B-93	B-93(1-2)_121518	12/15/2018	1 - 2	Primary		0.55	J	0.49	J	0.58	J	0.29	J
62	B-93	B-93(2-3)_121518	12/15/2018	2 - 3	Primary		0.64	J	0.5	J	0.65	J	0.24	J
63	B-29	B-29(0-1)_092917	9/29/2017	0 - 1	Primary		5		***4.6***		6.3		0.81	
63	B-29	B-29(1-3)_092917	9/29/2017	1 - 3	Primary		2.7		***2.4***		3.6		0.39	
63	B-30	B-30(0-1)_100417	10/4/2017	0 - 1	Primary		3		***3.5***		4.8		0.82	J
63	B-30	B-30(3-3.8)_100417	10/4/2017	3 - 3.8	Primary		0.37		0.41		0.58		0.11	J
63	B-31	B-31(1-2)_101817	10/18/2017	1 - 2	Primary		0.51		0.45		0.64		0.058	
63	B-31	B-31(5-5.5)_101817	10/18/2017	5 - 5.5	Primary		5.5		***4***		5.8		0.67	

TABLE 3-5A
SUMMARY OF RI SOIL SAMPLE ARAR/PRG EXCEEDANCES
RIVERSIDE INDUSTRIAL PARK SUPERFUND SITE
NEWARK, NEW JERSEY

							PAHs							
							Benzo(a) anthracene ARAR = 17 mg/kg		Benzo(a)pyrene ARAR = 2 mg/kg		Benzo(b) fluoranthene ARAR = 17 mg/kg		Dibenzo(a,h) anthracene ARAR = 2 mg/kg	
Lot ID	Location	Sample ID	Sample Date	Sample Depth Interval (ft bgs)	Sample Type	Parent sample ID	Result (mg/kg)	Qual	Result (mg/kg)	Qual	Result (mg/kg)	Qual	Result (mg/kg)	Qual
63	B-32	B-32(1-2)_100417	10/4/2017	1 - 2	Primary		0.75		0.91		1.3		0.19	
63	B-32	B-32(2-4)_100417	10/4/2017	2 - 4	Primary		1.4		2.2		2.6		0.4	
63	B-33	B-33(0.5-1.5)_100417	10/4/2017	0.5 - 1.5	Primary		0.35		0.34		0.47		0.088	
63	B-33	B-33(3.5-4.5)_100417	10/4/2017	3.5 - 4.5	Primary		0.41		0.42		0.58		0.094	
63	B-85	B-85(0-0.5)_121218	12/12/2018	0 - 0.5	Primary		0.22		0.22		0.28		0.098	J
63	B-85	B-85(2.5-3.5)_121218	12/12/2018	2.5 - 3.5	Primary		34		28		29		5	
63	B-87	B-87(0-1)_121318	12/13/2018	0 - 1	Primary		0.77		0.74		0.69		0.15	
63	B-87	B-87(1-3)_121318	12/13/2018	1 - 3	Primary		0.44	J	0.35		0.38		0.095	
63	B-87	DUP-2_121318	12/13/2018	1 - 3	Duplicate	B-87(1-3)_121318	0.64	J	0.53		0.56		0.13	
64	B-34	B-34(0-1)_100617	10/6/2017	0 - 1	Primary		0.29		0.32		0.42		0.068	
64	B-34	B-34(5-5.5)_100617	10/6/2017	5 - 5.5	Primary		0.24		0.24		0.28		0.048	
64	B-35	B-35(1-2)_100417	10/4/2017	1 - 2	Primary		0.084		0.092		0.13		0.021	
64	B-35	B-35(2-3.8)_100417	10/4/2017	2 - 3.8	Primary		0.18		0.12		0.13		0.022	
64	B-36	B-36(0-1)_100417	10/4/2017	0 - 1	Primary		0.25		0.27		0.4		0.056	
64	B-36	B-36(3-3.7)_100417	10/4/2017	3 - 3.7	Primary		0.0044	J	0.0029	J	0.0054		0.0047	U
64	B-37	B-37(0-1)_100417	10/4/2017	0 - 1	Primary		0.72		0.82		1.1		0.18	
64	B-37	B-37(1-3)_100417	10/4/2017	1 - 3	Primary		0.95		0.89	J	1.2		0.16	
64	B-38	B-38(0-1)_100917	10/9/2017	0 - 1	Primary		0.72	J	0.66	J	0.85	J	0.11	J
64	B-38	DUP-4_101017	10/9/2017	0 - 1	Duplicate	B-38(0-1)_100917	0.028	J	0.034	J	0.052	J	0.0097	J
64	B-38	B-38(1-3)_100917	10/9/2017	1 - 3	Primary		0.008		0.0038	J	0.0063		0.0042	U
64	B-38	B-38(FILL)_100917	10/9/2017	-3 - 0	Primary		4.8		4.3		5.8		0.91	J
64	B-41	B-41(0-1)_092617	9/26/2017	0 - 1	Primary		2.6		2.4		3.3		0.5	J
64	B-41	B-41(5-7)_092717	9/27/2017	5 - 7	Primary		0.07		0.059		0.083		0.0098	
64	B-42	B-42(0.3-1.3)_100217	10/2/2017	0.3 - 1.3	Primary		0.11		0.14		0.39	J	0.06	
64	B-42	B-42(7-9)_100217	10/2/2017	7 - 9	Primary		1.9		1.6		2		0.31	
64	B-69	B-69(0-1)_092717	9/27/2017	0 - 1	Primary		0.21		0.2		0.28		0.04	
64	B-69	B-69(1-3)_092717	9/27/2017	1 - 3	Primary		0.25		0.23		0.35		0.056	
64	B-70	B-70(0-1)_092717	9/27/2017	0 - 1	Primary		0.12		0.1		0.16		0.025	
64	B-70	B-70(5-7)_092717	9/27/2017	5 - 7	Primary		2		1.6		2.3		0.3	J
64	B-74	B-74(0-1)_100417	10/4/2017	0 - 1	Primary		0.46	J	0.5	J	0.71	J	0.12	
64	B-74	B-74(3-4)_100417	10/4/2017	3 - 4	Primary		0.025		0.035		0.05		0.019	U
64	B-75	B-75(0-1)_092917	9/29/2017	0 - 1	Primary		0.12		0.12		0.18		0.03	
64	B-75	B-75(1-3)_092917	9/29/2017	1 - 3	Primary		0.0042	U	0.0042	U	0.0042	U	0.0042	U
64	B-86	B-86(0.3-1.3)_121118	12/11/2018	0.3 - 1.3	Primary		7.5		5.3		5.4		1.3	J
64	B-86	B-86(1.3-3.3)_121118	12/11/2018	1.3 - 3.3	Primary		7.9		6		7		1.6	
64	B-88	B-88(0-1)_121318	12/13/2018	0 - 1	Primary		0.7		0.78		1		0.22	
64	B-88	B-88(11-13)_121318	12/13/2018	11 - 13	Primary		0.59		0.58		0.55		0.079	J
64	B-88	B-88(1-3)_121318	12/13/2018	1 - 3	Primary		0.19		0.13		0.39		0.06	J
64	B-89	B-89(0-1)_121318	12/13/2018	0 - 1	Primary		0.36		0.34		0.42		0.1	
64	B-89	B-89(1-3)_121318	12/13/2018	1 - 3	Primary		0.062		0.072		0.099		0.034	J
64	B-90	B-90(0-1)_121218	12/12/2018	0 - 1	Primary		0.71		0.65		0.65		0.28	J
64	B-90	B-90(11-13)_121218	12/12/2018	11 - 13	Primary		0.17		0.17		0.14		0.036	J
64	B-90	B-90(1-2.2)_121218	12/12/2018	1.2 - 2	Primary		0.4		0.32		0.37		0.17	J
64	B-91	B-91(0-1)_121518	12/15/2018	0 - 1	Primary		1.4		1.4		1.3		0.33	
64	B-91	B-91(11-13)_121518	12/15/2018	11 - 13	Primary		0.077		0.078		0.077		0.015	
64	B-91	B-91(1-3)_121518	12/15/2018	1 - 3	Primary		5.1		4.2		4.3		1.1	
64	B-92	B-92(0-1)_121218	12/12/2018	0 - 1	Primary		0.42		0.51		0.45		0.14	
64	B-92	B-92(1-2.5)_121218	12/12/2018	1 - 2.5	Primary		1.2		0.88		1.2		0.31	J
64	B-94	B-94(0-1)_121318	12/13/2018	0 - 1	Primary		0.84		0.84		1.2		0.2	
64	B-94	B-94(1-3)_121318	12/13/2018	1 - 3	Primary		0.26		0.27		0.32		0.075	
65	B-39	B-39(0.5-1.5)_100317	10/3/2017	0.5 - 1.5	Primary		0.26		0.23		0.27		0.038	
65	B-39	B-39(5-7)_100317	10/3/2017	5 - 7	Primary		0.023		0.026		0.031		0.0039	U
65	B-40	B-40(0-1)_092617	9/26/2017	0 - 1	Primary		0.57	J	0.33	J	0.93	J	0.14	
65	B-40	B-40(5-7)_092717	9/27/2017	5 - 7	Primary		0.06		0.055		0.089		0.011	
65	B-43	B-43(0-1)_092617	9/26/2017	0 - 1	Primary		0.096		0.075		0.11		0.017	
65	B-43	B-43(5-7)_092617	9/26/2017	5 - 7	Primary		1.3		1.2		1.6		0.27	
65	B-76	B-76(0-1)_102317	10/23/2017	0 - 1	Primary		2.1		1.8		2.4		0.23	
65	B-76	B-76(1-3)_102317	10/23/2017	1 - 3	Primary		0.32	J	0.37	J	0.47	J	0.077	J
65	B-76	DUP-7_102317	10/23/2017	1 - 3	Duplicate	B-76(1-3)_102317	0.85	J	1.6	J	2.2	J	0.37	
66	B-44	B-44(0-1)_100217	10/2/2017	0 - 1	Primary		0.51	J	0.53	J	0.7	J	0.095	
66	B-44	B-44(5-5.5)_100217	10/2/2017	5 - 5.5	Primary		2.6		2.2		2.8		0.42	J
66	B-78	B-78(0.5-1.5)_102517	10/25/2017	0.5 - 1.5	Primary		0.52		0.44		0.6		0.056	
66	B-78	B-78(5-7)_102517	10/25/2017	5 - 7	Primary		1.7		1.5		1.9		0.2	
66	B-84	B-84(11-13)_121218	12/12/2018	11 - 13	Primary		0.83		0.75		0.6		0.13	J
66	B-84	B-84(1-2)_121218	12/12/2018	1 - 2	Primary		0.24		0.22		0.24		0.058	
66	B-84	B-84(2-4)_121218	12/12/2018	2 - 4	Primary		2.5		1.7		2.4		0.71	J
67	B-51	B-51(1-2)_092817	9/28/2017	1 - 2	Primary		0.27		0.21		0.31		0.079	
67	B-51	B-51(5-7)_092817	9/28/2017	5 - 7	Primary		0.46		0.37		0.47		0.086	
67	B-52	B-52(0-1)_102317	10/23/2017	0 - 1	Primary		0.58	J	0.54	J	0.77	J	0.069	
67	B-52	B-52(1-3)_102317	10/23/2017	1 - 3	Primary		0.74		0.68		0.9		0.078	
67	B-53	B-53(0-1)_092817	9/28/2017	0 - 1	Primary		2.8		2.6		3.6		0.53	
67	B-53	B-53(1-3)_092817	9/28/2017	1 - 3	Primary		16		13		17		2.2	
67	B-54	B-54(1-2)_092817	9/28/2017	1 - 2	Primary		16		13		16		2	
67	B-54	B-54(7-8)_092817	9/28/2017	7 - 8	Primary		0.86		0.66		0.87		0.13	
67	B-55	B-55(0.5-1.5)_100317	10/3/2017	0.5 - 1.5	Primary		2.3		2.1		2.5		0.42	J
67	B-55	B-55(3.5-5)_100317	10/3/2017	3.5 - 5	Primary		0.78		0.75		1		0.14	
67	B-81	B-81(0.3-1.3)_121218	12/12/2018	0.3 - 1.3	Primary		0.39		0.36		0.36		0.094	
67	B-81	B-81(5-7)_121218	12/12/2018	5 - 7	Primary		2.3		1.5		2.4		0.63	J
68	B-56	B-56(1-2)_092717	9/27/2017	1 - 2	Primary		0.36		0.37		0.52		0.1	
68	B-56	B-56(2-4)_092717	9/27/2017	2 - 4	Primary		0.067		0.054		0.077		0.0098	

TABLE 3-5A
SUMMARY OF RI SOIL SAMPLE ARAR/PRG EXCEEDANCES
RIVERSIDE INDUSTRIAL PARK SUPERFUND SITE
NEWARK, NEW JERSEY

							PAHs							
							Benzo(a) anthracene ARAR = 17 mg/kg		Benzo(a)pyrene ARAR = 2 mg/kg		Benzo(b) fluoranthene ARAR = 17 mg/kg		Dibenzo(a,h) anthracene ARAR = 2 mg/kg	
Lot ID	Location	Sample ID	Sample Date	Sample Depth Interval (ft bgs)	Sample Type	Parent sample ID	Result (mg/kg)	Qual	Result (mg/kg)	Qual	Result (mg/kg)	Qual	Result (mg/kg)	Qual
68	B-57	B-57(1-2)_100317	10/3/2017	1 - 2	Primary		1.2		1.2		1.5		0.24	
68	B-57	B-57(2-4)_100317	10/3/2017	2 - 4	Primary		0.03		0.035		0.053		0.005	U
68	B-58	B-58(1-2)_092717	9/27/2017	1 - 2	Primary		0.19		0.17		0.29		0.037	
68	B-58	B-58(6-8)_092717	9/27/2017	6 - 8	Primary		0.0011	J	0.0039	U	0.0039	U	0.0039	U
68	B-59	B-59(12-13.5)_100317	10/3/2017	9 - 10.5	Primary		0.045		0.026		0.031		0.0038	U
68	B-59	B-59(5-7)_100317	10/3/2017	2 - 4	Primary		0.44	J	0.47	J	0.6	J	0.13	
68	B-59	DUP-2_100317	10/3/2017	2 - 4	Duplicate	B-59(5-7)_100317	1.5	J	1.7	J	2.1	J	0.36	J
68	B-59	B-59(FILL)_100317	10/3/2017	-3 - 0	Primary		0.12		0.11		0.17		0.026	
68	B-60	B-60(0-1)_092617	9/26/2017	0 - 1	Primary		0.83		0.66		0.83		0.13	
68	B-60	B-60(5-7)_092617	9/26/2017	5 - 7	Primary		0.33		0.3		0.42		0.074	
68	B-60	B-60(FILL)_092617	9/26/2017	-4 - 0	Primary		1.4		1.3		1.7		0.28	
68	B-77	B-77(0-1)_092817	9/28/2017	0 - 1	Primary		2		1.6		2		0.26	
68	B-77	B-77(1-3)_092817	9/28/2017	1 - 3	Primary		0.39	J	0.33		0.43	J	0.054	
68	B-77	DUP-1_092817	9/28/2017	1 - 3	Duplicate	B-77(1-3)_092817	0.69	J	0.55		0.77	J	0.11	J
68	B-80	B-80(0.3-1.3)_121218	12/12/2018	0.3 - 1.3	Primary		1		0.81		1.1		0.28	J
68	B-80	B-80(1.3-3.3)_121218	12/12/2018	1.3 - 3.3	Primary		0.46		0.65		0.85		0.17	
68	B-82	B-82(11-13)_121118	12/11/2018	11 - 13	Primary		0.27	U	0.0039	J	0.27	U	0.00055	J
68	B-82	B-82(1-2)_121118	12/11/2018	1 - 2	Primary		1.2		0.92		1.1		0.22	
68	B-82	B-82(5-7)_121118	12/11/2018	5 - 7	Primary		0.063		0.061		0.086		0.023	
68	B-83	B-83(0.3-1.3)_121118	12/11/2018	0.3 - 1.3	Primary		1.4		1.1		1.2		0.28	
68	B-83	B-83(1.3-3.3)_121118	12/11/2018	1.3 - 3.3	Primary		0.71	J	1.1	J	1.3	J	0.28	J
68	B-83	DUP-1_121118	12/11/2018	1.3 - 3.3	Duplicate	B-83(1.3-3.3)_12111	1.3	J	1.4	J	1.7	J	0.4	J
69	B-61	B-61(0-1)_101117	10/11/2017	0 - 1	Primary		0.15		0.12		0.2		0.02	
69	B-61	B-61(5-6)_101117	10/11/2017	5 - 6	Primary		0.6		0.56		0.82		0.065	
69	B-62	B-62(0-1)_101117	10/11/2017	0 - 1	Primary		0.58		0.57		0.8		0.065	
69	B-62	B-62(5-5.5)_101117	10/11/2017	5 - 5.5	Primary		0.14		0.11		0.21		0.019	
69	B-63	B-63(0-1)_101117	10/11/2017	0 - 1	Primary		1		1.1		1.6		0.2	
69	B-63	B-63(1-3)_101117	10/11/2017	1 - 3	Primary		8.9		***7.3***		9.7		1.2	
69	B-101	B-101(0-1)_121418	12/14/2018	0 - 1	Primary		0.097		0.087		0.062		0.012	J
69	B-101	B-101(11-13)_121418	12/14/2018	11 - 13	Primary		0.0012	J	0.0013	J	0.001	J	0.0038	U
69	B-101	B-101(5-6)_121418	12/14/2018	5 - 6	Primary		0.027		0.036	J	0.027		0.0076	J
69	B-102	B-102(0-1)_121418	12/14/2018	0 - 1	Primary		0.26		0.23		0.31		0.061	
69	B-102	B-102(1-2.9)_121418	12/14/2018	1 - 2.9	Primary		0.33		0.29		0.4		0.065	
70	B-19	B-19(0-1)_101117	10/11/2017	0 - 1	Primary		0.37		0.41		0.61		0.057	
70	B-19	B-19(2-4)_101117	10/11/2017	2 - 4	Primary		0.094		0.084		0.13		0.017	J
70	B-64	B-64(1.5-2.5)_101117	10/11/2017	1.5 - 2.5	Primary		0.56	J	0.54	J	0.74	J	0.08	
70	B-64	DUP-5_101117	10/11/2017	1.5 - 2.5	Duplicate	B-64(1.5-2.5)_10111	0.97	J	0.91	J	1.3	J	0.19	
70	B-64	B-64(2.5-4.5)_101117	10/11/2017	2.5 - 4.5	Primary		0.13		0.2		0.31		0.036	
70	B-65	B-65(0.5-1.5)_101317	10/13/2017	0.5 - 1.5	Primary		0.071		0.077		0.14		0.017	J
70	B-65	B-65(1.5-2.7)_101317	10/13/2017	1.5 - 2.7	Primary		0.12		0.15		0.22		0.026	
70	B-66	B-66(1.5-2.5)_101017	10/10/2017	1.5 - 2.5	Primary		0.44		0.6		0.8		0.099	
70	B-66	B-66(2.5-4.5)_101017	10/10/2017	2.5 - 4.5	Primary		0.5		0.56		0.76		0.1	
70	B-67	B-67(1.5-2.5)_101017	10/10/2017	1.5 - 2.5	Primary		0.25		0.23		0.32	J	0.044	
70	B-67	B-67(2.5-3.8)_101017	10/10/2017	2.5 - 3.8	Primary		0.46		0.32		0.55		0.048	
70	B-100	B-100(11-13)_121418	12/14/2018	11 - 13	Primary		6.8		***3.5***		6.2		1.3	J
70	B-100	B-100(2.2-3.2)_121418	12/14/2018	2.2 - 3.2	Primary		0.093		0.059		0.13		0.032	
70	B-100	B-100(3.2-4.2)_121418	12/14/2018	3.2 - 4.2	Primary		0.19		0.16		0.21		0.047	

Notes:
ARAR = Applicable or Relevant and Appropriate Requirements.
PRG = Preliminary Remediation Goal
Detected result exceeds ARAR or PRG
Reporting Detection Limit exceeds ARAR or PRG
NR = Not reportable
J - Estimated Value, result >MDL and <RL
J+ - Estimated High
J- - Estimated Low
U - Not detected above the laboratory reporting limit
Total PCBs are calculated as the sum of detected Aroclor concentration. If all the Aroclors are reported as nondetected, then the highest reporting limit of the Aroclors is reported.

Only parameters that have a result greater than the selected ARAR/PRG and used in the soil and soil gas alternatives are listed

TABLE 3-5A
SUMMARY OF RI SOIL SAMPLE ARAR/PRG EXCEEDANCES
RIVERSIDE INDUSTRIAL PARK SUPERFUND SITE
NEWARK, NEW JERSEY

							Total PCBs		VOCs					
							Total PCBs		Benzene		Naphthalene		Vinyl Chloride	
							ARAR = 1 mg/kg		ARAR = 5 mg/kg		ARAR = 17 mg/kg		ARAR = 2 mg/kg	
Lot ID	Location	Sample ID	Sample Date	Sample Depth Interval (ft bgs)	Sample Type	Parent sample ID	Result (mg/kg)	Qual	Result (mg/kg)	Qual	Result (mg/kg)	Qual	Result (mg/kg)	Qual
1	B-3	B-3(1-2)_102517	10/25/2017	1 - 2	Primary		0.039	U	2		5.3		0.36	U
1	B-3	B-3(2-3)_102517	10/25/2017	2 - 3	Primary		0.036	U	0.005	U	0.58		0.005	U
1	B-4	B-4(0-1)_100617	10/6/2017	0 - 1	Primary		0.036	U	0.29	U	0.93	U	0.0055	U
1	B-4	B-4(1-3)_100617	10/6/2017	1 - 3	Primary		0.051	J	0.0048	J	0.24	J	0.0055	U
1	B-5	B-5(0.5-1.5)_101317	10/13/2017	0.5 - 1.5	Primary		0.037	U	0.0047	U	0.19	U	0.0047	U
1	B-5	B-5(5-6.5)_101317	10/13/2017	5 - 6.5	Primary		0.035	U	0.0048	U	0.18	U	0.0048	U
1	B-12	B-12(0-1)_101317	10/13/2017	0 - 1	Primary		0.029	J	0.42	U	0.15	J	0.0071	U
1	B-12	B-12(1-3)_101317	10/13/2017	1 - 3	Primary		0.026	J	0.52	U	0.097	J	0.0093	U
1	B-79	B-79(1-2)_102617	10/26/2017	1 - 2	Primary		0.038	U	0.0061	U	0.27		0.0061	U
1	B-79	B-79(5-6)_102617	10/26/2017	5 - 6	Primary		0.029	J	0.23	U	0.19	U	0.23	U
1	B-96	B-96(1-2)_121518	12/15/2018	1 - 2	Primary		0.0033	J	0.0044	U	0.2	U	0.0044	U
1	B-96	B-96(2-3.5)_121518	12/15/2018	2 - 3.5	Primary		0.036	U	0.0044	U	0.0036	U	0.0044	U
1	B-97	B-97(11-13)_121518	12/15/2018	11 - 13	Primary		0.037	U	0.004	U	0.0039	U	0.004	U
1	B-97	B-97(1-2)_121518	12/15/2018	1 - 2	Primary		0.014	J	0.0048	U	0.0093		0.0048	U
1	B-97	DUP-4_121518	12/15/2018	1 - 2	Duplicate	B-97(1-2)_121518	0.22	J	0.0013	J	0.2	U	0.0042	U
1	B-97	B-97(2-3.8)_121518	12/15/2018	2 - 3.8	Primary		0.039	U	0.0038	U	0.2	U	0.0038	U
1	B-98	B-98(0-1)_121418	12/14/2018	0 - 1	Primary		0.049		0.0036	J	0.14	J	0.0049	UJ
1	B-98	B-98(1-2.9)_121418	12/14/2018	1 - 2.9	Primary		0.024	J	0.00067	J	0.17	J	0.0038	U
57	B-6	B-6(3.5-4.5)_101717	10/17/2017	3.5 - 4.5	Primary		0.037	U	0.0059	U	0.19	U	0.0059	U
57	B-6	B-6(5-5.5)_101717	10/17/2017	5 - 5.5	Primary		0.036	U	0.0052	U	7.4		0.0052	U
57	B-7	B-7(0.5-1.5)_101017	10/10/2017	0.5 - 1.5	Primary		0.088	J	0.36		0.19	U	0.005	U
57	B-7	B-7(5-6)_101017	10/10/2017	5 - 6	Primary		0.036	U	0.01		0.19	U	0.0042	U
57	B-8	B-8(1.5-2.5)_101017	10/10/2017	1.5 - 2.5	Primary		0.184	J	0.0044	U	0.19	U	0.0044	U
57	B-8	B-8(5-6.25)_101017	10/10/2017	5 - 6.25	Primary		0.041	J	0.25	U	0.19	U	0.25	U
57	B-9	B-9(0-1)_101617	10/16/2017	0 - 1	Primary		3.5	J	0.0056	UJ	0.49	J	0.0056	U
57	B-9	B-9(5-6)_101617	10/16/2017	5 - 6	Primary		0.27	J	0.0059	U	0.22	U	0.0059	U
57	B-10	B_10(3_5)_101617	10/16/2017	3 - 5	Primary		0.042	U	0.0054	U	0.22	U	0.0054	U
57	B-71	B-71(3-5)_101617	10/16/2017	3 - 5	Primary		0.039	U	0.0043	U	0.2	U	0.0043	U
58	B-13	B-13(0-1)_101117	10/11/2017	0 - 1	Primary		0.038	U	0.0055	U	0.2	U	0.0055	U
58	B-13	B-13(1-3)_101117	10/11/2017	1 - 3	Primary		0.038	U	0.28	U	0.33		0.0065	U
58	B-14	B-14(0-1)_101717	10/17/2017	0 - 1	Primary		0.035	U	0.0052	U	0.051	J	0.0052	U
58	B-14	B-14(7-7.5)_101717	10/17/2017	7 - 7.5	Primary		0.036	U	0.0048	U	0.18	U	0.0048	U
58	B-15	B-15(0.25-1.25)_101717	10/17/2017	0.25 - 1.25	Primary		0.21	J	0.0058	U	0.19	U	0.0058	U
58	B-15	B-15(5-6)_101717	10/17/2017	5 - 6	Primary		0.037	UJ	0.0047	U	0.19	U	0.0047	U
58	B-16	B-16(0-1)_101217	10/12/2017	0 - 1	Primary		0.037	U	0.34	U	0.29		0.34	U
58	B-16	B-16(7-7.75)_101217	10/12/2017	7 - 7.75	Primary		0.036	U	0.25	U	2.1		0.0049	U
58	B-17	B-17(0.25-1.25)_101717	10/17/2017	0.25 - 1.25	Primary		0.15	J	0.0051	U	1.8	U	0.0051	U
58	B-17	B-17(5-6.5)_101717	10/17/2017	5 - 6.5	Primary		0.039	U	0.0046	U	0.2	U	0.0046	U
58	B-17	DUP-6_101717	10/17/2017	5 - 6.5	Duplicate	B-17(5-6.5)_101717	0.038	U	0.0054	U	0.2	U	0.0054	U
59	B-18	B-18(0-1)_101217	10/12/2017	0 - 1	Primary		0.036	U	0.0053	U	0.18	U	0.0053	U
59	B-18	B-18(5-6)_101217	10/12/2017	5 - 6	Primary		0.038	U	0.0046	U	0.2	U	0.0046	U
59	B-99	B-99(0-1)_121518	12/15/2018	0 - 1	Primary		0.21		0.029	J+	0.031	J	NR	
59	B-99	B-99(11-13)_121518	12/15/2018	11 - 13	Primary		0.041	U	0.0046	U	0.0041	U	0.0046	U
59	B-99	B-99(1-2.9)_121518	12/15/2018	1 - 2.9	Primary		0.0089	J	0.0068	U	0.22	U	0.0068	U
59	B-103	B-103(0-1)_121418	12/14/2018	0 - 1	Primary		0.43		0.0045	U	0.071	J	0.0045	U
59	B-103	B-103(5-7)_121418	12/14/2018	5 - 7	Primary		0.04	U	0.0052	U	0.0039	U	0.0052	U
59	B-104	B-104(0-1)_121418	12/14/2018	0 - 1	Primary		0.46		0.0046	U	0.014	J	0.0046	U
59	B-104	B-104(7-8.7)_121418	12/14/2018	7 - 8.7	Primary		0.037	U	0.0046	U	0.0028	J	0.0046	U
59	B-104	DUP-3_121418	12/14/2018	7 - 8.7	Duplicate	B-104(7-8.7)_12141	0.038	U	0.0052	U	0.0021	J	0.0052	U
60	B-20	B-20(3.5-4)_101817	10/18/2017	3.5 - 4	Primary		0.04	U	0.0051	U	0.21	U	0.0051	U
60	B-20	B-20(5-6)_101817	10/18/2017	5 - 6	Primary		0.039	U	0.0055	UJ	0.2	U	0.0055	U
60	B-22	B-22(0-1)_100617	10/6/2017	0 - 1	Primary		0.12	J	0.0048	U	0.088	J	0.0048	U
60	B-22	B-22(1-3)_100617	10/6/2017	1 - 3	Primary		0.036	U	0.0044	U	0.18	U	0.0044	U
60	B-23	B-23(0-1)_100517	10/5/2017	0 - 1	Primary		0.075	J	0.0045	U	0.18	U	0.0045	U
60	B-23	B-23(1-3)_100517	10/5/2017	1 - 3	Primary		0.037	U	0.33	U	0.19	U	0.33	U
60	B-95	B-95(0-1)_121318	12/13/2018	0 - 1	Primary		0.018	J	0.004	J	0.048		0.0053	U
60	B-95	B-95(11-13)_121318	12/13/2018	11 - 13	Primary		0.055	U	0.0072	U	0.0022	J	0.0072	U
60	B-95	B-95(1-2.8)_121318	12/13/2018	1 - 2.8	Primary		0.014	J	0.0036	J	0.011	J	0.0047	U
60	B-105	B-105(0.7-1.7)_121518	12/15/2018	0.7 - 1.7	Primary		0.038	U	0.0068	UJ	0.021	J	0.0068	U
60	B-105	B-105(1.7-3.2)_121518	12/15/2018	1.7 - 3.2	Primary		0.0037	J	0.0044	U	0.077	U	0.0044	U
61	B-24	B-24(0.5-1.5)_100517	10/5/2017	0.5 - 1.5	Primary		0.1	J	NR		0.044	J	0.0049	UJ
61	B-24	B-24(1.5-3.5)_100517	10/5/2017	1.5 - 3.5	Primary		0.039	U	0.0055	U	0.79	J	0.0055	U
61	B-24	DUP-3_100517	10/5/2017	1.5 - 3.5	Duplicate	B-24(1.5-3.5)_10051	0.039	U	0.0058	U	0.85	J	0.0058	U
61	B-25	B-25(0.5-1.5)_100517	10/5/2017	0.5 - 1.5	Primary		0.1	J	0.0052	U	0.36	U	0.0052	U
61	B-25	B-25(5-5.5)_100517	10/5/2017	5 - 5.5	Primary		0.099	J	0.31	U	0.37	U	0.0054	U
61	B-26	B-26(0.5-1.5)_100517	10/5/2017	0.5 - 1.5	Primary		0.02	J	0.0093	UJ	0.2	U	0.0093	U
61	B-26	B-26(5-5.8)_100517	10/5/2017	5 - 5.8	Primary		0.015	J	0.016	J+	0.12	J	0.0067	U
61	B-27	B-27(0.5-1.5)_100517	10/5/2017	0.5 - 1.5	Primary		0.021	J	0.0081		0.049	J	0.0054	U
61	B-27	B-27(5-5.5)_100517	10/5/2017	5 - 5.5	Primary		0.015	J	0.0055	U	0.091	J	0.0055	U
61	B-68	B-68(1-2)_102417	10/24/2017	1 - 2	Primary		0.042	U	0.0077	U	0.22	U	0.0077	U
62	B-28	B-28(0.5-1.5)_100917	10/9/2017	0.5 - 1.5	Primary		0.059		0.006	U	0.95	U	0.006	U
62	B-28	B-28(1.5-2.75)_100917	10/9/2017	1.5 - 2.75	Primary		0.164	J	0.007	U	0.11	J	0.007	U
62	B-93	B-93(1-2)_121518	12/15/2018	1 - 2	Primary		0.074		NR		68		NR	
62	B-93	B-93(2-3)_121518	12/15/2018	2 - 3	Primary		0.089		0.55	U	53		0.55	U
63	B-29	B-29(0-1)_092917	9/29/2017	0 - 1	Primary		0.189	J	0.0054	U	0.058	J	0.0054	U
63	B-29	B-29(1-3)_092917	9/29/2017	1 - 3	Primary		0.157	J	0.005	J	0.059	J	0.0056	U
63	B-30	B-30(0-1)_100417	10/4/2017	0 - 1	Primary		0.19	J	0.0078	U	0.3	J	0.0078	U
63	B-30	B-30(3-3.8)_100417	10/4/2017	3 - 3.8	Primary		0.029	J	0.0072	U	0.4		0.0072	U
63	B-31	B-31(1-2)_101817	10/18/2017	1 - 2	Primary		0.04	U	0.024		0.28		0.0065	U
63	B-31	B-31(5-5.5)_101817	10/18/2017	5 - 5.5	Primary		0.042	U	0.0066	J	0.33		0.0071	U

TABLE 3-5A
SUMMARY OF RI SOIL SAMPLE ARAR/PRG EXCEEDANCES
RIVERSIDE INDUSTRIAL PARK SUPERFUND SITE
NEWARK, NEW JERSEY

							Total PCBs		VOCs					
							Total PCBs		Benzene		Naphthalene		Vinyl Chloride	
							ARAR = 1 mg/kg		ARAR = 5 mg/kg		ARAR = 17 mg/kg		ARAR = 2 mg/kg	
Lot ID	Location	Sample ID	Sample Date	Sample Depth Interval (ft bgs)	Sample Type	Parent sample ID	Result (mg/kg)	Qual	Result (mg/kg)	Qual	Result (mg/kg)	Qual	Result (mg/kg)	Qual
63	B-32	B-32(1-2)_100417	10/4/2017	1 - 2	Primary		0.068	J	0.0072	UJ	0.094	J	0.0072	U
63	B-32	B-32(2-4)_100417	10/4/2017	2 - 4	Primary		0.041	UJ	0.0066	UJ	0.34		0.0066	U
63	B-33	B-33(0.5-1.5)_100417	10/4/2017	0.5 - 1.5	Primary		0.23	J	0.0046	U	0.063	J	0.0046	U
63	B-33	B-33(3.5-4.5)_100417	10/4/2017	3.5 - 4.5	Primary		0.04	U	0.006	J+	0.085	J	0.0058	U
63	B-85	B-85(0-0.5)_121218	12/12/2018	0 - 0.5	Primary		0.11	J	0.006	U	0.0092	J	0.006	U
63	B-85	B-85(2.5-3.5)_121218	12/12/2018	2.5 - 3.5	Primary		0.044	U	0.42	U	0.27	J	0.42	U
63	B-87	B-87(0-1)_121318	12/13/2018	0 - 1	Primary		0.018	J	0.0036	J	0.17		0.0077	UJ
63	B-87	B-87(1-3)_121318	12/13/2018	1 - 3	Primary		0.082		0.0036	J	0.14		0.0082	UJ
63	B-87	DUP-2_121318	12/13/2018	1 - 3	Duplicate	B-87(1-3)_121318	0.097		0.15	J	0.15		0.48	UJ
64	B-34	B-34(0-1)_100617	10/6/2017	0 - 1	Primary		0.045	J	0.17	J	0.3		0.0054	U
64	B-34	B-34(5-5.5)_100617	10/6/2017	5 - 5.5	Primary		0.036	U	2.6	U	1.1		2.6	U
64	B-35	B-35(1-2)_100417	10/4/2017	1 - 2	Primary		0.011	J	*16*		0.19		0.0086	U
64	B-35	B-35(2-3.8)_100417	10/4/2017	2 - 3.8	Primary		0.36	J	*7.9*		2.5		0.44	U
64	B-36	B-36(0-1)_100417	10/4/2017	0 - 1	Primary		0.16		0.0043	U	0.2		0.0043	U
64	B-36	B-36(3-3.7)_100417	10/4/2017	3 - 3.7	Primary		0.018	J	0.5	U	0.65		0.5	U
64	B-37	B-37(0-1)_100417	10/4/2017	0 - 1	Primary		0.13	J	0.0084	J+	0.18	U	0.005	U
64	B-37	B-37(1-3)_100417	10/4/2017	1 - 3	Primary		0.045	J	0.0049	UJ	0.93	U	0.0049	U
64	B-38	B-38(0-1)_100917	10/9/2017	0 - 1	Primary		0.42	J	0.28	U	0.95	U	0.28	U
64	B-38	DUP-4_101017	10/9/2017	0 - 1	Duplicate	B-38(0-1)_100917	0.26	J	0.26	U	0.19	U	0.26	U
64	B-38	B-38(1-3)_100917	10/9/2017	1 - 3	Primary		0.042	U	0.005	U	0.21	U	0.005	U
64	B-38	B-38(FILL)_100917	10/9/2017	-3 - 0	Primary		*3.7*	*J*	0.0054	U	0.22	J	0.0054	U
64	B-41	B-41(0-1)_092617	9/26/2017	0 - 1	Primary		*1.4*		0.0052	U	0.93	U	0.0052	U
64	B-41	B-41(5-7)_092717	9/27/2017	5 - 7	Primary		0.036	U	0.0042	U	0.19	U	0.0042	U
64	B-42	B-42(0.3-1.3)_100217	10/2/2017	0.3 - 1.3	Primary		0.194	J	0.0053	U	0.94	U	0.0053	U
64	B-42	B-42(7-9)_100217	10/2/2017	7 - 9	Primary		0.049	UJ	0.0075	U	0.054	J	0.0075	U
64	B-69	B-69(0-1)_092717	9/27/2017	0 - 1	Primary		0.04	J	0.0043	U	0.18	U	0.0043	U
64	B-69	B-69(1-3)_092717	9/27/2017	1 - 3	Primary		0.56	J	0.0041	UJ	0.053	J	0.0041	U
64	B-70	B-70(0-1)_092717	9/27/2017	0 - 1	Primary		0.157	J	0.005	U	0.18	U	0.005	UJ
64	B-70	B-70(5-7)_092717	9/27/2017	5 - 7	Primary		0.04	U	0.038		1	U	0.0051	U
64	B-74	B-74(0-1)_100417	10/4/2017	0 - 1	Primary		0.26	J	0.004	U	0.86	U	0.004	U
64	B-74	B-74(3-4)_100417	10/4/2017	3 - 4	Primary		0.038	U	*68*		0.2	U	0.39	U
64	B-75	B-75(0-1)_092917	9/29/2017	0 - 1	Primary		0.093	J	0.0045	U	0.18	U	0.0045	U
64	B-75	B-75(1-3)_092917	9/29/2017	1 - 3	Primary		0.015	J	0.48	U	0.21	U	0.48	U
64	B-86	B-86(0.3-1.3)_121118	12/11/2018	0.3 - 1.3	Primary		0.036	J	0.0052	UJ	1.1		0.0052	UJ
64	B-86	B-86(1.3-3.3)_121118	12/11/2018	1.3 - 3.3	Primary		0.042	U	0.0064	UJ	0.35	J	0.0064	UJ
64	B-88	B-88(0-1)_121318	12/13/2018	0 - 1	Primary		0.28		0.0019	J	0.19		0.0048	UJ
64	B-88	B-88(11-13)_121318	12/13/2018	11 - 13	Primary		0.045	U	0.0033	J	0.064	J	0.0079	UJ
64	B-88	B-88(1-3)_121318	12/13/2018	1 - 3	Primary		0.016	J	0.27	J	0.11		0.3	UJ
64	B-89	B-89(0-1)_121318	12/13/2018	0 - 1	Primary		0.15		0.0018	J	0.011	J	0.0051	U
64	B-89	B-89(1-3)_121318	12/13/2018	1 - 3	Primary		0.072		0.12	J	0.41		0.34	U
64	B-90	B-90(0-1)_121218	12/12/2018	0 - 1	Primary		0.075	J	0.0049	U	0.017	J	0.0049	U
64	B-90	B-90(11-13)_121218	12/12/2018	11 - 13	Primary		0.051	U	0.53	U	0.069		0.53	U
64	B-90	B-90(1-2.2)_121218	12/12/2018	1.2 - 2	Primary		0.071		0.0061	U	0.039	J	0.0061	U
64	B-91	B-91(0-1)_121518	12/15/2018	0 - 1	Primary		*1.4*		0.0046	U	0.058	J	0.0046	U
64	B-91	B-91(11-13)_121518	12/15/2018	11 - 13	Primary		0.047	U	0.0017	J	0.019		0.0058	U
64	B-91	B-91(1-3)_121518	12/15/2018	1 - 3	Primary		0.53		0.00064	J	0.27	J	0.0044	U
64	B-92	B-92(0-1)_121218	12/12/2018	0 - 1	Primary		0.45		0.016	J	0.019	J	0.0042	UJ
64	B-92	B-92(1-2.5)_121218	12/12/2018	1 - 2.5	Primary		0.47		0.005	UJ	0.044	J	0.0048	UJ
64	B-94	B-94(0-1)_121318	12/13/2018	0 - 1	Primary		0.11		0.0045	U	0.18	U	0.0045	U
64	B-94	B-94(1-3)_121318	12/13/2018	1 - 3	Primary		0.22		0.41	J	0.11		0.48	U
65	B-39	B-39(0.5-1.5)_100317	10/3/2017	0.5 - 1.5	Primary		0.154		0.0049	U	0.2	U	0.0049	U
65	B-39	B-39(5-7)_100317	10/3/2017	5 - 7	Primary		0.037	J	0.0058	U	0.2	U	0.0058	U
65	B-40	B-40(0-1)_092617	9/26/2017	0 - 1	Primary		*3.1*	*J*	0.0065	U	1	U	0.0065	U
65	B-40	B-40(5-7)_092717	9/27/2017	5 - 7	Primary		0.036	J-	0.0061	U	0.22	U	0.0061	U
65	B-43	B-43(0-1)_092617	9/26/2017	0 - 1	Primary		0.046	J	0.0039	U	0.061	J	0.0039	UJ
65	B-43	B-43(5-7)_092617	9/26/2017	5 - 7	Primary		0.145	J	0.0047	U	0.73		0.0047	U
65	B-76	B-76(0-1)_102317	10/23/2017	0 - 1	Primary		0.037	U	0.0063	U	0.068	J	0.0063	U
65	B-76	B-76(1-3)_102317	10/23/2017	1 - 3	Primary		0.037	U	0.0052	U	0.19	U	0.0052	U
65	B-76	DUP-7_102317	10/23/2017	1 - 3	Duplicate	B-76(1-3)_102317	0.042	U	0.0063	U	0.076	J	0.0063	U
66	B-44	B-44(0-1)_100217	10/2/2017	0 - 1	Primary		0.036	U	0.0047	U	0.94	U	0.0047	U
66	B-44	B-44(5-5.5)_100217	10/2/2017	5 - 5.5	Primary		0.21	J	0.0079	J+	1.5		0.0054	U
66	B-78	B-78(0.5-1.5)_102517	10/25/2017	0.5 - 1.5	Primary		0.038	U	0.0047	U	0.2	U	0.0047	U
66	B-78	B-78(5-7)_102517	10/25/2017	5 - 7	Primary		0.05	U	0.007	U	0.32	J	0.007	U
66	B-84	B-84(11-13)_121218	12/12/2018	11 - 13	Primary		0.05	U	0.0047	U	0.04	J	0.0047	U
66	B-84	B-84(1-2)_121218	12/12/2018	1 - 2	Primary		0.0073	J	0.005	UJ	0.011	J	0.005	U
66	B-84	B-84(2-4)_121218	12/12/2018	2 - 4	Primary		0.036	U	0.0049	U	0.22	J	0.0049	U
67	B-51	B-51(1-2)_092817	9/28/2017	1 - 2	Primary		0.153	J	0.0042	UJ	0.26		0.0042	U
67	B-51	B-51(5-7)_092817	9/28/2017	5 - 7	Primary		0.04	U	0.0059	U	0.24		0.0059	U
67	B-52	B-52(0-1)_102317	10/23/2017	0 - 1	Primary		*5*	*J*	0.0057	U	0.53	J	0.0057	U
67	B-52	B-52(1-3)_102317	10/23/2017	1 - 3	Primary		0.44	J	0.0077	U	0.13	J	0.0077	U
67	B-53	B-53(0-1)_092817	9/28/2017	0 - 1	Primary		0.193		0.0056	U	0.049	J	0.0056	U
67	B-53	B-53(1-3)_092817	9/28/2017	1 - 3	Primary		0.039	U	0.0058	U	3.9		0.0058	U
67	B-54	B-54(1-2)_092817	9/28/2017	1 - 2	Primary		0.037	U	0.0045	U	3.3		0.0045	U
67	B-54	B-54(7-8)_092817	9/28/2017	7 - 8	Primary		0.049	UJ	0.0093	U	0.25	U	0.0093	U
67	B-55	B-55(0.5-1.5)_100317	10/3/2017	0.5 - 1.5	Primary		0.024	J	NR		0.93	U	0.0049	UJ
67	B-55	B-55(3.5-5)_100317	10/3/2017	3.5 - 5	Primary		0.04	U	0.0055	U	0.12	J	0.0055	U
67	B-81	B-81(0.3-1.3)_121218	12/12/2018	0.3 - 1.3	Primary		0.81	J	0.25	U	0.078		0.25	U
67	B-81	B-81(5-7)_121218	12/12/2018	5 - 7	Primary		0.091	J-	0.0047	U	0.24	J	0.0047	U
68	B-56	B-56(1-2)_092717	9/27/2017	1 - 2	Primary		0.183		0.0057	UJ	0.16	J	0.1	
68	B-56	B-56(2-4)_092717	9/27/2017	2 - 4	Primary		0.1	J	0.005	U	0.21	U	*2.9*	

TABLE 3-5A
SUMMARY OF RI SOIL SAMPLE ARAR/PRG EXCEEDANCES
RIVERSIDE INDUSTRIAL PARK SUPERFUND SITE
NEWARK, NEW JERSEY

							Total PCBs		VOCs					
							Total PCBs		Benzene		Naphthalene		Vinyl Chloride	
							ARAR = 1 mg/kg		ARAR = 5 mg/kg		ARAR = 17 mg/kg		ARAR = 2 mg/kg	
Lot ID	Location	Sample ID	Sample Date	Sample Depth Interval (ft bgs)	Sample Type	Parent sample ID	Result (mg/kg)	Qual	Result (mg/kg)	Qual	Result (mg/kg)	Qual	Result (mg/kg)	Qual
68	B-57	B-57(1-2)_100317	10/3/2017	1 - 2	Primary		0.01	J	0.0049	U	0.4	U	0.0049	U
68	B-57	B-57(2-4)_100317	10/3/2017	2 - 4	Primary		0.05	U	0.0076	U	0.26	U	0.0076	U
68	B-58	B-58(1-2)_092717	9/27/2017	1 - 2	Primary		0.038	U	0.18	J	0.3		0.36	U
68	B-58	B-58(6-8)_092717	9/27/2017	6 - 8	Primary		0.039	U	0.0043	U	0.2	U	0.0043	U
68	B-59	B-59(12-13.5)_100317	10/3/2017	9 - 10.5	Primary		0.038	U	0.0046	U	0.2	U	0.0046	U
68	B-59	B-59(5-7)_100317	10/3/2017	2 - 4	Primary		0.027	J	0.0058	U	0.19	U	0.0058	U
68	B-59	DUP-2_100317	10/3/2017	2 - 4	Duplicate	B-59(5-7)_100317	0.036	U	0.006	U	0.37	U	0.006	U
68	B-59	B-59(FILL)_100317	10/3/2017	-3 - 0	Primary		0.13	J	0.0047	U	0.18	U	0.0047	U
68	B-60	B-60(0-1)_092617	9/26/2017	0 - 1	Primary		0.035	U	0.0043	U	0.058	J	0.0043	U
68	B-60	B-60(5-7)_092617	9/26/2017	5 - 7	Primary		0.024	J	0.005	U	0.044	J	0.005	U
68	B-60	B-60(FILL)_092617	9/26/2017	-4 - 0	Primary		0.036	U	0.0043	U	0.14	J	0.0043	U
68	B-77	B-77(0-1)_092817	9/28/2017	0 - 1	Primary		0.019	J	0.0048	U	0.18	U	0.0048	U
68	B-77	B-77(1-3)_092817	9/28/2017	1 - 3	Primary		0.034	U	0.0073	U	0.18	U	0.0073	U
68	B-77	DUP-1_092817	9/28/2017	1 - 3	Duplicate	B-77(1-3)_092817	0.035	U	0.0054	U	0.18	U	0.0054	U
68	B-80	B-80(0.3-1.3)_121218	12/12/2018	0.3 - 1.3	Primary		0.22		0.47	J	0.093	J	1.7	U
68	B-80	B-80(1.3-3.3)_121218	12/12/2018	1.3 - 3.3	Primary		0.011	J	0.0059	U	0.095		0.0059	U
68	B-82	B-82(11-13)_121118	12/11/2018	11 - 13	Primary		0.051	U	0.0075	UJ	0.0013	J	0.0075	UJ
68	B-82	B-82(1-2)_121118	12/11/2018	1 - 2	Primary		0.15	J-	2	UJ	0.039	J	2	UJ
68	B-82	B-82(5-7)_121118	12/11/2018	5 - 7	Primary		0.013	J	0.0057	UJ	0.0066	J	0.074	J
68	B-83	B-83(0.3-1.3)_121118	12/11/2018	0.3 - 1.3	Primary		0.17	J	0.39	U	0.23		0.39	U
68	B-83	B-83(1.3-3.3)_121118	12/11/2018	1.3 - 3.3	Primary		0.21		0.092	J	0.12	J	NR	
68	B-83	DUP-1_121118	12/11/2018	1.3 - 3.3	Duplicate	B-83(1.3-3.3)_12111	0.22		0.013	J	0.21	J	0.0071	UJ
69	B-61	B-61(0-1)_101117	10/11/2017	0 - 1	Primary		0.77		0.0053	U	0.077	J	0.0053	U
69	B-61	B-61(5-6)_101117	10/11/2017	5 - 6	Primary		0.036	U	0.0044	U	0.19	U	0.0044	U
69	B-62	B-62(0-1)_101117	10/11/2017	0 - 1	Primary		0.22	J	0.0049	U	0.18	U	0.0049	U
69	B-62	B-62(5-5.5)_101117	10/11/2017	5 - 5.5	Primary		0.038	U	0.0072	U	0.14	J	0.0072	U
69	B-63	B-63(0-1)_101117	10/11/2017	0 - 1	Primary		0.11	J	0.0065	U	0.18	U	0.0065	U
69	B-63	B-63(1-3)_101117	10/11/2017	1 - 3	Primary		0.11		0.0047	U	0.64	J	0.0047	U
69	B-101	B-101(0-1)_121418	12/14/2018	0 - 1	Primary		0.0077	J	0.0013	J	0.029		0.0058	U
69	B-101	B-101(11-13)_121418	12/14/2018	11 - 13	Primary		0.038	U	0.0043	U	0.2	U	0.0043	U
69	B-101	B-101(5-6)_121418	12/14/2018	5 - 6	Primary		0.0053	J	0.0045	U	0.33		0.0045	U
69	B-102	B-102(0-1)_121418	12/14/2018	0 - 1	Primary		0.29		0.0045	U	0.2	U	0.0045	U
69	B-102	B-102(1-2.9)_121418	12/14/2018	1 - 2.9	Primary		0.0066	J	0.0044	U	0.055	U	0.0044	U
70	B-19	B-19(0-1)_101117	10/11/2017	0 - 1	Primary		0.038	U	0.0059	U	0.19	U	0.0056	U
70	B-19	B-19(2-4)_101117	10/11/2017	2 - 4	Primary		0.19		0.0051	U	0.19	U	0.0051	U
70	B-64	B-64(1.5-2.5)_101117	10/11/2017	1.5 - 2.5	Primary		0.3	J	0.0053	U	0.19	U	0.0051	U
70	B-64	DUP-5_101117	10/11/2017	1.5 - 2.5	Duplicate	B-64(1.5-2.5)_10111	0.67	J	0.0049	U	0.19	U	0.0049	U
70	B-64	B-64(2.5-4.5)_101117	10/11/2017	2.5 - 4.5	Primary		0.19	J	0.0057	UJ	0.19	U	0.0057	U
70	B-65	B-65(0.5-1.5)_101317	10/13/2017	0.5 - 1.5	Primary		0.037	U	0.0057	U	0.19	U	0.0057	U
70	B-65	B-65(1.5-2.7)_101317	10/13/2017	1.5 - 2.7	Primary		***2.2***		0.0053	U	0.19	U	0.0053	U
70	B-66	B-66(1.5-2.5)_101017	10/10/2017	1.5 - 2.5	Primary		0.086	J	0.0055	U	0.18	U	0.0055	U
70	B-66	B-66(2.5-4.5)_101017	10/10/2017	2.5 - 4.5	Primary		0.059	J	0.0096	J+	0.048	J	0.0068	U
70	B-67	B-67(1.5-2.5)_101017	10/10/2017	1.5 - 2.5	Primary		0.067	J	0.0056	U	0.92	U	0.0056	U
70	B-67	B-67(2.5-3.8)_101017	10/10/2017	2.5 - 3.8	Primary		***10***	***J***	0.13	J	5.4		0.39	U
70	B-100	B-100(11-13)_121418	12/14/2018	11 - 13	Primary		0.052	U	0.0066	U	0.44	J	0.0066	U
70	B-100	B-100(2.2-3.2)_121418	12/14/2018	2.2 - 3.2	Primary		***2***		0.027	J+	0.061		0.4	U
70	B-100	B-100(3.2-4.2)_121418	12/14/2018	3.2 - 4.2	Primary		0.65		0.0048	UJ	0.031		0.0048	U

Notes:
ARAR = Applicable or Relevant and Appropriate Requirements.
PRG = Preliminary Remediation Goal
Detected result exceeds ARAR or PRG
Reporting Detection Limit exceeds ARAR or PRG
NR = Not reportable
J - Estimated Value, result >MDL and <RL
J+ - Estimated High
J- - Estimated Low
U - Not detected above the laboratory reporting limit
Total PCBs are calculated as the sum of detected Aroclor concentration. If all the Aroclors are reported as nondetected, then the highest reporting limit of the Aroclors is reported.

Only parameters that have a result greater than the selected ARAR/PRG and used in the soil and soil gas alternatives are listed

TABLE 3-5B
SUMMARY OF HISTORIC SOIL SAMPLE ARAR/PRG EXCEEDANCES
RIVERSIDE INDUSTRIAL PARK SUPERFUND SITE
NEWARK, NEW JERSEY

							Metals					
							Arsenic		Copper		Lead	
							ARAR = 19 mg/kg		PRG = 526 mg/kg		PRG = 800 mg/kg	
Lot	Location	Sample ID	Sample Date	Depth Interval (ft bgs)	Sample Type	Parent Sample ID	Result	Qual	Result	Qual	Result	Qual
1	BE-1_1	BE-1 (7.5-8)	9/14/2010	7.5 - 8	Primary		***23***		60		***1100***	
1	BE-2_1	BE-2 (4.5-5)	9/14/2010	4.5 - 5	Primary		2.2		29		69	
1	BE-3_1	BE-3 (7.5-8)	9/14/2010	7.5 - 8	Primary							
1	SB-3_1	SB-3 (2.5-3)	7/30/2008	2.5 - 3	Primary		4.77		76.2		***1370***	
58	S-1_58	S-1	10/6/2009	Less than 14 feet	Primary				ND		24	
58	S-10_58	S-10A	10/6/2009	Less than 14 feet	Primary				65.5		300	
58	S-10_58	S-10B	10/6/2009	Less than 14 feet	Primary				8.5		ND	
58	S-2_58	S-2	10/6/2009	Less than 14 feet	Primary				5.9		ND	
58	S-3_58	S-3	10/6/2009	Less than 14 feet	Primary				8.4		3.5	
58	S-4_58	S-4A	10/6/2009	Less than 14 feet	Primary				188		***1820***	
58	S-4_58	S-4B	10/6/2009	Less than 14 feet	Primary				5.3		ND	
58	S-5_58	S-5	10/6/2009	Less than 14 feet	Primary				48.7		554	
58	S-6_58	S-6A	10/6/2009	Less than 14 feet	Primary				44.7		219	
58	S-6_58	S-6B	10/6/2009	Less than 14 feet	Primary				4.1		ND	
58	S-7_58	S-7	10/6/2009	Less than 14 feet	Primary				181		258	
58	S-8_58	S-8	10/6/2009	Less than 14 feet	Primary				21.3		74.5	
58	S-9_58	S-9	10/6/2009	Less than 14 feet	Primary				4.2		ND	
60	SB-FILL-1_60	SB-FILL-1 (5.5-6)	11/13/2008	5.5 - 6	Primary		13.2		150		126	
60	SB-FILL-2_60	SB-FILL-2 (5.5-6)	11/13/2008	5.5 - 6	Primary		4.46		35.5		14.8	
60	SB-FILL-3_60	SB-FILL-3 (6.5-7)	11/13/2008	6.5 - 7	Primary		1.83		12.9		12.1	
60	SB-FILL-4_60	SB-FILL-4 (5.5-6)	11/13/2008	5.5 - 6	Primary		2.24		12.4		47.4	
60	SB-PAD-1_60	SB-PAD-1 (6.5-7)	11/13/2008	6.5 - 7	Primary							
60	SB-PAD-2_60	SB-PAD-2 (6.5-7)	11/13/2008	6.5 - 7	Primary							
60	SB-PAD-3_60	SB-PAD-3 (6.5-7)	11/13/2008	6.5 - 7	Primary							
60	SB-PAD-4_60	SB-PAD-4 (6.5-7)	11/13/2008	6.5 - 7	Primary							
62	SB-4_62	SB-4 (5.5-6)	5/14/2008	5.5 - 6	Primary		9.62		75.3		153	
62	SB-5_62	SB-5 (5.5-6)	5/14/2008	5.5 - 6	Primary		***34.2***		206		239	
62	SB-6_62	SB-6 (6.5-7)	5/14/2008	6.5 - 7	Primary		10.3		64.9		653	
66	SB-1_66	SB-1 (4.5-5)	5/14/2008	4.5 - 5	Primary		6.9		35.3		126	
66	SB-2_66	SB-2 (4.5-5)	5/14/2008	4.5 - 5	Primary		2.09		18.6		100	
66	SB-3_66	SB-3 (4.5-5)	5/14/2008	4.5 - 5	Primary		8.34		178		***950***	
68	B-54_68	B-54 (0.5-1)	6/22/1994	0.5 - 1	Primary		17.8	J	45.1		182	
68	B-54_68	B-54 (1.5-2)	5/1/1995	1.5 - 2	Duplicate	B-54 (1.5-2)						
68	B-54_68	B-54 (1.5-2)	5/1/1995	1.5 - 2	Primary							
68	B-54_68	B-54 (1-1.5)	6/22/1994	1 - 1.5	Primary		9.4		25.5		317	
68	B-54_68	B-54 (5-5.5)	5/1/1995	5 - 5.5	Primary							
68	B-56_68	B-56 (1.5-2)	5/1/1995	1.5 - 2	Primary							
68	B-56_68	B-56 (5-5.5)	5/1/1995	5 - 5.5	Primary							
68	B-57_68	B-57 (0.5-1)	5/1/1995	0.5 - 1	Duplicate	B-57 (0.5-1)	4.2		51.7		123	
68	B-57_68	B-57 (0.5-1)	5/1/1995	0.5 - 1	Primary		5.7		67		146	
68	B-57_68	B-57 (1.5-2)	5/1/1995	1.5 - 2	Primary							
68	B-57_68	B-57 (3.5-4)	5/1/1995	3.5 - 4	Primary		2.8		91.5		128	
68	B-57_68	B-57 (5-5.5)	5/1/1995	5 - 5.5	Primary							
68	B-58_68	B-58 (1.5-2)	5/1/1995	1.5 - 2	Primary							
68	B-58_68	B-58 (5-5.5)	5/1/1995	5 - 5.5	Primary							
68	B-59_68	B-59 (0.5-1)	6/22/1994	0.5 - 1	Primary		7.5		62.2		121	
68	B-59_68	B-59 (1.5-2)	6/22/1994	1.5 - 2	Primary							
68	B-59_68	B-59 (5-5.5)	6/22/1994	5 - 5.5	Primary							
68	B-60_68	B-60 (0.5-1)	5/1/1995	0.5 - 1	Primary		13.1		70.6		271	
68	B-60_68	B-60 (1.5-2)	5/1/1995	1.5 - 2	Primary							
68	B-60_68	B-60 (5-5.5)	5/1/1995	5 - 5.5	Primary							
68	B-61_68	B-61 (1.5-2)	5/1/1995	1.5 - 2	Primary							
68	B-61_68	B-61 (5-5.5)	5/1/1995	5 - 5.5	Primary							
68	B-62_68	B-62 (1.5-2)	6/22/1994	1.5 - 2	Primary							
68	B-62_68	B-62 (3-3.5)	6/22/1994	3 - 3.5	Primary		11.5	J	223		185	
68	B-62_68	B-62 (5-5.5)	6/22/1994	5 - 5.5	Primary							
68	B-63_68	B-63 (0.5-1)	6/22/1994	0.5 - 1	Primary		***28.2***	***J***	29		80.4	
68	B-63_68	B-63 (1.5-2)	6/22/1994	1.5 - 2	Primary							
68	B-63_68	B-63 (3-3.5)	6/22/1994	3 - 3.5	Primary		6		82.2		516	
68	B-63_68	B-63 (5-5.5)	6/22/1994	5 - 5.5	Primary							
68	B-64_68	B-64 (3.5-4)	5/1/1995	3.5 - 4	Duplicate	B-64 (3.5-4)						
68	B-64_68	B-64 (3.5-4)	5/1/1995	3.5 - 4	Primary							
68	B-65_68	B-65 (3-3.5)	6/22/1994	3 - 3.5	Primary							
68	B-66_68	B-66 (2-2.5)	6/22/1994	2 - 2.5	Primary							
68	GP-1_68	GP-1, S-1 (5-5.5)	1/12/1995	5 - 5.5	Primary							
68	GP-1_68	GP-1, S-2 (7.5-8)	1/12/1995	7.5 - 8	Primary							
68	GP-1_68	GP-1, S-4 (11.5-12)	1/12/1995	11.5 - 12	Primary							
68	GP-2_68	GP-2, S-2 (7-7.5)	1/12/1995	7 - 7.5	Primary							
68	GP-2_68	GP-2, S-4 (11.5-12)	1/12/1995	11.5 - 12	Primary							
68	GP-5_68	GP-5, S-1 (5.5-6)	1/12/1995	5.5 - 6	Primary							
68	GP-5_68	GP-5, S-2 (7-7.5)	1/12/1995	7 - 7.5	Primary							
68	GP-5_68	GP-5, S-4 (11.5-12)	1/12/1995	11.5 - 12	Duplicate	GP-5, S-4 (11.5-12)						
68	GP-5_68	GP-5, S-4 (11.5-12)	1/12/1995	11.5 - 12	Primary							
63-64	B-1_63-64	B1-1 (2.1-2.6)	5/26/2010	2.1 - 2.6	Primary		6.1		110		510	
63-64	B-1_63-64	B1-2 (8.5-10)	5/26/2010	8.5 - 10	Primary		14		69		480	
63-64	B-10_63-64	B10-1 (6-7)	5/26/2010	6 - 7	Primary		***21***		160	K	420	

TABLE 3-5B
SUMMARY OF HISTORIC SOIL SAMPLE ARAR/PRG EXCEEDANCES
RIVERSIDE INDUSTRIAL PARK SUPERFUND SITE
NEWARK, NEW JERSEY

							Metals					
							Arsenic		Copper		Lead	
							ARAR = 19 mg/kg		PRG = 526 mg/kg		PRG = 800 mg/kg	
Lot	Location	Sample ID	Sample Date	Depth Interval (ft bgs)	Sample Type	Parent Sample ID	Result	Qual	Result	Qual	Result	Qual
63-64	B-10_63-64	B10-2 (10-11)	5/26/2010	10 - 11	Primary		8.5		220	K	310	
63-64	B-11_63-64	B11-1 (2-6)	5/26/2010	2 - 6	Primary		6.3		130	K	470	
63-64	B-12_63-64	B12-1 (2.1-2.8)	5/26/2010	2.1 - 2.8	Primary		5		180	K	470	
63-64	B-12_63-64	B12-2 (6.4-7.5)	5/26/2010	6.4 - 7.5	Primary		17		87	K	460	
63-64	B-2_63-64	B2-1 (7.5-10)	5/26/2010	7.5 - 10	Primary		5.1		55		380	
63-64	B-2_63-64	B2-2 (10-12.5)	5/26/2010	10 - 12.5	Primary		2.1		23		25	
63-64	B-3_63-64	B3-1 (5-7)	5/26/2010	5 - 7	Primary		12		51		570	
63-64	B-3_63-64	B3-1 (5-7)	5/26/2010	5 - 7	Primary							
63-64	B-3_63-64	B3-2 (7-9)	5/26/2010	7 - 9	Primary		***25***		190		610	
63-64	B-4_63-64	B4-1 (2.5-4)	5/26/2010	2.5 - 4	Primary		3.2		34		120	
63-64	B-4_63-64	B4-1 (8-10)	5/26/2010	8 - 10	Primary		11		58		420	
63-64	B-4_63-64	B4-2 (8-10)	5/26/2010	8 - 10	Primary							
63-64	B-5_63-64	B5-1 (1-4)	5/26/2010	1 - 4	Primary		7.5		87		***4700***	
63-64	B-5_63-64	B5-2 (9-11)	5/26/2010	9 - 11	Primary		7.2		66		210	
63-64	B-6_63-64	B6-1 (1-2.5)	5/26/2010	1 - 2.5	Primary		***22***		180		***1600***	
63-64	B-6_63-64	B6-2 (5-5)	5/26/2010	5 - 5	Primary		8.4		88		790	
63-64	B-7_63-64	B7-1 (8.5-9)	5/26/2010	8.5 - 9	Primary		***34***		170		***4300***	
63-64	B-7_63-64	B7-2 (10-10.5)	5/26/2010	10 - 10.5	Primary		18		91		***2100***	
63-64	B-8_63-64	B8-1 (5-5.5)	5/26/2010	5 - 5.5	Primary		***63***		230		***4000***	
63-64	B-8_63-64	B8-2 (10-11)	5/26/2010	10 - 11	Primary		10		69		***820***	
63-64	B-8_63-64	B8-2d (10-11)	5/26/2010	10 - 11	Duplicate	B8-2 (10-11)	9.8		69		***810***	
63-64	B-9_63-64	B9-1 (5-6)	5/26/2010	5 - 6	Primary		***35***		160		***2700***	
63-64	B-9_63-64	B9-2 (10-11)	5/26/2010	10 - 11	Primary		***30***		220		***2700***	
63-64	HF-2_63-64	HF-2 (11-12.5)	9/23/2009	11 - 12.5	Primary		***56.6***		167		***10800***	
63-64	HF-2_63-64	HF-2R (11-12.5)	9/28/2009	11 - 12.5	Primary							
63-64	HF-3_63-64	HF-3 (7-7.5)	9/23/2009	7 - 7.5	Primary		9.8		101		355	
63-64	HF-3_63-64	HF-3R (7-7.5)	9/28/2009	7 - 7.5	Primary							
63-64	HF-4_63-64	HF-4 (11-11.5)	9/23/2009	11 - 11.5	Primary		8.1		79.6		296	
63-64	HF-5_63-64	HF-5 (6.5-7)	9/23/2009	6.5 - 7	Primary		7.9		59.6		166	
63-64	HF-6_63-64	HF-6 (10.5-11)	9/23/2009	10.5 - 11	Primary		9.8		97		627	
63-64	HF-7_63-64	HF-7 (16-16.5)	9/23/2009	16 - 16.5	Primary		7.5		1650		59.4	
63-64	HF-NW_63-64	HF-NWA (2-2.5)	9/23/2009	2 - 2.5	Primary		16.5		***150***		***2470***	
63-64	HF-NW_63-64	HF-NWB (6.5-7)	9/23/2009	6.5 - 7	Primary		***30.3***		75.5		***1680***	
63-64	HF-NW_63-64	HF-NWC (11.5-12)	9/23/2009	11.5 - 12	Primary		12.7		79.8		***1520***	
63-64	HF-NW_63-64	HF-NWD (18-18.5)	9/23/2009	18 - 18.5	Primary		ND		8		4.1	
63-64	LD-1_63-64	LD-1 (1.5-2)	9/23/2009	1.5 - 2	Primary		8.9		96.4		***967***	
63-64	LD-1A_63-64	LD-1A (4.5-5)	9/23/2009	4.5 - 5	Primary		6		104		455	
63-64	LD-2_63-64	LD-2 (1.5-2)	9/23/2009	1.5 - 2	Primary		5		138		415	
63-64	LD-3_63-64	LD-3 (1.5-2)	9/23/2009	1.5 - 2	Primary		***21.9***		90.8		***1610***	
63-64	LD-4_63-64	LD-4 (2.5-3)	9/23/2009	2.5 - 3	Primary		10.1		114		494	
63-64	LD-5_63-64	LD-5 (10-10.5)	9/23/2009	10 - 10.5	Primary		***42***		162		***4420***	
63-64	STG-1_63-64	STG-1 (1.5-2)	9/23/2009	1.5 - 2	Primary		2.4		20.2		99.6	
63-64	STG-2_63-64	STG-2 (10-10.5)	9/23/2009	10 - 10.5	Primary		***40.1***		330		***3420***	
63-64	STG-3_63-64	STG-3 (2.5-3)	9/23/2009	2.5 - 3	Primary		11.3		107		***1510***	
63-64	TRANS-1_63-64	TRANS-1 (0.5-1)	9/23/2009	0.5-1	Primary							
63-64	TRENCH-1_63-64	TRENCH-1 (5.5-6)	9/23/2009	5.5 - 6	Primary		7.7		77.6		522	
63-64	TT-1_63-64	TT-1 (1.5-2)	9/23/2009	1.5 - 2	Primary		***51.7***		219		***3580***	
63-64	TT-1_63-64	TT-1R (1.5-2)	9/28/2009	1.5 - 2	Primary							
63-64	UST-DG/HF-1_63-64	UST-DG/HF-1 (6.5-7)	9/23/2009	6.5 - 7	Primary		13.3		177		657	
63-64	UST-DG/HF-1_63-64	UST-DG/HF-1R (6.5-7)	9/28/2009	6.5 - 7	Primary							

Notes:
ARAR = Applicable or Relevant and Appropriate Requirements.
PRG = Preliminary Remediation Goal
ND = Not detected and reporting detection limit is not available
Detected result exceeds ARAR or PRG
Reporting Detection Limit exceeds ARAR or PRG
D - Result is from diluted sample
J - Estimated Value, result >MDL and <RL
K - Estimated, unspecified laboratory non-conformance
U - Not detected above the laboratory reporting limit
Total PCBs are calculated as the sum of detected Aroclor concentration. If all the Aroclors are reported as nondetected, then the highest reporting limit of the Aroclors is reported.
Not Analyzed
Only parameters that have a result greater than the selected ARAR/PRG and used in the soil and soil gas alternatives are listed

TABLE 3-5B
SUMMARY OF HISTORIC SOIL SAMPLE ARAR/PRG EXCEEDANCES
RIVERSIDE INDUSTRIAL PARK SUPERFUND SITE
NEWARK, NEW JERSEY

							PAHs							
							Benzo(a) anthracene ARAR = 17 mg/kg		Benzo(a)pyrene ARAR = 2 mg/kg		Benzo(b) fluoranthene ARAR = 17 mg/kg		Dibenzo(a,h) anthracene ARAR = 2 mg/kg	
Lot	Location	Sample ID	Sample Date	Depth Interval (ft bgs)	Sample Type	Parent Sample ID	Result	Qual	Result	Qual	esult (mg/k	Qual	esult (mg/k	Qual
1	BE-1_1	BE-1 (7.5-8)	9/14/2010	7.5 - 8	Primary		0.23		0.32		0.39		0.26	
1	BE-2_1	BE-2 (4.5-5)	9/14/2010	4.5 - 5	Primary		0.005	J	0.013		0.015		ND	
1	BE-3_1	BE-3 (7.5-8)	9/14/2010	7.5 - 8	Primary									
1	SB-3_1	SB-3 (2.5-3)	7/30/2008	2.5 - 3	Primary		0.442		0.282		0.767		0.147	J
58	S-1_58	S-1	10/6/2009	Less than 14 feet	Primary		ND		ND		ND		ND	
58	S-10_58	S-10A	10/6/2009	Less than 14 feet	Primary		0.363		0.348		0.305		0.566	
58	S-10_58	S-10B	10/6/2009	Less than 14 feet	Primary		ND		ND		ND		ND	
58	S-2_58	S-2	10/6/2009	Less than 14 feet	Primary		0.0554		0.0383		ND		ND	
58	S-3_58	S-3	10/6/2009	Less than 14 feet	Primary		ND		ND		ND		ND	
58	S-4_58	S-4A	10/6/2009	Less than 14 feet	Primary		0.437		0.406		0.431		0.0994	
58	S-4_58	S-4B	10/6/2009	Less than 14 feet	Primary		ND		ND		ND		ND	
58	S-5_58	S-5	10/6/2009	Less than 14 feet	Primary		0.0808		0.0981		0.132		0.0352	
58	S-6_58	S-6A	10/6/2009	Less than 14 feet	Primary		0.187		0.173		0.163		ND	
58	S-6_58	S-6B	10/6/2009	Less than 14 feet	Primary		ND		ND		ND		ND	
58	S-7_58	S-7	10/6/2009	Less than 14 feet	Primary		ND		ND		ND		ND	
58	S-8_58	S-8	10/6/2009	Less than 14 feet	Primary		0.24		0.251		0.254		0.0351	
58	S-9_58	S-9	10/6/2009	Less than 14 feet	Primary		ND		ND		ND		ND	
60	SB-FILL-1_60	SB-FILL-1 (5.5-6)	11/13/2008	5.5 - 6	Primary									
60	SB-FILL-2_60	SB-FILL-2 (5.5-6)	11/13/2008	5.5 - 6	Primary		ND		ND		ND		ND	
60	SB-FILL-3_60	SB-FILL-3 (6.5-7)	11/13/2008	6.5 - 7	Primary									
60	SB-FILL-4_60	SB-FILL-4 (5.5-6)	11/13/2008	5.5 - 6	Primary									
60	SB-PAD-1_60	SB-PAD-1 (6.5-7)	11/13/2008	6.5 - 7	Primary									
60	SB-PAD-2_60	SB-PAD-2 (6.5-7)	11/13/2008	6.5 - 7	Primary									
60	SB-PAD-3_60	SB-PAD-3 (6.5-7)	11/13/2008	6.5 - 7	Primary									
60	SB-PAD-4_60	SB-PAD-4 (6.5-7)	11/13/2008	6.5 - 7	Primary									
62	SB-4_62	SB-4 (5.5-6)	5/14/2008	5.5 - 6	Primary		ND		ND		ND		ND	
62	SB-5_62	SB-5 (5.5-6)	5/14/2008	5.5 - 6	Primary		0.297	J	ND		ND		ND	
62	SB-6_62	SB-6 (6.5-7)	5/14/2008	6.5 - 7	Primary		ND		ND		ND		ND	
66	SB-1_66	SB-1 (4.5-5)	5/14/2008	4.5 - 5	Primary		ND		ND		ND		ND	
66	SB-2_66	SB-2 (4.5-5)	5/14/2008	4.5 - 5	Primary		ND		ND		ND		ND	
66	SB-3_66	SB-3 (4.5-5)	5/14/2008	4.5 - 5	Primary		0.543		0.58		0.442		0.155	J
68	B-54_68	B-54 (0.5-1)	6/22/1994	0.5 - 1	Primary									
68	B-54_68	B-54 (1.5-2)	5/1/1995	1.5 - 2	Duplicate	B-54 (1.5-2)								
68	B-54_68	B-54 (1.5-2)	5/1/1995	1.5 - 2	Primary									
68	B-54_68	B-54 (1-1.5)	6/22/1994	1 - 1.5	Primary									
68	B-54_68	B-54 (5-5.5)	5/1/1995	5 - 5.5	Primary									
68	B-56_68	B-56 (1.5-2)	5/1/1995	1.5 - 2	Primary									
68	B-56_68	B-56 (5-5.5)	5/1/1995	5 - 5.5	Primary									
68	B-57_68	B-57 (0.5-1)	5/1/1995	0.5 - 1	Duplicate	B-57 (0.5-1)								
68	B-57_68	B-57 (0.5-1)	5/1/1995	0.5 - 1	Primary									
68	B-57_68	B-57 (1.5-2)	5/1/1995	1.5 - 2	Primary									
68	B-57_68	B-57 (3.5-4)	5/1/1995	3.5 - 4	Primary									
68	B-57_68	B-57 (5-5.5)	5/1/1995	5 - 5.5	Primary									
68	B-58_68	B-58 (1.5-2)	5/1/1995	1.5 - 2	Primary									
68	B-58_68	B-58 (5-5.5)	5/1/1995	5 - 5.5	Primary									
68	B-59_68	B-59 (0.5-1)	6/22/1994	0.5 - 1	Primary									
68	B-59_68	B-59 (1.5-2)	6/22/1994	1.5 - 2	Primary									
68	B-59_68	B-59 (5-5.5)	6/22/1994	5 - 5.5	Primary									
68	B-60_68	B-60 (0.5-1)	5/1/1995	0.5 - 1	Primary									
68	B-60_68	B-60 (1.5-2)	5/1/1995	1.5 - 2	Primary									
68	B-60_68	B-60 (5-5.5)	5/1/1995	5 - 5.5	Primary									
68	B-61_68	B-61 (1.5-2)	5/1/1995	1.5 - 2	Primary									
68	B-61_68	B-61 (5-5.5)	5/1/1995	5 - 5.5	Primary									
68	B-62_68	B-62 (1.5-2)	6/22/1994	1.5 - 2	Primary									
68	B-62_68	B-62 (3-3.5)	6/22/1994	3 - 3.5	Primary									
68	B-62_68	B-62 (5-5.5)	6/22/1994	5 - 5.5	Primary									
68	B-63_68	B-63 (0.5-1)	6/22/1994	0.5 - 1	Primary									
68	B-63_68	B-63 (1.5-2)	6/22/1994	1.5 - 2	Primary									
68	B-63_68	B-63 (3-3.5)	6/22/1994	3 - 3.5	Primary									
68	B-63_68	B-63 (5-5.5)	6/22/1994	5 - 5.5	Primary									
68	B-64_68	B-64 (3.5-4)	5/1/1995	3.5 - 4	Duplicate	B-64 (3.5-4)								
68	B-64_68	B-64 (3.5-4)	5/1/1995	3.5 - 4	Primary									
68	B-65_68	B-65 (3-3.5)	6/22/1994	3 - 3.5	Primary									
68	B-66_68	B-66 (2-2.5)	6/22/1994	2 - 2.5	Primary									
68	GP-1_68	GP-1, S-1 (5-5.5)	1/12/1995	5 - 5.5	Primary									
68	GP-1_68	GP-1, S-2 (7.5-8)	1/12/1995	7.5 - 8	Primary									
68	GP-1_68	GP-1, S-4 (11.5-12)	1/12/1995	11.5 - 12	Primary									
68	GP-2_68	GP-2, S-2 (7-7.5)	1/12/1995	7 - 7.5	Primary									
68	GP-2_68	GP-2, S-4 (11.5-12)	1/12/1995	11.5 - 12	Primary									
68	GP-5_68	GP-5, S-1 (5.5-6)	1/12/1995	5.5 - 6	Primary									
68	GP-5_68	GP-5, S-2 (7-7.5)	1/12/1995	7 - 7.5	Primary									
68	GP-5_68	GP-5, S-4 (11.5-12)	1/12/1995	11.5 - 12	Duplicate	GP-5, S-4 (11.5-12)								
68	GP-5_68	GP-5, S-4 (11.5-12)	1/12/1995	11.5 - 12	Primary									
63-64	B-1_63-64	B1-1 (2.1-2.6)	5/26/2010	2.1 - 2.6	Primary		2.8		2.5		2.5		0.69	
63-64	B-1_63-64	B1-2 (8.5-10)	5/26/2010	8.5 - 10	Primary									
63-64	B-10_63-64	B10-1 (6-7)	5/26/2010	6 - 7	Primary									

TABLE 3-5B
SUMMARY OF HISTORIC SOIL SAMPLE ARAR/PRG EXCEEDANCES
RIVERSIDE INDUSTRIAL PARK SUPERFUND SITE
NEWARK, NEW JERSEY

							PAHs							
							Benzo(a) anthracene ARAR = 17 mg/kg		Benzo(a)pyrene ARAR = 2 mg/kg		Benzo(b) fluoranthene ARAR = 17 mg/kg		Dibenzo(a,h) anthracene ARAR = 2 mg/kg	
Lot	Location	Sample ID	Sample Date	Depth Interval (ft bgs)	Sample Type	Parent Sample ID	Result	Qual	Result	Qual	esult (mg/k	Qual	esult (mg/k	Qual
63-64	B-10_63-64	B10-2 (10-11)	5/26/2010	10 - 11	Primary		4.9	D	***4.1***	***D***	3.3		1	
63-64	B-11_63-64	B11-1 (2-6)	5/26/2010	2 - 6	Primary									
63-64	B-12_63-64	B12-1 (2.1-2.8)	5/26/2010	2.1 - 2.8	Primary									
63-64	B-12_63-64	B12-2 (6.4-7.5)	5/26/2010	6.4 - 7.5	Primary									
63-64	B-2_63-64	B2-1 (7.5-10)	5/26/2010	7.5 - 10	Primary		0.59		0.56		0.75		0.19	
63-64	B-2_63-64	B2-2 (10-12.5)	5/26/2010	10 - 12.5	Primary		0.06	J	0.051	J	0.061	J		
63-64	B-3_63-64	B3-1 (5-7)	5/26/2010	5 - 7	Primary									
63-64	B-3_63-64	B3-1 (5-7)	5/26/2010	5 - 7	Primary		0.35	J	0.34	J	0.42	J		
63-64	B-3_63-64	B3-2 (7-9)	5/26/2010	7 - 9	Primary									
63-64	B-4_63-64	B4-1 (2.5-4)	5/26/2010	2.5 - 4	Primary		1.5		1.3		1.2		0.4	
63-64	B-4_63-64	B4-1 (8-10)	5/26/2010	8 - 10	Primary									
63-64	B-4_63-64	B4-2 (8-10)	5/26/2010	8 - 10	Primary		0.24	J	0.2	J	0.25	J		
63-64	B-5_63-64	B5-1 (1-4)	5/26/2010	1 - 4	Primary		0.14	J	0.2		0.2		0.09	J
63-64	B-5_63-64	B5-2 (9-11)	5/26/2010	9 - 11	Primary									
63-64	B-6_63-64	B6-1 (1-2.5)	5/26/2010	1 - 2.5	Primary						0.43			
63-64	B-6_63-64	B6-2 (5-5)	5/26/2010	5 - 5	Primary									
63-64	B-7_63-64	B7-1 (8.5-9)	5/26/2010	8.5 - 9	Primary		0.36		0.34		0.25		0.11	J
63-64	B-7_63-64	B7-2 (10-10.5)	5/26/2010	10 - 10.5	Primary		0.2	J	0.16	J	0.18	J	0.059	J
63-64	B-8_63-64	B8-1 (5-5.5)	5/26/2010	5 - 5.5	Primary		1.1		0.82	J	1.2		0.22	J
63-64	B-8_63-64	B8-2 (10-11)	5/26/2010	10 - 11	Primary		0.38		0.34		0.4		0.088	J
63-64	B-8_63-64	B8-2d (10-11)	5/26/2010	10 - 11	Duplicate	B8-2 (10-11)	1.2		0.98		1.4		0.27	
63-64	B-9_63-64	B9-1 (5-6)	5/26/2010	5 - 6	Primary									
63-64	B-9_63-64	B9-2 (10-11)	5/26/2010	10 - 11	Primary		1.4		1.5		1.2		0.38	
63-64	HF-2_63-64	HF-2 (11-12.5)	9/23/2009	11 - 12.5	Primary		0.0585		0.0518	J	0.0378	J	ND	
63-64	HF-2_63-64	HF-2R (11-12.5)	9/28/2009	11 - 12.5	Primary									
63-64	HF-3_63-64	HF-3 (7-7.5)	9/23/2009	7 - 7.5	Primary		ND		ND		ND		ND	
63-64	HF-3_63-64	HF-3R (7-7.5)	9/28/2009	7 - 7.5	Primary									
63-64	HF-4_63-64	HF-4 (11-11.5)	9/23/2009	11 - 11.5	Primary		0.086		ND		ND		0.0245	J
63-64	HF-5_63-64	HF-5 (6.5-7)	9/23/2009	6.5 - 7	Primary		ND		ND		ND		ND	
63-64	HF-6_63-64	HF-6 (10.5-11)	9/23/2009	10.5 - 11	Primary		0.0198	J	ND		ND		ND	
63-64	HF-7_63-64	HF-7 (16-16.5)	9/23/2009	16 - 16.5	Primary		0.152		0.136		0.0914		0.0428	
63-64	HF-NW_63-64	HF-NWA (2-2.5)	9/23/2009	2 - 2.5	Primary		0.728		0.513		0.694		0.176	
63-64	HF-NW_63-64	HF-NWB (6.5-7)	9/23/2009	6.5 - 7	Primary		ND		ND		ND		ND	
63-64	HF-NW_63-64	HF-NWC (11.5-12)	9/23/2009	11.5 - 12	Primary		ND		ND		ND		ND	
63-64	HF-NW_63-64	HF-NWD (18-18.5)	9/23/2009	18 - 18.5	Primary		ND		ND		ND		ND	
63-64	LD-1_63-64	LD-1 (1.5-2)	9/23/2009	1.5 - 2	Primary		0.577		0.68		0.595		0.187	
63-64	LD-1A_63-64	LD-1A (4.5-5)	9/23/2009	4.5 - 5	Primary		0.671		0.874		0.844		0.247	
63-64	LD-2_63-64	LD-2 (1.5-2)	9/23/2009	1.5 - 2	Primary		0.1		0.115		0.132		0.0415	
63-64	LD-3_63-64	LD-3 (1.5-2)	9/23/2009	1.5 - 2	Primary		0.462		0.4		0.419		0.142	
63-64	LD-4_63-64	LD-4 (2.5-3)	9/23/2009	2.5 - 3	Primary		1.15		1.08		1.08		0.32	
63-64	LD-5_63-64	LD-5 (10-10.5)	9/23/2009	10 - 10.5	Primary		0.624		0.514		0.594		0.113	
63-64	STG-1_63-64	STG-1 (1.5-2)	9/23/2009	1.5 - 2	Primary		0.019	J	0.0154	J	0.0168	J	ND	
63-64	STG-2_63-64	STG-2 (10-10.5)	9/23/2009	10 - 10.5	Primary		0.0588		0.0395	J	0.0612		ND	
63-64	STG-3_63-64	STG-3 (2.5-3)	9/23/2009	2.5 - 3	Primary		0.0349	J	0.0443		0.0573		ND	
63-64	TRANS-1_63-64	TRANS-1 (0.5-1)	9/23/2009	0.5-1	Primary									
63-64	TRENCH-1_63-64	TRENCH-1 (5.5-6)	9/23/2009	5.5 - 6	Primary		1.8		1.54		1.19		0.293	
63-64	TT-1_63-64	TT-1 (1.5-2)	9/23/2009	1.5 - 2	Primary		0.0561		0.0629		0.0612		0.0231	J
63-64	TT-1_63-64	TT-1R (1.5-2)	9/28/2009	1.5 - 2	Primary									
63-64	UST-DG/HF-1_63-64	UST-DG/HF-1 (6.5-7)	9/23/2009	6.5 - 7	Primary		0.312		0.263		0.253		0.0739	
63-64	UST-DG/HF-1_63-64	UST-DG/HF-1R (6.5-7)	9/28/2009	6.5 - 7	Primary									

Notes:
ARAR = Applicable or Relevant and Appropriate Requirements.
PRG = Preliminary Remediation Goal
ND = Not detected and reporting detection limit is not available
Detected result exceeds ARAR or PRG
Reporting Detection Limit exceeds ARAR or PRG
D - Result is from diluted sample
J - Estimated Value, result >MDL and <RL
K - Estimated, unspecified laboratory non-conformance
U - Not detected above the laboratory reporting limit
Total PCBs are calculated as the sum of detected Aroclor concentration. If all the Aroclors are reported as nondetected, then the highest reporting limit of the Aroclors is reported.
Not Analyzed
Only parameters that have a result greater than the selected ARAR/PRG and used in the soil and soil gas alternatives are listed

TABLE 3-5B
SUMMARY OF HISTORIC SOIL SAMPLE ARAR/PRG EXCEEDANCES
RIVERSIDE INDUSTRIAL PARK SUPERFUND SITE
NEWARK, NEW JERSEY

							Total PCBs		VOCs					
							Total PCBs		Benzene		Naphthalene		Vinyl Chloride	
							ARAR = 1 mg/kg		ARAR = 5 mg/kg		ARAR = 17 mg/kg		ARAR = 2 mg/kg	
Lot	Location	Sample ID	Sample Date	Depth Interval (ft bgs)	Sample Type	Parent Sample ID	esult (mg/k	Qual	esult (mg/k	Qual	esult (mg/k	Qual	esult (mg/k	Qual
1	BE-1_1	BE-1 (7.5-8)	9/14/2010	7.5 - 8	Primary						0.86			
1	BE-2_1	BE-2 (4.5-5)	9/14/2010	4.5 - 5	Primary						0.012			
1	BE-3_1	BE-3 (7.5-8)	9/14/2010	7.5 - 8	Primary									
1	SB-3_1	SB-3 (2.5-3)	7/30/2008	2.5 - 3	Primary						1.44			
58	S-1_58	S-1	10/6/2009	Less than 14 feet	Primary		ND				0.038			
58	S-10_58	S-10A	10/6/2009	Less than 14 feet	Primary		ND				ND			
58	S-10_58	S-10B	10/6/2009	Less than 14 feet	Primary		ND				ND			
58	S-2_58	S-2	10/6/2009	Less than 14 feet	Primary		ND				5.18			
58	S-3_58	S-3	10/6/2009	Less than 14 feet	Primary		ND				ND			
58	S-4_58	S-4A	10/6/2009	Less than 14 feet	Primary		0.4957				0.548			
58	S-4_58	S-4B	10/6/2009	Less than 14 feet	Primary		ND				ND			
58	S-5_58	S-5	10/6/2009	Less than 14 feet	Primary		ND				ND			
58	S-6_58	S-6A	10/6/2009	Less than 14 feet	Primary		ND				ND			
58	S-6_58	S-6B	10/6/2009	Less than 14 feet	Primary		ND				ND			
58	S-7_58	S-7	10/6/2009	Less than 14 feet	Primary		ND				ND			
58	S-8_58	S-8	10/6/2009	Less than 14 feet	Primary		ND				ND			
58	S-9_58	S-9	10/6/2009	Less than 14 feet	Primary		ND				ND			
60	SB-FILL-1_60	SB-FILL-1 (5.5-6)	11/13/2008	5.5 - 6	Primary									
60	SB-FILL-2_60	SB-FILL-2 (5.5-6)	11/13/2008	5.5 - 6	Primary		ND		ND		ND		ND	
60	SB-FILL-3_60	SB-FILL-3 (6.5-7)	11/13/2008	6.5 - 7	Primary									
60	SB-FILL-4_60	SB-FILL-4 (5.5-6)	11/13/2008	5.5 - 6	Primary									
60	SB-PAD-1_60	SB-PAD-1 (6.5-7)	11/13/2008	6.5 - 7	Primary				ND				ND	
60	SB-PAD-2_60	SB-PAD-2 (6.5-7)	11/13/2008	6.5 - 7	Primary				ND				ND	
60	SB-PAD-3_60	SB-PAD-3 (6.5-7)	11/13/2008	6.5 - 7	Primary				ND				ND	
60	SB-PAD-4_60	SB-PAD-4 (6.5-7)	11/13/2008	6.5 - 7	Primary				ND				ND	
62	SB-4_62	SB-4 (5.5-6)	5/14/2008	5.5 - 6	Primary		0.501				9			
62	SB-5_62	SB-5 (5.5-6)	5/14/2008	5.5 - 6	Primary		ND				1.97			
62	SB-6_62	SB-6 (6.5-7)	5/14/2008	6.5 - 7	Primary		0.154		ND		1.17		ND	
66	SB-1_66	SB-1 (4.5-5)	5/14/2008	4.5 - 5	Primary		ND				ND			
66	SB-2_66	SB-2 (4.5-5)	5/14/2008	4.5 - 5	Primary		ND				ND			
66	SB-3_66	SB-3 (4.5-5)	5/14/2008	4.5 - 5	Primary		0.045		ND		ND		ND	
68	B-54_68	B-54 (0.5-1)	6/22/1994	0.5 - 1	Primary									
68	B-54_68	B-54 (1.5-2)	5/1/1995	1.5 - 2	Duplicate	B-54 (1.5-2)							ND	
68	B-54_68	B-54 (1.5-2)	5/1/1995	1.5 - 2	Primary								ND	
68	B-54_68	B-54 (1-1.5)	6/22/1994	1 - 1.5	Primary									
68	B-54_68	B-54 (5-5.5)	5/1/1995	5 - 5.5	Primary								ND	
68	B-56_68	B-56 (1.5-2)	5/1/1995	1.5 - 2	Primary								ND	
68	B-56_68	B-56 (5-5.5)	5/1/1995	5 - 5.5	Primary								ND	
68	B-57_68	B-57 (0.5-1)	5/1/1995	0.5 - 1	Duplicate	B-57 (0.5-1)								
68	B-57_68	B-57 (0.5-1)	5/1/1995	0.5 - 1	Primary									
68	B-57_68	B-57 (1.5-2)	5/1/1995	1.5 - 2	Primary								ND	
68	B-57_68	B-57 (3.5-4)	5/1/1995	3.5 - 4	Primary									
68	B-57_68	B-57 (5-5.5)	5/1/1995	5 - 5.5	Primary								ND	
68	B-58_68	B-58 (1.5-2)	5/1/1995	1.5 - 2	Primary								ND	
68	B-58_68	B-58 (5-5.5)	5/1/1995	5 - 5.5	Primary								ND	
68	B-59_68	B-59 (0.5-1)	6/22/1994	0.5 - 1	Primary									
68	B-59_68	B-59 (1.5-2)	6/22/1994	1.5 - 2	Primary								ND	
68	B-59_68	B-59 (5-5.5)	6/22/1994	5 - 5.5	Primary								ND	
68	B-60_68	B-60 (0.5-1)	5/1/1995	0.5 - 1	Primary									
68	B-60_68	B-60 (1.5-2)	5/1/1995	1.5 - 2	Primary								ND	
68	B-60_68	B-60 (5-5.5)	5/1/1995	5 - 5.5	Primary								ND	
68	B-61_68	B-61 (1.5-2)	5/1/1995	1.5 - 2	Primary								ND	
68	B-61_68	B-61 (5-5.5)	5/1/1995	5 - 5.5	Primary								ND	
68	B-62_68	B-62 (1.5-2)	6/22/1994	1.5 - 2	Primary								ND	
68	B-62_68	B-62 (3-3.5)	6/22/1994	3 - 3.5	Primary									
68	B-62_68	B-62 (5-5.5)	6/22/1994	5 - 5.5	Primary								ND	
68	B-63_68	B-63 (0.5-1)	6/22/1994	0.5 - 1	Primary									
68	B-63_68	B-63 (1.5-2)	6/22/1994	1.5 - 2	Primary								ND	
68	B-63_68	B-63 (3-3.5)	6/22/1994	3 - 3.5	Primary									
68	B-63_68	B-63 (5-5.5)	6/22/1994	5 - 5.5	Primary								ND	
68	B-64_68	B-64 (3.5-4)	5/1/1995	3.5 - 4	Duplicate	B-64 (3.5-4)			ND				ND	
68	B-64_68	B-64 (3.5-4)	5/1/1995	3.5 - 4	Primary				ND				ND	
68	B-65_68	B-65 (3-3.5)	6/22/1994	3 - 3.5	Primary				ND				ND	
68	B-66_68	B-66 (2-2.5)	6/22/1994	2 - 2.5	Primary				ND				ND	
68	GP-1_68	GP-1, S-1 (5-5.5)	1/12/1995	5 - 5.5	Primary				0.82	U			0.82	U
68	GP-1_68	GP-1, S-2 (7.5-8)	1/12/1995	7.5 - 8	Primary				0.14	U			0.14	U
68	GP-1_68	GP-1, S-4 (11.5-12)	1/12/1995	11.5 - 12	Primary				0.0076	U			0.0076	U
68	GP-2_68	GP-2, S-2 (7-7.5)	1/12/1995	7 - 7.5	Primary				0.0058	U			0.0058	U
68	GP-2_68	GP-2, S-4 (11.5-12)	1/12/1995	11.5 - 12	Primary				0.0015	U			0.027	
68	GP-5_68	GP-5, S-1 (5.5-6)	1/12/1995	5.5 - 6	Primary				0.15	U			0.15	U
68	GP-5_68	GP-5, S-2 (7-7.5)	1/12/1995	7 - 7.5	Primary				0.2	U			0.2	U
68	GP-5_68	GP-5, S-4 (11.5-12)	1/12/1995	11.5 - 12	Duplicate	GP-5, S-4 (11.5-12)			0.0058	U			0.0058	U
68	GP-5_68	GP-5, S-4 (11.5-12)	1/12/1995	11.5 - 12	Primary				0.0058	U			0.0058	U
63-64	B-1_63-64	B1-1 (2.1-2.6)	5/26/2010	2.1 - 2.6	Primary						0.16	J		
63-64	B-1_63-64	B1-2 (8.5-10)	5/26/2010	8.5 - 10	Primary									
63-64	B-10_63-64	B10-1 (6-7)	5/26/2010	6 - 7	Primary						1.8			

TABLE 3-5B
SUMMARY OF HISTORIC SOIL SAMPLE ARAR/PRG EXCEEDANCES
RIVERSIDE INDUSTRIAL PARK SUPERFUND SITE
NEWARK, NEW JERSEY

							Total PCBs		VOCs					
							Total PCBs		Benzene		Naphthalene		Vinyl Chloride	
							ARAR = 1 mg/kg		ARAR = 5 mg/kg		ARAR = 17 mg/kg		ARAR = 2 mg/kg	
Lot	Location	Sample ID	Sample Date	Depth Interval (ft bgs)	Sample Type	Parent Sample ID	esult (mg/k	Qual	esult (mg/k	Qual	esult (mg/k	Qual	esult (mg/k	Qual
63-64	B-10_63-64	B10-2 (10-11)	5/26/2010	10 - 11	Primary						0.96			
63-64	B-11_63-64	B11-1 (2-6)	5/26/2010	2 - 6	Primary									
63-64	B-12_63-64	B12-1 (2.1-2.8)	5/26/2010	2.1 - 2.8	Primary									
63-64	B-12_63-64	B12-2 (6.4-7.5)	5/26/2010	6.4 - 7.5	Primary									
63-64	B-2_63-64	B2-1 (7.5-10)	5/26/2010	7.5 - 10	Primary									
63-64	B-2_63-64	B2-2 (10-12.5)	5/26/2010	10 - 12.5	Primary									
63-64	B-3_63-64	B3-1 (5-7)	5/26/2010	5 - 7	Primary									
63-64	B-3_63-64	B3-1 (5-7)	5/26/2010	5 - 7	Primary						1.4			
63-64	B-3_63-64	B3-2 (7-9)	5/26/2010	7 - 9	Primary									
63-64	B-4_63-64	B4-1 (2.5-4)	5/26/2010	2.5 - 4	Primary				0.31		0.31			
63-64	B-4_63-64	B4-1 (8-10)	5/26/2010	8 - 10	Primary									
63-64	B-4_63-64	B4-2 (8-10)	5/26/2010	8 - 10	Primary									
63-64	B-5_63-64	B5-1 (1-4)	5/26/2010	1 - 4	Primary									
63-64	B-5_63-64	B5-2 (9-11)	5/26/2010	9 - 11	Primary				0.38	J				
63-64	B-6_63-64	B6-1 (1-2.5)	5/26/2010	1 - 2.5	Primary						1.1			
63-64	B-6_63-64	B6-2 (5-5)	5/26/2010	5 - 5	Primary									
63-64	B-7_63-64	B7-1 (8.5-9)	5/26/2010	8.5 - 9	Primary				0.38	J	0.093	J		
63-64	B-7_63-64	B7-2 (10-10.5)	5/26/2010	10 - 10.5	Primary				1.7		0.44			
63-64	B-8_63-64	B8-1 (5-5.5)	5/26/2010	5 - 5.5	Primary				0.59					
63-64	B-8_63-64	B8-2 (10-11)	5/26/2010	10 - 11	Primary				2.9		0.084	J		
63-64	B-8_63-64	B8-2d (10-11)	5/26/2010	10 - 11	Duplicate	B8-2 (10-11)					0.15	J		
63-64	B-9_63-64	B9-1 (5-6)	5/26/2010	5 - 6	Primary									
63-64	B-9_63-64	B9-2 (10-11)	5/26/2010	10 - 11	Primary						0.21	J		
63-64	HF-2_63-64	HF-2 (11-12.5)	9/23/2009	11 - 12.5	Primary		ND		ND		ND		ND	
63-64	HF-2_63-64	HF-2R (11-12.5)	9/28/2009	11 - 12.5	Primary				3.32				ND	
63-64	HF-3_63-64	HF-3 (7-7.5)	9/23/2009	7 - 7.5	Primary		ND		ND		ND		ND	
63-64	HF-3_63-64	HF-3R (7-7.5)	9/28/2009	7 - 7.5	Primary				ND				ND	
63-64	HF-4_63-64	HF-4 (11-11.5)	9/23/2009	11 - 11.5	Primary		ND		0.00053	J	ND		ND	
63-64	HF-5_63-64	HF-5 (6.5-7)	9/23/2009	6.5 - 7	Primary		ND		ND		ND		ND	
63-64	HF-6_63-64	HF-6 (10.5-11)	9/23/2009	10.5 - 11	Primary		ND		ND		ND		ND	
63-64	HF-7_63-64	HF-7 (16-16.5)	9/23/2009	16 - 16.5	Primary		ND		ND		ND		ND	
63-64	HF-NW_63-64	HF-NWA (2-2.5)	9/23/2009	2 - 2.5	Primary		ND		0.0021		0.694		ND	
63-64	HF-NW_63-64	HF-NWB (6.5-7)	9/23/2009	6.5 - 7	Primary		0.518		3.71		ND		ND	
63-64	HF-NW_63-64	HF-NWC (11.5-12)	9/23/2009	11.5 - 12	Primary		0.171		0.378		ND		ND	
63-64	HF-NW_63-64	HF-NWD (18-18.5)	9/23/2009	18 - 18.5	Primary		ND		ND		ND		ND	
63-64	LD-1_63-64	LD-1 (1.5-2)	9/23/2009	1.5 - 2	Primary		ND		0.0017		ND		ND	
63-64	LD-1A_63-64	LD-1A (4.5-5)	9/23/2009	4.5 - 5	Primary		1.7		0.0062		0.06		ND	
63-64	LD-2_63-64	LD-2 (1.5-2)	9/23/2009	1.5 - 2	Primary		0.1546		ND		0.0508		ND	
63-64	LD-3_63-64	LD-3 (1.5-2)	9/23/2009	1.5 - 2	Primary		0.506		0.0015	J	0.353		ND	
63-64	LD-4_63-64	LD-4 (2.5-3)	9/23/2009	2.5 - 3	Primary		0.2478		0.0016		0.215		ND	
63-64	LD-5_63-64	LD-5 (10-10.5)	9/23/2009	10 - 10.5	Primary		0.1		2.7		0.342		ND	
63-64	STG-1_63-64	STG-1 (1.5-2)	9/23/2009	1.5 - 2	Primary		ND		ND		ND		ND	
63-64	STG-2_63-64	STG-2 (10-10.5)	9/23/2009	10 - 10.5	Primary		0.3		3.9		0.413		ND	
63-64	STG-3_63-64	STG-3 (2.5-3)	9/23/2009	2.5 - 3	Primary		0.3		0.00066	J	0.072		ND	
63-64	TRANS-1_63-64	TRANS-1 (0.5-1)	9/23/2009	0.5-1	Primary		ND							
63-64	TRENCH-1_63-64	TRENCH-1 (5.5-6)	9/23/2009	5.5 - 6	Primary		0.4		0.0562	J	0.432		ND	
63-64	TT-1_63-64	TT-1 (1.5-2)	9/23/2009	1.5 - 2	Primary		ND		0.181		0.0324	J	ND	
63-64	TT-1_63-64	TT-1R (1.5-2)	9/28/2009	1.5 - 2	Primary				ND				ND	
63-64	UST-DG/HF-1_63-64	UST-DG/HF-1 (6.5-7)	9/23/2009	6.5 - 7	Primary		ND		3.06	J	ND		ND	
63-64	UST-DG/HF-1_63-64	UST-DG/HF-1R (6.5-7)	9/28/2009	6.5 - 7	Primary				ND				ND	

Notes:
ARAR = Applicable or Relevant and Appropriate Requirements.
PRG = Preliminary Remediation Goal
ND = Not detected and reporting detection limit is not available
Detected result exceeds ARAR or PRG
Reporting Detection Limit exceeds ARAR or PRG
D - Result is from diluted sample
J - Estimated Value, result >MDL and <RL
K - Estimated, unspecified laboratory non-conformance
U - Not detected above the laboratory reporting limit
Total PCBs are calculated as the sum of detected Aroclor concentration. If all the Aroclors are reported as nondetected, then the highest reporting limit of the Aroclors is reported.
Not Analyzed
Only parameters that have a result greater than the selected ARAR/PRG and used in the soil and soil gas alternatives are listed

TABLE 3-5C
SUMMARY OF RI SOIL GAS SAMPLE PRG EXCEEDANCES
RIVERSIDE INDUSTRIAL PARK SUPERFUND SITE
NEWARK, NEW JERSEY

							VOCs					
							Naphthalene		Trichloroethylene		Total Xylenes	
							PRG = 0.62 mg/kg		PRG = 0.02 mg/kg		PRG = 6.5 mg/kg	
Lot ID	Location	Sample ID	Sample Date	Depth Interval (ft bgs)	Sample Type	Parent sample ID	Result (mg/kg)	Qual	Result (mg/kg)	Qual	Result (mg/kg)	Qual
1	B-3	B-3(1-2)_102517	10/25/2017	1 - 2	Primary		***5.3***		0.36	U	3.35	
1	B-3	B-3(2-3)_102517	10/25/2017	2 - 3	Primary		0.58		0.005	U	0.056	
1	B-4	B-4(0-1)_100617	10/6/2017	0 - 1	Primary		0.93	U	0.29	U	0.29	U
1	B-4	B-4(1-3)_100617	10/6/2017	1 - 3	Primary		0.24	J	0.0055	UJ	0.015	J+
1	B-5	B-5(0.5-1.5)_101317	10/13/2017	0.5 - 1.5	Primary		0.19	U	0.0047	U	0.0047	U
1	B-5	B-5(5-6.5)_101317	10/13/2017	5 - 6.5	Primary		0.18	U	0.0048	U	0.0048	U
1	B-12	B-12(0-1)_101317	10/13/2017	0 - 1	Primary		0.15	J	0.42	U	***25.1***	
1	B-12	B-12(1-3)_101317	10/13/2017	1 - 3	Primary		0.097	J	0.52	U	***24.8***	
1	B-79	B-79(1-2)_102617	10/26/2017	1 - 2	Primary		0.27		0.0061	U	1.34	J+
1	B-79	B-79(5-6)_102617	10/26/2017	5 - 6	Primary		0.19	U	0.23	U	0.13	J
1	B-96	B-96(1-2)_121518	12/15/2018	1 - 2	Primary		0.2	U	0.0044	U	0.0044	U
1	B-96	B-96(2-3.5)_121518	12/15/2018	2 - 3.5	Primary		0.0036	U	0.0044	U	0.0044	U
1	B-97	B-97(11-13)_121518	12/15/2018	11 - 13	Primary		0.0039	U	0.004	U	0.0024	J
1	B-97	B-97(1-2)_121518	12/15/2018	1 - 2	Primary		0.0093		0.0048	U	0.006	J
1	B-97	DUP-4_121518	12/15/2018	1 - 2	Duplicate	B-97(1-2)_121518	0.2	U	0.0042	U	0.0335	J
1	B-97	B-97(2-3.8)_121518	12/15/2018	2 - 3.8	Primary		0.2	U	0.0038	U	0.0038	U
1	B-98	B-98(0-1)_121418	12/14/2018	0 - 1	Primary		0.14	J	NR		NR	
1	B-98	B-98(1-2.9)_121418	12/14/2018	1 - 2.9	Primary		0.17	J	0.0038	U	0.0038	U
57	B-6	B-6(3.5-4.5)_101717	10/17/2017	3.5 - 4.5	Primary		0.19	U	0.0059	U	0.0059	U
57	B-6	B-6(5-5.5)_101717	10/17/2017	5 - 5.5	Primary		***7.4***		0.0052	U	0.0052	U
57	B-7	B-7(0.5-1.5)_101017	10/10/2017	0.5 - 1.5	Primary		0.19	U	0.28	U	3.46	
57	B-7	B-7(5-6)_101017	10/10/2017	5 - 6	Primary		0.19	U	0.0042	U	0.0067	
57	B-8	B-8(1.5-2.5)_101017	10/10/2017	1.5 - 2.5	Primary		0.19	U	0.0044	U	0.0044	U
57	B-8	B-8(5-6.25)_101017	10/10/2017	5 - 6.25	Primary		0.19	U	0.25	U	0.25	U
57	B-9	B-9(0-1)_101617	10/16/2017	0 - 1	Primary		0.49	J	0.0056	UJ	0.0056	UJ
57	B-9	B-9(5-6)_101617	10/16/2017	5 - 6	Primary		0.22	U	0.0059	U	0.017	
57	B-10	B_10(3_5)_101617	10/16/2017	3 - 5	Primary		0.22	U	0.0054	U	0.0054	U
57	B-71	B-71(3-5)_101617	10/16/2017	3 - 5	Primary		0.2	U	0.0043	U	0.0043	U
58	B-13	B-13(0-1)_101117	10/11/2017	0 - 1	Primary		0.2	U	***0.04***		0.174	
58	B-13	B-13(1-3)_101117	10/11/2017	1 - 3	Primary		0.33		0.28	U	***124***	
58	B-14	B-14(0-1)_101717	10/17/2017	0 - 1	Primary		0.051	J	0.0052	U	0.0052	U
58	B-14	B-14(7-7.5)_101717	10/17/2017	7 - 7.5	Primary		0.18	U	0.0048	U	0.0048	U
58	B-15	B-15(0.25-1.25)_101717	10/17/2017	0.25 - 1.25	Primary		0.19	U	0.0058	U	0.0058	U
58	B-15	B-15(5-6)_101717	10/17/2017	5 - 6	Primary		0.19	U	0.0047	U	0.0047	U
58	B-16	B-16(0-1)_101217	10/12/2017	0 - 1	Primary		0.29		***2***		***11.1***	
58	B-16	B-16(7-7.75)_101217	10/12/2017	7 - 7.75	Primary		***2.1***		0.25	U	2.22	J
58	B-17	B-17(0.25-1.25)_101717	10/17/2017	0.25 - 1.25	Primary		1.8	U	0.0051	U	0.0051	U
58	B-17	B-17(5-6.5)_101717	10/17/2017	5 - 6.5	Primary		0.2	U	0.0046	U	0.0046	U
58	B-17	DUP-6_101717	10/17/2017	5 - 6.5	Duplicate	B-17(5-6.5)_101717	0.2	U	0.0054	U	0.0073	
59	B-18	B-18(0-1)_101217	10/12/2017	0 - 1	Primary		0.18	U	0.0053	U	0.0053	U
59	B-18	B-18(5-6)_101217	10/12/2017	5 - 6	Primary		0.2	U	0.0046	U	0.0046	U
59	B-99	B-99(0-1)_121518	12/15/2018	0 - 1	Primary		0.031	J	0.0054	UJ	0.01	J+
59	B-99	B-99(11-13)_121518	12/15/2018	11 - 13	Primary		0.0041	U	0.0046	U	0.0046	U
59	B-99	B-99(1-2.9)_121518	12/15/2018	1 - 2.9	Primary		0.22	U	0.0068	U	0.0068	U
59	B-103	B-103(0-1)_121418	12/14/2018	0 - 1	Primary		0.071	J	0.0045	U	0.0045	U
59	B-103	B-103(5-7)_121418	12/14/2018	5 - 7	Primary		0.0039	U	0.0052	U	0.0052	U
59	B-104	B-104(0-1)_121418	12/14/2018	0 - 1	Primary		0.014	J	0.0046	U	0.00092	J
59	B-104	B-104(7-8.7)_121418	12/14/2018	7 - 8.7	Primary		0.0028	J	0.0046	U	0.0046	U
59	B-104	DUP-3_121418	12/14/2018	7 - 8.7	Duplicate	B-104(7-8.7)_121418	0.0021	J	0.0052	U	0.0052	U
60	B-20	B-20(3.5-4)_101817	10/18/2017	3.5 - 4	Primary		0.21	U	0.0051	U	0.0051	U
60	B-20	B-20(5-6)_101817	10/18/2017	5 - 6	Primary		0.2	U	0.012	J+	0.0055	UJ
60	B-22	B-22(0-1)_100617	10/6/2017	0 - 1	Primary		0.088	J	0.0048	U	0.0048	U
60	B-22	B-22(1-3)_100617	10/6/2017	1 - 3	Primary		0.18	U	0.0044	U	0.0044	U
60	B-23	B-23(0-1)_100517	10/5/2017	0 - 1	Primary		0.18	U	0.0068		0.0045	U
60	B-23	B-23(1-3)_100517	10/5/2017	1 - 3	Primary		0.19	U	***0.7***		0.33	U
60	B-95	B-95(0-1)_121318	12/13/2018	0 - 1	Primary		0.048		0.25	U	0.0346	J+
60	B-95	B-95(11-13)_121318	12/13/2018	11 - 13	Primary		0.0022	J	0.0072	U	0.0072	U
60	B-95	B-95(1-2.8)_121318	12/13/2018	1 - 2.8	Primary		0.011	J	0.0047	UJ	0.0118	J
60	B-105	B-105(0.7-1.7)_121518	12/15/2018	0.7 - 1.7	Primary		0.021	J	0.0093	J+	0.0068	UJ
60	B-105	B-105(1.7-3.2)_121518	12/15/2018	1.7 - 3.2	Primary		0.077	U	0.0044	U	0.0044	U
61	B-24	B-24(0.5-1.5)_100517	10/5/2017	0.5 - 1.5	Primary		0.044	J	NR		NR	
61	B-24	B-24(1.5-3.5)_100517	10/5/2017	1.5 - 3.5	Primary		***0.79***	***J***	0.0055	U	0.0078	J+
61	B-24	DUP-3_100517	10/5/2017	1.5 - 3.5	Duplicate	B-24(1.5-3.5)_100517	***0.85***	***J***	0.0058	U	0.0081	J+
61	B-25	B-25(0.5-1.5)_100517	10/5/2017	0.5 - 1.5	Primary		0.36	U	0.0052	U	0.0052	U
61	B-25	B-25(5-5.5)_100517	10/5/2017	5 - 5.5	Primary		0.37	U	0.31	U	0.31	U
61	B-26	B-26(0.5-1.5)_100517	10/5/2017	0.5 - 1.5	Primary		0.2	U	***0.21***	***J+***	0.0097	J+
61	B-26	B-26(5-5.8)_100517	10/5/2017	5 - 5.8	Primary		0.12	J	***1.6***		0.67	
61	B-27	B-27(0.5-1.5)_100517	10/5/2017	0.5 - 1.5	Primary		0.049	J	0.0054	U	0.0076	J+
61	B-27	B-27(5-5.5)_100517	10/5/2017	5 - 5.5	Primary		0.091	J	0.0055	U	0.0055	U
61	B-68	B-68(1-2)_102417	10/24/2017	1 - 2	Primary		0.22	U	***0.024***		0.0077	U

Prepared by USEPA

TABLE 3-5C
SUMMARY OF RI SOIL GAS SAMPLE PRG EXCEEDANCES
RIVERSIDE INDUSTRIAL PARK SUPERFUND SITE
NEWARK, NEW JERSEY

							VOCs					
							Naphthalene		Trichloroethylene		Total Xylenes	
							PRG = 0.62 mg/kg		PRG = 0.02 mg/kg		PRG = 6.5 mg/kg	
Lot ID	Location	Sample ID	Sample Date	Depth Interval (ft bgs)	Sample Type	Parent sample ID	Result (mg/kg)	Qual	Result (mg/kg)	Qual	Result (mg/kg)	Qual
62	B-28	B-28(0.5-1.5)_100917	10/9/2017	0.5 - 1.5	Primary		0.95	U	0.006	U	0.006	U
62	B-28	B-28(1.5-2.75)_100917	10/9/2017	1.5 - 2.75	Primary		0.11	J	0.007	U	0.007	U
62	B-93	B-93(1-2)_121518	12/15/2018	1 - 2	Primary		***68***		NR		NR	
62	B-93	B-93(2-3)_121518	12/15/2018	2 - 3	Primary		***53***		0.55	U	0.55	U
63	B-29	B-29(0-1)_092917	9/29/2017	0 - 1	Primary		0.058	J	0.0054	U	0.0054	U
63	B-29	B-29(1-3)_092917	9/29/2017	1 - 3	Primary		0.059	J	0.0056	U	0.0091	
63	B-30	B-30(0-1)_100417	10/4/2017	0 - 1	Primary		0.3	J	0.0078	U	0.0078	U
63	B-30	B-30(3-3.8)_100417	10/4/2017	3 - 3.8	Primary		0.4		0.0072	U	0.022	
63	B-31	B-31(1-2)_101817	10/18/2017	1 - 2	Primary		0.28		0.0065	U	0.0065	U
63	B-31	B-31(5-5.5)_101817	10/18/2017	5 - 5.5	Primary		0.33		0.0071	U	0.012	
63	B-32	B-32(1-2)_100417	10/4/2017	1 - 2	Primary		0.094	J	0.0072	UJ	0.0072	UJ
63	B-32	B-32(2-4)_100417	10/4/2017	2 - 4	Primary		0.34		0.0066	UJ	0.0066	UJ
63	B-33	B-33(0.5-1.5)_100417	10/4/2017	0.5 - 1.5	Primary		0.063	J	***0.037***		0.13	J
63	B-33	B-33(3.5-4.5)_100417	10/4/2017	3.5 - 4.5	Primary		0.085	J	0.0058	U	0.015	J+
63	B-85	B-85(0-0.5)_121218	12/12/2018	0 - 0.5	Primary		0.0092	J	0.006	U	0.006	U
63	B-85	B-85(2.5-3.5)_121218	12/12/2018	2.5 - 3.5	Primary		0.27	J	0.42	U	0.42	U
63	B-87	B-87(0-1)_121318	12/13/2018	0 - 1	Primary		0.17		0.0018	J	0.0071	J
63	B-87	B-87(1-3)_121318	12/13/2018	1 - 3	Primary		0.14		0.0063	J	0.0028	J
63	B-87	DUP-2_121318	12/13/2018	1 - 3	Duplicate	B-87(1-3)_121318	0.15		***0.14***	***J***	0.22	J
64	B-34	B-34(0-1)_100617	10/6/2017	0 - 1	Primary		0.3		0.0054	U	***8.96***	
64	B-34	B-34(5-5.5)_100617	10/6/2017	5 - 5.5	Primary		***1.1***		2.6	U	***92.7***	
64	B-35	B-35(1-2)_100417	10/4/2017	1 - 2	Primary		0.19		***0.036***		4.76	J
64	B-35	B-35(2-3.8)_100417	10/4/2017	2 - 3.8	Primary		***2.5***		0.44	U	***54.7***	
64	B-36	B-36(0-1)_100417	10/4/2017	0 - 1	Primary		0.2		0.0043	U	0.0043	U
64	B-36	B-36(3-3.7)_100417	10/4/2017	3 - 3.7	Primary		***0.65***		0.5	U	0.5	U
64	B-37	B-37(0-1)_100417	10/4/2017	0 - 1	Primary		0.18	U	0.005	UJ	0.0243	J+
64	B-37	B-37(1-3)_100417	10/4/2017	1 - 3	Primary		0.93	U	0.0049	UJ	0.0049	UJ
64	B-38	B-38(0-1)_100917	10/9/2017	0 - 1	Primary		0.95	U	0.28	U	1.1	J
64	B-38	DUP-4_101017	10/9/2017	0 - 1	Duplicate	B-38(0-1)_100917	0.19	U	0.26	U	2.6	U
64	B-38	B-38(1-3)_100917	10/9/2017	1 - 3	Primary		0.21	U	0.005	U	0.01	
64	B-38	B-38(FILL)_100917	10/9/2017	-3 - 0	Primary		0.22	J	0.0054	U	0.0054	U
64	B-41	B-41(0-1)_092617	9/26/2017	0 - 1	Primary		0.93	U	0.0052	U	0.0052	U
64	B-41	B-41(5-7)_092717	9/27/2017	5 - 7	Primary		0.19	U	0.0042	U	0.0042	U
64	B-42	B-42(0.3-1.3)_100217	10/2/2017	0.3 - 1.3	Primary		0.94	U	0.0053	U	0.0053	U
64	B-42	B-42(7-9)_100217	10/2/2017	7 - 9	Primary		0.054	J	0.0075	U	0.0075	U
64	B-69	B-69(0-1)_092717	9/27/2017	0 - 1	Primary		0.18	U	0.0043	U	0.0043	U
64	B-69	B-69(1-3)_092717	9/27/2017	1 - 3	Primary		0.053	J	0.0041	UJ	0.0025	J
64	B-70	B-70(0-1)_092717	9/27/2017	0 - 1	Primary		0.18	U	0.005	U	0.005	U
64	B-70	B-70(5-7)_092717	9/27/2017	5 - 7	Primary		1	U	0.0051	U	0.0094	J
64	B-74	B-74(0-1)_100417	10/4/2017	0 - 1	Primary		0.86	U	0.004	U	0.0151	
64	B-74	B-74(3-4)_100417	10/4/2017	3 - 4	Primary		0.2	U	0.39	U	***16.6***	
64	B-75	B-75(0-1)_092917	9/29/2017	0 - 1	Primary		0.18	U	0.0045	U	0.0045	U
64	B-75	B-75(1-3)_092917	9/29/2017	1 - 3	Primary		0.21	U	0.48	U	0.48	U
64	B-86	B-86(0.3-1.3)_121118	12/11/2018	0.3 - 1.3	Primary		***1.1***		0.0052	UJ	0.0052	UJ
64	B-86	B-86(1.3-3.3)_121118	12/11/2018	1.3 - 3.3	Primary		0.35	J	0.0064	UJ	0.0064	UJ
64	B-88	B-88(0-1)_121318	12/13/2018	0 - 1	Primary		0.19		0.0011	J	0.0382	J
64	B-88	B-88(11-13)_121318	12/13/2018	11 - 13	Primary		0.064	J	0.0079	UJ	0.0079	UJ
64	B-88	B-88(1-3)_121318	12/13/2018	1 - 3	Primary		0.11		0.3	UJ	0.18	J
64	B-89	B-89(0-1)_121318	12/13/2018	0 - 1	Primary		0.011	J	0.00073	J	0.0014	J
64	B-89	B-89(1-3)_121318	12/13/2018	1 - 3	Primary		0.41		0.34	U	0.34	U
64	B-90	B-90(0-1)_121218	12/12/2018	0 - 1	Primary		0.017	J	0.0049	U	0.0049	U
64	B-90	B-90(11-13)_121218	12/12/2018	11 - 13	Primary		0.069		0.53	U	0.48	J
64	B-90	B-90(1-2.2)_121218	12/12/2018	1.2 - 2	Primary		0.039	J	0.0061	U	0.0051	J
64	B-91	B-91(0-1)_121518	12/15/2018	0 - 1	Primary		0.058	J	0.0046	U	0.00066	J
64	B-91	B-91(11-13)_121518	12/15/2018	11 - 13	Primary		0.019		0.0058	U	0.0011	J
64	B-91	B-91(1-3)_121518	12/15/2018	1 - 3	Primary		0.27	J	0.0012	J	0.0029	J
64	B-92	B-92(0-1)_121218	12/12/2018	0 - 1	Primary		0.019	J	0.0048	UJ	0.0012	J
64	B-92	B-92(1-2.5)_121218	12/12/2018	1 - 2.5	Primary		0.044	J	0.0023	J	0.0048	UJ
64	B-94	B-94(0-1)_121318	12/13/2018	0 - 1	Primary		0.18	U	0.0045	U	0.0045	U
64	B-94	B-94(1-3)_121318	12/13/2018	1 - 3	Primary		0.11		0.48	U	6.5	
65	B-39	B-39(0.5-1.5)_100317	10/3/2017	0.5 - 1.5	Primary		0.2	U	0.0049	U	0.0049	U
65	B-39	B-39(5-7)_100317	10/3/2017	5 - 7	Primary		0.2	U	0.0076		0.0058	U
65	B-40	B-40(0-1)_092617	9/26/2017	0 - 1	Primary		1	U	0.0065	U	0.0065	U
65	B-40	B-40(5-7)_092717	9/27/2017	5 - 7	Primary		0.22	U	0.0061	U	0.0061	U
65	B-43	B-43(0-1)_092617	9/26/2017	0 - 1	Primary		0.061	J	0.0039	U	0.0039	U
65	B-43	B-43(5-7)_092617	9/26/2017	5 - 7	Primary		***0.73***		0.0047	U	0.0042	J
65	B-76	B-76(0-1)_102317	10/23/2017	0 - 1	Primary		0.068	J	0.0063	U	0.0063	U
65	B-76	B-76(1-3)_102317	10/23/2017	1 - 3	Primary		0.19	U	0.0052	U	0.0052	U
65	B-76	DUP-7_102317	10/23/2017	1 - 3	Duplicate	B-76(1-3)_102317	0.076	J	0.0063	U	0.0063	U
66	B-44	B-44(0-1)_100217	10/2/2017	0 - 1	Primary		0.94	U	0.0047	U	0.0047	U
66	B-44	B-44(5-5.5)_100217	10/2/2017	5 - 5.5	Primary		***1.5***		0.0054	U	1.63	J

TABLE 3-5C
SUMMARY OF RI SOIL GAS SAMPLE PRG EXCEEDANCES
RIVERSIDE INDUSTRIAL PARK SUPERFUND SITE
NEWARK, NEW JERSEY

							VOCs					
							Naphthalene		Trichloroethylene		Total Xylenes	
							PRG = 0.62 mg/kg		PRG = 0.02 mg/kg		PRG = 6.5 mg/kg	
Lot ID	Location	Sample ID	Sample Date	Depth Interval (ft bgs)	Sample Type	Parent sample ID	Result (mg/kg)	Qual	Result (mg/kg)	Qual	Result (mg/kg)	Qual
66	B-78	B-78(0.5-1.5)_102517	10/25/2017	0.5 - 1.5	Primary		0.2	U	0.0047	U	0.0047	U
66	B-78	B-78(5-7)_102517	10/25/2017	5 - 7	Primary		0.32	J	0.007	U	0.007	U
66	B-84	B-84(11-13)_121218	12/12/2018	11 - 13	Primary		0.04	J	0.0047	U	0.0047	U
66	B-84	B-84(1-2)_121218	12/12/2018	1 - 2	Primary		0.011	J	0.005	UJ	0.005	UJ
66	B-84	B-84(2-4)_121218	12/12/2018	2 - 4	Primary		0.22	J	0.0049	U	0.0049	U
67	B-51	B-51(1-2)_092817	9/28/2017	1 - 2	Primary		0.26		0.0042	UJ	0.0042	UJ
67	B-51	B-51(5-7)_092817	9/28/2017	5 - 7	Primary		0.24		***0.028***		0.022	
67	B-52	B-52(0-1)_102317	10/23/2017	0 - 1	Primary		0.53	J	0.0057	U	***10.5***	
67	B-52	B-52(1-3)_102317	10/23/2017	1 - 3	Primary		0.13	J	0.0077	U	0.0077	U
67	B-53	B-53(0-1)_092817	9/28/2017	0 - 1	Primary		0.049	J	0.0056	U	0.0056	U
67	B-53	B-53(1-3)_092817	9/28/2017	1 - 3	Primary		***3.9***		0.0058	U	0.0058	U
67	B-54	B-54(1-2)_092817	9/28/2017	1 - 2	Primary		***3.3***		0.0045	U	0.0045	U
67	B-54	B-54(7-8)_092817	9/28/2017	7 - 8	Primary		0.25	U	0.0093	U	0.0093	U
67	B-55	B-55(0.5-1.5)_100317	10/3/2017	0.5 - 1.5	Primary		0.93	U	0.012	J+	NR	
67	B-55	B-55(3.5-5)_100317	10/3/2017	3.5 - 5	Primary		0.12	J	0.0055	U	0.0055	U
67	B-81	B-81(0.3-1.3)_121218	12/12/2018	0.3 - 1.3	Primary		0.078		0.25	U	2.61	
67	B-81	B-81(5-7)_121218	12/12/2018	5 - 7	Primary		0.24	J	0.0047	U	0.0047	U
68	B-56	B-56(1-2)_092717	9/27/2017	1 - 2	Primary		0.16	J	***0.038***	***J+***	0.0082	J+
68	B-56	B-56(2-4)_092717	9/27/2017	2 - 4	Primary		0.21	U	***5.4***		4.64	
68	B-57	B-57(1-2)_100317	10/3/2017	1 - 2	Primary		0.4	U	0.0049	U	0.0049	U
68	B-57	B-57(2-4)_100317	10/3/2017	2 - 4	Primary		0.26	U	0.0076	U	0.0076	U
68	B-58	B-58(1-2)_092717	9/27/2017	1 - 2	Primary		0.3		0.36	U	***79***	
68	B-58	B-58(6-8)_092717	9/27/2017	6 - 8	Primary		0.2	U	0.0043	U	0.0043	U
68	B-59	B-59(12-13.5)_100317	10/3/2017	9 - 10.5	Primary		0.2	U	0.0046	U	0.0046	U
68	B-59	B-59(5-7)_100317	10/3/2017	2 - 4	Primary		0.19	U	0.0058	U	0.0058	U
68	B-59	DUP-2_100317	10/3/2017	2 - 4	Duplicate	B-59(5-7)_100317	0.37	U	0.006	U	0.006	U
68	B-59	B-59(FILL)_100317	10/3/2017	-3 - 0	Primary		0.18	U	0.0047	U	0.0047	U
68	B-60	B-60(0-1)_092617	9/26/2017	0 - 1	Primary		0.058	J	0.0043	U	0.0043	U
68	B-60	B-60(5-7)_092617	9/26/2017	5 - 7	Primary		0.044	J	0.005	U	0.005	U
68	B-60	B-60(FILL)_092617	9/26/2017	-4 - 0	Primary		0.14	J	0.0043	U	0.0043	U
68	B-77	B-77(0-1)_092817	9/28/2017	0 - 1	Primary		0.18	U	0.0048	U	0.0048	U
68	B-77	B-77(1-3)_092817	9/28/2017	1 - 3	Primary		0.18	U	0.0073	U	0.0073	U
68	B-77	DUP-1_092817	9/28/2017	1 - 3	Duplicate	B-77(1-3)_092817	0.18	U	0.0054	U	0.0054	U
68	B-80	B-80(0.3-1.3)_121218	12/12/2018	0.3 - 1.3	Primary		0.093	J	***10***		0.69	J
68	B-80	B-80(1.3-3.3)_121218	12/12/2018	1.3 - 3.3	Primary		0.095		0.0028	J	0.00054	J
68	B-82	B-82(11-13)_121118	12/11/2018	11 - 13	Primary		0.0013	J	0.0075	UJ	0.0075	UJ
68	B-82	B-82(1-2)_121118	12/11/2018	1 - 2	Primary		0.039	J	***0.88***	***J***	2	UJ
68	B-82	B-82(5-7)_121118	12/11/2018	5 - 7	Primary		0.0066	J	0.0057	UJ	0.0057	UJ
68	B-83	B-83(0.3-1.3)_121118	12/11/2018	0.3 - 1.3	Primary		0.23		***0.11***	***J***	1.89	
68	B-83	B-83(1.3-3.3)_121118	12/11/2018	1.3 - 3.3	Primary		0.12	J	NR		0.0093	J
68	B-83	DUP-1_121118	12/11/2018	1.3 - 3.3	Duplicate	B-83(1.3-3.3)_121118	0.21	J	NR		NR	
69	B-61	B-61(0-1)_101117	10/11/2017	0 - 1	Primary		0.077	J	0.0053	U	0.0053	U
69	B-61	B-61(5-6)_101117	10/11/2017	5 - 6	Primary		0.19	U	0.0044	U	0.0044	U
69	B-62	B-62(0-1)_101117	10/11/2017	0 - 1	Primary		0.18	U	0.0049	U	0.0049	U
69	B-62	B-62(5-5.5)_101117	10/11/2017	5 - 5.5	Primary		0.14	J	0.0072	U	0.0072	U
69	B-63	B-63(0-1)_101117	10/11/2017	0 - 1	Primary		0.18	U	0.0065	U	0.0074	
69	B-63	B-63(1-3)_101117	10/11/2017	1 - 3	Primary		***0.64***	***J***	0.0047	U	0.0047	U
69	B-101	B-101(0-1)_121418	12/14/2018	0 - 1	Primary		0.029		0.0058	U	0.095	
69	B-101	B-101(11-13)_121418	12/14/2018	11 - 13	Primary		0.2	U	0.0043	U	0.0043	U
69	B-101	B-101(5-6)_121418	12/14/2018	5 - 6	Primary		0.33		0.0045	U	0.0045	U
69	B-102	B-102(0-1)_121418	12/14/2018	0 - 1	Primary		0.2	U	0.0045	U	0.00304	J
69	B-102	B-102(1-2.9)_121418	12/14/2018	1 - 2.9	Primary		0.055	U	0.0044	U	0.0044	U
70	B-19	B-19(0-1)_101117	10/11/2017	0 - 1	Primary		0.19	U	***0.035***	***J***	0.0059	U
70	B-19	B-19(2-4)_101117	10/11/2017	2 - 4	Primary		0.19	U	0.0051	U	0.0051	U
70	B-64	B-64(1.5-2.5)_101117	10/11/2017	1.5 - 2.5	Primary		0.19	U	0.0053	U	0.0053	U
70	B-64	DUP-5_101117	10/11/2017	1.5 - 2.5	Duplicate	B-64(1.5-2.5)_101117	0.19	U	0.0049	U	0.0049	U
70	B-64	B-64(2.5-4.5)_101117	10/11/2017	2.5 - 4.5	Primary		0.19	U	0.0057	UJ	0.0057	UJ
70	B-65	B-65(0.5-1.5)_101317	10/13/2017	0.5 - 1.5	Primary		0.19	U	0.02		0.57	J
70	B-65	B-65(1.5-2.7)_101317	10/13/2017	1.5 - 2.7	Primary		0.19	U	0.0053	U	0.0053	U
70	B-66	B-66(1.5-2.5)_101017	10/10/2017	1.5 - 2.5	Primary		0.18	U	***0.037***		0.0055	U
70	B-66	B-66(2.5-4.5)_101017	10/10/2017	2.5 - 4.5	Primary		0.048	J	0.0068	UJ	0.0311	J
70	B-67	B-67(1.5-2.5)_101017	10/10/2017	1.5 - 2.5	Primary		0.92	U	***0.026***		0.0056	U
70	B-67	B-67(2.5-3.8)_101017	10/10/2017	2.5 - 3.8	Primary		***5.4***		0.39	U	***12.94***	
70	B-100	B-100(11-13)_121418	12/14/2018	11 - 13	Primary		0.44	J	0.0066	U	0.0066	U
70	B-100	B-100(2.2-3.2)_121418	12/14/2018	2.2 - 3.2	Primary		0.061		0.4	U	0.13	J
70	B-100	B-100(3.2-4.2)_121418	12/14/2018	3.2 - 4.2	Primary		0.031		0.0048	UJ	0.0037	J

Notes:
ARAR = Applicable or Relevant and Appropriate Requirements.
PRG = Preliminary Remediation Goal
Detected result exceeds ARAR or PRG
Reporting Detection Limit exceeds ARAR or PRG
NR = Not reportable
J - Estimated Value, result >MDL and <RL
J+ - Estimated High
J- - Estimated Low
U - Not detected above the laboratory reporting limit
Total Xylenes are calculated as the sum of detected isomers concentrations. If all the isomers are reported as nondetected, then the highest reporting limit of the isomers is reported.

TABLE 3-5C
SUMMARY OF RI SOIL GAS SAMPLE PRG EXCEEDANCES
RIVERSIDE INDUSTRIAL PARK SUPERFUND SITE
NEWARK, NEW JERSEY

							VOCs					
							Naphthalene		Trichloroethylene		Total Xylenes	
							PRG = 0.62 mg/kg		PRG = 0.02 mg/kg		PRG = 6.5 mg/kg	
Lot ID	Location	Sample ID	Sample Date	Depth Interval (ft bgs)	Sample Type	Parent sample ID	Result (mg/kg)	Qual	Result (mg/kg)	Qual	Result (mg/kg)	Qual

Only parameters that have a result greater than the selected ARAR/PRG and used in the soil and soil gas alternatives are listed

TABLE 3-5D
SUMMARY OF HISTORIC SOIL GAS SAMPLE PRG EXCEEDANCES
RIVERSIDE INDUSTRIAL PARK SUPERFUND SITE
NEWARK, NEW JERSEY

							VOCs					
							Naphthalene		Trichloroethene		Total Xylene	
							PRG = 0.62 mg/kg		PRG = 0.02 mg/kg		PRG = 6.5 mg/kg	
Lot	Location	Sample ID	Sample Date	Depth Interval (ft bgs)	Sample Type	Parent Sample ID	esult (mg/k	Qual	esult (mg/k	Qual	esult (mg/k	Qual
1	BE-1_1	BE-1 (7.5-8)	9/14/2010	7.5 - 8	Primary		***0.86***				ND	
1	BE-2_1	BE-2 (4.5-5)	9/14/2010	4.5 - 5	Primary		0.012				0.0023	J
1	BE-3_1	BE-3 (7.5-8)	9/14/2010	7.5 - 8	Primary						ND	
1	SB-3_1	SB-3 (2.5-3)	7/30/2008	2.5 - 3	Primary		***1.44***				2.11	
58	S-1_58	S-1	10/6/2009	Less than 14 feet	Primary		0.038		ND		***121***	
58	S-10_58	S-10A	10/6/2009	Less than 14 feet	Primary		ND		ND		ND	
58	S-10_58	S-10B	10/6/2009	Less than 14 feet	Primary		ND		ND		6.39	
58	S-2_58	S-2	10/6/2009	Less than 14 feet	Primary		***5.18***		***0.597***	***J***	***344***	
58	S-3_58	S-3	10/6/2009	Less than 14 feet	Primary		ND		ND		ND	
58	S-4_58	S-4A	10/6/2009	Less than 14 feet	Primary		0.548		ND		3.43	
58	S-4_58	S-4B	10/6/2009	Less than 14 feet	Primary		ND		ND		ND	
58	S-5_58	S-5	10/6/2009	Less than 14 feet	Primary		ND		ND		ND	
58	S-6_58	S-6A	10/6/2009	Less than 14 feet	Primary		ND		ND		ND	
58	S-6_58	S-6B	10/6/2009	Less than 14 feet	Primary		ND		ND		1.81	
58	S-7_58	S-7	10/6/2009	Less than 14 feet	Primary		ND		ND		ND	
58	S-8_58	S-8	10/6/2009	Less than 14 feet	Primary		ND		ND		0.174	
58	S-9_58	S-9	10/6/2009	Less than 14 feet	Primary		ND		ND		ND	
60	SB-FILL-1_60	SB-FILL-1 (5.5-6)	11/13/2008	5.5 - 6	Primary							
60	SB-FILL-2_60	SB-FILL-2 (5.5-6)	11/13/2008	5.5 - 6	Primary		ND		ND		ND	
60	SB-FILL-3_60	SB-FILL-3 (6.5-7)	11/13/2008	6.5 - 7	Primary							
60	SB-FILL-4_60	SB-FILL-4 (5.5-6)	11/13/2008	5.5 - 6	Primary							
60	SB-PAD-1_60	SB-PAD-1 (6.5-7)	11/13/2008	6.5 - 7	Primary				***7.06***		ND	
60	SB-PAD-2_60	SB-PAD-2 (6.5-7)	11/13/2008	6.5 - 7	Primary				ND		ND	
60	SB-PAD-3_60	SB-PAD-3 (6.5-7)	11/13/2008	6.5 - 7	Primary				***0.414***	***J***	ND	
60	SB-PAD-4_60	SB-PAD-4 (6.5-7)	11/13/2008	6.5 - 7	Primary				ND		ND	
62	SB-4_62	SB-4 (5.5-6)	5/14/2008	5.5 - 6	Primary		***9***					
62	SB-5_62	SB-5 (5.5-6)	5/14/2008	5.5 - 6	Primary		***1.97***					
62	SB-6_62	SB-6 (6.5-7)	5/14/2008	6.5 - 7	Primary		***1.17***		ND		1.99	
66	SB-1_66	SB-1 (4.5-5)	5/14/2008	4.5 - 5	Primary		ND					
66	SB-2_66	SB-2 (4.5-5)	5/14/2008	4.5 - 5	Primary		ND					
66	SB-3_66	SB-3 (4.5-5)	5/14/2008	4.5 - 5	Primary		ND		***0.13***	***J***	ND	
68	B-54_68	B-54 (0.5-1)	6/22/1994	0.5 - 1	Primary							
68	B-54_68	B-54 (1.5-2)	5/1/1995	1.5 - 2	Duplicate	B-54 (1.5-2)			0.0074			
68	B-54_68	B-54 (1.5-2)	5/1/1995	1.5 - 2	Primary				0.013			
68	B-54_68	B-54 (1-1.5)	6/22/1994	1 - 1.5	Primary							
68	B-54_68	B-54 (5-5.5)	5/1/1995	5 - 5.5	Primary				ND			
68	B-56_68	B-56 (1.5-2)	5/1/1995	1.5 - 2	Primary				ND			
68	B-56_68	B-56 (5-5.5)	5/1/1995	5 - 5.5	Primary				ND			
68	B-57_68	B-57 (0.5-1)	5/1/1995	0.5 - 1	Duplicate	B-57 (0.5-1)						
68	B-57_68	B-57 (0.5-1)	5/1/1995	0.5 - 1	Primary							
68	B-57_68	B-57 (1.5-2)	5/1/1995	1.5 - 2	Primary				ND			
68	B-57_68	B-57 (3.5-4)	5/1/1995	3.5 - 4	Primary							
68	B-57_68	B-57 (5-5.5)	5/1/1995	5 - 5.5	Primary				ND			
68	B-58_68	B-58 (1.5-2)	5/1/1995	1.5 - 2	Primary				0.014			
68	B-58_68	B-58 (5-5.5)	5/1/1995	5 - 5.5	Primary				0.0025			
68	B-59_68	B-59 (0.5-1)	6/22/1994	0.5 - 1	Primary							
68	B-59_68	B-59 (1.5-2)	6/22/1994	1.5 - 2	Primary				ND			
68	B-59_68	B-59 (5-5.5)	6/22/1994	5 - 5.5	Primary				ND			
68	B-60_68	B-60 (0.5-1)	5/1/1995	0.5 - 1	Primary							
68	B-60_68	B-60 (1.5-2)	5/1/1995	1.5 - 2	Primary				ND			
68	B-60_68	B-60 (5-5.5)	5/1/1995	5 - 5.5	Primary				ND			
68	B-61_68	B-61 (1.5-2)	5/1/1995	1.5 - 2	Primary				ND			
68	B-61_68	B-61 (5-5.5)	5/1/1995	5 - 5.5	Primary				ND			
68	B-62_68	B-62 (1.5-2)	6/22/1994	1.5 - 2	Primary				ND			
68	B-62_68	B-62 (3-3.5)	6/22/1994	3 - 3.5	Primary							
68	B-62_68	B-62 (5-5.5)	6/22/1994	5 - 5.5	Primary				ND			
68	B-63_68	B-63 (0.5-1)	6/22/1994	0.5 - 1	Primary							
68	B-63_68	B-63 (1.5-2)	6/22/1994	1.5 - 2	Primary				ND			
68	B-63_68	B-63 (3-3.5)	6/22/1994	3 - 3.5	Primary							
68	B-63_68	B-63 (5-5.5)	6/22/1994	5 - 5.5	Primary				ND			
68	B-64_68	B-64 (3.5-4)	5/1/1995	3.5 - 4	Duplicate	B-64 (3.5-4)			ND		ND	
68	B-64_68	B-64 (3.5-4)	5/1/1995	3.5 - 4	Primary				ND		ND	
68	B-65_68	B-65 (3-3.5)	6/22/1994	3 - 3.5	Primary				ND		ND	
68	B-66_68	B-66 (2-2.5)	6/22/1994	2 - 2.5	Primary				ND		ND	
68	GP-1_68	GP-1, S-1 (5-5.5)	1/12/1995	5 - 5.5	Primary				***0.46***	***J***	0.82	
68	GP-1_68	GP-1, S-2 (7.5-8)	1/12/1995	7.5 - 8	Primary				0.14	U	0.14	
68	GP-1_68	GP-1, S-4 (11.5-12)	1/12/1995	11.5 - 12	Primary				0.0076	U	0.0076	
68	GP-2_68	GP-2, S-2 (7-7.5)	1/12/1995	7 - 7.5	Primary				0.014		0.0058	
68	GP-2_68	GP-2, S-4 (11.5-12)	1/12/1995	11.5 - 12	Primary				0.0015	U	0.0015	
68	GP-5_68	GP-5, S-1 (5.5-6)	1/12/1995	5.5 - 6	Primary				0.15	U	0.15	
68	GP-5_68	GP-5, S-2 (7-7.5)	1/12/1995	7 - 7.5	Primary				0.2	U	0.2	
68	GP-5_68	GP-5, S-4 (11.5-12)	1/12/1995	11.5 - 12	Duplicate	GP-5, S-4 (11.5-12)			0.0058	U	0.0058	
68	GP-5_68	GP-5, S-4 (11.5-12)	1/12/1995	11.5 - 12	Primary				0.0058	U	0.0058	
63-64	B-1_63-64	B1-1 (2.1-2.6)	5/26/2010	2.1 - 2.6	Primary		0.16	J				
63-64	B-1_63-64	B1-2 (8.5-10)	5/26/2010	8.5 - 10	Primary							

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TABLE 3-5D
SUMMARY OF HISTORIC SOIL GAS SAMPLE PRG EXCEEDANCES
RIVERSIDE INDUSTRIAL PARK SUPERFUND SITE
NEWARK, NEW JERSEY

							VOCs					
							Naphthalene		Trichloroethene		Total Xylene	
							PRG = 0.62 mg/kg		PRG = 0.02 mg/kg		PRG = 6.5 mg/kg	
Lot	Location	Sample ID	Sample Date	Depth Interval (ft bgs)	Sample Type	Parent Sample ID	esult (mg/k	Qual	esult (mg/k	Qual	esult (mg/k	Qual
63-64	B-10_63-64	B10-1 (6-7)	5/26/2010	6 - 7	Primary		***1.8***					
63-64	B-10_63-64	B10-2 (10-11)	5/26/2010	10 - 11	Primary		***0.96***					
63-64	B-11_63-64	B11-1 (2-6)	5/26/2010	2 - 6	Primary							
63-64	B-12_63-64	B12-1 (2.1-2.8)	5/26/2010	2.1 - 2.8	Primary							
63-64	B-12_63-64	B12-2 (6.4-7.5)	5/26/2010	6.4 - 7.5	Primary							
63-64	B-2_63-64	B2-1 (7.5-10)	5/26/2010	7.5 - 10	Primary							
63-64	B-2_63-64	B2-2 (10-12.5)	5/26/2010	10 - 12.5	Primary							
63-64	B-3_63-64	B3-1 (5-7)	5/26/2010	5 - 7	Primary							
63-64	B-3_63-64	B3-1 (5-7)	5/26/2010	5 - 7	Primary		***1.4***					
63-64	B-3_63-64	B3-2 (7-9)	5/26/2010	7 - 9	Primary							
63-64	B-4_63-64	B4-1 (2.5-4)	5/26/2010	2.5 - 4	Primary		0.31				0.64	
63-64	B-4_63-64	B4-1 (8-10)	5/26/2010	8 - 10	Primary							
63-64	B-4_63-64	B4-2 (8-10)	5/26/2010	8 - 10	Primary							
63-64	B-5_63-64	B5-1 (1-4)	5/26/2010	1 - 4	Primary							
63-64	B-5_63-64	B5-2 (9-11)	5/26/2010	9 - 11	Primary							
63-64	B-6_63-64	B6-1 (1-2.5)	5/26/2010	1 - 2.5	Primary		***1.1***					
63-64	B-6_63-64	B6-2 (5-5)	5/26/2010	5 - 5	Primary						1.5	
63-64	B-7_63-64	B7-1 (8.5-9)	5/26/2010	8.5 - 9	Primary		0.093	J			2.3	J
63-64	B-7_63-64	B7-2 (10-10.5)	5/26/2010	10 - 10.5	Primary		0.44				1.94	J
63-64	B-8_63-64	B8-1 (5-5.5)	5/26/2010	5 - 5.5	Primary						0.35	J
63-64	B-8_63-64	B8-2 (10-11)	5/26/2010	10 - 11	Primary		0.084	J			6.39	
63-64	B-8_63-64	B8-2d (10-11)	5/26/2010	10 - 11	Duplicate	B8-2 (10-11)	0.15	J			0.96	
63-64	B-9_63-64	B9-1 (5-6)	5/26/2010	5 - 6	Primary							
63-64	B-9_63-64	B9-2 (10-11)	5/26/2010	10 - 11	Primary		0.21	J				
63-64	HF-2_63-64	HF-2 (11-12.5)	9/23/2009	11 - 12.5	Primary		ND		ND		ND	
63-64	HF-2_63-64	HF-2R (11-12.5)	9/28/2009	11 - 12.5	Primary				ND		***11.6***	
63-64	HF-3_63-64	HF-3 (7-7.5)	9/23/2009	7 - 7.5	Primary		ND		ND		ND	
63-64	HF-3_63-64	HF-3R (7-7.5)	9/28/2009	7 - 7.5	Primary				ND		ND	
63-64	HF-4_63-64	HF-4 (11-11.5)	9/23/2009	11 - 11.5	Primary		ND		ND		0.0012	J
63-64	HF-5_63-64	HF-5 (6.5-7)	9/23/2009	6.5 - 7	Primary		ND		ND		1.84	J
63-64	HF-6_63-64	HF-6 (10.5-11)	9/23/2009	10.5 - 11	Primary		ND		ND		ND	
63-64	HF-7_63-64	HF-7 (16-16.5)	9/23/2009	16 - 16.5	Primary		ND		ND		0.237	J
63-64	HF-NW_63-64	HF-NWA (2-2.5)	9/23/2009	2 - 2.5	Primary		***0.694***		ND		0.0087	
63-64	HF-NW_63-64	HF-NWB (6.5-7)	9/23/2009	6.5 - 7	Primary		ND		ND		1.33	J
63-64	HF-NW_63-64	HF-NWC (11.5-12)	9/23/2009	11.5 - 12	Primary		ND		ND		ND	
63-64	HF-NW_63-64	HF-NWD (18-18.5)	9/23/2009	18 - 18.5	Primary		ND		ND		ND	
63-64	LD-1_63-64	LD-1 (1.5-2)	9/23/2009	1.5 - 2	Primary		ND		ND		0.0103	
63-64	LD-1A_63-64	LD-1A (4.5-5)	9/23/2009	4.5 - 5	Primary		0.06		ND		0.0109	
63-64	LD-2_63-64	LD-2 (1.5-2)	9/23/2009	1.5 - 2	Primary		0.0508		ND		0.554	J
63-64	LD-3_63-64	LD-3 (1.5-2)	9/23/2009	1.5 - 2	Primary		0.353		ND		0.0063	
63-64	LD-4_63-64	LD-4 (2.5-3)	9/23/2009	2.5 - 3	Primary		0.215		ND		0.0056	
63-64	LD-5_63-64	LD-5 (10-10.5)	9/23/2009	10 - 10.5	Primary		0.342		ND		***65***	
63-64	STG-1_63-64	STG-1 (1.5-2)	9/23/2009	1.5 - 2	Primary		ND		ND		ND	
63-64	STG-2_63-64	STG-2 (10-10.5)	9/23/2009	10 - 10.5	Primary		0.413		ND		***8.34***	
63-64	STG-3_63-64	STG-3 (2.5-3)	9/23/2009	2.5 - 3	Primary		0.072		ND		0.022	
63-64	TRANS-1_63-64	TRANS-1 (0.5-1)	9/23/2009	0.5-1	Primary							
63-64	TRENCH-1_63-64	TRENCH-1 (5.5-6)	9/23/2009	5.5 - 6	Primary		0.432		ND		***27.9***	
63-64	TT-1_63-64	TT-1 (1.5-2)	9/23/2009	1.5 - 2	Primary		0.0324	J	ND		0.28	J
63-64	TT-1_63-64	TT-1R (1.5-2)	9/28/2009	1.5 - 2	Primary				ND		ND	
63-64	UST-DG/HF-1_63-64	UST-DG/HF-1 (6.5-7)	9/23/2009	6.5 - 7	Primary		ND		ND		ND	
63-64	UST-DG/HF-1_63-64	UST-DG/HF-1R (6.5-7)	9/28/2009	6.5 - 7	Primary				ND		ND	

Notes:
ARAR = Applicable or Relevant and Appropriate Requirements.
PRG = Preliminary Remediation Goal
ND = Not detected and reporting detection limit is not available
Detected result exceeds ARAR or PRG
Reporting Detection Limit exceeds ARAR or PRG
D - Result is from diluted sample
J - Estimated Value, result >MDL and <RL
K - Estimated, unspecified laboratory non-conformance
U - Not detected above the laboratory reporting limit
Total Xylenes are calculated as the sum of detected concentrations. If the sum the null, the highest reporting limit of the isomers is reported.
Not Analyzed
Only parameters that have a result greater than the selected ARAR/PRG and used in the soil and soil gas alternatives are listed

Prepared by USEPA

TABLE 3-6
SUMMARY OF GROUNDWATER SAMPLE ARAR EXCEEDANCES
RIVERSIDE INDUSTRIAL PARK SUPERFUND SITE
NEWARK, NEW JERSEY

LOT ID:					1	1	1	1	1	1	1	1	1	1
SITE ID:					E-5	E-5	E-5	E-6	E-6	E-6	E-6	E-7	E-7	E-7
SAMPLE DEPTH (FT BGS)					6.40-6.40	5.73-5.73	4.67-4.67	5.18-5.18	5.18-5.18	5.5-5.5	4.46-4.46	5.24-5.24	5.2-5.2	4.74-4.74
COLLECTION DATE:					3/13/2018	6/5/2018	2/13/2019	3/13/2018	3/13/2018	6/12/2018	2/14/2019	3/13/2018	6/7/2018	2/15/2019
Lab Analyte	**CAS**	**ARAR[1]**	**Basis**	**Units**	**Primary**	**Primary**	**Primary**	**Primary**	**Duplicate**	**Primary**	**Primary**	**Primary**	**Primary**	**Primary**
VOCs (ug/l)														
Acetone	67-64-1	6000	NJGWQS - GWQC	ug/l	56 J	8.9 U	6 R	31 J	64 J	55	32 J	6 U	80	6 U
Benzene	71-43-2	1	NJDEP MCL	ug/l	0.036 J	0.047 J	0.031 J	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Dibromo-3-chloropropane, 1,2-	96-12-8	0.02	NJGWQS - GWQC/PQL	ug/l	2 U	2 U	2 U	2 U	2 U	2 UJ	2 U	2 U	2 U	2 U
Dichloropropene, 1,3- (TRANS)	10061-02-6	1	NJGWQS - PQL	ug/l	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Ethylbenzene	100-41-4	700	NJGWQS - GWQC	ug/l	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.76	0.2 U	0.2 U	0.2 U
Hexanone, 2-	591-78-6	40	NJGWQS - GWQC	ug/l	3 R	3 U	2.1 J	3 R	3 R	3 U	3 R	3 R	3 U	3 R
Methyl Ethyl Ketone (2-Butanone)	78-93-3	300	NJGWQS - GWQC	ug/l	10 R	10 U	10 R	10 R	10 R	10 U	10 R	10 R	10 U	10 R
Methylene Chloride	75-09-2	3	NJGWQS - GWQC	ug/l	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Tetrachloroethane, 1,1,2,2-	79-34-5	1	NJGWQS - GWQC/PQL	ug/l	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Tetrachloroethylene	127-18-4	1	NJDEP MCL	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Toluene	108-88-3	600	NJGWQS - GWQC	ug/l	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.24	0.2 U	0.2 U	0.2 U
Trichlorobenzene, 1,2,4-	120-82-1	9	NJGWQS - GWQC	ug/l	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
Trichloroethane, 1,1,2-	79-00-5	3	NJGWQS - GWQC	ug/l	0.2 U	0.2 U	0.39	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Trichloroethylene	79-01-6	1	NJGWQS - GWQC/PQL	ug/l	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.11 J	0.2 U	0.2 U	0.1 J	0.068 J
Vinyl Chloride	75-01-4	1	NJGWQS - PQL	ug/l	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 UJ	0.02 U	0.02 U	0.02 U	0.02 UJ
Xylene, m,p	179601-23-1	1000	NJGWQS - GWQC	ug/l	0.12 J	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	4	0.5 U	0.5 U	0.5 U
Xylene, o-	95-47-6	1000	NJGWQS - GWQC	ug/l	0.5 U	0.15 J	0.5 U	0.5 U	0.16 J	0.5 U	1.2	0.5 U	0.5 U	0.5 U
SVOCs (ug/l)														
Benz[a]anthracene	56-55-3	0.1	NJGWQS - PQL	ug/l	0.016 J	0.48 U	0.47 U	0.0057 J	0.0047 J	0.019 J	0.0039 J	0.0036 J	0.1 U	0.0038 J
Benzo[a]pyrene	50-32-8	0.1	NJGWQS - PQL	ug/l	0.33 U	0.48 U	0.47 U	0.098 U	0.098 U	0.025 J	0.094 U	0.1 U	0.1 U	0.097 U
Benzo[b]fluoranthene	205-99-2	0.2	NJGWQS - PQL	ug/l	0.33 U	0.48 U	0.47 U	0.098 U	0.098 U	0.024 J	0.094 U	0.0059 J	0.1 U	0.007 J
Bis(2-ethylhexyl)phthalate	117-81-7	3	NJGWQS - PQL	ug/l	4.9 U	4.8 U	4.7 U	4.9 U	4.9 U	5.1 UJ	*8*	5.1 U	5.1 U	4.9 U
Cresol, p-	106-44-5	50	NJGWQS - GWQC	ug/l	9.9 U	9.6 U	9.4 U	9.8 U	9.8 U	10 UJ	9.4 U	10 U	10 U	9.7 U
Dioxane, 1,4-	123-91-1	0.4	NJGWQS - GWQC	ug/l	0.087 J	0.077 J	0.074 J	0.2 U	0.2 U	0.17 J	0.2 U	0.078 J	0.2 U	0.085 J
Indeno[1,2,3-cd]pyrene	193-39-5	0.2	NJGWQS - PQL	ug/l	0.33 U	0.48 U	0.47 U	0.098 U	0.098 U	0.022 J	0.094 U	0.012 J	0.1 U	0.0042 J
Methylnaphthalene, 2-	91-57-6	30	NJGWQS - GWQC	ug/l	4.9 U	0.48 U	0.2 J	4.9 U	4.9 U	5.1 UJ	0.0067 J	5.1 U	0.1 U	0.097 U
Pentachlorophenol	87-86-5	0.3	NJGWQS - GWQC	ug/l	9.9 U	9.6 U	0.94 U	9.8 U	9.8 U	10 UJ	9.4 U	10 U	10 U	9.7 U
Metals (ug/l)														
Aluminum	7429-90-5	200	NJGWQS - GWQC	ug/l	87.6	30.7	46.8 J+	20 U	20 U	30.9	17.4 J	154	10.8 J	29.6
Antimony	7440-36-0	6	NJGWQS - GWQC	ug/l	2 U	2 U	2 U	0.33 J	0.36 J	3.4	3.4 J-	1.4 J	2.5	1.3 J
Arsenic	7440-38-2	3	NJGWQS - PQL	ug/l	*12.1*	*4.9 J*	*3.5*	*4.8*	*4.7*	*3.2*	2.1	*5.7*	*4.8*	1.8
Barium	7440-39-3	2000	USEPA/NJDEP - MCL	ug/l	170 J+	175	159	93.2 J+	96.8 J+	219	138	155 J+	352	115
Beryllium	7440-41-7	1	NJGWQS - GWQC/PQL	ug/l	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Cadmium	7440-43-9	4	NJGWQS - GWQC	ug/l	1 R	1 U	1 U	1 R	1 R	1 U	0.19 J	0.18 J	0.59 J	0.088 J
Iron	7439-89-6	300	NJGWQS - GWQC	ug/l	*20700*	*20100 J*	*13500*	*1550*	*1590*	*670*	45.5 J	*1690*	165 J	*610*
Lead	7439-92-1	5	NJGWQS - GWQC/PQL	ug/l	1.4	0.55 J	1 U	2	2.1	3.3	1.4	2	1.4	1.5
Manganese	7439-96-5	50	NJGWQS - GWQC	ug/l	*1450*	*1630 J*	*1920*	*991*	*1010*	*919*	*139*	*104*	44.4	*90.8*
Selenium	7782-49-2	40	NJGWQS - GWQC	ug/l	23.9	8.8	9	15.7	15.7	10	3.2 J	19.7	17.7	7.7
Sodium	7440-23-5	50000	NJGWQS - GWQC	ug/l	*86400*	*78700*	*62200*	24800	*24900*	*79100*	40200	40700	*91400*	41300

Notes:
ARAR = Applicable or Relevant and Appropriate Requirements
[1] ARAR is the lowest value of the NJGWQS, NJDEP MCL and USEPA MCL. NJGWQS basis is Groundwater Quality Criterion (GWQC) or Practical Quantitation Level (PQL).
Detected result exceeds ARAR
Reporting Detection Limit exceeds ARAR
J - Estimated Value, result >MDL and <RL
J+ - Estimated High
J- - Estimated Low
U - Not detected above the laboratory reporting limit
D - Result is from a diluted sample
R - Rejected value
Only chemicals that have a result greater than the ARAR are listed

TABLE 3-6
SUMMARY OF GROUNDWATER SAMPLE ARAR EXCEEDANCES
RIVERSIDE INDUSTRIAL PARK SUPERFUND SITE
NEWARK, NEW JERSEY

LOT ID:					57	57	57	57	57	57	58	58	58	58	58
SITE ID:					MW-116	MW-116	MW-116	MW-118	MW-118	MW-118	MW-114	MW-114	MW-114	MW-115	MW-115
SAMPLE DEPTH (FT BGS)					5.09-5.09	6.02-6.02	5.99-5.99	4.00-4.00	5.52-5.52	6.35-6.35	9.52-9.52	10.05-10.05	10.24-10.24	7.15-7.15	7.53-7.53
COLLECTION DATE:					3/8/2018	6/6/2018	2/19/2019	3/8/2018	6/11/2018	2/18/2019	3/8/2018	6/6/2018	2/19/2019	3/9/2018	6/6/2018
Lab Analyte	**CAS**	**ARAR[1]**	**Basis**	**Units**	**Primary**	**Primary**	**Primary**	**Primary**	**Primary**	**Primary**	**Primary**	**Primary**	**Primary**	**Primary**	**Primary**
VOCs (ug/l)															
Acetone	67-64-1	6000	NJGWQS - GWQC	ug/l	280 J	6 U	6 U	71000 J	51000 J	60000 J	6 U	61	6 U	2400 J	6 U
Benzene	71-43-2	1	NJDEP MCL	ug/l	0.064 J	0.049 J	0.2 U	3.3 J+	200 U	0.2 U	0.12 J	0.2 U	0.2 U	2.6 J+	0.55
Dibromo-3-chloropropane, 1,2-	96-12-8	0.02	NJGWQS - GWQC/PQL	ug/l	2 UJ	2 U	2 U	200 U	2000 U	2 U	2 U	2 U	2 U	2 U	2 U
Dichloropropene, 1,3- (TRANS)	10061-02-6	1	NJGWQS - PQL	ug/l	0.2 UJ	0.2 U	0.2 U	20 U	200 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Ethylbenzene	100-41-4	700	NJGWQS - GWQC	ug/l	0.2 U	0.2 U	0.2 U	20 U	200 U	8.4	550	8 J-	0.61	480	270
Hexanone, 2-	591-78-6	40	NJGWQS - GWQC	ug/l	5.7 J	3 U	5.6 J	300 R	3000 UJ	3 R	3 R	3 U	3 R	3 R	3 U
Methyl Ethyl Ketone (2-Butanone)	78-93-3	300	NJGWQS - GWQC	ug/l	10 R	10 U	10 R	1000 R	10000 U	10 R	10 R	10 U	10 R	10 R	10 U
Methylene Chloride	75-09-2	3	NJGWQS - GWQC	ug/l	5 UJ	5 U	5 U	500 U	5000 U	2.4 J	5 U	5 U	5 U	5 U	5 U
Tetrachloroethane, 1,1,2,2-	79-34-5	1	NJGWQS - GWQC/PQL	ug/l	0.2 UJ	0.2 U	0.2 U	20 U	200 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Tetrachloroethylene	127-18-4	1	NJDEP MCL	ug/l	0.5 UJ	0.5 U	0.5 UJ	50 U	500 U	0.21 J	0.5 U	0.5 U	0.5 UJ	0.59	0.36 J
Toluene	108-88-3	600	NJGWQS - GWQC	ug/l	0.2 UJ	0.2 U	0.2 U	230	270	130	18	4.8	1	210	60
Trichlorobenzene, 1,2,4-	120-82-1	9	NJGWQS - GWQC	ug/l	0.3 UJ	0.3 U	0.3 U	30 U	300 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
Trichloroethane, 1,1,2-	79-00-5	3	NJGWQS - GWQC	ug/l	0.2 UJ	0.2 U	0.2 U	20 U	200 U	0.2 U	0.2 U	0.2 U	6.8	0.2 U	0.2 U
Trichloroethylene	79-01-6	1	NJGWQS - GWQC/PQL	ug/l	0.2 UJ	0.2 U	0.2 U	20 U	200 U	0.2 U	0.2 U	0.2 U	0.2 U	0.6	0.39
Vinyl Chloride	75-01-4	1	NJGWQS - PQL	ug/l	0.02 UJ	0.02 U	0.02 UJ	2 U	20 UJ	0.02 U	0.02 U	0.02 U	0.02 UJ	0.061 J	0.02 U
Xylene, m,p	179601-23-1	1000	NJGWQS - GWQC	ug/l	3.2 J	0.5 U	0.5 U	61	500 U	29	3000	0.5 U	0.65	1700	710
Xylene, o-	95-47-6	1000	NJGWQS - GWQC	ug/l	0.5 UJ	0.23 J	0.18 J	50 U	500 U	5.8	360	0.5 U	0.41 J	810	340
SVOCs (ug/l)															
Benz[a]anthracene	56-55-3	0.1	NJGWQS - PQL	ug/l	0.033 J	0.041 J	0.028 J	5 U	0.3 J	0.1 J	0.5 U	9.4 U	0.097 U	5.1 U	9.5 U
Benzo[a]pyrene	50-32-8	0.1	NJGWQS - PQL	ug/l	0.1 U	0.094 U	0.095 U	5 U	5.2 U	0.065 J	0.5 U	9.4 U	0.097 U	5.1 U	9.5 U
Benzo[b]fluoranthene	205-99-2	0.2	NJGWQS - PQL	ug/l	0.012 J	0.013 J	0.0097 J	5 U	0.27 J	0.058 J	0.5 U	9.4 U	4.9 U	5.1 U	9.5 U
Bis(2-ethylhexyl)phthalate	117-81-7	3	NJGWQS - PQL	ug/l	1.2 J	4.7 U	4.8 U	50 U	52 U	12	5 U	9.4 U	4.9 U	3.1 J	48 U
Cresol, p-	106-44-5	50	NJGWQS - GWQC	ug/l	2.3 J	9.4 U	9.5 U	61 J	56 J	120 J+	9.9 U	19 U	9.7 U	10 U	95 UJ
Dioxane, 1,4-	123-91-1	0.4	NJGWQS - GWQC	ug/l	4	2.8	2.4	20 U	21 UJ	0.94	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Indeno[1,2,3-cd]pyrene	193-39-5	0.2	NJGWQS - PQL	ug/l	0.005 J	0.0071 J	0.0044 J	5 U	5.2 U	0.04 J	0.5 U	9.4 U	0.097 U	5.1 U	9.5 U
Methylnaphthalene, 2-	91-57-6	30	NJGWQS - GWQC	ug/l	5.1 U	4.7 U	0.017 J	50 U	0.22 J	0.33 J	5.9	9.4 U	0.32 J	7	48 U
Pentachlorophenol	87-86-5	0.3	NJGWQS - GWQC	ug/l	10 U	9.4 U	9.5 U	100 U	100 U	9.9 U	0.99 R	19 U	9.7 U	10 R	95 U
Metals (ug/l)															
Aluminum	7429-90-5	200	NJGWQS - GWQC	ug/l	22.1 J+	27.7	24.5	2220	1820	2330	30.2 J+	46.8	17.3 J	30.3 J+	26.2
Antimony	7440-36-0	6	NJGWQS - GWQC	ug/l	0.32 J	0.31 J	2 UJ	1.2 J	0.72 J	2 U	2 U	2 U	2 UJ	0.33 J	2 U
Arsenic	7440-38-2	3	NJGWQS - PQL	ug/l	21.7	16.2	7.1	14.2 J-	7.3	4.7	2	1.6	1 U	5.2	2.6
Barium	7440-39-3	2000	USEPA/NJDEP - MCL	ug/l	4910	4010	2290	580	494	831	131	139	96.1	105	324
Beryllium	7440-41-7	1	NJGWQS - GWQC/PQL	ug/l	1 U	1 U	1 U	1.2 J+	0.68 J	1	1 U	1 U	1 U	1 U	1 U
Cadmium	7440-43-9	4	NJGWQS - GWQC	ug/l	1 U	1 U	1 U	0.59 J	0.16 J	2 U	1 U	1 U	1 U	1 U	1 U
Iron	7439-89-6	300	NJGWQS - GWQC	ug/l	90000	63600	52700	142000	154000	144000	17800	12400	7780	5740	20200
Lead	7439-92-1	5	NJGWQS - GWQC/PQL	ug/l	1.6	2 J	1.2	568	26	13.8	1 U	0.28 J	1 U	1 U	1 UJ
Manganese	7439-96-5	50	NJGWQS - GWQC	ug/l	10500	6520	6420	15800	7240	8430	2310	1460	1030	236	622
Selenium	7782-49-2	40	NJGWQS - GWQC	ug/l	79.8	55.4 J	24.6	29.1 J-	21.8	17.7	6.2	5.6 J	5.6	3.1 J	6.5 J
Sodium	7440-23-5	50000	NJGWQS - GWQC	ug/l	4000000	3970000	2600000	410000	378000	325000	162000	160000	153000	25000	117000

Notes:
ARAR = Applicable or Relevant and Appropriate Requirements
[1] ARAR is the lowest value of the NJGWQS, NJDEP MCL and USEPA MCL. NJGWQS basis is Groundwater Quality
Detected result exceeds ARAR
Reporting Detection Limit exceeds ARAR
J - Estimated Value, result >MDL and <RL
J+ - Estimated High
J- - Estimated Low
U - Not detected above the laboratory reporting limit
D - Result is from a diluted sample
R - Rejected value
Only chemicals that have a result greater than the ARAR are listed

TABLE 3-6
SUMMARY OF GROUNDWATER SAMPLE ARAR EXCEEDANCES
RIVERSIDE INDUSTRIAL PARK SUPERFUND SITE
NEWARK, NEW JERSEY

LOT ID:					58	58	58	60	60	60	60	60	60	62	62
SITE ID:					MW-115	MW-115	MW-124	E-8	E-8	E-8	MW-117	MW-117	MW-117	E-4	E-4
SAMPLE DEPTH (FT BGS)					7.95-7.95	7.95-7.95	10.45-10.45	4.30-4.30	3.2-3.2	5-5	3.20-3.20	4.38-4.38	3.73-3.73	3.95-3.95	4.2-4.2
COLLECTION DATE:					2/19/2019	2/19/2019	2/14/2019	3/14/2018	6/4/2018	2/14/2019	3/8/2018	6/6/2018	2/19/2019	3/14/2018	6/11/2018
Lab Analyte	**CAS**	**ARAR[1]**	**Basis**	**Units**	**Primary**	**Duplicate**	**Primary**	**Primary**	**Primary**	**Primary**	**Primary**	**Primary**	**Primary**	**Primary**	**Primary**
VOCs (ug/l)															
Acetone	67-64-1	6000	NJGWQS - GWQC	ug/l	6 U	6 U	240 J	6 U	6 U	6.2 J	280 J	6 U	300 U	6 U	30 J
Benzene	71-43-2	1	NJDEP MCL	ug/l	***2.1***	***1.9***	0.11 J	0.2 U	0.046 J	0.2 U	0.2 U	0.2 U	0.2 U	0.043 J	0.049 J
Dibromo-3-chloropropane, 1,2-	96-12-8	0.02	NJGWQS - GWQC/PQL	ug/l	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Dichloropropene, 1,3- (TRANS)	10061-02-6	1	NJGWQS - PQL	ug/l	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Ethylbenzene	100-41-4	700	NJGWQS - GWQC	ug/l	200	200	***4900***	0.2 U	0.18 J	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Hexanone, 2-	591-78-6	40	NJGWQS - GWQC	ug/l	3 R	3 R	3 R	3 R	3 U	3 R	3 R	3 U	1.8 J	3 R	3 UJ
Methyl Ethyl Ketone (2-Butanone)	78-93-3	300	NJGWQS - GWQC	ug/l	10 R	10 R	10 R	10 R	10 U	10 R	10 R	10 U	***330 J***	10 R	10 U
Methylene Chloride	75-09-2	3	NJGWQS - GWQC	ug/l	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Tetrachloroethane, 1,1,2,2-	79-34-5	1	NJGWQS - GWQC/PQL	ug/l	0.2 U	0.2 U	0.2 U	0.43	0.52	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Tetrachloroethylene	127-18-4	1	NJDEP MCL	ug/l	0.24 J	0.24 J	0.5 U	0.12 J	0.5 U	0.17 J	0.17 J	0.5 U	0.12 J	0.085 J	0.089 J
Toluene	108-88-3	600	NJGWQS - GWQC	ug/l	43	38	***2100***	0.2 U	0.056 J	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Trichlorobenzene, 1,2,4-	120-82-1	9	NJGWQS - GWQC	ug/l	0.099 J	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
Trichloroethane, 1,1,2-	79-00-5	3	NJGWQS - GWQC	ug/l	0.49	0.48	***5.4***	***4.2***	***5.8***	***4.1***	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Trichloroethylene	79-01-6	1	NJGWQS - GWQC/PQL	ug/l	0.89	0.8	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.11 J	0.2 U	0.2 U
Vinyl Chloride	75-01-4	1	NJGWQS - PQL	ug/l	0.02 UJ	0.02 UJ	0.02 U	0.057	0.078	0.083	0.02 U	0.02 U	0.02 UJ	0.02 U	0.02 UJ
Xylene, m,p	179601-23-1	1000	NJGWQS - GWQC	ug/l	260	250	***24000***	0.5 U	0.5 U	0.5 U	4.4 J	0.5 U	0.5 U	0.26 J	0.5 U
Xylene, o-	95-47-6	1000	NJGWQS - GWQC	ug/l	210	210	***8700***	0.5 U	0.28 J	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
SVOCs (ug/l)															
Benz[a]anthracene	56-55-3	0.1	NJGWQS - PQL	ug/l	0.49 U	0.016 J	***0.17 J***	0.098 U	0.2 U	0.0029 J	0.99 U	0.0037 J	0.0029 J	0.099 U	0.5 U
Benzo[a]pyrene	50-32-8	0.1	NJGWQS - PQL	ug/l	0.49 U	0.49 U	3.8 U	0.098 U	0.2 U	0.095 UJ	0.99 U	0.095 U	0.097 U	0.099 U	0.5 U
Benzo[b]fluoranthene	205-99-2	0.2	NJGWQS - PQL	ug/l	1.9 U	0.49 U	***0.24 J***	0.098 U	0.2 U	0.095 UJ	0.99 U	0.095 U	0.097 U	0.099 U	0.5 U
Bis(2-ethylhexyl)phthalate	117-81-7	3	NJGWQS - PQL	ug/l	4.9 U	4.9 U	4.7 U	4.9 U	4.9 U	4.7 UJ	1.2 J	4.8 U	24 U	5 U	5 U
Cresol, p-	106-44-5	50	NJGWQS - GWQC	ug/l	9.7 R	9.8 R	9.5 U	9.8 U	9.8 U	9.4 UJ	9.9 U	9.5 U	49 U	9.9 U	9.9 U
Dioxane, 1,4-	123-91-1	0.4	NJGWQS - GWQC	ug/l	0.2 U	0.2 U	0.2 U	***1.1***	***0.96***	***0.65***	***7.4***	***20***	***5.4***	***0.85 J***	***0.71***
Indeno[1,2,3-cd]pyrene	193-39-5	0.2	NJGWQS - PQL	ug/l	0.49 U	0.49 U	***0.29 J***	0.098 U	0.2 U	0.095 UJ	0.99 U	0.095 U	0.097 U	0.099 U	0.5 U
Methylnaphthalene, 2-	91-57-6	30	NJGWQS - GWQC	ug/l	2.4 J	1.9 J	3.4 J	4.9 U	0.2 U	0.05 J	0.99 U	0.095 U	0.1 J+	5 U	0.5 U
Pentachlorophenol	87-86-5	0.3	NJGWQS - GWQC	ug/l	9.7 R	9.8 R	9.5 U	9.8 U	9.8 U	9.6 U	9.9 U	9.5 U	49 U	9.9 U	9.9 U
Metals (ug/l)															
Aluminum	7429-90-5	200	NJGWQS - GWQC	ug/l	20.8	21.3	19.4 J	20 U	7.7 J	15 J	40.6	95.4	59.3	26.8	33.9
Antimony	7440-36-0	6	NJGWQS - GWQC	ug/l	2 UJ	2 UJ	2 UJ	2 U	2 U	2 UJ	1.1 J	2 U	2 U	0.52 J	0.27 J
Arsenic	7440-38-2	3	NJGWQS - PQL	ug/l	0.74 J	1	2.8	***7.2***	***3.1 J***	2.5	***8***	***5.2***	***6.3***	***9.1***	2.6
Barium	7440-39-3	2000	USEPA/NJDEP - MCL	ug/l	328	335	160	296 J+	284	291	86.3	203	177	281 J+	246
Beryllium	7440-41-7	1	NJGWQS - GWQC/PQL	ug/l	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Cadmium	7440-43-9	4	NJGWQS - GWQC	ug/l	1 U	1 U	1 U	1 R	1 U	1 U	0.18 J	1 U	0.17 J	0.18 J	0.082 J
Iron	7439-89-6	300	NJGWQS - GWQC	ug/l	***10900***	***11200***	***15300***	***16800***	***13500 J***	***13100***	278	***2260***	***5580***	***5110***	***4340***
Lead	7439-92-1	5	NJGWQS - GWQC/PQL	ug/l	1 U	1 U	1 U	0.55 J	1 U	0.45 J	***8.9***	1.9 J	***17.7***	***7.1***	***7.4***
Manganese	7439-96-5	50	NJGWQS - GWQC	ug/l	***286***	***263***	***850***	***726***	***625 J***	***637***	***71.1***	***624***	***1350***	***2380***	***753***
Selenium	7782-49-2	40	NJGWQS - GWQC	ug/l	5.8	6.4	6.7	24.5	10.2	9	8.7	13 J	8.8	25.3	6
Sodium	7440-23-5	50000	NJGWQS - GWQC	ug/l	***225000***	***229000***	***357000***	***82300***	***61900***	***70900***	***285000***	***613000***	***402000***	***56100***	***66600***

Notes:
ARAR = Applicable or Relevant and Appropriate Requirements
[1] ARAR is the lowest value of the NJGWQS, NJDEP MCL and USEPA MCL. NJGWQS basis is Groundwater Quality
Detected result exceeds ARAR
Reporting Detection Limit exceeds ARAR
J - Estimated Value, result >MDL and <RL
J+ - Estimated High
J- - Estimated Low
U - Not detected above the laboratory reporting limit
D - Result is from a diluted sample
R - Rejected value
Only chemicals that have a result greater than the ARAR are listed

TABLE 3-6
SUMMARY OF GROUNDWATER SAMPLE ARAR EXCEEDANCES
RIVERSIDE INDUSTRIAL PARK SUPERFUND SITE
NEWARK, NEW JERSEY

LOT ID:					62	63	63	63	63	63	63	63	63	63
SITE ID:					E-4	MW-107	MW-107	MW-107	MW-108	MW-108	MW-108	MW-108	MW-110	MW-110
SAMPLE DEPTH (FT BGS)					3.25-3.25	5.54-5.54	6.05-6.05	4.95-4.95	4.30-4.30	4.55-4.55	4.55-4.55	3.9-3.9	5.65-5.65	5.12-5.12
COLLECTION DATE:					2/14/2019	3/6/2018	6/7/2018	2/13/2019	3/6/2018	6/5/2018	6/5/2018	2/15/2019	3/14/2018	6/7/2018
Lab Analyte	**CAS**	**ARAR[1]**	**Basis**	**Units**	**Primary**	**Primary**	**Primary**	**Primary**	**Primary**	**Primary**	**Duplicate**	**Primary**	**Primary**	**Primary**
VOCs (ug/l)														
Acetone	67-64-1	6000	NJGWQS - GWQC	ug/l	61 J	44 J	250	810 J	38 J	6 U	7.4 U	49 J	47 J	170
Benzene	71-43-2	1	NJDEP MCL	ug/l	0.04 J	***46***	***33***	***15***	***14***	***10***	***9.7***	***11***	***9.2 J+***	***9.1***
Dibromo-3-chloropropane, 1,2-	96-12-8	0.02	NJGWQS - GWQC/PQL	ug/l	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Dichloropropene, 1,3- (TRANS)	10061-02-6	1	NJGWQS - PQL	ug/l	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Ethylbenzene	100-41-4	700	NJGWQS - GWQC	ug/l	48	14	24	9.6	28	14	13	11	0.25	0.2
Hexanone, 2-	591-78-6	40	NJGWQS - GWQC	ug/l	3 R	3 R	2 J	3 R	3 R	3 U	3 U	3 R	3.3 J	2.9 J
Methyl Ethyl Ketone (2-Butanone)	78-93-3	300	NJGWQS - GWQC	ug/l	10 R	3.1 J	10 U	10 R	10 R	10 U	10 U	10 R	47 J	32
Methylene Chloride	75-09-2	3	NJGWQS - GWQC	ug/l	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Tetrachloroethane, 1,1,2,2-	79-34-5	1	NJGWQS - GWQC/PQL	ug/l	0.38	0.2 U	0.28	0.24	0.2 U	0.2 U	0.2 U	0.2 U	0.057 J	0.2 U
Tetrachloroethylene	127-18-4	1	NJDEP MCL	ug/l	0.5 U	0.22 J	0.3 J	0.15 J	0.11 J	0.1 J	0.096 J	0.5 U	0.5 U	0.5 U
Toluene	108-88-3	600	NJGWQS - GWQC	ug/l	0.2 U	22	10	3	0.79	0.47	0.47	0.7	0.43	0.51
Trichlorobenzene, 1,2,4-	120-82-1	9	NJGWQS - GWQC	ug/l	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.081 J	0.3 U
Trichloroethane, 1,1,2-	79-00-5	3	NJGWQS - GWQC	ug/l	***5.6***	0.2 U	0.26	0.2 U	***3.3***	***3.9***	***4***	0.2 U	0.19 J	0.29
Trichloroethylene	79-01-6	1	NJGWQS - GWQC/PQL	ug/l	0.2 U	0.55	0.59	0.34	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Vinyl Chloride	75-01-4	1	NJGWQS - PQL	ug/l	0.02 U	0.13 J	0.02 U	0.068	0.15 J+	0.095	0.079	0.051	0.034 J	0.053
Xylene, m,p	179601-23-1	1000	NJGWQS - GWQC	ug/l	0.5 U	220	270	72	21	8.2	8	7.5	1	0.8
Xylene, o-	95-47-6	1000	NJGWQS - GWQC	ug/l	0.5 U	28	47	23	19	12	12	14	1.1	2
SVOCs (ug/l)														
Benz[a]anthracene	56-55-3	0.1	NJGWQS - PQL	ug/l	0.095 U	0.03 J	10 U	0.056 J	0.076 J	1.9 U	1.9 U	***0.29 J***	0.98 U	10 U
Benzo[a]pyrene	50-32-8	0.1	NJGWQS - PQL	ug/l	0.095 U	0.49 U	10 U	0.036 J	***0.13 J***	1.9 U	1.9 U	***0.38 J***	0.98 U	10 U
Benzo[b]fluoranthene	205-99-2	0.2	NJGWQS - PQL	ug/l	0.095 UJ	0.033 J	10 U	0.055 J	1 U	1.9 U	1.9 U	***0.38 J***	0.98 U	10 U
Bis(2-ethylhexyl)phthalate	117-81-7	3	NJGWQS - PQL	ug/l	4.8 U	4.9 U	52 U	1.7 J	5 U	48 U	48 U	1.9 J	4.9 U	20 U
Cresol, p-	106-44-5	50	NJGWQS - GWQC	ug/l	9.5 U	5.2 J	14 J	2.9 J	10 U	96 U	96 U	9.4 U	9.8 U	40 U
Dioxane, 1,4-	123-91-1	0.4	NJGWQS - GWQC	ug/l	0.29	0.1 J	0.2 U	0.077 J	***0.81***	***0.51***	***0.48***	***0.41***	***11***	***6.5***
Indeno[1,2,3-cd]pyrene	193-39-5	0.2	NJGWQS - PQL	ug/l	0.095 U	0.49 U	10 U	0.029 J	1 U	1.9 U	1.9 U	***0.26 J***	0.98 U	10 U
Methylnaphthalene, 2-	91-57-6	30	NJGWQS - GWQC	ug/l	0.076 J	5.6	7.4 J	3	5 U	48 U	48 U	0.23 J	2.3 J	0.99 J
Pentachlorophenol	87-86-5	0.3	NJGWQS - GWQC	ug/l	9.5 U	9.8 U	100 U	***0.42 J***	10 U	3.8 UJ	3.8 UJ	9.4 U	9.8 U	40 U
Metals (ug/l)														
Aluminum	7429-90-5	200	NJGWQS - GWQC	ug/l	38.2	47	54.9	***600***	114	50.4	67.9	***1910***	20 U	65.1
Antimony	7440-36-0	6	NJGWQS - GWQC	ug/l	2 UJ	0.5 J	0.33 J	1.3 J	0.35 J	2 U	2 U	1.1 J	2 U	2 U
Arsenic	7440-38-2	3	NJGWQS - PQL	ug/l	2.5	***10.1***	***6.7***	***6.5***	***6.8***	***5.4 J***	***5.6 J***	***5.3***	***19***	***10.9***
Barium	7440-39-3	2000	USEPA/NJDEP - MCL	ug/l	302	494	447	291	253	258	285	297	206 J+	221
Beryllium	7440-41-7	1	NJGWQS - GWQC/PQL	ug/l	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Cadmium	7440-43-9	4	NJGWQS - GWQC	ug/l	1 U	0.13 J	0.17 J	0.088 J	0.13 J	0.099 J	0.12 J	0.45 J	0.1 J	1 U
Iron	7439-89-6	300	NJGWQS - GWQC	ug/l	***9300***	***20100***	***15100***	***10800***	***12100***	***9890 J***	***10900 J***	***7070***	***14700***	***16400***
Lead	7439-92-1	5	NJGWQS - GWQC/PQL	ug/l	3.7	***36.4***	***39.2***	***54.2***	***15.4***	***6.1***	***7.1***	***109***	3.3	***6.6***
Manganese	7439-96-5	50	NJGWQS - GWQC	ug/l	***722***	***1280***	***1080***	***816***	***756***	***621 J***	***689 J***	***686***	***1160 J***	***1150***
Selenium	7782-49-2	40	NJGWQS - GWQC	ug/l	8.6	26.4	18.6	8.7	20.3	12	13.1	11.6	24.8	10.4
Sodium	7440-23-5	50000	NJGWQS - GWQC	ug/l	***95000***	29600	26600	14500	35000	25300	28000	45300	***134000***	***108000***

Notes:
ARAR = Applicable or Relevant and Appropriate Requirements
[1] ARAR is the lowest value of the NJGWQS, NJDEP MCL and USEPA MCL. NJGWQS basis is Groundwater Quality
Detected result exceeds ARAR
Reporting Detection Limit exceeds ARAR
J - Estimated Value, result >MDL and <RL
J+ - Estimated High
J- - Estimated Low
U - Not detected above the laboratory reporting limit
D - Result is from a diluted sample
R - Rejected value
Only chemicals that have a result greater than the ARAR are listed

TABLE 3-6
SUMMARY OF GROUNDWATER SAMPLE ARAR EXCEEDANCES
RIVERSIDE INDUSTRIAL PARK SUPERFUND SITE
NEWARK, NEW JERSEY

LOT ID:					63	63	63	63	64	64	64	64
SITE ID:					MW-110	MW-111	MW-111	MW-111	E-3	E-3	E-3	MW-105
SAMPLE DEPTH (FT BGS)					6.15-6.15	2.95-2.95	3.1-3.1	3.04-3.04	4.42-4.42	4.25-4.25	3.71-3.71	2.65-2.65
COLLECTION DATE:					2/14/2019	3/14/2018	6/7/2018	2/14/2019	3/13/2018	6/5/2018	2/13/2019	3/13/2018
Lab Analyte	CAS	ARAR[1]	Basis	Units	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary
VOCs (ug/l)												
Acetone	67-64-1	6000	NJGWQS - GWQC	ug/l	100 J	6 R	20	20 J	240 J	6 U	280 J	29 J
Benzene	71-43-2	1	NJDEP MCL	ug/l	***5.6***	***2.4***	***1.5***	***2.2***	0.42	0.25	0.12 J	0.54
Dibromo-3-chloropropane, 1,2-	96-12-8	0.02	NJGWQS - GWQC/PQL	ug/l	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Dichloropropene, 1,3- (TRANS)	10061-02-6	1	NJGWQS - PQL	ug/l	0.2 U	0.2 U	0.2 U	0.2 UJ	0.2 U	0.2 U	0.2 U	0.2 U
Ethylbenzene	100-41-4	700	NJGWQS - GWQC	ug/l	0.2 U	0.28	0.72	0.41 U	0.43	0.077 J	0.2 U	0.2 U
Hexanone, 2-	591-78-6	40	NJGWQS - GWQC	ug/l	3.7 J	3 R	1.3 J	3 R	3 R	3 U	3 R	3 R
Methyl Ethyl Ketone (2-Butanone)	78-93-3	300	NJGWQS - GWQC	ug/l	10 R	10 R	10 U	10 R	10 R	10 U	10 R	10 R
Methylene Chloride	75-09-2	3	NJGWQS - GWQC	ug/l	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Tetrachloroethane, 1,1,2,2-	79-34-5	1	NJGWQS - GWQC/PQL	ug/l	0.069 J	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.65	0.2 U
Tetrachloroethylene	127-18-4	1	NJDEP MCL	ug/l	0.5 U	0.5 U	0.18 J	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Toluene	108-88-3	600	NJGWQS - GWQC	ug/l	0.36	1.1	0.47	0.31	0.11 J	0.13 J	0.064 J	0.054 J
Trichlorobenzene, 1,2,4-	120-82-1	9	NJGWQS - GWQC	ug/l	0.3 U	0.3 U	0.3 U	0.3 UJ	0.3 U	0.3 U	0.3 U	0.3 U
Trichloroethane, 1,1,2-	79-00-5	3	NJGWQS - GWQC	ug/l	0.25	0.2 U	0.2 U	0.2 U	***4***	***3.4***	***6.7***	0.2 U
Trichloroethylene	79-01-6	1	NJGWQS - GWQC/PQL	ug/l	0.2 U	0.2 U	0.17 J	0.12 J	0.2 U	0.2 U	0.2 U	0.079 J
Vinyl Chloride	75-01-4	1	NJGWQS - PQL	ug/l	0.02 U	0.066	0.02 U	0.11	0.02 U	0.02 U	0.02 U	0.02 U
Xylene, m,p	179601-23-1	1000	NJGWQS - GWQC	ug/l	0.5 U	1.3	2.6	1.2 U	0.5 U	0.34 J	0.5 U	0.5 U
Xylene, o-	95-47-6	1000	NJGWQS - GWQC	ug/l	1	8.9	8.9	10	0.62	0.65	0.5 U	0.21 J
SVOCs (ug/l)												
Benz[a]anthracene	56-55-3	0.1	NJGWQS - PQL	ug/l	0.027 J	0.011 J	1 U	0.016 J	0.49 U	1.9 U	0.94 U	0.0053 J
Benzo[a]pyrene	50-32-8	0.1	NJGWQS - PQL	ug/l	0.63 U	0.2 U	1 U	0.094 U	0.49 U	1.9 U	0.94 U	0.098 U
Benzo[b]fluoranthene	205-99-2	0.2	NJGWQS - PQL	ug/l	0.63 UJ	0.2 U	1 U	0.01 J	0.49 U	1.9 U	0.94 U	0.098 U
Bis(2-ethylhexyl)phthalate	117-81-7	3	NJGWQS - PQL	ug/l	4.7 U	4.9 U	5.1 U	4.7 U	4.9 U	9.7 U	4.7 U	4.9 U
Cresol, p-	106-44-5	50	NJGWQS - GWQC	ug/l	9.4 U	9.8 U	10 U	9.4 U	9.7 U	19 U	9.4 U	9.8 U
Dioxane, 1,4-	123-91-1	0.4	NJGWQS - GWQC	ug/l	***5.3***	0.14 J	0.11 J	***0.48***	0.19 J	0.19 J	0.11 J	0.2 U
Indeno[1,2,3-cd]pyrene	193-39-5	0.2	NJGWQS - PQL	ug/l	0.63 U	0.2 U	1 U	0.0087 J	0.49 U	1.9 U	0.94 U	0.098 U
Methylnaphthalene, 2-	91-57-6	30	NJGWQS - GWQC	ug/l	0.13 J	4.9 U	1 U	0.051 J	4.9 U	9.7 U	0.73 J	4.9 U
Pentachlorophenol	87-86-5	0.3	NJGWQS - GWQC	ug/l	9.4 U	9.8 U	10 U	9.4 U	9.7 U	3.9 UJ	1.9 U	9.8 U
Metals (ug/l)												
Aluminum	7429-90-5	200	NJGWQS - GWQC	ug/l	143	21.7	57.4	76.2	43.3	54.9	70.6 J+	27.3
Antimony	7440-36-0	6	NJGWQS - GWQC	ug/l	2 UJ	2 U	2 U	2 UJ	0.29 J	2 U	1.7 J	3.3
Arsenic	7440-38-2	3	NJGWQS - PQL	ug/l	***9.1***	***8.1***	***4.1***	***4.2***	***11.7***	***4.9 J***	***3.3***	***10.1***
Barium	7440-39-3	2000	USEPA/NJDEP - MCL	ug/l	318	882 J+	627	743	282 J+	287	209	40.3 J+
Beryllium	7440-41-7	1	NJGWQS - GWQC/PQL	ug/l	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Cadmium	7440-43-9	4	NJGWQS - GWQC	ug/l	***4.3***	1 R	1 U	0.11 J	0.13 J	1 U	1 U	1 J-
Iron	7439-89-6	300	NJGWQS - GWQC	ug/l	***18000***	***4230***	***2670***	***3340***	***14700***	***14500 J***	***4800***	***13100***
Lead	7439-92-1	5	NJGWQS - GWQC/PQL	ug/l	***39.9***	4.9	***10.7***	***14.6***	1.7	2.1	1.4 J+	***14.7***
Manganese	7439-96-5	50	NJGWQS - GWQC	ug/l	***1310***	***1130 J***	***714***	***1040***	***1100***	***1090 J***	***439***	***702***
Selenium	7782-49-2	40	NJGWQS - GWQC	ug/l	9.5	21.2	7.1	8.7	39.4	14.9	7.9	32.1
Sodium	7440-23-5	50000	NJGWQS - GWQC	ug/l	***109000***	36800	36800	48700	***60800***	***57600***	39100	***73000***

Notes:
ARAR = Applicable or Relevant and Appropriate Requirements
[1] ARAR is the lowest value of the NJGWQS, NJDEP MCL and USEPA MCL. NJGWQS basis is Groundwater Quality
Detected result exceeds ARAR
Reporting Detection Limit exceeds ARAR
J - Estimated Value, result >MDL and <RL
J+ - Estimated High
J- - Estimated Low
U - Not detected above the laboratory reporting limit
D - Result is from a diluted sample
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Only chemicals that have a result greater than the ARAR are listed

TABLE 3-6
SUMMARY OF GROUNDWATER SAMPLE ARAR EXCEEDANCES
RIVERSIDE INDUSTRIAL PARK SUPERFUND SITE
NEWARK, NEW JERSEY

LOT ID:					64	64	64	64	64	64	64	64	64	64	64	64	64
SITE ID:					MW-105	MW-105	MW-105	MW-106	MW-106	MW-106	MW-109	MW-109	MW-109	MW-109	MW-112	MW-112	MW-112
SAMPLE DEPTH (FT BGS)					3-3	2.54-2.54	2.54-2.54	3.12-3.12	5.01-5.01	4.19-4.19	4.02-4.02	4.02-4.02	4.33-4.33	3.61-3.61	5.15-5.15	4.62-4.62	5.3-5.3
COLLECTION DATE:					6/5/2018	2/13/2019	2/13/2019	3/13/2018	6/4/2018	2/15/2019	3/9/2018	3/9/2018	6/5/2018	2/15/2019	3/9/2018	6/7/2018	2/14/2019
Lab Analyte	**CAS**	**ARAR[1]**	**Basis**	**Units**	**Primary**	**Primary**	**Duplicate**	**Primary**	**Primary**	**Primary**	**Primary**	**Duplicate**	**Primary**	**Primary**	**Primary**	**Primary**	**Primary**
VOCs (ug/l)																	
Acetone	67-64-1	6000	NJGWQS - GWQC	ug/l	140	17 J	18 J	140 J	6 U	31 J	63 J	86 J	32	29 J	48 J	80	42 J
Benzene	71-43-2	1	NJDEP MCL	ug/l	0.75	0.33	0.32	***89 J***	***82***	***73***	***1.2***	***1.5***	***1.4***	***1.8***	0.48	0.4	0.083 J
Dibromo-3-chloropropane, 1,2-	96-12-8	0.02	NJGWQS - GWQC/PQL	ug/l	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Dichloropropene, 1,3- (TRANS)	10061-02-6	1	NJGWQS - PQL	ug/l	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Ethylbenzene	100-41-4	700	NJGWQS - GWQC	ug/l	0.09 J	0.2 U	0.2 U	***880***	500	120	0.2 U	0.2 U	0.057 J	0.2 U	0.57	0.25	0.2 U
Hexanone, 2-	591-78-6	40	NJGWQS - GWQC	ug/l	3 U	3 R	1.9 J	35 J	35	3 R	3 R	3 R	3 U	3 R	3 R	3 U	3 R
Methyl Ethyl Ketone (2-Butanone)	78-93-3	300	NJGWQS - GWQC	ug/l	10 U	10 R	10 R	200 J	10 U	10 R	4.7 J	4.5 J	10 U	10 R	10 R	8.6 J	10 R
Methylene Chloride	75-09-2	3	NJGWQS - GWQC	ug/l	5 U	5 U	5 U	***9.2***	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Tetrachloroethane, 1,1,2,2-	79-34-5	1	NJGWQS - GWQC/PQL	ug/l	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.52	0.2 U	0.29
Tetrachloroethylene	127-18-4	1	NJDEP MCL	ug/l	0.5 U	0.5 U	0.5 U	***3.5***	***1.6***	0.5 U	0.084 J	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Toluene	108-88-3	600	NJGWQS - GWQC	ug/l	0.068 J	0.2 U	0.2 U	59 J	12	4.6	0.13 J	0.13 J	0.1 J	0.067 J	0.17 J	0.063 J	0.2 U
Trichlorobenzene, 1,2,4-	120-82-1	9	NJGWQS - GWQC	ug/l	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.073 J	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
Trichloroethane, 1,1,2-	79-00-5	3	NJGWQS - GWQC	ug/l	0.2 U	0.2 U	0.2 U	0.2 U	0.64	0.2 U	0.2 U	***3.7 J***	0.2 U	***3.5***	0.2 U	0.2 U	2
Trichloroethylene	79-01-6	1	NJGWQS - GWQC/PQL	ug/l	0.1 J	0.098 J	0.097 J	***35***	***11***	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Vinyl Chloride	75-01-4	1	NJGWQS - PQL	ug/l	0.02 U	0.021	0.02 U	0.92	***1.1***	0.2 U	0.02 U	0.02 U	0.02 U	0.02 UJ	0.02 U	0.02 U	0.02 U
Xylene, m,p	179601-23-1	1000	NJGWQS - GWQC	ug/l	0.14 J	0.5 U	0.5 U	***4000***	***1900***	410	0.55	0.53	0.31 J	0.83	1.9	0.66	0.5 U
Xylene, o-	95-47-6	1000	NJGWQS - GWQC	ug/l	0.23 J	0.2 J	0.19 J	140 J	170	61	0.58	0.54	0.5 U	0.56	1.6	0.65	0.5 U
SVOCs (ug/l)																	
Benz[a]anthracene	56-55-3	0.1	NJGWQS - PQL	ug/l	0.19 U	0.067 J	0.06 J	2 U	9.6 U	1.6 U	0.021 J	0.015 J	0.023 J	0.01 J	0.1 U	2 U	0.0048 J
Benzo[a]pyrene	50-32-8	0.1	NJGWQS - PQL	ug/l	0.19 U	0.075 J	0.058 J	2 U	9.6 U	1.6 U	0.017 J	0.02 J	0.48 U	0.0063 J	0.011 J	2 U	0.095 U
Benzo[b]fluoranthene	205-99-2	0.2	NJGWQS - PQL	ug/l	0.19 U	0.071 J	0.06 J	2 U	9.6 U	1.6 UJ	0.019 J	0.026 J	48 U	0.0065 J	0.0085 J	2 U	0.095 U
Bis(2-ethylhexyl)phthalate	117-81-7	3	NJGWQS - PQL	ug/l	4.8 U	2.8 J	3 J	9.8 U	96 U	4.7 U	5 U	5 U	4.8 U	4.7 U	5.1 U	10 U	4.7 U
Cresol, p-	106-44-5	50	NJGWQS - GWQC	ug/l	9.6 U	1.6 J	9.3 U	14 J	190 U	9.4 U	10 U	10 U	9.6 U	9.4 U	10 U	20 U	9.5 U
Dioxane, 1,4-	123-91-1	0.4	NJGWQS - GWQC	ug/l	0.2 U	0.2 U	0.2 U	***16***	***1.3***	***0.49***	***3.3***	***3.7***	***4.7***	***2.2***	***1.2***	***2.1***	***1.1***
Indeno[1,2,3-cd]pyrene	193-39-5	0.2	NJGWQS - PQL	ug/l	0.19 U	0.046 J	0.034 J	2 U	9.6 U	1.6 U	0.013 J	0.015 J	0.48 U	0.094 U	0.0055 J	2 U	0.095 U
Methylnaphthalene, 2-	91-57-6	30	NJGWQS - GWQC	ug/l	4.8 U	0.052 J	0.048 J	24	***31***	6.7	0.1	0.11	4.8 U	0.049 J	0.1 U	2 U	0.042 J
Pentachlorophenol	87-86-5	0.3	NJGWQS - GWQC	ug/l	0.38 UJ	0.19 U	0.19 U	3.9 R	19 UJ	9.4 U	0.26 J	0.2 J	0.96 UJ	9.4 U	10 U	20 U	9.5 U
Metals (ug/l)																	
Aluminum	7429-90-5	200	NJGWQS - GWQC	ug/l	34.8	141	170	36.5	130	71.7	116	150	102	74.3	20 U	51.7	5.1 J
Antimony	7440-36-0	6	NJGWQS - GWQC	ug/l	3.2	5.9	***6.4***	1.4 J	0.87 J	0.37 J	0.69 J	0.74 J	2 U	2 UJ	0.33 J	0.32 J	0.25 J
Arsenic	7440-38-2	3	NJGWQS - PQL	ug/l	***5.2 J***	***4.3***	***4.7***	***38.6***	***28 J***	***11.9***	***9.7***	***9.2***	***8 J***	***4.4***	***5.1***	***6.7***	***3.9***
Barium	7440-39-3	2000	USEPA/NJDEP - MCL	ug/l	240	678	702	284 J+	397	289	245	240	286	284	163	223	257
Beryllium	7440-41-7	1	NJGWQS - GWQC/PQL	ug/l	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Cadmium	7440-43-9	4	NJGWQS - GWQC	ug/l	0.36 J	0.78 J	0.78 J	0.1 J	1 U	1 U	0.2 J	0.16 J	0.11 J	1 U	1 U	1 U	0.12 J
Iron	7439-89-6	300	NJGWQS - GWQC	ug/l	***16200 J***	***18400***	***19000***	***16000***	***31200 J***	***29200***	***20900***	***20400***	***28500 J***	***25100***	***11900***	***10300***	***9540***
Lead	7439-92-1	5	NJGWQS - GWQC/PQL	ug/l	***36.5***	***42.8***	***47.6***	***12.8***	***26.5***	***24.4***	***20.7***	***21***	***14.6***	***9.1***	0.83 J	***8.2***	0.33 J
Manganese	7439-96-5	50	NJGWQS - GWQC	ug/l	***594 J***	***653***	***673***	***1040***	***1020 J***	***1100***	***957***	***927***	***878 J***	***1060***	***494***	***563***	***514***
Selenium	7782-49-2	40	NJGWQS - GWQC	ug/l	12.8	10.2	10.7	***89***	***41.5***	36	18.2	17.5	11.4	13.1	12.8	12.2	10.3
Sodium	7440-23-5	50000	NJGWQS - GWQC	ug/l	***69400***	***70400***	***72800***	***302000***	***290000***	***181000***	***54900***	***52000***	***53600***	***66000***	***95600***	***66700***	***93800***

Notes:
ARAR = Applicable or Relevant and Appropriate Requirements
[1] ARAR is the lowest value of the NJGWQS, NJDEP MCL and USEPA MCL. NJGWQS basis is Groundwater Quality
Detected result exceeds ARAR
Reporting Detection Limit exceeds ARAR
J - Estimated Value, result >MDL and <RL
J+ - Estimated High
J- - Estimated Low
U - Not detected above the laboratory reporting limit
D - Result is from a diluted sample
R - Rejected value
Only chemicals that have a result greater than the ARAR are listed

TABLE 3-6
SUMMARY OF GROUNDWATER SAMPLE ARAR EXCEEDANCES
RIVERSIDE INDUSTRIAL PARK SUPERFUND SITE
NEWARK, NEW JERSEY

LOT ID:					65	65	65	66	66	66	66
SITE ID:					MW-101	MW-101	MW-101	E-2	E-2	E-2	E-2
SAMPLE DEPTH (FT BGS)					6.22-6.22	7.4-7.4	7.33-7.33	2.85-2.85	3.8-3.8	3.8-3.8	3.42-3.42
COLLECTION DATE:					3/14/2018	6/5/2018	2/12/2019	3/14/2018	6/12/2018	6/12/2018	2/13/2019
Lab Analyte	**CAS**	**ARAR[1]**	**Basis**	**Units**	**Primary**	**Primary**	**Primary**	**Primary**	**Primary**	**Duplicate**	**Primary**
VOCs (ug/l)											
Acetone	67-64-1	6000	NJGWQS - GWQC	ug/l	6 R	7.3 U	6 R	6 R	34	34	6 R
Benzene	71-43-2	1	NJDEP MCL	ug/l	0.2 U	0.2 U	0.046 J	0.078 J	0.14 J	0.14 J	0.2 U
Dibromo-3-chloropropane, 1,2-	96-12-8	0.02	NJGWQS - GWQC/PQL	ug/l	2 U	2 U	2 U	2 U	2 UJ	2 UJ	2 U
Dichloropropene, 1,3- (TRANS)	10061-02-6	1	NJGWQS - PQL	ug/l	0.094 J	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Ethylbenzene	100-41-4	700	NJGWQS - GWQC	ug/l	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Hexanone, 2-	591-78-6	40	NJGWQS - GWQC	ug/l	3 R	3 U	3 R	3 R	3 U	3 U	3 R
Methyl Ethyl Ketone (2-Butanone)	78-93-3	300	NJGWQS - GWQC	ug/l	10 R	7.5 J	6.2 J	10 R	10 U	10 U	10 R
Methylene Chloride	75-09-2	3	NJGWQS - GWQC	ug/l	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Tetrachloroethane, 1,1,2,2-	79-34-5	1	NJGWQS - GWQC/PQL	ug/l	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Tetrachloroethylene	127-18-4	1	NJDEP MCL	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Toluene	108-88-3	600	NJGWQS - GWQC	ug/l	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Trichlorobenzene, 1,2,4-	120-82-1	9	NJGWQS - GWQC	ug/l	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
Trichloroethane, 1,1,2-	79-00-5	3	NJGWQS - GWQC	ug/l	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Trichloroethylene	79-01-6	1	NJGWQS - GWQC/PQL	ug/l	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Vinyl Chloride	75-01-4	1	NJGWQS - PQL	ug/l	0.02 U	0.071	0.9	0.02 U	0.02 UJ	0.02 UJ	0.02 U
Xylene, m,p	179601-23-1	1000	NJGWQS - GWQC	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Xylene, o-	95-47-6	1000	NJGWQS - GWQC	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
SVOCs (ug/l)											
Benz[a]anthracene	56-55-3	0.1	NJGWQS - PQL	ug/l	0.098 U	0.098 U	0.096 U	0.088 J	0.014 J	0.013 J	0.0077 J
Benzo[a]pyrene	50-32-8	0.1	NJGWQS - PQL	ug/l	0.098 U	0.098 U	0.096 U	***0.13***	0.099 U	0.099 U	0.095 U
Benzo[b]fluoranthene	205-99-2	0.2	NJGWQS - PQL	ug/l	0.098 U	4.9 U	0.096 U	0.074 J	0.099 U	0.099 U	0.0057 J
Bis(2-ethylhexyl)phthalate	117-81-7	3	NJGWQS - PQL	ug/l	4.9 U	4.9 U	1.5 J	4.9 U	5 U	5 U	4.7 U
Cresol, p-	106-44-5	50	NJGWQS - GWQC	ug/l	9.8 U	9.8 U	9.6 U	9.7 U	9.9 U	9.9 U	9.5 U
Dioxane, 1,4-	123-91-1	0.4	NJGWQS - GWQC	ug/l	0.18 J	0.14 J	0.2	***0.51***	***0.51***	***0.45***	0.17 J
Indeno[1,2,3-cd]pyrene	193-39-5	0.2	NJGWQS - PQL	ug/l	0.098 U	4.9 UJ	0.096 U	0.063 J	0.099 U	0.099 U	0.095 U
Methylnaphthalene, 2-	91-57-6	30	NJGWQS - GWQC	ug/l	0.098 U	0.098 U	0.096 U	4.9 U	0.099 U	0.099 U	0.0049 J
Pentachlorophenol	87-86-5	0.3	NJGWQS - GWQC	ug/l	9.8 U	0.2 U	0.19 U	9.7 U	9.9 U	9.9 U	0.19 U
Metals (ug/l)											
Aluminum	7429-90-5	200	NJGWQS - GWQC	ug/l	25.9	9 J	77.6 J+	89.2	7.2 J	7.1 J	43.6 J+
Antimony	7440-36-0	6	NJGWQS - GWQC	ug/l	***22.7***	1.8 J	1.8 J	2 U	2 U	2 U	0.44 J
Arsenic	7440-38-2	3	NJGWQS - PQL	ug/l	***13.2***	***5.1 J***	3	***10.6***	***3.2***	2.9	1.3
Barium	7440-39-3	2000	USEPA/NJDEP - MCL	ug/l	86.3 J+	112	98.4	99.5 J+	103	100	42.6
Beryllium	7440-41-7	1	NJGWQS - GWQC/PQL	ug/l	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Cadmium	7440-43-9	4	NJGWQS - GWQC	ug/l	0.28 J	1 U	1 U	1 R	1 U	1 U	1 U
Iron	7439-89-6	300	NJGWQS - GWQC	ug/l	85.1 J	***1290 J***	***1740***	***507***	***385***	***370***	252
Lead	7439-92-1	5	NJGWQS - GWQC/PQL	ug/l	1 U	1 U	1 U	3.7	0.43 J	0.37 J	1.8 J+
Manganese	7439-96-5	50	NJGWQS - GWQC	ug/l	***125***	***726 J***	***865***	***317***	***339***	***330***	***177***
Selenium	7782-49-2	40	NJGWQS - GWQC	ug/l	***71.6***	14.9	11	33.7	10.6	10	5 J
Sodium	7440-23-5	50000	NJGWQS - GWQC	ug/l	32800	38000	35200	38800	42300	47600	19700

Notes:
ARAR = Applicable or Relevant and Appropriate Requirements
[1] ARAR is the lowest value of the NJGWQS, NJDEP MCL and USEPA MCL. NJGWQS basis is Groundwater Quality
Detected result exceeds ARAR
Reporting Detection Limit exceeds ARAR
J - Estimated Value, result >MDL and <RL
J+ - Estimated High
J- - Estimated Low
U - Not detected above the laboratory reporting limit
D - Result is from a diluted sample
R - Rejected value
Only chemicals that have a result greater than the ARAR are listed

TABLE 3-6
SUMMARY OF GROUNDWATER SAMPLE ARAR EXCEEDANCES
RIVERSIDE INDUSTRIAL PARK SUPERFUND SITE
NEWARK, NEW JERSEY

LOT ID:					66	66	66	66	66	66	67	67	67
SITE ID:					MW-102	MW-102	MW-102	MW-104	MW-104	MW-104	MW-103	MW-103	MW-103
SAMPLE DEPTH (FT BGS)					7.50-7.50	8.78-8.78	8.39-8.39	4.23-4.23	5.05-5.05	4.9-4.9	3.18-3.18	4.05-4.05	4.22-4.22
COLLECTION DATE:					3/6/2018	6/12/2018	2/12/2019	3/14/2018	6/7/2018	2/13/2019	3/6/2018	6/12/2018	2/13/2019
Lab Analyte	**CAS**	**ARAR[1]**	**Basis**	**Units**	**Primary**	**Primary**	**Primary**	**Primary**	**Primary**	**Primary**	**Primary**	**Primary**	**Primary**
VOCs (ug/l)													
Acetone	67-64-1	6000	NJGWQS - GWQC	ug/l	36 J	63	6 U	14 J	220	73 J	6 U	24	6 R
Benzene	71-43-2	1	NJDEP MCL	ug/l	0.2 U	0.2 U	0.2 U	0.2	0.21	0.16 J	0.2 U	0.03 J	0.2 U
Dibromo-3-chloropropane, 1,2-	96-12-8	0.02	NJGWQS - GWQC/PQL	ug/l	2 U	2 UJ	2 U	2 U	2 U	2 U	2 U	2 UJ	2 U
Dichloropropene, 1,3- (TRANS)	10061-02-6	1	NJGWQS - PQL	ug/l	0.096 J	0.2 U	0.2 U	0.094 J	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Ethylbenzene	100-41-4	700	NJGWQS - GWQC	ug/l	0.2 U	0.2 U	0.2 U	1.5	2.2	0.78	0.2 U	0.2 U	0.2 U
Hexanone, 2-	591-78-6	40	NJGWQS - GWQC	ug/l	1.2 J	3 U	1.6 J	3 R	3 U	3 R	3 R	3 U	3 R
Methyl Ethyl Ketone (2-Butanone)	78-93-3	300	NJGWQS - GWQC	ug/l	10 R	4.6 J	10 R	10 R	10 U	10 R	10 R	10 U	10 R
Methylene Chloride	75-09-2	3	NJGWQS - GWQC	ug/l	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Tetrachloroethane, 1,1,2,2-	79-34-5	1	NJGWQS - GWQC/PQL	ug/l	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Tetrachloroethylene	127-18-4	1	NJDEP MCL	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.098 J	0.087 J
Toluene	108-88-3	600	NJGWQS - GWQC	ug/l	0.2 U	0.2 U	0.2 U	0.053 J	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Trichlorobenzene, 1,2,4-	120-82-1	9	NJGWQS - GWQC	ug/l	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
Trichloroethane, 1,1,2-	79-00-5	3	NJGWQS - GWQC	ug/l	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Trichloroethylene	79-01-6	1	NJGWQS - GWQC/PQL	ug/l	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.13 J	0.11 J
Vinyl Chloride	75-01-4	1	NJGWQS - PQL	ug/l	0.02 U	0.02 UJ	0.02 U	0.02 U	0.02 U	0.02	0.02 UJ	0.02 UJ	0.02 U
Xylene, m,p	179601-23-1	1000	NJGWQS - GWQC	ug/l	0.5 U	0.5 U	0.5 U	0.46 J	0.38 J	0.5 U	0.5 U	0.5 U	0.5 U
Xylene, o-	95-47-6	1000	NJGWQS - GWQC	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
SVOCs (ug/l)													
Benz[a]anthracene	56-55-3	0.1	NJGWQS - PQL	ug/l	0.049 J	0.012 J	0.0045 J	0.052 J	***0.11 J***	0.024 J	0.033 J	5 U	0.098 U
Benzo[a]pyrene	50-32-8	0.1	NJGWQS - PQL	ug/l	0.064 J	0.012 J	0.096 U	0.044 J	***0.12 J***	0.021 J	0.038 J	5 U	0.098 U
Benzo[b]fluoranthene	205-99-2	0.2	NJGWQS - PQL	ug/l	0.049 J	0.01 J	0.096 U	0.034 J	0.076 J	0.018 J	0.03 J	5 U	0.098 U
Bis(2-ethylhexyl)phthalate	117-81-7	3	NJGWQS - PQL	ug/l	4.9 U	4.9 U	4.8 U	5 U	5.1 U	4.7 U	4.8 U	5 UJ	4.9 U
Cresol, p-	106-44-5	50	NJGWQS - GWQC	ug/l	9.8 U	9.8 U	9.6 U	10 U	10 U	9.4 U	9.7 U	10 UJ	9.8 U
Dioxane, 1,4-	123-91-1	0.4	NJGWQS - GWQC	ug/l	***2.3***	***5.9***	***3.5***	***0.48***	0.38	0.4	***0.86***	***1.4***	0.32
Indeno[1,2,3-cd]pyrene	193-39-5	0.2	NJGWQS - PQL	ug/l	0.039 J	0.0076 J	0.096 U	0.022 J	0.054 J	0.01 J	0.021 J	5 U	0.098 U
Methylnaphthalene, 2-	91-57-6	30	NJGWQS - GWQC	ug/l	4.9 U	4.9 U	0.096 U	5 U	0.047 J	0.0096 J	4.8 U	5 U	0.098 U
Pentachlorophenol	87-86-5	0.3	NJGWQS - GWQC	ug/l	9.8 U	9.8 U	0.19 U	10 U	10 U	0.19 U	9.7 U	10 U	0.2 U
Metals (ug/l)													
Aluminum	7429-90-5	200	NJGWQS - GWQC	ug/l	61.1	48.6	20 U	34.9	58.8	43.6 J+	20 U	9.9 J	20 U
Antimony	7440-36-0	6	NJGWQS - GWQC	ug/l	0.98 J	2 U	2 U	0.27 J	2 U	1.1 J	3.3	0.93 J	***10.4***
Arsenic	7440-38-2	3	NJGWQS - PQL	ug/l	***10.3***	***5.9***	***6.6***	***11.9***	***4.8***	***3.1***	***7.3***	***5.1***	2
Barium	7440-39-3	2000	USEPA/NJDEP - MCL	ug/l	168	235	213	223 J+	195	146	52.2	73.4	64.6
Beryllium	7440-41-7	1	NJGWQS - GWQC/PQL	ug/l	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Cadmium	7440-43-9	4	NJGWQS - GWQC	ug/l	0.28 J	0.11 J	0.095 J	1 R	0.09 J	1 U	1 U	0.23 J	0.15 J
Iron	7439-89-6	300	NJGWQS - GWQC	ug/l	***10200***	***28900***	***18400***	***14200***	***9810***	***8970***	***944***	***409***	101 J
Lead	7439-92-1	5	NJGWQS - GWQC/PQL	ug/l	***12.8***	***5.3***	1.1 J+	***7.8***	***10.4***	***7.2***	4.5	***18.7***	***9.7***
Manganese	7439-96-5	50	NJGWQS - GWQC	ug/l	***2670***	***2520***	***2500***	***1500***	***1160***	***1160***	48.1	30.7	17.1
Selenium	7782-49-2	40	NJGWQS - GWQC	ug/l	35.8	18	20.5	37.2	13.7	11.3	7.4	6.6	4.2 J
Sodium	7440-23-5	50000	NJGWQS - GWQC	ug/l	***55800***	***81300***	***66400***	***72900***	***59800***	47100	***239000***	***123000***	***54500***

Notes:
ARAR = Applicable or Relevant and Appropriate Requirements
[1] ARAR is the lowest value of the NJGWQS, NJDEP MCL and USEPA MCL. NJGWQS basis is Groundwater Quality
Detected result exceeds ARAR
Reporting Detection Limit exceeds ARAR
J - Estimated Value, result >MDL and <RL
J+ - Estimated High
J- - Estimated Low
U - Not detected above the laboratory reporting limit
D - Result is from a diluted sample
R - Rejected value
Only chemicals that have a result greater than the ARAR are listed

TABLE 3-6
SUMMARY OF GROUNDWATER SAMPLE ARAR EXCEEDANCES
RIVERSIDE INDUSTRIAL PARK SUPERFUND SITE
NEWARK, NEW JERSEY

LOT ID:					68	68	68	68	68	68	69	69	69	69	69	69
SITE ID:					E-1	E-1	E-1	MW-123	MW-123	MW-123	MW-120	MW-120	MW-120	MW-121	MW-121	MW-121
SAMPLE DEPTH (FT BGS)					6.18-6.18	7-7	7.04-7.04	5.63-5.63	6.55-6.55	6.5-6.5	5.06-5.06	6.1-6.1	6.16-6.16	3.30-3.30	4.13-4.13	3.96-3.96
COLLECTION DATE:					3/12/2018	6/5/2018	2/12/2019	3/12/2018	6/5/2018	2/12/2019	3/8/2018	6/6/2018	2/19/2019	3/8/2018	6/6/2018	2/19/2019
Lab Analyte	**CAS**	**ARAR[1]**	**Basis**	**Units**	**Primary**	**Primary**	**Primary**	**Primary**	**Primary**	**Primary**	**Primary**	**Primary**	**Primary**	**Primary**	**Primary**	**Primary**
VOCs (ug/l)																
Acetone	67-64-1	6000	NJGWQS - GWQC	ug/l	21 J	48	6 R	22 J	6 U	6 R	87 J	21	6 U	52 J	12 U	6 U
Benzene	71-43-2	1	NJDEP MCL	ug/l	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.077 J	0.035 J	0.2 U	0.2 U	0.2 U	0.2 U
Dibromo-3-chloropropane, 1,2-	96-12-8	0.02	NJGWQS - GWQC/PQL	ug/l	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	*1 J*	2 U
Dichloropropene, 1,3- (TRANS)	10061-02-6	1	NJGWQS - PQL	ug/l	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Ethylbenzene	100-41-4	700	NJGWQS - GWQC	ug/l	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.21	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Hexanone, 2-	591-78-6	40	NJGWQS - GWQC	ug/l	3 U	3 U	3 R	3 U	3 U	3 R	3 R	3 U	3 R	3 R	3 U	1.8 J
Methyl Ethyl Ketone (2-Butanone)	78-93-3	300	NJGWQS - GWQC	ug/l	5 J	4.6 J	10 R	3.8 J	3.6 J	2.7 J	10 R	10 U	10 R	10 R	10 U	10 R
Methylene Chloride	75-09-2	3	NJGWQS - GWQC	ug/l	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Tetrachloroethane, 1,1,2,2-	79-34-5	1	NJGWQS - GWQC/PQL	ug/l	0.39	0.56	0.5	0.087 J	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Tetrachloroethylene	127-18-4	1	NJDEP MCL	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 U	0.5 U	0.5 UJ
Toluene	108-88-3	600	NJGWQS - GWQC	ug/l	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.052 J	0.2 U
Trichlorobenzene, 1,2,4-	120-82-1	9	NJGWQS - GWQC	ug/l	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
Trichloroethane, 1,1,2-	79-00-5	3	NJGWQS - GWQC	ug/l	0.26	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.08 J	0.2 U	0.091 J
Trichloroethylene	79-01-6	1	NJGWQS - GWQC/PQL	ug/l	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Vinyl Chloride	75-01-4	1	NJGWQS - PQL	ug/l	0.02 U	0.02 U	0.02 U	0.44	0.13	0.057	0.02 U	0.02 U	0.02 UJ	0.02 U	0.02 U	0.02 UJ
Xylene, m,p	179601-23-1	1000	NJGWQS - GWQC	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.98	0.5 U	0.5 U	0.43 J	0.33 J	0.5 U
Xylene, o-	95-47-6	1000	NJGWQS - GWQC	ug/l	0.5 U	0.2 J	0.2 J	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.22 J	0.16 J
SVOCs (ug/l)																
Benz[a]anthracene	56-55-3	0.1	NJGWQS - PQL	ug/l	0.0055 J	0.0061 J	0.0032 J	0.005 J	0.0035 J	0.0039 J	0.011 J	0.015 J	0.0094 J	0.029 J	0.024 J	0.012 J
Benzo[a]pyrene	50-32-8	0.1	NJGWQS - PQL	ug/l	0.099 U	0.2 U	0.095 U	0.099 U	0.098 U	0.094 U	0.1 U	0.096 U	0.094 U	0.1 U	0.094 U	0.093 U
Benzo[b]fluoranthene	205-99-2	0.2	NJGWQS - PQL	ug/l	0.099 U	0.2 U	0.095 U	0.099 U	0.098 U	0.094 U	0.0066 J	0.011 J	0.0093 J	0.016 J	0.0071 J	0.0052 J
Bis(2-ethylhexyl)phthalate	117-81-7	3	NJGWQS - PQL	ug/l	4.9 U	4.9 U	1.3 J	4.9 U	4.9 U	1.2 J	5 U	4.8 U	4.7 U	5.1 U	4.7 U	4.7 U
Cresol, p-	106-44-5	50	NJGWQS - GWQC	ug/l	9.9 U	9.8 U	9.5 U	9.9 U	9.8 U	9.4 U	10 U	9.6 U	9.4 U	10 U	9.4 U	9.3 U
Dioxane, 1,4-	123-91-1	0.4	NJGWQS - GWQC	ug/l	***3.2***	***3.5***	***2.6***	***13***	***8.5***	***6.5***	0.19 J	0.18 J	0.19 J	***1.8***	***1.9***	***1***
Indeno[1,2,3-cd]pyrene	193-39-5	0.2	NJGWQS - PQL	ug/l	0.099 U	0.2 U	0.095 U	0.099 U	0.098 U	0.094 U	0.1 U	0.008 J	0.005 J	0.01 J	0.094 U	0.093 U
Methylnaphthalene, 2-	91-57-6	30	NJGWQS - GWQC	ug/l	0.099 U	0.2 U	0.011 J	4.9 U	4.9 U	0.0041 J	5 U	4.8 U	0.0088 J	5.1 U	4.7 U	0.011 J
Pentachlorophenol	87-86-5	0.3	NJGWQS - GWQC	ug/l	9.9 U	9.8 U	0.19 U	9.9 U	9.8 U	0.19 U	10 U	9.6 U	9.4 U	10 U	9.4 U	9.3 U
Metals (ug/l)																
Aluminum	7429-90-5	200	NJGWQS - GWQC	ug/l	99.5	126	20 U	***240***	37	140	80.2	55.1	***258***	53	45.8	17.4 J
Antimony	7440-36-0	6	NJGWQS - GWQC	ug/l	2 U	2 U	2 U	2 U	2 U	2 U	***6.8***	2.9	2.8 J	0.32 J	2 U	2 UJ
Arsenic	7440-38-2	3	NJGWQS - PQL	ug/l	***5.5***	***3.5 J***	***3.7***	***8.7***	***5.1 J***	***4.6***	***10.1***	***7.3***	***4.1***	***7.2***	***5.3***	***3.7***
Barium	7440-39-3	2000	USEPA/NJDEP - MCL	ug/l	195	205	188	208	273	241	488	462	307	553	726	614
Beryllium	7440-41-7	1	NJGWQS - GWQC/PQL	ug/l	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Cadmium	7440-43-9	4	NJGWQS - GWQC	ug/l	1 U	1 U	1 U	1 U	1 U	1 U	0.46 J	0.43 J	0.69 J	0.14 J	1 U	1 U
Iron	7439-89-6	300	NJGWQS - GWQC	ug/l	***13300***	***11800 J***	***9620***	***15000***	***13600 J***	***12400***	***14100***	***12200***	***10000***	***12000***	***13500***	***18900***
Lead	7439-92-1	5	NJGWQS - GWQC/PQL	ug/l	1.3	1.1	1 U	1.2	1 U	1 U	***25.3***	***12.6 J***	***10.3***	4.2	2.6 J	0.36 J
Manganese	7439-96-5	50	NJGWQS - GWQC	ug/l	***3010***	***2870 J***	***2990***	***2730***	***2520 J***	***2570***	***490***	***638***	***444***	***476***	***395***	***794***
Selenium	7782-49-2	40	NJGWQS - GWQC	ug/l	19.8	11.8	10.4	23.8	15	14.1	22.5	15.7 J	7.7	21	15.9 J	11.7
Sodium	7440-23-5	50000	NJGWQS - GWQC	ug/l	***64100***	***68600***	***55700***	***78900***	***96000***	***73000***	***240000***	***247000***	***168000***	***328000***	***395000***	***239000***

Notes:
ARAR = Applicable or Relevant and Appropriate Requirements
[1] ARAR is the lowest value of the NJGWQS, NJDEP MCL and USEPA MCL. NJGWQS basis is Groundwater Qualit
Detected result exceeds ARAR
Reporing Detection Limit exceeds ARAR
J - Estimated Value, result >MDL and <RL
J+ - Estimated High
J- - Estimated Low
U - Not detected above the laboratory reporting limit
D - Result is from a diluted sample
R - Rejected value
Only chemicals that have a result greater than the ARAR are listed

TABLE 3-6
SUMMARY OF GROUNDWATER SAMPLE ARAR EXCEEDANCES
RIVERSIDE INDUSTRIAL PARK SUPERFUND SITE
NEWARK, NEW JERSEY

LOT ID:					69	69	69	70	70	70	Site-Wide	Site-Wide	Site-Wide	Site-Wide	Site-Wide
SITE ID:					MW-122	MW-122	MW-122	MW-119	MW-119	MW-119	MW-201	MW-202	MW-203	MW-204	MW-205
SAMPLE DEPTH (FT BGS)					5.30-5.30	6.12-6.12	6.35-6.35	3.50-3.50	4.42-4.42	4.21-4.21	7.22-7.22	8.06-8.06	6.34-6.34	7.03-7.03	7.3-7.3
COLLECTION DATE:					3/8/2018	6/6/2018	2/19/2019	3/6/2018	6/6/2018	2/14/2019	2/13/2019	2/14/2019	2/13/2019	2/18/2019	2/19/2019
Lab Analyte	**CAS**	**ARAR[1]**	**Basis**	**Units**	**Primary**	**Primary**	**Primary**	**Primary**	**Primary**	**Primary**	**Primary**	**Primary**	**Primary**	**Primary**	**Primary**
VOCs (ug/l)															
Acetone	67-64-1	6000	NJGWQS - GWQC	ug/l	***34000***	6 U	6 U	28 J	6 U	37 J	15 J	160 J	36 J	6 U	6 U
Benzene	71-43-2	1	NJDEP MCL	ug/l	0.044 J	0.033 J	0.2 U	0.2 U	0.2 U	0.2 U	***1.3***	***23***	0.037 J	0.2 U	***1.1***
Dibromo-3-chloropropane, 1,2-	96-12-8	0.02	NJGWQS - GWQC/PQL	ug/l	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Dichloropropene, 1,3- (TRANS)	10061-02-6	1	NJGWQS - PQL	ug/l	***100 J***	0.2 U	0.2 U	0.096 J	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Ethylbenzene	100-41-4	700	NJGWQS - GWQC	ug/l	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1.6	1.1	7.3	0.2 U	0.2 U	3.3
Hexanone, 2-	591-78-6	40	NJGWQS - GWQC	ug/l	***1100 J***	1.3 J	1.7 J	1.3 J	3 U	3.5 J	2.7 J	3 R	3 R	3 U	3 R
Methyl Ethyl Ketone (2-Butanone)	78-93-3	300	NJGWQS - GWQC	ug/l	6.5 J	10 U	10 R	10 R	10 U	10 R	10 R	8.1 J	10 R	10 U	10 R
Methylene Chloride	75-09-2	3	NJGWQS - GWQC	ug/l	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Tetrachloroethane, 1,1,2,2-	79-34-5	1	NJGWQS - GWQC/PQL	ug/l	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.14 J	0.25	***1.1***	0.2 U	0.2 U
Tetrachloroethylene	127-18-4	1	NJDEP MCL	ug/l	0.5 U	0.5 U	0.5 UJ	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	***1.2 J***
Toluene	108-88-3	600	NJGWQS - GWQC	ug/l	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1.3	0.52	0.092 J	0.064 J	3.3
Trichlorobenzene, 1,2,4-	120-82-1	9	NJGWQS - GWQC	ug/l	***75 J***	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
Trichloroethane, 1,1,2-	79-00-5	3	NJGWQS - GWQC	ug/l	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.37	2.2	***7.6***	0.2 U	0.2 U
Trichloroethylene	79-01-6	1	NJGWQS - GWQC/PQL	ug/l	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.11 J
Vinyl Chloride	75-01-4	1	NJGWQS - PQL	ug/l	0.02 U	0.02 U	0.02 UJ	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 UJ
Xylene, m,p	179601-23-1	1000	NJGWQS - GWQC	ug/l	0.5 U	0.16 J	0.5 U	0.5 U	0.19 J	0.5 U	6.6	26	0.52	0.5 U	25
Xylene, o-	95-47-6	1000	NJGWQS - GWQC	ug/l	0.5 U	0.17 J	0.22 J	0.5 U	0.16 J	0.5 U	2.2	33	0.48 J	0.15 J	15 J-
SVOCs (ug/l)															
Benz[a]anthracene	56-55-3	0.1	NJGWQS - PQL	ug/l	0.1 U	0.096 U	0.093 U	0.0065 J	0.039 J	0.094 U	0.0091 J	0.97 U	0.095 U	***0.12***	0.094 U
Benzo[a]pyrene	50-32-8	0.1	NJGWQS - PQL	ug/l	0.1 U	0.096 U	0.093 U	0.1 U	0.093 U	0.094 U	0.096 U	0.089 J	0.095 U	0.043 J	0.094 U
Benzo[b]fluoranthene	205-99-2	0.2	NJGWQS - PQL	ug/l	0.1 U	0.096 U	4.7 U	0.1 U	0.032 J	0.094 U	0.0052 J	0.97 U	0.095 U	0.02 J	0.094 U
Bis(2-ethylhexyl)phthalate	117-81-7	3	NJGWQS - PQL	ug/l	5.1 U	4.8 U	4.7 U	5 U	4.6 U	1.8 J	1.9 J	4.7 U	4.8 U	4.9 U	4.7 U
Cresol, p-	106-44-5	50	NJGWQS - GWQC	ug/l	10 U	9.6 U	9.3 U	10 U	9.3 U	9.4 U	9.6 U	4.2 J	9.5 U	9.7 U	9.4 U
Dioxane, 1,4-	123-91-1	0.4	NJGWQS - GWQC	ug/l	0.33	0.37	0.35	0.2 U	***0.98***	***0.69***	***5.5***	***1.4***	0.069 J	***0.64 J***	0.073 J
Indeno[1,2,3-cd]pyrene	193-39-5	0.2	NJGWQS - PQL	ug/l	0.1 U	0.096 U	0.093 U	0.1 U	0.02 J	0.094 U	0.096 U	0.97 U	0.095 U	0.0076 J	0.094 U
Methylnaphthalene, 2-	91-57-6	30	NJGWQS - GWQC	ug/l	0.1 U	0.096 U	0.019 J	5 U	4.6 U	0.0029 J	0.17	0.74 J	0.014 J	0.83	0.033 J
Pentachlorophenol	87-86-5	0.3	NJGWQS - GWQC	ug/l	10 U	9.6 U	9.3 U	10 U	9.3 U	9.4 U	0.19 U	9.7 UJ	0.19 U	9.7 U	9.4 U
Metals (ug/l)															
Aluminum	7429-90-5	200	NJGWQS - GWQC	ug/l	20 U	22.2	5.5 J	96.9	111	9.4 J	30.8 J+	87.8	42 J+	49.4	48.8
Antimony	7440-36-0	6	NJGWQS - GWQC	ug/l	0.32 J	2 U	2 UJ	3.1	0.44 J	0.57 J	2 U	2 UJ	2 U	2 UJ	2 UJ
Arsenic	7440-38-2	3	NJGWQS - PQL	ug/l	***8.5***	***7.1***	2.2	2.2	***6.2***	***4.1***	***12.9***	***17.6***	2.4	***26.7***	1
Barium	7440-39-3	2000	USEPA/NJDEP - MCL	ug/l	162	174	125	219	1430	735	1170	515	345	281	408
Beryllium	7440-41-7	1	NJGWQS - GWQC/PQL	ug/l	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Cadmium	7440-43-9	4	NJGWQS - GWQC	ug/l	0.091 J	1 U	1 U	2.8	0.44 J	2.6	1 U	1 U	1 U	1 U	0.12 J
Iron	7439-89-6	300	NJGWQS - GWQC	ug/l	***18900***	***17400***	***11700***	***1510***	***15300***	***14100***	***22500***	***33400***	***7700***	***8680***	227
Lead	7439-92-1	5	NJGWQS - GWQC/PQL	ug/l	***7***	3.6 J	0.71 J	***6.5***	***7.9 J***	2	1.5 J+	0.63 J	1 U	1.6	1 U
Manganese	7439-96-5	50	NJGWQS - GWQC	ug/l	***2150***	***1520***	***1080***	***81.7***	***192***	***370***	***3040***	***2330***	***1960***	***10100***	***3640***
Selenium	7782-49-2	40	NJGWQS - GWQC	ug/l	11.2	8.4 J	5	6.8	14.8 J	11.5	9.8	11.6	5.8	7	7.4
Sodium	7440-23-5	50000	NJGWQS - GWQC	ug/l	***82100***	***55500***	36400	***198000***	***505000***	***281000***	***151000***	***80900***	***95400***	***198000***	***211000***

Notes:
ARAR = Applicable or Relevant and Appropriate Requirements
[1] ARAR is the lowest value of the NJGWQS, NJDEP MCL and USEPA MCL. NJGWQS basis is Groundwater Quality
Detected result exceeds ARAR
Reporting Detection Limit exceeds ARAR
J - Estimated Value, result >MDL and <RL
J+ - Estimated High
J- - Estimated Low
U - Not detected above the laboratory reporting limit
D - Result is from a diluted sample
R - Rejected value
Only chemicals that have a result greater than the ARAR are listed

TABLE 3-7
CALCULATION OF RISK BASED CONCENTRATIONS
VISITOR SCENARIO
Riverside Industrial Park Superfund Site
Newark, New Jersey

EXPOSURE EQUATIONS:

Non Cancer

$$\text{RBC-ing nc} = \frac{\text{THQ} * \text{AT nc} * \text{C2} * \text{BW}}{\text{EF} * \text{ED} * \text{IRs} * \text{FS} * 1/\text{RfD} * \text{C1}}$$

Parameter		Description		Value	Reference
		Child			
IRs	=	Ingestion rate of soil - child	mg/day	200	USEPA 2014
EF	=	Exposure Frequency - child	days/yr	52	Ramboll 2020
ED	=	Exposure Duration - child	years	6	USEPA 2014
FS	=	Fraction soil contact at Site	unitless	1	Ramboll 2020
BW	=	Body Weight - child	kg	15	USEPA 2014
ATnc	=	Averaging Time - noncancer	years	6	USEPA 1989
THQ	=	Target Hazard Quotient	unitless	1	USEPA 1991
RfD	=	Reference Dose	mg/kg-d	Chemical-specific	ATSDR 2019
C1	=	Units conversion factor 1	kg/mg	0.000001	Universal
C2	=	Units conversion factor 2	days/yr	365	Universal
RBC-ing nc	=	Noncancer risk-based soil soncentration-incidental ingestion	mg/kg	Chemical-specific	Calculated

Chemical of Potential Concern	CAS	Toxicity Values	RBC - Non Cancer[1]
		RfD	RBC-ing nc
Metals			
Copper	7440-50-8	0.001	526

Notes:

NA = not available.

NC = not calculated.

[1] Risk-based concentrations were not calculated for the dermal contact and inhalation of dust exposure pathways. This is because there is no dermal absorption factor or inhalation toxicity value available for copper. Cancer-based concentrations were also not calculated, since copper is not classified as a carcinogen.

References:

Ramboll 2020. Final Baseline Human Health Risk Assessment, Riverside Industrial Park Superfund Site. Newark, New Jersey. March 25, 2020.

ATSDR 2019. Minimal Risk Levels. RfD is the intermediate minimal risk level (0.01 mg/kg/day) with a subchronic to chronic uncertainty factor of 10, per USEPA Region 2 (Ramboll, 2020).

USEPA 2014. Memorandum: Human Health Evaluation Manual, Supplemental Guidance: Update of Standard Default Exposure Factors. February 6, 2014. Office of Solid Waste and Emergency Response. OSWER Directive 9200.1-120.

USEPA 1991. United States Environmental Protection Agency. Risk Assessment Guidance for Superfund Volume I. Human Health Evaluation Manual (Part B, Development of Risk-based Preliminary Remediation Goals). EPA/540/R-92/003. Washington D.C., December 1991.

USEPA 1989. Risk Assessment Guidance for Superfund, Human Health Evaluation Manual, Part A, Interim Final, OSWER Directive 9285.701A. Office of Solid Waste and Emergency Response, USEPA, Washington D.C., December.

Table 3-8
Calculation of Lead Risk Based Concentrations [1]
Indoor Worker
Riverside Industrial Park Superfund Site
Newark, New Jersey

Variable	Description of Variable	Units	GSDi and PbBo from Analysis of NHANES 2009-2014
$PbB_{fetal, 0.95}$	Target PbB in fetus (e.g., 2-8 µg/dL)	µg/dL	5
$R_{fetal/maternal}$	Fetal/maternal PbB ratio	--	0.9
BKSF	Biokinetic Slope Factor	µg/dL per µg/day	0.4
GSD_i[2]	Geometric standard deviation PbB	--	1.8
PbB_0[2]	Baseline PbB	µg/dL	0.6
IR_S[3]	Soil ingestion rate (including soil-derived indoor dust)	g/day	0.050
$AF_{S, D}$	Absorption fraction (same for soil and dust)	--	0.12
$EF_{S, D}$[4]	Exposure frequency (same for soil and dust)	days/yr	219
$AT_{S, D}$[5]	Averaging time (same for soil and dust)	days/yr	365
PRG in Soil for no more than 5% probability that fetal PbB exceeds target PbB [6]		ppm	1,050

Notes:

[1] Model Source: U.S. EPA (1996). Recommendations of the Technical Review Workgroup for Lead for an Interim Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil. Model version date: 6/14/2017. U.S. EPA Technical Review Workgroup for Lead, Adult Lead Committee Available online at: https://www.epa.gov/superfund/lead-superfund-sites-software-and-users-manuals#update

Highlighted input parameters indicate receptor and/or site-specific values. All other parameters are model default values.

[2]GSDi and PbB_0 are updated values, obtained from USEPA, Update of the Adult Lead Methodology's Default Baseline Blood Lead Concentration and Geometric Standard Deviation Parameters. OSWER 9200.2-82. May 2017.

[3]This soil ingestion rate for the indoor worker was obtained from Appendix F (Table F.4) of the April 2020 Final Baseline Human Health Risk Assessment prepared by Ramboll.

[4]This exposure frequency for the indoor worker was obtained from Appendix F (Table F.4) of April 2020 Final Baseline Human Health Risk Assessment prepared by Ramboll.

[5]This averaging time for the indoor worker was obtained from Appendix F (Table F.4) of the April 2020 Final Baseline Human Health Risk Assessment prepared by Ramboll.

[6] The acceptable USEPA threshold that estimated fetal blood lead levels exceed the target blood level is 5%.

-- = Not applicable; ug/g = micrograms per gram; ppm = parts per million; ug/dL = micrograms per deciliter; ug/day = micrograms per day
g/day = grams per day; days/yr = days per year

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Table 3-9
Calculation of Lead Risk Based Concentrations [1]
Outdoor Worker
Riverside Industrial Park Superfund Site
Newark, New Jersey

Variable	Description of Variable	Units	GSDi and PbBo from Analysis of NHANES 2009-2014
$PbB_{fetal,\ 0.95}$	Target PbB in fetus (e.g., 2-8 µg/dL)	µg/dL	5
$R_{fetal/maternal}$	Fetal/maternal PbB ratio	--	0.9
BKSF	Biokinetic Slope Factor	µg/dL per µg/day	0.4
GSD_i[2]	Geometric standard deviation PbB	--	1.8
PbB_0[2]	Baseline PbB	µg/dL	0.6
IR_S[3]	Soil ingestion rate (including soil-derived indoor dust)	g/day	0.067
$AF_{S,D}$	Absorption fraction (same for soil and dust)	--	0.12
$EF_{S,D}$[4]	Exposure frequency (same for soil and dust)	days/yr	219
$AT_{S,D}$[5]	Averaging time (same for soil and dust)	days/yr	365
PRG in Soil for no more than 5% probability that fetal PbB exceeds target PbB [6]		ppm	784

Notes:

[1] Model Source: U.S. EPA (1996). Recommendations of the Technical Review Workgroup for Lead for an Interim Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil. Model version date: 6/14/2017. U.S. EPA Technical Review Workgroup for Lead, Adult Lead Committee
Available online at: https://www.epa.gov/superfund/lead-superfund-sites-software-and-users-manuals#update
Highlighted input parameters indicate receptor and/or site-specific values. All other parameters are model default values.

[2]GSDi and PbB_0 are updated values, obtained from USEPA, Update of the Adult Lead Methodology's Default Baseline Blood Lead Concentration and Geometric Standard Deviation Parameters. OSWER 9200.2-82. May 2017.

[3]This soil ingestion rate for the outdoor worker was obtained from Appendix F (Table F.4) of the April 2020 Final Baseline Human Health Risk Assessment prepared by Ramboll.

[4]This exposure frequency for the outdoor worker was obtained from Appendix F (Table F.4) of April 2020 Final Baseline Human Health Risk Assessment prepared by Ramboll.

[5]This averaging time for the outdoor worker was obtained from Appendix F (Table F.4) of the April 2020 Final Baseline Human Health Risk Assessment prepared by Ramboll.

[6] The acceptable USEPA threshold that estimated fetal blood lead levels exceed the target blood level is 5%.

-- = Not applicable; ug/g = micrograms per gram; ppm = parts per million; ug/dL = micrograms per deciliter; ug/day = micrograms per day
g/day = grams per day; days/yr = days per year

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Table 3-10
Calculation of Lead Risk Based Concentrations [1]
Utility Worker
Riverside Industrial Park Superfund Site
Newark, New Jersey

Variable	Description of Variable	Units	GSDi and PbBo from Analysis of NHANES 2009-2014
$PbB_{fetal, 0.95}$	Target PbB in fetus (e.g., 2-8 µg/dL)	µg/dL	5
$R_{fetal/maternal}$	Fetal/maternal PbB ratio	--	0.9
BKSF	Biokinetic Slope Factor	µg/dL per µg/day	0.4
GSD_i[2]	Geometric standard deviation PbB	--	1.8
PbB_0[2]	Baseline PbB	µg/dL	0.6
IR_S[3]	Soil ingestion rate (including soil-derived indoor dust)	g/day	0.067
$AF_{S, D}$	Absorption fraction (same for soil and dust)	--	0.12
$EF_{S, D}$[4]	Exposure frequency (same for soil and dust)	days/yr	13
$AT_{S, D}$[5]	Averaging time (same for soil and dust)	days/yr	91
PRG in Soil for no more than 5% probability that fetal PbB exceeds target PbB [6]		ppm	3,292

Notes:

[1] Model Source: U.S. EPA (1996). Recommendations of the Technical Review Workgroup for Lead for an Interim Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil. Model version date: 6/14/2017. U.S. EPA Technical Review Workgroup for Lead, Adult Lead Committee Available online at: https://www.epa.gov/superfund/lead-superfund-sites-software-and-users-manuals#update

Highlighted input parameters indicate receptor and/or site-specific values. All other parameters are model default values.

[2]GSDi and PbB_0 are updated values, obtained from USEPA, Update of the Adult Lead Methodology's Default Baseline Blood Lead Concentration and Geometric Standard Deviation Parameters. OSWER 9200.2-82. May 2017.

[3]This soil ingestion rate for the utility worker was obtained from Appendix F (Table F.4) of the April 2020 Final Baseline Human Health Risk Assessment prepared by Ramboll.

[4]This exposure frequency for the utility worker was obtained from Appendix F (Table F.4) of April 2020 Final Baseline Human Health Risk Assessment prepared by Ramboll.

[5]This averaging time for the utility worker was obtained from Appendix F (Table F.4) of the April 2020 Final Baseline Human Health Risk Assessment prepared by Ramboll.

[6] The acceptable USEPA threshold that estimated fetal blood lead levels exceed the target blood level is 5%.

-- = Not applicable; ug/g = micrograms per gram; ppm = parts per million; ug/dL = micrograms per deciliter; ug/day = micrograms per day
g/day = grams per day; days/yr = days per year

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Table 3-11
Calculation of Lead Risk Based Concentrations [1]
Construction Worker
Riverside Industrial Park Superfund Site
Newark, New Jersey

Variable	Description of Variable	Units	GSDi and PbBo from Analysis of NHANES 2009-2014
$PbB_{fetal, 0.95}$	Target PbB in fetus (e.g., 2-8 µg/dL)	µg/dL	5
$R_{fetal/maternal}$	Fetal/maternal PbB ratio	--	0.9
BKSF	Biokinetic Slope Factor	µg/dL per µg/day	0.4
GSD_i[2]	Geometric standard deviation PbB	--	1.8
PbB_0[2]	Baseline PbB	µg/dL	0.6
IR_S[3]	Soil ingestion rate (including soil-derived indoor dust)[3]	g/day	0.100
$AF_{S, D}$	Absorption fraction (same for soil and dust)	--	0.12
$EF_{S, D}$[4]	Exposure frequency (same for soil and dust)[4]	days/yr	65
$AT_{S, D}$[5]	Averaging time (same for soil and dust)	days/yr	91
PRG in Soil for no more than 5% probability that fetal PbB exceeds target PbB [6]		ppm	441

Notes:

[1] Model Source: U.S. EPA (1996). Recommendations of the Technical Review Workgroup for Lead for an Interim Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil. Model version date: 6/14/2017. U.S. EPA Technical Review Workgroup for Lead, Adult Lead Committee Available online at: https://www.epa.gov/superfund/lead-superfund-sites-software-and-users-manuals#update

Highlighted input parameters indicate receptor and/or site-specific values. All other parameters are model default values.

[2]GSDi and PbB_0 are updated values, obtained from USEPA, Update of the Adult Lead Methodology's Default Baseline Blood Lead Concentration and Geometric Standard Deviation Parameters. OSWER 9200.2-82. May 2017.

[3]This soil ingestion rate for the construction worker was obtained from Appendix F (Table F.4) of the April 2020 Final Baseline Human Health Risk Assessment prepared by Ramboll.

[4]This exposure frequency for the construction worker was obtained from Appendix F (Table F.4) of April 2020 Final Baseline Human Health Risk Assessment prepared by Ramboll.

[5]This averaging time for the construction worker was obtained from Appendix F (Table F.4) of the April 2020 Final Baseline Human Health Risk Assessment prepared by Ramboll.

[6] The acceptable USEPA threshold that estimated fetal blood lead levels exceed the target blood level is 5%.

-- = Not applicable; ug/g = micrograms per gram; ppm = parts per million; ug/dL = micrograms per deciliter; ug/day = micrograms per day
g/day = grams per day; days/yr = days per year

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TABLE 3-12
CALCULATION OF RISK BASED CONCENTRATIONS
INDOOR WORKER SCENARIO
Vapor Intrusion - Soil to Indoor Air

Riverside Industrial Park Superfund Site
Newark, New Jersey

EXPOSURE EQUATIONS:

Inhalation of Indoor Air:

$$IA\ nc = \frac{THQ * AT\ nc * C2}{EF * ED * ET * (1/C3) * (1/RfC)} \qquad IA\ c = \frac{TR * ATc * C2}{IUR * (1/C3) * ED * EF * ET}$$

Target Soil Gas Concentration :

$$Csg\ (noncancer\ and\ cancer) = \frac{IA\ nc\ or\ IA\ c}{alpha}$$

Risk-based Soil Concentration:

$$RBC\ (noncancer\ and\ cancer) = (Csg\text{-}noncancer\ or\ Csg\text{-}cancer)/ [C1 / (Kd / H') + (\theta w / H'*\rho b) + (\theta a / \rho b)]$$

Parameter		Description	Units	Value	Reference
EF	=	Exposure Frequency - adult	days/yr	250	USEPA 2014
ED	=	Exposure Duration - adult	years	25	USEPA 2014
ET	=	Exposure time indoors - adult	hours/day	8	USEPA 2014
ATc	=	Averaging Time - cancer	years	70	USEPA 1989
ATnc	=	Averaging Time - noncancer	years	25	USEPA 1989
THQ	=	Target Hazard Quotient	unitless	1	USEPA 1991
TR	=	Target Cancer Risk	unitless	0.000001	USEPA 1991
RfC	=	Reference Concentration	mg/m^3	Chemical-specific	See Ramboll 2020
IUR	=	Inhalation Unit Risk	$(mg/m^3)^{-1}$	Chemical-specific	See Ramboll 2020
C1	=	Units conversion factor 1	L/m^3	1000	Universal
C2	=	Units conversion factor 2	days/yr	365	Universal
C3	=	Units conversion factor 3	hours/day	24	Universal
IA-nc	=	Indoor Air Concentration - noncancer	mg/m^3		
IA-c	=	Indoor Air Concentration - cancer	mg/m^3		
Csg-noncancer	=	Target soil gas concentration - noncancer	mg/m^3		
Csg-cancer	=	Target soil gas concentration - cancer	mg/m^3		
RBC-noncancer	=	Soil risk-based concentration - noncancer	mg/kg	Chemical-specific	Calculated Values
RBC-cancer	=	Soil risk-based concentration - cancer	mg/kg		
Alpha	=	Soil gas - Indoor Air Attenuation Factor	unitless		
Kd	=	Soil-water partition coefficient (fraction organic carbon * Koc)	L/kg		
H'	=	Henry's Law constant	unitless		
θw	=	Water-filled soil porosity	unitless	0.055	
θa	=	Air-filled soil porosity	unitless	0.32	Values for sand; Ramboll, 2020
ρb	=	Dry soil bulk density	kg/L	1.66	

Chemical of Potential Concern	Toxicity Values		Alpha	IA-nc	IA-c	Csg - Noncancer	Csg - Cancer	Kd	H'	RBC - Noncancer THQ = 1	RBC- Cancer ILCR = 10-6	RBC- Cancer ILCR = 10-5	RBC- Cancer ILCR = 10-4
	RFC	IUR				Inhalation	Inhalation			Inhalation	Inhalation	Inhalation	Inhalation
Volatile Organic Compounds (VOCs)													
Trichloroethene (TCE)	2.0E-03	4.1E-03	2.9E-04	8.8E-03	3.0E-03	3.1E+01	1.0E+01	3.4E-01	2.4E-01	5.3E-02	1.80E-02	1.8E-01	1.8E+00
Total Xylenes	1.0E-01	NA	2.9E-04	4.4E-01	NC	1.5E+03	NC	7.7E-01	2.0E-01	6.5E+00	NC	NC	NC
Naphthalene	3.0E-03	3.4E-02	2.9E-04	1.3E-02	3.6E-04	4.6E+01	1.3E+00	4.0E+00	8.3E-03	2.2E+01	6.2E-01	6.2E+00	6.2E+01

Notes:

Ramboll 2020. Final Baseline Human Health Risk Assessment, Riverside Industrial Park Superfund Site. Newark, New Jersey. March 25, 2020.

USEPA 2014. Memorandum: Human Health Evaluation Manual, Supplemental Guidance: Update of Standard Default Exposure Factors. February 6, 2014. Office of Solid Waste and Emergency Response. OSWER Directive 9200.1-120.

USEPA 1991. United States Environmental Protection Agency. Risk Assessment Guidance for Superfund Volume I. Human Health Evaluation Manual (Part B, Development of Risk-based Preliminary Remediation Goals). EPA/540/R-92/003. Washington D.C., December 1991

USEPA 1989. Risk Assessment Guidance for Superfund, Human Health Evaluation Manual, Part A, Interim Final, OSWER Directive 9285.701A. Office of Solid Waste and Emergency Response, USEPA, Washington D.C., December.

NA = not available.

NC = not calculated.

Table 3-13
Preliminary Remediation Goals for Soil
Riverside Industrial Park Superfund Site
Newark, New Jersy

Chemical of Potential Concern[1]	Human Health RBCs[2, 3, 4]										Ecological RBCs[5]	ARARs[6]	Representative Historical Fill Average Value[7]	To Be Considered NJDEP Impact to Groundwater Soil Remediation Standards[8]	Human Health PRGs[9] Sitewide	Basis for Human Health PRG	Ecological PRGs Lots 67 and 69[9]	Basis for Ecological PRG
	Visitor		Indoor Worker					Outdoor Worker	Utility Worker	Construction Worker								
	Based on Target HQ = 1	Based on IEUBK Model	Based on Target ILCR = 10^{-6}	Based on Target ILCR 10^{-5}	Based on Target ILCR 10^{-4}	Based on Target HQ = 1	Based on ALM Model	RBC Based on ALM Model	RBC Based on ALM Model	RBC Based on ALM Model								
Volatile Organic Compounds (VOCs)																		
Benzene	--	--	--	--	--	--	--	--	--	--	--	5	--	0.01	5	ARAR	5	ARAR
Cumene	--	--	--	--	--	--	--	--	--	--	0.04	NA	--	--	NA	--	0.04	Ecological RBC
Ethyl Benzene	--	--	--	--	--	--	--	--	--	--	0.27	110,000	--	13	110,000	ARAR	0.27	Ecological RBC
2-Hexanone	--	--	--	--	--	--	--	--	--	--	0.36	NA	--	--	NA	--	0.36	Ecological RBC
Toluene	--	--	--	--	--	--	--	--	--	--	0.15	91,000	--	7	91,000	ARAR	0.15	Ecological RBC
1,1,1-Trichloroethane	--	--	--	--	--	--	--	--	--	--	0.04	NA	--	0.3	NA	--	0.04	Ecological RBC
Trichloroethene	--	--	0.02	0.18	1.80	0.05	--	--	--	--	---	10	--	0.01	0.02	ILCR 10^{-6}	0.05	HQ = 1
Total Xylenes	--	--	--	--	--	6.50	--	--	--	--	0.10	170,000	--	19	6.50	HQ = 1	0.10	Ecological RBC
Semivolatile Organic Compounds (SVOCs)																		
PAHs (High MW)	--	--	--	--	--	--	--	--	--	--	1.10	NA	--	--	NA	--	1.10	Ecological RBC
Benzo(a)anthracene	--	--	--	--	--	--	--	--	--	--	1.10	17	1.37	0.8	17	ARAR	1.10	ESC
Benzo(a)pyrene	--	--	--	--	--	--	--	--	--	--	1.10	2	1.89	0.2	2	ARAR	1.10	ESC
Benzo(b)fluoranthene	--	--	--	--	--	--	--	--	--	--	1.10	17	1.91	2	17	ARAR	1.10	ESC
Benzo(g,h,i)perylene	--	--	--	--	--	--	--	--	--	--	1.10	30,000	--	NA	30,000	ARAR	1.10	Ecological RBC
Benzo(k)fluoranthene	--	--	--	--	--	--	--	--	--	--	1.10	170	1.79	25	170	ARAR	1.10	ESC
bis(2-Ethylhexyl)phthalate	--	--	--	--	--	--	--	--	--	--	0.02	140	--	1,200	140	ARAR	0.02	Ecological RBC
Carbazole	--	--	--	--	--	--	--	--	--	--	0.07	96	--	NA	96	ARAR	0.07	Ecological RBC
Chrysene	--	--	--	--	--	--	--	--	--	--	1.10	1,700	--	80	1,700	ARAR	1.10	Ecological RBC
Dimethylphthalate	--	--	--	--	--	--	--	--	--	--	0.35	NA	--	--	NA	--	0.35	Ecological RBC
Di-n-butylphthalate	--	--	--	--	--	--	--	--	--	--	0.01	68,000	--	760	68,000	ARAR	0.01	Ecological RBC
Fluoranthene	--	--	--	--	--	--	--	--	--	--	1.10	24,000	--	1,300	24,000	ARAR	1.10	Ecological RBC
Indeno(1,2,3-cd)pyrene	--	--	--	--	--	--	--	--	--	--	1.10	17	1.41	7	17	ARAR	1.10	ESC
Naphthalene	--	--	0.62	6.20	62	22	--	--	--	--	---	17	--	25	0.62	ILCR 10^{-6}	6	ILCR 10^{-5}
Pyrene	--	--	--	--	--	--	--	--	--	--	1.10	18,000	--	840	18,000	ARAR	1.10	Ecological RBC
Polychlorinated biphenyls (PCBs)																		
PCBs (total)	--	--	--	--	--	--	--	--	--	--	0.04	1	--	0.2	1	ARAR	0.04	Ecological RBC
Aroclor-1254	--	--	--	--	--	--	--	--	--	--	0.04	1	--	--	1	ARAR	0.04	Ecological RBC
Aroclor-1260	--	--	--	--	--	--	--	--	--	--	0.04	1	--	--	1	ARAR	0.04	Ecological RBC
Aroclor-1262	--	--	--	--	--	--	--	--	--	--	0.04	1	--	--	1	ARAR	0.04	Ecological RBC
Inorganics																		
Aluminum	--	--	--	--	--	--	--	--	--	--	50	NA	--	6,000	NA	--	50	Ecological RBC
Antimony	--	--	--	--	--	--	--	--	--	--	0.27	450	--	6	450	ARAR	0.27	Ecological RBC
Arsenic	--	--	--	--	--	--	--	--	--	--	---	19	--	19	19	ARAR	19	ARAR
Barium	--	--	--	--	--	--	--	--	--	--	330	59,000	--	2,100	59,000	ARAR	330	Ecological RBC
Cadmium	--	--	--	--	--	--	--	--	--	--	0.36	78	11	2	78	ARAR	0.36	ESC
Chromium (total)	--	--	--	--	--	--	--	--	--	--	23	NA	--	--	NA	--	23	Ecological RBC
Chromium VI	--	--	--	--	--	--	--	--	--	--	0.34	NA	--	--	NA	--	0.34	Ecological RBC
Copper	526	--	--	--	--	--	--	--	--	--	28	45,000	--	11,000	526	HQ = 1	28	Ecological RBC
Cyanide (total)	--	--	--	--	--	--	--	--	--	--	0.10	680	--	20	680	ARAR	0.10	Ecological RBC
Lead	--	567	--	--	--	--	1,050	784	3,292	441	11	800	574	90	800	ARAR	1.10	ESC
Manganese	--	--	--	--	--	--	--	--	--	--	220	5,900	--	65	5,900	ARAR	220	Ecological RBC
Mercury	--	--	--	--	--	--	--	--	--	--	0.01	65	--	0.1	65	ARAR	0.01	Ecological RBC
Nickel	--	--	--	--	--	--	--	--	--	--	38	23,000	--	48	23,000	ARAR	38	Ecological RBC
Selenium	--	--	--	--	--	--	--	--	--	--	0.52	5,700	--	11	5,700	ARAR	0.52	Ecological RBC
Vanadium	--	--	--	--	--	--	--	--	--	--	7.80	1,100	--	NA	1,100	ARAR	7.80	Ecological RBC
Zinc	--	--	--	--	--	--	--	--	--	--	46	110,000	580	930	110,000	ARAR	46	ESC
Additional Chemicals																		
2,3,7,8-Tetrachlorodibenzo-p-dioxin	--	--	--	--	--	--	--	--	--	--	0.0000032	NA	--	--	NA	--	0.0000032	Ecological RBC

Table 3-13
Preliminary Remediation Goals for Soil
Riverside Industrial Park Superfund Site
Newark, New Jersy

Notes:

ARAR - Applicable or Relevant and Appropriate Requirements

NA - Not available

RBC = risk-based concentration

-- = not a chemical of potential concern for receptor/pathway

1. Soil concentrations are presented in units of miligrams per kilogram (mg/kg)

2. The soil RBCs for carcinogenic effects (Incremental Lifetime Cancer Risk; ILCR) are based on a target cancer risk range of 10^{-6} to 10^{-4}. The soil RBCs for non-cancer hazards (Hazard Quotient; HQ) are based on a target hazard index of 1. See Table 3-7 and 3-12 for calculation of risk-based concentrations.

3 See Section 3.7.2 for further discussion on derivation of the child visitor lead RBC.

4. RBCs for lead were developed using the Adult Lead Model (ALM) for the indoor worker, outdoor worker, utility worker, and construction worker. Calculations are presented in Tables 3-8 through 3-11.

5. Ecological RBCs are the ecological screening criteria (ESC) as presented in the Screening Level Ecological Risk Assessment by Ramboll Inc. (April 2020)

6. ARARs are the New Jersey nonresidential direct contact soil remediation standards, as presented in Table 1B of NJAC 2:26D

7. Representative historical fill values are from retracted New Jersey Department of Protection (NJDEP), N.J.A.C. 7:26E Technical Requirements for Site Remediation, Table 4-2, (November 2009). While these values are no longer supported by NJDEP, they are listed here as a point of comparison

8. ARARs applicable to non-residential use of soil include the NJDEP NRDCSRS (N.J.A.C. 7:26D-4.3). NJDEP "Guidance Document for Development of Impact to Groundwater Soil Remediation Standards" is a soil TBC. Site-specific Impact to Groundwater Soil Screening Levels (IGWSSLs) were not developed for a soil-fill comparison because ARARs were available for comparison and exceedance determination.

9. PRGs were selected based on the following:

a. Human Health: Lowest concentration between human health RBC (lowest value between HQ=1 or 10^{-6} cancer risk or lead model) if available and the ARAR (if available). For lead, the ARAR was selected as the final PRG; see report text for explanation.

Ecological (Lots 67 and 69 only): Lowest concentration between human health RBC, ecological RBC and ARAR, as available.

b. If human health and/or ecological RBC value in (a) is lower than the NJDEP historical fill average value (if available), then the human health and/or ecological PRG was set at the historical fill average value.

Table 3-14
Demonstration of Cumulative Hazard and Cancer Risk for Soil Preliminary Remediation Goals
Riverside Industrial Park Superfund Site
Newark, New Jersey

Receptor	Chemical of Potential Concern	Non-cancer Hazard-Based RBC [1]	Cancer risk-Based RBC [1]	Preliminary Remediation Goal (PRG) [2]	PRG-associated Risk and Hazard [3]		
					Cancer	Non-cancer	
		mg/kg	mg/kg	mg/kg	ILCR	HI	Target Organ [4]
Future Child Visitor	Copper	526	NC	526	---	1	Gastrointestinal
				Total Risk/Hazard:	---	**1**	*(no HI breakdown needed)*
Future Indoor Worker	Naphthalene	22	0.62	0.62	1E-06	0.03	Respiratory; Nervous
	Trichloroethene	0.05	0.02	0.02	1E-06	0.4	Immune; Development; Cardiovascular
	Total Xylenes	6.5	NC	6.5	NC	1	Nervous
				Total Risk/Hazard:	**2E-06**	**1.4**	
				Worker HI breakdown by target organ:		*1.0*	*Nervous*
						0.03	*Respiratory*
						0.4	*Immune; Development; Cardiovascular*

Notes:
mg/kg - milligrams per kilogram
HI - hazard index associated with soil PRG
ILCR - incremental lifetime cancer risk associated with soil PRG
RBC - risk-based concentration
NC - not calculated; COPC not classified as a carcinogen
[1]Cancer risk and non-cancer hazard RBCs, where applicable, were calculated based on an target cancer risk of 10^{-6} and a target hazard quotient (HQ) of 1, as shown on Table 3-13
[2] Indicates the final selected PRG, as presented on Table 3-13
[3] The target risk/hazard associated with the PRG, as calculated using the following equation:

$$Risk = \frac{(Target\ ILCR\ or\ HQ * PRG)}{RBC\ (cancer\ or\ noncancer}$$

[4] Primary target organ information as presented in Table 5.02 in Appendix A of the Baseline Human Health Risk Assessment (Ramboll, 2020)

TABLE 4-1
TECHNOLOGY SCREENING TABLE – WASTE
IDENTIFICATION OF CANDIDATE TECHNOLOGIES
RIVERSIDE INDUSTRIAL PARK SUPERFUND SITE
NEW JERSEY

GENERAL RESPONSE ACTION	REMEDIAL TECHNOLOGY	PROCESS OPTIONS	DESCRIPTION	SCREENING COMMENTS (Effectiveness, Implementability, and Relative Cost)	RETAINED
No Action	Not Applicable	Not Applicable	Under this response action, no active response action will be taken to address concerns regarding waste. The no action alternative is required to be considered by the NCP to provide a baseline against which all other alternatives may be compared.	Effectiveness: would not be effective in reducing toxicity, mobility, or volume for potential source material or principal threat waste and would not meet RAOs. Implementability: Because no action would be taken, this option can be implemented. Relative cost: No capital, administrative, or O&M cost.	Yes
Removal	Mechanical Transfer	Containerization or Transport Vehicle	Waste would be pumped, vacuumed or otherwise transferred into DOT-approved containers or transport vehicles. Solid and separate phase liquid waste would be segregated. Dewatering for UST removal may be required because the groundwater table is shallow (approximately 4 to 10 feet bgs) and UST contents may be in contact with groundwater. Containerization of dewatering liquids for subsequent characterization is anticipated.	Effectiveness: Removal would be ancillary to subsequent disposal and would thereby be effective in reducing mobility in the environment. No change of waste volume or toxicity would occur without subsequent treatment. Implementability: The presence of subsurface utilities (e.g., water line) would need to be assessed prior to UST closure by removal. Implementation would be restricted to UST-certified contractors. Dewatering is anticipated with collection of post-removal compliance soil samples above the water table. Relative cost: No maintenance is required. Generally low- to moderate-cost alternative.	Yes
Disposal	Disposal (off-site)	Solid Waste Landfill, Used Oil Recycling, or Treatment and Disposal	Wastes are transported to an appropriately licensed facility for disposal. Treatment prior to disposal may be necessary. Wastes must be characterized prior to disposal. Disposal restrictions may require pretreatment prior to disposal.	Effectiveness: Disposal would be effective in preventing direct contact and reducing mobility in the environment. Treatment to meet land disposal requirements would reduce waste volume and/or toxicity. Implementability: The presence of subsurface utilities (e.g., water line) would need to be assessed prior to UST closure by removal. Relative cost: No maintenance is required. Requires waste characterization, disposal fees, and trucking costs. Generally moderate-cost alternative.	Yes

TABLE 4-2
TECHNOLOGY SCREENING TABLE - SOIL
IDENTIFICATION OF CANDIDATE TECHNOLOGIES
RIVERSIDE INDUSTRIAL PARK SUPERFUND SITE
NEW JERSEY

GENERAL RESPONSE ACTION	REMEDIAL TECHNOLOGY	PROCESS OPTIONS	DESCRIPTION	SCREENING COMMENTS (Effectiveness, Implementability, and Relative Cost)	RETAINED
No Action	Not Applicable	Not Applicable	Under this response action, no active response action will be taken to address concerns regarding contaminated soil. The no action alternative is required to be considered by the NCP to provide a baseline against which all other alternatives may be compared.	Effectiveness: The no action alternative would not meet ARARs or reduce unacceptable risks to human health or the environment. Implementability: Because no action would be taken, this option is the easiest to implement. Relative cost: No capital, administrative, or O&M cost. Lowest cost alternative.	Yes
Institutional Controls/Access Restrictions	Land Use Restrictions	Deed Notice	File a Deed Notice whereby the owner agrees to subject the property to certain statutory and regulatory requirements that impose certain restrictions upon the use of the property, and to provide notice to subsequent owners, lessees and operators of the restrictions including the monitoring, maintenance, and reporting requirements that are outlined in the Deed Notice.	Effectiveness: Institutional controls would not reduce the toxicity, mobility, or volume of contaminants and would not reduce COPC concentrations to protective levels. These controls alone would not be protective of human health because soil contamination exists at concentrations greater than the PRGs. The Site is zoned as commercial, and a deed notice may be implemented to keep this designation in the future. The effectiveness of institutional controls depends on the reliability of their execution, which is most likely controlled by the local government. Implementability: Deed notices have been established for some lots that bind the property owners to certain land use restrictions, notice requirements, and the obligation to inspect and maintain any engineering controls that prevent direct contact with historic fill/soil. Enhancement of existing deed notices may be feasible to allow elevated levels of contaminated soil to remain permanently on-site. Relative cost: Periodic reporting required. Generally low-cost alternative.	Yes
		Zoning/ Ordinances	Restrictions for protection of public health. Issued and enforced by a governing body or regulatory agency. The Site is a Dedicated Industrial Zone by the City of Newark.	Effectiveness: Zoning ordinances alone would not reduce the toxicity, mobility, or volume of contaminants and would not reduce site—related contaminant concentrations to protective levels. These controls alone would not be protective of human health because soil contamination exists at concentrations greater than the PRGs. The effectiveness of ordinances depends on the reliability of their execution, which is most likely controlled by the local government. Implementability: Zoning ordinances have been established for flood zone development. Public approval of additional ordinances to further restrict Site use may be difficult to achieve initially. Ordinance enforcement would be moderately difficult. Relative cost: Generally low-cost alternative. Periodic reporting required.	Yes
	Barriers	Fencing/Signs	Erect a fence and signs around contaminated areas to restrict access and prevent contact with contaminated soils.	Effectiveness: Fencing and warning signs can be effective in reducing human exposure to contaminated soil but do not reduce the toxicity, mobility, or volume of the contamination, which would continue to pose risks to human health and the environment. These controls would not reduce contaminant concentrations to protective levels. Fencing could reduce on-site illegal activities and thus new contaminant sources. May conflict with intended Site use. May be used in conjunction with another technology. Implementability: This process option would be easily implementable for the site since equipment for this process option is readily available. Relative cost: Requires maintenance and monitoring. Periodic inspections and maintenance as required to address damage. Generally low- to moderate-cost alternative.	Yes
Engineering Controls	Cover Systems	Single-Layer Cap	Single-layer caps can consist of a synthetic membrane or a single layer of soil, clay, asphalt, or concrete. Single synthetic membrane caps are the simplest of caps designed to minimize infiltration and prevent direct contact.	Effectiveness: The engineered structure would be effective in preventing direct contact with contaminated soil, promoting runoff, and reducing infiltration and associated dissolution of COPC, but would not reduce toxicity or volume, and would not eliminate contact of groundwater with contaminated soil due shallow groundwater, tidal fluctuations, and flooding. Single-layer caps are relatively susceptible to loss of integrity, unless properly inspected and maintained. Primary drawbacks to single synthetic membrane caps are susceptibility to penetration by animals, weathering, and unequal settlement. Application often combined with use of institutional controls. An effective means of preventing direct contact with impacted soil/fill. Currently present as an engineering control at the Site. Implementability: This process option is technically implementable using conventional earthmoving equipment. The materials, experienced vendors, and equipment are readily available. Installing a cap within the 100-year flood zone could require NJDEP's approval, and would require soil erosion control measures to ensure the integrity of the cap as designed to ensure that the contaminants would not be released or pose risks to human and ecological receptors in case of flooding. Relative cost: Periodic inspections and maintenance as required to address damage. Generally moderate-cost alternative.	Yes
		Combination Cap	Combination caps consist of a synthetic membrane liner overlain by soil, with an asphalt or concrete surface layer. This type of cap can eliminate infiltration, leachate generation, air emissions, and direct contact with contaminated media and provides better protection of groundwater compared to the single-layer cap.	Effectiveness: Due to the presence of several layers, this technology is more likely to be effective in preventing direct contact to impacted soil and historic fill than a single layer cap. A low-permeability layer would help to prevent direct contact with contaminated soil, promote runoff, reduce infiltration and associated dissolution of COPC, and reduce transmission of water or vapor through the cap but would not eliminate contact of groundwater with contaminated soil due shallow groundwater, tidal fluctuations, and flooding. This technology requires maintenance and inspection to maintain integrity. Implementability: This process option is technically implementable using conventional earthmoving equipment. The materials, experienced vendors, and equipment are readily available. Installing a cap within the 100-year flood zone would require NJDEP's approval, and would require soil erosion control measures to ensure the integrity of the cap as designed to ensure that the contaminants would not be released or pose risks to human and ecological receptors in case of flooding. Relative cost: Periodic inspections and maintenance as required to address damage. Generally moderate- to high-cost alternative.	Yes
		Multimedia Cap	Multimedia caps typically have several layers composed of the following: a bedding layer installed on top of the contaminated soil, an impervious layer of clay, a second bedding layer and a second impervious layer, a drainage layer, and vegetative cover. Multimedia caps provide the greatest reduction of soil infiltration and durability compared to the single-layer cap.	Effectiveness: Due to the presence of several layers, this technology is more likely to retain its integrity than a single-layer cap for reducing COPC mobility. A low-permeability layer would help to prevent direct contact with contaminated soil, promote runoff, reduce infiltration and associated dissolution of COPC, and reduce transmission of water or vapor through the cap, but would not reduce toxicity or volume, and would not eliminate contact of groundwater with contaminated soil due shallow groundwater, tidal fluctuations, and flooding. A double low-permeability layer is typically applied as a remedy for waste in place (e.g., landfills, surface impoundments) and preserves open green space. This technology requires maintenance and inspection to maintain integrity. The surface of this cap is not suitable for roadways, parking, and material storage occurring at the Site. Implementability: This process option is technically implementable using conventional earthmoving equipment. The materials, experienced vendors, and equipment are readily available. Installing a cap within the 100-year flood zone could require NJDEP's approval, and would require soil erosion control measures to ensure the integrity of the cap as designed to ensure that the contaminants would not be released or pose risks to human and ecological receptors in case of flooding. Relative cost: Periodic inspections and maintenance as required to address damage. Generally high-cost alternative.	No

TABLE 4-2
TECHNOLOGY SCREENING TABLE - SOIL
IDENTIFICATION OF CANDIDATE TECHNOLOGIES
RIVERSIDE INDUSTRIAL PARK SUPERFUND SITE
NEW JERSEY

GENERAL RESPONSE ACTION	REMEDIAL TECHNOLOGY	PROCESS OPTIONS	DESCRIPTION	SCREENING COMMENTS (Effectiveness, Implementability, and Relative Cost)	RETAINED
Engineering Controls	Vertical Barriers	Slurry Wall	Slurry wall construction typically entails the excavation and backfilling of a trench with either a soil/bentonite or cement/bentonite slurry mixture. Soil/bentonite slurry walls are more flexible, achieve low hydraulic conductivities, and are cheaper than cement/bentonite slurry walls. Where superior strengths are required, cement/bentonite slurry walls can be constructed. To prevent underflow of contaminated groundwater, the slurry walls are typically keyed into underlying confining clay layers within an aquifer. Slurry walls are containment barriers that could be installed inland of the bulkhead wall to help isolate impacted soil from groundwater and the river. May be used in combination with the existing or replaced bulkhead wall to isolate impacted soil.	Effectiveness: A slurry wall would help reduce mobility of COPC and direct contact with most contaminated soil, but would not reduce toxicity or volume. Based upon subsurface voids along existing river wall between building 6 and 10, and possible wall structure tie-backs, slurry wall alignment could be 15-20 feet inland of the present wall where competent soil (needed for slurry wall trench) is likely to exist. This alignment would result in some contaminated soil "outside" of slurry wall reducing its effectiveness. Furthermore, slurry wall construction methods preclude installation along the river bank to prevent erosion or sloughing of Site soils. A slurry wall would not be effective for isolating COPC in soil. Implementability: A slurry wall would be difficult to implement. Active buried infrastructure and building foundations would need to be avoided, removed, or rerouted. Installation may be disruptive to current commercial operations. At some locations (i.e. Buildings 7, 10, and 17) there is insufficient space between river and existing buildings. Geotechnical study of barrier alignment and possible effects on adjacent structures would be needed. Relative cost: No anticipated maintenance. Generally moderate- to high-cost alternative.	Yes
		Shoreline Revetment	Riprap or interlocking concrete block is placed on a prepared subgrade to absorb the energy of waves or flowing water as defense against erosion to help protect the slope and preserve the existing uses of the shoreline.	Effectiveness: Revetment would be installed to enhance or in lieu of the existing bulkhead. Revetment would be placed on a prepared slope and sized according to anticipated maximum flow velocities. Some encroachment into access routes that are immediately inland of the existing wall (i.e., Lots 60 and 61) would be inevitable. At some locations (i.e., Buildings 7, 10, and 17), there are space limitations between the river and existing buildings. If buildings remain, river encroachment is likely. Revetment installation could be complemented by installing berms to control surface water. A geomembrane could be placed under the revetment to reduce potential Site and river interaction (soil and groundwater). Implementability: Implementation of shoreline revetment would require landowner consent and coordination with future redevelopment plans which may pose some difficulty. Inactive river wall pipes would be sealed. Would require a geotechnical investigation for geomembrane installation termination design. If the design includes working below the mudflat to install a geomembrane, the difficulty of construction would be relatively high. Relative costs: Requires maintenance to address damage as identified through routine inspection, especially following extreme precipitation events, to maintain effectiveness. Generally moderate-cost alternative, depending on maintenance requirements from extreme events.	Yes
		Sheet Piling	Sheet pile barrier walls are formed by driving interlocking sheet piles constructed of steel, wood, concrete, or plastic to isolate the contaminated soil from the surrounding environment.	Effectiveness: A barrier would be installed to protect the riverbank from erosion and slumping and reduce potential infiltration from and potential exfiltration to the river. The barrier would reduce the mobility of COPC and exposure by direct contact with contaminated soil, but would not reduce toxicity or volume. If extended above ground surface, a barrier could also help prevent river flooding. Would not serve as an earth retaining structure unless waling and buried tiebacks are also installed. Existing occupied buildings could limit wall placement to more inland portions of the Site. May be used in combination with or in lieu of the existing bulkhead. At some locations (i.e., Buildings 7 and 10), there are space limitations between the river and existing buildings. If buildings remain, river encroachment is likely. Implementability: Demonstration of permit equivalencies would require several months. Geotechnical study of barrier design and possible effects on adjacent structures needed. Quality control is required to ensure proper interlocking of the sheets. Active buried infrastructure and building foundations may need to be removed, avoided or rerouted. Installation may be disruptive to current commercial operations. At some locations (i.e., Buildings 7, 10, and 17) there is insufficient space between river and existing buildings. If buildings remain, river encroachment is likely which would increase the difficulty of implementation. Inactive river wall pipes would be sealed. This technology would be implemented with difficulty using specialty equipment and contractors. Relative cost: Requires maintenance to address damage as identified through routine inspection of exposed portions of the barrier. Generally high-cost alternative.	Yes
		Soil Berm	An earthen dike would be placed along the riverbank to help contain river flow onto the Site during flooding events.	Effectiveness: A dike would likely be an ancillary technology to another form of vertical barrier as a component of an alternative depending on ground surface elevation and relative barrier height to raise the total elevation of the remedy and help control surface water movement onto the Site from the river and potential offsite transport of soil containing COPCs. Soil berms would not reduce the toxicity, mobility, or volume of COPC. If extended above ground surface, a barrier could also help prevent river flooding. Would not serve as an earth retaining structure. Existing occupied buildings could limit berm placement to more inland portions of the Site. May be used in combination with the existing bulkhead. At some locations (i.e., Buildings 7, 10, and 17), there is insufficient space between the river and existing buildings. If buildings remain, river encroachment is likely. Implementability: An earthen berm would be readily implemented. Bulkhead stabilization or improvement could be required if a soil berm is used in combination with the existing bulkhead. Conventional earthmoving equipment and contractors would install clean (i.e., non-contaminated) fill. At some locations (i.e., Buildings 7, 10, and 17) there is insufficient space between river and existing buildings. If buildings remain, river encroachment is likely which would increase the difficulty of implementation. Relative cost: Requires maintenance to address damage as identified through routine of the berm. Generally low-cost alternative.	Yes

TABLE 4-2
TECHNOLOGY SCREENING TABLE - SOIL
IDENTIFICATION OF CANDIDATE TECHNOLOGIES
RIVERSIDE INDUSTRIAL PARK SUPERFUND SITE
NEW JERSEY

GENERAL RESPONSE ACTION	REMEDIAL TECHNOLOGY	PROCESS OPTIONS	DESCRIPTION	SCREENING COMMENTS (Effectiveness, Implementability, and Relative Cost)	RETAINED
Removal	Excavation	Mechanical	Contaminated soil is excavated using conventional excavation equipment. Depending upon the vertical extent of the contaminated soils, dewatering may be required. Sheeting and shoring may be required, depending upon depth and geotechnical conditions. Removal of soil below the groundwater table is not anticipated due the volume of water and soil that would be generated, given the extent of urban fill.	Effectiveness: Excavation is effective for removal where equipment can access the contaminated materials and has space to maneuver. Depending on the extent of excavation, it could completely remove the contamination exceeding the PRGs or leave some residual contamination. However, excavation alone would not reduce the toxicity, mobility, or volume of the contaminants. Excavation is a common construction technique. The excavated soils can either be treated and placed back into the excavation or shipped off-site for treatment/disposal. In the latter case, backfilling with clean (i.e. contaminant free) fill, of appropriate geotechnical properties may be necessary. Implementability: Excavation is technically and administratively feasible at the Site. The presence of subsurface infrastructure such as utilities, tanks and vaults, buildings and building foundations, bulkheads and bulkhead tie-backs may interfere with or prevent excavation. Site redevelopment prior to or in coordination with remediation could mitigate these potentially interfering subsurface features. Requires confirmation sampling. Relative cost: No anticipated long-term maintenance. Generally moderate- to high-cost alternative.	Yes
Treatment	In-Situ Treatment (Biological)	Phytoremedia-tion	The use of plants to remediate environmental media in situ. May or may not involve periodic harvesting of plants, depending upon method utilized. Most effective where constituent containing soil is within ten feet of the ground surface.	Effectiveness: Metabolic reactions with certain organic compounds (e.g., solvents, explosives and crude oil) and uptake of certain metals could reduce volume and mobility of select COPC. Phytoremediation would be limited by the ability of soil to support vegetation, availability of plant species that tolerate and uptake Site contaminants, and duration of growing season. In addition, limited area not currently in use for industrial purposes or planned for future use as such make this technology unattractive. Implementability: Phytoremediation requires a long-term commitment and would be relatively labor intensive with specialized knowledge. May require bench scale/pilot studies during design. Based upon zoning, expected future use, and minimal open space for planting, this technology would be very difficult to implement and is not well suited for the Site. Relative cost: Requires periodic inspections, replacement/harvesting, and confirmation sampling. Generally low- to moderate-cost alternative.	No
		Bioventing	Air is drawn through the impacted vadose zone via extraction wells equipped with low flow vacuums to promote biodegradation by providing only enough oxygen to sustain microbial activity in the vadose zone.	Effectiveness: Applicable only to certain organic contaminants, such as heavier petroleum hydrocarbons (i.e., not readily treated by SVE). This technology would not reduce the toxicity, mobility, or volume of inorganic COPC. Highly dependent on soil geotechnical properties such as air permeability and homogeneity. May require engineering controls due to residual inorganics. Implementability: Implementation of bioventing would be moderately difficult and would need to be coordinated with future Site development to avoid interference with intended land use. May require bench scale/pilot studies during design. Requires a continuous source of energy, blower operation, and confirmation sampling. Relative cost: Generally moderate-cost alternative. No anticipated long-term maintenance.	Yes
	In-Situ Treatment (Physical)	Electrokinetic Remediation	Application of low intensity direct electrical current across electrode pairs implanted in the ground on each side of a chemical containing area of soil, causing electro-osmosis and ion migration. Chemical constituents migrate toward respective electrodes depending upon their charge. Process may be enhanced through use of surfactants or reagents to increase chemical constituent removal rates at the electrodes. Process separates and extracts heavy metals, radionuclides, and organic chemical constituents from saturated or unsaturated soils, sludges, and sediments.	Effectiveness: The presence of buried features such as utility lines, building foundations, irregular/heterogeneous fill can adversely impact efficacy. Methodologies are innovative with limited application history. This technology is not well suited for this Site due to the prevalence of buried metal and soil heterogeneity (density and permeability) which would limit effectiveness. Implementability: The electrokinetic technology would be relatively easy to implement in select areas where buried metal is not as abundant. May require bench scale/pilot studies during design. Relative cost: Requires a continuous source of energy, electrode maintenance, treatment or removal of separated chemical constituents, and confirmation sampling. No anticipated long-term maintenance. Generally high-cost alternative.	No
		Soil Vapor Extraction (SVE)	A vacuum (much greater air exchange than bioventing) is applied to the subsurface though a well network to create a negative pressure gradient that causes the movement of vapors toward the extraction wells. Contaminants are drawn to a collection points and extracted. Extracted vapors are treated, as necessary, and discharged to the atmosphere.	Effectiveness: Applicable only to certain volatile and semi-volatile contaminants, such as petroleum hydrocarbons. The toxicity, mobility, and volume of inorganics would not be reduced. More successful with lighter (more volatile) compounds, such as gasoline. Highly dependent on soil geotechnical properties such as air permeability and homogeneity. Due to high water table (i.e., 4 to 10 feet below ground surface) and corresponding thin vadose zone, short-circuiting to the atmosphere is likely without an impermeable cover layer. Additional treatment of contaminants after collection may be required. Retained for possible application under building foundations to mitigate vapor intrusion where the foundation subbase is likely to provide a permeable, continuous, homogenous layer below the slab. Implementability: SVE is readily implementable with conventional drilling, plumbing, and electrical trades. May require bench scale/pilot studies during design. If vapor treatment is required, spent treatment media would need to be removed for disposal or regeneration. Relative cost: Requires a continuous source of energy, blower operation, and confirmation sampling. No anticipated long-term maintenance. Generally moderate-cost alternative.	Yes
		Air Stripping and Air Sparging	An array of injection wells is used to inject gas (e.g., air, oxygen, or ozone) under pressure to volatilize chemicals sorbed to soil, dissolved in groundwater, or present as non-aqueous phase liquid and to stimulate biodegradation in unsaturated soil. Oxygen levels, nutrients, and pH can be controlled to enhance biological activity.	Effectiveness: Applicable only to volatile organic contaminants. The toxicity, mobility, and volume of inorganics would not be reduced. Highly dependent on soil geotechnical properties such as air permeability and homogeneity. Due to high water table (i.e., 4 to 10 feet below ground surface) and corresponding thin vadose zone, short-circuiting to the atmosphere is likely without an impermeable cover layer. In addition, due to fluctuating water table, vaporized contaminants in the vadose zone at low tide could re-enter the aqueous phase at high tide, reducing overall efficiency. Implementability: Air sparging and air stripping is readily implementable with conventional drilling, plumbing, and electrical trades. May require bench scale/pilot studies during design. If vapor treatment is required, spent treatment media would need to be removed for disposal or regeneration. Relative cost: Requires a continuous source of energy, blower operation, and confirmation sampling. No anticipated long-term maintenance. Generally moderate-cost alternative.	Yes

TABLE 4-2
TECHNOLOGY SCREENING TABLE - SOIL
IDENTIFICATION OF CANDIDATE TECHNOLOGIES
RIVERSIDE INDUSTRIAL PARK SUPERFUND SITE
NEW JERSEY

GENERAL RESPONSE ACTION	REMEDIAL TECHNOLOGY	PROCESS OPTIONS	DESCRIPTION	SCREENING COMMENTS (Effectiveness, Implementability, and Relative Cost)	RETAINED
Treatment	In-Situ Treatment (Physical)	Multi-phase Extraction (MPE)	MPE is a technology that extracts soil vapor and groundwater simultaneously. The groundwater table is lowered in order to dewater the saturated zone. This allows the VOCs sorbed on the previously saturated soil to be stripped by the induced vapor flow and extracted. In addition, soluble VOCs in the extracted groundwater are removed. There are two types of MPE: two-phase extraction (TPE) and Low or High Vacuum Dual-Phase extraction.	Effectiveness: Applicable only to volatile organic contaminants. The toxicity, mobility, and volume of inorganics would not be reduced. Highly dependent on soil geotechnical properties such as air permeability and homogeneity. Vadose zone thickness and variability due to tidally influenced groundwater elevations is not amenable to this technology. Implementability: MPE is implementable with moderate difficulty requiring specialized contractors. May require bench scale/pilot studies during design. If vapor treatment is required, spent treatment media would need to be removed for disposal or regeneration. Dewatering could generate significant water volumes for management/treatment/disposal. Relative Cost: Requires a continuous source of energy, blower operation, and confirmation sampling. No anticipated long-term maintenance. Generally moderate-cost alternative.	No
		Soil Flushing - Surfactant-Enhanced Aquifer Remediation	A surfactant solution is injected into the constituent containing zone while water is simultaneously removed to maintain hydraulic control over the movement of the surfactant solution and the mobilized chemical constituents. Surfactant flooding is followed by water flooding to remove residual chemical constituents and injected chemicals.	Effectiveness: Highly dependent on soil geotechnical properties such as permeability and homogeneity and contaminant sorption properties as influenced by soil geochemistry. The toxicity, mobility, and volume of COPC in vadose zone soil would not be reduced. Implementability: Soil fushing is implementable with moderate difficulty and would need specialized contractors. The tidal influence on the saturated zone may necessitate significant design and operational controls to maintain surfactant recovery. May require bench scale/pilot studies during design. Relative cost: Requires a continuous power source, pumping, confirmation sampling, and treatment of extracted flushing liquids. No anticipated long-term maintenance. Generally high-cost alternative.	No
		Cosolvent Flushing	Cosolvent flushing involves injecting a solvent mixture (e.g., water plus a miscible organic solvent such as alcohol) into either vadose zone, saturated zone, or both to extract organic chemical constituents.	Effectiveness: Highly dependent on soil geotechnical properties such as air permeability and homogeneity and contaminant sorption properties as influenced by soil geochemistry. Implementability: Cosolvent fushing is implementable with moderate difficulty and would require specialized contractors. The tidal influence on the saturated zone may necessitate significant design and operational controls to maintain solvent recovery. May require bench scale/pilot studies during design. Relative cost: Requires a continuous power source, pumping, confirmation sampling, and treatment of extracted flushing liquids. No anticipated long-term maintenance. Generally high-cost alternative	No
		Thermal Remediation	Thermal heating uses electrical resistance or gas well heating techniques to remove sorbed organics contaminants by heating the subsurface sufficiently to vaporize the organics. This technology can be applied to chemicals in both the vadose and saturated zones. The volatile organic compound vapors are recovered through vapor extraction wells.	Effectiveness: Limited to only to organic contaminants. The toxicity, mobility, and volume of COPC in vadose zone soil would not be reduced. Additional treatment of contaminants after collection is required. Shallow water table may lead to inefficiency as energy needed to vaporize organics is lost to groundwater. Implementability: Significant energy inputs (electricity or gas) is necessary, which may take several months to procure. The treatment system may require permitting. May require bench scale/pilot studies during design. Relative cost: Requires a continuous power source, heating and blower operation, confirmation sampling, and treatment/disposal of condensate. No anticipated long-term maintenance. Generally high-cost alternative.	No
	In-Situ (Chemical)	In-situ Chemical Oxidation (ISCO)	Chemical oxidation by injecting and mixing oxidizing agents such as hydrogen peroxide, sodium and potassium permanganate, ozone, sodium and potassium persulfate. Most organic contaminants are amenable to oxidation.	Effectiveness: Would reduce toxicity, mobility, and volume of organic COPC in soil. Ambient oxidant demands must be estimated, to develop a proper dosing regimen. Implementability: Would be implemented with moderate difficulty using conventional excavating equipment and potentially proprietary treatment agents. Bench scale testing and treatability/pilot study may be required during design. Relative cost: Requires post-treatment demonstration sampling and possibly multiple mixing events. Generally moderate-cost alternative.	Yes
	In-Situ Treatment (Thermal)	Steam Stripping	Steam is injected into soil so that chemical constituents are volatilized and can be removed via extraction wells.	Effectiveness: Limited to only to organic contaminants. Additional treatment of contaminants after collection is required. The toxicity, mobility, and volume of COPC in vadose zone soil would not be reduced. Significant energy inputs (electricity or gas) is necessary to generate steam. Shallow water table may lead to inefficiency as energy needed to vaporize organics is lost to groundwater. Effectiveness is highly dependent on soil geotechnical properties such as air permeability and homogeneity. Due to shallow groundwater, control and collection of steam is likely to be difficult. Implementability: Steam stripping would be difficult to implement. Significant energy inputs (electricity or gas) is necessary, which may take several months to procure. The treatment system may require permitting. May require bench scale/pilot studies during design. Relative cost: Requires continuous energy input, compressor and blower operation, confirmation sampling, and treatment of collected steam and condensate. Generally high-cost alternative	No
		Vitrification	Uses an electric current to melt soil or other earthen materials at extremely high temperatures (2,900 to 3,650°F). Inorganic chemical constituents are incorporated into the vitrified glass and crystalline mass and organic pollutants are destroyed by pyrolysis. In situ applications use graphite electrodes to heat soil.	Effectiveness: Interference from buried features (e.g. utilities, building foundations) are expected to adversely impact application. Impacts of heat generation on neighboring users and receptors must be accounted for. Due to shallow groundwater, significant steam generation is anticipated and energy needed to pyrolyze organics is lost to groundwater. Effective control and collection of steam is likely to be difficult. Implementability: Vitrification would be difficult to implement. Significant energy inputs (electricity or gas) is necessary, which may take several months to procure. The treatment system may require permitting. May require bench scale/pilot studies during design. Relative cost: Requires significant energy input, blower operation, and treatment collected steam/vapors. No anticipated long-term maintenance. Generally, very high-cost alternative.	No

TABLE 4-2
TECHNOLOGY SCREENING TABLE - SOIL
IDENTIFICATION OF CANDIDATE TECHNOLOGIES
RIVERSIDE INDUSTRIAL PARK SUPERFUND SITE
NEW JERSEY

GENERAL RESPONSE ACTION	REMEDIAL TECHNOLOGY	PROCESS OPTIONS	DESCRIPTION	SCREENING COMMENTS (Effectiveness, Implementability, and Relative Cost)	RETAINED
Treatment	In-Situ Treatment (Immobilization)	Stabilization/ Solidification (Organic and Inorganic Based)	Chemical immobilization of materials by injecting and mixing a stabilization/solidification agent into the soil.	Effectiveness: Stabilization/solidification would reduce mobility, but not toxicity or volume of COPC. Near-surface pressure injection of dissolved or suspended treatment agents in heterogeneous Site soils may result in uneven mixing (i.e., poor penetration in fine-grained soil, and preferential flow along utility corridors). Interference from buried features (e.g. utilities, building foundations) may adversely impact mechanical mixing in some areas. Community impacts from odors and contaminant volatilization must be controlled. Implementability: Stabilization/solidification would be readily implemented using conventional earthmoving equipment, with some specialized expertise to determine reagent type and mixing ratios. Mixing to the top of the water table is anticipated to allow incorporation of Site groundwater for hydrolysis. Extensive treatability testing and mixing regiment studies may be required during design. Relative cost: Requires stabilization/solidification agent, mixing or injection, and confirmation sampling. No anticipated maintenance. Generally moderate-cost alternative.	Yes
Treatment	Ex-Situ Treatment (Immobilization)	Stabilization/ Solidification (Organic and Inorganic Based)	Chemical immobilization of materials by excavating and mixing a stabilization/solidification agent into the soil.	Effectiveness: Stabilization/solidification would reduce mobility, but not toxicity or volume of COPC. Coarse fill materials (e.g. concrete, wood) must be separated. Community impacts from odors and contaminant volatilization must be controlled. Excavation to the top of the water table is anticipated. Implementability: Stabilization/solidification would be readily implemented using conventional earthmoving equipment, with some specialized expertise to determine reagent type and mixing ratios. Extensive treatability testing and mixing regiment studies may be required during design. Would require off-site disposal and backfilling with clean (i.e., contaminant-free) fill. Relative cost: Requires excavation, confirmation sampling, stabilization/solidification agent, mixing, and off-site disposal of treated soil. No anticipated maintenance. Generally moderate-cost alternative.	Yes
	Ex-Situ Treatment (Extraction)	Solvent Extraction	A solvent is used to extract organic chemical constituents from excavated soils. The solvent is separated from the materials and reused.	Effectiveness: Coarse fill materials (e.g. concrete, wood) must be separated. Limited to organics. Would not reduce mobility, toxicity, or volume of inorganic COPC. Results are variable depending on geotechnical and geochemical conditions. Typically applied to limited areas with significant impacts (hot spots). Implementability: Solvent extraction is implementable with moderate difficulty due to the need for specialized contractors. May require bench scale/pilot studies during design. Relative cost: Requires excavation, confirmation sampling, solvent, pumping/recirculation, and treatment/disposal of solvent. No anticipated long-term maintenance. Generally high-cost alternative.	No
	Ex-Situ Treatment (Thermal)	Thermal Desorption	Chemical constituents are separated from the excavated soils at a relatively low temperature and are condensed into a concentrated liquid form suitable for transport offsite to a traditional treatment or disposal facility.	Effectiveness: Coarse fill materials (e.g. concrete, wood) must be separated. Limited to organics. Would not reduce mobility, toxicity, or volume of inorganic COPC. Treated soil may contain residual organics or metals. Typically applied to limited areas with significant impacts (hot spots). Implementability: Thermal desorption is implementable with moderate difficulty due to the need for specialized contractors. May require bench scale/pilot studies during design. PCB Aroclor concentrations above 50 ppm have not been encountered at the Site, but if reported during the pre-design investigation, appropriate actions will be taken. Relative cost: Requires excavation, confirmation sampling, a continuous power source, heating and blower operation, and treatment/disposal of condensate. No anticipated long-term maintenance. Generally high-cost alternative.	Yes
		Incineration	Excavated soils are thermally treated in a fluidized bed, rotary kiln, cement kiln, or infrared incinerator, which may require RCRA permitting. Incineration may be performed on-site or off-site using mobile or fixed facilities.	Effectiveness: Coarse fill materials (e.g. concrete, wood) must be separated. Limited to organics. Would not reduce mobility, toxicity, or volume of inorganic COPC. Implementability: On-site incineration would be difficult to implement due to the need for specialized contractor and permitting requirements. Requires a significant energy source, which may require months to procure and/or generate significant greenhouse gas. May require bench scale/pilot studies during design. Off-site incineration at an existing permitted facility is implementable but will require rail transport to an out of state facility, PCB Aroclor concentrations above 50 ppm have not been encountered at the Site, but if reported during the pre-design investigation, appropriate actions will be taken. Relative cost: Requires excavation, dewatering and confirmation sampling. On-site treatment will require significant energy input, airborne particulate removal, acid gas neutralization, disposal of captured particulates and ash, and air monitoring. Off-site treatment will require rail transport. No anticipated long-term maintenance. Generally, very high-cost alternative.	Yes, for off-site treatment only.
		Pyrolysis	Pyrolysis is a process of destructive distillation, using a reduced oxygen atmosphere. Organic contaminants are thermally decomposed into ions. The process converts waste into a clean product gas and an inert vitrified slag that requires no further waste treatment and is suitable for long term storage or reuse.	Effectiveness: The volume and toxicity of organic COPC and the mobility of inorganic COPC would be reduced. Significant amounts of energy are required. Coarse fill materials (e.g. concrete, wood) must be separated. Implementability: Requires a significant energy source, which may be difficult to procure and/or generate significant greenhouse gas. May require bench scale/pilot studies during design. Relative cost: Requires excavation, confirmation sampling, significant energy input, airborne particulate removal, acid gas neutralization, disposal of captured particulates and ash, and air monitoring. No anticipated long-term maintenance. Generally, very high-cost alternative	No
		Vitrification	Uses an electric current to melt soil or other earthen materials at extremely high temperatures (2,900 to 3,650°F). Inorganic chemical constituents are incorporated into the vitrified glass and crystalline mass and organic pollutants are destroyed by pyrolysis.	Effectiveness: The volume and toxicity of organic COPC and the mobility of inorganic COPC would be reduced. Significant amounts of energy are required. Coarse fill materials (e.g. concrete, wood) must be separated. Implementability: Requires a significant energy source, which may be difficult to procure and/or generate significant greenhouse gas. May require bench scale/pilot studies during design. Relative cost: Requires excavation, confirmation sampling, significant energy input, airborne particulate removal, acid gas neutralization, disposal of captured particulates and ash, and air monitoring. No anticipated long-term maintenance. Generally, very high-cost alternative	No

TABLE 4-2
TECHNOLOGY SCREENING TABLE - SOIL
IDENTIFICATION OF CANDIDATE TECHNOLOGIES
RIVERSIDE INDUSTRIAL PARK SUPERFUND SITE
NEW JERSEY

GENERAL RESPONSE ACTION	REMEDIAL TECHNOLOGY	PROCESS OPTIONS	DESCRIPTION	SCREENING COMMENTS (Effectiveness, Implementability, and Relative Cost)	RETAINED
Treatment	Ex-Situ Treatment (Biological)	Landfarming/ Composting	Soil is mixed with amendments and placed on a treatment area. Leachate collection is provided. The soil and amendments are mixed using a windrow composter, conventional tilling equipment, or other means to provide aeration. Moisture, heat, nutrients, oxygen, and pH can be controlled to enhance biodegradation. Other organic amendments such as wood chips or alfalfa are added to composting systems. Land-farmed soil would either be used as backfill in excavated areas or removed for off-site disposal.	Effectiveness: Landfarming would be effective in reducing volume and toxicity of organic COPC, but would not reduce toxicity, mobility, or volume of inorganic COPC. Coarse fill materials (e.g. concrete, wood) must be separated. Due to inorganic residuals, landfarming would be an ancillary technology to containment and/or institutional controls. Implementability: Landfarming would be difficult to implement due to significant space and time requirements conflicting with current and anticipated land use/redevelopment. May require bench scale/pilot studies during design. Potential community impacts from odors and contaminant volatilization must be controlled. May require procurement of off-site clean (i.e., contaminant-free) soil for backfilling excavations. Relative cost: Requires excavation, confirmation sampling, amending agents, mixing, leachate treatment/disposal, and vapor collection/treatment. No long-term maintenance. Generally low- to moderate-cost alternative.	No
		Biopiles	Excavated soil is mixed with amendments and placed in aboveground enclosures and aerated with blowers or vacuum pumps. Moisture, heat, nutrients, oxygen, and pH can be controlled to enhance biodegradation.	Effectiveness: Biopiles would be effective in reducing volume and toxicity of organic COPC, but would not reduce toxicity, mobility, or volume of inorganic COPC. Coarse fill materials (e.g. concrete, wood) must be separated. Due to inorganic residuals, biopiles would be an ancillary technology to containment and/or institutional controls. Implementability: Biopiles would be difficult to implement due to significant space and time requirements conflicting with current and anticipated land use/redevelopment. May require bench scale/pilot studies during design. Potential community impacts from odors and contaminant volatilization must be controlled. May require procurement of off-site clean (i.e., contaminant-free) soil for backfilling excavations. Relative cost: Requires excavation, confirmation sampling, mixing, leachate treatment/disposal, and vapor collection/treatment. No long-term maintenance. Generally low- to moderate-cost alternative.	No
	Ex-Situ Treatment (Chemical)	Chemical Oxidation	Chemical oxidation by mixing oxidizing agents such as hydrogen peroxide, sodium and potassium permanganate, ozone, sodium and potassium persulfate. Most organic contaminants are amenable to oxidation.	Effectiveness: Would reduce toxicity, mobility, and volume of organic COPC in soil. Ambient oxidant demands must be estimated, to develop a proper dosing regimen. Implementability: Would be implemented with moderate difficulty using conventional excavating equipment and potentially proprietary treatment agents. Bench scale testing and treatability/pilot study may be required during design. Relative cost: Requires post-treatment demonstration sampling and possibly multiple mixing events. Generally moderate-cost alternative.	Yes
Beneficial Reuse	Beneficial reuse	On-Site Fill	Soil testing (treated or untreated) results would be used to demonstrate attainment of appropriate cleanup standards for on-site placement as excavation backfill or other beneficial use.	Effectiveness: Beneficial reuse is only suitable for material with low concentrations of contaminants. May be an ancillary technology to on-site treatment. Implementability: Beneficial reuse would be readily implementable following testing and determination of equivalency with NJDEP's "Fill Material Guidance for SRP Sites" dated April 2015. Coarse fil materials (e.g., concrete) may need to be segregated to suit reuse criteria (i.e., road base material, engineered fill, etc.). Conventional earthmoving equipment would be used for debris segregation. Off-site disposal of debris and oversized materials may be required. Relative cost: Requires soil/fill testing and possible off-site disposal of segregated unsuitable fill material. Generally low- to moderate-cost alternative.	Yes
Disposal	Disposal (off-site)	Solid Waste or Hazardous Waste Landfill	Excavated soils are transported to an appropriate licensed facility for landfilling, or beneficial reuse. Treatment prior to disposal may be necessary.	Effectiveness: Landfill disposal is effective in preventing direct contact with and reducing the mobility of contaminants. The volume and toxicity of the waste would not be reduced unless treatment is conducted. Implementability: This technology is readily implementable. Depending on the daily capacity of the disposal facility, production rates may be limited. Soils must be characterized prior to disposal. Disposal restrictions may require pretreatment prior to disposal. Relative cost: Requires waste characterization and disposal fees. Trucking costs can be significant. No long-term maintenance. Generally moderate- to high-cost alternative.	Yes

TABLE 4-3
TECHNOLOGY SCREENING TABLE – GROUNDWATER
IDENTIFICATION OF CANDIDATE TECHNOLOGIES
RIVERSIDE INDUSTRIAL PARK SUPERFUND SITE
NEW JERSEY

GENERAL RESPONSE ACTION	REMEDIAL TECHNOLOGY	PROCESS OPTIONS	DESCRIPTION	SCREENING COMMENTS (Effectiveness, Implementability, and Relative Cost)	RETAINED
No Action	Not Applicable	Not Applicable	Under this response action, no active response action will be taken to address concerns regarding contaminated groundwater. The no action alternative is required to be considered by the NCP to provide a baseline against which all other alternatives may be compared.	Effectiveness: No action would not be effective in reducing toxicity, mobility, or volume for potential source material or principal threat waste and would not meet RAOs. Implementability: Because no action would be taken, this option is the easiest to implement. Relative cost: No capital, administrative, or O&M cost. Lowest cost alternative.	Yes
Institutional Controls/Access Restrictions	Use Restrictions	Classification Exception Area (CEA)	Submit to the NJDEP an application with the necessary information to establish a classification exception area, that gives notice of the fact that groundwater in the area does not meet designated use requirements.	Effectiveness: CEAs would not reduce the toxicity, mobility, or volume of contaminants and would not reduce COPC concentrations to protective levels. These controls alone would not be protective of human health because contamination exists at concentrations greater than PRGs. CEAs have been established for some lots to prevent groundwater use for purposes other than monitoring. CEAs will remain in place as long as groundwater does not meet designated use standards. Implementability: CEAs have been established for some lots that bind the property owners to groundwater use restrictions and notice requirements. Designation of additional CEAs may be feasible. Relative cost: Groundwater monitoring and periodic reporting will be required as a component of the CEA. Generally low-cost alternative.	Yes
		Well Restriction Area (WRA)	Typically, part of a classification exception area, the NJDEP establishes a prohibition for installing wells for potable or other uses in the designated area	Effectiveness: WRAs would not reduce the toxicity, mobility, or volume of contaminants and would not reduce COPC concentrations to protective levels. These controls alone would not be protective of human health because contamination exists at concentrations greater than PRGs. Well Restriction Areas (WRAs) have been established for lots with CEAs and will remain in place as long as groundwater does not meet designated use standards. Implementability: Designation of WRAs for additional CEAs would be required. Relative cost: Periodic reporting is required to demonstrate compliance. Generally low-cost alternative.	Yes
	Barriers	Fencing/Signage	Sumps in existing buildings and future buildings present opportunities for groundwater exposure into basements. Access restrictions via fencing or secured utility room/vault to restrict access and prevent contact with groundwater and vapors. Warning signs also.	Effectiveness: Fencing and warning signs can be effective in reducing human exposure to contaminated groundwater but do not reduce the toxicity, mobility, or volume of the contamination, which would continue to pose risks to human health and the environment. These controls would not reduce contaminant concentrations to protective levels. May conflict with intended Site use. May be used in conjunction with another technology. Implementability: This process option would be easily implementable for the site since equipment for this process option is readily available. Relative cost: Requires maintenance and monitoring. Periodic inspections and maintenance as required to address damage. Generally low- to moderate-cost alternative.	Yes
Engineering Controls	Subsurface Barriers	Slurry Walls	Slurry wall construction typically entails the excavation and backfilling of a trench with either a soil/bentonite or cement/bentonite slurry mixture. Soil/bentonite slurry walls are more flexible, achieve low hydraulic conductivities, and are cheaper than cement/bentonite slurry walls. Where superior strengths are required, cement/bentonite slurry walls can be constructed. To prevent underflow of contaminated groundwater, the slurry walls are typically keyed into underlying confining clay layers within an aquifer.	Effectiveness: Slurry walls are containment barriers applicable to plume control (mobility reduction) and can be used with various technologies and process options to help isolate impacted groundwater and achieve hydraulic control. Due to relatively permeable historic fill and proximity of river, would require surrounding the hydraulic control area to prevent lateral groundwater inflow. A thicker wall than would be typical may be required to resist tidal influence. Existing occupied buildings would limit wall placement and capture area. May be used in combination with the existing or replaced bulkhead wall to isolate the capture area. Based upon subsurface voids along existing river wall between building 6 and 10, and possible wall structure tie backs, slurry wall alignment could be 15-20 feet inland of the present river wall where competent soil (needed for slurry wall trench) is likely to exist. This alignment would result in some soil/fill and groundwater "outside" of slurry wall thus reducing overall effectiveness. Implementability: A slurry wall would be difficult to implement. Active buried infrastructure and building foundations would need to be avoided, removed, or rerouted. Installation may be disruptive to current commercial operations. At some locations (i.e. Buildings 7, 10, and 17) there is insufficient space between river and existing buildings. Geotechnical study of barrier alignment and possible effects on adjacent structures needed. Relative cost: No anticipated maintenance. Generally moderate- to high-cost alternative.	Yes
		Sheet Piling	Sheet pile barrier walls are formed by driving interlocking sheet piles constructed of steel, wood, concrete, or plastic to isolate the contaminated soil from the surrounding environment. As with slurry wall, sheet piling is commonly keyed into lower confining layers to prevent groundwater underflows.	Effectiveness: A barrier would be installed to replace the deteriorated portions of the bulkhead wall to reduce influence of river water on Site groundwater (tidal effects), and reduce potential groundwater exfiltration to river thereby reducing potential mobility of groundwater COPC. Sheet piling would not reduce toxicity or volume. If extended above ground surface, a barrier could also help prevent river flooding, river sediment deposition on Site, infiltration of flood water, and serve as a Site surface water control feature. Inactive river wall pipes would be sealed. Existing occupied buildings would limit wall placement and capture area for inland portions of the Site. May be used in combination with the existing or replaced bulkhead wall to isolate the capture area. At some locations (i.e., Buildings 7, 10, and 17), there are space limitations between the river and existing buildings. If buildings remain, river encroachment is likely. Implementability: Quality control is required to ensure proper interlocking of the sheets. Active buried infrastructure and building foundations could need to be removed, avoided or rerouted. Installation may be disruptive to current commercial operations. Geotechnical study of barrier alignment and possible effects on adjacent structures needed. Relative cost: Requires maintenance to address damage as identified through routine inspection of exposed portions of the barrier. Generally moderate- to high-cost alternative.	Yes
		Grout Curtains	Grout curtains are fixed, subsurface barriers formed by the pressure injection of grout in a regular pattern of drilled holes. Typically, the grout is injected into pipes arranged in a pattern of two or three adjacent rows. The injected grout fills open pore spaces and sets or gels in the soil voids, reducing the permeability of the grouted area.	Effectiveness: Grout curtains are similar to slurry walls although they do not require extensive trenching. Installation and propagation of grout may be difficult in cases of debris fill or heterogeneous subsurface media. Would not be applicable for installation near the river bank due to the potential for grout loss into the river. Due to relatively permeable historic fill and proximity of river, would require surrounding the hydraulic control area to prevent hydraulic communication with the river. Existing occupied buildings would limit curtain placement and capture area. Additionally, existing buried infrastructure may create preferential pathways (i.e., voids and more permeable bedding) preventing a continuous barrier. Implementability: Grout curtains would be somewhat difficult to implement due to buried infrastructure and existing buildings. Treatability studies to design the grout and injection pattern may be required and geotechnical study of barrier alignment and possible effects on adjacent structures. Installation may be disruptive to current commercial operations. Relative cost: No anticipated maintenance. Generally moderate-cost alternative.	No

TABLE 4-3
TECHNOLOGY SCREENING TABLE – GROUNDWATER
IDENTIFICATION OF CANDIDATE TECHNOLOGIES
RIVERSIDE INDUSTRIAL PARK SUPERFUND SITE
NEW JERSEY

GENERAL RESPONSE ACTION	REMEDIAL TECHNOLOGY	PROCESS OPTIONS	DESCRIPTION	SCREENING COMMENTS (Effectiveness, Implementability, and Relative Cost)	RETAINED
Engineering Controls	Subsurface Barriers	Diaphragm Walls	Diaphragm walls are barriers composed of reinforced concrete panels emplaced by slurry trenching techniques. They may be cast-in-place or pre-cast and are capable of supporting heavy loads. Diaphragm walls can only be expected to have permeabilities comparable to cement/bentonite walls if the joints between the cast panels are made correctly. As with other containment methods, these would have to be keyed into a lower confining layer to prevent groundwater underflow.	Effectiveness: Similar to slurry walls. Due to relatively permeable historic fill and proximity of river, would require surrounding the hydraulic control area to prevent hydraulic communication with the river. Existing occupied buildings would limit wall placement and capture area. May be used in combination with the existing bulkhead wall isolate the capture area. Active existing buried infrastructure would need to be avoided, removed, or rerouted. Installation may be disruptive to current commercial operations. At some locations (i.e. Buildings 7and 10) there is limited space between river and existing buildings. Based upon subsurface voids along existing river wall between building 6 and 10, and possible wall structure tie backs, slurry wall alignment could be 15-20 feet inland of the present wall where competent soil (needed for slurry wall trench) is likely to exist. This alignment would result in some soil/historic fill "outside" of slurry wall. Implementability: Installation generates a large amount of spoils. Installation is difficult where subsurface contains coarse fill. Geotechnical study of barrier alignment and possible effects on adjacent structures needed. Relative cost: Requires maintenance to address damage as identified through periodic inspection. Generally high-cost alternative. Does not offer benefits over other less costly options.	No
Removal	Collection Systems	Well Point Dewatering Systems	A well point dewatering system consists of an array of well points (constructed of steel pipes with perforated tips) that are driven into the aquifer and connected at the surface by a manifold hooked up to a vacuum system.	Effectiveness: As a stand-alone technology, well points would not reduce toxicity or volume of COPC but would reduce mobility. For maximum operating efficiency, lift attainable by suction pump is about 22 feet. System design parameters are dependent upon site hydrogeologic conditions. The river presents a boundary condition that will likely hinder the development of a mature cone of depression. To create appropriate capture zones, removed water volumes could be significant due to river influence (recharge). Induced infiltration of river water should be minimized to optimally address impacted groundwater by selective well point placement and possible installation of a subsurface barrier between the well points and river. Typically used for short-term withdrawal in preparation for soil excavation (i.e., manifold and pipes are not buried for freeze protection and well points may lose efficiency from biological fouling or sedimentation). No perceived benefit to removal of groundwater using well points vs. removal directly from an excavation, except for possible reduction of suspended solids via in situ filtration through the formation. Implementability: Well points would be relatively easy to install and add or replace as needed for effective dewatering on a temporary basis. Relative cost: Requires a continuous power source, vacuum blower, and well point maintenance. Ongoing operation and maintenance activities. Generally low-cost alternative.	No
		Ejector Wells	Ejector well construction specifications are similar to those of well points. Pumping and extraction of groundwater is achieved by bubbling air upward through the well casing and allowing the air pressure to lift the groundwater to the surface. Ejector wells are applicable for high-lift, low-flow conditions.	Effectiveness: As a stand-alone technology, wells would not reduce toxicity or volume of COPC, but would reduce mobility. Ejector wells have very low operating efficiencies. System design parameters are dependent upon site hydrogeologic conditions. The river presents a boundary condition that will likely hinder the development of a mature cone of depression. To create appropriate capture zones, removed water volumes could be significant due to river influence (recharge). Due to inherent low-flow capability and anticipated recharge rates due to river proximity, well spacing would be relatively close. Induced infiltration of river water should be minimized to optimally address impacted groundwater by selective well screen placement and possible installation of a subsurface barrier between the wells and river. Not applicable for this setting due to shallow groundwater (i.e., high-lift not required). Implementability: Ejector wells would be readily implemented with conventional drilling contractors. Relative cost: Requires a continuous power source, compressor, ejector well maintenance. Ongoing operation and maintenance activities. Generally low-cost alternative.	No
		Pumping Wells	Pumping wells are similar to traditional wells and are installed in a boring consisting of riser casing, well screen, and sand filter pack. The wells can be installed at regular intervals across a site to allow for the overlapping of the cones of depression (capture zones) created by simultaneous pumping to achieve the collection of contaminated groundwater and halt the migration of a plume.	Effectiveness: As a stand-alone technology, wells would not reduce toxicity or volume of COPC, but would reduce mobility. System design parameters are dependent upon site hydrogeologic conditions. The river presents a boundary condition that will likely hinder the development of a mature cone of depression. To create appropriate capture zones, removed water volumes could be significant due to river influence (recharge). Induced infiltration of river water should be minimized to optimally address impacted groundwater by selective well screen placement and possible installation of a subsurface barrier between the wells and river. There are no unacceptable health risks under the current use and CEAs are anticipated for those lots currently without one to prevent groundwater use for other than monitoring Groundwater concentrations of some COPCs were lower for the last event than prior events. Pump and treat options may address organic COPC but would not eliminate ongoing dissolution of inorganic COPC to groundwater that remains in contact with urban fill or remaining contaminated soils. Implementability: Wells would be readily implemented with conventional drilling contractors. Requires a continuous power source, pump, and well maintenance. Ongoing operation and maintenance activities. Relative cost: Generally moderate-cost alternative.	Yes
Removal	Collection Systems	Subsurface Drains	Subsurface drains include any type of buried conduit used to convey and collect groundwater by gravity flow. They function like an infinite line of extraction wells, creating a continuous zone of influence enabling groundwater within these zones to flow toward the drain. Subsurface drains installed along a line or at regular intervals across a site are constructed by trench excavation in the aquifer of concern, placement of a perforated drainage pipe in the base of the trench, and backfilling of the trench with aggregate. The individual drain pipes subsequently drain into a collection sump, which can be emptied (pumped) periodically.	Effectiveness: As a stand-alone technology, drains would not reduce toxicity or volume of COPC, but would reduce mobility. Subsurface drains are most effective for shallow depths of less than 20 feet. System design parameters are dependent upon site hydrogeologic conditions. The river presents a boundary condition that will likely hinder the development of a mature cone of depression. To create appropriate capture zones, removed water volumes could be significant due to river influence (recharge). Induced infiltration of river water should be minimized to optimally address impacted groundwater by selective well screen placement and possible installation of a subsurface barrier between the wells and river. There are no unacceptable health risks under the current use and CEAs are anticipated for those lots currently without one to prevent groundwater use for other than monitoring. Groundwater concentrations of some COPCs were lower for the last event than prior events. Pump and treat options may address organic COPC but would not eliminate ongoing dissolution of inorganic COPC to groundwater that remains in contact with urban fill or remaining contaminated soils. Implementability: Wells would be readily implemented with conventional trenching equipment and pipe contractors. Relative cost: Disposal of cuttings required. Requires a continuous power source, ongoing pump, and sediment flushing/removal from collection pipes and sumps. Ongoing operation and maintenance activities. Generally moderate- to high-cost alternative	Yes

TABLE 4-3
TECHNOLOGY SCREENING TABLE – GROUNDWATER
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GENERAL RESPONSE ACTION	REMEDIAL TECHNOLOGY	PROCESS OPTIONS	DESCRIPTION	SCREENING COMMENTS (Effectiveness, Implementability, and Relative Cost)	RETAINED
Treatment	Ex-Situ (Physical)	Coagulation, flocculation, and sedimentation	Coagulation, flocculation, and sedimentation are the combination of three processes for the removal of solids in water. Sedimentation is the separation of suspended particles that are heavier than water by gravitational settling. Coagulation is a chemical technique directed towards the destabilization of colloidal particles in the water into larger particles which can settle out. Flocculation is a slow mixing technique which promotes the agglomeration of the destabilized particles to precipitate out of the water.	Effectiveness: As a stand-alone technology, these processes would not reduce toxicity or volume of COPC but would reduce mobility. Coagulation, flocculation, and sedimentation are an integral part of any aqueous treatment system and are used specifically for the removal of suspended solids. Reduction of toxicity and volume of organics and dissolved inorganics will also require treatment via other physical or chemical processes. As indicated for removal technologies, pump and treat options would offer marginal improvement of groundwater quality and are not carried forward for detailed analysis. Implementability: This technology would be implemented with moderate difficultly via water treatment specialists. May require bench scale/pilot studies during design. Following start-up of possible extraction options, total suspended solids concentrations should be manageable with other options to avoid addition of coagulants. Relative cost: Requires a continuous power source, mixing and settling tanks, chemical additives, chemical metering, and monitoring of discharge. Requires regular O&M support and depending on flows and treatment complexity could be continuous (i.e., 24/7). Ongoing operation and maintenance activities. Generally moderate-cost alternative.	No
		Filtration	Filtration is the separation and removal of suspended solids from a liquid by passing the liquid through a porous medium comprised of a fibrous fabric, a screen, or a bed of granular material. To aid filtration, ground cellulose or diatomaceous earth is commonly added to the filter medium. Fluid flow through the filter media may be accomplished by gravity, by inducing partial vacuum on one side of the medium, or by exerting a mechanical pressure on a dewatered sludge enclosed by filter media.	Effectiveness: As a stand-alone technology, filtration would not reduce toxicity or volume of COPC, but would reduce mobility. Filtration is used primarily to remove any residual suspended solids remaining in the water following coagulation/sedimentation. As indicated for removal technologies, pump and treat options would offer marginal improvement of groundwater quality and are not carried forward for detailed analysis. Implementability: This technology would be implemented with moderate difficultly via water treatment specialists. May require bench scale/pilot studies during design. Relative cost: Requires a continuous power source, pumping for elevation/pressure head, replacement or backwashing of filter media, off-site disposal of removed solids, and monitoring of discharge. Requires regular O&M support and depending on flows and treatment complexity could be continuous (i.e., 24/7). Ongoing operation and maintenance activities. Generally moderate-cost alternative.	Yes
		Granular Activated Carbon	Chemical contaminants can be removed from water by the physical and chemical adsorption of organics onto the surface of carbon particles. Wastewater is pumped through a bed of granular activated carbon where close contact with carbon particles promotes adsorption of contaminants. Carbon adsorption removes a broad range of organic contaminants and a select number of inorganic contaminants. The exhausted carbon must be removed for disposal or regeneration.	Effectiveness: Carbon adsorption would reduce COPC mobility but would not reduce toxicity or volume. The technology is very effective for the removal of VOCs and achieves a high level of contaminant removal. Operational guidelines for this technology are that contaminant concentrations should be less than 10,000 parts per million (ppm) with suspended solids less than 50 ppm. Reduction of dissolved inorganics may require treatment via other physical or chemical processes. Ongoing operation and maintenance activities. As indicated for removal technologies, pump and treat options would offer marginal improvement of groundwater quality and are not carried forward for detailed analysis. Implementability: This technology would be implemented with moderate difficultly via water treatment specialists. May require bench scale/pilot studies during design. Relative cost: Requires a continuous power source, pumping for elevation/pressure head, backwashing of filter media, replacement and off-site disposal or regeneration of spent carbon, and monitoring of discharge. Requires regular O&M support and depending on flows and treatment complexity could be continuous (i.e., 24/7). Generally moderate- to high-cost alternative.	Yes
		Ion Exchange	Ion exchange is a process by which ions of a given species are displaced from an insoluble exchange material by ions of a different species in solution. Ion exchangers can be operated in either a batch or a continuous mode. Spent resin is usually regenerated by exposing it to a very concentrated solution of the original exchange ion, enabling a reverse exchange to take place, resulting in regenerated resin and a concentrated solution of the removed ion which can then be processed for recovery and reuse.	Effectiveness: The process is used to treat metal-containing wastes including cations and anions and certain organic substances. Ion exchange would reduce COPC mobility but would not reduce toxicity or volume. Limitations to the ion exchange process are compound selectivity/competition, pH, and suspended solids. High solid concentrations sometimes lead to resin blinding and diminishing efficiency. As indicated for removal technologies, pump and treat options would offer marginal improvement of groundwater quality and are not carried forward for detailed analysis. Implementability: This technology would be implemented with moderate difficultly via water treatment specialists and proprietary products. May require bench scale/pilot studies during design. Relative cost: Requires a continuous power source, pumping for elevation/pressure head, replacement and off-site disposal or regeneration of spent exchange media, and monitoring of discharge. Requires regular O&M support and depending on flows and treatment complexity could be continuous (i.e., 24/7). Ongoing operation and maintenance activities. Generally moderate- to high-cost alternative.	No

TABLE 4-3
TECHNOLOGY SCREENING TABLE – GROUNDWATER
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GENERAL RESPONSE ACTION	REMEDIAL TECHNOLOGY	PROCESS OPTIONS	DESCRIPTION	SCREENING COMMENTS (Effectiveness, Implementability, and Relative Cost)	RETAINED
Treatment	Ex-Situ (Physical)	Chelation	Chelation is a chemical process in which ionic species, such as cationic metals, form coordination bonds with ions or molecules called ligands, modifying the properties of the metal ions. Ligands attached to insoluble species or matrices would have the effect of tying metals to the solid phase. When the removal capacity is saturated, the medium must be regenerated or replaced.	Effectiveness: Chelation would not reduce COPC toxicity or volume but would reduce mobility. The process is used to treat metal-containing waters. Limitations to the process are compound selectivity/competition, pH, and suspended solids. As indicated for removal technologies, pump and treat options would offer marginal improvement of groundwater quality and are not carried forward for detailed analysis. Implementability: This technology would be implemented with moderate difficultly via water treatment specialists and proprietary products. May require bench scale/pilot studies during design. Relative cost: Requires a continuous power source, pumping for elevation/pressure head, replacement and off-site disposal or regeneration of chelation medium, and monitoring of discharge. Requires regular O&M support and depending on flows and treatment complexity could be continuous (i.e., 24/7). Ongoing operation and maintenance activities. Generally moderate- to high-cost alternative.	No
		Air Stripping	Air stripping is a mass transfer process in which volatile contaminants in water are transferred into the air. Air stripping is frequently accomplished in a packed tower equipped with an air blower. The factors important in the removal of organics from water include Henry's Law constants, temperature, pressure, air-to-water ratios, and the surface area available for mass transfer.	Effectiveness: Air stripping would not reduce COPC toxicity, mobility or volume. Air stripping is most effective for the removal of VOCs as a pretreatment step prior to activated carbon. The recovery of volatilized hazardous gases by means of emission control apparatuses may be required for subsequent treatment. As indicated for removal technologies, pump and treat options would offer marginal improvement of groundwater quality and are not carried forward for detailed analysis. Implementability: This technology would be implemented with moderate difficultly via water treatment specialists. Air permits may be required. May require bench scale/pilot studies during design. Relative cost: Requires a continuous power source, aerator pumping, and monitoring of discharge. Requires regular O&M support and depending on flows and treatment complexity could be continuous (i.e., 24/7). Ongoing operation and maintenance activities. Generally moderate- to high-cost alternative.	No
		Steam Stripping	Steam stripping uses steam to evaporate VOCs from aqueous waste streams. Stream stripping is essentially a continuous fractional distillation process carried out in a packed or tray tower. Clean steam provides direct heat to the column in which gas flows from the bottom to the top of the tower. The resulting residuals are contaminated steam condensate, recovered solvent, and stripped effluent. The organic vapor and the bottoms would require further treatment.	Effectiveness: Steam stripping will not be effective for inorganic COPC but will treat less volatile and more soluble organic wastes than will air stripping and can handle concentrations from less than 100 ppm to approximately 10 percent organics. Would not reduce COPC toxicity, mobility or volume. Implementability: This technology would be implemented with moderate difficultly. May require bench scale/pilot studies during design. Relative cost: Requires a continuous power source, steam generation, disposal of recovered solvent, vapor and bottoms treatment, and monitoring of discharge. Requires regular O&M support and depending on flows and treatment complexity could be continuous (i.e., 24/7). Ongoing operation and maintenance activities. Generally high-cost alternative. Does not offer benefits over other less costly options.	No
		Critical Fluid Extraction	Critical fluid extraction involves extraction of the aqueous constituents using a solvent and subsequent separation of the solvent and organics with reuse of the solvent. The aqueous stream enters near the top of an extractor, while the solvent is fed countercurrently into the bottom. At or near the gas' critical point, the organics in the aqueous stream dissolve into the solvent. Organic-laden extract can then be removed from the top of the column while clean water exits from the bottom. The extract then goes to a separator, where the temperature and pressure are decreased, causing the organics to separate from the solvent which is recycled and returned to the extractor.	Effectiveness: Critical fluid extraction can remove chlorinated hydrocarbons, phenols, benzene and its derivatives, alcohols, ketones, acids, oil, and greases. Would not reduce COPC toxicity or volume but would reduce mobility. Implementability: This technology would be implemented with moderate difficultly. May require bench scale/pilot studies during design. As indicated for removal technologies, pump and treat options would offer marginal improvement of groundwater quality and are not carried forward for detailed analysis. Relative cost: Requires a continuous power source, pumping, heating, solvent metering, organics disposal, and monitoring of discharge. Requires regular O&M support and depending on flows and treatment complexity could be continuous (i.e., 24/7). Ongoing operation and maintenance activities Generally high-cost alternative. Does not offer benefits over other less costly options.	No
		Reverse Osmosis	Reverse osmosis uses a semipermeable membrane which will allow the passage of only certain components of a solution and a driving force to separate these components at a useful rate. The membrane is permeable to the solvent (groundwater), but impermeable to most dissolved organics and inorganics.	Effectiveness: Reverse osmosis may be used to concentrate dilute solutions of many inorganic and some organic solutes. Would not reduce COPC toxicity or volume but would reduce mobility. Reprocessing may be necessary to optimize pH, remove strong oxidants, and filter out suspended solids. Implementability: This technology would be implemented with moderate difficultly. May require bench scale/pilot studies during design. As indicated for removal technologies, pump and treat options would offer marginal improvement of groundwater quality and are not carried forward for detailed analysis. Requires a continuous power source, pumping, disposal of filter residue, membrane maintenance, and monitoring of discharge. Requires regular O&M support and depending on flows and treatment complexity could be continuous (i.e., 24/7). Ongoing operation and maintenance activities. Reverse osmosis is a high-cost treatment alternative, suitable for low volume applications. Does not offer benefits over other less costly options	No
		Oil-Water Separation	Gravitational forces are used to separate two or more immiscible liquids having sufficiently different densities. Flow rates in continuous processes are kept low to enable liquid/liquid separation when the liquid mix is allowed to settle. Floating oil can be skimmed off the top using an oil skimmer, while the water flows out of the lower portion of the chamber. Acids may be used to break an oil/water emulsion and enhance separation to allow for greater oil removal efficiencies.	Effectiveness: Oil-water separation is usually a pretreatment process whose effectiveness is influenced by the aqueous waste stream's flow rate, temperature, and pH. Ongoing operation and maintenance activities. Because free-phase product has not been observed in groundwater monitoring wells, this process option will be screened out. Implementability: May require bench scale/pilot studies during design. Relative cost: Requires a continuous power source, pumping, disposal of free-phase product, and monitoring of discharge. May also require metering of acid and neutralization. Requires regular O&M support and depending on flows and treatment complexity could be continuous (i.e., 24/7). Generally moderate-cost alternative.	No

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GENERAL RESPONSE ACTION	REMEDIAL TECHNOLOGY	PROCESS OPTIONS	DESCRIPTION	SCREENING COMMENTS (Effectiveness, Implementability, and Relative Cost)	RETAINED
Treatment	Ex-Situ (Physical)	Thickening/Dewatering	Thickening/dewatering is a process used to increase the solids content of sludge by removing a portion of the liquid fraction by such unit processes as filtration, etc.	Effectiveness: The process is generally proposed for wastewater treatment sludges (such as those that may be generated from a pump-and-treat system). There are no unacceptable health risks under the current use and CEAs are anticipated for those lots currently without one to prevent groundwater use for other than monitoring. RIR evidence suggests that cessation of illegal dumping has improved groundwater quality. Pump and treat options may address organic COPC, but would not eliminate dissolution of inorganic COPC to groundwater that remains in contact with urban fill. As indicated for removal technologies, pump and treat options would offer marginal improvement of groundwater quality and are not carried forward for detailed analysis. Implementability: May require bench scale/pilot studies during design. Sludge generation from ex-situ biological treatment could be thickened prior to disposal. Relative cost: Requires a continuous power source, pumping, sludge disposal, and monitoring of discharge. Requires regular O&M support and depending on flows and treatment complexity could be continuous (i.e., 24/7). Ongoing operation and maintenance activities. Generally low-cost alternative.	No
	Ex-Situ (Chemical)	Neutralization	Neutralization is the interaction of an acid with a base to enable the adjustment of the pH to 7.0, at which level the concentrations of hydrogen and hydroxyl ions are equal.	Effectiveness: The process is generally proposed for wastewater treatment. Because pH of site groundwater is near neutral, this option is not applicable unless other treatment process options significantly alter pH (e.g., chemical precipitation) or acidic off-gases are generated (e.g., incineration or pyrolysis). Implementability: May require bench scale/pilot studies during design. Relative cost: Requires a continuous power source, pumping, metering of neutralizer, and monitoring of discharge. Requires regular O&M support and depending on flows and treatment complexity could be continuous (i.e., 24/7). Ongoing operation and maintenance activities. Generally low-cost alternative.	No
		Chemical Oxidation	Chemical oxidation by mixing oxidizing agents such as hydrogen peroxide, sodium and potassium permanganate, ozone, sodium and potassium persulfate. Most organic contaminants are amenable to oxidation.	Effectiveness: Would reduce toxicity, mobility, and volume of organic COPC in groundwater. Ambient oxidant demands must be estimated, to develop a proper dosing regimen. Chemical oxidation would likely be an ancillary technology to another form of treatment as a component of an alternative. Implementability: Would be implemented with moderate difficulty using conventional containment and pumps, and potentially proprietary treatment agents. Bench scale testing and treatability/pilot study may be required during design. Relative cost: Requires a continuous power source, pumping, metering of oxidizer, and monitoring of discharge. Requires regular O&M support and depending on flows and treatment complexity could be continuous (i.e., 24/7). Ongoing operation and maintenance activities. Generally moderate-cost alternative.	Yes
		Chemical Precipitation	Chemical precipitation is widely used for the removal of heavy metals wherein the chemical equilibrium of a waste is changed through the addition of an acid or alkali to reduce the solubility of the undesired components. This causes them to precipitate out of solution in the form of colloidal or solid particulates.	Effectiveness: The process is limited in that not all metals have a common pH at which they precipitate. Chelating and complexing agents can interfere with the precipitation process. Ongoing operation and maintenance activities. As indicated for removal technologies, pump and treat options would offer marginal improvement of groundwater quality and are not carried forward for detailed analysis. Implementability: May require bench scale/pilot studies during design. Relative cost: Requires a continuous power source, pumping, disposal of precipitate, and metering of neutralizer, and monitoring of discharge. Requires regular O&M support and depending on flows and treatment complexity could be continuous (i.e., 24/7). Generally moderate-cost alternative.	Yes
		Ultraviolet/Hydrogen Peroxide	Ultraviolet radiation is electromagnetic radiation that has a wavelength shorter than visible, but longer than x-ray radiation. Ultraviolet radiation causes the rearrangement of molecular structures resulting in the formation of new chemical compounds. Hydrogen peroxide is an unstable, highly reactive oxidizing agent which, when coupled with the ultraviolet radiation, has been shown to be successful in the degradation of certain organics.	Effectiveness: Ultraviolet/hydrogen peroxide is generally restricted to waters with a 1% or lower concentration of hazardous contaminants, or contaminants that are not easily oxidized by conventional methods. Implementability: May require pre-filtering to reduce turbidity. May require bench scale/pilot studies during design. Relative cost: Requires a continuous power source, pumping, UV bulb maintenance, metering of hydrogen peroxide, and monitoring of discharge. Requires regular O&M support, and depending on flows and treatment complexity could be continuous (i.e., 24/7). Ongoing operation and maintenance activities. Generally moderate- to high-cost alternative. Does not offer benefits over other options for oxidation of site contaminants and requires use of a hazardous substance (hydrogen peroxide).	No
	Ex-Situ (Biological)	Suspended Growth - Activated Sludge	The activated sludge process only treats aqueous organic waste streams having less than a 1% suspended solids content. During the process, organic contaminants in the aqueous wastes are broken down through the activity of aerobic microorganisms which metabolize biodegradable organics. The treatment includes conventional activated sludge processes, as well as modifications such as sequencing batch reactors. The aeration process includes pumping the aqueous waste into an aeration tank where the biological treatment occurs. This is followed by the stream being sent to a clarifier where the treated aqueous waste is separated from the sludge biomass.	Effectiveness: Activated sludge processes are not suitable for removing highly chlorinated organics, aliphatics, amines, and aromatic compounds from an aqueous waste stream. Reduction of dissolved inorganics will require treatment via other physical or chemical processes. Some heavy metals and organic chemicals can be harmful to the microorganisms. The influent should contain a suitable ratio of carbon, nitrogen and phosphorous. Generally requires a relatively large system due to long retention times (typically several hours). As indicated for removal technologies, pump and treat options would offer marginal improvement of groundwater quality and are not carried forward for detailed analysis. Implementability: Due to presence in groundwater of heavy metals (arsenic, lead, chromium) and aromatics (4-methylphenol) that may hinder activated sludge growth, and anticipated variability in influent contaminant and sodium chloride concentrations due to fluctuating water table from tidal influence, this option may require bench scale/pilot studies during design. Relative cost: Requires a continuous power source, pumping, disposal of sludge, and monitoring of discharge. Requires regular O&M support and depending on flows and treatment complexity could be continuous (i.e., 24/7). Ongoing operation and maintenance activities. Generally moderate-cost alternative.	No

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GENERAL RESPONSE ACTION	REMEDIAL TECHNOLOGY	PROCESS OPTIONS	DESCRIPTION	SCREENING COMMENTS (Effectiveness, Implementability, and Relative Cost)	RETAINED
Treatment	Ex-Situ (Biological)	Fixed Film Growth - Rotating Biological Contactor, Trickling Filters.	Rotating biological contactors employ microorganisms attached to a fixed medium that is rotated through the aqueous waste stream in a closed reactor. In a trickling filter, the influent wastewater is distributed over fixed media that serve as a substrate for the microbes. The fixed film growth systems aerobically treat aqueous waste streams containing alcohols, phenols, phthalates, cyanide, and ammonia.	Effectiveness: The fixed film growth systems are essentially applicable to the same waste streams as the activated sludge treatment process. Ongoing operation and maintenance activities. As indicated for removal technologies, pump and treat options would offer marginal improvement of groundwater quality and are not carried forward for detailed analysis. Implementability: Due to presence in groundwater of heavy metals (arsenic, lead, chromium) and aromatics (4-methylphenol) that may hinder activated sludge growth, and anticipated variability in influent contaminant and sodium chloride concentrations due to fluctuating water table from tidal influence, this option may require bench scale/pilot studies during design. Relative cost: Requires a continuous power source, pumping, disposal of sludge, and monitoring of discharge. Requires regular O&M support and depending on flows and treatment complexity could be continuous (i.e., 24/7). Generally moderate-cost alternative.	No
	Ex-Situ (Thermal)	Liquid Injection Incineration	Liquid injection incinerators are usually cylindrical refractory secondary combustors for low-calorific material. Liquid wastes are introduced to the combustion chamber by means of specifically designed nozzles that mix with air and fuel as needed. The resulting gases, following combustion, are collected and treated to remove particulates and to neutralize acid gases. Pretreatment may be required for feeding some aqueous wastes to specific nozzles to provide efficient mixing with the oxygen source and to maintain a continuous waste flow.	Effectiveness: The burners are susceptible to clogging by particulates or caked material at the nozzles. Heavy metal wastes and wastes having high inorganic contents are not suitable for treatment. Implementability: Would be difficult to implement for Site groundwater due to specialty knowledge and equipment. May require bench scale/pilot studies during design. Off-gas treatment and permitting may be required. Relative cost: Requires significant energy input, pumping, pre-treatment solids removal, airborne particulate removal, acid gas neutralization, disposal of captured particulates and ash, and air monitoring. Requires continuous (i.e., 24/7) attendance and monitoring during operation. Ongoing operation and maintenance activities. Generally high-cost alternative.	No
		Pyrolysis	Pyrolysis is the chemical decomposition of wastes accomplished in an oxygen- deficient atmosphere. The system involves the use of two chambers. The separation of the volatile components from the nonvolatile components and ash is achieved in the primary chamber (pyrolyzer). In the secondary combustion chamber, volatile components are burned under proper operating conditions to destroy any remaining hazardous components. Temperatures in the pyrolyzer range from 1,000 to 1,300° F.	Effectiveness: Pyrolysis is only applicable to wastes containing pure organics. Systems are usually designed for specific wastes and are not readily adaptable to a variety of wastes. In addition, pyrolysis of chlorinated organics can lead to the formation of hazardous products of incomplete combustion (PICs). Implementability: Would be difficult to implement for Site groundwater due to specialty knowledge and equipment. Off-gas treatment and permitting may be required. May require bench scale/pilot studies during design. Relative cost: Requires significant energy input, pumping, pre-treatment solids removal, airborne particulate removal, acid gas neutralization, disposal of captured particulates and ash, and air monitoring. Requires continuous (i.e., 24/7) attendance and monitoring during operation. Ongoing operation and maintenance activities. Generally high-cost alternative.	No
		Wet Air Oxidation	Wet air oxidation uses high-temperature oxidation under controlled conditions to destroy dissolved or suspended organic waste constituents, oxidizable inorganics, and wastes not readily amenable to biological treatment. Aqueous phase oxidation of organic constituents is achieved at temperatures between 350 and 650°F and pressures ranging from 300 to 3,000 pounds per square inch (psi). Liquid wastes are pumped into the system and are mixed with compressed air or oxygen. The air-waste mixture then passes through a heat exchanger before entering the reactor, where the oxygen in the air reacts with organic constituents in the waste. The gas and liquid phase are separated following oxidation.	Effectiveness: Wet air oxidation is not suitable for inorganics or for wastes containing low concentrations of organics. Implementability: Off-gas treatment and permitting may be required. May require bench scale/pilot studies during design. Relative cost: Requires significant energy input, pumping, pre-treatment solids removal, airborne particulate removal, acid gas neutralization, disposal of captured particulates and ash, discharge and air monitoring. Requires continuous (i.e., 24/7) attendance and monitoring during operation. Ongoing operation and maintenance activities. Generally high-cost alternative.	No
	In-Situ (Biological)	Bioremediation	Bioremediation is a process used to treat contaminated groundwater by altering environmental conditions to stimulate growth of microorganisms that degrade the target contaminants. Most bioremediation processes involve oxidation-reduction reactions where either an electron acceptor is added to stimulate oxidation of a reduced contaminant (e.g. hydrocarbons) or an electron donor is added to reduce oxidized pollutants (e.g., chlorinated solvents). In both cases additional nutrients, and pH buffers may need to be added to optimize conditions for the microorganisms. In some cases, specialized microbial cultures are added (bioaugmentation) to further enhance biodegradation	Effectiveness: Aerobic and anaerobic bioremediation are well understood and documented. Would reduce volume, toxicity, and mobility of groundwater organic COPC. Amendments and deliverable methods are widely available. Relies on indigenous microorganisms. Implementability: Due to presence in groundwater of heavy metals (arsenic, lead, chromium) and aromatics (4-methylphenol) that may hinder biological growth, and anticipated variability in influent contaminant and sodium chloride concentrations due to fluctuating water table from tidal influence, this option may require bench scale/pilot studies during design. Relative cost: Requires groundwater monitoring and possibly periodic nutrient/pH buffer reinjection. Generally low- to moderate-cost alternative.	Yes
		Biosparging	Air is pumped at low rates through well points, to stimulate aerobic bioremediation.	Efficiency: Would reduce volume, toxicity, and mobility of groundwater organic COPC. The method is well understood, and tools and equipment are readily available. Efficacy is susceptible to site hydrogeologic conditions, such as air permeability and homogeneity. Relies on indigenous microorganisms.. Implementability: Due to presence in groundwater of heavy metals (arsenic, lead, chromium) and aromatics (4-methylphenol) that may hinder biological growth, and anticipated variability in influent contaminant and sodium chloride concentrations due to fluctuating water table from tidal influence, this option may require bench scale/pilot studies during design. Relative cost: Requires a continuous power source, aeration, well point maintenance, groundwater monitoring, and possibly periodic nutrient/pH buffer reinjection. Ongoing operation and maintenance activities. Generally moderate-cost alternative.	Yes

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GENERAL RESPONSE ACTION	REMEDIAL TECHNOLOGY	PROCESS OPTIONS	DESCRIPTION	SCREENING COMMENTS (Effectiveness, Implementability, and Relative Cost)	RETAINED
Treatment	In-Situ (Physical)	Immobilization	Nano-scale activated carbon slurry is injected in the subsurface to provide binding sites for organic contaminants. This supports the development of biofilms and the enhanced biodegradation of organic contaminants	Effectiveness: This is an innovative technology with a good performance record. Would reduce mobility of groundwater COPC but would not reduce toxicity or volume. Implementability: Due to low absorption efficiency of some soluble inorganics in aqueous solution, assessment of Site geochemistry and mobility of inorganics may be required for design. May require bench scale/pilot studies during design. Relative cost: Requires groundwater monitoring, and possibly multiple slurry injections. Generally moderate-cost alternative.	Yes
		Air Sparging	In-situ air sparging of the site groundwater would be conducted by constructing sparge points (wells) to the appropriate depths into the contaminated groundwater. Aeration would be provided at each sparge point by blowers/compressors and, as necessary, an aboveground header/distribution system. A soil vapor extraction system (SVE) (vents and vacuum blowers) with off-gas treatment could be used to attempt to capture VOC-laden air from the vadose zone above the sparge point system. Emissions controls (off gas treatment) would be required on the SVE exhaust.	Effectiveness: Air sparging is effective in removing VOCs from the groundwater. Efficacy is susceptible to site hydrogeologic conditions, such as air permeability and homogeneity. Due to high water table (i.e., 4 to 10 feet below ground surface) and corresponding thin vadose zone, short-circuiting of a vacuum recovery system (SVE) to the atmosphere is likely without an impermeable cover layer, leading to substantially reduced collection efficiency. In addition, due to fluctuating water table, vaporized contaminants in the vadose zone at low tide could re-enter the aqueous phase at high tide, reducing overall efficiency. Implementability: Air sparging would be readily implemented with conventional installation methods and equipment. May require bench scale/pilot studies during design. Relative cost: Requires maintenance of sparge (and extraction) points, a continuous source of energy, compressors (and blowers), groundwater monitoring, and possibly periodic nutrient/pH buffer reinjection. Ongoing operation and maintenance activities. Generally moderate-cost alternative.	Yes
		In-Well Vapor Stripping	In-well vapor stripping technology involves the creation of a groundwater circulation pattern and simultaneous aeration within the stripping well to volatilize VOCs from the circulating groundwater. Air-lift pumping is used to lift groundwater and strip it of contaminants. Contaminated vapors may be drawn off for aboveground treatment or released to the vadose zone for biodegradation. Partially treated groundwater is forced out of the well into the vadose zone where it reinfiltrates to the water table. Untreated groundwater enters the well at its base, replacing the water lifted through pumping. Eventually, the partially treated water is cycled back through the well until contaminant concentration levels are reduced.	Effectiveness: Would reduce volume, toxicity, and mobility of groundwater organic COPC. Applications of in-well stripping have generally involved chlorinated organic solvents (e.g., trichloroethene) and petroleum product contamination (e.g., benzene, toluene, ethylbenzene, xylene [BTEX], total petroleum hydrocarbon [TPH]). In-well stripping has been used in a variety of soil types from silty clay to sandy gravel. Efficacy is susceptible to site hydrogeologic conditions, especially mesoscale lithologic variability and preferential pathways. Due to high water table (i.e., 4 to 10 feet below ground surface) and corresponding thin vadose zone, there is little opportunity for vadose zone biodegradation. Also, short-circuiting of a vacuum recovery system (SVE) to the atmosphere is likely without an impermeable cover layer, leading to substantially reduced collection efficiency. Implementability: In well vapor stripping would be implemented with moderate difficulty. May require bench scale/pilot studies during design. Relative cost: Requires a continuous source of energy, pumping, maintenance of well screens, and groundwater monitoring, and possibly periodic nutrient/pH buffer reinjection. Ongoing operation and maintenance activities. Generally moderate- to high-cost alternative.	No
	In-Situ (Chemical)	Treatment Walls	Treatment walls involve construction of permanent, semi-permanent, or replaceable units across the flow path of a contaminant plume. As the contaminated groundwater moves passively through the treatment wall, the contaminants are removed by physical, chemical, and/or biological processes, including precipitation, sorption, oxidation/reduction, fixation, or degradation. These simple mechanical barriers may contain metal-based catalysts, chelating agents, nutrients and oxygen, or other agents that are placed either in the path of the plumes to prevent further migration or immediately downgradient of the contaminant source to prevent plume formation.	Effectiveness: Would reduce mobility but may not reduce toxicity or volume. Treatment walls can be designed for the abatement of metals and VOCs. An important uncertainty in this option is the operating life of the in-situ removal technology (carbon adsorption and/or ion exchange and/or zero-valence metals) and the feasibility of replacing or regenerating this capacity when exhausted. Due to fluctuating water table and flow direction in response to tidal influence, impacted groundwater may not reach the wall without pumping to induce hydraulic gradient. Implementability: Would be implemented with moderate difficulty using conventional earthmoving equipment and possibly proprietary treatment agents. May require bench scale/pilot studies during design. Relative cost: Requires groundwater monitoring and possible replacement of treatment medium or biological amendments. Generally moderate- to high-cost alternative.	No
		Chemical Precipitation	An array of injection wells or mechanical mixing is used to introduce iron sulfide or other fixative agent. Dissolved heavy metals then precipitate and substitute for iron within an iron sulfide lattice.	Effectiveness: The process is limited in that not all metals will chemically react with iron sulfide. Chelating and complexing agents can interfere with the precipitation process. Implementability: May require bench scale/pilot studies during design. Relative cost: May require multiple additions to achieve desired results. Generally moderate-cost alternative.	Yes
		Funnel and Gate	The funnel-and-gate system for in-situ treatment of contaminated plumes consists of low hydraulic conductivity (e.g., $1x10^{-6}$ cm/s) cutoff walls with gaps that contain in-situ reaction zones. Cutoff walls (the funnel) modify flow patterns so that groundwater primarily flows through high conductivity gaps (the gates). The type of cutoff walls most likely to be used in the current practice are slurry walls, sheet piles, or soil admixtures applied by soil mixing or jet grouting.	Effectiveness: See above comments for subsurface barriers and treatment walls. Due to fluctuating water table and flow direction in response to tidal influence, impacted groundwater may not reach the gate without pumping to induce hydraulic gradient. Implementability: Would be implemented with moderate difficulty using conventional earthmoving equipment and potentially proprietary treatment agents. May require bench scale/pilot studies during design. Relative cost: Requires groundwater monitoring and possible replacement of treatment medium or biological amendments. Generally moderate- to high-cost alternative.	No
		In-situ Chemical Oxidation (ISCO)	An array of injection wells or direct push points is used to introduce oxidizing agents such as hydrogen peroxide, sodium and potassium permanganate, ozone, sodium and potassium persulfate. Most organic contaminants are amenable to oxidation.	Effectiveness: Would reduce toxicity, mobility, and volume of organic COPC in groundwater. A wide array of reagents and delivery tools are available. Ambient oxidant demands must be estimated, to develop a proper dosing regimen. Implementability: Would be implemented with moderate difficulty using conventional drilling or excavating equipment and potentially proprietary treatment agents. Bench scale testing and treatability/pilot study may be required during design. Relative cost: Requires groundwater monitoring and possibly multiple slurry injections. Generally moderate-cost alternative.	Yes
		In-situ Chemical Reduction (ISCR)	Similar to ISCO, but a reductant, such as calcium polysulfide, is utilized to develop reducing geochemical conditions that favor the immobilization of certain multivalent metals, such as chromium.	Effectiveness: Would reduce mobility of certain inorganic COPC and decrease volume and toxicity of certain organic COPC in groundwater. Ambient oxidant demands must be estimated to develop a proper dosing regimen. Implementability: Would be implemented with moderate difficulty using conventional drilling or excavating equipment and potentially proprietary treatment agents. May require bench scale/pilot studies during design. Relative cost: Requires groundwater monitoring and possibly multiple slurry injections. Generally moderate- to high-cost alternative.	Yes

TABLE 4-3
TECHNOLOGY SCREENING TABLE – GROUNDWATER
IDENTIFICATION OF CANDIDATE TECHNOLOGIES
RIVERSIDE INDUSTRIAL PARK SUPERFUND SITE
NEW JERSEY

GENERAL RESPONSE ACTION	REMEDIAL TECHNOLOGY	PROCESS OPTIONS	DESCRIPTION	SCREENING COMMENTS (Effectiveness, Implementability, and Relative Cost)	RETAINED
Monitored Natural Attenuation	Continued Monitoring	Not Applicable	Natural Attenuation would involve the demonstration that natural processes can remove and/or attenuate migration of site contaminants. Natural attenuation differs from "no action" in that natural attenuation is implemented only if it can be demonstrated and proven that natural attenuation will reduce the contaminant levels to meet ARARs. Metals would be attenuated by, precipitated on, and/or adsorbed to, aquifer materials. VOCs would be adsorbed to aquifer materials or biodegraded. Due to the potential for migration of contaminants, a site-specific demonstration of its applicability is needed. This demonstration would involve periodic sampling and analyses on a monitoring well network (existing and supplemented with additional wells) for contaminants of concern as well as indicator parameters for natural attenuation. Appropriate modeling would be conducted to demonstrate attenuation of contaminants based upon monitoring data.	Effectiveness: Monitored Natural Attenuation is often implemented as the final step, following application of another treatment methods, such as bioremediation, ISCR, or ISCO. LNAPL has been identified in soil at one temporary well point. MNA will not apply to free-phase product or residual product, should they be identified in groundwater. Groundwater concentrations of some COPCs were lower for the last event than prior events. Natural attenuation may be a factor in this finding. Implementability: MNA would be readily implemented. Relative cost: Requires groundwater monitoring. Generally low-cost alternative.	Yes
Disposal	Disposal (off-site)	Discharge to Local POTW	In this option, groundwater would be routed to a nearby POTW using the existing Site conveyance system following pretreatment as required to comply with the facility's pretreatment standards.	Effectiveness: At present, this option is feasible, assuming that the POTW's requirements (i.e., hydraulic and treatment capacity) can be met. Would be considered for temporary dewatering activities only. Implementability: Would require thorough water quality characterization for POTW approval. Relative cost: Requires discharge monitoring and usage fees. Generally low- to high-cost alternative.	Yes
		Disposal to Off-Site TSDF	This option entails off-site hauling of groundwater treated to the levels necessary for acceptance at an approved off-site TSDF.	Effectiveness: Would be effective for reducing mobility, toxicity, and volume of groundwater COPC. Locating an appropriate TSDF is required. Would be considered for temporary dewatering activities only. Implementability: Would require thorough water quality characterization for TSDF approval. Relative cost: Requires discharge monitoring and transport and usage fees. Generally moderate- to high-cost alternative.	No
	Disposal (on-site)	Discharge to Surface Water	In this disposal option, treated groundwater would be directly discharged to the active storm water conveyance system at the site.	Effectiveness: This option would not reduce toxicity, mobility, or volume of groundwater COPC without prior treatment, but could reduce potential exposure. This disposal option is feasible assuming that direct discharge effluent quality requirements can be met. Implementability: Direct discharge could be implemented through compliance with the substantive portions of the NPDES permitting process. Relative cost: Requires discharge monitoring. Generally low- to moderate-cost alternative.	Yes
		Reinjection	Reinjection involves recharge of treated groundwater to the subsurface for plume recovery.	Effectiveness: This option would not reduce toxicity, mobility, or volume of groundwater COPC without treatment. Reinjection for plume recovery must occur outside the plume boundaries to be effective. System design parameters are dependent upon site hydrogeologic conditions. Well performance may degrade with time. Due to thin vadose zone and possible upwelling of reinjected groundwater to the surface increasing potential for exposure, this option is not applicable. Implementability: Reinjection would be readily implementable with conventional drilling methods and available equipment. Relative cost: Requires discharge monitoring and injection well maintenance. Generally low- to moderate-cost alternative.	No

TABLE 4-4
TECHNOLOGY SCREENING TABLE – SOIL GAS
IDENTIFICATION OF CANDIDATE TECHNOLOGIES
RIVERSIDE INDUSTRIAL PARK SUPERFUND SITE
NEW JERSEY

GENERAL RESPONSE ACTION	REMEDIAL TECHNOLOGY	PROCESS OPTIONS	DESCRIPTION	SCREENING COMMENTS (Effectiveness, Implementability, Relative Cost)	RETAINED
No Action	Not Applicable	Not Applicable	Under this response action, no active response action will be taken to address concerns regarding soil gas. The no action alternative is required to be considered by the NCP to provide a baseline against which all other alternatives may be compared.	Effectiveness: The no action alternative would not meet ARARs or reduce unacceptable risks to human health or the environment. Implementability: Because no action would be taken, this option can be implemented. Relative cost: No capital, administrative, or O&M cost.	Yes
Institutional Controls	Use Restrictions	Deed Notice	File a Deed Notice (or similarly captioned covenant) whereby the owner agrees to subject the property to certain statutory and regulatory requirements that impose restrictions upon the use of the property, to restrict certain uses of the property, and to provide notice to subsequent owners, lessees and operators of the restrictions and the monitoring, maintenance, and biennial certification requirements are outlined in the Deed Notice.	Effectiveness: Institutional controls would not reduce the toxicity, mobility, or volume of contaminants and would not reduce COPC concentrations to protective levels. These controls alone would not be protective of human health because soil contamination exists at concentrations greater than the PRGs. The Site is zoned as commercial, and a deed notice may be implemented to keep this designation in the future. The effectiveness of institutional controls depends on the reliability of their execution, which is most likely controlled by the local government Implementability: Deed notices have been established for some lots that bind the property owners to certain land use restrictions, notice requirements, and the obligation to inspect and maintain any engineering controls that prevent direct contact with historic fill/soil. Enhancement of existing deed notices may be feasible to allow elevated levels of contaminated soil to remain permanently on-site. Relative cost: Periodic reporting required. Generally low-cost alternative.	Yes
		Classification Exception Area	Submit to the NJDEP an application with the necessary information to establish a classification exception area, that gives notice of the fact that groundwater in the area does not meet designated use requirements.	Effectiveness: CEAs would not reduce the toxicity, mobility, or volume of contaminants and would not reduce COPC concentrations to protective levels. These controls alone would not be protective of human health because contamination exists at concentrations greater than PRGs. CEAs have been established for some lots to prevent groundwater use for purposes other than monitoring. CEAs will remain in place as long as groundwater does not meet designated use standards. Implementability: CEAs have been established for some lots that bind the property owners to groundwater use restrictions and notice requirements. Designation of additional CEAs may be feasible. Relative cost: Groundwater monitoring and periodic reporting will be required as a component of the CEA. Generally low-cost alternative.	Yes
	Monitoring	Indoor Air Sampling	Conduct indoor air sampling in existing occupied buildings	Effectiveness: Air monitoring will be effective in protecting human health from potential exposure to vapor intrusion by monitoring air quality and triggering corrective action to prevent an unacceptable exposure. Implementability: Equipment is readily available, requires property owner cooperation and access. Relative cost: Periodic air monitoring and reporting. Generally low-cost alternative	Yes
Engineering Controls	Subsurface Barriers	Vapor Barrier	A passive barrier consisting of a synthetic membrane installed prior to foundation construction to reduce soil vapor migration.	Effectiveness: Vapor barriers would not reduce the toxicity, mobility, or volume of contaminants but could reduce COPC concentrations to protective levels in indoor air. Vapor barriers can be used with passive or active subsurface depressurization process options to help prevent indoor vapor intrusion. Vapor barriers are considered a supplement to extraction mitigation measures and may be sprayed on to existing building interiors or placed below foundations for new construction. Implementability: Vapor barriers are an easily implemented option for new construction with a variety of materials to choose from. Relative cost: No anticipated long-term maintenance. Generally low-cost alternative.	Yes
Removal	Subsurface Depressurization	Active Subsurface Depressurization System (Soil Vapor Extraction)	A negative pressure field (vacuum) is applied to the subsurface though a well network beneath and/or around a building to prevent VI into the building. Active subsurface depressurization systems use a fan or blower to create a negative pressure field (vacuum) below a slab or other barrier.	Effectiveness: Active depressurization would not reduce COPC toxicity or volume but would reduce mobility in the vadose zone. Preferred over a passive system, especially for existing buildings, due to higher success rate for VI mitigation. Implementability: Subsurface depressurization is readily implemented with conventional plumbing and electrical trades. Additional treatment of contaminants after collection may be required. The treatment system may require permitting. Relative cost: Requires continuous power source and maintenance of mechanical components. Periodic monitoring to confirm venting. Generally moderate-cost alternative.	Yes
	Subsurface Depressurization	Passive Subsurface Depressurization System	Natural temperature and barometric pressure fluctuations (e.g., wind) are relied on to induce pressure gradients in a vent stack to remove soil vapors from beneath and/or around a building.	Effectiveness: Depressurization would not reduce COPC toxicity or volume but would reduce mobility in the vadose zone. Vent pipe can be routed through a building to help heat the air from the subsurface for convective flow. Pressure gradient between the sub-slab and the atmosphere may induce advective flow during weather events. Wind over the vent reduces pressure for advective flow. Installation of a solar-powered wind turbine on the stack may be used to help induce a pressure gradient. Not as reliable as an active system. Not recommended without highly permeable sub-slab conditions, or where the seasonal high-water table is less than 5 feet below the building slab. Not retained for detailed analysis. Implementability: Subsurface depressurization is readily implemented with conventional plumbing and electrical trades. Additional treatment of contaminants after collection may be required. Relative cost: Periodic monitoring to confirm venting. Generally low-cost alternative.	No
		Sub-Slab Ventilation System	A venting layer is placed below the slab (new construction) to allow for unimpeded movement of soil gas vapors laterally beyond the footprint of a building or to vent pipes placed in the venting layer. Perforated pipe is placed in the venting layer or at the perimeter of the venting material to assist with collecting and exhausting vapors.	Effectiveness: Would not reduce COPC toxicity, mobility, or volume but could reduce COPC concentrations to protective levels in indoor air. May be used in combination with a passive barrier. Not applicable for existing buildings. Would add marginal benefit to a passive barrier. Not retained for further analysis. Implementability: A venting layer would be easily implemented option for new construction with conventional earthmoving materials and equipment. Relative cost: Periodic monitoring to confirm venting. Generally moderate-cost alternative.	No

TABLE 4-4
TECHNOLOGY SCREENING TABLE – SOIL GAS
IDENTIFICATION OF CANDIDATE TECHNOLOGIES
RIVERSIDE INDUSTRIAL PARK SUPERFUND SITE
NEW JERSEY

GENERAL RESPONSE ACTION	REMEDIAL TECHNOLOGY	PROCESS OPTIONS	DESCRIPTION	SCREENING COMMENTS (Effectiveness, Implementability, Relative Cost)	RETAINED
Treatment	Ex-Situ Treatment (Physical)	Immobilization/Adsorption	Soil gas is treated with vapor-phase granular activated carbon (GAC), polymers, or zeolites to adsorb and remove volatile compounds.	Effectiveness: Would not reduce COPC toxicity or volume but would reduce mobility. GAC is effective for treating a wide range of volatile compounds and is less expensive than zeolites or polymers. Zeolites are better suited for treating volatile compounds with high polarity (e.g., alcohols and organic acids) or high vapor pressures (e.g., vinyl chloride, methyl tert-butyl ether, and methylene chloride). Implementability: A vapor-phase treatment system would be readily implemented with conventional plumbing and electrical trades and potentially proprietary treatment media. Relative cost: Requires replacement of spent adsorbent. Ongoing operation maintenance activities. Generally low-cost alternative.	Yes
		Photocatalytic Oxidation	Ultraviolet light is used with a semiconductor (e.g., titanium oxide) to generate protons and highly reactive hydroxyl radicals for oxidation of volatile compounds.	Effectiveness: Would reduce toxicity, mobility and volume of soil vapor. Effective for treating a wide range of halogenated and non-halogenated compounds, aromatic and aliphatic hydrocarbons, alcohols, ethers, ketones and aldehydes. Works best at flow rates of less than 100 standard cubic feet per minute. Not widely used for soil vapor treatment. Implementability: Would be implemented with moderate difficulty with specialized knowledge of treatment capabilities. May require bench scale/pilot studies during design. Relative cost: Ongoing operation maintenance activities. Would require a continuous ultraviolet light source. Generally moderate-cost alternative.	Yes
	Ex-Situ Treatment (Thermal)	Thermal Oxidation	Direct flame, flameless, or catalytic oxidizers are used to destroy non-halogenated volatile organic compounds, semivolatile organic compounds, and hydrocarbons at a wide range of concentrations.	Effectiveness: Capable of reducing toxicity, mobility and volume of specific classes of compounds including alcohols, aliphatics, aromatics, esters, and ketones that are generally not Site COPC. If halogenated compounds are present (i.e., chlorinated compounds), acid gases may be generated requiring additional treatment. Most cost-effective for treating concentrations of vapor contaminants greater than 500 parts per million by volume. Safeguards required if concentrations approach lower explosive limit. May produce dioxins and furans if improperly operated. Implementability: Would be implemented with moderate difficulty with specialized knowledge of treatment capabilities. May require bench scale/pilot studies during design. Relative cost: Requires supplemental energy at low concentrations. Ongoing operation maintenance activities. Generally a high-cost alternative. Would offer no additional benefit to less expensive treatment technologies.	No
	Ex-Situ Treatment (Biological)	Biofiltration	Live cultures are used to consume or metabolize chemicals in the off-gas.	Effectiveness: Would reduce toxicity, mobility, and volume of certain Site COPC. Best used for treating dilute (less than 1,500 parts per million by volume) concentrations of mono-aromatic hydrocarbons, alcohols, aldehydes and ketones. Sensitive to variations in operating parameters, such as moisture content, temperature, pH, and influent concentrations. Implementability: Fluctuating groundwater levels contributing to variations in moisture and concentrations of organic compounds would be problematic for this process option. Would require maintenance of substrate for biological culture. Relative cost: Ongoing operation maintenance activities. Generally moderate-cost alternative.	No

TABLE 4-5
TECHNOLOGY SCREENING TABLE – SEWER WATER
IDENTIFICATION OF CANDIDATE TECHNOLOGIES
RIVERSIDE INDUSTRIAL PARK SUPERFUND SITE
NEW JERSEY

GENERAL RESPONSE ACTION	REMEDIAL TECHNOLOGY	PROCESS OPTIONS	DESCRIPTION	SCREENING COMMENTS (Effectiveness, Implementability, and Relative Cost)	RETAINED
No Action	Not Applicable	Not Applicable	Under this response action, no active response action will be taken to address concerns regarding sewer water. The no action alternative is required to be considered by the NCP to provide a baseline against which all other alternatives may be compared.	Effectiveness: The no action alternative would not meet ARARs or reduce unacceptable risks to human health or the environment. Implementability: Because no action would be taken, this option can be implemented. Relative cost: No capital, administrative, or O&M cost.	Yes
Removal	Mechanical Transfer	Containerization or Transport Vehicle	Sewer water would be pumped or vacuumed into DOT-approved containers or transport vehicles.	Effectiveness: Removal would be ancillary to subsequent disposal and would thereby be effective in reducing mobility in the environment. No change of waste volume or toxicity would occur without subsequent treatment. Once water is removed from inactive sewers, associated sewer pipe and manholes would be closed in place by plugging/filling to prevent future buildup of water and solids in the manhole. Dewatering sewer removal or in-place closure may be required because the groundwater table is shallow (approximately 4 to 10 feet bgs) and sewers may be in contact with groundwater. Containerization of dewatering liquids for subsequent characterization is anticipated. Implementability: Implementation would require a contractors specialized in sewers. Dewatering is anticipated with collection of post-removal compliance soil samples above the water table. Relative cost: No maintenance is required if inactive sewers are closed/removed. Generally low- to moderate-cost alternative.	Yes
		Pumped	Sewer water would be pumped into active local POTW conveyance system.	Effectiveness: Removal would be ancillary to subsequent disposal and would thereby be effective in reducing mobility in the environment. No change of waste volume or toxicity would occur without subsequent treatment. Once water is removed from inactive sewers, associated sewer pipe and manholes would be closed in place by plugging/filling to prevent future buildup of water and solids in the manhole. Implementability: Implementation would require a contractors specialized in sewers. Relative cost: No maintenance is required if inactive sewers are closed/removed. Generally low- to moderate-cost alternative.	Yes
Disposal	Disposal (off-site)	Discharge to Local POTW	Sewer water would be routed to a nearby POTW using the existing Site conveyance system following pretreatment as required to comply with the facility's pretreatment standards.	Effectiveness: Would be effective for reducing mobility, toxicity, and volume of sewer water COPC (assuming that material is treated prior to disposal). At present, this option is feasible, assuming that the POTW's requirements (i.e., hydraulic and treatment capacity) can be met. Implementability: Would require thorough water quality characterization for POTW approval. Would reduce the mobility of the sewer material; however, the toxicity and volume of the COCs in the sewer material would not be affected unless treated prior to disposal Relative cost: Requires discharge monitoring and usage fees. Generally low- to moderate-cost alternative.	Yes
		Disposal to Off-Site TSD facility	This option entails off-site hauling of sewer water treated to the levels necessary for acceptance at an approved off-site TSD facility.	Effectiveness: Would be effective for reducing mobility, toxicity, and volume of sewer water COPC (assuming that material is treated prior to disposal). Locating an appropriate TSD facility is required. Implementability: Would require thorough water quality characterization for TSD approval. Would reduce the mobility of the sewer material; however, the toxicity and volume of the COCs in the sewer material would not be affected unless treated prior to disposal Relative cost: Requires discharge monitoring and transport and usage fees. Generally moderate- to high-cost alternative.	Yes

Table 5-1
Preliminary Screening of Remedial Alternatives
Riverside Industrial Park Superfund Site
Newark, New Jersey

	Overall Effectiveness	Implement-ability	Cost	Screening Comments
Waste				
1 – No Action	Poor	Excellent	Low	Retained per NCP
2 – Removal and Off-Site Disposal	Excellent	Good	Medium	
Soil/Fill				
1 – No Action	Poor	Excellent	Low	Retained per NCP
2 – Institutional Controls and NAPL Removal	Poor-Fair	Excellent	Low	
3 – Institutional Controls, Engineering Controls, and NAPL Removal	Good	Good	Medium	
4 – Inst Controls, Engr Controls, Limited Removal, and NAPL Removal	Good-Excellent	Good	Medium-High	
5 – Inst Controls, Engr Controls, In-Situ Remediation and NAPL Removal	Good-Excellent	Poor-Fair	High	Retained, although implementability uncertain at this time
6 – Inst Controls, Removal/Off-Site Disposal, and NAPL Removal	Excellent	Poor	Very High	Not implementable (water management, offsets around underground utilities, and limited space between buildings)
7 – Inst, Ex-Situ Treatment/Replacement, Engr Controls and NAPL Removal	Good-Excellent	Poor	Very High	Not implementable (water management, offsets around underground utilities, and limited space between buildings)
Groundwater				
1 – No Action	Poor	Excellent	Low	Retained per NCP
2 – Institutional Controls, Containment at River, and Pump and Treat	Good	Good	High	
3 – Institutional Controls and In-Situ Remediation	Fair-Good	Good	Medium	
4 – Institutional Controls, P&T, and Targeted Periodic In-Situ Remediation	Good-Excellent	Good-Excellent	Medium	
5 – Inst. Controls, Containment at River, and Focused In-Situ Remediation	Fair-Good	Good	Medium	
6 - Institutional Controls and Site Containment	Poor	Poor	High	Not implementable (underground utilities/building proximity along western boundary)
7 – Institutional Controls, Containment at River, and MNA	Unknown	Poor	Medium	Not implemented (no MNA study conducted to determine if MNA is occurring at Site; containment at river without a pumping system is not feasible)
Sewer				
1 – No Action	Poor	Excellent	Low	Retained per NCP
2 – Removal and Off-Site Disposal	Excellent	Good	Low	
Soil Gas				
1 – No Action	Poor	Excellent	Low	Retained per NCP
2 – Inst Controls, Monitoring/Engr Controls, and Site-Wide Engr Controls	Good	Excellent	Low	
3 – Inst Controls, Site-Wide Engr Controls, and In-Situ Remediation	Good-Excellent	Poor-Fair	High	Retained, although implementability uncertain at this time
4 – Inst Controls, Site-Wide Engr Controls, and Removal/Disposal	Good	Poor	Very High	Not implementable (water management, offsets around underground utilities, and limited space between buildings)
5 - Inst Controls, Site-Wide Engr Controls, and Ex-Situ Treatment/Replacement	Good	Poor	Very High	Not implementable (water management, offsets around underground utilities, and limited space between buildings)

Table 6-1
Detailed Screening of Remedial Alternatives
Riverside Industrial Park Superfund Site
Newark, New Jersey

	Overall Effectiveness					Implement-ability	Cost
	Overall Protection of Human Health/ Environment	Compliance with ARARs	Long-term Effectiveness and Permanence	Reduction of Mobility/ Toxicity/Volume by Treatment	Short-term Effectiveness		
Waste							
1 – No Action	Poor	Poor	Poor	Poor	Excellent	Excellent	Low
2 – Removal and Off-Site Disposal	Excellent	Excellent	Excellent	Good	Good	Good	Medium
Soil/Fill							
1 – No Action	Poor	Poor	Poor	Poor	Excellent	Excellent	Low
2 – Institutional Controls and NAPL Removal	Poor-Fair	Poor-Fair	Poor-Fair	Poor-Fair	Good-Excellent	Excellent	Low
3 – Institutional Controls, Engineering Controls, and NAPL Removal	Good	Good	Good	Fair	Good	Good	Medium
4 – Inst. Controls, Engineering Controls, Focused Removal, and NAPL Removal	Good-Excellent	Good-Excellent	Good-Excellent	Good	Good	Good	Medium-High
5 – Inst. Controls, In-Situ Remediation, Engineering Controls, and NAPL Removal	Good-Excellent	Good	Good-Excellent	Fair-Good	Fair	Poor-Fair	High
Groundwater							
1 – No Action	Poor	Poor	Poor	Poor	Excellent	Excellent	Low
2 – Institutional Controls, Containment at River, and Pump and Treat	Good	Good	Good	Good	Good	Good	High
3 – Institutional Controls and In-Situ Remediation	Good	Good	Fair-Good	Fair	Fair	Good	Medium
4 – Institutional Controls, P&T, and Targeted Periodic In-Situ Remediation	Good-Excellent	Good-Excellent	Good-Excellent	Good	Good	Good-Excellent	Medium-High
5 – Institutional Controls, Containment at River, and Focused In-Situ Remediation	Good	Good	Good	Fair	Fair-Good	Good	Medium
Sewer							
1 – No Action	Poor	Poor	Poor	Poor	Excellent	Excellent	Low
2 – Removal and Off-Site Disposal	Excellent	Excellent	Excellent	Good	Good	Good	Low
Soil Gas							
1 – No Action	Poor	Poor	Poor	Poor	Excellent	Excellent	Low
2 – Inst. Controls, Monitoring/Engineering Controls, and Site-Wide Engineering Controls	Good	Good	Good	Poor	Excellent	Excellent	Low
3 – Inst. Controls, Site-Wide Engineering Controls, and In-Situ Remediation	Good-Excellent	Good-Excellent	Good-Excellent	Good	Fair-Good	Poor-Fair	High

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Table 6-2
Cost Summary of Remedial Alternatives
Riverside Industrial Park Superfund Site
Newark, New Jersey

	Total Capital Cost	Annual O&M	Total Net Present Worth
Waste			
1 – No Action	$0	$0	**$0**
2 – Removal and Off-Site Disposal	$1,798,211	$0	**$1,580,700**
Soil/Fill			
1 – No Action	$0	$0	**$0**
2 – Institutional Controls and NAPL Removal	$303,322	$8,125	**$356,100**
3 – Institutional Controls, Engineering Controls, and NAPL Removal	$11,140,405	$75,000	**$10,450,900**
4 - Institutional Controls, Engineering Controls, Focused Removal with Off-Site Disposal of Lead, and NAPL Removal	$13,623,160	$75,000	**$12,633,300**
5 - Institutional Controls, In-Situ Remediation, Engineering Controls, and NAPL Removal	$15,222,505	$68,750	**$13,971,400**
Groundwater			
1 – No Action	$0	$0	**$0**
2 – Institutional Controls, Site Containment and Pump and Treat	$30,590,844	$1,125,000	**$34,258,600**
3 – Institutional Controls and In-Situ Remediation	$28,459,770	$131,250	**$20,844,800**
4 - Institutional Controls, Pump and Treat, and Targeted Periodic In-Situ Remediation	$12,831,750	$1,500,000	**$24,234,400**
5 - Institutional Controls, Site Containment at River Edge, and Focused In-Situ Remediation	$20,811,881	$131,250	**$17,193,900**
Soil Gas			
1 – No Action	$0	$0	**$0**
2 – Alternative 2 - Institutional Controls, Air Monitoring or Engineering Controls (existing occupied buildings) and Site-Wide Engineering Controls (future buildings)	$123,525	$31,500	**$449,800**
3 – Institutional Controls, Site-Wide Engineering Controls (future buildings), and Air Monitoring or Engineering Controls and In-Situ Remediation of Soil/Fill (existing occupied buildings)	$4,591,968	$0	**$4,050,800**
Sewer			
1 – No Action	$0	$0	**$0**
2 – Removal and Off-Site Disposal	$27,981	$0	**$24,900**

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Table 6-3
Projected Durations of Remedial Alternatives
Riverside Industrial Park Superfund Site
Newark, New Jersey

	Projected Duration		
	Pre-Design Investigation and/or Testing	Remedial Design	On-Site Remedial Action
Waste			
1 – No Action	--	--	--
2 – Removal and Off-Site Disposal	2 -4 month	2 -4 month	1-2 months
Soil/Fill			
1 – No Action	--	--	--
2 – Institutional Controls and NAPL Removal	1-2 months	2 -4 months	1 -2 months
3 – Institutional Controls, Engineering Controls, and NAPL Removal	6-8 months	6-8 months	6-10 months
4 - Institutional Controls, Engineering Controls, Focused Removal with Off-Site Disposal of Lead, and NAPL Removal	6-8 months	6-10 months	8-12 months
5 - Institutional Controls, In-Situ Remediation, Engineering Controls, and NAPL Removal	8-12 months	8-12 months	8-12 months
Groundwater			
1 – No Action	--	--	--
2 – Institutional Controls, Site Containment and Pump and Treat	12-18 months	9-12 months	12-18 months
3 – Institutional Controls and In-Situ Remediation	6-10 months	6-8 months	9-12 months (first round of injections only)
4 - Institutional Controls, Pump and Treat, and Targeted Periodic In-Situ Remediation	12-18 months	9-12 months	8-10 months (not including targeted injections)
5 - Institutional Controls, Site Containment, and Focused In-Situ Remediation	10-14 months	8-10 months	9-12 months (first round of injections only)
Soil Gas			
1 – No Action	--	--	--
2 – Alternative 2 - Institutional Controls, Air Monitoring or Engineering Controls (existing occupied buildings) and Site-Wide Engineering Controls (future buildings)	<1 month	1-2 months	1-2 months
3 – Institutional Controls, Site-Wide Engineering Controls (future buildings), and Air Monitoring or Engineering Controls and In-Situ Remediation of Soil/Fill (existing occupied buildings)	4 -6 months	4-6 months	4-6 months (initial round of injections)
Sewer			
1 – No Action	--	--	--
2 – Removal and Off-Site Disposal	1 month	1-2 months	<1 month

Notes:

1. Repair of the bulkhead under the Soil/Fill Alternatives 4 and 5 contributes approximately $3,600,000 to the total direct cost.
2. Schedule includes time for regulatory reviews and modifications
3. For Soil Gas Alternative 3, it is anticipated that additional rounds of injection would be delayed for 2 to 5 years depending on reagents.

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