DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION

RCRA Corrective Action
Environmental Indicator (EI) RCRAInfo Code (CA725)
Current Human Exposures Under Control

Facility Name: **Military Ocean Terminal**
Facility Address: **Bayonne, Hudson County, New Jersey**
Facility EPA ID#: **NJ0210022752**

Definition of Environmental Indicators (for the RCRA Corrective Action)

Environmental Indicators (EIs) are measures being used by the RCRA Corrective Action program to go beyond programmatic activity measures (e.g., reports received and approved) to track changes in the quality of the environment. The two EIs developed to-date indicate the quality of the environment in relation to current human exposures to contamination and the migration of contaminated groundwater. An EI for non-human (ecological) receptors is intended to be developed in the future.

Definition of "Current Human Exposures Under Control" EI

A positive "Current Human Exposures Under Control" EI determination ("YE" status code) indicates that there are no unacceptable human exposures to "contamination" (i.e., contaminants in concentrations in excess of appropriate risk-based levels) that can be reasonably expected under current land- and groundwater-use conditions (for all contamination subject to RCRA corrective action at or from the identified facility [i.e., site-wide]).

Relationship of EI to Final Remedies

While final remedies remain the long-term objective of the RCRA Corrective Action program, the EIs are near-term objectives, which are currently being used as program measures for the Government Performance and Results Act of 1993, (GPRA). The "Current Human Exposures Under Control" EI is for reasonably expected human exposures under current land- and groundwater-use conditions ONLY, and does not consider potential future land- or groundwater-use conditions or ecological receptors. The RCRA Corrective Action program's overall mission, to protect human health and the environment, requires that final remedies address these issues (i.e., potential future human exposure scenarios, future land and groundwater uses, and ecological receptors).

Duration / Applicability of EI Determinations

EI determination status codes should remain in the Resource Conservation and Recovery Act Information system (RCRAInfo) national database ONLY as long as they remain true (i.e., RCRAInfo status codes must be changed when the regulatory authorities become aware of contrary information).

Facility Information

The Military Ocean Terminal, Bayonne (MOTBY), is located on a 679-acre man-made peninsula. It is located adjacent to (east of) the City of Bayonne in Hudson County, northeastern New Jersey. The peninsula is approximately two miles long and one-third mile wide, and extends eastward into the Upper

New York Bay. The site varies from approximately 3,000 feet wide at the west end to 1,400 feet wide at the east end. Dredged channels lie to the south (South Channel) and north (North Channel) of the peninsula. The Hudson River enters Upper New York Bay to the northeast of MOTBY, while Kill Van Kull enters Upper New York Bay just south of MOTBY. Staten Island is immediately south of Kill Van Kull. The region surrounding MOTBY is extensively developed and is a mixed land-use area. MOTBY currently consists mostly of paved and/or concrete areas and structures, including approximately 75 buildings, specifically in the eastern and central portions of the peninsula.

From 1937 to 1939, approximately six million cubic yards of hydraulic fill dredged from the New York Harbor were placed into bulkheads, creating the peninsula on which the facility is located. The terminal surface was constructed with sand dredged from the New York Bay. In 1941, the U.S. Navy purchased the terminal and performed additional construction. From 1941 to 1995, a variety of military tenants used the facility to support ocean shipment of military materiel and personnel. In July 1965, the Army established the Military Ocean Terminal on a portion of the facility.

Title for this property was transferred to the U.S. Army in 1967. In 1995, MOTBY was designated for closure under the Base Realignment and Closure Act (BRAC) and in September 1999, MOTBY terminated all military operations. The City of Bayonne maintains the installation, which houses office space in Building 82 for a portion of the city's police force, administrative staff, and maintenance staff. The City of Bayonne's fire department operates a fire station in Building 44B. MOTBY is accessed though the main entrance gate that has a guardhouse occupied 24 hours a day by the City of Bayonne police.

Approximately 27 acres of the 679-acre peninsula were previously transferred to the U.S. Coast Guard. According to the Final Decision Document (October 2002), approximately 460 acres have been designated as requiring No Further Action (NFA) and have already been transferred from the Army to the Bayonne Local Redevelopment Authority (BLRA), which has been designated by the Department of Defense as the local reuse authority and represents the City of Bayonne. Approximately 192 acres requiring remedial action have been leased to the BLRA under a Lease in Furtherance of Conveyance and will be transferred to the BLRA prior to remedial action completion under the Early Transfer mechanism.

The BLRA and the Army have signed an Environmental Services Cooperative Agreement (ESCA) for the implementation and completion of the site cleanup. BLRA will perform the cleanup, while the Army is responsible for cleanup program oversight. A 1997 Remedial Investigation (RI) and a 2000 Supplemental Remedial Investigation (SRI), were conducted at areas identified in previous investigations as requiring further delineation. Planned remedial actions at the site were included in the Final Decision Document dated October 2002, which were selected by the U.S. Army, the New Jersey Department of Environmental Protection (NJDEP) and the U.S. Environmental Protection Agency (EPA). The BLRA has developed a Remedial Action Work Plan (RAWP) in accordance with NJDEP requirements. Remedial action is currently ongoing at the site, with excavations completed in May 2003 and engineering control construction scheduled for late 2003 or early 2004.

1. Has **all** available relevant/significant information on known and reasonably suspected releases to soil, groundwater, surface water/sediments, and air, subject to RCRA Corrective Action (e.g., from solid waste management units (SWMU), regulated units (RU), and areas of concern (AOC)), been **considered** in this EI determination?

   _X_ If yes - check here and continue with #2 below.

   ____ If no - re-evaluate existing data, or

   ____ If data are not available skip to #6 and enter IN (more information needed) status code

Summary of OUs and AOCs: During the RI, 23 OUs were identified at the MOTBY site. These OUs either specified a task to be accomplished, or a group of study areas to be investigated (Ref. 9). OU9 was later separated into the Landfill and North Fill Areas, and the Miscellaneous Soils AOC was added. A total of nine OUs/AOCs not included in this NFA determination were retained for remedial action due to contaminant concentrations in soils and groundwater in exceedence of applicable standards. Summaries of the nine OUs are provided below. Four of these OUs (OU9 Landfill, OU9 North Fill Area, OU11, and OU17) comprise most of the western potion of the facility (Ref. 5). The remaining OUs consist of small, isolated contaminated areas that are located within predominantly clean areas. For a site map of all NFA areas and all areas requiring remedial action, see Figure 2-2 of the Final Decision Document (Ref. 5).

Current use of the site and surrounding area is non-residential; therefore, only the contaminants exceeding the New Jersey Non-Residential Direct Contact Soil Cleanup Criteria (NJ NRDCSCC) are of concern for current site conditions. However, the planned Deed Notice will address the areas with soil contaminant concentrations in excess of New Jersey Residential Direct Contact Soil Cleanup Criteria (NJ RDCSCC) (Ref. 8). A brief description of the remedial activities planned or in progress for each OU is presented at the end of each OU summary; for more detail, please refer to the RAWP (Ref. 6).

OU5. Facility-Wide Groundwater: This OU encompasses site-wide hydrogeologic characterization and groundwater investigations. Areas of specific attention include portions of OU2, OU7, OU9, OU11, OU16, OU19, and OU20. Contaminants detected above NJ Ground Water Quality Criteria (NJ GWQC) include inorganics, VOCs, and 4,4-Dichlorodiphenyl dichloroethane (4,4-DDD). The selected remedial alternative for groundwater is natural attenuation of all dissolved contaminants detected above NJ GWQC. A groundwater monitoring program for eight consecutive quarters is currently underway (Ref. 7). A Classification Exception Area (CEA) has also been established, with the horizontal extent encompassing the entire peninsula and the vertical extent defined by the depth of the historical fill (Ref. 1).

OU7. Area 44C Boiler Building: This OU, located near the northern bulkhead, is the site of a former boiler facility. OU7 includes a number of buildings and two heating oil pipelines. Site history for this OU indicates the use, storage, and releases of different types of oil, anhydrous ammonia, and other hazardous materials from various underground storage tanks (USTs), aboveground storage tanks (ASTs), and railroad tank cars (Ref. 6). The heating oil pipelines were used to transfer oil directly from ships to the boiler plant USTs. These USTs leaked fuel oil and were removed in 1998, though full removal of the soils was not performed at that time.

Contaminants detected above NJ NRDCSCC in surface soil[1] during the RI and SRI include polynuclear aromatic hydrocarbons (PAHs), aldrin, and Aroclor 1260. PAHs were detected above NJ NRDCSCC in subsurface soil. Elevated concentrations of total petroleum hydrocarbon (TPH) were also detected, compared to the NJDEP maximum total organic content (TOC) soil criterion (Ref. 6). The depth of PAH and TPH contamination (generally below the water table) corresponds to the depth of the former USTs (Ref. 6). Free-phase product remains within the subsurface soil and was detected in a groundwater well at a thickness of approximately one foot in the vicinity of the impacted soil (Ref. 6). A total of 2,496 tons of potentially petroleum-impacted soils were excavated in Spring 2003, and approximately 1,096 tons of excavated soil was stockpiled for landfill closure while 1,400 tons of petroleum-impacted soil was transported off site for recycling (Ref. 7). Approximately 361,000 gallons of groundwater and residual free-phase product were recovered from the open excavations and transported off site for treatment (Ref. 7). Excavation and proper disposal of 10 tons of subsurface soil and steam piping associated with the former boiler building were also performed, and all excavated areas were backfilled with clean fill to pre-existing grade (Ref. 7). A deed notice will be prepared to restrict future use of areas where PAH contamination could not be removed due to access constraints caused by active utilities (Ref. 8).

OU9. Landfill: The landfill is located at the western end of the MOTBY peninsula and encompasses approximately 26.3 acres. A spring located on the northeast side of the landfill discharges to a storm drain, which in turn empties into the North Channel. A variety of land uses, including drum storage, incinerator/burning, and landfilling of wastes (from the early 1940s to the late 1960s) were performed at the site. In 1969, the landfill was covered with sand and gravel. Since 1970, use has been limited primarily to construction debris disposal, although in 1990, several loads of railroad ballast were deposited in the landfill. Part of the landfill is located in OU11 but will be remediated with the OU9 Landfill remedy. A 0.6-acre burn area to the east of the landfill and small pockets of wetlands, which total approximately 3.6 acres, are also included in the OU9 Landfill remedy. Contaminants detected above NJ NRDCSCC in surface soil during the RI include PAHs, inorganics, pesticides, and Aroclor 1260. Contaminants detected above NJ NRDCSCC in subsurface soil during the RI and SRI include PAHs, inorganics, pesticides, and Aroclor 1254. During the SRI, surface water sampling collected from open water within the landfill and spring detected concentrations of copper, lead, and manganese above NJ Surface Water Quality Criteria (SWQC). The selected remedial alternative includes installation of a soil cover system consisting of 18 inches of fill and 6 inches of topsoil, which would be graded and vegetated. The landfill will be closed following capping, possibly with some waivers from technical requirements pending NJDEP approval, and groundwater will be monitored for 30 years (Ref. 5). Designated wetlands on the landfill that will be filled as part of the cover system will be mitigated or restored. Signs will be posted around the perimeter of the landfill to demarcate the landfill boundaries, and a deed notice will be placed on this OU to limit future use to non-residential activities and restrict disturbance of the soil cover (Ref. 5).

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[1]Soil sampling conducted at MOTBY during the RI and SRI did not always conform to the traditional distinction between surface soil (e.g., < 2 feet below ground surface [bgs]) and subsurface soil (e.g., > 2 feet bgs). Sampling results that covered a range of depths were difficult to classify under these traditional definitions. Therefore, for the purposes of this EI determination, surface soil shall include all sample locations beginning at zero feet bgs (e.g. 0 - 0.5 feet bgs or 0 - 2 feet bgs). Subsurface soil shall be defined as any sample beginning at one foot bgs or greater (e.g 1 - 3 feet bgs, 6 - 8 feet bgs).

OU9. North Fill Area: The North Fill Area is approximately 32.6 acres of dredged fill material originally constructed as a barrier between the landfill and the Upper New York Bay, with the landfill located to the south and the Defense Reutilization and Marketing Office (DRMO) Storage Area (OU11) to the east. The North Fill Area includes approximately 12.7 acres of wetlands. Analysis of test pit soils indicated that North Fill materials can be considered uniform throughout the OU and these materials can thus be characterized using historical fill default criteria (Ref. 5). Average concentrations of all PAHs and all inorganic compounds (except beryllium) were detected below the average values detected in typical historic fill, although arsenic and beryllium were detected at maximum concentrations slightly exceeding NJ NRDCSCC. The average values for the typical historical fill slightly exceeded NJ NRDCSCC for benzo(a)pyrene and dibenz(a,h)anthracene. The selected remedial alternative for OU9 North Fill Area includes installation of a six-foot-high chain-link perimeter fence accompanied with sign postings to restrict access, and preparation of a deed notice that limits future use to non-residential activities and restricts disturbance of the soils in the North Fill Area (Ref. 5).

OU11. DRMO Storage Area: This area was used by the DRMO primarily for storage of materials, including excess equipment, scrap metal, and drums containing various materials, including wastes. This OU is subdivided into study areas (SAs), including SA 203, SA 204, and SA 205. The western edge of these SAs includes a portion of the landfill, but landfill soil contamination identified within OU11 is being addressed under OU9. Additionally, the northeast section of SA 205 contains a small area of buried waste/debris that will be addressed under OU20. Contaminants in surface soil above NJ NRDCSCC include benzo(a)pyrene, copper, and PCBs. Contaminants detected above NJ NRDCSCC in subsurface soil include PAHs, inorganics, and Aroclor 1260. PCB-impacted soil was excavated and properly disposed of off site, and the excavated areas were backfilled and compacted to pre-existing grade (Ref. 7). Engineering controls will also be applied, including using/repairing existing asphalt pavement or installing a new asphalt pavement cap, depending on location (Ref. 5). A deed notice will be implemented that limits site use to non-residential use and restricts disturbance of the covers (Ref. 5).

OU17. Railroad Classification Yard: The Railroad Classification Yard (RCY) is located south of the landfill and along the southern portion of the peninsula. The yard was designed and utilized for facilitation of railroad operations. Several PAHs, inorganics, and dieldrin were detected in surface soil at concentrations exceeding NJ NRDCSCC. The selected remedial alternative includes placement of an 18-inch thick layer of clean soil to cap approximately 428,528 square feet of contaminated surface soils, mitigation/restoration of affected wetlands, and establishment of a deed notice to limit future use to non-residential purposes and restrict disturbance of the covers (Ref. 5).

OU20. Waste/Debris Lots 94, 95, and 205: This OU is underlain by fill mixed with waste material such as lumber, concrete, brick, and metal on approximately 6.3 acres of land in Lots 94, 95, and 205. Buried waste/debris was discovered in portions of Lots 94, 95, and 205 during the SRI, but is not indicative of a continuing practice of dumping (Ref. 5). PAHs and inorganics were detected in subsurface soils at concentrations above NJ NRDCSCC (Ref. 3). An additional groundwater investigation was performed in 2001 (Ref. 4), and the contamination detected is described under OU5. The selected remedial action includes covering all unpaved areas with an

18-inch soil cover, repairing the existing asphalt cover, and establishing a deed notice to limit future use to non-residential purposes and restrict disturbance of the covers (Ref. 5).

OU23. Facility-Wide PCBs: Several PCB-containing transformers, located inside and outside of buildings, were removed from the site between 1980 and 1994. This OU addresses soil outside buildings that was contaminated with PCBs from transformer-related operations. PCBs were detected in subsurface soil exceeding NJ NRDCSCC in OU12, and were detected in surface soil above NJ NRDCSCC in OU7, OU10, OU12, OU16, and the Light Rail Parcel (near Building 228A) (Ref. 5). PCB-impacted soil in SAs 105 and 108, which contained PCBs in excess of 50 mg/kg (Ref. 6), was excavated and disposed of properly off site, and the excavated areas were backfilled and compacted to pre-existing grade (Ref. 7). Engineering controls (i.e., placement of an asphalt paving cap over areas with PCB contamination remaining above NJ NRDCSCC), and institutional controls (i.e., establishment of a deed notice to limit the site to non-residential use and to restrict disturbance of the covers) will also be implemented for OU23 (Ref. 5).

Miscellaneous Soils: The RI and SRI identified 24 separate areas of soil contamination above NJ NRDCSCC in seven OUs, which were divided into two groups. Group 1 soil samples were collected from depths of two feet bgs or greater, and/or below an asphalt pavement cover, while Group 2 soil samples were collected at or near the ground surface in areas with partial or no surface cover (Ref. 6). Surface soil contaminants detected above NJ NRDCSCC for Group 1 soils include PAHs detected under pavement. Contaminants detected in subsurface soil at concentrations exceeding NJ NRDCSCC for Group 1 soils include TPH, PAHs, and inorganics. Surface soil contaminants detected above NJ NRDCSCC for Group 2 soils include TPH, PAHs, inorganics, pesticides, and PCBs. The selected remedial action for Group 1 soils includes the use of engineering controls (existing pavement will be repaired, new pavement will be placed over contaminated areas, or the existing soil cover of at least two feet will be used), and institutional controls (a deed notice will be prepared that limits future use to non-residential purposes and restricts disturbance of the covers) (Ref. 5). Group 2 soil remediation consists of engineering and institutional controls combined with removal of PCB hot spots. PCB-contaminated soil in SAs 100P and 103 was excavated and properly disposed of off site, and the excavated areas were backfilled and compacted to pre-existing grade (Ref. 7). A new nine-inch thick pavement will be placed over an area of approximately nine acres, and a deed notice will be prepared that limits future use to non-residential purposes and restricts disturbance of the covers (Ref. 5).

References:

1. Letter from NJDEP to MOTBY, re: Draft Supplemental RIR, November 2000, et. al. Dated March 16, 2001.
2. Letter from Bruce Venner, NJDEP, to Major General Privratsky, US Army, re: Clean Parcels Area of Concern, Unrestricted Use No Further Action Letter and Covenant Not to Sue. Dated September 25, 2001.
3. Feasibility Study, Military Ocean Terminal, Bayonne (MOTBY), Bayonne, New Jersey. Prepared by Ecology and Environment, Inc. Dated October 2001.
4. Draft Supplemental Remedial Investigation Wells at Lots 95 and 205, Military Ocean Terminal, Bayonne (MOTBY), Bayonne, New Jersey. Prepared by Ecology and Environment, Inc. Dated December 2001.

5. Final Decision Document for Nine Areas of Concern/Operable Units at Military Ocean Terminal, Bayonne, New Jersey. Prepared by Ecology and Environment, Inc. Dated October 2002.
6. Remedial Action Workplan, Military Ocean Terminal Bayonne (MOTBY), Bayonne, New Jersey, Revision 2.0. Prepared by EXCEL Environmental Resources, Inc. Dated November 2002.
7. Quarterly Remedial Action Progress Report No. 4, April 1, 2003 Through June 30, 2003, Military Ocean Terminal Bayonne (MOTBY), Bayonne Local Redevelopment Authority, Bayonne, New Jersey. Prepared by EXCEL Environmental Resources, Inc. Dated July 2003.
8. Letter from David Grupp, EXCEL Environmental Resources, Inc., to Alan Straus, US EPA, re: Summary of Current and Future Exposures to Humans and the Environment. Dated July 17, 2003.

2. Are groundwater, soil, surface water, sediments, or air **media** known or reasonably suspected to be "**contaminated**"[2] above appropriately protective risk-based levels (applicable promulgated standards, as well as other appropriate standards, guidelines, guidance, or criteria) from releases subject to RCRA Corrective Action (from SWMUs, RUs or AOCs)?

Media	Yes	No	?	Rationale/Key Contaminants
Groundwater	x			VOCs, inorganics, 4,4-DDD
Air (indoors)[3]		x		
Surface Soil	x			PAHs, inorganics, pesticides, PCBs
Surface Water	x			Inorganics
Sediment		x		
Subsurface Soil	x			PAHs, inorganics, pesticides, PCBs
Air (Outdoor)		x		

____ If no (for all media) - skip to #6, and enter YE status code after providing or citing appropriate levels, and referencing sufficient supporting documentation demonstrating that these levels are not exceeded.

__X__ If yes (for any media) - continue after identifying key contaminants in each contaminated medium, citing appropriate levels (or provide an explanation for the determination that the medium could pose an unacceptable risk), and referencing supporting documentation.

____ If unknown (for any media) - skip to #6 and enter IN status code.

Rationale:

Groundwater

The MOTBY site is underlain by four hydrogeological units: fill, harbor sediment, glacial sediment, and bedrock. Groundwater within the fill occurs under unconfined conditions. Groundwater recharge to the fill unit occurs via infiltration of precipitation and, to a much lesser extent, via groundwater inflow from the

[2] "Contamination" and "contaminated" describe media containing contaminants (in any form, NAPL and/or dissolved, vapors, or solids, that are subject to RCRA) in concentrations in excess of appropriately protective risk-based "levels" (for the media, that identify risks within the acceptable risk range).

[3] Recent evidence (from the Colorado Department of Public Health and Environment, and others) suggests that unacceptable indoor air concentrations are more common in structures above groundwater with volatile contaminants than previously believed. This is a rapidly developing field and reviewers are encouraged to look to the latest guidance for the appropriate methods and scale of demonstration necessary to be reasonably certain that indoor air (in structures located above (and adjacent to) groundwater with volatile contaminants) does not present unacceptable risks.

western site boundary where the peninsula joins the original land surface. The recharge creates a groundwater high at the western boundary that extends along the length of the peninsula (Ref. 1). Groundwater flow is generally from the northwest towards the northeast and southeast, where discharge occurs along the peninsula perimeter into New York Harbor. The fill unit contains an upper fresh water layer and a lower saline water layer, separated by a zone of diluted brackish water, which fluctuates in thickness depending on tide and precipitation events. Fresh water within the fill is not used for potable water supply and no potable wells are permitted to be installed, per City of Bayonne regulations (Ref. 4). The site is serviced by a public water supply.

The underlying unit is represented by the original harbor sediment, which consists of silt and clay, with varying amounts of sand and gravel. The unit acts as an aquitard that has prevented contamination in the fill from migrating downward to the underlying glacial unit (Ref. 1). The underlying glacial unit consists of approximately 40 feet of clay, silt, sand, gravel, and boulders. The glacial unit is in direct contact with the saline water in New York Harbor and is underlain by bedrock comprised of Manhattan Schist and arkosic sandstones of the Stockton Formation (Ref. 1).

As part of remedial investigations at the site, 65 monitoring wells were installed (Ref. 4). Four of these wells were installed in the glacial unit and one well was installed in the bedrock. The remaining wells were installed in the fill unit. In 2001, three additional monitoring wells were installed within the OU20 area (Ref. 6). Locations for these wells are presented in Figure 3-29 of the RAWP (Ref. 7).

Contaminant concentrations in excess of the NJ GWQC for Class-IIA potable groundwater have been reported in the fill unit. During the initial RI in 1997, analytical results from 13 on-site wells indicated inorganic, VOC, and pesticide concentrations above the NJ GWQC (Ref. 1). Free product was also detected floating in one well at OU7 (MW07-04), but was not detected in wells located within 200 feet downgradient. Additional groundwater sampling was conducted in March 2000 as part of the SRI (Ref. 3) and as part of a subsequent investigation performed at OU20 (Ref. 6). Similar groundwater contamination at reduced concentrations was observed and consisted of inorganics (arsenic, chloride ion, iron, manganese, and sodium), VOCs (benzene, cis-1,2-dichloroethene [DCE], 1,2-dichloropropane, ethylbenzene, 4-methyl-2-pentanone, methyl-tert-butyl-ether [MTBE], tetrachloroethene [PCE], trichloroethene [TCE], vinyl chloride), and a pesticide (4,4-DDD) above NJ GWQC (Table 1). According to the Feasibility Study (FS) (Ref. 5), the inorganic constituents that exceed the NJ GWQC have been attributed to seawater (chloride and sodium) and fill composition (arsenic, iron, manganese, and sodium), a position that was accepted by NJDEP in a May 23, 2000, letter (Ref. 2). In addition, benzene concentrations above NJ GWQC in OU2 (well MW02-28) have been attributed to off-site, upgradient sources (Ref. 1). Table 1 presents the groundwater contaminants detected above NJ GWQC during the most recent quarterly monitoring event (April 2003).

Table 1 - Groundwater Contaminants above NJ GWQC MOTBY (µg/L)

Operable Unit	Groundwater [1]		NJ GWQC
	Contaminant[2]	Concentration	
OU7 Gas Station/Boiler Plant	PCE TCE	3.7 1.3	1 1
OU11 DRMO Storage Area	Vinyl chloride	7	5
OU16 MTMC Command Center	Benzene	650	1

[1] Concentration represents the maximum detected value for each contaminant by area. All samples were collected in April 2003, the fifth quarter of the eight-quarter groundwater monitoring program, and the results are presented in Appendix B of the July 2003 Quarterly Remedial Action Progress Report (Ref. 9). Groundwater concentrations were screened against the NJ GWQC or the Practical Quantitation Levels (PQL), whichever was higher.

[2] Inorganic constituents that exceeded NJ GWQC have been attributed to saltwater and fill composition and therefore are excluded from the table.

Air (Indoors)

The maximum concentrations of VOCs detected from the most recent groundwater sampling (April 2003) were compared to the State of Connecticut Groundwater Standards for Protection of Indoor Air under the Industrial/Commercial scenario (CT I/C VC) to identify constituents that may be a concern due to potential migration into indoor air. Vinyl chloride was detected above its corresponding CT I/C VC (2 µg/L) in OU11 (7 µg/L in MW11-DM16). Benzene was detected above its CT I/C VC (530 µg/L) in OU16 (650 µg/L in MW16-02).

MW11-DM16 is not located near any existing structures or buildings (see Figure 3-29 of RAWP) (Ref. 7). MW16-02 is located at the edge of Building 91D (post exchange/gas station), where gasoline USTs were previously removed and gasoline pumps are currently active (Ref. 1). However, benzene appears to be attenuating naturally at this monitoring well, as evidenced by the 79 percent decrease in concentrations detected between the 1997 RI (3,100 µg/L) and the April 2003 sampling (650 µg/L), and only slightly exceeds its CT I/C VC (530 µg/L).

Thus, given the lack of a routinely occupied building in the area of one VOC-impacted area and the apparent natural attenuation of another VOC impact near an actively used building, VOC migration from groundwater into indoor air is not currently considered a concern at the site.

Surface/Subsurface Soil

Surface soil and subsurface soil have been impacted at the site by TPH, PAHs, inorganics, pesticides, and PCBs above the NJ NRDCSCC. Types of contaminants are listed by OU below, while maximum detections for each contaminant are listed by OU in Attachment 1.

OU7: Contaminants detected above NJ NRDCSCC in surface soil include PAHs, aldrin, and Aroclor 1260. PAHs and TPH were detected above NJ NRDCSCC in subsurface soil. See Attachment A for maximum detected concentrations of aldrin and Aroclor 1260. As mentioned above, 2,496 tons of potentially petroleum-impacted soils were excavated, approximately 361,000 gallons of groundwater and residual free-phase product were recovered from the open excavations, and 10 tons of subsurface soil and steam piping associated with the former boiler building was excavated in Spring 2003 (Ref. 8). The RAWP states that planned remedial action included excavation of TPH to the 10,000 mg/kg NJDEP TOC criterion, and that this excavation will effectively address PAH concentrations above NJ NRDCSCC (Ref. 7). However, access constraints were encountered during the excavations due to the presence of existing, active utilities (Ref. 9). The remediation contractor states that contamination above unspecified NJ Soil Cleanup Criteria could not be removed due to these constraints (Ref. 9). Therefore, it is possible that TPH/PAH contamination remains in OU7 above NJ NRDCSCC but it is unlikely that the maximum TPH/PAH concentrations detected in the RI and SRI are still present due to the excavation and disposal activities that did take place. The deed notice to be prepared for this OU will limit future use to non-residential purposes in specific areas with contaminant concentrations above the NJ RDCSCC.

OU9 Landfill: Contaminants detected above NJ NRDCSCC in surface soil include PAHs, inorganics, pesticides, and Aroclor 1260. Contaminants detected above NJ NRDCSCC in subsurface soil include PAHs, inorganics, pesticides, and Aroclor 1254. See Attachment 1 for maximum detected concentrations of each contaminant.

OU9 North Fill Area: Two inorganics were detected at maximum concentrations exceeding NJ NRDCSCC. The typical historical fill average values for two PAHs exceeded NJ NRDCSCC. See Attachment 1 for maximum detected concentrations of each contaminant.

OU11: Contaminants detected above NJ NRDCSCC in surface soil include benzo(a)pyrene, copper, and PCBs. Contaminants detected above NJ NRDCSCC in subsurface soil include PAHs, inorganics, and Aroclor 1260. In Spring 2003, a PCB hot spot was excavated to 50 mg/kg and properly disposed of off site, and the excavated area was backfilled and compacted to pre-existing grade. See Attachment 1 for maximum detected concentrations of each contaminant.

OU17: PAHs, inorganics, and dieldrin were detected above NJ NRDCSCC in surface soil. See Attachment 1 for maximum detected concentrations of each contaminant.

OU20: PAHs and inorganics were detected above NJ NRDCSCC in subsurface soil. See Attachment 1 for maximum detected concentrations of each contaminant.

OU23: PCBs were detected above NJ NRDCSCC in surface soil and subsurface soil. PCB-impacted soil from three areas of OU23 was excavated to 50 mg/kg and properly disposed of off site, and the excavated areas were backfilled and compacted to pre-existing grade (Ref. 8).

Miscellaneous Soils (Groups 1 and 2): Surface soil contaminants detected above NJ NRDCSCC include TPH, PAHs, inorganics, pesticides, and PCBs. Contaminants detected in subsurface soil at concentrations exceeding NJ NRDCSCC include TPH, PAHs, and inorganics. PCB-impacted soil from two areas of this AOC was excavated to 50 mg/kg and disposed of

properly off site, and the excavated areas were backfilled and compacted to pre-existing grade (Ref. 8). See Attachment A for maximum detected concentrations of each contaminant.

Surface Water/Sediment

During the SRI, three surface water samples and one sediment sample were collected in OU9 Landfill from ponded water on the landfill and water from a spring in the eastern portion of the landfill. Three inorganics were detected above NJ SWQC: copper (138 µg/L; NJ SWQC = 5.6 µg/L [Chronic, New York Harbor/New Jersey Estuary Criterion]), lead (9.8 µg/L; NJ SWQC = 5 µg/L), and manganese (1,440 µg/L; NJ SWQC = 100 µg/L). No contaminants were in sediment above the NJ NRDCSCC.

As previously mentioned, MOTBY is a man-made peninsula that extends approximately 10,000 feet eastward into the Upper New York Bay. Dredged channels lie to the south (South Channel) and north (North Channel) of the peninsula. The Hudson River enters Upper New York Bay to the northeast of MOTBY, while Kill Van Kull enters Upper New York Bay just south of MOTBY. Staten Island is immediately south of Kill Van Kull. The region surrounding MOTBY is extensively developed and mostly industrial (Ref. 1). Surface water and sediment in Upper New York Bay is regionally impacted by industrial sources in the surrounding area. Thus, given the limited detections of contaminants in groundwater and the localized areas of groundwater contamination, it is unlikely that activities at the MOTBY site have adversely impacted surface water and sediment in the Upper New York Bay.

Air (Outdoors)

No assessment of impacts to outdoor air has been conducted at this property. However, the majority of the MOTBY site is covered by asphalt pavement or buildings. Thus, limited migration of contaminants bound to airborne particulate matter is expected at this site. A few small areas exist on site that are covered with vegetation or grass; however, based upon the limited amount of exposed surface soil and the depth to groundwater at the site, volatile emissions and/or the migration of particulates entrained on dust are not expected to be significant.

References:

1. Remedial Investigation Report, Military Ocean Terminal, Bayonne (MOTBY), Bayonne, New Jersey. Prepared by Ecology and Environment, Inc. Dated September 1998.
2. Letter from Robert Hayton, NJDEP, to Mirza Baig, HQMTMC FOA Bayonne, re: Historic Fill, Military Ocean Terminal, Bayonne, Hudson County, New Jersey. Dated May 23, 2000.
3. Draft Supplemental Remedial Investigation Report. Prepared by Ecology and Environment, Inc. Dated November 2000.
4. Application for Designation of a Classification Exception Area. Prepared by Ecology and Environment, Inc. Dated May 2001.
5. Feasibility Study, Military Ocean Terminal, Bayonne (MOTBY), Bayonne, New Jersey. Prepared by Ecology and Environment, Inc. Dated October 2001.
6. Draft Supplemental Remedial Investigation Wells at Lots 95 and 205, Military Ocean Terminal, Bayonne (MOTBY), Bayonne, New Jersey. Prepared by Ecology and Environment, Inc. Dated December 2001.
7. Remedial Action Workplan, Military Ocean Terminal Bayonne (MOTBY), Bayonne, New Jersey, Revision 2.0. Prepared by EXCEL Environmental Resources, Inc. Dated November 2002.

8. Quarterly Remedial Action Progress Report No. 4, April 1, 2003, Through June 30, 2003, Military Ocean Terminal Bayonne (MOTBY). Prepared by EXCEL Environmental Resources, Inc. Dated July 2003.
9. Letter from David Grupp, EXCEL Environmental Resources, Inc. to Alan Straus, US EPA, re: Summary of Current and Future Exposures to Humans and the Environment. Dated July 17, 2003.

3. Are there **complete pathways** between "contamination" and human receptors such that exposures can be reasonably expected under the current (land- and groundwater-use) conditions?

Summary Exposure Pathway Evaluation Table
*Potential **Human Receptors** (Under Current Conditions)*

"Contaminated" Media	Residents	Workers	Day-Care	Construction	Trespasser	Recreation	Food[4]
Groundwater	No	No	–	No	–	–	–
Air (indoor)							
Surface Soil (e.g. < 2 ft)	No	No	–	Yes	No	No	–
Surface Water	No	No	–	Yes	No	No	–
Sediment							
Subsurface Soil (e.g., > 2 ft)	–	–	–	No	–	–	–
Air (outdoors)							

Instruction for Summary Exposure Pathway Evaluation Table:

1. Strike out specific Media including Human Receptors' spaces for Media which are not "contaminated" as identified in #2 above.

2. Enter "yes" or "no" for potential "completeness" under each "Contaminated" Media — Human Receptor combination (Pathway).

Note: In order to focus the evaluation to the most probable combinations some potential "Contaminated" Media - Human Receptor combinations (Pathways) do not have check spaces. These spaces instead have dashes ("--"). While these combinations may not be probable in most situations they may be possible in some settings and should be added as necessary.

____ If no (pathways are not complete for any contaminated media-receptor combination) - skip to #6, and enter "YE" status code, after explaining and/or referencing condition(s) in place, whether natural or man-made, preventing a complete exposure pathway from each contaminated medium (e.g., use optional Pathway Evaluation Work Sheet to analyze major pathways).

__X__ If yes (pathways are complete for any "Contaminated" Media - Human Receptor combination) - continue after providing supporting explanation.

____ If unknown (for any "Contaminated" Media - Human Receptor combination) - skip to #6 and enter "IN" status code.

[4] Indirect Pathway/Receptor (e.g., vegetables, fruits, crops, meat and dairy products, fish, shellfish)

Rationale:

Groundwater

Groundwater has been contaminated with VOCs and 4,4-DDD as a result of site-related activities in several areas. Fresh water within the fill is not used for potable water supply and no potable wells are permitted to be installed, per City of Bayonne regulations (Ref. 1); the site is serviced by a public water supply. An application for the establishment of a CEA was submitted to NJDEP and approved as part of a September 2001 NJDEP comment letter (Ref. 2). The CEA, which includes a Well Restriction Area (WRA), documents the existence of groundwater concentrations above NJ GWQC and restricts the current and future use of the shallow groundwater for any potable or non-potable use without prior treatment and advance NJDEP approval. The contaminants specified in the CEA include dissolved inorganics, which have been attributed to the historic fill and saltwater intrusion, and organic contaminants, which have been attributed to site activities (Ref. 2). The CEA is already in place, covers the entire site, and extends to the base of the fill unit. See Figure 2-1 in the Application for the Designation of the CEA (Ref. 1) for an illustration of CEA boundaries. The dissolved inorganic concentrations are expected to remain above the NJ GWQC for an indeterminate amount of time; therefore, the CEA duration for inorganics will be effectively permanent. The CEA duration for the organic contaminants is estimated at 18 years. The CEA emphasizes that the fill unit is not, and will not be, used for potable supply, and that discharges to New York Harbor will be minimal and will not significantly impact the ecological resources (Ref. 1).

Excavation of soil hot spots was completed in May 2003, and future remedial activities to be performed by skilled remedial workers include the following: maintenance, repair, or installation of new asphalt pavement; placement of clean, vegetated soil covers; and/or fencing and posting of signs (Ref. 4). The above-mentioned future remedial activities should not expose remedial workers, who are assumed to wear personal protective equipment (PPE) and adhere to strict Occupational Safety and Health Administration (OSHA) guidelines, to contaminated groundwater because they are not intrusive.

Therefore, there is no potentially complete exposure pathway between groundwater contaminants and human receptors.

Surface/Subsurface Soil

As presented in response to Question 2, there are several areas on site with contamination in surface/subsurface soil above NJ NRDCSCC. The main surface and subsurface soil contaminants exceeding NJ NRDCSCC include TPH, PAHs, inorganics, pesticides, and PCBs. All hot spot soil excavation activities were completed by the BLRA in May 2003, and engineering control construction (including capping, paving, and fencing) is scheduled for late 2003 or early 2004 (Ref. 4). A deed notice will be issued for all soil areas with contaminant concentrations above NJ RDCSCC, as outlined in Questions 1 and 2. Engineering control inspections will be performed periodically, maintenance will be performed on an as-needed basis to ensure the integrity of the covers, and a five-year review of the remedy performance will be conducted as appropriate in these OUs (Ref. 3). Additionally, a biennial

review and certification will be performed to certify that the cover is in place and functioning as needed in order to obtain a NFA letter from NJDEP (Ref. 3).

As mentioned above for groundwater, the only on-site activities scheduled for the near future are engineering control construction activities to be performed by skilled remedial workers. These activities will involve some disturbance of surface soil; therefore, the potential for direct exposure to impacted surface soil is being considered a potentially complete exposure pathway for an on-site remedial worker (classified as a construction worker for the purpose of this EI Determination). However, given that the engineering controls do not require intrusive activities or disturbance of subsurface soil, direct exposure for remedial workers to impacted subsurface soil is not considered a potentially complete exposure pathway.

The BLRA regulates site activities involving surface and subsurface soil disturbance or construction-related activities at all impacted areas at the site. Before any such activity can proceed, advance written approval must be secured from BLRA, the local utility authorities must approve, and a Building Permit must be issued through the City of Bayonne (Ref. 4). A sign is currently posted within each OU that identifies the potential for hazardous substances to be present (Ref. 4). Additionally, the impacted areas at the site have additional controls including asphalt pavement, clean soil cover with grass or other vegetative cover and/or gravel, and/or fencing (Ref. 4). These controls prevent tenants or construction workers potentially hired by tenants from contacting surface or subsurface soil before the final engineering control activities are completed (Ref. 4).

The site is also sufficiently secured to protect other receptors (e.g., trespassers) from exposure to contamination in on-site areas. MOTBY can only be accessed through one entrance gate, located at Route 440 and 32nd Street. The entrance gate has a guardhouse occupied 24 hours per day by the City of Bayonne Police Department, and personal identification is required for anyone entering the site. The peninsula perimeter is secured by fencing and the Bayonne Police Department routinely patrols the site throughout the day (Ref. 4).

As a result, the potential for direct exposure to impacted surface and subsurface soil is not being considered a potentially complete exposure pathway for human receptors at this time, with the exception of on-site remedial workers to surface soil.

Surface Water

As presented in response to Question 2, copper, lead, and manganese were detected above NJ SWQC in OU9 Landfill (in ponded water on the landfill and water from a spring in the eastern portion of the landfill).

Access to the site is limited as described above for surface/subsurface soil. Access to the landfill is currently controlled by fencing and a locked gate, and planned actions include sign posting to further restrict access and delimit landfill boundaries (Ref. 4). The landfill is not currently in use (Ref. 4).

Although discharge from the spring was estimated at 10,000 gallons per day in the RI, during the SRI the spring appeared as a stagnant pond (Ref. 3). Similarly, the areal extent of the ponded water was smaller during the SRI than observed during the RI (Ref. 3). As discussed in Question 1, remedial action for this OU includes, among other measures: landfill closure, grading of the ground surface for drainage, construction of a 2-foot thick cap, and vegetation of the cover for runoff and erosion control. Therefore, regardless of any natural shrinkage of these surface water sources that may be occurring, these surface

water sources should be covered and/or removed as part of the planned remedial action. Water would not be expected to collect on the surface of the cover due to the vegetation and grading of the ground surface.

As a result of existing controls and possible shrinkage of the surface water sources since sampling occurred, surface water contamination is not currently of concern at the site for any receptors except on-site remedial workers (classified as construction workers for the purpose of this EI Determination).

Reference(s):

1. Application for Designation of a Classification Exception Area. Prepared by Ecology and Environment, Inc. Dated May 2001.
2. Letter from Bruce Venner, NJDEP, to Major General Privratsky, US Army, re: Clean Parcels Area of Concern, Unrestricted Use No Further Action Letter and Covenant Not to Sue. Dated September 25, 2001.
3. Final Decision Document for Nine Areas of Concern/Operable Units at Military Ocean Terminal, Bayonne, New Jersey. Prepared by Ecology and Environment, Inc. Dated October 2002.
4. Letter from David Grupp, Excel Environmental Resources, Inc. to Alan Straus, US EPA, re: Summary of Current and Future Exposures to Humans and the Environment. Dated July 17, 2003.

4. Can the exposures from any of the complete pathways identified in #3 be reasonably expected to be significant[5] (i.e., potentially "unacceptable" because exposures can be reasonably expected to be: 1) greater in magnitude (intensity, frequency and/or duration) than assumed in the derivation of the acceptable "levels" (used to identify the "contamination"); or 2) the combination of exposure magnitude (perhaps even though low) and contaminant concentrations (which may be substantially above the acceptable "levels") could result in greater than acceptable risks?

__X__ If no (exposures cannot be reasonably expected to be significant (i.e., potentially "unacceptable") for any complete exposure pathway) - skip to #6 and enter "YE" status code after explaining and/or referencing documentation justifying why the exposures (from each of the complete pathways) to "contamination" (identified in #3) are not expected to be "significant."

____ If yes (exposures could be reasonably expected to be "significant" (i.e., potentially "unacceptable") for any complete exposure pathway) - continue after providing a description (of each potentially "unacceptable" exposure pathway) and explaining and/or referencing documentation justifying why the exposures (from each of the remaining complete pathways) to "contamination" (identified in #3) are not expected to be "significant."

____ If unknown (for any complete pathway) - skip to #6 and enter "IN" status code.

Surface Soil

As discussed in response to Question 3, the potential for on-site remedial workers to come in direct contact with contaminated surface soil is being considered a potentially complete exposure pathway due to planned remedial activities, which include the installation of engineering controls (e.g., capping and placement of covers) in impacted surface soil areas.

However, exposures are not expected to be significant because remedial workers are assumed to wear PPE and adhere to strict OSHA guidelines to minimize exposure to contamination. Thus, exposure to contaminated surface soil on site for workers conducting remedial activities is not expected to pose a significant risk.

Surface Water

As discussed in response to Question 3, the potential for on-site remedial workers to come in direct contact with contaminated surface water is being considered a potentially complete exposure pathway due to planned remedial activities. These planned activities include soil capping, wetlands mitigation, landfill closure, groundwater monitoring, and sign posting, among other measures.

[5] If there is any question on whether the identified exposures are "significant" (i.e., potentially "unacceptable") consult a Human Health Risk Assessment specialist with appropriate education, training and experience.

However, exposures are not expected to be significant because remedial workers are assumed to wear PPE and adhere to strict OSHA guidelines to minimize exposure to contamination. Thus, exposure to contaminated surface water on site for workers conducting remedial activities is not expected to pose a significant risk.

5. Can the “significant” exposures (identified in #4) be shown to be within acceptable limits?

____ If yes (all “significant” exposures have been shown to be within acceptable limits) - continue and enter “YE” after summarizing and referencing documentation justifying why all “significant” exposures to “contamination” are within acceptable limits (e.g., a site-specific Human Health Risk Assessment).

____ If no (there are current exposures that can be reasonably expected to be “unacceptable”) - continue and enter “NO” status code after providing a description of each potentially “unacceptable” exposure.

____ If unknown (for any potentially “unacceptable” exposure) - continue and enter “IN” status code.

This question is not applicable. See response to Question No. 4.

6. Check the appropriate RCRIS status codes for the Current Human Exposures Under Control EI event code (CA725), and obtain Supervisor (or appropriate Manager) signature and date on the EI determination below (and attach appropriate supporting documentation as well as a map of the facility):

_X_ YE - Yes, "Current Human Exposures Under Control" has been verified. Based on a review of the information contained in this EI determination, "Current Human Exposures" are expected to be "Under Control" at the Military Ocean Terminal, Bayonne, Hudson County, New Jersey, EPA ID#NJ0210022752 under current and reasonably expected conditions. This determination will be re-evaluated when the Agency/State becomes aware of significant changes at the facility.

____ NO - "Current Human Exposures" are NOT "Under Control."

___ IN - More information is needed to make a determination.

Completed by: _____ Date:_____
Amy Brezin
Environmental Consultant
Booz Allen Hamilton

Reviewed by: _____ Date:_____
Kristin McKenney
Risk Assessor
Booz Allen Hamilton

Also Reviewed by: _____ Date:_____
Alan Straus, RPM
RCRA Programs Branch
EPA Region 2

_____ Date:_____
Barry Tornick, Section Chief
RCRA Programs Branch
EPA Region 2

Approved by: original signed by: Date: 9/24/2003
Adolph Everett, Acting Chief
RCRA Programs Branch
EPA Region 2

Locations where references may be found:

References reviewed to prepare this EI determination are identified after each response. Reference materials are available at the USEPA Region 2, RCRA Records Center, located at 290 Broadway, 15th Floor, New York, New York, and the New Jersey Department of Environmental Protection Office located at 401 East State Street, Records Center, 6th Floor, Trenton, New Jersey.

Contact telephone and e-mail numbers: Alan Straus, EPA RPM
(212) 637-4160
straus.alan@epa.gov

FINAL NOTE: THE HUMAN EXPOSURES EI IS A QUALITATIVE SCREENING OF EXPOSURES AND THE DETERMINATIONS WITHIN THIS DOCUMENT SHOULD NOT BE USED AS THE SOLE BASIS FOR RESTRICTING THE SCOPE OF MORE DETAILED (E.G., SITE-SPECIFIC) ASSESSMENTS OF RISK.

Attachments

The following attachments have been provided to support this EI determination.

Attachment 1 - Maximum Detected Concentrations in Soil By OU

Attachment 2 - Summary of Media Impacts Table

Attachment 1- Maximum Detected Concentrations in Soil By OU [1]

Contaminant	NJ NRDCSCC	OU7	OU9 Landfill	OU9 North Fill	OU11	OU17	OU20	Misc. Soils (Group 1 and 2)
Surface Soil								
TPH	10,000 [2]	NA	NA	NA	NA	NA	NA	41,400
Benzo(a)anthracene	4	--	24 J	NA	NA	8.72	NA	27
Benzo(a)pyrene	0.66	--	20J	1.89 [3]	2.2J	6.84	NA	25
Benzo(b)flouranthene	4	--	24	NA	NA	7.44	NA	25
Benzo(k)flouranthene	4	--	23 J	NA	NA	6.83	NA	20
Chrysene	40	--	NA	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene	0.66	--	NA	1.24 [3]	NA	1.17	NA	9.4
Indeno(1,2,3-cd)pyrene	4	--	6.6 J	NA	NA	NA	NA	18
Arsenic	20	NA	NA	23.4 J	NA	132	NA	63.1
Beryllium	2	NA	12.6	4	NA	NA	NA	NA
Copper	600	NA	2,870 J	NA	1,500	1,150	NA	NA
Lead	600	NA	4,970	NA	NA	2,190	NA	668
Zinc	1,500	NA	9,150	NA	NA	9,920	NA	NA
Aldrin	0.17	0.84	0.5	NA	NA	NA	NA	0.849
Dieldrin	0.18	NA	0.56	NA	NA	1.4	NA	0.39
Aroclor 1254	2	NA	NA	NA	2.92	NA	NA	23

Contaminant	NJ NRDCSCC	OU7	OU9 Landfill	OU9 North Fill	OU11	OU17	OU20	Misc. Soils (Group 1 and 2)
Aroclor 1260	2	4.78	3	NA	2.47	NA	NA	50

Contaminant	NJ NRDCSCC	OU7	OU9 Landfill	OU9 North Fill	OU11	OU17	OU20	Misc. Soils (Group 1 and 2)
Subsurface Soil								
TPH	10,000[2]	--	NA	NA	NA	NA	NA	31,100
Benzo(a)anthracene	4	--	17.9	NA	6.6	NA	11.3 J	8.44
Benzo(a)pyrene	0.66	--	40	NA	5.9	NA	9.24 J	5.93
Benzo(b)flouranthene	4	--	55	NA	5.7	NA	9.51 J	8.8
Benzo(k)flouranthene	4	--	41	NA	4.6	NA	8.96 J	4.3
Chrysene	40	--	NA	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene	0.66	--	3	NA	1.9	NA	1.67 J	3.67
Indeno(1,2,3-cd)pyrene	4	--	24	NA	5.1	NA	4.23 J	NA
Arsenic	20	NA	31	NA	22.4 J	NA	36.7	102
Beryllium	2	NA	4.5	NA	NA	NA	NA	35
Copper	600	NA	1,340 J	NA	1,590	NA	777 J	1,350
Lead	600	NA	5,820	NA	NA	NA	NA	2,160
Zinc	1,500	NA	5,190	NA	3,670	NA	11,200 J	12,200
Aldrin	0.17	NA	0.79	NA	NA	NA	NA	NA
Dieldrin	0.18	NA	0.249	NA	NA	NA	NA	NA
Aroclor 1254	2	NA	6.7	NA	NA	NA	NA	NA
Aroclor 1260	2	NA	NA	NA	50 [4]	NA	NA	NA

[1] OU23 has not been included in the table because the only detected contaminant was PCBs in surface soil (50 mg/kg due to hot spot excavation) and subsurface soil (2.3 mg/kg) above the NJ NRDCSCC (2.0 mg/kg).
[2] NJDEP maximum TOC soil criterion was used because there is no applicable NJ NRDCSCC.
[3] Average concentration of typical historical fill.
[4] PCB hot spots were removed in OU11 and the Miscellaneous Soils AOC in Spring 2003 to a level of 50 mg/kg, per the RAWP.
NA - Contaminant not detected above relevant standard.

-- Indicates that TPH and PAHs were excavated in Spring 2003 and the maximum concentrations detailed in Question 2 have most likely been removed. It is unknown whether contamination exists above NJ NRDCSCC.
All contaminant concentrations are expressed in mg/kg.

Attachment 2 - Summary of Media Impacts Table

Military Ocean Terminal, Bayonne, Hudson County, New Jersey

OU	GW	AIR (Indoors)	SURF SOIL	SURF WATER	SED	SUB SURF SOIL[1]	AIR (Outdoors)	CORRECTIVE ACTION MEASURE	KEY CONTAMINANTS
OU5	Yes	No	No	No	No	No	No	▸ In progress: natural attenuation with groundwater monitoring ▸ Established: Classification Exception Area and Well Restriction Area	VOCs, 4,4-DDD
OU7	Yes	No	Yes	No	No	Yes	No	▸ Completed: excavation, off-site disposal, and backfilling of petroleum-impacted soil ▸ Completed: removal of groundwater potentially contaminated with free product ▸ Planned: repaving of excavated areas ▸ In progress: groundwater monitoring ▸ Planned: deed notice implementation	TPH, PAHs, aldrin, Aroclor 1260
OU9 Landfill	No	No	Yes	No	No	Yes	No	▸ Completed: landfill fenced and ground is covered with existing vegetation ▸ Completed: signs posted ▸ Planned: soil capping and mitigation of disturbed wetlands ▸ Planned: landfill closure ▸ Planned: groundwater monitoring ▸ Planned: deed notice implementation	PAHs, inorganics, pesticides, PCBs
OU9 North Fill Area	No	No	No	No	No	Yes	No	▸ Completed: north landfill area fenced and ground is covered with existing vegetation ▸ Completed: signs posted ▸ Planned: deed notice implementation	PAHs, inorganics

OU	GW	AIR (Indoors)	SURF SOIL	SURF WATER	SED	SUB SURF SOIL[1]	AIR (Outdoors)	CORRECTIVE ACTION MEASURE	KEY CONTAMINANTS
OU11	No	No	Yes	No	No	Yes	No	▸ Completed: excavation, off-site disposal, backfilling of PCB hot spot soil ▸ Completed: fencing, signs posted and existing ground cover ▸ Planned: repair of existing asphalt pavement, installation of new pavement as necessary ▸ Planned: deed notice implementation	PAHs, inorganics, PCBs
OU17	No	No	Yes	No	No	No	No	▸ Completed: signs posted, existing ground cover ▸ Planned: clean soil cover and mitigation of disturbed wetlands ▸ Planned: deed notice implementation	PAHs, inorganics, dieldrin
OU20	No	No	No	No	No	Yes	No	▸ Completed: fencing, signs posted, existing ground cover ▸ Planned: placement of clean soil cover over unpaved areas, repair of existing asphalt pavement and/or installation of new pavement ▸ Planned: deed notice implementation	PAHs, inorganics
OU23	No	No	Yes	No	No	Yes	No	▸ Completed: excavation, off-site disposal, backfilling of PCB hot spot soil ▸ Completed: fencing, signs posted, existing ground cover ▸ Planned: placement of clean soil cover, maintenance/repair of existing asphalt pavement and/or installation of new pavement ▸ Planned: deed notice implementation	PCBs

OU	GW	AIR (Indoors)	SURF SOIL	SURF WATER	SED	SUB SURF SOIL[1]	AIR (Outdoors)	CORRECTIVE ACTION MEASURE	KEY CONTAMINANTS
AOC Misc. Soils	No	No	Yes	No	No	Yes	No	▸ Completed: fencing, signs posted, existing ground cover ▸ Planned for Group 1 soils: use of existing soil cover, repair of existing pavement, or installation of new pavement ▸ Completed for Group 2 soils: excavation, off-site disposal, backfilling of PCB hot spot soil ▸ Planned for Group 2 soils: placement of clean soil cover, maintenance and repair of existing asphalt pavement and/or installation of new pavement ▸ Planned: deed notice implementation for Group 1 and 2 soils	TPH, PAHs, inorganics, pesticides, PCBs