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REVISED FINAL DATA USABILITY WORKSHEETS SITES 41 AND 46 WITH TRANSMITTAL
NSW EARLE NJ
4/2/2013
TETRA TECH

TETRA TECH

PHIL-25165

April 2, 2013

Project Number 02091

Naval Facilities Engineering Command Mid-Atlantic
Northeast IPT
9742 Maryland Avenue
Norfolk, Virginia 23511-3095

Attn: Mr. Roberto Pagtalunan

Reference: CLEAN Contract No. N62470-08-D-1001
Contract Task Order (CTO) No. WE15

Subject: Submission of Revised Final Site 41 and Site 46 Data Useability Worksheets
Naval Weapons Station (NWS) Earle
Colts Neck, New Jersey

Dear Mr. Pagtalunan:

Enclosed are the Revised Final Data Useability Worksheets for Site 41 (EPIC Site L) - MSC Van Parking Lot and Site 46 (EPIC Site Q) - Military Sealift Command Firefighting School. The worksheets were revised in accordance with EPA's review comments on the final version (dated February 6, 2013).

As requested by the Navy, copies of these documents are being forwarded under cover of this letter to Ms. Jessica Mollin at EPA Region 2 and Ms. Erica Bergman at NJDEP. Both hard copy and electronic (CD) formats of the documents are being provided to each recipient.

We appreciate the opportunity to provide these services to the Navy. Please contact me if you have any questions or require additional copies.

Sincerely,

Mary M. Mang

Mary M. Mang
Project Manager

MMM/nfs

Enclosure

c: Bonnie Capito (NAVFAC Midwest) (no enclosure)
Scott Fleming (NWS Earle) (1 copy)
Jessica Mollin (EPA Region II) (2 copies)
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DATA USEABILITY WORKSHEET
Site: NWS Earle Site 41 (EPIC Site L) – MSC Van Parking Lot
Medium: Soil

Details regarding the EPIC Site L sampling and analytical program and data quality objectives were presented in the NWS Earle Remedial Investigation (RI) Work Plan and Quality Assurance Project Plan (QAPP) (Halliburton NUS, 1995) and the NWS Earle RI report (Brown & Root Environmental, 1996). Relevant supporting information is summarized in the following paragraphs to facilitate the evaluation of data usability worksheets. The assessment for data usability is designed to evaluate whether the data are appropriate for use in the human health risk assessment.

EPIC Site L is comprised of a 15.7-acre area near Asbury Avenue and Pine Brook Road within the Mainside Area of the NWS Earle facility. About one-third of the site was used at one time for storage of new and old telephone poles, railroad ballast stone, miscellaneous metal, plastic, and wood scrap material, and small asphalt and concrete piles. Materials from activities conducted by the NWS Earle Public Works Department have been stored at the site for 25 to 30 years, and past storage practices are not well documented.

Previous investigations included a 1992 Preliminary Assessment Addendum comprised of interview findings and aerial photo analyses. Physical observations from the field consisted of a stained area near a treated utility pole storage area and a hardened pile of asphalt.

The primary objective of the RI was to determine if storage and disposal activities have impacted site soils. The 1995 work plan for the NWS Earle RI was reviewed by EPA and responses and revisions were addressed by the Navy. During the RI field investigation, seven surface soil samples and one field duplicate were collected at the locations shown in the attached Figure 28-1, extracted from the 1996 RI report. Of the seven locations, L-SS-01 was collected from the asphalt pile area along the power line for the purpose of determining if asphalt storage has impacted soil. Two surface soil samples, L-SS-02 and L-SS-03 (plus one field duplicate), were collected from the pile of telephone poles to determine if telephone pole storage has impacted soil. Sample L-SS-04 was collected from the asphalt pile north of the site to evaluate if past/current storage activities have impacted soil. Three samples, L-SS-05, L-SS-06, and L-SS-07, were collected at drainage depressions or areas where offsite migration was possible to determine if contamination may be moving from the site. During field sampling, no problems were encountered that would have suggested any issues with sampling precision, accuracy, representativeness, or completeness. As stated in Section 3.2 of the RI work plan, soil sampling was conducted according to Halliburton NUS SOPs and the New Jersey Department of Environmental Protection and Energy (NJDEPE) Field Sampling Procedures Manual.

At Site 41, a biased sampling approach (i.e., “purposive” or “judgmental” sampling) was applied to determine if storage and disposal operations have impacted soil. EPA Data Useability Guidance (DUGS) states that purposive or judgmental sampling designs may be adequate to detect hot spots, which was the intent of the Site 41 investigation. Limited sampling was conducted in areas that exhibited the greatest impact from operations, based on observations of debris and stained soil. As a result, the soil data set is not necessarily representative of a truly unbiased mixture of impacted and unimpacted sample locations and depths across the whole site. This approach accomplishes the objective of estimating an upper range for potential human health risks from hypothetical soil exposure, and is useable information because the findings of the risk assessment suggest that there are no unacceptable risks from potentially site-related COPCs. Cancer risk levels for a hypothetical resident exposed to soil were within the acceptable range – there were no unacceptable noncancer hazards, and detected carcinogenic compounds except arsenic (which was within the background range) yielded a cancer risk sum of 1E-5, with the greatest contribution from six PAHs that exhibited a lifetime residential cancer risk of 8.2E-6 from Table 28-7 in the RI report.

Surface soil samples were submitted to Lancaster Laboratories for Target Compound List (TCL) volatile organic compounds (VOCs), TCL semi-volatile organic compounds (SVOCs), total petroleum hydrocarbons (TPHs), Target Analyte List (TAL metals), and TCL pesticides/polychlorinated biphenyls (PCBs) analyses following low/medium concentration EPA Contract Laboratory Program (CLP) scopes of work (SOWs). The laboratory's nominal quantitation limits for organics and required detection limits for inorganics achieved the method requirements referenced in the QAPP/Work Plan. The organic quantitation limits and inorganic detection limits in the most recent versions of the low/medium CLP analytical protocols (SOM01.2 and ISM01.2) are generally within a factor of two compared to the contract required quantitation limits (CRQLs) for the analytical methods from the 1996 RI (OLM01.8 and ILM02.1). In the 1996 RI, nominal values for VOC CRQLs were 10 ug/kg, SVOC CRQLs 330 ug/kg (830 ug/kg for low response compounds), pesticide CRQLs 1.7 or 3.3 ug/kg (except for methoxychlor and toxaphene), and PCB CRQLs 33 ug/kg. In contrast, the current CLP SOW SOM01.2 specifies nominal values for VOC CRQLs of 5 ug/kg (10 for ketones), SVOC CRQLs of 170 ug/kg (330 for low response compounds), pesticide CRQLs of 1.7 or 3.3 ug/kg (except for methoxychlor and toxaphene), and PCB CRQLs of 33 ug/kg.

The RI report's sample detection limits were based on instrument detection limits (IDLs) reported by Lancaster Laboratories as adjusted for sample weight and moisture. The IDLs were all less than or equal to the contract required detection limits (CRDLs) specified in the CLP routine analytical services SOW. Recently, the CLP's inorganic CRDLs have been lowered by a factor of two for several metals. In the 1996 RI data set, the inorganic sample detection limits were all less than the CRDLs from the current CLP SOW. The inorganic detection limits for non-detected results are shown for all surface soil samples collected at Site L in the attached Table 1-2.

To evaluate the applicability of the concentrations found in soil, the detected concentrations were compared to screening levels derived from the Regional Screening Level (RSL) Tables available from http://www.epa.gov/region9/superfund/prg/. The RSLs are developed using risk assessment guidance from the EPA superfund program. The values are risk-based concentrations developed from standardized equations combining exposure information assumptions with EPA toxicity data. RSLs are considered by the agency to be protective for humans (including sensitive subgroups) under exposure conditions applicable to certain types of receptors. For example, the residential exposure RSLs are protective for humans over a lifetime, covering an exposure duration considered to represent the reasonable upper range duration living at one residence based on demographic studies. The industrial exposure RSLs are protective for adult workers over an exposure duration considered to be the reasonable upper range duration of employment at one company, based on employment studies. RSLs are not always applicable to the exposure scenarios unique to a particular site and do not address non-human health endpoints, such as ecological impacts. The chemical-specific RSLs are generic; they are calculated without site-specific information. Exposure assumptions may be recalculated using site-specific information during a baseline human health risk assessment (HHRA). In a HHRA, the goal of the comparison of detected concentrations to RSLs is to determine whether the concentrations found in the soil are within an acceptable limit, such that those chemicals that are present at concentrations that could contribute to significant risks (above RSLs) are carried through the quantitative risk assessment, while chemicals with concentrations less than RSLs do not require a detailed estimation of risks from site exposures.

Organic and inorganic detected sample concentrations and sample detection limits were compared to the May 2012 residential soil exposure and industrial soil exposure RSLs as tabulated in the right-hand column of Table 1-2. The RSL values are based on receptor exposures established at a cancer risk level of 1 x 10^{-6} (one in a million risk) or a noncarcinogenic toxicity-based hazard index (HI) of 0.1 where the goal of protection is a cumulative HI of less than 1 for additivity across chemicals affecting the same target organ. The exceedance of either of these values may still indicate that at concentrations equal to the detection limit, the potential risks may remain within the acceptable risk range (i.e., cancer risk between 1 x10^{-6} and 1 x10^{-4} or below the goal of protection of a HI of 1. For example, the concentration of 0.22 ppm in soil for PCBs is based on a risk of 1 x10^{-6} while the detection limit of 0.33 mg/kg is at a risk level of approximately 2 x10^{-6} that remains within the risk range of 1 x10^{-6} to 1 x10^{-4}.

Inorganic sample detection limits were below their respective residential RSLs except for two metals, arsenic and thallium. Thallium is not expected to be associated with the types of materials stored or disposed at the site. With respect to arsenic, all sample results except one were positive, which enables a fairly representative evaluation of soil arsenic distribution. In Table 1-2, the SVOCs that exhibited sample quantitation limits greater than their respective RSLs included N-nitroso-di-N-propylamine, bis(2-chloroethyl)ether, hexachlorobenzene, and pentachlorophenol. None of these substances were found in any soil samples or were anticipated to be found in the types of materials used or disposed at the site. Certain carcinogenic polycyclic aromatic hydrocarbons (PAHs) also exhibited detection limits that were greater than residential RSLs, including benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, dibenz(a,h)anthracene, and indeno(1,2,3-cd)pyrene. For most of these PAHs, detections occurred in several samples at levels near or below the CRQLs, since the method of analysis provides the ability to detect and report estimated concentrations down to a small fraction of the CRQL. In conclusion, the analytical methods used achieved the quantitation/detection limits required by routine CLP analytical services low/medium concentration methods and were able to determine the presence or absence and quantify TCL/TAL substances found at concentrations of interest at the site. Comparison of data to RSLs indicates that the analytical data are considered of appropriate quality for purposes of evaluation of potential human health risks.

FIGURE 28-1

(Reference: Remedial Investigation Report for Naval Weapons Station Earle. July 1996. Brown & Root Environmental.)

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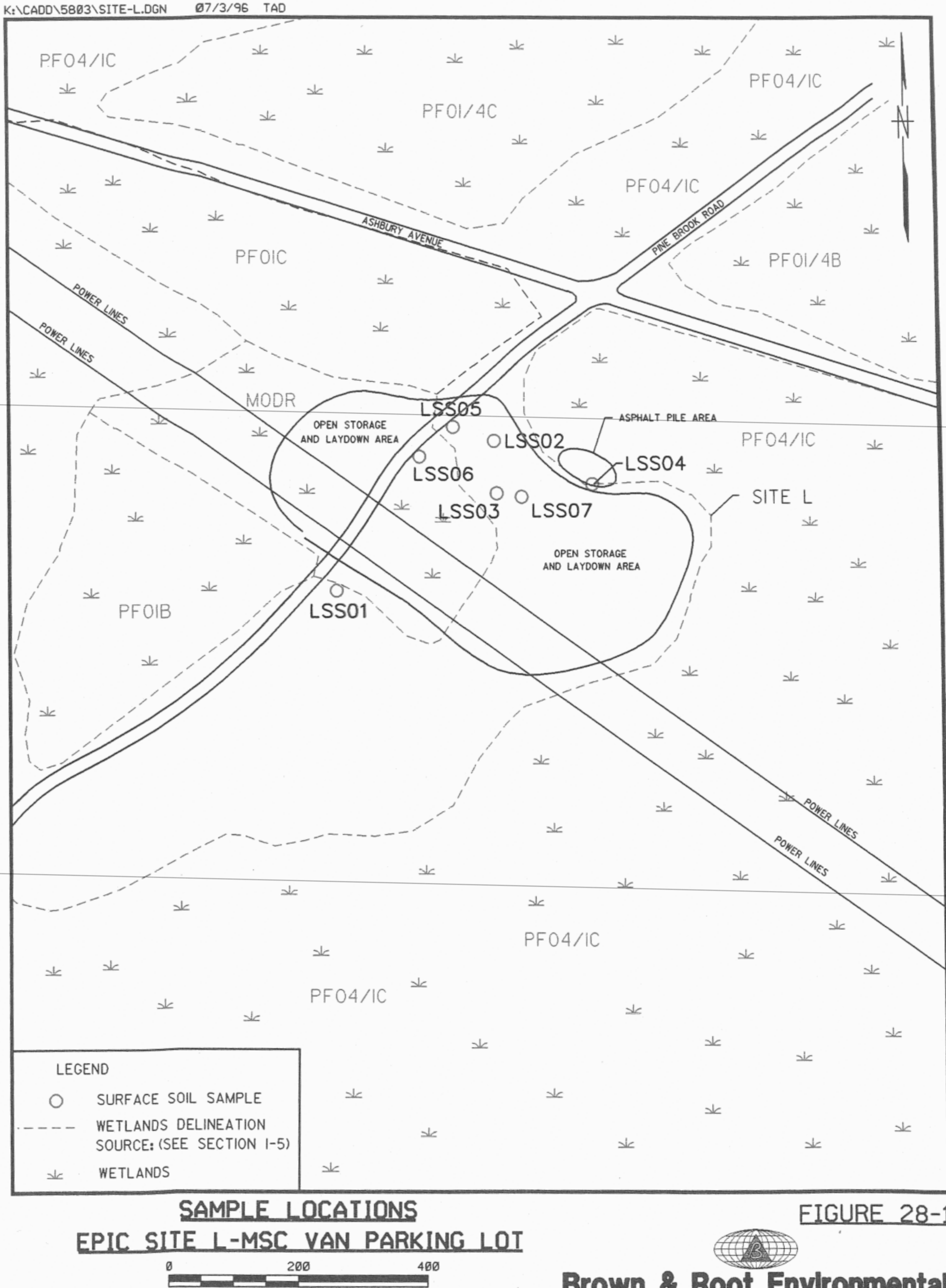


SAMPLE LOCATIONS
EPIC SITE L-MSC VAN PARKING LOT

FIGURE 28-1

Brown & Root Environmental

TABLE 1-2

**(Reference: Remedial Investigation Report for Naval Weapons Station Earle.
July 1996. Brown & Root Environmental.)**

TABLE 1-2

COMPARISON OF RI SURFACE SOIL ANALYTICAL DATA TO REGIONAL SCREENING LEVELS (RSLS)
SITE 41 - MSC VAN PARKING AREA (EPIC SITE L)
NAVAL WEAPONS STATION EARLE
PAGE 1 OF 4

SAMPLE LOCATION	LSS01	LSS02	LSS03	LSS03-DUP	LSS04	LSS05	LSS06	LSS07	EPA Regional Screening Levels (RSLs)	
DATA SOURCE	1995 RI, Dec.	1995 RI, Dec.	1995 RI, Dec.	1995 RI, Dec.	1995 RI, Dec.	1995 RI, Dec.	1995 RI, Dec.	1995 RI, Dec.	Residential Soil RSLs	Industrial Soil RSLs
INORGANICS	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**
aluminum	612	1,450	977	1,100	1,710	879	1,470	300	7,700 n	99,000 n
antimony	2.8 U	2.6 U	2.6 U	2.6 U	2.6 U	2.5 U	2.6 U	2.8 U	3.1 n	41 n
arsenic	2.7	2.7	1.6	1.8	4.5	0.58 U	0.93	5.9	0.39 c	1.6 c
barium	2.4	24.3	1.6	2.2	10.4	0.56	17.1	18.2	1,500 n	19,000 n
beryllium	0.061 U	0.10	0.084 U	0.084 U	0.19	0.073	0.15	0.12	16 n	200 n
cadmium	0.075 U	0.51	1.0 J	0.59 U	0.16	0.069	0.27	0.52	7 n	80 n
calcium***	59.1	255	76.8	86.8	1,720	417	1,850	10,800	-	-
chromium, total	24.0	5.8	6.7	7.4	26.7	4.6	9.2	17.2	0.29*; 12,000**	5.6*; 150,000**
cobalt	0.14 U	0.31	0.86 U	0.86 U	0.41	0.15	0.39	2.0	2.3 n	30 n
copper	3.5	37.8 J	3.0	2.2	5.8 J	5.2	8.4 J	19.3	310 n	4,100 n
iron	5,000	3,280	7,060	7,390	8,860	2,390	3,880	7,700	5,500 n	72,000 n
lead	12.0	78.6	6.2 J	6.9 J	15.6	45.9	21.8	31.2	400	800
magnesium***	88.1	66.0	42.9	49.4	423	236	776	1,520	-	-
manganese	6.0	17.1	6.5 J	7.7 J	25.7	18.6	61.5	65.1	-	-
mercury	0.041	0.036	0.031	0.038	0.040	0.043	0.042	0.068	0.78 n	10 n
nickel	0.61	1.8	0.80 U	0.79 U	1.9	1.0	2.0	5.4	150 n	2,000 n
potassium***	211	49.2	63.2	73.7	642	60.8	195	552 U	-	-
selenium	0.63 UJ	0.58 UJ	0.58 UJ	0.57 UJ	0.59 UJ	0.56 UJ	0.59 UJ	0.62 UJ	39 n	510 n
silver	0.077 U	0.071 U	0.64 U	0.64 U	0.073 U	0.069 U	0.18	0.077 U	39 n	510 n
sodium***	30.9	24.5	19.8	13.5	33.0	27.4	54	278	-	-
thallium	0.87 U	0.80 U	0.80 U	0.79 U	0.8 U	0.78 U	0.82 U	0.86 U	0.078 n	1 n
vanadium	24.4	7.8	15.4 J	16.3 J	16.9	7.6	14.3	18.6 J	-	-
zinc	8.1 J	162 J	5.3	5.3	22.0 J	7.5 J	19.6 J	35.6	2,300 n	31,000 n
SEMIVOLATILES	**µg/kg**	**µg/kg**	**µg/kg**	**µg/kg**	**µg/kg**	**µg/kg**	**µg/kg**	**µg/kg**	**µg/kg**	**µg/kg**
1,2,4-trichlorobenzene	400 U	370 U	370 U	370 U	380 U	350 U	380 U	400 U	22,000 c	99,000 c
1,2-dichlorobenzene	400 U	370 U	370 U	370 U	380 U	350 U	380 U	400 U	190,000 n	980,000 n
1,3-dichlorobenzene	400 U	370 U	63.0 J	370 U	380 U	350 U	380 U	400 U	-	-
1,4-dichlorobenzene	400 U	370 U	63.0 J	370 U	380 U	350 U	380 U	400 U	2,400 c	12,000 c
2,2'-oxybis(1-chloropropane)	400 UJ	370 UJ	370 UJ	370 UJ	380 UJ	350 UJ	380 UJ	400 UJ	4,600 c	22,000 c
2,4,5-trichlorophenol	1000 U	920 U	920 U	920 U	940 U	890 U	940 U	1000 U	610,000 n	6,200,000 n
2,4,6-trichlorophenol	400 U	370 U	370 U	370 U	380 U	350 U	380 U	400 U	44,000 c	160,000 c
2,4-dichlorophenol	400 U	370 U	370 U	370 U	380 U	350 U	380 U	400 U	18,000 n	180,000 n
2,4-dimethylphenol	400 U	370 U	370 U	370 U	380 U	350 U	380 U	400 U	120,000 n	1,200,000 n
2,4-dinitrophenol	1000 U	920 U	920 U	920 U	940 U	890 U	940 U	1000 U	12,000 n	120,000 n
2,4-dinitrotoluene	400 U	370 U	370 U	370 UJ	380 UJ	350 UJ	380 UJ	400 U	1,600 c	5,500 c
2,6-dinitrotoluene	400 U	370 U	370 U	370 U	380 U	350 U	380 U	400 U	6,100 n	62,000 n
2-chloronaphthalene	400 U	370 U	370 U	370 U	380 U	350 U	380 U	400 U	630,000 n	8,200,000 n
2-chlorophenol	400 U	370 U	370 U	370 U	380 U	350 U	380 U	400 U	39,000 n	510,000 n
2-methylnaphthalene	400 U	370 U	370 U	370 U	380 U	350 U	380 U	400 U	23,000 n	220,000 n
2-methylphenol	400 U	370 U	370 U	370 U	380 U	350 U	380 U	400 U	310,000 n	3,100,000 n
2-nitroaniline	1000 U	920 U	920 U	920 U	940 U	890 U	940 U	1000 U	61,000 n	600,000 n
2-nitrophenol	400 U	370 U	370 U	370 U	380 U	350 U	380 U	400 U	-	-
3,3'-dichlorobenzidine	400 U	370 U	370 U	370 U	380 U	350 U	380 U	400 U	1,100 c	3,800 c
3-nitroaniline	1000 U	920 U	920 U	920 U	940 U	890 U	940 U	1000 U	-	-
4,6-dinitro-2-methylphenol	1000 U	920 U	920 U	920 U	940 U	890 U	940 U	1000 U	-	-
4-bromophenyl-phenylether	400 U	370 U	370 U	370 U	380 U	350 U	380 U	400 U	-	-
4-chloro-3-methylphenol	400 U	370 U	370 U	370 U	380 U	350 U	380 U	400 U	610,000 n	6,200,000 n
4-chloroaniline	400 U	370 U	370 U	370 U	380 U	350 U	380 U	400 U	2,400 c	8,600 c
4-chlorophenyl-phenylether	400 U	370 U	370 U	370 U	380 U	350 U	380 U	400 U	-	-
4-methylphenol	400 U	370 U	370 U	370 U	380 U	350 U	380 U	400 U	610,000 n	6,200,000 n
4-nitroaniline	1000 U	920 U	920 U	920 U	940 U	890 U	940 U	1000 U	24,000 c	86,000 c
4-nitrophenol	1000 U	920 U	920 U	920 U	940 U	890 U	940 U	1000 U	-	-

TABLE 1-2

COMPARISON OF RI SURFACE SOIL ANALYTICAL DATA TO REGIONAL SCREENING LEVELS (RSLS)
SITE 41 - MSC VAN PARKING AREA (EPIC SITE L)
NAVAL WEAPONS STATION EARLE

SAMPLE LOCATION	LSS01		LSS02		LSS03		LSS03-DUP		LSS04		LSS05		LSS06		LSS07		EPA Regional Screening Levels (RSLs)			
DATA SOURCE	1995 RI, Dec.		1995 RI, Dec.		1995 RI, Dec.		1995 RI, Dec.		1995 RI, Dec.		1995 RI, Dec.		1995 RI, Dec.		1995 RI, Dec.		Residential Soil RSLs		Industrial Soil RSLs	
N-nitroso-di-n-propylamine	400	U	370	U	370	U	370	U	380	U	350	U	380	U	400	U	69	c	250	c
N-nitrosodiphenylamine (1)	400	U	370	U	370	U	370	U	380	U	350	U	380	U	400	U	99,000	c	350,000	c
acenaphthene	400	U	370	U	370	U	47.0	J	380	U	350	U	380	U	66.0	J	340,000	n	3,300,000	n
acenaphthylene	400	U	370	U	370	U	370	U	380	U	350	U	380	U	42.0	J	-		-	
anthracene	400	U	370	U	77.0	J	97.0	J	380	U	350	U	380	U	170	J	1,700,000	n	17,000,000	n
benzo(a)anthracene	400	U	370	U	160	J	220	J	71.0	J	350	U	380	U	630		150	c	2,100	c
benzo(a)pyrene	400	U	370	U	85.0	J	110	J	80.0	J	350	U	70.0	J	700		15	c	210	c
benzo(b)fluoranthene	400	U	370	U	1,100		1,200		160	J	350	U	160	J	960		150	c	2,100	c
benzo(g,h,i)perylene	400	U	370	U	98.0	J	110	J	380	U	350	U	380	U	520		-		-	
benzo(k)fluoranthene	400	U	370	U	370	U	370	U	380	U	350	U	380	U	400	U	1,500	c	21,000	c
bis(2-chloroethoxy)methane	400	U	370	U	370	U	370	U	380	U	350	U	380	U	400	U	18,000	n	180,000	n
bis(2-chloroethyl)ether	400	U	370	U	43.0	J	370	U	380	U	350	U	380	U	400	U	210	c	1,000	c
bis(2-ethylhexyl)phthalate	400	U	370	U	370	U	370	U	380	U	350	U	380	U	400	U	35,000	c	120,000	c
butylbenzylphthalate	400	U	370	U	370	U	370	U	380	U	350	U	380	U	400	U	260,000	c	910,000	c
carbazole	400	U	370	U	190	J	240	J	380	U	350	U	380	U	55.0	J	-		-	
chrysene	400	U	370	U	990		1,200		90	J	350	U	110	J	680		15,000	c	210,000	c
di-n-butylphthalate	400	U	370	U	370	U	370	U	380	U	350	U	380	U	400	U	610,000	n	6,200,000	n
di-n-octylphthalate	400	U	370	U	370	U	370	U	380	U	350	U	380	U	400	U	73,000		740,000	
dibenz(a,h)anthracene	400	U	370	U	370	U	370	U	380	U	350	U	380	U	190	J	15	c	210	c
dibenzofuran	400	U	370	U	63.0	J	85.0	J	380	U	350	U	380	U	56.0	J	7,800	n	100,000	n
diethylphthalate	400	U	370	U	370	U	370	U	380	U	350	U	380	U	400	U	4,900,000	n	49,000,000	n
dimethylphthalate	400	U	370	U	370	U	370	U	380	U	350	U	380	U	400	U	-		-	
fluoranthene	400	U	46.0	J	2,500		3,800		160	J	350	U	170	J	1,000		230,000	n	2,200,000	n
fluorene	400	U	370	U	370	U	53.0	J	380	U	350	U	380	U	120	J	230,000	n	2,200,000	n
hexachlorobenzene	400	U	370	U	370	U	370	U	380	U	350	U	380	U	400	U	300	c	1,100	c
hexachlorobutadiene	400	U	370	U	370	U	370	U	380	U	350	U	380	U	400	U	6,200	c	22,000	c
hexachlorocyclopentadiene	400	U	370	U	370	UJ	370	U	380	U	350	U	380	U	400	U	37,000	n	370,000	n
hexachloroethane	400	U	370	U	47.0	J	370	U	380	U	350	U	380	U	400	U	12,000	c	43,000	c
indeno(1,2,3-cd)pyrene	400	U	370	U	120	J	140	J	50	J	350	U	380	U	530		150	c	2,100	c
isophorone	400	U	370	U	370	U	370	U	380	U	350	U	380	U	400	U	510,000	c	1,800,000	c
naphthalene	400	U	370	U	43.0	J	370	U	380	U	350	U	380	U	45.0	J	3,600	c	18,000	c
nitrobenzene	400	U	370	U	370	U	370	U	380	U	350	U	380	U	400	U	4,800	c	24,000	c
pentachlorophenol	1000	U	920	U	920	U	920	U	940	U	890	U	940	U	1000	U	890	c	2,700	c
phananthrene	400	U	370	U	1,400		2,400		91.0	J	350	U	65.0	J	710		-		-	
phenol	400	U	370	U	43.0	J	370	U	380	U	350	U	380	U	400	U	1,800,000	n	18,000,000	n
pyrene	400	U	370	U	1600		2,200		150	J	350	U	170	J	1,200		170,000	n	1,700,000	n
VOLATILES	**µg/kg**		**µg/kg**		**µg/kg**		**µg/kg**		**µg/kg**		**µg/kg**		**µg/kg**		**µg/kg**		**µg/kg**		**µg/kg**	
1,1,1-trichloroethane	12.0	U	11.0	U	11.0	U	11.0	U	11.0	U	11.0	U	11.0	U	12.0	U	870,000	n	3,800,000	n
1,1,2,2-tetrachloroethane	12.0	U	11.0	U	11.0	U	11.0	U	11.0	U	11.0	U	11.0	U	12.0	U	560	c	2,800	c
1,1,2-trichloroethane	12.0	U	11.0	U	11.0	U	11.0	U	11.0	U	11.0	U	11.0	U	12.0	U	1,100	c	5,300	c
1,1-dichloroethane	12.0	U	11.0	U	11.0	U	11.0	U	11.0	U	11.0	U	11.0	U	12.0	U	3,300	c	17,000	c
1,1-dichloroethene	12.0	U	11.0	U	11.0	U	11.0	U	11.0	U	11.0	U	11.0	U	12.0	U	24,000	n	110,000	n
1,2-dichloroethane	12.0	U	11.0	U	11.0	U	11.0	U	11.0	U	11.0	U	11.0	U	12.0	U	430	c	2,200	c
1,2-dichloroethene (total)	12.0	U	11.0	U	11.0	U	11.0	U	11.0	U	11.0	U	11.0	U	12.0	U	70,000	n	920,000	n
1,2-dichloropropane	12.0	U	11.0	U	11.0	U	11.0	U	11.0	U	11.0	U	11.0	U	12.0	U	940	c	4,700	c
2-butanone	12.0	U	11.0	U	11.0	U	11.0	U	11.0	U	11.0	U	11.0	U	12.0	U	2,800,000	n	20,000,000	n
2-hexanone	12.0	U	11.0	U	11.0	U	11.0	U	11.0	U	11.0	U	11.0	U	12.0	U	21,000	n	140,000	n
4-methyl-2-pentanone	12.0	U	11.0	U	11.0	U	11.0	U	11.0	U	11.0	U	11.0	U	12.0	U	530,000	n	5,300,000	n
acetone	12.0	U	11.0	U	11.0	U	11.0	U	11.0	U	11.0	U	11.0	U	12.0	U	610,000	n	6,300,000	n
benzene	12.0	U	11.0	U	11.0	U	11.0	U	11.0	U	11.0	U	11.0	U	12.0	U	1,100	c	5,400	c

TABLE 1-2

COMPARISON OF RI SURFACE SOIL ANALYTICAL DATA TO REGIONAL SCREENING LEVELS (RSLS)
SITE 41 - MSC VAN PARKING AREA (EPIC SITE L)
NAVAL WEAPONS STATION EARLE

SAMPLE LOCATION	LSS01		LSS02		LSS03		LSS03-DUP		LSS04		LSS05		LSS06		LSS07		EPA Regional Screening Levels (RSLs)			
DATA SOURCE	1995 RI, Dec.		1995 RI, Dec.		1995 RI, Dec.		1995 RI, Dec.		1995 RI, Dec.		1995 RI, Dec.		1995 RI, Dec.		1995 RI, Dec.		Residential Soil RSLs		Industrial Soil RSLs	
bromodichloromethane	12.0	U	11.0	U	11.0	U	11.0	U	11.0	U	11.0	U	11.0	U	12.0	U	270	c	1,400	c
bromoform	12.0	U	11.0	U	11.0	U	11.0	U	11.0	U	11.0	U	11.0	U	12.0	U	62,000	c	220,000	c
bromomethane	12.0	UJ	11.0	UJ	11.0	UJ	11.0	UJ	11.0	UJ	11.0	UJ	11.0	UJ	12.0	UJ	730	n	3,200	n
carbon disulfide	12.0	U	11.0	U	11.0	U	11.0	U	11.0	U	11.0	U	11.0	U	12.0	U	82,000	n	370,000	n
carbon tetrachloride	12.0	U	11.0	U	11.0	U	11.0	U	11.0	U	11.0	U	11.0	U	12.0	U	610	c	3,000	c
chlorobenzene	12.0	U	11.0	U	11.0	U	11.0	U	11.0	U	11.0	U	11.0	U	12.0	U	29,000	n	140,000	n
chloroethane	12.0	U	11.0	U	11.0	U	11.0	U	11.0	U	11.0	U	11.0	UJ	12.0	U	1,500,000	n	6,100,000	n
chloroform	12.0	U	11.0	U	11.0	U	11.0	U	11.0	U	11.0	U	11.0	U	12.0	U	290	c	1,500	c
chloromethane	12.0	U	11.0	U	11.0	U	11.0	U	11.0	U	11.0	U	11.0	UJ	12.0	U	12,000	n	50,000	n
cis-1,3-dichloropropene	12.0	U	11.0	U	11.0	U	11.0	U	11.0	U	11.0	U	11.0	U	12.0	U	1,700	c	8,300	c
dibromochloromethane	12.0	U	11.0	U	11.0	U	11.0	U	11.0	U	11.0	U	11.0	U	12.0	U	680	c	3,300	c
ethylbenzene	12.0	U	11.0	U	11.0	U	11.0	U	11.0	U	11.0	U	11.0	U	12.0	U	5,400	c	27,000	c
methylene chloride	12.0	U	11.0	U	11.0	U	11.0	U	11.0	U	11.0	U	8.0	J	12.0	U	56,000	c	960,000	c
styrene	12.0	U	11.0	U	11.0	U	11.0	U	11.0	U	11.0	U	11.0	U	12.0	U	630,000	n	3,600,000	n
tetrachloroethene	12.0	U	11.0	U	11.0	U	11.0	U	11.0	U	11.0	U	11.0	U	12.0	U	22,000	c	110,000	c
toluene	12.0	U	11.0	U	11.0	U	11.0	U	11.0	U	11.0	U	11.0	U	12.0	U	500,000	n	4,500,000	n
trans-1,3-dichloropropene	12.0	U	11.0	U	11.0	U	11.0	U	11.0	U	11.0	U	11.0	U	12.0	U	1,700	c	8,300	c
trichloroethene	12.0	U	11.0	U	11.0	U	11.0	U	11.0	U	11.0	U	11.0	U	12.0	U	910	c	6,400	c
vinyl chloride	12.0	U	11.0	U	11.0	U	11.0	U	11.0	U	11.0	U	11.0	U	12.0	U	60	c	1,700	c
xylene (total)	12.0	U	11.0	U	11.0	U	11.0	U	11.0	U	11.0	U	11.0	U	12.0	U	63,000	n	270,000	n
PESTICIDES/PCBS	**µg/kg**		**µg/kg**		**µg/kg**		**µg/kg**		**µg/kg**		**µg/kg**		**µg/kg**		**µg/kg**		**µg/kg**		**µg/kg**	
4,4'-DDD	82.0	N J	3.7	U	3.7	U	3.7	U	9.8		3.5	U	0.48	R	4.9	N J	2,000	c	7,200	c
4,4'-DDE	120	J	3.7	U	3.7	U	3.7	U	96.0		3.6	U	1.6	J	28.0		1,400	c	5,100	c
4,4'-DDT	1500		2.3	J	2.1	N J	2.2	R	39.0		1.6	J	7.2		14.0		1,700	c	7,000	c
Aroclor-1016****	40.0	U	37.0	U	37.0	U	37.0	U	37.0	U	35.0	U	37.0	U	40.0	U	390	n	21000	c
Aroclor-1221****	82.0	U	74.0	U	74.0	U	74.0	U	76.0	U	72.0	U	76.0	U	81.0	U	140	c	540	c
Aroclor-1232****	40.0	U	37.0	U	37.0	U	37.0	U	37.0	U	35.0	U	37.0	U	40.0	U	140	c	540	c
Aroclor-1242****	40.0	U	37.0	U	37.0	U	37.0	U	37.0	U	35.0	U	37.0	U	40.0	U	220	c	740	c
Aroclor-1248****	40.0	U	37.0	U	37.0	U	37.0	U	37.0	U	35.0	U	37.0	U	40.0	U	220	c	740	c
Aroclor-1254****	40.0	U	37.0	U	37.0	U	37.0	U	37.0	U	35.0	U	37.0	U	40.0	U	220	c	740	c
Aroclor-1260****	40.0	U	37.0	U	37.0	U	37.0	U	37.0	U	35.0	U	37.0	U	40.0	U	220	c	740	c
aldrin	2.1	U	1.9	U	1.8		1.9	U	1.9	U	1.8	U	1.9	U	2.0	U	29	c	100	c
alpha-BHC	2.1	U	1.9	U	1.9	U	1.9	U	1.9	U	1.8	U	1.9	U	2.0	U	77	c	270	c
alpha-chlordane	2.1	U	1.9	U	1.9	U	1.9	U	9.7	N J	1.8	U	0.42	N J	2.6	J	1,600		6,500	
beta-BHC	2.1	U	1.9	U	1.9	U	1.9	U	1.9	U	1.8	U	1.9	U	2.0	U	270	c	960	c
delta-BHC	2.1	U	1.9	U	1.9	U	1.9	U	1.9	U	1.8	U	1.9	U	2.0	U	-		-	
dieldrin	4.0	U	0.30	J	3.7	U	3.7	U	3.7	U	0.21	R	0.38	R	4.0	U	30	c	110	c
endosulfan I	2.1	U	1.9	U	1.9	U	1.9	U	1.9	U	1.8	U	1.9	U	2.0	U	37,000		370,000	
endosulfan II	4.0	U	3.7	U	3.7	U	6.7	R	3.7	U	3.5	U	3.7	U	4.0	U	37,000		370,000	
endosulfan sulfate	4.1	U	3.7	U	3.7	U	3.7	U	3.7	U	3.5	U	3.7	U	4.0	U	37,000		370,000	
endrin	4.0	U	3.7	U	3.7	U	3.7	U	3.7	U	3.5	U	3.7	U	4.0	U	1,800	n	18,000	n
endrin aldehyde	4.0	U	3.7	U	3.7	U	3.7	U	3.7	U	3.5	U	3.7	U	4.0	U	1,800		18,000	
endrin ketone	4.4	U	3.7	U	3.7	U	3.7	U	3.8	U	3.5	U	3.8	U	4.0	U	1,800		18,000	
gamma-BHC (Lindane)	2.1	U	1.9	U	0.35	R	0.57	R	1.9	U	1.8	U	1.9	U	0.14	R	520	c	2100	c
gamma-chlordane	0.6	R	1.9	U	1.9	U	1.9	U	8.0		1.8	U	0.38	J	3.1		1,600		6,500	
heptachlor	2.1	U	0.17	J	1.9	U	1.9	U	0.27	N J	1.8	U	1.9	U	2.0	U	110	c	380	c
heptachlor epoxide	2.1	U	1.9	U	1.9	U	1.9	U	1.0	J	1.8	U	1.9	U	2.0	U	53	c	190	c
methoxychlor	20.0	U	19.0	U	5.8	N J	8.5	R	19.0	U	18.0	U	19.0	U	20.0	U	31,000	n	310,000	n
toxaphene	210.0	U	190.0	U	190	U	190	U	190	U	180	U	190	U	200	U	440	c	1,600	c

COMPARISON OF RI SURFACE SOIL ANALYTICAL DATA TO REGIONAL SCREENING LEVELS (RSLS)
SITE 41 - MSC VAN PARKING AREA (EPIC SITE L)
NAVAL WEAPONS STATION EARLE

Footnotes to soil criteria:

*	Criteria shown for hexavalent (VI) chromium since the values are more stringent. Chromium speciation was not measured at the site. In soil, hexavalent chromium exists in strongly oxidizing and alkaline environments. Trivalent chromium exists in moderately oxidizing and reducing environments, which applies to most natural soils.
**	Criteria shown for trivalent chromium for information only.
	Residential Lead criterion based on the USEPA integrated Exposure Uptake Biokinetic (IEUBK) model utilizing the default parameters. The concentration is considered to protect 95% of target population (children) at a blood lead level of 10 µg/dL.
***	Calcium, magnesium, sodium, and potassium are essential nutrients and are therefore not applicable to evaluation for human health risks.
c	RSL is based on cancer risks.
n	RSL is based on noncancer hazards.
****	The RSLs for PCBs are presented as total PCBs consistent with USEPA, 1996. PCBs: Cancer Dose-Response Assessment and Application to Environmental Mixtures. EPA/600/P-96/001F. Office of Research and Development, National Center for Environmental Assessment. Washington, DC.

Footnotes to sample results:

(shading)	Shading denotes exceedance of EPA RSLs for Residential Contact with Soil. RSLs for noncarcinogens are multiplied by 0.1 for additivity across chemicals.
NA	Not Sampled
J	Value is estimated because concentration is below the quantitation limit or because of exceedances of data validation quality control criteria.
N	Compound is considered to be tentatively identified based on exceedance of QC criteria for compound identification.
R	Positive result is considered rejected based on exceedance of data validation quality control criteria.
U	Compound or element was not detected. Value is the detection limit (inorganics) or quantitation limit (organics).

Sample Data Source:
Brown & Root Environmental. 1996. Remedial Investigation Report for Naval Weapons Station Earle, Colts Neck, New Jersey. Wayne, Pennsylvania. July.

SITE 41 WORKSHEETS

DATA USEABILITY WORKSHEET
Site: NWS Earle Site 41 (EPIC Site L) – MSC Van Parking Lot
Medium: Soil

Activity	Comment
Field Sampling	
Discuss sampling problems and field conditions that affect data useability.	There were no apparent sampling or field problems that would affect data useability. The sampling was summarized in the 1996 RI report.
Are samples representative of receptor exposure for this medium (e.g. sample depth, grab vs composite, filtered vs unfiltered, low flow, etc.)?	Yes. Surface soil sample results are representative of locations of storage and/or material lay down areas within the site. Site continues to be actively used by NWS Earle Public Works Department for temporary storage of; stone, gravel, roadbed materials (i.e., concrete, asphalt), storm water drainage piping, etc. There was no evidence of waste burial or disposal at the site. Sampling was conducted in December 1995 for full TCL/TAL analytes and TPH.
Assess the effect of field QC results on data useability.	Field QA/QC samples included trip, rinsate, and field blanks, and one field duplicate. Data validation was performed and did not reveal any evidence of QC blank contamination originating in the field. Acceptable field precision was indicated by field duplicate results.
Summarize the effect of field sampling issues on the risk assessment, if applicable.	There were no field sampling issues identified that should affect the risk assessment.
Analytical Techniques	
Were the analytical methods appropriate for quantitative risk assessment?	Yes. Samples were analyzed for organic compounds following Contract Laboratory Program (CLP) routine analytical methods. Inorganic analyses were also performed according to CLP routine analysis methods.
Were detection limits adequate?	Yes. First, the method detection and quantitation limits achieved the CLP contract required detection limits (CRDLs) and contract required quantitation limits (CRQLs) for routine soil analysis. In addition, detection limits were also compared to risk-based RSLs for residential and industrial soil contact to evaluate attainment of project goals. Inorganic sample detection limits were below their respective residential RSLs except for two metals, arsenic and thallium. Thallium is not expected to be associated with the types of materials stored or disposed at the site. With respect to arsenic, all sample results except one were positive, which enables a fairly representative evaluation of soil arsenic distribution. Of the SVOCs that exhibited SQLs greater than RSLs, pentachlorophenol and N-nitroso-di-n-propylamine were not found in any samples and were not anticipated to be found in the

Activity	Comment
	types of materials used or stored at the site. Bis(2-chloroethyl)ether was detected in one sample at 1/5 of the RSL, which indicates the analysis could detect this compound at a level below the SQL. Five carcinogenic PAHs exhibited SQLs above their RSLs, but all were detected in some samples at levels equal to a fraction of the CRQL, which allowed estimates of human health risk to be calculated. There are six carcinogenic PAH target compounds, and all were detected at trace levels in one or more soil samples, so that detection capability was adequate to demonstrate that cancer risk levels were within the acceptable range (the six PAHs yielded a lifetime residential cancer risk of 8.2E-6 from Table 28-7 in the RI report). Arsenic (which was within the background range) contributed to 96% of estimated cancer risks, whereas PAHs were associated with only 3% of overall cancer risks.
Summarize the effect of analytical technique issues on the risk assessment, if applicable.	There were no analytical technique issues that should affect the risk assessment.
Data Quality Objectives	
Precision - How were duplicates handled?	Laboratory duplicates and matrix spikes/matrix spike duplicates were analyzed as required by the methods. Field duplicates were also collected. Region II Data Validation Guidance was followed to evaluate precision.
Accuracy - How were split samples handled?	No split samples were collected.
Representativeness - Indicate any problems associated with data representativeness (e.g., trip blank or rinsate blank contamination, chain of custody problems, etc.).	Laboratory blanks caused a few low level results to be qualified “U” for aldrin, 4,4’-DDE, endosulfan sulfate, methoxychlor, endrin aldehyde, and endrin ketone. No chain of custody issues were noted. The overall quantity of data collected was evaluated to determine if project goals were satisfied, At Site 41, a biased sampling approach (i.e., “purposive” or “judgmental” sampling) was applied to determine if storage and disposal operations have impacted soil. EPA Data Useability Guidance (DUGS) states that purposive or judgmental sampling designs maybe be adequate to detect hot spots, which was the intent of the Site 41 investigation. Limited sampling was conducted in areas that exhibited the greatest impact from operations, based on observations of debris and stained soil. As a result, the soil data set is not necessarily representative of a truly unbiased mixture of impacted and unimpacted sample locations and depths across the whole site. This approach accomplishes the objective of

Activity	Comment
	estimating an upper range for potential human health risks from hypothetical soil exposure, and is useable information because the findings of the risk assessment suggest that there are no unacceptable risks from potentially site-related COPCs. Cancer risk levels were within the acceptable range (the six PAHs yielded a lifetime residential cancer risk of 8.2E-6 from Table 28-7 in the RI report). A second source of uncertainty is associated with a small sample data set. Only eight soil samples were collected in the area. Although sampling was focused to identify areas where soil impacts were most probable, the fact that only eight samples were collected contributes to statistical uncertainty. There is likely to be an impact on the accuracy of the derived 95% UCL estimates. (EPA's ProUCL software recommends at least 8 to 10 detected results to estimate a reliable UCL.)
Completeness - Indicate any problems associated with data completeness (e.g., incorrect sample analysis, incomplete sample records, problems with field procedures, etc.).	No problems were associated with data completeness.
Comparability - Indicate any problems associated with data comparability.	No problems are anticipated with data comparability due to the use of routine CLP methods of analysis.
Were the DQOs specified in the QAPP satisfied?	The DQOs specified in the QAPP were met with respect to the frequency and types of field QA/QC samples, use of proper field QC preventative measures (e.g., decontamination and sample handling), and achieving successful analysis of 99 percent of analytes in samples (Only 10 results out of 1,203 results were rejected.)
Summarize the effect of DQO issues on the risk assessment, if applicable.	There were no DQO issues identified that should affect the risk assessment. While the Site 41 RI report was prepared in 1996, there were no problems encountered in reviewing the historical data to perform a data useability assessment because relevant reports and documentation were complete, including the work plan, the RI report and all its appendices, and data validation checklists and support documentation for all SDGs.
Data Validation and Interpretation	
What are the data validation requirements?	Data validation was conducted on 100 percent of the laboratory data following the Region II SOPs by Brown and Root Environmental's Wayne, PA office (now Tetra Tech, Inc., King of Prussia, PA). Field samples were qualified based on field QC sample results and laboratory QC results per SOP guidelines.

DATA USEABILITY WORKSHEET (continued)
Site: NWS Earle Site 41 (EPIC Site L) – MSC Van Parking Lot
Medium: Soil

Activity	Comment
What method or guidance was used to validate the data?	Laboratory data were validated in accordance with the QAPP requirements, which refer to Region II SOPs for Evaluation of Metals Data for CLP, Revision 1/92, and the SOP for CLP Organic Data Review, Revision 5/93. The EPA Region 2 Data Validation checklists were completed by data validation chemists and a senior data validator reviewed and approved each validation report.
Was the data validation method consistent with guidance? Discuss any discrepancies.	All validation qualifiers were applied in accordance with Region II SOP guidelines cited above. Recent changes were made to EPA Region II organic data validation SOPs HW-33, 35, 36, and 37, but the changes largely affect minor differences in the cutoff criteria for values to qualify estimated (J/UJ), which still leaves the data usable. Also, cutoff criteria for assessing organic blank contamination were restricted to qualify fewer sample results. However, no impacts were seen for this particular data set that would change the results used for the risk assessment.
Were all data qualifiers defined? Discuss those which were not.	Data qualifiers were defined in the footnotes to the analytical results tables.
Which qualifiers represent useable data?	Usable data were represented as positive results annotated with no qualifier or with a “J” qualifier, or as nondetected results with a “U” qualifier or a “UJ” qualifier. Pesticides with “NJ” qualifier (tentatively identified, estimated value) were also used. The rationale for using data qualified as estimated (J/UJ) was based on EPA guidance (RAGS, Part A, Section 5.4.1). The reasons why these results were qualified estimated are found in the data validation checklists and are explained in the summary comments below. Since none of the cases involving “J” qualifiers involved QC problems severe enough to imply that the presence or absence of a compound is in doubt or that the magnitude of bias or imprecision was extremely high, “J”-qualified results are usable to render a confident decision on whether contamination should or should not trigger remediation or other action. In the cases involving the qualifier for presumptive or tentative identification (N-qualifier) that applied to five pesticide compounds, the reported results represent a worst case; i.e., it is assumed these pesticides are actually present, although quantitative agreement between the concentrations detected on two columns was not perfect. Since the risk assessment demonstrated that estimated pesticide cancer risks were below the

Activity	Comment
	1E-6 lower end of the acceptable risk range (Table 28-7 in the RI report), the "N"-qualified data are sufficient to demonstrate that potential pesticide risks are not unacceptable.
Which qualifiers represent unuseable data?	Ten pesticide results were rejected (qualified "R") based on high percent differences in the concentration results obtained on two gas chromatographic (GC) columns. Data qualified "U" for blank contamination were considered as not detected in the risk assessment. The pesticide results qualified "R" are likely to be artifacts of other organic compounds found in soil samples that mask the pesticide retention times on one or both GC columns. EPA guidance (RAGS, Part A) recommends not using rejected ("R"-qualified) data in the risk assessment. Note that it is a relatively common occurrence in pesticide analysis for the second column confirmation to fail the percent difference criterion because of the numerous organic compounds that exist and which are detectable by GC, in addition to the handful of target compound pesticides. Cleanups are not always capable of removing all concentration levels of non-pesticide organic compounds that may occur in sample extracts. Only in the event that a required cleanup was not performed or if a particular pesticide was known or anticipated to have been disposed at the site would a more critical judgment of pesticide fraction data usability be advised.
How are tentatively identified compounds handled?	Tentatively identified compounds (TICs) were evaluated during data validation to determine if any target compounds were inadvertently missed and to determine if any classes of chemicals were present that were not adequately represented by the concurrent identification of one or more analogous target compounds belonging to the same chemical class.
Summarize the effect of data validation and interpretation issues on the risk assessment, if applicable.	There were no other significant issues in data interpretation or data validation. Data qualified as estimated "J" included organics detected below the CRQL, a few pesticides with high percent differences between two GC columns, and six metals qualified for serial dilution. Nondetects qualified estimated "UJ" included one metal qualified for matrix spike recovery and five organics qualified for calibration percent difference. Note that the matrix spike results were not below the lower QC limits that would have caused rejection of nondetected results, nor were the calibration percent differences significant enough to suggest any

Activity	Comment
	possibility of severe impairment of detection capability.
Additional notes:	No other problems were noted.

Note: The purpose of this Worksheet is to succinctly summarize the data useability analysis and conclusions. Reference specific pages in the Remedial Investigation and/or the Risk Assessment text to further expand on the information presented here.

DATA USEABILITY WORKSHEET
Site: NWS Earle Site 46 (EPIC Site Q) – Military Sealift Command Firefighting School
Media: Soil, Sediment, and Groundwater

Details regarding the EPIC Site Q sampling and analytical program and data quality objectives were presented in the NWS Earle Remedial Investigation (RI) Work Plan and Quality Assurance Project Plan (QAPP) (Halliburton NUS, 1995) and the NWS Earle RI report (Brown & Root Environmental, 1996). Relevant supporting information is summarized in the following paragraphs to facilitate the evaluation of data usability worksheets. The assessment for data usability is designed to evaluate whether the data are appropriate for use in the human health risk assessment.

EPIC Site Q occupies a 5.5-acre area at the southwestern corner of the NWS Earle Mainside Area. The fire-fighting school was built in 1975 and is used by the Navy and a variety of state and county groups to practice firefighting. The school is operated by the Military Sealift Command, which reports having all necessary operating permits and is inspected on a regular basis by the New Jersey Department of Environmental Protection (NJDEP). Prior to 2006 the facility had an oil/water separator and retention pond for the treatment of training wastewaters. The station also had a National Pollutant Discharge and Elimination System (NPDES) permit, which required regular monitoring and set discharge limits, for disposal of the water from the separator to the pond. Although water falling on the concrete pad was normally collected for treatment in the oil-water separator, there was some evidence noted that water flowed over the berm to the southeast portion of the pad. In 2006 the Military Sealift Command completed the installation of a closed loop collection system to contain the waters generated from the firefighting training exercises prior to sending them to an onsite facility for treatment and filtration prior to reuse. As a result, the NPDES permit has been terminated and the retention pond is no longer used.

Previous investigations included a 1992 Preliminary Assessment Addendum comprised of interview findings and aerial photo analyses. The primary objective of the RI was to determine potential impacts to various site media. The 1995 work plan for the NWS Earle RI was reviewed by EPA and responses and revisions were addressed by the Navy. Runoff over the berm in the southeast corner was a potential source to evaluate for impacting soils and groundwater. The groundwater investigation was designed as a screening tool to evaluate areas most likely to be potentially impacted from past firefighting training activities. Three temporary monitoring wells were constructed from 2-inch-diameter PVC and were screened across the water table at intervals from 4-10 feet and 10-20 feet. One sediment sample was collected to evaluate potential impacts to the pond near the outfall of the oil/water separator. Three subsurface soil samples were collected from two locations at depths of 2-4 feet, 4-6 feet, and 0.5-1.0 foot below the existing grade. Sample locations are shown in the attached Figure 29-1, extracted from the 1996 RI report.

During field sampling, no problems were encountered that would have suggested any issues with sampling precision, accuracy, representativeness, or completeness. As stated in Section 3.2 of the RI Work Plan, sampling was conducted according to Halliburton NUS Standard Operating Procedures (SOPs) and the New Jersey Department of Environmental Protection and Energy (NJDEPE) Field Sampling Procedures Manual.

At Site 46, a biased sampling approach (i.e., “purposive” or “judgmental” sampling) was applied to determine if fire training operations have impacted soil, sediment, or groundwater. EPA Data Useability Guidance (DUGS) states that purposive or judgmental sampling designs may be adequate to detect hot spots, which was the intent of the Site 46 investigation. Limited sampling was conducted in areas that would exhibit the greatest impact from adjacent operations. For soil, this involved sampling near the oil/water separator at location QSB02 from Figure 29-2 in the RI report, and at location QSB03 in the southeast corner of the site where runoff over the berm may have impacted soils. One sediment sample was collected at location QSD01, in the retention pond and adjacent to the outflow of the oil/water separator. For groundwater, hydropunch sample QHP03 was collected downgradient and near the oil/water separator, while sample QHP04 was collected near the holding tanks adjacent to the retention pond. Sample QHP03 was collected immediately east of the existing leach field. As a result, the sample data sets are not necessarily representative of a truly unbiased mixture of impacted and unimpacted sample locations and depths across the whole site. This approach accomplishes the objective of estimating an upper range for potential human health risks from hypothetical receptor exposures, and is useable information because the findings of the risk assessment suggest that there are no unacceptable risks from potentially site-related COPCs. Cancer risk levels for a hypothetical resident exposed to soil were within the acceptable range. There were no unacceptable noncancer hazards. Detected carcinogenic compounds in soil yielded a cancer risk for hypothetical residential receptors below 1E-6, the lower end of the acceptable risk range. Cancer risks were also less than 1E-6 for exposure to sediment by a recreational receptor. Groundwater samples were collected using hydropunch sampling methods, which is suitable for assessing whether or not a release has occurred but not for assessing quantitative risks from future tap water use of groundwater. Note that Site 46 has remained an actively used facility for conducting fire training operations since the 1996 RI and reports having all necessary operating permits and is inspected on a regular basis by the New Jersey Department of Environmental Protection (NJDEP).

Groundwater, sediment, and soil samples were submitted to Lancaster Laboratories for Target Compound List (TCL) volatile organic compounds (VOCs) and TCL semivolatile organic compounds (SVOCs) analysis following low/medium concentration contract laboratory program (CLP) scopes of work (SOWs) and total petroleum hydrocarbons (TPH) analysis following EPA method 418.1. The laboratory’s nominal quantitation limits achieved the method requirements referenced in the QAPP/work plan. The organic quantitation limits in the most recent version of the low/medium CLP analytical protocol (SOM01.2) are generally within a factor of two compared to the contract required quantitation limits (CRQLs) for the analytical methods applied in the 1995 RI (OLM01.8). For soil/sediment samples, nominal values for VOC CRQLs were 10 ug/kg, SVOC CRQLs 330 ug/kg (830 ug/kg for low response compounds), pesticide CRQLs 1.7 or 3.3 ug/kg (except for methoxychlor and toxaphene), and PCB CRQLs 33 ug/kg. In contrast, the current CLP SOW SOM01.2 specifies nominal values for VOC CRQLs of 5 ug/kg (10 for ketones), SVOC CRQLs of 170 ug/kg (330 for low response compounds), pesticide CRQLs of 1.7 or 3.3 ug/kg (except for methoxychlor and toxaphene), and PCB CRQLs of 33 ug/kg. In the 1995 RI, groundwater analysis achieved CRQLs of 10 ug/L for VOCs and SVOCs, which is compared to the current CLP SOW’s low/medium concentration CRQLs of 5 ug/L and 10 ug/L for VOCs and 5 ug/L for SVOCs.

To evaluate the applicability of concentrations found in each medium, the detected soil, sediment, and groundwater concentrations were compared to screening levels derived from the Regional Screening Level (RSL) Tables available from http://www.epa.gov/region9/superfund/prg/. The RSLs are developed using risk assessment guidance from the EPA superfund program. The values are risk-based concentrations developed from standardized equations combining exposure information assumptions with EPA toxicity data. RSLs are considered by the agency to be protective for humans (including sensitive subgroups) under exposure conditions applicable to certain types of receptors. For example, the residential exposure RSLs are protective for humans over a lifetime, covering an exposure duration considered to represent the reasonable upper range duration living at one residence based on demographic studies. The industrial exposure RSLs are protective for adult workers over an exposure duration considered to be the reasonable upper range duration of employment at one company, based on employment studies. RSLs are not always applicable to the exposure scenarios unique to a particular site and do not address non-human health endpoints, such as ecological impacts. The chemical-specific RSLs are generic; they are calculated without site-specific information. Exposure assumptions may be recalculated using site-specific information during a baseline human health risk assessment (HHRA). In a HHRA, the goal of the comparison of detected concentrations to RSLs is to determine whether the concentrations found in the soil are within an acceptable limit, such that those chemicals that are present at concentrations that could contribute to significant risks (above RSLs) are carried through the quantitative risk assessment, while chemicals with concentrations less than RSLs do not require a detailed estimation of risks from site exposures.

Soil detected sample concentration limits and sample quantitation limits were compared to the May 2012 residential soil exposure and industrial soil exposure RSLs as tabulated in the right-hand columns of Table 1-3 (attached). The RSL values are based on surface soil contact by receptors established at a cancer risk level of 1×10^{-6} (one in a million risk) or a noncarcinogenic toxicity-based hazard index (HI) of 0.1 where the goal of protection is a cumulative HI of less than 1 for additivity across chemicals affecting the same target organ. The rationale for soil exposure assumes that soil at the site may be disturbed so as to become available at the surface for receptor contact (i.e., ingestion and dermal contact). The exceedance of either residential or industrial RSLs may still indicate that at concentrations equal to the detection limit, the potential risks may remain within the acceptable risk range (i.e., cancer risk between 1×10^{-6} and 1×10^{-4} or below the goal of protection of a HI of 1. For example, the concentration of 22 ppm in soil for 1,2,4-trichlorobenzene is based on a risk of 1×10^{-6} while the detection limit of 0.40 mg/kg is at a risk level of approximately 2×10^{-6} that remains within the risk range of 1×10^{-6} to 1×10^{-4}.

The SVOCs for which CRQLs were greater than their respective RSLs included hexachlorobenzene, pentachlorophenol, bis(2-chloroethyl)ether, and N-nitroso-di-N-propylamine. None of these substances were found in any soil samples or were anticipated to be found in the types of materials used or disposed at the site. Certain carcinogenic polycyclic aromatic hydrocarbons (PAHs) also exhibited detection limits that were greater than residential RSLs, including benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, dibenz(a,h)anthracene, and indeno(1,2,3-cd)pyrene. There were no detections of these PAHs. In addition, the flammable solvents used during firefighting training are associated with lighter hydrocarbons and not heavier PAHs.

Sediment detected sample concentration limits and sample quantitation limits were compared to the May 2012 residential soil exposure RSLs and the Sediment Ecological Toxicity Threshold Values as tabulated in the right-hand columns of Table 1-4 (attached). The RSL values are based on sediment direct contact (incidental ingestion or dermal absorption) by receptors, again established at a cancer risk level of 1 x 10^{-6} or a noncarcinogenic toxicity-based HI of 0.1 where the goal is a HI of less than 1 for additivity of chemicals affecting the same target organ. In sediment, SVOC sample quantitation limits were elevated because of the presence of alkane hydrocarbon chromatographic interferents requiring a 10-fold extract dilution and because of 72 percent moisture of the sample aliquot used for analysis, so that several of the SVOC sample quantitation limits were greater than their respective RSLs or Sediment Ecological Toxicity Threshold Values. For the same reasons, several VOCs displayed sample quantitation limits exceeding their respective RSLs or Sediment Ecological Toxicity Threshold Values, including cis-1,3-dichloropropene, trans-1,3-dichloropropene, 1,1,1-trichloroethane, 1,1-dichloroethene, carbon tetrachloride, chlorobenzene, vinyl chloride, and trichloroethene.

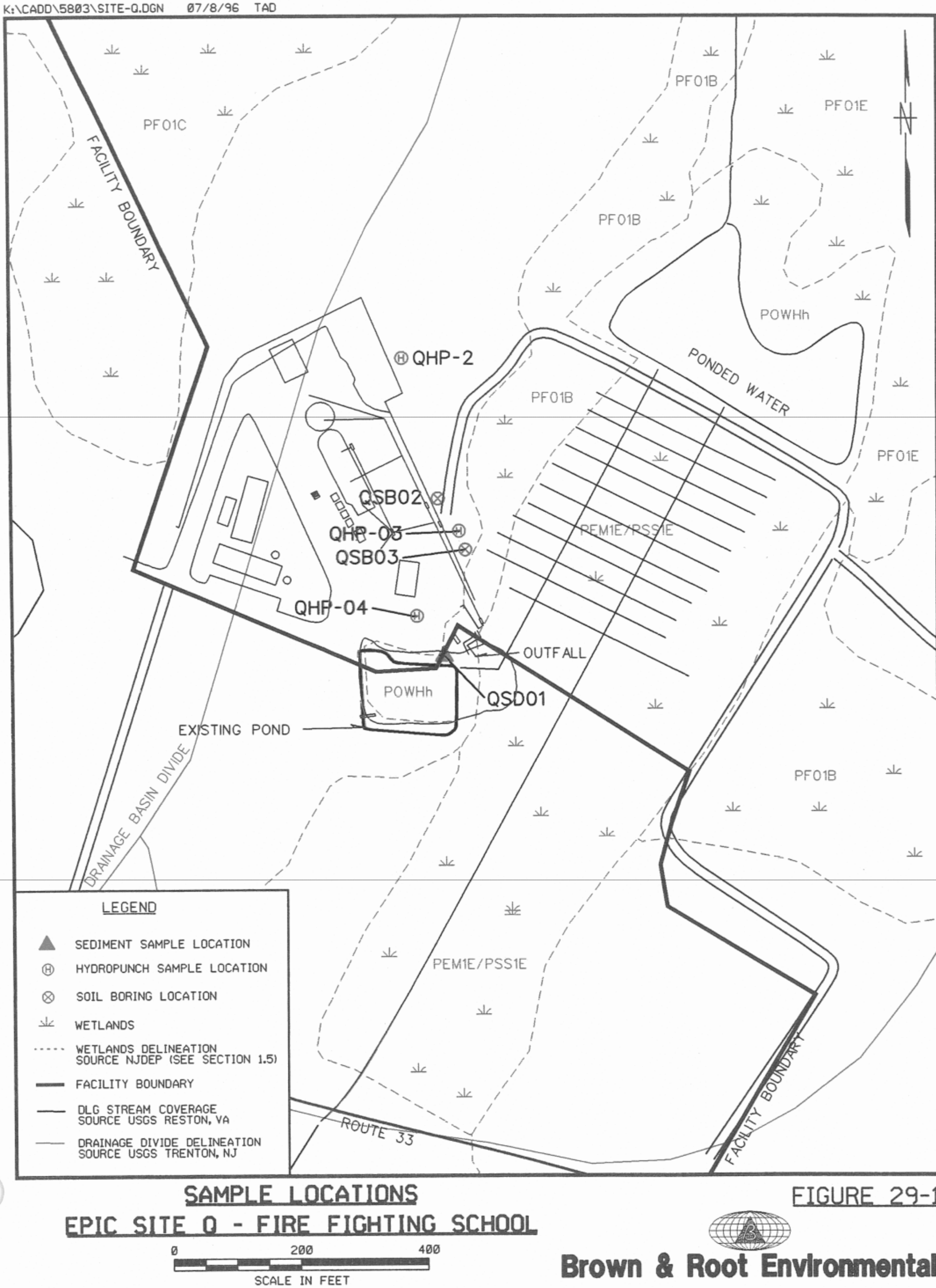
Table 1-5 (attached) compares groundwater sample quantitation limits to residential tap water RSLs and EPA MCLs. The RSL values are based on tap water contact by residential receptors established at a cancer risk level of 1 x 10^{-6} (one in a million risk) or a noncarcinogenic toxicity-based hazard index (HI) of 0.1. Twenty-one (21) VOCs and 34 SVOCs displayed sample quantitation limits exceeding their respective RSLs. Sample quantitation limits achieved QAPP requirements for CLP low/medium concentration protocols. Note that the objective of the temporary well sampling was to perform a screening level investigation for potential impacts to groundwater in those areas that would be potentially most impacted by any releases to see if further groundwater studies were needed.

In summary, based on an evaluation of the data and comparison to RSLs, the analytical data are considered of appropriate quality for purposes of evaluation of potential human health risks.

FIGURE 29-1

(Reference: Remedial Investigation Report for Naval Weapons Station Earle. July 1996. Brown & Root Environmental.)

K:\CADD\5803\SITE-Q.DGN 07/8/96 TAD



SAMPLE LOCATIONS
EPIC SITE Q - FIRE FIGHTING SCHOOL

FIGURE 29-1

Brown & Root Environmental

TABLE 1-3

(Reference: Remedial Investigation Report for Naval Weapons Station Earle. July 1996. Brown & Root Environmental.)

TABLE 1-3

COMPARISON OF RI SUBSURFACE SOIL ANALYTICAL DATA TO REGIONAL SCREENING LEVELS (RSLS)
SITE 46 (EPIC SITE Q) - FIREFIGHTING SCHOOL
NAVAL WEAPONS STATION EARLE

SAMPLE LOCATION	QSB02-02		QSB02-04		QSB03-01		EPA Regional Screening Levels (RSLs)			
SAMPLE DEPTH	2-4 feet		4-6 feet		0.5-1 foot					
DATA SOURCE	1995 RI, Dec.		1995 RI, Dec.		1995 RI, Dec.		Residential Soil RSLs		Industrial Soil RSLs	
SEMIVOLATILES	**µg/kg**		**µg/kg**		**µg/kg**		**µg/kg**		**µg/kg**	
1,2,4-trichlorobenzene	400	U	400	U	390	U	22,000	c	99,000	c
1,2-dichlorobenzene	400	U	400	U	390	U	190,000	n	980,000	n
1,3-dichlorobenzene	400	U	400	U	390	U	-		-	
1,4-dichlorobenzene	400	U	400	U	390	U	2,400	c	12,000	c
2,2'-oxybis(1-chloropropane)	400	U	400	U	390	U	4,600	c	22,000	c
2,4,5-trichlorophenol	1,000	U	1,000	U	980	U	610,000	n	6,200,000	n
2,4,6-trichlorophenol	400	U	400	U	390	U	44,000	c	160,000	c
2,4-dichlorophenol	400	U	400	U	390	U	18,000	n	180,000	n
2,4-dimethylphenol	400	U	400	U	390	U	120,000	n	1,200,000	n
2,4-dinitrophenol	1,000	U	1,000	U	980	U	12,000	n	120,000	n
2,4-dinitrotoluene	400	U	400	U	390	U	1,600	c	5,500	c
2,6-dinitrotoluene	400	U	400	U	390	U	6,100	n	62,000	n
2-chloronaphthalene	400	U	400	U	390	U	630,000	n	8,200,000	n
2-chlorophenol	400	U	400	U	390	U	39,000	n	510,000	n
2-methylnaphthalene	600		700		390	U	23,000	n	220,000	n
2-methylphenol	400	U	400	U	390	U	310,000	n	3,100,000	n
2-nitroaniline	1,000	U	1,000	U	980	U	61,000	n	600,000	n
2-nitrophenol	400	U	400	U	390	U	-		-	
3,3'-dichlorobenzidine	400	U	400	U	390	U	1,100	c	3,800	c
3-nitroaniline	1,000	U	1,000	U	980	U	-		-	
4,6-dinitro-2-methylphenol	1000	U	1000	U	980	U	-		-	
4-bromophenyl-phenylether	400	U	400	U	390	U	-		-	
4-chloro-3-methylphenol	400	U	400	U	390	U	610,000	n	6,200,000	n
4-chloroaniline	400	U	400	U	390	U	2,400	c	8,600	c
4-chlorophenyl-phenylether	400	U	400	U	390	U	-		-	
4-methylphenol	400	U	400	U	390	U	610,000	n	6,200,000	n
4-nitroaniline	1,000	U	1,000	U	980	U	24,000	c	86,000	c
4-nitrophenol	1,000	U	1,000	U	980	U	-		-	
N-nitroso-di-n-propylamine	400	U	400	U	390	U	69	c	250	c
N-nitrosodiphenylamine (1)	400	U	400	U	390	U	99,000	c	350,000	c
acenaphthene	56.0	J	63.0	J	390	U	340,000	n	3,300,000	n
acenaphthylene	400	U	400	U	390	U	-		-	
anthracene	400	U	400	U	390	U	1,700,000	n	17,000,000	n
benzo(a)anthracene	400	U	400	U	390	U	150	c	2,100	c
benzo(a)pyrene	400	U	400	U	390	U	15	c	210	c
benzo(b)fluoranthene	400	U	400	U	390	U	150	c	2,100	c
benzo(g,h,i)perylene	400	U	400	U	390	U	-		-	
benzo(k)fluoranthene	400	U	400	U	390	U	1,500	c	21,000	c
bis(2-chloroethoxy)methane	400	U	400	U	390	U	18,000	n	180,000	n
bis(2-chloroethyl)ether	400	U	400	U	390	U	210	c	1,000	c
bis(2-ethylhexyl)phthalate	400	U	400	U	390	U	35,000	c	120,000	c
butylbenzylphthalate	400	U	400	U	390	U	260,000	c	910,000	c
carbazole	400	U	400	U	390	U	-		-	
chrysene	400	U	400	U	390	U	15,000	c	210,000	c
di-n-butylphthalate	400	U	400	U	390	U	610,000	n	6,200,000	n
di-n-octylphthalate	400	U	400	U	390	U	73,000		740,000	
dibenz(a,h)anthracene	400	U	400	U	390	U	15	c	210	c
dibenzofuran	74.0	J	77.0	J	390	U	7,800	n	100,000	n
diethylphthalate	400	U	400	U	390	U	4,900,000	n	49,000,000	n
dimethylphthalate	400	U	400	U	390	U	-		-	
fluoranthene	400	U	400	U	390	U	230,000	n	2,200,000	n
fluorene	110	J	120	J	390	U	230,000	n	2,200,000	n
hexachlorobenzene	400	U	400	U	390	U	300	c	1,100	c
hexachlorobutadiene	400	U	400	U	390	U	6,200	c	22,000	c
hexachlorocyclopentadiene	400	U	400	U	390	U	37,000	n	370,000	n
hexachloroethane	400	U	400	U	390	U	12,000	c	43,000	c
indeno(1,2,3-cd)pyrene	400	U	400	U	390	U	150	c	2,100	c
isophorone	400	U	400	U	390	U	510,000	c	1,800,000	c
naphthalene	44.0	J	400	U	390	U	3,600	c	18,000	c
nitrobenzene	400	U	400	U	390	U	4,800	c	24,000	c
pentachlorophenol	1000	U	1000	U	980	U	890	c	2,700	c
phananthrene	260	J	250	J	390	U	-		-	
phenol	400	U	400	U	390	U	1,800,000	n	18,000,000	n
pyrene	400	U	400	U	390	U	170,000	n	1,700,000	n

TABLE 1-3

COMPARISON OF RI SUBSURFACE SOIL ANALYTICAL DATA TO REGIONAL SCREENING LEVELS (RSLS)
SITE 46 (EPIC SITE Q) - FIREFIGHTING SCHOOL
NAVAL WEAPONS STATION EARLE
PAGE 2 OF 2

SAMPLE LOCATION	QSB02-02		QSB02-04		QSB03-01		EPA Regional Screening Levels (RSLs)			
SAMPLE DEPTH	2-4 feet		4-6 feet		0.5-1 foot					
DATA SOURCE	1995 RI, Dec.		1995 RI, Dec.		1995 RI, Dec.		Residential Soil RSLs		Industrial Soil RSLs	
VOLATILES	**µg/kg**		**µg/kg**		**µg/kg**		**µg/kg**		**µg/kg**	
1,1,1-trichloroethane	12.0	U	12.0	U	12.0	U	870,000	n	3,800,000	n
1,1,2,2-tetrachloroethane	12.0	U	12.0	U	12.0	U	560	c	2,800	c
1,1,2-trichloroethane	12.0	U	12.0	U	12.0	U	1,100	c	5,300	c
1,1-dichloroethane	12.0	U	12.0	U	12.0	U	3,300	c	17,000	c
1,1-dichloroethene	12.0	U	12.0	U	12.0	U	24,000	n	110,000	n
1,2-dichloroethane	12.0	U	12.0	U	12.0	U	430	c	2,200	c
1,2-dichloroethene (total)	12.0	U	12.0	U	12.0	U	70,000	n	920,000	n
1,2-dichloropropane	12.0	U	12.0	U	12.0	U	940	c	4,700	c
2-butanone	12.0	U	12.0	U	12.0	U	2,800,000	n	20,000,000	n
2-hexanone	12.0	U	12.0	U	12.0	U	21,000	n	140,000	n
4-methyl-2-pentanone	12.0	U	12.0	U	12.0	U	530,000	n	5,300,000	n
acetone	67.0	U	17.0	U	12.0	U	610,000	n	6,300,000	n
benzene	12.0	U	12.0	U	12.0	U	1,100	c	5,400	c
bromodichloromethane	12.0	U	12.0	U	12.0	U	270	c	1,400	c
bromoform	12.0	U	12.0	U	12.0	U	62,000	c	220,000	c
bromomethane	12.0	U	12.0	U	12.0	U	730	n	3,200	n
carbon disulfide	12.0	U	12.0	U	12.0	U	82,000	n	370,000	n
carbon tetrachloride	12.0	U	12.0	U	12.0	U	610	c	3,000	c
chlorobenzene	12.0	U	12.0	U	12.0	U	29,000	n	140,000	n
chloroethane	12.0	U	12.0	U	12.0	U	1,500,000	n	6,100,000	n
chloroform	12.0	U	12.0	U	12.0	U	290	c	1,500	c
chloromethane	12.0	U	12.0	U	12.0	U	12,000	n	50,000	n
cis-1,3-dichloropropene	12.0	U	12.0	U	12.0	U	1,700	c	8,300	c
dibromochloromethane	12.0	U	12.0	U	12.0	U	680	c	3,300	c
ethylbenzene	12.0	U	12.0	U	12.0	U	5,400	c	27,000	c
methylene chloride	12.0	U	12.0	U	12.0	U	56,000	c	960,000	c
styrene	12.0	U	12.0	U	12.0	U	630,000	n	3,600,000	n
tetrachloroethene	12.0	U	12.0	U	12.0	U	22,000	c	110,000	c
toluene	12.0	U	12.0	U	12.0	U	500,000	n	4,500,000	n
trans-1,3-dichloropropene	12.0	U	12.0	U	12.0	U	1,700	c	8,300	c
trichloroethene	2.0	J	55.0		9.0	J	910	c	6,400	c
vinyl chloride	12.0	U	12.0	U	12.0	U	60	c	1,700	c
xylene (total)	12.0	U	12.0	U	12.0	U	63,000	n	270,000	n

Footnotes to sample results:

(shading)	Shading denotes detection limits exceed EPA Regional Screening Levels (RSLs) for Residential Soils.
NA	Not Sampled
J	Value is estimated because concentration is below the quantitation limit or because of exceedances of data validation quality control criteria.
N	Compound is considered to be tentatively identified based on exceedance of QC criteria for compound identification.
R	Positive result is considered rejected based on exceedance of data validation quality control criteria.
U	Compound or element was not detected. Value is the detection limit (inorganics) or quantitation limit (organics).
c	RSL is based on cancer risks.
n	RSL is based on noncancer hazards.

Note: EPA Regional screening levels are multiplied by 0.1 for noncarcinogens to account for potential additivity of noncancer effects.

Sample Data Source:
Brown & Root Environmental. 1996. Remedial Investigation Report for Naval Weapons Station Earle, Colts Neck, New Jersey. Wayne, Pennsylvania. July.

TABLE 1-4

(Reference: Remedial Investigation Report for Naval Weapons Station Earle. July 1996. Brown & Root Environmental.)

TABLE 1-4

COMPARISON OF RI SEDIMENT ANALYTICAL DATA TO RSLS, ARARS, AND TBCS
SITE 46 (EPIC SITE Q) - FIREFIGHTING SCHOOL
NAVAL WEAPONS STATION EARLE

SAMPLE LOCATION	QSD01		EPA Regional Screening Levels (RSLs) for Residential Soil		EPA Regional Screening Levels (RSLs) for Industrial Soil		ARARS & TBCs
DATA SOURCE	1995 RI, Dec.						Sediment Ecological Toxicity Threshold Values
SEMIVOLATILES	**µg/kg**		**µg/kg**		**µg/kg**		**µg/kg**
1,2,4-trichlorobenzene	12,000	U	22,000	c	99,000	c	2,100
1,2-dichlorobenzene	12,000	U	190,000	n	980,000	n	16.5
1,3-dichlorobenzene	12,000	U	-		-		4,430
1,4-dichlorobenzene	12,000	U	2,400	c	12,000	c	599
2,2'-oxybis(1-chloropropane)	12,000	U	4,600	c	22,000	c	-
2,4,5-trichlorophenol	30,000	U	610,000	n	6,200,000	n	-
2,4,6-trichlorophenol	12,000	U	44,000	c	160,000	c	213
2,4-dichlorophenol	12,000	U	18,000	n	180,000	n	117
2,4-dimethylphenol	12,000	U	120,000	n	1,200,000	n	29
2,4-dinitrophenol	30,000	U	12,000	n	120,000	n	-
2,4-dinitrotoluene	12,000	U	1,600	c	5,500	c	41.6
2,6-dinitrotoluene	12,000	U	6,100	n	62,000	n	-
2-chloronaphthalene	12,000	U	630,000	n	8,200,000	n	-
2-chlorophenol	12,000	U	39,000	n	510,000	n	31.2
2-methylnaphthalene	12,000	U	23,000	n	220,000	n	20.2
2-methylphenol	12,000	U	310,000	n	3,100,000	n	-
2-nitroaniline	30,000	U	61,000	n	600,000	n	-
2-nitrophenol	21,000	U	-		-		-
3,3'-dichlorobenzidine	12,000	U	1,100	c	3,800	c	127
3-nitroaniline	30,000	U	-		-		-
4,6-dinitro-2-methylphenol	30,000	U	-		-		-
4-bromophenyl-phenylether	12,000	U	-		-		1,230
4-chloro-3-methylphenol	12,000	U	610,000	n	6,200,000	n	-
4-chloroaniline	12,000	U	2,400	c	8,600	c	-
4-chlorophenyl-phenylether	12,000	U	-		-		-
4-methylphenol	12,000	U	610,000	n	6,200,000	n	670
4-nitroaniline	30,000	U	24,000	c	86,000	c	-
4-nitrophenol	30,000	U	-		-		-
N-nitroso-di-n-propylamine	12,000	U	69	c	250	c	2,680
N-nitrosodiphenylamine (1)	12,000	U	99,000	c	350,000	c	-
acenaphthene	12,000	U	340,000	n	3,300,000	n	6.7
acenaphthylene	12,000	U	-		-		5.9
anthracene	12,000	U	1,700,000	n	17,000,000	n	57.2
benzo(a)anthracene	12,000	U	150	c	2,100	c	108
benzo(a)pyrene	12,000	U	15	c	210	c	150
benzo(b)fluoranthene	1,600	J	150	c	2,100	c	27.2
benzo(g,h,i)perylene	12,000	U	-		-		170
benzo(k)fluoranthene	12,000	U	1,500	c	21,000	c	27.2
bis(2-chloroethoxy)methane	12,000	U	18,000	n	180,000	n	-
bis(2-chloroethyl)ether	12,000	U	210	c	1,000	c	-
bis(2-ethylhexyl)phthalate	12,000	U	35,000	c	120,000	c	180
butylbenzyl phthalate	12,000	U	260,000	c	910,000	c	10,900
carbazole	12,000	U	-		-		-
chrysene	1,300	J	15,000	c	210,000	c	340
di-n-butylphthalate	12,000	U	610,000	n	6,200,000	n	6,470
di-n-octylphthalate	12,000	U	-		-		-
dibenz(a,h)anthracene	12,000	U	15	c	210	c	33
dibenzofuran	12,000	U	7,800	n	100,000	n	415
diethylphthalate	1,500	J	4,900,000	n	49,000,000	n	603
dimethylphthalate	12,000	U	-		-		-
fluoranthene	12,000	U	230,000	n	2,200,000	n	423
fluorene	12,000	U	230,000	n	2,200,000	n	77.4
hexachlorobenzene	12,000	U	300	c	1,100	c	20
hexachlorobutadiene	12,000	U	6,200	c	22,000	c	-
hexachlorocyclopentadiene	12,000	U	37,000	n	370,000	n	-
hexachloroethane	12,000	U	12,000	c	43,000	c	1027
indeno(1,2,3-cd)pyrene	12,000	U	150	c	2,100	c	17
isophorone	12,000	U	510,000	c	1,800,000	c	-
naphthalene	12,000	U	3,600	c	18,000	c	176
nitrobenzene	12,000	U	4,800	c	24,000	c	-
pentachlorophenol	30,000	U	890	c	2,700	c	504
phananthrene	12,000	U	-		-		204
phenol	12,000	U	1,800,000	n	18,000,000	n	420
pyrene	3,300	J	170,000	n	1,700,000	n	490

TABLE 1-4

COMPARISON OF RI SEDIMENT ANALYTICAL DATA TO RSLS, ARARS, AND TBCS
SITE 46 (EPIC SITE Q) - FIREFIGHTING SCHOOL
NAVAL WEAPONS STATION EARLE

SAMPLE LOCATION	QSD01		EPA Regional Screening Levels (RSLs) for Residential Soil		EPA Regional Screening Levels (RSLs) for Industrial Soil		ARARS & TBCs Sediment Ecological Toxicity Threshold Values
DATA SOURCE	1995 RI, Dec.						
VOLATILES	**µg/kg**		**µg/kg**		**µg/kg**		**µg/kg**
1,1,1-trichloroethane	180	U	870,000	n	3,800,000	n	30.2
1,1,2,2-tetrachloroethane	180	U	560	c	2,800	c	1,360
1,1,2-trichloroethane	180	U	1,100	c	5,300	c	1,240
1,1-dichloroethane	180	U	3,300	c	17,000	c	-
1,1-dichloroethene	180	U	24,000	n	110,000	n	31
1,2-dichloroethane	180	U	430	c	2,200	c	-
1,2-dichloroethene (total)	180	U	70,000	n	920,000	n	1,050
1,2-dichloropropane	180	U	940	c	4,700	c	-
2-butanone	180	U	2,800,000	n	20,000,000	n	-
2-hexanone	180	U	21,000	n	140,000	n	-
4-methyl-2-pentanone	180	U	530,000	n	5,300,000	n	-
acetone	390	U	610,000	n	6,300,000	n	-
benzene	180	U	1,100	c	5,400	c	-
bromodichloromethane	180	U	270	c	1,400	c	-
bromoform	180	U	62,000	c	220,000	c	654
bromomethane	180	U	730	n	3,200	n	-
carbon disulfide	180	U	82,000	n	370,000	n	0.851
carbon tetrachloride	180	U	610	c	3,000	c	64.2
chlorobenzene	180	U	29,000	n	140,000	n	8.42
chloroethane	180	U	1,500,000	n	6,100,000	n	-
chloroform	180	U	290	c	1,500	c	-
chloromethane	180	U	12,000	n	50,000	n	-
cis-1,3-dichloropropene	180	U	1,700	c	8,300	c	0.0509
dibromochloromethane	180	U	680	c	3,300	c	-
ethylbenzene	180	U	5,400	c	27,000	c	1,100
methylene chloride	180	U	56,000	c	960,000	c	-
styrene	180	U	630,000	n	3,600,000	n	559
tetrachloroethene	180	U	22,000	c	110,000	c	468
toluene	180	U	500,000	n	4,500,000	n	-
trans-1,3-dichloropropene	180	U	1,700		8,300		0.0509
trichloroethene	180	U	910	c	6,400	c	96.9
vinyl chloride	180	U	60	c	1,700	c	-
xylene (total)	93.0	J	63,000	n	270,000	n	120

Footnotes to sample results:
Shading denotes detection limits exceed ARARs and/or TBCs or EPA RSLs for Residential Contact with Soil.
RSLs for noncarcinogens are multiplied by 0.1 for additivity across chemicals.
J Value is estimated because concentration is below the quantitation limit or because of exceedances of data validation quality control criteria.
U Compound or element was not detected. Value is the detection limit (inorganics) or quantitation limit (organics).
c RSL is based on cancer risks.
n RSL is based on noncancer hazards.

Ecological Screening Level References:

USEPA (U.S. Environmental Protection Agency), 2006. Region III BTAG Freshwater Sediment Screening Benchmarks. Philadelphia, Pennsylvania. August.
NJDEP Ecological Screening Criteria, July 2008.

Sample Data Source:

Brown & Root Environmental. 1996. Remedial Investigation Report for Naval Weapons Station Earle, Colts Neck, New Jersey. Wayne, Pennsylvania. July.

TABLE 1-5

(Reference: Remedial Investigation Report for Naval Weapons Station Earle. July 1996. Brown & Root Environmental.)

TABLE 1-5

COMPARISON OF RI GROUNDWATER ANALYTICAL DATA TO SCREENING LEVELS
SITE 46 (EPIC SITE Q) - FIREFIGHTING SCHOOL
NAVAL WEAPONS STATION EARLE

SAMPLE LOCATION	Q-HP-04		Q-HP-03		Q-HP-02		Screening Levels		
DATA SOURCE	1995 RI, Dec.		1995 RI, Dec.		1995 RI, Dec.		EPA Tapwater RSL		EPA MCL
VOLATILES	**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**
1,1,1-trichloroethane	10	U	10	U	10	U	750	n	200
1,1,2,2-tetrachloroethane	10	U	10	U	10	U	0.066	c	
1,1,2-trichloroethane	10	U	10	U	10	U	0.24	c	5
1,1-dichloroethane	10	U	10	U	10	U	2.4	c	
1,1-dichloroethene	10	U	10	U	10	U	26	n	7
1,2-dichloroethane	10	U	10	U	10	U	0.15	c	5
1,2-dichloroethene (total)	10	U	10	U	10	U	13	n	
1,2-dichloropropane	10	U	10	U	10	U	0.38	c	5
2-butanone	10	U	10	U	10	U	490	n	
2-hexanone	10	U	10	U	10	U	3.4	n	
4-methyl-2-pentanone	10	U	10	U	10	U	100	n	
acetone	10	U	4	J	2	J	1200	n	
benzene	10	U	10	U	10	U	0.39	c	5
bromodichloromethane	10	U	10	U	10	U	0.12	c	8.0E+01(F)
bromoform	10	U	10	U	10	U	7.9	c	8.0E+01(F)
bromomethane	10	U	10	U	10	U	0.7	n	
carbon disulfide	10	U	10	U	10	U	72	n	
carbon tetrachloride	10	U	10	U	10	U	0.39	c	5
chlorobenzene	10	U	10	U	10	U	7.2	n	100
chloroethane	10	U	10	U	10	U	2100	n	
chloroform	8	J	10	U	14		0.19	c	8.0E+01(F)
chloromethane	10	U	10	U	10	U	19	n	
cis-1,3-dichloropropene	10	U	10	U	10	U	0.41	c	
dibromochloromethane	10	U	10	U	10	U	0.15	c	8.0E+01(F)
ethylbenzene	10	U	10	U	10	U	1.3	c	700
methylene chloride	10	U	10	U	10	U	9.9	c	5
styrene	10	U	10	U	10	U	110	n	100
tetrachloroethene	10	U	10	U	10	U	9.7	c	5
toluene	10	U	10	U	10	U	86	n	1000
trans-1,3-dichloropropene	10	U	10	U	10	U	0.41		
trichloroethene	10	U	10	U	10	U	0.44	c	5
vinyl chloride	10	U	10	U	10	U	0.015	c	2
xylene (total)	10	U	10	U	10	U	19	n	10000
SEMIVOLATILES	**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**
1,2,4-trichlorobenzene	10	U	10	U	10	U	0.99	c	70
1,2-dichlorobenzene	10	U	10	U	10	U	28	n	600
1,3-dichlorobenzene	10	U	10	U	10	U	-		-
1,4-dichlorobenzene	10	U	10	U	10	U	0.42	c	75
2,2'-oxybis(1-chloropropane)	10	U	10	U	10	U	0.31	c	
2,4,5-trichlorophenol	25	U	25	U	25	U	89	n	
2,4,6-trichlorophenol	10	U	10	U	10	U	3.5	c	
2,4-dichlorophenol	10	U	10	U	10	U	3.5	n	
2,4-dimethylphenol	10	U	10	U	10	U	27	n	
2,4-dinitrophenol	25	U	25	U	25	U	3	n	
2,4-dinitrotoluene	10	U	10	U	10	U	0.2	c	
2,6-dinitrotoluene	10	U	10	U	10	U	1.5	n	
2-chloronaphthalene	10	U	10	U	10	U	55	n	
2-chlorophenol	10	U	10	U	10	U	7.1	n	
2-methylnaphthalene	10	U	3	J	10	U	2.7	n	
2-methylphenol	10	U	10	U	10	U	72	n	
2-nitroaniline	25	U	25	U	25	U	15	n	
2-nitrophenol	10	U	10	U	10	U	-		-
3,3'-dichlorobenzidine	10	U	10	U	10	U	0.11	c	
3-nitroaniline	25	U	25	U	25	U	-		-
4,6-dinitro-2-methylphenol	25	U	25	U	25	U	-		-
4-bromophenyl-phenylether	10	U	10	U	10	U	-		-
4-chloro-3-methylphenol	10	U	10	U	10	U	110	n	
4-chloroaniline	10	U	10	U	10	U	0.32	c	

TABLE 1-5

COMPARISON OF RI GROUNDWATER ANALYTICAL DATA TO SCREENING LEVELS
SITE 46 (EPIC SITE Q) - FIREFIGHTING SCHOOL
NAVAL WEAPONS STATION EARLE

SAMPLE LOCATION	Q-HP-04		Q-HP-03		Q-HP-02		Screening Levels		
DATA SOURCE	1995 RI, Dec.		1995 RI, Dec.		1995 RI, Dec.		EPA Tapwater RSL		EPA MCL
4-chlorophenyl-phenylether	10	U	10	U	10	U	-		-
4-methylphenol	10	U	10	U	10	U	140	n	
4-nitroaniline	25	U	25	U	25	U	3.3	c	
4-nitrophenol	25	U	25	U	25	U	-		-
N-nitroso-di-n-propylamine	10	U	10	U	10	U	0.0093	c	
N-nitrosodiphenylamine (1)	10	U	10	U	10	U	10	c	
acenaphthene	10	U	10	U	10	U	40	n	
acenaphthylene	10	U	10	U	10	U	-		-
anthracene	10	U	10	U	10	U	130	n	
benzo(a)anthracene	10	U	10	U	10	U	0.029	c	
benzo(a)pyrene	10	U	10	U	10	U	0.0029	c	0.2
benzo(b)fluoranthene	10	U	10	U	10	U	0.029	c	
benzo(g,h,i)perylene	10	U	10	U	10	U	-		-
benzo(k)fluoranthene	10	U	10	U	10	U	0.29	c	
bis(2-chloroethoxy)methane	10	U	10	U	10	U	4.6	n	
bis(2-chloroethyl)ether	10	U	10	U	10	U	0.012	c	
bis(2-ethylhexyl)phthalate	3	J	10	U	1	J	4.8	c	6
butylbenzylphthalate	10	U	10	U	10	U	14	c	
carbazole	10	U	10	U	10	U	-		-
chrysene	10	U	10	U	10	U	2.9	c	
di-n-butylphthalate	10	U	10	U	10	U	67	n	
di-n-octylphthalate	10	U	10	U	10	U	19	n	-
dibenz(a,h)anthracene	10	U	10	U	10	U	0.0029	c	
dibenzofuran	10	U	10	U	10	U	0.58	n	
diethylphthalate	10	U	10	U	10	U	1100	n	
dimethylphthalate	10	U	10	U	10	U	-		-
fluoranthene	10	U	10	U	10	U	63	n	
fluorene	10	U	10	U	10	U	22	n	
hexachlorobenzene	10	U	10	U	10	U	0.042	c	1
hexachlorobutadiene	10	U	10	U	10	U	0.26	c	
hexachlorocyclopentadiene	10	U	10	U	10	U	2.2	n	50
hexachloroethane	10	U	10	U	10	U	0.79	c	
indeno(1,2,3-cd)pyrene	10	U	10	U	10	U	0.029	c	
isophorone	10	U	10	U	10	U	67	c	
naphthalene	10	U	2	J	10	U	0.14	c	
nitrobenzene	10	U	10	U	10	U	0.12	c	
pentachlorophenol	25	U	25	U	25	U	0.035	c	1
phenanthrene	10	U	10	U	10	U	-		-
phenol	10	U	10	U	10	U	450	n	
pyrene	10	U	10	U	10	U	8.7	n	

Footnotes to sample results:

(shading)	Shading denotes detection limits exceed EPA Regional Screening Levels (RSLs) for Tapwater.
J	Value is estimated because concentration is below the quantitation limit or because of exceedances of data validation quality control criteria.
U	Compound or element was not detected. Value is the detection limit (inorganics) or quantitation limit (organics).
c	RSL is based on cancer risks.
n	RSL is based on noncancer hazards.

Note: EPA Regional screening levels are multiplied by 0.1 for noncarcinogens to account for potential additivity of noncancer effects.

Sample Data Source:
Brown & Root Environmental. 1996. Remedial Investigation Report for Naval Weapons Station Earle, Colts Neck, New Jersey. Wayne, Pennsylvania. July.

SITE 46 WORKSHEETS

DATA USEABILITY WORKSHEET
Site: NWS Earle Site 46 (EPIC Site Q) – Military Sealift Command Firefighting School
Media: Soil

Activity	Comment
Field Sampling	
Discuss sampling problems and field conditions that affect data useability.	There were no apparent sampling or field problems that would affect data useability.
Are samples representative of receptor exposure for this medium (e.g. sample depth, grab vs composite, filtered vs unfiltered, low flow, etc.)?	Yes. Subsurface soil sample results are representative of potential locations where runoff originating from the fire training area may have impacted the subsurface soil. Soil boring samples from location QSB02 (2-4 feet and 4-6 feet) represent soil depths under the concrete pad with elevated HNu readings where runoff may have infiltrated cracks in the containment pad. One soil sample from QSB03 (0.5-1 foot) represents the soil depth where runoff may have flowed over the berm and infiltrated exposed soil. Sampling was conducted in December 1995 for TCL VOCs and SVOCs and TPH.
Assess the effect of field QC results on data useability.	Field QA/QC samples included trip, rinsate, and field blanks. Data validation was performed and did not reveal any evidence of QC blank contamination originating in the field.
Summarize the effect of field sampling issues on the risk assessment, if applicable.	There were no field sampling issues identified that should affect the risk assessment.
Analytical Techniques	
Were the analytical methods appropriate for quantitative risk assessment?	Yes. Samples were analyzed for organic compounds following Contract Laboratory Program (CLP) routine analytical methods. TPH analytical methods were used to evaluate evidence of contamination but not to estimate risks. TCL VOC and SVOC analytes include components of TPH with toxic properties.
Were detection limits adequate?	Yes. First, the sample quantitation limits (SQLs) achieved the CLP contract required quantitation limits (CRQLs) for routine soil analysis. In addition, SQLs were also compared to risk-based RSLs to evaluate attainment of project goals. Five carcinogenic PAHs exhibited SQLs greater than their respective residential soil RSLs. Several noncarcinogenic PAHs were found in soil samples, but in each case noncarcinogenic PAH SQLs were less than their RSLs. In addition, the GC/MS VOC and SVOC methods can typically detect concentrations at a fraction (1/5 to 1/3) of the CRQLs. For each carcinogenic PAH, if the RSL was adjusted from a 1E-6 to a 1E-5 cancer risk level, the 10X

Activity	Comment
	adjusted RSL concentration would equate to a detectable PAH concentration. Assuming less than ten carcinogenic target compounds are present, detection limits would be protective for a cumulative cancer risk of 1E-4 for soil exposure, which is at the upper end of the acceptable risk range, Therefore, project goals were achieved with the ability to measure soil concentrations that would preclude unacceptable human health risk.
Summarize the effect of analytical technique issues on the risk assessment, if applicable.	There were no analytical technique issues that should affect the risk assessment.
Data Quality Objectives	
Precision - How were duplicates handled?	Laboratory matrix spikes/matrix spike duplicates were analyzed as required by the methods. No field duplicates were collected at this NWS Earle site due to the limited number of soil samples. Region II Data Validation Guidance was followed to evaluate precision.
Accuracy - How were split samples handled?	No split samples were collected.
Representativeness - Indicate any problems associated with data representativeness (e.g., trip blank or rinsate blank contamination, chain of custody problems, etc.).	Laboratory blanks revealed low level results for bis(2-ethylhexyl) phthalate, 2-butanone, acetone, and methylene chloride. Associated sample results were qualified as nondetected (“U”). No chain of custody issues were noted. The overall quantity of data collected was evaluated to determine if project goals were satisfied, At Site 46, a biased sampling approach (i.e., “purposive” or “judgmental” sampling) was applied to determine if fire training operations have impacted soil. EPA Data Useability Guidance (DUGS) states that purposive or judgmental sampling designs maybe be adequate to detect hot spots, which was the intent of the Site 46 investigation. Limited sampling was conducted to include areas that exhibited the greatest impact from operations, as described in the accompanying data useability narrative. As a result, the soil data set is not necessarily representative of a truly unbiased mixture of impacted and unimpacted sample locations and depths across the whole site. This approach accomplishes the objective of estimating an upper range for potential human health risks from hypothetical soil exposure, and is useable information because the findings of the risk assessment suggest that there are no unacceptable risks. Cancer risk levels were within the acceptable range (less than 1E-6, the lower limit of the acceptable risk range, as shown in Table 29-9 in the RI report).

DATA USEABILITY WORKSHEET (continued)
Site: NWS Earle Site 46 (EPIC Site Q) – Military Sealift Command Firefighting School
Medium: Soil

Activity	Comment
	A second source of uncertainty is associated with the small sample data set. Only three soil samples were collected in the area. Although sampling was focused to identify areas where soil impacts were most probable, the fact that only three samples were collected precludes using a statistical UCL to estimate risks, and the maximum detected concentration was used instead.
Completeness - Indicate any problems associated with data completeness (e.g., incorrect sample analysis, incomplete sample records, problems with field procedures, etc.).	No problems were associated with data completeness.
Comparability - Indicate any problems associated with data comparability.	No problems are anticipated with data comparability due to the use of routine CLP methods of analysis.
Were the DQOs specified in the QAPP satisfied?	The DQOs specified in the QAPP were met with respect to the frequency and types of field QA/QC samples, use of proper field QC preventative measures (e.g., decontamination and sample handling), and achieving successful analysis of 100 percent of analytes in samples (No results were rejected out of the data set).
Summarize the effect of DQO issues on the risk assessment, if applicable.	There were no DQO issues identified that should affect the risk assessment. While the Site 46 RI report was prepared in 1996, there were no problems encountered in reviewing the historical data to perform a data useability assessment because relevant reports and documentation were complete, including the work plan, the RI report and all its appendices, and data validation checklists and support documentation for all SDGs.
Data Validation and Interpretation	
What are the data validation requirements?	Data validation was conducted on 100 percent of the laboratory data following the Region II SOPs by Brown and Root Environmental's Wayne, PA office (now Tetra Tech, Inc., King of Prussia, PA). Field samples were qualified based on field QC sample results and laboratory QC results per SOP guidelines.
What method or guidance was used to validate the data?	Laboratory data were validated in accordance with the QAPP requirements, which refer to the Region II SOP for CLP Organic Data Review, Revision 5/93. TPH data were validated using the analogous requirements in the Region II SOP for Evaluation of Metals Data for CLP, Revision 1/92. The EPA Region 2 Data Validation checklists were completed by data validation chemists and a senior data validator reviewed and approved each validation report.
Was the data validation method consistent with guidance? Discuss any discrepancies.	All validation qualifiers were applied in accordance with Region II SOP guidelines cited above. Recent

DATA USEABILITY WORKSHEET (continued)
Site: NWS Earle Site 46 (EPIC Site Q) – Military Sealift Command Firefighting School
Medium: Soil

Activity	Comment
	changes were made to EPA Region II organic data validation SOPs HW-33 and HW- 35, but the changes largely affect minor differences in the cutoff criteria for values to qualify estimated (J/UJ), which still leaves the data usable. Also, cutoff criteria for assessing organic blank contamination were restricted to qualify fewer sample results. However, no impacts were seen for this particular data set that would change the results used for the risk assessment.
Were all data qualifiers defined? Discuss those which were not.	Data qualifiers were defined in the footnotes to the analytical results tables.
Which qualifiers represent useable data?	Usable data were represented as positive results annotated with no qualifier or with a "J" qualifier, or as nondetected results with a "U" qualifier. The rationale for using data qualified as estimated (J/UJ) was based on EPA guidance (RAGS, Part A, Section 5.4.1). The reasons why these results were qualified estimated are found in the data validation checklists and are explained in the summary comments below. Since none of the cases involving "J" qualifiers involved QC problems severe enough to imply that the presence or absence of a compound is in doubt or that the magnitude of bias or imprecision was extremely high, "J"-qualified results are usable to render a confident decision on whether contamination should or should not trigger remediation or other action.
Which qualifiers represent unuseable data?	No analytical results were qualified as unusable or rejected ("R").
How are tentatively identified compounds handled?	Tentatively identified compounds (TICs) were evaluated during data validation to determine if any target compounds were inadvertently missed and to determine if any classes of chemicals were present that were not adequately represented by the concurrent identification of one or more analogous target compounds belonging to the same chemical class.
Summarize the effect of data validation and interpretation issues on the risk assessment, if applicable.	There were no other significant issues in data interpretation or data validation. Data qualified as estimated "J" included organics detected below the CRQL.
Additional notes:	No other problems were noted.

Note: The purpose of this Worksheet is to succinctly summarize the data useability analysis and conclusions. Reference specific pages in the Remedial Investigation and/or the Risk Assessment text to further expand on the information presented here.

DATA USEABILITY WORKSHEET
Site: NWS Earle Site 46 (EPIC Site Q) – Military Sealift Command Firefighting School
Medium: Sediment

Activity	Comment
Field Sampling	
Discuss sampling problems and field conditions that affect data useability.	There were no apparent sampling or field problems that would affect data useability.
Are samples representative of receptor exposure for this medium (e.g. sample depth, grab vs composite, filtered vs unfiltered, low flow, etc.)?	Yes. Sediment sample results are representative of the pond area potentially impacted by discharges prior to installation of the oil-water separator upgrades. Sampling was conducted in December 1995 for TCL VOCs and SVOCs and TPH.
Assess the effect of field QC results on data useability.	Field QA/QC samples included trip, rinsate, and field blanks. Data validation was performed and did not reveal any evidence of QC blank contamination originating in the field.
Summarize the effect of field sampling issues on the risk assessment, if applicable.	There were no field sampling issues identified that should affect the risk assessment.
Analytical Techniques	
Were the analytical methods appropriate for quantitative risk assessment?	Yes. Samples were analyzed for organic compounds following Contract Laboratory Program (CLP) routine analytical methods. TPH analytical methods were used to evaluate evidence of contamination but not to estimate risks. TCL VOC and SVOC analyses include components of TPH with toxic properties.
Were detection limits adequate?	Yes. First, the laboratory achieved the CLP contract required quantitation limits (CRQLs) on a wet-weight and undiluted instrument level basis. However, the sediment sample contained high percent moisture and alkane hydrocarbon chromatographic interferences that necessitated extract dilution prior to analysis. This had a 30-fold impact on sample quantitation limits (SQLs). Detection limits were compared to risk-based RSLs to evaluate attainment of project goals. Benzo(b)fluoranthene, chrysene, and pyrene were found in sediment at levels roughly equal to 1/10 to 1/4 of SQLs. Although carcinogenic PAHs exhibited SQLs greater than residential soil RSLs, the residential soil RSLs are overprotective for sediment exposures in this case. The 1996 RI report's risk assessment assumed a 1/50 reduction in annual exposure frequency (7 days versus 350 days per year) for recreational sediment contact (Table 2-17) compared to residential soil contact (Table 2-14). Also, it would require at least 10 compounds present at a risk level of 1E-5 to exceed the 1E-4 cancer risk level goal. Therefore, cumulative

Activity	Comment
	cancer risk levels would be ensured to fall within the acceptable risk range even if carcinogenic PAH and VOC RSLs were adjusted by 10X (going from a 1E-6 to a 1E-5 cancer risk level) and further adjusted by 50-fold to account for less frequent/intermittent activity patterns for recreational sediment contact compared to residential soil contact. The net adjusted RSL concentrations would equate to detectable PAH concentrations in the sediment sample analysis. From the standpoint of protection of human health, the sample analysis of sediment achieved project goals in terms of adequate detection capability to measure sediment concentrations that would preclude unacceptable risks from recreational exposure. Several VOCs and SVOCs exhibited SQLs above ecological screening levels, However, the conclusions of the Ecological Risk Assessment (Section 29.8.5 of the RI report) noted that, "Epic Site Q contains little or no terrestrial habitat … The only habitat on the site is the aquatic habitat associated with the retention pond south of the fire fighting area". In addition, "No outlets for surface water exist in the pond and contaminant concentrations in pond sediments were not significantly elevated, which precludes contaminant contributions to the Mingamahone Brook watershed." Note that since 2006, a closed loop collection system contains the waters generated from the firefighting training exercises prior to sending them to an onsite facility for treatment and filtration prior to reuse. Therefore, the retention pond is no longer used.
Summarize the effect of analytical technique issues on the risk assessment, if applicable.	Sample quantitation limits were somewhat elevated due to alkane hydrocarbons and sediment percent moisture.
Data Quality Objectives	
Precision - How were duplicates handled?	Laboratory matrix spikes/matrix spike duplicates were analyzed as required by the methods. No field duplicates were collected at this NWS Earle site due to the limited number of sediment samples. Region II Data Validation Guidance was applied to evaluate precision.
Accuracy - How were split samples handled?	No split samples were collected.
Representativeness - Indicate any problems associated with data representativeness (e.g., trip blank or rinsate blank contamination, chain of custody problems, etc.).	Laboratory blanks revealed low level results for bis(2-ethylhexyl) phthalate, 2-butanone, acetone, and methylene chloride. Any associated sample results were qualified as nondetected ("U"). No chain of custody issues were noted. The overall quantity of data collected was evaluated to

DATA USEABILITY WORKSHEET (continued)
Site: NWS Earle Site 46 (EPIC Site Q) – Military Sealift Command Firefighting School
Medium: Sediment

Activity	Comment
	determine if project goals were satisfied, At Site 46, a biased sampling approach (i.e., "purposive" or "judgmental" sampling) was applied to determine if fire training operations have impacted sediment. EPA Data Useability Guidance (DUGS) states that purposive or judgmental sampling designs maybe be adequate to detect hot spots, which was the intent of the Site 46 investigation. Limited sampling was conducted to include the area that exhibited the greatest impact from operations, as described in the accompanying data useability narrative. As a result, the sediment data set is not necessarily representative of a truly unbiased mixture of impacted and unimpacted sediment locations for the entire pond, but does reflect conditions in the immediate proximity of the oil/water separator discharge where maximum impacts would occur from the outfall to the pond. This approach accomplishes the objective of estimating an upper range for potential human health risks from hypothetical sediment exposure, and is useable information because the findings of the risk assessment suggest that there are no unacceptable risks. Cancer risk levels were within the acceptable range (less than 1E-6, the lower limit of the acceptable risk range, as shown in Table 29-11 in the RI report). A second source of uncertainty is associated with the small sample data set. Only one sediment sample was collected in the area. Although sampling was focused to characterize the area where sediment impacts were greatest, the fact that only one sample was collected precludes using a statistical UCL to estimate risks.
Completeness - Indicate any problems associated with data completeness (e.g., incorrect sample analysis, incomplete sample records, problems with field procedures, etc.).	No problems were associated with data completeness.
Comparability - Indicate any problems associated with data comparability.	No problems are anticipated with data comparability due to the use of routine CLP methods of analysis.
Were the DQOs specified in the QAPP satisfied?	The DQOs specified in the QAPP were met with respect to the frequency and types of field QA/QC samples, use of proper field QC preventative measures (e.g., decontamination and sample handling), and achieving successful analysis of 100 percent of analytes in samples (No results were rejected out of the data set).
Summarize the effect of DQO issues on the risk assessment, if applicable.	There were no DQO issues identified that should affect the risk assessment. While the Site 46 RI investigation report was prepared in 1996, there were no problems encountered in reviewing the historical data to perform

Activity	Comment
	a data useability assessment because relevant reports and documentation were complete, including the work plan, the RI report and all its appendices, and data validation checklists and support documentation for all SDGs.
Data Validation and Interpretation	
What are the data validation requirements?	Data validation was conducted on 100 percent of the laboratory data following the Region II SOPs by Brown and Root Environmental's Wayne, PA office (now Tetra Tech, Inc., King of Prussia, PA). Field samples were qualified based on field QC sample results and laboratory QC results per SOP guidelines.
What method or guidance was used to validate the data?	Organic data were validated in accordance with the QAPP requirements, which refer to the Region II SOP for CLP Organic Data Review, Revision 5/93. TPH data were validated using the analogous requirements in the Region II SOP for Evaluation of Metals Data for CLP, Revision 1/92. The EPA Region 2 Data Validation checklists were completed by data validation chemists and a senior data validator reviewed and approved each validation report.
Was the data validation method consistent with guidance? Discuss any discrepancies.	All validation qualifiers were applied in accordance with Region II SOP guidelines cited above. Recent changes were made to EPA Region II organic data validation SOPs HW-33 and HW- 35, but this mainly affected thresholds to qualify (J/UJ), so data are usable.
Were all data qualifiers defined? Discuss those which were not.	Data qualifiers were defined in the footnotes to the analytical results tables.
Which qualifiers represent useable data?	Usable data were represented as positive results annotated with no qualifier or with a "J" qualifier, or as nondetected results with a "U" qualifier. The rationale for using data qualified as estimated (J/UJ) was based on EPA guidance (RAGS, Part A, Section 5.4.1). The reasons why these results were qualified estimated are found in the data validation checklists and are explained in the summary comments below. Since none of the cases involving "J" qualifiers involved QC problems severe enough to imply that the presence or absence of a compound is in doubt or that the magnitude of bias or imprecision was extremely high, "J"-qualified results are usable to render a confident decision on whether contamination should or should not trigger remediation or other action.

DATA USEABILITY WORKSHEET (continued)
Site: NWS Earle Site 46 (EPIC Site Q) – Military Sealift Command Firefighting School
Medium: Sediment

Activity	Comment
Which qualifiers represent unuseable data?	No analytical results were qualified as unusable or rejected (“R”).
How are tentatively identified compounds handled?	Tentatively identified compounds (TICs) were evaluated during data validation to determine if any target compounds were inadvertently missed and to determine if any classes of chemicals were present that were not adequately represented by the concurrent identification of one or more analogous target compounds belonging to the same chemical class.
Summarize the effect of data validation and interpretation issues on the risk assessment, if applicable.	There were no other significant issues in data interpretation or data validation. Data qualified as estimated “J” included organics detected below the CRQL.
Additional notes:	No other problems were noted.

Note: The purpose of this Worksheet is to succinctly summarize the data useability analysis and conclusions. Reference specific pages in the Remedial Investigation and/or the Risk Assessment text to further expand on the information presented here.

DATA USEABILITY WORKSHEET
Site: NWS Earle Site 46 (EPIC Site Q) – Military Sealift Command Firefighting School
Medium: Groundwater

Activity	Comment
Field Sampling	
Discuss sampling problems and field conditions that affect data useability.	There were no apparent sampling or field problems that would affect data useability.
Are samples representative of receptor exposure for this medium (e.g. sample depth, grab vs composite, filtered vs unfiltered, low flow, etc.)?	Yes. Groundwater sample results are representative of potential locations where runoff originating from the fire training area may have flowed through cracks in the containment pad or over a berm and infiltrated soil and eventually groundwater. Sampling was conducted in December 1995 for TCL VOCs and SVOCs and TPH.
Assess the effect of field QC results on data useability.	Field QA/QC samples included trip, rinsate, and field blanks, but these results were included within a different laboratory SDG report. Data validation was performed and did not reveal any evidence of QC blank contamination originating in the field.
Summarize the effect of field sampling issues on the risk assessment, if applicable.	There were no field sampling issues identified that should affect the risk assessment.
Analytical Techniques	
Were the analytical methods appropriate for quantitative risk assessment?	Yes. Samples were analyzed for organic compounds following Contract Laboratory Program (CLP) routine analytical methods. TPH analytical methods were used to evaluate evidence of contamination but not to estimate risks. TCL VOC and SVOC analyses include components of TPH with toxic properties.
Were detection limits adequate?	Yes. First, the sample quantitation limits (SQLs) achieved the CLP contract required quantitation limits (CRQLs) for low/medium concentration analysis as per the QAPP. In addition, SQLs were also compared to groundwater health-based criteria to evaluate attainment of project goals. For groundwater, the chief concerns are evaluating detection capability for compounds expected to be related to fire training activities (petroleum hydrocarbons) as well as compounds that were found in soil or sediment and which might leach to groundwater. Although groundwater SQLs exceeded risk-based RSLs for several VOCs and SVOCs, the detection limits for benzene, toluene, and xylenes were adequate to determine if concentrations were above MCLs. Also, benzene, toluene, and ethylbenzene were not detected in soils or sediment. A low level of xylene was found in sediment, and low levels of TCE, naphthalene, and

DATA USEABILITY WORKSHEET (continued)
Site: NWS Earle Site 46 (EPIC Site Q) – Military Sealift Command Firefighting School
Medium: Groundwater

Activity	Comment
	2-methylnaphthalene were found in soil. Focusing on those compounds found in soil/sediment, evaluation of groundwater sampling results revealed only naphthalene and 2-methylnaphthalene detected at levels below the SQLs, while TCE was not detected. In conclusion, groundwater analysis was able to demonstrate that VOCs associated with petroleum hydrocarbons did not exceed MCLs, and only trace levels of two low molecular weight PAHs were present in groundwater. Therefore, the groundwater analysis detection limits were adequate to characterize the magnitude of potential impacts related to fire training activities.
Summarize the effect of analytical technique issues on the risk assessment, if applicable.	There were no analytical technique issues that should affect the risk assessment.
Data Quality Objectives	
Precision - How were duplicates handled?	Laboratory matrix spikes/matrix spike duplicates were analyzed as required by the methods. No field duplicates were collected at this NWS Earle site due to the limited number of groundwater samples. Region II Data Validation Guidance was used to assess precision.
Accuracy - How were split samples handled?	No split samples were collected.
Representativeness - Indicate any problems associated with data representativeness (e.g., trip blank or rinsate blank contamination, chain of custody problems, etc.).	No problems were noted that impacted sample results associated with laboratory blanks or field QC blanks. No chain of custody issues were noted. The overall quantity of data collected was evaluated to determine if project goals were satisfied, At Site 46, a biased sampling approach (i.e., “purposive” or “judgmental” sampling) was applied to determine if fire training operations have impacted groundwater. EPA Data Useability Guidance (DUGS) states that purposive or judgmental sampling designs maybe be adequate to detect hot spots, which was the intent of the Site 46 investigation. One round of groundwater sampling was conducted at locations that would potentially exhibit the greatest impact from fire training operations, as described in the accompanying data useability narrative. Sample QHP03 was collected downgradient and near the oil/water separator, while sample QHP04 was collected near the holding tanks adjacent to the retention pond. Sample QHP03 was collected immediately east of the existing leach field. Groundwater samples were collected using hydropunch sampling methods, which is suitable for assessing whether or not a release has occurred but not for

Activity	Comment
	assessing quantitative risks from future tap water use of groundwater. Note that Site 46 has remained an actively used facility for conducting fire training operations since the 1996 RI and reports having all necessary operating permits and is inspected on a regular basis by the New Jersey Department of Environmental Protection (NJDEP).
Completeness - Indicate any problems associated with data completeness (e.g., incorrect sample analysis, incomplete sample records, problems with field procedures, etc.).	No problems were associated with data completeness.
Comparability - Indicate any problems associated with data comparability.	No problems are anticipated with data comparability due to the use of routine CLP methods of analysis.
Were the DQOs specified in the QAPP satisfied?	The DQOs specified in the QAPP were met with respect to the frequency and types of field QA/QC samples, use of proper field QC preventative measures (e.g., decontamination and sample handling), and achieving successful analysis of 100 percent of analytes in samples (No results were rejected out of the data set).
Summarize the effect of DQO issues on the risk assessment, if applicable.	There were no DQO issues identified that should affect the risk assessment. While the Site 46 RI report was prepared in 1996, there were no problems encountered in reviewing the historical data to perform a data useability assessment because relevant reports and documentation were complete, including the work plan, the RI report and all its appendices, and data validation checklists and support documentation for all SDGs.
Data Validation and Interpretation	
What are the data validation requirements?	Data validation was conducted on 100 percent of the laboratory data following the Region II SOPs by Brown and Root Environmental's Wayne, PA office (now Tetra Tech, Inc., King of Prussia, PA). Field samples were qualified based on QC measurement data per SOP guidelines.
What method or guidance was used to validate the data?	Organic data were validated in accordance with the QAPP requirements, which refer to the Region II SOP for CLP Organic Data Review, Revision 5/93. TPH data were validated using the analogous requirements in the Region II SOP for Evaluation of Metals Data for CLP, Revision 1/92. The EPA Region 2 Data Validation checklists were completed by data validation chemists and a senior data validator reviewed and approved each validation report.
Was the data validation method consistent with guidance? Discuss any discrepancies.	All validation qualifiers were applied in accordance with Region II SOP guidelines cited above. Recent

Activity	Comment
	changes were made to EPA Region II organic data validation SOPs HW-33 and HW- 35, but this mainly affected thresholds to qualify (J/UJ), so data are usable.
Were all data qualifiers defined? Discuss those which were not.	Data qualifiers were defined in the footnotes to the analytical results tables.
Which qualifiers represent useable data?	Usable data were represented as positive results annotated with no qualifier or with a "J" qualifier, or as nondetected results with a "U" qualifier. The rationale for using data qualified as estimated (J/UJ) was based on EPA guidance (RAGS, Part A, Section 5.4.1). The reasons why these results were qualified estimated are found in the data validation checklists and are explained in the summary comments below. Since none of the cases involving "J" qualifiers involved QC problems severe enough to imply that the presence or absence of a compound is in doubt or that the magnitude of bias or imprecision was extremely high, "J"-qualified results are usable to render a confident decision on whether contamination should or should not trigger remediation or other action.
Which qualifiers represent unuseable data?	No analytical results were qualified as unusable or rejected ("R").
How are tentatively identified compounds handled?	Tentatively identified compounds (TICs) were evaluated during data validation to determine if any target compounds were inadvertently missed and to determine if any classes of chemicals were present that were not adequately represented by the concurrent identification of one or more analogous target compounds belonging to the same chemical class.
Summarize the effect of data validation and interpretation issues on the risk assessment, if applicable.	There were no other significant issues in data interpretation or data validation. Data qualified as estimated "J" included organics detected below the CRQL.
Additional notes:	No other problems were noted.

Note: The purpose of this Worksheet is to succinctly summarize the data useability analysis and conclusions. Reference specific pages in the Remedial Investigation and/or the Risk Assessment text to further expand on the information presented here.